Attachment 1a

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CULTURAL RESOURCES REPORT COVER SHEET

Author: N. Sikes and C. Arrington
Title of Report: Archaeological Survey, Testing, and Monitoring at 45PI66, 45PI455, and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, DuPont, Washington

Date of Report: 4-14-2011

County(ies): Pierce Section: 26 Township: 19 N Range: 01E

Quad: Nisqually (1981) Acres: 25.3

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Export Files submitted? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☒ Yes ☐ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☒ Yes ☐ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☒ Yes # ☐ No

DAHP Archaeological Site #:

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- Please submit paper copies of reports ***unbound.***
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ARCHEOLOGICAL SURVEY, TESTING AND MONITORING AT 45PI66, 45PI455 AND 45PI773, DUPONT INDUSTRIAL PARTNERS, LLC, LOT Y PROJECT

CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

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Final – April 14, 2011

ABSTRACT

This cultural resources investigation was conducted where DuPont Industrial Partners, LLC plans to develop a multi-building industrial park on Lot Y in the City of DuPont, Pierce County, Washington. The approximately 25.3-acre project is located on private land known as Lot Y (Assessor's Property Tax Parcel No. 0119262019) situated within the city limits west of Center Drive and north of Sequalitchew Creek. The work was conducted under an Archaeological Excavation Permit approved by the Washington State Department of Archaeology & Historic Preservation (DAHP) on February 7, 2011 (Permit No. 2010-54). The fieldwork included a pedestrian survey and examination of subsurface sediments in a series of 125 shovel test probes and 22 geotechnical exploration pits placed within Lot Y. The work was monitored by a member of the Nisqually Tribe.

No evidence was found of two previously recorded historic archaeological sites (45PI66 Methodist Episcopal Mission site and 45PI455 9th U.S. Cavalry Bivouac site) and one flaked stone isolate (45PI773), except for two brick fragments within the boundaries of 45PI66. Nor was there any evidence of two other archaeological sites (45PI63 Railroad Dump #3 site and 45PI64 Burning Ground Dump site) formerly located within Lot Y that were completely removed a decade ago during hazardous materials remediation. Two surface historic archaeological sites (45PI01224 railroad track segment and 45PI01225 concrete platform) and one isolated kerosene can were identified during the fieldwork within Lot Y, but they are not considered significant. One additional archaeological site (45PI01226 set of bridge abutments) located north of Sequalitchew Creek but immediately outside of Lot Y was also recorded. Except for two brick fragments, one flat iron bar and one can, no portable artifacts were identified; no artifacts were collected.

No significant cultural properties will be affected by the project, and no further cultural resource action is warranted at this time. Should cultural resources be discovered during project implementation, an Unanticipated Cultural Resources Discovery Plan is attached as an appendix to this report. This report will be filed with the DAHP and a copy provided to affected Tribes.

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INTRODUCTION

Parus Consulting, Inc. (PCI) was retained by DuPont Industrial Partners, LLC to provide cultural clearance in accordance with prevailing Washington state laws for the proposed Lot Y project in the City of DuPont. An Archaeological Excavation Permit (Permit) was approved by the Washington State Department of Archaeology & Historic Preservation (DAHP) on February 7, 2011 (Permit No. 2010-54) (Appendix A).

The Permit was required because two historic archaeological sites (45PI66 Methodist Episcopal Mission site and 45PI455 9th U.S. Cavalry Bivouac site) and one prehistoric isolate (45PI773) are located within the Lot Y project area (Figures 1 and 2). In 1993, site 45PI66 was determined eligible for listing on the National Register of Historic Places (NRHP) under Criterion A. Site 45PI455 is considered potentially eligible for NRHP listing. Both sites are considered contributing elements to a proposed Nisqually-Sequalitchew Historic District. Prior archaeological investigations of sites 45PI66 and 45PI455 in 1989 and 2000 included backhoe peels, shovel tests, and block and unit excavations. In addition, a portion of 45PI455 was monitored during a hazardous materials remediation program. No surface evidence of these two sites or the isolate remained within Lot Y.

Two additional historic sites (45PI63 Railroad Dump #3 site and 45PI64 Burning Ground Dump site) located within Lot Y were determined not eligible for NRHP listing in 1993. Both sites were completely removed during hazardous materials remediation in 2000.

The services completed by PCI under the Permit include intensive-level pedestrian survey, subsurface testing, monitoring of geotechnical exploration pits, preparation of this report summarizing the cultural resources investigation and related forms recording newly identified resources, and completion of an Unanticipated Cultural Resources Discovery Plan.

PROJECT LOCATION AND DESCRIPTION

The project encompasses approximately 25.3 acres on private land known as Lot Y (Assessor's Property Tax Parcel No. 0119262019) located in the City of DuPont, Pierce County, Washington. Lot Y is located within the city limits west of Center Drive and north of Sequalitchew Creek. The Lot Y project area is situated within Section 26, Township 19 North, Range 01 East on the Nisqually 1981 USGS 7.5-minute topographic map (Willamette Meridian) (Figure 1).

The cultural resources excavations were conducted where the private landowner, DuPont Industrial Partners, LLC plans to develop a multi-building industrial park on Lot Y. The complex would include up to 12 buildings totaling approximately 340,000 square feet of building area, roadways, loading areas, approximately 650 parking spaces, and installation of underground utilities. Plans also include construction of a trail along the creek to the southwest of the industrial park.

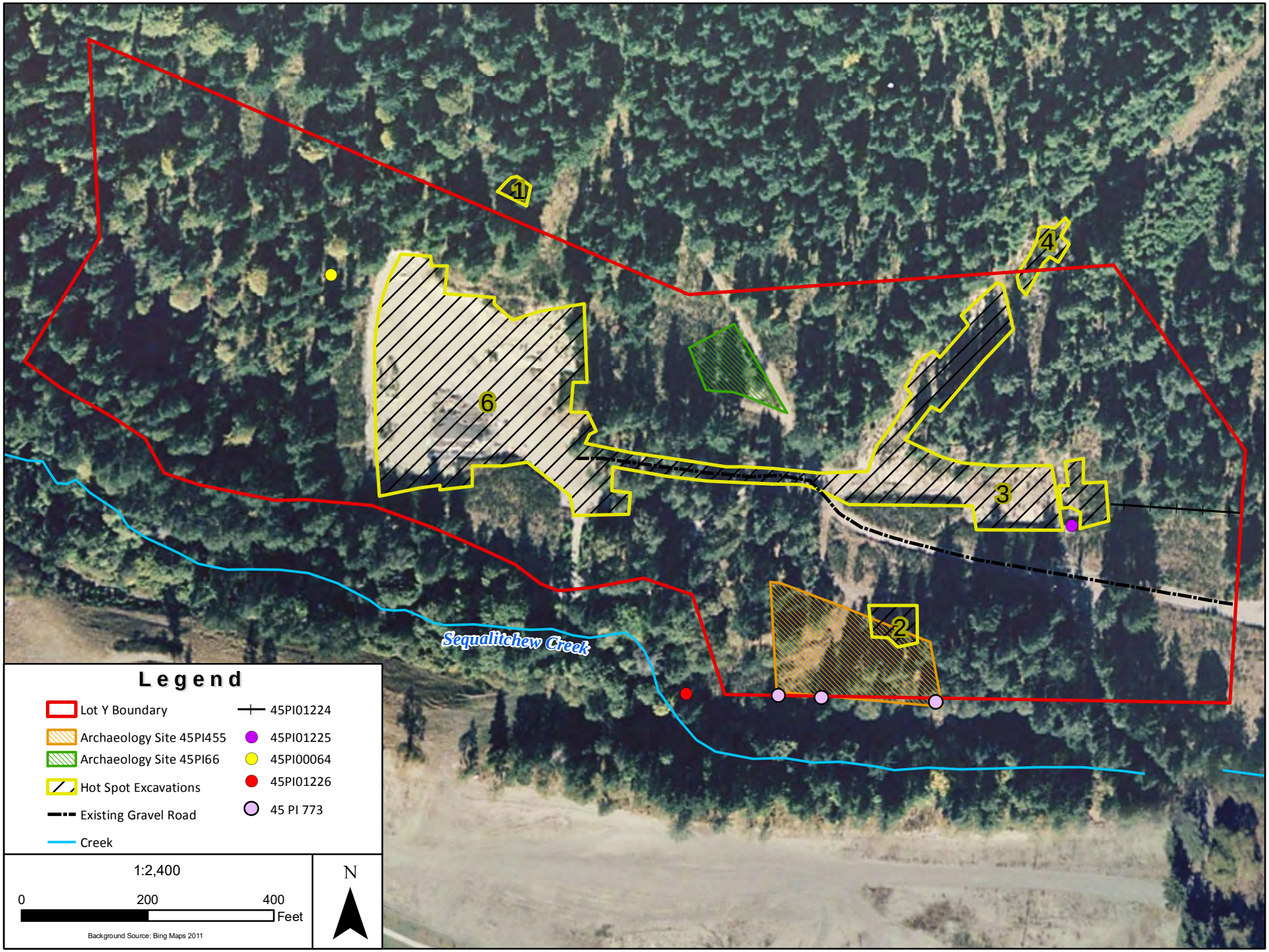
Plans for public access along the creekside trail to be constructed to the south of the industrial park include erection of an interpretive sign explaining the history of the temporary encampment within Lot Y of the 9th U.S. Cavalry Buffalo Soldiers. The content of the sign will include reference to the war games enacted by the large contingent of Buffalo Soldiers from Fort Walla Walla in 1904, and the discovery of the stables area at 45PI455, the 9th U.S. Cavalry Bivouac site along Sequalitchew Creek.

In addition, the existing the historical marker erected by the DuPont Company in 1927 at the site of the former Methodist Episcopal Mission (45PI66) will be retained on the property. The marker will be moved to the trailhead area where the public will have continued access to read about the history of the Mission, the first religious institution on Puget Sound, established in 1840.

Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Location Map

PARUS CONSULTING, INC.

Figure 1



Quad Name: Nisqually PR 1981

T19N, R 1E, Section 26

DuPont Lot Y: Archaeological Resource and Remediation Location Map

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Figure 2

REGULATORY SETTING

The Permit was completed pursuant to permit requirements found in the Washington Administrative Code (WAC) 25-48-060. There is no federal involvement in this project. The cultural resources investigation for the proposed project was conducted under prevailing Washington state laws, which serve to protect from known disturbance archaeological sites and Native American graves on both public and private lands. These laws include Executive Order 05-05, Indian Graves and Records (Revised Code of Washington [RCW] 27.44), Archaeological Sites and Resources (RCW 27.53), Archaeological Excavation and Removal Permit (WAC 25-48), and Discovery of Human Remains (RCW 27.44).

PROJECT SETTING

ENVIRONMENTAL SETTING AND DEPOSITIONAL CONTEXT

The project area is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973) approximately 0.8 mile east of the southern part of Puget Sound shoreline and north of Sequalitchew Creek. Sequalitchew Creek drains the Edmond's Marsh area about 0.3 mile southeast of the project, and empties into Puget Sound approximately 1.5 miles northwest of the marsh. The Puget Trough is a basin that lies between the Coast Range to the west and the Cascade Range to the east.

The geomorphology of the project area is largely the result of Pleistocene glaciations. The last advance of a continental glacier through the Puget Trough began approximately 20,000 years ago when the Cordilleran Ice Sheet moved south from British Columbia. By 15,000 years ago, the Puget Lobe of this ice sheet extended some 19 miles south of the present city of Olympia (Orr and Orr 1996). Similar to other southern Puget Sound lowlands, glacial outwash deposits comprise the area in and around the project region.

Over time, soils forms on the glacial outwash sediments, with the addition of wind-blown volcanic ash. Within the project area are the deep, somewhat excessively drained Spanaway gravelly sandy loam soils (41A), which formed on the gravelly outwash deposits on terraces and plains (Soil Survey Staff 2009). A typical soil profile for this series is an A horizon of gravelly sandy loam (0-14 inches), a B horizon of very gravelly sandy loam (14-18 inches), above a C horizon of extremely gravelly sand (18-60 inches), with the cobble content increasing down profile.

Puget Sound and the Cascade Range, west and east of the project, influence the regional climate. Characteristic climatic conditions for this region include wet, mild winters and warm, dry summers, with the majority of annual precipitation falling as rain between October and March (Franklin and Dyrness 1988). Native vegetation found throughout much of the Puget Trough province is the *Tsuga heterophylla* (western hemlock) forest (Franklin and Dyrness 1973:16–17, 88). In addition to western hemlock, forest trees include Douglas fir (*Pseudotsuga menziesii*), cedar (*Thuja plicata*), and alder (*Alnus rubra*), along with other species in valley bottoms or forest margins and a variety of understory plants, ferns, and mosses. Prairie and marsh vegetation was historically recorded in the project vicinity near Sequalitchew Creek and Edmond's Marsh.

The saltwater and freshwater resources of the Puget Sound, its bays and inlets attracted exploitation and settlement prior to historic logging and development of this rich, ecologically diverse region. Among the wildlife once common to the region are black bear, bobcat, cougar, deer, elk, raccoon, red fox, and snowshoe hare, as well as a variety of waterfowl, fish, and shellfish.

CULTURAL SETTING

Prehistoric Overview

Occupation in western Washington during the prehistoric period is estimated to have occurred as early as 12,000 years ago (Ames and Maschner 1999). Prehistoric material culture in western Washington has been categorized according to "horizons" or "periods" that define technological, economic, social and ideological elements (Ames and Maschner 1999). During the Paleoindian Period (dating to 12,500 BP and earlier), people are thought to have been highly mobile hunter-gatherers whose toolkit included fluted Clovis projectile points.

The Archaic or Early Period (12,500–5,000 BP) saw an increase in sedentism reflected in more kinds of stone tool types and evidence of permanent villages. Within the Puget Sound and Strait of Juan de Fuca, artifacts from this period are referred to as "Olcott" after the type site in Snohomish County (Nelson 1990). Increasing populations, an increase in reliance on marine resources, and more complex socio-economic organization, as well as the appearance of ground stone and bone tools in the archaeological record, characterizes the Middle Period (5,000–2,500 BP) in the Puget Sound (Ames and Maschner 1999; Matson and Coupland 1995). During the last 2,500 years, the Late Period is characterized by the development of craft specialization and social stratification, establishment of permanent winter villages, and an increased reliance on marine resources.

Ethnographic Overview

The project area is located in the traditional territory of the Puyallup Tribe who spoke the Puyallup Nisqually language of the Southern Coastal Salish language family. Their territory encompassed the Puyallup River drainage from Mount Rainier to Commencement Bay, and the uplands east of the Tacoma Narrows (Suttles and Lane 1990). Ethnographies indicate that the Puyallup relied on salmon as a dietary staple and secured additional natural resources from the surrounding saltwater, riverine and upland environmental settings. Their multi-family, plank-house villages were occupied during the winter months and typically situated adjacent to waterways. Smaller, seasonal camps were associated with hunting and gathering a variety of resources, including deer, elk, berries, and roots.

Ethnographic data indicate the Nisqually inhabited the area along the upper part of Sequalitchew Creek (Wessen et al. 2005, 2008). Sequalitchew Village was located at the mouth of the creek and described by the ethnographer as "where Dupont Creek enters the Sequalitcu River" (Smith 1940:8, 13). The village inhabitants would have pursued fishing, hunting and gathering from this winter village and from seasonal camps during the remainder of the year.

As part of the Medicine Creek Treaty of 1854, the Puyallup received a 1,280-acre tract extending along the high bluff from Commencement Bay to Point Defiance. By 1873, the reservation lands had been enlarged to 18,062 acres, and included lands on the southern and eastern side of Commencement Bay (Harmon 1995; Ruby and Brown 1986). Congress later established a commission to authorize sale of tracts with the Puyallup reservation, and by 1895 nearly half the acreage had been sold, including the waterfront properties.

Historic Overview

Euro-American history began in western Washington with the coming of explorers as early as the 16th century. In 1792, the expedition by British explorer George Vancouver first encountered Twana and other Southern Coast Salish when sailing up Hood Canal and Puget Sound. U.S. Navy Lt. Charles Wilkes explored Hood Canal in 1841, and named Suquamish Harbor (later Squamish Harbor) as well as Pit Passage (now Pitt Passage). By 1846, the United States owned what is now western Washington as the U.S.–British boundary was moved north to the 49th parallel. American settlers poured into the area that

was then known as the Oregon Territory, established in 1848, and the Donation Land Claim Act was passed in 1850. The arrival of the first transcontinental railroad in the 1880s served to fuel settlement and economic development.

In the project vicinity, the Hudson's Bay Company (HBC) established a small storehouse for their fur trade near the mouth of Sequalitchew Creek as early as 1832 (Carpenter 1986). The following year they erected a small fort immediately east, and 10 years later in 1843, a much larger fort complex was established approximately 0.75 miles farther east (known as Fort Nisqually). To meet the demands for export of agricultural and dairy products, the company had established the Puget's Sound Agricultural Company (PSAC) by 1838. The 1843 fort was constructed near the buildings and structures comprising this enterprise. Although the treaty with Great Britain had required the removal of the HBC from United States territory, HBC/PSAC traders, farmers and dairymen continued to occupy the 1843 Fort Nisqually complex, to raise crops and to produce dairy products until compensation was received from the U.S. government in 1869. The lands were then titled to the last clerk of the company, Edward Huggins.

During the years between the departure of HBC/PSAC in 1869 and the development of the DuPont Powder Works in 1906, the area was populated by American settlers. The homesteaders used the land for farming and livestock grazing. In 1904, the 9th U.S. Cavalry camped, stabled their horses, and conducted war games near and within the project area on the prairies between Sequalitchew and Steilacoom Creeks (see Moura 1991a:8-9). The troops camped within the project area along Sequalitchew Creek were designated the Second Brigade, Camp Nisqually. Under the command of Colonel Charles H. Noble, the camp contained about 2,000 soldiers from Fort Walla Walla. The 9th U.S. Cavalry troops were African-American, referred to as Buffalo Soldiers.

Two years later, the DuPont Powder Works was established on the land by the E.I. DuPont de Nemours Company (Munyan 1972). In addition to an explosives manufacturing plant, the DuPont facilities included a company town, docks along the Puget Sound shoreline, and a narrow-gauge railroad used to transport their products. The "Old Town" period represents the time of the construction and early operation of the DuPont Powder Works (1906 into the early 1920s). During this period, buildings were frequently constructed and demolished. The construction of roads and the railway network, the annual clearing and burning of underbrush, as well as relatively frequent explosions, resulted in extensive land disturbance.

When DuPont Powder Works closed in 1976, it was purchased by the Weyerhaeuser Company. Many of the production buildings were burned prior to release of the property to Weyerhaeuser to prevent detonation of undetected explosives. During the last 20 years, Quadrant Corporation (formerly Weyerhaeuser Real Estate Company) has developed the planned community known as Northwest Landing in the project vicinity.

Photograph 1 shows the narrow-gauge railroad built by the DuPont Powder Works above the south side of Sequalitchew Creek (outside and south of Lot Y). The train is moving the last load of black powder that had been manufactured by the plant and subsequently stored in a warehouse rented by the city. This last powder run occurred circa 1990 (personal communication, Fred Foreman).

Photograph 1. Last powder run on narrow-gauge (south side of Sequalitchew Creek)

PREVIOUS ARCHAEOLOGIAL RESEARCH

RESEARCH METHODS

A cultural resources search was performed for the project on October 21, 2010 using the DAHP electronic GIS database to gather archaeological information relative to reports and sites within and in the vicinity of the project area. This information was supplemented with archival research into the history of this region and of archaeological investigations in the immediate project vicinity. This assessment considered previous studies, the magnitude and nature of the undertaking, the nature and extent of potential effects on historic properties, and the likely nature and location of currently unknown archaeological resources within the project area.

During the fieldwork program between February 17 and March 4, 2011, PCI archaeologist Cindy Arrington conducted additional archival and oral history research. Archival research at the City of DuPont History Museum included discussions with Museum Director Johanna Jones on the area's history and review of numerous documents and photographs. A map of the DuPont Works drawn by E. Davies and dated March 15, 1955 shows the "Burning Ground" within the Lot Y project area and the system of roads and narrow-gauge and standard-gauge railroad tracks crisscrossing within the plant boundaries. The map also shows two bridges on Sequalitchew Creek immediately south of the project area, which were used by the company's narrow- and standard-gauge railroads. A digital version of this map was provided by Fred Foreman, a lifetime resident of the City of DuPont and a former part-time, summer DuPont Powder Works employee. Mr. Foreman gladly conveyed his enthusiasm and knowledge of the history of this region, and spent time with Ms. Arrington. In addition to the Davies map, Mr. Foreman also provided DVDs of archaeological investigations in 1989 of 1833 Fort Nisqually and of an informal visit to the Methodist Episcopal Mission site (45PI66) during removal of contaminated soil at nearby site 45PI64 (Burning Ground Dump site). Along with photographs obtained from DAHP of the hot spot archaeological monitoring program carried out a decade ago by Daugherty and Condon (2000), the video of hazardous waste removal provided a clearer picture of the landscape within Lot Y prior to re-shaping by heavy mechanical equipment while removing contaminated topsoil.

LOCAL ARCHAEOLOGICAL INVESTIGATIONS

The project vicinity is part of a complex cultural landscape with cultural resources dating from occupation of the area by Native Americans to historic period settlement—beginning in 1832 by the HBC with related agricultural activities started by the PSAC by 1838, and continuing through 70 years of industrial

development by the DuPont Company between 1906 and 1976. The following discussion focuses on studies within the former DuPont Powder Works property, which was acquired in 1976 by the Weyerhaeuser Company from E.I. DuPont de Nemours Company. As indicated in Table 1, several of these prior archaeological investigations have included all or portions of the current project area.

Table 1. Prior Cultural Resources Investigations within or near Project Area

Year	Author(s)	Report Title	Proximity to project
1977	Onat, A.R., Lee A. Bennett, and Timothy Riordan	Cultural Resources Survey: DuPont Site, Volume I, Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near Lot Y
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site	Within and near Lot Y
1989	Welch, Jeanne	A Cultural Overview and Comprehensive Management Plan for the DuPont Property, Pierce County, Washington	Within and near Lot Y
1990	Stilson, M. Leland	A Data Recovery Study of 45PI401, Hudson's Bay Dwellings at Northwest Landing, Pierce County, Washington	0.1 mile east
1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within
1991	Stilson, M. Leland	A Data Recovery Study of 45PI405, the 1843 Fort Nisqually Village at Northwest Landing, Pierce County, Washington	0.1 mile east
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the "Hot Spot" Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near Lot Y
2002	Maass, Alex	Interim Archaeological Monitoring Report for the Former DuPont Works Site, Parcel 1	Adjacent (to west)
2003	Maass, Alex	2002 Field Season Archaeological Monitoring Report for the Former DuPont Works Site, Parcel 1	Adjacent (to west)
2003	Wessen, Gary	Exploring the Boundary and Possible Interpretation of 45PI485	South of creek
2004	Wessen, Gary	Archaeological Testing at 45PI576, Former DuPont Works Site, City of DuPont, Pierce County, Washington	South of creek
2005	Dampf, Steven	Archaeological Monitoring Report for the 2003 and 2004 Field Seasons at the Former Dupont Works Site Parcel 1, City of DuPont, Pierce County, Washington	Adjacent (to west)
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near Lot Y
2006	Thompson, Gail	Archaeological Implementation Report for Remediation of Soils at the Former DuPont Works Site Parcel 1, City of DuPont, Pierce County, Washington	Adjacent (to west)
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near Lot Y

The first intensive survey of the 3,000 acres comprising the former DuPont Powder Works property was completed over 30 years ago. A total of 26 cultural resources were identified during the survey, including 8 prehistoric and 18 historic sites (Blukis Onat et al. 1977). Blukis Onat and others (1977) studied the prehistoric and ethnohistoric sites identified within the surveyed area, while Stratton and Lindeman (1977) completed archival research on the historic period resources. The 26 sites include 1833 Fort Nisqually (45PI55), 1843 Fort Nisqually (45PI56), and the Sequalitchew Village site (45PI54). The 1833 Fort Nisqually site, located slightly more than 0.5 mile west of Lot Y, was listed on the NRHP in 1974 and is also listed in the Washington Heritage Register (WHR). Located approximately 0.2 mile southeast of Lot Y, the 1843 Fort Nisqually site (45PI56) is considered eligible for NRHP listing. The Sequalitchew

Village site, a historic property, is located at the mouth of Sequalitchew Creek approximately 1.5 miles west of Lot Y and contains remnants of a shell midden. Burials associated with the village were recorded as a separate site (45PI76), since they are located on the opposite, north side of the creek from the village.

As discussed further below, of the 26 sites recorded by Blukis Onat et al. (1977), three are located within Lot Y (45PI63 Railroad Dump #3, 45PI64 Burning Ground Dump, and 45PI66 Methodist Episcopal Mission Site). An additional 12 sites (2 prehistoric and 10 historic) of those identified during the 1977 survey are located within 0.5 mile of but outside Lot Y.

The extensive disturbance of the entire DuPont property by construction of numerous roadways and narrow-gauge railroad tracks, as well as the operations of the explosives manufacturing plant, was discussed in the report by Blukis Onat et al. (1977:57) and they recommended a more intensive survey might identify additional archaeological sites. Over ten years later, the former DuPont property was resurveyed again as part of the development of a Cultural Resources Management Plan for the Weyerhaeuser Company by Jeanne Welch (Welch 1989a). Each of the archaeological sites identified during the survey by Blukis Onat et al. (1977) was relocated, including the three within Lot Y (45PI63, 45PI64, and 45PI66). More intensive survey was accomplished in 1988 in areas planned by Weyerhaeuser for well or reservoir construction, or for logging, and the work included a testing and evaluation program developed to determine the significance of known cultural resources. Backhoes were used for sod removal in vegetated areas and for exploratory trenching.

The archaeologists also completed a testing program to identify significant cultural resources within the planned corridor for construction of Center Drive (Welch 1989a:4.2, 4.4). Center Drive trends north-south and is located 0.1 mile east of Lot Y. Two sites within the right-of-way of Center Drive on the north and south sides of Sequalitchew Creek were identified (45PI401 and 45PI405) (Welch 1989a, 1989b, 1989c). The sites are located just outside the west palisade wall of 1843 Fort Nisqually (45PI56). Each site contains the remains of HBC/PSAC dwellings, and a large number of historic as well as prehistoric artifacts were recovered from 45PI401 and 45PI405 during initial testing and subsequent data recovery excavations (Welch 1989a; Stilson 1990, 1991). The two sites are located only a short distance from Lot Y, approximately 0.1 mile to the east, and are discussed in more detail below.

Archaeological test excavations within Lot Y were conducted in 1989 by Guy Moura to identify the precise location of the buildings within the Methodist Episcopal Mission Site (45PI66), and to test the significance of Railroad Dump #3 (45PI63) (Moura 1991a; also see Daugherty and Condon 2001:Part I). He was also hired to investigate a third area within Lot Y where historic accounts indicated the 9th U.S. Cavalry had camped during military maneuvers in 1904 (later designated 45PI455) (Moura 1991a, 1991b; also see Daugherty and Condon 2001:Part I). Moura completed a series of backhoe peels, shovel test probes, and block and unit excavations within and near the boundaries of 45PI63, 45PI66, and 45PI455.

Under a Consent Decree signed in 1991 by the Washington State Department of Ecology, E.I. DuPont de Nemours Company and Weyerhaeuser Company, DuPont and Weyerhaeuser were jointly responsible for cleaning up an 841-acre tract, which had been contaminated by the former industrial explosives manufacturing facility (Thompson 2006:4). Archaeological monitoring of soil remediation activities and related archaeological investigations were carried out between 2001 and 2004. Detailed information on the monitoring is contained in reports by Alex Maass (2002, 2003) and Steven Dampf (2005). A large prehistoric chipped stone scatter (45PI576) was identified south of Sequalitchew Creek and south of Lot Y (Thompson 2006:21, 32). Two small projectile points suggest the site was occupied during the past 2,000 years, although the overall assemblage indicates there may be an older component. Because of the low density of artifacts recovered from testing in a highly disturbed setting, the site was recommended ineligible for NRHP listing. Two prehistoric isolates were also recorded south of the creek and

approximately 50 meters east of 45PI576. HRA 30a-d included one core, one flake, and two edge-modified flakes; HRA 31a-d included four basalt flakes (Thompson 2006:22).

Lot Y was included within the acreage under the Consent Decree requiring remediation of hazardous materials (mainly lead and arsenic contaminated soil) contained within the former DuPont property, and additional archaeological investigations revolved around remedial activities. The removal of contaminated soil in "hot spot" areas within Lot Y was monitored by archaeologists in 1999 and 2000, and included segments of the narrow gauge railroad tracks, Railroad Dump #3 (45PI63), the Burning Ground Dump site (45PI64), and a portion of the 9th U.S. Cavalry Bivouac site (45PI455) (Daugherty and Condon 2000:7) (Figure 2). After clearing and grubbing, excavation of the hot spots generally achieved a depth of 46 centimeters below surface (cmbs) (18 inches). The area around removal of a designated hot spot was expanded by 25 feet in each cardinal direction so the initial excavation area around a hot spot measured at least 50x50 feet.

During remediation activities, a historic debris deposit associated with the 1843 Fort Nisqually complex was identified to the south of Sequalitchew Creek. Southeast of Lot Y and near the two previously recorded HBS/PSAC dwelling sites (45PI401 and 45PI405), the deposit was recorded as 45PI485 (Daugherty and Condon 2000).

A comprehensive document reporting on the subsurface testing or hot spot monitoring at the four known sites within Lot Y (45PI63, 45PI64, 45PI66, and 45PI455) was completed the following year (Daugherty and Condon 2001:Parts I and II). Part I of that document is Moura's report on the test excavations completed in 1989 at 45PI63, 45PI66, and 45PI455 (also see Moura 1991a, 1991b). Part II of that document reproduced and updated the information at all four sites from the hot spot removal program reported by Daugherty and Condon (2000).

Beginning in 1993, Richard Daugherty evaluated the significance of a number of the archaeological sites within the former DuPont Powder Works property and prepared National Register nomination forms for them. These included the four sites within Lot Y (45PI63, 45PI64, 45PI66, and 45PI455), as well as the two HBC/PSAC dwelling sites east of Lot Y (45PI401 and 45PI405), discussed below.

In January 2005, during a survey for the proposed expansion of an existing gravel mine, the four sites (45PI63, 45PI64, 45PI66, and 45PI455) previously recorded in the project area were relocated, but no effort was made to further investigate them since each had been previously evaluated (Wessen et al. 2005:15). No potentially significant archaeological sites were newly identified during the surface survey, and it was decided to investigate the areas close to Sequalitchew Creek by subsurface testing. The subsequent recovery of four pieces of chipped stone debitage from a series of shovel test probes was recorded as a prehistoric isolate (45PI773) (Wessen et al. 2005, 2008) (Figure 2).

PREVIOUSLY RECORDED CULTURAL RESOURCES NEAR PROJECT AREA

As noted above, 12 (2 prehistoric and 10 historic) of the 26 sites recorded by Blukis Onat et al. (1977) are located within 0.5 mile of but outside Lot Y (Table 2). As shown in the table, an additional 13 sites (2 prehistoric and 11 historic) and 5 isolates (2 prehistoric and 3 historic) have been previously recorded within 0.5 mile of but outside Lot Y. According to the records, one historic (45PI58) and one prehistoric site (45PI75) may have never existed. The three remaining pre-Contact sites include two burial sites (45PI77, 45PI404) and a chipped stone scatter (45PI576).

The previously recorded historic sites are mainly associated with the HBC/PSAC era and the Old Town period. The Old Town period represents the time of the construction and early operation of the DuPont Powder Works (1906 into the early 1920s). Eight of the historic-era sites are associated with the earlier HBC/PSAC period (1832–1869). These include 1843 Fort Nisqually (45PI56), the remains of

ethnohistoric men's dwelling houses (45PI74), three burial sites (45PI78, 45PI413, 45PI451), two sites with house foundations and artifacts (45PI401, 45PI405), and a debris deposit (45PI485). The artifacts from one site (45PI563) date from both the HBC/PSAC and Old Town periods.

Seven of the previously recorded sites are attributed to the DuPont Powder Works Old Town period. These include a men's boarding house (45PI57), the Old Town dump (45PI59), a domestic trash dump (45PI60), two debris deposits or scatters associated with the narrow gauge railroad that transported the explosives (45PI61, 45PI62), the munitions plant (45PI70), a remnant of a dirt road (45PI441), and a recently recorded non-functional segment of narrow-gauge railroad track and berm (45PI01224). 45PI01224 was identified during survey in 2010 of the 12.8-acre property (known as Lot X) adjacent to the eastern edge of Lot Y (Sikes and Arrington 2010). The narrow-gauge track and berm continue to the west beneath a chain-link fence into Lot Y.

One of the historic period sites is the garbage dump (45PI448) used by the city of DuPont from 1927 to 1946. The two remaining historic-era sites include one with 100 to 200-year old human skeletal fragments (45PI712) and a debris scatter with artifacts ranging in age from 1916 to the mid-1960s (45PI783).

The two prehistoric isolates identified within the 0.5 mile radius were recorded south of Sequalitchew Creek during archaeological monitoring of soil remediation activities within the Consent Decree area (Thompson 2006:22). The isolates are located approximately 50 meters east of 45PI576, a large prehistoric chipped stone scatter south of the creek and south of Lot Y. HRA 30a-d included one core, one flake, and two edge-modified flakes; HRA 31a-d included four basalt flakes.

The three historic-era isolates were identified recently during the recent survey of Lot X (Sikes and Arrington 2010). The isolates are located approximately 400 feet east of Lot Y. GEO Isolate #1 is a surface pile of 51 railroad spikes; GEO Isolate #2 is a pile of broken, formed aggregate concrete chunks; and GEO Isolate #3 is a scatter of milled lumber.

Of the previously recorded sites within the 0.5 mile radius outside Lot Y, three are considered eligible for NRHP listing: the 1843 Fort Nisqually site (45PI56) and the two HBC/PSAC dwelling sites (45PI401, 45PI405). The latter two sites are also considered contributing elements to the proposed Nisqually-Sequalitchew Historic District (Point Nisqually Defense Fund 2003) (see discussion below).

Outside the 0.5 mile radius, nearby historic properties include 1833 Fort Nisqually (45PI55), the Sequalitchew Village Site (45PI54), the DuPont Village Historic District, and Fort Lewis. Throughout its period of significance (1917–1948), Fort Lewis was one of the preeminent U.S. Army training posts. The DuPont Village Historic District encompasses the 43-acre company town developed by E.I. DuPont de Nemours Company between 1906 and 1915. The district is located less than 1 mile southeast of Lot Y.

Table 2. Previously Recorded Resources within 0.5 Mile of Project Area

Site No.	Brief Description	Historic Period	Recorded by and year	NRHP Eligibility
45PI00056	Historic 1843 Fort Nisqually (1832-1869)	HBC/PSAC	Riordan 1977; Daugherty 1993 NRHP form	Eligible
45PI00057	Historic men's boarding house, DuPont era; destroyed	Old Town	Riordan 1977; Daugherty 1993 NRHP form	Not eligible
45PI00058	Site recorded as historic brick yard dump but it never existed	n/a	Riordan 1977; Daugherty 1993 NRHP form	Not eligible
45PI00059	Historic Old Town dump, 1906-1909	Old Town	Riordan 1977; Daugherty 1993 NRHP form	Not eligible

Site No.	Brief Description	Historic Period	Recorded by and year	NRHP Eligibility
45PI00060	Historic domestic trash dump, DuPont Powder Works, 1906-1909	Old Town	Riordan 1977; Daugherty 1993 NRHP form	Not eligible
45PI00061	Historic railroad or domestic debris deposit	Old Town	Riordan 1977; Daugherty 1993 NRHP form	Not eligible
45PI00062	Historic railroad debris deposit, ca. 1906-1909	Old Town	Riordan 1977; Daugherty 1993 NRHP form	Not eligible
45PI00070	Historic DuPont munitions plant, ca. 1906	Old Town	Riordan 1977	Not determined
45PI00074	Ethnographic men's dwelling houses, 1844-1869, Fort Nisqually	HBC/PSAC	Blukis Onat 1977; Daugherty 1992; Daugherty 1993 NRHP form	Not determined
45PI00075	Site recorded as a prehistoric midden at DuPont crystallizer but it never existed	n/a	Blukis Onat 1977; Daugherty 1993 NRHP form	Not eligible
45PI00077	Old Fort Lake Graves	Pre-Contact	Blukis Onat 1977	Not determined
45PI00078	Historic 1843 Fort Nisqually burial	HBC/PSAC	Blukis Onat 1977	Not determined
45PI00401	Historic Hudson's Bay house; historic and prehistoric artifacts; ca. 1845-1869	HBC/PSAC	Welch 1988; Daugherty 1993 NRHP form	Eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00404	Pre-Contact Nisqually Indian Burial Site	Pre-Contact	Welch 1988; Daughtery and Wessen 1988	Not determined
45PI00405	Historic Hudson's Bay house foundations, historic and prehistoric artifacts, ca. 1845-1869	HBC/PSAC	Welch 1988; Daugherty 1993 NRHP form	Eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00413	Historic Native American cemetery, 1840-1870	HBC/PSAC	Daugherty 1991	Not determined
45PI00441	Historic dirt road remnant, 1846	Old Town	Solimano 1996	Recommended not eligible
45PI00448	Historic City of DuPont garbage dump, 1927-1946	DuPont	Daugherty 1996; Daugherty 1996 NRHP form	Not eligible
45PI00451	Historic Lone Fir grave site, 1850	HBC/PSAC	Daugherty 1997	Not determined
45PI00485	Historic debris deposit, ca. 1840-1870	HBC/PSAC	Daugherty 2000; Wessen 2002	Not determined
45PI00563	Historic debris scatter, 1843-1930s	HBC/PSAC and Old Town	Chesmore 2001, 2002; Wilson 2002 NRHP form	Not eligible
45PI00576	Prehistoric chipped stone scatter	prehistoric	Wessen 2004	Recommended not eligible
45PI00712	Human skeletal fragments, ca. 100-200 yrs old		Wessen 2003	Not determined
45PI00783	Historic debris scatter, 1916-1964		McKillop 2007	Not eligible
45PI1224	Historic railroad track and berm, 1906-1920s	Old Town	Arrington 2010	Not eligible
GEO Isolate #1	Historic isolate (railroad spikes)		Arrington 2010	Not eligible
GEO Isolate #2	Historic isolate (concrete chunks)		Arrington 2010	Not eligible

Site No.	Brief Description	Historic Period	Recorded by and year	NRHP Eligibility
GEO Isolate #3	Historic isolate (milled lumber)		Arrington 2010	Not eligible
HRA 30a-d	Prehistoric isolate (core, 3 flakes)		Thompson 2006	Not eligible
HRA 31a-d	Prehistoric isolate (4 flakes)		Thompson 2006	Not eligible

PREVIOUSLY RECORDED SITES AND ISOLATE WITHIN PROJECT AREA

One prehistoric isolate (45PI773) and four historic archaeological sites (45PI63 Railroad Dump #3, 45PI64 Burning Ground Dump, 45PI66 Methodist Episcopal Mission Site, and 45PI455 9th U.S. Cavalry Bivouac site) have been previously recorded within the project area (Table 3; Figure 2). One of the historic sites (45PI66) is associated with the HBC/PSAC era (1832-1869) and one (45PI63) with the Old Town period (1906–early 1920s). Site 45PI64 is associated with later operation of the explosives manufacturing plant from the 1930s until the plant closed in 1945. Temporary occupation by the 9th U.S. Cavalry (45PI455) occurred in 1904 between the HBC/PSAC and Old Town periods.

Site 45PI66 has been determined eligible for listing on the NRHP, and site 45PI455 is potentially eligible. These two sites are also encompassed within the proposed Nisqually-Sequalitchew Historic District as contributing elements. The district is still pending approval.

Of the four previously recorded sites within Lot Y, two (45PI63 Railroad Dump #3 site and 45PI64 Burning Ground Dump site) had been determined not eligible for NRHP listing and were completely removed during hazardous materials remediation in 1999 and 2000 (Daugherty and Condon 2000, 2001). These former sites were located within two of the cleared hot spots (HS-4 and HS-6) shown on Figure 2.

Although not located within Lot Y, this section and Table 3 include discussion of two additional sites that contain artifacts or features representing former HBC/PSAC dwellings associated with 1843 Fort Nisqually. The two sites, 45PI401 and 45PI405, are located on the north and south banks of Sequalitchew Creek approximately 0.1 mile east of Lot Y. The sites also contain a large number of chipped stone artifacts.

The history of archaeological investigations at each of these resources within and near Lot Y is presented below.

Table 3. Previously Recorded Cultural Resources within and near Project Area

Site No.	Brief Description	Historic Period	Recorded by and year	Prior Reports	NRHP Eligibility
Sites and Isolate Recorded within Project Area					
45PI00063	Historic debris deposit, two loci along railroad, 1910-1930; removed during soil remediation	Old Town	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Moura, 1991a; Daugherty and Condon, 2001	Not eligible
45PI00064	Historic DuPont Powder Works burning ground dump, 1930s-1945; removed during soil remediation	DuPont	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Daugherty and Condon, 2000, 2001	Not eligible

Site No.	Brief Description	Historic Period	Recorded by and year	Prior Reports	NRHP Eligibility
45PI00066	Historic 1840-1842 Methodist Episcopal Mission	HBC/PSAC	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al. , 1977; Welch, 1989a; Moura, 1991a; Daugherty and Condon, 2000, 2001	Eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00455	Historic 9th U.S. Cavalry Bivouac, Camp Nisqually, 1904;partially removed during soil remediation	Between HBC/PSAC and DuPont	Daugherty, 1997; Daugherty, 1997 NRHP form	Moura, 1991a, 1991b; Daugherty and Condon, 2000, 2001	Potentially eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00773	Prehistoric chipped stone isolate	n/a	Wessen, 2005	Wessen et al., 2005, 2008	Not eligible
Sites Recorded near Project Area					
45PI00401	Historic Hudson's Bay house; historic and prehistoric artifacts; ca. 1845-1869; destroyed during bridge construction	HBC/PSAC	Welch, 1988; Daugherty, 1993 NRHP form	Welch, 1989a; Stilson, 1990	Eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00405	Historic Hudson's Bay house foundations, historic and prehistoric artifacts, ca. 1845-1869; destroyed during road partially construction	HBC/PSAC	Welch, 1988; Daugherty, 1993 NRHP form	Welch, 1989a; Stilson, 1991	Eligible, included in proposed Nisqually-Sequalitchew Historic District

45PI63 Railroad Dump Site

This site was initially recorded by Timothy Riordan as Railroad Dump #3 during the survey of the former DuPont Powder Works property by Blukis Onat et al. (1977). The dump is located at the junction of two narrow-gauge railroad tracks from the DuPont Powder Works Old Town period. Recorded in two distinct loci (A and B, each of which was approximately 10 meters in diameter), a dirt road developed after the track was abandoned may have split the debris deposit.

Material from the site mainly dates between 1910 and 1930 (the Old Town period) and includes mainly domestic ceramic and glass fragments, with a few nails and fabric remnants (Daugherty and Condon 2001; Moura 1991a; Daugherty 1993a). Over 260 artifacts were collected in 1989, mainly from the ground surface along the tracks, with only a single 1x1 meter test unit excavated in Area B (Moura 1991a:13-17). Additional artifacts were recovered during subsequent soil remediation activities in loci A and B (Daugherty and Condon 2001:32-46). The recovery of mainly domestic items led Daugherty and Condon (2001:46) to conclude that occupants of Old Town had used 45PI63 as a dump.

In 1993, the State Historic Preservation Officer (SHPO) determined site 45PI63 ineligible for NRHP listing (see October 19, 1993 memorandum and NRHP Determination of Eligibility Form). The site has been extensively looted (Welch 1989a:4.20; Thompson 2006:27), and prior to soil remediation, there had been extensive damage to the site by logging and railroad construction. No treatment measures were required during soil remediation, which removed the entire site (Daugherty and Condon 2001:46). Prior to removal, 45PI63 was located in the area on Figure 2 marked as HS-4.

45PI64 Burning Ground Dump Site

This site was initially recorded by Timothy Riordan during the survey of the former DuPont Powder Works property by Blukis Onat et al. (1977). At the location of a former black powder manufacture and storage building, site 45PI64 was used as a dump where hazardous and non-hazardous waste from the manufacturing plants at the DuPont Powder Works was discarded and burned. The site was used as a burning ground dump from the 1930s until the black powder mill was closed in 1945. The “Burning

Ground" is clearly shown on the 1955 map of the DuPont Works drawn by E. Davies. Prior to turning the property over to Weyerhaeuser, DuPont systematically dynamited this site to prevent detonation of undetected explosives (Thompson 2006:30).

Due to contamination by hazardous waste, archaeological work within site 45PI64 was not permitted. In 1993, the SHPO determined the site ineligible for NRHP listing (see October 19, 1993 memorandum and NRHP Determination of Eligibility Form). Archaeological monitoring during a program to remove "hot spots" or contaminated soils was conducted at the site in 2000 (Daugherty and Condon 2000), and the entire area (approximately 3,000 square feet) was removed during the subsequent hot-spot treatment program (Daugherty and Condon 2001:47, 50). Prior to removal, 45PI64 was located in the large cleared area marked as HS-6 on Figure 2.

Although former site 45PI64 was near the historical marker for the Methodist Episcopal Mission (45PI66), no evidence of the Mission building or stockade or of prehistoric or historic cultural materials were identified during hot spot removal, with the exception of contaminated, broken tools and hardware from the DuPont operation.

45PI66 Methodist Episcopal Mission Site

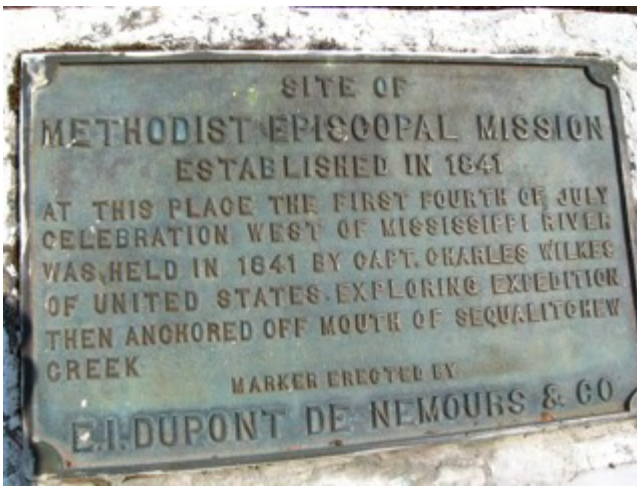
Initially recorded during the survey by Blukis Onat et al. (1977), this site has been determined eligible for NRHP listing under Criterion A (association with significant events) (NRHP Determination of Eligibility Form dated September 29, 1993). The site is not considered eligible under Criterion D (data potential) because it has been extensively disturbed by road and railroad construction and there has been little recovery of archaeological material during testing. Site 45PI66 also contributes to the proposed Nisqually-Sequalitchew Historic District (see below).

The Methodist-Episcopal Mission and associated school were founded in 1834 on land provided by the HBC. The goal was to convert and educate the Native Americans camping at Fort Nisqually (Carpenter 1986:98-99). Construction of the Mission buildings began in 1839 and a missionary group began services the following year. Several outbuildings and a garden were contained within the Mission grounds, which were surrounded by a stockade and located approximately 0.5 mile from the fort. The Mission building measured 18 feet wide by 32 feet long and 9 feet high, and an addition was constructed on the west side. The Mission was not successful, was abandoned in 1842, and later destroyed by fire. The land was also used for agriculture and in 1904 it was temporarily occupied by the military on training maneuvers. In 1927, the DuPont Company erected a historical marker at the site of the former Mission—the first religious institution on Puget Sound (Photographs 2 and 3).

Archaeological investigations (backhoe peels, shovel tests, 1x2 meter units) around the historical marker were conducted in 1989 (Welch 1989a; Moura 1991a). Some 29 backhoe peels were made in the area surrounding the bronze marker, but no evidence of the former Mission building was uncovered and additional testing was recommended (Welch 1989a:4.1, 4.22). Moura's team recovered chimney stones, 2 square nails, 3 window glass and 9 bottle glass fragments, and a couple pieces of ceramic (Moura 1991a:6-8). Excavation efforts (55 shovel tests and four 1x2 meter units) were stopped by 25 cmbs (0.8 feet) when sterile gravels were encountered, similar to other sites in this vicinity.

Moura (1991a:8) considered the accumulated evidence supported his contention that the Methodist-Episcopal Mission had been found. He also noted that the ashy matrix with brick, bone, and charcoal flecks in the excavation units above 25 cmbs (0.8 feet) at 45PI66 mimics that identified at the nearby HBC/PSAC dwellings site (45PI405) as hearth and chimney remnants, as discussed in the data recovery report on that site by Stilson (1991). Site 45PI405 is associated with the 1843 Fort Nisqually.

Photograph 2. Marker at Methodist-Episcopal Mission Site (45PI66)



Photograph 3. Text of 1927 marker erected by the DuPont Company (plan view)

Eleven years later, contrary to expectations, no evidence of the Mission building or stockade was identified during archaeological monitoring of contaminated soil removal at nearby site 45PI64 (Burning Ground Dump site) (Daugherty and Condon 2000; Daugherty and Condon 2001:47-48). Although chimney stones were identified at 45PI66 during the testing by Moura in 1989, archaeologists have debated about whether the stones and other artifacts identify the exact location of the Mission building. Daugherty and Condon (2001:48), for example, believe Moura's results are equivocal, although they do state "there appears to be little question that the actual location of the Mission is within a few hundred yards or so of the monument" erected by the DuPont Company.

45PI455 9th U.S. Cavalry Bivouac Site

Historic records indicate about 2,000 men were bivouacked at "Camp Nisqually" for a few months in 1904. The 9th U.S. Cavalry (also known as Buffalo Soldiers) practiced mock battles at the edge of the prairie north of Sequalitchew Creek. After the mock battles ended, the camp and surrounding area were cleared and the refuse burned before the troops departed for return to Fort Walla Walla.

Archaeological investigations (backhoe peels, block and unit excavations) within a 120 square meter area conducted by Moura in 1989 recovered over 800 artifacts and 170 small, burned animal bone fragments (deer, sheep/goat food remains) below the surface (Moura 1991a, 1991b). The artifacts include horseshoes, horseshoe nails, horse teeth, harness tackle, square and wire nails, burned bone fragments, a 1901 dime, and a 1903 rifle cartridge, all associated with the cavalry encampment. Liquor bottles and shotgun shells date to late 19th century use of the area, while prehistoric occupation is evidenced by chipped stone tools (2 knives) and debitage (5 flakes) made from a variety of toolstone (petrified wood, chert, and basalt). Two railroad spikes date to after the DuPont Powder Works was established in 1906. Similar to other sites in this vicinity, sterile gravels were encountered within 30 cmbs (1 foot) (Moura 1991a:9, 1991b:1). There was no surface evidence of the site.

A site number (45PI455) was assigned to the 9th U.S. Cavalry Bivouac area following the test excavations completed by Moura in 1989. The site measures approximately 225 by 100 meters (738 by 328 feet), and historic documentation indicates the artifact assemblage represents the temporary stable area (Moura 1991a:12, 1991b:5). In 1998, State Archaeologist Robert Whitlam indicated this site is potentially eligible for NRHP listing and recommended further work to define the boundaries of the Native American and Buffalo Soldier occupations (letter to Richard Daugherty dated February 17, 1998). Site 45PI455 is also

considered potentially eligible for NRHP inclusion as part of the proposed Nisqually-Sequalitchew Historic District (see below).

Additional work at site 45PI455 during archaeological monitoring of contaminated soil removal uncovered no further evidence of this brief occupation by the Buffalo Soldiers (Daugherty and Condon 2000, 2001). Although the bivouac area was encompassed within the targeted hot spots (HS-2 on Figure 2), the remediation program did not include the "stable" area excavated by Moura in 1989 (Moura 1991a, 1991b).

45PI773 Prehistoric Chipped Stone Isolate

This chipped stone isolate was recorded in 2005 by Gary Wessen during survey and excavation of subsurface shovel test probes along Sequalitchew Creek for the proposed expansion of an existing gravel mine (Wessen et al. 2005, 2008). The isolate consists of a total of four pieces of debitage (one complete secondary flake and three flake fragments) manufactured from basalt or dacite. The material was encountered within an approximately 40 x 30 meter area, with one artifact close to the surface in a previously disturbed, very dark brown gravelly sandy loam. The remaining three artifacts were recovered potentially in situ between 30 and 50 cmbs (1-1.6 feet) in a dark yellowish brown gravelly sandy loam.

The archaeologists had placed a series of 31 shovel test probes in this area, 26 of which were arranged at 10-meter intervals along a single east-west trending line located approximately 5 meters north of the northern edge of the creek (Wessen et al. 2008:29). The four pieces of chipped stone were recovered from a section of the test line that was approximately 40 meters long. Of the five probes in the section, four contained a flake or flake fragment. None of the four probes contained more than one artifact. Five additional shovel test probes were excavated in three lines extending northward away from the creek, but no artifacts were recovered. Each probe measured approximately 30 to 38 cm in diameter.

The soil profile in the vicinity of the chipped stone isolate is described as having three strata (Wessen et al. 2008:30). The upper stratum is a very dark brown (10YR 2/2) gravelly sandy loam ranging in thickness from 8 to 25 cm. Next is a dark yellowish brown (10YR 3/4) gravelly sandy loam with a thickness of 40 to 50 cm, followed by a dark yellowish brown gravelly sand with cobbles. Small charcoal fragments were recovered from the two sandy loam horizons. In addition to one piece of debitage, the upper horizon contained a small quantity of concrete rubble, one square nail, and a mammal bone fragment, which suggested the stratum had been previously disturbed.

Isolate 45PI773 is located near site 45PI455, the 9th U.S. Cavalry Bivouac site, along the north side of the upper edge of Sequalitchew Creek. It is unknown if the four pieces of debitage recovered at 45PI773 are related to the prehistoric chipped stone artifacts (2 knives and 5 flakes) recovered during the 1989 test excavations at 45PI455 (Moura 1991a, 1991b; Wessen et al. 2008:30). Since little information on prehistoric occupation of this area can be provided by the few pieces of debitage recovered from the discontinuous subsurface probes, isolate 45PI773 was recommended ineligible for NRHP listing (Wessen et al. 2008:32).

Nisqually-Sequalitchew Historic District (proposed)

Proposed by the Point Nisqually Defense Fund (2003), this historic district would cover approximately 360 acres along both sides of Sequalitchew Creek. Thirteen archaeological sites are identified in the NRHP nomination form as contributing elements. These include 45PI66 and 45PI455 within Lot Y, as well as 45PI401 near Lot Y, in the northern extent of the proposed district. The district has not yet been approved. The nomination assumes undisturbed deposits remain at the sites in sufficient quantity and diversity to address research questions related to the history of the district. It is unclear if intact remains

exist at the sites and if so, whether the deposits would contain the data required to address the research questions.

45PI401 HBC/PSAC Dwelling Site

Located approximately 0.1 mile east of Lot Y, site 45PI401 was identified in 1988 on the north bank of Sequalitchew Creek during survey of the right-of-way for then-planned Center Drive (Welch 1989a:4.28). The site had been previously disturbed by DuPont Company development, including the Old Town complex and railroad, and cattle grazing. Data recovery investigations at the site ensued and 5,000 historic and 100 prehistoric artifacts, foundation remains, a shell concentration, and fire pits were identified (Stilson 1990, 1991; Daugherty 1993b). The lithic assemblage includes 10 projectile points, 6 utilized flakes, 1 scraper, 1 ground stone adze blade, and 82 modified or non-utilized flakes (Stilson 1990:47). The investigation covered 450 square feet and included shovel test probes, backhoe peels and trenches, 1x2 meter units, and 1x1 meter units. There was a rapid decrease in the frequency of artifacts as the distance of the shovel test probes, which extended 30 meters to the west, increased away from the site.

Site 45PI401 is the location of former HBC/PSAC dwellings associated with 1843 Fort Nisqually (45PI56). The site is located just outside the west palisade wall of the fort. The two dwellings date from the 1840s to 1850s, and may have been that of a dairyman and of a Nisqually tribal member who was in charge of the dairy after ca. 1850 (Stilson 1990:121). In Stilson's view (1990:119), the large number of lithic artifacts is associated with the Nisqually tribesman employed by PSAC. It is also feasible, however, that the material represents Native American occupation of the area prior to nonindigenous settlement. The site is considered eligible for NRHP inclusion and contributes to the proposed Nisqually-Sequalitchew Historic District. It was destroyed during construction of a bridge over Sequalitchew Creek.

45PI405 HBC/PSAC Dwelling Site

Located approximately 0.1 mile east of Lot Y, site 45PI405 was identified in 1988 on the south bank of Sequalitchew Creek during survey of the right-of-way for Center Drive (Welch 1989a:4.28). The site was also located at the junction of two DuPont Company access roads, and had been previously disturbed by DuPont Company development, including the Old Town complex and railroad, and cattle grazing. Similar to site 45PI401, this site also contains HBC/PSAC structural remains associated with 1843 Fort Nisqually as well as over 53,000 artifacts, including Native American lithics, which were recovered during data recovery investigations (Stilson 1991; Daugherty 1993c). The area investigated totaled 2,756 square feet. The lithic assemblage includes 52 tools/tool fragments and 89 pieces of debitage. Similar to the chipped stone found at 45PI401, the lithics may have been associated with the historic period or perhaps earlier.

Site 45PI405 is located just outside the west palisade wall of 1843 Fort Nisqually (45PI56). It is considered eligible for NRHP inclusion and contributes to the proposed Nisqually-Sequalitchew Historic District. Situated within and straddling Center Drive, the majority of the site was destroyed during construction of the roadway.

TRIBAL CONSULTATION

The inventory for the Permit involved correspondence with cultural representatives or Tribal Historic Preservation Officers (THPOs) for the Nisqually, Puyallup and Squaxin Tribes (see Appendix B). A phone call was received from Joe Kalama of the Nisqually Tribe expressing their desire to monitor the subsurface investigations. We contacted the Tribe again as the date for the fieldwork approached, and Kareem Gannie served as the project Native American monitor for survey and subsurface testing.

RESEARCH DESIGN

ARCHAEOLOGICAL EXPECTATIONS

Based on the literature review and history of this region, the project area has a high sensitivity for the presence of prehistoric and historic cultural resources. Similarly, the DAHP predictive model shows the area as "Very High Risk." The project area is within the traditional territory of the Nisqually Tribe along Sequalitchew Creek and relatively near the village at the mouth of the creek. Chipped stone tools have been found within Lot Y (45PI773) and in close proximity to the project (45PI401, 45PI405, 45PI576), and Native American burials within a 0.5-mile radius of Lot Y (Tables 2 and 3). The project is also within an area that was settled in the early 1880s during the HBC/PSAC era, an area used in 1904 by the 9th U.S. Cavalry bivouac and war games, the Old Town period of the DuPont Powder Works and its railroad network, and the early years of today's city of DuPont. A variety of historic period artifacts, features or deposits have been previously identified within Lot Y (45PI63, 45PI64, 45PI66, 45PI455) and in close proximity to the project (e.g., 45PI401, 45PI405), and historic period burials found within the 0.5-mile radius (Tables 2 and 3).

The project area has been extensively disturbed throughout the historic period, beginning by construction of the Methodist Episcopal Mission (45PI66) during the HBC/PSAC era and related removal of old growth trees, agricultural practices and cattle grazing, and by construction of the DuPont plant facilities and railroad network (45PI63, 45PI64). Extensive land disturbance during DuPont's Old Town period in the early 1900s resulted from logging, land leveling, the frequent construction and demolition of buildings, road and railway network construction, annual clearing and burning of underbrush, and relatively frequent explosions. Site 45PI64 was the location of a former black powder manufacture and storage building, and the site was also used as a dump where hazardous and non-hazardous waste from the DuPont Powder Works plants was discarded and burned. In addition, many of the production buildings were burned prior to release of the property to Weyerhaeuser after the DuPont Powder Works closed in 1976.

More recently, contaminated soil remediation activities resulted in extensive damage to the landscape within the project area and included complete removal of two of the archaeological sites (45PI63 and 45PI64) and partial removal of a third site (45PI455). Methods used during the remediation program included clearing and grubbing of vegetation subsequent to locating and flagging each hot spot (Daugherty and Condon 2000:7). The excavations generally achieved a depth of 46 cmbs (1.5 feet), and each initial excavation area around a hot spot measured at least 50x50 feet, since the area around removal of a designated hot spot was expanded by 25 feet in each cardinal direction. Figure 2 illustrates the extent of hot spot removal within Lot Y.

Based on existing archaeological data for this area, the types of archaeological materials that might be present in the general vicinity could potentially include the remains of artifacts (e.g., flaked stone tools, tool-making debris, ground stone tools, fire-affected rock), soil discoloration or shell that might indicate the presence of a cultural midden, fire pits, soil depressions, and features indicative of the former presence of structures or buildings (e.g., postholes, foundations) or historic debris (e.g., horse paraphernalia, railroad ties, concrete blocks, metal, glass, ceramics). Chipped stone tools, if present, may be related to either the prehistoric or ethnohistoric periods. Historic-period cultural resources, if present, would most likely be related to settlement in the early 1800s during the HBC/PSAC era, the 9th U.S. Cavalry bivouac and war games of 1904, the early years of the DuPont Powder Works (Old Town period), including construction of the narrow-gauge railroad, and the early years of today's city of DuPont.

Considering the gravelly nature of the Spanaway soils and the history of disturbance, it is expected that cultural material, if present, would be discovered above a depth of 25 to 30 cmbs (0.8-1 foot). As discussed above, sterile gravels have been encountered at shallow depths (25-30 cmbs) at archaeological sites in this vicinity, including 45PI66 and 45PI455 within the project area.

OBJECTIVES

As presented in the Permit, the goals of this investigation are to determine if any intact subsurface archaeological deposits from the prehistoric, ethnohistoric, or historic periods remain within the project area, to document them, to add important information to the sites determined eligible (45PI66 Methodist Episcopal Mission site) or considered potentially eligible (45PI455 9th U.S. Cavalry Bivouac site) for NRHP listing, and to assess the potential eligibility for listing on the NRHP of any newly discovered sites. More specifically, based on our knowledge of the prehistory, ethnography, and history of the project vicinity and the results of the prior local archaeological investigations, the following research questions guided the investigation:

1. Is there evidence for the exact location of the 1840–1842 Methodist Episcopal Mission building? Although extensive investigations have taken place within site 45PI66 and chimney stones were recovered, the opinion that the precise location of the Mission was identified is considered equivocal (compare Moura 1991a:8; Daugherty and Condon 2001:48). This site has been determined eligible for NRHP listing under Criterion A, and such evidence (i.e., postholes) would contribute additional important information about the location of the Mission building.

2. Is there additional evidence preserved of the 9th U.S. Cavalry 1904 encampment? Investigation extending outward from the backhoe peels completed in 1989 (Moura 1991a, 1991b) and the soil remediation program in 2000 (Daugherty and Condon 2000, 2001) within site 45PI455 may uncover further evidence of this brief occupation by the Buffalo Soldiers, such as privy holes or trash pits. Such evidence would contribute important information to the potential eligibility of this site for NRHP listing.

3. Is there evidence of an intact continuous chipped stone scatter along the northern side of Sequalitchew Creek that indicates Native Americans repeatedly occupied the area prior to Euro-American settlement during the historic period, and does the evidence indicate a firm link between previously recorded resources? Such evidence may connect the four pieces of debitage recorded as isolate 45PI773 and recovered from a series of discontinuous subsurface probes (Wessen et al. 2008) to the seven chipped stone artifacts recovered during the 1989 test excavations at site 45PI455, the 9th U.S. Cavalry Bivouac site (Moura 1991a, 1991b).

4. Is there additional evidence for HBC-PSAC activities outside of and not related to previously recorded site 45PI66? If undisturbed deposits or features from this mid-1800s period exist, the newly discovered sites may be eligible for listing on the NRHP, depending on the nature of the discovery (e.g., post holes, privy holes, wells, trash pits, burials, etc.).

5. Is there additional evidence for Old Town period activities outside of and not related to previously recorded site 45PI63 (Railroad Dump)? If undisturbed deposits or features from this early 1900s period exist, the newly discovered sites may be eligible for listing on the NRHP, depending on the nature of the discovery (e.g., trash pits, privy holes, wells, burials, etc.).

6. Is there additional evidence for DuPont period activities outside of and not related to previously recorded site 45PI64 (Burning Ground Dump)? If undisturbed deposits or features dating to this period from the 1920s to 1945 exist, the newly discovered sites may be eligible for listing on the NRHP, depending on the nature of the discovery (e.g., burials, trash pits, wells, privy holes, etc.).

FIELD METHODS AND PERSONNEL

All work by PCI for this investigation was conducted by professional archaeologists as defined under RCW 27.53.030(8) and who meet the Secretary of the Interior's Standards (National Park Service [NPS], 1983). PCI archaeologists Cindy Arrington, M.S., and Peter Morris completed the fieldwork, and Dr. Nancy Sikes served as the cultural resources Principal Investigator for the project. Kareem Gannie of the Nisqually Tribe served as the project Native American monitor for survey and subsurface testing.

Field methods approved for this project included intensive-level pedestrian survey followed by subsurface testing, and then monitoring of geotechnical subsurface exploration in the project area. These three phases of fieldwork were conducted by PCI archaeologists on the dates in February and March 2011 shown in Table 4. The methods employed for each field phase are presented separately below.

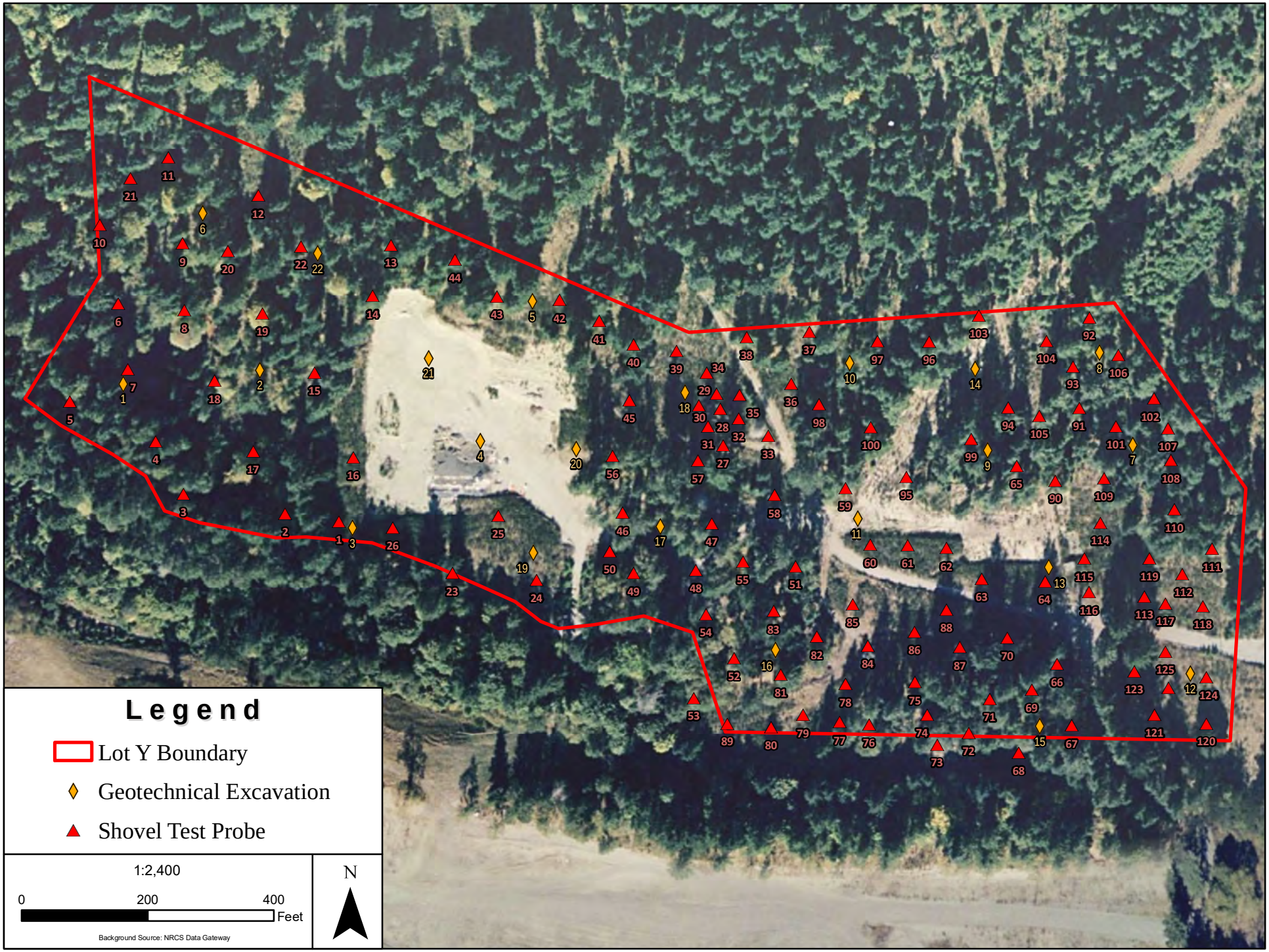
Table 4. Project Field Phase Dates and Personnel

Field Phase	Archaeologist (s)	Date of Fieldwork
Survey	Cindy Arrington and Peter Morris	February 17–18, 2011
Subsurface testing	Cindy Arrington	February 21-28 and March 1-2 2011
Monitoring of geotechnical subsurface exploration	Cindy Arrington	March 3-4, 2011

The pedestrian survey was conducted prior to any subsurface excavations to identify any previously unrecorded archaeological material from the prehistoric, ethnohistoric or historic periods that could potentially be present on the surface of the project area. The intensive-level pedestrian survey encompassed the entire 25.3-acre project area. Transect spacing within the project area was no greater than 15 meters apart and was accomplished on an east-to-west bearing. The 25.3-acres surveyed by PCI archaeologists comprise the maximum physical footprint of potential ground-disturbing activities associated with the proposed construction (Figure 1).

Following the pedestrian survey, a series of 125 shovel test probes (STPs) and 22 geotechnical excavations (GTEs) were excavated within the project area at random intervals as shown on Figure 3. At the request of the City of DuPont and DAHP, no STPs were placed in existing trails, pedestrian paths, or gravel roadways. Additionally, all STPs were backfilled and compacted daily. The STPs and GTEs were accomplished by mechanical excavation using a backhoe with a 2-foot bucket attachment and smooth plate. Dan Andreas of Miles Resources operated the mechanical equipment. PCI archaeologists remained at a safe distance from all mechanical equipment, while continuing to examine the sides of the trenches for cultural resources. All field personnel were aware of prior soil contamination within Lot Y (mainly lead and arsenic) and related remediation completed in 1999 and 2000, and observed standard safety protocols.

Each of the 125 STPs measured 3 feet in length and 2.5 feet in width. STP levels were dug in 7-cm (3-inch) increments or until sterile gravels were encountered. Soils taken from the STPs were screened through 1/8-inch hardware cloth. No STPs were placed in three hot spots (HS-3, HS-4 and HS-6, which include the former locations of 45PI63A, 45PI63B, and 45PI64) where the prior remediation efforts 11 years ago removed contaminated soils and where sterile gravel is now exposed throughout these portions of the project area, as clearly visible on the aerial photograph (compare Figures 2 and 3). Sterile gravel was encountered in 123 of 125 STPs between 35 and 130 cmbs (1.1-4.3 feet); mixed stratigraphy or fill was present in two STPs. Records for the individual STPs, detailing levels, soil texture, color, and comments, are located in Appendix C.



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Subsurface Testing Map

PARUS CONSULTING, INC.

Figure 3

Each of the 22 GTEs measured 3 feet wide by 5 feet long. GTE upper levels were dug in 3-inch (7-centimeter) increments or until sterile gravels were encountered, while lower levels, after encountering sterile gravels, were dug in1-foot increments. Four of the GTEs were excavated within the hot spot removal areas (Figures 2 and 3). Soils taken from the GTEs at 4 feet, 6 feet, and 10 feet were screened through 1/8-inch hardware cloth. Twenty GTEs were excavated to 305 cmbs (10 feet); one GTE with mixed stratigraphy was terminated at 250 cmbs (8.2 feet); one GTE filled with water at 244 cmbs (8 feet). Records for the individual GTEs, detailing levels, soil texture, color, and comments, are located in Appendix C.

All undeveloped ground surface areas within the current project limits were examined for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools, fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, fire pits, soil depressions, and features indicative of the former presence of structures or buildings (e.g., postholes, foundations), or historic debris (e.g., metal, glass, ceramics). Ground disturbances, including a graveled dirt road and dirt two-track, were visually inspected. Climatic conditions varied from sunshine during the first three days of fieldwork to inclement weather (rain, snow, sleet, or hail) during part or all of each succeeding day.

Photographs of the current project area, ground surface visibility, STPs, GTEs, and items of interest were taken with a digital camera. Soil color was recorded using a Munsell© Soil Color Chart. The surveyed acreage and location of the STPs and GTEs were recorded with a handheld Trimble® GeoXT global positioning system (GPS) unit. Field notes and photographs are on file at PCI.

Except for two brick fragments, one flat iron bar and one can, no portable artifacts were identified; no artifacts were collected. For all archaeological materials identified during the fieldwork, PCI archaeologists completed the appropriate Washington Archaeological Site Inventory and Isolate forms.

FIELD RESULTS

GENERAL DESCRIPTION AND SUMMARY

The northern, eastern and western sides of the project area are immediately bordered by dense conifer forest (Photograph 4). Elevation within Lot Y increases from 64 meters above mean sea level (msl) by approximately 1 to 3 meters from east to west, and from 61 to 68 meters above msl from south to north. Sequalitchew Creek is located approximately 50 feet outside the entire Lot Y southern boundary at the bottom of a steep embankment. At the time of the pedestrian survey, the creek had a generous water flow.

Photograph 4. Forest to north, east, and west of Lot Y (view to southwest)

The project area contains four cleared hot spots (HS) where the contaminated topsoil was removed during remediation efforts in 1999 and 2000 (Figure 2). HS-6 is a large semi-square clearing that lacks vegetation, and is currently used as a gravel pit. As shown on the figure, a narrow linear extension of HS-6 extends eastward to meet the western extent of HS-3 south of the recorded boundaries of site 45PI66. Vegetation is re-establishing within the HS-2, HS-3, and HS-4 remediation clearings, and includes mostly small conifers, scotch broom and grasses.

A paved walking trail maintained by the City of DuPont and situated outside the southern border of Lot Y parallels the northern side of Sequalitchew Creek. As shown on Figure 2, a dirt road transects a portion of the project area, running east to west, starting at a chain-link fence on the eastern boundary and ending at the eastern edge of HS-6. The road is approximately 1,067 feet long and has a thin gravel coating. An approximately 460-foot long area devoid of vegetation, the previous location of a narrow-gauge railroad track, leads northeast from HS-3 to HS-4. All railroad tracks were removed from the project area between 1995 and 2000 (personal communication, Fred Foreman).

A non-functional segment of a narrow-gauge railroad track bisects the eastern edge of the project area. There is also a concrete loading platform in the eastern portion of the project area. The platform is located approximately where the former sets of narrow gauge and standard gauge railroad tracks crossed each other as shown on the March 15, 1955 map of the DuPont Works drawn by E. Davies. To the south and immediately outside of the current project area is a set of concrete bridge abutments near Sequalitchew Creek. These are the remnants of a narrow-gauge railroad bridge shown on the 1955 map. The track segment, concrete platform, and set of bridge abutments were recorded as archaeological sites (see below).

As detailed below, except for two brick fragments located on the surface and at depth within the boundaries of 45PI66 (Methodist Episcopal Mission site), no evidence was found during this investigation within Lot Y of the previously recorded sites and isolate covered by the excavation permit.

Vegetation within the project area perimeter consists of open, second growth conifer forest dominated by Douglas fir, sword fern, and scotch broom, and includes red alder, elderberry, and grasses. Visibility on the ground in the majority of the project area is very poor, near zero percent, due to a dense coverage of grass, moss, and forest duff (Photograph 5). In the open ground areas in HS-6 and HS-3, visibility is good to excellent, ranging between 30 and 100 percent (Photograph 6).

Photograph 5. Visibility at 0% (view to northeast)

Photograph 6. Visibility at 30-100% (view to northeast)

SUBSURFACE TESTING RESULTS

The subsurface stratigraphy was consistent within 123 of the 125 STPs and all 22 GTEs excavated within the project area (Figure 3). The soil throughout the project area is consistent with the description for the Spanaway series developed on glacial outwash sediments (Soil Survey Staff 2009). There are three soil horizons, though horizon 2 is not present in all STPs or GTEs. The depth of the horizons varies across the Lot Y landscape in relation to the topography and prior human disturbance. Horizon 1 is a moist, very dark brown (10 YR 2/2) gravelly sandy loam with weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots with a very high organic matter content. Horizon 2 is a moist very fine crumb dark gray brown (10 YR 3/2) gravelly sandy loam with little distinction in texture from horizon 1. Horizon 3 is moist and fluctuates between a dark gray brown (2 YR 4/2) and an olive brown (2YR 4/4) gravelly sand with no soil matrix. The single grained, loose sand is the prominent content with some rounded to sub-rounded cobbles; it is also very compact.

Only two of the subsurface units (STPs 28 and 115) contained cultural material. A brick fragment, measuring 3x4x2 inches, was located at 20 cmbs (8 inches) in STP 28 within site 45PI66 (Methodist Episcopal Mission). The brick was not handmade and no maker's marks were located on the fragment. Additionally, a smaller brick fragment was located at ground level within inches of STP 35 (also within 45PI66). STP 115 is located 18.5 feet due east of a concrete platform and the soil is entirely mixed down to a level of 200 cmbs (6.6 feet). A flat iron bar with four bolts protruding was located at 160 cmbs (5.2 feet). The iron bar measured 24 inches long by 3 inches wide and 1/8th inch thick, and has four 3.5-inch metal bolts spaced roughly 7 to 8 inches apart (Photograph 7). The iron bar appears to be associated with the concrete platform, given its close proximity and the paint on the bolt heads matches the metal on the platform.

Photograph 7. Flat iron bar in STP 115 (plan view)

All but two of the 125 STPs (STP 89 and 115) were excavated until sterile gravel was encountered. Although the presence of the Spanaway series soil horizons was consistent, the depth of sterile gravel varied from 35 cmbs to 130 cmbs (1.1-4.3 feet) across the project area. STP 115 had mixed stratigraphy and was excavated to a depth of 200 cmbs (6.6 feet). The soil in STP 89 is a moist, brown (7.5 YR 4/4) silty loam until the typical underlying horizon appears at 110 cmbs (3.6 feet) as a moist, dark green brown (2.5 YR 4/4) gravelly sand. The typical upper horizon of gravelly sandy loam appears to have been removed near STP 89 and replaced with imported soil. The STP was placed 66 feet northeast of the set of bridge abutments. It seems likely that more stable soil was imported for the approach to the narrow-gauge bridge that once crossed Sequalitchew Creek.

Six of the STPs located in the eastern portion of the project (STPs 113, 116-119) near the gravel road each display a gray upper horizon not noted in any other portion of the project area (Photograph 8). The moist, dark gray (2.5 YR 3/1) soil is similar in structure to the typical horizon 1, but is noticeably different in color and is relatively thin (0-25 cm [0-9.8 inches]), and is likely related to prior disturbance.

STPs 120 through 125, located in the southeastern portion of the project area, all show evidence of a grass fire. Small flecks of charcoal are noted in the upper 5 cm of each unit. Of these six STPs, only STP 120—with a total depth of 95 cmbs (3.1 feet) and nearest the creek—contained horizon 2. The profiles in STPs 121 through 125 are restricted to horizon 1 (0-60 cmbs [0-23.6 inches]) and horizon 3 (60-80 cmbs [23.6-31.5 inches]).

With the exception of the brick fragment in STP 28 and the iron bar in STP 115, no cultural material was located in the series of 125 STPs excavated within the project area.

Photograph 8. Upper gray horizon in eastern STPs near gravel road (view to west)

GEOTECHNICAL SUBSURFACE EXPLORATION RESULTS

Of the 22 GTEs placed in the project area (Figure 3), all but two (GTEs 9 and 14) were taken to a depth of 305 cmbs (10 feet). The soils throughout the GTEs are relatively consistent with the Spanaway series (Photograph 9), although only five (GTEs 1, 3, 5, 12, 13, and 15) contain horizon 2.

In the eastern sector of the project area, GTE 9 has mixed stratigraphy and was excavated to a depth of 250 cmbs (8.2 feet). The upper horizon is a thin layer of sand (0-20 cmbs [0-8 inches]) followed by a mix of horizon 1 very dark brown (10 YR 2/2) gravelly sandy loam and sand with very few cobbles. It appears to be imported fill material. This unit is in close proximity to two of the hot spots (HS-3 and HS-4) cleared for soil contamination (compare Figures 2 and 3). In the northeastern sector, GTE 14 was terminated at 244 cmbs (8 feet) when water entered the unit and began to fill rapidly.

No cultural material was located in any of the 22 GTEs excavated within Lot Y.

Photograph 9. Sediments within GTE 16 (plan view)

PREVIOUSLY RECORDED RESOURCES WITHIN PROJECT AREA

The only evidence found during this investigation within Lot Y of the two previously recorded historic archaeological sites (45PI66 and 45PI455) and one prehistoric isolate (45PI773) was the two brick fragments located within the boundaries of 45PI66, the Methodist Episcopal Mission site. In addition, there was no evidence of the two archaeological sites (45PI63 and 45PI64) formerly located within Lot Y that were completely removed during hazardous materials remediation in 2000.

45PI66 Methodist Episcopal Mission Site

During this field investigation, eight STPs (STPs 28-35) were placed within the previously identified boundary of 45PI66. Two fragmented red brick pieces were located: one fragmented piece in STP 28 at 20 cmbs (8 inches) (Photograph 10) and one at ground level within inches of STP 35. The larger of the two brick fragments (3x4x2 inches in STP 28) was not handmade and had no maker's marks. No other cultural artifacts were identified within the site boundary.

Photograph 10. Brick fragment in STP 28 (plan view)

The soil within the STPs placed within the site boundaries is a shallow (0-25 cm [0-9.8 inch]) moist, very dark brown (10 YR 2/2) gravelly sandy loam with a weak fine granular structure; soft, very friable, nonsticky and nonplastic; with many fine roots and a very high organic matter content. Below the single soil horizon is a moist, dark gray brown (2.5 YR R 4/2) gravelly sand with no soil matrix. Within the single-grained, loose sand are some medium to large rounded to sub-rounded cobbles. This profile description is consistent with that described during the archaeological excavations conducted in 1989 within 45PI66 (Welch 1989a; Moura 1991a). Those excavations were stopped when sterile gravels were encountered at 25 cmbs (0.8 feet).

No evidence was discovered during this investigation of the exact location of the 1840–1842 Methodist Episcopal Mission building or of any undisturbed archaeological deposits or features related to the mission, the HBC/PSAC era, or any other archaeological period. The work further substantiates the opinion that site 45PI66 is not eligible under Criterion D (data potential). The Methodist Episcopal Mission site has, however, been determined eligible for NRHP listing under Criterion A for its association with significant events.

45PI455 9th U.S. Cavalry Bivouac Site

There was no surface evidence of site 45PI455 during this investigation and no cultural material or deposits within a series of 12 STPs (STPs 72-82 and 84) placed within or adjacent to the recorded site boundaries. The soil horizons within the STPs are consistent with the Spanaway series, with the lower gravelly sand horizon encountered between 35 and 70 cmbs (1.1-2.3 feet). During test excavations in 1989 when nearly 1,000 artifacts and animal bone fragments were collected, sterile gravels were encountered within 30 cmbs (1 foot) (Moura 1991a:9, 1991b:1).

No additional evidence of the 9th U.S. Cavalry 1904 encampment or of any undisturbed archaeological deposits or features was discovered during this investigation. Since 1998 when State Archaeologist Robert Whitlam indicated this site is potentially eligible for NRHP listing and recommended further work to define the boundaries of the Native American and Buffalo Soldier occupations, no further evidence of site 45PI455 was uncovered during the remediation program a decade ago (Daugherty and Condon 2000, 2001) or during the current endeavor. Site 45PI455 is thus not considered eligible for NRHP listing under Criterion D (data potential). The 9th U.S. Cavalry Bivouac site is, however, considered potentially eligible for NRHP inclusion as part of the proposed Nisqually-Sequalitchew Historic District.

45PI773 Prehistoric Chipped Stone Isolate

No cultural material was identified on the surface of 45PI773 or within three STPs (STPs 72, 77, 80) placed during this field investigation within or adjacent to the locations of the shovel test probes excavated in 2005 (Wessen et al. 2005, 2008). The soil horizons within the three STPs are consistent with the Spanaway series, with the lower gravelly sand horizon encountered between 22 and 70 cmbs (0.7-2.3 feet). The soil profile in the vicinity of where the four pieces of debitage were encountered in the series of discontinuous subsurface probes was described by Wessen et al. as having three strata (2008:30) with the lower gravelly sand horizon with cobbles at 50 cmbs (1.6 feet).

No evidence was discovered during this investigation of any undisturbed archaeological deposits or features, including no sign of an intact continuous chipped stone scatter along the northern side of Sequalitchew Creek that might have linked the four pieces of debitage recorded as isolate 45PI773 to the seven chipped stone artifacts recovered during the 1989 test excavations at nearby 45PI455 (9th U.S. Cavalry Bivouac site). PCI agrees with the prior recommendation that isolate 45PI773 is ineligible for NRHP listing.

NEWLY IDENTIFIED RESOURCES WITHIN PROJECT AREA

Four historic period resources were newly identified during the pedestrian survey: three archaeological sites and one isolate (Figure 2). The three sites include a segment of a previously identified narrow-gauge railroad track and grade (45PI01224), a railroad concrete loading platform (45PI01225), and a set of railroad bridge abutments (45PI01226). The isolate (45PI00064) is one galvanized kerosene can. A brief description of the newly identified historic period resources is presented below. Detailed information can be found in the State of Washington Archaeological Site Inventory and Isolate Forms, attached as Appendix D.

No prehistoric or ethnohistoric period resources were newly identified during pedestrian survey of the surface or within the subsurface excavations.

45PI01224 Narrow Gauge Railroad Track

This site was originally recorded by Arrington during survey in 2010 of the 12.8-acre property (known as Lot X) adjacent to the eastern edge of Lot Y (Sikes and Arrington 2010). It is a non-functional segment of a narrow-gauge railroad track situated on an earthen berm; it extends into both Lots X and Y beneath a chain-link fence marking the property boundaries. The track and berm bisect the eastern edge of the Lot Y project area (Figure 2; Photograph 11). The earthen berm is approximately 20 inches high and 20 feet wide. The narrow gauge track extends 207 feet west from the eastern project area boundary. The site is covered with forest duff, lichen, and scotch broom. The narrow-gauge track and berm continue east into Lot X beneath the chain-link fence for approximately 98 feet.

The short abandoned track and berm segment are attributed to construction by the DuPont Powder Works; the narrow-gauge railroad was used to transport their products during the Old Town period (1906-1920s). This site is recommended ineligible for listing on the NRHP or WHR. The segment is in poor condition with no evidence of associated artifacts or cultural deposits and has no potential to yield additional information. The eastern end of the spur was truncated presumably after DuPont Powder Works closed in 1976.

Photograph 11. 45PI01224 segment of narrow-gauge track (view to east)

45PI01225 Concrete Loading Platform

A concrete loading platform is located approximately where the standard-gauge and one of the narrow-gauge tracks previously crossed near the eastern edge of Lot Y. The platform is visible on satellite imagery, but was previously unrecorded. During the functional period of the platform, it likely was used

for loading or unloading materials onto DuPont Powder Works trains that would have moved east to west and north to south past the platform.

The platform is primarily concrete, with a steel railing as a perimeter of the upper platform surface. The platform is 192 inches square and 77 inches tall. The surface perimeter has a 3-inch concrete lip with occasional breaks to permit loading access. There is an arrangement of 2-inch by 6-inch wood boards bolted to the interior surface of the concrete lip, with a steel railing situated along the perimeter lip of the platform (Photograph 12). The railing is painted yellow and is 39.5 inches tall, with a lower bar and upper bar. The lower bar is 19.5 inches high, and the upper bar is 39 inches high. There are openings in the rail with steel chains stretched across on the south and east sides of the platform; one opening is 55 inches wide, and the other is 51 inches wide.

On the north side of the platform there is a 30-inch wide opening that appears to be a person-access stepping platform, with vertical handrails and a swinging safety bar (non-operational). On the east of the platform is a small debris pile consisting of heavy-gauge sheet metal, milled lumber, crushed pipe (1.5-inch diameter), and steel railing segment with chain. The platform is built with well sorted aggregate, form poured concrete. It does not appear on the very detailed 1955 map drawn by E. Davies. Locals recall the platform was not built until the early 1960s and then it was seldom used (personal communication, Fred Foreman). This site has no potential to yield additional information and is recommended ineligible for listing on the NRHP or WHR.

Photograph 12. Concrete loading platform (view to east)

45PI01226 Railroad Bridge Abutments

This site is comprised of the remnants of a narrow-gauge railroad bridge that traversed Sequalitchew Creek from north to south. This bridge crossing is shown on the 1955 map drawn by E. Davies. The remains include two concrete abutments that have a 165-inch horizontal separation (Photograph 13). Both abutments have a poured-form aggregate concrete construction, with a smooth finished top. The lower abutment is 150 inches long, 32 inches high from the ground, and 12 inches wide at the top. The upper abutment is 128 inches long, 51 inches high from the ground, with the base at 20 inches wide, and the top of the abutment 12.5 inches wide. The abutments are covered with moss and are surrounded by decomposing forest duff and vegetation, including ferns, conifers, deciduous trees, and grasses.

The set of abutments is immediately outside of the Lot Y project area, and 35 feet north of Sequalitchew Creek (Figure 2). There are two pieces of milled lumber located between the abutments; they are each 6 by 6 inches, but vary in length. One piece is 45 inches long, and the other is 60 inches long. The longer

piece is intact, and has a 5-inch by 8.5-inch metal cleat with spikes on one side (Photograph 14). An identical set of concrete abutments is visible on the south side of the creek outside the project area.

This bridge was the only narrow-gauge railroad bridge within the DuPont Powder Works to cross Sequalitchew Creek, and is shown on the 1955 map drawn by E. Davies. It was used for transport of material by train from the plant to the burning ground (later recorded as 45PI64) and then proceeding further north to the storage area (personal communication, Fred Foreman and Johanna Jones). The bridge was removed in the late 1990s. The remaining set of abutments has no potential to yield additional information and is recommended ineligible for listing on the NRHP or WHR.

Photograph 13. Bridge abutment (view to north)

Photograph 14. Wood debris showing cleat (plan view)

45PI00064 Parus Isolate #1 Kerosene Can

A galvanized kerosene can was located near the edge of the northwest corner of the area known locally as the "gravel pit" (HS-6 on Figure 2) and formerly the burning ground (45PI64). The sides of the can are dented and it exhibits some oxidation. It is missing the pour spout and wire handle, but is mostly intact (Photograph 15). The top is domed and ribbed, and the base diameter is 11 inches, with a height of 14 inches. The dimensions suggest the volume of this can was approximately 5 gallons. Considering the lengthy range of manufacture, the age of the can is undeterminable.

Photograph 15. Kerosene can (plan view)

PROJECT CONCLUSIONS, FINDINGS AND RECOMMENDATIONS

No evidence was found during this investigation within Lot Y of 45PI66 (Methodist Episcopal Mission site), 45PI455 (9th U.S. Cavalry Bivouac site) or 45PI773 (chipped stone isolate), except for two brick fragments located on the surface and at depth within the boundaries of 45PI66. Nor was there any surface or subsurface evidence of the two archaeological sites (45PI63 and 45PI64) formerly located within Lot Y that were completely removed a decade ago during hazardous materials remediation.

No historic properties will be affected by implementation of the Lot Y project. Although the Methodist Episcopal Mission site has been determined eligible for NRHP listing under Criterion A for its association with significant events and also contributes to the proposed Nisqually-Sequalitchew Historic District, site 45PI66 is not eligible under Criterion D (data potential). Similarly, although the location of the brief occupation by the 9th U.S. Cavalry Buffalo Soldiers is potentially eligible for NRHP inclusion as a contributing element of the proposed Nisqually-Sequalitchew Historic District under Criterion A, site 45PI455 is not considered eligible for NRHP listing under Criterion D. Isolate 45PI773 is considered ineligible for NRHP listing.

The two newly identified sites within Lot Y, 45PI1224 (railroad track segment) and 45PI01225 (concrete platform), and are recommended ineligible for listing on the NRHP or WHR. The kerosene can isolate (45PI00064) is considered ineligible for listing. The third newly identified site, 45PI01226 (bridge abutments; also recommended ineligible for listing on the NRHP or WHR), is located immediately outside the Lot Y project area.

Considering the results of the literature search, local ethnographic settlement and subsistence patterns, the prehistory and history of the vicinity, and DAHP's predictive model, the project area is considered highly sensitive for prehistoric, ethnohistoric, and historic-era cultural resources. On the other hand, Lot Y has been extensively disturbed beginning with historic period settlement in the early 1880s, then operation of the DuPont Powder Works in the early to mid-1900s (including use of part of Lot Y as a burning ground dump from the 1930s until 1945), followed by subsurface archaeological investigations and related artifact collection between 1989 and 2005 and by environmental remediation activities in 1999 and 2000. Based on the lack of cultural deposits in the gravelly sandy loam and gravelly sand subsurface sediments exposed in the series of 125 STPs and 22 GTEs excavated to depths between 35 and 305 cmbs (1.1-10

feet), the potential for discovery of buried archaeological materials, features or deposits by implementation of this project is considered low. Therefore, no further cultural resource action is warranted.

There is always the potential for the existence of buried archaeological materials within the project area, mostly likely restricted to shallow depths above the outwash gravels, and an Unanticipated Cultural Resources Discovery Plan has been prepared for the project and is attached to this report as Appendix E. Pursuant to the Discovery Plan, should cultural resources be encountered during construction or ground-disturbing activities connected with this project, work in the area must be halted and a professional archaeologist, who meets the definition under RCW 27.53.030(8), should be notified immediately to evaluate the resource(s) encountered. Should human skeletal remains be encountered, all activity in the area must halt, the remains protected from further disturbance, and the county coroner and local law enforcement notified immediately (RCW 27.44, 68.50, 68.60).

Resources within this area that might be encountered might include prehistoric and ethnohistoric materials such as flaked stone tools, tool-making debris, stone milling tools, fire-affected rock, basketry, culturally modified animal bone, fishing implements or soil darkened by cultural activities (midden). Historic materials might include remnants of railroad or roadway construction activities or other industry or commerce (e.g., railroad ties, concrete blocks, machinery parts), building remains, metal, glass, cans, ceramic artifacts, or other debris older than 50 years.

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APPENDIX A:
Archaeological Excavation Permit No. 2010-54

STATE OF WASHINGTON
DEPARTMENT OF ARCHAEOLOGY AND HISTORIC PRESERVATION
1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501
Mailing address: PO Box 48343 • Olympia, Washington 98504-8343
(360) 586-3065 • Fax Number (360) 586-3067 • Website: www.dahp.wa.gov

February 7, 2011

Ms. Lia Estigoy
DuPont Industrial Partners, LLC
1201 Pacific Avenue, Suite 1501
Tacoma, WA 98402

Nancy E. Sikes and Cindy Arrington
GeoEngineers, Inc.
1101 S. Fawcett Avenue, Suite 200
Tacoma, WA 98402

Dear Ms. Estigoy, Ms. Sikes and Ms. Arrington:

I have reviewed the application you submitted for archaeological excavations at 45PI00066. It is my intention to grant the permit application for excavations at 45PI00066. Please take note of the Special Conditions on the permit.

If you feel aggrieved by this decision you may request an administrative hearing within twenty-one days after receipt of this notice. Your request should be sent to the address listed below.

Director
Department of Archaeology and Historic Preservation
PO Box 48343
Olympia, WA 98504-8343

Sincerely,

Stephenie Kramer
Assistant State Archaeologist
(360) 586-3083
Email: stephenie.kramer@dahp.wa.gov

Enclosure

STATE OF WASHINGTON

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501
Mailing address: PO Box 48343 • Olympia, Washington 98504-8343

ARCHAEOLOGICAL EXCAVATION PERMIT
NO: 2010-54

Archaeological sites:	45PI66, 45PI455 and 45PI773, Lot Y
Individual Responsible for carrying out the terms and conditions of the permit:	Lia Estigoy Property Owner
Individual responsible for field investigations:	Nancy Sikes & Cindy Arrington GeoEngineers, Inc.
Nature of work:	Sub-surface survey and geotechnical pits, archaeological testing
Repository in which collected records and data shall be deposited:	Nisqually Tribe & DuPont Historical Museum; cc DAHP on transfer
Date fieldwork to begin:	**Upon receipt; but notify DAHP and Tribes via email before starting**
Date fieldwork shall end:	April 31, 2011
Period of analysis:	Concurrent through May 31, 2011
Date final report due:	May 31, 2011 Per WAC 25-48-041, if the report is late, a Notice of Violation will be issued & a $5000 penalty assessed

Special Conditions:

- Follow protocols stated in permit application of 12/2/10 and email of 2/7/11
- Notify DAHP and Tribes if intact archaeological deposits are observed
- Switch to hand excavation for intact deposits
- Restore trails if units are needed in trail areas
- Be aware of City of DuPont's comments regarding arsenic
- Provide copy of report to DAHP & affected Tribes
- Report must meet DAHP's Survey and Inventory Standards
- Append catalog & BetaAnalytic sheets to report, reference permit number
- If human remains are encountered, stop work, secure the area, notify the county coroner, sheriff, DAHP, & affected Tribes per RCW 27.44.055

Issued this 7th day of February 2011.

Stephenie Kramer
Assistant State Archaeologist

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION
Protect the Past, Shape the Future

APPENDIX B:
Correspondence with Local Tribes

Native American Tracking Sheet
DuPont Industrial Partners, LLC
DuPont, WA – Lot Y

GeoEngineers Project No. 16785-003-00

Contact Name	Date Letter Sent Via Email	Comments/Concerns Recommendation
Puyallup Tribe 3009 East Portland Avenue Tacoma, Washington 98404 Judy Wright, THPO Cultural Resources 253-573-7897 Judy.Wright@puyalluptribe.com	**11-8-2010**	No response
Nisqually Tribe 4820 She-Nah-num Drive SE Olympia, Washington 98513 360-456-5221 phone Thor Hoyte, Cultural Resources Hoyte.thor@nisqually-nsn.gov	**11-8-2010**

GeoEngineers
1101 S Fawcett, Suite 200
Tacoma, Washington 98402
253.383.4940

November 8, 2010

Puyallup Tribe
3009 East Portland Avenue
Tacoma, Washington 98404

Attention: Judy Wright, THPO Cultural Resources

Sent via email: Judy.Wright@puyalluptribe.com

Subject: Cultural Resources Assessment for the DuPont Industrial Partners, LLC, Lot Y DuPont Washington

Dear Ms. Wright:

I am writing to inform you of a cultural resources assessment that is planned for the above-referenced project. GeoEngineers is conducting this assessment at the request of the DuPont Industrial Partners, LLC. The project is located northwest of the town of DuPont near the intersection of Center Drive and Powerline Road in the City of DuPont, Washington (Township 19N, Range 01E, Section 26 on the Nisqually 7.5 quadrangle, Willamette Meridian). The project will consist of an intensive pedestrian survey and subsurface testing in the form of auger units for a total of approximately 26- acres (Figure 1).

Archaeologists have previously recorded and investigated four sites on Lot Y: 45PI63, the Railroad Dump #3 Site; 45PI66, the Methodist Episcopal Mission Site; 45PI455, the 9th Cavalry BivouacSite; and 45PI773, a small lithic scatter. Additionally, Site, 45PI64 The Burning Ground Dump Site, had been recorded in 1977 and additional work done in 2000. The entire site (approximately 3,000 square feet) was removed during a hot spot or contaminated soils treatment program for hazardous substances in 2001. In 1993, the SHPO determined the site ineligible for NRHP listing.

An Application for an Archaeological Excavation Permit is being completed pursuant to permit requirements found in the Washington Administrative Code [WAC] 25-48-060. There is no federal involvement in this project. The work for the proposed project will be conducted under prevailing Washington state laws, which serve to protect from known disturbance of archaeological sites and Native American graves on both public and private lands. These laws include Executive Order 05-05, Indian Graves and Records (Revised Code of Washington [RCW] 27.44), Archaeological Sites and Resources (RCW 27.53), Archaeological Excavation and Removal Permit (WAC 25-48), and Discovery of Human Remains (RCW 27.44).

GeoEngineers is in the process of reviewing available background information. Background research will include a site files search at the Washington State Department of Archaeology and Historic Preservation, review of previously recorded cultural resource sites, reports, and review pertinent published literature and ethnographies. Results of our investigation will be presented in a technical report.

We are aware that all information regarding cultural resources is within published sources. Should the Tribe have additional information concerning cultural resources, we would like to include it in our study. Please contact me should you wish to provide any comments or additional information. I appreciate your assistance in this matter and look forward to hearing from you. If I can answer any questions you may have, please do not hesitate to contact me at Carrington@geoengineers.com or at 916-765-9381.

Best Regards,

Cindy Arrington
Cultural Resource Specialist

Attachment:
Figure 1

GeoEngineers
1101 S Fawcett, Suite 200
Tacoma, Washington 98402
253.383.4940

November 8, 2010

Nisqually Tribe
4820 She-Nah-num Drive SE
Olympia, Washington 98513

Attention: Thor Hoyte, Cultural Resources

Sent via email: Hoyte.thor@nisqually-nsn.gov

Subject: Cultural Resources Assessment for the DuPont Industrial Partners, LLC, Lot Y DuPont Washington

Dear Mr. Hoyte:

I am writing to inform you of a cultural resources assessment that is planned for the above-referenced project. GeoEngineers is conducting this assessment at the request of the DuPont Industrial Partners, LLC. The project is located northwest of the town of DuPont near the intersection of Center Drive and Powerline Road in the City of DuPont, Washington (Township 19N, Range 01E, Section 26 on the Nisqually 7.5 quadrangle, Willamette Meridian). The project will consist of an intensive pedestrian survey and subsurface testing in the form of auger units for a total of approximately 26- acres (Figure 1).

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Best Regards,

Cindy Arrington
Cultural Resource Specialist

Attachment:
Figure 1

GeoEngineers
1101 S Fawcett, Suite 200
Tacoma, Washington 98402
253.383.4940

November 8, 2010

Squaxin Tribe
SE 70 Squaxin Lane
Shelton, Washington 98584

Attention: Rhonda Foster, THPO Cultural Resources

Sent via email: rfoster@squaxin.nsn.us

Subject: Cultural Resources Assessment for the DuPont Industrial Partners, LLC, Lot Y DuPont Washington

Dear Ms. Foster:

I am writing to inform you of a cultural resources assessment that is planned for the above-referenced project. GeoEngineers is conducting this assessment at the request of the DuPont Industrial Partners, LLC. The project is located northwest of the town of DuPont near the intersection of Center Drive and Powerline Road in the City of DuPont, Washington (Township 19N, Range 01E, Section 26 on the Nisqually 7.5 quadrangle, Willamette Meridian). The project will consist of an intensive pedestrian survey and subsurface testing in the form of auger units for a total of approximately 26- acres (Figure 1).

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Best Regards,

Cindy Arrington
Cultural Resource Specialist

Attachment:
Figure 1

Lot Y

T19N, R 1E, Section 26
USGS 7.5' Topographic Map Series, Nisqually (1981) Quad.

N
W E
S

1:24,000

2,000 0 2,000
Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Location of Lot Y

DuPont Industrial Partners, LLC
Dupont, Washington

GeoEngineers

Figure 1

Office: Tacoma Path: W:\Tacoma\Projects\16\16785003\GIS\16785003_F1_LocationMap.mxd Map Revised: November 8, 2010 CRC

From: Cindy J. Arrington
To: kalama.joe@nisqually-nsn.gov
Subject: RE: Requested information
Date: Friday, November 19, 2010 7:55:00 AM

Good Morning Joe:

I have an upcoming project in DuPont and which requires a Washington Archaeological Excavation permit. It is my clients intention to donate to the Nisqually Tribe ("Tribe") and/or DuPont Historical Museum ("Museum") any archaeological materials collected during the subsurface archaeological excavations planned on their private land ("Lot Y") in the City of DuPont, Pierce County, Washington. The project comprises approximately 26 acres, the property is located west of Center Drive and north of Sequalitchew Creek. It is situated in Section 26 of Township 19 North Range 1 East, on the 1981 Nisqually 7.5-minute USGS topographic map (Willamette Meridian).

Permission for excavation and related removal of archaeological material from Lot Y is being requested in an Archaeological Excavation Permit filed with the Department of Archaeology and Historic Preservation (DAHP) pursuant to permit requirements found in the Washington Administrative Code 25-48-060. As part of that permit, I need to secure curation letters from those individuals we seek to donate the artifacts to, should any artifacts be located/identified. Please note that subsurface testing will not begin until February 2011.

It is our intention that archaeological materials associated with the prehistoric or ethnohistoric periods will be donated to the Tribe for curation, and that historic period archaeological materials will be donated to the Museum for curation. A catalog and copies of records, data, photographs, and other documents derived from the excavation process will accompany any collection donated to either the Tribe or Museum.

If you could please contact me at your earliest convenience so that we may discuss the project.

Cindy J. Arrington, M.S., RPA
Associate
Cultural Resource Specialist

GeoEngineers
t: 916.444.5825
f: 916.441.2532
c 916.765.9381
e: carrington@geoengineers.com

3301 C Street, Suite 200 A
Sacramento, California 95816
www.geoengineers.com

From: Thor Hoyte [mailto:hoyte.thor@nisqually-nsn.gov]
Sent: Wednesday, November 17, 2010 1:59 PM
To: Cindy J. Arrington
Cc: kalama.joe@nisqually-nsn.gov
Subject: Re: Requested information

Sorry. Please contact Joe Kalama, who is on this email.

On Nov 16, 2010, at 12:24 PM, "Cindy J. Arrington" <carrington@geoengineers.com>

wrote:

> Good Afternoon Mr. Hoyte: On November 5, I sent an email requesting your assistance with a project in DuPont, WA. I have not received a reply and have been unable to reach you by phone. If you could contact me at your earliest convenience.
>
> Best regards,

Cindy J. Arrington, M.S., RPA
Associate
Cultural Resource Specialist

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Confidentiality: This message is confidential and intended solely for use of the individual or entity to whom it is addressed. If you are not the person for whom this message is intended, please delete it and notify me immediately, and please do not copy or send this message to anyone else.

APPENDIX C:
Detailed Subsurface Excavation Records

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 1- 5	2/21/2011	0-17	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		18-60	None	Moist/VFC/SL/DGB	10 YR 3/2	Little distinction between this layer and the previous one, expect for color.
		60-78	None	Moist/VFC/SL/DYB	10 YR 3/4	Small charcoal flecks, not in situ. Rounded to sub-rounded cobbles, increasing in density. Cobbles 60% of matrix
		78-85	None	Moist/VFC/SL/DYB	10 YR 4/4	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact. Some large cobbles measuring over 18cm in width.
STP 6-9	2/21/2011	0-20	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		20-49	None	Moist/VFC/SL/DGB	10 YR 3/2	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		49-77		Moist/VFC/SL/DYB	10 YR 3/4	Small charcoal flecks, not in situ. Rounded to sub-rounded cobbles, increasing in density. Cobbles 60% of matrix
		77-90	None	Moist/GS/DYB	10 YR 4/4	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, SC = Silty clay, GS = Gravelly Sand, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 10 - 12	2/21/2011	0-18	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		20-90	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		90-110	None	Moist/GS/DGB	2.5Y 4/2	Rounded to sub-rounded cobbles, very compact and increased density.
STP 13 - 16	2/21/2011	0-40	None	Moist/SL/VDB	10 YR 2/3	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-60	None	Moist/SL/DGB	10 YR 3/2	Very high in organic matter content, has mellow, sooty feel; gravelly sandy loam with larger cobbles appearing around 45-49cmbs than decreasing by 60cmbs.
		60-85	None	Moist/GS/OB	2.5 Y 5/3	Gravelly sand with no soil matrix. More sand; single grained; loose, than cobbles. Cobbles are rounded to sub-rounded and low density.
STP 17 - 19	2/22/2011	0-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		70-90	None	Moist/GS/DYB	10 YR 4/6	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y Recorder: C. Arrington

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 20-22	2/22/2011	0-45	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		45-80	None	Moist/GS/DYB	10 YR 4/6	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact.
STP 23-27	2/22/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		60-80	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact.
***STP 27-36**	2/22/2011	0-25	Yes	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		25-50	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with few rounded to sub-rounded cobbles.
STP 37-44	2/23/2011	0-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		70-90	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 45	2/23/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-50	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

***Note:** STPs 28-35 were placed within the recorded location of Site 45PI66 (Methodist Episcopal Mission). One piece of fragmented red brick was located at 20cmbs in STP 28. A second red brick fragment was located at ground surface in STP 35.

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 46-51	2/25/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		60-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 52-52	2/25/2011	0-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		70-80	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 54	2/25/2011	0-25	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		25-35	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 55-57	2/25/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		40-60	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 58	2/25/2011	0-110	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		110-120	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington** **Date:** August 26, 2010

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 59-60	2/25/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		40-60	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 61	2/25/2011	0-35	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		35-55	None	Moist/GS/DYB	10 YR 4/6	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact.
		55-110	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		110-130	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 62	2/25/2011	0-40	None	Moist/VFC/SL/DGB	10 YR 3/2	This layer is typically seen in the second horizon, with the darker (10 YR 2/2) high in organic matter overlying it. No signs of mixing in the stratigraphy.
		40-120	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		120-130	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 63-65	2/25/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #		Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 66-70	2/26/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 71-72	2/26/2011	0-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		70-90	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 73-75	2/26/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 76	2/26/2011	0-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		70-90	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #		Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 77	2/26/2011	0-22	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		22-60	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		60-75	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 78-80	2/26/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-65	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 81-83	2/26/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 84-85	2/26/2011	0-35	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		35-45	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 86-88	2/26/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		60-80	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 89	2/26/2011	0-110	None	Moist/SL/VFC/B	7.5 Yr 4/4	Weak fine granular structure; soft, very friable, nonsticky and nonplastic, sooty feel, no cobbles or pebbles. This layer appears to be imported soil. The stratigraphy is uninterrupted until you reach 110 cmbs, where the typical underlying horizon appears. The typical upper horizon; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam appears to have been removed and imported soil placed. This STP was placed near the (66 feet) bridge abutment and could be that more stable soil was imported for the approach to the narrow-gauge bridge.
		110-130	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 90	2/28/2011	0-15	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		15-40	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		40-50	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 91	2/28/2011	0-7	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		7-25	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 92-95	2/28/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 96	2/28/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-50	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		50-60	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 97-98	2/28/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 99	2/28/2011	0-10	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		10-30	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 100-101	2/28/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		60-75	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 102	2/28/2011	0-45	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		45-60	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		60-75	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 103	3/1/2011	0-20	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		20-30	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 104	3/1/2011	0-5	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		5-20	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 105	3/1/2011	0-30	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		30-45	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		45-60	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 106	3/1/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		60-70	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		70-80	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 107-110	3/1/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-65	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 111	3/1/2011	0-65	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		65-80	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		80-90	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 112	3/1/2011	0-30	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		30-45	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 113	3/1/2011	0-25	None	Moist/GS/DG	2.5 Y 3.1	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		25-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		70-85	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 114	3/1/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		60-75	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		75-85	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 115	3/1/2011	0-200	Yes	Moist/GS/DG	2.5 Y 3.1	This unit is completely mixed (photo taken #58) the matrix resembles horizon 1 with Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam however, there is no stratigraphic distinction between 0-200 cmbs. A metal artifact was located at 160 cmbs. The artifact is a flat metal bar with 4-bolts protruding from one side.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, DG = Dark Gray

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 116	3/2/2011	0-25	None	Moist/GS/DG	2.5 Y 3.1	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		25-55	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		55-75	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 117-119	3/2/2011	0-10	None	Moist/GS/DG	2.5 Y 3.1	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		10-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-65	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 120		0-20	None	Moist/VFC/SL/DYB	10 YR 3/4	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam. Medium to small cobbles rounded and subrounded. Small flecks of charcoal, indicative of a grass fire in the area.
		20-80	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		80-95	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 121-125	3/2/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam. Small flecks of charcoal, indicative of a grass fire in the area.
		60-80	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
GTE 1	3/3/2011	0-30	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		30-60	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		60-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 2	3/3/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-305	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
GTE 3	3/3/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-80	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		80-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 4	3/3/2011	0-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 5	3/3/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-50	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		50-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 6	3/3/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		60-305	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

Subsurface Testing Record

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Project: DuPont Industrial Partners, LLC, Lot Y Recorder: C. Arrington

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
GTE 7	3/3/2011	0-55	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		55-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 8	3/3/2011	0-90	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		90-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 9	3/3/2011	0-250	None	Moist/SL/VDB		This unit is completely mixed. There is a small (20cmbs) layer of sand on the surface and the rest is a mix between horizon 1 (10 YR 2/2) and sand. Very little cobbles. It appears to be fill material. This unit is in close proximity to a hot spot cleared for soil contamination.
GTE 10	3/3/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-305	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
GTE 11	3/3/2011	0-5	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		5-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 12-13	3/4/2011	0-65	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		65-75	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		75-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 14	3/4/2011	0-5	None	Moist/VFC/SL/DYB	10 YR 3/4	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam. Small to medium cobble and become increasingly more compact.
		5-244	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles. Water hit at 244cmbs.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
GTE 15	3/4/2011	0-65	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		65-80	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		80-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 16-17	3/4/2011	0-65	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		65-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 18-19	3/4/2011	0-45	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		45-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles. Water hit at 244cmbs.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
GTE 20	3/4/2011	0-3	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		3-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 21	3/4/2011	0-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 22		0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Soils Photograph** **Recorder: C. Arrington**

Photograph 52. Showing horizon 1 (10 YR 2/2)

Photograph 53. Showing horizon 2 (10 YR 3/4)

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Soils Photograph** **Recorder: C. Arrington**

Photograph 44. Showing horizon 3 (2.5Y 4/4)

Photograph 61. Showing gray horizon (2.5 Y 3.1)
Upper most layer in photograph

APPENDIX D:
Site and Isolate Record Forms

STATE OF WASHINGTON
ARCHAEOLOGICAL SITE INVENTORY FORM

Smithsonian Number: **PI01224**

***County:** Pierce

***Date:** 7-19-2011 ***Compiler:** C. Arrington

Location Information Restrictions *(Yes/No/Unknown)***:** No

SITE DESIGNATION

Site Name: Narrow gauge railroad and berm

Field/ Temporary ID: GEO-RR10 (**Update**)

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

SITE LOCATION

***USGS Quad Map Name:** Nisqually

***Legal Description:** **T**19N **R** 1 **E/W:** E **Section(s):** 26

Quarter Section(s): NENW

***UTM:** **Zone** 10 **Easting** 526801 **Northing** 5217214

Latitude: **Longitude:** **Elevation (FT/M):** 220ft

Other Maps: **Type:**

Scale: **Source:**

Drainage, Major: Sequalitchew Creek **Drainage, Minor:** **River Mile:**

Aspect: **Slope:** 1-3%

Location Description** *(General to Specific):** This site is located on the north side of Sequalitchew Creek, northwest of the Town of DuPont. It is situated east of the old DuPont works property. The area is disturbed and is dominated by grasses and brushy plants. The project area is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973) approximately 1 mile east of the southern part of Puget Sound shoreline. Sequalitchew Creek drains the Edmond's Marsh area about 1 mile east, and empties into Puget Sound approximately 1.5 miles to the northwest. The Puget Trough is a basin that lies between the Coast Range to the west and the Cascade Range to the east.

Approach *(For Relocation Purposes)***:** From I-5 take the DuPont Center Drive exit (north) approximately 1.5 miles to Power Road, turning left, to the intersection of a gravel road (205 feet). The isolate is located on the north side of the gravel road, 736feet from the intersection of Power Road (at the end of gravel just before the chain-link fence) and approximately 22 feet due north of the gravel road.

SITE DESCRIPTION

***Narrative Description:**

This site is an extension of site GEO-RR10 recorded on September 28, 2010 for Creekside DuPont Partners. The site is a non-functional narrow-gauge railroad track situated on an earthen berm bisecting the eastern edge of the project area. The earthen berm is approximately 20 inches in height and roughly 20 feet in width. The narrow gauge tracks extend 207 feet east from the eastern project area boundary (chain link fence) running due west. The site is covered with lichen, and trees growing through the tracks and the berm. Within the project area, the tracks end at an earthen mound that appears to have been dug immediately adjacent to the southeast side of the tracks (burrow pit). The narrow-gauge track and berm continue to the east beneath a chain-link fence for a distance of 98 feet beyond the project area. The short abandoned track and berm segment within the project area are attributed to construction by the DuPont Powder Works; the narrow-gauge railroad was used to transport their products during the Old Town period (1906-1920s). There was no evidence of artifacts or cultural deposits in association with the tracks or berm, and this site is not recommended eligible for listing on the NRHP or Washington Heritage Register (WHR). The eastern end of the spur was truncated presumably after DuPont Powder Works closed in 1976.

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

***Site Dimensions**

***Length:** 207 feet ***Direction: E/W** x ***Width:** 20 feet ***Direction:** N/S

***Method of Horizontal Measurement:** GPS

***Depth:** Surface * **Method of Vertical Measurement:** GPS

****Vegetation** *(On Site)***:** Mostly grasses and scotch broom

Local: Douglas fir, Pacific madrone, red alder, elderberry, sword fern

Local: Glacial Plain

Water Resources *(Type)***:** Sequalitchew Creek **Distance:** 426 feet SW **Permanence:** year round

***Method of Collection(s):** No materials collected

CULTURAL MATERIALS AND FEATURES

***Narrative Description:**

This site was originally recorded by Arrington during survey in 2010 of the 12.8-acre property (known as Lot X) adjacent to the eastern edge of Lot Y (Sikes and Arrington 2010). It is a non-functional segment of a narrow-gauge railroad track situated on an earthen berm; it extends into both Lots X and Y beneath a chain-link fence marking the property boundaries. The track and berm bisect the eastern edge of the Lot Y project area. The earthen berm is approximately 20 inches high and 20 feet wide. The narrow gauge track extends 207 feet west from the eastern project area boundary. The site is covered with forest duff, lichen, and scotch broom. The narrow-gauge track and berm continue east into Lot X beneath the chain-link fence for approximately 98 feet.

The short abandoned track and berm segment are attributed to construction by the DuPont Powder Works; the narrow-gauge railroad was used to transport their products during the Old Town period (1906-1920s). This site is recommended ineligible for listing on the NRHP or WHR. The segment is in poor condition with no evidence of associated artifacts or cultural deposits and has no potential to yield additional information. The eastern end of the spur was truncated presumably after DuPont Powder Works closed in 1976.

***Method of Collection(s):** None

Location of Artifacts** *(Temporary/Permanent):** N/A

SITE AGE

***Component:** ***Dates:** 1906-1920s ***Dating Method:**

Phase: **Basis for Phase Designation:**

The short abandoned track and berm segment within the project area are attributed to construction by the DuPont Powder Works; the narrow-gauge railroad was used to transport their products during the Old Town period (1906-1920s).

SITE RECORDERS

Observed by: C. Arrington and Pete Morris

***Date Recorded:** February 17, 2011

Recorded by** *(Professional Archaeologist):** Cindy Arrington

***Affiliation:** Parus Consulting, Inc. ***Affiliation Phone Number:** 916-782-5818

***Affiliation Address:** 1508 Eureka Road, Suite 170, Roseville, CA 95661

***Affiliation E-mail:** cindy@parusconsulting.com

Date Revisited: **Revisited By:**

SITE HISTORY

Previous Work *(Done on Archaeological Site)***:**

Year	Author(s)	Report Title	Proximity to project
1977	Onat, A.R., Lee A. Bennett, and Timothy Riorda	Cultural Resources Survey: DuPont Site, Volume I Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near project area
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site.	Within and near project area
1989	Welch, Jeanne	A Cultural Overview and Comprehensive Management Plan for the DuPont Property, Pierce County, Washington	Within and near project area
1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within project area
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the "Hot Spot" Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within project area
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near project area
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area

LAND OWNERSHIP

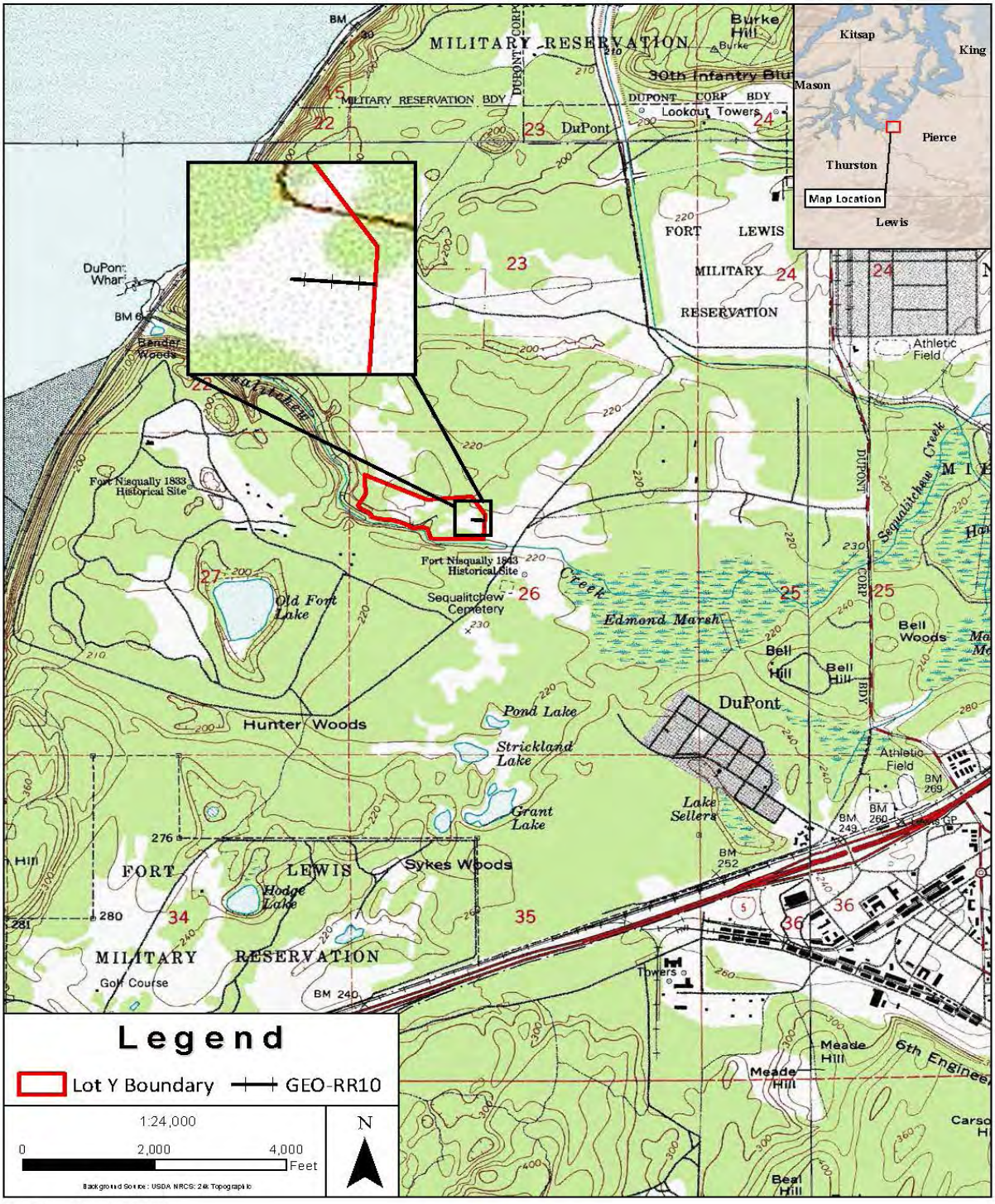
***Owner:** DuPont Industrial Partners, LLC
Address: 1201 Pacific Avenue, Suite 1501
Tacoma, WA 98402

***Tax Lot/ Parcel No:**

RESEARCH REFERENCES

***Items/Documents Used In Research** *(Specify)*: 1973 Franklin, Jerry F., and C. T. Dyrness *Natural Vegetation of Oregon and Washington*. Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service, Portland, Oregon.

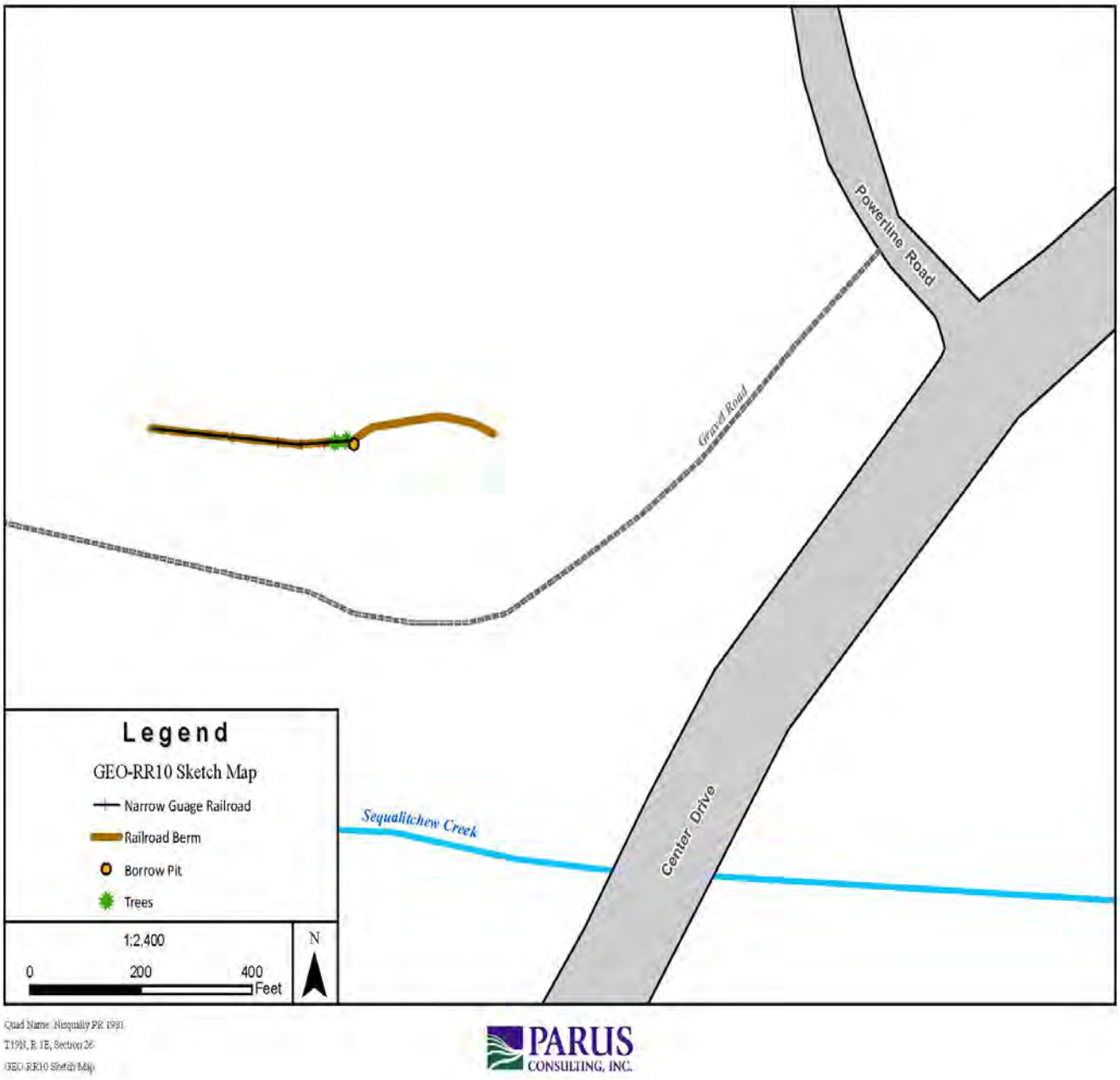
USGS MAP



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: GEO-RR10 Location Map

PARUS CONSULTING, INC.

SKETCH MAP


Powerline Road
Gravel Road
Sequalitchew Creek
Center Drive
Legend
GEO-RR10 Sketch Map
Narrow Guage Railroad
Railroad Berm
Borrow Pit
Trees
1:2,400
0
200
400
Feet
N
Quad Name: Nisqually NE 1981
T19N, R 1E, Section 26
GEO-RR10 Sketch Map
PARUS
CONSULTING, INC.

PHOTOGRAPH(S)

Figure 1: Geo RR10 extension (view to east)

STATE OF WASHINGTON
ARCHAEOLOGICAL SITE INVENTORY FORM

Smithsonian Number: PI01225

***County:** Pierce

***Date:** 7-19-2011 ***Compiler:** C. Arrington

Location Information Restrictions *(Yes/No/Unknown)*: No

SITE DESIGNATION

Site Name: Concrete Platform

Field/ Temporary ID: Parus-01-11

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

SITE LOCATION

***USGS Quad Map Name:** Nisqually

***Legal Description: T**19N **R** 1 **E/W:** E **Section(s):** 26

Quarter Section(s): NENW

***UTM: Zone** 10 **Easting** 526780 **Northing** 5217203

Latitude: **Longitude:** **Elevation (FT/M):** 220ft

Other Maps: **Type:**

Scale: **Source:**

Drainage, Major: Sequalitchew Creek **Drainage, Minor:** **River Mile:**

Aspect: **Slope:** 1-3%

***Location Description** *(General to Specific)*: This site is located on the north side of Sequalitchew Creek, northwest of the Town of DuPont. It is situated east of the old DuPont works property. The area is disturbed and is dominated by grasses and brushy plants. The project area is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973) approximately 1 mile east of the southern part of Puget Sound shoreline. Sequalitchew Creek drains the Edmond's Marsh area about 1 mile east, and empties into Puget Sound approximately 1.5 miles to the northwest. The Puget Trough is a basin that lies between the Coast Range to the west and the Cascade Range to the east.

Approach *(For Relocation Purposes)*: From I-5 take the DuPont Center Drive exit (north) approximately 1.5 miles to Power Road, turning left, to the intersection of a gravel road (205 feet). The isolate is located on the north side of the gravel road, 979 feet from the intersection of Power Road and approximately 76 feet due north of the gravel road.

SITE DESCRIPTION

***Narrative Description:**

The loading platform is located 233 feet west of the eastern boundary of the project area, 76 feet due north of the existing gravel road. The platform is situated in hot spot #3 where the area was cleared of topsoil, using a mechanical backhoe in 2001 due to soil contamination and remediation efforts.

Vegetation within the site area consists of open second growth conifer forest dominated by Douglas fir, sword fern, and scotch broom, and includes red alder, elderberry, and grasses. Visibility on the surrounding ground surface is poor ranging from 10-30 percent.

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

***Site Dimensions**

***Length:** 16 feet ***Direction: E/W** x ***Width:** 16 feet ***Direction:** N/S

***Method of Horizontal Measurement:** Tapped

***Depth:** 6’ 5” above ground surface * **Method of Vertical Measurement:** Tapped

****Vegetation** *(On Site)***:** Mostly grasses and scotch broom

Local: Douglas fir, Pacific madrone, red alder, elderberry, sword fern

Local: Glacial Plain

Water Resources *(Type)***:** Sequalitchew Creek **Distance:** 384 feet south **Permanence:** year round

***Method of Collection(s):** No materials collected

CULTURAL MATERIALS AND FEATURES

***Narrative Description:**

A concrete loading platform is located approximately where the standard-gauge and one of the narrow-gauge tracks previously crossed near the eastern edge of Lot Y. The platform is visible on satellite imagery, but was previously unrecorded. During the functional period of the platform, it likely was used for loading or unloading materials onto DuPont Powder Works trains that would have moved east to west and north to south past the platform.

The platform is primarily concrete, with a steel railing as a perimeter of the upper platform surface. The platform is 192 inches square and 77 inches tall. The surface perimeter has a 3-inch concrete lip with occasional breaks to permit loading access. There is an arrangement of 2-inch by 6-inch wood boards bolted to the interior surface of the concrete lip, with a steel railing situated along the perimeter lip of the platform. The railing is painted yellow and is 39.5 inches tall, with a lower bar and upper bar. The lower bar is 19.5 inches high, and the upper bar is 39 inches high. There are openings in the rail with steel chains stretched across on the south and east sides of the platform; one opening is 55 inches wide, and the other is 51 inches wide.

On the north side of the platform there is a 30-inch wide opening that appears to be a person-access stepping platform, with vertical handrails and a swinging safety bar (non-operational). On the east of the platform is a small debris pile consisting of heavy-gauge sheet metal, milled lumber, crushed pipe (1.5-inch diameter), and steel railing segment with chain. The platform is built with well sorted aggregate, form poured concrete. It does not appear on the very detailed 1955 map drawn by E. Davies. Locals recall the platform was not built until the early 1960s and then it was seldom used (personal communication, Fred Foreman). This site has no potential to yield additional information and is recommended ineligible for listing on the NRHP or WHR.

***Method of Collection(s):** None

***Location of Artifacts** *(Temporary/Permanent)*: N/A

SITE AGE

***Component:** *Dates:** 1960s *Dating Method:**

Phase: **Basis for Phase Designation:**

SITE RECORDERS

Observed by: C. Arrington and Pete Morris

***Date Recorded:** February 17, 2011

Recorded by** *(Professional Archaeologist):** Cindy Arrington

***Affiliation:** Parus Consulting, Inc. ***Affiliation Phone Number:** 916-782-5818

***Affiliation Address:** 1508 Eureka Road, Suite 170, Roseville, CA 95661

***Affiliation E-mail:** cindy@parusconsulting.com

Date Revisited: **Revisited By:**

SITE HISTORY

Previous Work *(Done on Archaeological Site)***:**

Year	Au□hor(s)	Report Title	Proximity to project
1977	Onat, A.R., Lee A. Bennett, and Timothy Riordan	Cultural Resources Survey: DuPont Site, Volume I□ Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near project area
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site.	Within and near project area
1989	Welch, Jeanne	A Cultural Overview and Comprehensive Management Plan for the DuPont Property, Pierce County, Washington	Within and near project area
1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within project area
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the "Hot Spot" Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within project area
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near project area
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area

LAND OWNERSHIP

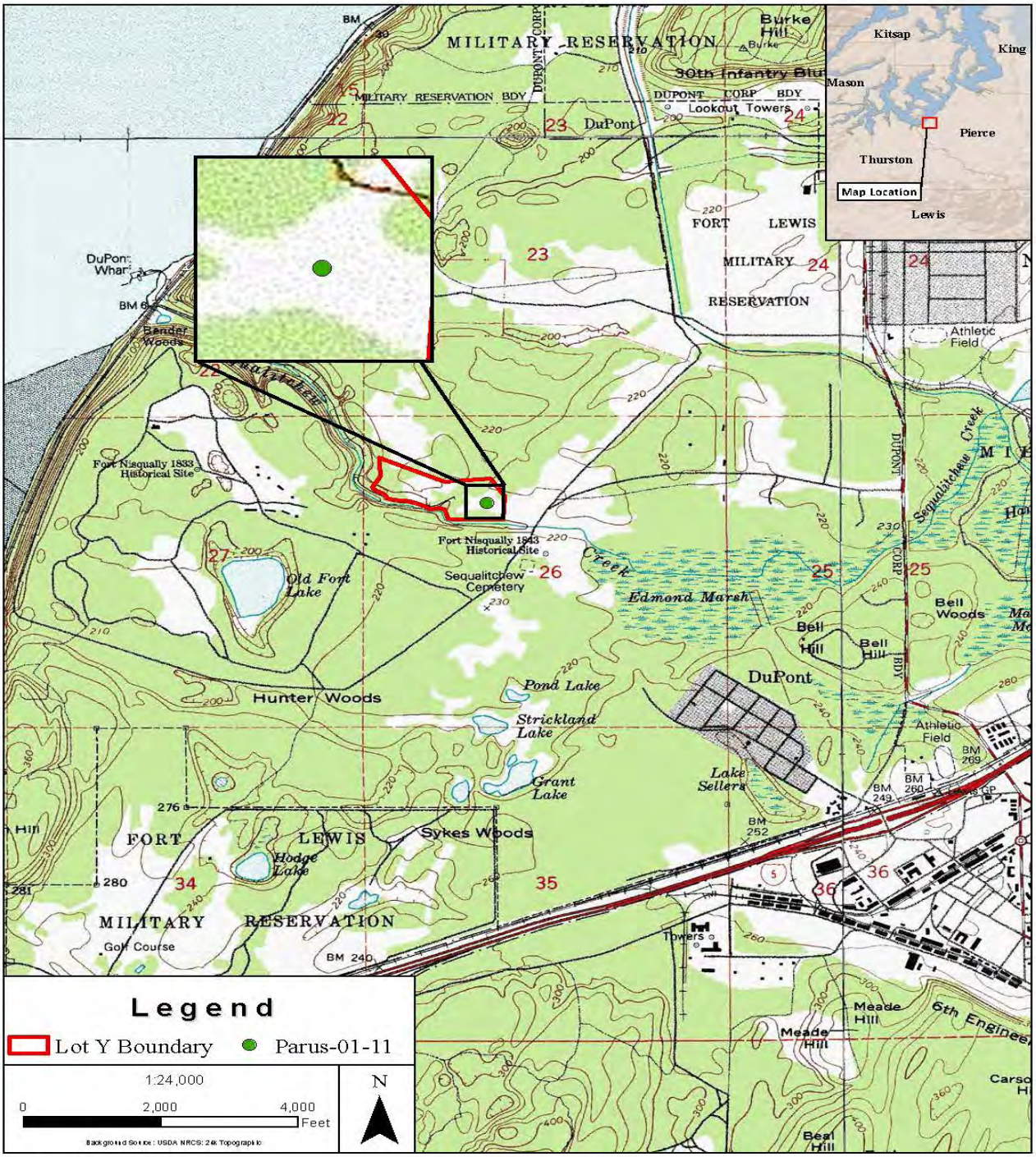
***Owner:** DuPont Industrial Partners, LLC
Address: 1201 Pacific Avenue, Suite 1501
Tacoma, WA 98402

***Tax Lot/ Parcel No:**

RESEARCH REFERENCES

***Items/Documents Used In Research** *(Specify)*: 1973 Franklin, Jerry F., and C. T. Dyrness *Natural Vegetation of Oregon and Washington*. Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service, Portland, Oregon.

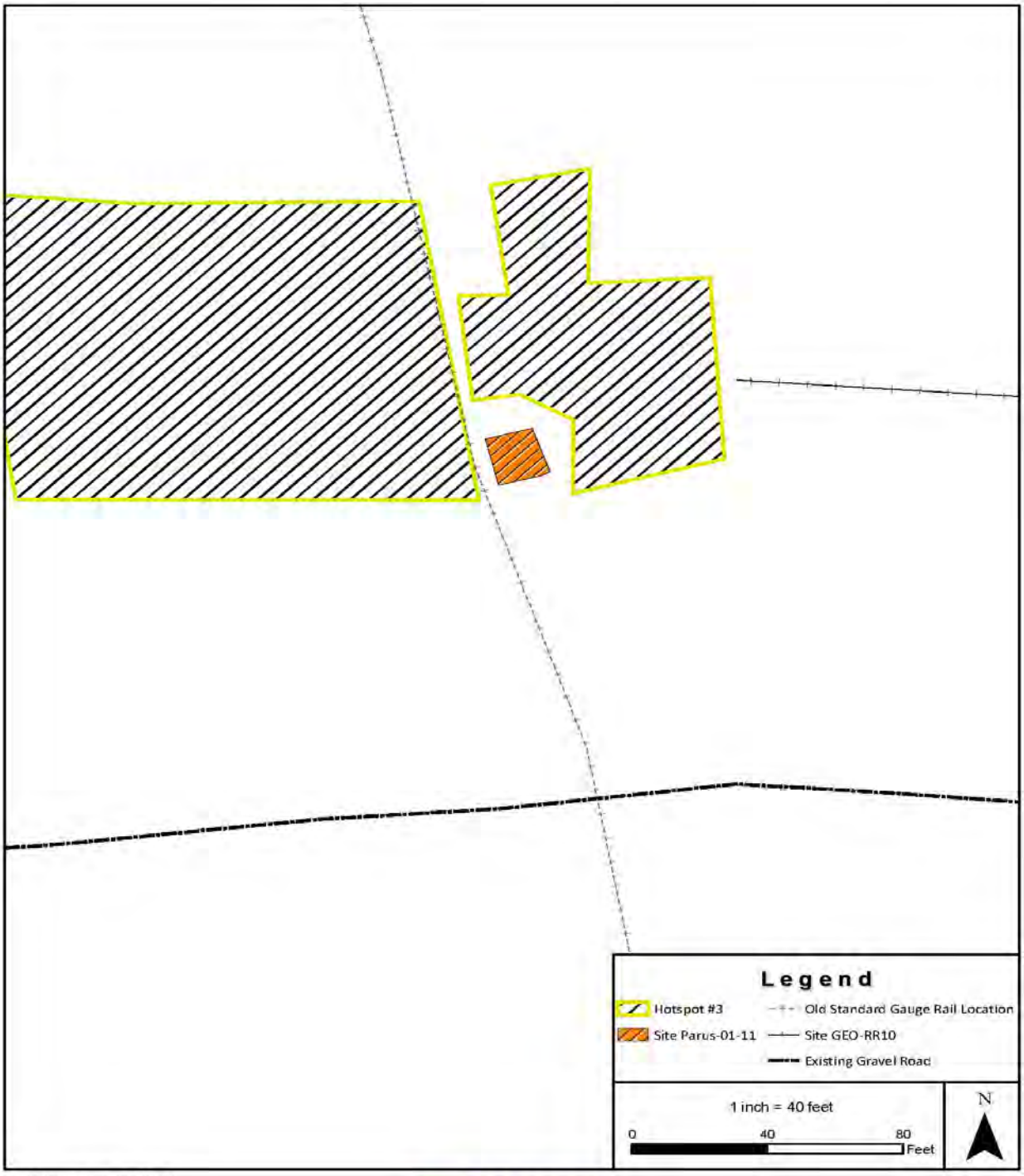
USGS MAP



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Parus-01-11 Location Map

PARUS CONSULTING, INC.

SKETCH MAP


Legend
Hotspot #3
Old Standard Gauge Rail Location
Site Parus-01-11
Site GEO-RR10
Existing Gravel Road
1 inch = 40 feet
0
40
80
Feet
N
Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Parus-01-11 Sketch Map
PARUS
CONSULTING, INC.

PHOTOGRAPH(S)

Figure 1: East side of platform (view to west)

Figure 2: North side of platform (view to southwest)

PHOTOGRAPH(S)

Figure 3: West side of platform (view to northeast)

Figure 4: Debris pile on east side of platform (view to north)

STATE OF WASHINGTON
ARCHAEOLOGICAL SITE INVENTORY FORM

Smithsonian Number:PI01226

***County:** Pierce

***Date:** 7-19-2011 ***Compiler:** C. Arrington

Location Information Restrictions *(Yes/No/Unknown)*: No

SITE DESIGNATION

Site Name: Bridge Abutment – Narrow-Gauge Railroad

Field/ Temporary ID: Parus-02-11

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

SITE LOCATION

***USGS Quad Map Name:** Nisqually

***Legal Description: T**19N **R** 1 **E/W:** E **Section(s):** 26

Quarter Section(s): SWNW

***UTM: Zone** 10 **Easting** 526592 **Northing** 5217123

Latitude: **Longitude:** **Elevation (FT/M):** 222ft

Other Maps: **Type:**

Scale: **Source:**

Drainage, Major: Sequalitchew Creek **Drainage, Minor:** **River Mile:**

Aspect: **Slope:** 1-3%

***Location Description** *(General to Specific)*: This site is located on the north side of Sequalitchew Creek, northwest of the Town of DuPont. It is situated east of the old DuPont works property. The area is disturbed and is dominated by grasses and brushy plants. The project area is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973) approximately 1 mile east of the southern part of Puget Sound shoreline. Sequalitchew Creek drains the Edmond's Marsh area about 1 mile east, and empties into Puget Sound approximately 1.5 miles to the northwest. The Puget Trough is a basin that lies between the Coast Range to the west and the Cascade Range to the east.

Approach *(For Relocation Purposes)*: From I-5 take the DuPont Center Drive exit (north) approximately 1.5 miles to Power Road, turning left, to the intersection of a gravel road (205 feet). The site is located on the south side of the gravel road, 1,348 feet from the intersection of Power Road and approximately 467 feet due south of the gravel road.

SITE DESCRIPTION

***Narrative Description:**

The site, a narrow-gauge railroad bridge (depicted on the E. Davies 1955 map), is located on the north bank of Sequalitchew Creek, 467 feet due south of the gravel road. There are two additional abutments, both an upper and lower, on the south bank of the creek and look to be identical to those located on the north bank.

The abutments are covered with moss, and is surrounded by decomposing forest duff and vegetation, including ferns, conifers, deciduous trees, and grasses. Visibility on the surrounding ground surface is poor ranging from 0-10 percent.

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

***Site Dimensions**

Upper abutment ***Length:** 128 inches ***Direction: E/W** x ***Width:** 12.5 inches ***Direction:** E/W

Lower abutment ***Length:** 150 inches ***Direction: E/W** x ***Width:** 12 inches ***Direction:** E/W

***Method of Horizontal Measurement:** Tapped

***Depth:** 51 inches for upper and 32 inches for lower above ground surface

* **Method of Vertical Measurement:** Tapped

****Vegetation** *(On Site)***:** The abutment is covered with moss, and is surrounded by decomposing forest duff and vegetation, including ferns, conifers, deciduous trees, and grasses.

Local: Douglas fir, Pacific madrone, red alder, elderberry, sword fern

Local: Glacial Plain

Water Resources *(Type)***:** Sequalitchew Creek **Distance:** 35 feet south **Permanence:** year round

***Method of Collection(s):** No materials collected

CULTURAL MATERIALS AND FEATURES

***Narrative Description:**

This site is comprised of the remnants of a narrow-gauge railroad bridge that traversed Sequalitchew Creek from north to south. This bridge crossing is shown on the 1955 map drawn by E. Davies. The remains include two concrete abutments that have a 165-inch horizontal separation. Both abutments have a poured-form aggregate concrete construction, with a smooth finished top. The lower abutment is 150 inches long, 32 inches high from the ground, and 12 inches wide at the top. The upper abutment is 128 inches long, 51 inches high from the ground, with the base at 20 inches wide, and the top of the abutment 12.5 inches wide. The abutments are covered with moss and are surrounded by decomposing forest duff and vegetation, including ferns, conifers, deciduous trees, and grasses.

The set of abutments is immediately outside of the Lot Y project area, and 35 feet north of Sequalitchew Creek. There are two pieces of milled lumber located between the abutments; they are each 6 by 6 inches, but vary in length. One piece is 45 inches long, and the other is 60 inches long. The longer piece is intact, and has a 5-inch by 8.5-inch metal cleat with spikes on one side. An identical set of concrete abutments is visible on the south side of the creek outside the project area.

This bridge was the only narrow-gauge railroad bridge within the DuPont Powder Works to cross Sequalitchew Creek, and is shown on the 1955 map drawn by E. Davies. It was used for transport of material by train from the plant to the burning ground (later recorded as 45PI64) and then proceeding further north to the storage area (personal communication, Fred Foreman and Johanna Jones). The bridge was removed in the late 1990s. The remaining set of abutments has no potential to yield additional information and is recommended ineligible for listing on the NRHP or WHR.

***Method of Collection(s):** None

***Location of Artifacts** *(Temporary/Permanent)*: N/A

SITE AGE

***Component:** *Dates:** 1906-1920s ***Dating Method:**

Phase: **Basis for Phase Designation:**

The narrow-gauge bridge is attributed to construction by the DuPont Powder Works; the narrow-gauge railroad was used to transport their products during the Old Town period (1906-1920s).

SITE RECORDERS

Observed by: C. Arrington and P. Morris

***Date Recorded:** February 17, 2011

Recorded by** *(Professional Archaeologist):** Cindy Arrington

***Affiliation:** Parus Consulting, Inc. ***Affiliation Phone Number:** 916-782-5818

***Affiliation Address:** 1508 Eureka Road, Suite 170, Roseville, CA 95661

***Affiliation E-mail:** cindy@parusconsulting.com

Date Revisited: **Revisited By:**

SITE HISTORY

Previous Work *(Done on Archaeological Site)***:**

Year	Author(s)	Report Title	Proximity to project
1977	Onat, A.R., Lee A. Bennett, and Timothy Riordan	Cultural Resources Survey: DuPont Site, Volume I Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near project area
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site.	Within and near project area
1989	Welch, Jeanne	A Cultural Overview and Comprehensive Management Plan for the DuPont Property, Pierce County, Washington	Within and near project area
1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within project area
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the "Hot Spot" Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within project area
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near project area
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area

LAND OWNERSHIP

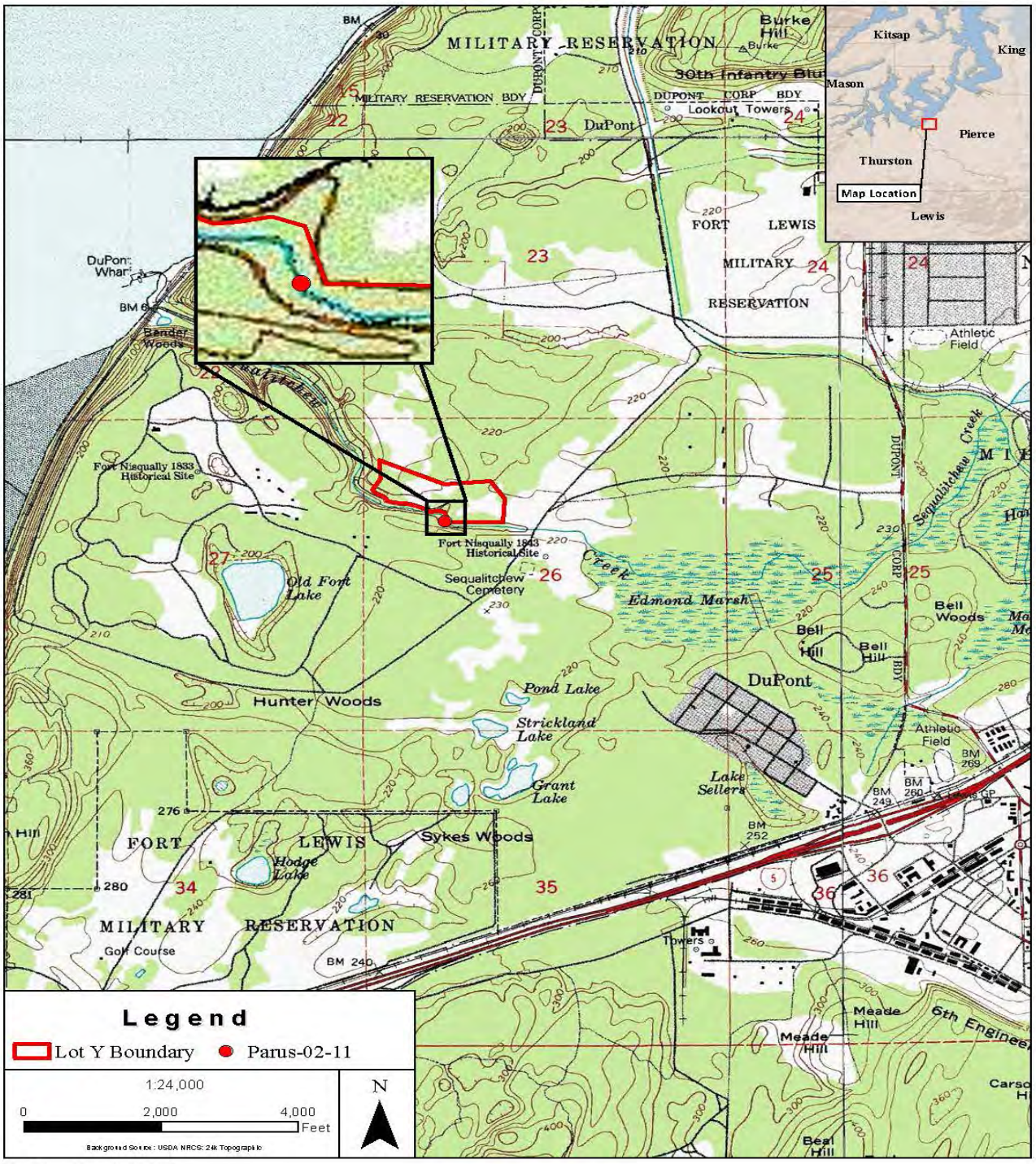
***Owner:** DuPont Industrial Partners, LLC
Address: 1201 Pacific Avenue, Suite 1501
Tacoma, WA 98402

***Tax Lot/ Parcel No:**

RESEARCH REFERENCES

***Items/Documents Used In Research** *(Specify)*: 1973 Franklin, Jerry F., and C. T. Dyrness *Natural Vegetation of Oregon and Washington*. Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service, Portland, Oregon.

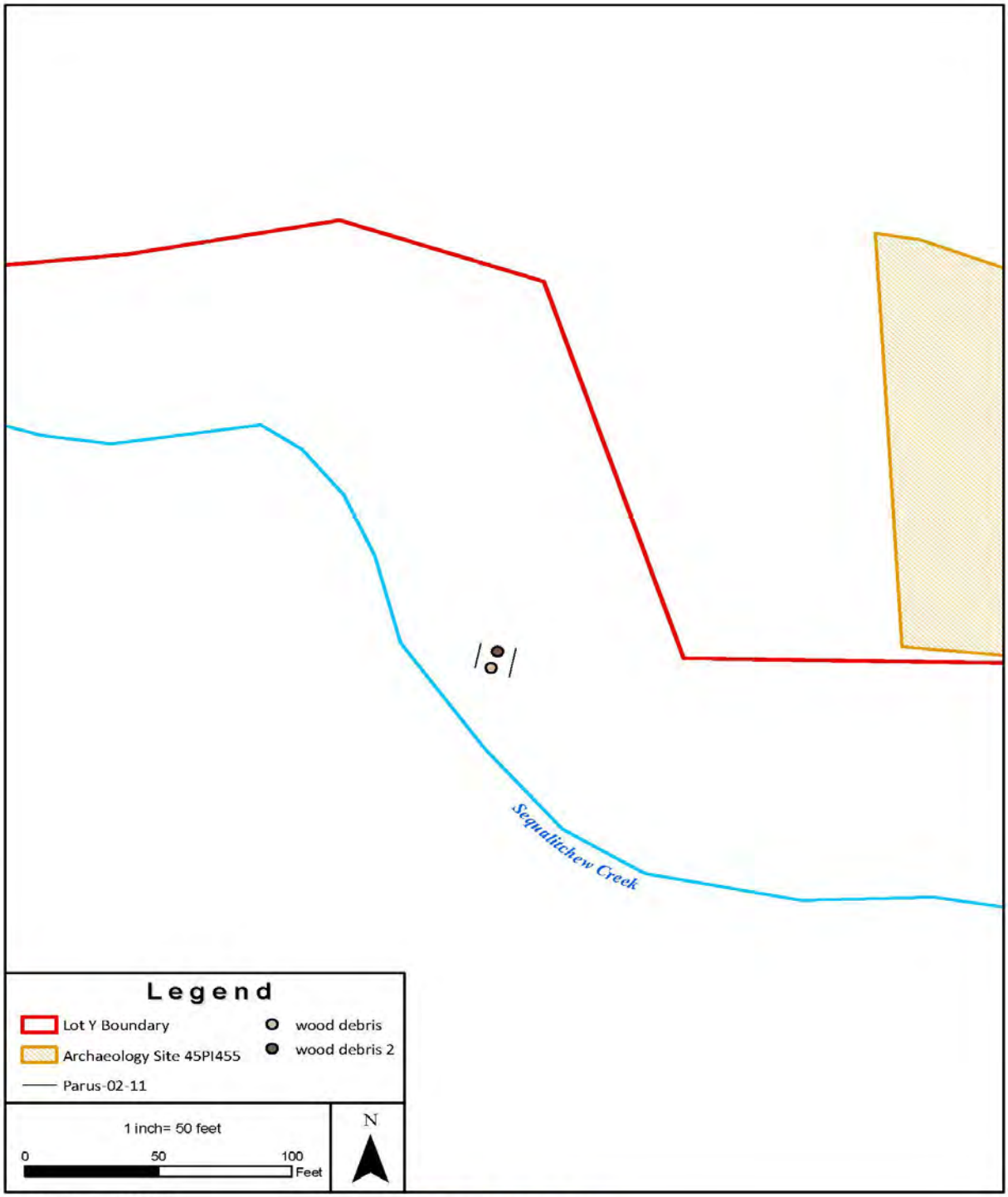
USGS MAP



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Parus-02-11 Location Map

PARUS CONSULTING, INC.

SKETCH MAP



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Parus-02-11 Sketch Map

PARUS CONSULTING, INC.

PHOTOGRAPH(S)

Figure 1: Upper and lower abutments (view to north)

Figure 2: South face of lower abutment (view to north)

PHOTOGRAPH(S)

Figure 3: East side of upper abutment (view to west)

PHOTOGRAPH(S)

Figure 4: Wood debris near lower abutment (plan view)

Figure 5: Wood debris with metal cleat near lower abutment (plan view)

STATE OF WASHINGTON
ARCHAEOLOGICAL ISOLATE INVENTORY FORM

Smithsonian Number: PI00064

***County:** Pierce

***Date:** 2-17-2011 ***Compiler:** C. Arrington

ISOLATE DESIGNATION

Isolate Name: Kerosene Can

Field/ Temporary ID: Parus Isolate #1

Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Pages 19-23):** Historic isolate

ISOLATE LOCATION

***USGS Quad Map Name:** Nisqually

***Legal Description: T**19N **R** 1 **E/W:** E **Section(s):** 26

Quarter Section(s): NWNW

***UTM: Zone** 10 **Easting** 526413 **Northing** 5217323

Latitude: **Longitude:** **Elevation (FT/M):** 220ft

Other Maps: **Type:**

Scale: **Source:**

Drainage, Major: Sequalitchew Creek **Drainage, Minor:** **River Mile:**

Aspect: **Slope:** 1-3%

Location Description** *(General to Specific):** This isolate is located on the north side of Sequalitchew Creek, northwest of the Town of DuPont. It is situated east of the old DuPont works property. The area is disturbed and is dominated by grasses and brushy plants. The project area is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973) approximately 1 mile east of the southern part of Puget Sound shoreline. Sequalitchew Creek drains the Edmond's Marsh area about 1 mile east, and empties into Puget Sound approximately 1.5 miles to the northwest. The Puget Trough is a basin that lies between the Coast Range to the west and the Cascade Range to the east.

ISOLATE DESCRIPTION

***Narrative Description:** A galvanized kerosene can was located near the edge of the northwest corner of the area known locally as the “gravel pit” (HS-6 on Figure 2) and formerly the burning ground (45PI64). The sides of the can are dented and it exhibits some oxidation. It is missing the pour spout and wire handle, but is mostly intact. The top is domed and ribbed, and the base diameter is 11 inches, with a height of 14 inches. The dimensions suggest the volume of this can was approximately 5 gallons. Considering the lengthy range of manufacture, the age of the can is undeterminable.

***Vegetation** *(On Site)*:** Mostly grasses, deciduous and conifer trees, and scotch broom
Local: Douglas fir, Pacific madrone, red alder, elderberry, sword fern
Local: Glacial Plain
Water Resources *(Type)*: Sequalitchew Creek **Distance:** 474 feet South **Permanence:** year round
***Method of Collection(s):** No materials collected

ISOLATE AGE

***Component:** None *__Dates:__ None ***Dating Method:** None
Phase: None **Basis for Phase Designation:** None

ISOLATE RECORDERS

Observed by: C. Arrington & Pete Morris

***Date Recorded:** February 17, 2011

Recorded by** *(Professional Archaeologist):** Cindy Arrington

***Affiliation:** Parus Consulting, Inc ***Affiliation Phone Number:** 916-765-9381

***Affiliation Address:** 1508 Eureka Road, Suite 170, Roseville, CA

***Affiliation E-mail:** Cindy@parusconsulting.com

Date Revisited: **Revisited By:**

ISOLATE HISTORY

Previous Work *(Done on Area Where Isolate was Found)***:**

Year	Author(s)	Report Title	Proximity to project
1977	Onat, A.R., Lee A. Bennett, and Timothy Riordan	Cultural Resources Survey: DuPont Site, Volum I, Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near project area
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site.	Within and near project area
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2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the "Hot Spot" Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within project area
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LAND OWNERSHIP

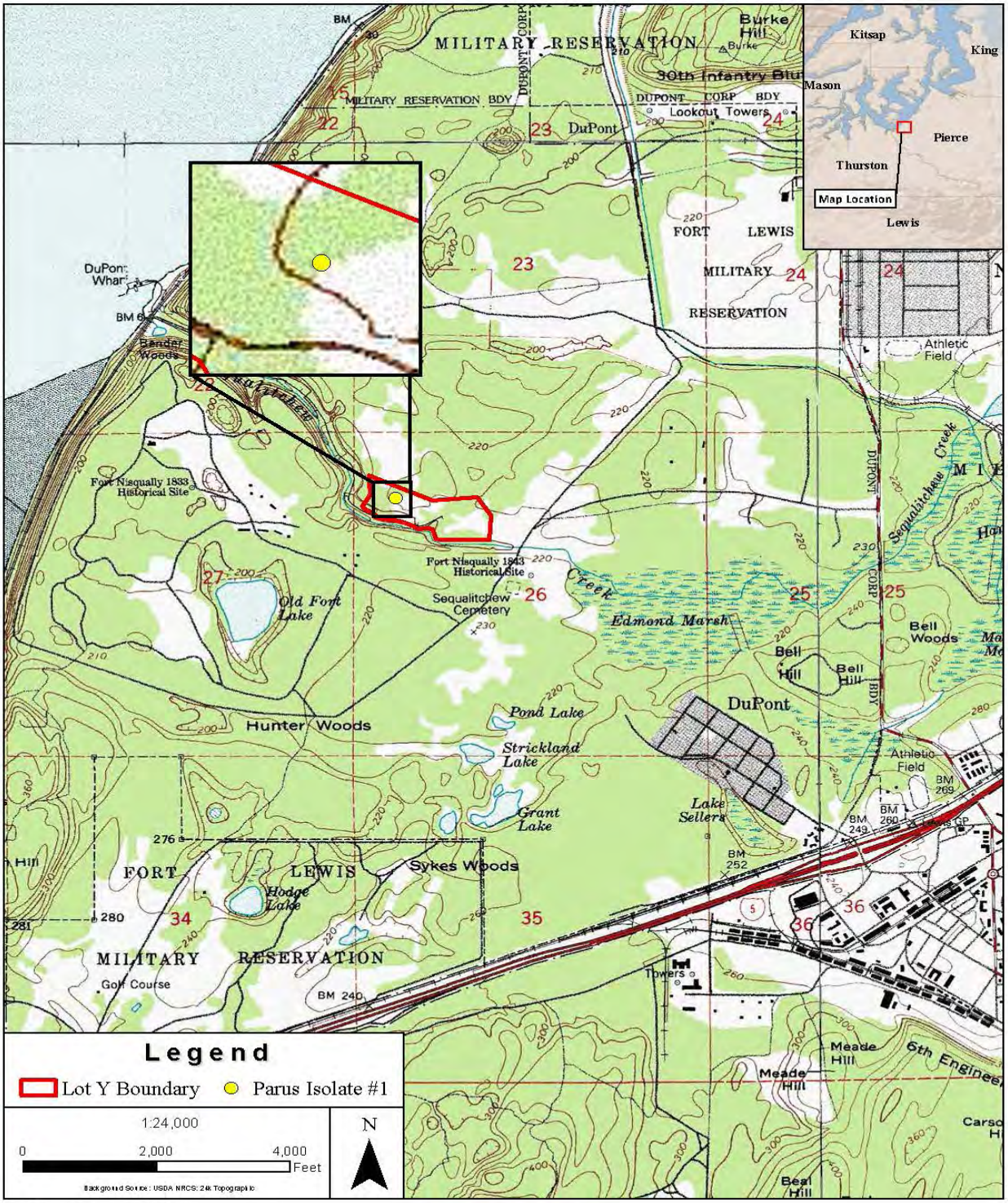
***Owner:** DuPont Industrial Partners, LLC
Address: 1201 Pacific Avenue, Suite 1501, Tacoma, WA 98402

***Tax Lot/ Parcel No:**

RESEARCH REFERENCES

***Items/Documents Used In Research** *(Specify)*: 1973 Franklin, Jerry F., and C. T. Dyrness *Natural Vegetation of Oregon and Washington*. Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service, Portland, Oregon.

USGS MAP



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Parus Isolate #1 Location Map

PARUS CONSULTING, INC.

Mandatory Information for Official Smithsonian Number designation.

Revised 2/2010

PHOTOGRAPH(S)

Figure 1 Kerosene can (in situ)

Figure 2 Kerosene can (top missing spout and handle)

PHOTOGRAPH(S)

Figure 3 Kerosene can (side view)

Figure 4 Kerosene can (side view)

APPENDIX E:
Unanticipated Cultural Resources Discovery Plan

UNANTICIPATED CULTURAL RESOURCES DISCOVERY PLAN

FOR

DUPONT INDUSTRIAL PARTNERS, LLC, LOT Y PROJECT

CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

Prepared For:

DuPont Industrial Partners, LLC
1201 Pacific Avenue, Suite 1501
Tacoma, Washington 98402

Prepared By:

Nancy E. Sikes, Ph.D., RPA

PARUS CONSULTING, INC.

1508 Eureka Road, Suite 170
Roseville, CA 95661

Final– April 14, 2011

TABLE OF CONTENTS

Introduction 1

Project Description, Location and History 1

Potential for Discovery 2

Discovery Procedures 2

Inadvertent Discovery of Archaeological Deposits 2

Inadvertent Discovery of Human Skeletal Remains 3

Summary 4

References 4

INTRODUCTION

DuPont Industrial Partners, LLC (Partners) plans to undertake various ground-disturbing activities during planned construction of a multi-building industrial park on Lot Y in the City of DuPont in Pierce County. This Discovery Plan presents the approach that Partners will use to ensure the protection of cultural resources and describes the steps and actions that must be taken should cultural resources, including human remains, be discovered during ground-disturbing or construction activities for the proposed Lot Y project. This plan provides a brief description of the project, the location of the project, the potential for encountering cultural resources materials or deposits, the discovery procedures that will be employed, and who will be notified if archaeological materials or deposits, or human skeletal remains, are exposed during project implementation.

PROJECT DESCRIPTION, LOCATION AND HISTORY

The project encompasses approximately 25.3 acres on private land known as Lot Y (Assessor's Property Tax Parcel No. 0119262019) located in the City of DuPont, Pierce County, Washington. Lot Y is located within the city limits west of Center Drive and north of Sequalitchew Creek. Partners plans to develop a multi-building industrial park on Lot Y. The complex would include up to 12 buildings totaling approximately 340,000 square feet of building area, roadways, loading areas, approximately 650 parking spaces, and installation of underground utilities.

Plans also include construction of a trail along the creek to the southwest of the industrial park. The existing historical marker erected by the DuPont Company in 1927 at the site of the former Methodist Episcopal Mission (45PI66) will be moved to the trailhead area where the public will have continued access. An interpretive sign explaining the history of the temporary encampment of the 9th U.S. Cavalry Buffalo Soldiers (45PI455) within Lot Y will also be erected.

The Lot Y project area is located within Section 26, Township 19 North, Range 01 East on the Nisqually 1981 USGS 7.5-minute topographic map (Willamette Meridian). Elevation within Lot Y ranges from 64 to 68 meters (210-223 feet) above mean sea level.

A cultural resources investigation for the Lot Y project was conducted for Partners by Parus Consulting, Inc. (PCI) (Sikes and Arrington 2011). The work was conducted under an Archaeological Excavation Permit approved by the Washington State Department of Archaeology & Historic Preservation (DAHP) on February 7, 2011 (Permit No. 2010-54). The study included background research, correspondence with cultural resources staff or Tribal Historic Preservation Officers (THPOs) for the Nisqually, Puyallup and Squaxin Tribes, and archaeological survey and excavation. The fieldwork was conducted in February and March 2011 and included examination of the surface and subsurface sediments in a series of shovel test probes and geotechnical exploration pits.

Monitoring of construction activities during project implementation was not recommended. Lot Y has been extensively disturbed beginning with historic period settlement in the early 1880s, then operation of the DuPont Powder Works in the early to mid-1900s (including use of part of Lot Y as a burning ground dump from the 1930s until 1945), followed by subsurface archaeological investigations and related artifact collection between 1989 and 2005 and by environmental remediation activities in 1999 and 2000. No evidence was found during the 2011 investigation of two previously recorded historic archaeological sites (45PI66 Methodist Episcopal Mission site and 45PI455 9th U.S. Cavalry Bivouac site) and one flaked stone isolate (45PI773), except for two brick fragments within the boundaries of 45PI66. Nor was there any evidence of two other archaeological sites (45PI63 Railroad Dump #3 site and 45PI64 Burning Ground Dump site) formerly located within Lot Y that were completely removed during hazardous

materials remediation. Two surface historic archaeological sites (GEO RR10 railroad track segment and Parus-01-11 concrete platform) were identified within Lot Y during the fieldwork in 2011, but they are not considered significant.

POTENTIAL FOR DISCOVERY

The potential for discovery of buried archaeological materials, features or deposits, or of buried human remains, by implementation of this project is considered low. No significant cultural/archaeological sites are known to remain within the project area, and there has been extensive disturbance to the Lot Y landscape. The nearest known archaeological sites are located on the north bank of Sequalitchew Creek immediately outside of the Lot Y project area (set of concrete bridge abutments) and approximately 0.1 mile east of Lot Y near Center Drive on the north and south banks of the creek (flaked stone artifacts and locations of mid-1850s dwellings near the west palisade wall of 1843 Fort Nisqually).

No significant cultural resources were identified on the surface or within the subsurface sediments exposed in a series of 125 shovel test probes and 22 geotechnical exploration pits placed within Lot Y. Excavated in February and March 2011, the 2.5 foot-wide, 3-foot long shovel test probes ranged from 1.1 to 4.3 feet in depth. The geotechnical exploration pits averaged 10 feet deep, 3 feet wide, and 5 feet long. The subsurface sediments are gravelly sandy loam over gravelly sand with no soil matrix. Except for one brick fragment and a flat iron bar, there was no indication of a midden or other cultural deposits, artifacts or features within the 147 excavation units.

DISCOVERY PROCEDURES

INADVERTENT DISCOVERY OF ARCHAEOLOGICAL DEPOSITS

Archaeological deposits within the proposed Lot Y project are protected by Washington State law: Indian Graves and Records (Revised Code of Washington [RCW] 27.44), Archaeological Sites and Resources (RCW 27.53), and Archaeological Excavation and Removal Permit (WAC 25-48). Failure to comply with these could constitute a Class C Felony.

If any Partners employee, its contractors or subcontractors believes that he or she has inadvertently uncovered any cultural resource, then all work adjacent to the discovery shall cease, and he or she shall immediately notify the construction foreman, inspector, or on-site Partners representative who shall immediately notify the contact at Partners responsible for on-site activities:

DuPont Industrial Partners, LLC
Lia Estigoy
(253) 396-4860

A cultural resource discovery could consist of:

- Prehistoric and ethnohistoric materials such as flaked stone tools, tool-making debris, stone milling tools, fire-affected rock, basketry, culturally modified animal bone, fishing implements or soil darkened by cultural activities (midden).

- Historic materials might include remnants of railroad or roadway construction activities or other industry or commerce (e.g., railroad ties, concrete blocks, machinery parts), building remains, metal, glass, cans, or ceramic artifacts or debris older than 50 years.

For all types and classes of cultural/archaeological material other than human remains (see below), the person responsible for on-site activities shall immediately call the Washington State Department of Archaeology and Historic Preservation (DAHP), which is the state agency with jurisdiction over archaeological discoveries:

Department of Archaeology and Historic Preservation (DAHP)
Gretchen Kaehler, Local Government Archaeologist
Direct line: (360) 586-3083
Cell: (360) 628-2755

The DAHP representative, Ms. Kaehler, will advise Partners (represented by Lia Estigoy) of the specific course of action following the discovery of archaeological materials, deposits or features. For the discovery of human remains, see below. Such actions specified by the DAHP representative could include avoidance of the finds with protection in place, or an archaeological assessment and recovery if avoidance is unfeasible, among other options. Ground-disturbing activity in the vicinity of the find(s) cannot resume until it has been approved by the DAHP representative.

INADVERTENT DISCOVERY OF HUMAN SKELETAL REMAINS

For this project on non-federal and non-tribal lands in the State of Washington, procedures and actions for the inadvertent discovery of human skeletal remains or suspected human remains must comply with RCW 27.44, RCW 68.50 and RCW 68.60. If ground disturbing activities encounter human skeletal remains during the course of construction, then all activity **must** cease that may cause further disturbance to those remains and the area of the find must be secured and protected from further disturbance. In addition, the finding of human skeletal remains **must** be reported to the County Coroner and local law enforcement in the most expeditious manner possible. The remains should not be touched, moved, or further disturbed.

Immediate notification by phone shall be made to the County Coroner, local law enforcement and DAHP:

Pierce County Coroner
Dr. Thomas B. Clark III
3619 Pacific Avenue
Tacoma, Washington 98418
Telephone: (253) 798-6494

DuPont Police Department
1780 Civic Drive, Ste. 100
DuPont, Washington 98327
Telephone: 911 or (253) 964-7060

The Pierce County Coroner will assume jurisdiction over the human skeletal remains and make a determination of whether those remains are forensic or non-forensic. If the County Coroner determines the remains are non-forensic, then he or she will report that finding to DAHP who will then take jurisdiction over those remains and report them to the appropriate cemeteries or affected tribes.

The State Physical Anthropologist will make a determination of whether the remains are Indian or Non-Indian and report that finding to the affected parties. The DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains. Ground-disturbing activity near the human remains may not resume until permission to resume work has been received by Partners from DAHP.

Department of Archaeology and Historic Preservation (DAHP)
Guy Tasa, State Physical Anthropologist
1063 South Capital Way, Suite 106
Olympia, WA 98501
Direct line: (360) 586-3535

SUMMARY

Following the procedures presented in the Discovery Plan will ensure that ground-disturbing and construction activities for implementation of the proposed Lot Y project are in compliance with state and local laws that protect archaeological resources on public lands.

REFERENCES

Sikes, Nancy E., and Cindy J. Arrington
2011 *Archaeological Survey, Testing and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington*. Report prepared by Parus Consulting, Inc. for DuPont Industrial Partners, LLC.

Attachment 1b

Geotechnical Engineering Services

Lot "Y" Industrial Park
DuPont, Washington

for
DuPont Industrial Partners, LLC

October 10, 2011

Received 11-21-2022

GeoEngineers
Earth Science + Technology

Geotechnical Engineering Services

Lot “Y” Industrial Park
DuPont, Washington

for
DuPont Industrial Partners, LLC

October 10, 2011

GeoEngineers

1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

Geotechnical Engineering Services

Lot "Y" Industrial Park
DuPont, Washington

File No. 16785-003-00

October 10, 2011

Prepared for:

DuPont Industrial Partners, LLC
1201 Pacific Avenue, Suite 1501
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Attention: Lia Estigoy

Prepared by:

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INTRODUCTION AND PROJECT UNDERSTANDING

This report presents a summary of our findings, conclusions and recommendations regarding geotechnical engineering aspects of the proposed industrial park to be located west of the property addressed as 14464 Center Drive in DuPont, Washington. The location of the project area is included as Figure 1. Our understanding of the project is based on our discussions with you, project team meetings with Barghausen Engineers (project civil engineers) BCRA (project architects), review of preliminary conceptual plans and review of survey records completed by ESM Consulting Engineers, LLC. We have also prepared a cultural resources study for the subject site under separate cover.

We understand that the property will be developed as a mixed industrial and office park. Current plans are to construct up to 13 different structures over an irregular-shaped area of approximately 26 acres. The structures will range in size from 12,000 square feet to 57,000 square feet and will have one or two stories. Slabs-on-grade or dock-high slabs are anticipated; deep excavations for underground parking and/or a basement level are not planned. Additional improvements will include underground utility installation, asphalt concrete parking, and stormwater design and treatment (including infiltration) in accordance with the 2005 Washington State Department of Ecology (Ecology) Stormwater Management Manual for Western Washington (*SWMWW)*.

The exact layout of the development has not been determined at this time, including building locations, structural loads, and the size and location of infiltration facilities. Because structural loading information has not been provided, we have used assumed load values. Based on our experience with warehouse structures we assume column and wall loads of 300 kips and 5 kips per linear foot, respectively. We also use an assumed floor load of 650 pounds per square foot (psf).

SCOPE OF SERVICES

The purpose of our services was to conduct subsurface investigations to use as a basis for developing geotechnical recommendations for the proposed site improvements. Our specific scope of services includes:

1. Reviewing readily available published geologic data and select in-house files for subsurface information pertinent to soil and groundwater conditions in the site vicinity.
    - We understand that excavation and/or remediation of lead- and arsenic- contaminated soil has been completed at the project site. The clean-up efforts are documented and published. Our services included conducting a brief review of this data for geotechnical information pertinent to this project.
2. Coordinating clearance and location of existing utilities in the project area. We contacted the Washington Utilities Coordinating Council "One Call" service prior to beginning explorations.
3. Exploring subsurface conditions at the project site by excavating 22 test pits to depths between 8 and 11 feet below existing grades.

4. Performing laboratory tests on selected soil samples obtained from the explorations to assist in determining the physical and engineering properties of the site soils. The laboratory testing program consisted of 10 grain-size analyses.
5. Evaluating the results of the sieve analyses with the infiltration criteria presented in the 2005 Ecology *SWMWW*. We provide infiltration rates for the samples tested for use in preliminary design of infiltration ponds.
6. Providing a general discussion of site soil and groundwater conditions based on our review, explorations and laboratory testing.
7. Providing recommendations for site preparation and earthwork. We discuss clearing and stripping, temporary and permanent cut slopes, suitability of on-site soils for use as structural fill, including constraints for wet weather construction, specifications for imported soil for use as structural fill, and fill placement and compaction requirements.
8. Providing general recommendations for site drainage and control of groundwater.
9. Classifying the Seismic Site Class and soil profile in accordance with Table 1613.5.2 of the 2009 International Building Code (IBC) and providing our opinion of soil liquefaction susceptibility.
10. Providing recommendations for design of shallow foundations to support structures and conventional retaining walls, including allowable soil bearing pressures, total and differential settlement estimates, lateral earth pressures (active and passive) and coefficient of friction for evaluating sliding resistance. We discuss suitable foundation material and bearing surface preparation, including removal of uncontrolled fill, soft, organic or otherwise unsuitable material, and backfill compaction.
11. Providing recommendations for support of on-grade floor slabs including capillary break, vapor retarder, underslab drainage, and modulus of subgrade reaction, as appropriate.
12. Providing recommendations for asphalt concrete pavement (ACP) design, including base and subbase requirements for the proposed parking areas. We provide typical minimum ACP section recommendations based on our experience.

SITE GEOLOGY

Based on review of the Geologic Map of the Nisqually 7.5 Minute Quadrangle, Thurston and Pierce Counties, Washington (Walsh et al., 2003). Vashon recessional outwash sand and gravel is the dominant, near-surface, geologic material mapped in the immediate project area. This material is commonly known as Steilacoom gravel. Vashon recessional outwash was deposited by melt water streams in front of the most recent glacier during its retreat from the Puget Sound region approximately 10,000 to 15,000 years ago. These deposits generally consist of permeable sand, or sand and gravel. Cobbles and boulders can also be encountered in this deposit, depending on the depositional history. Glacial till and/or advance outwash is commonly encountered at depth below the recessional outwash.

The United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey of Pierce County Area, Washington, maps the project area as Spanaway gravelly sandy loam (41A).

This soil unit is described as being formed in glacial outwash. It is further described as somewhat excessively drained with moderately rapid permeability, slow surface runoff and little erosion hazard.

SITE CONDITIONS

Surface Conditions

The project area is located west of the intersection of Center Drive and Power Line Road in DuPont, Washington. The project area is bounded on all sides by undeveloped property. Sequalitchew Creek is located south of the project area. Properties to the north and west are occupied by dense forests. The property to the east is occupied by medium dense forests with sparse open areas and a few gravel roads; one of which is orientated east to west and leads into and is located in the southeast half of the project area, Lot Y.

The overall shape of the project area is irregular. Topography is flat or slightly sloping down to the southeast. Vegetation in the approximate southeast half of the project area is typically low growing and sparse to moderately thick and is mostly grasses and scotch broom. The approximate north and west half of the property is densely forested with large evergreen fir trees and some oak trees. A larger clearing area surfaced with gravel is located in the approximate center-west portion of the project site. Some other clearings exist in the approximate northeast portions of the project area. Based on information obtained by and discussions with you and members of Ecology, we understand that these areas are a result of remedial soil activities and removal of contaminated soil that occurred within the project area during 1999 and 2000.

During our time on site, we observed areas throughout the project area where gravel is exposed at the surface and other areas where forest duff was observed to be on the order of 12 to 24 inches thick in locations containing dense vegetation. We did not observe any evidence of surface depressions, slopes failures or erosion, nor standing water or indications of wet surface conditions during our time on site.

Subsurface Explorations

We explored subsurface conditions at the site by excavating 22 test pits on March 3 and 4, 2011. The approximate locations of each test pit are indicated on Figure 2. The test pit depths were between 8 and 11 feet below surrounding grade. Details of the exploratory program, laboratory testing program and the test pit logs are presented in Appendix A.

Subsurface Conditions

The following description of the subsurface conditions is based on our explorations and our understanding of the regional geology. For the purposes of this report, we have characterized the site soils into three general units: 1) fill, 2) weathered soil and 3) recessional outwash. These units are described below. Surface material at the site typically consists of about 2 inches of forest duff and grass sod.

- **Fill** was observed only at the location of test pit TP-9. The fill consisted of medium dense sand with gravel. Layers of silty gravel approximately 2 to 4 inches thick were observed at a depth of

approximately 7 feet below existing grades (bgs). The fill extends to the full depth of exploration at this location. We anticipate that some fill may also exist in and near the locations where remedial activities occurred. Test pits TP-4, TP-11, TP-13, TP-14, TP-20 and TP-21 were located near areas where remedial activities were reported. We were unable to determine a distinct difference between the fill and native soil in these test pits.

- **Weathered soil** was typically observed to typically consist of dark brown to black silty sand or silty gravel with varying amounts of gravel or sand, cobbles and organic material at all test pit locations except TP-4, TP-9, TP-14 and TP-21. Where present, the weathered soil was observed to extend to depths between approximately 2 inches and 3 feet below surrounding grade. The weathered soil was observed to be in a loose to medium dense condition.
- **Recessional Outwash** observed in the explorations is typically described as medium dense or dense gravel with sand (GP and GW) and sand (SP); silty sand (SM) was observed in test pit TP-3. Cobbles were also observed in some of the test pits. Recessional outwash was observed at all of the test pit locations except TP-9.

Groundwater was observed in test pit TP-14 at a depth of about 8 feet bgs at the time of exploration. Groundwater conditions should be expected to vary as a result of season, precipitation and other factors. Based on our observations and previous explorations completed in the project vicinity, static groundwater elevations are expected to be below the depths of the test pit explorations completed for this project.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the results of our review, previous experience in the project vicinity and subsurface exploration program, it is our opinion that the site is generally suitable for the proposed development with regard to geotechnical considerations. A summary of the primary geotechnical considerations for the proposed development is provided below.

- Organic-rich surficial material should be stripped from all areas to be improved.
- Granular soils were generally encountered; however, we did observe that the majority of the explorations encountered soil with higher fines (particles passing the U.S. Standard No. 200 sieve) content; especially near the surface. Soil with a higher fines content are more sensitive to small changes in moisture content and may be difficult, if not impossible, to work and compact during wet weather conditions. This material can also be susceptible to disturbance from construction traffic when wet or if earthwork is performed during wet weather. Construction during periods of dry weather can reduce these possibilities.
- The proposed structures may be satisfactorily supported on continuous and isolated shallow foundations supported on compacted medium dense to very dense native soils or on structural fill that extends to native soil.
- Floor slabs may be supported on compacted native soil or on structural fill that extends to native soil.

- The glacial outwash deposits can contain cobbles and boulders. The contractor should be prepared for this possibility.
- On-site stormwater infiltration appears feasible. We provide preliminary infiltration rate recommendations further in this report. We recommend that we observe subsurface conditions in stormwater infiltration areas prior to construction to verify subsurface conditions and infiltration rates at the specific locations.

Stormwater Infiltration

Select soil samples obtained from test pits TP-2, TP-4, TP-7, TP-11, TP-12, TP-14, TP-15, TP-16, TP-20 and TP-22 were tested in general accordance with ASTM International (ASTM) D 422 to determine the grain-size distribution. The results of the grain-size distribution testing are presented in Appendix A, Figures A-24 through A-26. We followed the analysis procedures presented in the 2005 Ecology *SWMWW* to estimate design stormwater infiltration rates of the soil samples tested. Design stormwater infiltration rates for the soil samples tested are provided in the table below.

In general, it is our opinion that the recessional outwash encountered in our explorations should have adequate permeability and storage capacity to infiltrate stormwater from the site as proposed. We did not encounter groundwater seepage, staining or other indications of seasonal shallow groundwater in the explorations with the exception of test pit TP-14.

TABLE 1. SOIL INFILTRATION RATES[1]

Test Pit No.	Soil Sample No.	Soil Sample Depth (feet)	Percent Fines[2]	D10 Size (mm)[3]	USCS[4] Soil Classification	USDA[5] Soil Classification	Long-term Design Infiltration Rate[6] (Inches per Hour)
2	3	6	1.7	0.50	GP	Sand	9
4	1	4	1.0	0.50	SP	Sand	9
7	1	4	1.1	0.59	GP	Sand	9
11	2	4	1.5	0.53	GP	Sand	9
12	2	6	1.0	0.59	GP	Sand	9
14	3	6	2.0	1.75	GW	Loamy Sand	9
15	2	4	1.2	0.31	GP	Sand	6.5
16	2	6	0.6	1.23	GW	Sand	9
20	2	6	4.2	0.34	GP	Loamy Sand	6.5
22	1	4	1.1	0.47	GP	Sand	9

Notes:

[1] For selected soil samples.

[2] Fines = Silt and clay-sized particles passing U.S. No. 200 (0.75 mm) sieve.

[3] Based on ASTM D 422 Soil Gradation Test.

[4] Unified Soil Classification System (USCS).

[5] United States Department of Agriculture (USDA).

[6] Based on grain-size analysis and the procedures outlined in the 2005 Ecology Stormwater Management Manual for Western Washington Volume III Table 3.8.

The relatively clean sand and gravel soils encountered in the test pits should typically have adequate permeability and storage capacity to infiltrate stormwater from the site. In our opinion, the infiltration rates for the soil types presented may be used for design. However, because the exact location and elevation of the infiltration facilities has not yet been determined, the above infiltration rates should be considered preliminary. Once the facility location has been selected additional testing may be required. In addition, site and location-specific testing may be required by local jurisdictions. Stormwater should be treated in accordance with current regulations prior to infiltration. It should be noted that infiltration through fill is not permissible according to the 2005 Ecology *SWMWW* Volume III.

To help reduce clogging of infiltration facilities, we recommend they be protected during construction with siltation control facilities such as temporary settling basins, silt fences and hay bales. Suspended solids can clog the soil and reduce the infiltration rate. Periodic sweeping of paved areas, during and following construction, will help extend the life of the infiltration facilities. Equipment should not be permitted in the infiltration areas after they are excavated to grade because of the potential for compaction of the subgrade that could reduce the infiltration rate of the native soils.

Site Development and Earthwork

General

We anticipate that site development and earthwork will include stripping and clearing of surface vegetation, constructing foundations and then placing and compacting fill and backfill materials. We expect that the majority of site grading can be accomplished with conventional earthmoving equipment. The following sections provide recommendations for stripping, excavation, erosion control, subgrade development, fill materials, fill placement and compaction.

Stripping and Clearing

Based on our observations at the site, we estimate that the depth of stripping could be on the order of about 2 inches. Greater stripping depths may be required to remove localized zones of loose or organic soil and in areas where moderate to heavy vegetation is located. In addition, the primary root systems of shrubs and trees should be completely removed. Stripped material should be transported off site for disposal or processed and used as fill in landscaping areas.

Although we did not encounter boulders during our subsurface investigation, they can be present in the glacial deposits in the area and may also be in the existing fill. Accordingly, the contractor should be prepared to remove boulders, if encountered during grading or utility excavations. Boulders may be removed from the site or buried in landscape areas. Voids caused by boulder removal should be backfilled with structural fill.

Temporary Excavations, Support and Dewatering

Excavations deeper than 4 feet should be shored or laid back at a stable slope if workers are required to enter. Shoring and temporary slope inclinations must conform to the provisions of Title 296 Washington Administrative Code (WAC), Part N, "Excavation, Trenching and Shoring." Regardless of the soil type encountered in the excavation, shoring, trench boxes or sloped sidewalls will be required under Washington Industrial Safety and Health Act (WISHA). The contract

documents should specify that the contractor is responsible for selecting excavation and dewatering methods, monitoring the excavations for safety and providing shoring, as required, to protect personnel and structures. We provide additional recommendations in regard to temporary and permanent shoring below.

In general, temporary cut slopes should be inclined no steeper than about 1-1/2H to 1V (horizontal to vertical). This guideline assumes that all surface loads are kept at a minimum distance of at least one-half the depth of the cut away from the top of the slope and that significant seepage is not present on the slope face. Flatter cut slopes will be necessary where significant seepage occurs or if surcharge loads are anticipated. We observed caving in our explorations; on this basis, some sloughing and raveling of cut slopes should be expected. Temporary covering with heavy plastic sheeting should be used to protect these slopes during periods of wet weather.

Groundwater Handling During Construction

Based on our explorations and the proposed construction, we do not expect groundwater to be a major factor during shallow excavations and earthwork. However, some perched groundwater may occur in the near-surface soil depending on the time of year of construction. We anticipate that groundwater handling needs will typically be lower during the late summer and early fall months. We anticipate that shallow perched groundwater can typically be handled adequately with sumps, pumps, and/or diversion ditches, as necessary. Ultimately, we recommend that the contractor performing the work be made responsible for controlling and collecting groundwater encountered.

Permanent Cut and Fill Slopes

Based on site grades and the proposed construction, we anticipate that permanent cut and fill slopes may not be required for this project. However, if permanent slopes are necessary, we recommend they be constructed at a maximum inclination of 2H to 1V. Where 2H to 1V permanent slopes are not feasible, protective facings and/or retaining structures should be considered.

To achieve uniform compaction, we recommend that fill slopes be overbuilt slightly and subsequently cut back to expose well-compacted fill. Fill placement on slopes steeper than 5H to 1V should be benched into the slope face and include keyways. The configuration of the bench and keyway depends on the equipment being used. Bench excavations should be level and extend into the slope face. We recommend that a vertical cut of about 3 feet be maintained for benched excavations. Keyways should be about 1-1/2 times the width of the equipment used for grading or compaction.

Exposed areas should be re-vegetated as soon as practical to reduce the surface erosion and sloughing. Temporary protection should be used until permanent protection is established.

Surface Drainage

Surface water from roofs, driveways and landscape areas should be collected and controlled. Curbs or other appropriate measures such as sloping pavements, sidewalks and landscape areas should be used to direct surface flow away from the buildings, erosion sensitive areas and from behind retaining structures.

Erosion and Sedimentation Control

Potential sources or causes of erosion and sedimentation can be influenced by construction methods, slope length and gradient, amount of soil exposed and/or disturbed, soil type, construction sequencing and weather. Implementing an erosion and sedimentation control plan will reduce the project impact on erosion-prone areas. The plan should be designed in accordance with applicable city, county and/or state standards. The plan should incorporate basic planning principles, including:

- Scheduling grading and construction to reduce soil exposure.
- Re-vegetating or mulching denuded areas.
- Directing runoff away from denuded areas.
- Reducing the length and steepness of slopes with exposed soils.
- Decreasing runoff velocities.
- Preparing drainage ways and outlets to handle concentrated or increased runoff.
- Confining sediment to the project site.
- Inspecting and maintaining control measures frequently.

Some sloughing and raveling of exposed or disturbed soil on slopes should be expected. We recommend that disturbed soil be restored promptly so that surface runoff does not become channeled.

Temporary erosion protection should be used and maintained in areas with exposed or disturbed soils to help reduce erosion and reduce transport of sediment to adjacent areas and receiving waters. Permanent erosion protection should be provided by paving, structure construction or landscape planting.

Until the permanent erosion protection is established and the site is stabilized, site monitoring may be required by qualified personnel to evaluate the effectiveness of the erosion control measures and to repair and/or modify them as appropriate. Provisions for modifications to the erosion control system based on monitoring observations should be included in the erosion and sedimentation control plan.

Subgrade Preparation and Evaluation

Subgrade areas should be thoroughly compacted with heavy, smooth-drum vibratory equipment to a uniformly dense and unyielding condition prior to placement of structural fill or structural elements. We recommend that prepared subgrades be observed by a member of our firm, who will evaluate the suitability of the subgrade and identify any areas of yielding which are indicative of soft or loose soil. The exposed subgrade soil should be proof-rolled with heavy rubber-tired equipment and/or probed with a 1/2-inch-diameter steel rod, as appropriate depending on prevailing conditions. If soft, yielding or otherwise unsuitable areas revealed during probing or proof-rolling cannot be compacted to a stable and uniformly firm condition, we recommend that: 1) the subgrade soils be scarified (e.g., with a ripper or a farmer's disc), aerated and recompacted; or 2) the unsuitable soils be removed and replaced with structural fill, as needed.

Subgrade Protection and Wet Weather Considerations

The wet weather season generally begins in October and continues through May in western Washington; however, periods of wet weather can occur during any month of the year. In our opinion, site grading and fill placement could be considered during wet weather, but it should be noted that some of the soils encountered in our explorations, primarily near at the surface, contain a significant amount of fines and will be susceptible to disturbance during extended periods of wet weather. We provide the following recommendations if wet weather construction is considered:

- The ground surface in and around the work area should be sloped so that surface water is directed away from the work area. The ground surface should be graded so that areas of ponded water do not develop. Measures should be taken by the contractor to prevent surface water from collecting in excavations and trenches. Measures should be implemented to remove surface water from the work area.
- Earthwork activities should not take place during periods of heavy precipitation.
- Slopes with exposed soils should be covered with plastic sheeting.
- The contractor should take necessary measures to prevent on-site soils and other soils to be used as fill from becoming wet or unstable. These measures may include the use of plastic sheeting, sumps with pumps and grading. The site soils should not be left uncompacted and exposed to moisture. Sealing the surficial soils by rolling with a smooth-drum roller prior to periods of precipitation will help reduce the extent to which these soils become wet or unstable.
- Construction traffic should be restricted to specific areas of the site, preferably areas that are surfaced with working pad materials not susceptible to wet weather disturbance.
- Construction activities should be scheduled so that the length of time that soils are left exposed to moisture is reduced to the extent practical.
- Protective surfacing such as placing asphalt-treated base (ATB) or haul roads made of quarry spalls or a layer of free-draining material such as well graded pit-run sand and gravel may be necessary to protect completed areas. Typically, minimum gravel thicknesses on the order of 24 inches are necessary to provide adequate subgrade protection.
- During periods of wet weather, concrete should be placed as soon as practical after preparation of the footing excavations. Foundation bearing surfaces should not be exposed to standing water. Should water infiltrate and pool in the excavation, it should be removed before placing structural fill or reinforcing steel. Subgrade protection for foundations consisting of a lean concrete mat may be necessary if footing excavations are exposed to extended wet weather conditions.

Fill Materials

General

All fill that will support floor slabs, or foundations, or be placed in utility trenches should generally meet the criteria for structural fill presented below. Material used for fill should be free of debris, organic contaminants and rock fragments larger than 6 inches. The workability of material for use as fill will depend on the gradation and moisture content of the soil. As the amount of fines

(material passing the U.S. Standard No. 200 sieve) increases, soil becomes increasingly more sensitive to small changes in moisture content and adequate compaction becomes more difficult or impossible to achieve.

Structural Fill

We recommend that structural fill placed during wet weather consist of material of approximately the same quality as "gravel backfill for walls," as described in Section 9-03.12(2) of the Washington State Department of Transportation (WSDOT) Standard Specifications. Structural fill placed during dry weather may consist of material of approximately the same quality as "Gravel Borrow," as described in Section 9-03.14(1) of the WSDOT Standard Specifications.

Pipe Bedding

We recommend that fill placed below and around buried utility pipe consist of material of approximately the same quality as "Gravel Backfill for Pipe Zone Bedding," as described in Section 9-03.12(3) of the WSDOT Standard Specifications.

Quarry Spalls

We recommend that quarry spalls consist of material of approximately the same quality as described in Section 9-13.6 of the WSDOT Standard Specifications.

Footing Drains

In general, we do not anticipate the need for footing drains for foundations founded at depths about 3 feet below surrounding grade provided that soil exposed during foundation excavation is granular recessional outwash and contains small amounts of fines (typically GP, SP, GW, SW soil types). Where required, drain rock placed for footing drains (drainage zone) should consist of material of approximately the same quality as "gravel backfill for drains," as described in Section 9-03.12(4) of the 2010 WSDOT Standard Specifications.

Capillary Break Material

Capillary break below building slabs-on-grade should consist of material in general conformance with Section 9-03.1(4)C, grading No. 57 of the 2010 WSDOT Standard Specifications. Alternatively, a crushed base course conforming to section 9-03.9(3) conforming to the same specifications is in our opinion also appropriate.

Reuse of On-site Soils

Based on our observations and experience, it is our opinion that the native sand and gravel soils (SP, GP and GW) may be considered for re-use as structural fill. Some of the granular native soils contain a significant amount of fines; silty sand (SM), gravel with silt (GP-GM), and silty gravel (GM) may not be suitable for use as fill during periods of wet weather. There may also be instances where native soils that comprise silt (ML) is encountered. In our opinion, these soils are suitable for use as fill only during extended periods of dry weather.

Recycled Materials

Crushed asphalt and concrete may be considered for use as structural fill provided it meets the gradation criteria described above and that the material can be compacted to a uniformly firm and unyielding condition. The maximum particle size should not exceed 6 inches. Gradation of the recycled asphalt is typically difficult to control and because of this, we recommend it not be used where free-draining material is required, such as for retaining wall backfill. In addition, crushed asphalt has the potential to creep under large and sustained loads. We recommend that crushed/ recycled asphalt not be used under foundation elements. Recycled glass may be considered for use as capillary break material or pipe bedding. In general, we recommend "Recycled Materials" conform to Section 9-03.21 of the WSDOT Standard Specifications.

Fill Placement and Compaction

General

Fill materials should be compacted at a moisture content near optimum. The maximum allowable moisture content varies with the soil gradation and should be evaluated during construction. Fill and backfill material should be placed in uniform, horizontal lifts, and uniformly densified with vibratory compaction equipment. The maximum lift thickness will vary depending on the material and the compaction equipment used, but generally should not exceed 10 to 12 inches in loose thickness.

Area Fills and Bases

Fill placed to raise site grades and materials under pavements and slabs should be placed on a prepared subgrade that consists of densely compacted inorganic native soils or compacted fill. In general, we recommend fill be compacted to at least 95 percent of the maximum dry density (MDD) determined by ASTM Test Method D 1557 (modified Proctor).

Quarry Spall Placement

Quarry spalls may be used to stabilize wet subgrades and bearing surfaces. The spalls should be placed and tamped into place using the bucket of a backhoe or excavator until a firm and unyielding condition is observed.

Shallow Foundations

Where required, fill placed to establish grade for shallow spread footings should be placed on a subgrade that consists of proof-compacted existing soil. We recommend that structural fill be placed and compacted to at least 95 percent of the MDD determined by ASTM Test Method D 1557. If soft or disturbed soil is encountered we recommend overexcavation and replacement with structural fill. The zone of compacted structural fill should extend laterally beyond the footing edges a horizontal distance at least equal to the overexcavation depth for foundation embedment. Although not anticipated, if groundwater is encountered quarry spalls may be used to stabilize the base of the excavation prior to placing and compacting structural fill.

Trench Backfill

For utility excavations, we recommend that the initial lift of fill over the pipe be thick enough to reduce the potential for damage during compaction but generally should not be greater than about

18 inches. In addition, rock fragments greater than about 1 inch in maximum dimension should be excluded from this lift.

In pavement and structural areas, trench backfill should consist of structural fill and should be uniformly compacted in horizontal lifts to at least 95 percent of the MDD in the upper 2 feet below subgrade. Fill placed below a depth of 2 feet from subgrade may consist of common fill and should be compacted to at least 90 percent of the MDD. In nonstructural areas, trench backfill should be compacted to a firm condition that will support construction equipment, as necessary.

Seismic Design Considerations

General

The site is located in western Washington, which is seismically active. Seismicity in this region is attributed primarily to the interaction between the Pacific, Juan de Fuca and North American plates. The Juan de Fuca plate is subducting beneath the North American plate at the Cascadia Subduction Zone (CSZ). This produces both intercrustal (between plates) and intracrustal (within a plate) earthquakes.

Research is ongoing regarding large magnitude CSZ-related intercrustal earthquake activity along the Washington and Oregon coasts. Geologists are reporting evidence that suggests several large magnitude earthquakes (magnitude 8 to 9) have occurred along the CSZ in the last 1,500 years, the most recent of which occurred about 300 years ago. Five large subduction zone earthquakes of this magnitude have been observed globally since 1960: 1) in 1960, a magnitude 9.5 earthquake occurred in Chile; 2) in 1964, a magnitude 9.2 earthquake occurred in Alaska; 3) in 2006, a magnitude 9.2 earthquake occurred in Indonesia; and 4) in 2010 a magnitude 8.8 occurred of the coast of Chile; and 5) in 2011 a magnitude 9.0 occurred in Japan. No documented earthquakes of this magnitude have occurred along the CSZ during the recorded history of the Pacific Northwest.

Hundreds of smaller intracrustal earthquakes have been recorded in western Washington. Four of the most recent earthquakes were: 1) in 1946, a magnitude 7.2 earthquake occurred in the Vancouver Island, British Columbia area; 2) in 1949, a magnitude 7.1 earthquake occurred in the Olympia area; 3) in 1965, a magnitude 6.5 earthquake occurred between Seattle and Tacoma; and 4) on February 28, 2001, a magnitude 6.8 occurred at Nisqually near Olympia.

Based on our explorations, laboratory testing, experience and understanding of the geologic setting and seismic hazards, including liquefaction, lateral spreading, fault rupture and earthquake induced landsliding, it is our opinion that the site has a low risk of fault rupture and earthquake-induced landsliding. Recommended seismic design parameters and a discussion of soil liquefaction are provided below.

Seismic Design Criteria

Based on subsurface conditions encountered in our explorations and our understanding of the geologic conditions in the site vicinity, it is our opinion that the subsurface profile should be characterized as Site Class C in accordance with Section 1613 of the 2009 IBC. Seismic design parameters are provided in Table 2, below.

TABLE 2. SEISMIC DESIGN PARAMETERS

Site Coefficient	Site Factor
S_s = 1.182	F_a = 1.0
S_1 = 0.577	F_v = 1.383

Liquefaction Potential

Liquefaction refers to a condition where vibration or shaking of the ground, usually from earthquake forces, results in development of excess pore pressures in loose, saturated soils and subsequent loss of strength in the deposit of soil so affected. In general, soils that are susceptible to liquefaction include loose to medium dense "clean" to silty sands that are below the water table. Based on a review of the Liquefaction Susceptibility Map of Pierce County Washington the site is in an area mapped as having a "Very Low to Low" liquefaction susceptibility. In our opinion, the site soils have low susceptibility to liquefaction.

Shallow Foundations

Foundation Support and Minimum Size

Proposed structures can be satisfactorily founded on continuous wall or isolated column footings supported on compacted native granular soils, or on structural fill placed over native soils. The weathered soil encountered in the explorations will require additional compaction when excavated for foundation support. The exterior footings should be established at least 18 inches below the lowest adjacent grade. The recommended minimum footing depth is greater than the anticipated frost depth. Interior footings can be founded a minimum of 12 inches below the top of the floor slab. Isolated column and continuous wall footings should have minimum widths of 24 and 18 inches, respectively.

Bearing Capacity

We recommend that footings founded as recommended be proportioned using an allowable soil bearing pressure of 4,000 psf. The bearing pressure applies to the total of dead and long-term live loads and may be increased by one third when considering total loads, including earthquake or wind loads. This is a net bearing pressure. The weight of the footing and overlying backfill can be ignored in calculating footing sizes.

Footing Bearing Surface Preparation

Footing excavations should be performed using a smooth-edged bucket to limit bearing surface disturbance. The foundation bearing surface should be thoroughly compacted to a dense, non-yielding condition. Loose or disturbed materials present at the base of footing excavations should be removed or compacted. Foundation bearing surfaces should not be exposed to standing water. Should water infiltrate and pool in the excavation, it should be removed before placing structural fill or reinforcing steel.

We recommend that a member from our firm observe foundation excavations before placing reinforcing steel in order to confirm that adequate bearing surfaces have been prepared or provide recommendations for removal of unsuitable soil. Unsuitable bearing materials should be

recompacted or removed and replaced with compacted structural fill as recommended by the geotechnical engineer.

Foundation Settlement

We estimate that settlement of footings designed and constructed as recommended will be less than 1 inch, for an assumed loading condition of 300 kips per column. Differential settlements between comparably loaded isolated column footings or along 50 feet of continuous footing should be less than 1/2 inch. Settlement is expected to occur rapidly as loads are applied. Settlements could be larger than estimated if footings are placed on loose or disturbed soil.

Lateral Resistance

The ability of the soil to resist lateral loads is a function of frictional resistance, which can develop on the base of footings and slabs and the passive resistance, which can develop on the face of below-grade elements of the structure as these elements tend to move into the soil. For footings and floor slabs founded in accordance with the recommendations presented above, the allowable frictional resistance may be computed using a coefficient of friction of 0.40 applied to vertical dead-load forces. The allowable passive resistance on the face of footings, grade beams or other embedded foundation elements may be computed using an equivalent fluid density of 300 pounds per cubic foot (pcf) for undisturbed on-site soils or structural fill extending out from the face of the foundation element a distance at least equal to two and one-half times the depth of the element.

The passive earth pressure and friction components may be combined provided that the passive component does not exceed two-thirds of the total. The passive earth pressure value is based on the assumptions that the adjacent grade is level and that groundwater remains below the base of the footing throughout the year. The top foot of soil should be neglected when calculating passive lateral earth pressures unless the foundation area is covered with pavement or slab-on-grade. The lateral resistance values include a safety factor of approximately 1.5.

Conventional Subgrade and Retaining Walls

Drainage

Positive drainage is imperative behind any retaining structure. This can be accomplished by providing a drainage zone of free-draining material behind the wall with perforated pipes to discharge the collected water. The drainage material should consist of coarse sand and gravel containing less than 5 percent fines based on the fraction of material passing the 3/4-inch sieve. The wall drainage zone should extend horizontally at least 18 inches from the back of the wall.

A perforated smooth-walled rigid PVC pipe having a minimum diameter of 4 inches should be placed at the bottom of the drainage zone along the entire length of the wall, with the pipe invert at or below the base of the wall footing. The drainpipes should discharge to a tightline leading to an appropriate collection and disposal system. An adequate number of cleanouts should be incorporated into the design of the drains in order to provide access for regular maintenance. In general, roof downspouts, perimeter drains or other types of drainage systems should not be connected to retaining wall drain systems.

Design Parameters

The pressures presented assume that backfill placed within 2 feet of the wall is compacted by hand-operated equipment to a density of 90 percent of the MDD and that wall drainage measures are included as previously recommended. For walls constructed as described above, we recommend using an active lateral earth pressure corresponding to an equivalent fluid density of 35 pcf for the level backfill condition. For walls with backfill sloping upward behind the wall at 2H to 1V, an equivalent fluid density of 55 pcf should be used. This assumes that the tops of the walls are not structurally restrained and are free to rotate. For the at-rest condition (walls restrained from movement at the top) an equivalent fluid density of 55 pcf should be used for design. For seismic conditions, we recommend a uniform lateral pressure of 4H (where H is the height of the wall) psf be added to these lateral pressures. Note that if the retaining system is designed as a braced system but is expected to yield a small amount during a seismic event, an active earth pressure condition may be assumed and combined with the uniform seismic surcharge pressure.

The recommended pressures do not include the effects of surcharges from surface loads. If vehicles will be operated within one-half the height of the wall, a traffic surcharge should be added to the wall pressure. The traffic surcharge can be approximated by the equivalent weight of an additional 2 feet of backfill behind the wall. Additional surcharge loading conditions should also be considered on a case-by-case basis.

Retaining walls founded on native soil or structural fill extending to these materials may be designed using the allowable soil bearing values and lateral resistance values presented above in the "Shallow Foundations" section of this report. We estimate settlement of retaining structures will be similar to the values previously presented for building foundations.

Building Pads and Floor Slabs

A modulus of subgrade reaction of 300 pounds per cubic inch (pci) can be used for designing the building floor slab provided that the subgrade consists of dense native soil or structural fill and has been prepared in accordance with the "Site Development and Earthwork" section of this report. If silt is present at the proposed subgrade elevation, we recommend overexcavation and replacement of silt to a depth of 2 feet or to dense native granular soils, whichever is less.

Settlement for floor slabs designed and constructed as recommended are estimated to be less than 3/4 inch for a floor load of 650 psf. We estimate that differential settlement of floor slabs will be 1/2 inch or less over a span of 50 feet providing that the fill below the slab is compacted as specified. The subgrade soils are non-expansive, so heave is not anticipated beneath the floor slab.

We recommend that on-grade slabs be underlain by a minimum 6-inch-thick capillary break layer to reduce the potential for moisture migration into the slab. The capillary break material should consist of material as described above. The material should be placed as recommended in the "Fill Placement and Compaction" section of this report. If dry slabs are required (e.g., where adhesives are used to anchor carpet or tile to the slab), a waterproof liner may be placed as a vapor barrier below the slab.

Pavement Recommendations

Asphaltic Concrete Pavement

Pavement subgrades and fill should be prepared and placed as previously described. The crushed rock base course layer and subbase layer should be moisture conditioned near the optimum moisture content and compacted to at least 95 percent of the MDD determined in accordance with ASTM D 1557 test procedures. An appropriate number of in-place density tests should be conducted on the compacted base course to check that adequate compaction has been obtained. Crushed rock base course should conform to applicable sections of 4-04 and 9-03.9(3) of the WSDOT Standards. Subbase should generally consist of a gravel borrow conforming to Section 9-03.14(1) of the WSDOT Standards except as noted below.

For this project, we based the recommended pavement sections described below on an assumed in-situ California Bearing Ratio (CBR) between 15 and 20. The heavy-duty pavement section thickness is based on a traffic loading of about 1,000,000, 18-kip equivalent single-axle loads (ESALs); we used a design life of 10 years. The standard-duty section is appropriate for areas that will not be exposed to heavy truck loads. Hot mix asphalt (HMA) should conform to applicable sections of 5-04, 9-02 and 9-03 of the WSDOT Standards. The recommended pavement sections assume that final improvements surrounding the pavement will be designed and constructed such that stormwater or excess irrigation water from landscape areas does not infiltrate below the pavement section into the crushed base.

STANDARD-DUTY ASPHALTIC CONCRETE PAVEMENT

- 2 inches of hot mix asphalt.
- 4 inches of crushed surfacing base course and/or top course compacted as recommended.
- 12 inches compacted depth granular subbase. Native soil may be considered for use as the subbase provided that it is granular sand and gravel recessional outwash encountered below the weathered zone as indicated in the test pit logs.

HEAVY-DUTY ASPHALTIC CONCRETE PAVEMENT

- 3 inches of hot mix asphalt.
- 6 inches of crushed surfacing base course and/or top course compacted as recommended.
- 12 inches compacted depth granular subbase. Native soil may be considered for use as the subbase provided that it is granular sand and gravel recessional outwash encountered below the weathered zone as indicated in the test pit logs.

LIMITATIONS

We have prepared this report for the exclusive use by DuPont Industrial Partners, LLC and their authorized agents for the Lot "Y" Industrial Development site, which will be located west of the intersection of Center Drive and Power Line Road in DuPont, Washington. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix B titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report.

REFERENCES

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Lot Y

T19N, R 1E, Section 26
USGS 7.5' Topographic Map Series, Nisqually (1981) Quad.

N
W E
S

1:24,000

2,000 0 2,000
Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

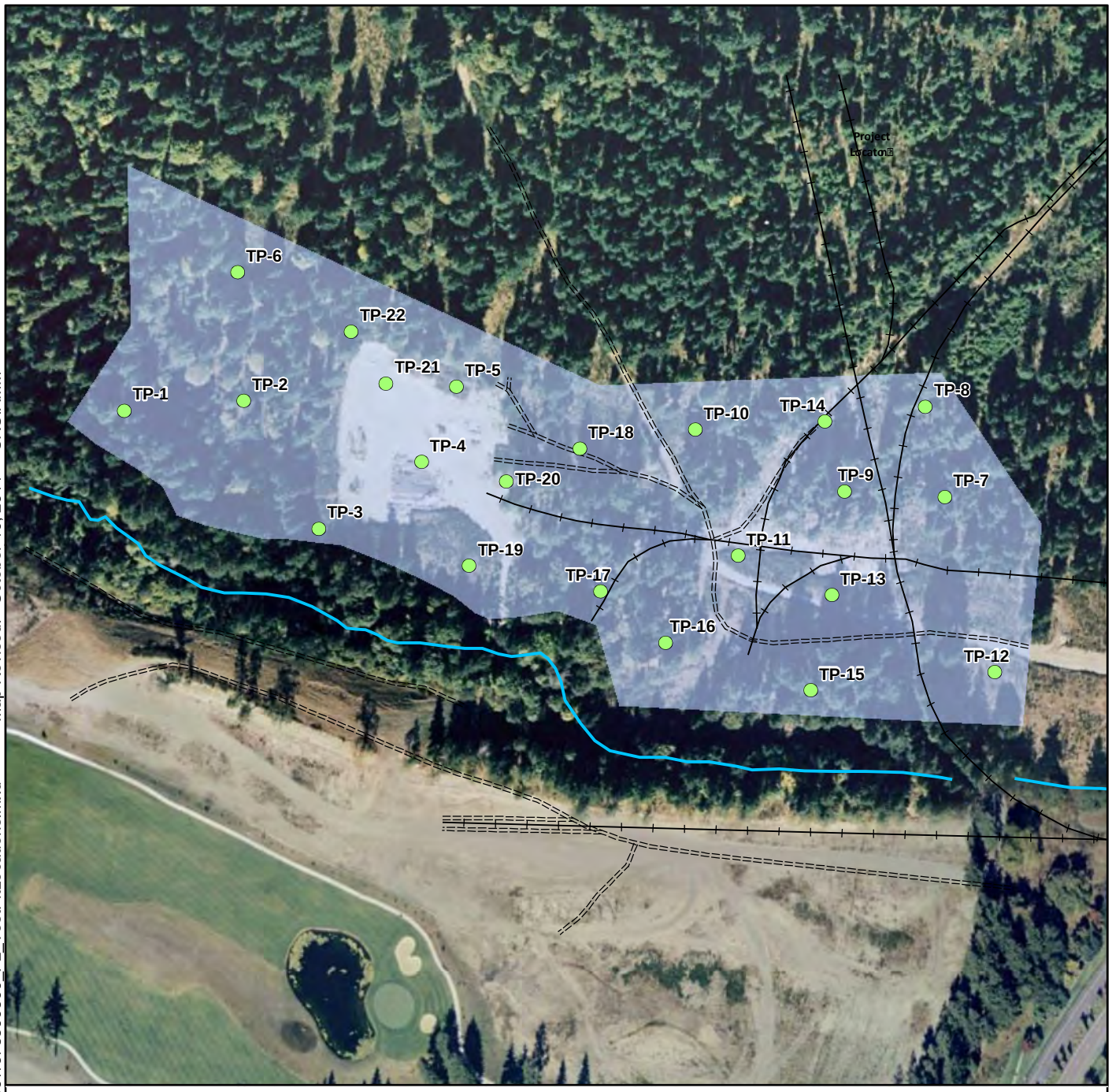
Vicinity Map

Lot Y Industrial Park
DuPont, Washington

GeoEngineers

Figure 1

Office: Tacoma Path: W:\Tacoma\Projects\16\16785003\GIS\16785003_F1_LocationMap.mxd Map Revised: October 10, 2011 CRC



Test Pit Locations

Lot Y

Sequalitchew Creek

Dirt Road

Railroad

N

W E

S

300 0 300

Feet

T19N, R 1E, Section 26
USGS 7.5' Topographic Map Series, Nisqually (1981) Quad.

Notes:
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Data Sources: ESRI Data & Maps, Street Maps 2005
Bing Aerial from ESRI Data Online.

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Site Plan

Lot Y Industrial Park
DuPont, Washington

GeoEngineers

Figure 2

Office: Tacoma Path: \\tac\projects\16\16785003\GIS\00\1678500300_F2_TestPitLocations.mxd Map Revised: October 10, 2011 CRC:AMM

APPENDIX A
Field Explorations and Laboratory Testing

APPENDIX A
FIELD EXPLORATIONS AND LABORATORY TESTING

Subsurface Explorations

Soil and groundwater conditions at the proposed development site were explored by excavating 22 test pits on March 3 and 4, 2011. Subsurface exploratory services were subcontracted to GeoEngineers, Inc. The test pit explorations extended to depths between 8 and 11 feet below existing site grades.

The locations of the test pits were determined by pacing and visual triangulation from existing site features such as roadways and property corners and by a handheld Trimble GeoXT global positioning system (GPS) unit where applicable. The elevations presented on the test pit logs are based on an abbreviated aerial survey obtained from Barghausen Consulting Engineers and the GPS unit, where applicable. The locations and elevations of the explorations should be considered approximate. Locations of the explorations are provided on the Site Plan, Figure 2.

Our field representative obtained samples, classified the soils, maintained a detailed log of each exploration and observed groundwater conditions where applicable. The samples were retained in sealed plastic bags to prevent moisture loss. The soils were classified visually in general accordance with the system described in Figure A-1, which includes a key to the exploration logs. Summary logs of the explorations are included as Figures A-2 through A-23. The densities noted on the test pit exploration logs are based on the difficulty of excavation, observations of caving and our experience and judgment.

Laboratory Testing

General

Representative soil samples were selected for laboratory tests to confirm our field classification and aid in evaluating infiltration characteristics. The following paragraphs provide a description of the tests performed.

Moisture Content (MC)

The moisture content of selected samples was determined in general accordance with ASTM International (ASTM) Test Method D 2216. The test results are used to aid in correlation with other pertinent engineering soil properties. The test results are presented on the test pit logs.

Particle-Size Analyses (SA)

Particle-size sieve analyses were performed on 12 samples in general accordance with ASTM Test Method C 136. This test method covers the quantitative determination of the distribution of particle sizes in soils. The distribution of particle sizes larger than the U.S. No. 200 sieve (75 micrometers) was determined by mechanical sieving. The results of the tests were used for soil classification and in determining engineering properties of the soil. Figures A-24 through A-26 present the sieve test results.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	CC	Cement Concrete
	AC	Asphalt Concrete
	CR	Crushed Rock/ Quarry Spalls
	TS	Topsoil/ Forest Duff/Sod

Measured groundwater level in exploration, well, or piezometer

Groundwater observed at time of exploration

Perched water observed at time of exploration

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Material Description Contact

Distinct contact between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

A "P" indicates sampler pushed using the weight of the drill rig.

Laboratory / Field Tests

%F	Percent fines
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
OC	Organic content
PM	Permeability or hydraulic conductivity
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
NT	Not Tested

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

KEY TO EXPLORATION LOGS

GeoEngineers

FIGURE A-1

Date Excavated: 3/3/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.5

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
209	1				DUFF		2 inches duff		
					SM		Black silty fine to coarse sand with organics and occasional gravel (loose, moist) (weathered)		
208	2				GP-GM		Brown fine to coarse gravel with sand and silt (dense, moist) (recessional outwash)		
207	3	X	1						
206	4								
205	5	X	2						
204	6								
203	7								
202	8	X	3						
201	9								
200	10	X	4						

Test pit completed at 10.5 feet
No groundwater seepage observed
Minor caving observed at ~2+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Tacoma: Date: 10/10/11 Path:P:\161678500300\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Log of Test Pit TP-1

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-2
Sheet 1 of 1

Date Excavated: 3/3/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.5

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
					DUFF		2 inches duff		
208	1				GM		Black silty fine to coarse gravel with sand and organics (medium dense, moist) (weathered)		
					SP		Brown fine to coarse sand with gravel, trace sand (dense, moist) (recessional outwash)		
207	2								
		X	1						
206	3								
205	4				GP		Brown fine to coarse gravel with sand, trace silt (very dense, moist) (recessional outwash)		
		X	2						
204	5								
203	6	X	3 SA					4	%F=1.7
202	7								
201	8	X	4						
200	9								
199	10	X	5						

Test pit completed at 10.5 feet
No groundwater seepage observed
Minor caving observed at ~3+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\16785003000.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Log of Test Pit TP-2

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-3
Sheet 1 of 1

Date Excavated: 3/3/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.5

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
208	1				DUFF		2 inches duff and sod		
					SM		Black silty fine to coarse sand with gravel and organics (loose, moist) (weathered)		
					SM		Red/brown silty fine to coarse sand (medium dense, moist) (recessional outwash)		
207	2	X	1						
206	3				GP-GM		Yellow/brown fine to coarse gravel with sand and silt, occasional cobbles (dense, moist) (recessional outwash)		
205	4								
204	5								
203	6	X	2						
202	7								
201	8	X	3						
200	9								
199	10	X	4						

Test pit completed at 10.5 feet
No groundwater seepage observed
Minor caving observed at ~4+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Log of Test Pit TP-3

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-4
Sheet 1 of 1

Date Excavated: 3/3/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
209	1				SP		Brown medium to coarse sand with gravel, trace silt (dense, moist) (recessional outwash)		
208	2								
207	3								
206	4	X	1 SA					4	%F=1.0
205	5								
204	6	X	2						
203	7				GP-GM		Brown fine to coarse gravel with sand and silt (dense, moist) (recessional outwash)		
					GP		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
202	8	X	3						
201	9								
200	10						Test pit completed at 10 feet No groundwater seepage observed Minor caving observed at ~3+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Tacoma: Date:10/10/11 Path:P:\16\16785003\GINT\16785003000.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Log of Test Pit TP-4

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-5
Sheet 1 of 1

Date Excavated: 3/3/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
209	1				DUFF		2 inches forest duff		
					GM		Black silty fine to coarse gravel with sand (medium dense, moist) (weathered)		
208	2				GP		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
207	3								
206	4	X	1						
205	5								
204	6	X	2		SP		Gray/brown fine to coarse sand with gravel, trace silt (dense, moist) (recessional outwash)		
203	7								
202	8	X	3						
201	9								
200	10						Test pit completed at 10 feet No groundwater seepage observed Minor caving observed at ~3+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-5

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-6
Sheet 1 of 1

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\1678500300.GPJ DBTemplate\LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 3/3/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.5

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
206	1	X	1		DUFF		2 inches duff		
					SM		Black silty fine to coarse sand with gravel and organics (medium dense, moist) (weathered)		
205	2								
204	3	X	2		GP		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
203	4	X	3		SP		Gray/brown fine to coarse sand with gravel, trace silt (dense, moist) (recessional outwash)		
202	5				GP		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
201	6	X	4						
200	7								
199	8								
198	9						Occasional cobbles		
197	10	X	5		GP-GM		Gray fine to coarse gravel with silt and sand (dense, moist)		
							Test pit completed at 10.5 feet No groundwater seepage observed Minor caving observed at ~3+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-6

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-7
Sheet 1 of 1

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 3/3/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.5

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
210	1				DUFF		2 inches		
					GM		Black/brown silty fine to coarse gravel with sand and organics (medium dense, moist) (weathered)		
209	2				GW		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
208	3								
207	4	X	1 SA					4	%F=1.1
206	5								
205	6	X	2						
204	7								
203	8								
202	9								
201	10								

Test pit completed at 10.5 feet
No groundwater seepage observed
Minor caving observed at ~3+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-7

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-8
Sheet 1 of 1

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 3/3/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 11.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
214	1				DUFF		2 inches duff		
					SM		Black silty fine to coarse sand with gravel and organics (medium dense, moist) (weathered)		
213	2								
212	3				SP		Brown fine to coarse sand with gravel, trace silt (dense, moist) (recessional outwash)		
211	4	X	1						
210	5								
209	6	X	2						
208	7								
207	8								
206	9								
205	10				GP-GM		Brown fine to coarse gravel with silt and sand (dense, moist) (recessional outwash)		
204	11	X	3						
							Test pit completed at 11 feet No groundwater seepage observed Minor caving observed at ~3+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Tacoma: Date:10/10/11 Path:P:\16\16785003\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Log of Test Pit TP-8

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-9
Sheet 1 of 1

Date Excavated: 3/3/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 8.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
208	1				DUFF		2 inches duff		
					SP		Brown fine to coarse sand with gravel, trace silt (medium dense, moist) (fill)		
207	2								
206	3								
205	4	X	1						
204	5								
203	6	X	2						
202	7						Occasional layers of black silty fine to coarse gravel 2 to 4 inches thick		
201	8						Test pit completed at 8 feet No groundwater seepage observed Minor caving observed at ~4+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-9

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-10
Sheet 1 of 1

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 3/3/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 9.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
200	1	X	1		DUFF		2 inches duff		
					SM		Black silty fine to coarse sand with gravel and organics (loose, moist) (weathered)		
199	2				GP		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
198	3				SP		Gray fine to coarse sand with gravel, trace silt (dense, moist) (recessional outwash)		
197	4	X	2						
196	5								
195	6	X	3						
194	7								
193	8								
192	9						Test pit completed at 9 feet No groundwater seepage observed Minor to severe caving observed at ~4+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-10

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-11
Sheet 1 of 1

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\16785003000.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 3/3/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.5

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
					SM		2 inches black silty sand with gravel and organics (medium dense, moist)		
					GP		Brown fine to coarse gravel with sand, trace silt, occasional cobbles (very dense, moist) (recessional outwash)		
193	1								
192	2	X	1						
191	3								
190	4	X	2 SA					4	%F=1.5
189	5								
188	6	X	3						
187	7								
186	8								
185	9								
184	10	X	4						

Test pit completed at 10.5 feet
No groundwater seepage observed
Moderate caving observed at ~5+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-11

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-12
Sheet 1 of 1

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\16785003000.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 3/4/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
201	1				SOD		2 inches sod		
					SM		Black silty fine to coarse sand with gravel and organics (medium dense, moist)		
200	2				GP		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
199	3								
198	4	X	1						
197	5								
196	6	X	2 SA					4	%F=1.0
195	7								
194	8								
193	9								
192	10						Test pit completed at 10 feet No groundwater seepage observed Minor caving observed at ~3+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-12

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-13
Sheet 1 of 1

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\16785003000.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 3/4/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.5

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
202	1				SOD		2 inches sod with sand		
					GM		Black silty fine to coarse gravel with sand and organics (loose, moist) (weathered)		
201	2				GP		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
200	3								
199	4	X	1						
198	5								
197	6	X	2						
196	7								
195	8								
194	9								
193	10	X	3						

Test pit completed at 10.5 feet
No groundwater seepage observed
No caving observed

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Tacoma: Date:10/10/11 Path:P:\161678500300\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Log of Test Pit TP-13

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-14
Sheet 1 of 1

Date Excavated: 3/4/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
203	1	X	1		GP		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
202	2								
201	3								
200	4	X	2						
199	5						Grades to wet		
198	6	X	3 SA		GW		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)	5	%F=2.0
197	7								
196	8					▽			
195	9								
194	10						Test pit completed at 10 feet Moderate groundwater seepage observed at 8 feet Moderate caving observed at ~2+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\16785003000.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Log of Test Pit TP-14

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-15
Sheet 1 of 1

Date Excavated: 3/4/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
202	1	X	1		DUFF		2 inches sod/duff		
					SM		Black silty fine to coarse sand with gravel and organics (medium dense, moist) (weathered)		
201	2								
200	3				GP		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
199	4	X	2 SA					5	%F=1.2
198	5								
197	6	X	3						
196	7								
195	8								
194	9								
193	10						Test pit completed at 10 feet No groundwater seepage observed Moderate caving observed at ~4+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-15

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-16
Sheet 1 of 1

Tacoma: Date:10/10/11 Path:P:\16\16785003\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 3/4/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
214	1				DUFF		2 inches duff/sod		
					SM		Black silty fine to coarse sand with gravel and organics (medium dense, moist) (weathered)		
213	2				GW		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
212	3								
211	4	X	1						
210	5								
209	6	X	2 SA					3	%F=0.6
208	7								
207	8								
206	9								
205	10						Test pit completed at 10 feet No groundwater seepage observed Moderate caving observed at ~4+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-16

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-17
Sheet 1 of 1

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\16785003000.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 3/4/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
204	1				DUFF		2 inches duff/sod		
					SM		Black silty fine to coarse sand with gravel and organics (loose, moist) (weathered)		
203	2				GP		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
202	3								
201	4	X	1						
200	5								
199	6	X	2						
198	7								
197	8								
196	9								
195	10						Test pit completed at 10 feet No groundwater seepage observed Moderate caving observed at ~5+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Tacoma: Date: 10/10/11 Path:P:\161678500300\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Log of Test Pit TP-17

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-18
Sheet 1 of 1

Date Excavated: 3/4/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 8.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
216	1				SOD		2 inches sod		
					GM		Black silty fine to coarse gravel with sand and organics (loose, moist) (weathered)		
215	2				GP		Brown fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
214	3								
213	4	X	1						
212	5								
211	6	X	2						
210	7								
209	8						Test pit completed at 8 feet No groundwater seepage observed Moderate to severe caving observed at ~2+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\16785003.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Log of Test Pit TP-18

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-19
Sheet 1 of 1

Date Excavated: 3/4/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.5

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
					SOD		2 inches sod		
206	1				SM		Black silty fine to coarse sand with gravel and organics (medium dense, moist) (weathered)		
205	2				GP		Gray fine to coarse gravel with sand, trace silt (dense, moist) (recessional outwash)		
204	3						Grades to brown		
203	4	X	1						
202	5								
201	6	X	2						
200	7								
199	8								
198	9	X	3		GP-GM		Gray fine to coarse gravel with sand and silt (dense, moist) (recessional outwash)		
197	10	X	4						

Test pit completed at 10.5 feet
No groundwater seepage observed
Moderate caving observed at ~3+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-19

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-20
Sheet 1 of 1

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 3/4/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.5

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
197	0				GM		Dark brown silty fine to coarse gravel with sand (medium dense, moist) (weathered)		
					GP		Brown fine to coarse gravel with sand, trace silt, occasional cobbles (dense, moist) (recessional outwash)		
196	1								
195	2								
194	3								
193	4	X	1						
192	5								
191	6	X	2 SA					6	%F=4.2
190	7								
189	8								
188	9								
	10	X	3		GP-GM		Gray fine to coarse gravel with sand and silt, occasional cobbles (dense, moist) (recessional outwash)		

Test pit completed at 10.5 feet
No groundwater seepage observed
Minimal caving observed at ~3+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Tacoma: Date:10/10/11 Path:P:\161678500300\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Log of Test Pit TP-20

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-21
Sheet 1 of 1

Date Excavated: 3/4/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 8.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
200	1				GP		Brown fine to coarse gravel with sand, trace silt, occasional cobbles (dense, moist) (recessional outwash)		
199	2								
198	3								
197	4	X	1						
196	5								
195	6	X	2						
194	7								
193	8						Test pit completed at 8 feet No groundwater seepage observed Severe caving observed at ~3+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-21

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-22
Sheet 1 of 1

Tacoma: Date: 10/10/11 Path:P:\16\16785003\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 3/4/2011 Logged By: EAW

Equipment: Deere 410E Total Depth (ft) 10.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
209	1				SOD		2 inches sod/duff		
					GM		Black silty fine to coarse gravel with sand and organics (loose, moist) (weathered)		
208	2				GP		Brown fine to coarse gravel with sand, trace silt, occasional cobbles (dense, moist) (recessional outwash)		
207	3								
206	4	X	1 SA					4	%F=1.1
205	5								
204	6	X	2						
203	7								
202	8								
201	9	X	3						
200	10						Test pit completed at 10 feet No groundwater seepage observed Moderate to severe caving observed at ~1.5+ feet		

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Tacoma: Date: 10/10/11 Path:P:\161678500300\GINT\1678500300.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

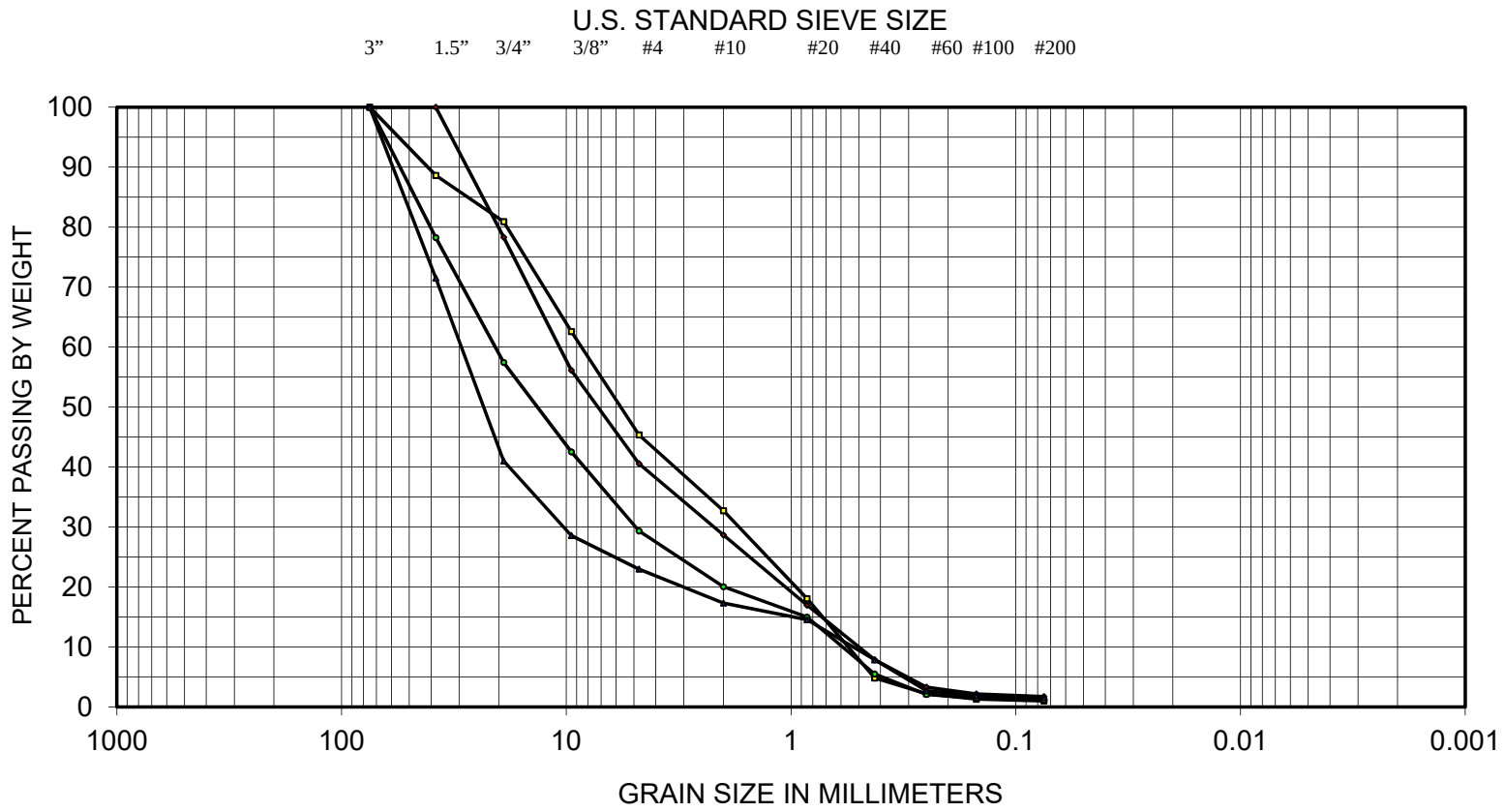
Log of Test Pit TP-22

GeoEngineers

Project: Lot Y Industrial Park
Project Location: DuPont, Washington
Project Number: 16785-003-00

Figure A-23
Sheet 1 of 1

16785-003-00



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	EXPLORATION NUMBER	DEPTH (ft)	MOISTURE (%)	SOIL CLASSIFICATION
◆	TP-2	6	4	Fine to coarse gravel with sand (GP)
□	TP-4	4	4	Fine to coarse sand with gravel (SP)
○	TP-7	4	4	Fine to coarse gravel with sand (GW)
△	TP-11	4	4	Fine to coarse gravel with sand (GP)

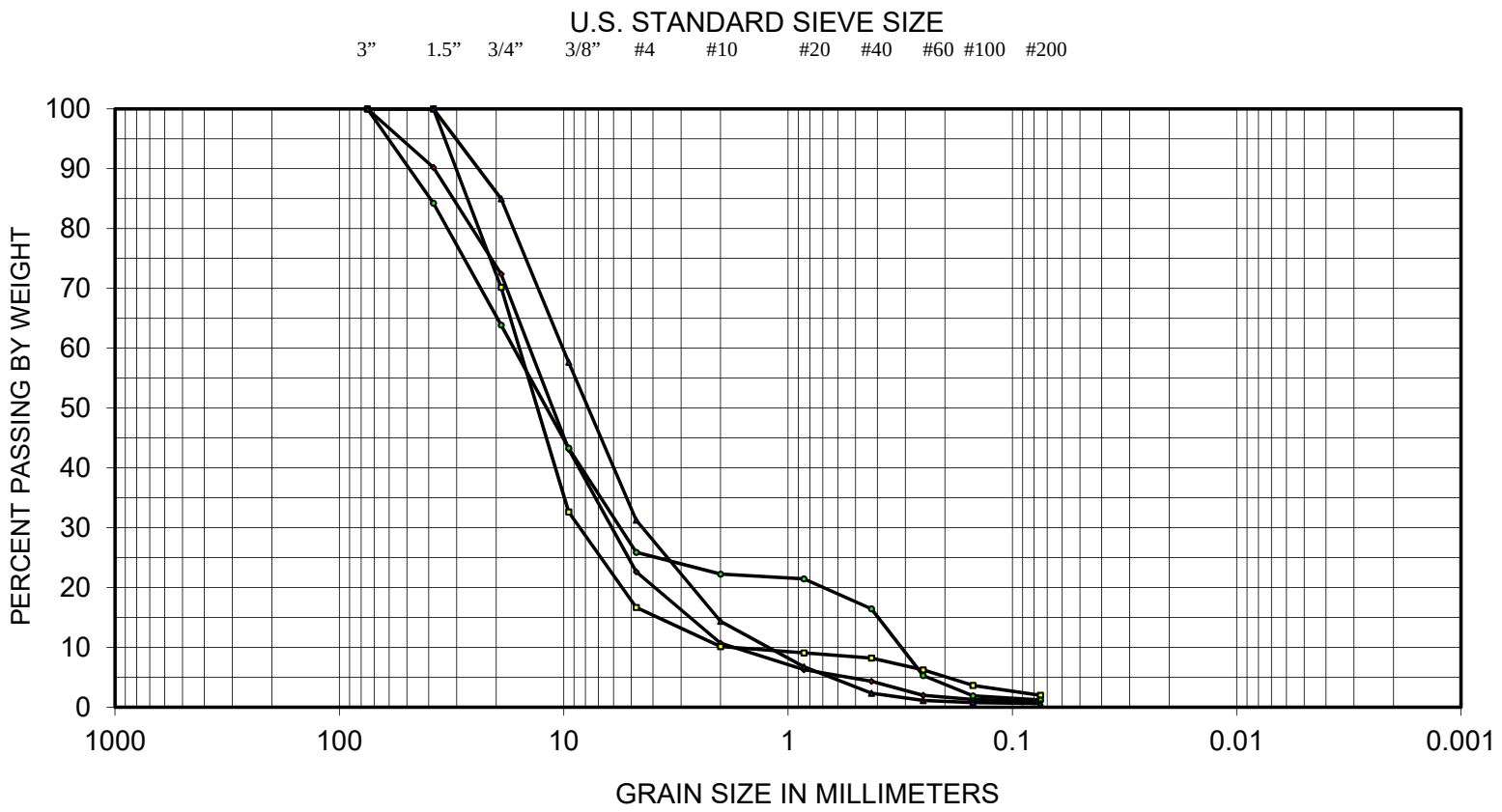
GeoEngineers

Lot Y Industrial Park
DuPont, Washington

Sieve Analysis Results

Figure A-24

16758-003-00



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	EXPLORATION NUMBER	DEPTH (ft)	MOISTURE (%)	SOIL CLASSIFICATION
◆	TP-12	6	4	Fine to coarse gravel with sand (GW)
□	TP-14	6	5	Fine to coarse gravel with sand (GW)
○	TP-15	4	5	Fine to coarse gravel with sand (GP)
△	TP-16	6	3	Fine to coarse gravel with sand (GW)

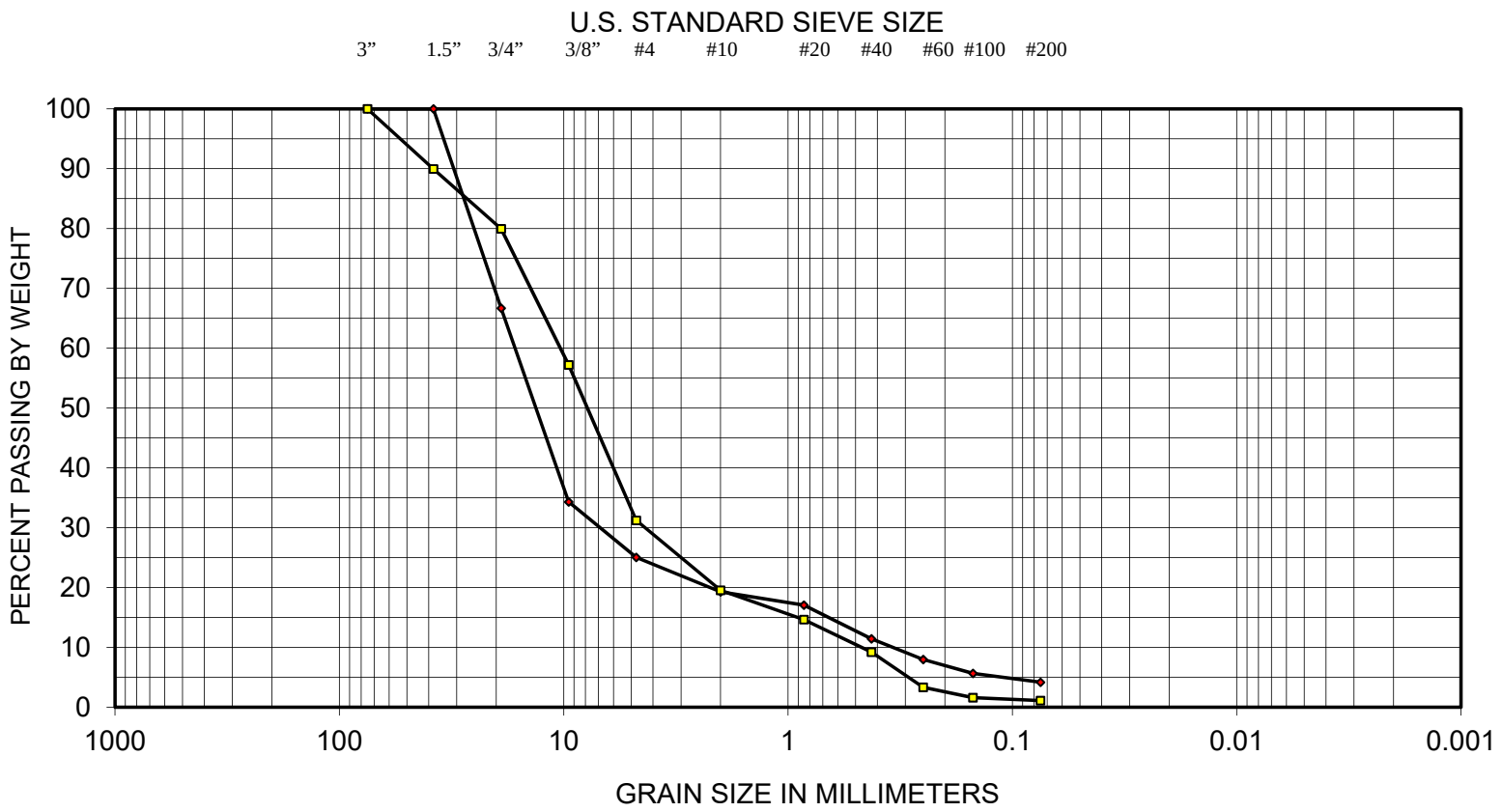
GeoEngineers

Figure A-25

Lot Y Industrial Park
DuPont, Washington

Sieve Analysis Results

16785-003-00



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	EXPLORATION NUMBER	DEPTH (ft)	MOISTURE (%)	SOIL CLASSIFICATION
◆	TP-20	6	6	Fine to coarse gravel with sand (GP)
■	TP-22	4	4	Fine to coarse gravel with sand (GP)

GeoEngineers

Figure A-26

Lot Y Industrial Park
DuPont, Washington

Sieve Analysis Results

APPENDIX B
Report Limitations and Guidelines for Use

APPENDIX B
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Geotechnical Services are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the exclusive use of DuPont Industrial Partners, LLC and their authorized agents. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, a geotechnical or geologic study conducted for a civil engineer or architect may not fulfill the needs of a construction contractor or even another civil engineer or architect that are involved in the same project. Because each geotechnical or geologic study is unique, each geotechnical engineering or geologic report is unique, prepared solely for the specific client and project site. Our report is prepared for the exclusive use of our Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted geotechnical practices in this area at the time this report was prepared. This report should not be applied for any purpose or project except the one originally contemplated.

A Geotechnical Engineering or Geologic Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the Lot "Y" Industrial Park in DuPont, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

- composition of the design team; or
- project ownership.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

Most Geotechnical and Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Geotechnical Engineering Report Recommendations Are Not Final

Do not over-rely on the preliminary construction recommendations included in this report. These recommendations are not final, because they were developed principally from GeoEngineers' professional judgment and opinion. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for this report's recommendations if we do not perform construction observation.

Sufficient monitoring, testing and consultation by GeoEngineers should be provided during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions.

A Geotechnical Engineering or Geologic Report Could be Subject to Misinterpretation

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or

geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

Give Contractors a Complete Report and Guidance

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering or geologic report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

Contractors are Responsible for Site Safety on their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and to adjacent properties.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical, Geologic and Environmental Reports Should not be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground

storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention, or assessment of the presence of Biological Pollutants in or around any structure. Accordingly, this report includes no interpretations, recommendations, findings, or conclusions for the purpose of detecting, preventing, assessing, or abating Biological Pollutants. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

Topsoil

For the purposes of this report, we consider topsoil to consist of generally fine-grained soil with an appreciable amount of organic matter based on visual examination, and to be unsuitable for direct support of the proposed improvements. However, the organic content and other mineralogical and gradational characteristics used to evaluate the suitability of soil for use in landscaping and agricultural purposes was not determined, nor considered in our analyses. Therefore, the information and recommendations in this report, and our logs and descriptions should not be used as a basis for estimating the volume of topsoil available for such purposes.

Received 11-21-2022

GeoEngineers
1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

May 11, 2018

DuPont Industrial Partners, LLC
C/O Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, Washington 98032

Attention: Dan Balmelli, PE

Subject: Report Addendum
Geotechnical Engineering Services
DuPont Industrial Warehouse
DuPont, Washington
File No. 16785-003-01

INTRODUCTION AND PROJECT UNDERSTANDING

This report addendum presents supplemental geotechnical recommendations and considerations for the DuPont Industrial Warehouse (previously titled as Lot "Y" Industrial Park). As part of this addendum, we are addressing comments in the City of DuPont Type III Site Plan Review and SEPA Environmental Review (PLNG 2018-008, -009) letter dated February 23, 2018. We have prepaired a geotechnical study dated October 10, 2011 for this project (October report). We understand that plans are underway to design and construct two (approximately 130,000 square feet each) industrial buildings (Building A and Building B) in the west portion of the site. Finished floor will be near Elevation 214 to 215 feet (NGVD29). Additional improvements will include site grading, installation of utilities, asphalt paving and construction of retaining structures. We include a revised and updated Site Plan with the proposed buildings and construction, attached as Figure 1.

We have reviewed preliminary civil engineering plan sheets C1 through C13 (civil plans). We understand that a retaining wall will be constructed south of Building B. The retaining wall will be located in a current ravine/depression area that will retain fill as part of site grading. The retaining wall is also just north of the border of a 50-foot setback boundary or buffer from the steep slopes located north of the property. The wall foundations of the retaining wall may encroach into the buffer. From the grading plan, it appears that the retaining wall will retain approximately 7 feet of fill at it's deepest point and taper off in the east and west direction.

CONCLUSIONS AND RECOMMENDATIONS

Encroachment Into Buffer Setback Area

Based on our review of proposed plans and subsurface explorations completed as part of our October study, we provide the following:

- It is our opinion that the proposed final site development condition, as reviewed, will not create a hazard to the subject property, surrounding properties, erosion, or sedimentation to off-site properties or bodies of water. The property will be paved and stormwater will be managed and directed into stormwater infiltration galleries. The proposed construction appears to eliminate the potential for erosion and channeling of water onto the slope area.
- Proper erosion and sedimentation will be required during construction. A temporary erosion and sedimentation control (TESC) plan has been developed for the subject site (sheets C2, C3, and C4 of the civil plans). This plan includes TESC measures that surround the proposed retaining structure. Temporary slope inclinations, protection of temporary slopes and erosion control recommendations are provided in our report and should be followed during construction.
- Additional construction recommendations presented in DMC 25.105.04(2)(c) should be implemented during physical grading and site development. These include minimizing erosion and landslide potential and minimizing disruption of the existing topography and natural vegetation. Care should be taken to cut slopes at inclinations recommended in our report and disturb only areas required to complete the work. Contractors completing earthwork should be made aware of the requirements presented in the DMC 25.105.02(2)(c).
- Final erosion control measures, once construction is complete, should include provisions as described in our October report.
- Because the retaining wall will be constructed between a sloping ravine, foundation elements for the retaining wall should be embeded deep enough such that a 2H to 1V (horizontal:vertical) slope from the lowest outermost foundation element is maintained from the toe of surrounding slopes. This may require additional excavation for the foundation and subsequent burying of portions of the retaining wall. Subgrade and bearing surface preparation recommendations presented in our October report should be followed.

UPDATED SEISMIC DESIGN CONSIDERATIONS

During preparation of our report, the 2009 International Building Code (IBC) was cited for seismic design criteria. Based on the 2015 IBC, we still conclude that the site may be characterized as Class C. Seismic design parameters in accordance with the 2015 IBC are provided in Table 1 below.

TABLE 1. 2015 IBC SEISMIC DESIGN VALUES

Site Coefficient	Site Factor	MCE[1] Spectral Response	Design Spectral Response
S_s = 1.304 g	F_a = 1.000	S_{MS} = 1.304 g	S_{DS} = 0.869 g
S_1 = 0.520 g	F_v = 1.300	S_{M1} = 0.676 g	S_{D1} = 0.451 g

Note:

[1] MCE = Maximum Considered Earthquake

Based on our understanding of site conditions, we recommend using a peak ground acceleration (PGA) equal to 0.5g as determined in accordance with Section 11.8.3 of American Society of Civil Engineers (ASCE) Standard 7-10. This is the same value as sited in the 2009 IBC.

USE OF PREVIOUS REPORT

Except as modified herin, we conclude that the recommendations and design considerations presented in our Ocbober 10, 2011 are still appropriate for this site and may be used for this project.

LIMITATIONS

We have prepared this report addendum for DuPont Industrial Partners LLC and Barghausen Engineers Inc. for the DuPont Industrial Warehouse project. The client may distribute copies of this report addendum to owner and owner's authorized agents and regulatory agencies as may be required for the project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices for geotechnical engineering services in this area at the time this report addendum was prepared. The conclusions, recommendations, and opinions presented in this report addendum are based on our professional knowledge, judgment and experience. No warranty, express or implied, applies to the services or this report addendum.

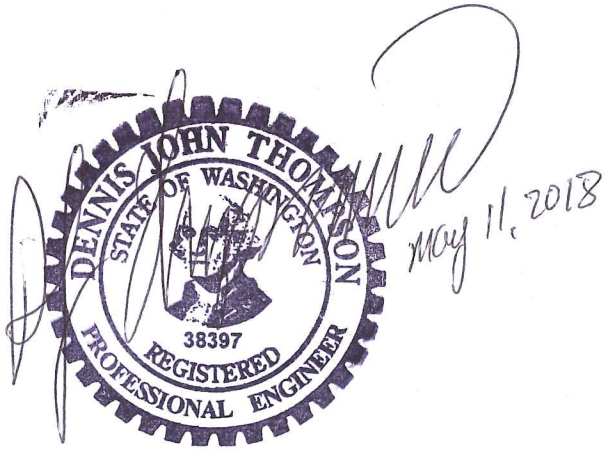
The limitations presented in our October 11, 2011 report apply to this addendum. Please refer to Appendix B titled "Report Limitations and Guidelines for Use" of our October 11, 2011 Geotechnical Engineering Services Report for additional information pertaining to use of this report addendum.

Respectfully Submitted,
GeoEngineers, Inc.

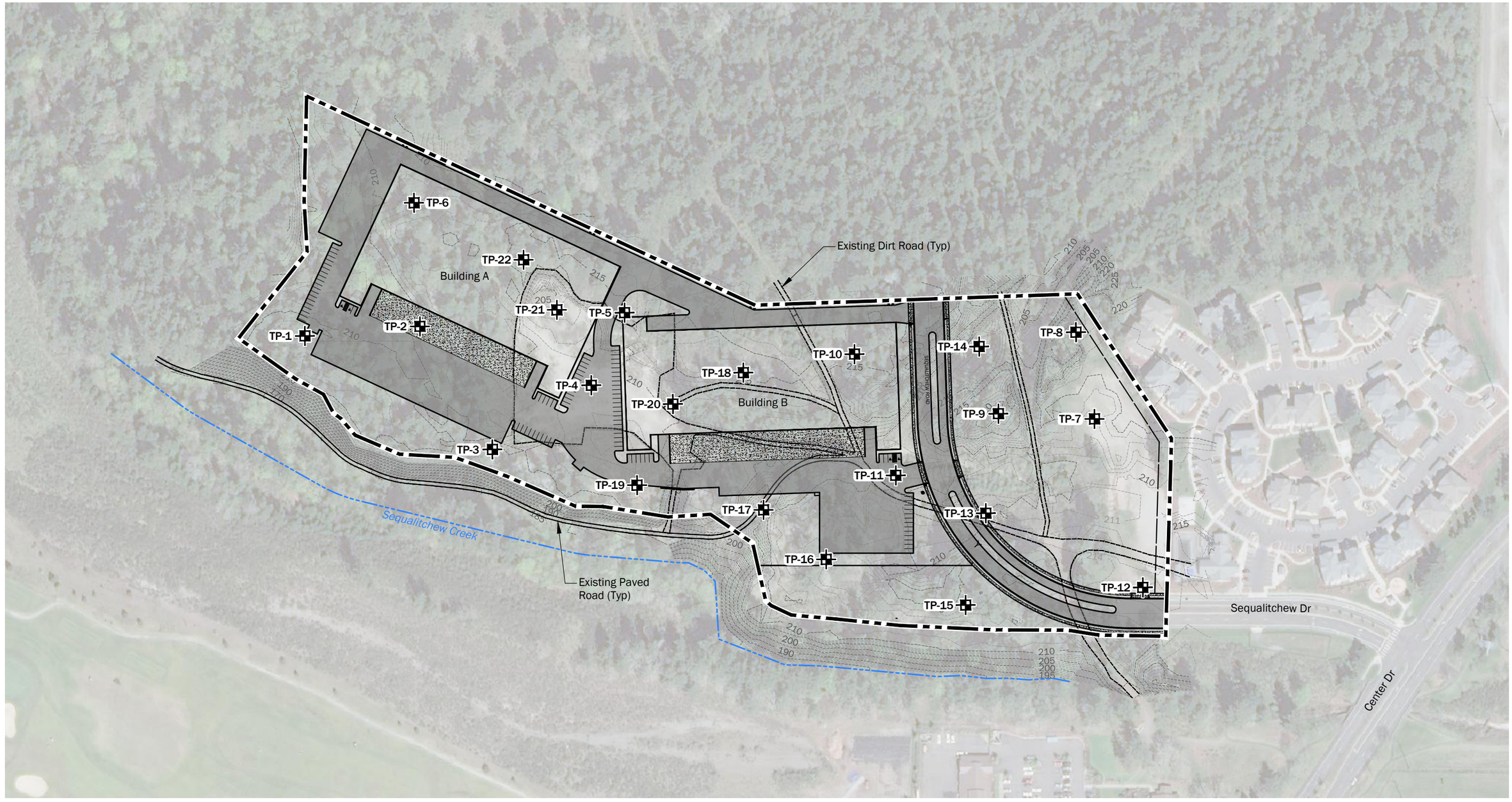
Dennis (DJ) Thompson, PE
Associate

DJT:tt

Attachment:
Figure 1 – Vicinity Map



Disclaimer: Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.



Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Aerial from Microsoft Bing. Survey background from Barghausen Consulting Engineers, Inc dated 8/8/2011. Proposed Plan from Barghausen Consulting Engineers, Inc dated 9/17/17.

Projection: Washington State Plane, South Zone, NAD83, US Foot

Legend

Site Boundary

TP-X Test Pit

N W E S

200 0 200
Feet

Site Plan

Lot Y Industrial Park
DuPont, Washington

GeoEngineers

Figure 1

P:\16\16785003\CAD\00\GeoTech Report\16785003_F02_Site Plan.dwg TAB:F02 Date Exported: 05/04/18 - 12:49 by cstickel

Attachment 1d

Bob Ferguson
ATTORNEY GENERAL OF WASHINGTON
Ecology Division
2425 Bristol Court SW 2nd Floor • Olympia WA 98502
PO Box 40117 • Olympia WA 98504-0117 • (360) 586-6770

October 17, 2018

Drew Zaborowski
Avenue 55
600 University Street, Suite 2305
Seattle, WA 98101

RE: **Proposed Development of a Portion of the Former DuPont Works Cleanup Site**

Dear Mr. Zaborowski,

You requested clarification on whether your proposed development of a distribution/ storage warehouse (with a small office component) is an allowable use under the Restrictive Covenant that encumbers a parcel that is within the Former DuPont Works Cleanup Site.

It has been represented to me that the entire proposed project is within "Lot 2 of that Record of Survey recorded under Recording No. 200601275001, Records of Pierce County, Washington" (Lot 2). Lot 2 is encumbered by a Declaration of Restrictive Covenant – Industrial, dated July 24, 2006 and recorded on July 25, 2006 (Industrial RC). The Restrictive Covenant was put into place pursuant to the Consent Decree between Ecology and Weyerhaeuser Company and EI DuPont De Nemours and Company, which is binding on all their successors and assigns (Pierce County Superior Court No. 03-2-10484-7).

The Consent Decree required institutional controls, such as the Industrial RC that encumbers Lot 2, because a cleanup action at the site under the Model Toxics Control Act (MTCA) resulted in residual contaminants in soil and groundwater that exceed MTCA cleanup levels for unrestricted land uses.

The Industrial RC states, among other things:

> Section 1: Restrictions on Use of Property. The Property has been remediated to meet the soil cleanup levels specified in MTCA for industrial

> property. The Property may be developed and used only for industrial use as allowed under the City of DuPont zoning regulations and Comprehensive Land Use Plan and under MTCA; provided, however that the Property shall not be developed and used for any of the following: residential uses, schools, daycares, parks, recreational uses, or any other use in which the likelihood of children having sustained access to soils can be reasonably anticipated.
>
> Section 2: Restrictions on Activities. The Owner may maintain and develop the Property consistent with this Restrictive Covenant. Normal construction and maintenance for permitted development is not restricted by this Section. Maintenance of any impervious surfaces is expressly permitted without prior approval so long as appropriate health and safety protocols are followed. For development activities permitted under this Restrictive Covenant, excavated soils must be managed properly and unless put back in place, must be either placed in an area within the boundaries of the Former DuPont Works Site that is zoned for industrial-type uses, or disposed off-site in accordance with applicable regulations. Excavated soils shall be managed to minimize exposure to workers and other adults, including but not limited to the use of best management practices to control dust and surface water runoff; and to prevent exposure to children. Any activity on the Property that could interfere with the continued protection of human health and the environment is prohibited without prior written approval from the Department of Ecology.

Industrial RC, at 2.

Ecology's site manager for this site, Andy Smith, and I met with City of DuPont Community Development Director Jeff Wilson and City Attorney Gordon Karg on October 9, 2018 to discuss this proposed project. According to the DuPont officials, allowable uses under the City's Manufacturing/Research Park (MRP) zoning are comparable to traditional light industrial uses. You have represented that your use is distribution/storage warehouse with a small office component, which both you and the DuPont officials represented are allowable uses under the City of Dupont's MRP zoning.

Pursuant to WAC 173-340-745, "to determine if the property is 'zoned for industrial use,'" the following characteristics shall be considered:

> (A) People do not normally live on industrial property. The primary potential exposure is to adult employees of businesses located on the industrial property;

> (B) Access to industrial property by the general public is generally not allowed. If access is allowed, it is highly limited and controlled due to safety or security considerations;
>
> (C) Food is not normally grown/raised on industrial property. (However, food processing operations are commonly considered industrial facilities);
>
> (D) Operations at industrial properties are often (but not always) characterized by use and storage of chemicals, noise, odors and truck traffic;
>
> (E) The surface of the land at industrial properties is often (but not always) mostly covered by buildings or other structures, paved parking lots, paved access roads and material storage areas—minimizing potential exposure to the soil; and
>
> (F) Industrial properties may have support facilities consisting of offices, restaurants, and other facilities that are commercial in nature but are primarily devoted to administrative functions necessary for the industrial use and/or are primarily intended to serve the industrial facility employees and not the general public.

Id.

Based on the representations made to me, it is my understanding that people will not live within the proposed project area, access to the proposed project by the general public will be limited and controlled, food will not be grown/raised on the property, the surface of the land at the proposed project area will be mostly covered by buildings or paved areas, and the small office component will be primarily devoted to administrative functions necessary for the proposed distribution/storage warehouse use.

Accordingly, based on the representations made to me and the preceding analysis, the proposed use appears to be an industrial use as allowed under the City of DuPont zoning regulations and Comprehensive Land Use Plan and under MTCA.

You also asked whether the Declaration of Public Trail Easement and Trail Construction Easement associated with the City's Sequalitchew Creek Trail violates the Industrial RC. From the information provided, it is not clear whether the trial easement exists within the area covered by the Industrial RC. However, several Restrictive Covenants were granted associated with the cleanup of the DuPont Site, including an Open Space RC. At our meeting on October 9, 2018, I asked the DuPont officials to establish that the existing trail and easement is consistent with the Open Space RC. If, for example, a GIS-based

map shows that the trail exists within the Open Space RC area, then there would be no violation of the Open Space RC or the Consent Decree.

I hope this information will be helpful. Please do not hesitate to contact me if you should have additional questions, or wish to discuss any aspect of this matter in greater detail. Please note that this is not a formal opinion of the Attorney General, but expresses my carefully considered legal opinion. My conclusions are based upon the facts summarized herein and current law. If either changes, my analysis or conclusions may change.

Please feel free to contact me with any questions at 360-586-3513 or by email at koalanik@atg.wa.gov.

Sincerely,

Koalani Kaulukukui-Barbee

KOALANI KAULUKUKUI-BARBEE
Assistant Attorney General
360-586-3513

KKB/MLK
cc (via email only): Andy Smith, Ecology
Jeff Wilson, City of DuPont
Gordon Karg, City of DuPont

Attachment 1e

Received 11-21-2022

CULTURAL RESOURCES ADDENDUM MEMO FOR THE AVENUE 55, LLC LOT Y PROJECT CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

Prepared for:

Avenue 55, LLC
601 Union Street, Ste. 2930
Seattle, WA 98101

Prepared by:
John A. Nadolski, MA

NATURAL INVESTIGATIONS COMPANY

3104 O Street, #221
Sacramento, CA 95816

October 17, 2022

EXECUTIVE SUMMARY

DuPont Industrial Partners, LLC in 2011 proposed the development of approximately 25.3-acres of private land at 1700 Center Drive in the City of DuPont, Pierce County, Washington. The parcel of land proposed for development is identified as Lot Y, Assessor's Property Tax Parcel No. 011926-2019. DuPont Industrial Partners, LLC proposed construction of a multi-building industrial park on Lot Y that included a maximum of twelve 12 buildings, parking spaces, roadways, installation of underground utilities, and construction of a trail along Sequalitchew Creek to the south of the proposed development. Parus Consulting, Inc. (PCI) was retained by DuPont Industrial Partners, LLC to conduct cultural resources investigations to facilitate construction of the project and comply with all Washington State Department of Archaeology & Historic Preservation (DAHP) regulations and the State Environmental Protection Act (SEPA). However, DuPont Industrial Partners, LLC did not construct any buildings or develop Lot Y.

Avenue 55, LLC is currently proposing to develop a section of Lot Y that was originally part of DuPont Industrial Partners, LLC proposed 2011 development. Avenue 55, LLC proposes to construct warehouse distribution facilities, parking spaces, and associated underground utilities on approximately 19.65 acres of Lot Y west of Sequalitchew Road. Avenue 55, LLC retained Natural Investigations Company, Inc. (Natural Investigations) to review PCI's report and present any new findings and/or recommendations to facilitate construction of the new project on Lot Y and comply with all state regulations (e.g., DAHP and SEPA) for the identification and protection of cultural resources. The purpose of this addendum is to present the results of Natural Investigations review of PCI's 2011 report and its findings, including any changes to the report or findings and/or any new recommendations for the protection of cultural resources.

PCI conducted cultural resources investigations for the proposed project on Lot Y in 2011. The investigations included a pedestrian survey and excavation of 125 shovel test probes and 22 geotechnical exploration pits. PCI's cultural resources investigations were conducted under Archaeological Excavation Permit (Permit) No. 2010-54 approved by the DAHP on February 7, 2011 and were monitored by a member of the Nisqually Tribe.

PCI's pedestrian survey and excavations did not identify any evidence of previously recorded sites and isolates on Lot Y including sites 45PI66, the site of a Methodist Episcopal Mission and 45PI455, the site of a 9th U.S. Cavalry Bivouac, and a flaked stone isolate, 45PI773. In addition, PCI cultural resources investigations confirmed previous reports that two sites 45PI63, Railroad Dump #3, and 45PI64, Burning Ground Dump, formerly located on Lot Y were completely destroyed/removed over twenty years ago as part of hazardous materials remediation across Lot Y. PCI did identify two new historic sites, 45PI01224, a segment of railroad track, and 45PI01225, a concrete platform and one isolated kerosene can on Lot Y.

Sites 45PI455 and 45PI66 were previously determined eligible for the National Register of Historic Places (NRHP) at 36 Code of Federal Regulations (CFR) Part 60.4 [a-d] under Criterion A because of their association with significant events in history, but there are no extant remnants of the sites on Lot Y. Sites 45PI01224 and 45PI01225 are not in the section of Lot Y currently proposed for development and do not meet any of the eligibility criteria for inclusion on the NRHP or the Washington Heritage Register (WHR) as described in Revised Code of Washington (RCW) 27.34.200. Consequently, PCI determined that no historic properties would be affected by development of Lot Y and because of the archaeological sensitivity of the area also recommended and prepared an Unanticipated Cultural Resources Discovery Plan for the project. PCI's report was filed with the DAHP and sent to the appropriate Tribes.

Natural Investigations reviewed PCI's 2011 report and the results of their cultural resources investigations. The cultural resources investigations and findings presented in the report for development of Lot Y are adequate and remain valid for Avenue 55, LLC's currently proposed project. Indeed, reduction in the size of the current project places sites 45PI01224 and 45PI01225 outside project boundaries. Therefore, Natural Investigations confirms the findings presented in PCI's 2011 report, does not recommend any additional investigations, and pursuant to DAHP regulations and SEPA Checklist Section B, Number 13, determines

that construction of the project currently proposed by Avenue 55, LLC would not affect any historic properties (i.e., properties eligible for or listed on the NRHP) or properties that could be eligible for the WHR.

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APPENDIX A: Archaeological Survey, Testing, and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington.Report prepared by Parus Consulting, Inc. 2011

INTRODUCTION

DuPont Industrial Partners, LLC in 2011 proposed the development of approximately 25.3-acres of private land at 1700 Center Drive in the City of DuPont, Pierce County, Washington. The parcel of land proposed for development is identified as Lot Y, Assessor's Property Tax Parcel No. 011926-2019. DuPont Industrial Partners, LLC proposed construction of a multi-building industrial park on Lot Y that included a maximum of twelve 12 buildings totaling approximately 340,000 square feet of building space, roadways, loading areas, approximately 650 parking spaces, installation of underground utilities, and construction of a trail along Sequalitchew Creek to the south of the proposed development. PCI was retained by DuPont Industrial Partners, LLC to conduct cultural resources investigations to facilitate construction of the project and comply with all DAHP regulations and SEPA. However, DuPont Industrial Partners, LLC did not construct any buildings or develop Lot Y.

Avenue 55, LLC is currently proposing to develop part of Lot Y that was originally part of DuPont Industrial Partners, LLC proposed 2011 development. Avenue 55, LLC retained Natural Investigations to review PCI's report and present any new findings to facilitate construction of the new project on Lot Y and comply with all state regulations (e.g., DAHP and SEPA) for the identification and protection of cultural resources. The purpose of this addendum is to present the results of Natural Investigations review of PCI's 2011 report and its findings, including any changes to the report or findings and/or any new recommendations for the protection of cultural resources.

PROJECT LOCATION AND DESCRIPTION

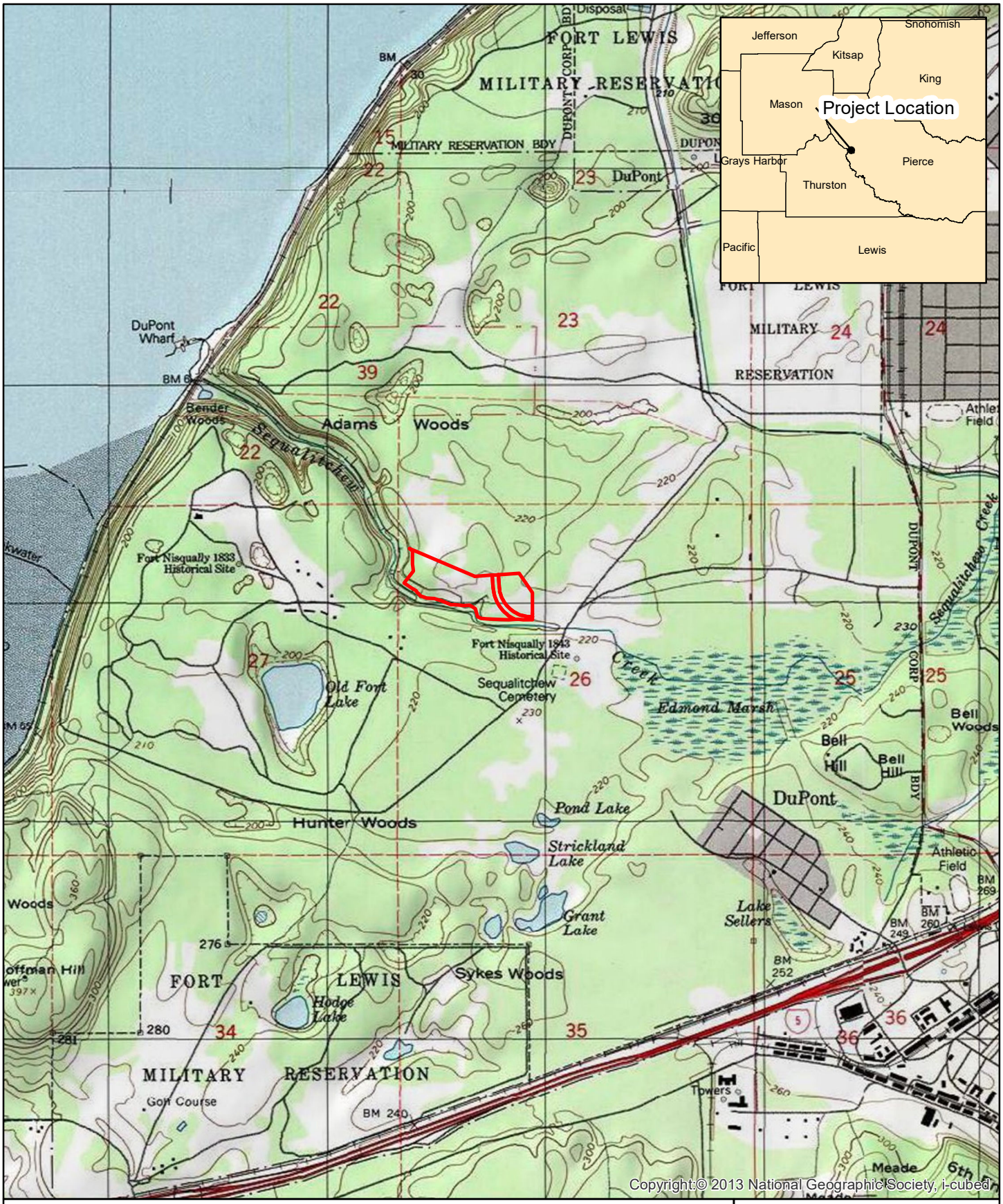
Avenue 55, LLC proposes to develop an approximately 19.65 acres parcel of land identified as Lot Y, Assessor's Property Tax Parcel No. 011926-2019 in the City of DuPont, Pierce County, Washington (Figure 1). The proposed development includes construction of two warehouse distribution facilities totaling approximately 268,380 square feet, 202 parking spaces, and associated underground utilities west of Sequalitchew Road (Figure 2).

REGULATORY SETTING

There is no federal involvement in the project as currently proposed. PCI's and Natural Investigations cultural resources investigations for the proposed project were conducted under prevailing Washington state laws that protect cultural resources (e.g., prehistoric archaeological sites, historic sites, historic buildings, and Native American sites and graves). These laws include Executive Order 05-05 (currently revised as Executive Order 21-02), Indian Graves and Records (RCW 27.44), Archaeological Sites and Resources (RCW 27.53), Archaeological Excavation and Removal Permit (Washington Administrative Code [WAC] 25-48), and Discovery of Human Remains (RCW 27.44). In addition, PCI obatined a permit to conduct cultural resources investigations including excavations within boundaries of known archaeological sites. The Permit (No. 2010-54) was completed pursuant to requirements at WAC 25-48-060.

REPORT ADDENDUM PREPARATION

John A. Nadolski, MA was the Principal Investigator for this project and is primary author of this report addendum. Mr. Nadolski has more than thirty-five years of experience in archaeology and exceeds all requirements of the *Secretary of Interior's Qualifications Standard*s (36 CFR Part 61; National Park Service 1983) and the DAHP. The format of this report addendum follows DAHP guidance.



Study Area

0 0.5 1 Kilometers

0 0.5 1 Miles

1:24,000

DuPont Lot Y Project
Figure 1 - Project Location

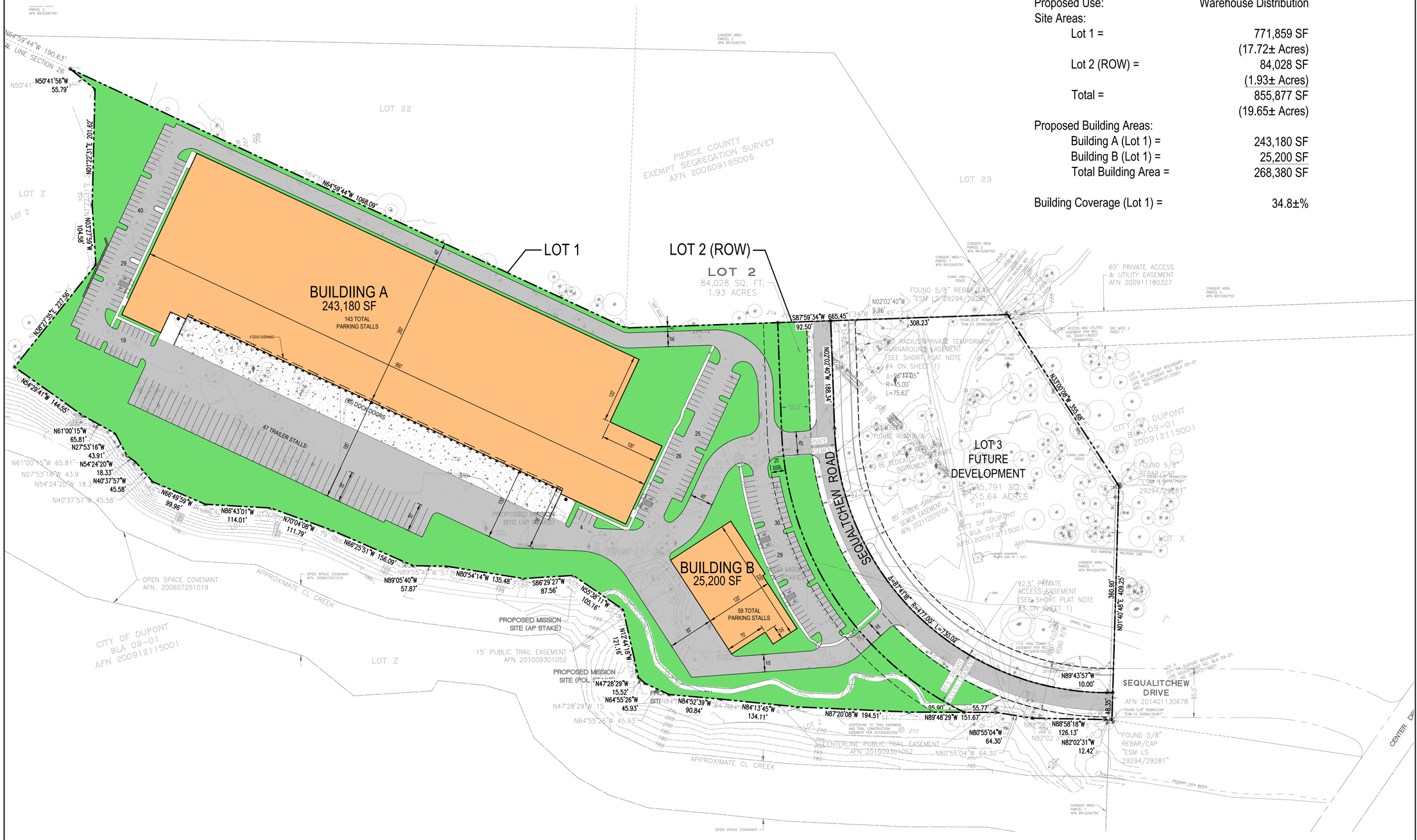
Natural Investigations Company

Map Date 10/12/2022

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26

SITE DETAILS

Site Address:	1700 Center Drivet Dupont, WA
Parcels:	011926-2019
Zoning:	Manufacturing and Research (MRP)
Proposed Use:	Warehouse Distribution
Site Areas:	
Lot 1 =	771,859 SF (17.72± Acres)
Lot 2 (ROW) =	84,028 SF (1.93± Acres)
Total =	855,877 SF (19.65± Acres)
Proposed Building Areas:	
Building A (Lot 1) =	243,180 SF
Building B (Lot 1) =	25,200 SF
Total Building Area =	268,380 SF
Building Coverage (Lot 1) =	34.8±%



SITE PLAN - OPTION A

Scale: 1" = 80'

NOTE:
AREAS SHOWN ARE SCHEMATIC AND APPROXIMATE ONLY FOR PRELIMINARY SITE EVALUATION UNTIL PROFESSIONAL SURVEY IS PERFORMED

INNOVA architects
950 Pacific Avenue, Suite 450
Tacoma, WA 98402
253-572-4903

Project Title:

1700 Center Drive
Dupont, WA

Client:

AVENUE55
600 University Street, Suite 2305
Seattle, WA 98101
206-707-9696

Job Number:

22-012

Issue Set and Date:

Preliminary Design
January 2022

NOT FOR CONSTRUCTION

DRAFT

REUSE OF DOCUMENTS
THIS DOCUMENT HAS BEEN SIGNED ELECTRONICALLY IN ACCORDANCE WITH WAC 196-27A-400 AND CHAPTER 19.34 RCW. UNAUTHORIZED ALTERATION OF ANY OF THE INFORMATION ON THIS DOCUMENT WILL INVALIDATE THE DOCUMENT, MY CERTIFICATION AND SIGNATURE. THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF THE PROFESSIONAL SERVICE, IS THE PROPERTY OF INNOVA ARCHITECTS AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT WRITTEN AUTHORIZATION OF INNOVA ARCHITECTS.

Revisions:

Sheet Title:

Preliminary
Site Plan, Option A

Designed by: B. Ludwig, J. Eaves

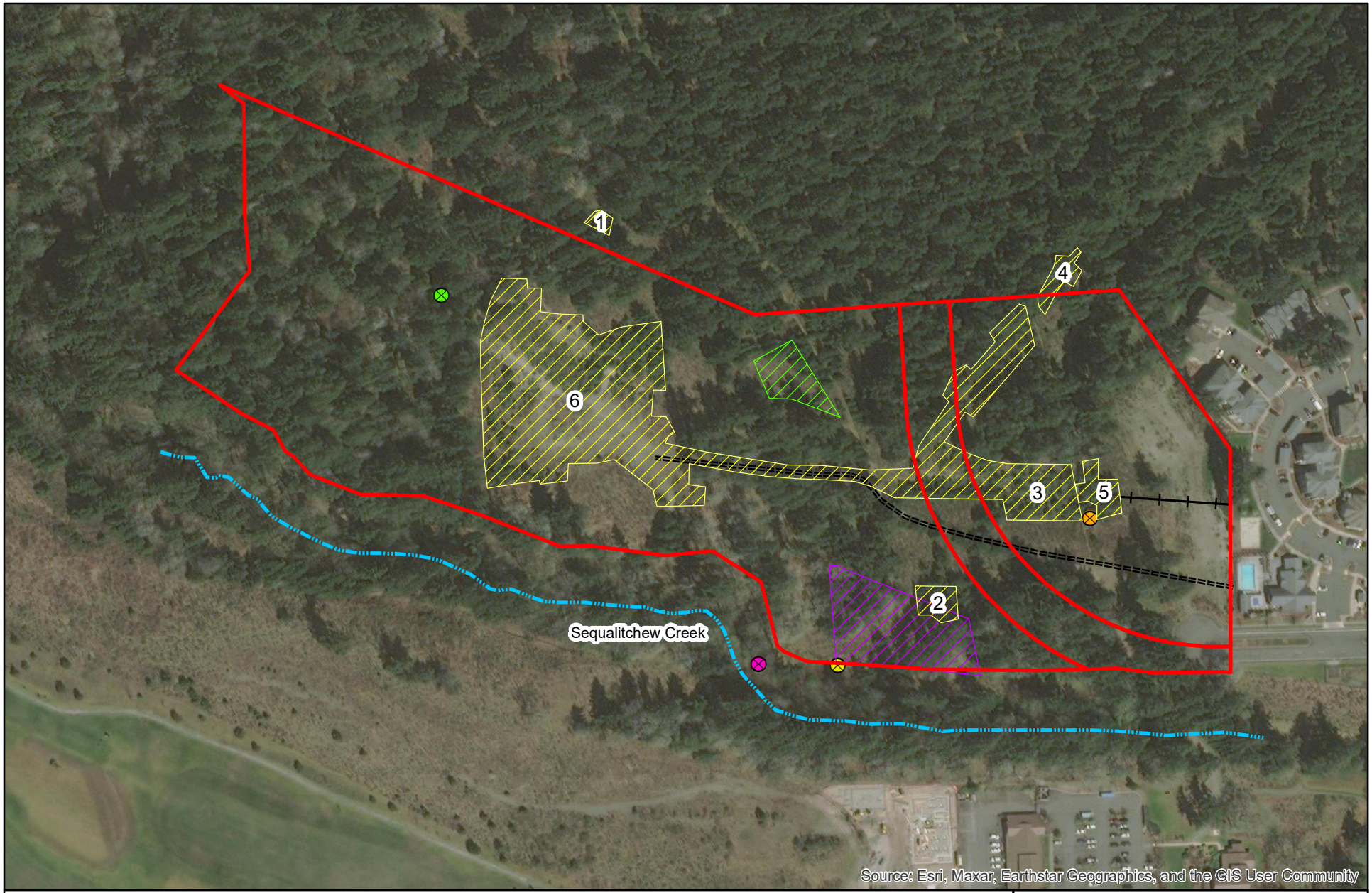
Drawn by: B. Ludwig, J. Eaves

Checked by: P. McCormick

Sheet Number:

A0.1

of Sheets



Lot Y Boundary
Hot Spot Excavations
45-PI-66
45-PI-455
45-PI-773
45-PI-01226
45-PI-00064
45-PI-01225
45-PI-01224
Existing Gravel Road

0 100 200 Meters

0 400 800 Feet

N W E S

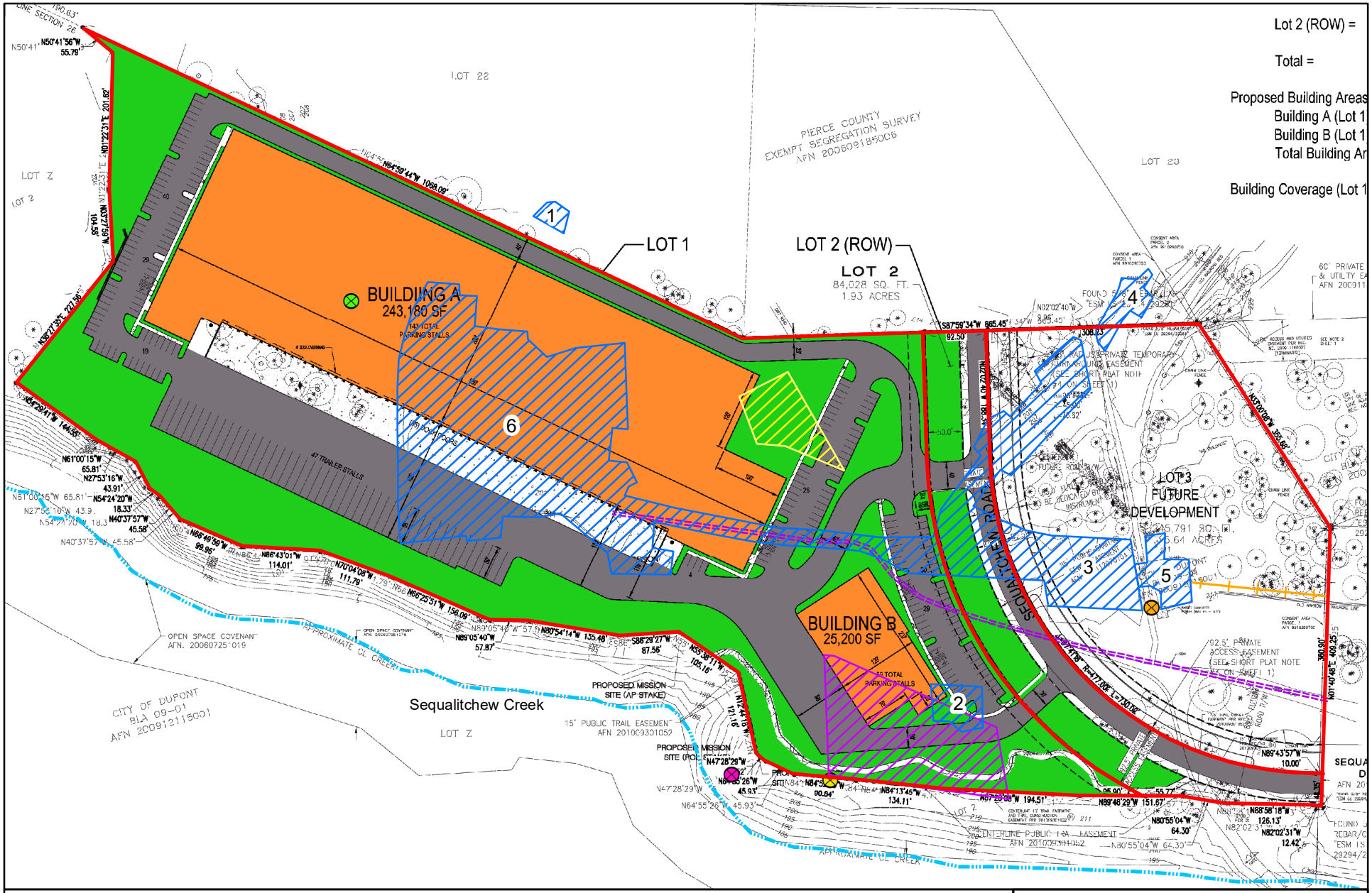
1:3,000

DuPont Lot Y Project
Figure 3:
Archaelogical Resource and Remediation

Natural Investigations Company

Map Date 10/12/2022

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26



Map Date 10/12/2022

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26

RESEARCH METHODS AND FINDINGS

PCI conducted a cultural resources records search for the project on October 21, 2010 using the DAHP electronic GIS database to identify previously recorded sites and previously conducted surveys on and near Lot Y (Tables 1 and 2). PCI also conducted tribal consultation (i.e., cultural representatives or Tribal Historic Preservation Officers for the Nisqually, Puyallup and Squaxin Tribes were contacted regarding the project), a pedestrian survey, subsurface testing, and monitoring of geotechnical subsurface exploration on Lot Y in February and March 2011. All PCI investigations were conducted under DAHP Permit No. 2010-54.

Table 1. Previous Studies on or near Lot Y

Year	Author(s)	Report Title	Proximity to Lot Y
1977	Onat, A.R., Lee A. Bennett, and Timothy Riordan	Cultural Resources Survey: DuPont Site, Volume I, Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near Lot Y
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site	Within and near Lot Y
1989	Welch, Jeanne	A Cultural Overview and Comprehensive Management Plan for the DuPont Property, Pierce County, Washington	Within and near Lot Y
1990	Stilson, M. Leland	A Data Recovery Study of 45PI401, Hudson's Bay Dwellings at Northwest Landing, Pierce County, Washington	0.1 mile east
1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within
1991	Stilson, M. Leland	A Data Recovery Study of 45PI405, the 1843 Fort Nisqually Village at Northwest Landing, Pierce County, Washington	0.1 mile east
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the "Hot Spot" Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near Lot Y
2002	Maass, Alex	Interim Archaeological Monitoring Report for the Former DuPont Works Site, Parcel 1	Adjacent (to west)
2003	Maass, Alex	2002 Field Season Archaeological Monitoring Report for the Former DuPont Works Site, Parcel 1	Adjacent (to west)
2003	Wessen, Gary	Exploring the Boundary and Possible Interpretation of 45PI485	South of creek
2004	Wessen, Gary	Archaeological Testing at 45PI576, Former DuPont Works Site, City of DuPont, Pierce County, Washington	South of creek
2005	Dampf, Steven	Archaeological Monitoring Report for the 2003 and 2004 Field Seasons at the Former Dupont Works Site Parcel 1, City of DuPont, Pierce County, Washington	Adjacent (to west)
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near Lot Y
2006	Thompson, Gail	Archaeological Implementation Report for Remediation of Soils at the Former DuPont Works Site Parcel 1, City of DuPont, Pierce County, Washington	Adjacent (to west)
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near Lot Y

Table 2. Previously Recorded Sites on Lot Y

Site No.	Brief Description	Recorded By/Year	Prior Reports	NRHP Eligibility
45PI00063	Historic debris deposit, two loci along railroad, 1910- 1930; removed during soil remediation	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Moura, 1991a; Daugherty and Condon, 2001	Not eligible
45PI00064	Historic DuPont Powder Works burning ground dump, 1930s-1945; removed during soil remediation	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Daugherty and Condon, 2000, 2001	Not eligible
45PI00066	Historic 1840-1842 Methodist Episcopal Mission	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Moura, 1991a; Daugherty and Condon, 2000, 2001	Eligible, included in proposed Nisqually- Sequalitchew Historic District
45PI00455	Historic 9th U.S. Cavalry Bivouac, Camp Nisqually, 1904; partially removed during soil remediation	Daugherty, 1997; Daugherty, 1997 NRHP form	Moura, 1991a, 1991b; Daugherty and Condon, 2000, 2001	Potentially eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00773	Prehistoric chipped stone isolate	Wessen, 2005	Wessen et al., 2005, 2008	Not eligible

SURVEY

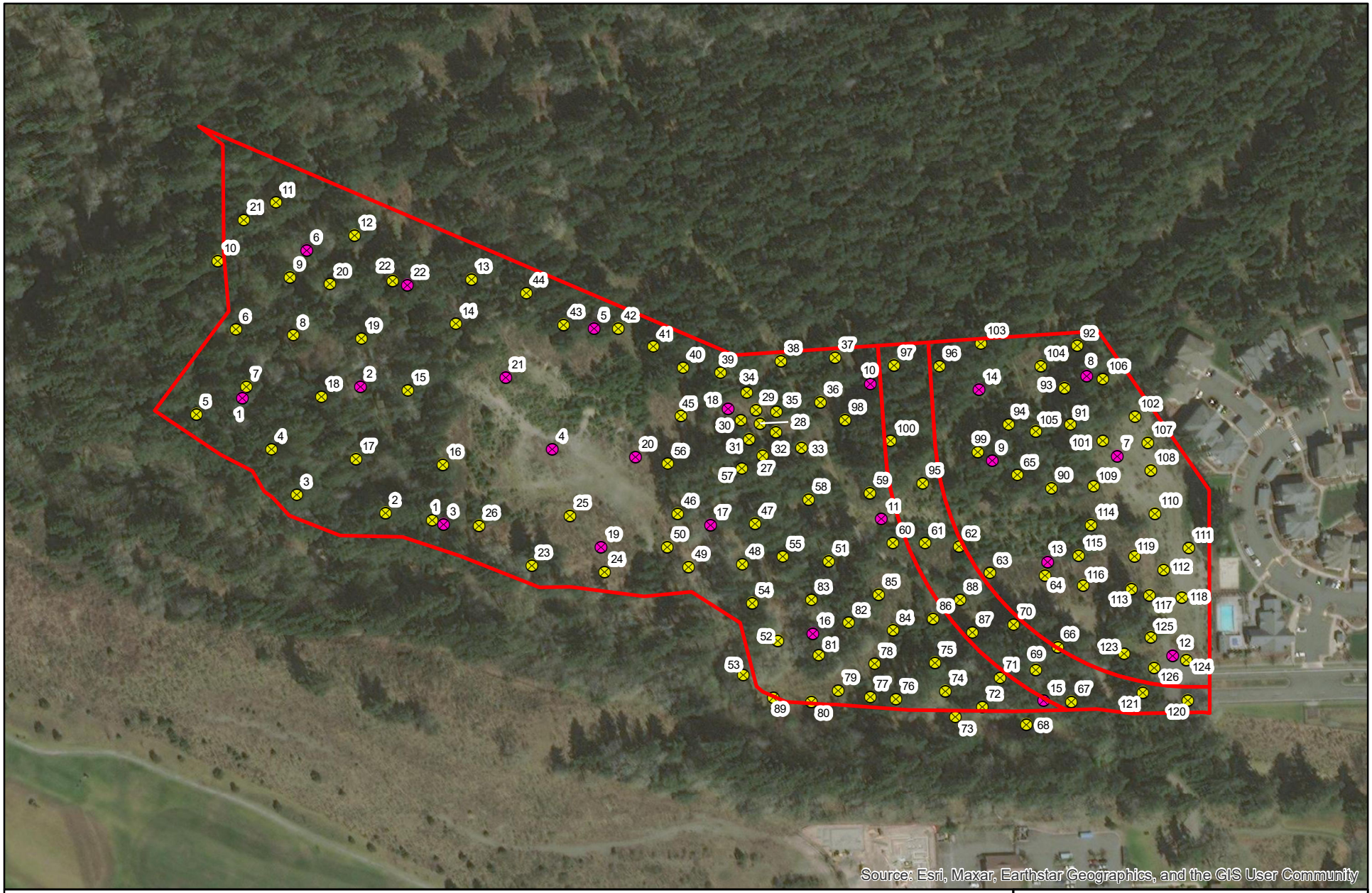
PCI conducted a pedestrian surface survey across the entire 25.3-acre original project area. Transect spacing was no greater than 15 meters apart and survey was accomplished on an east-to-west bearing.

EXCAVATIONS

Following the pedestrian survey, 125 shovel test probes (STPs) and 22 geotechnical excavations (GTEs) were excavated across Lot Y at random intervals as shown on Figure 4. At the request of the City of DuPont and the DAHP, no STPs were placed in existing trails, pedestrian paths, or gravel roadways. Additionally, all STPs were backfilled and compacted daily. The STPs and GTEs were excavated using a backhoe with a 2-foot bucket attachment and smooth plate. The excavation of the STPs and GTEs totaled approximately 450 cubic meters of soil.

Each of the 125 STPs measured 3 feet in length and 2.5 feet in width. STP levels were dug in 7-cm (3- inch) increments or until sterile gravels were encountered. Soils taken from the STPs were screened through 1/8-inch hardware cloth. No STPs were placed in three hot spots, HS-3, HS-4, and HS-6, that include the former locations of sites 45PI00063 and 45PI00064 where prior soil remediation efforts removed contaminated soils and where sterile gravel is now exposed across these areas of Lot Y (Figures 2 and 4). Sterile gravel was encountered in 123 of 125 STPs between 35 and 130 centimeters below the surface (cmbs) (1.1-4.3 feet) and mixed stratigraphy or fill was present in two STPs. Records for the individual STPs, detailing levels, soil texture, color, and comments are included in Appendix C of PCI's 2011 report included as Appendix A of this memo.

Each of the 22 GTEs measured 3 feet wide by 5 feet long. GTE upper levels were dug in 3 inch (7 centimeter) increments or until sterile gravels were encountered. Lower levels of the GTEs, after encountering sterile gravels, were dug in 1 foot increments. Four of the GTEs were excavated in hot spot removal areas (Figures 2 and 4). Soils taken from the GTEs at 4 feet, 6 feet, and 10 feet were screened through 1/8-inch hardware cloth. Twenty GTEs were excavated to 305 cmbs (10 feet); one GTE with mixed stratigraphy was terminated at 250 cmbs (8.2 feet); one GTE filled with water at 244 cmbs (8 feet). Records for the individual GTEs, detailing levels, soil texture, color, and comments, are included in Appendix C of PCI's 2011 report included as Appendix A of this memo.



Lot Y Boundary
Geotechnical Excavation
Shovel Test probe

0 100 200 Meters

0 400 800 Feet

N
W E
S

1:3,000

DuPont Lot Y Project
Figure 4: Subsurface Testing Map

Natural Investigations Company

Map Date 10/12/2022

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26

Surface Survey Results

All undeveloped ground surface areas in the boundaries of Lot Y were examined for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools, fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, fire pits, soil depressions, and features indicative of the former presence of structures or buildings (e.g., postholes, foundations), or historic debris (e.g., metal, glass, ceramics). Ground disturbances, including a graveled dirt road and dirt two-track, were visually inspected.

Surface survey did not identify any remnants of sites 45PI00063, 45PI00064, 45PI00455, or isolate 45PI00773. Survey did identify two brick fragments at the recorded location of site 45PI00066, three new historic sites, and a historic isolate. The three sites include 45PI01224, a segment of a previously identified narrow-gauge railroad track and grade, 45PI01225, a concrete railroad loading platform, and 45PI01226, a set of railroad bridge abutments. The isolate, 45PI00064, is a galvanized kerosene can. Only the isolated kerosene can, 45PI00064, is in the new Avenue 55, LLC project boundaries. No artifacts were collected. PCI archaeologists completed the appropriate Washington Archaeological Site Inventory and Isolate forms for all archaeological materials identified during the survey.

Subsurface Testing Results

The subsurface stratigraphy was consistent in 123 of the 125 STPs and all 22 GTEs excavated in the boundaries of Lot Y (Figure 4). The soil throughout the project area is consistent with the description for the Spanaway series developed on glacial outwash sediments. There are three soil horizons, though horizon 2 is not present in all STPs or GTEs. The depth of the horizons varies across the Lot Y landscape in relation to the topography and prior human disturbance. Horizon 1 is a moist, very dark brown (10 YR 2/2) gravelly sandy loam with weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots with a very high organic matter content. Horizon 2 is a moist very fine crumb dark gray brown (10 YR 3/2) gravelly sandy loam with little distinction in texture from horizon 1. Horizon 3 is moist and fluctuates between a dark gray brown (2 YR 4/2) and an olive brown (2YR 4/4) gravelly sand with no soil matrix. The single grained, loose sand is the prominent content with some rounded to sub-rounded cobbles; it is also very compact.

Only two of the subsurface units (STPs 28 and 115) contained cultural material. A brick fragment, measuring 3x4x2 inches, was located at 20 cmbs (8 inches) in STP 28 within site 45PI66 (Methodist Episcopal Mission). The brick was not handmade and no maker's marks were located on the fragment. Additionally, a smaller brick fragment was located at ground level within inches of STP 35 (also within 45PI66). STP 115 is located 18.5 feet due east of a concrete platform and the soil is entirely mixed down to a level of 200 cmbs (6.6 feet). A flat iron bar with four bolts protruding was located at 160 cmbs (5.2 feet). The iron bar measured 24 inches long by 3 inches wide and 1/8th inch thick, and has four 3.5-inch metal bolts spaced roughly 7 to 8 inches apart. The iron bar appears to be associated with the concrete platform, given its close proximity and the paint on the bolt heads matches the metal on the platform.

All but two of the 125 STPs (STP 89 and 115) were excavated until sterile gravel was encountered. Although the presence of the Spanaway series soil horizons was consistent, the depth of sterile gravel varied from 35 cmbs to 130 cmbs (1.1-4.3 feet) across Lot Y. STP 115 had mixed stratigraphy and was excavated to a depth of 200 cmbs (6.6 feet). The soil in STP 89 is a moist, brown (7.5 YR 4/4) silty loam until the typical underlying horizon appears at 110 cmbs (3.6 feet) as a moist, dark green brown (2.5 YR 4/4) gravelly sand. The typical upper horizon of gravelly sandy loam appears to have been removed near STP 89 and replaced with imported soil. The STP was placed 66 feet northeast of the set of bridge abutments. It seems likely that more stable soil was imported for the approach to the narrow-gauge bridge that once crossed Sequalitchew Creek.

Six of the STPs located in the eastern portion of the project (STPs 113, 116-119) near the gravel road display a gray upper horizon not noted in any other portion of the project area. The moist, dark gray (2.5 YR 3/1) soil is similar in structure to the typical horizon 1, but is noticeably different in color and is relatively thin (0-25 cm [0-9.8 inches]), and is likely related to prior disturbance.

STPs 120 through 125, located in the southeastern portion of the project area, all show evidence of a grass fire. Small flecks of charcoal are noted in the upper 5 cm of each unit. Of these six STPs, only STP 120 that is nearest to the creek extending to a depth of 95 cmbs (3.1 feet) and exhibited horizon 2.

In summary, only two artifacts were identified during excavation of the STPs. The two artifacts are the brick fragment recovered from STP 28 and the iron bar from STP 115. No other cultural material was identified as a result of excavation across Lot Y.

Geotechnical Subsurface Exploration Results

Twenty-two GTEs were excavated across Lot Y (Figure 4) to a depth of 305 cmbs (10 feet). Two GTEs, 9 and 14, were excavated to depths of 250 cmbs (8.2 feet) and 244 cmbs (8 feet), respectively. The soils throughout the GTEs are relatively consistent with the Spanaway series, although only five GTEs, 1, 3, 5, 12, 13, and 15, exhibit horizon 2. In the eastern section of Lot Y, GTE 9 has mixed stratigraphy and was excavated to a depth of 250 cmbs (8.2 feet). The upper horizon is a thin layer of sand (0-20 cmbs [0-8 inches]) followed by a mix of horizon 1 very dark brown (10 YR 2/2) gravelly sandy loam and sand with very few cobbles. It appears to be imported fill material. This unit is in close proximity to two of the hot spots, HS-3 and HS-4. In the northeastern section of Lot Y, GTE 14 was terminated at 244 cmbs (8 feet) when water entered the unit and began to fill rapidly. No cultural material was located in any of the 22 GTEs excavated across Lot Y.

CONCLUSIONS AND RECOMMENDATIONS

PCI completed an intensive-level pedestrian survey, subsurface testing (i.e., excavation of approximately 450 cubic meters of soil), monitored excavation of geotechnical exploration pits, and prepared an Unanticipated Cultural Resources Discovery Plan. PCI's investigations did not identify any evidence of site 45PI66, the Methodist Episcopal Mission, site 45PI455, a 9th U.S. Cavalry Bivouac, isolate 45PI773, a piece of chipped stone, or sites 45PI63 and 45PI64 that are reported as being destroyed as part of the hazardous materials remediation project that occurred across Lot Y. PCI did identify two new sites, 45PI1224, a segment of railroad track, and 45PI01225, a concrete platform, and isolate 45PI00064, a kerosene can.

Site 45PI66, the Methodist Episcopal Mission, is eligible for the NRHP under Criterion A for its association with significant events and also contributes to the proposed Nisqually-Sequalitchew Historic District, but the site is not eligible under Criterion D because there are no physical remains of the mission present on Lot Y. Similarly, site 45PI455, the location of the brief occupation of the area by the 9th U.S. Cavalry Buffalo Soldiers, is potentially eligible for the NRHP as a contributing element to the proposed Nisqually-Sequalitchew Historic District under Criterion A, but is not eligible under Criterion D because there are no physical remains of the bivouac area present on Lot Y. The two new sites in Lot Y, 45PI1224, a railroad track segment, and 45PI01225, a concrete platform, are recommended ineligible for the NRHP. The two isolates, 45PI773 and 45PI00064, are not eligible for the NRHP. In addition, new site 45PI01226, bridge abutments, located immediately outside the boundaries of Lot Y, is also recommended ineligible for the NRHP.

Lot Y has been extensively disturbed beginning with historic period settlement in the early 1880s, operation of the DuPont Powder Works in the early to mid-1900s (including use of part of Lot Y as a burning ground

dump from the 1930s until 1945), subsurface archaeological investigations and related artifact collection between 1989 and 2005, and environmental remediation activities in 1999 and 2000. In addition, survey and excavation by PCI did not identify any significant cultural resources. Therefore, PCI determined that no further cultural resources investigations were warranted prior to the development of Lot Y and that the development of the property would not affect any historic properties.

Regardless, the results of the literature research, local ethnographic settlement and subsistence patterns, the prehistory and history of the vicinity, and DAHP's predictive model, the project area is considered highly sensitive for prehistoric, ethnohistoric, and historic-era cultural resources. Consequently, PCI completed an Unanticipated Cultural Resources Discovery Plan for the development of Lot Y (Appendix E of PCI's report attached as Appendix A to this memo).

Natural Investigations reviewed PCI's cultural resources report titled *Archaeological Survey, Testing and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington* for the currently proposed development of Lot Y by Avenue 55, LLC and

- finds that the report is adequate for the currently proposed development of Lot Y;
- does not recommend any additional investigations for the currently proposed project because of the scale (e.g., excavation of 450 cubic meters of soil) and nature (e.g., soils remediation) of the previous investigations conducted across Lot Y;
- concurs with the findings in the report that sites 45PI00063, 45PI00064, 45PI00455, 45PI01224, and 45PI01225 do not meet the eligibility criteria for inclusion on the NRHP or the WHR;
- finds that sites 45PI01224 and 45PI01225 are not in the boundaries of the currently proposed project on Lot Y;
- concurs with PCI that implementation of the previously proposed project that includes areas of Lot Y currently proposed for development would not affect any historic properties as defined at 36 CFR 800, the SEPA Checklist Section B, Number 13, and the DAHP;
- recommends that the inadvertent discovery plan prepared by PCI should be updated to include current contact information for individuals and agencies identified in the plan and be implemented for the currently proposed project as recommended in PCI's 2011 report; and
- pursuant to Washington state guidance recommends that appropriate representatives of the Native American community be contacted and informed of the currently proposed project.

In summary, Natural Investigations review of PCI's 2011 report determined that previous investigations and PCI's investigations are adequate for Avenue 55, LLC's currently proposed development on Lot Y and implementation of the currently proposed project would not affect any historic properties as defined at 36 CFR 800 and SEPA.

REFERENCES CITED

Sikes, Nancy E., and Cindy J. Arrington
2011 *Archaeological Survey, Testing and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington*. Report prepared by Parus Consulting, Inc. for DuPont Industrial Partners, LLC.

APPENDIX A:

Archaeological Survey, Testing, and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington. Report prepared by Parus Consulting, Inc. 2011

CULTURAL RESOURCES REPORT COVER SHEET

Author: N. Sikes and C. Arrington
Title of Report: Archaeological Survey, Testing, and Monitoring at 45PI66, 45PI455, and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, DuPont, Washington

Date of Report: 4-14-2011

County(ies): Pierce Section: 26 Township: 19 N Range: 01E

Quad: Nisqually (1981) Acres: 25.3

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Export Files submitted? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☒ Yes ☐ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☒ Yes ☐ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☒ Yes # ☐ No

DAHP Archaeological Site #:

_____
_____
_____
_____
_____
_____
_____
_____
_____

- Submission of paper copy is required.
- Please submit paper copies of reports ***unbound.***
- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

ARCHEOLOGICAL SURVEY, TESTING AND MONITORING AT 45PI66, 45PI455 AND 45PI773, DUPONT INDUSTRIAL PARTNERS, LLC, LOT Y PROJECT

CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

Prepared For:

DuPont Industrial Partners, LLC

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Roseville, CA 95661

Final – April 14, 2011

ABSTRACT

This cultural resources investigation was conducted where DuPont Industrial Partners, LLC plans to develop a multi-building industrial park on Lot Y in the City of DuPont, Pierce County, Washington. The approximately 25.3-acre project is located on private land known as Lot Y (Assessor's Property Tax Parcel No. 0119262019) situated within the city limits west of Center Drive and north of Sequalitchew Creek. The work was conducted under an Archaeological Excavation Permit approved by the Washington State Department of Archaeology & Historic Preservation (DAHP) on February 7, 2011 (Permit No. 2010-54). The fieldwork included a pedestrian survey and examination of subsurface sediments in a series of 125 shovel test probes and 22 geotechnical exploration pits placed within Lot Y. The work was monitored by a member of the Nisqually Tribe.

No evidence was found of two previously recorded historic archaeological sites (45PI66 Methodist Episcopal Mission site and 45PI455 9th U.S. Cavalry Bivouac site) and one flaked stone isolate (45PI773), except for two brick fragments within the boundaries of 45PI66. Nor was there any evidence of two other archaeological sites (45PI63 Railroad Dump #3 site and 45PI64 Burning Ground Dump site) formerly located within Lot Y that were completely removed a decade ago during hazardous materials remediation. Two surface historic archaeological sites (45PI01224 railroad track segment and 45PI01225 concrete platform) and one isolated kerosene can were identified during the fieldwork within Lot Y, but they are not considered significant. One additional archaeological site (45PI01226 set of bridge abutments) located north of Sequalitchew Creek but immediately outside of Lot Y was also recorded. Except for two brick fragments, one flat iron bar and one can, no portable artifacts were identified; no artifacts were collected.

No significant cultural properties will be affected by the project, and no further cultural resource action is warranted at this time. Should cultural resources be discovered during project implementation, an Unanticipated Cultural Resources Discovery Plan is attached as an appendix to this report. This report will be filed with the DAHP and a copy provided to affected Tribes.

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INTRODUCTION

Parus Consulting, Inc. (PCI) was retained by DuPont Industrial Partners, LLC to provide cultural clearance in accordance with prevailing Washington state laws for the proposed Lot Y project in the City of DuPont. An Archaeological Excavation Permit (Permit) was approved by the Washington State Department of Archaeology & Historic Preservation (DAHP) on February 7, 2011 (Permit No. 2010-54) (Appendix A).

The Permit was required because two historic archaeological sites (45PI66 Methodist Episcopal Mission site and 45PI455 9th U.S. Cavalry Bivouac site) and one prehistoric isolate (45PI773) are located within the Lot Y project area (Figures 1 and 2). In 1993, site 45PI66 was determined eligible for listing on the National Register of Historic Places (NRHP) under Criterion A. Site 45PI455 is considered potentially eligible for NRHP listing. Both sites are considered contributing elements to a proposed Nisqually-Sequalitchew Historic District. Prior archaeological investigations of sites 45PI66 and 45PI455 in 1989 and 2000 included backhoe peels, shovel tests, and block and unit excavations. In addition, a portion of 45PI455 was monitored during a hazardous materials remediation program. No surface evidence of these two sites or the isolate remained within Lot Y.

Two additional historic sites (45PI63 Railroad Dump #3 site and 45PI64 Burning Ground Dump site) located within Lot Y were determined not eligible for NRHP listing in 1993. Both sites were completely removed during hazardous materials remediation in 2000.

The services completed by PCI under the Permit include intensive-level pedestrian survey, subsurface testing, monitoring of geotechnical exploration pits, preparation of this report summarizing the cultural resources investigation and related forms recording newly identified resources, and completion of an Unanticipated Cultural Resources Discovery Plan.

PROJECT LOCATION AND DESCRIPTION

The project encompasses approximately 25.3 acres on private land known as Lot Y (Assessor's Property Tax Parcel No. 0119262019) located in the City of DuPont, Pierce County, Washington. Lot Y is located within the city limits west of Center Drive and north of Sequalitchew Creek. The Lot Y project area is situated within Section 26, Township 19 North, Range 01 East on the Nisqually 1981 USGS 7.5-minute topographic map (Willamette Meridian) (Figure 1).

The cultural resources excavations were conducted where the private landowner, DuPont Industrial Partners, LLC plans to develop a multi-building industrial park on Lot Y. The complex would include up to 12 buildings totaling approximately 340,000 square feet of building area, roadways, loading areas, approximately 650 parking spaces, and installation of underground utilities. Plans also include construction of a trail along the creek to the southwest of the industrial park.

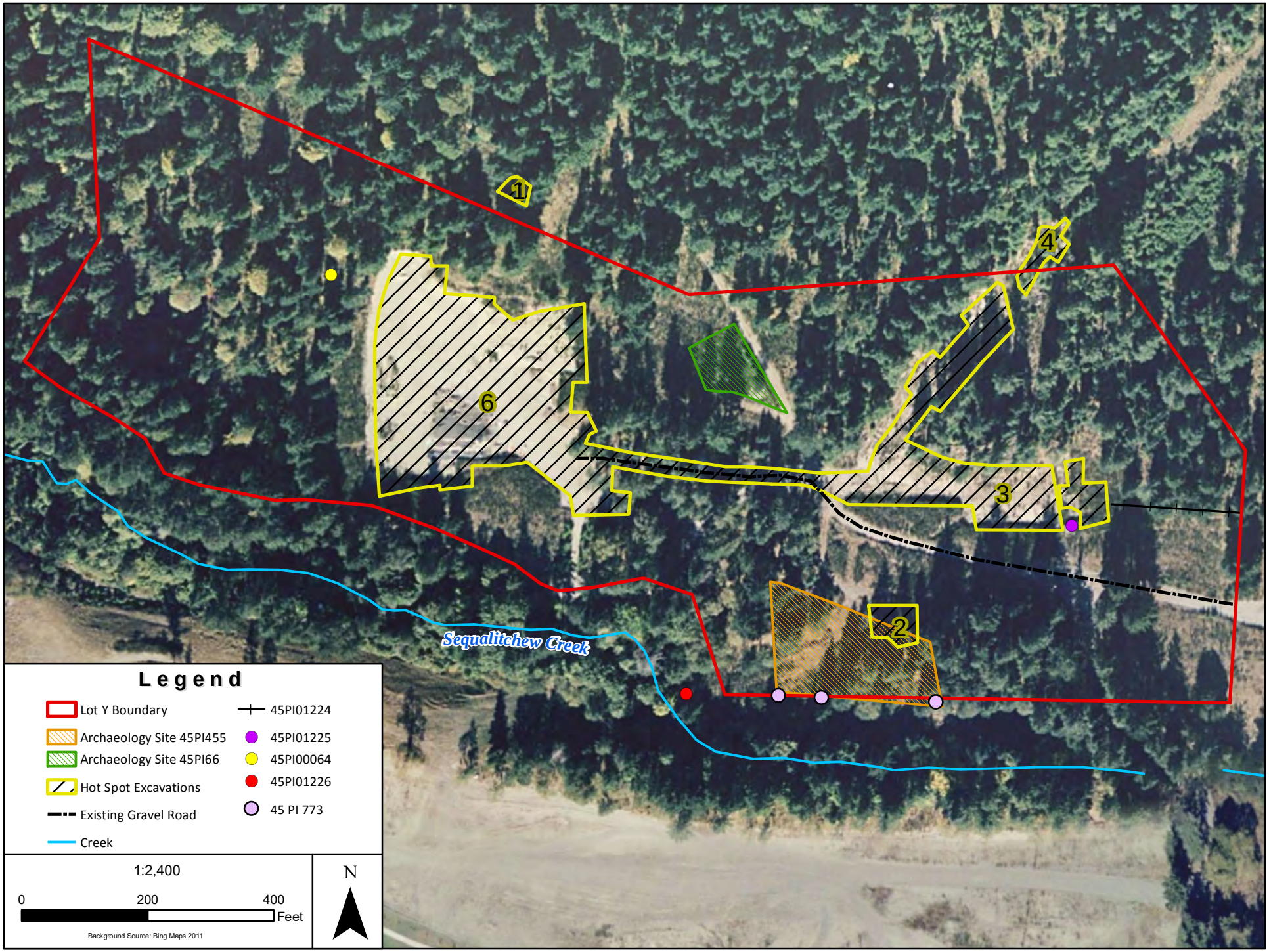
Plans for public access along the creekside trail to be constructed to the south of the industrial park include erection of an interpretive sign explaining the history of the temporary encampment within Lot Y of the 9th U.S. Cavalry Buffalo Soldiers. The content of the sign will include reference to the war games enacted by the large contingent of Buffalo Soldiers from Fort Walla Walla in 1904, and the discovery of the stables area at 45PI455, the 9th U.S. Cavalry Bivouac site along Sequalitchew Creek.

In addition, the existing the historical marker erected by the DuPont Company in 1927 at the site of the former Methodist Episcopal Mission (45PI66) will be retained on the property. The marker will be moved to the trailhead area where the public will have continued access to read about the history of the Mission, the first religious institution on Puget Sound, established in 1840.

Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Location Map

PARUS CONSULTING, INC.

Figure 1



Quad Name: Nisqually PR 1981

T19N, R 1E, Section 26

DuPont Lot Y: Archaeological Resource and Remediation Location Map

PARUS CONSULTING, INC.

Figure 2

REGULATORY SETTING

The Permit was completed pursuant to permit requirements found in the Washington Administrative Code (WAC) 25-48-060. There is no federal involvement in this project. The cultural resources investigation for the proposed project was conducted under prevailing Washington state laws, which serve to protect from known disturbance archaeological sites and Native American graves on both public and private lands. These laws include Executive Order 05-05, Indian Graves and Records (Revised Code of Washington [RCW] 27.44), Archaeological Sites and Resources (RCW 27.53), Archaeological Excavation and Removal Permit (WAC 25-48), and Discovery of Human Remains (RCW 27.44).

PROJECT SETTING

ENVIRONMENTAL SETTING AND DEPOSITIONAL CONTEXT

The project area is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973) approximately 0.8 mile east of the southern part of Puget Sound shoreline and north of Sequalitchew Creek. Sequalitchew Creek drains the Edmond's Marsh area about 0.3 mile southeast of the project, and empties into Puget Sound approximately 1.5 miles northwest of the marsh. The Puget Trough is a basin that lies between the Coast Range to the west and the Cascade Range to the east.

The geomorphology of the project area is largely the result of Pleistocene glaciations. The last advance of a continental glacier through the Puget Trough began approximately 20,000 years ago when the Cordilleran Ice Sheet moved south from British Columbia. By 15,000 years ago, the Puget Lobe of this ice sheet extended some 19 miles south of the present city of Olympia (Orr and Orr 1996). Similar to other southern Puget Sound lowlands, glacial outwash deposits comprise the area in and around the project region.

Over time, soils forms on the glacial outwash sediments, with the addition of wind-blown volcanic ash. Within the project area are the deep, somewhat excessively drained Spanaway gravelly sandy loam soils (41A), which formed on the gravelly outwash deposits on terraces and plains (Soil Survey Staff 2009). A typical soil profile for this series is an A horizon of gravelly sandy loam (0-14 inches), a B horizon of very gravelly sandy loam (14-18 inches), above a C horizon of extremely gravelly sand (18-60 inches), with the cobble content increasing down profile.

Puget Sound and the Cascade Range, west and east of the project, influence the regional climate. Characteristic climatic conditions for this region include wet, mild winters and warm, dry summers, with the majority of annual precipitation falling as rain between October and March (Franklin and Dyrness 1988). Native vegetation found throughout much of the Puget Trough province is the *Tsuga heterophylla* (western hemlock) forest (Franklin and Dyrness 1973:16–17, 88). In addition to western hemlock, forest trees include Douglas fir (*Pseudotsuga menziesii*), cedar (*Thuja plicata*), and alder (*Alnus rubra*), along with other species in valley bottoms or forest margins and a variety of understory plants, ferns, and mosses. Prairie and marsh vegetation was historically recorded in the project vicinity near Sequalitchew Creek and Edmond's Marsh.

The saltwater and freshwater resources of the Puget Sound, its bays and inlets attracted exploitation and settlement prior to historic logging and development of this rich, ecologically diverse region. Among the wildlife once common to the region are black bear, bobcat, cougar, deer, elk, raccoon, red fox, and snowshoe hare, as well as a variety of waterfowl, fish, and shellfish.

CULTURAL SETTING

Prehistoric Overview

Occupation in western Washington during the prehistoric period is estimated to have occurred as early as 12,000 years ago (Ames and Maschner 1999). Prehistoric material culture in western Washington has been categorized according to "horizons" or "periods" that define technological, economic, social and ideological elements (Ames and Maschner 1999). During the Paleoindian Period (dating to 12,500 BP and earlier), people are thought to have been highly mobile hunter-gatherers whose toolkit included fluted Clovis projectile points.

The Archaic or Early Period (12,500–5,000 BP) saw an increase in sedentism reflected in more kinds of stone tool types and evidence of permanent villages. Within the Puget Sound and Strait of Juan de Fuca, artifacts from this period are referred to as "Olcott" after the type site in Snohomish County (Nelson 1990). Increasing populations, an increase in reliance on marine resources, and more complex socio-economic organization, as well as the appearance of ground stone and bone tools in the archaeological record, characterizes the Middle Period (5,000–2,500 BP) in the Puget Sound (Ames and Maschner 1999; Matson and Coupland 1995). During the last 2,500 years, the Late Period is characterized by the development of craft specialization and social stratification, establishment of permanent winter villages, and an increased reliance on marine resources.

Ethnographic Overview

The project area is located in the traditional territory of the Puyallup Tribe who spoke the Puyallup Nisqually language of the Southern Coastal Salish language family. Their territory encompassed the Puyallup River drainage from Mount Rainier to Commencement Bay, and the uplands east of the Tacoma Narrows (Suttles and Lane 1990). Ethnographies indicate that the Puyallup relied on salmon as a dietary staple and secured additional natural resources from the surrounding saltwater, riverine and upland environmental settings. Their multi-family, plank-house villages were occupied during the winter months and typically situated adjacent to waterways. Smaller, seasonal camps were associated with hunting and gathering a variety of resources, including deer, elk, berries, and roots.

Ethnographic data indicate the Nisqually inhabited the area along the upper part of Sequalitchew Creek (Wessen et al. 2005, 2008). Sequalitchew Village was located at the mouth of the creek and described by the ethnographer as "where Dupont Creek enters the Sequalitcu River" (Smith 1940:8, 13). The village inhabitants would have pursued fishing, hunting and gathering from this winter village and from seasonal camps during the remainder of the year.

As part of the Medicine Creek Treaty of 1854, the Puyallup received a 1,280-acre tract extending along the high bluff from Commencement Bay to Point Defiance. By 1873, the reservation lands had been enlarged to 18,062 acres, and included lands on the southern and eastern side of Commencement Bay (Harmon 1995; Ruby and Brown 1986). Congress later established a commission to authorize sale of tracts with the Puyallup reservation, and by 1895 nearly half the acreage had been sold, including the waterfront properties.

Historic Overview

Euro-American history began in western Washington with the coming of explorers as early as the 16th century. In 1792, the expedition by British explorer George Vancouver first encountered Twana and other Southern Coast Salish when sailing up Hood Canal and Puget Sound. U.S. Navy Lt. Charles Wilkes explored Hood Canal in 1841, and named Suquamish Harbor (later Squamish Harbor) as well as Pit Passage (now Pitt Passage). By 1846, the United States owned what is now western Washington as the U.S.–British boundary was moved north to the 49th parallel. American settlers poured into the area that

was then known as the Oregon Territory, established in 1848, and the Donation Land Claim Act was passed in 1850. The arrival of the first transcontinental railroad in the 1880s served to fuel settlement and economic development.

In the project vicinity, the Hudson's Bay Company (HBC) established a small storehouse for their fur trade near the mouth of Sequalitchew Creek as early as 1832 (Carpenter 1986). The following year they erected a small fort immediately east, and 10 years later in 1843, a much larger fort complex was established approximately 0.75 miles farther east (known as Fort Nisqually). To meet the demands for export of agricultural and dairy products, the company had established the Puget's Sound Agricultural Company (PSAC) by 1838. The 1843 fort was constructed near the buildings and structures comprising this enterprise. Although the treaty with Great Britain had required the removal of the HBC from United States territory, HBC/PSAC traders, farmers and dairymen continued to occupy the 1843 Fort Nisqually complex, to raise crops and to produce dairy products until compensation was received from the U.S. government in 1869. The lands were then titled to the last clerk of the company, Edward Huggins.

During the years between the departure of HBC/PSAC in 1869 and the development of the DuPont Powder Works in 1906, the area was populated by American settlers. The homesteaders used the land for farming and livestock grazing. In 1904, the 9th U.S. Cavalry camped, stabled their horses, and conducted war games near and within the project area on the prairies between Sequalitchew and Steilacoom Creeks (see Moura 1991a:8-9). The troops camped within the project area along Sequalitchew Creek were designated the Second Brigade, Camp Nisqually. Under the command of Colonel Charles H. Noble, the camp contained about 2,000 soldiers from Fort Walla Walla. The 9th U.S. Cavalry troops were African-American, referred to as Buffalo Soldiers.

Two years later, the DuPont Powder Works was established on the land by the E.I. DuPont de Nemours Company (Munyan 1972). In addition to an explosives manufacturing plant, the DuPont facilities included a company town, docks along the Puget Sound shoreline, and a narrow-gauge railroad used to transport their products. The "Old Town" period represents the time of the construction and early operation of the DuPont Powder Works (1906 into the early 1920s). During this period, buildings were frequently constructed and demolished. The construction of roads and the railway network, the annual clearing and burning of underbrush, as well as relatively frequent explosions, resulted in extensive land disturbance.

When DuPont Powder Works closed in 1976, it was purchased by the Weyerhaeuser Company. Many of the production buildings were burned prior to release of the property to Weyerhaeuser to prevent detonation of undetected explosives. During the last 20 years, Quadrant Corporation (formerly Weyerhaeuser Real Estate Company) has developed the planned community known as Northwest Landing in the project vicinity.

Photograph 1 shows the narrow-gauge railroad built by the DuPont Powder Works above the south side of Sequalitchew Creek (outside and south of Lot Y). The train is moving the last load of black powder that had been manufactured by the plant and subsequently stored in a warehouse rented by the city. This last powder run occurred circa 1990 (personal communication, Fred Foreman).

Photograph 1. Last powder run on narrow-gauge (south side of Sequalitchew Creek)

PREVIOUS ARCHAEOLOGIAL RESEARCH

RESEARCH METHODS

A cultural resources search was performed for the project on October 21, 2010 using the DAHP electronic GIS database to gather archaeological information relative to reports and sites within and in the vicinity of the project area. This information was supplemented with archival research into the history of this region and of archaeological investigations in the immediate project vicinity. This assessment considered previous studies, the magnitude and nature of the undertaking, the nature and extent of potential effects on historic properties, and the likely nature and location of currently unknown archaeological resources within the project area.

During the fieldwork program between February 17 and March 4, 2011, PCI archaeologist Cindy Arrington conducted additional archival and oral history research. Archival research at the City of DuPont History Museum included discussions with Museum Director Johanna Jones on the area's history and review of numerous documents and photographs. A map of the DuPont Works drawn by E. Davies and dated March 15, 1955 shows the "Burning Ground" within the Lot Y project area and the system of roads and narrow-gauge and standard-gauge railroad tracks crisscrossing within the plant boundaries. The map also shows two bridges on Sequalitchew Creek immediately south of the project area, which were used by the company's narrow- and standard-gauge railroads. A digital version of this map was provided by Fred Foreman, a lifetime resident of the City of DuPont and a former part-time, summer DuPont Powder Works employee. Mr. Foreman gladly conveyed his enthusiasm and knowledge of the history of this region, and spent time with Ms. Arrington. In addition to the Davies map, Mr. Foreman also provided DVDs of archaeological investigations in 1989 of 1833 Fort Nisqually and of an informal visit to the Methodist Episcopal Mission site (45PI66) during removal of contaminated soil at nearby site 45PI64 (Burning Ground Dump site). Along with photographs obtained from DAHP of the hot spot archaeological monitoring program carried out a decade ago by Daugherty and Condon (2000), the video of hazardous waste removal provided a clearer picture of the landscape within Lot Y prior to re-shaping by heavy mechanical equipment while removing contaminated topsoil.

LOCAL ARCHAEOLOGICAL INVESTIGATIONS

The project vicinity is part of a complex cultural landscape with cultural resources dating from occupation of the area by Native Americans to historic period settlement—beginning in 1832 by the HBC with related agricultural activities started by the PSAC by 1838, and continuing through 70 years of industrial

development by the DuPont Company between 1906 and 1976. The following discussion focuses on studies within the former DuPont Powder Works property, which was acquired in 1976 by the Weyerhaeuser Company from E.I. DuPont de Nemours Company. As indicated in Table 1, several of these prior archaeological investigations have included all or portions of the current project area.

Table 1. Prior Cultural Resources Investigations within or near Project Area

Year	Author(s)	Report Title	Proximity to project
1977	Onat, A.R., Lee A. Bennett, and Timothy Riordan	Cultural Resources Survey: DuPont Site, Volume I, Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near Lot Y
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site	Within and near Lot Y
1989	Welch, Jeanne	A Cultural Overview and Comprehensive Management Plan for the DuPont Property, Pierce County, Washington	Within and near Lot Y
1990	Stilson, M. Leland	A Data Recovery Study of 45PI401, Hudson's Bay Dwellings at Northwest Landing, Pierce County, Washington	0.1 mile east
1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within
1991	Stilson, M. Leland	A Data Recovery Study of 45PI405, the 1843 Fort Nisqually Village at Northwest Landing, Pierce County, Washington	0.1 mile east
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the "Hot Spot" Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near Lot Y
2002	Maass, Alex	Interim Archaeological Monitoring Report for the Former DuPont Works Site, Parcel 1	Adjacent (to west)
2003	Maass, Alex	2002 Field Season Archaeological Monitoring Report for the Former DuPont Works Site, Parcel 1	Adjacent (to west)
2003	Wessen, Gary	Exploring the Boundary and Possible Interpretation of 45PI485	South of creek
2004	Wessen, Gary	Archaeological Testing at 45PI576, Former DuPont Works Site, City of DuPont, Pierce County, Washington	South of creek
2005	Dampf, Steven	Archaeological Monitoring Report for the 2003 and 2004 Field Seasons at the Former Dupont Works Site Parcel 1, City of DuPont, Pierce County, Washington	Adjacent (to west)
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near Lot Y
2006	Thompson, Gail	Archaeological Implementation Report for Remediation of Soils at the Former DuPont Works Site Parcel 1, City of DuPont, Pierce County, Washington	Adjacent (to west)
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near Lot Y

The first intensive survey of the 3,000 acres comprising the former DuPont Powder Works property was completed over 30 years ago. A total of 26 cultural resources were identified during the survey, including 8 prehistoric and 18 historic sites (Blukis Onat et al. 1977). Blukis Onat and others (1977) studied the prehistoric and ethnohistoric sites identified within the surveyed area, while Stratton and Lindeman (1977) completed archival research on the historic period resources. The 26 sites include 1833 Fort Nisqually (45PI55), 1843 Fort Nisqually (45PI56), and the Sequalitchew Village site (45PI54). The 1833 Fort Nisqually site, located slightly more than 0.5 mile west of Lot Y, was listed on the NRHP in 1974 and is also listed in the Washington Heritage Register (WHR). Located approximately 0.2 mile southeast of Lot Y, the 1843 Fort Nisqually site (45PI56) is considered eligible for NRHP listing. The Sequalitchew

Village site, a historic property, is located at the mouth of Sequalitchew Creek approximately 1.5 miles west of Lot Y and contains remnants of a shell midden. Burials associated with the village were recorded as a separate site (45PI76), since they are located on the opposite, north side of the creek from the village.

As discussed further below, of the 26 sites recorded by Blukis Onat et al. (1977), three are located within Lot Y (45PI63 Railroad Dump #3, 45PI64 Burning Ground Dump, and 45PI66 Methodist Episcopal Mission Site). An additional 12 sites (2 prehistoric and 10 historic) of those identified during the 1977 survey are located within 0.5 mile of but outside Lot Y.

The extensive disturbance of the entire DuPont property by construction of numerous roadways and narrow-gauge railroad tracks, as well as the operations of the explosives manufacturing plant, was discussed in the report by Blukis Onat et al. (1977:57) and they recommended a more intensive survey might identify additional archaeological sites. Over ten years later, the former DuPont property was resurveyed again as part of the development of a Cultural Resources Management Plan for the Weyerhaeuser Company by Jeanne Welch (Welch 1989a). Each of the archaeological sites identified during the survey by Blukis Onat et al. (1977) was relocated, including the three within Lot Y (45PI63, 45PI64, and 45PI66). More intensive survey was accomplished in 1988 in areas planned by Weyerhaeuser for well or reservoir construction, or for logging, and the work included a testing and evaluation program developed to determine the significance of known cultural resources. Backhoes were used for sod removal in vegetated areas and for exploratory trenching.

The archaeologists also completed a testing program to identify significant cultural resources within the planned corridor for construction of Center Drive (Welch 1989a:4.2, 4.4). Center Drive trends north-south and is located 0.1 mile east of Lot Y. Two sites within the right-of-way of Center Drive on the north and south sides of Sequalitchew Creek were identified (45PI401 and 45PI405) (Welch 1989a, 1989b, 1989c). The sites are located just outside the west palisade wall of 1843 Fort Nisqually (45PI56). Each site contains the remains of HBC/PSAC dwellings, and a large number of historic as well as prehistoric artifacts were recovered from 45PI401 and 45PI405 during initial testing and subsequent data recovery excavations (Welch 1989a; Stilson 1990, 1991). The two sites are located only a short distance from Lot Y, approximately 0.1 mile to the east, and are discussed in more detail below.

Archaeological test excavations within Lot Y were conducted in 1989 by Guy Moura to identify the precise location of the buildings within the Methodist Episcopal Mission Site (45PI66), and to test the significance of Railroad Dump #3 (45PI63) (Moura 1991a; also see Daugherty and Condon 2001:Part I). He was also hired to investigate a third area within Lot Y where historic accounts indicated the 9th U.S. Cavalry had camped during military maneuvers in 1904 (later designated 45PI455) (Moura 1991a, 1991b; also see Daugherty and Condon 2001:Part I). Moura completed a series of backhoe peels, shovel test probes, and block and unit excavations within and near the boundaries of 45PI63, 45PI66, and 45PI455.

Under a Consent Decree signed in 1991 by the Washington State Department of Ecology, E.I. DuPont de Nemours Company and Weyerhaeuser Company, DuPont and Weyerhaeuser were jointly responsible for cleaning up an 841-acre tract, which had been contaminated by the former industrial explosives manufacturing facility (Thompson 2006:4). Archaeological monitoring of soil remediation activities and related archaeological investigations were carried out between 2001 and 2004. Detailed information on the monitoring is contained in reports by Alex Maass (2002, 2003) and Steven Dampf (2005). A large prehistoric chipped stone scatter (45PI576) was identified south of Sequalitchew Creek and south of Lot Y (Thompson 2006:21, 32). Two small projectile points suggest the site was occupied during the past 2,000 years, although the overall assemblage indicates there may be an older component. Because of the low density of artifacts recovered from testing in a highly disturbed setting, the site was recommended ineligible for NRHP listing. Two prehistoric isolates were also recorded south of the creek and

approximately 50 meters east of 45PI576. HRA 30a-d included one core, one flake, and two edge-modified flakes; HRA 31a-d included four basalt flakes (Thompson 2006:22).

Lot Y was included within the acreage under the Consent Decree requiring remediation of hazardous materials (mainly lead and arsenic contaminated soil) contained within the former DuPont property, and additional archaeological investigations revolved around remedial activities. The removal of contaminated soil in "hot spot" areas within Lot Y was monitored by archaeologists in 1999 and 2000, and included segments of the narrow gauge railroad tracks, Railroad Dump #3 (45PI63), the Burning Ground Dump site (45PI64), and a portion of the 9th U.S. Cavalry Bivouac site (45PI455) (Daugherty and Condon 2000:7) (Figure 2). After clearing and grubbing, excavation of the hot spots generally achieved a depth of 46 centimeters below surface (cmbs) (18 inches). The area around removal of a designated hot spot was expanded by 25 feet in each cardinal direction so the initial excavation area around a hot spot measured at least 50x50 feet.

During remediation activities, a historic debris deposit associated with the 1843 Fort Nisqually complex was identified to the south of Sequalitchew Creek. Southeast of Lot Y and near the two previously recorded HBS/PSAC dwelling sites (45PI401 and 45PI405), the deposit was recorded as 45PI485 (Daugherty and Condon 2000).

A comprehensive document reporting on the subsurface testing or hot spot monitoring at the four known sites within Lot Y (45PI63, 45PI64, 45PI66, and 45PI455) was completed the following year (Daugherty and Condon 2001:Parts I and II). Part I of that document is Moura's report on the test excavations completed in 1989 at 45PI63, 45PI66, and 45PI455 (also see Moura 1991a, 1991b). Part II of that document reproduced and updated the information at all four sites from the hot spot removal program reported by Daugherty and Condon (2000).

Beginning in 1993, Richard Daugherty evaluated the significance of a number of the archaeological sites within the former DuPont Powder Works property and prepared National Register nomination forms for them. These included the four sites within Lot Y (45PI63, 45PI64, 45PI66, and 45PI455), as well as the two HBC/PSAC dwelling sites east of Lot Y (45PI401 and 45PI405), discussed below.

In January 2005, during a survey for the proposed expansion of an existing gravel mine, the four sites (45PI63, 45PI64, 45PI66, and 45PI455) previously recorded in the project area were relocated, but no effort was made to further investigate them since each had been previously evaluated (Wessen et al. 2005:15). No potentially significant archaeological sites were newly identified during the surface survey, and it was decided to investigate the areas close to Sequalitchew Creek by subsurface testing. The subsequent recovery of four pieces of chipped stone debitage from a series of shovel test probes was recorded as a prehistoric isolate (45PI773) (Wessen et al. 2005, 2008) (Figure 2).

PREVIOUSLY RECORDED CULTURAL RESOURCES NEAR PROJECT AREA

As noted above, 12 (2 prehistoric and 10 historic) of the 26 sites recorded by Blukis Onat et al. (1977) are located within 0.5 mile of but outside Lot Y (Table 2). As shown in the table, an additional 13 sites (2 prehistoric and 11 historic) and 5 isolates (2 prehistoric and 3 historic) have been previously recorded within 0.5 mile of but outside Lot Y. According to the records, one historic (45PI58) and one prehistoric site (45PI75) may have never existed. The three remaining pre-Contact sites include two burial sites (45PI77, 45PI404) and a chipped stone scatter (45PI576).

The previously recorded historic sites are mainly associated with the HBC/PSAC era and the Old Town period. The Old Town period represents the time of the construction and early operation of the DuPont Powder Works (1906 into the early 1920s). Eight of the historic-era sites are associated with the earlier HBC/PSAC period (1832–1869). These include 1843 Fort Nisqually (45PI56), the remains of

ethnohistoric men's dwelling houses (45PI74), three burial sites (45PI78, 45PI413, 45PI451), two sites with house foundations and artifacts (45PI401, 45PI405), and a debris deposit (45PI485). The artifacts from one site (45PI563) date from both the HBC/PSAC and Old Town periods.

Seven of the previously recorded sites are attributed to the DuPont Powder Works Old Town period. These include a men's boarding house (45PI57), the Old Town dump (45PI59), a domestic trash dump (45PI60), two debris deposits or scatters associated with the narrow gauge railroad that transported the explosives (45PI61, 45PI62), the munitions plant (45PI70), a remnant of a dirt road (45PI441), and a recently recorded non-functional segment of narrow-gauge railroad track and berm (45PI01224). 45PI01224 was identified during survey in 2010 of the 12.8-acre property (known as Lot X) adjacent to the eastern edge of Lot Y (Sikes and Arrington 2010). The narrow-gauge track and berm continue to the west beneath a chain-link fence into Lot Y.

One of the historic period sites is the garbage dump (45PI448) used by the city of DuPont from 1927 to 1946. The two remaining historic-era sites include one with 100 to 200-year old human skeletal fragments (45PI712) and a debris scatter with artifacts ranging in age from 1916 to the mid-1960s (45PI783).

The two prehistoric isolates identified within the 0.5 mile radius were recorded south of Sequalitchew Creek during archaeological monitoring of soil remediation activities within the Consent Decree area (Thompson 2006:22). The isolates are located approximately 50 meters east of 45PI576, a large prehistoric chipped stone scatter south of the creek and south of Lot Y. HRA 30a-d included one core, one flake, and two edge-modified flakes; HRA 31a-d included four basalt flakes.

The three historic-era isolates were identified recently during the recent survey of Lot X (Sikes and Arrington 2010). The isolates are located approximately 400 feet east of Lot Y. GEO Isolate #1 is a surface pile of 51 railroad spikes; GEO Isolate #2 is a pile of broken, formed aggregate concrete chunks; and GEO Isolate #3 is a scatter of milled lumber.

Of the previously recorded sites within the 0.5 mile radius outside Lot Y, three are considered eligible for NRHP listing: the 1843 Fort Nisqually site (45PI56) and the two HBC/PSAC dwelling sites (45PI401, 45PI405). The latter two sites are also considered contributing elements to the proposed Nisqually-Sequalitchew Historic District (Point Nisqually Defense Fund 2003) (see discussion below).

Outside the 0.5 mile radius, nearby historic properties include 1833 Fort Nisqually (45PI55), the Sequalitchew Village Site (45PI54), the DuPont Village Historic District, and Fort Lewis. Throughout its period of significance (1917–1948), Fort Lewis was one of the preeminent U.S. Army training posts. The DuPont Village Historic District encompasses the 43-acre company town developed by E.I. DuPont de Nemours Company between 1906 and 1915. The district is located less than 1 mile southeast of Lot Y.

Table 2. Previously Recorded Resources within 0.5 Mile of Project Area

Site No.	Brief Description	Historic Period	Recorded by and year	NRHP Eligibility
45PI00056	Historic 1843 Fort Nisqually (1832-1869)	HBC/PSAC	Riordan 1977; Daugherty 1993 NRHP form	Eligible
45PI00057	Historic men's boarding house, DuPont era; destroyed	Old Town	Riordan 1977; Daugherty 1993 NRHP form	Not eligible
45PI00058	Site recorded as historic brick yard dump but it never existed	n/a	Riordan 1977; Daugherty 1993 NRHP form	Not eligible
45PI00059	Historic Old Town dump, 1906-1909	Old Town	Riordan 1977; Daugherty 1993 NRHP form	Not eligible

Site No.	Brief Description	Historic Period	Recorded by and year	NRHP Eligibility
45PI00060	Historic domestic trash dump, DuPont Powder Works, 1906-1909	Old Town	Riordan 1977; Daugherty 1993 NRHP form	Not eligible
45PI00061	Historic railroad or domestic debris deposit	Old Town	Riordan 1977; Daugherty 1993 NRHP form	Not eligible
45PI00062	Historic railroad debris deposit, ca. 1906-1909	Old Town	Riordan 1977; Daugherty 1993 NRHP form	Not eligible
45PI00070	Historic DuPont munitions plant, ca. 1906	Old Town	Riordan 1977	Not determined
45PI00074	Ethnographic men's dwelling houses, 1844-1869, Fort Nisqually	HBC/PSAC	Blukis Onat 1977; Daugherty 1992; Daugherty 1993 NRHP form	Not determined
45PI00075	Site recorded as a prehistoric midden at DuPont crystallizer but it never existed	n/a	Blukis Onat 1977; Daugherty 1993 NRHP form	Not eligible
45PI00077	Old Fort Lake Graves	Pre-Contact	Blukis Onat 1977	Not determined
45PI00078	Historic 1843 Fort Nisqually burial	HBC/PSAC	Blukis Onat 1977	Not determined
45PI00401	Historic Hudson's Bay house; historic and prehistoric artifacts; ca. 1845-1869	HBC/PSAC	Welch 1988; Daugherty 1993 NRHP form	Eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00404	Pre-Contact Nisqually Indian Burial Site	Pre-Contact	Welch 1988; Daughtery and Wessen 1988	Not determined
45PI00405	Historic Hudson's Bay house foundations, historic and prehistoric artifacts, ca. 1845-1869	HBC/PSAC	Welch 1988; Daugherty 1993 NRHP form	Eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00413	Historic Native American cemetery, 1840-1870	HBC/PSAC	Daugherty 1991	Not determined
45PI00441	Historic dirt road remnant, 1846	Old Town	Solimano 1996	Recommended not eligible
45PI00448	Historic City of DuPont garbage dump, 1927-1946	DuPont	Daugherty 1996; Daugherty 1996 NRHP form	Not eligible
45PI00451	Historic Lone Fir grave site, 1850	HBC/PSAC	Daugherty 1997	Not determined
45PI00485	Historic debris deposit, ca. 1840-1870	HBC/PSAC	Daugherty 2000; Wessen 2002	Not determined
45PI00563	Historic debris scatter, 1843-1930s	HBC/PSAC and Old Town	Chesmore 2001, 2002; Wilson 2002 NRHP form	Not eligible
45PI00576	Prehistoric chipped stone scatter	prehistoric	Wessen 2004	Recommended not eligible
45PI00712	Human skeletal fragments, ca. 100-200 yrs old		Wessen 2003	Not determined
45PI00783	Historic debris scatter, 1916-1964		McKillop 2007	Not eligible
45PI1224	Historic railroad track and berm, 1906-1920s	Old Town	Arrington 2010	Not eligible
GEO Isolate #1	Historic isolate (railroad spikes)		Arrington 2010	Not eligible
GEO Isolate #2	Historic isolate (concrete chunks)		Arrington 2010	Not eligible

Site No.	Brief Description	Historic Period	Recorded by and year	NRHP Eligibility
GEO Isolate #3	Historic isolate (milled lumber)		Arrington 2010	Not eligible
HRA 30a-d	Prehistoric isolate (core, 3 flakes)		Thompson 2006	Not eligible
HRA 31a-d	Prehistoric isolate (4 flakes)		Thompson 2006	Not eligible

PREVIOUSLY RECORDED SITES AND ISOLATE WITHIN PROJECT AREA

One prehistoric isolate (45PI773) and four historic archaeological sites (45PI63 Railroad Dump #3, 45PI64 Burning Ground Dump, 45PI66 Methodist Episcopal Mission Site, and 45PI455 9th U.S. Cavalry Bivouac site) have been previously recorded within the project area (Table 3; Figure 2). One of the historic sites (45PI66) is associated with the HBC/PSAC era (1832-1869) and one (45PI63) with the Old Town period (1906–early 1920s). Site 45PI64 is associated with later operation of the explosives manufacturing plant from the 1930s until the plant closed in 1945. Temporary occupation by the 9th U.S. Cavalry (45PI455) occurred in 1904 between the HBC/PSAC and Old Town periods.

Site 45PI66 has been determined eligible for listing on the NRHP, and site 45PI455 is potentially eligible. These two sites are also encompassed within the proposed Nisqually-Sequalitchew Historic District as contributing elements. The district is still pending approval.

Of the four previously recorded sites within Lot Y, two (45PI63 Railroad Dump #3 site and 45PI64 Burning Ground Dump site) had been determined not eligible for NRHP listing and were completely removed during hazardous materials remediation in 1999 and 2000 (Daugherty and Condon 2000, 2001). These former sites were located within two of the cleared hot spots (HS-4 and HS-6) shown on Figure 2.

Although not located within Lot Y, this section and Table 3 include discussion of two additional sites that contain artifacts or features representing former HBC/PSAC dwellings associated with 1843 Fort Nisqually. The two sites, 45PI401 and 45PI405, are located on the north and south banks of Sequalitchew Creek approximately 0.1 mile east of Lot Y. The sites also contain a large number of chipped stone artifacts.

The history of archaeological investigations at each of these resources within and near Lot Y is presented below.

Table 3. Previously Recorded Cultural Resources within and near Project Area

Site No.	Brief Description	Historic Period	Recorded by and year	Prior Reports	NRHP Eligibility
Sites and Isolate Recorded within Project Area					
45PI00063	Historic debris deposit, two loci along railroad, 1910-1930; removed during soil remediation	Old Town	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Moura, 1991a; Daugherty and Condon, 2001	Not eligible
45PI00064	Historic DuPont Powder Works burning ground dump, 1930s-1945; removed during soil remediation	DuPont	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Daugherty and Condon, 2000, 2001	Not eligible

Site No.	Brief Description	Historic Period	Recorded by and year	Prior Reports	NRHP Eligibility
45PI00066	Historic 1840-1842 Methodist Episcopal Mission	HBC/PSAC	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al. , 1977; Welch, 1989a; Moura, 1991a; Daugherty and Condon, 2000, 2001	Eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00455	Historic 9th U.S. Cavalry Bivouac, Camp Nisqually, 1904;partially removed during soil remediation	Between HBC/PSAC and DuPont	Daugherty, 1997; Daugherty, 1997 NRHP form	Moura, 1991a, 1991b; Daugherty and Condon, 2000, 2001	Potentially eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00773	Prehistoric chipped stone isolate	n/a	Wessen, 2005	Wessen et al., 2005, 2008	Not eligible
Sites Recorded near Project Area					
45PI00401	Historic Hudson's Bay house; historic and prehistoric artifacts; ca. 1845-1869; destroyed during bridge construction	HBC/PSAC	Welch, 1988; Daugherty, 1993 NRHP form	Welch, 1989a; Stilson, 1990	Eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00405	Historic Hudson's Bay house foundations, historic and prehistoric artifacts, ca. 1845-1869; destroyed during road partially construction	HBC/PSAC	Welch, 1988; Daugherty, 1993 NRHP form	Welch, 1989a; Stilson, 1991	Eligible, included in proposed Nisqually-Sequalitchew Historic District

45PI63 Railroad Dump Site

This site was initially recorded by Timothy Riordan as Railroad Dump #3 during the survey of the former DuPont Powder Works property by Blukis Onat et al. (1977). The dump is located at the junction of two narrow-gauge railroad tracks from the DuPont Powder Works Old Town period. Recorded in two distinct loci (A and B, each of which was approximately 10 meters in diameter), a dirt road developed after the track was abandoned may have split the debris deposit.

Material from the site mainly dates between 1910 and 1930 (the Old Town period) and includes mainly domestic ceramic and glass fragments, with a few nails and fabric remnants (Daugherty and Condon 2001; Moura 1991a; Daugherty 1993a). Over 260 artifacts were collected in 1989, mainly from the ground surface along the tracks, with only a single 1x1 meter test unit excavated in Area B (Moura 1991a:13-17). Additional artifacts were recovered during subsequent soil remediation activities in loci A and B (Daugherty and Condon 2001:32-46). The recovery of mainly domestic items led Daugherty and Condon (2001:46) to conclude that occupants of Old Town had used 45PI63 as a dump.

In 1993, the State Historic Preservation Officer (SHPO) determined site 45PI63 ineligible for NRHP listing (see October 19, 1993 memorandum and NRHP Determination of Eligibility Form). The site has been extensively looted (Welch 1989a:4.20; Thompson 2006:27), and prior to soil remediation, there had been extensive damage to the site by logging and railroad construction. No treatment measures were required during soil remediation, which removed the entire site (Daugherty and Condon 2001:46). Prior to removal, 45PI63 was located in the area on Figure 2 marked as HS-4.

45PI64 Burning Ground Dump Site

This site was initially recorded by Timothy Riordan during the survey of the former DuPont Powder Works property by Blukis Onat et al. (1977). At the location of a former black powder manufacture and storage building, site 45PI64 was used as a dump where hazardous and non-hazardous waste from the manufacturing plants at the DuPont Powder Works was discarded and burned. The site was used as a burning ground dump from the 1930s until the black powder mill was closed in 1945. The “Burning

Ground" is clearly shown on the 1955 map of the DuPont Works drawn by E. Davies. Prior to turning the property over to Weyerhaeuser, DuPont systematically dynamited this site to prevent detonation of undetected explosives (Thompson 2006:30).

Due to contamination by hazardous waste, archaeological work within site 45PI64 was not permitted. In 1993, the SHPO determined the site ineligible for NRHP listing (see October 19, 1993 memorandum and NRHP Determination of Eligibility Form). Archaeological monitoring during a program to remove "hot spots" or contaminated soils was conducted at the site in 2000 (Daugherty and Condon 2000), and the entire area (approximately 3,000 square feet) was removed during the subsequent hot-spot treatment program (Daugherty and Condon 2001:47, 50). Prior to removal, 45PI64 was located in the large cleared area marked as HS-6 on Figure 2.

Although former site 45PI64 was near the historical marker for the Methodist Episcopal Mission (45PI66), no evidence of the Mission building or stockade or of prehistoric or historic cultural materials were identified during hot spot removal, with the exception of contaminated, broken tools and hardware from the DuPont operation.

45PI66 Methodist Episcopal Mission Site

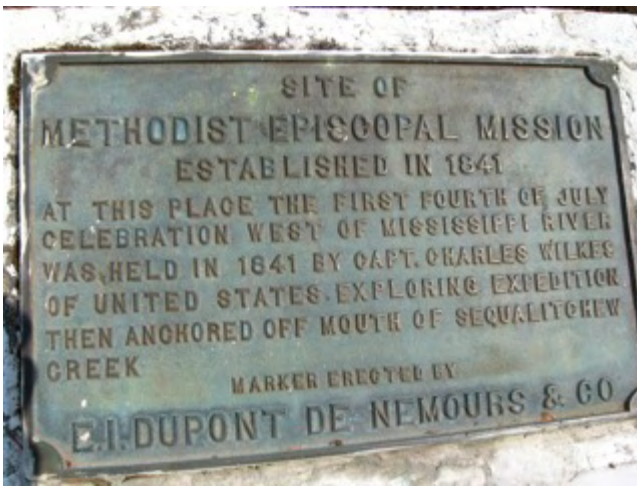
Initially recorded during the survey by Blukis Onat et al. (1977), this site has been determined eligible for NRHP listing under Criterion A (association with significant events) (NRHP Determination of Eligibility Form dated September 29, 1993). The site is not considered eligible under Criterion D (data potential) because it has been extensively disturbed by road and railroad construction and there has been little recovery of archaeological material during testing. Site 45PI66 also contributes to the proposed Nisqually-Sequalitchew Historic District (see below).

The Methodist-Episcopal Mission and associated school were founded in 1834 on land provided by the HBC. The goal was to convert and educate the Native Americans camping at Fort Nisqually (Carpenter 1986:98-99). Construction of the Mission buildings began in 1839 and a missionary group began services the following year. Several outbuildings and a garden were contained within the Mission grounds, which were surrounded by a stockade and located approximately 0.5 mile from the fort. The Mission building measured 18 feet wide by 32 feet long and 9 feet high, and an addition was constructed on the west side. The Mission was not successful, was abandoned in 1842, and later destroyed by fire. The land was also used for agriculture and in 1904 it was temporarily occupied by the military on training maneuvers. In 1927, the DuPont Company erected a historical marker at the site of the former Mission—the first religious institution on Puget Sound (Photographs 2 and 3).

Archaeological investigations (backhoe peels, shovel tests, 1x2 meter units) around the historical marker were conducted in 1989 (Welch 1989a; Moura 1991a). Some 29 backhoe peels were made in the area surrounding the bronze marker, but no evidence of the former Mission building was uncovered and additional testing was recommended (Welch 1989a:4.1, 4.22). Moura's team recovered chimney stones, 2 square nails, 3 window glass and 9 bottle glass fragments, and a couple pieces of ceramic (Moura 1991a:6-8). Excavation efforts (55 shovel tests and four 1x2 meter units) were stopped by 25 cmbs (0.8 feet) when sterile gravels were encountered, similar to other sites in this vicinity.

Moura (1991a:8) considered the accumulated evidence supported his contention that the Methodist-Episcopal Mission had been found. He also noted that the ashy matrix with brick, bone, and charcoal flecks in the excavation units above 25 cmbs (0.8 feet) at 45PI66 mimics that identified at the nearby HBC/PSAC dwellings site (45PI405) as hearth and chimney remnants, as discussed in the data recovery report on that site by Stilson (1991). Site 45PI405 is associated with the 1843 Fort Nisqually.

Photograph 2. Marker at Methodist-Episcopal Mission Site (45PI66)



Photograph 3. Text of 1927 marker erected by the DuPont Company (plan view)

Eleven years later, contrary to expectations, no evidence of the Mission building or stockade was identified during archaeological monitoring of contaminated soil removal at nearby site 45PI64 (Burning Ground Dump site) (Daugherty and Condon 2000; Daugherty and Condon 2001:47-48). Although chimney stones were identified at 45PI66 during the testing by Moura in 1989, archaeologists have debated about whether the stones and other artifacts identify the exact location of the Mission building. Daugherty and Condon (2001:48), for example, believe Moura's results are equivocal, although they do state "there appears to be little question that the actual location of the Mission is within a few hundred yards or so of the monument" erected by the DuPont Company.

45PI455 9th U.S. Cavalry Bivouac Site

Historic records indicate about 2,000 men were bivouacked at "Camp Nisqually" for a few months in 1904. The 9th U.S. Cavalry (also known as Buffalo Soldiers) practiced mock battles at the edge of the prairie north of Sequalitchew Creek. After the mock battles ended, the camp and surrounding area were cleared and the refuse burned before the troops departed for return to Fort Walla Walla.

Archaeological investigations (backhoe peels, block and unit excavations) within a 120 square meter area conducted by Moura in 1989 recovered over 800 artifacts and 170 small, burned animal bone fragments (deer, sheep/goat food remains) below the surface (Moura 1991a, 1991b). The artifacts include horseshoes, horseshoe nails, horse teeth, harness tackle, square and wire nails, burned bone fragments, a 1901 dime, and a 1903 rifle cartridge, all associated with the cavalry encampment. Liquor bottles and shotgun shells date to late 19th century use of the area, while prehistoric occupation is evidenced by chipped stone tools (2 knives) and debitage (5 flakes) made from a variety of toolstone (petrified wood, chert, and basalt). Two railroad spikes date to after the DuPont Powder Works was established in 1906. Similar to other sites in this vicinity, sterile gravels were encountered within 30 cmbs (1 foot) (Moura 1991a:9, 1991b:1). There was no surface evidence of the site.

A site number (45PI455) was assigned to the 9th U.S. Cavalry Bivouac area following the test excavations completed by Moura in 1989. The site measures approximately 225 by 100 meters (738 by 328 feet), and historic documentation indicates the artifact assemblage represents the temporary stable area (Moura 1991a:12, 1991b:5). In 1998, State Archaeologist Robert Whitlam indicated this site is potentially eligible for NRHP listing and recommended further work to define the boundaries of the Native American and Buffalo Soldier occupations (letter to Richard Daugherty dated February 17, 1998). Site 45PI455 is also

considered potentially eligible for NRHP inclusion as part of the proposed Nisqually-Sequalitchew Historic District (see below).

Additional work at site 45PI455 during archaeological monitoring of contaminated soil removal uncovered no further evidence of this brief occupation by the Buffalo Soldiers (Daugherty and Condon 2000, 2001). Although the bivouac area was encompassed within the targeted hot spots (HS-2 on Figure 2), the remediation program did not include the "stable" area excavated by Moura in 1989 (Moura 1991a, 1991b).

45PI773 Prehistoric Chipped Stone Isolate

This chipped stone isolate was recorded in 2005 by Gary Wessen during survey and excavation of subsurface shovel test probes along Sequalitchew Creek for the proposed expansion of an existing gravel mine (Wessen et al. 2005, 2008). The isolate consists of a total of four pieces of debitage (one complete secondary flake and three flake fragments) manufactured from basalt or dacite. The material was encountered within an approximately 40 x 30 meter area, with one artifact close to the surface in a previously disturbed, very dark brown gravelly sandy loam. The remaining three artifacts were recovered potentially in situ between 30 and 50 cmbs (1-1.6 feet) in a dark yellowish brown gravelly sandy loam.

The archaeologists had placed a series of 31 shovel test probes in this area, 26 of which were arranged at 10-meter intervals along a single east-west trending line located approximately 5 meters north of the northern edge of the creek (Wessen et al. 2008:29). The four pieces of chipped stone were recovered from a section of the test line that was approximately 40 meters long. Of the five probes in the section, four contained a flake or flake fragment. None of the four probes contained more than one artifact. Five additional shovel test probes were excavated in three lines extending northward away from the creek, but no artifacts were recovered. Each probe measured approximately 30 to 38 cm in diameter.

The soil profile in the vicinity of the chipped stone isolate is described as having three strata (Wessen et al. 2008:30). The upper stratum is a very dark brown (10YR 2/2) gravelly sandy loam ranging in thickness from 8 to 25 cm. Next is a dark yellowish brown (10YR 3/4) gravelly sandy loam with a thickness of 40 to 50 cm, followed by a dark yellowish brown gravelly sand with cobbles. Small charcoal fragments were recovered from the two sandy loam horizons. In addition to one piece of debitage, the upper horizon contained a small quantity of concrete rubble, one square nail, and a mammal bone fragment, which suggested the stratum had been previously disturbed.

Isolate 45PI773 is located near site 45PI455, the 9th U.S. Cavalry Bivouac site, along the north side of the upper edge of Sequalitchew Creek. It is unknown if the four pieces of debitage recovered at 45PI773 are related to the prehistoric chipped stone artifacts (2 knives and 5 flakes) recovered during the 1989 test excavations at 45PI455 (Moura 1991a, 1991b; Wessen et al. 2008:30). Since little information on prehistoric occupation of this area can be provided by the few pieces of debitage recovered from the discontinuous subsurface probes, isolate 45PI773 was recommended ineligible for NRHP listing (Wessen et al. 2008:32).

Nisqually-Sequalitchew Historic District (proposed)

Proposed by the Point Nisqually Defense Fund (2003), this historic district would cover approximately 360 acres along both sides of Sequalitchew Creek. Thirteen archaeological sites are identified in the NRHP nomination form as contributing elements. These include 45PI66 and 45PI455 within Lot Y, as well as 45PI401 near Lot Y, in the northern extent of the proposed district. The district has not yet been approved. The nomination assumes undisturbed deposits remain at the sites in sufficient quantity and diversity to address research questions related to the history of the district. It is unclear if intact remains

exist at the sites and if so, whether the deposits would contain the data required to address the research questions.

45PI401 HBC/PSAC Dwelling Site

Located approximately 0.1 mile east of Lot Y, site 45PI401 was identified in 1988 on the north bank of Sequalitchew Creek during survey of the right-of-way for then-planned Center Drive (Welch 1989a:4.28). The site had been previously disturbed by DuPont Company development, including the Old Town complex and railroad, and cattle grazing. Data recovery investigations at the site ensued and 5,000 historic and 100 prehistoric artifacts, foundation remains, a shell concentration, and fire pits were identified (Stilson 1990, 1991; Daugherty 1993b). The lithic assemblage includes 10 projectile points, 6 utilized flakes, 1 scraper, 1 ground stone adze blade, and 82 modified or non-utilized flakes (Stilson 1990:47). The investigation covered 450 square feet and included shovel test probes, backhoe peels and trenches, 1x2 meter units, and 1x1 meter units. There was a rapid decrease in the frequency of artifacts as the distance of the shovel test probes, which extended 30 meters to the west, increased away from the site.

Site 45PI401 is the location of former HBC/PSAC dwellings associated with 1843 Fort Nisqually (45PI56). The site is located just outside the west palisade wall of the fort. The two dwellings date from the 1840s to 1850s, and may have been that of a dairyman and of a Nisqually tribal member who was in charge of the dairy after ca. 1850 (Stilson 1990:121). In Stilson's view (1990:119), the large number of lithic artifacts is associated with the Nisqually tribesman employed by PSAC. It is also feasible, however, that the material represents Native American occupation of the area prior to nonindigenous settlement. The site is considered eligible for NRHP inclusion and contributes to the proposed Nisqually-Sequalitchew Historic District. It was destroyed during construction of a bridge over Sequalitchew Creek.

45PI405 HBC/PSAC Dwelling Site

Located approximately 0.1 mile east of Lot Y, site 45PI405 was identified in 1988 on the south bank of Sequalitchew Creek during survey of the right-of-way for Center Drive (Welch 1989a:4.28). The site was also located at the junction of two DuPont Company access roads, and had been previously disturbed by DuPont Company development, including the Old Town complex and railroad, and cattle grazing. Similar to site 45PI401, this site also contains HBC/PSAC structural remains associated with 1843 Fort Nisqually as well as over 53,000 artifacts, including Native American lithics, which were recovered during data recovery investigations (Stilson 1991; Daugherty 1993c). The area investigated totaled 2,756 square feet. The lithic assemblage includes 52 tools/tool fragments and 89 pieces of debitage. Similar to the chipped stone found at 45PI401, the lithics may have been associated with the historic period or perhaps earlier.

Site 45PI405 is located just outside the west palisade wall of 1843 Fort Nisqually (45PI56). It is considered eligible for NRHP inclusion and contributes to the proposed Nisqually-Sequalitchew Historic District. Situated within and straddling Center Drive, the majority of the site was destroyed during construction of the roadway.

TRIBAL CONSULTATION

The inventory for the Permit involved correspondence with cultural representatives or Tribal Historic Preservation Officers (THPOs) for the Nisqually, Puyallup and Squaxin Tribes (see Appendix B). A phone call was received from Joe Kalama of the Nisqually Tribe expressing their desire to monitor the subsurface investigations. We contacted the Tribe again as the date for the fieldwork approached, and Kareem Gannie served as the project Native American monitor for survey and subsurface testing.

RESEARCH DESIGN

ARCHAEOLOGICAL EXPECTATIONS

Based on the literature review and history of this region, the project area has a high sensitivity for the presence of prehistoric and historic cultural resources. Similarly, the DAHP predictive model shows the area as "Very High Risk." The project area is within the traditional territory of the Nisqually Tribe along Sequalitchew Creek and relatively near the village at the mouth of the creek. Chipped stone tools have been found within Lot Y (45PI773) and in close proximity to the project (45PI401, 45PI405, 45PI576), and Native American burials within a 0.5-mile radius of Lot Y (Tables 2 and 3). The project is also within an area that was settled in the early 1880s during the HBC/PSAC era, an area used in 1904 by the 9th U.S. Cavalry bivouac and war games, the Old Town period of the DuPont Powder Works and its railroad network, and the early years of today's city of DuPont. A variety of historic period artifacts, features or deposits have been previously identified within Lot Y (45PI63, 45PI64, 45PI66, 45PI455) and in close proximity to the project (e.g., 45PI401, 45PI405), and historic period burials found within the 0.5-mile radius (Tables 2 and 3).

The project area has been extensively disturbed throughout the historic period, beginning by construction of the Methodist Episcopal Mission (45PI66) during the HBC/PSAC era and related removal of old growth trees, agricultural practices and cattle grazing, and by construction of the DuPont plant facilities and railroad network (45PI63, 45PI64). Extensive land disturbance during DuPont's Old Town period in the early 1900s resulted from logging, land leveling, the frequent construction and demolition of buildings, road and railway network construction, annual clearing and burning of underbrush, and relatively frequent explosions. Site 45PI64 was the location of a former black powder manufacture and storage building, and the site was also used as a dump where hazardous and non-hazardous waste from the DuPont Powder Works plants was discarded and burned. In addition, many of the production buildings were burned prior to release of the property to Weyerhaeuser after the DuPont Powder Works closed in 1976.

More recently, contaminated soil remediation activities resulted in extensive damage to the landscape within the project area and included complete removal of two of the archaeological sites (45PI63 and 45PI64) and partial removal of a third site (45PI455). Methods used during the remediation program included clearing and grubbing of vegetation subsequent to locating and flagging each hot spot (Daugherty and Condon 2000:7). The excavations generally achieved a depth of 46 cmbs (1.5 feet), and each initial excavation area around a hot spot measured at least 50x50 feet, since the area around removal of a designated hot spot was expanded by 25 feet in each cardinal direction. Figure 2 illustrates the extent of hot spot removal within Lot Y.

Based on existing archaeological data for this area, the types of archaeological materials that might be present in the general vicinity could potentially include the remains of artifacts (e.g., flaked stone tools, tool-making debris, ground stone tools, fire-affected rock), soil discoloration or shell that might indicate the presence of a cultural midden, fire pits, soil depressions, and features indicative of the former presence of structures or buildings (e.g., postholes, foundations) or historic debris (e.g., horse paraphernalia, railroad ties, concrete blocks, metal, glass, ceramics). Chipped stone tools, if present, may be related to either the prehistoric or ethnohistoric periods. Historic-period cultural resources, if present, would most likely be related to settlement in the early 1800s during the HBC/PSAC era, the 9th U.S. Cavalry bivouac and war games of 1904, the early years of the DuPont Powder Works (Old Town period), including construction of the narrow-gauge railroad, and the early years of today's city of DuPont.

Considering the gravelly nature of the Spanaway soils and the history of disturbance, it is expected that cultural material, if present, would be discovered above a depth of 25 to 30 cmbs (0.8-1 foot). As discussed above, sterile gravels have been encountered at shallow depths (25-30 cmbs) at archaeological sites in this vicinity, including 45PI66 and 45PI455 within the project area.

OBJECTIVES

As presented in the Permit, the goals of this investigation are to determine if any intact subsurface archaeological deposits from the prehistoric, ethnohistoric, or historic periods remain within the project area, to document them, to add important information to the sites determined eligible (45PI66 Methodist Episcopal Mission site) or considered potentially eligible (45PI455 9th U.S. Cavalry Bivouac site) for NRHP listing, and to assess the potential eligibility for listing on the NRHP of any newly discovered sites. More specifically, based on our knowledge of the prehistory, ethnography, and history of the project vicinity and the results of the prior local archaeological investigations, the following research questions guided the investigation:

1. Is there evidence for the exact location of the 1840–1842 Methodist Episcopal Mission building? Although extensive investigations have taken place within site 45PI66 and chimney stones were recovered, the opinion that the precise location of the Mission was identified is considered equivocal (compare Moura 1991a:8; Daugherty and Condon 2001:48). This site has been determined eligible for NRHP listing under Criterion A, and such evidence (i.e., postholes) would contribute additional important information about the location of the Mission building.

2. Is there additional evidence preserved of the 9th U.S. Cavalry 1904 encampment? Investigation extending outward from the backhoe peels completed in 1989 (Moura 1991a, 1991b) and the soil remediation program in 2000 (Daugherty and Condon 2000, 2001) within site 45PI455 may uncover further evidence of this brief occupation by the Buffalo Soldiers, such as privy holes or trash pits. Such evidence would contribute important information to the potential eligibility of this site for NRHP listing.

3. Is there evidence of an intact continuous chipped stone scatter along the northern side of Sequalitchew Creek that indicates Native Americans repeatedly occupied the area prior to Euro-American settlement during the historic period, and does the evidence indicate a firm link between previously recorded resources? Such evidence may connect the four pieces of debitage recorded as isolate 45PI773 and recovered from a series of discontinuous subsurface probes (Wessen et al. 2008) to the seven chipped stone artifacts recovered during the 1989 test excavations at site 45PI455, the 9th U.S. Cavalry Bivouac site (Moura 1991a, 1991b).

4. Is there additional evidence for HBC-PSAC activities outside of and not related to previously recorded site 45PI66? If undisturbed deposits or features from this mid-1800s period exist, the newly discovered sites may be eligible for listing on the NRHP, depending on the nature of the discovery (e.g., post holes, privy holes, wells, trash pits, burials, etc.).

5. Is there additional evidence for Old Town period activities outside of and not related to previously recorded site 45PI63 (Railroad Dump)? If undisturbed deposits or features from this early 1900s period exist, the newly discovered sites may be eligible for listing on the NRHP, depending on the nature of the discovery (e.g., trash pits, privy holes, wells, burials, etc.).

6. Is there additional evidence for DuPont period activities outside of and not related to previously recorded site 45PI64 (Burning Ground Dump)? If undisturbed deposits or features dating to this period from the 1920s to 1945 exist, the newly discovered sites may be eligible for listing on the NRHP, depending on the nature of the discovery (e.g., burials, trash pits, wells, privy holes, etc.).

FIELD METHODS AND PERSONNEL

All work by PCI for this investigation was conducted by professional archaeologists as defined under RCW 27.53.030(8) and who meet the Secretary of the Interior's Standards (National Park Service [NPS], 1983). PCI archaeologists Cindy Arrington, M.S., and Peter Morris completed the fieldwork, and Dr. Nancy Sikes served as the cultural resources Principal Investigator for the project. Kareem Gannie of the Nisqually Tribe served as the project Native American monitor for survey and subsurface testing.

Field methods approved for this project included intensive-level pedestrian survey followed by subsurface testing, and then monitoring of geotechnical subsurface exploration in the project area. These three phases of fieldwork were conducted by PCI archaeologists on the dates in February and March 2011 shown in Table 4. The methods employed for each field phase are presented separately below.

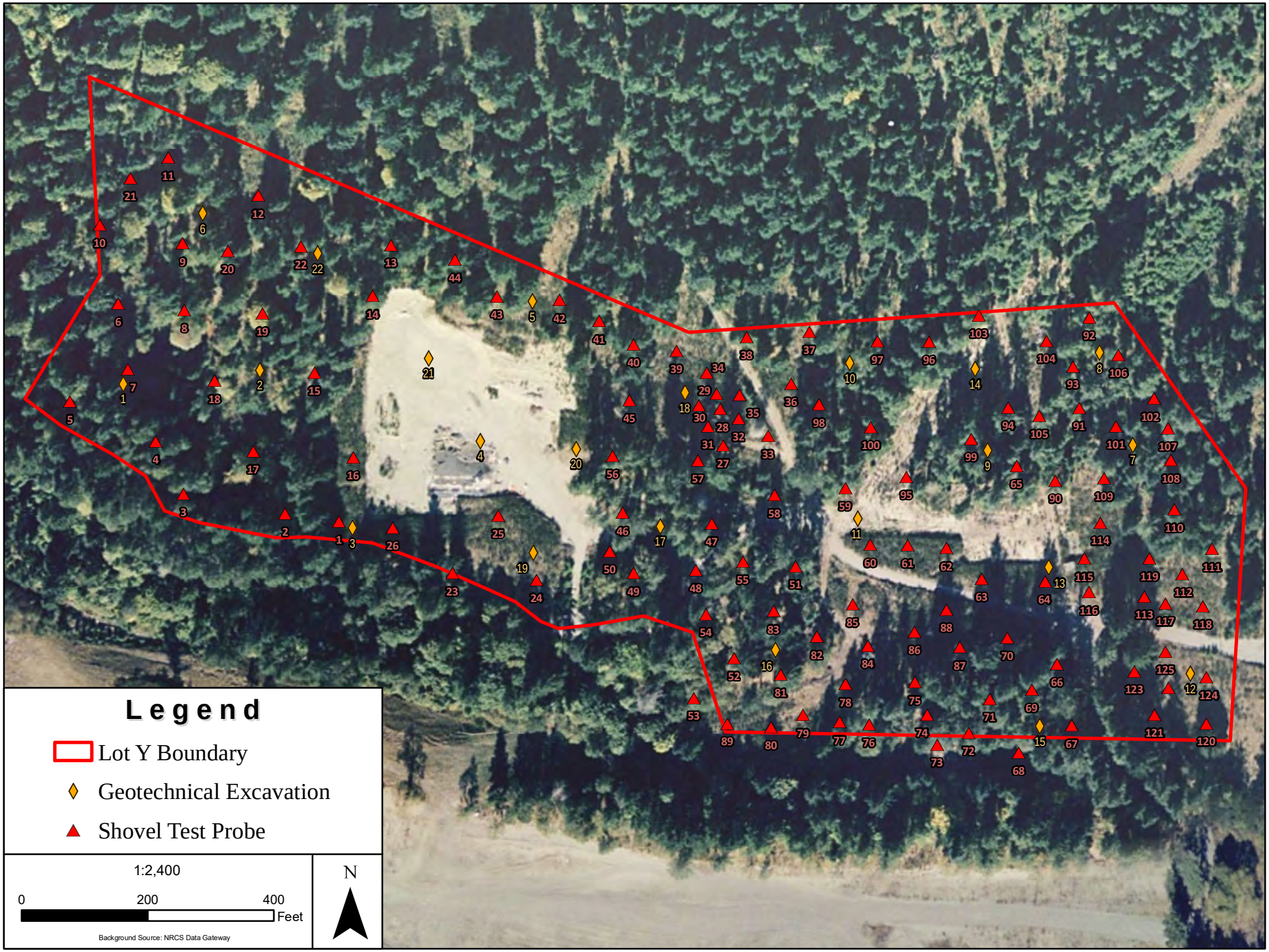
Table 4. Project Field Phase Dates and Personnel

Field Phase	Archaeologist (s)	Date of Fieldwork
Survey	Cindy Arrington and Peter Morris	February 17–18, 2011
Subsurface testing	Cindy Arrington	February 21-28 and March 1-2 2011
Monitoring of geotechnical subsurface exploration	Cindy Arrington	March 3-4, 2011

The pedestrian survey was conducted prior to any subsurface excavations to identify any previously unrecorded archaeological material from the prehistoric, ethnohistoric or historic periods that could potentially be present on the surface of the project area. The intensive-level pedestrian survey encompassed the entire 25.3-acre project area. Transect spacing within the project area was no greater than 15 meters apart and was accomplished on an east-to-west bearing. The 25.3-acres surveyed by PCI archaeologists comprise the maximum physical footprint of potential ground-disturbing activities associated with the proposed construction (Figure 1).

Following the pedestrian survey, a series of 125 shovel test probes (STPs) and 22 geotechnical excavations (GTEs) were excavated within the project area at random intervals as shown on Figure 3. At the request of the City of DuPont and DAHP, no STPs were placed in existing trails, pedestrian paths, or gravel roadways. Additionally, all STPs were backfilled and compacted daily. The STPs and GTEs were accomplished by mechanical excavation using a backhoe with a 2-foot bucket attachment and smooth plate. Dan Andreas of Miles Resources operated the mechanical equipment. PCI archaeologists remained at a safe distance from all mechanical equipment, while continuing to examine the sides of the trenches for cultural resources. All field personnel were aware of prior soil contamination within Lot Y (mainly lead and arsenic) and related remediation completed in 1999 and 2000, and observed standard safety protocols.

Each of the 125 STPs measured 3 feet in length and 2.5 feet in width. STP levels were dug in 7-cm (3-inch) increments or until sterile gravels were encountered. Soils taken from the STPs were screened through 1/8-inch hardware cloth. No STPs were placed in three hot spots (HS-3, HS-4 and HS-6, which include the former locations of 45PI63A, 45PI63B, and 45PI64) where the prior remediation efforts 11 years ago removed contaminated soils and where sterile gravel is now exposed throughout these portions of the project area, as clearly visible on the aerial photograph (compare Figures 2 and 3). Sterile gravel was encountered in 123 of 125 STPs between 35 and 130 cmbs (1.1-4.3 feet); mixed stratigraphy or fill was present in two STPs. Records for the individual STPs, detailing levels, soil texture, color, and comments, are located in Appendix C.



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Subsurface Testing Map

PARUS CONSULTING, INC.

Figure 3

Each of the 22 GTEs measured 3 feet wide by 5 feet long. GTE upper levels were dug in 3-inch (7-centimeter) increments or until sterile gravels were encountered, while lower levels, after encountering sterile gravels, were dug in1-foot increments. Four of the GTEs were excavated within the hot spot removal areas (Figures 2 and 3). Soils taken from the GTEs at 4 feet, 6 feet, and 10 feet were screened through 1/8-inch hardware cloth. Twenty GTEs were excavated to 305 cmbs (10 feet); one GTE with mixed stratigraphy was terminated at 250 cmbs (8.2 feet); one GTE filled with water at 244 cmbs (8 feet). Records for the individual GTEs, detailing levels, soil texture, color, and comments, are located in Appendix C.

All undeveloped ground surface areas within the current project limits were examined for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools, fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, fire pits, soil depressions, and features indicative of the former presence of structures or buildings (e.g., postholes, foundations), or historic debris (e.g., metal, glass, ceramics). Ground disturbances, including a graveled dirt road and dirt two-track, were visually inspected. Climatic conditions varied from sunshine during the first three days of fieldwork to inclement weather (rain, snow, sleet, or hail) during part or all of each succeeding day.

Photographs of the current project area, ground surface visibility, STPs, GTEs, and items of interest were taken with a digital camera. Soil color was recorded using a Munsell© Soil Color Chart. The surveyed acreage and location of the STPs and GTEs were recorded with a handheld Trimble® GeoXT global positioning system (GPS) unit. Field notes and photographs are on file at PCI.

Except for two brick fragments, one flat iron bar and one can, no portable artifacts were identified; no artifacts were collected. For all archaeological materials identified during the fieldwork, PCI archaeologists completed the appropriate Washington Archaeological Site Inventory and Isolate forms.

FIELD RESULTS

GENERAL DESCRIPTION AND SUMMARY

The northern, eastern and western sides of the project area are immediately bordered by dense conifer forest (Photograph 4). Elevation within Lot Y increases from 64 meters above mean sea level (msl) by approximately 1 to 3 meters from east to west, and from 61 to 68 meters above msl from south to north. Sequalitchew Creek is located approximately 50 feet outside the entire Lot Y southern boundary at the bottom of a steep embankment. At the time of the pedestrian survey, the creek had a generous water flow.

Photograph 4. Forest to north, east, and west of Lot Y (view to southwest)

The project area contains four cleared hot spots (HS) where the contaminated topsoil was removed during remediation efforts in 1999 and 2000 (Figure 2). HS-6 is a large semi-square clearing that lacks vegetation, and is currently used as a gravel pit. As shown on the figure, a narrow linear extension of HS-6 extends eastward to meet the western extent of HS-3 south of the recorded boundaries of site 45PI66. Vegetation is re-establishing within the HS-2, HS-3, and HS-4 remediation clearings, and includes mostly small conifers, scotch broom and grasses.

A paved walking trail maintained by the City of DuPont and situated outside the southern border of Lot Y parallels the northern side of Sequalitchew Creek. As shown on Figure 2, a dirt road transects a portion of the project area, running east to west, starting at a chain-link fence on the eastern boundary and ending at the eastern edge of HS-6. The road is approximately 1,067 feet long and has a thin gravel coating. An approximately 460-foot long area devoid of vegetation, the previous location of a narrow-gauge railroad track, leads northeast from HS-3 to HS-4. All railroad tracks were removed from the project area between 1995 and 2000 (personal communication, Fred Foreman).

A non-functional segment of a narrow-gauge railroad track bisects the eastern edge of the project area. There is also a concrete loading platform in the eastern portion of the project area. The platform is located approximately where the former sets of narrow gauge and standard gauge railroad tracks crossed each other as shown on the March 15, 1955 map of the DuPont Works drawn by E. Davies. To the south and immediately outside of the current project area is a set of concrete bridge abutments near Sequalitchew Creek. These are the remnants of a narrow-gauge railroad bridge shown on the 1955 map. The track segment, concrete platform, and set of bridge abutments were recorded as archaeological sites (see below).

As detailed below, except for two brick fragments located on the surface and at depth within the boundaries of 45PI66 (Methodist Episcopal Mission site), no evidence was found during this investigation within Lot Y of the previously recorded sites and isolate covered by the excavation permit.

Vegetation within the project area perimeter consists of open, second growth conifer forest dominated by Douglas fir, sword fern, and scotch broom, and includes red alder, elderberry, and grasses. Visibility on the ground in the majority of the project area is very poor, near zero percent, due to a dense coverage of grass, moss, and forest duff (Photograph 5). In the open ground areas in HS-6 and HS-3, visibility is good to excellent, ranging between 30 and 100 percent (Photograph 6).

Photograph 5. Visibility at 0% (view to northeast)

Photograph 6. Visibility at 30-100% (view to northeast)

SUBSURFACE TESTING RESULTS

The subsurface stratigraphy was consistent within 123 of the 125 STPs and all 22 GTEs excavated within the project area (Figure 3). The soil throughout the project area is consistent with the description for the Spanaway series developed on glacial outwash sediments (Soil Survey Staff 2009). There are three soil horizons, though horizon 2 is not present in all STPs or GTEs. The depth of the horizons varies across the Lot Y landscape in relation to the topography and prior human disturbance. Horizon 1 is a moist, very dark brown (10 YR 2/2) gravelly sandy loam with weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots with a very high organic matter content. Horizon 2 is a moist very fine crumb dark gray brown (10 YR 3/2) gravelly sandy loam with little distinction in texture from horizon 1. Horizon 3 is moist and fluctuates between a dark gray brown (2 YR 4/2) and an olive brown (2YR 4/4) gravelly sand with no soil matrix. The single grained, loose sand is the prominent content with some rounded to sub-rounded cobbles; it is also very compact.

Only two of the subsurface units (STPs 28 and 115) contained cultural material. A brick fragment, measuring 3x4x2 inches, was located at 20 cmbs (8 inches) in STP 28 within site 45PI66 (Methodist Episcopal Mission). The brick was not handmade and no maker's marks were located on the fragment. Additionally, a smaller brick fragment was located at ground level within inches of STP 35 (also within 45PI66). STP 115 is located 18.5 feet due east of a concrete platform and the soil is entirely mixed down to a level of 200 cmbs (6.6 feet). A flat iron bar with four bolts protruding was located at 160 cmbs (5.2 feet). The iron bar measured 24 inches long by 3 inches wide and 1/8th inch thick, and has four 3.5-inch metal bolts spaced roughly 7 to 8 inches apart (Photograph 7). The iron bar appears to be associated with the concrete platform, given its close proximity and the paint on the bolt heads matches the metal on the platform.

Photograph 7. Flat iron bar in STP 115 (plan view)

All but two of the 125 STPs (STP 89 and 115) were excavated until sterile gravel was encountered. Although the presence of the Spanaway series soil horizons was consistent, the depth of sterile gravel varied from 35 cmbs to 130 cmbs (1.1-4.3 feet) across the project area. STP 115 had mixed stratigraphy and was excavated to a depth of 200 cmbs (6.6 feet). The soil in STP 89 is a moist, brown (7.5 YR 4/4) silty loam until the typical underlying horizon appears at 110 cmbs (3.6 feet) as a moist, dark green brown (2.5 YR 4/4) gravelly sand. The typical upper horizon of gravelly sandy loam appears to have been removed near STP 89 and replaced with imported soil. The STP was placed 66 feet northeast of the set of bridge abutments. It seems likely that more stable soil was imported for the approach to the narrow-gauge bridge that once crossed Sequalitchew Creek.

Six of the STPs located in the eastern portion of the project (STPs 113, 116-119) near the gravel road each display a gray upper horizon not noted in any other portion of the project area (Photograph 8). The moist, dark gray (2.5 YR 3/1) soil is similar in structure to the typical horizon 1, but is noticeably different in color and is relatively thin (0-25 cm [0-9.8 inches]), and is likely related to prior disturbance.

STPs 120 through 125, located in the southeastern portion of the project area, all show evidence of a grass fire. Small flecks of charcoal are noted in the upper 5 cm of each unit. Of these six STPs, only STP 120—with a total depth of 95 cmbs (3.1 feet) and nearest the creek—contained horizon 2. The profiles in STPs 121 through 125 are restricted to horizon 1 (0-60 cmbs [0-23.6 inches]) and horizon 3 (60-80 cmbs [23.6-31.5 inches]).

With the exception of the brick fragment in STP 28 and the iron bar in STP 115, no cultural material was located in the series of 125 STPs excavated within the project area.

Photograph 8. Upper gray horizon in eastern STPs near gravel road (view to west)

GEOTECHNICAL SUBSURFACE EXPLORATION RESULTS

Of the 22 GTEs placed in the project area (Figure 3), all but two (GTEs 9 and 14) were taken to a depth of 305 cmbs (10 feet). The soils throughout the GTEs are relatively consistent with the Spanaway series (Photograph 9), although only five (GTEs 1, 3, 5, 12, 13, and 15) contain horizon 2.

In the eastern sector of the project area, GTE 9 has mixed stratigraphy and was excavated to a depth of 250 cmbs (8.2 feet). The upper horizon is a thin layer of sand (0-20 cmbs [0-8 inches]) followed by a mix of horizon 1 very dark brown (10 YR 2/2) gravelly sandy loam and sand with very few cobbles. It appears to be imported fill material. This unit is in close proximity to two of the hot spots (HS-3 and HS-4) cleared for soil contamination (compare Figures 2 and 3). In the northeastern sector, GTE 14 was terminated at 244 cmbs (8 feet) when water entered the unit and began to fill rapidly.

No cultural material was located in any of the 22 GTEs excavated within Lot Y.

Photograph 9. Sediments within GTE 16 (plan view)

PREVIOUSLY RECORDED RESOURCES WITHIN PROJECT AREA

The only evidence found during this investigation within Lot Y of the two previously recorded historic archaeological sites (45PI66 and 45PI455) and one prehistoric isolate (45PI773) was the two brick fragments located within the boundaries of 45PI66, the Methodist Episcopal Mission site. In addition, there was no evidence of the two archaeological sites (45PI63 and 45PI64) formerly located within Lot Y that were completely removed during hazardous materials remediation in 2000.

45PI66 Methodist Episcopal Mission Site

During this field investigation, eight STPs (STPs 28-35) were placed within the previously identified boundary of 45PI66. Two fragmented red brick pieces were located: one fragmented piece in STP 28 at 20 cmbs (8 inches) (Photograph 10) and one at ground level within inches of STP 35. The larger of the two brick fragments (3x4x2 inches in STP 28) was not handmade and had no maker's marks. No other cultural artifacts were identified within the site boundary.

Photograph 10. Brick fragment in STP 28 (plan view)

The soil within the STPs placed within the site boundaries is a shallow (0-25 cm [0-9.8 inch]) moist, very dark brown (10 YR 2/2) gravelly sandy loam with a weak fine granular structure; soft, very friable, nonsticky and nonplastic; with many fine roots and a very high organic matter content. Below the single soil horizon is a moist, dark gray brown (2.5 YR R 4/2) gravelly sand with no soil matrix. Within the single-grained, loose sand are some medium to large rounded to sub-rounded cobbles. This profile description is consistent with that described during the archaeological excavations conducted in 1989 within 45PI66 (Welch 1989a; Moura 1991a). Those excavations were stopped when sterile gravels were encountered at 25 cmbs (0.8 feet).

No evidence was discovered during this investigation of the exact location of the 1840–1842 Methodist Episcopal Mission building or of any undisturbed archaeological deposits or features related to the mission, the HBC/PSAC era, or any other archaeological period. The work further substantiates the opinion that site 45PI66 is not eligible under Criterion D (data potential). The Methodist Episcopal Mission site has, however, been determined eligible for NRHP listing under Criterion A for its association with significant events.

45PI455 9th U.S. Cavalry Bivouac Site

There was no surface evidence of site 45PI455 during this investigation and no cultural material or deposits within a series of 12 STPs (STPs 72-82 and 84) placed within or adjacent to the recorded site boundaries. The soil horizons within the STPs are consistent with the Spanaway series, with the lower gravelly sand horizon encountered between 35 and 70 cmbs (1.1-2.3 feet). During test excavations in 1989 when nearly 1,000 artifacts and animal bone fragments were collected, sterile gravels were encountered within 30 cmbs (1 foot) (Moura 1991a:9, 1991b:1).

No additional evidence of the 9th U.S. Cavalry 1904 encampment or of any undisturbed archaeological deposits or features was discovered during this investigation. Since 1998 when State Archaeologist Robert Whitlam indicated this site is potentially eligible for NRHP listing and recommended further work to define the boundaries of the Native American and Buffalo Soldier occupations, no further evidence of site 45PI455 was uncovered during the remediation program a decade ago (Daugherty and Condon 2000, 2001) or during the current endeavor. Site 45PI455 is thus not considered eligible for NRHP listing under Criterion D (data potential). The 9th U.S. Cavalry Bivouac site is, however, considered potentially eligible for NRHP inclusion as part of the proposed Nisqually-Sequalitchew Historic District.

45PI773 Prehistoric Chipped Stone Isolate

No cultural material was identified on the surface of 45PI773 or within three STPs (STPs 72, 77, 80) placed during this field investigation within or adjacent to the locations of the shovel test probes excavated in 2005 (Wessen et al. 2005, 2008). The soil horizons within the three STPs are consistent with the Spanaway series, with the lower gravelly sand horizon encountered between 22 and 70 cmbs (0.7-2.3 feet). The soil profile in the vicinity of where the four pieces of debitage were encountered in the series of discontinuous subsurface probes was described by Wessen et al. as having three strata (2008:30) with the lower gravelly sand horizon with cobbles at 50 cmbs (1.6 feet).

No evidence was discovered during this investigation of any undisturbed archaeological deposits or features, including no sign of an intact continuous chipped stone scatter along the northern side of Sequalitchew Creek that might have linked the four pieces of debitage recorded as isolate 45PI773 to the seven chipped stone artifacts recovered during the 1989 test excavations at nearby 45PI455 (9th U.S. Cavalry Bivouac site). PCI agrees with the prior recommendation that isolate 45PI773 is ineligible for NRHP listing.

NEWLY IDENTIFIED RESOURCES WITHIN PROJECT AREA

Four historic period resources were newly identified during the pedestrian survey: three archaeological sites and one isolate (Figure 2). The three sites include a segment of a previously identified narrow-gauge railroad track and grade (45PI01224), a railroad concrete loading platform (45PI01225), and a set of railroad bridge abutments (45PI01226). The isolate (45PI00064) is one galvanized kerosene can. A brief description of the newly identified historic period resources is presented below. Detailed information can be found in the State of Washington Archaeological Site Inventory and Isolate Forms, attached as Appendix D.

No prehistoric or ethnohistoric period resources were newly identified during pedestrian survey of the surface or within the subsurface excavations.

45PI01224 Narrow Gauge Railroad Track

This site was originally recorded by Arrington during survey in 2010 of the 12.8-acre property (known as Lot X) adjacent to the eastern edge of Lot Y (Sikes and Arrington 2010). It is a non-functional segment of a narrow-gauge railroad track situated on an earthen berm; it extends into both Lots X and Y beneath a chain-link fence marking the property boundaries. The track and berm bisect the eastern edge of the Lot Y project area (Figure 2; Photograph 11). The earthen berm is approximately 20 inches high and 20 feet wide. The narrow gauge track extends 207 feet west from the eastern project area boundary. The site is covered with forest duff, lichen, and scotch broom. The narrow-gauge track and berm continue east into Lot X beneath the chain-link fence for approximately 98 feet.

The short abandoned track and berm segment are attributed to construction by the DuPont Powder Works; the narrow-gauge railroad was used to transport their products during the Old Town period (1906-1920s). This site is recommended ineligible for listing on the NRHP or WHR. The segment is in poor condition with no evidence of associated artifacts or cultural deposits and has no potential to yield additional information. The eastern end of the spur was truncated presumably after DuPont Powder Works closed in 1976.

Photograph 11. 45PI01224 segment of narrow-gauge track (view to east)

45PI01225 Concrete Loading Platform

A concrete loading platform is located approximately where the standard-gauge and one of the narrow-gauge tracks previously crossed near the eastern edge of Lot Y. The platform is visible on satellite imagery, but was previously unrecorded. During the functional period of the platform, it likely was used

for loading or unloading materials onto DuPont Powder Works trains that would have moved east to west and north to south past the platform.

The platform is primarily concrete, with a steel railing as a perimeter of the upper platform surface. The platform is 192 inches square and 77 inches tall. The surface perimeter has a 3-inch concrete lip with occasional breaks to permit loading access. There is an arrangement of 2-inch by 6-inch wood boards bolted to the interior surface of the concrete lip, with a steel railing situated along the perimeter lip of the platform (Photograph 12). The railing is painted yellow and is 39.5 inches tall, with a lower bar and upper bar. The lower bar is 19.5 inches high, and the upper bar is 39 inches high. There are openings in the rail with steel chains stretched across on the south and east sides of the platform; one opening is 55 inches wide, and the other is 51 inches wide.

On the north side of the platform there is a 30-inch wide opening that appears to be a person-access stepping platform, with vertical handrails and a swinging safety bar (non-operational). On the east of the platform is a small debris pile consisting of heavy-gauge sheet metal, milled lumber, crushed pipe (1.5-inch diameter), and steel railing segment with chain. The platform is built with well sorted aggregate, form poured concrete. It does not appear on the very detailed 1955 map drawn by E. Davies. Locals recall the platform was not built until the early 1960s and then it was seldom used (personal communication, Fred Foreman). This site has no potential to yield additional information and is recommended ineligible for listing on the NRHP or WHR.

Photograph 12. Concrete loading platform (view to east)

45PI01226 Railroad Bridge Abutments

This site is comprised of the remnants of a narrow-gauge railroad bridge that traversed Sequalitchew Creek from north to south. This bridge crossing is shown on the 1955 map drawn by E. Davies. The remains include two concrete abutments that have a 165-inch horizontal separation (Photograph 13). Both abutments have a poured-form aggregate concrete construction, with a smooth finished top. The lower abutment is 150 inches long, 32 inches high from the ground, and 12 inches wide at the top. The upper abutment is 128 inches long, 51 inches high from the ground, with the base at 20 inches wide, and the top of the abutment 12.5 inches wide. The abutments are covered with moss and are surrounded by decomposing forest duff and vegetation, including ferns, conifers, deciduous trees, and grasses.

The set of abutments is immediately outside of the Lot Y project area, and 35 feet north of Sequalitchew Creek (Figure 2). There are two pieces of milled lumber located between the abutments; they are each 6 by 6 inches, but vary in length. One piece is 45 inches long, and the other is 60 inches long. The longer

piece is intact, and has a 5-inch by 8.5-inch metal cleat with spikes on one side (Photograph 14). An identical set of concrete abutments is visible on the south side of the creek outside the project area.

This bridge was the only narrow-gauge railroad bridge within the DuPont Powder Works to cross Sequalitchew Creek, and is shown on the 1955 map drawn by E. Davies. It was used for transport of material by train from the plant to the burning ground (later recorded as 45PI64) and then proceeding further north to the storage area (personal communication, Fred Foreman and Johanna Jones). The bridge was removed in the late 1990s. The remaining set of abutments has no potential to yield additional information and is recommended ineligible for listing on the NRHP or WHR.

Photograph 13. Bridge abutment (view to north)

Photograph 14. Wood debris showing cleat (plan view)

45PI00064 Parus Isolate #1 Kerosene Can

A galvanized kerosene can was located near the edge of the northwest corner of the area known locally as the "gravel pit" (HS-6 on Figure 2) and formerly the burning ground (45PI64). The sides of the can are dented and it exhibits some oxidation. It is missing the pour spout and wire handle, but is mostly intact (Photograph 15). The top is domed and ribbed, and the base diameter is 11 inches, with a height of 14 inches. The dimensions suggest the volume of this can was approximately 5 gallons. Considering the lengthy range of manufacture, the age of the can is undeterminable.

Photograph 15. Kerosene can (plan view)

PROJECT CONCLUSIONS, FINDINGS AND RECOMMENDATIONS

No evidence was found during this investigation within Lot Y of 45PI66 (Methodist Episcopal Mission site), 45PI455 (9th U.S. Cavalry Bivouac site) or 45PI773 (chipped stone isolate), except for two brick fragments located on the surface and at depth within the boundaries of 45PI66. Nor was there any surface or subsurface evidence of the two archaeological sites (45PI63 and 45PI64) formerly located within Lot Y that were completely removed a decade ago during hazardous materials remediation.

No historic properties will be affected by implementation of the Lot Y project. Although the Methodist Episcopal Mission site has been determined eligible for NRHP listing under Criterion A for its association with significant events and also contributes to the proposed Nisqually-Sequalitchew Historic District, site 45PI66 is not eligible under Criterion D (data potential). Similarly, although the location of the brief occupation by the 9th U.S. Cavalry Buffalo Soldiers is potentially eligible for NRHP inclusion as a contributing element of the proposed Nisqually-Sequalitchew Historic District under Criterion A, site 45PI455 is not considered eligible for NRHP listing under Criterion D. Isolate 45PI773 is considered ineligible for NRHP listing.

The two newly identified sites within Lot Y, 45PI1224 (railroad track segment) and 45PI01225 (concrete platform), and are recommended ineligible for listing on the NRHP or WHR. The kerosene can isolate (45PI00064) is considered ineligible for listing. The third newly identified site, 45PI01226 (bridge abutments; also recommended ineligible for listing on the NRHP or WHR), is located immediately outside the Lot Y project area.

Considering the results of the literature search, local ethnographic settlement and subsistence patterns, the prehistory and history of the vicinity, and DAHP's predictive model, the project area is considered highly sensitive for prehistoric, ethnohistoric, and historic-era cultural resources. On the other hand, Lot Y has been extensively disturbed beginning with historic period settlement in the early 1880s, then operation of the DuPont Powder Works in the early to mid-1900s (including use of part of Lot Y as a burning ground dump from the 1930s until 1945), followed by subsurface archaeological investigations and related artifact collection between 1989 and 2005 and by environmental remediation activities in 1999 and 2000. Based on the lack of cultural deposits in the gravelly sandy loam and gravelly sand subsurface sediments exposed in the series of 125 STPs and 22 GTEs excavated to depths between 35 and 305 cmbs (1.1-10

feet), the potential for discovery of buried archaeological materials, features or deposits by implementation of this project is considered low. Therefore, no further cultural resource action is warranted.

There is always the potential for the existence of buried archaeological materials within the project area, mostly likely restricted to shallow depths above the outwash gravels, and an Unanticipated Cultural Resources Discovery Plan has been prepared for the project and is attached to this report as Appendix E. Pursuant to the Discovery Plan, should cultural resources be encountered during construction or ground-disturbing activities connected with this project, work in the area must be halted and a professional archaeologist, who meets the definition under RCW 27.53.030(8), should be notified immediately to evaluate the resource(s) encountered. Should human skeletal remains be encountered, all activity in the area must halt, the remains protected from further disturbance, and the county coroner and local law enforcement notified immediately (RCW 27.44, 68.50, 68.60).

Resources within this area that might be encountered might include prehistoric and ethnohistoric materials such as flaked stone tools, tool-making debris, stone milling tools, fire-affected rock, basketry, culturally modified animal bone, fishing implements or soil darkened by cultural activities (midden). Historic materials might include remnants of railroad or roadway construction activities or other industry or commerce (e.g., railroad ties, concrete blocks, machinery parts), building remains, metal, glass, cans, ceramic artifacts, or other debris older than 50 years.

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APPENDIX A:
Archaeological Excavation Permit No. 2010-54

STATE OF WASHINGTON
DEPARTMENT OF ARCHAEOLOGY AND HISTORIC PRESERVATION
1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501
Mailing address: PO Box 48343 • Olympia, Washington 98504-8343
(360) 586-3065 • Fax Number (360) 586-3067 • Website: www.dahp.wa.gov

February 7, 2011

Ms. Lia Estigoy
DuPont Industrial Partners, LLC
1201 Pacific Avenue, Suite 1501
Tacoma, WA 98402

Nancy E. Sikes and Cindy Arrington
GeoEngineers, Inc.
1101 S. Fawcett Avenue, Suite 200
Tacoma, WA 98402

Dear Ms. Estigoy, Ms. Sikes and Ms. Arrington:

I have reviewed the application you submitted for archaeological excavations at 45PI00066. It is my intention to grant the permit application for excavations at 45PI00066. Please take note of the Special Conditions on the permit.

If you feel aggrieved by this decision you may request an administrative hearing within twenty-one days after receipt of this notice. Your request should be sent to the address listed below.

Director
Department of Archaeology and Historic Preservation
PO Box 48343
Olympia, WA 98504-8343

Sincerely,

Stephenie Kramer
Assistant State Archaeologist
(360) 586-3083
Email: stephenie.kramer@dahp.wa.gov

Enclosure

STATE OF WASHINGTON

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501
Mailing address: PO Box 48343 • Olympia, Washington 98504-8343

ARCHAEOLOGICAL EXCAVATION PERMIT
NO: 2010-54

Archaeological sites:	45PI66, 45PI455 and 45PI773, Lot Y
Individual Responsible for carrying out the terms and conditions of the permit:	Lia Estigoy Property Owner
Individual responsible for field investigations:	Nancy Sikes & Cindy Arrington GeoEngineers, Inc.
Nature of work:	Sub-surface survey and geotechnical pits, archaeological testing
Repository in which collected records and data shall be deposited:	Nisqually Tribe & DuPont Historical Museum; cc DAHP on transfer
Date fieldwork to begin:	**Upon receipt; but notify DAHP and Tribes via email before starting**
Date fieldwork shall end:	April 31, 2011
Period of analysis:	Concurrent through May 31, 2011
Date final report due:	May 31, 2011 Per WAC 25-48-041, if the report is late, a Notice of Violation will be issued & a $5000 penalty assessed

Special Conditions:

- Follow protocols stated in permit application of 12/2/10 and email of 2/7/11
- Notify DAHP and Tribes if intact archaeological deposits are observed
- Switch to hand excavation for intact deposits
- Restore trails if units are needed in trail areas
- Be aware of City of DuPont's comments regarding arsenic
- Provide copy of report to DAHP & affected Tribes
- Report must meet DAHP's Survey and Inventory Standards
- Append catalog & BetaAnalytic sheets to report, reference permit number
- If human remains are encountered, stop work, secure the area, notify the county coroner, sheriff, DAHP, & affected Tribes per RCW 27.44.055

Issued this 7th day of February 2011.

Stephenie Kramer
Assistant State Archaeologist

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION
Protect the Past, Shape the Future

APPENDIX B:
Correspondence with Local Tribes

Native American Tracking Sheet
DuPont Industrial Partners, LLC
DuPont, WA – Lot Y

GeoEngineers Project No. 16785-003-00

Contact Name	Date Letter Sent Via Email	Comments/Concerns Recommendation
Puyallup Tribe 3009 East Portland Avenue Tacoma, Washington 98404 Judy Wright, THPO Cultural Resources 253-573-7897 Judy.Wright@puyalluptribe.com	**11-8-2010**	No response
Nisqually Tribe 4820 She-Nah-num Drive SE Olympia, Washington 98513 360-456-5221 phone Thor Hoyte, Cultural Resources Hoyte.thor@nisqually-nsn.gov	**11-8-2010**

GeoEngineers
1101 S Fawcett, Suite 200
Tacoma, Washington 98402
253.383.4940

November 8, 2010

Puyallup Tribe
3009 East Portland Avenue
Tacoma, Washington 98404

Attention: Judy Wright, THPO Cultural Resources

Sent via email: Judy.Wright@puyalluptribe.com

Subject: Cultural Resources Assessment for the DuPont Industrial Partners, LLC, Lot Y DuPont Washington

Dear Ms. Wright:

I am writing to inform you of a cultural resources assessment that is planned for the above-referenced project. GeoEngineers is conducting this assessment at the request of the DuPont Industrial Partners, LLC. The project is located northwest of the town of DuPont near the intersection of Center Drive and Powerline Road in the City of DuPont, Washington (Township 19N, Range 01E, Section 26 on the Nisqually 7.5 quadrangle, Willamette Meridian). The project will consist of an intensive pedestrian survey and subsurface testing in the form of auger units for a total of approximately 26- acres (Figure 1).

Archaeologists have previously recorded and investigated four sites on Lot Y: 45PI63, the Railroad Dump #3 Site; 45PI66, the Methodist Episcopal Mission Site; 45PI455, the 9th Cavalry BivouacSite; and 45PI773, a small lithic scatter. Additionally, Site, 45PI64 The Burning Ground Dump Site, had been recorded in 1977 and additional work done in 2000. The entire site (approximately 3,000 square feet) was removed during a hot spot or contaminated soils treatment program for hazardous substances in 2001. In 1993, the SHPO determined the site ineligible for NRHP listing.

An Application for an Archaeological Excavation Permit is being completed pursuant to permit requirements found in the Washington Administrative Code [WAC] 25-48-060. There is no federal involvement in this project. The work for the proposed project will be conducted under prevailing Washington state laws, which serve to protect from known disturbance of archaeological sites and Native American graves on both public and private lands. These laws include Executive Order 05-05, Indian Graves and Records (Revised Code of Washington [RCW] 27.44), Archaeological Sites and Resources (RCW 27.53), Archaeological Excavation and Removal Permit (WAC 25-48), and Discovery of Human Remains (RCW 27.44).

GeoEngineers is in the process of reviewing available background information. Background research will include a site files search at the Washington State Department of Archaeology and Historic Preservation, review of previously recorded cultural resource sites, reports, and review pertinent published literature and ethnographies. Results of our investigation will be presented in a technical report.

We are aware that all information regarding cultural resources is within published sources. Should the Tribe have additional information concerning cultural resources, we would like to include it in our study. Please contact me should you wish to provide any comments or additional information. I appreciate your assistance in this matter and look forward to hearing from you. If I can answer any questions you may have, please do not hesitate to contact me at Carrington@geoengineers.com or at 916-765-9381.

Best Regards,

Cindy Arrington
Cultural Resource Specialist

Attachment:
Figure 1

GeoEngineers
1101 S Fawcett, Suite 200
Tacoma, Washington 98402
253.383.4940

November 8, 2010

Nisqually Tribe
4820 She-Nah-num Drive SE
Olympia, Washington 98513

Attention: Thor Hoyte, Cultural Resources

Sent via email: Hoyte.thor@nisqually-nsn.gov

Subject: Cultural Resources Assessment for the DuPont Industrial Partners, LLC, Lot Y DuPont Washington

Dear Mr. Hoyte:

I am writing to inform you of a cultural resources assessment that is planned for the above-referenced project. GeoEngineers is conducting this assessment at the request of the DuPont Industrial Partners, LLC. The project is located northwest of the town of DuPont near the intersection of Center Drive and Powerline Road in the City of DuPont, Washington (Township 19N, Range 01E, Section 26 on the Nisqually 7.5 quadrangle, Willamette Meridian). The project will consist of an intensive pedestrian survey and subsurface testing in the form of auger units for a total of approximately 26- acres (Figure 1).

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Best Regards,

Cindy Arrington
Cultural Resource Specialist

Attachment:
Figure 1

GeoEngineers
1101 S Fawcett, Suite 200
Tacoma, Washington 98402
253.383.4940

November 8, 2010

Squaxin Tribe
SE 70 Squaxin Lane
Shelton, Washington 98584

Attention: Rhonda Foster, THPO Cultural Resources

Sent via email: rfoster@squaxin.nsn.us

Subject: Cultural Resources Assessment for the DuPont Industrial Partners, LLC, Lot Y DuPont Washington

Dear Ms. Foster:

I am writing to inform you of a cultural resources assessment that is planned for the above-referenced project. GeoEngineers is conducting this assessment at the request of the DuPont Industrial Partners, LLC. The project is located northwest of the town of DuPont near the intersection of Center Drive and Powerline Road in the City of DuPont, Washington (Township 19N, Range 01E, Section 26 on the Nisqually 7.5 quadrangle, Willamette Meridian). The project will consist of an intensive pedestrian survey and subsurface testing in the form of auger units for a total of approximately 26- acres (Figure 1).

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Best Regards,

Cindy Arrington
Cultural Resource Specialist

Attachment:
Figure 1

Lot Y

T19N, R 1E, Section 26
USGS 7.5' Topographic Map Series, Nisqually (1981) Quad.

N
W E
S

1:24,000

2,000 0 2,000
Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
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Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Location of Lot Y

DuPont Industrial Partners, LLC
Dupont, Washington

GeoEngineers

Figure 1

Office: Tacoma Path: W:\Tacoma\Projects\16\16785003\GIS\16785003_F1_LocationMap.mxd Map Revised: November 8, 2010 CRC

From: Cindy J. Arrington
To: kalama.joe@nisqually-nsn.gov
Subject: RE: Requested information
Date: Friday, November 19, 2010 7:55:00 AM

Good Morning Joe:

I have an upcoming project in DuPont and which requires a Washington Archaeological Excavation permit. It is my clients intention to donate to the Nisqually Tribe ("Tribe") and/or DuPont Historical Museum ("Museum") any archaeological materials collected during the subsurface archaeological excavations planned on their private land ("Lot Y") in the City of DuPont, Pierce County, Washington. The project comprises approximately 26 acres, the property is located west of Center Drive and north of Sequalitchew Creek. It is situated in Section 26 of Township 19 North Range 1 East, on the 1981 Nisqually 7.5-minute USGS topographic map (Willamette Meridian).

Permission for excavation and related removal of archaeological material from Lot Y is being requested in an Archaeological Excavation Permit filed with the Department of Archaeology and Historic Preservation (DAHP) pursuant to permit requirements found in the Washington Administrative Code 25-48-060. As part of that permit, I need to secure curation letters from those individuals we seek to donate the artifacts to, should any artifacts be located/identified. Please note that subsurface testing will not begin until February 2011.

It is our intention that archaeological materials associated with the prehistoric or ethnohistoric periods will be donated to the Tribe for curation, and that historic period archaeological materials will be donated to the Museum for curation. A catalog and copies of records, data, photographs, and other documents derived from the excavation process will accompany any collection donated to either the Tribe or Museum.

If you could please contact me at your earliest convenience so that we may discuss the project.

Cindy J. Arrington, M.S., RPA
Associate
Cultural Resource Specialist

GeoEngineers
t: 916.444.5825
f: 916.441.2532
c 916.765.9381
e: carrington@geoengineers.com

3301 C Street, Suite 200 A
Sacramento, California 95816
www.geoengineers.com

From: Thor Hoyte [mailto:hoyte.thor@nisqually-nsn.gov]
Sent: Wednesday, November 17, 2010 1:59 PM
To: Cindy J. Arrington
Cc: kalama.joe@nisqually-nsn.gov
Subject: Re: Requested information

Sorry. Please contact Joe Kalama, who is on this email.

On Nov 16, 2010, at 12:24 PM, "Cindy J. Arrington" <carrington@geoengineers.com>

wrote:

> Good Afternoon Mr. Hoyte: On November 5, I sent an email requesting your assistance with a project in DuPont, WA. I have not received a reply and have been unable to reach you by phone. If you could contact me at your earliest convenience.
>
> Best regards,

Cindy J. Arrington, M.S., RPA
Associate
Cultural Resource Specialist

GeoEngineers
t: 916.444.5825
f: 916.441.2532
c 916.765.9381
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Confidentiality: This message is confidential and intended solely for use of the individual or entity to whom it is addressed. If you are not the person for whom this message is intended, please delete it and notify me immediately, and please do not copy or send this message to anyone else.

APPENDIX C:
Detailed Subsurface Excavation Records

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 1- 5	2/21/2011	0-17	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		18-60	None	Moist/VFC/SL/DGB	10 YR 3/2	Little distinction between this layer and the previous one, expect for color.
		60-78	None	Moist/VFC/SL/DYB	10 YR 3/4	Small charcoal flecks, not in situ. Rounded to sub-rounded cobbles, increasing in density. Cobbles 60% of matrix
		78-85	None	Moist/VFC/SL/DYB	10 YR 4/4	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact. Some large cobbles measuring over 18cm in width.
STP 6-9	2/21/2011	0-20	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		20-49	None	Moist/VFC/SL/DGB	10 YR 3/2	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		49-77		Moist/VFC/SL/DYB	10 YR 3/4	Small charcoal flecks, not in situ. Rounded to sub-rounded cobbles, increasing in density. Cobbles 60% of matrix
		77-90	None	Moist/GS/DYB	10 YR 4/4	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, SC = Silty clay, GS = Gravelly Sand, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 10 - 12	2/21/2011	0-18	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		20-90	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		90-110	None	Moist/GS/DGB	2.5Y 4/2	Rounded to sub-rounded cobbles, very compact and increased density.
STP 13 - 16	2/21/2011	0-40	None	Moist/SL/VDB	10 YR 2/3	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-60	None	Moist/SL/DGB	10 YR 3/2	Very high in organic matter content, has mellow, sooty feel; gravelly sandy loam with larger cobbles appearing around 45-49cmbs than decreasing by 60cmbs.
		60-85	None	Moist/GS/OB	2.5 Y 5/3	Gravelly sand with no soil matrix. More sand; single grained; loose, than cobbles. Cobbles are rounded to sub-rounded and low density.
STP 17 - 19	2/22/2011	0-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		70-90	None	Moist/GS/DYB	10 YR 4/6	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y Recorder: C. Arrington

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 20-22	2/22/2011	0-45	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		45-80	None	Moist/GS/DYB	10 YR 4/6	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact.
STP 23-27	2/22/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		60-80	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact.
***STP 27-36**	2/22/2011	0-25	Yes	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		25-50	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with few rounded to sub-rounded cobbles.
STP 37-44	2/23/2011	0-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		70-90	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 45	2/23/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-50	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

***Note:** STPs 28-35 were placed within the recorded location of Site 45PI66 (Methodist Episcopal Mission). One piece of fragmented red brick was located at 20cmbs in STP 28. A second red brick fragment was located at ground surface in STP 35.

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 46-51	2/25/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		60-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 52-52	2/25/2011	0-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		70-80	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 54	2/25/2011	0-25	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		25-35	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 55-57	2/25/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		40-60	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 58	2/25/2011	0-110	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		110-120	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington** **Date:** August 26, 2010

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 59-60	2/25/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		40-60	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 61	2/25/2011	0-35	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		35-55	None	Moist/GS/DYB	10 YR 4/6	Gravelly sand with no soil matrix. Rounded to sub-rounded cobbles, very compact.
		55-110	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		110-130	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 62	2/25/2011	0-40	None	Moist/VFC/SL/DGB	10 YR 3/2	This layer is typically seen in the second horizon, with the darker (10 YR 2/2) high in organic matter overlying it. No signs of mixing in the stratigraphy.
		40-120	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		120-130	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 63-65	2/25/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #		Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 66-70	2/26/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 71-72	2/26/2011	0-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		70-90	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 73-75	2/26/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 76	2/26/2011	0-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		70-90	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #		Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 77	2/26/2011	0-22	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		22-60	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		60-75	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 78-80	2/26/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-65	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 81-83	2/26/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 84-85	2/26/2011	0-35	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		35-45	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 86-88	2/26/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		60-80	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 89	2/26/2011	0-110	None	Moist/SL/VFC/B	7.5 Yr 4/4	Weak fine granular structure; soft, very friable, nonsticky and nonplastic, sooty feel, no cobbles or pebbles. This layer appears to be imported soil. The stratigraphy is uninterrupted until you reach 110 cmbs, where the typical underlying horizon appears. The typical upper horizon; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam appears to have been removed and imported soil placed. This STP was placed near the (66 feet) bridge abutment and could be that more stable soil was imported for the approach to the narrow-gauge bridge.
		110-130	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 90	2/28/2011	0-15	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		15-40	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		40-50	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 91	2/28/2011	0-7	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		7-25	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 92-95	2/28/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 96	2/28/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-50	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		50-60	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 97-98	2/28/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-70	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 99	2/28/2011	0-10	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		10-30	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 100-101	2/28/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		60-75	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 102	2/28/2011	0-45	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		45-60	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		60-75	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 103	3/1/2011	0-20	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		20-30	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 104	3/1/2011	0-5	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		5-20	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 105	3/1/2011	0-30	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		30-45	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		45-60	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 106	3/1/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		60-70	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		70-80	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 107-110	3/1/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-65	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 111	3/1/2011	0-65	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		65-80	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		80-90	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 112	3/1/2011	0-30	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		30-45	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 113	3/1/2011	0-25	None	Moist/GS/DG	2.5 Y 3.1	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		25-70	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		70-85	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 114	3/1/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		60-75	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		75-85	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
STP 115	3/1/2011	0-200	Yes	Moist/GS/DG	2.5 Y 3.1	This unit is completely mixed (photo taken #58) the matrix resembles horizon 1 with Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam however, there is no stratigraphic distinction between 0-200 cmbs. A metal artifact was located at 160 cmbs. The artifact is a flat metal bar with 4-bolts protruding from one side.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, DG = Dark Gray

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 116	3/2/2011	0-25	None	Moist/GS/DG	2.5 Y 3.1	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		25-55	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		55-75	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 117-119	3/2/2011	0-10	None	Moist/GS/DG	2.5 Y 3.1	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		10-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-65	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
STP 120		0-20	None	Moist/VFC/SL/DYB	10 YR 3/4	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam. Medium to small cobbles rounded and subrounded. Small flecks of charcoal, indicative of a grass fire in the area.
		20-80	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		80-95	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
STP 121-125	3/2/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam. Small flecks of charcoal, indicative of a grass fire in the area.
		60-80	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.
GTE 1	3/3/2011	0-30	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		30-60	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		60-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 2	3/3/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-305	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
GTE 3	3/3/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-80	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		80-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 4	3/3/2011	0-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 5	3/3/2011	0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-50	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		50-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 6	3/3/2011	0-60	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		60-305	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

Subsurface Testing Record

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Project: DuPont Industrial Partners, LLC, Lot Y Recorder: C. Arrington

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
GTE 7	3/3/2011	0-55	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		55-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 8	3/3/2011	0-90	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		90-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 9	3/3/2011	0-250	None	Moist/SL/VDB		This unit is completely mixed. There is a small (20cmbs) layer of sand on the surface and the rest is a mix between horizon 1 (10 YR 2/2) and sand. Very little cobbles. It appears to be fill material. This unit is in close proximity to a hot spot cleared for soil contamination.
GTE 10	3/3/2011	0-50	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; very high in organic matter content, has mellow, sooty feel, gravelly sandy loam
		50-305	None	Moist/GS/OB	2.5Y 4/4	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
GTE 11	3/3/2011	0-5	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		5-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 12-13	3/4/2011	0-65	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		65-75	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		75-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 14	3/4/2011	0-5	None	Moist/VFC/SL/DYB	10 YR 3/4	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam. Small to medium cobble and become increasingly more compact.
		5-244	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles. Water hit at 244cmbs.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
GTE 15	3/4/2011	0-65	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		65-80	None	Moist/VFC/SL/DYB	10 YR 3/4	Little distinction between this layer and the previous one, expect for color. Medium to large cobbles start in this layer and become increasingly more compact.
		80-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 16-17	3/4/2011	0-65	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		65-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 18-19	3/4/2011	0-45	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		45-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles. Water hit at 244cmbs.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Recorder: C. Arrington**

Unit #	Date	Level cmbs	Cultural Materials	Soil Type	Munsell	Comments
GTE 20	3/4/2011	0-3	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		3-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 21	3/4/2011	0-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles
GTE 22		0-40	None	Moist/SL/VDB	10 YR 2/2	Weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and some large (1/4 inch) roots; very high in organic matter content, has mellow, sooty feel; gravelly sandy loam
		40-305	None	Moist/GS/DGB	2.5Y 4/2	Gravelly sand with no soil matrix. The sand, single grained and loose is the prominent content with some rounded to sub-rounded cobbles.

KEY: FC = Fine crumb, VFC = Very fine crumb, SL = Sandy loam, B = Brown, DB = Dark brown, DGB = Dark gray brown
SPI = Small pebble inclusion, YB = Yellow brown, GS = Gravelly Sand, OB = Olive brown, DYB = Dark yellow brown, GTE = Geotechnical Excavation

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Soils Photograph** **Recorder: C. Arrington**

Photograph 52. Showing horizon 1 (10 YR 2/2)

Photograph 53. Showing horizon 2 (10 YR 3/4)

Subsurface Testing Record

Project: DuPont Industrial Partners, LLC, Lot Y **Soils Photograph** **Recorder: C. Arrington**

Photograph 44. Showing horizon 3 (2.5Y 4/4)

Photograph 61. Showing gray horizon (2.5 Y 3.1)
Upper most layer in photograph

APPENDIX D:
Site and Isolate Record Forms

STATE OF WASHINGTON
ARCHAEOLOGICAL SITE INVENTORY FORM

Smithsonian Number: **PI01224**

***County:** Pierce

***Date:** 7-19-2011 ***Compiler:** C. Arrington

Location Information Restrictions *(Yes/No/Unknown)***:** No

SITE DESIGNATION

Site Name: Narrow gauge railroad and berm

Field/ Temporary ID: GEO-RR10 (**Update**)

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

SITE LOCATION

***USGS Quad Map Name:** Nisqually

***Legal Description:** **T**19N **R** 1 **E/W:** E **Section(s):** 26

Quarter Section(s): NENW

***UTM:** **Zone** 10 **Easting** 526801 **Northing** 5217214

Latitude: **Longitude:** **Elevation (FT/M):** 220ft

Other Maps: **Type:**

Scale: **Source:**

Drainage, Major: Sequalitchew Creek **Drainage, Minor:** **River Mile:**

Aspect: **Slope:** 1-3%

Location Description** *(General to Specific):** This site is located on the north side of Sequalitchew Creek, northwest of the Town of DuPont. It is situated east of the old DuPont works property. The area is disturbed and is dominated by grasses and brushy plants. The project area is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973) approximately 1 mile east of the southern part of Puget Sound shoreline. Sequalitchew Creek drains the Edmond's Marsh area about 1 mile east, and empties into Puget Sound approximately 1.5 miles to the northwest. The Puget Trough is a basin that lies between the Coast Range to the west and the Cascade Range to the east.

Approach *(For Relocation Purposes)***:** From I-5 take the DuPont Center Drive exit (north) approximately 1.5 miles to Power Road, turning left, to the intersection of a gravel road (205 feet). The isolate is located on the north side of the gravel road, 736feet from the intersection of Power Road (at the end of gravel just before the chain-link fence) and approximately 22 feet due north of the gravel road.

SITE DESCRIPTION

***Narrative Description:**

This site is an extension of site GEO-RR10 recorded on September 28, 2010 for Creekside DuPont Partners. The site is a non-functional narrow-gauge railroad track situated on an earthen berm bisecting the eastern edge of the project area. The earthen berm is approximately 20 inches in height and roughly 20 feet in width. The narrow gauge tracks extend 207 feet east from the eastern project area boundary (chain link fence) running due west. The site is covered with lichen, and trees growing through the tracks and the berm. Within the project area, the tracks end at an earthen mound that appears to have been dug immediately adjacent to the southeast side of the tracks (burrow pit). The narrow-gauge track and berm continue to the east beneath a chain-link fence for a distance of 98 feet beyond the project area. The short abandoned track and berm segment within the project area are attributed to construction by the DuPont Powder Works; the narrow-gauge railroad was used to transport their products during the Old Town period (1906-1920s). There was no evidence of artifacts or cultural deposits in association with the tracks or berm, and this site is not recommended eligible for listing on the NRHP or Washington Heritage Register (WHR). The eastern end of the spur was truncated presumably after DuPont Powder Works closed in 1976.

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

***Site Dimensions**

***Length:** 207 feet ***Direction: E/W** x ***Width:** 20 feet ***Direction:** N/S

***Method of Horizontal Measurement:** GPS

***Depth:** Surface * **Method of Vertical Measurement:** GPS

****Vegetation** *(On Site)***:** Mostly grasses and scotch broom

Local: Douglas fir, Pacific madrone, red alder, elderberry, sword fern

Local: Glacial Plain

Water Resources *(Type)***:** Sequalitchew Creek **Distance:** 426 feet SW **Permanence:** year round

***Method of Collection(s):** No materials collected

CULTURAL MATERIALS AND FEATURES

***Narrative Description:**

This site was originally recorded by Arrington during survey in 2010 of the 12.8-acre property (known as Lot X) adjacent to the eastern edge of Lot Y (Sikes and Arrington 2010). It is a non-functional segment of a narrow-gauge railroad track situated on an earthen berm; it extends into both Lots X and Y beneath a chain-link fence marking the property boundaries. The track and berm bisect the eastern edge of the Lot Y project area. The earthen berm is approximately 20 inches high and 20 feet wide. The narrow gauge track extends 207 feet west from the eastern project area boundary. The site is covered with forest duff, lichen, and scotch broom. The narrow-gauge track and berm continue east into Lot X beneath the chain-link fence for approximately 98 feet.

The short abandoned track and berm segment are attributed to construction by the DuPont Powder Works; the narrow-gauge railroad was used to transport their products during the Old Town period (1906-1920s). This site is recommended ineligible for listing on the NRHP or WHR. The segment is in poor condition with no evidence of associated artifacts or cultural deposits and has no potential to yield additional information. The eastern end of the spur was truncated presumably after DuPont Powder Works closed in 1976.

***Method of Collection(s):** None

Location of Artifacts** *(Temporary/Permanent):** N/A

SITE AGE

***Component:** ***Dates:** 1906-1920s ***Dating Method:**

Phase: **Basis for Phase Designation:**

The short abandoned track and berm segment within the project area are attributed to construction by the DuPont Powder Works; the narrow-gauge railroad was used to transport their products during the Old Town period (1906-1920s).

SITE RECORDERS

Observed by: C. Arrington and Pete Morris

***Date Recorded:** February 17, 2011

Recorded by** *(Professional Archaeologist):** Cindy Arrington

***Affiliation:** Parus Consulting, Inc. ***Affiliation Phone Number:** 916-782-5818

***Affiliation Address:** 1508 Eureka Road, Suite 170, Roseville, CA 95661

***Affiliation E-mail:** cindy@parusconsulting.com

Date Revisited: **Revisited By:**

SITE HISTORY

Previous Work *(Done on Archaeological Site)***:**

Year	Author(s)	Report Title	Proximity to project
1977	Onat, A.R., Lee A. Bennett, and Timothy Riorda	Cultural Resources Survey: DuPont Site, Volume I Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near project area
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site.	Within and near project area
1989	Welch, Jeanne	A Cultural Overview and Comprehensive Management Plan for the DuPont Property, Pierce County, Washington	Within and near project area
1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within project area
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the "Hot Spot" Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within project area
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near project area
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area

LAND OWNERSHIP

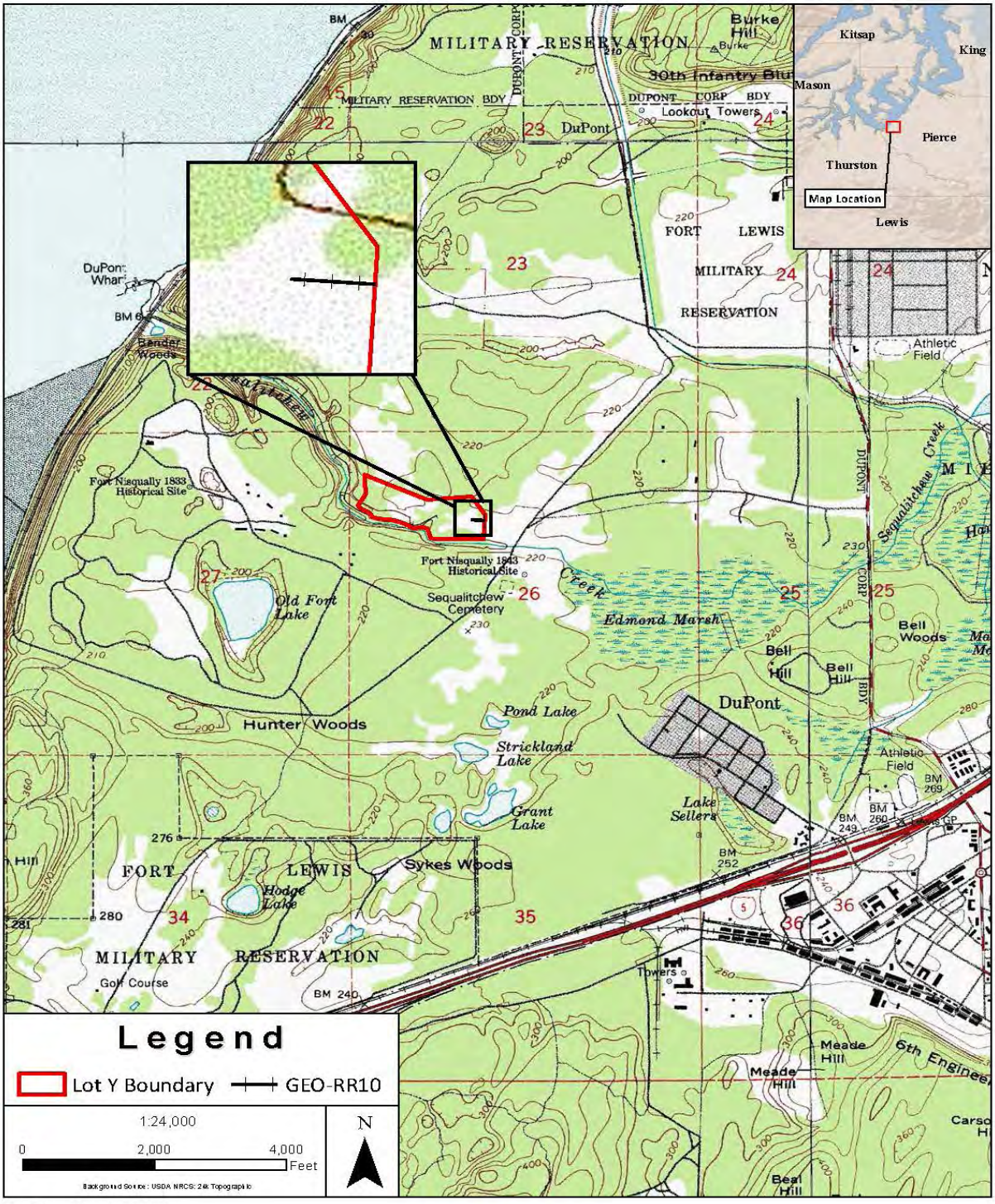
***Owner:** DuPont Industrial Partners, LLC
Address: 1201 Pacific Avenue, Suite 1501
Tacoma, WA 98402

***Tax Lot/ Parcel No:**

RESEARCH REFERENCES

***Items/Documents Used In Research** *(Specify)*: 1973 Franklin, Jerry F., and C. T. Dyrness *Natural Vegetation of Oregon and Washington*. Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service, Portland, Oregon.

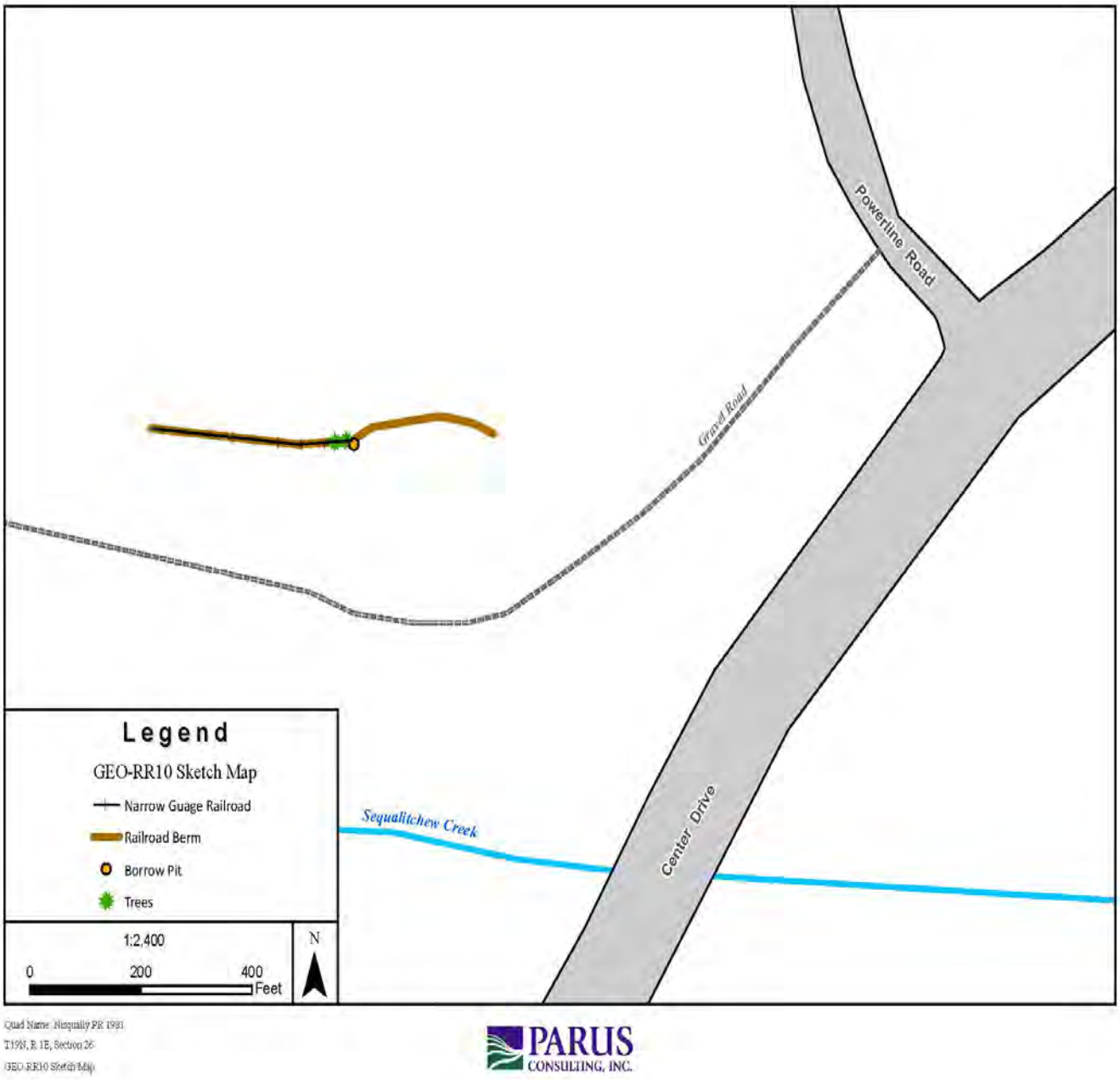
USGS MAP



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: GEO-RR10 Location Map

PARUS CONSULTING, INC.

SKETCH MAP


Powerline Road
Gravel Road
Sequalitchew Creek
Center Drive
Legend
GEO-RR10 Sketch Map
Narrow Guage Railroad
Railroad Berm
Borrow Pit
Trees
1:2,400
0
200
400
Feet
N
Quad Name: Nisqually NE 1981
T19N, R 1E, Section 26
GEO-RR10 Sketch Map
PARUS
CONSULTING, INC.

PHOTOGRAPH(S)

Figure 1: Geo RR10 extension (view to east)

STATE OF WASHINGTON
ARCHAEOLOGICAL SITE INVENTORY FORM

Smithsonian Number: PI01225

***County:** Pierce

***Date:** 7-19-2011 ***Compiler:** C. Arrington

Location Information Restrictions *(Yes/No/Unknown)*: No

SITE DESIGNATION

Site Name: Concrete Platform

Field/ Temporary ID: Parus-01-11

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

SITE LOCATION

***USGS Quad Map Name:** Nisqually

***Legal Description: T**19N **R** 1 **E/W:** E **Section(s):** 26

Quarter Section(s): NENW

***UTM: Zone** 10 **Easting** 526780 **Northing** 5217203

Latitude: **Longitude:** **Elevation (FT/M):** 220ft

Other Maps: **Type:**

Scale: **Source:**

Drainage, Major: Sequalitchew Creek **Drainage, Minor:** **River Mile:**

Aspect: **Slope:** 1-3%

***Location Description** *(General to Specific)*: This site is located on the north side of Sequalitchew Creek, northwest of the Town of DuPont. It is situated east of the old DuPont works property. The area is disturbed and is dominated by grasses and brushy plants. The project area is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973) approximately 1 mile east of the southern part of Puget Sound shoreline. Sequalitchew Creek drains the Edmond's Marsh area about 1 mile east, and empties into Puget Sound approximately 1.5 miles to the northwest. The Puget Trough is a basin that lies between the Coast Range to the west and the Cascade Range to the east.

Approach *(For Relocation Purposes)*: From I-5 take the DuPont Center Drive exit (north) approximately 1.5 miles to Power Road, turning left, to the intersection of a gravel road (205 feet). The isolate is located on the north side of the gravel road, 979 feet from the intersection of Power Road and approximately 76 feet due north of the gravel road.

SITE DESCRIPTION

***Narrative Description:**

The loading platform is located 233 feet west of the eastern boundary of the project area, 76 feet due north of the existing gravel road. The platform is situated in hot spot #3 where the area was cleared of topsoil, using a mechanical backhoe in 2001 due to soil contamination and remediation efforts.

Vegetation within the site area consists of open second growth conifer forest dominated by Douglas fir, sword fern, and scotch broom, and includes red alder, elderberry, and grasses. Visibility on the surrounding ground surface is poor ranging from 10-30 percent.

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

***Site Dimensions**

***Length:** 16 feet ***Direction: E/W** x ***Width:** 16 feet ***Direction:** N/S

***Method of Horizontal Measurement:** Tapped

***Depth:** 6’ 5” above ground surface * **Method of Vertical Measurement:** Tapped

****Vegetation** *(On Site)***:** Mostly grasses and scotch broom

Local: Douglas fir, Pacific madrone, red alder, elderberry, sword fern

Local: Glacial Plain

Water Resources *(Type)***:** Sequalitchew Creek **Distance:** 384 feet south **Permanence:** year round

***Method of Collection(s):** No materials collected

CULTURAL MATERIALS AND FEATURES

***Narrative Description:**

A concrete loading platform is located approximately where the standard-gauge and one of the narrow-gauge tracks previously crossed near the eastern edge of Lot Y. The platform is visible on satellite imagery, but was previously unrecorded. During the functional period of the platform, it likely was used for loading or unloading materials onto DuPont Powder Works trains that would have moved east to west and north to south past the platform.

The platform is primarily concrete, with a steel railing as a perimeter of the upper platform surface. The platform is 192 inches square and 77 inches tall. The surface perimeter has a 3-inch concrete lip with occasional breaks to permit loading access. There is an arrangement of 2-inch by 6-inch wood boards bolted to the interior surface of the concrete lip, with a steel railing situated along the perimeter lip of the platform. The railing is painted yellow and is 39.5 inches tall, with a lower bar and upper bar. The lower bar is 19.5 inches high, and the upper bar is 39 inches high. There are openings in the rail with steel chains stretched across on the south and east sides of the platform; one opening is 55 inches wide, and the other is 51 inches wide.

On the north side of the platform there is a 30-inch wide opening that appears to be a person-access stepping platform, with vertical handrails and a swinging safety bar (non-operational). On the east of the platform is a small debris pile consisting of heavy-gauge sheet metal, milled lumber, crushed pipe (1.5-inch diameter), and steel railing segment with chain. The platform is built with well sorted aggregate, form poured concrete. It does not appear on the very detailed 1955 map drawn by E. Davies. Locals recall the platform was not built until the early 1960s and then it was seldom used (personal communication, Fred Foreman). This site has no potential to yield additional information and is recommended ineligible for listing on the NRHP or WHR.

***Method of Collection(s):** None

***Location of Artifacts** *(Temporary/Permanent)*: N/A

SITE AGE

***Component:** *Dates:** 1960s *Dating Method:**

Phase: **Basis for Phase Designation:**

SITE RECORDERS

Observed by: C. Arrington and Pete Morris

***Date Recorded:** February 17, 2011

Recorded by** *(Professional Archaeologist):** Cindy Arrington

***Affiliation:** Parus Consulting, Inc. ***Affiliation Phone Number:** 916-782-5818

***Affiliation Address:** 1508 Eureka Road, Suite 170, Roseville, CA 95661

***Affiliation E-mail:** cindy@parusconsulting.com

Date Revisited: **Revisited By:**

SITE HISTORY

Previous Work *(Done on Archaeological Site)***:**

Year	Au□hor(s)	Report Title	Proximity to project
1977	Onat, A.R., Lee A. Bennett, and Timothy Riordan	Cultural Resources Survey: DuPont Site, Volume I□ Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near project area
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site.	Within and near project area
1989	Welch, Jeanne	A Cultural Overview and Comprehensive Management Plan for the DuPont Property, Pierce County, Washington	Within and near project area
1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within project area
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the "Hot Spot" Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within project area
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near project area
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area

LAND OWNERSHIP

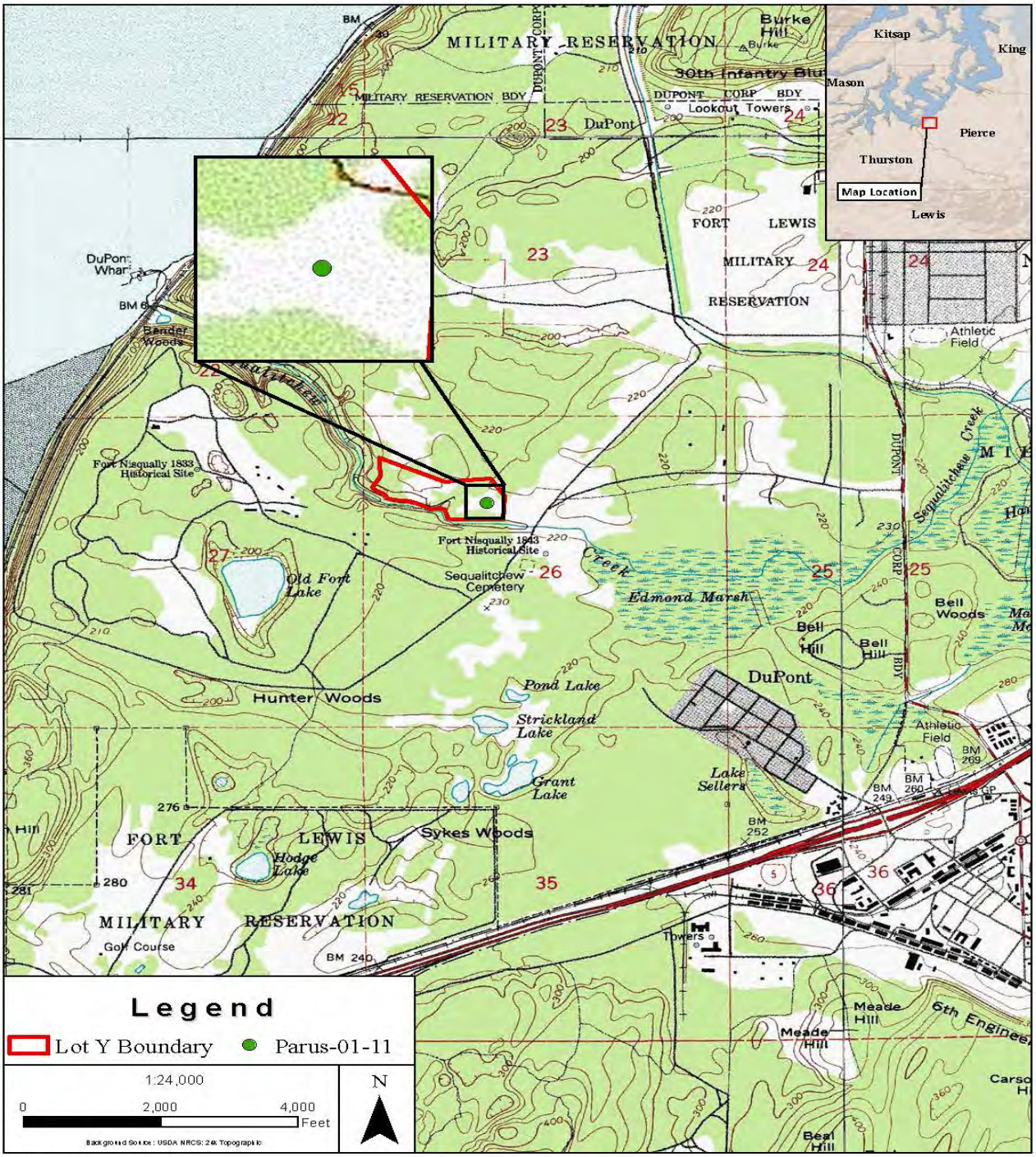
***Owner:** DuPont Industrial Partners, LLC
Address: 1201 Pacific Avenue, Suite 1501
Tacoma, WA 98402

***Tax Lot/ Parcel No:**

RESEARCH REFERENCES

***Items/Documents Used In Research** *(Specify)*: 1973 Franklin, Jerry F., and C. T. Dyrness *Natural Vegetation of Oregon and Washington*. Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service, Portland, Oregon.

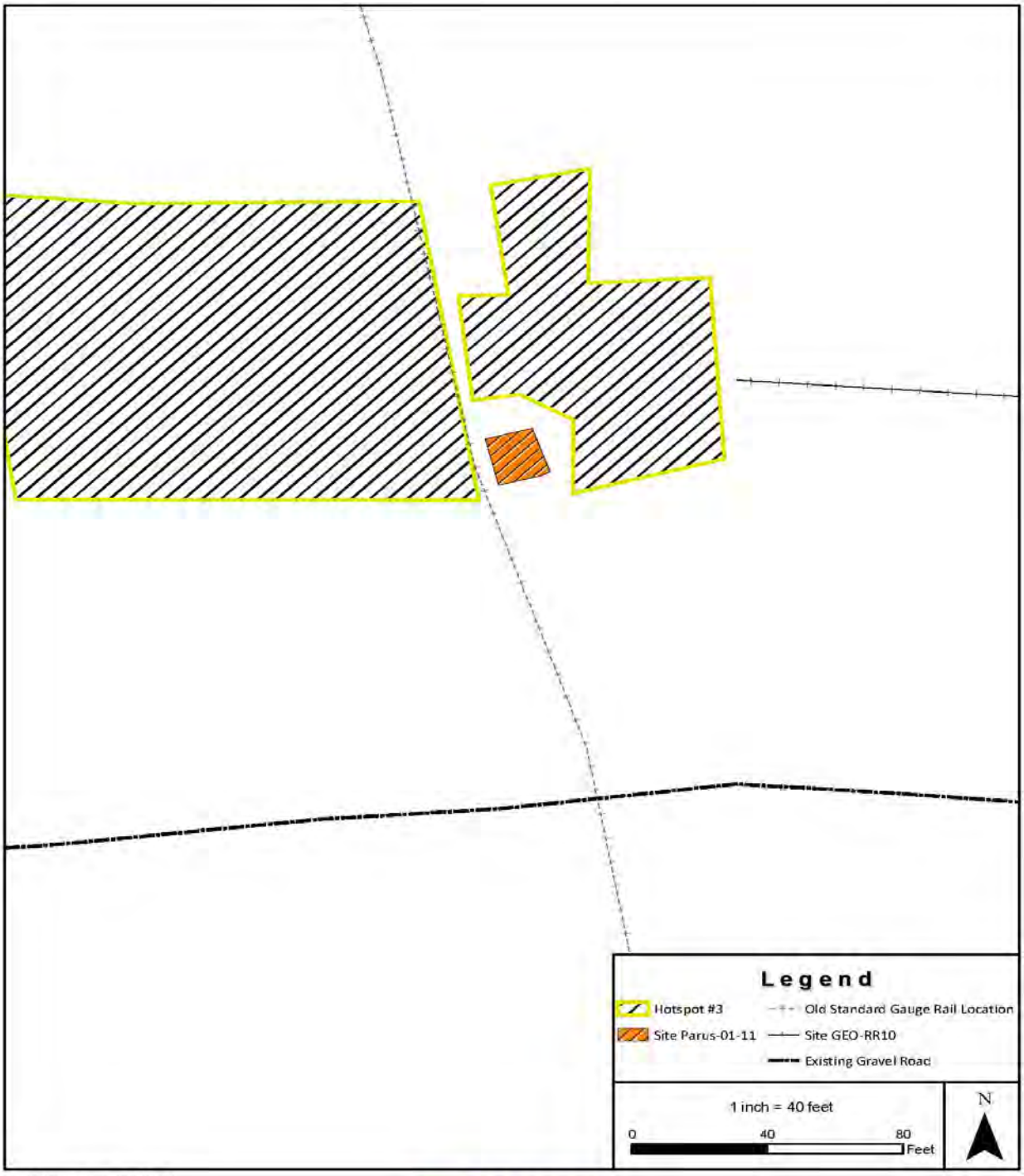
USGS MAP



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Parus-01-11 Location Map

PARUS CONSULTING, INC.

SKETCH MAP


Legend
Hotspot #3
Old Standard Gauge Rail Location
Site Parus-01-11
Site GEO-RR10
Existing Gravel Road
1 inch = 40 feet
0
40
80
Feet
N
Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Parus-01-11 Sketch Map
PARUS
CONSULTING, INC.

PHOTOGRAPH(S)

Figure 1: East side of platform (view to west)

Figure 2: North side of platform (view to southwest)

PHOTOGRAPH(S)

Figure 3: West side of platform (view to northeast)

Figure 4: Debris pile on east side of platform (view to north)

STATE OF WASHINGTON
ARCHAEOLOGICAL SITE INVENTORY FORM

Smithsonian Number:PI01226

***County:** Pierce

***Date:** 7-19-2011 ***Compiler:** C. Arrington

Location Information Restrictions *(Yes/No/Unknown)*: No

SITE DESIGNATION

Site Name: Bridge Abutment – Narrow-Gauge Railroad

Field/ Temporary ID: Parus-02-11

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

SITE LOCATION

***USGS Quad Map Name:** Nisqually

***Legal Description: T**19N **R** 1 **E/W:** E **Section(s):** 26

Quarter Section(s): SWNW

***UTM: Zone** 10 **Easting** 526592 **Northing** 5217123

Latitude: **Longitude:** **Elevation (FT/M):** 222ft

Other Maps: **Type:**

Scale: **Source:**

Drainage, Major: Sequalitchew Creek **Drainage, Minor:** **River Mile:**

Aspect: **Slope:** 1-3%

***Location Description** *(General to Specific)*: This site is located on the north side of Sequalitchew Creek, northwest of the Town of DuPont. It is situated east of the old DuPont works property. The area is disturbed and is dominated by grasses and brushy plants. The project area is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973) approximately 1 mile east of the southern part of Puget Sound shoreline. Sequalitchew Creek drains the Edmond's Marsh area about 1 mile east, and empties into Puget Sound approximately 1.5 miles to the northwest. The Puget Trough is a basin that lies between the Coast Range to the west and the Cascade Range to the east.

Approach *(For Relocation Purposes)*: From I-5 take the DuPont Center Drive exit (north) approximately 1.5 miles to Power Road, turning left, to the intersection of a gravel road (205 feet). The site is located on the south side of the gravel road, 1,348 feet from the intersection of Power Road and approximately 467 feet due south of the gravel road.

SITE DESCRIPTION

***Narrative Description:**

The site, a narrow-gauge railroad bridge (depicted on the E. Davies 1955 map), is located on the north bank of Sequalitchew Creek, 467 feet due south of the gravel road. There are two additional abutments, both an upper and lower, on the south bank of the creek and look to be identical to those located on the north bank.

The abutments are covered with moss, and is surrounded by decomposing forest duff and vegetation, including ferns, conifers, deciduous trees, and grasses. Visibility on the surrounding ground surface is poor ranging from 0-10 percent.

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Historic Railroad Properties

***Site Dimensions**

Upper abutment ***Length:** 128 inches ***Direction: E/W** x ***Width:** 12.5 inches ***Direction:** E/W

Lower abutment ***Length:** 150 inches ***Direction: E/W** x ***Width:** 12 inches ***Direction:** E/W

***Method of Horizontal Measurement:** Tapped

***Depth:** 51 inches for upper and 32 inches for lower above ground surface

* **Method of Vertical Measurement:** Tapped

****Vegetation** *(On Site)***:** The abutment is covered with moss, and is surrounded by decomposing forest duff and vegetation, including ferns, conifers, deciduous trees, and grasses.

Local: Douglas fir, Pacific madrone, red alder, elderberry, sword fern

Local: Glacial Plain

Water Resources *(Type)***:** Sequalitchew Creek **Distance:** 35 feet south **Permanence:** year round

***Method of Collection(s):** No materials collected

CULTURAL MATERIALS AND FEATURES

***Narrative Description:**

This site is comprised of the remnants of a narrow-gauge railroad bridge that traversed Sequalitchew Creek from north to south. This bridge crossing is shown on the 1955 map drawn by E. Davies. The remains include two concrete abutments that have a 165-inch horizontal separation. Both abutments have a poured-form aggregate concrete construction, with a smooth finished top. The lower abutment is 150 inches long, 32 inches high from the ground, and 12 inches wide at the top. The upper abutment is 128 inches long, 51 inches high from the ground, with the base at 20 inches wide, and the top of the abutment 12.5 inches wide. The abutments are covered with moss and are surrounded by decomposing forest duff and vegetation, including ferns, conifers, deciduous trees, and grasses.

The set of abutments is immediately outside of the Lot Y project area, and 35 feet north of Sequalitchew Creek. There are two pieces of milled lumber located between the abutments; they are each 6 by 6 inches, but vary in length. One piece is 45 inches long, and the other is 60 inches long. The longer piece is intact, and has a 5-inch by 8.5-inch metal cleat with spikes on one side. An identical set of concrete abutments is visible on the south side of the creek outside the project area.

This bridge was the only narrow-gauge railroad bridge within the DuPont Powder Works to cross Sequalitchew Creek, and is shown on the 1955 map drawn by E. Davies. It was used for transport of material by train from the plant to the burning ground (later recorded as 45PI64) and then proceeding further north to the storage area (personal communication, Fred Foreman and Johanna Jones). The bridge was removed in the late 1990s. The remaining set of abutments has no potential to yield additional information and is recommended ineligible for listing on the NRHP or WHR.

***Method of Collection(s):** None

***Location of Artifacts** *(Temporary/Permanent)*: N/A

SITE AGE

***Component:** *Dates:** 1906-1920s ***Dating Method:**

Phase: **Basis for Phase Designation:**

The narrow-gauge bridge is attributed to construction by the DuPont Powder Works; the narrow-gauge railroad was used to transport their products during the Old Town period (1906-1920s).

SITE RECORDERS

Observed by: C. Arrington and P. Morris

***Date Recorded:** February 17, 2011

Recorded by** *(Professional Archaeologist):** Cindy Arrington

***Affiliation:** Parus Consulting, Inc. ***Affiliation Phone Number:** 916-782-5818

***Affiliation Address:** 1508 Eureka Road, Suite 170, Roseville, CA 95661

***Affiliation E-mail:** cindy@parusconsulting.com

Date Revisited: **Revisited By:**

SITE HISTORY

Previous Work *(Done on Archaeological Site)***:**

Year	Author(s)	Report Title	Proximity to project
1977	Onat, A.R., Lee A. Bennett, and Timothy Riordan	Cultural Resources Survey: DuPont Site, Volume I Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near project area
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site.	Within and near project area
1989	Welch, Jeanne	A Cultural Overview and Comprehensive Management Plan for the DuPont Property, Pierce County, Washington	Within and near project area
1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within project area
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the "Hot Spot" Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within project area
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near project area
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area

LAND OWNERSHIP

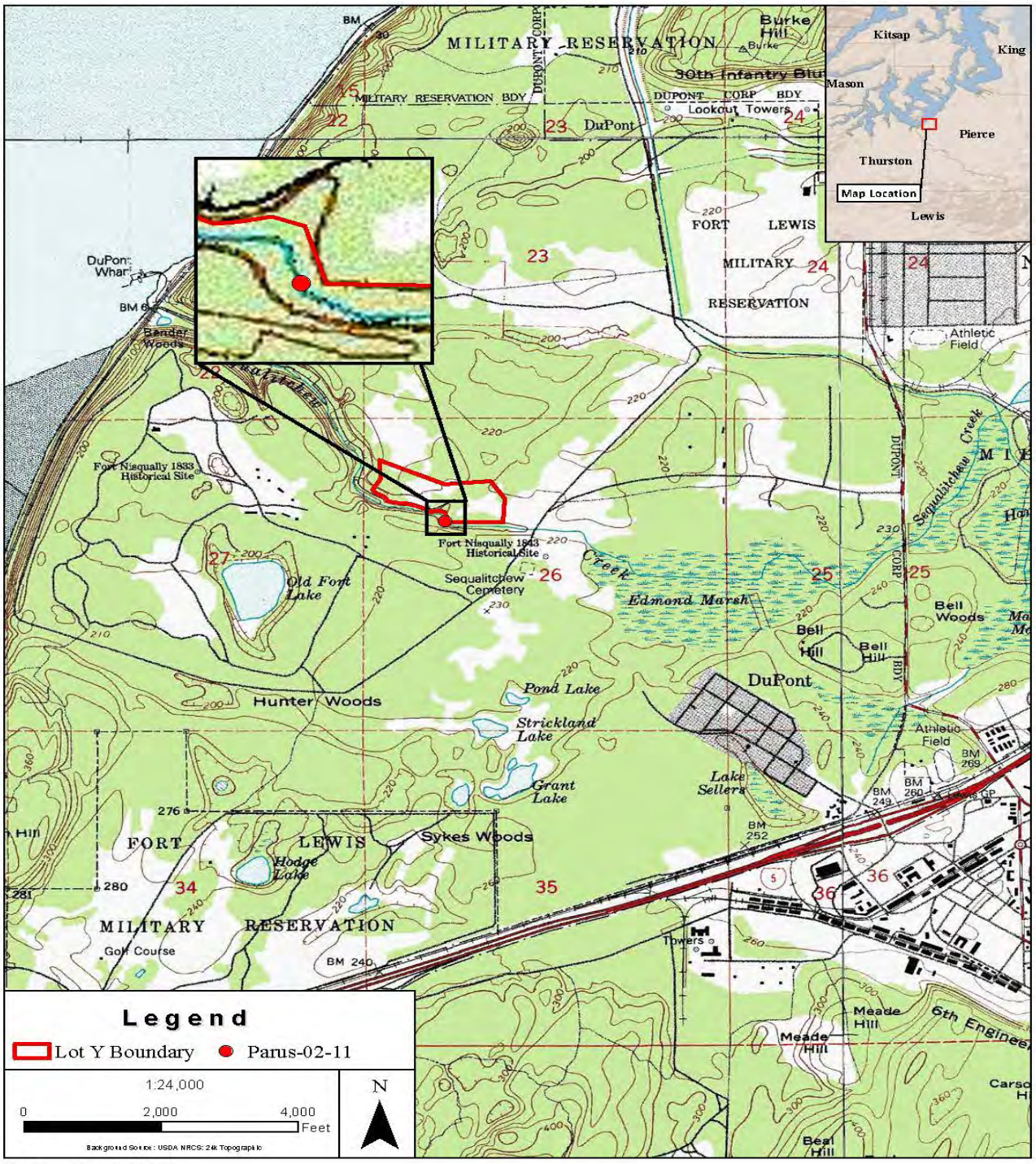
***Owner:** DuPont Industrial Partners, LLC
Address: 1201 Pacific Avenue, Suite 1501
Tacoma, WA 98402

***Tax Lot/ Parcel No:**

RESEARCH REFERENCES

***Items/Documents Used In Research** *(Specify)*: 1973 Franklin, Jerry F., and C. T. Dyrness *Natural Vegetation of Oregon and Washington*. Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service, Portland, Oregon.

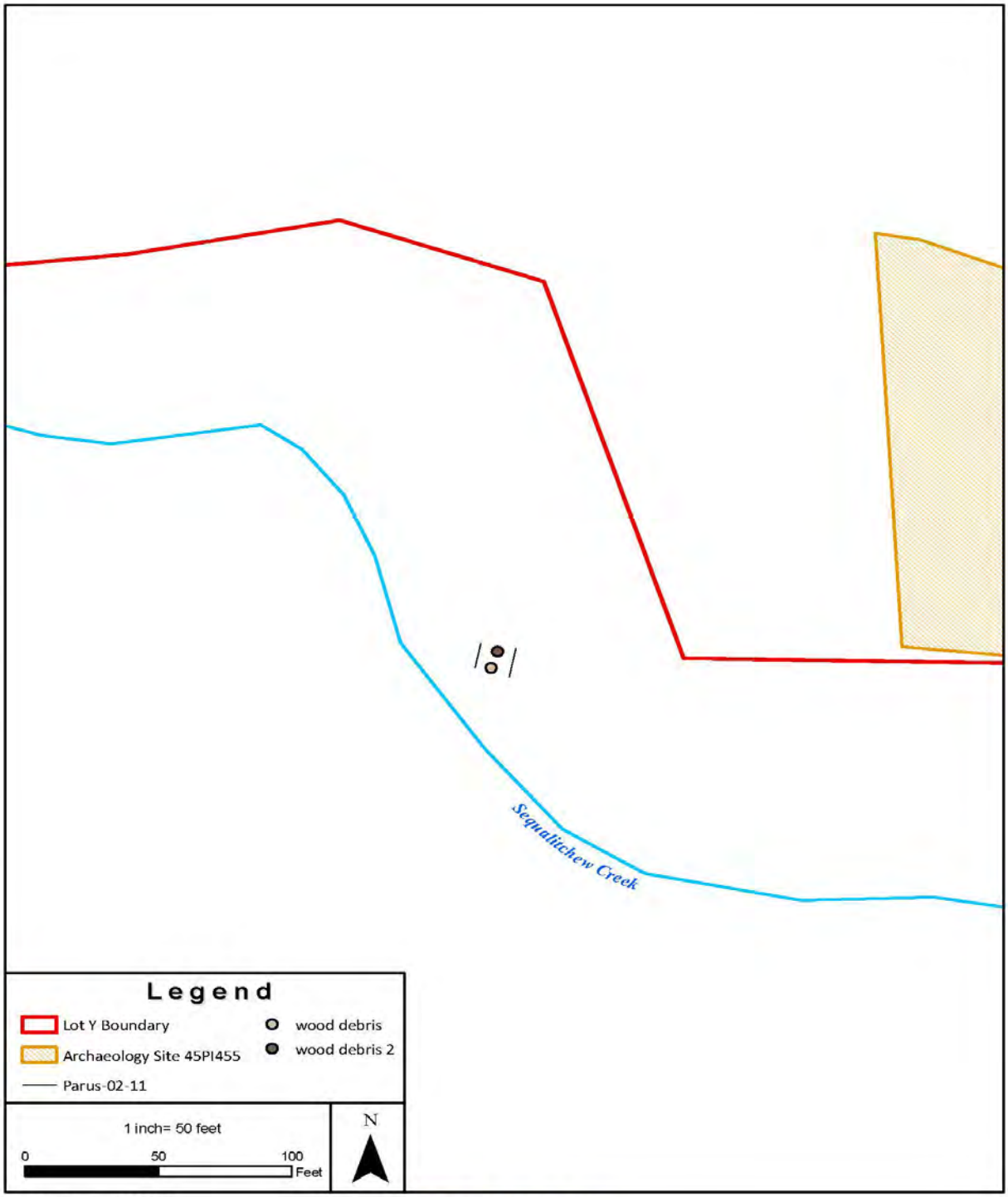
USGS MAP



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Parus-02-11 Location Map

PARUS CONSULTING, INC.

SKETCH MAP



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Parus-02-11 Sketch Map

PARUS CONSULTING, INC.

PHOTOGRAPH(S)

Figure 1: Upper and lower abutments (view to north)

Figure 2: South face of lower abutment (view to north)

PHOTOGRAPH(S)

Figure 3: East side of upper abutment (view to west)

PHOTOGRAPH(S)

Figure 4: Wood debris near lower abutment (plan view)

Figure 5: Wood debris with metal cleat near lower abutment (plan view)

STATE OF WASHINGTON
ARCHAEOLOGICAL ISOLATE INVENTORY FORM

Smithsonian Number: PI00064

***County:** Pierce

***Date:** 2-17-2011 ***Compiler:** C. Arrington

ISOLATE DESIGNATION

Isolate Name: Kerosene Can

Field/ Temporary ID: Parus Isolate #1

Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Pages 19-23):** Historic isolate

ISOLATE LOCATION

***USGS Quad Map Name:** Nisqually

***Legal Description: T**19N **R** 1 **E/W:** E **Section(s):** 26

Quarter Section(s): NWNW

***UTM: Zone** 10 **Easting** 526413 **Northing** 5217323

Latitude: **Longitude:** **Elevation (FT/M):** 220ft

Other Maps: **Type:**

Scale: **Source:**

Drainage, Major: Sequalitchew Creek **Drainage, Minor:** **River Mile:**

Aspect: **Slope:** 1-3%

Location Description** *(General to Specific):** This isolate is located on the north side of Sequalitchew Creek, northwest of the Town of DuPont. It is situated east of the old DuPont works property. The area is disturbed and is dominated by grasses and brushy plants. The project area is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973) approximately 1 mile east of the southern part of Puget Sound shoreline. Sequalitchew Creek drains the Edmond's Marsh area about 1 mile east, and empties into Puget Sound approximately 1.5 miles to the northwest. The Puget Trough is a basin that lies between the Coast Range to the west and the Cascade Range to the east.

ISOLATE DESCRIPTION

***Narrative Description:** A galvanized kerosene can was located near the edge of the northwest corner of the area known locally as the “gravel pit” (HS-6 on Figure 2) and formerly the burning ground (45PI64). The sides of the can are dented and it exhibits some oxidation. It is missing the pour spout and wire handle, but is mostly intact. The top is domed and ribbed, and the base diameter is 11 inches, with a height of 14 inches. The dimensions suggest the volume of this can was approximately 5 gallons. Considering the lengthy range of manufacture, the age of the can is undeterminable.

***Vegetation** *(On Site)*:** Mostly grasses, deciduous and conifer trees, and scotch broom
Local: Douglas fir, Pacific madrone, red alder, elderberry, sword fern
Local: Glacial Plain
Water Resources *(Type)*: Sequalitchew Creek **Distance:** 474 feet South **Permanence:** year round
***Method of Collection(s):** No materials collected

ISOLATE AGE

***Component:** None *__Dates:__ None ***Dating Method:** None
Phase: None **Basis for Phase Designation:** None

ISOLATE RECORDERS

Observed by: C. Arrington & Pete Morris

***Date Recorded:** February 17, 2011

Recorded by** *(Professional Archaeologist):** Cindy Arrington

***Affiliation:** Parus Consulting, Inc ***Affiliation Phone Number:** 916-765-9381

***Affiliation Address:** 1508 Eureka Road, Suite 170, Roseville, CA

***Affiliation E-mail:** Cindy@parusconsulting.com

Date Revisited: **Revisited By:**

ISOLATE HISTORY

Previous Work *(Done on Area Where Isolate was Found)***:**

Year	Author(s)	Report Title	Proximity to project
1977	Onat, A.R., Lee A. Bennett, and Timothy Riordan	Cultural Resources Survey: DuPont Site, Volum I, Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near project area
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site.	Within and near project area
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1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within project area
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the "Hot Spot" Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within project area
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near project area
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near project area

LAND OWNERSHIP

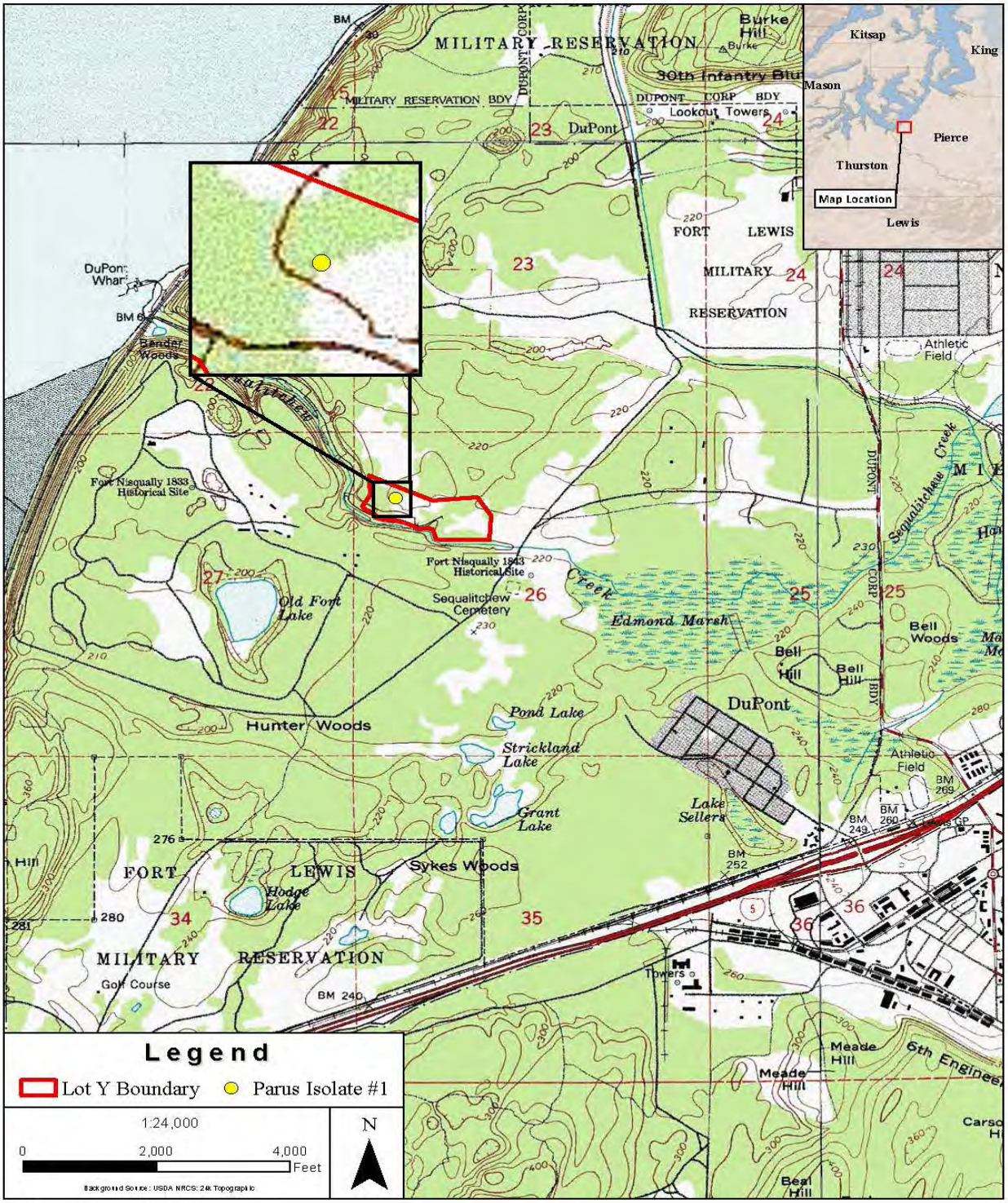
***Owner:** DuPont Industrial Partners, LLC
Address: 1201 Pacific Avenue, Suite 1501, Tacoma, WA 98402

***Tax Lot/ Parcel No:**

RESEARCH REFERENCES

***Items/Documents Used In Research** *(Specify)*: 1973 Franklin, Jerry F., and C. T. Dyrness *Natural Vegetation of Oregon and Washington*. Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service, Portland, Oregon.

USGS MAP



Quad Name: Nisqually PR 1981
T19N, R 1E, Section 26
DuPont Lot Y: Parus Isolate #1 Location Map

PARUS CONSULTING, INC.

Mandatory Information for Official Smithsonian Number designation.

Revised 2/2010

PHOTOGRAPH(S)

Figure 1 Kerosene can (in situ)

Figure 2 Kerosene can (top missing spout and handle)

PHOTOGRAPH(S)

Figure 3 Kerosene can (side view)

Figure 4 Kerosene can (side view)

APPENDIX E:
Unanticipated Cultural Resources Discovery Plan

UNANTICIPATED CULTURAL RESOURCES DISCOVERY PLAN

FOR

DUPONT INDUSTRIAL PARTNERS, LLC, LOT Y PROJECT

CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

Prepared For:

DuPont Industrial Partners, LLC
1201 Pacific Avenue, Suite 1501
Tacoma, Washington 98402

Prepared By:

Nancy E. Sikes, Ph.D., RPA

PARUS CONSULTING, INC.

1508 Eureka Road, Suite 170
Roseville, CA 95661

Final– April 14, 2011

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INTRODUCTION

DuPont Industrial Partners, LLC (Partners) plans to undertake various ground-disturbing activities during planned construction of a multi-building industrial park on Lot Y in the City of DuPont in Pierce County. This Discovery Plan presents the approach that Partners will use to ensure the protection of cultural resources and describes the steps and actions that must be taken should cultural resources, including human remains, be discovered during ground-disturbing or construction activities for the proposed Lot Y project. This plan provides a brief description of the project, the location of the project, the potential for encountering cultural resources materials or deposits, the discovery procedures that will be employed, and who will be notified if archaeological materials or deposits, or human skeletal remains, are exposed during project implementation.

PROJECT DESCRIPTION, LOCATION AND HISTORY

The project encompasses approximately 25.3 acres on private land known as Lot Y (Assessor's Property Tax Parcel No. 0119262019) located in the City of DuPont, Pierce County, Washington. Lot Y is located within the city limits west of Center Drive and north of Sequalitchew Creek. Partners plans to develop a multi-building industrial park on Lot Y. The complex would include up to 12 buildings totaling approximately 340,000 square feet of building area, roadways, loading areas, approximately 650 parking spaces, and installation of underground utilities.

Plans also include construction of a trail along the creek to the southwest of the industrial park. The existing historical marker erected by the DuPont Company in 1927 at the site of the former Methodist Episcopal Mission (45PI66) will be moved to the trailhead area where the public will have continued access. An interpretive sign explaining the history of the temporary encampment of the 9th U.S. Cavalry Buffalo Soldiers (45PI455) within Lot Y will also be erected.

The Lot Y project area is located within Section 26, Township 19 North, Range 01 East on the Nisqually 1981 USGS 7.5-minute topographic map (Willamette Meridian). Elevation within Lot Y ranges from 64 to 68 meters (210-223 feet) above mean sea level.

A cultural resources investigation for the Lot Y project was conducted for Partners by Parus Consulting, Inc. (PCI) (Sikes and Arrington 2011). The work was conducted under an Archaeological Excavation Permit approved by the Washington State Department of Archaeology & Historic Preservation (DAHP) on February 7, 2011 (Permit No. 2010-54). The study included background research, correspondence with cultural resources staff or Tribal Historic Preservation Officers (THPOs) for the Nisqually, Puyallup and Squaxin Tribes, and archaeological survey and excavation. The fieldwork was conducted in February and March 2011 and included examination of the surface and subsurface sediments in a series of shovel test probes and geotechnical exploration pits.

Monitoring of construction activities during project implementation was not recommended. Lot Y has been extensively disturbed beginning with historic period settlement in the early 1880s, then operation of the DuPont Powder Works in the early to mid-1900s (including use of part of Lot Y as a burning ground dump from the 1930s until 1945), followed by subsurface archaeological investigations and related artifact collection between 1989 and 2005 and by environmental remediation activities in 1999 and 2000. No evidence was found during the 2011 investigation of two previously recorded historic archaeological sites (45PI66 Methodist Episcopal Mission site and 45PI455 9th U.S. Cavalry Bivouac site) and one flaked stone isolate (45PI773), except for two brick fragments within the boundaries of 45PI66. Nor was there any evidence of two other archaeological sites (45PI63 Railroad Dump #3 site and 45PI64 Burning Ground Dump site) formerly located within Lot Y that were completely removed during hazardous

materials remediation. Two surface historic archaeological sites (GEO RR10 railroad track segment and Parus-01-11 concrete platform) were identified within Lot Y during the fieldwork in 2011, but they are not considered significant.

POTENTIAL FOR DISCOVERY

The potential for discovery of buried archaeological materials, features or deposits, or of buried human remains, by implementation of this project is considered low. No significant cultural/archaeological sites are known to remain within the project area, and there has been extensive disturbance to the Lot Y landscape. The nearest known archaeological sites are located on the north bank of Sequalitchew Creek immediately outside of the Lot Y project area (set of concrete bridge abutments) and approximately 0.1 mile east of Lot Y near Center Drive on the north and south banks of the creek (flaked stone artifacts and locations of mid-1850s dwellings near the west palisade wall of 1843 Fort Nisqually).

No significant cultural resources were identified on the surface or within the subsurface sediments exposed in a series of 125 shovel test probes and 22 geotechnical exploration pits placed within Lot Y. Excavated in February and March 2011, the 2.5 foot-wide, 3-foot long shovel test probes ranged from 1.1 to 4.3 feet in depth. The geotechnical exploration pits averaged 10 feet deep, 3 feet wide, and 5 feet long. The subsurface sediments are gravelly sandy loam over gravelly sand with no soil matrix. Except for one brick fragment and a flat iron bar, there was no indication of a midden or other cultural deposits, artifacts or features within the 147 excavation units.

DISCOVERY PROCEDURES

INADVERTENT DISCOVERY OF ARCHAEOLOGICAL DEPOSITS

Archaeological deposits within the proposed Lot Y project are protected by Washington State law: Indian Graves and Records (Revised Code of Washington [RCW] 27.44), Archaeological Sites and Resources (RCW 27.53), and Archaeological Excavation and Removal Permit (WAC 25-48). Failure to comply with these could constitute a Class C Felony.

If any Partners employee, its contractors or subcontractors believes that he or she has inadvertently uncovered any cultural resource, then all work adjacent to the discovery shall cease, and he or she shall immediately notify the construction foreman, inspector, or on-site Partners representative who shall immediately notify the contact at Partners responsible for on-site activities:

DuPont Industrial Partners, LLC
Lia Estigoy
(253) 396-4860

A cultural resource discovery could consist of:

- Prehistoric and ethnohistoric materials such as flaked stone tools, tool-making debris, stone milling tools, fire-affected rock, basketry, culturally modified animal bone, fishing implements or soil darkened by cultural activities (midden).

- Historic materials might include remnants of railroad or roadway construction activities or other industry or commerce (e.g., railroad ties, concrete blocks, machinery parts), building remains, metal, glass, cans, or ceramic artifacts or debris older than 50 years.

For all types and classes of cultural/archaeological material other than human remains (see below), the person responsible for on-site activities shall immediately call the Washington State Department of Archaeology and Historic Preservation (DAHP), which is the state agency with jurisdiction over archaeological discoveries:

Department of Archaeology and Historic Preservation (DAHP)
Gretchen Kaehler, Local Government Archaeologist
Direct line: (360) 586-3083
Cell: (360) 628-2755

The DAHP representative, Ms. Kaehler, will advise Partners (represented by Lia Estigoy) of the specific course of action following the discovery of archaeological materials, deposits or features. For the discovery of human remains, see below. Such actions specified by the DAHP representative could include avoidance of the finds with protection in place, or an archaeological assessment and recovery if avoidance is unfeasible, among other options. Ground-disturbing activity in the vicinity of the find(s) cannot resume until it has been approved by the DAHP representative.

INADVERTENT DISCOVERY OF HUMAN SKELETAL REMAINS

For this project on non-federal and non-tribal lands in the State of Washington, procedures and actions for the inadvertent discovery of human skeletal remains or suspected human remains must comply with RCW 27.44, RCW 68.50 and RCW 68.60. If ground disturbing activities encounter human skeletal remains during the course of construction, then all activity **must** cease that may cause further disturbance to those remains and the area of the find must be secured and protected from further disturbance. In addition, the finding of human skeletal remains **must** be reported to the County Coroner and local law enforcement in the most expeditious manner possible. The remains should not be touched, moved, or further disturbed.

Immediate notification by phone shall be made to the County Coroner, local law enforcement and DAHP:

Pierce County Coroner
Dr. Thomas B. Clark III
3619 Pacific Avenue
Tacoma, Washington 98418
Telephone: (253) 798-6494

DuPont Police Department
1780 Civic Drive, Ste. 100
DuPont, Washington 98327
Telephone: 911 or (253) 964-7060

The Pierce County Coroner will assume jurisdiction over the human skeletal remains and make a determination of whether those remains are forensic or non-forensic. If the County Coroner determines the remains are non-forensic, then he or she will report that finding to DAHP who will then take jurisdiction over those remains and report them to the appropriate cemeteries or affected tribes.

The State Physical Anthropologist will make a determination of whether the remains are Indian or Non-Indian and report that finding to the affected parties. The DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains. Ground-disturbing activity near the human remains may not resume until permission to resume work has been received by Partners from DAHP.

Department of Archaeology and Historic Preservation (DAHP)
Guy Tasa, State Physical Anthropologist
1063 South Capital Way, Suite 106
Olympia, WA 98501
Direct line: (360) 586-3535

SUMMARY

Following the procedures presented in the Discovery Plan will ensure that ground-disturbing and construction activities for implementation of the proposed Lot Y project are in compliance with state and local laws that protect archaeological resources on public lands.

REFERENCES

Sikes, Nancy E., and Cindy J. Arrington
2011 *Archaeological Survey, Testing and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington*. Report prepared by Parus Consulting, Inc. for DuPont Industrial Partners, LLC.

Attachment 1f

Received 11-21-2022

AUTHORIZATION TO ACT AS AGENT AFFIDAVIT

City of DuPont
1700 Civic Drive, DuPont, WA 98327
Telephone 253.964.8121
www.dupontwa.gov

I, Eric Cederstrand (Dupont Industrial Partners LLC), as property owner of the following described property

1700 Center Dr. DuPont, WA 98327 — Property Address
0119266005, 0119266006, 0119266007 — Parcel Number

hereby authorize

Avenue 55, LLC
Name
601 Union Street, Ste. 2930 Seattle, WA 98101
Address
206-707-9696 — Phone
bvarin@avenue55.net — Email Address

To act as agent on my behalf before the City of DuPont regarding the application to
Entitle these parcels for SEPA.
Entitle these parcels for SEPA.

Property Owner Signature — Date: 10/25/2022

Eric Cederstrand
Print Name

STATE OF WASHINGTON }
COUNTY OF PIERCE }

On this 25th day of October, 2022, personally appeared before me

Eric Cederstrand known to be the individual(s) described in and who executed the within and foregoing instrument and acknowledged that he/she signed the same as given, as his/her free and voluntary act and deed, for the uses and purposes therein mentioned, and under oath stated that he/she was authorized to execute said instrument.

IN WITNESS WHEREOF, I have hereto set my hand and affixed my official seal the day and year first above written.

LINNIE SMITH NOTARY PUBLIC 21033982 COMMISSION EXPIRES 10-04-25 STATE OF WASHINGTON

Linnie Smith
Notary Public
Linnie Smith
Print Name
NOTARY PUBLIC in and for the State of Washington
Residing at Tacoma, WA
My Commission expires: 10.4.25

SUBMIT COMPLETE FORM TO: Permits@dupontwa.gov

Rev. 2021

Received 11-21-2022

GeoEngineers
1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

November 8, 2022

Avenue 55, LLC
601 Union Street, Suite 2930
Seattle, Washington 98101

Attention: Ben Varin

Subject: Report Addendum
Geotechnical Engineering Services
DuPont Industrial Park
DuPont, Washington
File No. 26421-001-00

INTRODUCTION AND PROJECT UNDERSTANDING

This report addendum presents supplemental geotechnical recommendations and considerations for the proposed DuPont Industrial Park project. The site is located at 1700 Center Drive in DuPont, Washington. An overview of the property and surrounding area is shown on the Vicinity Map, Figure 1.

Our experience at the site includes involvement with the previous owner, Dupont Station Partners, LLC. for the proposed DuPont Industrial Warehouse (also referred to as Lot "Y" Industrial Park). We understand you have been given permission by Dupont Station Partners and have the full use of studies held by GeoEngineers and as related to the site address. Our previous geotechnical deliverables for the site consist of:

- "Geotechnical Engineering Services Report" dated October 10, 2011 (2011 Report). As part of our services, we advanced 22 test pit explorations in the project area to develop an understanding of subsurface conditions. The 2011 Report presents a summary of our findings, conclusions and recommendations regarding geotechnical engineering aspects of the proposed industrial park development.
- "Report Addendum" dated May 11, 2018 (2018 Addendum), which includes our review of a proposed development site plan and updated recommended seismic design parameters.

Our understanding of the current project is based on discussions and correspondence with Avenue 55, LLC. We were provided a "Preliminary Site Plan – Option A" dated January 2022 for review. The overall project will consist of construction of two new buildings; an approximate 243,000 square foot (sf) warehouse building (referred to as Building A) and an approximate 25,000 sf storage/office type building (referred to as Building B). Surrounding improvements will include paved parking and driveway areas, hardscaping, new

utility installation, landscaping, and stormwater management facilities. Stormwater infiltration facilities could be considered, if feasible. An additional project element may include construction of a wall or barrier structure along the south property boundary as part of improvements related to separating the project site from the Lower Sequalitchew Creek and associated buffers.

PURPOSE AND SCOPE OF SERVICES

The purpose of our services is to review site conditions and our previously provided geotechnical recommendations for the site. Based on the currently proposed improvements, we provide our opinion on suitability of our previous recommendations and provide updated/revised recommendations (if necessary).

Our services have been provided in accordance with our signed agreement with Avenue 55, LLC (signed October 17, 2022). Details regarding our specific scope of services for the project can be reviewed in our agreement or provided upon request.

SUBSURFACE CONDITIONS

Subsurface Explorations

We previously explored subsurface conditions at the site by excavating 22 test pits to depths between about 8 and 11 feet below ground surface (bgs), corresponding to Elevation 209 to 183.5 feet. Approximate locations of each test pit relative to currently proposed improvements are shown on the Site Plan, Figure 2. A detailed summary of the test pit explorations, including completed laboratory testing and test pit logs, is presented in our 2011 Geotechnical Report. A brief overview is provided below.

Soil Conditions

We interpret native soils encountered in the test pits to be recessional glacial outwash deposits, consisting of medium dense to very dense sand and gravel with varying amounts of silt and cobble. The upper few feet were occasionally weathered and loose to medium dense. Fill consisting of medium dense sand with gravel and trace silt was observed in one test pit (TP-9) extending to the full depths explored (8 feet bgs).

Based on our understanding of geologic conditions and experience in the area, we anticipate recessional outwash soils are underlain by dense to very dense glacially consolidated soils at depth (glacial till and/or advance outwash).

Groundwater Conditions

Groundwater seepage was observed in one test pit (TP-14) at about 8 feet bgs, corresponding to Elevation 196 feet. Seepage and/or wet soils were not observed in remaining test pit excavations (as deep as about Elevation 183.5 feet).

We reviewed published groundwater maps and well information available online from the United States Geological Survey (USGS) National Water Information System (NWIS). Our review indicates groundwater elevations in the vicinity decrease from east to west, between about Elevation 200 feet (east of site, near Interstate 5) to Elevation 10 feet (west of site, near Puget Sound). The nearest readily available and most recently discovered information reviewed consisted of five groundwater wells within an approximate 1 mile radius of the project site; measured groundwater depths at these locations were below Elevation 140 feet.

In addition to the regional groundwater, areas of shallow perched groundwater could also be present throughout the site. It is common for perched groundwater to be present near contacts where soil that is more permeable overlies soil that is less permeable (i.e., sand over silt). The quantity and location of perched groundwater, if encountered, at this site is expected to be dependent on infiltration of surface water. Site grading can affect infiltration and therefore, the quantity and location of perched groundwater. Slow to moderate groundwater seepage should be expected if perched groundwater conditions are encountered.

GEOTECHNICAL DESIGN RECOMMENDATIONS

General

Except as modified in this addendum, the conclusions and recommendations presented in our 2011 Geotechnical Report and 2018 Report Addendum are appropriate for project design and construction (including, but not limited to, site development and earthwork, fill placement and compaction, shallow foundation support and bearing surface preparation).

Updated and/or revised geotechnical design recommendations are provided in the sections below.

Seismic Design

Seismic Design Approach

Proposed structures will be designed in accordance with seismic design requirements presented in the 2021 International Building Code (IBC). The 2021 IBC states structures shall be designed and constructed to resist the effects of earthquake ground motions in accordance with American Society of Civil Engineers (ASCE) 7-16.

Seismic Design Parameters

We used map-based values available online as recommended by the USGS to determine the seismic design spectrum in accordance with ASCE 7-16.

Soils encountered in the test pits (as deep as about 11 feet bgs) consisted of medium dense to very dense sand and gravel recessional outwash deposits. We anticipate these soils are underlain by dense to very dense glacially consolidated soils at depth. We anticipate soils below the explorations and extending to depths of 100 feet bgs consist of dense to very dense glacially consolidated deposits. Based on subsurface conditions encountered, our review and our experience in similar soil conditions, we recommend using a design response spectrum for Site Class C. In our opinion, the parameters provided in Table 1 below are suitable for seismic design and analysis.

TABLE 1. RECOMMENDED SEISMIC DESIGN CRITERIA

2021 IBC (ASCE 7-16) Seismic Design Parameters	
Site Class	C
Mapped Spectral Response Acceleration at Short Periods (S_S)	1.371 g
Mapped Spectral Response Acceleration at 1-Second Periods (S_1)	0.487 g
Site Amplification Factor at 0.2 Seconds (F_a)	1.2
Site Amplification Factor at 1.0 Seconds (F_v)	1.5
Design Spectral Response Acceleration at Short Periods (S_{DS})	1.097 g
Design Spectral Response Acceleration at 1-Second Periods (S_{D1})	0.487 g
Site Modified Peak Ground Acceleration (PGA_M)	0.632 g

Liquefaction Potential

DESCRIPTION

Liquefaction refers to the condition by which vibration or shaking of the ground, usually from earthquake forces, disturbs the soil structure (i.e., the arrangement of individual soil particles) within saturated and unconsolidated soils. This rearrangement of particles results in the development of excess pore pressures in saturated soils with subsequent loss of strength. Liquefaction susceptibility is difficult to predict and not all soils are susceptible to liquefaction. In general, soils that are susceptible to liquefaction include very loose to medium dense, "clean" to silty sands below the water table.

Ground settlement, lateral spreading and/or sand boils may result from soil liquefaction. Structures, such as buildings, supported on liquefied soils may suffer loss of bearing capacity, foundation settlement and/or lateral movement that can be damaging to the buildings

SEISMIC HAZARD MAP REVIEW

We re-reviewed the "Liquefaction Susceptibility Map of Pierce County, Washington" (Palmer et al. 2004) and the Washington State Department of Natural Resources (DNR) Interactive Natural Hazards Map. According to the maps, the site has "very low to low" potential for liquefaction.

ESTIMATED LIQUEFACTION POTENTIAL

Based on the soil and groundwater conditions observed in our explorations, our interpretation of the regional geology and review of hazard maps in the area, it is still our opinion the potential for liquefaction at the site is low.

Lateral Spreading Potential

Lateral spreading related to seismic activity typically involves lateral displacement of large, surficial blocks of non-liquefied soil when an underlying soil layer loses strength during seismic shaking. Lateral spreading usually develops in areas where sloping ground or large grade changes (including retaining walls) are present. Based on our understanding of the subsurface conditions, liquefaction risk, current site topography and proposed site grading, it is our opinion the risk of lateral spreading at the site is low.

Surface Rupture Potential

We reviewed published geologic seismic feature maps of the project vicinity, including maps available online from the DNR, USGS, and the Washington Department of Geology and Earth Sciences map "Faults and Earthquakes in Washington State" (Czajkowski and Bowman 2014). The nearest mapped faults to the

project site are the Tacoma fault zone (approximately 10 miles northeast of the site) and the Olympia structure (approximately 10 miles southwest). Locations of these fault zones have been inferred from geophysical studies and there are no known surface expressions of the fault. Based on our understanding of local geology, bedrock in the project area is covered by several hundred feet of glacial soils. Based on this information and the fault distance from the project site, it is our opinion the risk for seismic surface rupture at the site is low.

Infiltration Feasibility Assessment

Infiltration Approach

Stormwater management facilities at the site could include bioretention and on-site infiltration areas. We understand stormwater facilities will be designed in accordance with the City of DuPont 2022 Municipal Code. Per Section 22.01.090 of the DuPont Code, the Department of Ecology "Stormwater Management Manual for Western Washington" (SWMMWW), shall be used for stormwater drainage design.

According to the 2019 SWMMWW, infiltration rate of on-site soils can be determined by either in-situ testing (e.g., pilot infiltration tests) or correlation to grain size distribution from soil samples. Grain size analysis is only appropriate for soils unconsolidated by glacial advance. We interpret soils encountered in test pits at the site to consist of recessional outwash deposits, which are unconsolidated by glacial advance. Therefore, it is our opinion the grain-size analysis method is appropriate for the site.

Where necessary, we also refer to the 2021 Pierce County Stormwater and Site Development Manual (SMSDM).

Stormwater Code Requirements

Per Section V-5.6.SSC-5 of the SWMMWW, the base of infiltration facility shall be greater than 5 feet above seasonal high water, bedrock, or other low permeability layer; a reduced 3-foot minimum separation can be considered if groundwater mounding analysis is completed. Per Section V-5.2.7, the minimum required vertical separation increases to 15 feet if the infiltration facility has a contributing drainage area exceeding 1 acre.

- We anticipate static groundwater elevations to be below the depths of the completed test pits, and as deep as 20 feet below surrounding grade, based on recent review of published information and our work in the nearby area, including nearby apartments toward the east.
- Soils encountered in the explorations at depth were observed to consist of recessional outwash deposits and are relatively uniform across exploration locations. No clear demarcation was observed between high or low permeable layers, and in general, low permeability soils were not observed.
- Therefore, it is our opinion a detailed groundwater analysis will not be required for relatively shallow infiltration facilities anticipated for this project. We suggest we be consulted for further review if infiltration facilities will be more than about 10 feet deep (below existing site grade).

Additional limitations to those referenced above are required for infiltration on site. Other requirements (including setback distances) set forth by the city, county, SWMMWW or other appropriate agencies should be evaluated and applied, as required.

Soil Grain-Size Analysis

Using the recommended procedures in the 2019 SWMMWW, we estimated initial saturated hydraulic conductivity ($K_{sat,initial}$) of selected soil samples based on grain-size analysis results using the Massmann method. Calculated $K_{sat,initial}$ was then reduced through correction factors to produce a preliminary long-term design infiltration rate ($K_{sat,design}$). Correction factors in the SWMMWW are based on site variability and number of tests conducted (CF_v), uncertainty of the test method (CF_t), and the potential for long-term clogging due to siltation and bio-buildup (CF_m). Recommended correction factors are outlined in Section V-5.4 of the SWMMWW.

Table 2 below summarizes the partial and total correction factor(s) we considered in our analysis.

TABLE 2. GRAIN-SIZE ANALYSIS CORRECTION FACTOR SUMMARY

Issue	Correction Factor Value
Site Variability and Number of Locations Tested (CF_v)	0.80
Test Method (CF_t)	0.40
Siltation and Bio-Buildup (CF_m)	0.90
Total Correction Factor = CF_v x CF_r x CF_m	**CF_T = 0.29**

Table 3 below summarizes selected samples for grain-size analysis, calculated initial (short-term) infiltration rates and calculated design (long-term, with correction factors applied) infiltration rates. We considered a maximum initial infiltration rate of 100 inches per hour (corresponding to a maximum design rate of 29 inches per hour) in our analysis. This is consistent with guidance presented in the Pierce County SMSDM, which allows a maximum design infiltration rate of 30 inches per hour.

TABLE 3. ESTIMATED INFILTRATION RATE SUMMARY

Exploration	Depth (feet)	Elevation (feet)	Geologic Unit	USCS Soil Type	Percent Fines	*Ksat,initial* (in/hr)[1]	*Ksat,design* (in/hr)[2]
TP-2	6	203	Recessional Outwash	GP	1.7	100	29
TP-4	4	206	Recessional Outwash	SP	1.0	100	29
TP-7	4	207	Recessional Outwash	GP	1.1	100	29
TP-11	4	190	Recessional Outwash	GP	1.5	100	29
TP-12	6	196	Recessional Outwash	GP	1.0	100	29
TP-14	6	198	Recessional Outwash	GW	2.0	100	29
TP-15	4	199	Recessional Outwash	GP	1.2	54.7	15.7
TP-16	6	209	Recessional Outwash	GW	0.6	100	29
TP-20	6	192	Recessional Outwash	GP	4.2	94.1	27.1
TP-22	4	206	Recessional Outwash	GP	1.1	100	29

Notes:

[1] We considered a maximum initial (measured) infiltration rate of 100 inches per hour.

[2] Per Pierce County, maximum allowable design infiltration rate is 30 inches per hour.

Recommended Design Infiltration Rate

Calculated design infiltration rates for the selected samples vary between about 15 and 29 inches per hour (considering a maximum allowable design rate of 30 inches per hour in accordance with Pierce County SMSDM). The upper few feet of soils encountered in the test pits were occasionally weathered and somewhat siltier. We anticipate reduced infiltration rates within these siltier soils. Somewhat "cleaner" soils

(fewer fines) and increased calculated infiltration rates were typically observed at depth within unweathered recessional outwash deposits. These deposits were encountered at depths between about 0 and 3 feet at exploration locations.

For infiltration facilities founded within unweathered recessional outwash deposits, we recommend a design infiltration rate of 15 inches per hour be considered as an average value across the site. This value may be considered somewhat conservative and likely higher rates can be considered on a case-by-case basis as infiltration facility locations and depths are finalized. We can provide additional review and recommendations as the design progresses.

Discussion and Construction Considerations

- Based on our explorations the site appears to be underlain by recessional outwash deposits, which typically have moderate to high infiltration potential. Soils encountered in the test pits at depth were relatively uniform across exploration locations and no clear demarcation was observed between high or low permeable layers.
- We did not note significant soil layering nor presence of underlying impermeable layers in our explorations. Other considerations such as other required vertical separations, locations, set-backs, treatments, or other requirements presented in the SWMMWW, or other appropriate code documents should also be considered in the design.
- Actual infiltration rates may vary than those provided above. We should be contacted to review our analysis once infiltration facility location(s) and depth(s) have been determined to verify the rates are appropriate for final design and/or provide revised recommendations.
- Field infiltration testing, such as pilot infiltration tests (PITs) can be considered to verify the infiltration rates provided above. We suggest this be observed with Regulatory Stormwater agencies in the field as it may save time, effort, and water resources typically required to do a PIT.
- We recommend we be retained during construction to observe soil conditions at the base of the infiltration facilities and verify exposed soil conditions are as anticipated for the proposed design.

Recommended Additional Geotechnical Services

Recommendations provided in this report are based on the assumptions and design information stated herein. We welcome the opportunity to review and discuss construction plans and specifications for this project as they are being developed. In addition, GeoEngineers should be retained to review the project plans and specifications when complete to confirm that our design recommendations have been implemented as intended.

Satisfactory foundation and earthwork performance depend to a large degree on quality of construction. Sufficient monitoring of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated.

We recommend that GeoEngineers be retained to observe construction at the site to confirm that subsurface conditions are consistent with the site explorations and to confirm that the intent of project plans and specifications relating to earthwork, pavement and foundation construction are being met.

LIMITATIONS

We have prepared this letter for the exclusive use by Avenue 55, LLC and their authorized agents for the proposed DuPont Industrial Park project in DuPont, Washington. Avenue 55, LLC may distribute copies of this report to owner and owner's authorized agents and regulatory agencies as may be required for the project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this letter was prepared. The conclusions, recommendations, and opinions presented in this report are based on our professional knowledge, judgment and experience. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix A titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report, including a brief overview of our limitations. The limitations presented in our October 11, 2011 report provide additional information pertaining to the use of this report addendum.

Sincerely,
GeoEngineers, Inc.

Stuart Thielmann, PE
Geotechnical Engineer

Dennis (DJ) Thompson, PE
Associate

ST:DJT:leh

Attachments
Figure 1. Vicinity Map
Figure 2. Site Plan
Appendix A. Report Limitations and Guidelines for Use

One electronic copy submitted

Source(s):
- ESRI

Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Disclaimer: This figure was created for a specific purpose and project. Any use of this figure for any other project or purpose shall be at the user's sole risk and without liability to GeoEngineers. The locations of features shown may be approximate. GeoEngineers makes no warranty or representation as to the accuracy, completeness, or suitability of the figure, or data contained therein. The file containing this figure is a copy of a master document, the original of which is retained by GeoEngineers and is the official document of record.

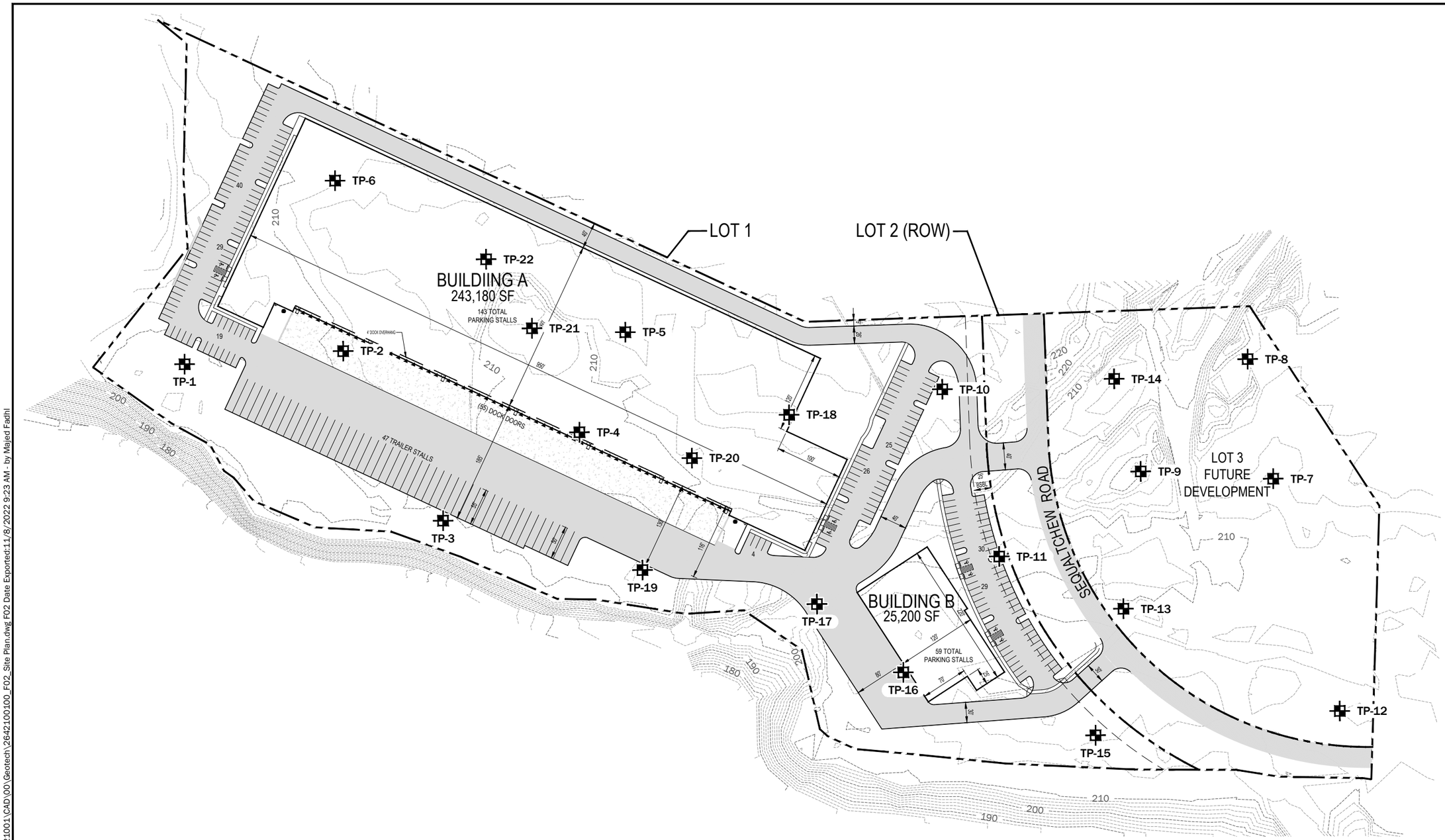
Vicinity Map

DuPont Industrial Park
DuPont, Washington

GeoEngineers

Figure 1

P:\26\26421001\GIS\26421001_Project\26421001_Project.aprx\2642100100_F01_VicinityMap Date Exported: 10/28/22 by mfadhl



Legend

TP-1 Test Pit by GeoEngineers, Inc., 2011

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Existing Grade Surface from Barghausen Consulting Engineers, Inc dated 8/8/2011. Designs from Innova Architechts dated January 2022.

Projection: NAD83 Washington State Planes, South Zone, US Foot

N W E S

150 0 150
Feet

Site Plan

DuPont Industrial Park
DuPont, Washington

GeoEngineers

Figure 2

\\geoengineers.com\WAN Projects\26\26421001\CAD\00\Geotech\26421001100_F02_Site Plan.dwg F02 Date Exported:11/8/2022 9:23 AM - by Majed Fadhl

APPENDIX A
Report Limitations and Guidelines for Use

APPENDIX A
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its reports. Please confer with GeoEngineers if you need to know more how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services are Performed for Specific Purposes, Persons and Projects

This report has been prepared for Avenue 55, LLC for the Project(s) specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our agreement with Avenue 55, LLC authorized October 17, 2022 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

A Geotechnical Engineering or Geologic Report is based on a Unique Set of Project-Specific Factors

This report has been prepared for the proposed DuPont Industrial Park project located in DuPont, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- Not prepared for you,
- Not prepared for your project,
- Not prepared for the specific site explored, or
- Completed before important project changes were made.

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

For example, changes that can affect the applicability of this report include those that affect:

- The function of the proposed structure;
- Elevation, configuration, location, orientation or weight of the proposed structure;
- Composition of the design team; or
- Project ownership.

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Information Provided by Others

GeoEngineers has relied upon certain data or information provided or compiled by others in the performance of our services. Although we use sources that we reasonably believe to be trustworthy, GeoEngineers cannot warrant or guarantee the accuracy or completeness of information provided or compiled by others.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Geotechnical Engineering Report Recommendations are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- Advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- Encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

Contractors are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Biological Pollutants

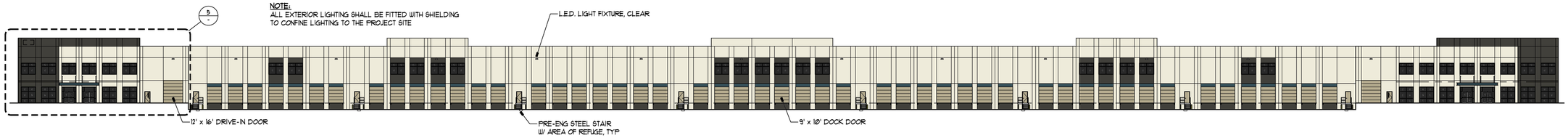
GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

Attachment 1h

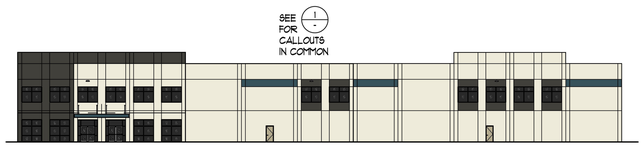
Received 11-21-2022

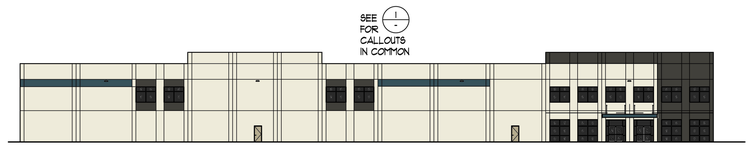
Received 11-21-2022



SOUTH ELEVATION 1

1/32" = 1'-0"



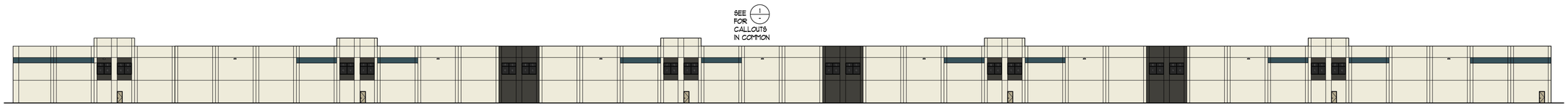


EAST ELEVATION 2

1/32" = 1'-0"

WEST ELEVATION 3

1/32" = 1'-0"

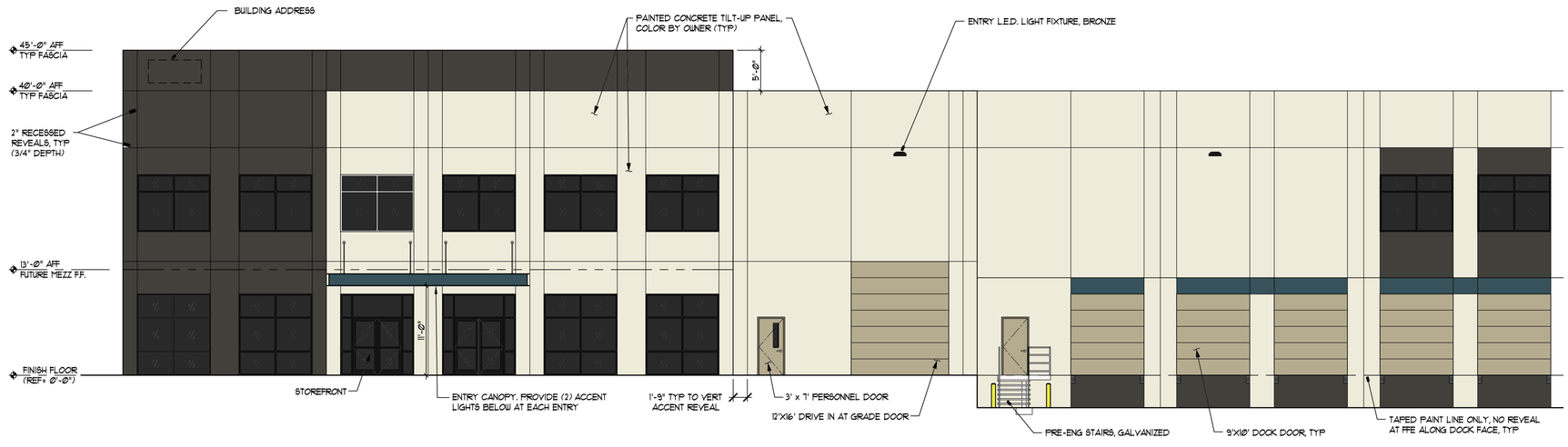


NORTH ELEVATION 4

1/32" = 1'-0"

EXTERIOR COLOR LEGEND:

- BUILDING BODY COLOR 1
  SHERWIN WILLIAMS SW 7632 "MODERN GRAY"
- BUILDING BODY COLOR 2
  SHERWIN WILLIAMS SW7674 "PEPPERCORN"
- STOREFRONT AND WINDOWS
  BLACK
- DOORS
  SHERWIN WILLIAMS SW7635 "PALISADE"
- CANOPIES
  AEP SPAN COOL REGAL BLUE



ENLARGED ELEVATION 5

1/8" = 1'-0"

INNOVA architects
950 Pacific Avenue, Suite 450
Tacoma, WA 98402
253-572-4903

Project Title:

DuPont 243
1700 Center Drive
DuPont, WA

Client:

AVENUE55
600 University Street, Suite 2305
Seattle, WA 98101
206-707-9696

Job Number:

22-012

Issue Set and Date:

SEPA Permit
November 14, 2022

NOT FOR CONSTRUCTION

REUSE OF DOCUMENTS
THIS DOCUMENT HAS BEEN SIGNED ELECTRONICALLY IN ACCORDANCE WITH WAC 196-27A-215 AND RCW 18.43.070 (3) (b) (iv). ANY UNAUTHORIZED ALTERATION OF ANY OF THE INFORMATION ON THIS DOCUMENT WILL INVALIDATE THE DOCUMENT, MY CERTIFICATION AND SIGNATURE.
THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF THE PROFESSIONAL SERVICE, IS THE PROPERTY OF INNOVA ARCHITECTS AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT WRITTEN AUTHORIZATION OF INNOVA ARCHITECTS.

4 _____
3 _____
2 _____
1 _____
Revisions:

Sheet Title:

Building A Elevations

Designed by: B. Ludwig, J. Eaves

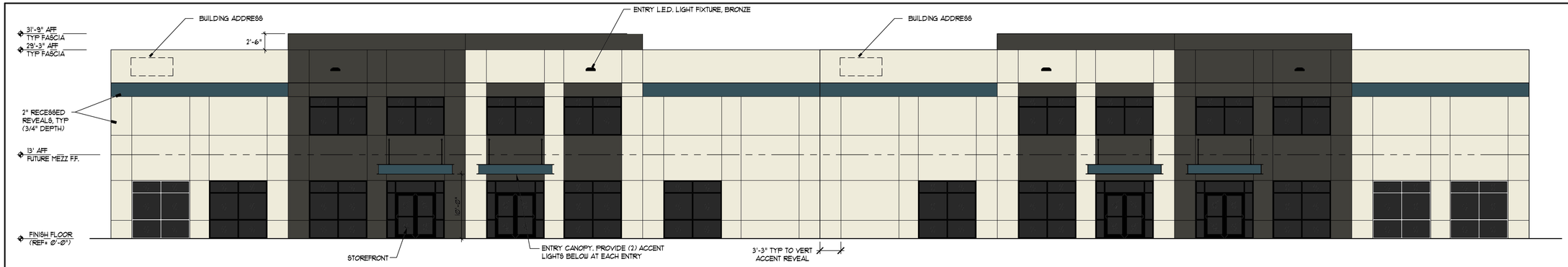
Drawn by: B. Ludwig, J. Eaves

Checked by: P. McCormick

Sheet Number:

A2.0a

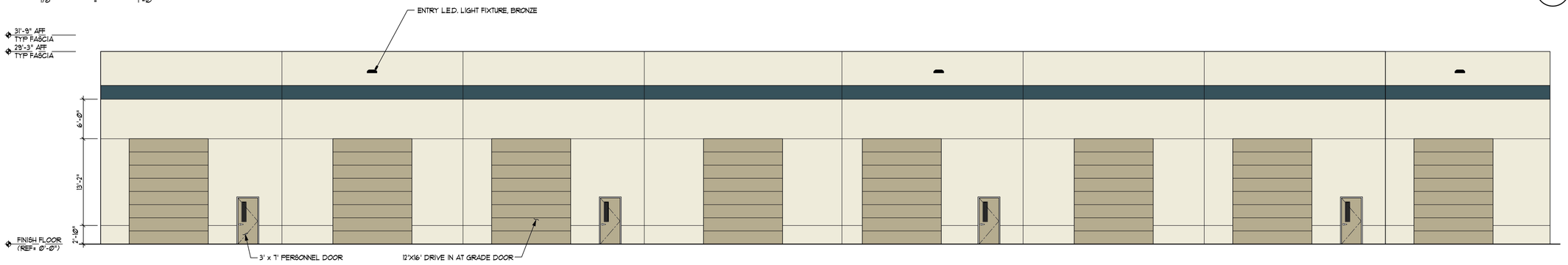
of Sheets



EAST ELEVATION

1/8" = 1'-0"

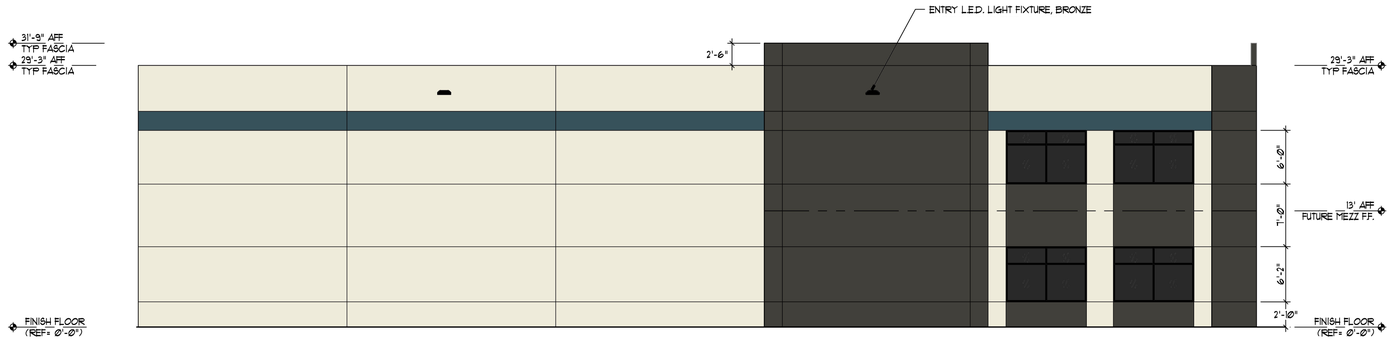
1



WEST ELEVATION

1/8" = 1'-0"

2



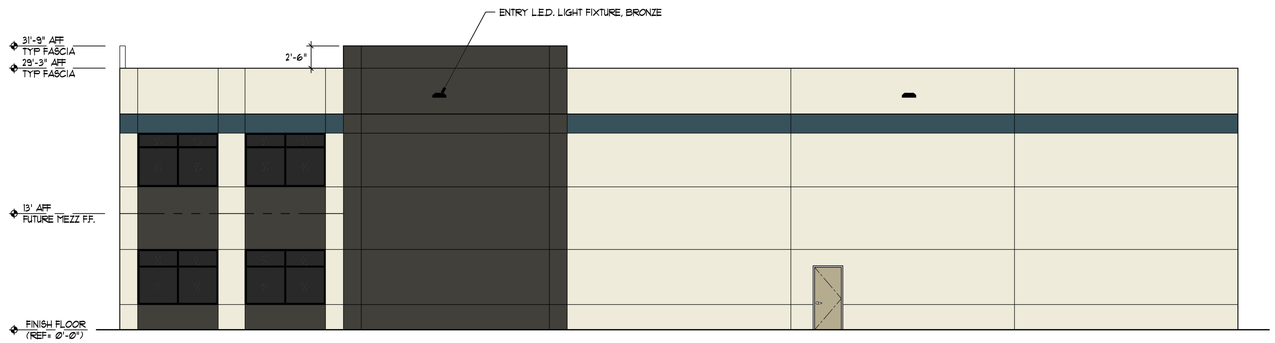
EXTERIOR COLOR LEGEND:

- BUILDING BODY COLOR 1
  SHERWIN WILLIAMS SW 7632 "MODERN GRAY"
- BUILDING BODY COLOR 2
  SHERWIN WILLIAMS SW7674 "PEPPERCORN"
- STOREFRONT AND WINDOWS
  BLACK
- DOORS
  SHERWIN WILLIAMS SW7635 "PALISADE"
- CANOPIES
  AEP SPAN COOL REGAL BLUE

SOUTH ELEVATION

1/8" = 1'-0"

3



NORTH ELEVATION

1/8" = 1'-0"

4

INNOVA architects
950 Pacific Avenue, Suite 450
Tacoma, WA 98402
253-572-4903

Project Title:

DuPont 243
1700 Center Drive
DuPont, WA

Client:

AVENUE55
600 University Street, Suite 2305
Seattle, WA 98101
206-707-9696

Job Number:

22-012

Issue Set and Date:

SEPA Permit
November 14, 2022

NOT FOR CONSTRUCTION

REUSE OF DOCUMENTS
THIS DOCUMENT HAS BEEN SIGNED ELECTRONICALLY IN ACCORDANCE WITH WAC 196-23-070 AND CHAPTER 19.34 RCW. UNAUTHORIZED ALTERATION OF ANY OF THE INFORMATION ON THIS DOCUMENT WILL INVALIDATE THE DOCUMENT, MY CERTIFICATION AND SIGNATURE. THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF SERVICE, IS AND SHALL REMAIN THE SOLE PROPERTY OF INNOVA ARCHITECTS AND SHALL NOT BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT WRITTEN AUTHORIZATION OF INNOVA ARCHITECTS.

Revisions:

Sheet Title:

Building B
Elevations

Designed by: B. Ludwig, J. Eaves

Drawn by: B. Ludwig, J. Eaves

Checked by: P. McCormick

Sheet Number:

A2.0b

of Sheets

Attachment 1i

Received 11-21-2022

City of DuPont
Planning Division
Land Use Application

1700 Civic Drive
DuPont, WA 98327
www.dupontwa.gov

Phone: (253) 912-5393
Fax: (253) 964-1455

City File Number: PLNG2022-027

All information listed in this application, or by applicable ordinance, must be submitted in order for a land use application to be determined complete. Only a complete land use application will be processed for conformance with adopted policies and requirements.

General Information:

Project name: DuPont 243

Applicant name: Ben Varin, Avenue 55

Address: 601 Union Street, Suite 2930, Seattle, WA 98101

Phone number: 206-707-9696 Fax number: Cell: 509-528-1893

Applicant's representative: Barghausen Consulting Engineers, Dan Balmelli / Betsy Dyer

Address: 18215-72nd Avenue South, Kent, WA 98032

Phone number: (425) 251-6222 Fax number: 209-396-8588 / 206-605-4072

Description of proposal. Be specific.

Construction of two office/warehouse use buildings on an approximately 20-acre vacant parcel of land. Site work improvements will include clearing and grading, paved truck parking and maneuvering areas, water and sanitary sewer extensions, storm water facility, landscaping and roadway improvements.

Site Information:

Assessor's Parcel Number(s): 011926-6005 and 6006

Area of site in square feet: 855,954 sq. ft.

Area of streets and alleys: 39,846 sq. ft.

Area of storm drainage improvements and conveyance lines: 13,238 sq. ft.

Area of open space and neighborhood green tracts: N/A

Area of critical areas and buffers: N/A

Area of building floors: 268,380 sq. ft.

Area of impervious surfaces: 268,380 sq. ft. (building) + 324,395 sq. ft. = 592,775 sq. ft.

Area of landscaping: 247,778 sq. ft.

Building height: approximately 45-foot

Number of dwelling units: N/A

Number of employees: approximately 90 to 120 persons

Number of disabled, compact and standard parking stalls: 194 standard stalls / 8 ADA accessible stalls / 0 compact

Description and area of all proposed tracts: N/A

Required Plans, Information and Fee:

(Quantity and minimum scale of each item or drawing is indicated in parenthesis. Plans shall be no larger than 24 by 36 inch sheet size)

1. ☐ Vicinity Map (include as part of site plan).
2. ☐ Site Plan drawn at 1 inch = 20 feet extending 100 feet beyond the property lines (eight copies).
3. ☐ Landscape Plans identifying: location, size and species of all landmark, historic and specimen trees; trees to be retained, specific tree protection measures drawn at 1 inch = 20 feet (seven copies).
4. ☐ Grading Plan with estimated dimensions and quantities of work involved drawn at 1 inch = 20 feet horizontal with 2' contour intervals (seven copies).
5. ☐ Storm Drainage and Utility Plan drawn at 1 inch = 20 feet (seven copies).
6. ☐ Preliminary Stormwater Management Report and calculations (three copies).
7. ☐ Roadway cross sections, (seven copies of single line drawing with dimensions).
8. ☐ One each 8 by 11 inch reduction of all drawings.
9. ☐ Average daily trips generated by the proposal based on the International Transportation Engineers Trip Generation Manual (two copies).
10. ☐ Building Elevations drawn at ¼ inch = 1 foot or larger. Identify building materials and colors (eight copies).
11. ☐ Title report of subject lot that is less than 30 days old to identify all encumbrances (two copies).
12. ☐ Draft of proposed covenants, conditions and restrictions related to the maintenance of open space or commonly owned improvements, if applicable (two copies).
13. ☐ Letter of Sewer Availability from Pierce County (two copies).
14. ☐ Letter of Water Availability from City of DuPont (two copies).
15. ☐ One site drawing showing the refuse enclosure(s) that is approved via signature and date by LeMay, Inc. Contact person is Charlie Maxwell, Public Relations Director, 253-537-8687.
16. ☐ Completed Environmental Checklist (two copies).
17. ☐ Completed Land Use Application (one copy).
18. ☐ Completed Agent Affidavit (one copy).
19. ☐ Filing fee(s).

Note:

Fill out and return this application with all material listed in the Required Plans, Information and Fee section. Submittal of all required plans, information and fees constitutes a complete application. You will be contacted by the City within 28 days of formal application submittal regarding whether the application is complete. Site work may not start until all necessary permits have been obtained. Paper or electronic drawings of the proposal may be requested for presentation purposes.

Daniel K. Balmelli, Agent 11-18-2022

(Applicant Signature) (Date)

Daniel K. Balmelli, P.E.

(Print name)

Barghausen Consulting Engineers

Attachment 1j

Received 11-21-2022

BARGHAUSEN

November 18, 2022

City of DuPont
Planning Division
1700 Civic Drive
DuPont, WA 98327

RE: SEPA Environmental and Land Use Review Application Package for
DuPont 243 located at
1700 Center Drive, DuPont, Pierce County, Washington
Tax Parcel No: 011926-6005 and 6006
Our Job No. 18666

On behalf of Avenue 55, Barghausen Consulting Engineers, Inc. is submitting the SEPA and Land Use application documents to begin review of the proposed DuPont 243 project. The project proposes to construct two office/warehouse buildings totaling approximately 268,380 square feet on an approximate 19.65-acre vacant parcel of land located on the west side of Sequalitchew Drive. In addition to construction of the new buildings, the project will include grading activities, paved truck maneuvering and truck and vehicular parking areas, landscaping, water and sanitary sewer extensions, stormwater collection and infiltration facility, extension of Sequalitchew Drive, franchise utility improvements, relocation and reconstruction of a portion of the existing Sequalitchew Trail and protection of an existing Mission Marker with a 50-foot buffer located within the middle east portion of the site.

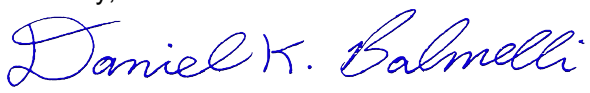
The following plans and documents are enclosed for review:

1. One (1) Electronic Copy Vicinity Map
2. One (1) Electronic Copy Preliminary Architectural Site Plan
3. One (1) Electronic Copy Preliminary Landscape Planting Plans
4. One (1) Electronic Copy Preliminary Civil Engineering Design Plans
5. One (1) Electronic Copy Stormwater Site Plan
6. One (1) Electronic Copy updated Traffic Impact Analysis
7. One (1) Electronic Copy Preliminary Building Elevations and Renderings
8. One (1) Electronic Copy Title Report
9. One (1) Electronic Copy Geotechnical Engineering Report
10. One (1) Electronic Copy Geotechnical Engineering Addendum dated May 11, 2018
11. One (1) Electronic Copy Geotechnical Engineering Addendum dated November 8, 2022
12. One (1) Electronic Copy Cultural Resources Report
13. One (1) Electronic Copy Cultural Resources Addendum Memo
14. One (1) Electronic Copy updated Tree Protection Plan

15. One (1) Electronic Copy request to Pierce County for Sewer Service Availability
16. One (1) Electronic Copy City of DuPont Water Availability
17. One (1) Electronic Copy request to LeMay, Inc. for Trash Enclosure Location Approval
18. One (1) Electronic Copy Environmental Checklist
19. One (1) Electronic Copy Land Use Application
20. One (1) Electronic Copy Authorization to Act as Agent Affidavit
21. One (1) Electronic Copy Mail Labels for Property Owners in 300-foot Radius (hard copy to City under separate cover)
22. One (1) Electronic Copy 300-foot Radius Map Exhibit
23. One (1) each Check in the amount of $3,750 for SEPA Review ($750) and Type IV Land Use Review ($3,000) Fees (check to City under separate cover)

We believe that the enclosed plans and documents compile a complete application package to begin the SEPA Environmental and Land Use review process for the DuPont 243 project. Please review at your earliest convenience and please feel free to contact me if you have any questions or need any additional information. Thank you.

Sincerely,



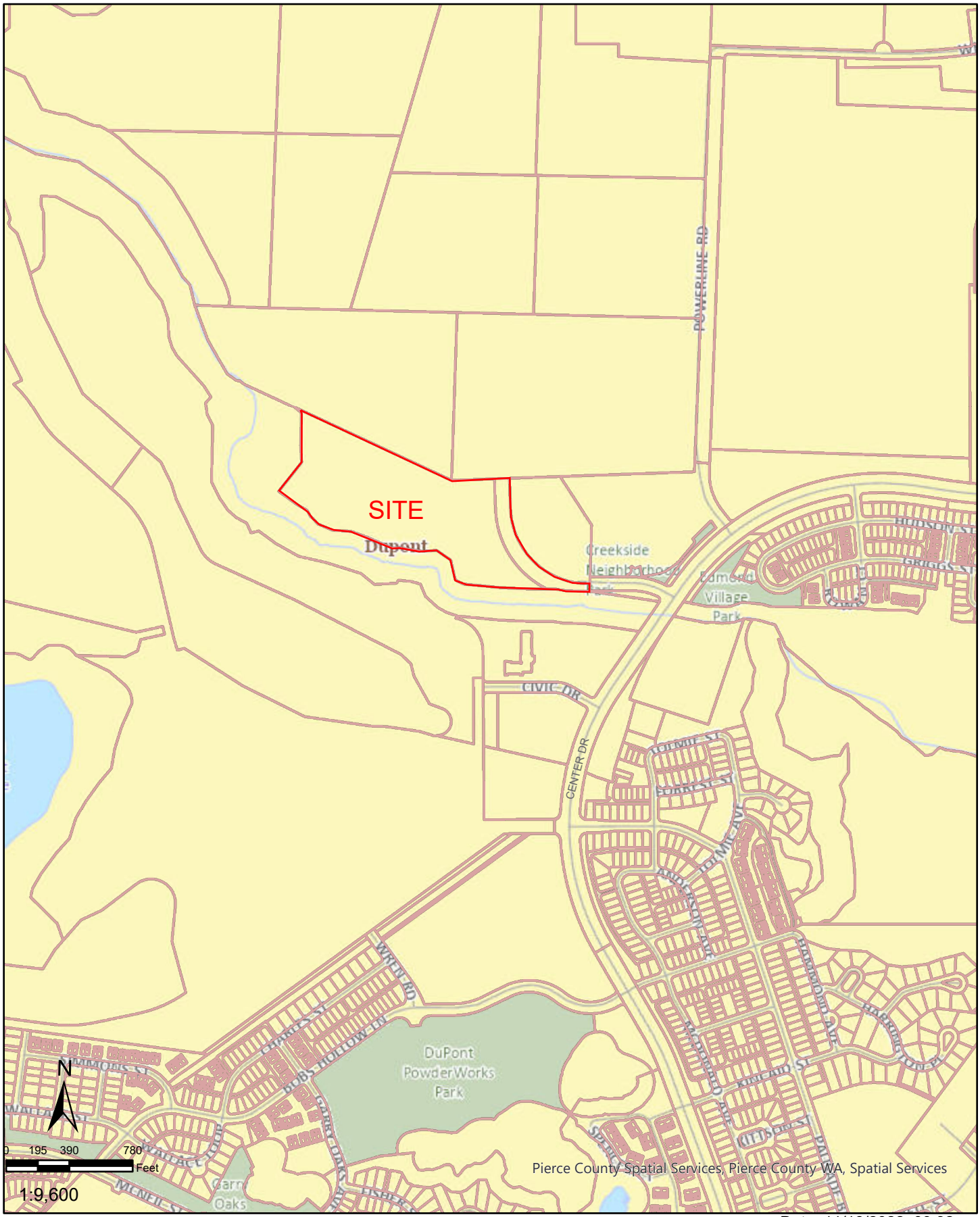
Daniel K. Balmelli, P.E.
Executive Vice President

DKB/bd
18666c.009.doc
enc: As Noted
cc: Ben Varin, Avenue 55
Drew Zaborowski, Avenue 55
Eric Cederstrand, DuPont Industrial Partners
Josh Towne, Barghausen Consulting Engineers, Inc.
Betsy Dyer, Barghausen Consulting Engineers, Inc.

Attachment 1k

Received 11-21-2022

DuPont 243 Vicinity Map



Disclaimer: The map features are approximate and have not been surveyed. Additional features not yet mapped may be present. Pierce County assumes no liability for variations ascertained by formal survey.

Date: 11/18/2022 09:32 AM

Attachment 1l

DATE	INVOICE	CUSTOMER	ACCT #	AMOUNT	DUE	AMT PAID	REC'D/Paid
1/26/2023	176254	Avenue 55	4853	$ 4,100.00	2/26/2023	$ 4,100.00	1/30/2023

Attachment 1m

ALTA COMMITMENT FOR TITLE INSURANCE

issued by agent:

CHICAGO TITLE
COMPANY OF WASHINGTON
NATIONAL COMMERCIAL SERVICES

Commitment Number:

222550-TC
Update Fifth
Commitment

NOTICE

IMPORTANT - READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and the Commitment Conditions, Chicago Title Insurance Company, a Florida corporation (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Amount of Insurance and the name of the Proposed Insured.

If all of the Schedule B, Part I-Requirements have not been met within one hundred eighty (180) days after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

Chicago Title Insurance Company

By:

Michael J. Nolan, President

Countersigned By:

Sara Bennett
Authorized Officer or Agent

Attest:

Marjorie Nemzura, Secretary

This page is only a part of a 2021 ALTA® Commitment for Title Insurance issued by Chicago Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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AMERICAN LAND TITLE ASSOCIATION

Transaction Identification Data, for which the Company assumes no liability as set forth in Commitment Condition 5.e.:

ISSUING OFFICE:	FOR SETTLEMENT INQUIRIES, CONTACT:
Title Officer: Adam Miller Chicago Title Insurance Company 1142 Broadway, Suite 200 Tacoma, WA 98402 Phone: 206-593-0591 Fax: 866-671-3908 Main Phone: (253)671-6623 Email: TeamTacoma@ctt.com	Escrow Officer: Shelley Anderson Chicago Title Company of Washington 1142 Broadway, Suite 200 Tacoma, WA 98402 Phone: 206-628-9746 Fax: 866-671-3915 Main Phone: (253)212-4000 Email: shelley.anderson@ctt.com

Order Number: 222550-TC

SCHEDULE A

1. Commitment Date: March 3, 2023 at 08:00 AM

2. Policy to be issued:

   (a) ALTA Owner's Policy 2021 w-WA Mod - Extended / Prior Title

Proposed Insured:	Avenue 55, LLC, a Washington limited liability company	
Proposed Amount of Insurance:	$3,686,865.00	
The estate or interest to be insured:	Fee Simple, as to Parcel A and Easement as to Parcels B, C and D	
Premium:	$	2,416.00
Tax:	$	248.85
Total:	$	2,664.85

   The above total includes an Extended Surcharge as follows:

Extended Surcharge Premium:	$	2,416.00
Extended Surcharge Tax:	$	248.85

3. The estate or interest in the Land at the Commitment Date is:

   Fee Simple, as to Parcel A and
   Easement as to Parcels B, C and D

4. The Title is, at the Commitment Date, vested in:

   DuPont Industrial Partners LLC, a Washington limited liability company

5. The Land is described as follows:

   SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

END OF SCHEDULE A

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EXHIBIT "A"

Legal Description

Parcel A:

Lot 3, City of DuPont Short Plat No. PLNG2020-017, recorded under Recording Number 202203015001, records of Pierce County, Washington.

Parcel B:

Private access easement over and across Lot 2, City of DuPont Short Plat No. PLNG2020-017, recorded under Recording Number 202203015001, records of Pierce County, Washington, as more particualrly delineated on said Short Plat.

Parcel C:

Easement for access as established by Access Easement recorded December 29, 2006, under Recording No. 200612290240, Records of Pierce County, Washington

Parcel D:

Easement for ingress, egress and utilities as established by Declaration of Easements for Ingress, Egress and Utilities, recorded November 18, 2009, under Recording Number 200911180327, Records of Pierce County, Washington.

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SCHEDULE B, PART I - Requirements

All of the following Requirements must be met:

1. The Proposed Insured must notify the Company in writing of the name of any party not referred to in this Commitment who will obtain an interest in the Land or who will make a loan on the Land. The Company may then make additional Requirements or Exceptions.

2. Pay the agreed amount for the estate or interest to be insured.

3. Pay the premiums, fees, and charges for the Policy to the Company.

4. Documents satisfactory to the Company that convey the Title or create the Mortgage to be insured, or both, must be properly authorized, executed, delivered, and recorded in the Public Records.

5. Additional requirements and/or exceptions may be added as details of the transaction are disclosed to, or become known by the Company.

6. Furnish recording instructions with the documents to be recorded in this transaction. Said instructions must address each requirement made herein, list any endorsements to be issued with the policy and specify the recording order of any documents furnished.

   The Company reserves the right to add additional items or make further requirements after review of the requested instructions prior to recording the documents or issuing any requested endorsement.

   The Company also reserves the right to charge any applicable additional fees for any endorsement requested.

7. If the Seller or Borrower intends to sign documents required to insure the transaction utilizing a remote online notary, please notify the Company immediately as additional underwriting requirements will need to be satisfied.

8. This item intentionally deleted

9. This item intentionally deleted

10. Payment of the real estate excise tax, if required.

    The Land is situated within the boundaries of local taxing authority of City of DuPont.

    CAUTION: Washington has a graduated excise tax rate for sales occurring on or after 1/1/2020 for most properties, although a flat rate applies to properties formally classified and specially valued as timberland or

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SCHEDULE B, PART I - Requirements
(continued)

agricultural land on the day of closing.

The rate of real estate excise tax to a sale on or after 1/1/2020 for properties which are not formally classified and specially valued as timberland or agricultural land is:

State portion: 1.10% on any portion of the sales price of $500,000 or less;
1.28% on any portion of the sales price above $500,000, up to $1,500,000;
2.75% on any portion of the sales price above $1,500,000, up to $3,000,000;
3.00% on any portion of the sales price above $3,000,000;

Local portion: 0.50% on the entire sales price.

An additional $5.00 State Technology Fee must be included in all excise tax payments.

If the transaction is exempt, an additional $5.00 Affidavit Processing Fee is required.

Any conveyance document must be accompanied by the official Washington State Excise Tax Affidavit, which can be found online at https://dor.wa.gov/get-form-or-publication/forms-subject/real-estate-excise-tax. The applicable excise tax must be paid and the affidavit approved at the time of the recording of the conveyance documents. (NOTE: Real Estate Excise Tax Affidavits must be printed as legal size forms).

11. The Company will require the following documents for review prior to the issuance of any title insurance predicated upon a conveyance or encumbrance from the entity named below.

Limited Liability Company: DuPont Industrial Partners LLC

a. A copy of its operating agreement, if any, and any and all amendments, supplements and/or modifications thereto, certified by the appropriate manager or member.

b. If a domestic Limited Liability Company, a copy of its Articles of Organization and all amendment thereto with the appropriate filing stamps.

c. If the Limited Liability Company is member-managed a full and complete current list of members certified by the appropriate manager or member.

d. A current dated certificate of good standing from the proper governmental authority of the state in which the entity was created

e. If less than all members, or managers, as appropriate, will be executing the closing documents, furnish evidence of the authority of those signing.

The Company reserves the right to add additional items or make further requirements after review of the requested documentation.

12. The Company will require the following documents for review prior to the issuance of any title insurance

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B, PART I - Requirements
(continued)

predicated upon a conveyance or encumbrance from the entity named below.

Limited Liability Company: Avenue 55, LLC

a. A copy of its operating agreement, if any, and any and all amendments, supplements and/or modifications thereto, certified by the appropriate manager or member.

b. If a domestic Limited Liability Company, a copy of its Articles of Organization and all amendment thereto with the appropriate filing stamps.

c. If the Limited Liability Company is member-managed a full and complete current list of members certified by the appropriate manager or member.

d. A current dated certificate of good standing from the proper governmental authority of the state in which the entity was created

e. If less than all members, or managers, as appropriate, will be executing the closing documents, furnish evidence of the authority of those signing.

The Company reserves the right to add additional items or make further requirements after review of the requested documentation.

13. **TO PROVIDE THE EXTENDED COVERAGE POLICY IDENTIFIED IN SCHEDULE A, GENERAL EXCEPTIONS A THROUGH D WILL BE CONSIDERED WHEN OUR INSPECTION AND REVIEW OF SURVEY IS COMPLETED AND UPON RECEIPT AND REVIEW OF THE COMPLETED OWNER'S AFFIDAVIT.**

If there have been recent improvements on the property within 90 days prior to closing we will require a signed indemnity agreement and a recent financial statement from each indemnitor.

If construction financing is to be insured, please contact the title officer for requirements.

The Company reserves the right to add additional exceptions or make further requirements after review of the property inspection and requested documentation.

14. A completed owner's affidavit (form to be supplied by the Company) will be required in connection with issuance of the policy(ies) shown in Schedule A.

15. The Company will require an ALTA/ACSM LAND TITLE SURVEY. If the owner of the Land the subject of this transaction is in possession of a current ALTA/ACSM LAND TITLE SURVEY, the Company will require that said survey be submitted for review and approval; otherwise, a new survey, satisfactory to the Company, must be prepared by a licensed land surveyor and supplied to the Company prior to the close of escrow.

The Company reserves the right to add additional items or make further requirements after review of the requested documentation.

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SCHEDULE B, PART I - Requirements
(continued)

16. The application for title insurance was placed by reference to only a street address or tax identification number. The proposed Insured must confirm that the legal description in this report covers the parcel(s) of Land requested to be insured. If the legal description is incorrect, the proposed Insured must notify the Company and/or the settlement company in order to prevent errors and to be certain that the legal description for the intended parcel(s) of Land will appear on any documents to be recorded in connection with this transaction and on the policy of title insurance.

END OF REQUIREMENTS

NOTES

The following matters will not be listed as Special Exceptions in Schedule B of the policy. There will be no coverage for loss arising by reason of the matters listed below because these matters are either excepted or excluded from coverage or are not matters covered under the insuring provisions of the policy.

Note A: Notice: Please be aware that due to the conflict between federal and state laws concerning the cultivation, distribution, manufacture or sale of marijuana, the Company is not able to close or insure any transaction involving Land that is associated with these activities.

Note B: FOR INFORMATIONAL PURPOSES ONLY:

The following may be used as an abbreviated legal description on the documents to be recorded, per Amended RCW 65.04.045. Said abbreviated legal description is not a substitute for a complete legal description within the body of the document:

Lot 3, SP No. PLNG2020-017, rec #202203015001
Tax Account No.: 011926-6007

Note C: There are NO conveyances affecting said Land recorded within 36 months of the date of this report.

Note D: This map/plat is being furnished as an aid in locating the herein described Land in relation to adjoining streets, natural boundaries and other land. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the Company does not insure dimensions, distances or acreage shown thereon.

END OF NOTES

END OF SCHEDULE B, PART I

This page is only a part of a 2021 ALTA® Commitment for Title Insurance issued by Chicago Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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SCHEDULE B, PART II - Exceptions

Some historical land records contain Discriminatory Covenants that are illegal and unenforceable by law. This Commitment and the Policy treat any Discriminatory Covenant in a document referenced in Schedule B as if each Discriminatory Covenant is redacted, repudiated, removed, and not republished or recirculated. Only the remaining provisions of the document will be excepted from coverage.

The Policy will not insure against loss or damage resulting from the terms and conditions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

GENERAL EXCEPTIONS

A. Rights or claims of parties in possession, or claiming possession, not shown by the Public Records.

B. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land.

C. Easements, prescriptive rights, rights-of-way, liens or encumbrances, or claims thereof, not shown by the Public Records.

D. Any lien, or right to a lien, for contributions to employee benefit funds, or for state workers' compensation, or for services, labor, or material heretofore or hereafter furnished, all as imposed by law, and not shown by the Public Records.

E. Taxes or special assessments which are not yet payable or which are not shown as existing liens by the Public Records.

F. Any lien for service, installation, connection, maintenance, tap, capacity, or construction or similar charges for sewer, water, electricity, natural gas or other utilities, or for garbage collection and disposal not shown by the Public Records.

G. Unpatented mining claims, and all rights relating thereto.

H. Reservations and exceptions in United States Patents or in Acts authorizing the issuance thereof.

I. Indian tribal codes or regulations, Indian treaty or aboriginal rights, including easements or equitable servitudes.

J. Water rights, claims or title to water.

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SCHEDULE B, PART II - Exceptions
(continued)

K. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I—Requirements are met.

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SCHEDULE B, PART II - Exceptions
(continued)

SPECIAL EXCEPTIONS

1. Reservation of all coal, oil, gas and mineral rights, and rights to explore for the same contained in the deed:

   Grantor: Weyerhaeuser Timber Co., a Washington corporation
   Recording Date: February 2, 1990
   Recording No.: 9002020329

   Said instrument was modified by instruments recorded under Recording Nos. 9405130746 and 9510310902.

   No determination has been made as to the current ownership or other matters affecting said reservations.

2. Covenants, conditions, restrictions and easements but omitting any covenants or restrictions, if any, including but not limited to those based upon race, color, religion, sex, sexual orientation, familial status, marital status, disability, handicap, national origin, ancestry, source of income, gender, gender identity, gender expression, medical condition or genetic information, as set forth in applicable state or federal laws, except to the extent that said covenant or restriction is permitted by applicable law, as set forth in the document

   Recording Date: August 24, 1992
   Recording No.: 9208240297

   Modification(s) of said covenants, conditions and restrictions:

   Recording Date: January 10, 1995
   Recording No.: 9501100462

   Modification(s) of said covenants, conditions and restrictions:

   Recording Date: March 15, 1995
   Recording No.: 9503150368

   Modification(s) of said covenants, conditions and restrictions:

   Recording Date: January 9, 1996
   Recording No.: 9601090368

   Modification(s) of said covenants, conditions and restrictions:

   Recording Date: January 26, 1996
   Recording No.: 9601260346

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SCHEDULE B, PART II - Exceptions
(continued)

Modification(s) of said covenants, conditions and restrictions:

Recording Date: March 12, 1996
Recording No.: 9603120707

Modification(s) of said covenants, conditions and restrictions:

Recording Date: September 11, 1996
Recording No.: 9609110555

Modification(s) of said covenants, conditions and restrictions:

Recording Date: December 24, 1996
Recording No.: 9612240420

Modification(s) of said covenants, conditions and restrictions:

Recording Date: October 17, 1997
Recording No.: 9710170646

Modification(s) of said covenants, conditions and restrictions:

Recording Date: March 17, 1998
Recording No.: 9803170310

Modification(s) of said covenants, conditions and restrictions:

Recording Date: July 7, 1998
Recording No.: 9807070025

Modification(s) of said covenants, conditions and restrictions:

Recording Date: December 20, 1999
Recording No.: 9912200109

Modification(s) of said covenants, conditions and restrictions:

Recording Date: December 6, 2000
Recording No.: 200012060263

Which is a re-recording of instrument recorded under Recording No. 200011080374.

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SCHEDULE B, PART II - Exceptions
(continued)

Modification(s) of said covenants, conditions and restrictions:

Recording Date: September 18, 2002
Recording No.: 200209180938

Modification(s) of said covenants, conditions and restrictions:

Recording Date: December 5, 2005
Recording No.: 200512050081

Modification(s) of said covenants, conditions and restrictions:

Recording Date: December 21, 2007
Recording No.: 200712210490

Modification(s) of said covenants, conditions and restrictions:

Recording Date: August 15, 2008
Recording No.: 200808150280

Modification(s) of said covenants, conditions and restrictions:

Recording Date: June 7, 2010
Recording No.: 201006070536

Modification(s) of said covenants, conditions and restrictions:

Recording Date: September 30, 2010
Recording No.: 201009301051

Modification(s) of said covenants, conditions and restrictions:

Recording Date: October 6, 2010
Recording No.: 201010060494

Modification(s) of said covenants, conditions and restrictions:

Recording Date: March 26, 2013
Recording No.: 201303260080

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SCHEDULE B, PART II - Exceptions
(continued)

3. This item intentionally deleted

4. Declaration of Restrictive Covenant regarding remedial action under Washington Model Toxics Control Act, including the terms and provisions thereof:

   Recording Date: December 23, 1997
   Recording No.: 9712230865

5. Declaration of Restrictive Covenant regarding remedial action under Washington Model Toxics Control Act, including the terms and provisions thereof:

   Recording Date: October 29, 1999
   Recording No.: 9910290750

6. Notice Regarding Historic District Designation and Declaration of Covenant, including the terms and provisions thereof:

   Recording Date: January 12, 2001
   Recording No.: 200101120143

   Modification(s) of said notice and covenant:

   Recording Date: June 12, 2006
   Recording No.: 200606120310

7. This item intentionally deleted

8. This item intentionally deleted

9. Declaration of Restrictive Covenant regarding remedial action under Washington Model Toxics Control Act, including the terms and provisions thereof:

   Recording Date: July 25, 2006
   Recording No.: 200607251020

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SCHEDULE B, PART II - Exceptions
(continued)

10. This item intentionally deleted

11. This item intentionally deleted

12. This item intentionally deleted

13. This item intentionally deleted

14. Amended and Restated Bylaws for Northwest Landing Commercial Owners Association, including the terms and provisions thereof:

    Recording Date: October 6, 2010
    Recording No.: 201010060495

15. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

    Granted to: City of DuPont
    Purpose: Temporary cul-de-sac
    Recording Date: January 30, 2014
    Recording No.: 201401300091
    Affects: Portion of said premises

16. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

    Granted to: Pierce County
    Purpose: Sanitary sewer main and appurtenances
    Recording Date: December 7, 2021
    Recording No.: 202112070104
    Affects: Portion of said premises

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SCHEDULE B, PART II - Exceptions
(continued)

17. Covenants, conditions, restrictions, recitals, reservations, easements, easement provisions, encroachments, dedications, building setback lines, notes, statements, and other matters, if any, but omitting any covenants or restrictions, if any, including but not limited to those based upon race, color, religion, sex, sexual orientation, familial status, marital status, disability, handicap, national origin, ancestry, or source of income, as set forth in applicable state or federal laws, except to the extent that said covenant or restriction is permitted by applicable law, as set forth on Short Plat No. PLNG2020-017:

Recording No: 202203015001

Those certain Temporary Easements established by document recorded under Recording No. 200906040666 and amended by document recorded under Recording No. 200911190365, and depicted on the face of said Short Plat, have expired by the terms of said documents.

18. Any unpaid assessments or charges and liability to further assessments or charges, for which a lien may have arisen (or may arise), all as provided for in instrument set forth below:

Imposed by: Northwest Landing Commercial Owners Association

19. This item intentionally deleted

20. General and special taxes and charges, payable February 15, delinquent if first half unpaid on May 1, second half delinquent if unpaid on November 1 of the tax year (amounts do not include interest and penalties):

Year:	2023
Tax Account No.:	011926-6007
Levy Code:	055
Assessed Value-Land:	$1,154,700.00
Assessed Value-Improvements:	$0.00

General and Special Taxes:	
Billed:	$9,109.14
Paid:	$0.00
Unpaid:	$9,109.14

21. The search did not disclose any open mortgages or deeds of trust of record, therefore the Company reserves the right to require further evidence to confirm that the property is unencumbered, and further reserves the right to make additional requirements or add additional items or exceptions upon receipt of the requested evidence.

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SCHEDULE B, PART II - Exceptions
(continued)

22. Any unrecorded leaseholds, right of vendors and holders of security interests on personal property installed upon the Land and rights of tenants to remove trade fixtures at the expiration of the terms.

23. Terms, provisions and conditions, as set forth in Access Easement:

Recording Date: December 29, 2006
Recording No.: 200612290240

Affects: Parcel C

24. Terms, provisions and conditions as set forth in Declaration of Easements for Ingress Egress and Utilities:

Recording Date: November 18, 2009
Recording No.: 200911180327

Affects: Parcel D

25. Any rights, interests, or claims which may exist or arise by reason of the following matters disclosed by survey:

Job No.: 18666
Dated: December 23, 2022
Prepared by: Barghausen Consulting Engineers, Inc.
Matters Shown: a) Fences do not conform to Easterly and Southerly property lines

END OF SCHEDULE B, PART II

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COMMITMENT CONDITIONS

1. DEFINITIONS

a. "Discriminatory Covenant": Any covenant, condition, restriction, or limitation that is unenforceable under applicable law because it illegally discriminates against a class of individuals based on personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or other legally protected class.

b. "Knowledge" or "Known": Actual knowledge or actual notice, but not constructive notice imparted by the Public Records.

c. "Land": The land described in Item 5 of Schedule A and improvements located on that land that by State law constitute real property. The term "Land" does not include any property beyond that described in Schedule A, nor any right, title, interest, estate, or easement in any abutting street, road, avenue, alley, lane, right-of-way, body of water, or waterway, but does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.

d. "Mortgage": A mortgage, deed of trust, trust deed, security deed, or other real property security instrument, including one evidenced by electronic means authorized by law.

e. "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.

f. "Proposed Amount of Insurance": Each dollar amount specified in Schedule A as the Proposed Amount of Insurance of each Policy to be issued pursuant to this Commitment.

g. "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.

h. "Public Records": The recording or filing system established under State statutes in effect at the Commitment Date under which a document must be recorded or filed to impart constructive notice of matters relating to the Title to a purchaser for value without Knowledge. The term "Public Records" does not include any other recording or filing system, including any pertaining to environmental remediation or protection, planning, permitting, zoning, licensing, building, health, public safety, or national security matters.

i. "State": The state or commonwealth of the United States within whose exterior boundaries the Land is located. The term "State" also includes the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, and Guam.

j. "Title": The estate or interest in the Land identified in Item 3 of Schedule A.

2. If all of the Schedule B, Part I-Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:

a. the Notice;

b. the Commitment to Issue Policy;

c. the Commitment Conditions;

d. Schedule A;

e. Schedule B, Part I-Requirements; and

f. Schedule B, Part II-Exceptions; and

g. a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company is not liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

a. The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:

i. comply with the Schedule B, Part I-Requirements;

ii. eliminate, with the Company's written consent, any Schedule B, Part II-Exceptions; or

iii. acquire the Title or create the Mortgage covered by this Commitment.

b. The Company is not liable under Commitment Condition 5.a. if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.

c. The Company is only liable under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.

This page is only a part of a 2021 ALTA® Commitment for Title Insurance issued by Chicago Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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AMERICAN LAND TITLE ASSOCIATION

(continued)

d. The Company's liability does not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Condition 5.a. or the Proposed Amount of Insurance.

e. The Company is not liable for the content of the Transaction Identification Data, if any.

f. The Company is not obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I-Requirements have been met to the satisfaction of the Company.

g. The Company's liability is further limited by the terms and provisions of the Policy to be issued to the Proposed Insured.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT; CHOICE OF LAW AND CHOICE OF FORUM

a. Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.

b. Any claim must be based in contract under the State law of the State where the Land is located and is restricted to the terms and provisions of this Commitment. Any litigation or other proceeding brought by the Proposed Insured against the Company must be filed only in a State or federal court having jurisdiction.

c. This Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.

d. The deletion or modification of any Schedule B, Part II-Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.

e. Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.

f. When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT IS ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for closing, settlement, escrow, or any other purpose.

8. PRO-FORMA POLICY

The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. CLAIMS PROCEDURES

This Commitment incorporates by reference all Conditions for making a claim in the Policy to be issued to the Proposed Insured. Commitment Condition 9 does not modify the limitations of liability in Commitment Conditions 5 and 6.

10. CLASS ACTION

ALL CLAIMS AND DISPUTES ARISING OUT OF OR RELATING TO THIS COMMITMENT, INCLUDING ANY SERVICE OR OTHER MATTER IN CONNECTION WITH ISSUING THIS COMMITMENT, ANY BREACH OF A COMMITMENT PROVISION, OR ANY OTHER CLAIM OR DISPUTE ARISING OUT OF OR RELATING TO THE TRANSACTION GIVING RISE TO THIS COMMITMENT, MUST BE BROUGHT IN AN INDIVIDUAL CAPACITY. NO PARTY MAY SERVE AS PLAINTIFF, CLASS MEMBER, OR PARTICIPANT IN ANY CLASS OR REPRESENTATIVE PROCEEDING. ANY POLICY ISSUED PURSUANT TO THIS COMMITMENT WILL CONTAIN A CLASS ACTION CONDITION.

11. ARBITRATION - INTENTIONALLY DELETED

END OF CONDITIONS

This page is only a part of a 2021 ALTA® Commitment for Title Insurance issued by Chicago Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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AMERICAN LAND TITLE ASSOCIATION

RECORDING REQUIREMENTS

Effective January 1, 1997, document format and content requirements have been imposed by Washington Law. Failure to comply with the following requirements may result in rejection of the document by the county recorder or imposition of a $50.00 surcharge.

First page or cover sheet:

3" top margin containing nothing except the return address.

1" side and bottom margins containing no markings or seals.

Title(s) of documents.

Recording no. of any assigned, released or referenced document(s).

Grantors names (and page no. where additional names can be found).

Grantees names (and page no. where additional names can be found).

Abbreviated legal description (Lot, Block, Plat Name or Section, Township, Range and Quarter, Quarter Section for unplatted). Said abbreviated legal description is not a substitute for a complete legal description which must also appear in the body of the document.

Assessor's tax parcel number(s).

Return address (in top 3" margin).

**A cover sheet can be attached containing the above format and data if the first page does not contain all required data.

Additional Pages:

1" top, side and bottom margins containing no markings or seals.

All Pages:

No stapled or taped attachments. Each attachment must be a separate page. All notary and other pressure seals must be smudged for visibility. Font size of 8 points or larger.

WIRE SAFE™ | Inquire before you wire!

WIRE FRAUD ALERT

This Notice is not intended to provide legal or professional advice.
If you have any questions, please consult with a lawyer.

All parties to a real estate transaction are targets for wire fraud and many have lost hundreds of thousands of dollars because they simply relied on the wire instructions received via email, without further verification. **If funds are to be wired in conjunction with this real estate transaction, we strongly recommend verbal verification of wire instructions through a known, trusted phone number prior to sending funds.**

In addition, the following non-exclusive self-protection strategies are recommended to minimize exposure to possible wire fraud.

- **NEVER RELY** on emails purporting to change wire instructions. Parties to a transaction rarely change wire instructions in the course of a transaction.
- **ALWAYS VERIFY** wire instructions, specifically the ABA routing number and account number, by calling the party who sent the instructions to you. DO NOT use the phone number provided in the email containing the instructions, use phone numbers you have called before or can otherwise verify. **Obtain the number of relevant parties to the transaction as soon as an escrow account is opened.** DO NOT send an email to verify as the email address may be incorrect or the email may be intercepted by the fraudster.
- **USE COMPLEX EMAIL PASSWORDS** that employ a combination of mixed case, numbers, and symbols. Make your passwords greater than eight (8) characters. Also, change your password often and do NOT reuse the same password for other online accounts.
- **USE MULTI-FACTOR AUTHENTICATION** for email accounts. Your email provider or IT staff may have specific instructions on how to implement this feature.

For more information on wire-fraud scams or to report an incident, please refer to the following links:

Federal Bureau of Investigation:
http://www.fbi.gov

Internet Crime Complaint Center:
http://www.ic3.gov

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FIDELITY NATIONAL FINANCIAL
PRIVACY NOTICE

Effective January 1, 2023

Fidelity National Financial, Inc. and its majority-owned subsidiary companies (collectively, "FNF," "our," or "we") respect and are committed to protecting your privacy. This Privacy Notice explains how we collect, use, and protect personal information, when and to whom we disclose such information, and the choices you have about the use and disclosure of that information.

A limited number of FNF subsidiaries have their own privacy notices. If a subsidiary has its own privacy notice, the privacy notice will be available on the subsidiary's website and this Privacy Notice does not apply.

Collection of Personal Information

FNF may collect the following categories of Personal Information:

- contact information (*e.g.*, name, address, phone number, email address);
- demographic information (*e.g.*, date of birth, gender, marital status);
- identity information (*e.g.* Social Security Number, driver's license, passport, or other government ID number);
- financial account information (*e.g.* loan or bank account information); and
- other personal information necessary to provide products or services to you.

We may collect Personal Information about you from:

- information we receive from you or your agent;
- information about your transactions with FNF, our affiliates, or others; and
- information we receive from consumer reporting agencies and/or governmental entities, either directly from these entities or through others.

Collection of Browsing Information

FNF automatically collects the following types of Browsing Information when you access an FNF website, online service, or application (each an "FNF Website") from your Internet browser, computer, and/or device:

- Internet Protocol (IP) address and operating system;
- browser version, language, and type;
- domain name system requests; and
- browsing history on the FNF Website, such as date and time of your visit to the FNF Website and visits to the pages within the FNF Website.

Like most websites, our servers automatically log each visitor to the FNF Website and may collect the Browsing Information described above. We use Browsing Information for system administration, troubleshooting, fraud investigation, and to improve our websites. Browsing Information generally does not reveal anything personal about you, though if you have created a user account for an FNF Website and are logged into that account, the FNF Website may be able to link certain browsing activity to your user account.

Other Online Specifics

Cookies. When you visit an FNF Website, a "cookie" may be sent to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive. Information gathered using cookies helps us improve your user experience. For example, a cookie can help the website load properly or can customize the display page based on your browser type and user preferences. You can choose whether or not to accept cookies by changing your Internet browser settings. Be aware that doing so may impair or limit some functionality of the FNF Website.

Web Beacons. We use web beacons to determine when and how many times a page has been viewed. This information is used to improve our websites.

Do Not Track. Currently our FNF Websites do not respond to "Do Not Track" features enabled through your browser.

Links to Other Sites. FNF Websites may contain links to unaffiliated third-party websites. FNF is not responsible for the privacy practices or content of those websites. We recommend that you read the privacy policy of every website you visit.

Use of Personal Information

FNF uses Personal Information for three main purposes:

- To provide products and services to you or in connection with a transaction involving you.
- To improve our products and services.
- To communicate with you about our, our affiliates', and others' products and services, jointly or independently.

When Information Is Disclosed

We may disclose your Personal Information and Browsing Information in the following circumstances:

- to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure;
- to affiliated or nonaffiliated service providers who provide or perform services or functions on our behalf and who agree to use the information only to provide such services or functions;
- to affiliated or nonaffiliated third parties with whom we perform joint marketing, pursuant to an agreement with them to jointly market financial products or services to you;
- to law enforcement or authorities in connection with an investigation, or in response to a subpoena or court order; or
- in the good-faith belief that such disclosure is necessary to comply with legal process or applicable laws, or to protect the rights, property, or safety of FNF, its customers, or the public.

The law does not require your prior authorization and does not allow you to restrict the disclosures described above. Additionally, we may disclose your information to third parties for whom you have given us authorization or consent to make such disclosure. We do not otherwise share your Personal Information or Browsing Information with nonaffiliated third parties, except as required or permitted by law.

We reserve the right to transfer your Personal Information, Browsing Information, and any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets, or in the event of bankruptcy, reorganization, insolvency, receivership, or an assignment for the benefit of creditors. By submitting Personal Information and/or Browsing Information to FNF, you expressly agree and consent to the use and/or transfer of the foregoing information in connection with any of the above described proceedings.

Security of Your Information

We maintain physical, electronic, and procedural safeguards to protect your Personal Information.

Choices With Your Information

Whether you submit Personal Information or Browsing Information to FNF is entirely up to you. If you decide not to submit Personal Information or Browsing Information, FNF may not be able to provide certain services or products to you.

For California Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties, except as permitted by California law. For additional information about your California privacy rights, please visit the "California Privacy" link on our website (https://fnf.com/pages/californiaprivacy.aspx) or call (888) 413-1748.

For Nevada Residents: We are providing this notice pursuant to state law. You may be placed on our internal Do Not Call List by calling FNF Privacy at (888) 714-2710 or by contacting us via the information set forth at the end of this Privacy Notice. For further information concerning Nevada's telephone solicitation law, you may contact: Bureau of Consumer Protection, Office of the Nevada Attorney General, 555 E. Washington St., Suite 3900, Las Vegas, NV 89101; Phone number: (702) 486-3132; email: aginquiries@ag.state.nv.us.

For Oregon Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties for marketing purposes, except after you have been informed by us of such sharing and had an opportunity to indicate that you do not want a disclosure made for marketing purposes.

For Vermont Residents: We will not disclose information about your creditworthiness to our affiliates and will not disclose your personal information, financial information, credit report, or health information to nonaffiliated third parties to market to you, other than as permitted by Vermont law, unless you authorize us to make those disclosures.

For Virginia Residents: For additional information about your Virginia privacy rights, please email privacy@fnf.com or call (888) 714-2710.

Information From Children

The FNF Websites are not intended or designed to attract persons under the age of eighteen (18). We do not collect Personal Information from any person that we know to be under the age of thirteen (13) without permission from a parent or guardian.

International Users

FNF's headquarters is located within the United States. If you reside outside the United States and choose to provide Personal Information or Browsing Information to us, please note that we may transfer that information outside of your country of residence. By providing FNF with your Personal Information and/or Browsing Information, you consent to our collection, transfer, and use of such information in accordance with this Privacy Notice.

FNF Website Services for Mortgage Loans

Certain FNF companies provide services to mortgage loan servicers, including hosting websites that collect customer information on behalf of mortgage loan servicers (the "Service Websites"). The Service Websites may contain links to both this Privacy Notice and the mortgage loan servicer or lender's privacy notice. The sections of this Privacy Notice titled When Information is Disclosed, Choices with Your Information, and Accessing and Correcting Information do not apply to the Service Websites. The mortgage loan servicer or lender's privacy notice governs use, disclosure, and access to your Personal Information. FNF does not share Personal Information collected through the Service Websites, except as required or authorized by contract with the mortgage loan servicer or lender, or as required by law or in the good-faith belief that such disclosure is necessary: to comply with a legal process or applicable law, to enforce this Privacy Notice, or to protect the rights, property, or safety of FNF or the public.

Your Consent To This Privacy Notice; Notice Changes

By submitting Personal Information and/or Browsing Information to FNF, you consent to the collection and use of the information in accordance with this Privacy Notice. We may change this Privacy Notice at any time. The Privacy Notice's effective date will show the last date changes were made. If you provide information to us following any change of the Privacy Notice, that signifies your assent to and acceptance of the changes to the Privacy Notice.

Accessing and Correcting Information; Contact Us

If you have questions or would like to correct your Personal Information, visit FNF's Privacy Inquiry Website or contact us by phone at (888) 714-2710, by email at privacy@fnf.com, or by mail to:

Fidelity National Financial, Inc.
601 Riverside Avenue,
Jacksonville, Florida 32204
Attn: Chief Privacy Officer

Attachment 1n

Pierce County
Planning & Public Works

Jen Tetatzin, PE, PMP — Director

2401 South 35th Street, Room 2
Tacoma, Washington 98409-7460
piercecountywa.gov/ppw

March 10, 2023

Avenue 55
Attn.: Ben Varin
601 Union Street, Ste 2930
Seattle, WA 98101
bvarin@avenue55.net
(Email Transmittal Only)

Subject: Site Specific Sewer Information for (3) Proposed Commercial Buildings
Application Number: SWDR #1004100
Application Expiration Date: 2/13/2024
Associated Sewer Service Permit Application Numbers: To be determined
Associated Sewer Line Extension Permit Application Number: To be determined
Building Permit: City of Dupont
Associated application: SWDR #1000894
Site Address: 1700 Center Drive
Parcel Numbers: 011926-6005, -6006 &-6007

Dear Ben:

Our office has researched the site-specific sewer information regarding the subject request and has the following comments.

Pierce County Planning and Public Works will not provide a commitment or guarantee of sewer availability for the subject proposal until payment of connection charges has been received by the Sewer Division. This letter shall be used for informational purposes only in support of a Land Use Application and shall not be misconstrued by the proponent or reviewing agency as a commitment on behalf of the Sewer Division.

This letter does not convey any vested rights or any exclusive privileges. It does not authorize any construction. It does not eliminate the need to comply with any County, State, Federal or local standards or regulations or the need to obtain all necessary permits. This letter is not a waiver of any departmental requirements. The information presented in this letter is general in nature and is based on estimates; therefore, it should not be relied upon as completely accurate.

Submittals for new applications and resubmittals for existing applications must be made online at http://piercecountywa.org/pals.

The payment of permit fees and connection charges can also be made at the same website. For payment of permit fees by mail or in person, use the following address: Pierce County Development Center (Annex), 2401 South 35th Street, Room 2, Tacoma, WA 98409.

Sewer Division Standard Plans and Forms, including handouts, bulletins, applications, and checklists can be downloaded in PDF format from the following webpage: www.piercecountywa.org/sewer.

PROPOSAL:

We understand that (3) commercial buildings are proposed: (1) 240,00 sq ft manufacturing warehouse and (1) 25,000 sq ft warehouse on Parcel 011926-6005 on the west side of Sequalitchew Drive and (1) 60,000 sq ft "flex" space on Parcel 011926-6007 on the east side of Sequalitchew Drive.

REQUIREMENT TO CONNECT

1. The subject property is located within the Pierce County Sewer Service area.

2. The subject property is within 300 feet of an existing accessible sanitary sewer which has sufficient capacity to accommodate the proposed development on the subject property.

3. The proposed buildings on the subject properties are required to connect to sanitary sewer.

CONNECTION POINT

1. Record drawings do not show any existing side sewer stubs to serve the subject tax parcels. The point of connection to sewer is manhole SSMH #15875 in Sequalitchew Drive at the southeast corner of the site. There is an existing 5-foot long, 8-inch diameter stub at 0.5 % slope west into SSMH #15875 that is approximately 11.5-feet deep at its capped end.

2. A sewer map and record drawings are enclosed.

APPLICATIONS/PERMITS

Prior to connection to the existing public sanitary sewer, the applicant must design and construct the required sanitary sewer facilities, at their expense, and comply with the following requirements.

1. A **Sewer Line Extension Permit** is required to extend the 8-inch sewer main from SSMH #15875 north up Sequalitchew Drive to serve the three proposed buildings. The 8-inch gravity main must be extended north up Sequalitchew Drive to the northern limits of Parcels 011926-6005 and -6007. Assume a pipe slope of 1.0% for the required sewer line extension. An 8-inch sewer main must also be extended into Parcel 011926-6005 to serve the two proposed buildings on that parcel.

a. Complete and submit form A1, ***Sewer Line Extension Permit Application***. A single application may be made for the public off-site sanitary sewer line extension and the private on-site sanitary sewer line extension.

b. Submit sanitary sewer plans stamped and signed by a WA State licensed professional engineer per County standards for review and approval, including required easements, if applicable. Proposed public sewer facilities and proposed private sewer facilities must be shown on separate engineered plans even though they may be covered under one sewer line extension permit.

c. Submit a complete, itemized, stamped, and signed engineer's construction cost estimate for all the sanitary sewage facilities to be constructed within the existing public right-of-way and public sanitary sewer easements.

d. Pay the Sewer Line Extension Permit Fees. The Sewer Line Extension Permit Fees consists of two parts: the Plan Review Fees and the Inspection Fees. The Sewer Line Extension Permit Plan Review Fees must be paid at the time of application, and the Sewer Line Extension Permit Inspection Fees must be paid prior to the issuance of the Sewer Line Extension Permit.

   See form **A1, *Sewer Line Extension Permit Application***, online for fees at:
   https://www.piercecountywa.gov/1654/Sewer-Forms-Plans-Group?NID=1654

2. A separate **Pretreatment Review** is required for each building and commercial tenant space. The user must comply with all Pierce County pretreatment requirements.

   a. See form H1, ***What Type of Industrial User Are You?*** to determine what type of pretreatment review application must be submitted. Submit the appropriate form (**A4**, ***Insignificant* / A5, *Minor* / A6, *Significant) Industrial User Pretreatment Review Application***. In addition, submit the required supplemental information and documents, and pay the Sewer Development Application Review Fee indicated on the application form.

      See form H1for guidance and forms A4, A5, and A6 for fees online at:
      https://www.piercecountywa.gov/1654/Sewer-Forms-Plans-Group?NID=1654

   b. Submit the required supplemental information referenced in the following bulletins:

      1. Bulletin B4, *Floor/Plumbing Plan*
      2. Bulletin B5, *Documented Water Use Data*

   c. If your facility will have floor drains, catch basins, sumps or any other outlet to the sewer system located in the same area/room where chemicals, paints, dyes, solvents, cleaners, or fuels are stored or used without spill containment measures, an Accidental Spill Prevention Plan will be required. Complete and submit form A12, ***Accidental Spill Prevention Plan Application*** along with the additional plan review fee.

3. A separate **Sewer Service Permit** is required to connect each of the proposed **commercial** buildings to the existing sanitary sewer system.

    a. Complete and submit form **A3, *Commercial Sewer Service Permit Application***, for each building to be connected along with a sewer site plan.

    b. A **commercial pump** may be required.

        i. County topographical information indicates that gravity sewer service may not be available for some proposed buildings depending upon their location on the property.
        ii. If sewer service cannot be provided by gravity, then submit sanitary sewer plans with a **commercial pump**, stamped, and signed by a WA State licensed professional engineer per County standards for review and approval, including required easements, if applicable.
        iii. Pay additional permit fees for a **commercial pump**.

    c. Pay the Sewer Service Permit Application Fees. The Sewer Service Permit Fees consists of two parts: the Plan Review Fees and the Inspection Fees. The Sewer Service Permit Plan Review Fees must be paid at the time of application, and the Sewer Service Permit Inspection Fees must be paid prior to the issuance of the Sewer Service Permit.

    See form **A3, *Commercial Sewer Service Permit Application*,** for fees online at: https://www.piercecountywa.gov/1654/Sewer-Forms-Plans-Group?NID=1654

SEWER CONTRACTOR

1. The applicant's sewer contractor must be listed on the Sewer Division's current Registered Side Sewer Contractors List.

2. If the applicant's sewer contractor is not currently registered with Pierce County, please have them follow the registration requirements prior to attempting to obtain the issued sewer line extension permit and sewer service permits. Please see form **T12**, ***Sewer Division Street Obstruction Bond***, for registration requirements.

3. Prior to the issuance of any sewer permits, the side sewer contractor must obtain any necessary right-of-way permit from the City of DuPont. It is the responsibility of the applicant to provide copies of the approved sewer plans to the right-of-way office, which is retained by the right-of-way permit office, at the time of the permit application or a right-of-way permit will not be issued.

CONNECTION CHARGES

1. Connection charges will be collected at the time of connection to the public sanitary sewer system, according to the rates in effect at that time.

2. Based on the information provided, outlined below is the total estimated sanitary sewer connection charge.

   Parcel Numbers: 011926-6005, -6006 & -6007
   ULID: Dupont
   Basin: Dupont

Estimated Connection Charge for (3) Buildings:	
Basin Area Charge: [7,000 GDP X (1 RE / 200 GPD)] X $1,916.00/RE	=$ 60,967.12
Treatment Plant Capacity Charge: [7,000 GDP X (1 RE / 200 GPD)] X $4,047.00/RE	=$ 128,775.54
Total Estimated Connection Charge for (3) Buildings:	**=$ 189,742.66**

   The connection charges shown above are based on an expected water usage of 7,000 gallons per day (GPD) and a standard conversion factor of 220 GPD per Residential Equivalent, or RE. Note that the connection charges shown above may change based on additional information to be gathered under the required pretreatment reviews.

3. **The connection charges for commercial uses in incorporated areas or King County must be paid in full prior to issuance of sewer service permits and prior to approval of associated building permits.**

4. Please note that any future Capital Improvement Projects or Reimbursement Agreements or Latecomers Agreements between the County and other property owners to construct improvements downstream of the subject property can result in a significantly higher Connection Charge.

5. Please note that the Capacity Charges, Basin Area Charges, and future monthly Sewer Service fees for all commercial buildings are calculated based on actual water flows when available. Therefore, we strongly recommend that the owner have a separate meter installed and a separate account initiated with the local water purveyor for irrigation water and any other water supply that will not be entering the sanitary sewer system. If a separate water meter and account is not feasible, the owner may enter into a Sub-metering Agreement with the County. Connection Charge requirements will not be recalculated based on sub-metered usage until the sub-meter has been installed according to approved plans, the Sub-metering Agreement approved by the County, and at least 12 months of sub-metered water readings submitted to our office for review. For further details regarding the ***Water Sub-metering Plan Review Application*** (A17) see Bulletin B21, ***Water Sub-metering Program***.

6. The total estimated connection charge will be recalculated at the time the owner purchases it based on the rates in effect at that time. On February 1 of each year, unless otherwise determined by ordinance of the Council, in accordance with Pierce County Ordinance 2019-28s, “the rates for the area charge and the treatment plant capacity charge shall be adjusted annually by the same amount as the percentage change in the Consumer Price Index for All Urban Consumers (CPI-U) for Seattle-Tacoma-Bremerton Metropolitan Statistical Area for the Preceding 12-month period.”.

7. Once paid, connection charges are credited against the parcel and are only refundable to the person(s) or entity that is the owner of record at the time of refund.

Note that the fees and connection charges shown in this letter are subject to change without prior notification.

If you have any questions regarding the above, please contact me at (253) 798-3076 or joseph.zukauskas@piercecountywa.gov.

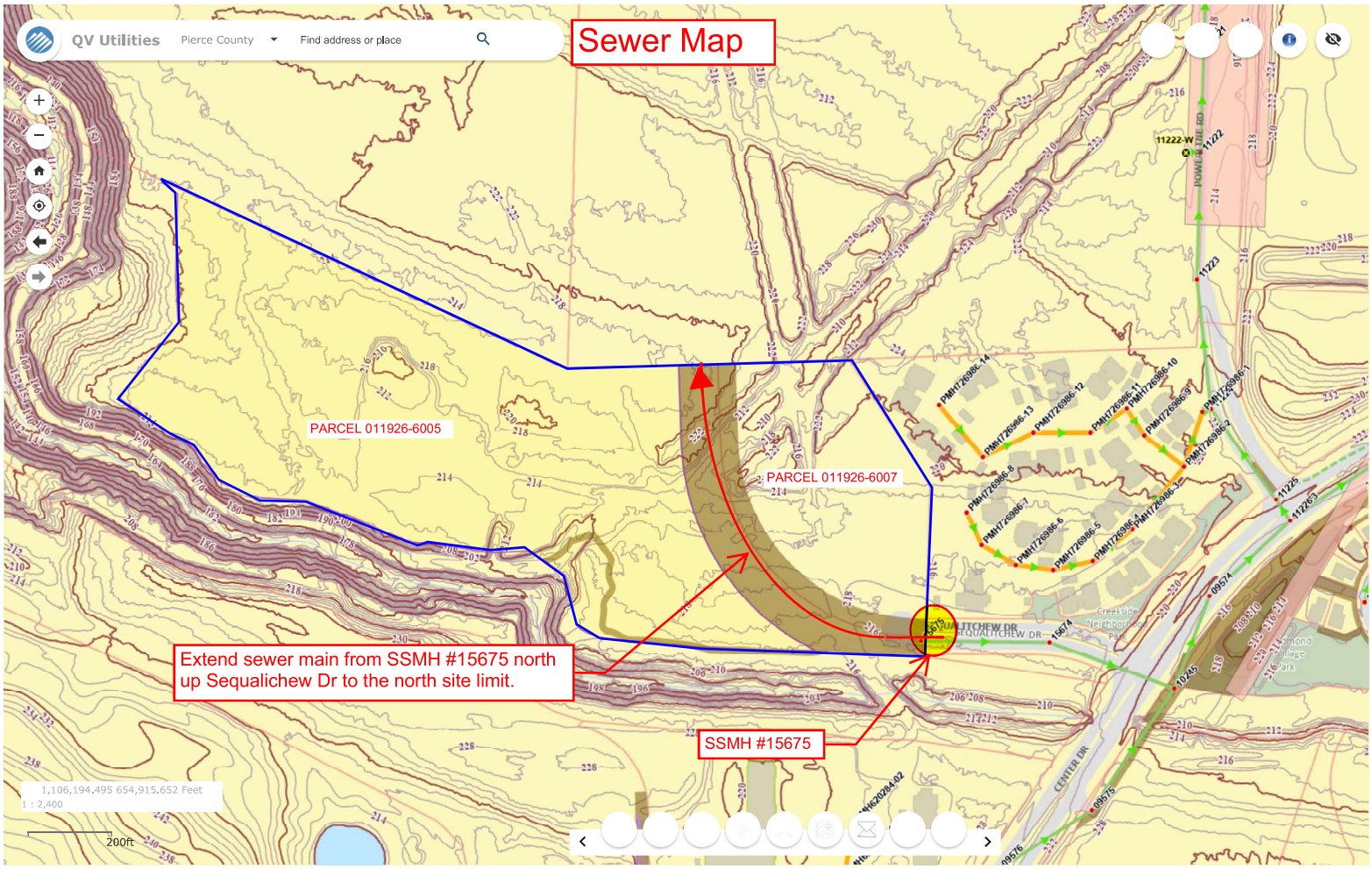
Sincerely,

Joseph Zukauskas
Civil Engineer 2

JZ:cmc

Enclosures: Copies of this letter and the record drawings are posted on-line at:
https://palsonline.co.pierce.wa.us/palsonline/#/permitSearch/permit/documents?applPermitId=1004100

ec: City of Dupont: banderson@dupontwa.gov
cc: William Anderson CBO, City of DuPont, 1700 Civic Drive, DuPont, WA 98327


QV Utilities
Pierce County
Find address or place
Sewer Map
PARCEL 011926-6005
PARCEL 011926-6007
Extend sewer main from SSMH #15675 north up Sequalichew Dr to the north site limit.
SSMH #15675
SEQUALICHEW DR
CENTER DR
POWELL RD
1,106,194.495 654,915.652 Feet
1 : 2,400
200ft

SWLE No. 721730

APPROVED AS-BUILT ACCEPTED _____ Date

WASTEWATER UTILITY MANAGER DATE

"PLAN APPROVAL EXPIRES ONE (1) YEAR FROM DATE OF APPROVAL."

RECORD DRAWING

PUBLIC SANITARY SEWER EXTENSION PLAN AND PROFILE

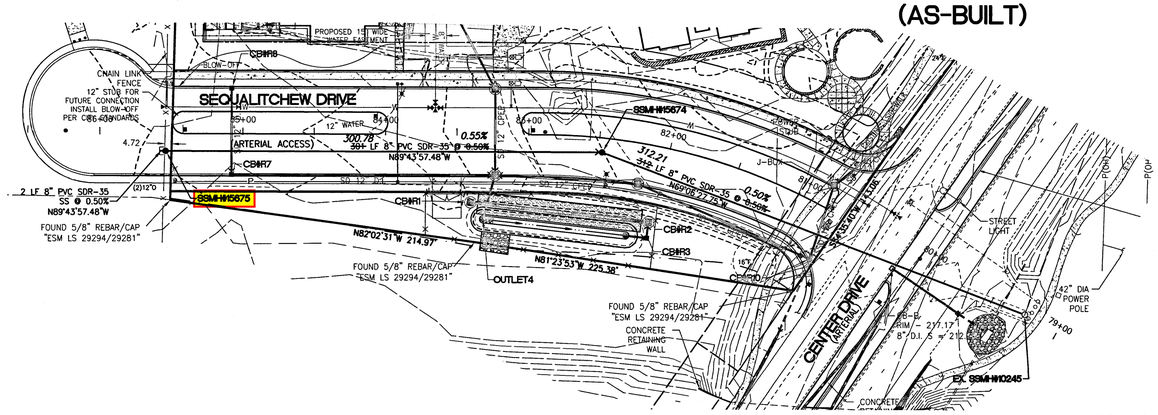
CREEKSIDE VILLAGE

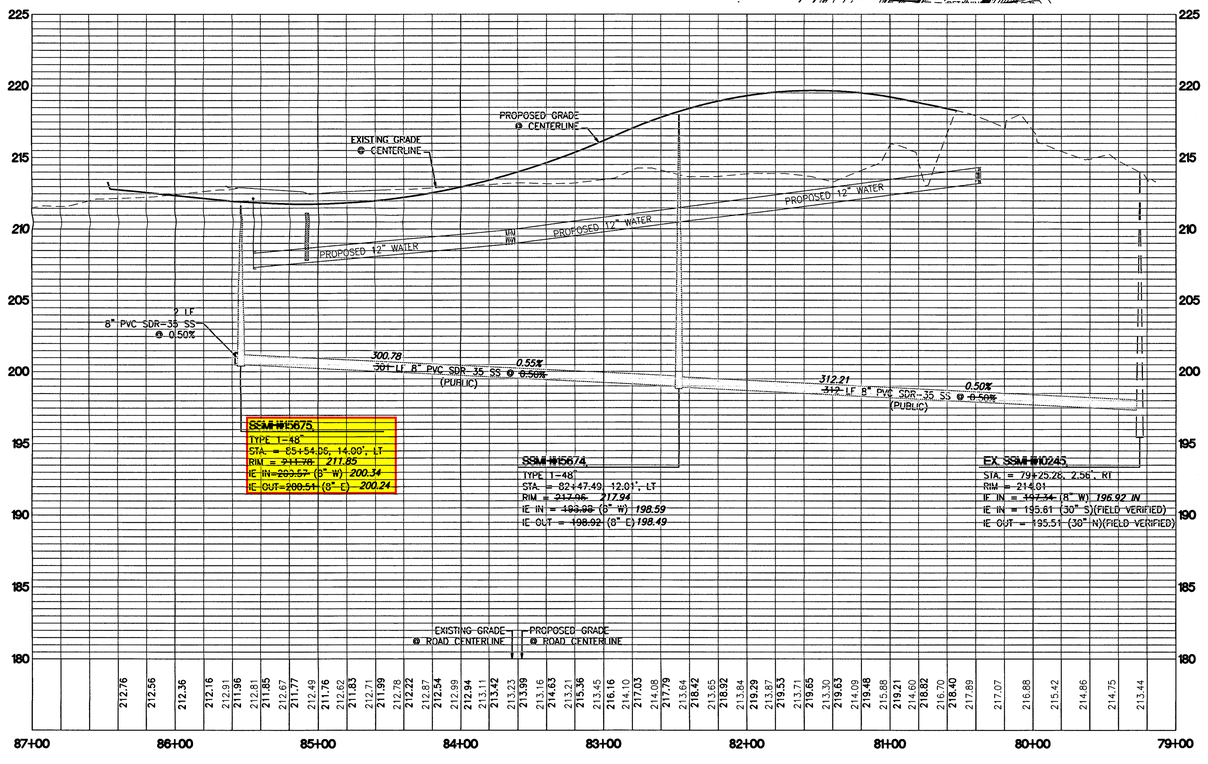
PORTIONS OF THE NW 1/4, AND THE NE 1/4, SECTION 26, TOWNSHIP 19 NORTH, RANGE EAST, W.M.
CITY OF DUPONT, PIERCE COUNTY, STATE OF WASHINGTON

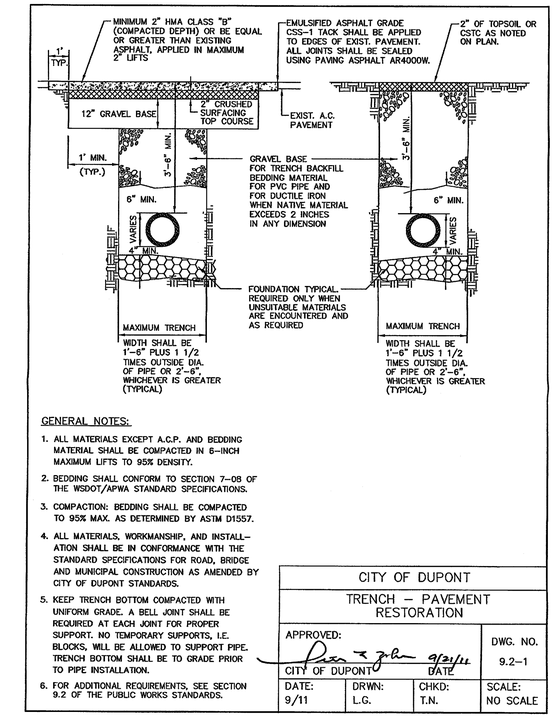
(AS-BUILT)

1"=50'

0 25 50 100







GENERAL NOTES:

1. ALL MATERIALS EXCEPT A.C.P. AND BEDDING MATERIAL SHALL BE COMPACTED IN 6-INCH MAXIMUM LIFTS TO 95% DENSITY.
2. BEDDING SHALL CONFORM TO SECTION 7-08 OF THE WSDOT/APWA STANDARD SPECIFICATIONS.
3. COMPACTION: BEDDING SHALL BE COMPACTED TO 95% MAX. AS DETERMINED BY ASTM D1557.
4. ALL MATERIALS, WORKMANSHIP, AND INSTALLATION SHALL BE IN CONFORMANCE WITH THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION AS AMENDED BY CITY OF DUPONT STANDARDS.
5. KEEP TRENCH BOTTOM COMPACTED WITH UNIFORM GRADE. A BELL JOINT SHALL BE REQUIRED AT EACH JOINT FOR PROPER SUPPORT. NO TEMPORARY SUPPORTS, I.E. BLOCKS, WILL BE ALLOWED TO SUPPORT PIPE. TRENCH BOTTOM SHALL BE TO GRADE PRIOR TO PIPE INSTALLATION.
6. FOR ADDITIONAL REQUIREMENTS, SEE SECTION 9.2 OF THE PUBLIC WORKS STANDARDS.

CITY OF DUPONT			
TRENCH – PAVEMENT RESTORATION			
APPROVED: CITY OF DUPONT		DATE 9/21/11	DWG. NO. 9.2-1
DATE: 9/11	DRWN: L.G.	CHKD: T.N.	SCALE: NO SCALE

DATUM
- [X] NGVD 29
- [ ] NAVD 88
- [ ] DATUM UNKNOWN

PER AS-BUILT REVISIONS 08/29/13

No.	Date	By	Ckd.	Appr.	Revision
1	2/9/2012	CP	CP	AS	REVISED PER COUNTY COMMENTS
2	3/27/2012	CP	CP	AS	REVISED PER COUNTY COMMENTS
3	4/13/2012	CP	CP	AS	REVISED PER COUNTY COMMENTS
4	8/31/2012	CP	CP	AS	REVISED PER CITY OF DUPONT COMMENTS
5	8/29/2013	CK	CP	CP	PER AS-BUILT REVISIONS.
6	9/06/2013	CK	CP	CP	REVISED PER PIERCE COUNTY COMMENTS

Designed AS
Drawn AJ
Checked AS
Approved DKB
Date 10/17/11

Scale:
Horizontal 1"=50'
Vertical N/A

COSTA PHILIPPIDES 38375 REGISTERED PROFESSIONAL ENGINEER STATE OF WASHINGTON
9/06/2013

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

For:
CREEKSIDE DUPONT PARTNERS, LLC
1201 PACIFIC AVENUE, SUITE 1501
TACOMA, WA 98402
CONTACT: ERIC CEDERSTRAND

Title:
AS-BUILT
PUBLIC
SANITARY SEWER EXTENSION
PLAN AND PROFILE
CREEKSIDE VILLAGE

Job Number 14464

Sheet 2 of 2

File:P:\14000s\1446\asbuilt\14464-s2-2.dwg Date/Time:9/6/2013 3:12 PM Scale:1" = 1' CPHILIPPIDES Xref: ----

721730-002

Attachment 1o

BARGHAUSEN

March 31, 2023

Barb Kincaid
City of DuPont
Department of Community Development
1700 Civic Drive
DuPont, WA 98327

RE: DuPont 243
Response to First Comment Letter and Request for Additional Information
For DuPont 243 Project
City File Numbers: PLNG2022-031 and -032
Our Job No. 18666

Dear Ms. Kincaid:

We have revised the plans and technical documents for the above-referenced project in accordance with your comment letter dated February 17, 2023. Enclosed are the following plans and documents for your review and approval:

1. One (1) each electronic file updated Title Report dated March 3, 2023
2. One (1) each electronic file LeMay Dumpster Location Approval dated March 15, 2023
3. One (1) each electronic file revised Civil Engineering Design Plans dated March 12, 2023
4. One (1) each electronic file revised Landscape and Irrigation Plans dated March 12, 2023
5. One (1) each electronic file revised Architectural Site Plan dated March 21, 2023
6. One (1) each electronic file revised Stormwater Site Plan dated March 13, 2023
7. One (1) each electronic file Lighting Calculations dated January 30, 2023
8. One (1) each electronic file Bat Habitat Reconnaissance dated March 9, 2023
9. One (1) each electronic file revised Tree Retention Plan dated March 1, 2023
10. One (1) each electronic file revised SEPA Checklist dated March 10, 2023
11. One (1) each electronic file Noise Study dated January 27, 2023
12. One (1) each electronic file Site Specific Sewer Information Letter dated March 10, 2023
13. One (1) each electronic file Department of Ecology Letter regarding allowable use dated October 17, 2018

The following outline provides each of your comments in italics, along with a narrative response describing how each comment was addressed:

A. Outdated Submittal Items

1. *The Title Report is required to be less than 30 days old at the time of application.* ***Submit a current title report.***

   Response: A current title report is included with this resubmittal.

2. *The Communications with LeMay for Dumpster Location dated Nov. 14, 2022, does not demonstrate that they have approved the location.* ***Provide the LeMay approval of the dumpster location.***

   Response: Dumpster location has been approved by LeMay and a copy is included with this resubmittal.

B. DMC 25.45 Performance Standards

1. *The civil cover sheet and landscape plans describe the site as being 18.49 acres. The WFCI report describes the site as 19.38 acres. The 2022 recorded short plat describes Lot 1 as 17.79 acres, Lot 2 as 1.93 acres, which is 19.65 acres.* ***Please reconcile the property area and confirm the correct area.***

   Response: The combined areas of Lot 1 and Lot 2 is 19.65 acres. This has been corrected on the civil cover sheet. Stormwater calculations also include 5.64 acres from the future development of Lot 3 for a total of 25.29 acres considered for stormwater facility sizing.

2. DMC 25.45.030 Provides the required performance standards:

   (a) A minimum 15-foot rear yard is required. The City interprets the rear yard to be the lot line opposite the front, so the west property line. There is a wall that appears to be greater than 6 feet in height proposed within the 15-foot setback. ***The wall must be less than 6 feet in height when within the setback area. The proposal is currently non-compliant for rear setbacks****.*

   Response: The site layout and grading at the west rear yard have been adjusted to reduce the proposed wall height to less than 6 feet. Please see revised site plan and grading.

   (b) Outdoor storage (supplies, materials, or products not contained in a structure) shall not cover more than two percent of the total site area and shall be screened from streets and adjoining properties by a 100 percent sight obscuring wall or fence. The city interprets the trailer parking area as outdoor storage, which is therefore required to meet these size limitations and screening requirements. ***Provide the area of the trailer parking demonstrating that it represents no more than two percent of the total site area and provide screening in the form of a screen wall. The exterior of the wall will also need landscaping to meet the City's blank wall requirements.***

   Response: The developer will continue to work with the city regarding the layout of the trailer parking area.

   (c) Trash enclosures shall be provided as required by Chapter 25.200 DMC. ***The trash enclosure for Building B is located adjacent to Sequalitchew Creek Trails and needs to be relocated. See also Landscaping, below.***

   Response: The trash enclosure proximate to Sequalitchew Creek Trail has been relocated and will be screened from the trail by landscape. The trash enclosure will be of materials providing opaque screening.

(d) *Noise levels shall not exceed the maximum allowed in Chapter 9.09 DMC (Sound and Vibration) for Class B (commercial) environmental designations.* ***A Noise Study will be required to demonstrate noise impacts to Sequalitchew Creek Trail are within permittable levels. Note that the city strongly prefers a site plan with the truck maneuver and dock locations on the north side to minimize noise impacts. Alternatively, a sound wall may be required to buffer noise impacts. See also, SEPA below.***

Response: An updated noise study is included with this resubmittal. Discussion with the city on site layout is still in progress.

(e) *Outdoor lighting shall be designed to minimize light escapement beyond the site.* ***Submit a photometrics plan for the site demonstrating compliance. See also SEPA, below.***

Response: Lighting calculations have been prepared and are included with this package.

C. Cultural, Historical and Archaeological Resources, DMC 25.80

3. *Per DMC 25.80.020 and 030 the site of the Methodist/Episcopal Mission is a designated cultural resource site, and no structure, roads or utilities are permitted within 50 feet of the markers identifying cultural resource sites. The site plan indicates the marker will remain in its existing location with a 50-foot buffer. It appears irrigation is depicted within the 50-foot radius.* ***Revise the irrigation plan to remove irrigation facilities from within the 50-foot radius of the marker****.*

Response: All irrigation facilities have been removed from 50-foot marker radius, and callouts have been added to that effect.

D. Landscaping, DMC 25.90

4. *Per DMC 25.90.030(1) requires street trees be planted within the right of way at a distance of 40 to 50 feet; be the same species as others within the same streetscape and at least two inches caliper and minimum branch height of six feet. You are proposing Acre Rubrum/Armstrong Gold Maple for the street trees with a 2-inch caliper. This type of tree is prohibited as a street tree.* ***Revise the street tree type per the Tree Care manual and of a type consistent with the trees planted within the existing Sequalitchew Drive right of way. Note, the City has recently listed all maple trees to the "prohibited" tree list.***

Response: Street trees within Sequalitchew Drive right-of-way have been revised to *Cornus kousa*, approved for 5-foot planters per the Tree Care Manual.

5. *Per DMC 25.090.030(3)(b), trash receptacles are required to be screened from high-use areas. The receptacle located south of Building B is directly adjacent to Sequalitchew Creek Trail, a high-use area and no screening is provided.* ***The enclosure shall be moved to a lesser used/visible area. Depending on the location and its visibility to either public right of way, screening may be required along all sides of the enclosure.***

Response: The trash enclosure proximate to Sequalitchew Creek Trails has been relocated and will be screened from the trail by landscape. The trash enclosure will be of materials providing opaque screening.

6. *DMC 25.090.040 requires that the landscaping require minimal irrigation**. A statement is required as to the technique to conserve water and the amount of irrigation required**.*

   Response: Conservation statement and irrigation calculations have been added to L-8 per comment.

E. Parking, DMC 25.95

7. *The proposal provides 199 vehicle parking spaces and 47 trailer parking spaces. A Parking Analysis is provided on the Architectural Site Plan that is based on building size. DMC 25.95.030 requires the parking quantity to be based on a range of 0.3 and 1.0 spaces per the number of workers at maximum shift. The City typically applies this standard to the entire building (i.e. not a separate/added requirement for office space) as it is assumed that warehouse type uses would contain some office space. You will be required to estimate the number of workers anticipated at maximum shift to demonstrate compliance with DMC 25.95.030. **Revise the parking analysis that is based on the parking requirements per DMC 25.95.030**. Note: the City does not include the trailer parking spaces in the total code required parking calculation.*

   Response: The parking analysis has been revised to illustrate compliance to minimum and maximum parking stalls based on estimated number of workers at maximum shift per DMC 25.95.030. Please see revised parking analysis on site plan Sheet A0.1.

8. *Per DMC 25.95.040(5) the parking shall not be located in required front yards or within five feet of any property line. It appears that the parking area located east of Building B is within the 25-foot front setback area and is not compliant**. Revise the proposal to remove parking in the front setback area.***

   Response: Building B and its parking proximate to the right-of-way have been adjusted and are no longer proposed to be located in the 25-foot setback area.

F. Critical Areas DMC 25.105

9. *Confirm/ensure that all grading is located outside of the 100-foot Sequalitchew Creek buffer.*

   Response: All project grading is outside of the 100-foot Sequalitchew Creek buffer. Please see the revised civil plans included with this resubmittal.

10. *The proposal is located within an area of the City that is mapped by WDFW as containing several terrestrial state priority habitats and species. **The City will require verification of the presence of the priority habitats and species within and adjacent to the development area in accordance with DMC 25.105.050(2)(e). If nests are found, the proposal shall meet the recommendations provided by WDFW.***

Response: Comment acknowledged. A Bat Habitat Reconnaissance was conducted and found no evidence of bat habitation on site. Please see the technical memo included with this resubmittal.

G. Tree Retention, DMC 25.120

DMC 25.120 Tree Retention applies to all new development projects that require Site Plan Approval. You provided Tree Retention Plans and a Tree Protection Report/Plan prepared by WFCI that were reviewed.

11. *Review of the WFCI Tree Report finds that trees were evaluated in the project and adjacent non-project area (Lot 3). The report states there are a total of 76 landmark* trees in the project area *and a total of 20 can be retained. The other 56 landmark trees are either unhealthy or located within the footprint of proposed building, roads, storm ponds, or parking lots. A total of 227 trees are noted as to be retained in the project area. The following additional information is needed within the WFCI report to complete Site Plan Review:*

    (a) Table 1 provides a summary of trees in cover type 1 but does not provide a listing of trees that meet the definition of landmark trees, which are the tree types that are regulated per DMC 25.120.030. ***Revise the table (or clarify) that the listed trees are only within the DuPont 243 West project area. Revise or provide an additional table that lists how many landmark OWOs and landmark non-oaks are within the project area.***

    Response: An additional table has been added to the updated Tree Retention Plan to clarify trees within the project area.

12. *DMC 25.120.030(3) required a minimum of 1.5 trees per acres to be retained, which is 37 trees. The landscape plans indicate that there are 770 trees within the project boundary and 397 trees will be removed, leaving 373 trees. The WFCI tree report provides that there are 682 healthy trees, which requires retention of 29 trees. The proposal will retain 225 trees, exceeding the minimum tree retention requirements.* ***Please reconcile the landscape plan and WFCI report so that the same statistics are provided****.*

    Response: Revised copies of the landscape plans and WFCI tree report are included with this resubmittal.

H. Transportation Concurrency

13. *DMC Chapter 25.115 describes the compliance requirements of the State Growth Management Act (GMA) for consistency between City and county-wide planning policies under the GMA, specifically related to adequacy of transportation facilities and level of service standards for new development. In your comment response letter, include a request to complete concurrency evaluation concurrent with the Site Plan Approval process.*

    Response: Comment acknowledged. We would like to request that the city begin the traffic concurrency evaluation process.

I. SEPA Requirements

The proposal will be subject to SEPA environmental review. ***Please submit the following****:*

1. *Update the SEPA Checklist as follows:*

   (a) Effective January 20, 2023 there is a new WA State SEPA Checklist that needs to be used for the application. It can be located at this link:

   SEPA document templates – Washington State Department of Ecology

   Response: The SEPA checklist has been updated per the new January 20, 2023 version.

   (b) Section A.8, add the new studies that are required to be submitted and listed below.

   Response: Section A.8 has been updated to include all project studies.

   (c) Section A.10, will a Forest Practices Permit be required for the proposal? If so, add to the list of permits.

   Response: A forestry practices permit will be required. This has been added to the list of permits.

   (d) Update Section B.5.a, and 5.d with the findings of the Priority Habitat & Species Reconnaissance.

   Response: Sections B.5.a. and 5.d. have been updated.

   (e) Update Section B.7.b with the findings of the Noise Study.

   Response: Section B.7.b has been updated.

2. *As described above, update the Arborists Report meeting the requirements of DMC Chapter 25.120.*

   Response: The Tree Retention Plan has been updated and a copy is included in the submittal.

3. *Verification of the presence of, and, if needed, mitigation for the protection of, Priority Habitats and Species per DMC 25.105.050(2)(e).*

   Response: A Bat Habitat Reconnaissance, prepared by Soundview Consultants, did not find evidence of Priority Habitat Species bat activity or roosting bat concentrations on the site. Please refer to the technical memorandum included with this package for additional information.

4. *Provide a Photometric Analysis in compliance with DMC 25.45.030(15) demonstrating no light spill to the Sequalitchew Creek Trail.*

   Response: Lighting calculations have been prepared and are included with this package.

5. *Noise Study describing existing ambient noise and predicted noise impacts to the Sequalitchew Creek Trail (see previous SEPA MDNS for specifics).*

   Response: A noise study prepared by JGL Acoustics, LLC is included with this package.

6. *Documentation from the Department of Ecology with guidance to what they will require regarding soil contamination. Alternatively, you may provide a letter from Ecology that states that Ecology will provide their comments and conditions as part of their SEPA environmental review process.*

   Response: A letter from the Department of Ecology is included with this resubmittal.

BUILDING DEPARTMENT COMMENTS. Contact Roy Shipman at (253) 912-5215 or rshipman@dupontwa.gov.

Response: Comment acknowledged.

FIRE DEPARTMENT COMMENTS. Contact Mike Turner at (253) 666-2760 or mturner@duontwa.gov.

Response: Comment acknowledged.

ENGINEERING AND WATER DEPARTMENT COMMENTS. Contact Shukri at (253) 912-5393, or bkincaid@dupontwa.gov.

Response: Comment acknowledged.

We believe that the above responses, together with the enclosed revised plans and technical documents, address the comments in your letter dated February 17, 2023. Please review and approve the enclosed at your earliest convenience. If you have questions or need additional information, please do not hesitate to contact me at this office. Thank you.

Sincerely,

Daniel K. Balmelli

Daniel K. Balmelli, P.E.
Executive Vice President

DKB/bd
18666c.010
enc: As noted
cc: Ben Varin, Avenue 55
Drew Zaborowski, Avenue 55
Brian Ludwig, Innova Architects
Josh Towne, Barghausen Consulting Engineers
Betsy Dyer, Barghausen Consulting Engineers

Attachment 1p

CULTURAL RESOURCES ADDENDUM MEMO FOR THE AVENUE 55, LLC DUPONT 243 PROJECT CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

Prepared for:

Avenue 55, LLC
601 Union Street, Ste. 2930
Seattle, WA 98101

Prepared by:
John A. Nadolski, MA

NATURAL INVESTIGATIONS COMPANY

3104 O Street, #221
Sacramento, CA 95816

July 2023

EXECUTIVE SUMMARY

DuPont Industrial Partners, LLC in 2011 proposed the development of approximately 25.3-acres of private land at 1700 Center Drive in the City of DuPont, Pierce County, Washington. The parcel of land proposed for development is identified as Lot Y, Assessor's Property Tax Parcel No. 011926-2019. DuPont Industrial Partners, LLC had proposed construction of a multi-building industrial park on Lot Y that included a maximum of twelve 12 buildings, parking spaces, roadways, installation of underground utilities, and construction of a trail along Sequalitchew Creek to the south of the proposed development. Parus Consulting, Inc. (PCI) was retained by DuPont Industrial Partners, LLC to conduct cultural resources investigations to facilitate construction of the project and comply with all Washington State Department of Archaeology & Historic Preservation (DAHP) regulations and the State Environmental Protection Act (SEPA). However, DuPont Industrial Partners, LLC did not construct any buildings or develop Lot Y.

Avenue 55, LLC is currently proposing to develop a section of Lot Y, defined as: Lot 1, which is 17.72 acres and 1.93 acres in Lot 2, totally 19.65, that was originally part of DuPont Industrial Partners, LLC proposed 2011 development. Avenue 55, LLC proposes to construct a warehouse distribution facility, parking spaces, and associated underground utilities on approximately 19.65 acres of Lot Y west of Sequalitchew Road, that they are now calling DuPont 243. Avenue 55, LLC retained Natural Investigations Company, Inc. (Natural Investigations) to review PCI's report and present any new findings and/or recommendations to facilitate construction of the new project on Lot Y and comply with all state regulations (e.g., DAHP and SEPA) for the identification and protection of cultural resources. The purpose of this addendum is to present the results of Natural Investigations review of PCI's 2011 report and its findings, including any changes to the report or findings and/or any new recommendations for the protection of cultural resources.

PCI conducted cultural resources investigations for the proposed originally project on Lot Y in 2011. The investigations included a pedestrian survey and excavation of 125 shovel test probes and 22 geotechnical exploration pits. PCI's cultural resources investigations were conducted under Archaeological Excavation Permit (Permit) No. 2010-54 approved by the DAHP on February 7, 2011 and were monitored by a member of the Nisqually Tribe.

PCI's pedestrian survey and excavations did not identify any evidence of previously recorded sites and isolates on Lot Y including sites 45PI66, the site of a Methodist Episcopal Mission and 45PI455, the site of a 9th U.S. Cavalry Bivouac, and a flaked stone isolate, 45PI773. In addition, PCI cultural resources investigations confirmed previous reports that two sites 45PI63, Railroad Dump #3, and 45PI64, Burning Ground Dump, formerly located on Lot Y were completely destroyed/removed over twenty years ago as part of hazardous materials remediation across Lot Y. PCI did identify two new historic sites, 45PI01224, a segment of railroad track, and 45PI01225, a concrete platform and one isolated kerosene can on Lot Y.

Sites 45PI455 and 45PI66 were previously determined eligible for the National Register of Historic Places (NRHP) at 36 Code of Federal Regulations (CFR) Part 60.4 [a-d] under Criterion A because of their association with significant events in history, but there are no extant remnants of the sites on Lot Y. Sites 45PI01224 and 45PI01225 are not in the section of Lot Y currently proposed for development and do not meet any of the eligibility criteria for inclusion on the NRHP or the Washington Heritage Register (WHR) as described in Revised Code of Washington (RCW) 27.34.200. Consequently, PCI determined that no historic properties would be affected by development of Lot Y and because of the archaeological sensitivity of the area also recommended and prepared an Unanticipated Cultural Resources Discovery Plan for the project. PCI's report was filed with the DAHP and sent to the appropriate Tribes.

Natural Investigations reviewed PCI's 2011 report and the results of their cultural resources investigations. The cultural resources investigations and findings presented in the report for development of Lot Y are adequate and remain valid for Avenue 55, LLC's currently proposed project, DuPont 243. Indeed, reduction in the size of the current project places sites 45PI01224 and 45PI01225 outside project boundaries.

Therefore, Natural Investigations confirms the findings presented in PCI's 2011 report, does not recommend any additional investigations, and pursuant to DAHP regulations and SEPA Checklist Section B, Number 13, determines that construction of the project currently proposed by Avenue 55, LLC would not affect any historic properties (i.e., properties eligible for or listed on the NRHP) or properties that could be eligible for the WHR.

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Subsurface Testing Results 10
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APPENDIX A: Archaeological Survey, Testing, and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington.Report prepared by Parus Consulting, Inc. 2011

INTRODUCTION

DuPont Industrial Partners, LLC in 2011 proposed the development of approximately 25.3-acres of private land at 1700 Center Drive in the City of DuPont, Pierce County, Washington. The parcel of land proposed for development is currently identified as Lot Y, Assessor's Property Tax Parcel No. 011926-6005, 011926-6006, and 011926-6007. DuPont Industrial Partners, LLC proposed construction of a multi-building industrial park on Lot Y that included a maximum of twelve 12 buildings totaling approximately 340,000 square feet of building space, roadways, loading areas, approximately 650 parking spaces, installation of underground utilities, and construction of a trail along Sequalitchew Creek to the south of the proposed development. PCI was retained by DuPont Industrial Partners, LLC to conduct cultural resources investigations to facilitate construction of the project and comply with all DAHP regulations and SEPA. However, DuPont Industrial Partners, LLC did not construct any buildings or develop Lot Y.

Avenue 55, LLC is currently proposing to develop part of Lot Y that was originally part of DuPont Industrial Partners, LLC proposed 2011 development. Avenue 55, LLC retained Natural Investigations to review PCI's report and present any new findings to facilitate construction of the new project on Lot Y and comply with all state regulations (e.g., DAHP and SEPA) for the identification and protection of cultural resources. The purpose of this addendum is to present the results of Natural Investigations review of PCI's 2011 report and its findings, including any changes to the report or findings and/or any new recommendations for the protection of cultural resources.

PROJECT LOCATION AND DESCRIPTION

Avenue 55, LLC proposes to develop an approximately 19.65 acres parcel of land identified as Lot Y, Assessor's Property Tax Parcel No. 011926-6005, 011926-6006 in the City of DuPont, Pierce County, Washington (Figure 1). The proposed development includes construction of one warehouse distribution facility totaling approximately 243,180 square feet, 138 parking spaces, 68 trailer stalls, a 27,130 square foot storm pond located in the southwest corner of Lot 1, public trails along the southern border, and associated underground utilities west of Sequalitchew Road (Figure 2).

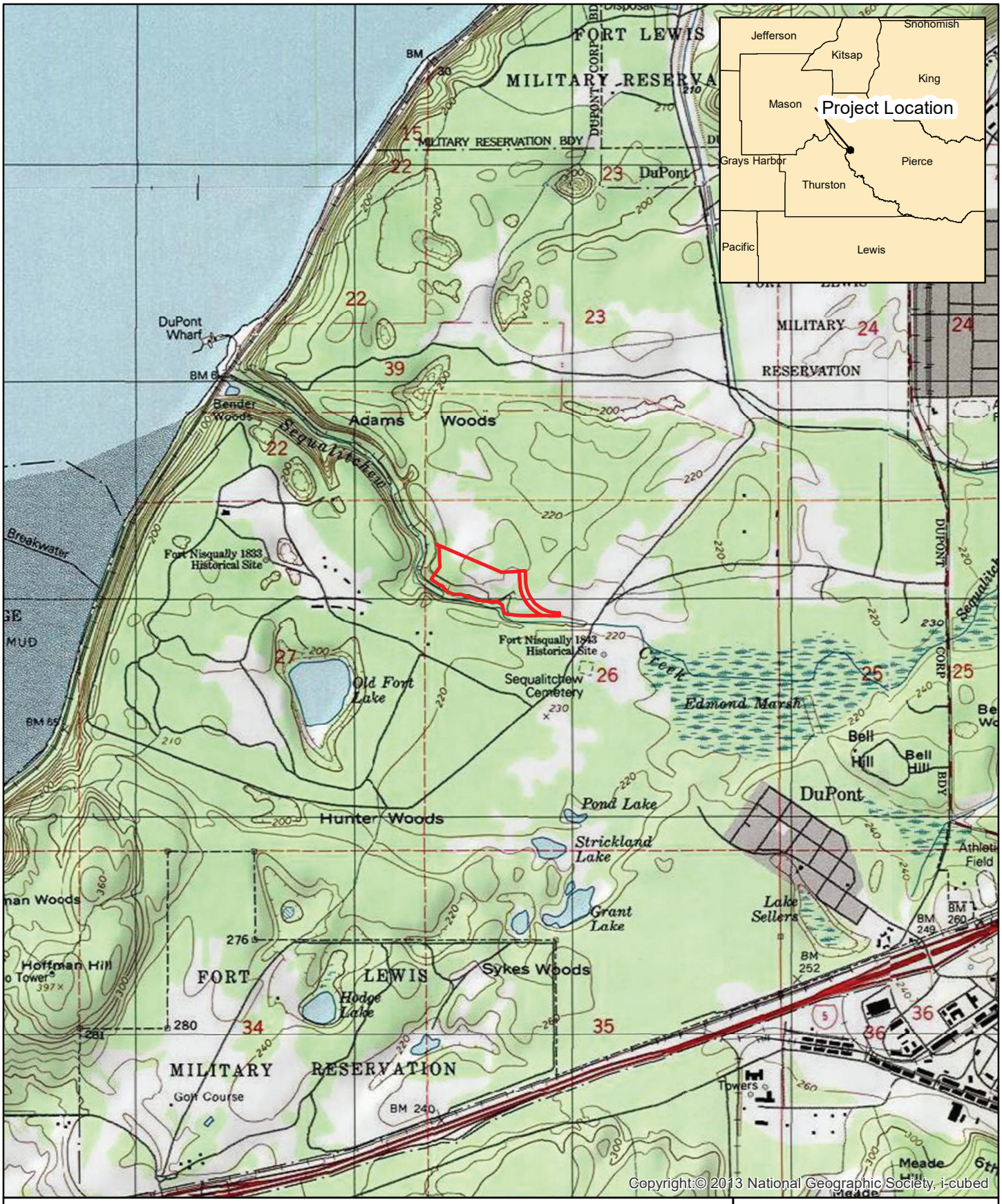
REGULATORY SETTING

There is no federal involvement in the project as currently proposed. PCI's and Natural Investigations cultural resources investigations for the proposed project were conducted under prevailing Washington state laws that protect cultural resources (e.g., prehistoric archaeological sites, historic sites, historic buildings, and Native American sites and graves). These laws include Executive Order 05-05 (currently revised as Executive Order 21-02), Indian Graves and Records (RCW 27.44), Archaeological Sites and Resources (RCW 27.53), Archaeological Excavation and Removal Permit (Washington Administrative Code [WAC] 25-48), and Discovery of Human Remains (RCW 27.44). In addition, PCI obatined a permit to conduct cultural resources investigations including excavations within boundaries of known archaeological sites. The Permit (No. 2010-54) was completed pursuant to requirements at WAC 25-48-060.

REPORT ADDENDUM PREPARATION

John A. Nadolski, MA was the Principal Investigator for this project and is primary author of this report addendum. Mr. Nadolski has more than thirty-five years of experience in archaeology and exceeds all

requirements of the *Secretary of Interior's Qualifications Standard*s (36 CFR Part 61; National Park Service 1983) and the DAHP. The format of this report addendum follows DAHP guidance.



Study Area

0 0.5 1 Kilometers

0 0.5 1 Miles

1:24,000

DuPont 243 Project
Figure 1 - Project Location

Natural Investigations Company

Map Date 7/19/2023

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26

SITE DETAILS

Site Address:	1700 Center Drive Dupont, WA
Parcels:	011926-2019
Zoning:	Manufacturing and Research (MRP)
Proposed Use:	Warehouse Distribution
Site Areas:	
Lot 1 =	771,859 SF (17.72± Acres)
Lot 2 (ROW) =	84,028 SF (1.93± Acres)
Total =	855,877 SF (19.65± Acres)
Proposed Building Areas:	
Building A (Lot 1) =	243,180 SF
Total Building Area =	243,180 SF
Building Coverage (Lot 1) =	31.5±%

Parking Analysis	
Building A, Assumes 12,000 SF Future Office	
Total 243,180 SF	
Per Shift minimum 0.3	42 Stalls
Per Shift maximum 1.0	138 Stalls
Parking Provided =	138 Stalls
Building A, Bicycle Parking	
1 Space per 20 Employee Spaces =	8 Stalls
Provided Spaces 4 each at 2 locations =	8 Stalls

Trailer Parking Provided =	68
▲ 9'x10' Dock Doors =	55
● 12'x16' Grade Doors =	2

Site Feature Legend:
- Primary Building Entrance =
- Future Office Areas
- ① Bicycle Parking Locations

- Landscape
- Asphalt surface
- Concrete Sidewalk
- Concrete surface
- Site Retaining walls

Site Notes:
1 - Historical Trail markers / exhibits can be placed along the Public Trail. Location of markers / exhibits to be provided by entity wanting said marker / exhibit.

SITE PLAN

Scale: 1" = 80'

NOTE:
SITE BOUNDARY AND SURVEY PROVIDED BY BARGHAUSEN CONSULTING ENGINEERS, INC. DATED 06/05/2018. RECEIVED 01/22/2022.

INNOVA architects
950 Pacific Avenue, Suite 450
Tacoma, WA 98402
253-572-4903

Project Title:
DuPont 243
1700 Center Drive
DuPont, WA

Client:
AVENUE55
600 University Street, Suite 2305
Seattle, WA 98101
206-707-9696

Job Number:
22-012

Issue Set and Date:
SEPA Permit
July 17, 2023

NOT FOR CONSTRUCTION

21004055 REGISTERED ARCHITECT SCOTT E. SALADIS STATE OF WASHINGTON

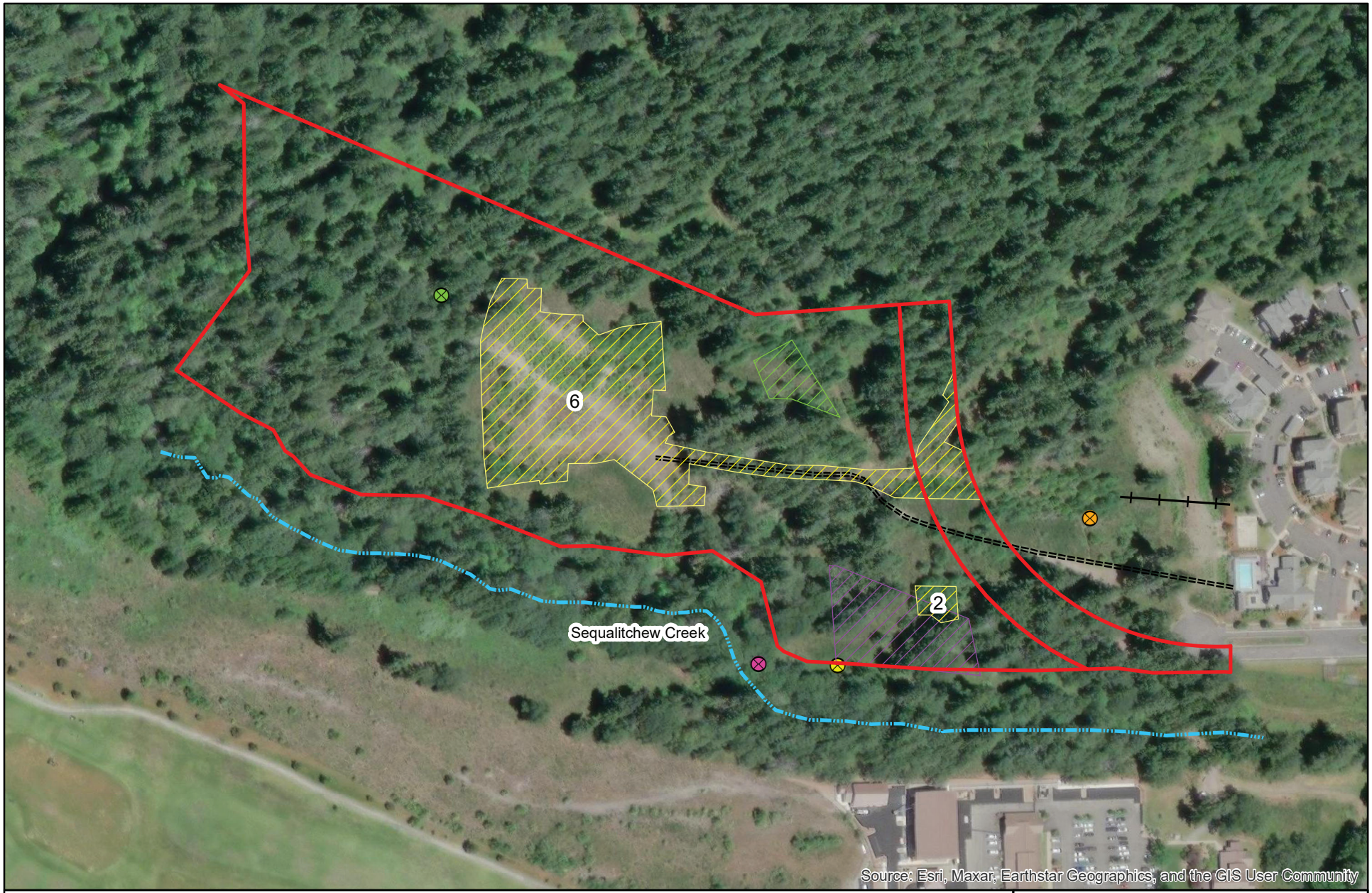
REUSE OF DOCUMENTS
THIS DOCUMENT HAS BEEN SIGNED ELECTRONICALLY IN ACCORDANCE WITH WAC 196-33-070 AND CHAPTER 19.34 RCW. UNAUTHORIZED ALTERATION OF ANY OF THE INFORMATION ON THIS DOCUMENT WILL INVALIDATE THE DOCUMENT, MY CERTIFICATION AND SIGNATURE. THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF THE PROFESSIONAL SERVICE, IS THE PROPERTY OF INNOVA ARCHITECTS AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT WRITTEN AUTHORIZATION OF INNOVA ARCHITECTS.

4 ____
3 ____
2 ____
1 City Comments - Letter Dated, February 17, 2023
Revisions:

Sheet Title:
SEPA
Site Plan

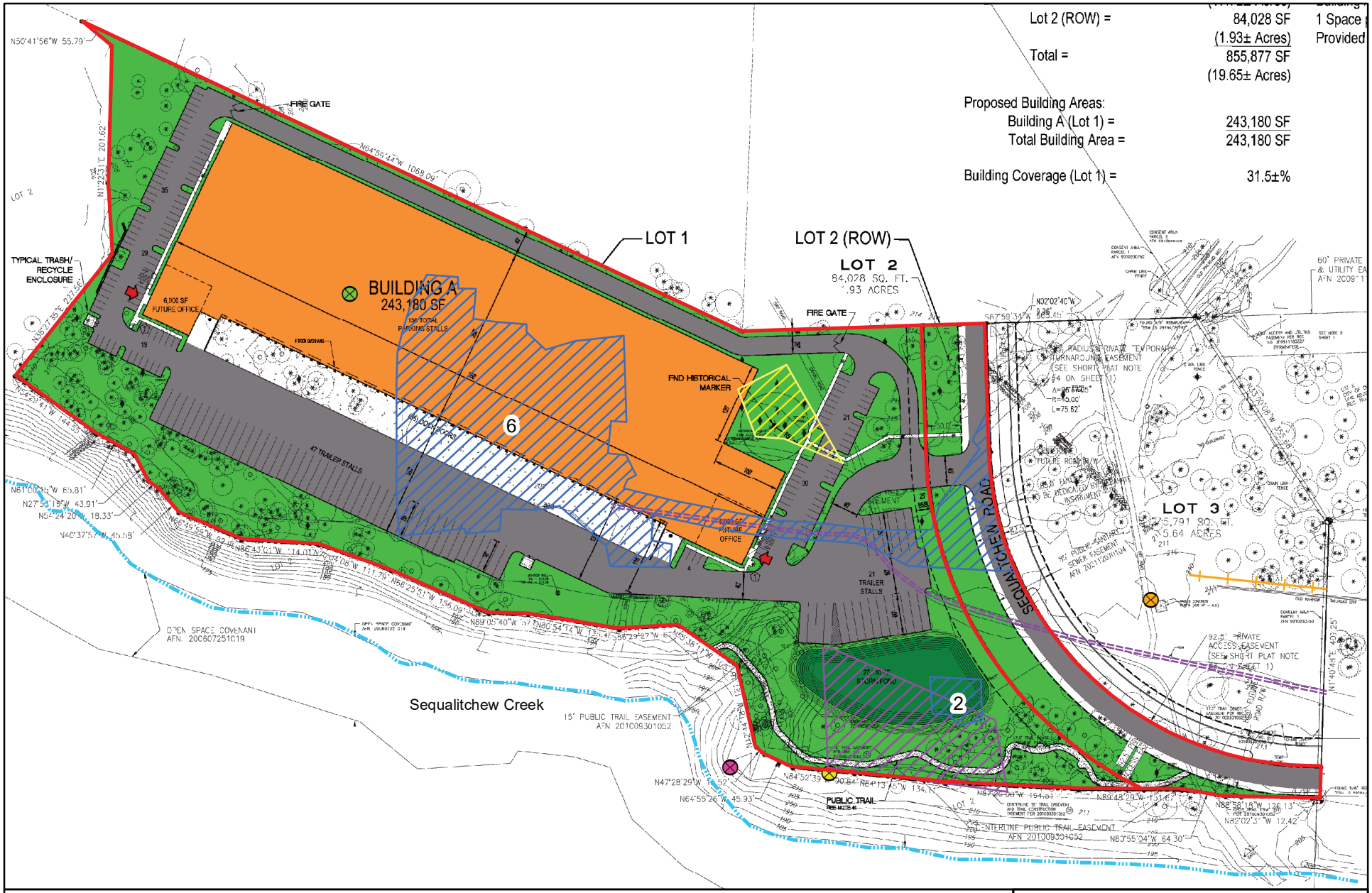
Designed by: B. Ludwig, J. Eaves
Drawn by: B. Ludwig, J. Eaves
Checked by: P. McCormick

Sheet Number:
A0.1
of Sheets



Map Date 7/20/2023

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26



Map Date 11/20/2023

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26

RESEARCH METHODS AND FINDINGS

PCI conducted a cultural resources records search for the project on October 21, 2010 using the DAHP electronic GIS database to identify previously recorded sites and previously conducted surveys on and near Lot Y (Tables 1 and 2). PCI also conducted tribal consultation (i.e., cultural representatives or Tribal Historic Preservation Officers for the Nisqually, Puyallup and Squaxin Tribes were contacted regarding the project), a pedestrian survey, subsurface testing, and monitoring of geotechnical subsurface exploration on Lot Y in February and March 2011. All PCI investigations were conducted under DAHP Permit No. 2010-54.

Table 1. Previous Studies on or near Lot Y

Year	Author(s)	Report Title	Proximity to Lot Y
1977	Onat, A.R., Lee A. Bennett, and Timothy Riordan	Cultural Resources Survey: DuPont Site, Volume I, Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near Lot Y
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site	Within and near Lot Y
1989	Welch, Jeanne	A Cultural Overview and Comprehensive Management Plan for the DuPont Property, Pierce County, Washington	Within and near Lot Y
1990	Stilson, M. Leland	A Data Recovery Study of 45PI401, Hudson's Bay Dwellings at Northwest Landing, Pierce County, Washington	0.1 mile east
1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within
1991	Stilson, M. Leland	A Data Recovery Study of 45PI405, the 1843 Fort Nisqually Village at Northwest Landing, Pierce County, Washington	0.1 mile east
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the “Hot Spot” Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near Lot Y
2002	Maass, Alex	Interim Archaeological Monitoring Report for the Former DuPont Works Site, Parcel 1	Adjacent (to west)
2003	Maass, Alex	2002 Field Season Archaeological Monitoring Report for the Former DuPont Works Site, Parcel 1	Adjacent (to west)
2003	Wessen, Gary	Exploring the Boundary and Possible Interpretation of 45PI485	South of creek
2004	Wessen, Gary	Archaeological Testing at 45PI576, Former DuPont Works Site, City of DuPont, Pierce County, Washington	South of creek
2005	Dampf, Steven	Archaeological Monitoring Report for the 2003 and 2004 Field Seasons at the Former Dupont Works Site Parcel 1, City of DuPont, Pierce County, Washington	Adjacent (to west)
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near Lot Y
2006	Thompson, Gail	Archaeological Implementation Report for Remediation of Soils at the Former DuPont Works Site Parcel 1, City of DuPont, Pierce County, Washington	Adjacent (to west)
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near Lot Y

Table 2. Previously Recorded Sites on Lot Y

Site No.	Brief Description	Recorded By/Year	Prior Reports	NRHP Eligibility
45PI00063	Historic debris deposit, two loci along railroad, 1910- 1930; removed during soil remediation	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Moura, 1991a; Daugherty and Condon, 2001	Not eligible
45PI00064	Historic DuPont Powder Works burning ground dump, 1930s-1945; removed during soil remediation	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Daugherty and Condon, 2000, 2001	Not eligible
45PI00066	Historic 1840-1842 Methodist Episcopal Mission	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Moura, 1991a; Daugherty and Condon, 2000, 2001	Eligible, included in proposed Nisqually- Sequalitchew Historic District
45PI00455	Historic 9th U.S. Cavalry Bivouac, Camp Nisqually, 1904; partially removed during soil remediation	Daugherty, 1997; Daugherty, 1997 NRHP form	Moura, 1991a, 1991b; Daugherty and Condon, 2000, 2001	Potentially eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00773	Prehistoric chipped stone isolate	Wessen, 2005	Wessen et al., 2005, 2008	Not eligible

SURVEY

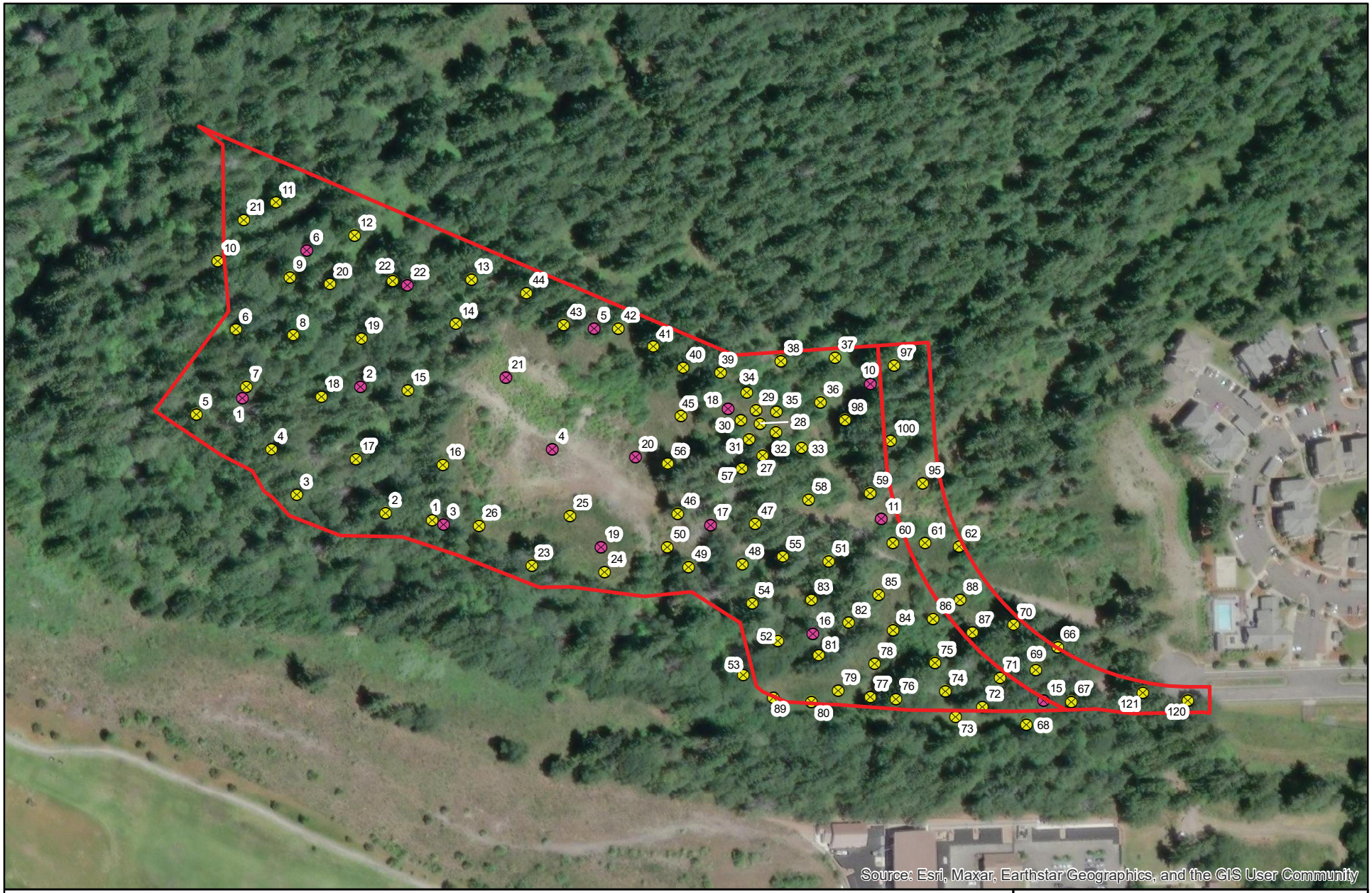
PCI conducted a pedestrian surface survey across the original 25.3-acre original project area. Transect spacing was no greater than 15 meters apart and survey was accomplished on an east-to-west bearing.

EXCAVATIONS

Following the pedestrian survey, 125 shovel test probes (STPs) and 22 geotechnical excavations (GTEs) were excavated across Lot Y at random intervals as shown on Figure 4. At the request of the City of DuPont and the DAHP, no STPs were placed in existing trails, pedestrian paths, or gravel roadways. Additionally, all STPs were backfilled and compacted daily. The STPs and GTEs were excavated using a backhoe with a 2-foot bucket attachment and smooth plate. The excavation of the STPs and GTEs totaled approximately 450 cubic meters of soil.

Each of the 125 STPs measured 3 feet in length and 2.5 feet in width. STP levels were dug in 7-cm (3- inch) increments or until sterile gravels were encountered. Soils taken from the STPs were screened through 1/8-inch hardware cloth. No STPs were placed in three hot spots, HS-3, HS-4, and HS-6, that include the former locations of sites 45PI00063 and 45PI00064 where prior soil remediation efforts removed contaminated soils and where sterile gravel is now exposed across these areas of Lot Y (Figures 2 and 4). Sterile gravel was encountered in 123 of 125 STPs between 35 and 130 centimeters below the surface (cmbs) (1.1-4.3 feet) and mixed stratigraphy or fill was present in two STPs. Records for the individual STPs, detailing levels, soil texture, color, and comments are included in Appendix C of PCI's 2011 report included as Appendix A of this memo.

Each of the 22 GTEs measured 3 feet wide by 5 feet long. GTE upper levels were dug in 3-inch (7 centimeter) increments or until sterile gravels were encountered. Lower levels of the GTEs, after encountering sterile gravels, were dug in 1-foot increments. Four of the GTEs were excavated in hot spot removal areas (Figures 2 and 4). Soils taken from the GTEs at 4 feet, 6 feet, and 10 feet were screened through 1/8-inch hardware cloth. Twenty GTEs were excavated to 305 cmbs (10 feet); one GTE with mixed stratigraphy was terminated at 250 cmbs (8.2 feet); one GTE filled with water at 244 cmbs (8 feet). Records for the individual GTEs, detailing levels, soil texture, color, and comments, are included in Appendix C of PCI's 2011 report included as Appendix A of this memo.



DuPont 243 Project
Figure 4: Subsurface Testing Map

Natural Investigations Company

Map Date 7/20/2023

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26

Surface Survey Results

All undeveloped ground surface areas in the boundaries of Lot Y were examined for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools, fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, fire pits, soil depressions, and features indicative of the former presence of structures or buildings (e.g., postholes, foundations), or historic debris (e.g., metal, glass, ceramics). Ground disturbances, including a graveled dirt road and dirt two-track, were visually inspected.

Surface survey did not identify any remnants of sites 45PI00063, 45PI00064, 45PI00455, or isolate 45PI00773. Survey did identify two brick fragments at the recorded location of site 45PI00066, three new historic sites, and a historic isolate. The three sites include 45PI01224, a segment of a previously identified narrow-gauge railroad track and grade, 45PI01225, a concrete railroad loading platform, and 45PI01226, a set of railroad bridge abutments. The isolate, 45PI00064, is a galvanized kerosene can. Only the isolated kerosene can, 45PI00064, is in the new Avenue 55, LLC project boundaries. No artifacts were collected. PCI archaeologists completed the appropriate Washington Archaeological Site Inventory and Isolate forms for all archaeological materials identified during the survey.

Subsurface Testing Results

The subsurface stratigraphy was consistent in 123 of the 125 STPs and all 22 GTEs excavated in the boundaries of DuPont 243 (Figure 4). The soil throughout the project area is consistent with the description for the Spanaway series developed on glacial outwash sediments. There are three soil horizons, though horizon 2 is not present in all STPs or GTEs. The depth of the horizons varies across the Lot Y landscape in relation to the topography and prior human disturbance. Horizon 1 is a moist, very dark brown (10 YR 2/2) gravelly sandy loam with weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots with a very high organic matter content. Horizon 2 is a moist very fine crumb dark gray brown (10 YR 3/2) gravelly sandy loam with little distinction in texture from horizon 1. Horizon 3 is moist and fluctuates between a dark gray brown (2 YR 4/2) and an olive brown (2YR 4/4) gravelly sand with no soil matrix. The single grained, loose sand is the prominent content with some rounded to sub-rounded cobbles; it is also very compact.

Only two of the subsurface units (STPs 28 and 115) contained cultural material. A brick fragment, measuring 3x4x2 inches, was located at 20 cmbs (8 inches) in STP 28 within site 45PI66 (Methodist Episcopal Mission). The brick was not handmade and no maker's marks were located on the fragment. Additionally, a smaller brick fragment was located at ground level within inches of STP 35 (also within 45PI66). STP 115 is located 18.5 feet due east of a concrete platform and the soil is entirely mixed down to a level of 200 cmbs (6.6 feet). A flat iron bar with four bolts protruding was located at 160 cmbs (5.2 feet). The iron bar measured 24 inches long by 3 inches wide and 1/8th inch thick, and has four 3.5-inch metal bolts spaced roughly 7 to 8 inches apart. The iron bar appears to be associated with the concrete platform, given its close proximity and the paint on the bolt heads matches the metal on the platform.

All but two of the 125 STPs (STP 89 and 115) were excavated until sterile gravel was encountered. Although the presence of the Spanaway series soil horizons was consistent, the depth of sterile gravel varied from 35 cmbs to 130 cmbs (1.1-4.3 feet) across Lot Y. STP 115 had mixed stratigraphy and was excavated to a depth of 200 cmbs (6.6 feet). The soil in STP 89 is a moist, brown (7.5 YR 4/4) silty loam until the typical underlying horizon appears at 110 cmbs (3.6 feet) as a moist, dark green brown (2.5 YR 4/4) gravelly sand. The typical upper horizon of gravelly sandy loam appears to have been removed near STP 89 and replaced with imported soil. The STP was placed 66 feet northeast of the set of bridge abutments. It seems likely that more stable soil was imported for the approach to the narrow-gauge bridge that once crossed Sequalitchew Creek.

Six of the STPs located in the eastern portion of the project (STPs 113, 116-119) near the gravel road display a gray upper horizon not noted in any other portion of the project area. The moist, dark gray (2.5 YR 3/1) soil is similar in structure to the typical horizon 1, but is noticeably different in color and is relatively thin (0-25 cm [0-9.8 inches]), and is likely related to prior disturbance.

STPs 120 through 125, located in the southeastern portion of the project area, all show evidence of a grass fire. Small flecks of charcoal are noted in the upper 5 cm of each unit. Of these six STPs, only STP 120 that is nearest to the creek extending to a depth of 95 cmbs (3.1 feet) and exhibited horizon 2.

In summary, only two artifacts were identified during excavation of the STPs. The two artifacts are the brick fragment recovered from STP 28 and the iron bar from STP 115. No other cultural material was identified as a result of excavation across Lot Y.

Geotechnical Subsurface Exploration Results

Twenty-two GTEs were excavated across Lot Y (Figure 4-only shows DuPont 243 GTEs, 16 total) to a depth of 305 cmbs (10 feet). Two GTEs, 9 and 14, were excavated to depths of 250 cmbs (8.2 feet) and 244 cmbs (8 feet), respectively. The soils throughout the GTEs are relatively consistent with the Spanaway series, although only five GTEs, 1, 3, 5, 12, 13, and 15, exhibit horizon 2. In the eastern section of Lot Y, GTE 9 has mixed stratigraphy and was excavated to a depth of 250 cmbs (8.2 feet). The upper horizon is a thin layer of sand (0-20 cmbs [0-8 inches]) followed by a mix of horizon 1 very dark brown (10 YR 2/2) gravelly sandy loam and sand with very few cobbles. It appears to be imported fill material. This unit is in close proximity to two of the hot spots, HS-3 and HS-4. In the northeastern section of Lot Y, GTE 14 was terminated at 244 cmbs (8 feet) when water entered the unit and began to fill rapidly. No cultural material was located in any of the 22 GTEs excavated across Lot Y.

CONCLUSIONS AND RECOMMENDATIONS

PCI completed an intensive-level pedestrian survey, subsurface testing (i.e., excavation of approximately 450 cubic meters of soil), monitored excavation of geotechnical exploration pits, and prepared an Unanticipated Cultural Resources Discovery Plan. PCI's investigations did not identify any evidence of site 45PI66, the Methodist Episcopal Mission, site 45PI455, a 9th U.S. Cavalry Bivouac, isolate 45PI773, a piece of chipped stone, or sites 45PI63 and 45PI64 that are reported as being destroyed as part of the hazardous materials remediation project that occurred across Lot Y. PCI did identify two new sites, 45PI1224, a segment of railroad track, and 45PI01225, a concrete platform, and isolate 45PI00064, a kerosene can.

Site 45PI66, the Methodist Episcopal Mission, is eligible for the NRHP under Criterion A for its association with significant events and also contributes to the proposed Nisqually-Sequalitchew Historic District, but the site is not eligible under Criterion D because there are no physical remains of the mission present on Lot Y. Similarly, site 45PI455, the location of the brief occupation of the area by the 9th U.S. Cavalry Buffalo Soldiers, is potentially eligible for the NRHP as a contributing element to the proposed Nisqually-Sequalitchew Historic District under Criterion A, but is not eligible under Criterion D because there are no physical remains of the bivouac area present on Lot Y. The two new sites in Lot Y, 45PI1224, a railroad track segment, and 45PI01225, a concrete platform, are recommended ineligible for the NRHP. The two isolates, 45PI773 and 45PI00064, are not eligible for the NRHP. In addition, new site 45PI01226, bridge abutments, located immediately outside the boundaries of Lot Y, is also recommended ineligible for the NRHP.

Lot Y has been extensively disturbed beginning with historic period settlement in the early 1880s, operation of the DuPont Powder Works in the early to mid-1900s (including use of part of Lot Y as a burning ground

dump from the 1930s until 1945), subsurface archaeological investigations and related artifact collection between 1989 and 2005, and environmental remediation activities in 1999 and 2000. In addition, survey and excavation by PCI did not identify any significant cultural resources. Therefore, PCI determined that no further cultural resources investigations were warranted prior to the development of Lot Y and that the development of the property would not affect any historic properties.

Regardless, the results of the literature research, local ethnographic settlement and subsistence patterns, the prehistory and history of the vicinity, and DAHP's predictive model, the project area is considered highly sensitive for prehistoric, ethnohistoric, and historic-era cultural resources. Consequently, PCI completed an Unanticipated Cultural Resources Discovery Plan for the development of Lot Y (Appendix E of PCI's report attached as Appendix A to this memo).

Natural Investigations reviewed PCI's cultural resources report titled *Archaeological Survey, Testing and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington* for the currently proposed development of Lot Y by Avenue 55, LLC and

- finds that the report is adequate for the currently proposed development of DuPont 243 Project;
- does not recommend any additional investigations for the currently proposed project because of the scale (e.g., excavation of 450 cubic meters of soil) and nature (e.g., soils remediation) of the previous investigations conducted across Lot Y;
- concurs with the findings in the report that sites 45PI00063, 45PI00064, 45PI00455, 45PI01224, and 45PI01225 do not meet the eligibility criteria for inclusion on the NRHP or the WHR;
- finds that sites 45PI01224 and 45PI01225 are not in the boundaries of the currently proposed DuPont 243 project on Lot Y;
- concurs with PCI that implementation of the previously proposed project that includes areas of Lot Y currently proposed for development would not affect any historic properties as defined at 36 CFR 800, the SEPA Checklist Section B, Number 13, and the DAHP;
- recommends that the inadvertent discovery plan prepared by PCI should be updated to include current contact information for individuals and agencies identified in the plan and be implemented for the currently proposed project as recommended in PCI's 2011 report; and
- pursuant to Washington state guidance recommends that appropriate representatives of the Native American community be contacted and informed of the currently proposed project.

In summary, Natural Investigations review of PCI's 2011 report determined that previous investigations and PCI's investigations are adequate for Avenue 55, LLC's currently proposed development of DuPont 243 on Lot Y and implementation of the DuPont 243 project would not affect any historic properties as defined at 36 CFR 800 and SEPA.

REFERENCES CITED

Sikes, Nancy E., and Cindy J. Arrington
2011 *Archaeological Survey, Testing and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington*. Report prepared by Parus Consulting, Inc. for DuPont Industrial Partners, LLC.

APPENDIX A:

Archaeological Survey, Testing, and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington. Report prepared by Parus Consulting, Inc. 2011

Attachment 1q

Soundview Consultants LLC
Environmental Assessment • Planning • Land Use Solutions
2907 Harborview Dr., Suite D, Gig Harbor, WA 98335
Phone: (253) 514-8952 Fax: (253) 514-8954

Technical Memorandum

To: **Ben Varin, Avenue 55** **File Number: 1184.0010**

From: **Matt DeCaro, Soundview Consultants LLC** **Date: July 19, 2023**

Re: **Bat Habitat Reconnaissance**
DuPont 243 – DuPont, Washington

Dear Mr. Varin,

Soundview Consultants (SVC) completed a bat habitat reconnaissance of the 19.65-acre site located at 1700 Center Drive in DuPont, Washington (Pierce County Tax Parcel Numbers 0119266005 and 0119266006). The reconnaissance was performed in response to a finding in the State Environmental Policy Act (SEPA) *Mitigated Determination of Nonsignificance* (MDNS) for the DuPont Industrial Park (City File Nos. PLNG 2018-008, -009, and -047) which stated:

> *Washington Dept. of Fish and Wildlife lists several priority habitats and species as being located within or adjacent to the property. None of the species are federally-listed as endangered or threatened. Priority Habitat species include the Big brown bat, Little brown bat, and Yuma myotis bat…Additional information regarding potential nesting locations or Priority Habitat Species and Habitats onsite or within the vicinity is needed. If nests are found, WDFW shall be consulted prior to any site development for construction-related mitigation measures required for their protection.*

Similar language was included in the City's *Notice of Complete Application, First Comment Letter and Request for Additional Information* (City File No. PLNG2022-031 and -032) dated February 17, 2023.

Findings

The "generalized locations" of three priority bat species or their habitats are identified by the Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) map as occurring in the Township, a 36-square mile area that includes all of Dupont and portions of the Nisqually National Wildlife Refuge, Anderson Island, Ketron Island, Olympia, and Lacey. The three bat species potentially occurring in this 36-squre mile area are the big brown bat (*Eptesicus fuscus*), little brown bat (*Myotis lucifungus*), and Yuma myotis (*Myotis yumanensis*).

SVC submitted an informational request to WDFW in 2023 for this project. According to the records provided by WDFW in response to the informational request, there are no documented occurrences of any priority bat species on the subject property or within the same section (Section 26, Township 19N, Range 1E) as the DuPont 243 site, including the three bat species referenced above. The nearest

documented occurrences of these bat species are from 15 years ago and greater than one mile from the subject property.

In January 2023, a qualified biologist with SVC completed bat habitat reconnaissance fieldwork. The reconnaissance consisted of informal walk-through surveys of the subject property and any accessible areas within 200 feet of the property for signs of bat activity.

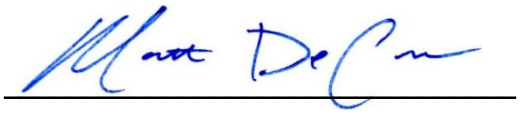
The site is mostly forested with Douglas fir (*Pseudotsuga menziesii*) and lesser amounts of Oregon white oak (*Quercus garryana*), Pacific madrone (*Arbutus menziesii*), western red cedar (*Thuja plicata*), and Pacific yew (*Taxus brevifolia*). Understory species include snowberry (*Symphoricarpos albus*), tall Oregon grape (*Mahonia aquifolium*), beaked hazelnut (*Corylus cornuta*), and orchard grass (*Dactylis glomerata*). Some areas of compacted gravel and Scotch broom (*Cytisus scoparius*) also occur.

SVC's biologist did not observe any bat activity or evidence of roosting bat concentrations. No caves, mine shafts, tunnels, old wells, or structures were observed that could provide a hibernaculum. No accumulated piles of bat guano indicative of roosting bat concentrations were observed. Audible bat squeaking was not detected, nor was an odor indicative of roosting bats observed. Based on these findings, there is no evidence that the site is occupied by the big brown bat, little brown bat, or Yuma myotis.

Conclusion

Due to the lack of known or observed bat colonies onsite, no additional bat studies are warranted and the project should be unencumbered by any terrestrial priority species. Please feel free to contact me at (253) 514-8952 or matt@soundviewconsultants.com if you have any questions.

Sincerely,



Matt DeCaro
Principal

GeoEngineers
1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

August 1, 2023

Avenue 55, LLC
601 Union Street, Suite 2930
Seattle, Washington 98101

Attention: Ben Varin

Subject: Revised Report Addendum 2
Geotechnical Engineering Services
DuPont 243
DuPont, Washington
File No. 26421-001-00

INTRODUCTION AND PROJECT UNDERSTANDING

This revised report addendum presents supplemental geotechnical recommendations and considerations for the proposed DuPont 243 project and is intended to replace our Report Addendum dated November 8, 2022 (2022 Addendum[1]). The purpose of this revision is to reflect the updated site plan layout described below and review final geotechnical design considerations presented in that study. The site is located at 1700 Center Drive in DuPont, Washington. An overview of the property and surrounding area is shown on the Figure 1, Vicinity Map.

Our experience at the site includes involvement with the previous owner, Dupont Station Partners, LLC. for the proposed DuPont Industrial Warehouse (also referred to as Lot "Y" Industrial Park). We understand you have been given permission by Dupont Station Partners, LLC and have the full use of studies held by GeoEngineers, Inc. (GeoEngineers) and as related to the site address. Our previous geotechnical deliverables for the site consist of:

- "Geotechnical Engineering Services, Lot 'Y' Industrial Park, DuPont, Washington" dated October 10, 2011 (2011 Report). As part of our services, we advanced 22 test pit explorations in the project area to develop an understanding of subsurface conditions. The 2011 Report presents

[1] "Report Addendum, Geotechnical Engineering Services, DuPont Industrial Park, DuPont, Washington", prepared for Avenue 55, LLC, dated November 8, 2022.

a summary of our findings, conclusions and recommendations regarding geotechnical engineering aspects of the proposed industrial park development.

- "Report Addendum, Geotechnical Engineering Services, DuPont Industrial Warehouse, DuPont, Washington" dated May 11, 2018 (2018 Addendum), which includes our review of a proposed development site plan and updated recommended seismic design parameters.

Our understanding of the current project is based on discussions and correspondence with Avenue 55, LLC, Barghausen Consulting Engineers, Inc. (project civil engineer) and Innova Architects (project architect). We were provided an updated site plan sheet A0.1 "SEPA Permit Date July 17, 2023". The overall project will include construction of an approximate 243,000 square foot, dock-high slab, warehouse building, referred to as Building A. Surrounding improvements will include paved parking and driveway areas, hardscaping, new utility installation, landscaping and stormwater management facilities, including an approximate 27,000 square foot infiltration pond (inferred from above plans). Additional elements may or may not include relatively short retaining walls (less than 8 feet tall) along the south property area, which will be considered as landscaping elements, to separate the project site from the Lower Sequalitchew Creek and associated buffers.

This report addendum is intended to provide recommendations to accommodate the proposed current design but also, some slight variations to the site planning and design (e.g., addition or elimination of retaining walls, small outbuilding structures, changes to roadway alignments, etc.). As such, we support the use of this geotechnical report for slight variations in site design. We would still recommend our review and comment on the variations, once established.

PURPOSE AND SCOPE OF SERVICES

The purpose of our services is to review site conditions and our previously provided geotechnical recommendations for the site. Based on the currently proposed improvements, we provide our opinion on the suitability of our previous recommendations and provide updated/revised recommendations (if necessary). Our services have been provided in accordance with our signed agreement with Avenue 55, LLC (signed October 17, 2022). Details regarding our specific scope of services for the project can be reviewed in our agreement or provided upon request.

SUBSURFACE CONDITIONS

Subsurface Explorations

We previously explored subsurface conditions at the site by excavating 22 test pits to depths between about 8 and 11 feet below ground surface (bgs), corresponding to Elevation 209 to 183.5 feet. Approximate locations of each test pit relative to currently proposed improvements are shown on the Figure 2, Site Plan. A detailed summary of the test pit explorations, including completed laboratory testing and test pit logs, is presented in our 2011 Geotechnical Report. A brief overview is provided below.

Soil Conditions

We interpret native soils encountered in the test pits to be recessional glacial outwash deposits, consisting of medium dense to very dense sand and gravel with varying amounts of silt and cobble. The upper few

feet were occasionally weathered and loose to medium dense. Fill consisting of medium dense sand with gravel and trace silt was observed in one test pit (TP-9) extending to the full depths explored (8 feet bgs).

Based on our understanding of geologic conditions and experience in the area, we anticipate recessional outwash soils are underlain by dense to very dense glacially consolidated soils at depth (glacial till and/or advance outwash).

Groundwater Conditions

Groundwater seepage was observed in one test pit (TP-14) at about 8 feet bgs, corresponding to Elevation 196 feet. Seepage and/or wet soils were not observed in remaining test pit excavations (as deep as about Elevation 183.5 feet).

We reviewed published groundwater maps and well information available online from the United States Geological Survey (USGS) National Water Information System (NWIS). Our review indicates groundwater elevations in the vicinity decrease from east to west, between about Elevation 200 feet (east of site, near Interstate 5) to Elevation 10 feet (west of site, near Puget Sound). The nearest readily available and most recently discovered information reviewed consisted of five groundwater wells within an approximate 1-mile radius of the project site; measured groundwater depths at these locations were below Elevation 140 feet.

In addition to the regional groundwater, areas of shallow perched groundwater could also be present throughout the site. It is common for perched groundwater to be present near contacts where soil that is more permeable overlies soil that is less permeable (i.e., sand over silt). The quantity and location of perched groundwater, if encountered, at this site is expected to be dependent on infiltration of surface water. Site grading can affect infiltration and therefore, the quantity and location of perched groundwater. Slow to moderate groundwater seepage should be expected if perched groundwater conditions are encountered. Slow seepage is defined as less than 1 gallon per minute (gpm) while moderate seepage is between 1 and 3 gpm.

GEOTECHNICAL DESIGN RECOMMENDATIONS

General

Except as modified in this addendum, the conclusions and recommendations presented in our 2011 Report and 2018 Addendum are appropriate for project design and construction. This includes but is not limited to site development and earthwork, fill placement and compaction, shallow foundation support and bearing surface preparation, retaining walls and stormwater designs. Updated and/or revised geotechnical design recommendations to these reports are provided in the sections below. The recommendations provided in this addendum supersede the recommendations presented in all our past studies, where applicable.

Seismic Design

Seismic Design Approach

Proposed structures will be designed in accordance with seismic design requirements presented in the 2018 or 2021 International Building Code (IBC). The 2018 and 2021 IBC both state that structures shall be designed and constructed to resist the effects of earthquake ground motions in accordance with the

American Society of Civil Engineers (ASCE) "Minimum Design Loads and Associated Criteria for Buildings and Other Structures, ASCE/SE 7-2016" (ASCE 7-16).

Seismic Design Parameters

We used map-based values available online as recommended by the USGS to determine the seismic design spectrum in accordance with ASCE 7-16.

Soils encountered in the test pits (as deep as about 11 feet bgs) consisted of medium dense to very dense sand and gravel recessional outwash deposits. We anticipate these soils are underlain by dense to very dense glacially consolidated soils at depth. We anticipate soils below the explorations and extending to depths of 100 feet bgs consist of dense to very dense glacially consolidated deposits. Based on subsurface conditions encountered, our review and our experience in similar soil conditions, we recommend using a design response spectrum for Site Class C. In our opinion, the parameters provided in Table 1 below are suitable for seismic design and analysis.

TABLE 1. RECOMMENDED SEISMIC DESIGN CRITERIA (2018 OR 2021 IBC PER ASCE 7-16)

ASCE 7-16 Seismic Design Parameters	
Site Class	C
Mapped Spectral Response Acceleration at Short Periods (S_S)	1.371 g
Mapped Spectral Response Acceleration at 1-Second Periods (S_1)	0.487 g
Site Amplification Factor at 0.2 Seconds (F_a)	1.2
Site Amplification Factor at 1.0 Seconds (F_v)	1.5
Design Spectral Response Acceleration at Short Periods (S_{DS})	1.097 g
Design Spectral Response Acceleration at 1-Second Periods (S_{D1})	0.487 g
Site Modified Peak Ground Acceleration (PGA_M)	0.632 g

Liquefaction Potential

DESCRIPTION

Liquefaction refers to the condition by which vibration or shaking of the ground, usually from earthquake forces, disturbs the soil structure (i.e., the arrangement of individual soil particles) within saturated and unconsolidated soils. This rearrangement of particles results in the development of excess pore pressures in saturated soils with subsequent loss of strength. Liquefaction susceptibility is difficult to predict and not all soils are susceptible to liquefaction. In general, soils that are susceptible to liquefaction include very loose to medium dense, "clean" to silty sands below the water table.

Ground settlement, lateral spreading and/or sand boils may result from soil liquefaction. Structures, such as buildings, supported on liquefied soils may suffer loss of bearing capacity, foundation settlement and/or lateral movement that can be damaging to the buildings.

SEISMIC HAZARD MAP REVIEW

We re-reviewed the "Liquefaction Susceptibility Map of Pierce County, Washington" (Palmer et al. 2004[2]) and the Washington State Department of Natural Resources (DNR) Interactive Natural Hazards Map. According to the maps, the site has "very low to low" potential for liquefaction.

ESTIMATED LIQUEFACTION POTENTIAL

Based on the soil and groundwater conditions observed in our explorations, our interpretation of the regional geology and review of hazard maps in the area, it is still our opinion the potential for liquefaction at the site is low.

Lateral Spreading Potential

Lateral spreading related to seismic activity typically involves lateral displacement of large, surficial blocks of non-liquefied soil when an underlying soil layer loses strength during seismic shaking. Lateral spreading usually develops in areas where sloping ground or large grade changes (including retaining walls) are present. Based on our understanding of the subsurface conditions, liquefaction risk, current site topography and proposed site grading, it is our opinion the risk of lateral spreading at the site is low.

Surface Rupture Potential

We reviewed published geologic seismic feature maps of the project vicinity, including maps available online from the DNR, USGS and the Washington Department of Geology and Earth Sciences map "Faults and Earthquakes in Washington State" (Czajkowski and Bowman 2014[3]). The nearest mapped faults to the project site are the Tacoma fault zone (approximately 10 miles northeast of the site) and the Olympia structure (approximately 10 miles southwest). Locations of these fault zones have been inferred from geophysical studies and there are no known surface expressions of the fault. Based on our understanding of local geology, bedrock in the project area is covered by several hundred feet of glacial soils. Based on this information and the fault distance from the project site, it is our opinion the risk for seismic surface rupture at the site is low.

Conventional Retaining Walls and Below-grade Structures

We recommend the following updates to the lateral earth pressures be used for design of conventional retaining walls and below-grade structures in Table 2 below. The parameters below include additional conditions not presented in our 2011 Report that we typically provide in today's studies, for use as needed. Our design pressures assume two conditions: level backfill and 2H:1V (horizontal: vertical) sloping backfill. If drained design parameters are used, drainage systems must be included in the design in accordance with the recommendations presented in our 2011 Report. Our 2011 Report also provides descriptions for the active and at-rest conditions, including surcharge loading, and should be used as part of retaining wall design.

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[2] Palmer, Stephen P., Magsino, Sammantha L., Bilderback, Eric L., Poelstra, James L., Folger, Derek S., and Niggemann, Rebecca A. 2004. Liquefaction Susceptibility Map of Pierce County, Washington. Washington state Department of Natural Resources. Dated September 1, 2004.

[3] Czajkowski, Jessica L. and Bowman, Jeffrey D. 2014. Faults and Earthquakes in Washington State. Washington State Department of Natural Resources. Open File Report 2014-05, 1 sheet, scale 1:750,000.

TABLE 2. LATERAL SOIL PRESSURE PARAMETERS FOR RETAINING WALLS AND BELOW-GRADE STRUCTURES

Soil Parameter	EFD[1] (Level Backfill Condition) (pounds per cubic foot [pcf])	EFD[1] (2H:1V Backfill Condition) (pcf)
Active Earth Pressure	35 pcf drained; 80 pcf undrained[2]	55 pcf drained; 90 pcf undrained[2]
At-rest Earth Pressure	55 pcf drained; 90 pcf undrained[2]	80 pcf drained; 100 pcf undrained[2]
Seismic Loading[3]	14*H pounds per square foot (psf)	22*H psf

Notes:

[1] Equivalent fluid density in pcf.

[2] This value includes hydrostatic pressures.

[3] If the retaining wall is to be designed for seismic forces, we recommend that the seismic loading be approximated using a uniform lateral pressure based on backfill condition, where H is the height (in feet) of the structure. This seismic lateral pressure is in addition to the static soil load and any anticipated hydrostatic pressures. This assumes that the wall is free to yield somewhat during a seismic event.

Infiltration Feasibility Assessment

Infiltration Approach

Stormwater management facilities at the site could include bioretention and on-site infiltration areas. We understand stormwater facilities will be designed in accordance with the City of DuPont 2022 Municipal Code. Per Section 22.01.090 of the DuPont Code, the Washington State Department of Ecology (Ecology) *Stormwater Management Manual for Western Washington* (SWMMWW), shall be used for stormwater drainage design.

According to the 2019 SWMMWW, infiltration rate of on-site soils can be determined by either in-situ testing (e.g., pilot infiltration tests [PIT]) or correlation to grain-size distribution from soil samples. Grain-size analysis is only appropriate for soils unconsolidated by glacial advance. We interpret soils encountered in test pits at the site to consist of recessional outwash deposits, which are unconsolidated by glacial advance. Therefore, it is our opinion that the grain-size analysis method is appropriate for the site.

Where necessary, we also refer to the *2021 Pierce County Stormwater and Site Development Manual* (SMSDM).

Soil Grain-Size Analysis

Using the recommended procedures in the 2019 SWMMWW, we estimated initial saturated hydraulic conductivity ($K_{sat,initial}$) of selected soil samples based on grain-size analysis results using the Massmann method. Calculated $K_{sat,initial}$ was then reduced through correction factors to produce a preliminary long-term design infiltration rate ($K_{sat,design}$). Correction factors in the SWMMWW are based on site variability and number of tests conducted (C_{Fv}), uncertainty of the test method (C_{Ft}), and the potential for long-term clogging due to siltation and bio-buildup (C_{Fm}). Recommended correction factors are outlined in Section V-5.4 of the SWMMWW.

Table 3 below summarizes the partial and total correction factor(s) we considered in our analysis.

TABLE 3. GRAIN-SIZE ANALYSIS CORRECTION FACTOR SUMMARY

Issue	Correction Factor Value
Site Variability and Number of Locations Tested (CF_v)	0.80
Test Method (CF_t)	0.40
Siltation and Bio-Buildup (CF_m)	0.90
Total Correction Factor = CF_v x CF_r x CF_m	**CF_T = 0.29**

Table 4 below summarizes selected samples for grain-size analysis, calculated initial (short-term) infiltration rates and calculated design (long-term, with correction factors applied) infiltration rates. We considered a maximum initial infiltration rate of 100 inches per hour (in/hr) (corresponding to a maximum design rate of 29 in/hr) in our analysis. This is consistent with guidance presented in the Pierce County SMSDM, which allows a maximum design infiltration rate of 30 in/hr.

TABLE 4. ESTIMATED INFILTRATION RATE SUMMARY

Exploration	Depth (feet)	Elevation (feet)	Geologic Unit	USCS Soil Type	Percent Fines	$K_{sat,initial}$ (in/hr) [1]	$K_{sat,design}$ (in/hr) [2]
TP-2	6	203	Recessional Outwash	GP	1.7	100	29
TP-4	4	206	Recessional Outwash	SP	1.0	100	29
TP-7	4	207	Recessional Outwash	GP	1.1	100	29
TP-11	4	190	Recessional Outwash	GP	1.5	100	29
TP-12	6	196	Recessional Outwash	GP	1.0	100	29
TP-14	6	198	Recessional Outwash	GW	2.0	100	29
TP-15	4	199	Recessional Outwash	GP	1.2	54.7	15.7
TP-16	6	209	Recessional Outwash	GW	0.6	100	29
TP-20	6	192	Recessional Outwash	GP	4.2	94.1	27.1
TP-22	4	206	Recessional Outwash	GP	1.1	100	29

Notes:

[1] We considered a maximum initial (measured) infiltration rate of 100 in/hr.

[2] Per Pierce County, maximum allowable design infiltration rate is 30 in/hr.

USCS = Unified Soil Classification System

Recommended Design Infiltration Rate

Calculated design infiltration rates for the selected samples vary between about 15 and 29 in/hr, when also considering Pierce County SMSDM design criteria, and the limit of 30 in/hr. The upper few feet of soil encountered in the test pits were occasionally weathered and somewhat siltier. We anticipate slower infiltration rates within these upper siltier soils. Somewhat "cleaner" soils (fewer fines) were typically observed at depth, on average of about 3 feet bgs. We anticipate, and the data supports, faster infiltration rates in these soils at depth, compared to the upper weathered soils.

Due to the presence of surface weathered recessional outwash deposits, we recommend a design infiltration rate of 15 in/hr be used as an average value across the site for this project. This value may be

considered somewhat conservative. It is likely higher rates can be considered for deeper facilities. This rate would have to be considered on a case-by-case basis.

Stormwater Facility Code Assessment and Additional Design Considerations

Per Section V-5.6.SSC-5 of the SWMMWW, the base of the infiltration facility shall be no less than 5 feet above seasonal high water, bedrock or other low permeability layer. A reduced 3-foot minimum separation can be considered if groundwater mounding analysis and other design factors indicate the prevention of overtopping and that the other site suitability criteria specified in Section V-5.6 are met. Per Section V-5.2.7 of the SWMMWW, the minimum required vertical separation increases to 15 feet if the infiltration facility has a contributing drainage area exceeding 1-acre, otherwise an analytical groundwater model would be required to determine the final design infiltration rate.

- We anticipate static groundwater elevations to be below the depths of the completed test pits, and as deep as 20 feet below surrounding grade, based on recent review of published information and our work in the nearby area.
- Soils encountered in the explorations at depth were observed to consist of recessional outwash deposits and are relatively uniform across exploration locations. No clear demarcation was observed between high or low permeable layers, and in general, low permeability soils were not observed.
- It is our opinion a detailed groundwater analysis will not be required for relatively shallow infiltration facilities anticipated for this project. We suggest we be consulted for further review if infiltration facilities will be more than about 15 feet deep (below existing site grade).
- Additional field infiltration testing, such as PITs, could be considered as a part of this project design and review, especially if site-specific and/or faster rates were desired. At this time, it is our opinion that a PIT study would not provide much more benefit to this project. Additionally, maintaining enough water in the hole for this test may also prove difficult. If PIT studies are desired/required, we recommend the process also be observed with Regulatory Stormwater Agencies in the field so they can directly observe the infiltration process.
- Other considerations such as separation limits from structures, pond locations, security, set-backs, treatments or other requirements presented in the SWMMWW should also be reviewed and considered as a part of the final stormwater facility design.
- To help reduce clogging of infiltration facilities, we recommend they be protected during construction with siltation elimination/siltation control facilities, such as sweeping, temporary settling basins, silt fences and hay bales.
- Compaction of infiltration pond subgrade should be avoided, and equipment should not be permitted in the infiltration areas after they are excavated to design grade.
- We recommend we review project plans and specifications regarding infiltration and be retained during construction to observe soil conditions at the base of the infiltration facilities and verify exposed soil conditions are as anticipated for the proposed design.

Additional Geotechnical Services

Recommendations provided in this report are based on the assumptions and design information stated herein. We welcome the opportunity to review and discuss construction plans and specifications for this project as they are being developed. In addition, GeoEngineers should be retained to review the project plans and specifications when complete to confirm that our design recommendations have been implemented as intended.

Satisfactory foundation and earthwork performance depend to a large degree on quality of construction. Sufficient monitoring of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated.

We recommend that GeoEngineers be retained to observe construction at the site to confirm that subsurface conditions are consistent with the site explorations and to confirm that the intent of project plans and specifications relating to earthwork, pavement and foundation construction are being met.

LIMITATIONS

We have prepared this letter for the exclusive use by Avenue 55, LLC and their authorized agents for the proposed DuPont 243 project in DuPont, Washington. Avenue 55, LLC may distribute copies of this report to the owner and owner's authorized agents and regulatory agencies as may be required for the project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this letter was prepared. The conclusions, recommendations and opinions presented in this report are based on our professional knowledge, judgment and experience. No warranty or other conditions, express or implied, should be understood. Please refer to Appendix A, Report Limitations and Guidelines for Use for additional information pertaining to the use of this report.

Sincerely,
GeoEngineers, Inc.

8/1/2023

Christopher R. Newton, PE
Geotechnical Engineer

Dennis (DJ) Thompson, PE
Associate

CRN:DJT:tlm:mce

Attachments
Figure 1. Vicinity Map
Figure 2. Site Plan
Appendix A. Report Limitations and Guidelines for Use

One electronic copy submitted

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Source(s):
- ESRI

Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet

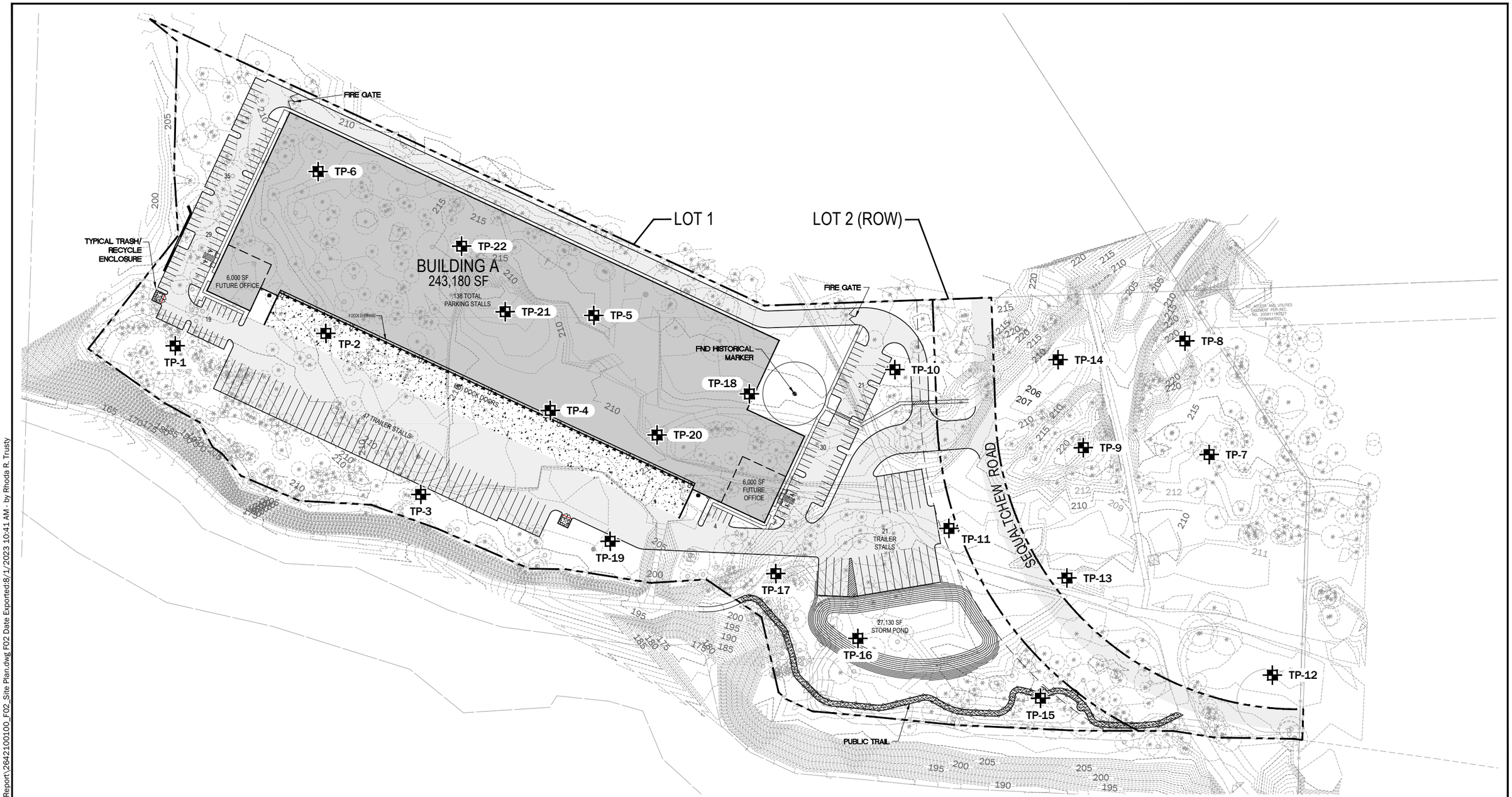
Disclaimer: This figure was created for a specific purpose and project. Any use of this figure for any other project or purpose shall be at the user's sole risk and without liability to GeoEngineers. The locations of features shown may be approximate. GeoEngineers makes no warranty or representation as to the accuracy, completeness, or suitability of the figure, or data contained therein. The file containing this figure is a copy of a master document, the original of which is retained by GeoEngineers and is the official document of record.

Vicinity Map

DuPont 243
DuPont, Washington

GeoEngineers

Figure 1



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Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Existing Grade Surface from Barghausen Consulting Engineers, Inc dated 6/5/2018.
Designs from Innova Architechts dated 7/17/2023.

Projection: NAD83 Washington State Planes, South Zone, US Foot

Legend

TP-1 Test Pit by GeoEngineers, Inc., 2011

N W E S

150 0 150
Feet

Site Plan

DuPont 243
DuPont, Washington

GeoEngineers

Figure 2

APPENDIX A
Report Limitations and Guidelines for Use

APPENDIX A
REPORT LIMITATIONS AND GUIDELINES FOR USE[4]

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its reports. Please confer with GeoEngineers if you need to know more how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services are Performed for Specific Purposes, Persons and Projects

This report has been prepared for Avenue 55, LLC for the Project(s) specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our agreement with Avenue 55, LLC authorized October 17, 2022 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

A Geotechnical Engineering or Geologic Report is based on a Unique Set of Project-Specific Factors

This report has been prepared for the proposed DuPont 243 project located in DuPont, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- Not prepared for you,
- Not prepared for your project,
- Not prepared for the specific site explored, or
- Completed before important project changes were made.

[4] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

For example, changes that can affect the applicability of this report include those that affect:

- The function of the proposed structure;
- Elevation, configuration, location, orientation or weight of the proposed structure;
- Composition of the design team; or
- Project ownership.

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Information Provided by Others

GeoEngineers has relied upon certain data or information provided or compiled by others in the performance of our services. Although we use sources that we reasonably believe to be trustworthy, GeoEngineers cannot warrant or guarantee the accuracy or completeness of information provided or compiled by others.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Geotechnical Engineering Report Recommendations are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- Advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- Encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

Contractors are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

Attachment 1s

Site Specific Sewer Information Letter

Sewer Development Review Application

APPLICATION
A8
Revised 2/1/2023

- Submit this application for sewer permitting requirements, fees and/or connection charges for proposed development or changes to existing development.
- You must submit a site plan with this application. See Bulletin B17 for details.
- Submit all documents in PDF format at piercecountywa.gov/permit.
- If you have questions, please contact us at (253) 798-2737.

A. Property Information

Parcel numbers: 011926-6005

Site address(es): 1700 Center Drive

City, State: **DuPont** Zip: **98327**

B. Applicant Information:

Applicant Name: Betsy Dyer, Barghausen Consulting Engineers

Email: bdyer@barghausen.com Phone: 425-251-6222 Alternate Phone:

Mailing Address: 18215-72nd Ave. S. City, State: **Kent** Zip: **98032**

C. Existing Uses

List all existing uses on the parcels shown in Section A

Existing Uses	Number of Existing Dwelling Units or Tenant Spaces	Number of Existing Buildings	Number of Existing Buildings to Remain	Number of Existing Buildings to be Demolished
Single-family Residences				
Duplexes				
Accessory Dwelling Units				
Apartment Units				
Condos				
Commercial				

List all existing commercial businesses and tenants:
Vacant property.

D. Proposed Uses (required for commercial uses only)

☐ Check if there are no proposed changes or expansions of use.

Proposed Uses	Number of New Dwelling Units or Tenant Spaces	Number of New Buildings	Total Number of Dwelling Units or Tenant Spaces (remaining plus proposed)	Total Number of Buildings (remaining plus proposed)
Single-family Residences				
Duplexes				
Accessory Dwelling Units				
Apartment Units				
Condos				
Commercial	1	1	1	1

List and describe all the proposed commercial businesses and tenants:
No existing businesses on site.

E. Water Use Data:

New Connections (Existing or Proposed Development):
What is the estimated sewer discharge or water use* in gallons per day (gpd) or hundred cubic feet per month (ccf/mo) from all the existing and proposed buildings on the property to be connected?

4,500 gpd _____ ccf/mo

Proposed Development on Previously Connected Property:
Will the proposed development or change in business require an increase in water use on the property?

☒ Yes ☐ No

If yes, then please submit documented Water Use Data* for the existing and proposed uses so the Sewer Division can determine what additional connection charges must be paid, if any.

*Please read Bulletin B5 Documented Water Use Data, to see what type of water use data must be submitted.

F. Site Specific Sewer Information Letter Application Fee

☐ Existing Single Family Residences or Duplexes (to remain) $125.00

☐ Existing Apartments, Condos, Mobile Home Parks, or Commercial Buildings (to remain) $200.00

☒ Proposed Residential or Commercial Development $300.00

Site Plan Map

Attachment 1t

City of DuPont
Planning Division
Land Use Application

1700 Civic Drive
DuPont, WA 98327
www.dupontwa.gov

Phone: (253) 912-5393
Fax: (253) 964-1455

City File Number: _____

All information listed in this application, or by applicable ordinance, must be submitted in order for a land use application to be determined complete. Only a complete land use application will be processed for conformance with adopted policies and requirements.

General Information:

Project name: DuPont 243

Applicant name: Ben Varin, Avenue 55

Address: 601 Union Street, Suite 2930, Seattle, WA 98101

Phone number: 206-707-9696 Fax number: Cell: 509-528-1893

Applicant's representative: Barghausen Consulting Engineers, Dan Balmelli / Betsy Dyer

Address: 18215-72nd Avenue South, Kent, WA 98032

Phone number: (425) 251-6222 Fax number: 209-396-8588 / 206-605-4072

Description of proposal. Be specific.

Construction of one office/warehouse use building on two vacant parcels of land totaling 19.65 acres in size. Site work improvements will include clearing and grading, paved truck parking and maneuvering areas, water and sanitary sewer extensions, storm water facility, landscaping and roadway improvements.

Site Information:

Assessor's Parcel Number(s): 011926-6005 and 6006

Area of site in square feet: 855,887 sq. ft.

Area of streets and alleys: 39,846 sq. ft.

Area of storm drainage improvements and conveyance lines: 3,687 ln. ft. storm lines, 29,185 sq. ft. pond

Area of open space and neighborhood green tracts: N/A

Area of critical areas and buffers: N/A

Area of building floors: 243,180 sq. ft.

Area of impervious surfaces: 243,180 sq. ft. (building) + 308,176 sq. ft. (pavement) = 551,356 sq. ft.

Area of landscaping: 243,936 sq. ft.

Building height: approximately 45-foot

Number of dwelling units: N/A

Number of employees: approximately 90 to 120 persons

Number of disabled, compact and standard parking stalls: 138 standard stalls / 4 ADA accessible stalls / 0 compact

Description and area of all proposed tracts: N/A

Required Plans, Information and Fee:

(Quantity and minimum scale of each item or drawing is indicated in parenthesis. Plans shall be no larger than 24 by 36 inch sheet size)

1. ☐ Vicinity Map (include as part of site plan).
2. ☐ Site Plan drawn at 1 inch = 20 feet extending 100 feet beyond the property lines (eight copies).
3. ☐ Landscape Plans identifying: location, size and species of all landmark, historic and specimen trees; trees to be retained, specific tree protection measures drawn at 1 inch = 20 feet (seven copies).
4. ☐ Grading Plan with estimated dimensions and quantities of work involved drawn at 1 inch = 20 feet horizontal with 2' contour intervals (seven copies).
5. ☐ Storm Drainage and Utility Plan drawn at 1 inch = 20 feet (seven copies).
6. ☐ Preliminary Stormwater Management Report and calculations (three copies).
7. ☐ Roadway cross sections, (seven copies of single line drawing with dimensions).
8. ☐ One each 8 by 11 inch reduction of all drawings.
9. ☐ Average daily trips generated by the proposal based on the International Transportation Engineers Trip Generation Manual (two copies).
10. ☐ Building Elevations drawn at ¼ inch = 1 foot or larger. Identify building materials and colors (eight copies).
11. ☐ Title report of subject lot that is less than 30 days old to identify all encumbrances (two copies).
12. ☐ Draft of proposed covenants, conditions and restrictions related to the maintenance of open space or commonly owned improvements, if applicable (two copies).
13. ☐ Letter of Sewer Availability from Pierce County (two copies).
14. ☐ Letter of Water Availability from City of DuPont (two copies).
15. ☐ One site drawing showing the refuse enclosure(s) that is approved via signature and date by LeMay, Inc. Contact person is Charlie Maxwell, Public Relations Director, 253-537-8687.
16. ☐ Completed Environmental Checklist (two copies).
17. ☐ Completed Land Use Application (one copy).
18. ☐ Completed Agent Affidavit (one copy).
19. ☐ Filing fee(s).

Note:

Fill out and return this application with all material listed in the Required Plans, Information and Fee section. Submittal of all required plans, information and fees constitutes a complete application. You will be contacted by the City within 28 days of formal application submittal regarding whether the application is complete. Site work may not start until all necessary permits have been obtained. Paper or electronic drawings of the proposal may be requested for presentation purposes.

Daniel K. Balmelli, Agent 08-04-2023

(Applicant Signature) (Date)

Daniel K. Balmelli, P.E.

(Print name)

Barghausen Consulting Engineers

Attachment 1u

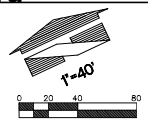
SEQUALITCHEW TRAIL LINE OF SIGHT EXHIBIT

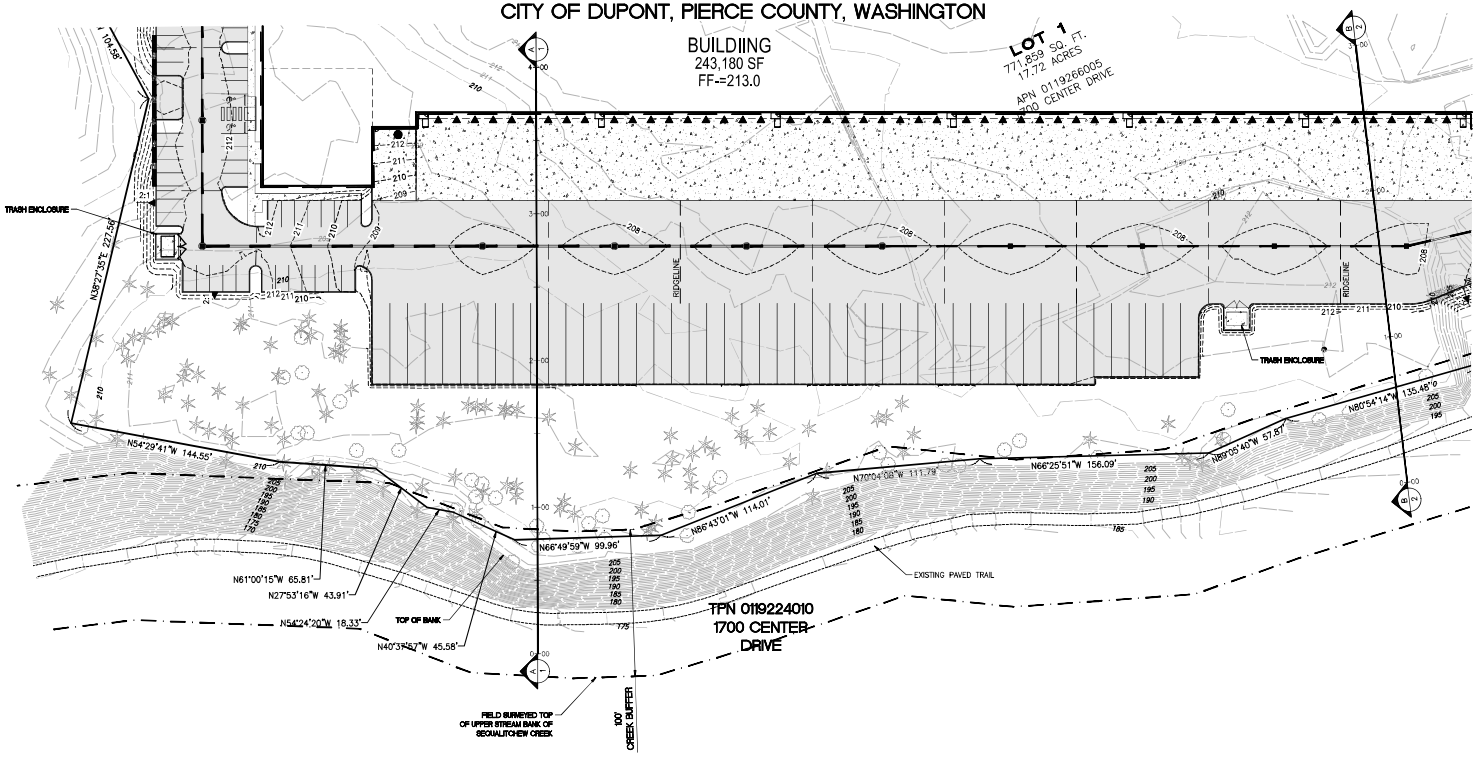
FOR

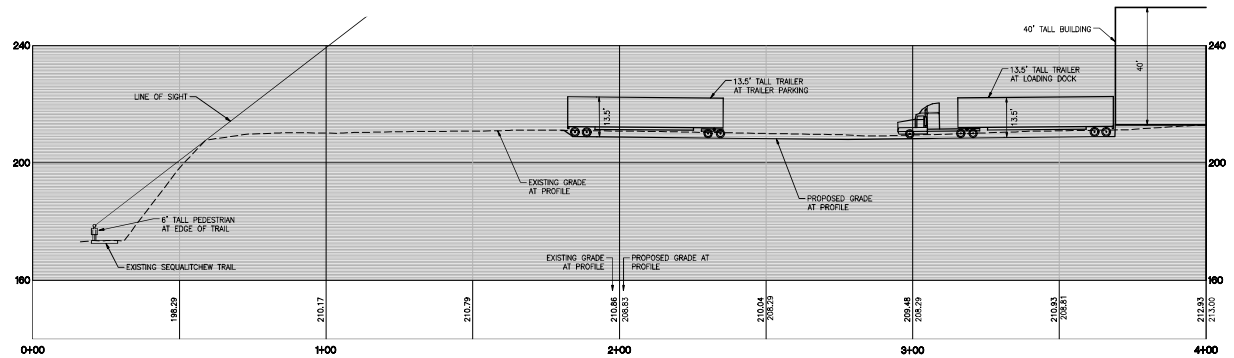
DUPONT 243

A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

NOTE:
ALL TREES SHOWN ON THIS SHEET ARE TO REMAIN DURING DEMOLITION







TRAIL LINE OF SIGHT PROFILE A
SCALE HOR: 1" = 20' VERT: 1" = 20'

No.	Date	By	Chkd.	Appr.	Revision

Title: SEQUALITCHEW TRAIL LINE OF SIGHT EXHIBIT FOR DUPONT 243

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

25672 REGISTERED PROFESSIONAL ENGINEER
08/06/2023

Designed JAT
Drawn JAT
Checked DRB
Approved DRB
Date 08/06/23

Scale: Horizontal 1"=40' Vertical N/A

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 18666
Sheet 1 of 2

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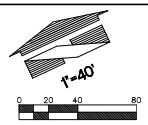
SEQUALITCHEW TRAIL LINE OF SIGHT EXHIBIT

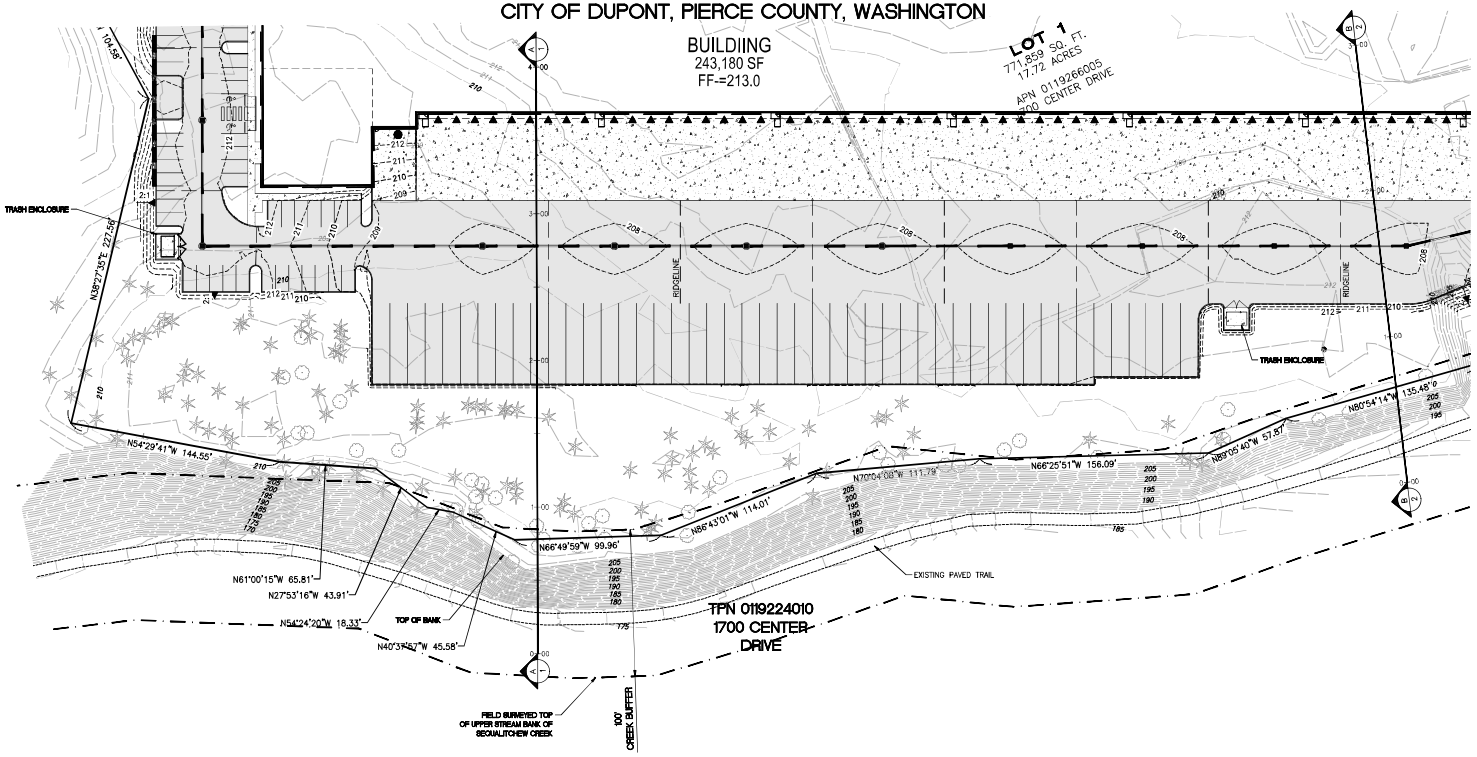
FOR

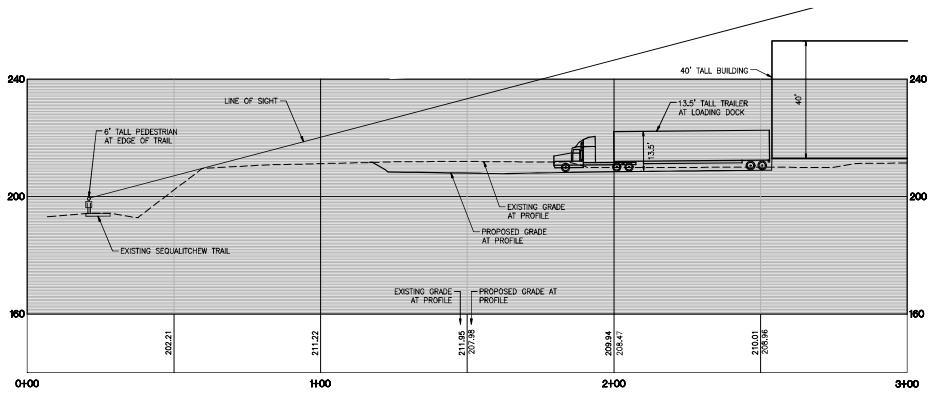
DUPONT 243

A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

NOTE:
ALL TREES SHOWN ON THIS SHEET ARE TO REMAIN DURING DEMOLITION







TRAIL LINE OF SIGHT PROFILE B
SCALE HOR: 1" = 20' VERT: 1" = 20'

No. | Date | By | Chkd. | Appr. | Revision

Title: SEQUALITCHEW TRAIL LINE OF SIGHT EXHIBIT FOR DUPONT 243

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

25672 REGISTERED PROFESSIONAL ENGINEER
08/06/2023

Scale: Horizontal 1"=40' Vertical N/A
Designed JAT Drawn JAT Checked DRB Approved DRB Date 08/06/23

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
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CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 18666
Sheet 2 of 2

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Attachment 1v

BARGHAUSEN

August 8, 2023

Barb Kincaid
City of DuPont
Department of Community Development
1700 Civic Drive
DuPont, WA 98327

RE: DuPont 243
Response to May 12, 2023 Comment Letter for DuPont 243 Project
City File Numbers: PLNG2022-031 and -032
Our Job No. 18666

Dear Ms. Kincaid:

We have revised the plans and technical documents for the above-referenced project in accordance with your comment letter dated May 12, 2023. Enclosed are the following plans and documents for your review and approval:

1. One (1) each electronic file revised Architectural Site Plan dated July 17, 2023
2. One (1) each electronic file Dumpster Location Approval dated July 31, 2023
3. One (1) each electronic file revised Land Use Application dated August 4, 2023
4. One (1) each electronic file revised SEPA Checklist dated August 4, 2023
5. One (1) each electronic file revised Noise Study dated July 21, 2023
6. One (1) each electronic file revised Landscape Planting Plan dated August 2, 2023.
7. One (1) each electronic file revised Traffic Impact Analysis dated July 27, 2023
8. One (1) each electronic file revised Tree Retention Plan dated August 6, 2023
9. One (1) each electronic file revised Photometric Plan dated July 25, 2023
10. One (1) each electronic file revised Cultural Resources Plan dated July 25, 2023
11. One (1) each electronic file revised Geotechnical Report dated August 1, 2023
12. One (1) each electronic file revised Bat Habitat Reconnaissance dated July 19, 2023
13. One (1) each electronic file revised Site Specific Sewer Information Letter Application dated July 31, 2023
14. One (1) each electronic file revised Civil Engineering Plans dated August 4, 2023
15. One (1) each electronic file revised Stormwater Site Plan dated August 4, 2023
16. One (1) each Sequalitchew Trail Visual Analysis dated August 6, 2023.

The following outline provides each of your comments in italics, along with a narrative response describing how each comment was addressed:

A. General Comments

1. *The submitted plans depict future improvements on the eastern parcel (Lot 3) and in some instances the plans for development of Lot 3 are described (cul-de-sac construction, tree removal for example). The SEPA Checklist, however, describes only the portion of the proposal occurring on Lots 1 and 2. The City recently received a pre-application meeting request with documents showing a development proposal for Lot 3. When two proposals consist of common aspects (access, geography, stormwater, ownership, etc.), agencies may wish to analyze "similar actions" in a single environmental document (WAC 197-11-060(3)(c)). Your options are:*

   (a) *So that the proposal is clearly and properly defined, remove all future buildings depicted on Lot 3 from the project plans and wait until the SEPA environmental review is completed for Lots 1 and 2 before submitting SEPA and permit applications for Lot 3; or*

   (b) *Have one combined SEPA process for both projects. Under scenario (b) you would have to provide a combined SEPA checklist describing both projects. The land use applications under scenario (b) could be completed separately/independently in a phased manner, or could be combined if you prefer.*

   Response: This project will proceed with option (a). All potential development depicted on Lot 3 has been removed from the plans. We are electing to wait until the SEPA environmental review is completed for Lots 1 and 2 before submitting SEPA and permit applications for Lot 3.

B. DMC 25.45 Performance Standards

1. *DMC 25.45.030 Provides the required performance standards:*

   (a) *The City previously commented that the outdoor storage requirements would apply to the trailer parking area. After further conversation, the SEPA mitigation measures that were applied to the previous proposal (Mitigation Measures 3, 8 and 9, see attached), would likely serve to mitigate for the noise, lighting impacts associated with the trailer parking area. See SEPA, below.*

   Response: Comment acknowledged. Please see the attached noise study and photometric plan for an analysis of any offsite impacts from the proposed project.

   (b) *Based on previous comments, the trash enclosure for Building B was relocated to avoid being adjacent to the Sequalitchew Creek Trail. The proposed trash enclosure is still within close proximity (approximately 20 feet) to the Sequalitchew Creek Trail and requires screening in accordance with DMC 25.90.030(3) due to the trail being a high use area.* ***You may propose screening in your resubmittal, or the City will condition the approval to provide screening.*** *During building permit review the enclosure will be evaluated for compliance with DMC Chapter 25.100.*

   Response: Building B and its associated trash enclosure have been removed from the plans.

(c) *The previous comment regarding noise levels in accordance with DMC 9.09 (Sound and Vibration) was acknowledged. You submitted a Noise Study which has been sent out for peer review. We will provide the peer review comments when received.*

Response: Comment acknowledged. Any additional comments received from peer review of the noise study will be addressed at that time.

C. Landscaping, DMC 25.90

1. *DMC 25.90.030(3) requires a moderate buffer between parking lots and adjacent public right-of-way. DMCC 25.10.020.060 defines a buffer as a strip of trees, shrubs, and ground cover of sufficient height, width, and density to screen, within three years of planting. For moderate buffers the screening level at three years is to be 50 percent. Berms, grade separations, walls, and fences may be incorporated to achieve up to 50 percent of the minimum screening. Parking lots are located adjacent to the right of way and are required to provide the moderate buffer screening. The plans depict the moderate buffer screening in a strip adjacent to the parking stalls. Within the Lot 2 area, existing vegetation is proposed to be retained in the north sector and the areas that are already cleared are proposed for "erosion-control hydroseed" mix. It does not appear as though any other landscaping is proposed within Lot 2.* ***Revise the landscape plans to add trees within Lot 2 in the areas that were either already cleared or will be cleared/graded for the proposal. Revise the hydroseed mix in Lot 2 from erosion-control to turfgrass lawn****.*

   Response: Landscape plans have been revised to show trees within Lot 2, moderate buffer adjacent to right-of-way instead of parking stalls, and lawn area as turfgrass lawn instead of erosion-control hydroseed.

D. *Parking Comments, DMC 25.95*
A revised parking analysis was provided on Sheet A0.1 and describes a total of 138 spaces for Building A and 58 spaces for Building B for a total of 196 spaces. In addition, 47 trailer parking spaces are provided. The SEPA checklist states that 90 to 120 persons are anticipated to work at the completed development depending on the type of tenants. The City parking code allows between .3 and 1.0 parking spaces per worker at maximum shift for the proposed use. The City will condition the project to provide the proposed worker statistics at the time of building permit application demonstrating compliance with Chapter 25.95.

Response: Comment acknowledged. Proposed worker statistics will be provided at the time of the building permit application.

E. Tree Comments, DMC 25.120
We cannot evaluate tree retention using the existing trees and statistics for an off-site area. The improvements, grading and tree retention should only be shown for the western parcel improvements. ***Revise all plans and the WFCI Tree Retention Report to remove the eastern parcel improvements and tree calculations.***

Response: All eastern parcel improvements and tree calculations have been removed from the

tree retention report and landscape sheets.

a. *As mentioned above in Section A.1,* ***update the WCFI tree retention report to show a project area of 19.65 acres including the correct two parcel numbers. Revise the summary of landmark trees, including those to be removed, to be specific to the 19.65-acre property.***

Response: Report was updated using parcels 0119266005 & 0119266006. Total project acreage is 19.65-acres. The Landmark tree summary has been updated to include only trees on the two parcels.

b. *A previous comment requested that* ***the tree retention plan table for Type 1 be revised or clarified to only include trees that are within the Dupont 243 area.*** *This was not updated and therefore the comment remains.*

Response: The Type I summary table has been updated to include trees only within the boundaries of the two project parcels.

c. *Landscape Plans state a tree retention of 225 trees, but the tree retention report exhibits show a total of 227 trees to be retained.* ***Update tree retention amounts to be consistent across all landscape plans, tree retention plans, and the tree retention report.***

Response: All tree retention quantities and calculations reflect those shown in most recent tree protection plan.

d. *Tree Retention Plan Map (Attachment 1) depicts the non-project area, which is inconsistent with the narrative.* ***Revise the narrative to match Attachment 1****. It also depicts Type I overlapping the project and non-project area, which means that some of the Type I trees retained (or removed) are within the non-project area.* ***Update Attachment 1 and the report tree accounting to only include trees to be retained within the 19.65-acre project area.***

Response: The exhibit in Attachment 1 has been updated to include only the project area. The non-project area has been removed and currently only includes the 19.65-acre project area.

e. *The Landmark Trees section on page 4 states that one landmark Oregon White Oak will be removed. Attachment 2 on the Tree Retention Plan only shows one landmark fir tree to be removed in Area D, but does not show the Oregon White Oak to be removed in Area A.* ***Update Attachment 2 in the WFCI report to locate the Landmark OWO tree to be removed in Area A.***

Response: Attachment A was updated showing the location of Landmark tree #12 that will be removed as cited in the Landmark Tree section. The tree is not in Area A but located in the new right-of-way of Sequalitchew Road.

f. The site plan in Attachment 2 has not been updated and shows the trash enclosure for Building B adjacent to Sequalitchew Creek Trail. ***Update the site plan in Attachment 2.*** *A landmark tree shown to be retained on the WCFI report Attachment 2 (south of and adjacent to the trash enclosure for Building A on the western portion of the site) is not depicted on the Sheet L2 or the grading plans.* ***Update all plans to be consistent with attachments shown in the WCFI report.***

Response: All existing trees to be removed or retained match those shown in most recent tree protection plan

g. Sheets L1 and L2 of the Landscape Plans (Tree Retention Plan) depicts grading contours, tree types and locations, the tree protection radius, and which trees are to be saved versus removed. DMC 25.120.030(5) requires no clearing, grading, trenching, cutting, impervious surfacing, or other construction within the drip line of any tree to be retained. There are numerous trees depicted as to be retained with the required tree protection radius, but the radius falls within proposed grading or impervious surfaces. ***Revise Sheets L1 and L2 to depict trees that require special protection methods to ensure their survival. Add the tree protection requirements provided in the WFCI Tree Protection Report to the Tree Retention Plans. Also add the measures described in DMC 25.120.030(5) and DMC 25.120.030(7) to the plans.***

Response: Trees whose CRZs are impacted by proposed trail construction are called out on landscape plan sheets with reference to tree protection measures found in the most recent tree protection plan, and those measures and the measures described in DMC 25.120.030(5) and DMC 25.120.030(7) have been added to sheet L1.

h. Sheet L2 depicts the Existing Landmark Oregon White Oak to be removed within the Sequalitchew Road right of way with two call out locations, however, one tree is depicted. ***Correct the notation on Sheet L2.***

Response: This notation has been corrected.

i. *Sheet L2 depicts a landmark Oregon White Oak to be retained with its tree protection radius falling within the relocated and paved Sequalitchew Creek Trail (See Figure 1 below). It is assumed this tree is intended to be protected during trail construction, but it is not clear if the tree will survive.* ***WFCI shall address the tree protection measures required to save the tree in the WFCI Tree Protection Plan. Provide notes on Tree Protection Plans with the required tree protection, maintenance and monitoring measures for this landmark OWO tree.***

j.

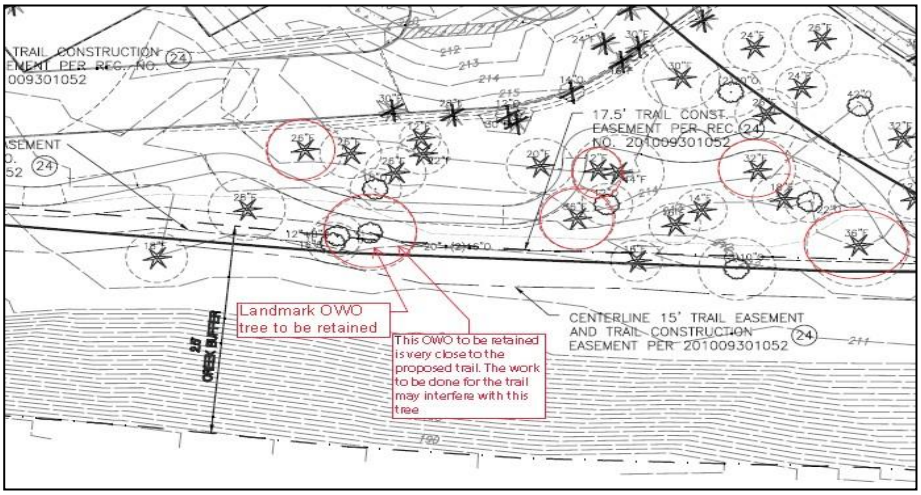

Figure 1 - Tree Protection Radius within proposed grading and impervious surfaces

Response: The Tree Protection Measures section of the report has been updated to address tree protection, maintenance, and monitoring of trees for the new Sequalitchew Creek Trail.

F. SEPA Requirements

We have the following comments on the SEPA checklist:

a. *See the General Comments provided above in Section A. Update SEPA Checklist Item A.7 in accordance with your desired approach for SEPA review of the project as described in Section A.*

Response: SEPA checklist item A7 has been updated to be consistent with the revised plans per our response to section A of this comment letter.

b. *Section B.7.a Environmental Health is not completed correctly. The site is the former location of the DuPont Power Works Company and is located within the Asarco plume boundary. The soils were remediated, however there are known residual concentrations in portions of the property of hazardous substances which exceed the soil and groundwater cleanup levels specific in the Washington Model Toxics Control Act (MTCA). Land use of the property is limited to industrial purposes per the 1999 Department of Ecology Restrictive Covenant. Ecology previously commented (Sept. 12, 2018) that they recommended a soil remediation plan and entrance into the Voluntary Cleanup Program prior to issuance of site development permits followed by obtaining a No Further Action Letter from Ecology. On Oct. 17, 2018 the State Attorney*

General provided a letter that stated that the proposed use appears to be allowed under the City of DuPont zoning regulations, Comprehensive Land Use Plan and MTCA. The letter does not clarify remediation/clean up or NFA requirements. These details should be added to Section B.7.

Response: The required information has been added to section B.7.a of the SEPA checklist.

c. *The Noise Study is currently undergoing peer review. We will provide comments when received.*

Response: Comment acknowledged. Any additional comments received from peer review of the noise study will be addressed at that time.

d. *The City is concerned about the noise, light and glare impacts of the truck/trailer maneuvering and storage area impacts to the users of Sequalitchew Creek trail and area wildlife. Similar to the prior proposal, the City intends to require SEPA mitigation measures to minimize these impacts (see attachment).*

Response: Comment acknowledged. An updated noise study and photometric plan are included with this resubmittal.

e. *Section B.7.b of the SEPA Checklist mentions the Noise Study, but does not include specific findings. The revised SEPA checklist states that the noise generated by the proposal is within the City of Dupont noise levels, but the Noise Study states that these levels will be exceeded from 6am- 7am daily.* ***Update the SEPA checklist response to be consistent with the findings provided in the Noise Study and any comments to be provided by the peer review consultant.***

Response: The SEPA checklist has been updated to mention that the noise study indicates levels beyond the city noise ordinance standards at an onsite portion of Sequalitchew Trail only between the hours of 6am-7am.

f. *SEPA Checklist item 10 describes that views would be altered but not entirely obstructed. It is our understanding that you have prepared/completed a Visual Analysis.* ***Please provide a copy of the Visual Analysis.***

Response: A copy of the trail visual analysis is included with this resubmittal.

BUILDING DEPARTMENT COMMENTS. *Contact Roy Shipman at (253) 912-5216 or rshipman@dupontwa.gov.*

FIRE DEPARTMENT COMMENTS. *Contact Mike Turner at (253) 666-2760 or mturner@dupontwa.gov.*

ENGINEERING AND WATER DEPARTMENT COMMENTS. *Contact Barb Kincaid at (253) 912.5393, or bkincaid@dupontwa.gov.*

We believe that the above responses, together with the enclosed revised plans and technical documents, address the comments in your letter dated May 12, 2023. Please review and approve the enclosed at your earliest convenience. If you have questions or need additional information, please do not hesitate to contact me at this office. Thank you.

Sincerely,

Daniel K. Balmelli

Daniel K. Balmelli, P.E.
Executive Vice President

DKB/bd
18666c.012
enc: As noted
cc: Ben Varin, Avenue 55
Drew Zaborowski, Avenue 55
Brian Ludwig, Innova Architects
Josh Towne, Barghausen Consulting Engineers
Betsy Dyer, Barghausen Consulting Engineers

Attachment 1w

DUPONT INDUSTRIAL

DuPont, WA

TRAFFIC IMPACT ANALYSIS (TIA)

October 9, 2023

HEATH & ASSOCIATES

Transportation Planning & Engineering

DUPONT INDUSTRIAL
TRAFFIC IMPACT ANALYSIS

Prepared for:

Ben Varin
Avenue 55
601 Union Street, Suite 2930
Seattle, WA 98101

Prepared by:

Heath & Associates
PO Box 397
Puyallup, WA 98371
(253) 770 1401
Heathtraffic.com

License:

10/09/2023

DUPONT INDUSTRIAL
TRAFFIC IMPACT ANALYSIS

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3. Existing Conditions....6
4. Forecast Traffic Demand and Analysis....12
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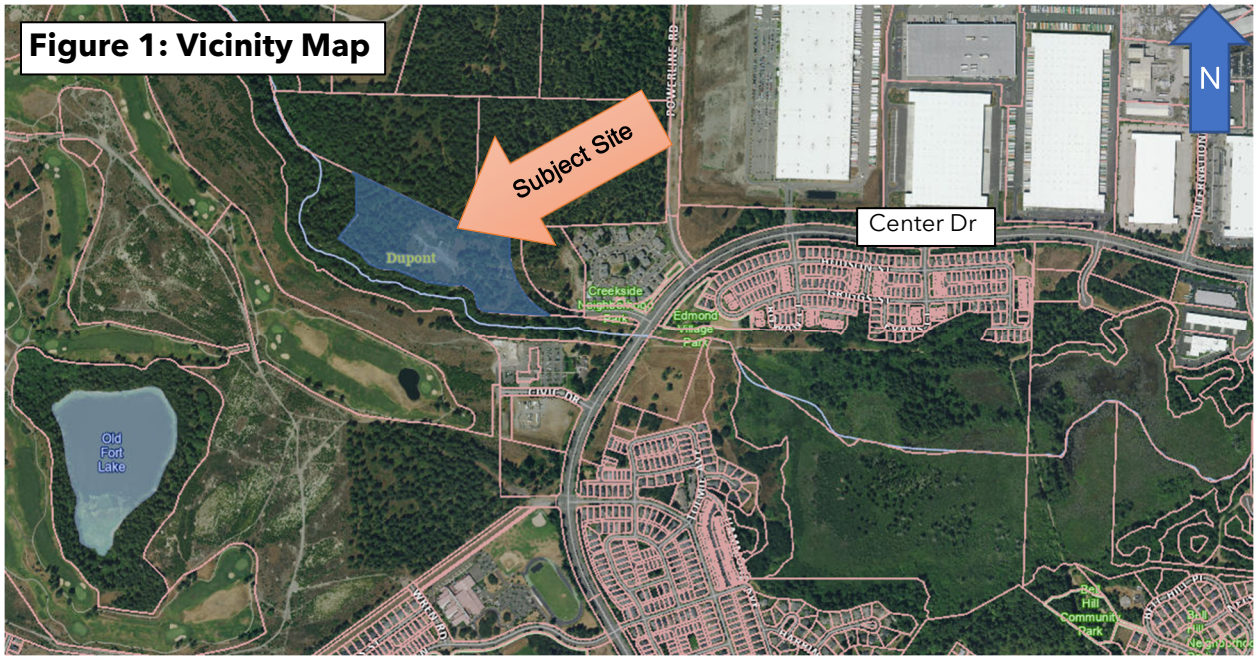
DUPONT INDUSTRIAL
TRAFFIC IMPACT ANALYSIS

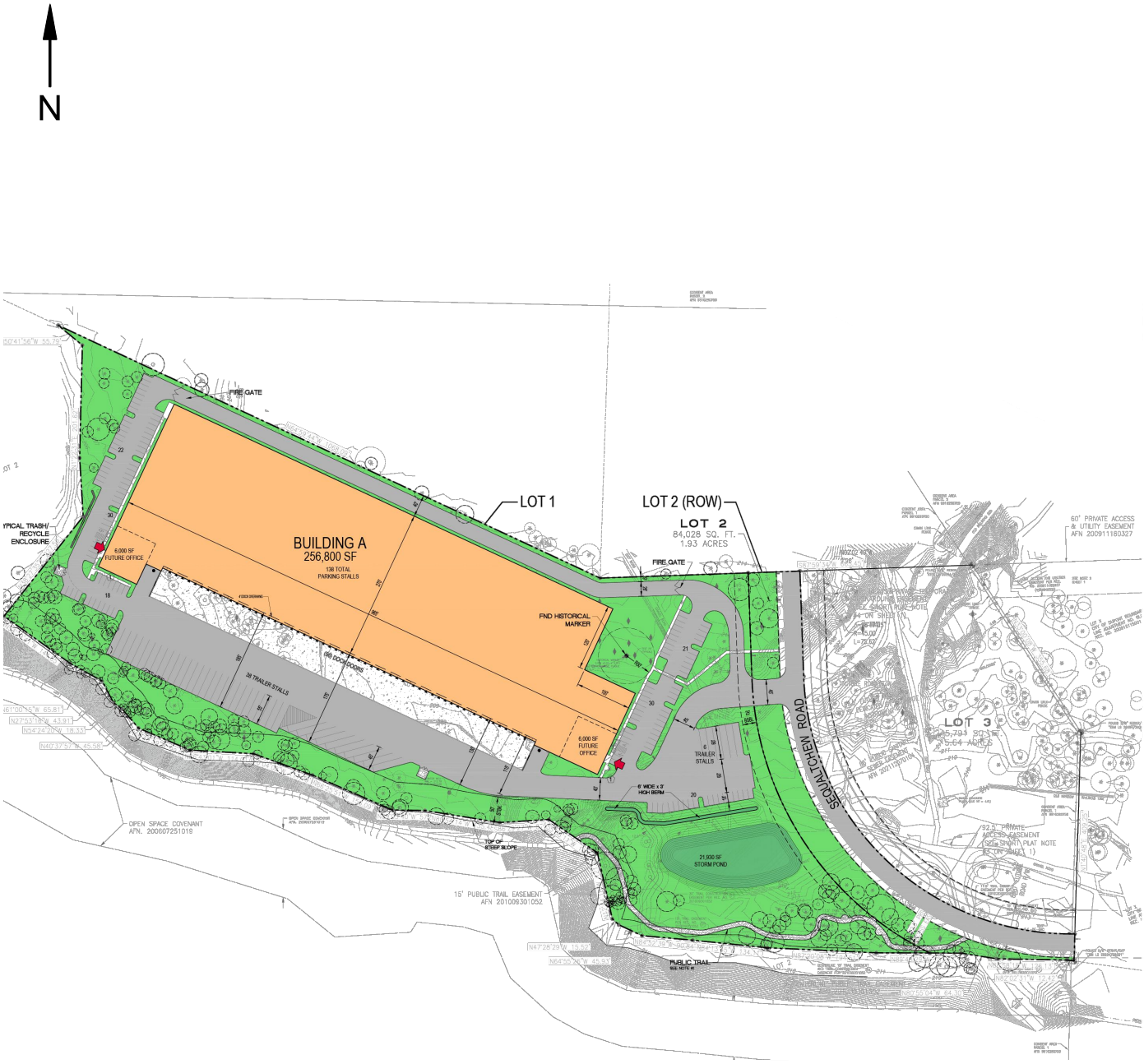
1. INTRODUCTION

The main goals of this study focus on the analysis of existing roadway conditions and forecasts of newly generated project traffic. The first task includes the review of general roadway information on the adjacent street system, baseline vehicular volumes, and entering sight distance data. Forecasts of future traffic and dispersion patterns on the street system are then determined using established trip generation and distribution techniques. As a final step, appropriate conclusions and mitigation measures are defined.

2. PROJECT DESCRIPTION

The Dupont Industrial project proposes for the construction of approximately 256,800 square feet of warehousing located in the city of Dupont. The subject site, with an address of 1700 Center Drive, comprises undeveloped, 19.65-acres within tax parcel #'s: 0119266005 & 0119266006. Access is to occur via a northwesterly extension of Sequalitchew Drive. One new driveway is proposed to extend westerly from the Sequalitchew Drive extension into the subject site. Figure 1 below shows the aerial vicinity of the project. A conceptual site plan illustrating the proposed building layout and access location is presented in Figure 2.





HEATH&ASSOCIATES
Transportation Planning & Engineering

DUPONT INDUSTRIAL

CONCEPTUAL SITE PLAN
FIGURE 2

3. EXISTING CONDITIONS

3.1 Existing Street System

The primary roadways serving the subject site are listed and described below.

Center Drive is a north-south, multilane major arterial that is situated east of the subject site. Travel lanes are approximately 12-feet in width with turn lanes typically available at major intersections. The typical cross section of the roadway is two lanes of travel in either direction with a center raised median or two-way left turn lane. Shoulders are paved with the available width, allowing bike travel. Detached sidewalks are also provided in most areas. The posted speed limit is 35 mph.

Sequalitchew Drive is a three lane, east-west local roadway, which currently terminates at approximately the southeastern corner of the subject property. The roadway is proposed to be extended northwesterly, providing future access to the site. Travel lanes are approximately 11-feet wide, and 4.5-foot-wide bike lanes are provided along either side of the roadway. Shoulders are comprised of curb and gutter, with sidewalk additionally provided along the north side of the road.

3.2 Roadway Improvements

A review of the City of Dupont's Six Year Transportation Improvement Program (2024-2029) indicates that improvement projects are planned in the vicinity. Descriptions and summaries of each project are provided in Table 1 below.

Table 1: Transportation Improvement Projects

Name	Location	Improvement	Cost
Center Dr Overlay Phases 4A, 4B, & 5 (Map ID#'s 1, 2, 5)	Powerline Rd to McNeil St	Design and construct asphalt overlay for pavement preservation.	$2,066,880
Systemic Pedestrian Safety Improvements (Map ID# 3)	Bob Hollow Ln/Wren Rd & Hoffman Hill /Trail of Packwood Avenue	Install RRFB, street lighting, signing, pavement markings, and curb ramps as needed.	$229,000
Sequalitchew Creek Pedestrian Crossing onto Center Drive (Map ID# 8)	Center Dr: culvert to City Hall	Conduct a study for the Sequalitchew Creek Pedestrian Crossing.	$10,000

3.3 Public Transit

A review of the Pierce Transit and Sound Transit regional bus schedules indicates that the nearest transit service provided in the vicinity of the subject site is located at Dupont Station, approximately 1.5-miles south of the development. Routes 592 (Dupont to Seattle) and 590/594 (Lakewood/Tacoma to Seattle) provide service at the Dupont Station. Refer to Pierce Transit and Sound Transit schedules and maps for further information.

3.4 Existing Peak Hour Volumes and Travel Patterns

Field data for this study was collected in October of 2022. Traffic counts were taken at the intersections outlined below, which are anticipated to receive the bulk of the anticipated vehicular demands. As traffic counts are less than one-year old, the volumes at the five outlying study intersections are considered baseline conditions.

1. Center Dr & Sequalitchew Dr
2. Center Dr & Palisade Blvd
3. Center Dr & Bob's Hollow Ln
4. Center Dr & McNeil St
5. Center Dr & Wilmington Dr

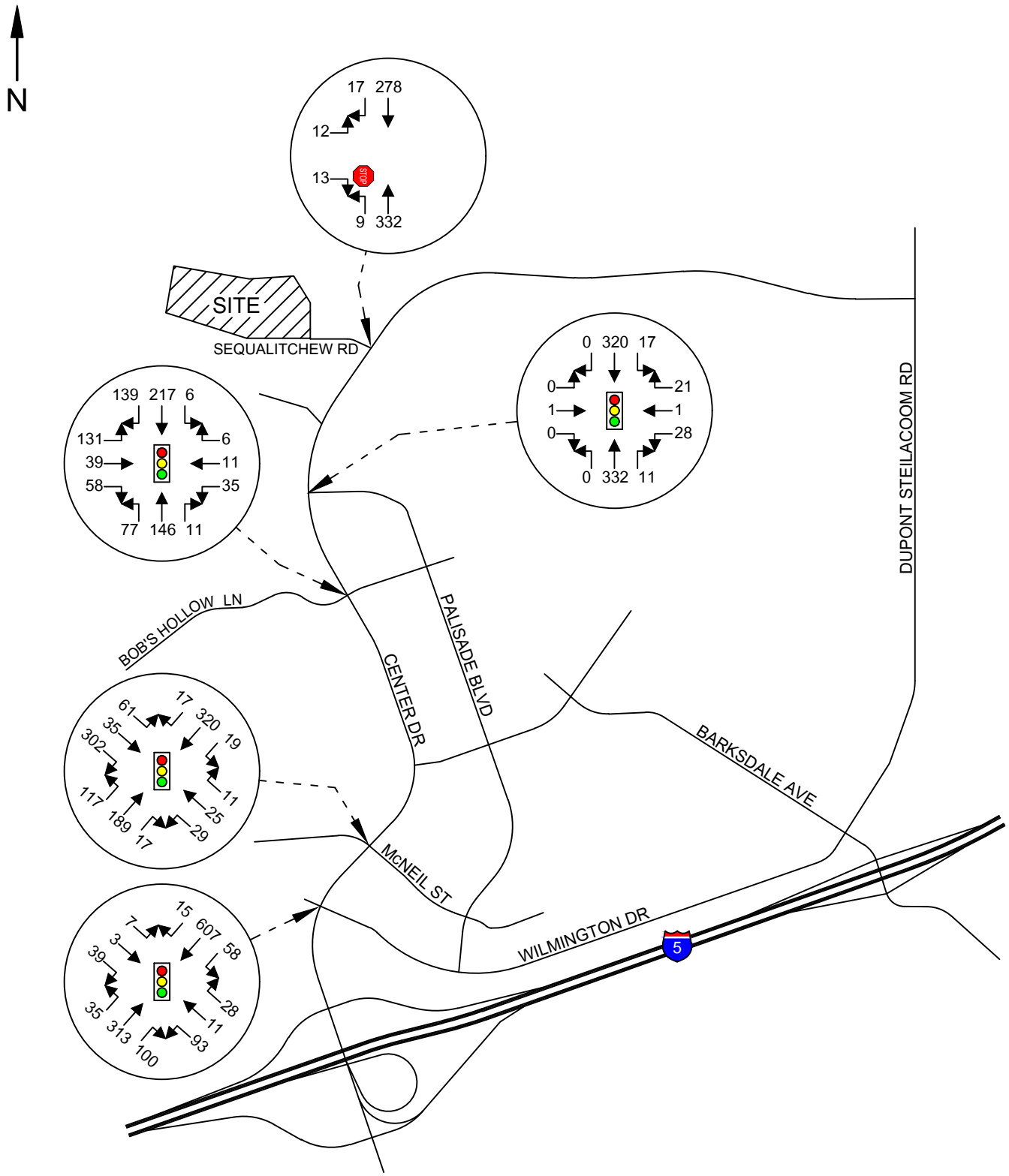
Study intersections herein are consistent with those analyzed within the original *Dupont Industrial TIA (3/6/2018).* Data was obtained during the morning and evening peak periods between the hours of 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM, which generally translates to highest overall roadway volumes in a given 24-hour period. The peak hour of each timeframe was then derived from each field count and used for analysis. Intersection volumes for the AM and PM peak hours are presented in Figures 3 and 4. The full two-hour counts have been attached to the appendix for reference.

3.5 Non-Motorist Activity & Infrastructure

Pedestrian and bicycle activity were observed at the intersections of study during the respective peak hours of analysis. Pedestrian and bicyclist volumes noted during the AM peak hour are illustrated in Figures A and B in the appendix, respectively. PM peak hour non-motorist volumes are illustrated in Figures C and D. The heaviest pedestrian volumes were observed at the Center Drive & Bob's Hollow Lane intersection given the close proximity to Pioneer Middle School. Extensive non-motorist infrastructure at and in the vicinity of said intersection is provided in the form

of bike lanes, sidewalk and pedestrian actuated crossings. No significant increase with respect to non-motorist transport would be expected from the development given the industrial nature of the proposed project.

Moreover, detached sidewalk and wide paved shoulders/dedicated bike lanes are provided along either side of Center Drive. These paths provide connectivity to the Sequalitchew Creek Trail, the trailhead of which is located just south of the subject site within the Dupont City Police Department parking lot. The recreational trail jogs approximately 1.5-miles westerly to the Puget Sound beach front.



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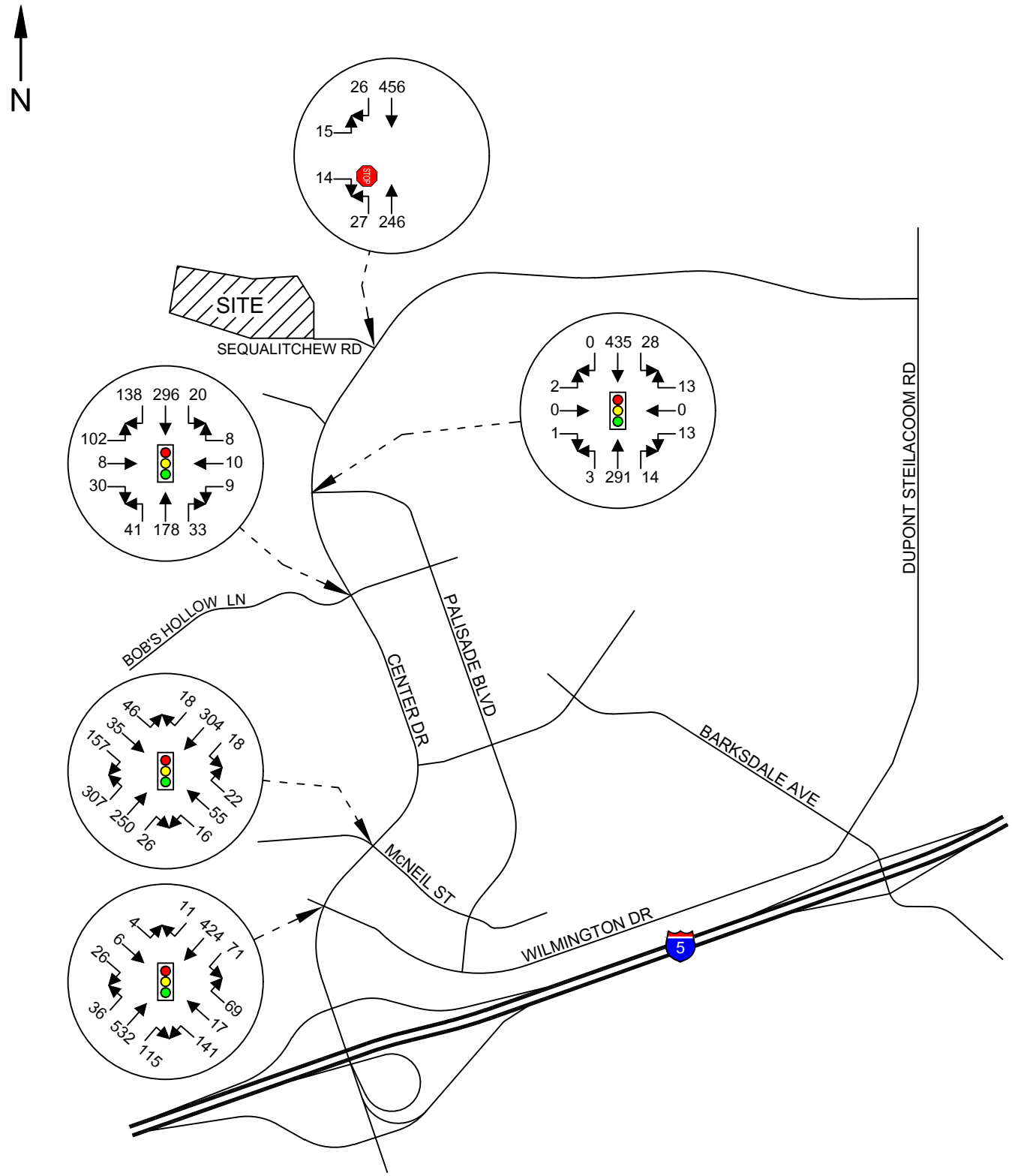
DUPONT INDUSTRIAL

BASELINE AM PEAK HOUR VOLUMES
FIGURE 3



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BASELINE PM PEAK HOUR VOLUMES
FIGURE 4

3.6 Baseline Level of Service

Baseline intersection delays were determined through the use of the *Highway Capacity Manual* 7th Edition. Capacity analysis is used to determine level of service (LOS) which is an established measure of congestion for transportation facilities. The range[1] for intersection level of service is LOS A to LOS F with the former indicating the best operating conditions with low control delays and the latter indicating the worst conditions with heavy control delays. Detailed descriptions of intersection LOS are given in the Highway Capacity Manual. Level of service calculations were made through the use of the *Synchro 12* analysis program. Delays presented represent overall weighted average delays for signalized controlled intersections. For side-street, stop-controlled intersections, LOS is determined by the approach with the highest delay. Table 2 below portrays baseline LOS delays for the key intersections of study.

Table 2: Baseline Weekday Peak Hour Level of Service

Delays given in seconds per vehicle

		AM Peak Hour		*PM Peak Hour*	
Intersection	**Control**	**LOS**	**Delay**	**LOS**	**Delay**
Center Dr & Sequalitchew Dr	Stop	B	10.4	B	12.4
Center Dr & Palisade Blvd	Signal	A	5.9	A	5.6
Center Dr & Bob's Hollow Ln	Signal	B	12.0	A	9.7
Center Dr & McNeil St	Signal	B	12.8	B	16.4
Center Dr & Wilmington Dr	Signal	B	10.5	B	12.1

The City of Dupont[2] has adopted a concurrency standard of LOS D. All study intersections are shown to operate satisfactorily with LOS B or better conditions during the critical AM and PM peak hours of study, meeting City LOS Standards.

---

[1] *Signalized Intersections - Level of Service*

Level of Service	Control Delay per Vehicle (sec)
A	≤10
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

Stop Controlled Intersections – Level of Service

Level of Service	Control Delay per Vehicle (sec)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Highway Capacity Manual, 7th Edition

[2] City of DuPont 2015 Comprehensive Plan, Chapter 9 - Transportation

4. FORECAST TRAFFIC DEMAND & ANALYSIS

4.1 Project Trip Generation

Trip generation is used to determine the magnitude of project impacts on the surrounding street system. This is usually denoted by the quantity or specific number of new trips that enter and exit a project during a designated time period, such as a specific peak hour (AM or PM) or an entire day. Data presented in this report was taken from the Institute of Transportation Engineer's publication *Trip Generation,* 11th Edition. The designated land use for this project is defined as Warehousing (LUC 150). Table 3 below summarizes the estimated project trip generation using ITE equations. Included are the average weekday daily traffic (AWDT) and the AM and PM peak hours. Refer to the appendix for trip generation output.

Table 3: Project Trip Generation

Land Use	Sq. Ft.	Trip Type	AWDT	AM Peak-Hour			PM Peak-Hour		
				In	Out	Total	In	Out	Total
LUC 150-Warehousing	256,800	Pass. Vehicle	**298**	39	10	**49**	12	37	**49**
		Truck	**146**	3	2	**5**	4	4	**8**
		Total	**444**	42	12	**54**	16	41	**57**

Project trips associated with the proposed development are estimated to total 444 average weekday daily trips with 54 trips (42 inbound / 12 outbound) occurring in the AM peak hour and 57 trips (16 inbound / 41 outbound) in the PM peak hour. Moreover, ITE data indicates that approximately 5 AM peak hour trips (3 inbound / 2 outbound) and 8 PM peak hour trips (4 inbound / 4 outbound) are to be in the form of heavy vehicles.

4.2 Distribution & Assignment

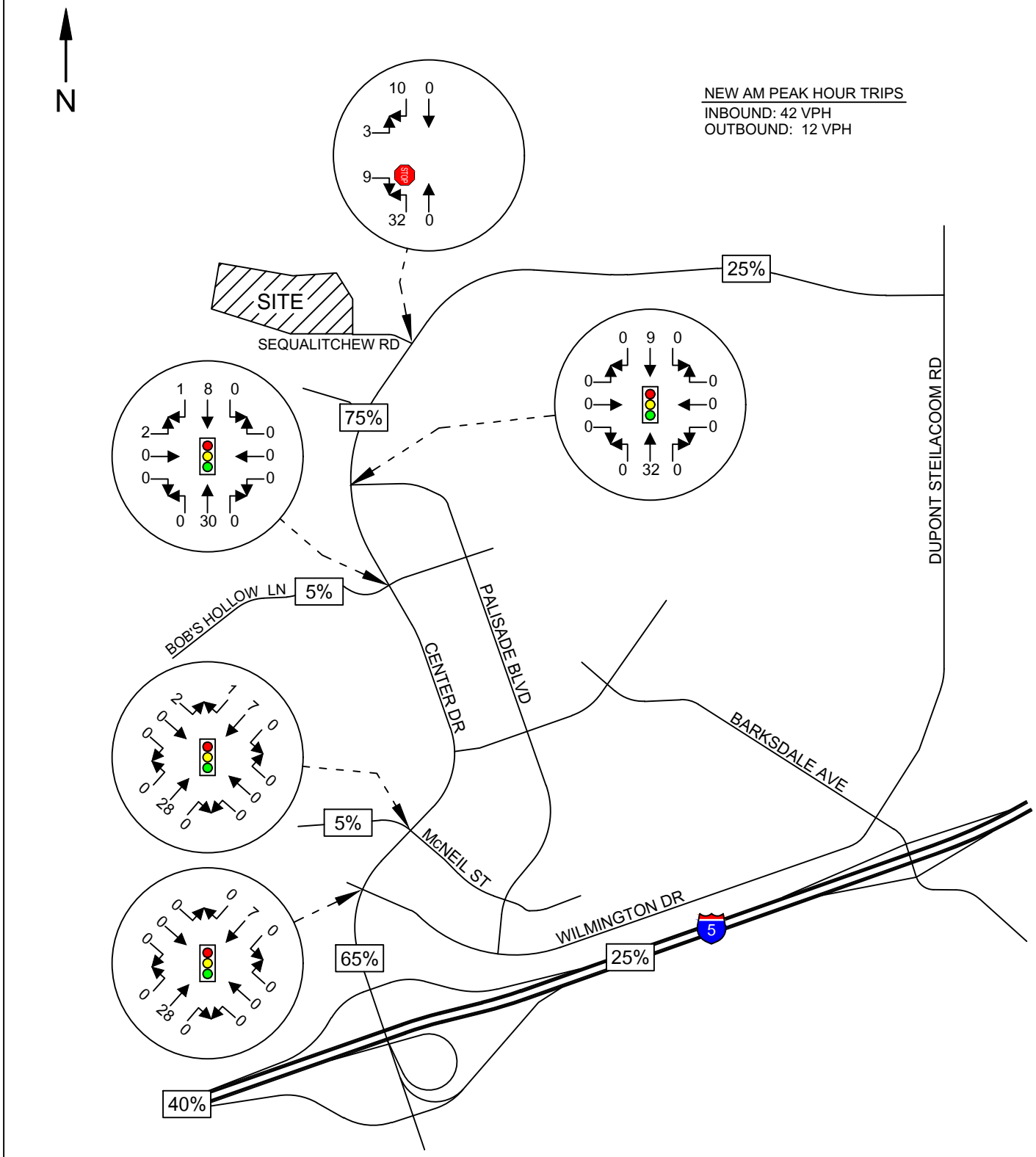
Trip distribution describes the process by which project generated trips are dispersed on the street network surrounding the site. The trips generated by the project are expected to follow the general trip pattern as shown in Figure 5 (AM peak hour) and Figure 6 (PM peak hour). Distribution percentages are based primarily on existing travel patterns and the location of the Interstate 5 interchange on Center Drive. Heavy trucks are restricted on Center Drive between Palisade Boulevard and

McNeil Street and were therefore modeled traveling east to use DuPont-Steilacoom Road to access I-5. Overall, trip distribution and assignment assumptions emulate those utilized within the original *Dupont Industrial TIA (3/6/2018).*

4.3 Future Peak Hour Volumes

The estimated build-out year of 2025 was used as the horizon study year in order to assess future impacts. To derive forecast 2025 peak hour volumes, a 2.0 percent compound annual background growth rate was applied to the baseline volumes. It should be noted that existing counts conducted at the study intersections were compared with historic 2018 peak hour volumes gathered for the previous iteration of this report. The counts conducted in October of 2022 were shown to be comparable with historic volumes, indicating little to no growth at the study intersections (see appendix for percent differential spreadsheet). As such, pipeline volumes provided by the City of DuPont in 2018 were included in future estimations. A list of pipeline volumes can also be found in the appendix.

AM and PM peak hour pipeline volumes are provided in Figures 7 and 8. Figures 9 and 10 show forecast 2025 AM and PM peak hour background volumes, which include a growth rate and pipeline volumes. Figures 11 and 12 illustrate forecast 2025 AM and PM peak hour volumes with project-generated traffic included.



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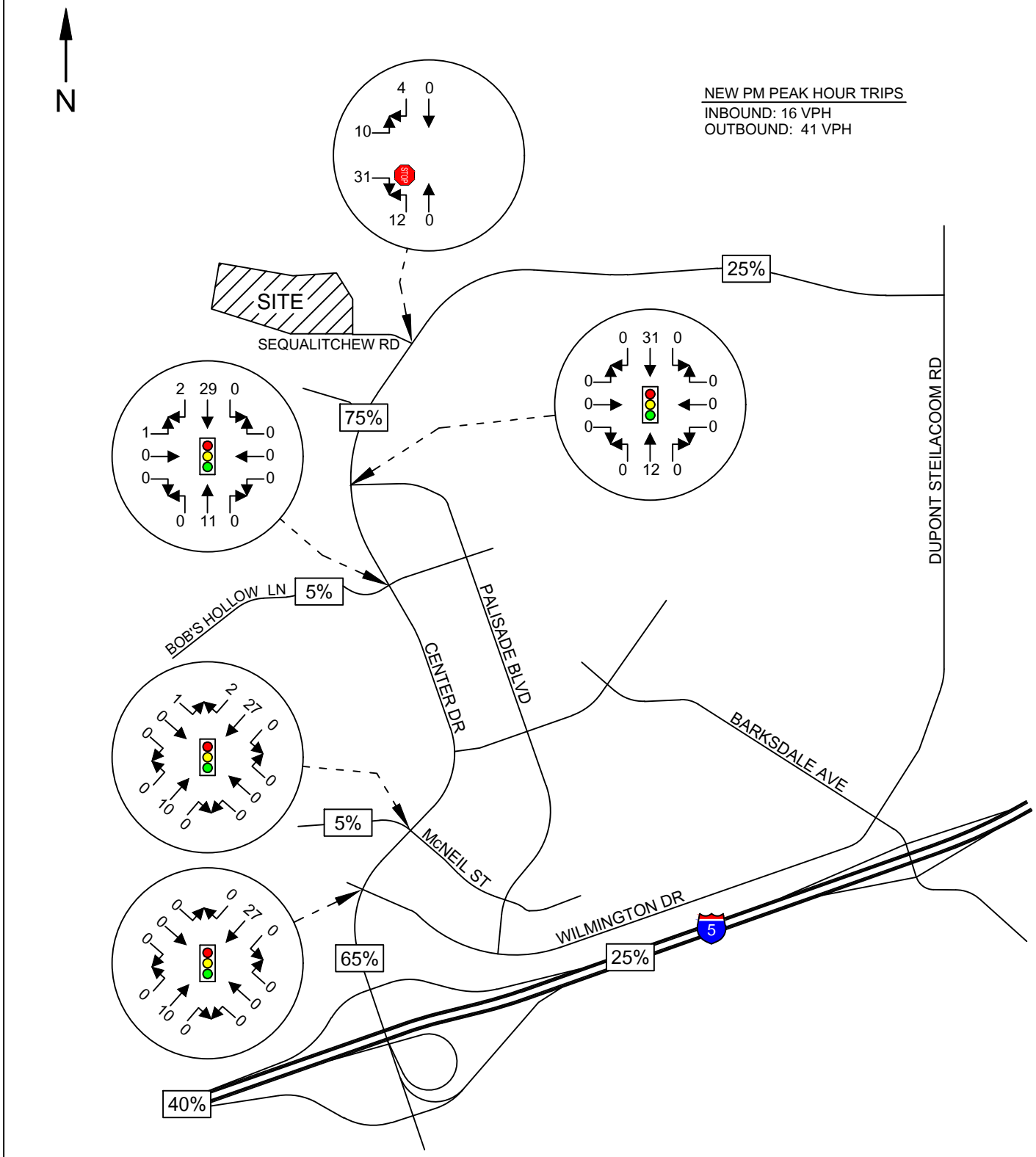
DUPONT INDUSTRIAL
AM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 5



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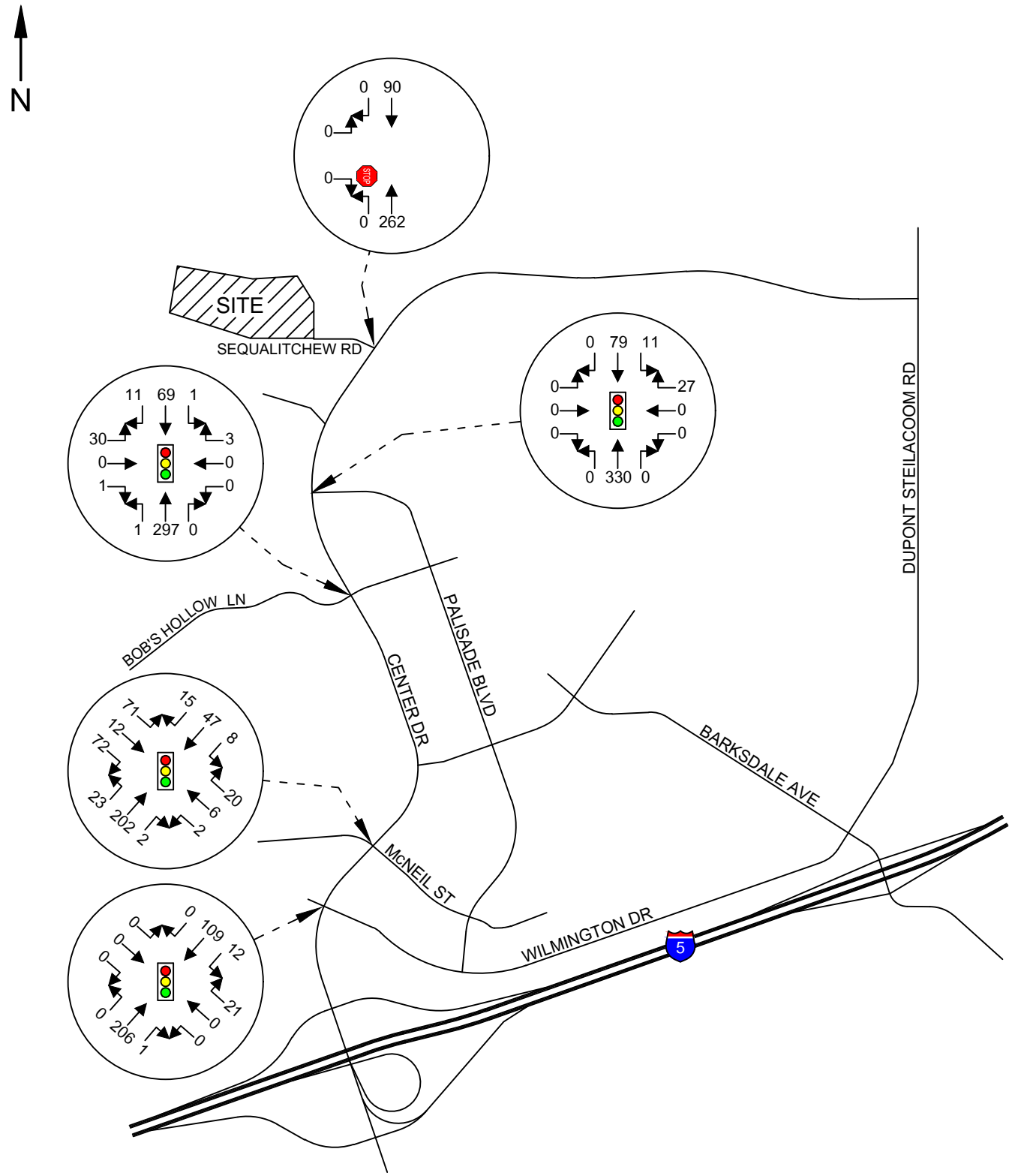
DUPONT INDUSTRIAL
PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 6



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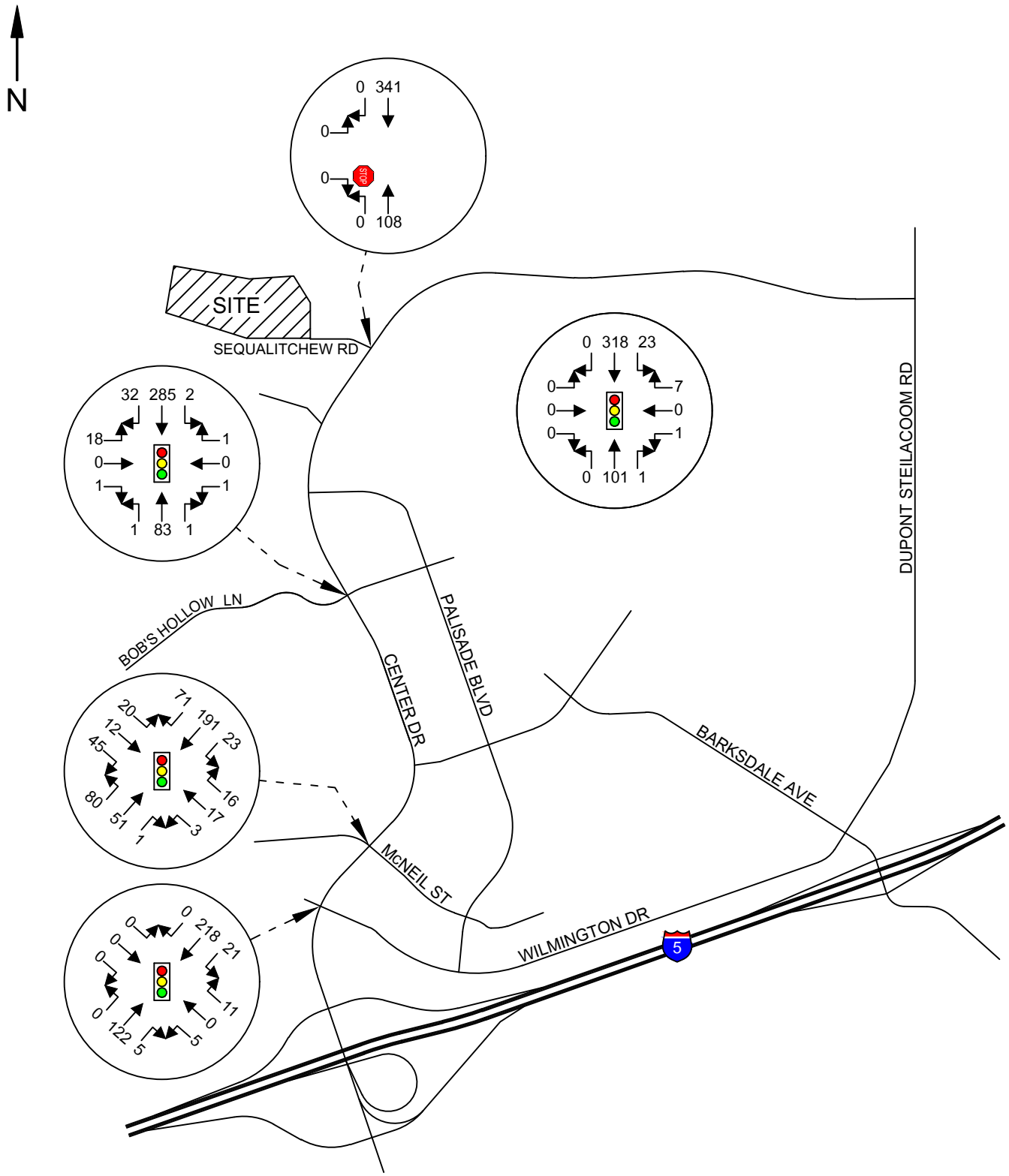
AM PEAK HOUR PIPELINE VOLUMES
FIGURE 7



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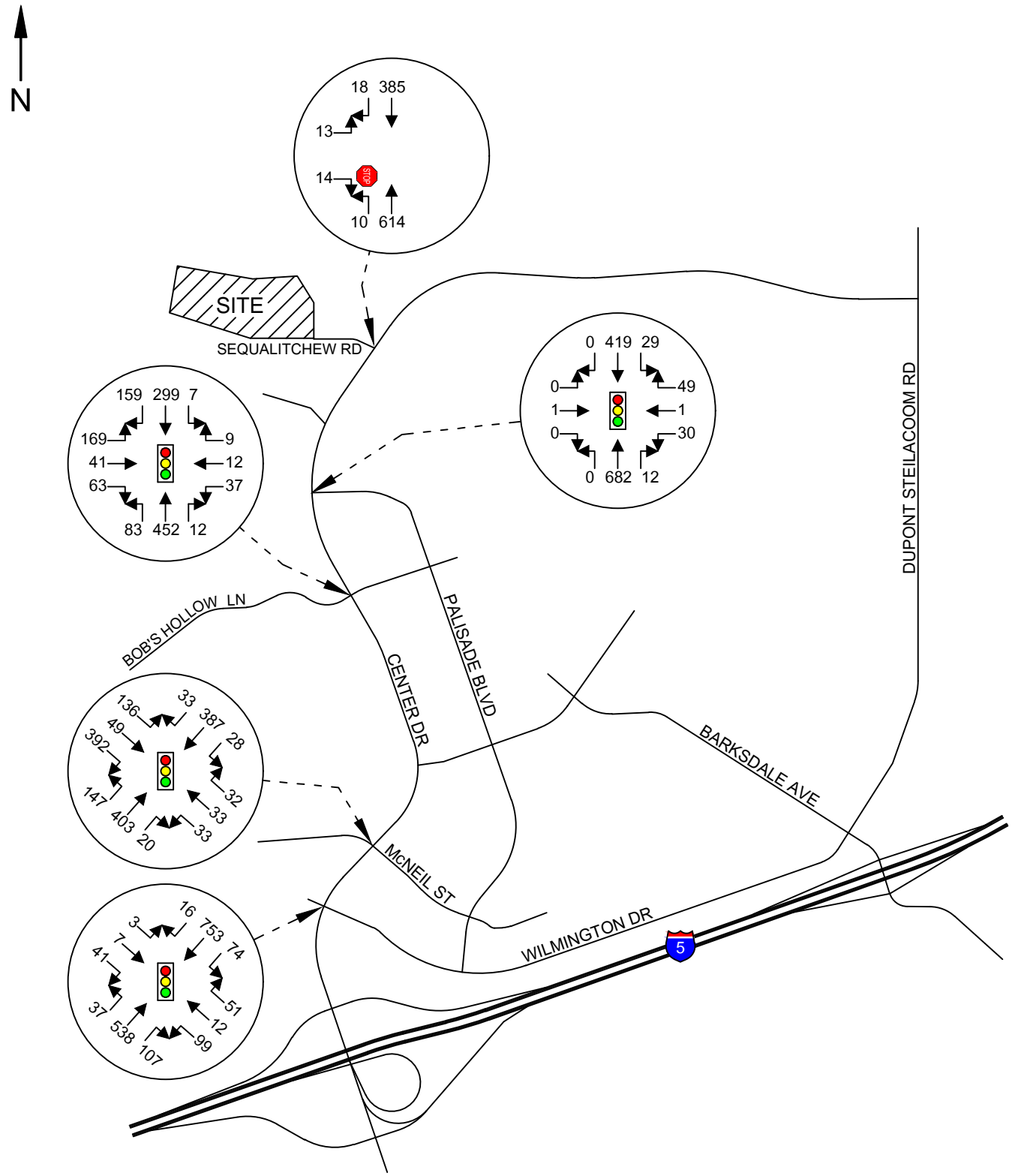
PM PEAK HOUR PIPELINE VOLUMES
FIGURE 8



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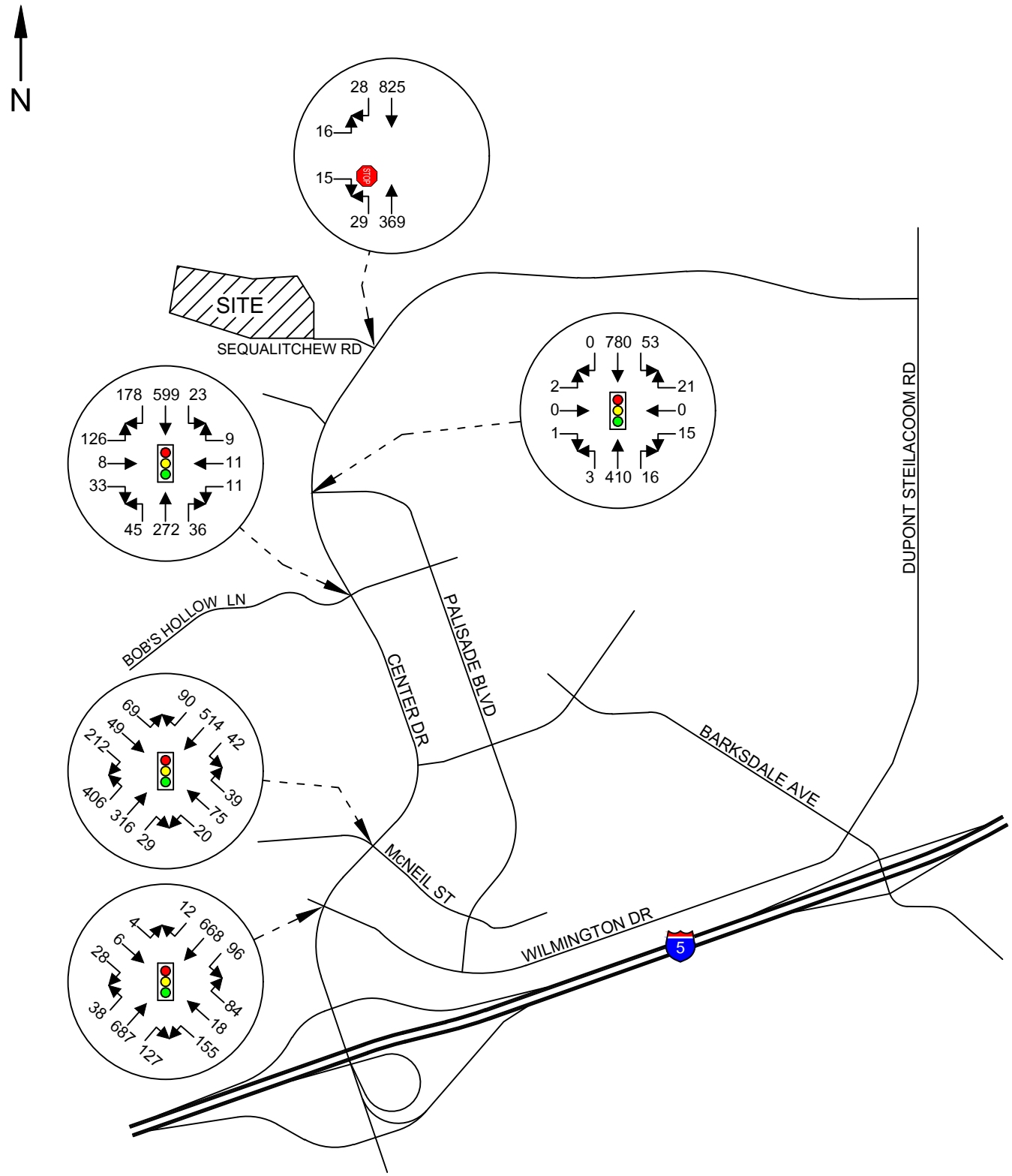
DUPONT INDUSTRIAL

FORECAST 2025 AM PEAK HOUR BACKGROUND VOLUMES
FIGURE 9



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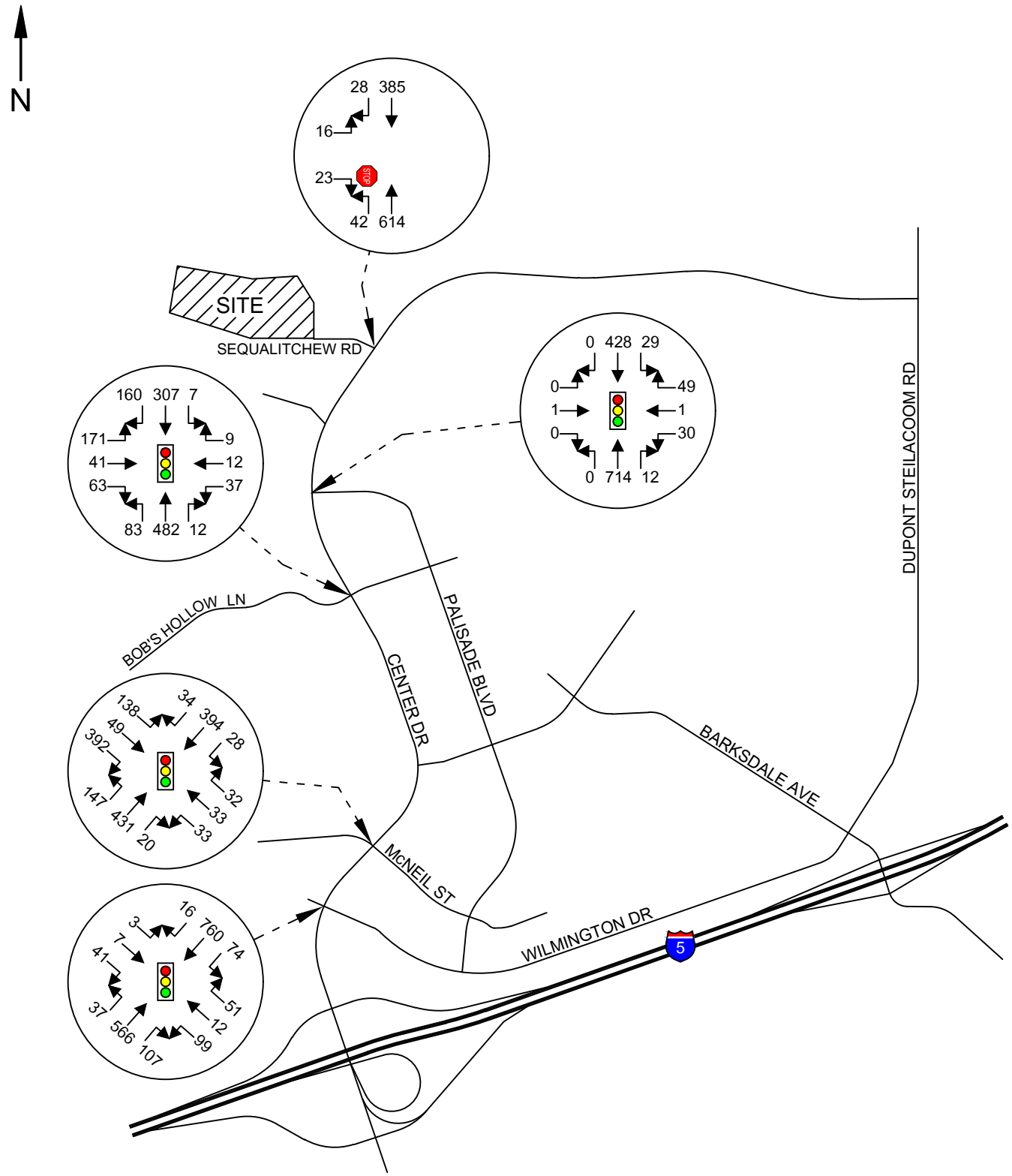
FORECAST 2025 PM PEAK HOUR BACKGROUND VOLUMES
FIGURE 10



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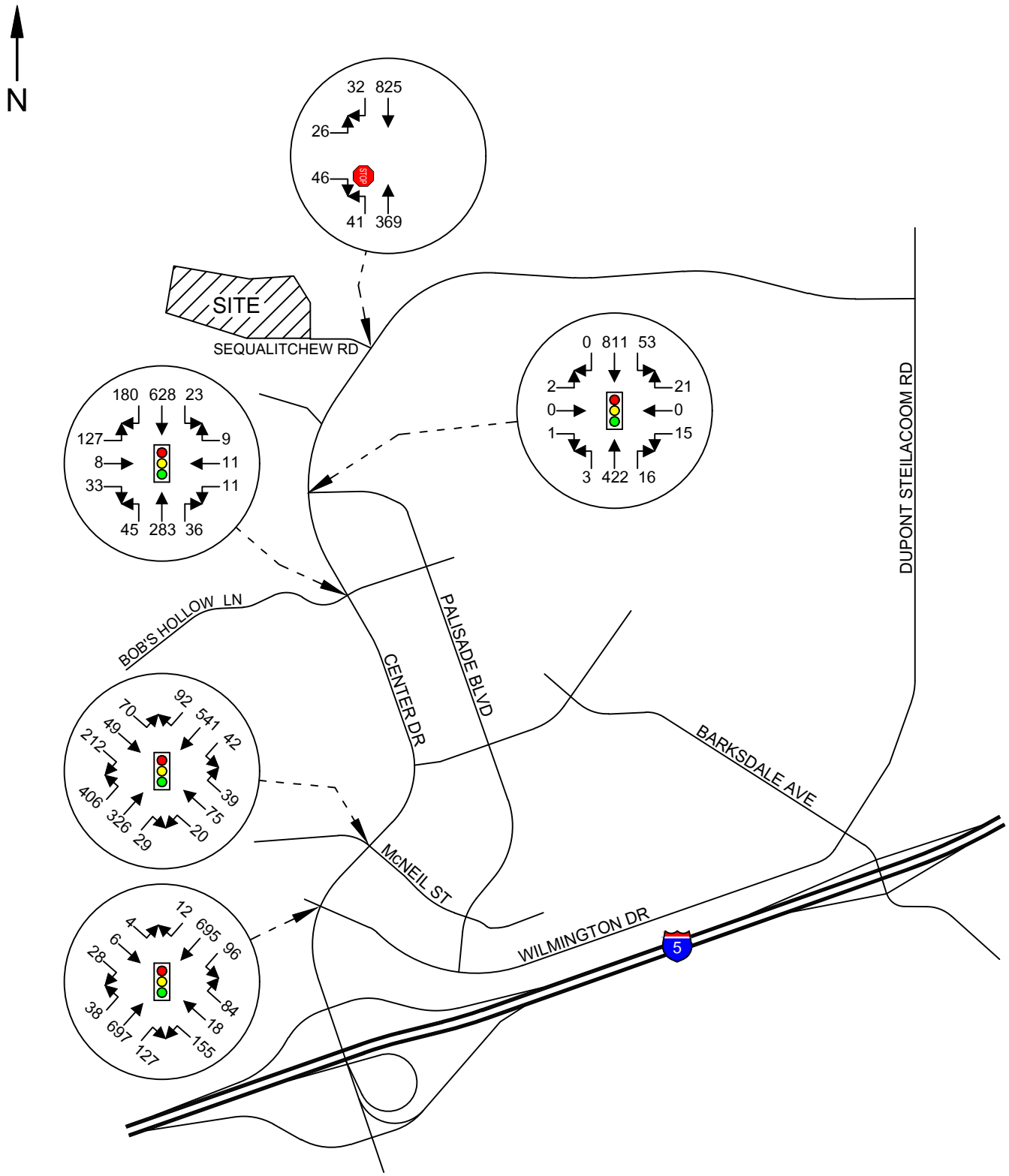
DUPONT INDUSTRIAL

FORECAST 2025 AM PEAK HOUR VOLUMES WITH PROJECT
FIGURE 11



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DUPONT INDUSTRIAL

FORECAST 2025 PM PEAK HOUR VOLUMES WITH PROJECT
FIGURE 12

4.4 Future Level of Service

Level of service analyses were made of the future 2025 AM and PM peak hour volumes without and with project related trips added to the key roadways and intersections. This analysis once again involved the use the *Synchro* 12 analysis program. Delays for the key intersection movements under future conditions are shown in Table 4 below.

Table 4: Forecast 2025 Weekday Peak Hour Level of Service

Delays given in seconds per vehicle

			Background		*With Project*	
Intersection	**Control**	**Peak Hour**	**LOS**	**Delay**	**LOS**	**Delay**
Center Dr & Sequalitchew Dr	Stop	AM	B	11.6	B	12.1
		PM	C	17.7	C	18.3
Center Dr & Palisade Blvd	Signal	AM	A	7.2	A	7.3
		PM	A	8.2	A	8.2
Center Dr & Bob's Hollow Ln	Signal	AM	B	14.3	B	14.5
		PM	B	13.8	B	13.9
Center Dr & McNeil St	Signal	AM	B	16.5	B	16.6
		PM	C	22.8	C	23.2
Center Dr & Wilmington Dr	Signal	AM	B	11.0	B	11.1
		PM	B	13.2	B	13.3

Forecast 2025 AM and PM peak hour delays are shown to operate with up to LOS C conditions both with or without the Dupont Industrial project. As such, no operational deficiencies are identified as a result of the development proposal.

4.5 Site Access & Driveway Design

As shown in the conceptual site plan (see Figure 2), access to/from the subject site is proposed via a northwesterly extension of Sequalitchew Drive. One driveway extending west from this roadway extension is proposed to serve the development. Any new access and/or roadway shall be designed in accordance with city standards, providing sufficient sight lines in accordance with *American Association of State Highway and Transportation Officials* (AASHTO) specifications.

5. CONCLUSIONS & MITIGATION

Dupont Industrial is a proposed warehousing development comprising approximately 256,800 square feet in the city of Dupont. The subject site is located on undeveloped 19.65-acres within tax parcel #'s: 0119266005 & 0119266006. Dupont Industrial comprises a site address of 17000 Center Street and is located west of Center Drive. A northwesterly extension of Sequalitchew Drive is proposed to serve the site, with a new driveway extending west into the development from said extension. Refer to the site plan on Figure 2 for the proposed building and access layout.

Existing level of service (LOS) is summarized in Table 2 and indicates that the study intersections operate with acceptable LOS B or better delays during the AM and PM peak hours. Based on ITE data the project would be anticipated to generate 54 new AM peak hour trips (42 in / 12 out) and 57 new PM peak hour trips (16 in / 41 out). Approximately 5 AM peak hour and 8 PM peak hour trips are anticipated to be in the form of heavy vehicle. For forecast analyses, a horizon year of 2025 was examined to assess impacts under future conditions. Table 4 summarizes forecast 2025 weekday peak hour LOS delays without and with the project. Forecast 2025 AM and PM peak hour conditions are shown to continue to meet city of Dupont standards with up to LOS C delays. Overall, no operational deficiencies are identified as a result of the development proposal.

No mitigation is identified at this time.

DUPONT INDUSTRIAL
TRAFFIC IMPACT ANALYSIS

APPENDIX

Heath & Associates

PO Box 397 Puyallup, WA 98371

File Name : 5017a
Site Code : 00005017
Start Date : 10/13/2022
Page No : 1

Groups Printed- Passenger + - Heavy

	Center Dr Southbound			Center Dr Northbound			Sequalitchew Dr Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
07:00 AM	1	37	38	114	0	114	3	6	9	161
07:15 AM	6	70	76	83	2	85	2	3	5	166
07:30 AM	3	73	76	66	2	68	4	1	5	149
07:45 AM	7	98	105	69	5	74	4	2	6	185
Total	17	278	295	332	9	341	13	12	25	661
08:00 AM	10	67	77	71	0	71	5	3	8	156
08:15 AM	4	31	35	57	1	58	9	5	14	107
08:30 AM	3	44	47	53	6	59	5	7	12	118
08:45 AM	2	32	34	70	2	72	12	5	17	123
Total	19	174	193	251	9	260	31	20	51	504
Grand Total	36	452	488	583	18	601	44	32	76	1165
Apprch %	7.4	92.6		97	3		57.9	42.1		
Total %	3.1	38.8	41.9	50	1.5	51.6	3.8	2.7	6.5	
Passenger +	35	412	447	566	17	583	43	31	74	1104
% Passenger +	97.2	91.2	91.6	97.1	94.4	97	97.7	96.9	97.4	94.8
Heavy	1	40	41	17	1	18	1	1	2	61
% Heavy	2.8	8.8	8.4	2.9	5.6	3	2.3	3.1	2.6	5.2

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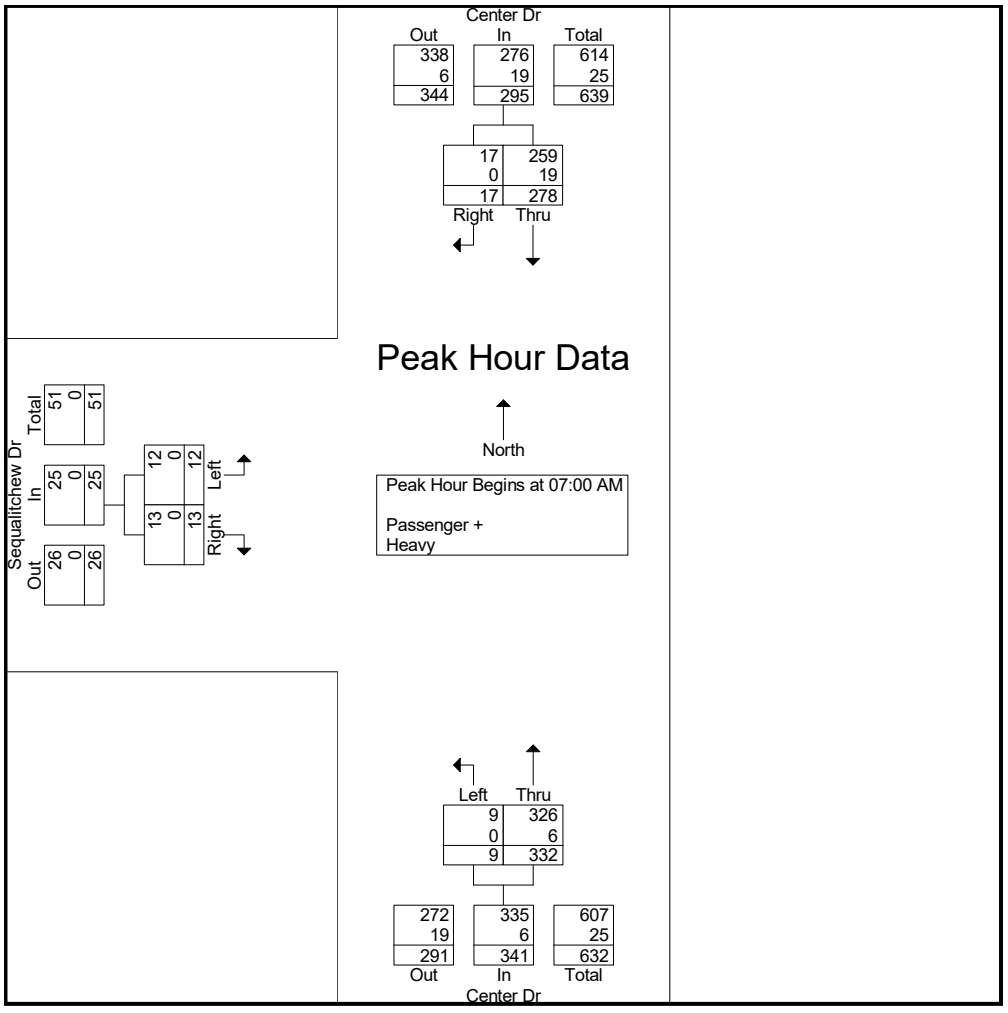
PO Box 397 Puyallup, WA 98371

File Name : 5017a
Site Code : 00005017
Start Date : 10/13/2022
Page No : 2

	Center Dr Southbound			Center Dr Northbound			Sequalitchew Dr Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	1	37	38	**114**	0	**114**	3	**6**	**9**	161
07:15 AM	6	70	76	83	2	85	2	3	5	166
07:30 AM	3	73	76	66	2	68	**4**	1	5	149
07:45 AM	**7**	**98**	**105**	69	**5**	74	4	2	6	**185**
Total Volume	17	278	295	332	9	341	13	12	25	661
% App. Total	5.8	94.2		97.4	2.6		52	48		
PHF	.607	.709	.702	.728	.450	.748	.813	.500	.694	.893
Passenger +	17	259	276	326	9	335	13	12	25	636
% Passenger +	100	93.2	93.6	98.2	100	98.2	100	100	100	96.2
Heavy	0	19	19	6	0	6	0	0	0	25
% Heavy	0	6.8	6.4	1.8	0	1.8	0	0	0	3.8



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File Name : 5017b
Site Code : 00005017
Start Date : 10/12/2022
Page No : 1

Groups Printed- Passenger + - Heavy

	Center Dr Southbound			Center Dr Northbound			Sequalitchew Dr Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
04:00 PM	6	91	97	35	6	41	3	2	5	143
04:15 PM	8	80	88	50	8	58	3	3	6	152
04:30 PM	7	99	106	46	2	48	1	2	3	157
04:45 PM	11	96	107	49	2	51	4	3	7	165
Total	32	366	398	180	18	198	11	10	21	617
05:00 PM	10	92	102	64	7	71	3	3	6	179
05:15 PM	7	109	116	46	10	56	5	6	11	183
05:30 PM	4	159	163	76	4	80	3	2	5	248
05:45 PM	5	96	101	60	6	66	3	4	7	174
Total	26	456	482	246	27	273	14	15	29	784
Grand Total	58	822	880	426	45	471	25	25	50	1401
Apprch %	6.6	93.4		90.4	9.6		50	50		
Total %	4.1	58.7	62.8	30.4	3.2	33.6	1.8	1.8	3.6	
Passenger +	58	818	876	418	45	463	25	25	50	1389
% Passenger +	100	99.5	99.5	98.1	100	98.3	100	100	100	99.1
Heavy	0	4	4	8	0	8	0	0	0	12
% Heavy	0	0.5	0.5	1.9	0	1.7	0	0	0	0.9

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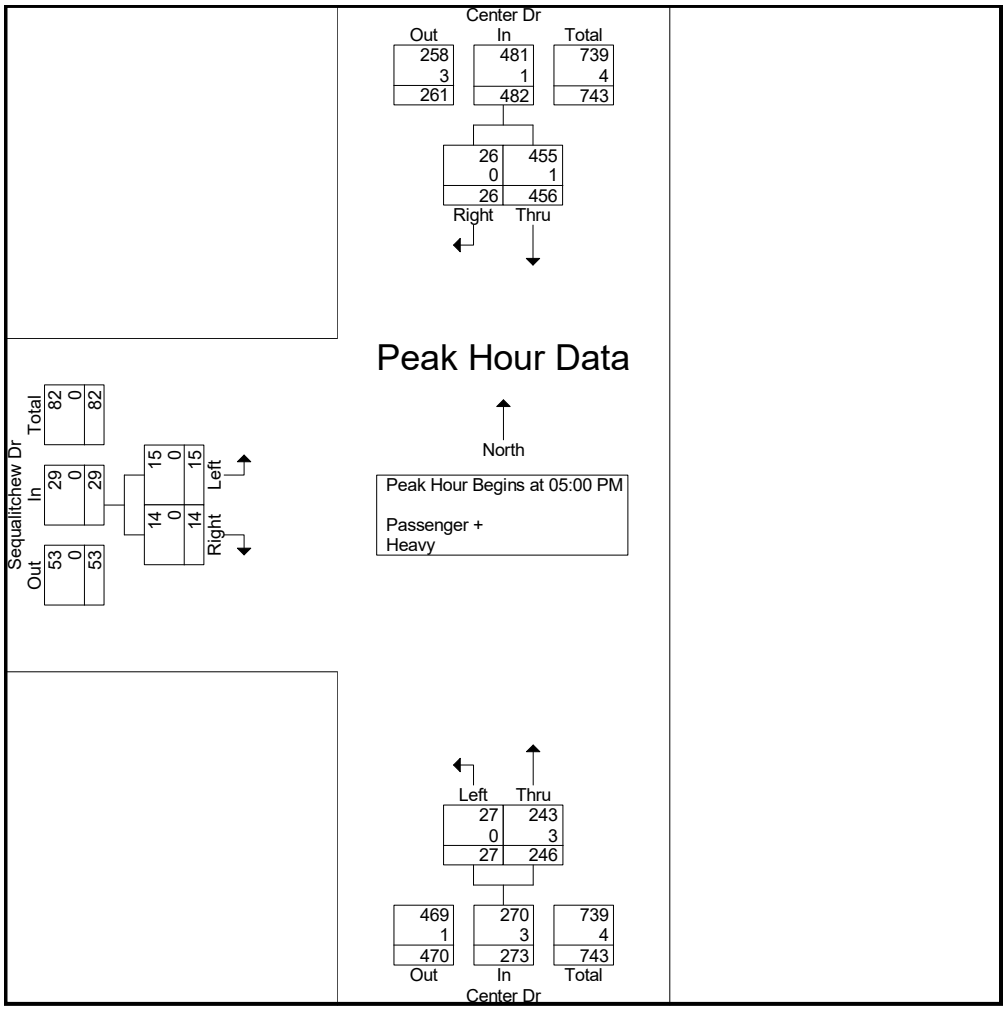
PO Box 397 Puyallup, WA 98371

File Name : 5017b
Site Code : 00005017
Start Date : 10/12/2022
Page No : 2

	Center Dr Southbound			Center Dr Northbound			Sequalitchew Dr Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	**10**	92	102	64	7	71	3	3	6	179
05:15 PM	7	109	116	46	**10**	56	**5**	**6**	**11**	183
05:30 PM	4	**159**	**163**	**76**	4	**80**	3	2	5	**248**
05:45 PM	5	96	101	60	6	66	3	4	7	174
Total Volume	26	456	482	246	27	273	14	15	29	784
% App. Total	5.4	94.6		90.1	9.9		48.3	51.7		
PHF	.650	.717	.739	.809	.675	.853	.700	.625	.659	.790
Passenger +	26	455	481	243	27	270	14	15	29	780
% Passenger +	100	99.8	99.8	98.8	100	98.9	100	100	100	99.5
Heavy	0	1	1	3	0	3	0	0	0	4
% Heavy	0	0.2	0.2	1.2	0	1.1	0	0	0	0.5



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PO Box 397 Puyallup, WA 98371

File Name : 5017c
Site Code : 00005017
Start Date : 10/13/2022
Page No : 1

Groups Printed- Passenger + - Heavy

	Center Dr Southbound				Palisade Blvd Westbound				Center Dr Northbound				Palisade Blvd Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00 AM	0	44	2	46	4	0	8	12	4	114	0	118	0	0	0	0	176
07:15 AM	0	71	3	74	4	0	7	11	3	77	0	80	0	0	0	0	165
07:30 AM	0	116	5	121	9	0	6	15	1	67	0	68	0	0	0	0	204
07:45 AM	0	89	7	96	4	1	7	12	3	74	0	77	0	1	0	1	186
Total	0	320	17	337	21	1	28	50	11	332	0	343	0	1	0	1	731
08:00 AM	0	76	4	80	7	0	6	13	4	68	0	72	0	0	0	0	165
08:15 AM	0	36	6	42	5	0	7	12	3	63	0	66	0	0	0	0	120
08:30 AM	0	51	4	55	3	0	7	10	2	55	0	57	0	0	0	0	122
08:45 AM	0	41	5	46	6	0	4	10	1	62	0	63	0	0	0	0	119
Total	0	204	19	223	21	0	24	45	10	248	0	258	0	0	0	0	526
Grand Total	0	524	36	560	42	1	52	95	21	580	0	601	0	1	0	1	1257
Apprch %	0	93.6	6.4		44.2	1.1	54.7		3.5	96.5	0		0	100	0		
Total %	0	41.7	2.9	44.6	3.3	0.1	4.1	7.6	1.7	46.1	0	47.8	0	0.1	0	0.1	
Passenger +	0	485	34	519	42	1	52	95	20	558	0	578	0	1	0	1	1193
% Passenger +	0	92.6	94.4	92.7	100	100	100	100	95.2	96.2	0	96.2	0	100	0	100	94.9
Heavy	0	39	2	41	0	0	0	0	1	22	0	23	0	0	0	0	64
% Heavy	0	7.4	5.6	7.3	0	0	0	0	4.8	3.8	0	3.8	0	0	0	0	5.1

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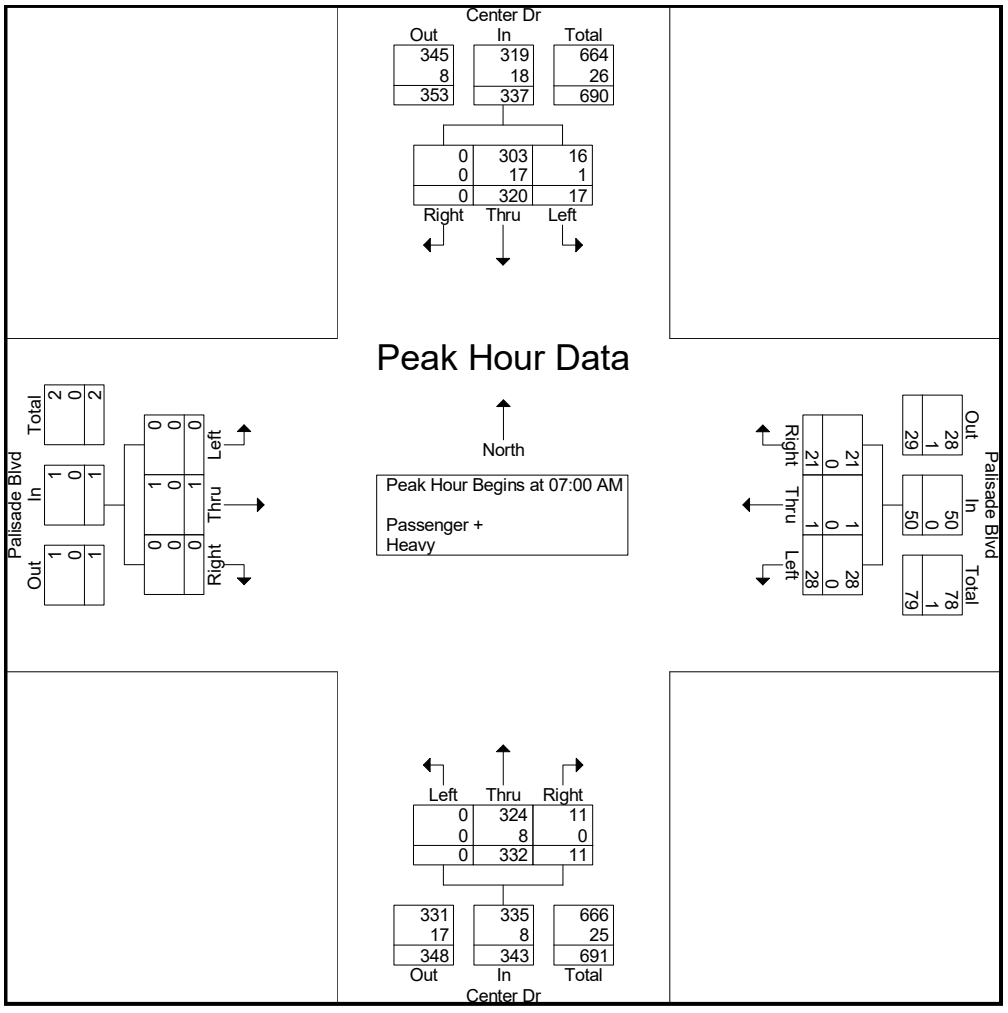
PO Box 397 Puyallup, WA 98371

File Name : 5017c
Site Code : 00005017
Start Date : 10/13/2022
Page No : 2

	Center Dr Southbound				Palisade Blvd Westbound				Center Dr Northbound				Palisade Blvd Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	44	2	46	4	0	**8**	12	**4**	**114**	0	**118**	0	0	0	0	176
07:15 AM	0	71	3	74	4	0	7	11	3	77	0	80	0	0	0	0	165
07:30 AM	0	**116**	5	**121**	**9**	0	6	**15**	1	67	0	68	0	0	0	0	**204**
07:45 AM	0	89	**7**	96	4	**1**	7	12	3	74	0	77	0	**1**	0	**1**	186
Total Volume	0	320	17	337	21	1	28	50	11	332	0	343	0	1	0	1	731
% App. Total	0	95	5		42	2	56		3.2	96.8	0		0	100	0		
PHF	.000	.690	.607	.696	.583	.250	.875	.833	.688	.728	.000	.727	.000	.250	.000	.250	.896
Passenger +	0	303	16	319	21	1	28	50	11	324	0	335	0	1	0	1	705
% Passenger +	0	94.7	94.1	94.7	100	100	100	100	100	97.6	0	97.7	0	100	0	100	96.4
Heavy	0	17	1	18	0	0	0	0	0	8	0	8	0	0	0	0	26
% Heavy	0	5.3	5.9	5.3	0	0	0	0	0	2.4	0	2.3	0	0	0	0	3.6



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PO Box 397 Puyallup, WA 98371

File Name : 5017d
Site Code : 00005017
Start Date : 10/12/2022
Page No : 1

Groups Printed- Passenger + - Heavy

	Center Dr Southbound				Palisade Blvd Westbound				Center Dr Northbound				Palisade Blvd Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:00 PM	0	77	13	90	1	0	1	2	4	39	0	43	0	0	0	0	135
04:15 PM	0	73	12	85	3	0	6	9	2	54	0	56	0	0	0	0	150
04:30 PM	0	103	7	110	4	0	9	13	3	48	0	51	0	0	0	0	174
04:45 PM	0	96	8	104	5	0	5	10	4	48	1	53	1	0	0	1	168
Total	0	349	40	389	13	0	21	34	13	189	1	203	1	0	0	1	627
05:00 PM	0	92	9	101	5	0	5	10	0	70	0	70	0	0	1	1	182
05:15 PM	0	102	6	108	2	0	3	5	7	74	0	81	0	0	0	0	194
05:30 PM	0	145	8	153	5	0	3	8	5	72	1	78	0	0	0	0	239
05:45 PM	0	96	5	101	1	0	2	3	2	75	2	79	1	0	1	2	185
Total	0	435	28	463	13	0	13	26	14	291	3	308	1	0	2	3	800
Grand Total	0	784	68	852	26	0	34	60	27	480	4	511	2	0	2	4	1427
Apprch %	0	92	8		43.3	0	56.7		5.3	93.9	0.8		50	0	50		
Total %	0	54.9	4.8	59.7	1.8	0	2.4	4.2	1.9	33.6	0.3	35.8	0.1	0	0.1	0.3	
Passenger +	0	779	68	847	26	0	34	60	27	472	4	503	2	0	2	4	1414
% Passenger +	0	99.4	100	99.4	100	0	100	100	100	98.3	100	98.4	100	0	100	100	99.1
Heavy	0	5	0	5	0	0	0	0	0	8	0	8	0	0	0	0	13
% Heavy	0	0.6	0	0.6	0	0	0	0	0	1.7	0	1.6	0	0	0	0	0.9

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File Name : 5017d
Site Code : 00005017
Start Date : 10/12/2022
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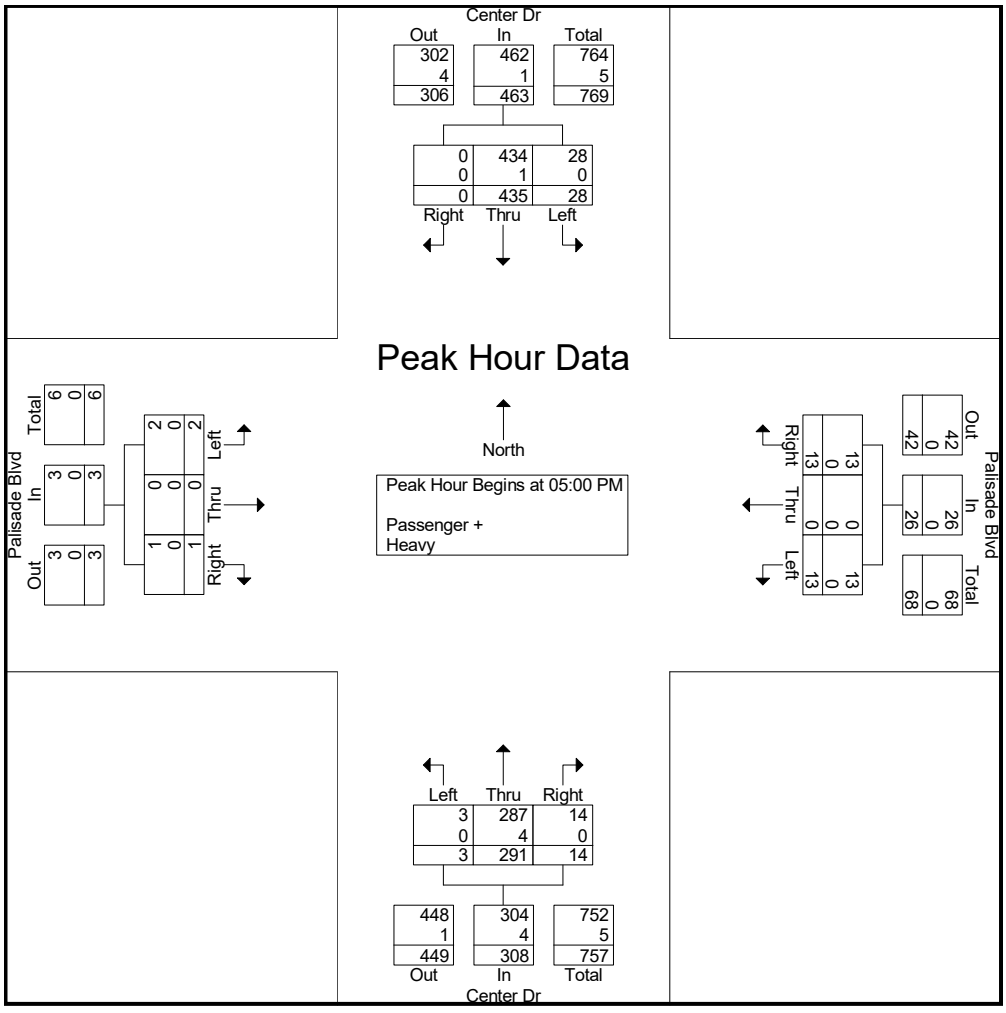
	Center Dr Southbound				Palisade Blvd Westbound				Center Dr Northbound				Palisade Blvd Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	92	**9**	101	**5**	0	**5**	**10**	0	70	0	70	0	0	**1**	1	182
05:15 PM	0	102	6	108	2	0	3	5	**7**	74	0	**81**	0	0	0	0	194
05:30 PM	0	**145**	8	**153**	5	0	3	8	5	72	1	78	0	0	0	0	**239**
05:45 PM	0	96	5	101	1	0	2	3	2	**75**	**2**	79	**1**	0	1	**2**	185
Total Volume	0	435	28	463	13	0	13	26	14	291	3	308	1	0	2	3	800
% App. Total	0	94	6		50	0	50		4.5	94.5	1		33.3	0	66.7		
PHF	.000	.750	.778	.757	.650	.000	.650	.650	.500	.970	.375	.951	.250	.000	.500	.375	.837
Passenger +	0	434	28	462	13	0	13	26	14	287	3	304	1	0	2	3	795
% Passenger +	0	99.8	100	99.8	100	0	100	100	100	98.6	100	98.7	100	0	100	100	99.4
Heavy	0	1	0	1	0	0	0	0	0	4	0	4	0	0	0	0	5
% Heavy	0	0.2	0	0.2	0	0	0	0	0	1.4	0	1.3	0	0	0	0	0.6



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File Name : 5017e
Site Code : 00005017
Start Date : 10/13/2022
Page No : 1

Groups Printed- Passenger + - Heavy

	Center Dr Southbound				Bobs Hollow Ln Westbound				Center Dr Northbound				Bobs Hollow Ln Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00 AM	10	38	2	50	2	0	6	8	4	61	4	69	12	4	53	69	196
07:15 AM	19	49	1	69	1	0	8	9	2	55	8	65	4	1	28	33	176
07:30 AM	47	74	0	121	1	0	9	10	2	34	26	62	10	4	31	45	238
07:45 AM	49	42	2	93	1	6	11	18	3	34	27	64	15	10	39	64	239
Total	125	203	5	333	5	6	34	45	11	184	65	260	41	19	151	211	849
08:00 AM	24	52	3	79	3	5	7	15	4	23	16	43	29	24	33	86	223
08:15 AM	5	32	1	38	1	2	4	7	1	35	11	47	14	3	28	45	137
08:30 AM	14	40	5	59	6	0	7	13	3	28	3	34	9	4	25	38	144
08:45 AM	8	35	0	43	0	6	3	9	2	37	2	41	10	20	30	60	153
Total	51	159	9	219	10	13	21	44	10	123	32	165	62	51	116	229	657
Grand Total	176	362	14	552	15	19	55	89	21	307	97	425	103	70	267	440	1506
Apprch %	31.9	65.6	2.5		16.9	21.3	61.8		4.9	72.2	22.8		23.4	15.9	60.7		
Total %	11.7	24	0.9	36.7	1	1.3	3.7	5.9	1.4	20.4	6.4	28.2	6.8	4.6	17.7	29.2	
Passenger +	164	336	13	513	14	19	54	87	21	296	94	411	100	65	260	425	1436
% Passenger +	93.2	92.8	92.9	92.9	93.3	100	98.2	97.8	100	96.4	96.9	96.7	97.1	92.9	97.4	96.6	95.4
Heavy	12	26	1	39	1	0	1	2	0	11	3	14	3	5	7	15	70
% Heavy	6.8	7.2	7.1	7.1	6.7	0	1.8	2.2	0	3.6	3.1	3.3	2.9	7.1	2.6	3.4	4.6

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File Name : 5017e
Site Code : 00005017
Start Date : 10/13/2022
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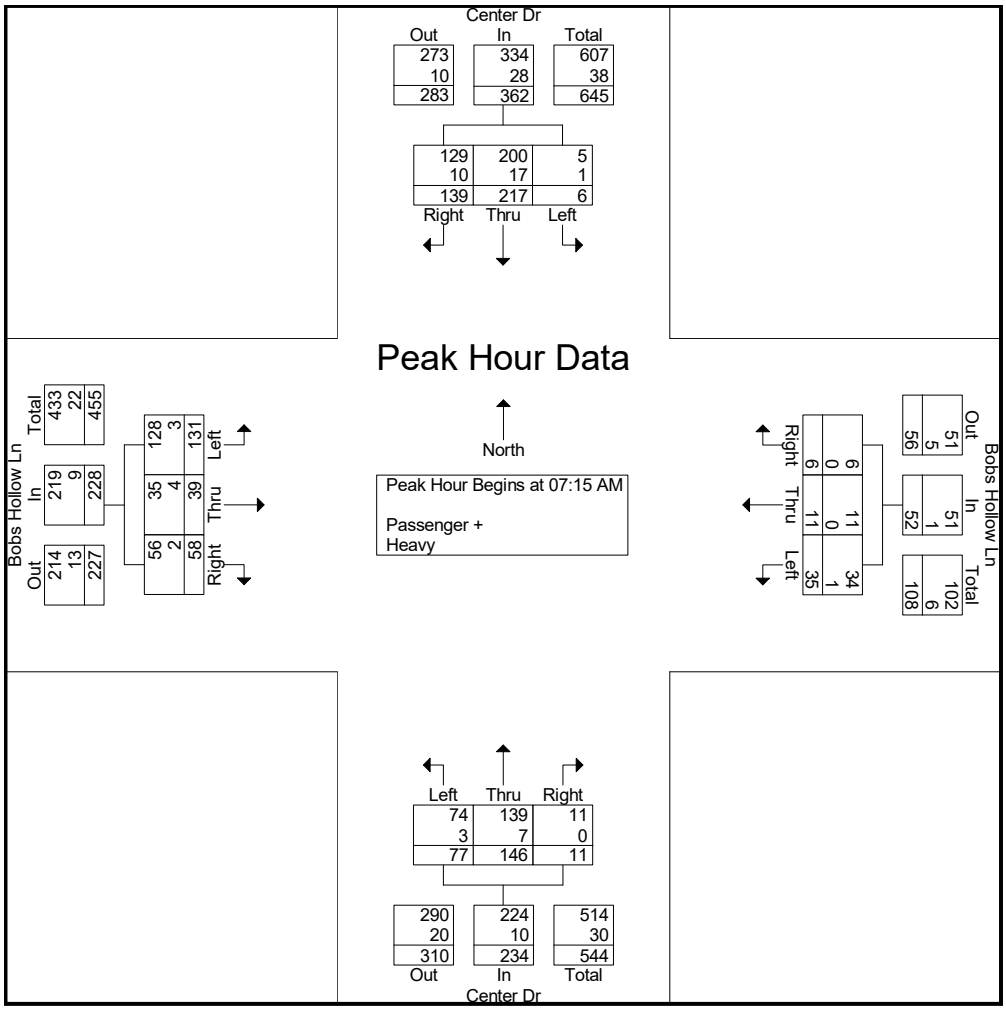
	Center Dr Southbound				Bobs Hollow Ln Westbound				Center Dr Northbound				Bobs Hollow Ln Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	19	49	1	69	1	0	8	9	2	**55**	8	**65**	4	1	28	33	176
07:30 AM	47	**74**	0	**121**	1	0	9	10	2	34	26	62	10	4	31	45	238
07:45 AM	**49**	42	2	93	1	**6**	**11**	**18**	3	34	**27**	64	15	10	**39**	64	**239**
08:00 AM	24	52	**3**	79	**3**	5	7	15	**4**	23	16	43	**29**	**24**	33	**86**	223
Total Volume	139	217	6	362	6	11	35	52	11	146	77	234	58	39	131	228	876
% App. Total	38.4	59.9	1.7		11.5	21.2	67.3		4.7	62.4	32.9		25.4	17.1	57.5		
PHF	.709	.733	.500	.748	.500	.458	.795	.722	.688	.664	.713	.900	.500	.406	.840	.663	.916
Passenger +	129	200	5	334	6	11	34	51	11	139	74	224	56	35	128	219	828
% Passenger +	92.8	92.2	83.3	92.3	100	100	97.1	98.1	100	95.2	96.1	95.7	96.6	89.7	97.7	96.1	94.5
Heavy	10	17	1	28	0	0	1	1	0	7	3	10	2	4	3	9	48
% Heavy	7.2	7.8	16.7	7.7	0	0	2.9	1.9	0	4.8	3.9	4.3	3.4	10.3	2.3	3.9	5.5



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PO Box 397 Puyallup, WA 98371

File Name : 5017f
Site Code : 00005017
Start Date : 10/12/2022
Page No : 1

Groups Printed- Passenger + - Heavy

	Center Dr Southbound				Bobs Hollow Ln Westbound				Center Dr Northbound				Bobs Hollow Ln Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:00 PM	33	50	1	84	2	4	4	10	6	31	9	46	6	3	8	17	157
04:15 PM	38	44	3	85	4	2	9	15	10	36	8	54	4	4	13	21	175
04:30 PM	45	56	2	103	2	2	3	7	8	34	9	51	12	1	14	27	188
04:45 PM	38	60	2	100	0	7	4	11	5	40	10	55	13	5	13	31	197
Total	154	210	8	372	8	15	20	43	29	141	36	206	35	13	48	96	717
05:00 PM	26	60	8	94	4	4	1	9	7	32	13	52	10	1	28	39	194
05:15 PM	32	66	6	104	3	3	4	10	6	45	8	59	8	5	26	39	212
05:30 PM	46	111	3	160	0	3	3	6	12	49	9	70	3	1	28	32	268
05:45 PM	34	59	3	96	1	0	1	2	8	52	11	71	9	1	20	30	199
Total	138	296	20	454	8	10	9	27	33	178	41	252	30	8	102	140	873
Grand Total	292	506	28	826	16	25	29	70	62	319	77	458	65	21	150	236	1590
Apprch %	35.4	61.3	3.4		22.9	35.7	41.4		13.5	69.7	16.8		27.5	8.9	63.6		
Total %	18.4	31.8	1.8	51.9	1	1.6	1.8	4.4	3.9	20.1	4.8	28.8	4.1	1.3	9.4	14.8	
Passenger +	289	504	28	821	16	25	29	70	62	315	77	454	63	21	146	230	1575
% Passenger +	99	99.6	100	99.4	100	100	100	100	100	98.7	100	99.1	96.9	100	97.3	97.5	99.1
Heavy	3	2	0	5	0	0	0	0	0	4	0	4	2	0	4	6	15
% Heavy	1	0.4	0	0.6	0	0	0	0	0	1.3	0	0.9	3.1	0	2.7	2.5	0.9

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File Name : 5017f
Site Code : 00005017
Start Date : 10/12/2022
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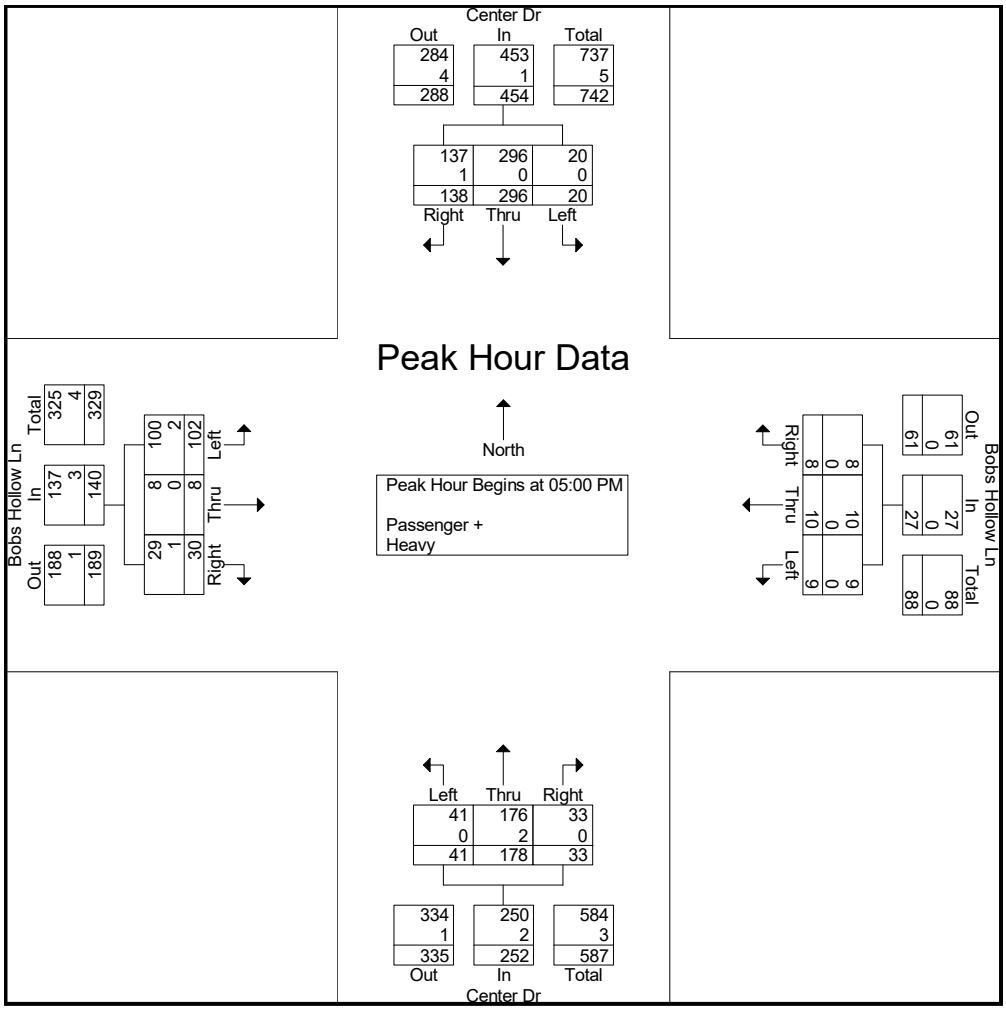
	Center Dr Southbound				Bobs Hollow Ln Westbound				Center Dr Northbound				Bobs Hollow Ln Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	26	60	**8**	94	**4**	**4**	1	9	7	32	**13**	52	**10**	1	**28**	**39**	194
05:15 PM	32	66	6	104	3	3	**4**	**10**	6	45	8	59	8	**5**	26	39	212
05:30 PM	**46**	**111**	3	**160**	0	3	3	6	**12**	49	9	70	3	1	28	32	**268**
05:45 PM	34	59	3	96	1	0	1	2	8	**52**	11	**71**	9	1	20	30	199
Total Volume	138	296	20	454	8	10	9	27	33	178	41	252	30	8	102	140	873
% App. Total	30.4	65.2	4.4		29.6	37	33.3		13.1	70.6	16.3		21.4	5.7	72.9		
PHF	.750	.667	.625	.709	.500	.625	.563	.675	.688	.856	.788	.887	.750	.400	.911	.897	.814
Passenger +	137	296	20	453	8	10	9	27	33	176	41	250	29	8	100	137	867
% Passenger +	99.3	100	100	99.8	100	100	100	100	100	98.9	100	99.2	96.7	100	98.0	97.9	99.3
Heavy	1	0	0	1	0	0	0	0	0	2	0	2	1	0	2	3	6
% Heavy	0.7	0	0	0.2	0	0	0	0	0	1.1	0	0.8	3.3	0	2.0	2.1	0.7



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File Name : 5017g
Site Code : 00005017
Start Date : 10/13/2022
Page No : 1

Groups Printed- Passenger + - Heavy

	Center Dr Southbound				McNeil St Westbound				Center Dr Northbound				McNeil St Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00 AM	4	63	1	68	1	3	7	11	3	53	18	74	65	8	10	83	236
07:15 AM	5	72	5	82	0	3	7	10	3	48	26	77	77	8	18	103	272
07:30 AM	1	92	4	97	3	9	8	20	4	50	33	87	96	9	15	120	324
07:45 AM	8	64	3	75	5	8	6	19	3	51	36	90	60	9	14	83	267
Total	18	291	13	322	9	23	28	60	13	202	113	328	298	34	57	389	1099
08:00 AM	3	92	7	102	3	5	8	16	7	40	22	69	69	9	14	92	279
08:15 AM	9	55	1	65	3	9	6	18	1	37	29	67	60	6	11	77	227
08:30 AM	3	54	3	60	3	4	9	16	0	30	32	62	67	10	13	90	228
08:45 AM	5	45	4	54	3	7	8	18	7	22	29	58	68	19	33	120	250
Total	20	246	15	281	12	25	31	68	15	129	112	256	264	44	71	379	984
Grand Total	38	537	28	603	21	48	59	128	28	331	225	584	562	78	128	768	2083
Apprch %	6.3	89.1	4.6		16.4	37.5	46.1		4.8	56.7	38.5		73.2	10.2	16.7		
Total %	1.8	25.8	1.3	28.9	1	2.3	2.8	6.1	1.3	15.9	10.8	28	27	3.7	6.1	36.9	
Passenger +	36	511	28	575	18	43	58	119	27	320	216	563	556	78	125	759	2016
% Passenger +	94.7	95.2	100	95.4	85.7	89.6	98.3	93	96.4	96.7	96	96.4	98.9	100	97.7	98.8	96.8
Heavy	2	26	0	28	3	5	1	9	1	11	9	21	6	0	3	9	67
% Heavy	5.3	4.8	0	4.6	14.3	10.4	1.7	7	3.6	3.3	4	3.6	1.1	0	2.3	1.2	3.2

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File Name : 5017g
Site Code : 00005017
Start Date : 10/13/2022
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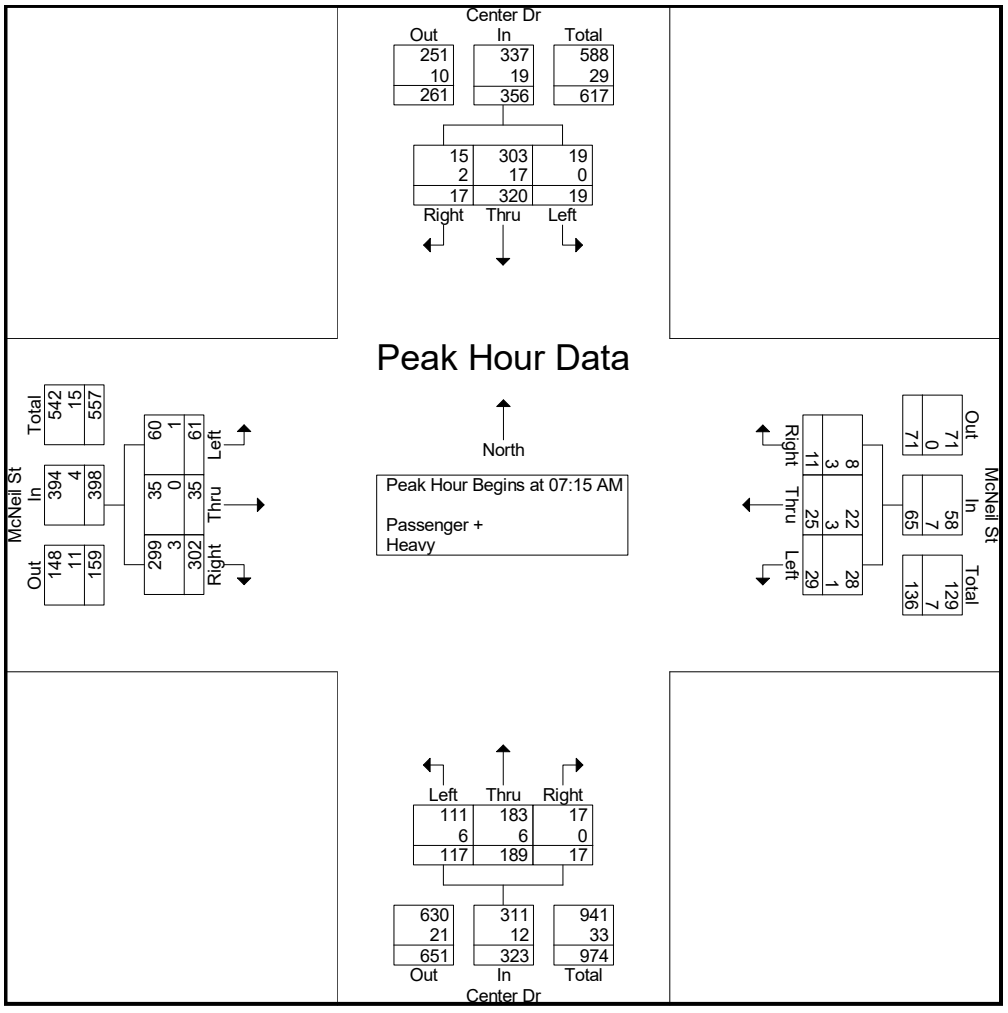
	Center Dr Southbound				McNeil St Westbound				Center Dr Northbound				McNeil St Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	5	72	5	82	0	3	7	10	3	48	26	77	77	8	**18**	103	272
07:30 AM	1	**92**	4	97	3	**9**	**8**	**20**	4	50	33	87	**96**	**9**	15	**120**	**324**
07:45 AM	**8**	64	3	75	**5**	8	6	19	3	**51**	**36**	**90**	60	9	14	83	267
08:00 AM	3	92	**7**	**102**	3	5	8	16	**7**	40	22	69	69	9	14	92	279
Total Volume	17	320	19	356	11	25	29	65	17	189	117	323	302	35	61	398	1142
% App. Total	4.8	89.9	5.3		16.9	38.5	44.6		5.3	58.5	36.2		75.9	8.8	15.3		
PHF	.531	.870	.679	.873	.550	.694	.906	.813	.607	.926	.813	.897	.786	.972	.847	.829	.881
Passenger +	15	303	19	337	8	22	28	58	17	183	111	311	299	35	60	394	1100
% Passenger +	88.2	94.7	100	94.7	72.7	88.0	96.6	89.2	100	96.8	94.9	96.3	99.0	100	98.4	99.0	96.3
Heavy	2	17	0	19	3	3	1	7	0	6	6	12	3	0	1	4	42
% Heavy	11.8	5.3	0	5.3	27.3	12.0	3.4	10.8	0	3.2	5.1	3.7	1.0	0	1.6	1.0	3.7



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PO Box 397 Puyallup, WA 98371

File Name : 5017h
Site Code : 00005017
Start Date : 10/12/2022
Page No : 1

Groups Printed- Passenger + - Heavy

	Center Dr Southbound				McNeil St Westbound				Center Dr Northbound				McNeil St Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:00 PM	6	59	3	68	4	16	5	25	8	41	78	127	40	5	7	52	272
04:15 PM	5	63	8	76	9	21	5	35	9	48	66	123	37	7	10	54	288
04:30 PM	4	72	8	84	3	15	15	33	9	53	65	127	46	10	5	61	305
04:45 PM	10	63	4	77	5	9	10	24	5	60	61	126	36	12	8	56	283
Total	25	257	23	305	21	61	35	117	31	202	270	503	159	34	30	223	1148
05:00 PM	6	74	2	82	7	13	7	27	6	44	77	127	51	7	9	67	303
05:15 PM	3	72	8	83	4	11	1	16	5	63	78	146	29	9	11	49	294
05:30 PM	5	85	7	97	8	23	5	36	8	73	80	161	43	13	12	68	362
05:45 PM	4	73	1	78	3	8	3	14	7	70	72	149	34	6	14	54	295
Total	18	304	18	340	22	55	16	93	26	250	307	583	157	35	46	238	1254
Grand Total	43	561	41	645	43	116	51	210	57	452	577	1086	316	69	76	461	2402
Apprch %	6.7	87	6.4		20.5	55.2	24.3		5.2	41.6	53.1		68.5	15	16.5		
Total %	1.8	23.4	1.7	26.9	1.8	4.8	2.1	8.7	2.4	18.8	24	45.2	13.2	2.9	3.2	19.2	
Passenger +	43	557	40	640	43	115	44	202	56	448	574	1078	311	67	76	454	2374
% Passenger +	100	99.3	97.6	99.2	100	99.1	86.3	96.2	98.2	99.1	99.5	99.3	98.4	97.1	100	98.5	98.8
Heavy	0	4	1	5	0	1	7	8	1	4	3	8	5	2	0	7	28
% Heavy	0	0.7	2.4	0.8	0	0.9	13.7	3.8	1.8	0.9	0.5	0.7	1.6	2.9	0	1.5	1.2

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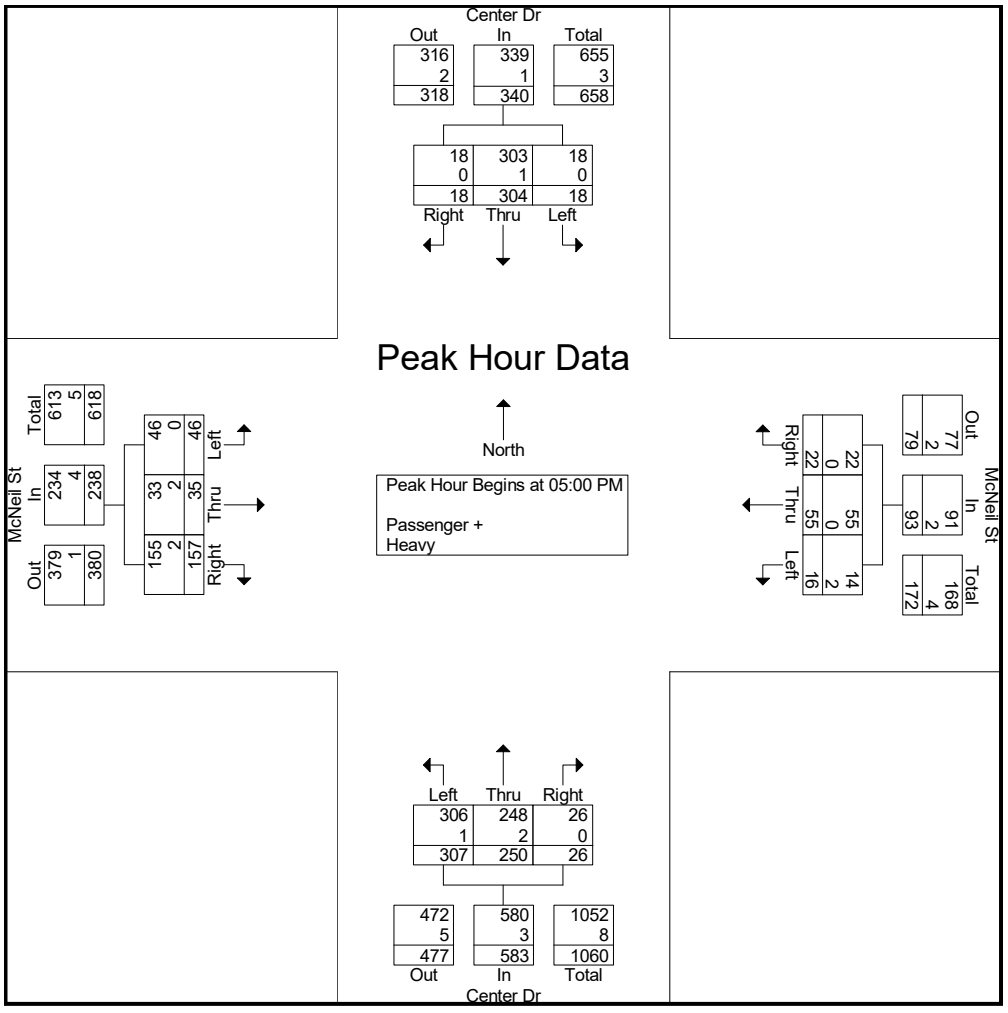
PO Box 397 Puyallup, WA 98371

File Name : 5017h
Site Code : 00005017
Start Date : 10/12/2022
Page No : 2

	Center Dr Southbound				McNeil St Westbound				Center Dr Northbound				McNeil St Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**6**	74	2	82	7	13	**7**	27	6	44	77	127	**51**	7	9	67	303
05:15 PM	3	72	**8**	83	4	11	1	16	5	63	78	146	29	9	11	49	294
05:30 PM	5	**85**	7	**97**	**8**	**23**	5	**36**	**8**	**73**	**80**	**161**	43	**13**	12	**68**	**362**
05:45 PM	4	73	1	78	3	8	3	14	7	70	72	149	34	6	**14**	54	295
Total Volume	18	304	18	340	22	55	16	93	26	250	307	583	157	35	46	238	1254
% App. Total	5.3	89.4	5.3		23.7	59.1	17.2		4.5	42.9	52.7		66	14.7	19.3		
PHF	.750	.894	.563	.876	.688	.598	.571	.646	.813	.856	.959	.905	.770	.673	.821	.875	.866
Passenger +	18	303	18	339	22	55	14	91	26	248	306	580	155	33	46	234	1244
% Passenger +	100	99.7	100	99.7	100	100	87.5	97.8	100	99.2	99.7	99.5	98.7	94.3	100	98.3	99.2
Heavy	0	1	0	1	0	0	2	2	0	2	1	3	2	2	0	4	10
% Heavy	0	0.3	0	0.3	0	0	12.5	2.2	0	0.8	0.3	0.5	1.3	5.7	0	1.7	0.8



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PO Box 397 Puyallup, WA 98371

File Name : 5017i
Site Code : 00005017
Start Date : 10/13/2022
Page No : 1

Groups Printed- Passenger + - Heavy

	Center Dr Southbound				Wilmington Dr Westbound				Center Dr Northbound				Wilmington Dr Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00 AM	5	121	17	143	5	0	19	24	15	72	12	99	8	1	1	10	276
07:15 AM	3	146	8	157	6	5	26	37	27	89	8	124	8	1	3	12	330
07:30 AM	1	178	22	201	6	3	21	30	29	83	8	120	10	2	0	12	363
07:45 AM	7	128	13	148	9	1	15	25	17	77	12	106	14	2	0	16	295
Total	16	573	60	649	26	9	81	116	88	321	40	449	40	6	4	50	1264
08:00 AM	4	155	15	174	7	2	31	40	27	64	7	98	7	2	0	9	321
08:15 AM	1	118	12	131	6	2	19	27	23	63	13	99	5	4	2	11	268
08:30 AM	2	115	17	134	6	2	20	28	27	54	6	87	10	1	2	13	262
08:45 AM	2	118	8	128	6	8	14	28	32	53	14	99	11	3	0	14	269
Total	9	506	52	567	25	14	84	123	109	234	40	383	33	10	4	47	1120
Grand Total	25	1079	112	1216	51	23	165	239	197	555	80	832	73	16	8	97	2384
Apprch %	2.1	88.7	9.2		21.3	9.6	69		23.7	66.7	9.6		75.3	16.5	8.2		
Total %	1	45.3	4.7	51	2.1	1	6.9	10	8.3	23.3	3.4	34.9	3.1	0.7	0.3	4.1	
Passenger +	25	1042	111	1178	50	22	157	229	188	534	79	801	73	16	8	97	2305
% Passenger +	100	96.6	99.1	96.9	98	95.7	95.2	95.8	95.4	96.2	98.8	96.3	100	100	100	100	96.7
Heavy	0	37	1	38	1	1	8	10	9	21	1	31	0	0	0	0	79
% Heavy	0	3.4	0.9	3.1	2	4.3	4.8	4.2	4.6	3.8	1.2	3.7	0	0	0	0	3.3

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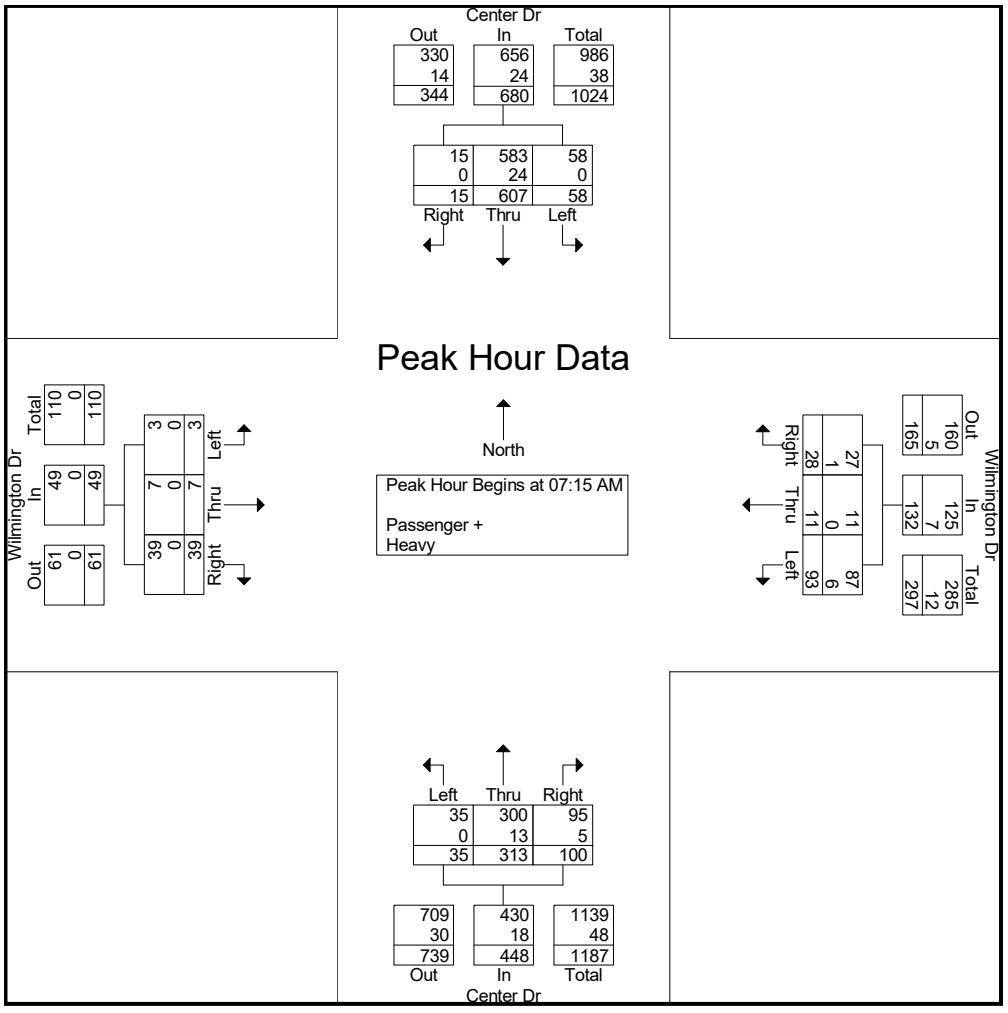
PO Box 397 Puyallup, WA 98371

File Name : 5017i
Site Code : 00005017
Start Date : 10/13/2022
Page No : 2

	Center Dr Southbound				Wilmington Dr Westbound				Center Dr Northbound				Wilmington Dr Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	3	146	8	157	6	**5**	26	37	27	**89**	8	**124**	8	1	**3**	12	330
07:30 AM	1	**178**	**22**	**201**	6	3	21	30	**29**	83	8	120	10	**2**	0	12	**363**
07:45 AM	**7**	128	13	148	**9**	1	15	25	17	77	**12**	106	**14**	2	0	**16**	295
08:00 AM	4	155	15	174	7	2	**31**	**40**	27	64	7	98	7	2	0	9	321
Total Volume	15	607	58	680	28	11	93	132	100	313	35	448	39	7	3	49	1309
% App. Total	2.2	89.3	8.5		21.2	8.3	70.5		22.3	69.9	7.8		79.6	14.3	6.1		
PHF	.536	.853	.659	.846	.778	.550	.750	.825	.862	.879	.729	.903	.696	.875	.250	.766	.902
Passenger +	15	583	58	656	27	11	87	125	95	300	35	430	39	7	3	49	1260
% Passenger +	100	96.0	100	96.5	96.4	100	93.5	94.7	95.0	95.8	100	96.0	100	100	100	100	96.3
Heavy	0	24	0	24	1	0	6	7	5	13	0	18	0	0	0	0	49
% Heavy	0	4.0	0	3.5	3.6	0	6.5	5.3	5.0	4.2	0	4.0	0	0	0	0	3.7



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PO Box 397 Puyallup, WA 98371

File Name : 5017j
Site Code : 00005017
Start Date : 10/12/2022
Page No : 1

Groups Printed- Passenger + - Heavy

	Center Dr Southbound				Wilmington Dr Westbound				Center Dr Northbound				Wilmington Dr Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:00 PM	1	97	10	108	16	1	30	47	32	126	9	167	6	2	0	8	330
04:15 PM	0	102	14	116	17	7	38	62	29	110	12	151	16	3	0	19	348
04:30 PM	1	113	23	137	17	11	34	62	25	110	7	142	10	1	0	11	352
04:45 PM	2	100	22	124	18	5	24	47	32	114	12	158	9	0	2	11	340
Total	4	412	69	485	68	24	126	218	118	460	40	618	41	6	2	49	1370
05:00 PM	2	112	18	132	14	3	39	56	29	117	9	155	5	0	1	6	349
05:15 PM	0	101	16	117	18	6	31	55	30	135	10	175	5	3	0	8	355
05:30 PM	2	122	19	143	20	5	42	67	22	149	6	177	7	2	0	9	396
05:45 PM	7	89	18	114	17	3	29	49	34	131	11	176	9	1	3	13	352
Total	11	424	71	506	69	17	141	227	115	532	36	683	26	6	4	36	1452
Grand Total	15	836	140	991	137	41	267	445	233	992	76	1301	67	12	6	85	2822
Apprch %	1.5	84.4	14.1		30.8	9.2	60		17.9	76.2	5.8		78.8	14.1	7.1		
Total %	0.5	29.6	5	35.1	4.9	1.5	9.5	15.8	8.3	35.2	2.7	46.1	2.4	0.4	0.2	3	
Passenger +	15	821	138	974	136	41	261	438	223	985	75	1283	67	12	6	85	2780
% Passenger +	100	98.2	98.6	98.3	99.3	100	97.8	98.4	95.7	99.3	98.7	98.6	100	100	100	100	98.5
Heavy	0	15	2	17	1	0	6	7	10	7	1	18	0	0	0	0	42
% Heavy	0	1.8	1.4	1.7	0.7	0	2.2	1.6	4.3	0.7	1.3	1.4	0	0	0	0	1.5

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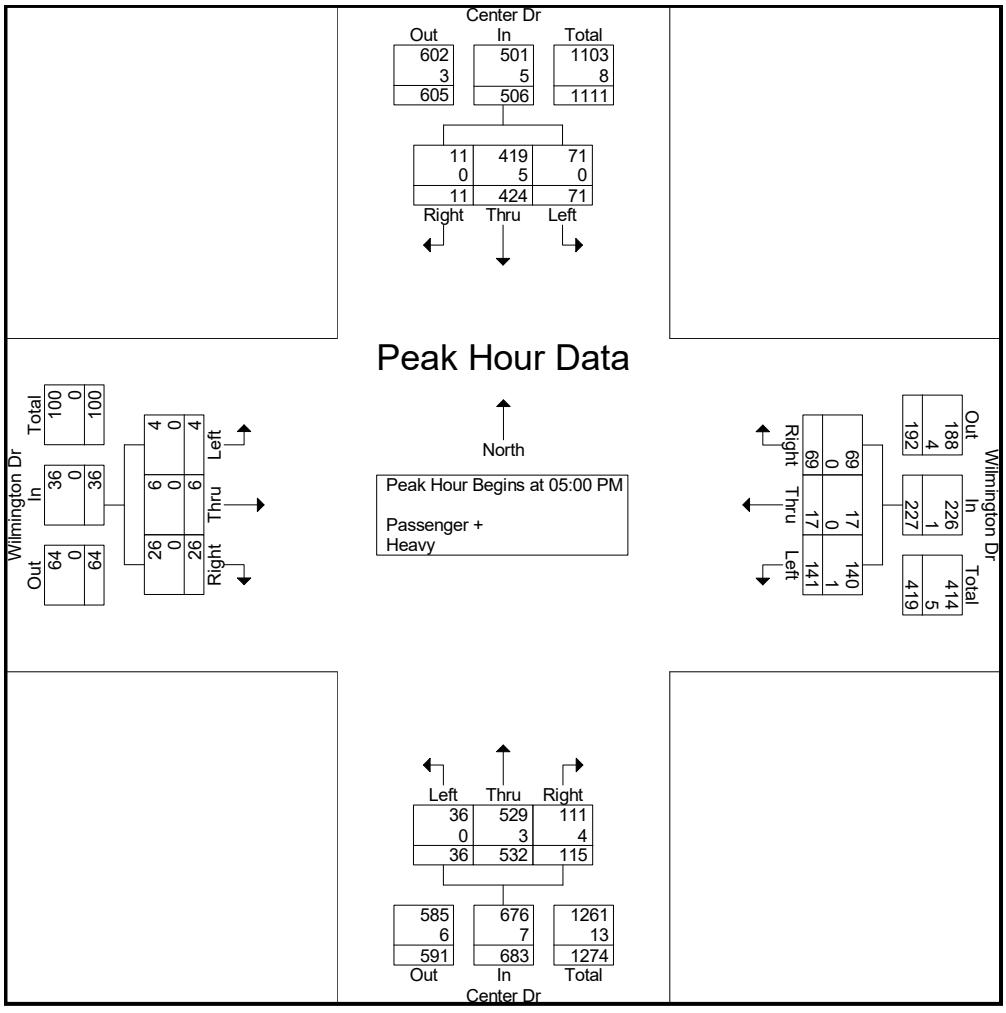
PO Box 397 Puyallup, WA 98371

File Name : 5017j
Site Code : 00005017
Start Date : 10/12/2022
Page No : 2

	Center Dr Southbound				Wilmington Dr Westbound				Center Dr Northbound				Wilmington Dr Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	2	112	18	132	14	3	39	56	29	117	9	155	5	0	1	6	349
05:15 PM	0	101	16	117	18	**6**	31	55	30	135	10	175	5	**3**	0	8	355
05:30 PM	2	**122**	**19**	**143**	**20**	5	**42**	**67**	22	**149**	6	**177**	7	2	0	9	**396**
05:45 PM	**7**	89	18	114	17	3	29	49	**34**	131	**11**	176	**9**	1	**3**	**13**	352
Total Volume	11	424	71	506	69	17	141	227	115	532	36	683	26	6	4	36	1452
% App. Total	2.2	83.8	14		30.4	7.5	62.1		16.8	77.9	5.3		72.2	16.7	11.1		
PHF	.393	.869	.934	.885	.863	.708	.839	.847	.846	.893	.818	.965	.722	.500	.333	.692	.917
Passenger +	11	419	71	501	69	17	140	226	111	529	36	676	26	6	4	36	1439
% Passenger +	100	98.8	100	99.0	100	100	99.3	99.6	96.5	99.4	100	99.0	100	100	100	100	99.1
Heavy	0	5	0	5	0	0	1	1	4	3	0	7	0	0	0	0	13
% Heavy	0	1.2	0	1.0	0	0	0.7	0.4	3.5	0.6	0	1.0	0	0	0	0	0.9



AM Peak Hour Forecast Intersection Volumes

1. Sequalitchew Rd & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	TOTAL	
2018 Count	22	287	0	0	0	0	0	334	10	21	0	8	682	
Baseline 2022	17	278	0	0	0	0	0	332	9	13	0	12	661	
% Volume Difference													3.13	%

2. Palisade Blvd & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	TOTAL	
2018 Count	1	301	23	26	0	23	11	330	2	1	0	2	720	
Baseline 2022	0	320	17	21	1	28	11	332	0	0	1	0	731	
% Volume Difference													1.52	%

3. Bob's Hollow Ln & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	TOTAL	
2018 Count	179	159	5	8	15	29	13	148	60	117	17	168	918	
Baseline 2022	139	217	6	6	11	35	11	146	77	58	39	131	876	
% Volume Difference													4.68	%

4. McNeil St & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	TOTAL	
2018 Count	14	317	16	9	21	34	85	203	107	359	47	45	1257	
Baseline 2022	17	320	19	11	25	29	17	189	117	302	35	61	1142	
% Volume Difference													9.59	%

5. Wilmington Dr & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	TOTAL	
2018 Count	19	636	49	27	16	98	156	359	68	46	18	3	1495	
Baseline 2022	15	607	58	28	11	93	100	313	35	39	3	7	1309	
% Volume Difference													13.27	%

PM Peak Hour Forecast Intersection Volumes

1. Sequalitchew Rd & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	TOTAL	
2018 Count	38	418	0	0	0	0	0	259	23	7	0	15	760	
Baseline 2022	26	456	0	0	0	0	0	246	27	14	0	15	784	
% Volume Difference													3.11	%

2. Palisade Blvd & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	TOTAL	
2018 Count	7	434	28	23	0	29	29	244	1	17	0	7	819	
Baseline 2022	0	435	28	13	0	13	14	291	3	1	0	2	800	
% Volume Difference													2.35	%

3. Bob's Hollow Ln & Center Dr

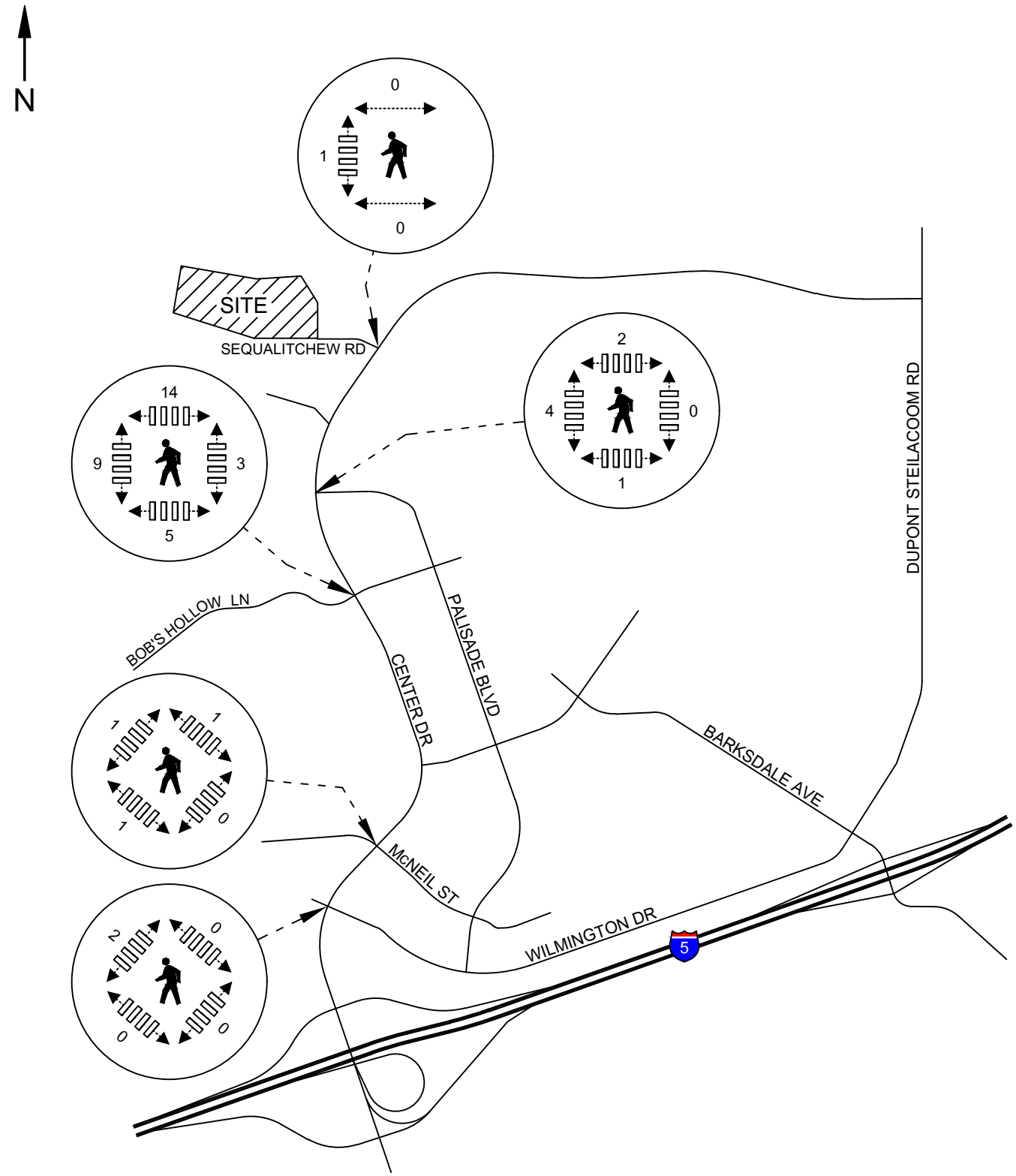
	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	TOTAL	
2018 Count	149	294	12	7	20	14	42	192	43	24	13	80	890	
Baseline 2022	138	296	20	8	10	9	33	178	41	30	8	102	873	
% Volume Difference													1.93	%

4. McNeil St & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	TOTAL	
2018 Count	30	299	25	26	63	69	26	256	382	141	33	40	1390	
Baseline 2022	18	304	18	22	55	16	26	250	307	157	35	46	1254	
% Volume Difference													10.29	%

5. Wilmington Dr & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	TOTAL	
2018 Count	9	443	61	85	18	245	141	579	44	30	14	3	1672	
Baseline 2022	11	424	71	69	17	141	115	532	36	26	6	4	1452	
% Volume Difference													14.08	%



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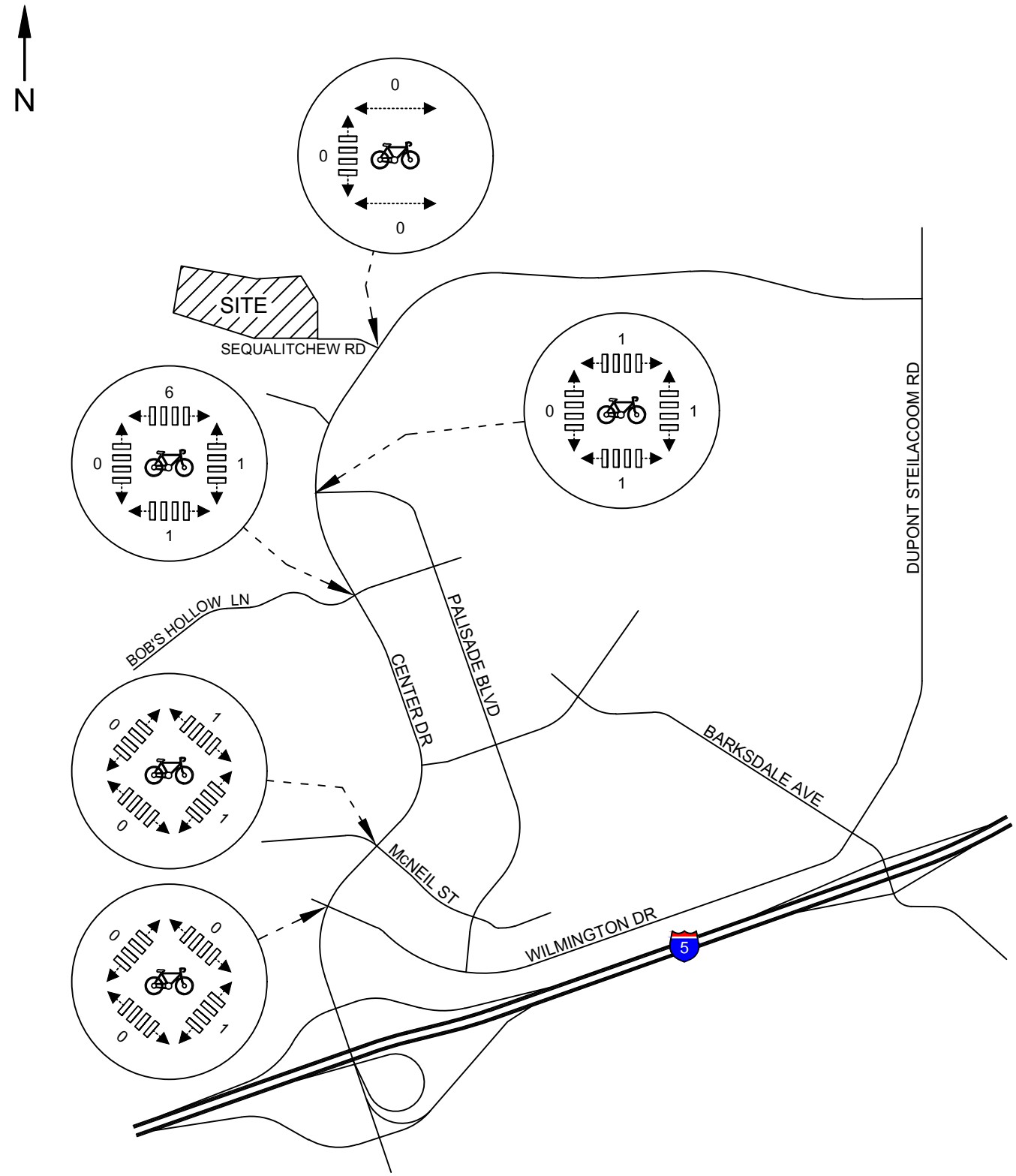
EXISTING AM PEAK HOUR PEDESTRIAN VOLUMES
FIGURE A



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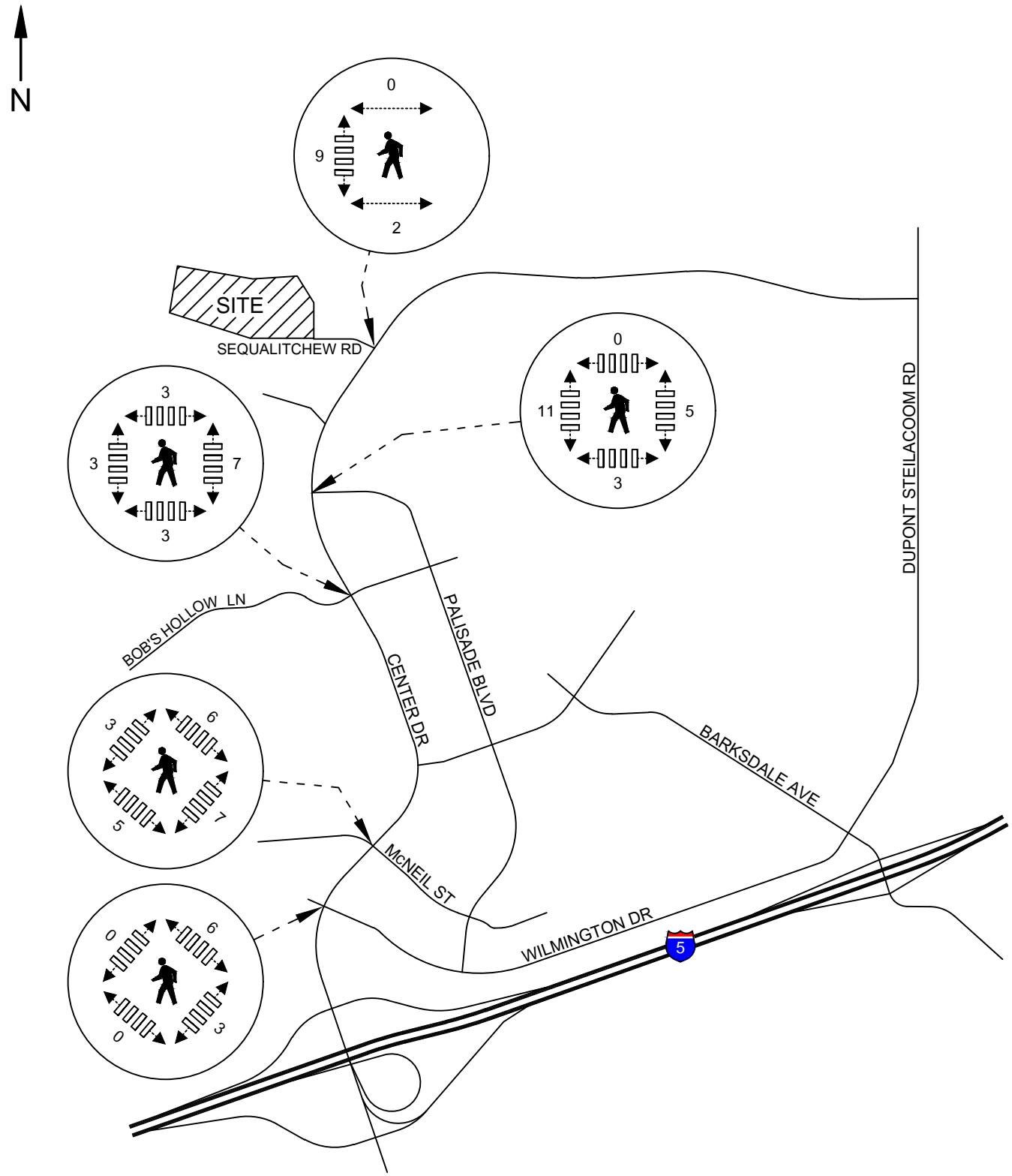
EXISTING AM PEAK HOUR BICYCLIST VOLUMES
FIGURE B



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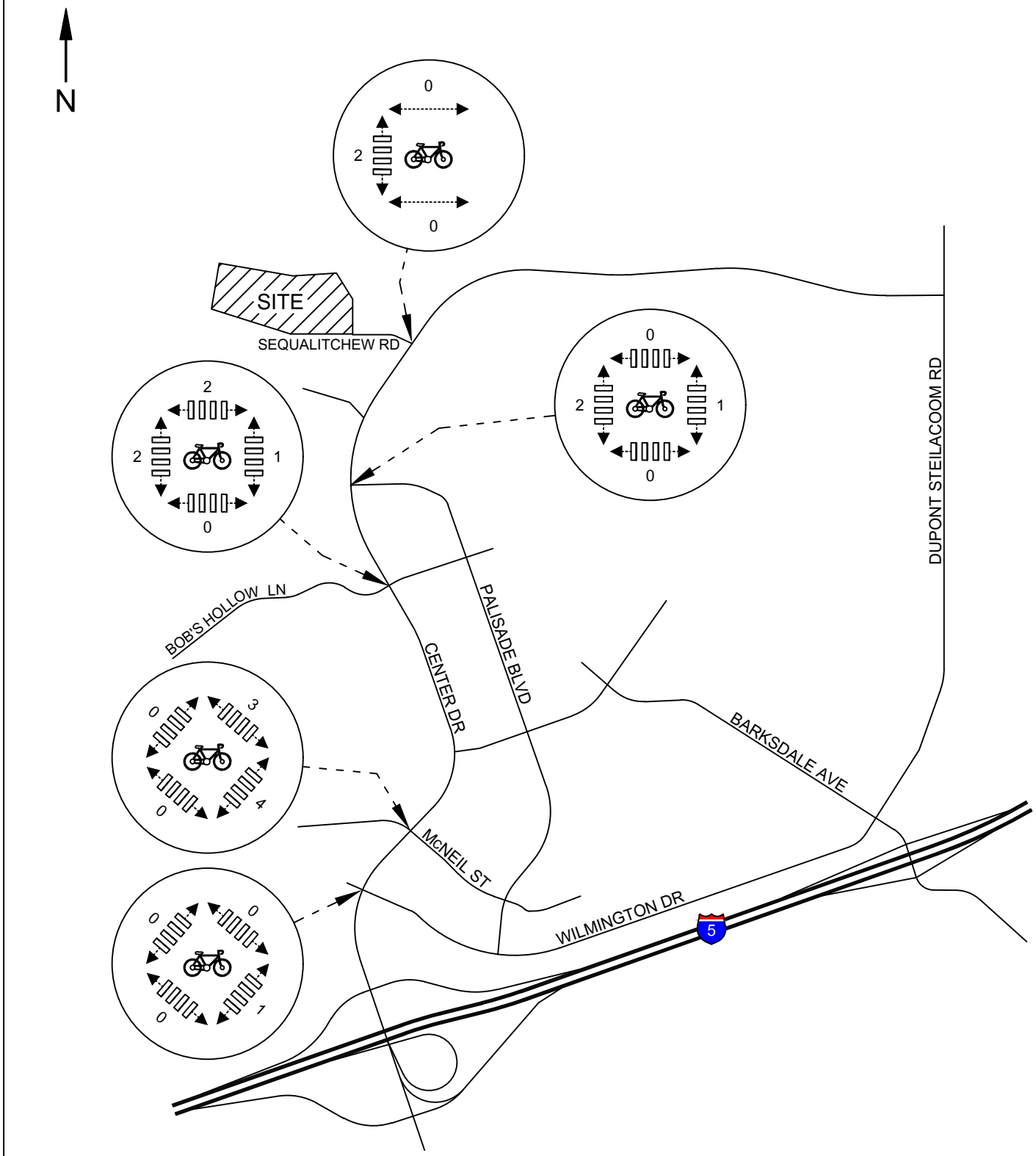
EXISTING PM PEAK HOUR PEDESTRIAN VOLUMES
FIGURE C



HEATH & ASSOCIATES

TRAFFIC AND CIVIL ENGINEERING

DUPONT INDUSTRIAL

EXISTING PM PEAK HOUR BICYCLIST VOLUMES
FIGURE D

Warehousing
(150)

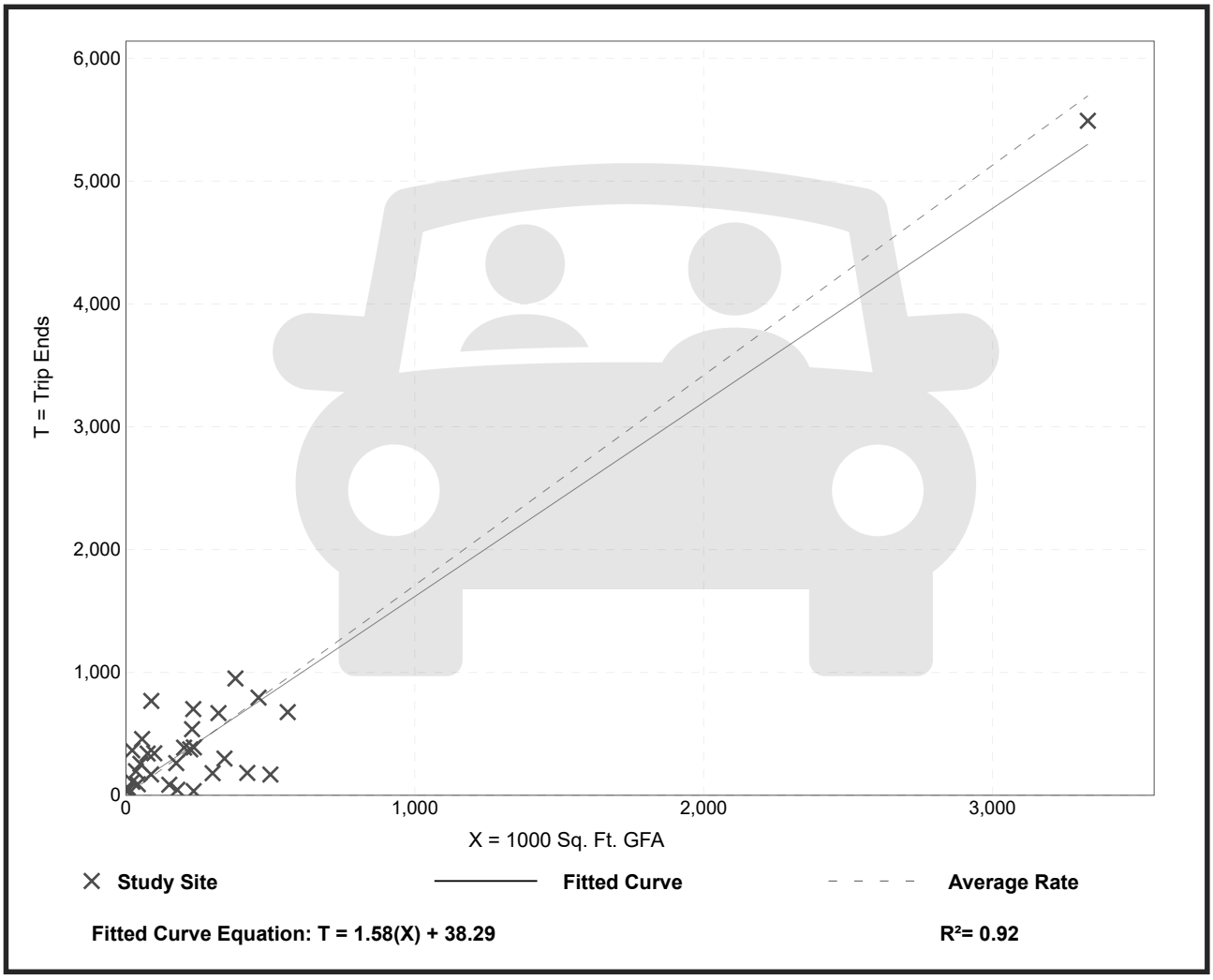
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 31
Avg. 1000 Sq. Ft. GFA: 292
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.71	0.15 - 16.93	1.48

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

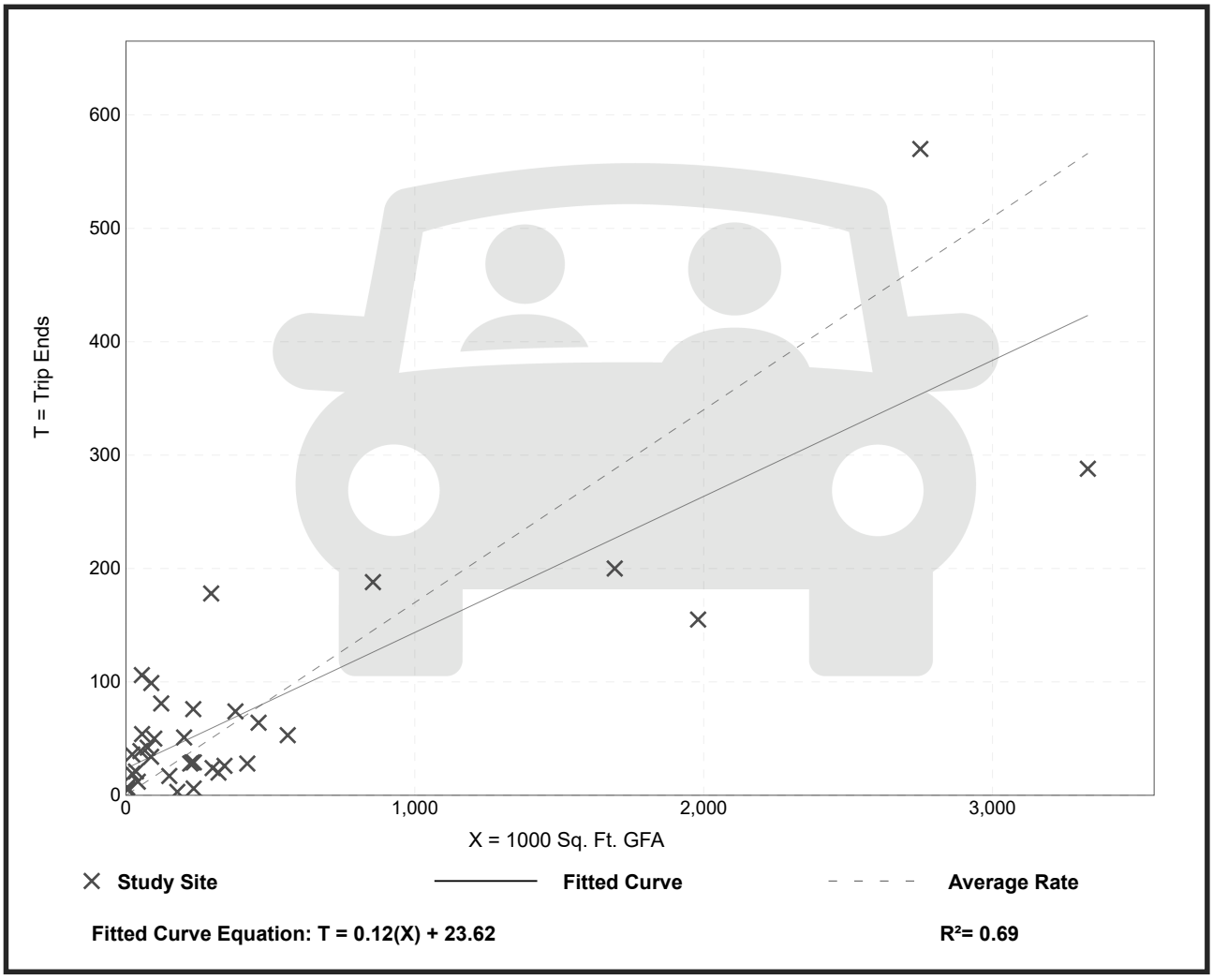
Warehousing
(150)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 36
Avg. 1000 Sq. Ft. GFA: 448
Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.17	0.02 - 1.93	0.19

Data Plot and Equation



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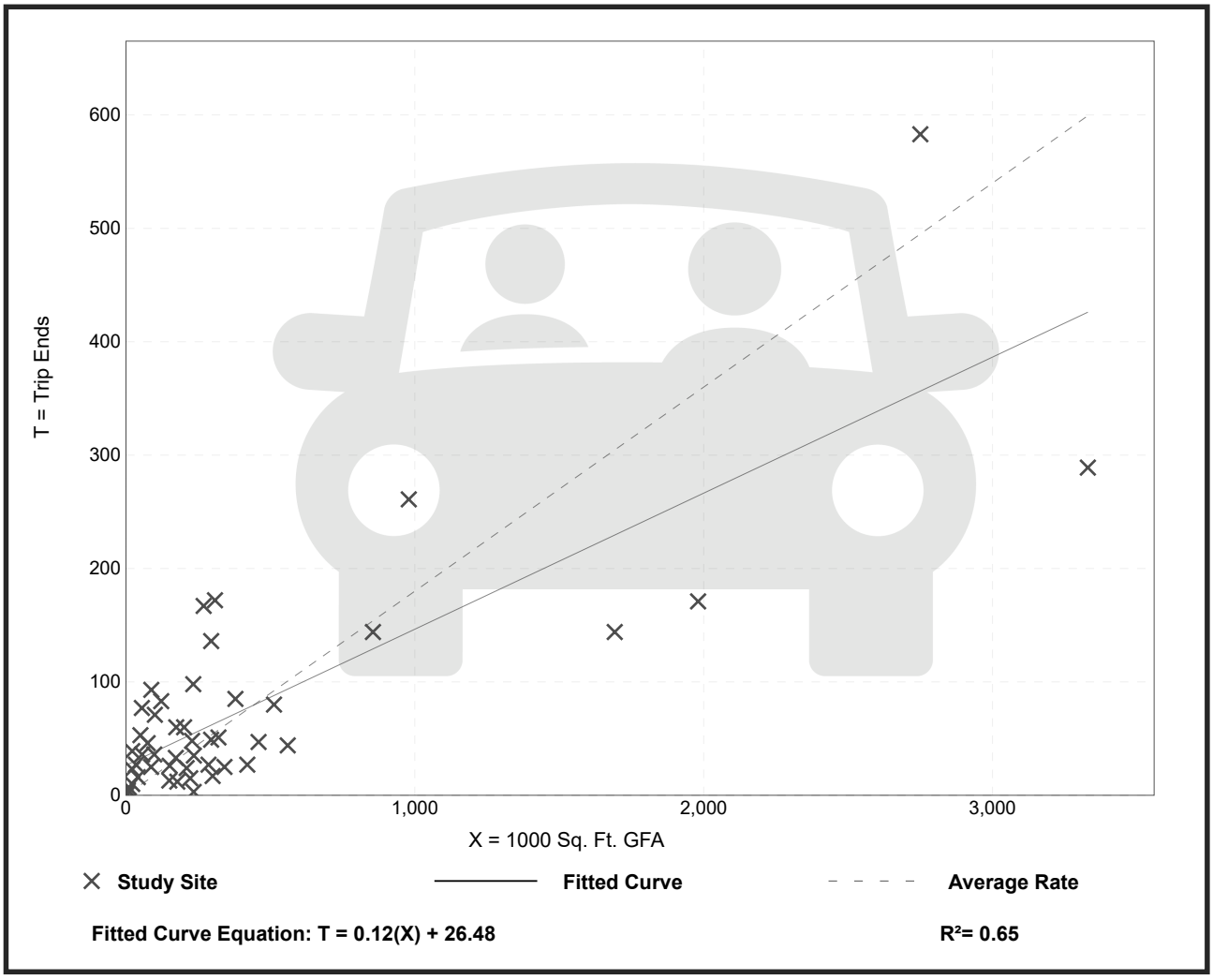
Warehousing
(150)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 49
Avg. 1000 Sq. Ft. GFA: 400
Directional Distribution: 28% entering, 72% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.18	0.01 - 1.80	0.18

Data Plot and Equation



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Warehousing
(150)

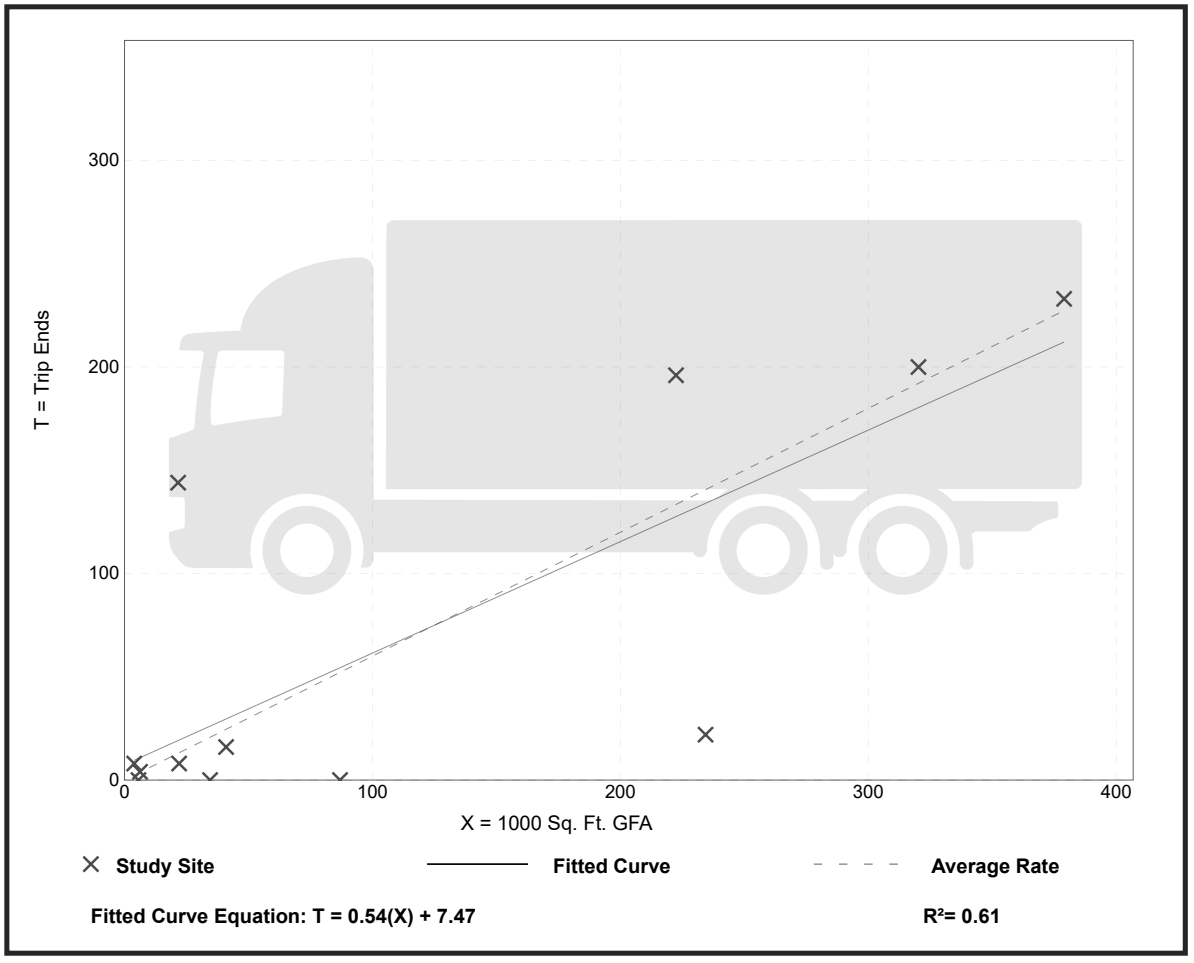
Truck Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 12
Avg. 1000 Sq. Ft. GFA: 115
Directional Distribution: 50% entering, 50% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.60	0.00 - 6.66	0.86

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

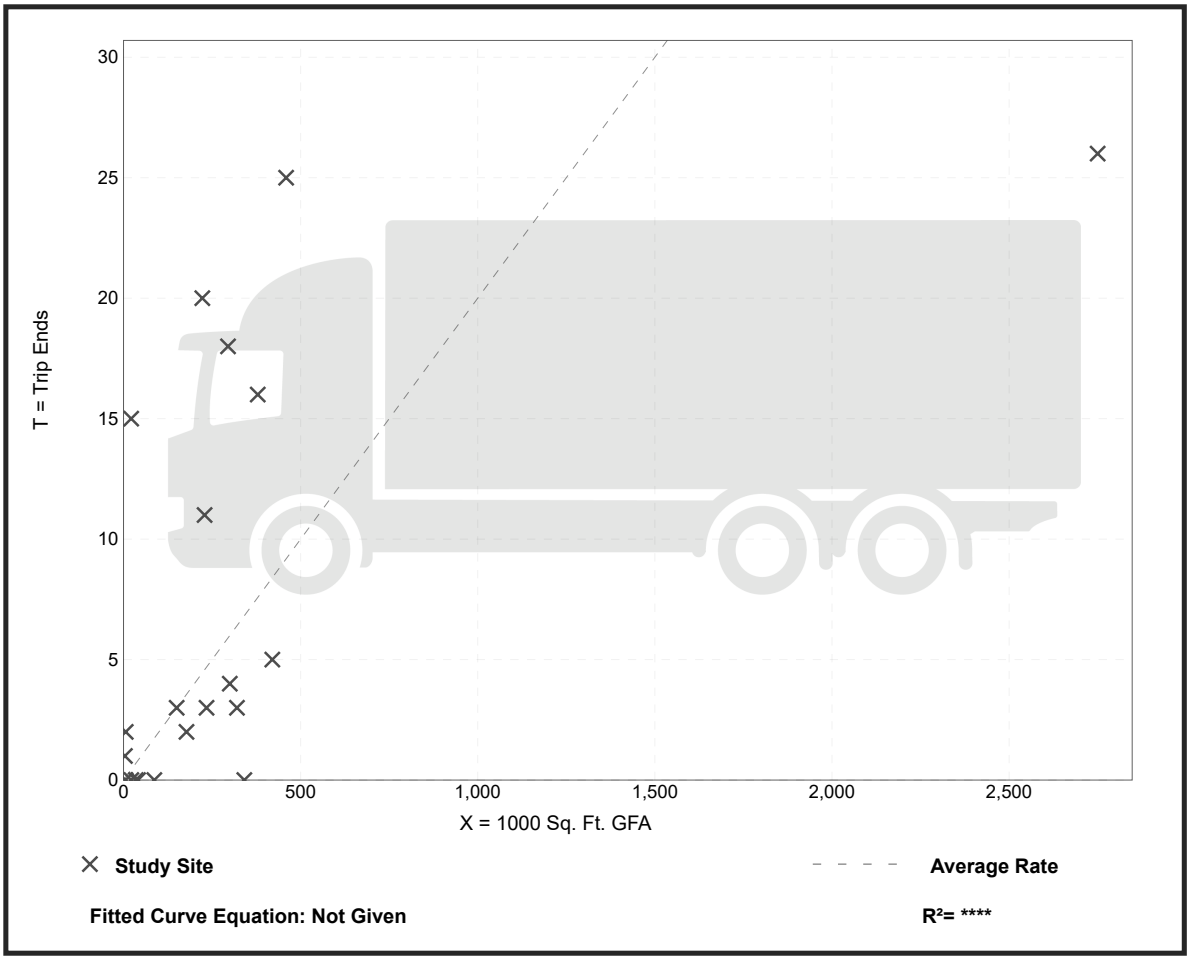
Warehousing
(150)

Truck Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 21
Avg. 1000 Sq. Ft. GFA: 309
Directional Distribution: 52% entering, 48% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.02	0.00 - 0.69	0.05

Data Plot and Equation



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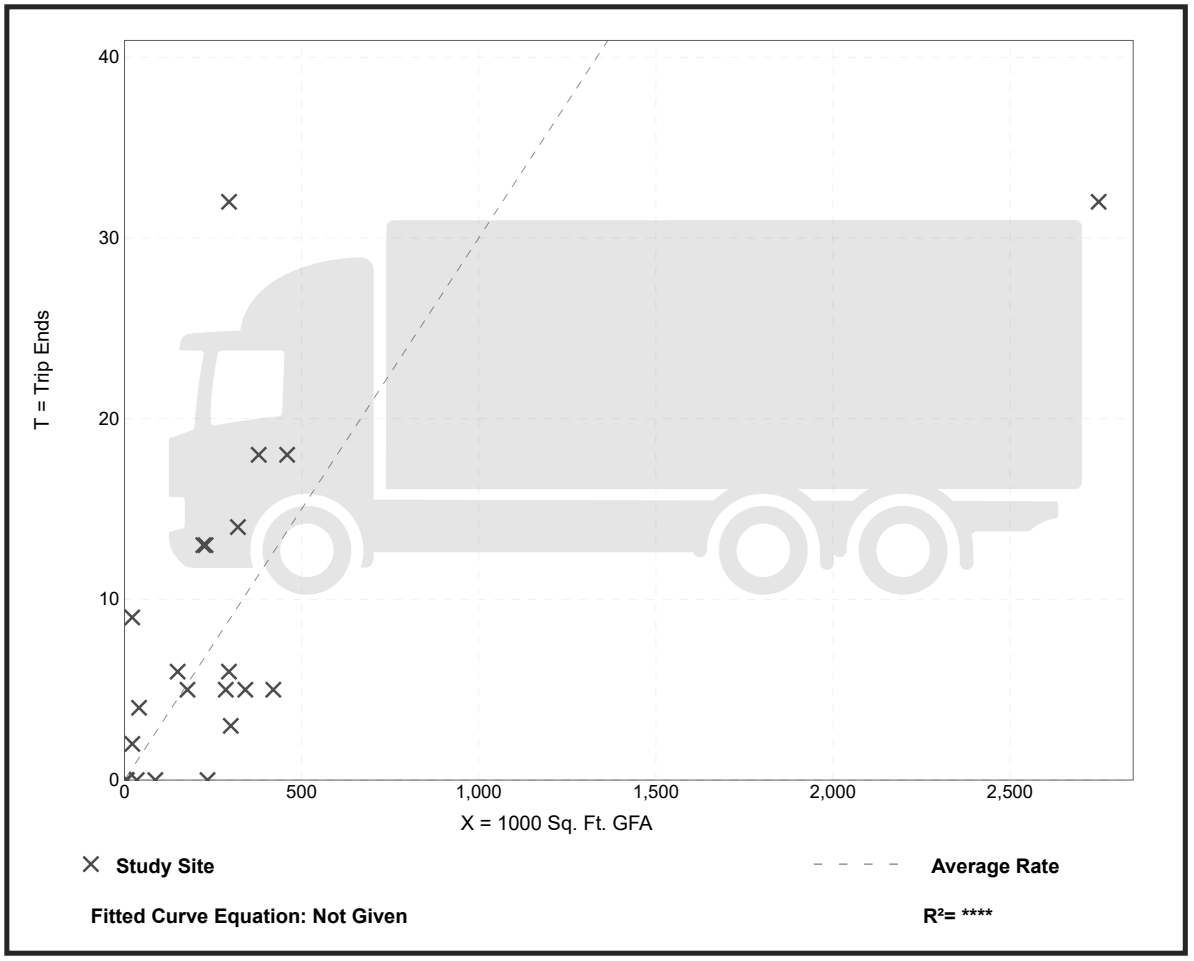
Warehousing
(150)

Truck Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 23
Avg. 1000 Sq. Ft. GFA: 308
Directional Distribution: 52% entering, 48% exiting

Truck Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.03	0.00 - 0.42	0.03

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

PIPELINE TRIPS AT CRITICAL INTERSECTIONS – DUPONT INDUSTRIAL (AM PEAK HOUR)

1. Center Drive/Wilmington Drive

Development	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Village IV (2)	0	0	0	0	0	1	0	4	0	2	16	0
Williamson Pl. (3)	0	0	0	0	0	0	0	12	0	0	3	0
International Place	0	0	0	0	0	0	0	5	0	0	1	0
Patriot's Lndng. (1)	0	0	0	0	0	1	0	17	0	4	50	0
Civic Ctr. Phase 2	0	0	0	0	0	5	0	28	0	3	4	0
Civic Ctr. Phase 3	0	0	0	0	0	1	0	27	0	0	4	0
NW Logistics (1)	0	0	0	0	0	0	0	10	0	0	5	0
DuPont Corp. Ctr.	0	0	0	0	0	13	0	101	0	3	24	0
DuPont Storage (1)	0	0	0	0	0	0	0	2	1	0	2	0
Total	**0**	**0**	**0**	**0**	**0**	**21**	**0**	**206**	**1**	**12**	**109**	**0**

(1) – estimated trips; assignment not available or not provided in TIA
(2) – assignment revised to reflect modified trip generation for partial build-out
(3) – modified from original TIA to reflect scaled-back SEPA proposal

2. Center Drive/McNeil Street

Development	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Village IV (2)	0	2	18	0	1	0	5	0	0	0	0	0
Williamson Pl. (3)	17	0	0	0	0	3	0	12	0	0	3	2
International Place	8	0	0	0	0	1	0	5	0	0	1	3
Patriot's Lndng. (1)	2	8	54	0	3	0	18	0	0	0	0	1
Civic Ctr. Phase 2	3	0	0	0	0	4	0	33	0	3	7	0
Civic Ctr. Phase 3	3	0	0	0	0	2	0	28	0	0	4	0
NW Logistics (1)	0	0	0	0	0	0	0	10	0	0	5	0
DuPont Corp. Ctr.	38	0	0	0	0	8	0	114	0	2	27	9
DuPont Storage (1)	0	2	0	2	2	2	0	0	2	3	0	0
Total	**71**	**12**	**72**	**2**	**6**	**20**	**23**	**202**	**2**	**8**	**47**	**15**

(1) – estimated trips; assignment not available or not provided in TIA
(2) – assignment revised to reflect modified trip generation for partial build-out
(3) – modified from original TIA to reflect scaled-back SEPA proposal

3. Center Drive/Bob's Hollow Lane

Development	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Village IV (2)	7	0	0	0	0	0	0	0	0	0	0	2
Williamson Pl. (3)	0	0	0	0	0	0	0	35	0	0	5	0
International Place	0	0	0	0	0	0	0	15	0	0	4	0
Patriot's Lndng. (1)	5	0	0	0	0	0	0	2	0	0	1	2
Civic Ctr. Phase 2	12	0	0	0	0	0	0	40	0	0	10	6
Civic Ctr. Phase 3	6	0	0	0	0	0	0	33	0	0	4	1
NW Logistics (1)	0	0	0	0	0	0	0	10	0	0	5	0
DuPont Corp. Ctr.	0	0	0	0	0	3	0	161	0	1	38	0
DuPont Storage (1)	0	0	1	0	0	0	1	1	0	0	2	0
Total	**30**	**0**	**1**	**0**	**0**	**3**	**1**	**297**	**0**	**1**	**69**	**11**

(1) – estimated trips; assignment not available or not provided in TIA
(2) – assignment revised to reflect modified trip generation for partial build-out
(3) – modified from original TIA to reflect scaled-back SEPA proposal

4. Center Drive/Palisade Blvd.

Development	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Village IV (2)	0	0	0	0	0	0	0	7	0	0	2	0
Williamson Pl. (3)	0	0	0	0	0	3	0	35	0	0	5	0
International Place	0	0	0	0	0	2	0	15	0	0	4	0
Patriot's Lndng. (1)	0	0	0	0	0	0	0	7	0	0	3	0
Civic Ctr. Phase 2	0	0	0	0	0	10	0	52	0	7	16	0
Civic Ctr. Phase 3	0	0	0	0	0	4	0	39	0	1	5	0
NW Logistics (1)	0	0	0	0	0	0	0	10	0	0	5	0
DuPont Corp. Ctr.	0	0	0	0	0	8	0	164	0	2	39	0
DuPont Storage (1)	0	0	0	0	0	0	0	1	0	1	0	0
Total	**0**	**0**	**0**	**0**	**0**	**27**	**0**	**330**	**0**	**11**	**79**	**0**

(1) – estimated trips; assignment not available or not provided in TIA
(2) – assignment revised to reflect modified trip generation for partial build-out
(3) – modified from original TIA to reflect scaled-back SEPA proposal

5. Center Drive/Sequalitchew

Development	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Village IV (2)	0	0	0	0	0	0	0	7	0	0	2	0
Williamson Pl. (3)	0	0	0	0	0	0	0	38	0	0	5	0
International Place	0	0	0	0	0	0	0	17	0	0	4	0
Patriot's Lndng. (1)	0	0	0	0	0	0	0	7	0	0	3	0
Civic Ctr. Phase 2	0	0	0	0	0	0	0	8	0	0	18	0
Civic Ctr. Phase 3	0	0	0	0	0	0	0	2	0	0	11	0
NW Logistics (1)	0	0	0	0	0	0	0	10	0	0	5	0
DuPont Corp. Ctr.	0	0	0	0	0	0	0	172	0	0	41	0
DuPont Storage (1)	0	0	0	0	0	0	0	1	0	0	1	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**262**	**0**	**0**	**90**	**0**

(1) – estimated trips; assignment not available or not provided in TIA
(2) – assignment revised to reflect modified trip generation for partial build-out
(3) – modified from original TIA to reflect scaled-back SEPA proposal

PIPELINE TRIPS AT CRITICAL INTERSECTIONS – DUPONT INDUSTRIAL (PM PEAK HOUR)

1. Center Drive/Wilmington Drive

Development	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Village IV (2)	0	0	0	0	0	1	0	18	0	1	8	0
Williamson Pl. (3)	0	0	0	0	0	0	0	3	0	0	12	0
International Place	0	0	0	0	0	0	0	2	0	0	6	0
Patriot's Lndng. (1)	0	0	0	0	0	4	0	57	0	3	33	0
Civic Ctr. Phase 2	0	0	0	0	0	1	0	5	0	2	25	0
Civic Ctr. Phase 3	0	0	0	0	0	0	0	4	0	1	25	0
NW Logistics (1)	0	0	0	0	0	0	0	5	0	0	12	0
DuPont Corp. Ctr.	0	0	0	0	0	3	0	27	0	12	96	0
DuPont Storage	0	0	0	5	0	2	0	1	5	2	1	0
Total	**0**	**0**	**0**	**5**	**0**	**11**	**0**	**122**	**5**	**21**	**218**	**0**

(1) – estimated trips; assignment not available or not provided in TIA
(2) – assignment revised to reflect modified trip generation for partial build-out
(3) – modified from original TIA to reflect scaled-back SEPA proposal

2. Center Drive/McNeil Street

Development	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Village IV (2)	0	1	9	0	1	0	19	0	0	0	0	0
Williamson Pl. (3)	3	0	0	0	0	3	0	3	0	3	12	17
International Place	3	0	0	0	0	1	0	2	0	2	6	9
Patriot's Lndng. (1)	2	5	36	0	9	0	61	0	0	0	0	3
Civic Ctr. Phase 2	1	0	0	0	0	2	0	6	0	3	27	3
Civic Ctr. Phase 3	1	0	0	0	0	1	0	4	0	2	26	3
NW Logistics (1)	0	0	0	0	0	0	0	5	0	0	12	0
DuPont Corp. Ctr.	10	0	0	0	0	2	0	30	0	7	108	36
DuPont Storage	0	6	0	3	7	7	0	1	1	6	0	0
Total	**20**	**12**	**45**	**3**	**17**	**16**	**80**	**51**	**1**	**23**	**191**	**71**

(1) – estimated trips; assignment not available or not provided in TIA
(2) – assignment revised to reflect modified trip generation for partial build-out
(3) – modified from original TIA to reflect scaled-back SEPA proposal

Revised 02/13/2018

3. Center Drive/Bob's Hollow Lane

Development	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Village IV (2)	8	0	0	0	0	0	0	0	0	0	0	10
Williamson Pl. (3)	0	0	0	0	0	0	0	9	0	0	32	0
International Place	0	0	0	0	0	0	0	6	0	0	18	0
Patriot's Lndng. (1)	6	0	0	0	0	0	0	2	0	0	3	10
Civic Ctr. Phase 2	3	0	0	0	0	0	0	9	0	0	33	7
Civic Ctr. Phase 3	1	0	0	0	0	0	0	6	0	0	31	5
NW Logistics (1)	0	0	0	0	0	0	0	5	0	0	12	0
DuPont Corp. Ctr.	0	0	0	0	0	1	0	43	0	2	154	0
DuPont Storage (1)	0	0	1	1	0	0	1	3	1	0	2	0
Total	**18**	**0**	**1**	**1**	**0**	**1**	**1**	**83**	**1**	**2**	**285**	**32**

(1) – estimated trips; assignment not available or not provided in TIA
(2) – assignment revised to reflect modified trip generation for partial build-out
(3) – modified from original TIA to reflect scaled-back SEPA proposal

4. Center Drive/Palisade Blvd.

Development	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Village IV (2)	0	0	0	0	0	0	0	8	0	0	10	0
Williamson Pl. (3)	0	0	0	0	0	0	0	9	0	3	32	0
International Place	0	0	0	0	0	0	0	6	0	2	18	0
Patriot's Lndng. (1)	0	0	0	0	0	0	0	8	0	0	13	0
Civic Ctr. Phase 2	0	0	0	0	0	4	0	12	0	7	40	0
Civic Ctr. Phase 3	0	0	0	0	0	1	0	7	0	4	36	0
NW Logistics (1)	0	0	0	0	0	0	0	5	0	0	12	0
DuPont Corp. Ctr.	0	0	0	0	0	2	0	44	0	7	156	0
DuPont Storage (1)	0	0	0	1	0	0	0	2	1	0	1	0
Total	**0**	**0**	**0**	**1**	**0**	**7**	**0**	**101**	**1**	**23**	**318**	**0**

(1) – estimated trips; assignment not available or not provided in TIA
(2) – assignment revised to reflect modified trip generation for partial build-out
(3) – modified from original TIA to reflect scaled-back SEPA proposal

5. Center Drive/Sequalitchew

Development	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Village IV (2)	0	0	0	0	0	0	0	8	0	0	10	0
Williamson Pl. (3)	0	0	0	0	0	0	0	9	0	0	35	0
International Place	0	0	0	0	0	0	0	6	0	0	20	0
Patriot's Lndng. (1)	0	0	0	0	0	0	0	8	0	0	13	0
Civic Ctr. Phase 2	0	0	0	0	0	0	0	16	0	0	47	0
Civic Ctr. Phase 3	0	0	0	0	0	0	0	8	0	0	40	0
NW Logistics (1)	0	0	0	0	0	0	0	5	0	0	12	0
DuPont Corp. Ctr.	0	0	0	0	0	0	0	46	0	0	163	0
DuPont Storage (1)	0	0	0	0	0	0	0	2	0	0	1	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**108**	**0**	**0**	**341**	**0**

(1) – estimated trips; assignment not available or not provided in TIA
(2) – assignment revised to reflect modified trip generation for partial build-out
(3) – modified from original TIA to reflect scaled-back SEPA proposal

AM Peak Hour Forecast Intersection Volumes

Annual Growth Rate: 2 %
# of Years to Horizon: 3
2025

1. Sequalitchew Rd & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Baseline	17	278	0	0	0	0	0	332	9	13	0	12
Project Trips	10	0	0	0	0	0	0	0	32	9	0	3
Pipeline	0	90	0	0	0	0	0	262	0	0	0	0
Without	18	385	0	0	0	0	0	614	10	14	0	13
With Project	28	385	0	0	0	0	0	614	42	23	0	16

2. Palisade Blvd & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Baseline	0	320	17	21	1	28	11	332	0	0	1	0
Project Trips	0	9	0	0	0	0	0	32	0	0	0	0
Pipeline	0	79	11	27	0	0	0	330	0	0	0	0
Without	0	419	29	49	1	30	12	682	0	0	1	0
With Project	0	428	29	49	1	30	12	714	0	0	1	0

3. Bob's Hollow Ln & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Baseline	139	217	6	6	11	35	11	146	77	58	39	131
Project Trips	1	8	0	0	0	0	0	30	0	0	0	2
Pipeline	11	69	1	3	0	0	0	297	1	1	0	30
Without	159	299	7	9	12	37	12	452	83	63	41	169
With Project	160	307	7	9	12	37	12	482	83	63	41	171

4. McNeil St & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Baseline	17	320	19	11	25	29	17	189	117	302	35	61
Project Trips	1	7	0	0	0	0	0	28	0	0	0	2
Pipeline	15	47	8	20	6	2	2	202	23	72	12	71
Without	33	387	28	32	33	33	20	403	147	392	49	136
With Project	34	394	28	32	33	33	20	431	147	392	49	138

5. Wilmington Dr & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Baseline	15	607	58	28	11	93	100	313	35	39	7	3
Project Trips	0	7	0	0	0	0	0	28	0	0	0	0
Pipeline	0	109	12	21	0	0	1	206	0	0	0	0
Without	16	753	74	51	12	99	107	538	37	41	7	3
With Project	16	760	74	51	12	99	107	566	37	41	7	3

PM Peak Hour Forecast Intersection Volumes

Annual Growth Rate: 2 %
# of Years to Horizon: 3
2025

1. Sequalitchew Rd & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Baseline	26	456	0	0	0	0	0	246	27	14	0	15
Project Trips	4	0	0	0	0	0	0	0	12	31	0	10
Pipeline	0	341	0	0	0	0	0	108	0	0	0	0
Without	28	825	0	0	0	0	0	369	29	15	0	16
With Project	32	825	0	0	0	0	0	369	41	46	0	26

2. Palisade Blvd & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Baseline	0	435	28	13	0	13	14	291	3	1	0	2
Project Trips	0	31	0	0	0	0	0	12	0	0	0	0
Pipeline	0	318	23	7	0	1	1	101	0	0	0	0
Without	0	780	53	21	0	15	16	410	3	1	0	2
With Project	0	811	53	21	0	15	16	422	3	1	0	2

3. Bob's Hollow Ln & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Baseline	138	296	20	8	10	9	33	178	41	30	8	102
Project Trips	2	29	0	0	0	0	0	11	0	0	0	1
Pipeline	32	285	2	1	0	1	1	83	1	1	0	18
Without	178	599	23	9	11	11	36	272	45	33	8	126
With Project	180	628	23	9	11	11	36	283	45	33	8	127

4. McNeil St & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Baseline	18	304	18	22	55	16	26	250	307	157	35	46
Project Trips	2	27	0	0	0	0	0	10	0	0	0	1
Pipeline	71	191	23	16	17	3	1	51	80	45	12	20
Without	90	514	42	39	75	20	29	316	406	212	49	69
With Project	92	541	42	39	75	20	29	326	406	212	49	70

5. Wilmington Dr & Center Dr

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Baseline	11	424	71	69	17	141	115	532	36	26	6	4
Project Trips	0	27	0	0	0	0	0	10	0	0	0	0
Pipeline	0	218	21	11	0	5	5	122	0	0	0	0
Without	12	668	96	84	18	155	127	687	38	28	6	4
With Project	12	695	96	84	18	155	127	697	38	28	6	4

Intersection	
Int Delay, s/veh	0.5

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	9	332	278	17	12	13
Future Vol, veh/h	9	332	278	17	12	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	210	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	1	2	7	1	1	1
Mvmt Flow	10	373	312	19	13	15

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	331	0	-	0	529	166
Stage 1	-	-	-	-	322	-
Stage 2	-	-	-	-	207	-
Critical Hdwy	4.12	-	-	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.21	-	-	-	3.51	3.31
Pot Cap-1 Maneuver	1232	-	-	-	482	853
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	811	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1232	-	-	-	478	853
Mov Cap-2 Maneuver	-	-	-	-	559	-
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	811	-

Approach	NB	SB	SE
HCM Control Delay, s/v	0.21	0	10.4
HCM LOS			B

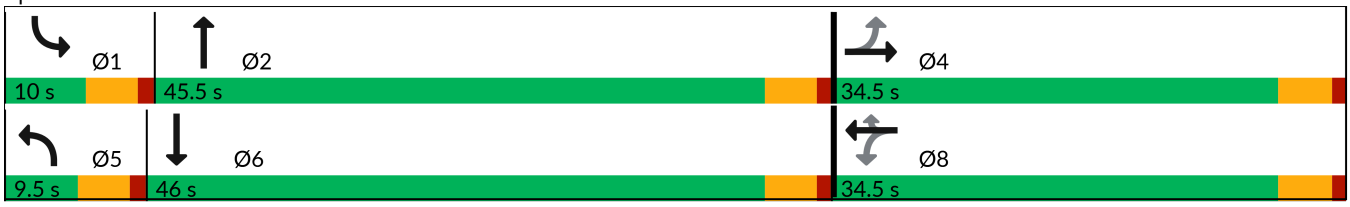
Minor Lane/Major Mvmt	NBL	NBT	SELn1	SELn2	SBT	SBR
Capacity (veh/h)	1232	-	559	853	-	-
HCM Lane V/C Ratio	0.008	-	0.024	0.017	-	-
HCM Control Delay (s/veh)	7.9	-	11.6	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

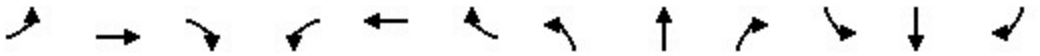
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	0	28	1	21	0	332	11	17	320	0
Future Volume (vph)	0	1	0	28	1	21	0	332	11	17	320	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					1.00	0.98		1.00		1.00		
Frt						0.850		0.995				
Flt Protected					0.954					0.950		
Satd. Flow (prot)	0	1881	0	0	1795	1599	1881	3519	0	1703	3438	0
Flt Permitted					0.916					0.950		
Satd. Flow (perm)	0	1881	0	0	1716	1566	1881	3519	0	1697	3438	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						73		5				
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		299			493			577			506	
Travel Time (s)		8.2			13.4			11.2			9.9	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	2%	1%	6%	5%	1%
Adj. Flow (vph)	0	1	0	31	1	23	0	369	12	19	356	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	32	23	0	381	0	19	356	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	34.5	34.5		28.5	28.5	28.5	9.5	40.5		9.5	44.5	
Total Split (s)	34.5	34.5		34.5	34.5	34.5	9.5	45.5		10.0	46.0	
Total Split (%)	38.3%	38.3%		38.3%	38.3%	38.3%	10.6%	50.6%		11.1%	51.1%	
Maximum Green (s)	30.0	30.0		30.0	30.0	30.0	5.0	41.0		5.5	41.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	23.0	23.0		17.0	17.0	17.0		29.0			33.0	
Pedestrian Calls (#/hr)	5	5		0	0	0		5			5	
Act Effct Green (s)		9.3			9.6	9.6		31.6		6.8	32.5	
Actuated g/C Ratio		0.23			0.24	0.24		0.80		0.17	0.82	
v/c Ratio		0.00			0.08	0.05		0.14		0.07	0.13	
Control Delay (s/veh)		15.0			14.5	0.2		6.1		24.8	4.3	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay (s/veh)		15.0			14.5	0.2		6.1		24.8	4.3	
LOS		B			B	A		A		C	A	
Approach Delay (s/veh)		15.0			8.5			6.1			5.3	
Approach LOS		B			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 39.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.14			
Intersection Signal Delay (s/veh): 5.9		Intersection LOS: A	
Intersection Capacity Utilization 37.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Center Dr & Palisade Blvd



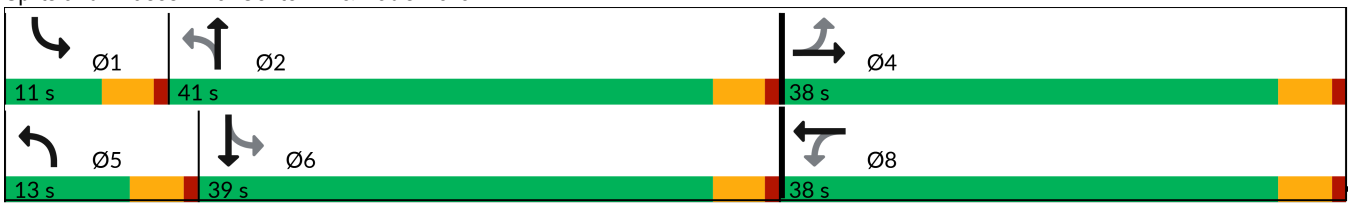


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	39	58	35	11	6	77	146	11	6	217	139
Future Volume (vph)	131	39	58	35	11	6	77	146	11	6	217	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	140		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			115			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99		1.00	1.00		0.99	0.99	
Frt		0.966			0.983			0.989			0.941	
Flt Protected		0.972			0.968		0.950			0.950		
Satd. Flow (prot)	0	1712	0	0	1762	0	1736	3402	0	1543	3117	0
Flt Permitted		0.790			0.783		0.426			0.644		
Satd. Flow (perm)	0	1386	0	0	1421	0	775	3402	0	1039	3117	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			7			10			151	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		344			542			617			532	
Travel Time (s)		9.4			14.8			12.0			10.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	10%	3%	3%	1%	1%	4%	5%	1%	17%	8%	7%
Adj. Flow (vph)	142	42	63	38	12	7	84	159	12	7	236	151
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	247	0	0	57	0	84	171	0	7	387	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		23.5	23.5		9.5	31.5		9.5	32.5	
Total Split (s)	38.0	38.0		38.0	38.0		13.0	41.0		11.0	39.0	
Total Split (%)	42.2%	42.2%		42.2%	42.2%		14.4%	45.6%		12.2%	43.3%	
Maximum Green (s)	33.5	33.5		33.5	33.5		8.5	36.5		6.5	34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	9.0	9.0		12.0	12.0			20.0			21.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		13.6			13.6		19.9	18.9		16.6	13.6	
Actuated g/C Ratio		0.31			0.31		0.45	0.43		0.38	0.31	
v/c Ratio		0.56			0.13		0.16	0.12		0.02	0.36	
Control Delay (s/veh)		19.2			13.6		7.6	8.6		7.2	9.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		19.2			13.6		7.6	8.6		7.2	9.7	
LOS		B			B		A	A		A	A	
Approach Delay (s/veh)		19.2			13.6			8.3			9.6	
Approach LOS		B			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 43.9			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay (s/veh): 12.0		Intersection LOS: B	
Intersection Capacity Utilization 42.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Center Dr & Bob's Hollow Ln



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	61	35	302	29	25	11	117	189	17	19	320	17
Future Volume (vph)	61	35	302	29	25	11	117	189	17	19	320	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		325	200		200	250		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			95			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		1.00	0.98	0.99	1.00		0.99	1.00	
Frt			0.850			0.850		0.988			0.993	
Flt Protected		0.969			0.974		0.950			0.950		
Satd. Flow (prot)	0	1812	1599	0	1727	1272	1719	3459	0	1787	3397	0
Flt Permitted		0.771			0.792		0.950			0.950		
Satd. Flow (perm)	0	1436	1569	0	1401	1245	1709	3459	0	1776	3397	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			238			73		13			6	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		502			454			455			433	
Travel Time (s)		13.7			12.4			8.9			8.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	2%	1%	1%	3%	12%	27%	5%	3%	1%	1%	5%	12%
Adj. Flow (vph)	69	40	343	33	28	13	133	215	19	22	364	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	109	343	0	61	13	133	234	0	22	383	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		6	7		2	3	7	4		3	8	
Permitted Phases	6		6	2		2						
Detector Phase	6	6	7	2	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	31.5	31.5	9.5	25.5	25.5	9.5	9.5	42.5		9.5	26.5	
Total Split (s)	36.6	36.6	20.0	36.6	36.6	10.4	20.0	43.0		10.4	33.4	
Total Split (%)	40.7%	40.7%	22.2%	40.7%	40.7%	11.6%	22.2%	47.8%		11.6%	37.1%	
Maximum Green (s)	32.1	32.1	15.5	32.1	32.1	5.9	15.5	38.5		5.9	28.9	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag			Lead			Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	20.0	20.0		14.0	14.0			19.0			15.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		11.2	18.7		11.0	15.5	10.0	25.9		6.7	12.0	
Actuated g/C Ratio		0.25	0.42		0.25	0.35	0.22	0.58		0.15	0.27	
v/c Ratio		0.30	0.43		0.18	0.03	0.35	0.12		0.08	0.42	
Control Delay (s/veh)		18.5	4.0		16.9	0.1	22.2	9.1		26.1	17.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		18.5	4.0		16.9	0.1	22.2	9.1		26.1	17.1	
LOS		B	A		B	A	C	A		C	B	
Approach Delay (s/veh)		7.5			14.0			13.8			17.6	
Approach LOS		A			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 44.8			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay (s/veh): 12.8		Intersection LOS: B	
Intersection Capacity Utilization 47.5%		ICU Level of Service A	
Analysis Period (min) 15			

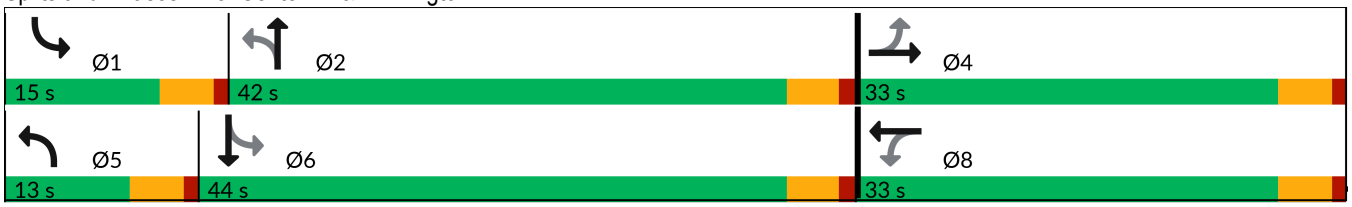
Splits and Phases: 4: Center Dr & McNeil St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	7	39	93	11	28	35	313	100	58	607	15
Future Volume (vph)	3	7	39	93	11	28	35	313	100	58	607	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	100		0	105		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	0.99		1.00	1.00	
Frt		0.874			0.892			0.964			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1613	0	1687	1617	0	1787	3314	0	1787	3457	0
Flt Permitted	0.729			0.724			0.385			0.457		
Satd. Flow (perm)	1363	1613	0	1277	1617	0	722	3314	0	856	3457	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		43			31			58			3	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		190			493			682			320	
Travel Time (s)		5.2			13.4			13.3			6.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	7%	1%	4%	1%	4%	5%	1%	4%	1%
Adj. Flow (vph)	3	8	43	103	12	31	39	348	111	64	674	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	51	0	103	43	0	39	459	0	64	691	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	26.5	26.5		25.5	25.5		9.5	22.5		9.5	31.5	
Total Split (s)	33.0	33.0		33.0	33.0		13.0	42.0		15.0	44.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		14.4%	46.7%		16.7%	48.9%	
Maximum Green (s)	28.5	28.5		28.5	28.5		8.5	37.5		10.5	39.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0						7.0	
Flash Dont Walk (s)	11.0	11.0		14.0	14.0						20.0	
Pedestrian Calls (#/hr)	5	5		5	5						5	
Act Effct Green (s)	10.4	10.4		10.5	10.5		23.6	21.6		24.7	24.0	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.55	0.50		0.57	0.56	
v/c Ratio	0.01	0.12		0.33	0.10		0.07	0.27		0.10	0.36	
Control Delay (s/veh)	15.7	8.1		19.2	9.4		5.9	10.1		5.9	10.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	15.7	8.1		19.2	9.4		5.9	10.1		5.9	10.3	
LOS	B	A		B	A		A	B		A	B	
Approach Delay (s/veh)		8.5			16.3			9.7			10.0	
Approach LOS		A			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 43.1			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.36			
Intersection Signal Delay (s/veh): 10.5		Intersection LOS: B	
Intersection Capacity Utilization 46.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Center Dr & Wilmington Dr



Intersection	
Int Delay, s/veh	0.8

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	27	246	456	26	15	14
Future Vol, veh/h	27	246	456	26	15	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	210	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	34	311	577	33	19	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	610	0	-	0	818	305
Stage 1	-	-	-	-	594	-
Stage 2	-	-	-	-	224	-
Critical Hdwy	4.12	-	-	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.21	-	-	-	3.51	3.31
Pot Cap-1 Maneuver	972	-	-	-	316	694
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	795	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	972	-	-	-	305	694
Mov Cap-2 Maneuver	-	-	-	-	405	-
Stage 1	-	-	-	-	499	-
Stage 2	-	-	-	-	795	-

Approach	NB	SB	SE
HCM Control Delay, s/v	0.87	0	12.39
HCM LOS			B

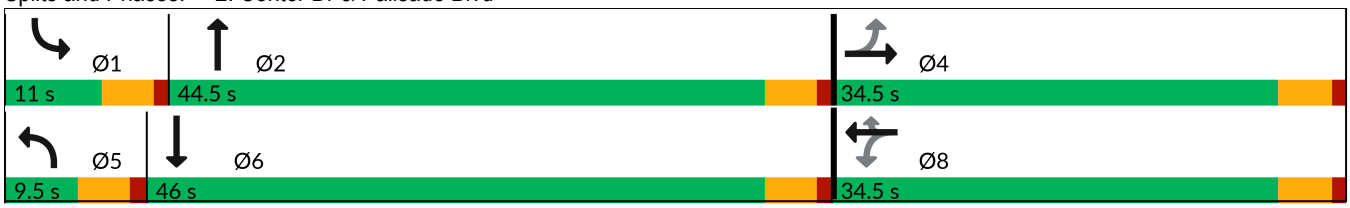
Minor Lane/Major Mvmt	NBL	NBT	SELn1	SELn2	SBT	SBR
Capacity (veh/h)	972	-	405	694	-	-
HCM Lane V/C Ratio	0.035	-	0.047	0.026	-	-
HCM Control Delay (s/veh)	8.8	-	14.3	10.3	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.1	-	-

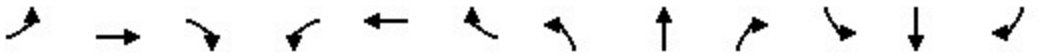
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	13	0	13	3	291	14	28	435	0
Future Volume (vph)	2	0	1	13	0	13	3	291	14	28	435	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00	0.98	1.00	1.00		1.00		
Frt		0.955				0.850		0.993				
Flt Protected		0.968			0.950		0.950			0.950		
Satd. Flow (prot)	0	1728	0	0	1787	1599	1787	3544	0	1787	3574	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1778	0	0	1873	1566	1782	3544	0	1780	3574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73				73		7				
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		299			493			577			506	
Travel Time (s)		8.2			13.4			11.2			9.9	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	2	0	1	15	0	15	4	346	17	33	518	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	3	0	0	15	15	4	363	0	33	518	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	34.5	34.5		28.5	28.5	28.5	9.5	40.5		9.5	44.5	
Total Split (s)	34.5	34.5		34.5	34.5	34.5	9.5	44.5		11.0	46.0	
Total Split (%)	38.3%	38.3%		38.3%	38.3%	38.3%	10.6%	49.4%		12.2%	51.1%	
Maximum Green (s)	30.0	30.0		30.0	30.0	30.0	5.0	40.0		6.5	41.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	23.0	23.0		17.0	17.0	17.0		29.0			33.0	
Pedestrian Calls (#/hr)	5	5		0	0	0		5			5	
Act Effct Green (s)		9.1			9.4	9.4	6.3	34.7		7.5	34.8	
Actuated g/C Ratio		0.23			0.24	0.24	0.16	0.89		0.19	0.89	
v/c Ratio		0.01			0.03	0.03	0.01	0.12		0.10	0.16	
Control Delay (s/veh)		0.0			14.2	0.2	25.3	4.9		23.0	4.8	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		0.0			14.2	0.2	25.3	4.9		23.0	4.8	
LOS		A			B	A	C	A		C	A	
Approach Delay (s/veh)					7.2			5.2			5.9	
Approach LOS					A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 39.1			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.16			
Intersection Signal Delay (s/veh): 5.6		Intersection LOS: A	
Intersection Capacity Utilization 38.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Center Dr & Palisade Blvd



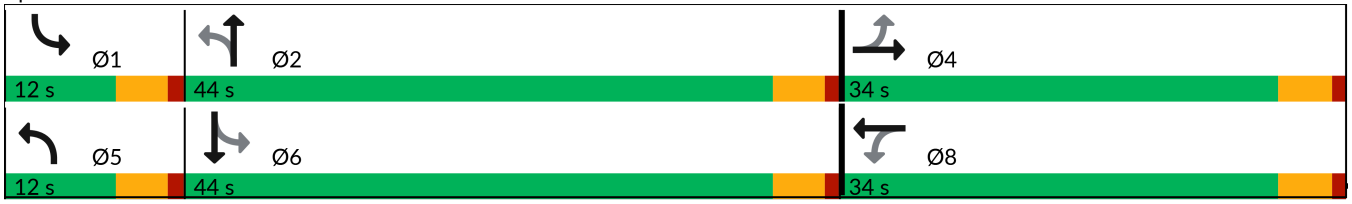


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	8	30	9	10	8	41	178	33	20	296	138
Future Volume (vph)	102	8	30	9	10	8	41	178	33	20	296	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	140		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			115			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99		1.00	0.99		0.99	0.99	
Frt		0.971			0.959			0.976			0.952	
Flt Protected		0.965			0.984		0.950			0.950		
Satd. Flow (prot)	0	1734	0	0	1763	0	1787	3471	0	1787	3368	0
Flt Permitted		0.764			0.874		0.420			0.591		
Satd. Flow (perm)	0	1366	0	0	1563	0	787	3471	0	1105	3368	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			10			30			108	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		344			542			617			532	
Travel Time (s)		9.4			14.8			12.0			10.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	2%	1%	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	126	10	37	11	12	10	51	220	41	25	365	170
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	173	0	0	33	0	51	261	0	25	535	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		23.5	23.5		9.5	31.5		9.5	32.5	
Total Split (s)	34.0	34.0		34.0	34.0		12.0	44.0		12.0	44.0	
Total Split (%)	37.8%	37.8%		37.8%	37.8%		13.3%	48.9%		13.3%	48.9%	
Maximum Green (s)	29.5	29.5		29.5	29.5		7.5	39.5		7.5	39.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	9.0	9.0		12.0	12.0			20.0			21.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		11.3			10.9		21.6	22.1		20.4	19.9	
Actuated g/C Ratio		0.28			0.27		0.54	0.55		0.51	0.50	
v/c Ratio		0.44			0.08		0.08	0.14		0.04	0.31	
Control Delay (s/veh)		17.5			12.6		6.1	7.1		6.0	8.8	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		17.5			12.6		6.1	7.1		6.0	8.8	
LOS		B			B		A	A		A	A	
Approach Delay (s/veh)		17.5			12.6			6.9			8.6	
Approach LOS		B			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 40.1			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay (s/veh): 9.7		Intersection LOS: A	
Intersection Capacity Utilization 44.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Center Dr & Bob's Hollow Ln

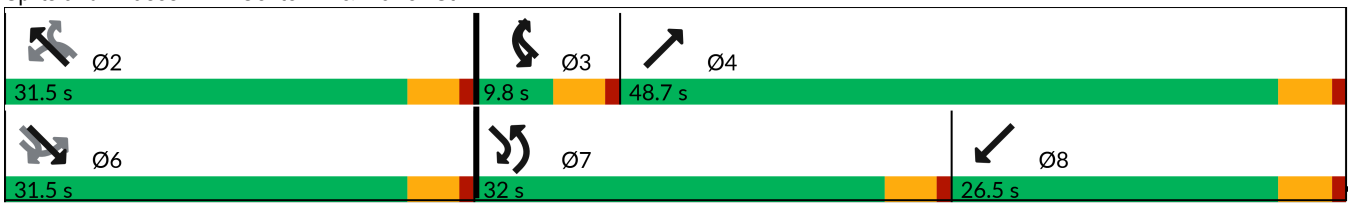


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	46	35	157	16	55	22	307	250	26	18	304	18
Future Volume (vph)	46	35	157	16	55	22	307	250	26	18	304	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		325	200		200	250		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			95			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		1.00	0.98	0.99	1.00		0.99	1.00	
Frt			0.850			0.850		0.986			0.991	
Flt Protected		0.972			0.989		0.950			0.950		
Satd. Flow (prot)	0	1790	1599	0	1813	1599	1787	3513	0	1787	3535	0
Flt Permitted		0.778			0.914		0.950			0.950		
Satd. Flow (perm)	0	1428	1569	0	1674	1565	1776	3513	0	1777	3535	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			158			73		17			6	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		502			454			455			433	
Travel Time (s)		13.7			12.4			8.9			8.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	6%	1%	13%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	53	40	180	18	63	25	353	287	30	21	349	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	93	180	0	81	25	353	317	0	21	370	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		6	7		2	3	7	4		3	8	
Permitted Phases	6		6	2		2						
Detector Phase	6	6	7	2	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	31.5	31.5	9.5	25.5	25.5	9.5	9.5	42.5		9.5	26.5	
Total Split (s)	31.5	31.5	32.0	31.5	31.5	9.8	32.0	48.7		9.8	26.5	
Total Split (%)	35.0%	35.0%	35.6%	35.0%	35.0%	10.9%	35.6%	54.1%		10.9%	29.4%	
Maximum Green (s)	27.0	27.0	27.5	27.0	27.0	5.3	27.5	44.2		5.3	22.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag			Lead			Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	20.0	20.0		14.0	14.0			19.0			15.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		11.3	25.3		11.2	15.1	16.5	33.4		6.3	12.6	
Actuated g/C Ratio		0.22	0.49		0.21	0.29	0.32	0.64		0.12	0.24	
v/c Ratio		0.30	0.21		0.23	0.05	0.62	0.14		0.10	0.43	
Control Delay (s/veh)		23.3	2.1		21.8	0.2	23.8	7.4		32.1	21.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		23.3	2.1		21.8	0.2	23.8	7.4		32.1	21.1	
LOS		C	A		C	A	C	A		C	C	
Approach Delay (s/veh)		9.3			16.7			16.1			21.7	
Approach LOS		A			B			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 52.1			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay (s/veh): 16.4		Intersection LOS: B	
Intersection Capacity Utilization 51.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Center Dr & McNeil St

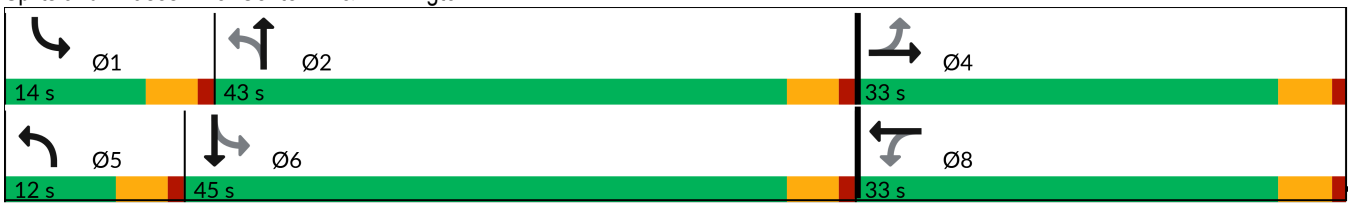


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	6	26	141	17	69	36	532	115	71	424	11
Future Volume (vph)	4	6	26	141	17	69	36	532	115	71	424	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	100		0	105		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	0.99		1.00	1.00	
Frt		0.880			0.879			0.973			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1625	0	1787	1625	0	1787	3441	0	1787	3557	0
Flt Permitted	0.697			0.734			0.481			0.307		
Satd. Flow (perm)	1304	1625	0	1371	1625	0	901	3441	0	576	3557	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			75			36			4	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		190			493			682			320	
Travel Time (s)		5.2			13.4			13.3			6.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	4%	1%	1%	1%
Adj. Flow (vph)	4	7	28	153	18	75	39	578	125	77	461	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	35	0	153	93	0	39	703	0	77	473	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	26.5	26.5		25.5	25.5		9.5	22.5		9.5	31.5	
Total Split (s)	33.0	33.0		33.0	33.0		12.0	43.0		14.0	45.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		13.3%	47.8%		15.6%	50.0%	
Maximum Green (s)	28.5	28.5		28.5	28.5		7.5	38.5		9.5	40.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0						7.0	
Flash Dont Walk (s)	11.0	11.0		14.0	14.0						20.0	
Pedestrian Calls (#/hr)	5	5		5	5						5	
Act Effct Green (s)	12.0	12.0		12.0	12.0		23.6	20.2		25.1	22.6	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.49	0.42		0.52	0.47	
v/c Ratio	0.01	0.08		0.45	0.20		0.07	0.48		0.16	0.28	
Control Delay (s/veh)	16.0	9.0		21.3	7.7		6.2	12.9		6.6	10.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	16.0	9.0		21.3	7.7		6.2	12.9		6.6	10.2	
LOS	B	A		C	A		A	B		A	B	
Approach Delay (s/veh)		9.7			16.1			12.6			9.7	
Approach LOS		A			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 47.9			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay (s/veh): 12.1		Intersection LOS: B	
Intersection Capacity Utilization 48.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Center Dr & Wilmington Dr



Intersection	
Int Delay, s/veh	0.4

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	10	614	385	18	13	14
Future Vol, veh/h	10	614	385	18	13	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	210	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	1	2	7	1	1	1
Mvmt Flow	11	690	433	20	15	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	453	0	-	0	810	226
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	367	-
Critical Hdwy	4.12	-	-	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.21	-	-	-	3.51	3.31
Pot Cap-1 Maneuver	1111	-	-	-	320	780
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	674	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1111	-	-	-	316	780
Mov Cap-2 Maneuver	-	-	-	-	436	-
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	674	-

Approach	NB	SB	SE
HCM Control Delay, s/v	0.13	0	11.55
HCM LOS			B

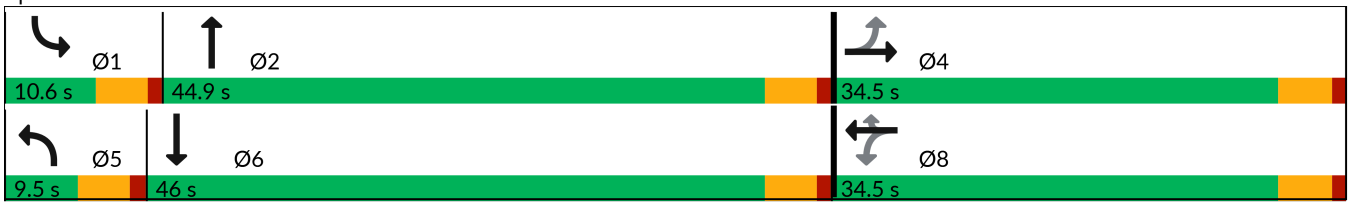
Minor Lane/Major Mvmt	NBL	NBT	SELn1	SELn2	SBT	SBR
Capacity (veh/h)	1111	-	436	780	-	-
HCM Lane V/C Ratio	0.01	-	0.033	0.02	-	-
HCM Control Delay (s/veh)	8.3	-	13.5	9.7	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	0	30	1	49	0	682	12	29	419	0
Future Volume (vph)	0	1	0	30	1	49	0	682	12	29	419	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					1.00	0.98		1.00		1.00		
Frt						0.850		0.997				
Flt Protected					0.954					0.950		
Satd. Flow (prot)	0	1881	0	0	1795	1599	1881	3527	0	1703	3438	0
Flt Permitted					0.732					0.950		
Satd. Flow (perm)	0	1881	0	0	1371	1566	1881	3527	0	1699	3438	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						73		2				
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		299			493			577			506	
Travel Time (s)		8.2			13.4			11.2			9.9	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	2%	1%	6%	5%	1%
Adj. Flow (vph)	0	1	0	33	1	54	0	758	13	32	466	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	34	54	0	771	0	32	466	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	34.5	34.5		28.5	28.5	28.5	9.5	40.5		9.5	44.5	
Total Split (s)	34.5	34.5		34.5	34.5	34.5	9.5	44.9		10.6	46.0	
Total Split (%)	38.3%	38.3%		38.3%	38.3%	38.3%	10.6%	49.9%		11.8%	51.1%	
Maximum Green (s)	30.0	30.0		30.0	30.0	30.0	5.0	40.4		6.1	41.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	23.0	23.0		17.0	17.0	17.0		29.0			33.0	
Pedestrian Calls (#/hr)	5	5		0	0	0		5			5	
Act Effct Green (s)		9.6			9.7	9.7		32.4		6.9	33.5	
Actuated g/C Ratio		0.21			0.22	0.22		0.72		0.15	0.75	
v/c Ratio		0.00			0.11	0.14		0.30		0.12	0.18	
Control Delay (s/veh)		16.0			16.9	4.3		7.5		26.3	5.0	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay (s/veh)		16.0			16.9	4.3		7.5		26.3	5.0	
LOS		B			B	A		A		C	A	
Approach Delay (s/veh)		16.0			9.2			7.5			6.4	
Approach LOS		B			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 44.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.30			
Intersection Signal Delay (s/veh): 7.2		Intersection LOS: A	
Intersection Capacity Utilization 46.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Center Dr & Palisade Blvd

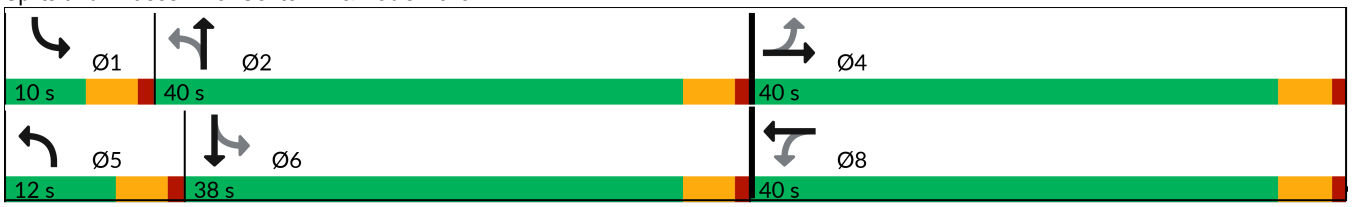


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	41	63	37	12	9	83	452	12	7	299	159
Future Volume (vph)	169	41	63	37	12	9	83	452	12	7	299	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	140		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			115			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99		1.00	1.00		1.00	0.99	
Frt		0.969			0.979			0.996			0.948	
Flt Protected		0.970			0.969		0.950			0.950		
Satd. Flow (prot)	0	1717	0	0	1756	0	1736	3425	0	1543	3143	0
Flt Permitted		0.774			0.781		0.343			0.467		
Satd. Flow (perm)	0	1365	0	0	1412	0	624	3425	0	755	3143	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			10			3			124	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		344			542			617			532	
Travel Time (s)		9.4			14.8			12.0			10.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	10%	3%	3%	1%	1%	4%	5%	1%	17%	8%	7%
Adj. Flow (vph)	184	45	68	40	13	10	90	491	13	8	325	173
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	297	0	0	63	0	90	504	0	8	498	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		23.5	23.5		9.5	31.5		9.5	32.5	
Total Split (s)	40.0	40.0		40.0	40.0		12.0	40.0		10.0	38.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		13.3%	44.4%		11.1%	42.2%	
Maximum Green (s)	35.5	35.5		35.5	35.5		7.5	35.5		5.5	33.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	9.0	9.0		12.0	12.0			20.0			21.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		16.3			16.3		23.6	22.6		19.1	14.9	
Actuated g/C Ratio		0.32			0.32		0.47	0.45		0.38	0.30	
v/c Ratio		0.65			0.14		0.20	0.33		0.02	0.49	
Control Delay (s/veh)		22.5			12.9		9.3	11.0		8.9	14.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		22.5			12.9		9.3	11.0		8.9	14.0	
LOS		C			B		A	B		A	B	
Approach Delay (s/veh)		22.5			12.9			10.8			13.9	
Approach LOS		C			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 50.3			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay (s/veh): 14.3		Intersection LOS: B	
Intersection Capacity Utilization 49.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Center Dr & Bob's Hollow Ln



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	136	49	392	33	33	32	147	403	20	28	387	33
Future Volume (vph)	136	49	392	33	33	32	147	403	20	28	387	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		325	200		200	250		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			95			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		1.00	0.98	0.99	1.00		1.00	1.00	
Frt			0.850			0.850		0.993			0.988	
Flt Protected		0.965			0.976		0.950			0.950		
Satd. Flow (prot)	0	1802	1599	0	1725	1272	1719	3478	0	1787	3369	0
Flt Permitted		0.735			0.798		0.950			0.950		
Satd. Flow (perm)	0	1367	1569	0	1408	1245	1710	3478	0	1779	3369	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			146			73		7			10	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		502			454			455			433	
Travel Time (s)		13.7			12.4			8.9			8.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	2%	1%	1%	3%	12%	27%	5%	3%	1%	1%	5%	12%
Adj. Flow (vph)	155	56	445	38	38	36	167	458	23	32	440	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	211	445	0	76	36	167	481	0	32	478	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		6	7		2	3	7	4		3	8	
Permitted Phases	6		6	2		2						
Detector Phase	6	6	7	2	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	31.5	31.5	9.5	25.5	25.5	9.5	9.5	42.5		9.5	26.5	
Total Split (s)	36.0	36.0	23.0	36.0	36.0	11.0	23.0	43.0		11.0	31.0	
Total Split (%)	40.0%	40.0%	25.6%	40.0%	40.0%	12.2%	25.6%	47.8%		12.2%	34.4%	
Maximum Green (s)	31.5	31.5	18.5	31.5	31.5	6.5	18.5	38.5		6.5	26.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag			Lead			Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	20.0	20.0		14.0	14.0			19.0			15.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		14.9	26.5		14.9	21.4	11.6	24.6		6.5	14.0	
Actuated g/C Ratio		0.27	0.48		0.27	0.39	0.21	0.45		0.12	0.25	
v/c Ratio		0.57	0.53		0.20	0.07	0.46	0.31		0.15	0.55	
Control Delay (s/veh)		25.4	7.3		18.5	1.1	26.3	12.5		30.5	21.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		25.4	7.3		18.5	1.1	26.3	12.5		30.5	21.6	
LOS		C	A		B	A	C	B		C	C	
Approach Delay (s/veh)		13.1			12.9			16.1			22.1	
Approach LOS		B			B			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 55			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay (s/veh): 16.5		Intersection LOS: B	
Intersection Capacity Utilization 55.1%		ICU Level of Service B	
Analysis Period (min) 15			

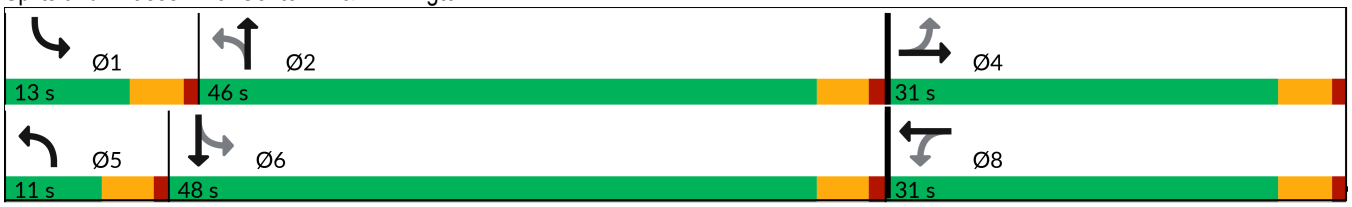
Splits and Phases: 4: Center Dr & McNeil St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	7	41	99	12	51	37	538	107	74	753	16
Future Volume (vph)	3	7	41	99	12	51	37	538	107	74	753	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	100		0	105		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	1.00		1.00	1.00	
Frt		0.872			0.878			0.975			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1608	0	1687	1584	0	1787	3363	0	1787	3461	0
Flt Permitted	0.711			0.722			0.302			0.319		
Satd. Flow (perm)	1330	1608	0	1273	1584	0	567	3363	0	599	3461	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		46			57			34			3	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		190			493			682			320	
Travel Time (s)		5.2			13.4			13.3			6.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	7%	1%	4%	1%	4%	5%	1%	4%	1%
Adj. Flow (vph)	3	8	46	110	13	57	41	598	119	82	837	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	54	0	110	70	0	41	717	0	82	855	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	26.5	26.5		25.5	25.5		9.5	22.5		9.5	31.5	
Total Split (s)	31.0	31.0		31.0	31.0		11.0	46.0		13.0	48.0	
Total Split (%)	34.4%	34.4%		34.4%	34.4%		12.2%	51.1%		14.4%	53.3%	
Maximum Green (s)	26.5	26.5		26.5	26.5		6.5	41.5		8.5	43.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0						7.0	
Flash Dont Walk (s)	11.0	11.0		14.0	14.0						20.0	
Pedestrian Calls (#/hr)	5	5		5	5						5	
Act Effct Green (s)	10.9	10.9		11.1	11.1		26.1	24.5		27.7	27.0	
Actuated g/C Ratio	0.23	0.23		0.24	0.24		0.56	0.53		0.60	0.58	
v/c Ratio	0.01	0.13		0.36	0.17		0.08	0.40		0.15	0.42	
Control Delay (s/veh)	17.3	8.5		21.4	8.6		5.9	11.5		6.0	10.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	17.3	8.5		21.4	8.6		5.9	11.5		6.0	10.4	
LOS	B	A		C	A		A	B		A	B	
Approach Delay (s/veh)		9.0			16.4			11.2			10.0	
Approach LOS		A			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 46.4			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.42			
Intersection Signal Delay (s/veh): 11.0		Intersection LOS: B	
Intersection Capacity Utilization 49.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Center Dr & Wilmington Dr



Intersection	
Int Delay, s/veh	0.7

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	29	369	825	28	16	15
Future Vol, veh/h	29	369	825	28	16	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	210	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	37	467	1044	35	20	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1080	0	-	0	1369	540
Stage 1	-	-	-	-	1062	-
Stage 2	-	-	-	-	307	-
Critical Hdwy	4.12	-	-	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.21	-	-	-	3.51	3.31
Pot Cap-1 Maneuver	648	-	-	-	139	489
Stage 1	-	-	-	-	296	-
Stage 2	-	-	-	-	723	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	648	-	-	-	131	489
Mov Cap-2 Maneuver	-	-	-	-	228	-
Stage 1	-	-	-	-	279	-
Stage 2	-	-	-	-	723	-

Approach	NB	SB	SE
HCM Control Delay, s/v	0.79	0	17.66
HCM LOS			C

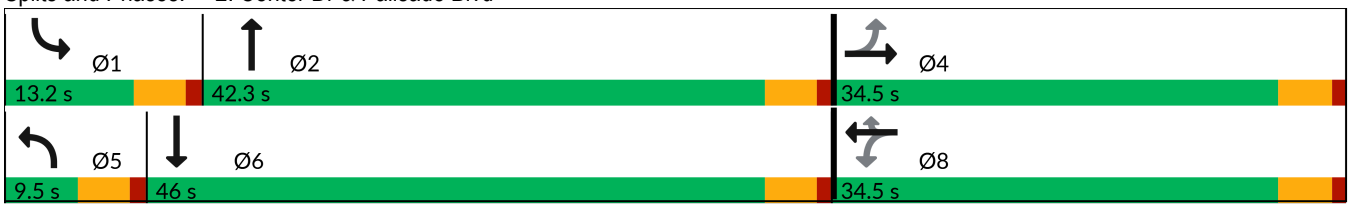
Minor Lane/Major Mvmt	NBL	NBT	SELn1	SELn2	SBT	SBR
Capacity (veh/h)	648	-	228	489	-	-
HCM Lane V/C Ratio	0.057	-	0.089	0.039	-	-
HCM Control Delay (s/veh)	10.9	-	22.4	12.7	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	0.1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	15	0	21	3	410	16	53	780	0
Future Volume (vph)	2	0	1	15	0	21	3	410	16	53	780	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00	0.98	1.00	1.00		1.00		
Frt		0.955				0.850		0.994				
Flt Protected		0.968			0.950		0.950			0.950		
Satd. Flow (prot)	0	1728	0	0	1787	1599	1787	3549	0	1787	3574	0
Flt Permitted		0.789			0.909		0.950			0.950		
Satd. Flow (perm)	0	1403	0	0	1702	1566	1784	3549	0	1782	3574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73				73		5				
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		299			493			577			506	
Travel Time (s)		8.2			13.4			11.2			9.9	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	2	0	1	18	0	25	4	488	19	63	929	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	3	0	0	18	25	4	507	0	63	929	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	34.5	34.5		28.5	28.5	28.5	9.5	40.5		9.5	44.5	
Total Split (s)	34.5	34.5		34.5	34.5	34.5	9.5	42.3		13.2	46.0	
Total Split (%)	38.3%	38.3%		38.3%	38.3%	38.3%	10.6%	47.0%		14.7%	51.1%	
Maximum Green (s)	30.0	30.0		30.0	30.0	30.0	5.0	37.8		8.7	41.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	23.0	23.0		17.0	17.0	17.0		29.0			33.0	
Pedestrian Calls (#/hr)	5	5		0	0	0		5			5	
Act Effct Green (s)		9.2			9.3	9.3	5.9	29.0		7.9	36.0	
Actuated g/C Ratio		0.21			0.21	0.21	0.13	0.65		0.18	0.81	
v/c Ratio		0.01			0.05	0.06	0.02	0.22		0.20	0.32	
Control Delay (s/veh)		0.0			17.1	0.3	28.0	9.3		24.6	6.5	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		0.0			17.1	0.3	28.0	9.3		24.6	6.5	
LOS		A			B	A	C	A		C	A	
Approach Delay (s/veh)					7.3			9.4			7.6	
Approach LOS					A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 44.3			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.32			
Intersection Signal Delay (s/veh): 8.2		Intersection LOS: A	
Intersection Capacity Utilization 46.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Center Dr & Palisade Blvd

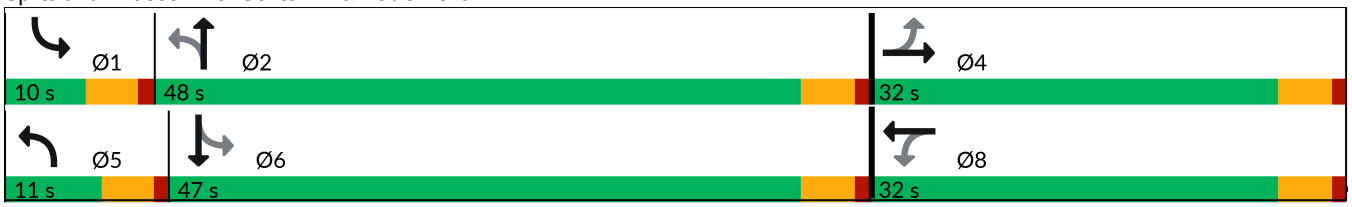


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	8	33	11	11	9	45	272	36	23	599	178
Future Volume (vph)	126	8	33	11	11	9	45	272	36	23	599	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	140		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			115			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99		1.00	1.00		1.00	0.99	
Frt		0.973			0.962			0.983			0.966	
Flt Protected		0.964			0.982		0.950			0.950		
Satd. Flow (prot)	0	1736	0	0	1766	0	1787	3500	0	1787	3428	0
Flt Permitted		0.754			0.878		0.205			0.526		
Satd. Flow (perm)	0	1351	0	0	1576	0	385	3500	0	985	3428	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			11			22			59	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		344			542			617			532	
Travel Time (s)		9.4			14.8			12.0			10.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	2%	1%	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	156	10	41	14	14	11	56	336	44	28	740	220
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	207	0	0	39	0	56	380	0	28	960	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		23.5	23.5		9.5	31.5		9.5	32.5	
Total Split (s)	32.0	32.0		32.0	32.0		11.0	48.0		10.0	47.0	
Total Split (%)	35.6%	35.6%		35.6%	35.6%		12.2%	53.3%		11.1%	52.2%	
Maximum Green (s)	27.5	27.5		27.5	27.5		6.5	43.5		5.5	42.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	9.0	9.0		12.0	12.0			20.0			21.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		14.5			14.5		31.9	29.9		30.2	27.3	
Actuated g/C Ratio		0.25			0.25		0.56	0.52		0.53	0.48	
v/c Ratio		0.59			0.10		0.15	0.21		0.05	0.57	
Control Delay (s/veh)		26.5			15.8		6.9	8.9		6.4	13.5	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		26.5			15.8		6.9	8.9		6.4	13.5	
LOS		C			B		A	A		A	B	
Approach Delay (s/veh)		26.5			15.8			8.6			13.3	
Approach LOS		C			B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 57.1			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay (s/veh): 13.8		Intersection LOS: B	
Intersection Capacity Utilization 54.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Center Dr & Bob's Hollow Ln

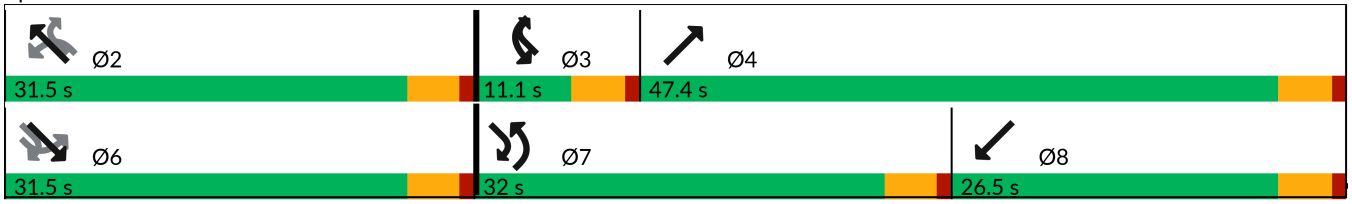


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	69	49	212	20	75	39	406	316	29	42	514	90
Future Volume (vph)	69	49	212	20	75	39	406	316	29	42	514	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		325	200		200	250		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			95			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		1.00	0.98	1.00	1.00		1.00	0.99	
Frt			0.850			0.850		0.987			0.978	
Flt Protected		0.972			0.990		0.950			0.950		
Satd. Flow (prot)	0	1792	1599	0	1817	1599	1787	3518	0	1787	3476	0
Flt Permitted		0.758			0.911		0.950			0.950		
Satd. Flow (perm)	0	1393	1569	0	1670	1565	1780	3518	0	1778	3476	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			40			73		14			21	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		502			454			455			433	
Travel Time (s)		13.7			12.4			8.9			8.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	6%	1%	13%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	79	56	244	23	86	45	467	363	33	48	591	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	135	244	0	109	45	467	396	0	48	694	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		6	7		2	3	7	4		3	8	
Permitted Phases	6		6	2		2						
Detector Phase	6	6	7	2	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	31.5	31.5	9.5	25.5	25.5	9.5	9.5	42.5		9.5	26.5	
Total Split (s)	31.5	31.5	32.0	31.5	31.5	11.1	32.0	47.4		11.1	26.5	
Total Split (%)	35.0%	35.0%	35.6%	35.0%	35.0%	12.3%	35.6%	52.7%		12.3%	29.4%	
Maximum Green (s)	27.0	27.0	27.5	27.0	27.0	6.6	27.5	42.9		6.6	22.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag			Lead			Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	20.0	20.0		14.0	14.0			19.0			15.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		13.7	35.0		13.4	17.9	24.0	42.1		6.8	19.6	
Actuated g/C Ratio		0.20	0.52		0.20	0.26	0.35	0.62		0.10	0.29	
v/c Ratio		0.48	0.29		0.33	0.10	0.74	0.18		0.27	0.68	
Control Delay (s/veh)		32.9	6.8		28.7	2.1	31.3	9.4		39.2	27.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		32.9	6.8		28.7	2.1	31.3	9.4		39.2	27.6	
LOS		C	A		C	A	C	A		D	C	
Approach Delay (s/veh)		16.1			20.9			21.2			28.3	
Approach LOS		B			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 67.8			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay (s/veh): 22.8		Intersection LOS: C	
Intersection Capacity Utilization 65.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Center Dr & McNeil St

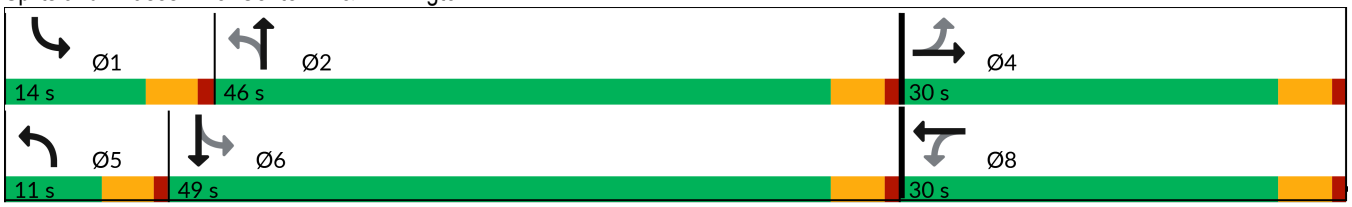


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	6	28	155	18	84	38	687	127	96	668	12
Future Volume (vph)	4	6	28	155	18	84	38	687	127	96	668	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	100		0	105		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	1.00		1.00	1.00	
Frt		0.878			0.877			0.977			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1621	0	1787	1620	0	1787	3460	0	1787	3562	0
Flt Permitted	0.685			0.733			0.371			0.212		
Satd. Flow (perm)	1282	1621	0	1369	1620	0	696	3460	0	398	3562	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			91			31			3	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		190			493			682			320	
Travel Time (s)		5.2			13.4			13.3			6.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	4%	1%	1%	1%
Adj. Flow (vph)	4	7	30	168	20	91	41	747	138	104	726	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	37	0	168	111	0	41	885	0	104	739	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	26.5	26.5		25.5	25.5		9.5	22.5		9.5	31.5	
Total Split (s)	30.0	30.0		30.0	30.0		11.0	46.0		14.0	49.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		12.2%	51.1%		15.6%	54.4%	
Maximum Green (s)	25.5	25.5		25.5	25.5		6.5	41.5		9.5	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0						7.0	
Flash Dont Walk (s)	11.0	11.0		14.0	14.0						20.0	
Pedestrian Calls (#/hr)	5	5		5	5						5	
Act Effct Green (s)	12.9	12.9		12.9	12.9		29.4	24.6		32.9	30.2	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.52	0.44		0.59	0.54	
v/c Ratio	0.01	0.09		0.54	0.25		0.08	0.58		0.25	0.39	
Control Delay (s/veh)	19.3	10.3		27.7	8.7		6.0	14.8		7.0	10.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	19.3	10.3		27.7	8.7		6.0	14.8		7.0	10.1	
LOS	B	B		C	A		A	B		A	B	
Approach Delay (s/veh)		11.1			20.1			14.4			9.7	
Approach LOS		B			C			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 56.1			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay (s/veh): 13.2		Intersection LOS: B	
Intersection Capacity Utilization 55.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Center Dr & Wilmington Dr



Intersection	
Int Delay, s/veh	0.7

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	42	614	385	28	16	23
Future Vol, veh/h	42	614	385	28	16	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	210	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	1	2	7	7	20	1
Mvmt Flow	47	690	433	31	18	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	464	0	-	0	888	232
Stage 1	-	-	-	-	448	-
Stage 2	-	-	-	-	439	-
Critical Hdwy	4.12	-	-	-	7.2	6.92
Critical Hdwy Stg 1	-	-	-	-	6.2	-
Critical Hdwy Stg 2	-	-	-	-	6.2	-
Follow-up Hdwy	2.21	-	-	-	3.7	3.31
Pot Cap-1 Maneuver	1101	-	-	-	251	773
Stage 1	-	-	-	-	561	-
Stage 2	-	-	-	-	567	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1101	-	-	-	241	773
Mov Cap-2 Maneuver	-	-	-	-	361	-
Stage 1	-	-	-	-	537	-
Stage 2	-	-	-	-	567	-

Approach	NB	SB	SE
HCM Control Delay, s/v	0.54	0	12.14
HCM LOS			B

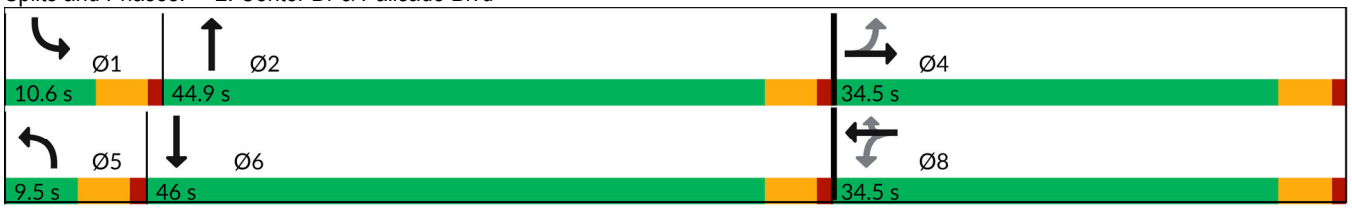
Minor Lane/Major Mvmt	NBL	NBT	SELn1	SELn2	SBT	SBR
Capacity (veh/h)	1101	-	361	773	-	-
HCM Lane V/C Ratio	0.043	-	0.05	0.033	-	-
HCM Control Delay (s/veh)	8.4	-	15.5	9.8	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	0.1	-	-

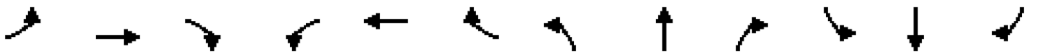
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	0	30	1	49	0	714	12	29	428	0
Future Volume (vph)	0	1	0	30	1	49	0	714	12	29	428	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					1.00	0.98		1.00		1.00		
Frt						0.850		0.998				
Flt Protected					0.954					0.950		
Satd. Flow (prot)	0	1881	0	0	1795	1599	1881	3531	0	1703	3438	0
Flt Permitted					0.732					0.950		
Satd. Flow (perm)	0	1881	0	0	1371	1566	1881	3531	0	1699	3438	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						73		2				
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		299			493			577			506	
Travel Time (s)		8.2			13.4			11.2			9.9	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	2%	1%	6%	5%	1%
Adj. Flow (vph)	0	1	0	33	1	54	0	793	13	32	476	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	34	54	0	806	0	32	476	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	34.5	34.5		28.5	28.5	28.5	9.5	40.5		9.5	44.5	
Total Split (s)	34.5	34.5		34.5	34.5	34.5	9.5	44.9		10.6	46.0	
Total Split (%)	38.3%	38.3%		38.3%	38.3%	38.3%	10.6%	49.9%		11.8%	51.1%	
Maximum Green (s)	30.0	30.0		30.0	30.0	30.0	5.0	40.4		6.1	41.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	23.0	23.0		17.0	17.0	17.0		29.0			33.0	
Pedestrian Calls (#/hr)	5	5		0	0	0		5			5	
Act Effct Green (s)		9.6			9.7	9.7		32.9		6.8	34.0	
Actuated g/C Ratio		0.21			0.21	0.21		0.73		0.15	0.75	
v/c Ratio		0.00			0.12	0.14		0.31		0.12	0.18	
Control Delay (s/veh)		16.0			17.1	4.4		7.6		26.5	5.0	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay (s/veh)		16.0			17.1	4.4		7.6		26.5	5.0	
LOS		B			B	A		A		C	A	
Approach Delay (s/veh)		16.0			9.3			7.6			6.4	
Approach LOS		B			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 45.2			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.31			
Intersection Signal Delay (s/veh): 7.3		Intersection LOS: A	
Intersection Capacity Utilization 46.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Center Dr & Palisade Blvd



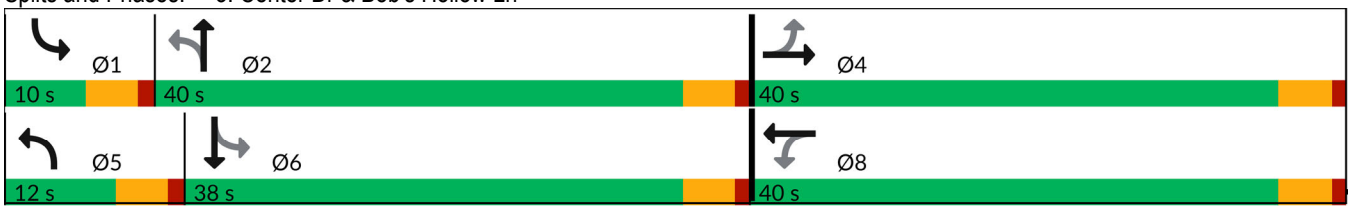


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	41	63	37	12	9	83	482	12	7	307	160
Future Volume (vph)	171	41	63	37	12	9	83	482	12	7	307	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	140		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			115			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99		1.00	1.00		1.00	0.99	
Frt		0.969			0.979			0.996			0.949	
Flt Protected		0.970			0.969		0.950			0.950		
Satd. Flow (prot)	0	1718	0	0	1756	0	1736	3425	0	1543	3146	0
Flt Permitted		0.773			0.780		0.338			0.452		
Satd. Flow (perm)	0	1363	0	0	1410	0	615	3425	0	731	3146	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			10			3			119	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		344			542			617			532	
Travel Time (s)		9.4			14.8			12.0			10.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	10%	3%	3%	1%	1%	4%	5%	1%	17%	8%	7%
Adj. Flow (vph)	186	45	68	40	13	10	90	524	13	8	334	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	299	0	0	63	0	90	537	0	8	508	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		23.5	23.5		9.5	31.5		9.5	32.5	
Total Split (s)	40.0	40.0		40.0	40.0		12.0	40.0		10.0	38.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		13.3%	44.4%		11.1%	42.2%	
Maximum Green (s)	35.5	35.5		35.5	35.5		7.5	35.5		5.5	33.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	9.0	9.0		12.0	12.0			20.0			21.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		16.6			16.6		24.0	23.0		19.5	15.4	
Actuated g/C Ratio		0.33			0.33		0.47	0.45		0.38	0.30	
v/c Ratio		0.65			0.14		0.20	0.35		0.02	0.49	
Control Delay (s/veh)		22.9			13.0		9.3	11.3		8.9	14.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		22.9			13.0		9.3	11.3		8.9	14.3	
LOS		C			B		A	B		A	B	
Approach Delay (s/veh)		22.9			13.0			11.0			14.2	
Approach LOS		C			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 51			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay (s/veh): 14.5		Intersection LOS: B	
Intersection Capacity Utilization 49.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Center Dr & Bob's Hollow Ln

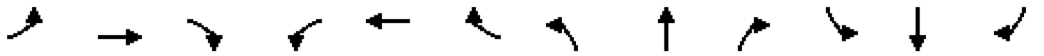


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	138	49	392	33	33	32	147	431	20	28	394	34
Future Volume (vph)	138	49	392	33	33	32	147	431	20	28	394	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		325	200		200	250		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			95			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		1.00	0.98	0.99	1.00		1.00	1.00	
Frt			0.850			0.850		0.993			0.988	
Flt Protected		0.964			0.976		0.950			0.950		
Satd. Flow (prot)	0	1800	1599	0	1725	1272	1719	3478	0	1787	3369	0
Flt Permitted		0.734			0.798		0.950			0.950		
Satd. Flow (perm)	0	1365	1569	0	1408	1245	1710	3478	0	1780	3369	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			140			73		7			10	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		502			454			455			433	
Travel Time (s)		13.7			12.4			8.9			8.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	2%	1%	1%	3%	12%	27%	5%	3%	1%	1%	5%	12%
Adj. Flow (vph)	157	56	445	38	38	36	167	490	23	32	448	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	213	445	0	76	36	167	513	0	32	487	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		6	7		2	3	7	4		3	8	
Permitted Phases	6		6	2		2						
Detector Phase	6	6	7	2	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	31.5	31.5	9.5	25.5	25.5	9.5	9.5	42.5		9.5	26.5	
Total Split (s)	36.0	36.0	23.0	36.0	36.0	11.0	23.0	43.0		11.0	31.0	
Total Split (%)	40.0%	40.0%	25.6%	40.0%	40.0%	12.2%	25.6%	47.8%		12.2%	34.4%	
Maximum Green (s)	31.5	31.5	18.5	31.5	31.5	6.5	18.5	38.5		6.5	26.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag			Lead			Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	20.0	20.0		14.0	14.0			19.0			15.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		15.1	26.6		15.1	21.6	11.6	24.7		6.5	14.2	
Actuated g/C Ratio		0.27	0.48		0.27	0.39	0.21	0.45		0.12	0.26	
v/c Ratio		0.57	0.53		0.20	0.07	0.46	0.33		0.15	0.56	
Control Delay (s/veh)		25.6	7.4		18.5	1.1	26.5	12.7		30.6	21.7	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		25.6	7.4		18.5	1.1	26.5	12.7		30.6	21.7	
LOS		C	A		B	A	C	B		C	C	
Approach Delay (s/veh)		13.3			12.9			16.1			22.2	
Approach LOS		B			B			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 55.3			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay (s/veh): 16.6		Intersection LOS: B	
Intersection Capacity Utilization 55.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: Center Dr & McNeil St

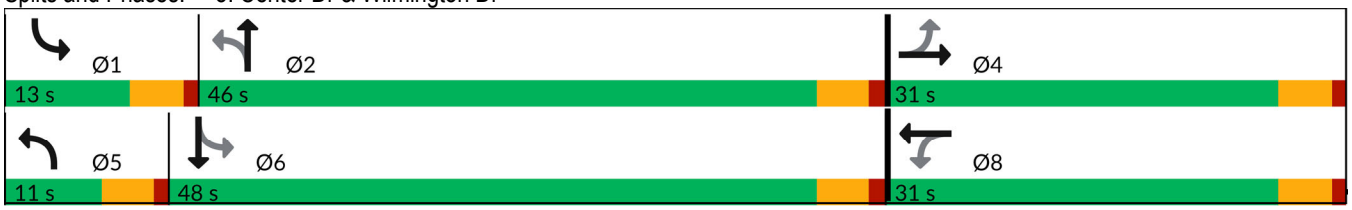


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	7	41	99	12	51	37	566	107	74	760	16
Future Volume (vph)	3	7	41	99	12	51	37	566	107	74	760	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	100		0	105		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	1.00		1.00	1.00	
Frt		0.872			0.878			0.976			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1608	0	1687	1584	0	1787	3367	0	1787	3461	0
Flt Permitted	0.711			0.722			0.299			0.305		
Satd. Flow (perm)	1330	1608	0	1273	1584	0	561	3367	0	572	3461	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		46			57			32			3	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		190			493			682			320	
Travel Time (s)		5.2			13.4			13.3			6.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	7%	1%	4%	1%	4%	5%	1%	4%	1%
Adj. Flow (vph)	3	8	46	110	13	57	41	629	119	82	844	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	54	0	110	70	0	41	748	0	82	862	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	26.5	26.5		25.5	25.5		9.5	22.5		9.5	31.5	
Total Split (s)	31.0	31.0		31.0	31.0		11.0	46.0		13.0	48.0	
Total Split (%)	34.4%	34.4%		34.4%	34.4%		12.2%	51.1%		14.4%	53.3%	
Maximum Green (s)	26.5	26.5		26.5	26.5		6.5	41.5		8.5	43.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0						7.0	
Flash Dont Walk (s)	11.0	11.0		14.0	14.0						20.0	
Pedestrian Calls (#/hr)	5	5		5	5						5	
Act Effct Green (s)	10.9	10.9		11.1	11.1		26.5	24.8		28.1	27.3	
Actuated g/C Ratio	0.23	0.23		0.24	0.24		0.57	0.53		0.60	0.58	
v/c Ratio	0.01	0.13		0.37	0.17		0.08	0.41		0.16	0.43	
Control Delay (s/veh)	17.3	8.6		21.6	8.6		5.9	11.6		6.0	10.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	17.3	8.6		21.6	8.6		5.9	11.6		6.0	10.3	
LOS	B	A		C	A		A	B		A	B	
Approach Delay (s/veh)		9.0			16.6			11.3			10.0	
Approach LOS		A			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 46.7			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay (s/veh): 11.1		Intersection LOS: B	
Intersection Capacity Utilization 50.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Center Dr & Wilmington Dr



Intersection	
Int Delay, s/veh	1.3

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	41	369	825	32	26	46
Future Vol, veh/h	41	369	825	32	26	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	210	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	1	1	1	13	15	2
Mvmt Flow	52	467	1044	41	33	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1085	0	-	0	1402	542
Stage 1	-	-	-	-	1065	-
Stage 2	-	-	-	-	337	-
Critical Hdwy	4.12	-	-	-	7.1	6.94
Critical Hdwy Stg 1	-	-	-	-	6.1	-
Critical Hdwy Stg 2	-	-	-	-	6.1	-
Follow-up Hdwy	2.21	-	-	-	3.65	3.32
Pot Cap-1 Maneuver	645	-	-	-	116	484
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	658	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	645	-	-	-	107	484
Mov Cap-2 Maneuver	-	-	-	-	198	-
Stage 1	-	-	-	-	244	-
Stage 2	-	-	-	-	658	-

Approach	NB	SB	SE
HCM Control Delay, s/v	1.11	0	18.26
HCM LOS			C

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SELn2	SBT	SBR
Capacity (veh/h)	645	-	198	484	-	-
HCM Lane V/C Ratio	0.081	-	0.166	0.12	-	-
HCM Control Delay (s/veh)	11.1	-	26.8	13.4	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.6	0.4	-	-

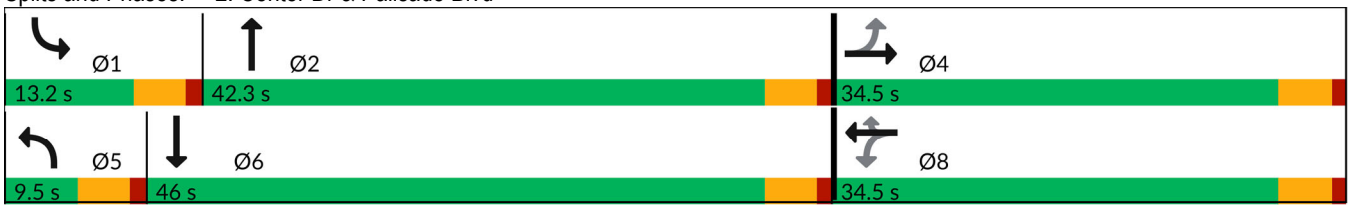
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	15	0	21	3	422	16	53	811	0
Future Volume (vph)	2	0	1	15	0	21	3	422	16	53	811	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			1.00	0.98	1.00	1.00		1.00		
Frt		0.955				0.850		0.995				
Flt Protected		0.968			0.950		0.950			0.950		
Satd. Flow (prot)	0	1728	0	0	1787	1599	1787	3552	0	1787	3574	0
Flt Permitted		0.789			0.889		0.950			0.950		
Satd. Flow (perm)	0	1403	0	0	1665	1566	1784	3552	0	1782	3574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73				73		5				
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		299			493			577			506	
Travel Time (s)		8.2			13.4			11.2			9.9	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	2	0	1	18	0	25	4	502	19	63	965	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	3	0	0	18	25	4	521	0	63	965	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	34.5	34.5		28.5	28.5	28.5	9.5	40.5		9.5	44.5	
Total Split (s)	34.5	34.5		34.5	34.5	34.5	9.5	42.3		13.2	46.0	
Total Split (%)	38.3%	38.3%		38.3%	38.3%	38.3%	10.6%	47.0%		14.7%	51.1%	
Maximum Green (s)	30.0	30.0		30.0	30.0	30.0	5.0	37.8		8.7	41.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	23.0	23.0		17.0	17.0	17.0		29.0			33.0	
Pedestrian Calls (#/hr)	5	5		0	0	0		5			5	
Act Effct Green (s)		9.2			9.3	9.3	5.9	29.5		7.9	36.5	
Actuated g/C Ratio		0.20			0.21	0.21	0.13	0.66		0.18	0.81	
v/c Ratio		0.01			0.05	0.07	0.02	0.22		0.20	0.33	
Control Delay (s/veh)		0.0			17.1	0.3	28.3	9.3		24.8	6.6	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		0.0			17.1	0.3	28.3	9.3		24.8	6.6	
LOS		A			B	A	C	A		C	A	
Approach Delay (s/veh)					7.4			9.4			7.7	
Approach LOS					A			A			A	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 44.9
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.33
Intersection Signal Delay (s/veh): 8.2 Intersection LOS: A
Intersection Capacity Utilization 46.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2: Center Dr & Palisade Blvd

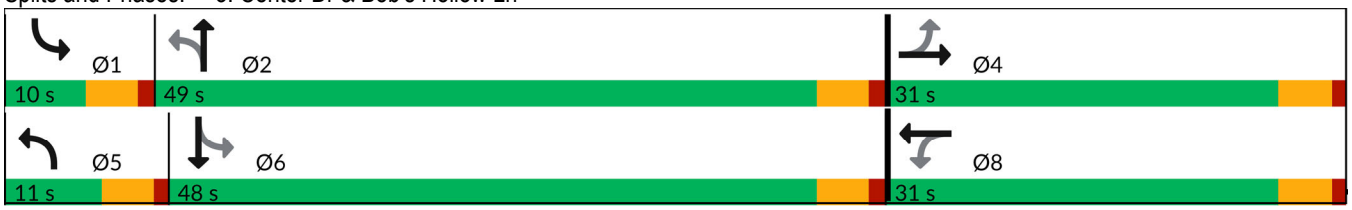


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	8	33	11	11	9	45	283	36	23	628	180
Future Volume (vph)	127	8	33	11	11	9	45	283	36	23	628	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	140		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			115			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99		1.00	1.00		1.00	0.99	
Frt		0.973			0.962			0.983			0.967	
Flt Protected		0.964			0.982		0.950			0.950		
Satd. Flow (prot)	0	1736	0	0	1766	0	1787	3501	0	1787	3432	0
Flt Permitted		0.753			0.878		0.194			0.520		
Satd. Flow (perm)	0	1349	0	0	1576	0	364	3501	0	974	3432	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			11			21			57	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		344			542			617			532	
Travel Time (s)		9.4			14.8			12.0			10.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	2%	1%	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	157	10	41	14	14	11	56	349	44	28	775	222
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	208	0	0	39	0	56	393	0	28	997	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		23.5	23.5		9.5	31.5		9.5	32.5	
Total Split (s)	31.0	31.0		31.0	31.0		11.0	49.0		10.0	48.0	
Total Split (%)	34.4%	34.4%		34.4%	34.4%		12.2%	54.4%		11.1%	53.3%	
Maximum Green (s)	26.5	26.5		26.5	26.5		6.5	44.5		5.5	43.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	9.0	9.0		12.0	12.0			20.0			21.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		14.7			14.7		33.3	31.2		31.5	28.7	
Actuated g/C Ratio		0.25			0.25		0.57	0.53		0.54	0.49	
v/c Ratio		0.60			0.10		0.15	0.21		0.05	0.58	
Control Delay (s/veh)		27.6			16.4		7.0	8.8		6.3	13.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		27.6			16.4		7.0	8.8		6.3	13.6	
LOS		C			B		A	A		A	B	
Approach Delay (s/veh)		27.6			16.4			8.6			13.4	
Approach LOS		C			B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 58.7			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay (s/veh): 13.9		Intersection LOS: B	
Intersection Capacity Utilization 54.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Center Dr & Bob's Hollow Ln

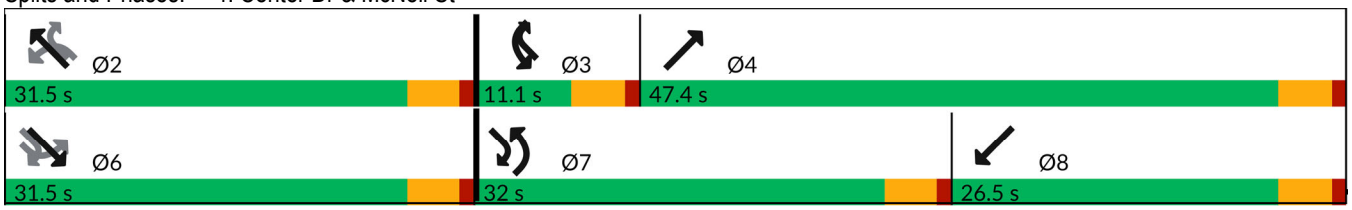


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	70	49	212	20	75	39	406	326	29	42	541	92
Future Volume (vph)	70	49	212	20	75	39	406	326	29	42	541	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		325	200		200	250		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			95			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00	0.98		1.00	0.98	1.00	1.00		1.00	0.99	
Frt			0.850			0.850		0.988			0.978	
Flt Protected		0.971			0.990		0.950			0.950		
Satd. Flow (prot)	0	1790	1599	0	1817	1599	1787	3522	0	1787	3477	0
Flt Permitted		0.757			0.911		0.950			0.950		
Satd. Flow (perm)	0	1391	1569	0	1670	1565	1780	3522	0	1778	3477	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			33			73		14			20	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		502			454			455			433	
Travel Time (s)		13.7			12.4			8.9			8.4	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	6%	1%	13%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	80	56	244	23	86	45	467	375	33	48	622	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	244	0	109	45	467	408	0	48	728	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		6	7		2	3	7	4		3	8	
Permitted Phases	6		6	2		2						
Detector Phase	6	6	7	2	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	31.5	31.5	9.5	25.5	25.5	9.5	9.5	42.5		9.5	26.5	
Total Split (s)	31.5	31.5	32.0	31.5	31.5	11.1	32.0	47.4		11.1	26.5	
Total Split (%)	35.0%	35.0%	35.6%	35.0%	35.0%	12.3%	35.6%	52.7%		12.3%	29.4%	
Maximum Green (s)	27.0	27.0	27.5	27.0	27.0	6.6	27.5	42.9		6.6	22.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag			Lead			Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	20.0	20.0		14.0	14.0			19.0			15.0	
Pedestrian Calls (#/hr)	5	5		5	5			5			5	
Act Effct Green (s)		13.7	35.2		13.4	17.9	24.0	42.8		6.8	20.4	
Actuated g/C Ratio		0.20	0.51		0.20	0.26	0.35	0.62		0.10	0.30	
v/c Ratio		0.49	0.29		0.34	0.10	0.75	0.19		0.27	0.70	
Control Delay (s/veh)		33.4	7.1		28.9	2.2	31.9	9.4		39.5	28.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		33.4	7.1		28.9	2.2	31.9	9.4		39.5	28.1	
LOS		C	A		C	A	C	A		D	C	
Approach Delay (s/veh)		16.5			21.1			21.4			28.8	
Approach LOS		B			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 68.7			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay (s/veh): 23.2		Intersection LOS: C	
Intersection Capacity Utilization 66.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Center Dr & McNeil St

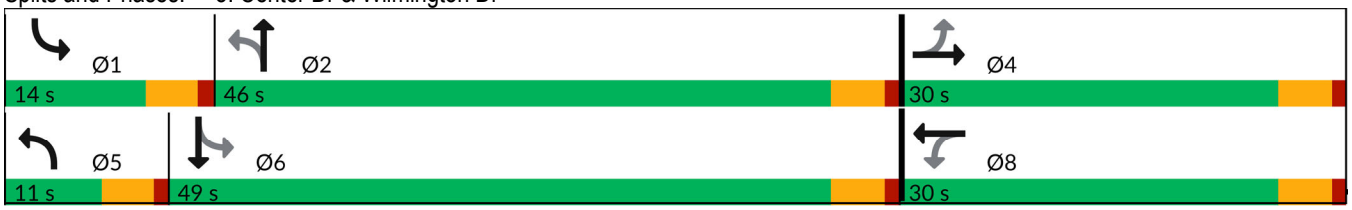


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	6	28	155	18	84	38	697	127	96	695	12
Future Volume (vph)	4	6	28	155	18	84	38	697	127	96	695	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	100		0	105		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			95		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99	0.98		1.00	1.00		1.00	1.00	
Frt		0.878			0.877			0.977			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1621	0	1787	1620	0	1787	3460	0	1787	3562	0
Flt Permitted	0.685			0.733			0.358			0.208		
Satd. Flow (perm)	1282	1621	0	1369	1620	0	672	3460	0	391	3562	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			91			31			3	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		190			493			682			320	
Travel Time (s)		5.2			13.4			13.3			6.2	
Confl. Peds. (#/hr)	5		5	5		5	5		5	5		5
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	4%	1%	1%	1%
Adj. Flow (vph)	4	7	30	168	20	91	41	758	138	104	755	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	37	0	168	111	0	41	896	0	104	768	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	26.5	26.5		25.5	25.5		9.5	22.5		9.5	31.5	
Total Split (s)	30.0	30.0		30.0	30.0		11.0	46.0		14.0	49.0	
Total Split (%)	33.3%	33.3%		33.3%	33.3%		12.2%	51.1%		15.6%	54.4%	
Maximum Green (s)	25.5	25.5		25.5	25.5		6.5	41.5		9.5	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0						7.0	
Flash Dont Walk (s)	11.0	11.0		14.0	14.0						20.0	
Pedestrian Calls (#/hr)	5	5		5	5						5	
Act Effct Green (s)	12.9	12.9		12.9	12.9		29.6	24.9		33.2	30.4	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.52	0.44		0.59	0.54	
v/c Ratio	0.01	0.09		0.54	0.25		0.09	0.58		0.25	0.40	
Control Delay (s/veh)	19.5	10.4		27.8	8.8		6.0	14.9		7.0	10.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	19.5	10.4		27.8	8.8		6.0	14.9		7.0	10.2	
LOS	B	B		C	A		A	B		A	B	
Approach Delay (s/veh)		11.2			20.3			14.5			9.8	
Approach LOS		B			C			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 56.4			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay (s/veh): 13.3		Intersection LOS: B	
Intersection Capacity Utilization 55.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Center Dr & Wilmington Dr



SITE DETAILS

Site Address:	1700 Center Drive Dupont, WA
Parcels:	011926-2019
Zoning:	Manufacturing and Research (MRP)
Proposed Use:	Warehouse Distribution
Site Areas:	
Lot 1 =	771,859 SF (17.72± Acres)
Lot 2 (ROW) =	84,028 SF (1.93± Acres)
Total =	855,877 SF (19.65± Acres)
Proposed Building Areas:	
Building A (Lot 1) =	256,800 SF
Total Building Area =	256,800 SF
Building Coverage (Lot 1) =	33.3±%

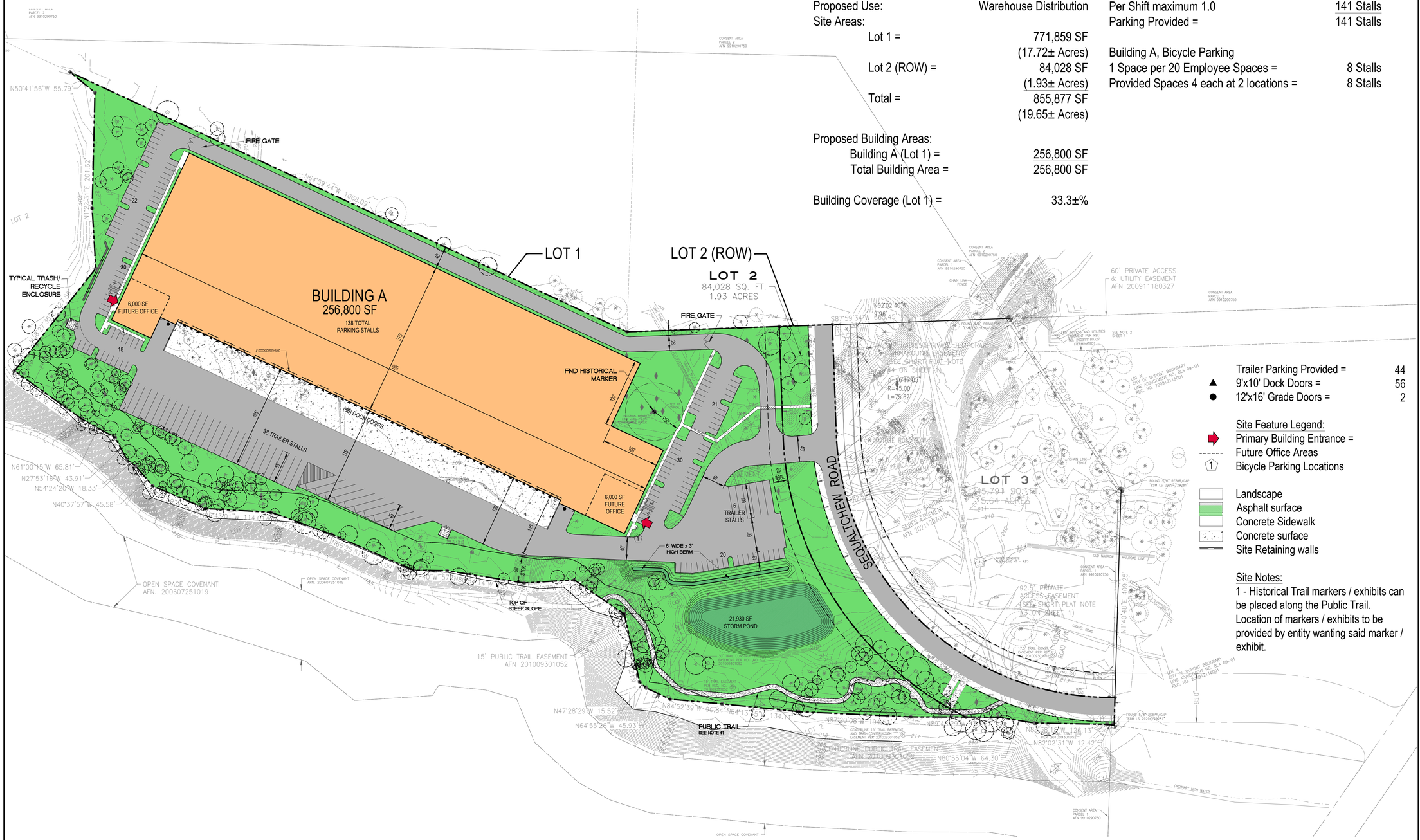
Parking Analysis	
Building A, Assumes 12,000 SF Future Office	
Total 256,800 SF	
Per Shift minimum 0.3	43 Stalls
Per Shift maximum 1.0	141 Stalls
Parking Provided =	141 Stalls
Building A, Bicycle Parking	
1 Space per 20 Employee Spaces =	8 Stalls
Provided Spaces 4 each at 2 locations =	8 Stalls

Trailer Parking Provided =	44
▲ 9'x10' Dock Doors =	56
● 12'x16' Grade Doors =	2

Site Feature Legend:
- Primary Building Entrance =
- Future Office Areas
- ① Bicycle Parking Locations

- Landscape
- Asphalt surface
- Concrete Sidewalk
- Concrete surface
- Site Retaining walls

Site Notes:
1 - Historical Trail markers / exhibits can be placed along the Public Trail. Location of markers / exhibits to be provided by entity wanting said marker / exhibit.



SITE PLAN

Scale: 1" = 80'

1

NOTE:
SITE BOUNDARY AND SURVEY PROVIDED BY BARGHAUSEN CONSULTING ENGINEERS, INC. DATED 06/05/2018. RECEIVED 01/22/2022.

INNOVA architects
950 Pacific Avenue, Suite 450
Tacoma, WA 98402
253-572-4903

Project Title:
DuPont 243
1700 Center Drive
DuPont, WA

Client:
AVENUE55
600 University Street, Suite 2305
Seattle, WA 98101
206-707-9696

Job Number:
22-012

Issue Set and Date:
SEPA Permit
July 11, 2023

NOT FOR CONSTRUCTION

REUSE OF DOCUMENTS
THIS DOCUMENT HAS BEEN SIGNED ELECTRONICALLY IN ACCORDANCE WITH WAC 196-27A-025 AND CHAPTER 19.34 RCW. THE DIGITAL SIGNATURE ASSOCIATED WITH THIS INFORMATION ON THIS DOCUMENT WILL INVALIDATE THE DOCUMENT, MY CERTIFICATION AND SIGNATURE. THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF THE PROFESSIONAL SERVICE, IS THE PROPERTY OF INNOVA ARCHITECTS AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT WRITTEN AUTHORIZATION OF INNOVA ARCHITECTS.

3 _____
2 _____
1 _____
1 City Comments - Letter Dated, February 17, 2023

Revisions:

Sheet Title:
SEPA
Site Plan

Designed by: B. Ludwig, J. Eaves
Drawn by: B. Ludwig, J. Eaves
Checked by: P. McCormick

Sheet Number:
A0.1
of Sheets

Attachment 1x

GeoEngineers
1101 Fawcett Ave, Suite 200
Tacoma, Washington 98402
253.383.4940

October 20, 2023

Avenue 55, LLC
601 Union Street, Suite 2930
Seattle, Washington 98101

Attention: Ben Varin

Subject: Report Addendum 3
Geotechnical Engineering Services
DuPont-West
DuPont, Washington
File No. 26421-001-00

INTRODUCTION AND PROJECT UNDERSTANDING

This report addendum (Addendum 3) presents geotechnical recommendations and considerations for the proposed DuPont-West project and is intended to provide supplemental geotechnical design recommendations to our previous studies at the site. The purpose of this addendum is to reflect the updated site plan layout described below and provide discussion on critical areas, specifically geologically hazardous areas consisting of landslide and erosion hazards near the site. The site is located at 1700 Center Drive in DuPont, Washington. An overview of the property and its surrounding area is shown on the Figure 1, Vicinity Map.

Our experience at the site includes involvement with the previous owner, Dupont Station Partners, LLC for the proposed DuPont Industrial Warehouse (also referred to as Lot "Y" Industrial Park). We understand Avenue 55, LLC has been given permission by Dupont Station Partners, LLC to have the full use of studies held by GeoEngineers, Inc. (GeoEngineers) and as related to the site address. Our previous geotechnical deliverables for the site include:

- "Geotechnical Engineering Services, Lot 'Y' Industrial Park, DuPont, Washington" dated October 10, 2011 (2011 Report). As part of our services, we advanced 22 test pit explorations in the project area to develop an understanding of subsurface conditions. The 2011 Report presents a summary of our findings, conclusions, and recommendations regarding geotechnical engineering aspects of the proposed industrial park development.
- "Report Addendum, Geotechnical Engineering Services, DuPont Industrial Warehouse, DuPont, Washington" dated May 11, 2018 (2018 Addendum), which includes our review of a proposed development site plan and updated recommended seismic design parameters.

- Report Addendum, Geotechnical Engineering Services, DuPont Industrial Park, DuPont, Washington", dated November 8, 2022 (November 2022 Addendum).
- "Revised Report Addendum 2, Geotechnical Engineering Services, DuPont 243, DuPont, Washington" dated August 1, 2023 (August 2023 Addendum), which includes our review of an updated development site plan and confirmation of previously provided geotechnical design recommendations.

We have also reviewed the following document by GeoEngineers, prepared for others, nearby:

- GeoEngineers, Inc. 2011. Stream Habitat Assessment Summary, Creekside Village Development, DuPont, Washington. Prepared for Creekside DuPont Partners, LLC, on October 12, 2011. (GeoEngineers File No. 16785-002-01).

Our understanding of the current project is based on discussions and correspondence with Avenue 55, LLC and review of an updated site plan sheet A0.1 "SEPA Site Plan" dated July 11, 2023 (Site Plan). The project will include construction of a 256,800-square-foot, dock-high slab, warehouse building, referred to as Building A. Surrounding improvements will include paved parking and driveway areas, hardscaping, new utility installation, landscaping, and stormwater management facilities, including a 21,930-square-foot stormwater pond (inferred from above Site Plan). A relatively short retaining wall (up to 6 feet tall) is proposed along the west parking lot and adjacent to the west property boundary. The site development features are shown on the attached Figure 2, Site Plan.

The south property boundary runs near parallel and above a southward facing slope that leads down to Sequalitchew Creek Trail and Sequalitchew Creek. The slope is typically in excess of 25 feet tall, with height increasing up to or even greater than 50 feet toward the west. The slope is inclined downward from the site between about 1H:1V (horizontal:vertical) and 3½H:1V. Some local areas are on the order of ¾H:1V. The Sequalitchew Creek Trail bisects the approximate center of the slope and runs approximately parallel with the top of the slope. The eastern half of the trail varies in elevation and essentially rises near the elevation of the top of the slope.

PURPOSE AND SCOPE OF SERVICES

The purpose of our services is to complete a limited slope reconnaissance and to provide discussion on critical areas (geologically hazardous areas) at the site. The terms of our services have been provided in accordance with our signed agreement with Avenue 55, LLC (signed October 17, 2022). We have been requested to address the City of DuPont Comments provided in their review letter dated September 22, 2023, as follows: "Provide a letter from the geotechnical engineer that address the City's Geologic Hazard assessment requirements, makes a recommendation for a protective buffer, and depict the protective buffer on the plans."

LITERATURE REVIEW AND ASSESSMENT

Geology Review

We include our geology literature review from our past studies (2011 Report) which states:

"Based on review of the Geologic Map of the Nisqually 7.5 Minute Quadrangle, Thurston and Pierce Counties, Washington (Walsh et al., 2003). Vashon recessional outwash sand and gravel is the dominant, near-surface, geologic material mapped in the immediate project area. This material is commonly known as Steilacoom gravel. Vashon recessional outwash was deposited by melt water streams in front of the most recent glacier during its retreat from the Puget Sound region approximately 10,000 to 15,000 years ago. These deposits generally consist of permeable sand, or sand and gravel. Cobbles and boulders can also be encountered in this deposit, depending on the depositional history. Glacial till and/or advance outwash is commonly encountered at depth below the recessional outwash."

We also provide the following contained in our 2011 report: "The United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey of Pierce County Area, Washington, maps the project area as Spanaway gravelly sandy loam (41A). This soil unit is described as being formed in glacial outwash. It is further described as somewhat excessively drained with moderately rapid permeability, slow surface runoff and little erosion hazard."

Based on our current review and studies, it is our opinion that the soil descriptions in the published literature documents are still appropriate for this project.

Washington State DNR Geologic Information Portal

We reviewed the Washington State Department of Natural Resources (Washington State DNR) Geologic Information Portal (accessed October 16, 2023), which provides maps of landslides and areas susceptible to landslides. Based on our review, the southward facing slope near the southern property boundary is mapped as having a susceptibility to shallow landsliding. No active landslides appear to be mapped in the project vicinity.

DuPont Municipal Code

General

We reviewed the City of DuPont "DuPont Municipal Code" (DMC). Specifically, we reviewed Chapter 25.105 "Critical Areas" of the DMC which provides criteria for Geologically Hazardous Areas consisting of Landslide and Erosion Hazards. Seismic design and opinions have been provided in our past studies. In summary, we concluded that seismic hazards (liquefaction, lateral spreading, surface fault ruptures) do not appear to be present at this site and in our opinion, are at a low risk of occurring.

Landslide Hazard Areas

Based on our review of the Site Plan and understanding of the site, the southward facing slope meets the following criteria provided in the DMC for landslide hazard areas based on the following:

- Slope is mapped by the Washington State DNR as having a susceptibility to shallow landsliding.
- A majority of the slope grade is 40 percent or steeper and has vertical relief of 10 feet or more.

Erosion Hazard Areas

Per the DMC, the southward facing slope would be designated as an erosion hazard area, primarily because it is associated with the Sequalitchew Creek "channel migration zone". The DMC states that "Channel migration zones, also known as riverine erosion areas, are defined as the areas along a river or stream within which the channel(s) can be reasonably predicted to migrate over time. This is a result of natural and normally occurring geomorphic, hydrological, and related processes when considered with the characteristics of the river or stream and its surroundings, and in consideration of river and stream management plans. Channel migration hazard areas shall include potential channel migration, channel avulsion, bank erosion, and stability of slopes along the river or stream".

Slope Reconnaissance

We completed a limited slope reconnaissance on October 12, 2023, of the southward facing slope between the upland part of the site and Sequilitchew Creek. Our slope reconnaissance was focused primarily on the central to western half of the site, where the slope is generally steepest and closest to proposed parking and building improvements. Our observations were made from hiking the top of the slope and at the approximate midline-base of the slope along the Sequalitchew Creek Trail.

The slope is generally forested with deciduous and coniferous trees, and densely vegetated with underbrush (i.e., small shrubs and trees, sword ferns, etc.). "Horse tails", plant vegetation typically formed in the presence of constant wet surface water, were also observed in isolated, clustered sections (approximately 50 feet or less in length) along the northern edge of the Sequalitchew Creek trail below the project area. The ground appeared wet where horse tails were present, and intermittently outside of areas containing horse tails. We did not observe the presence of groundwater seepage flow in this area during our reconnaissance.

We probed the slope surfaces around the trail area, primarily to north of the trail, with a ½-inch diameter steel probe rod and through forest duff and/or vegetative matter, where accessible and as needed. Typical probe depths were generally less than 6 inches, with isolated locations between 12 and 18 inches, before firmer underlying soil conditions were encountered. Similarly, near the top of the slope, probe depths were generally between about 12 and 18 inches before reaching firm soil conditions.

Natural soil along the slope surfaces was observed to be intermittently exposed and generally consisted of sand and gravel with varying silt content. Probe depths were generally less than 2 inches in these exposed soils and were noted to be in a dense condition. We interpret the soil conditions, where exposed, along the slope surfaces to generally be consistent with the glacial recessional outwash deposits recorded in our 2011 Report and the overall geologic conditions reported in the project vicinity. Some of the exposures could be indicative of a glacial till or glacial drift material, and generally comprised very dense, glacially consolidated silty sand with gravel. It is common for glacial till and drift materials to underly recessional outwash deposits in the project area.

Where accessible, we did not observe tension cracks or signs of movement near the top of the slope. Periodic and isolated "pistol butting" of tree trunks, at their base, were observed along the slope faces, but were typically surrounded by well-established mature trees growing vertically. Pistol butting of trees can indicate past or current slope movements; however, based on the soil conditions observed and the vertical growth patterns for surrounding trees, the pistol butting observed is, in our opinion, likely attributed to the tree germinating on a slope, potential damage incurred early in the tree's life, and/or due to slow colluvial creep of the duff and upper weathered soil zone. In some isolated areas of exposed soil, we observed minor surface raveling, shallow surficial slumps, and sloughing.

We consider the surface raveling, shallow surficial slumps, and sloughing observed to be associated with minor erosion and surficial failures common to natural slopes in the project vicinity and region. We did not observe any indications of significant seepage or global slope instability. Since our field efforts were completed in 2011, and in some instances prior to 2011 (studies completed for nearby projects), we have not observed any indications of landsliding or received reports of soil movements within the slope below the project area.

CONCLUSIONS AND RECOMMENDATIONS

General

Except as modified in this addendum, the conclusions and recommendations presented in our 2011 Report and subsequent addenda are appropriate for geotechnical project design and construction. In this addendum, we provide additional geotechnical considerations for the project, specifically relating to geologically hazardous areas south of the proposed development.

Based on definitions presented in the DMC, it is our opinion that the southward facing slope can be designated as both a landslide hazard and erosion hazard area due to characteristics of a steep slope, shallow landslide potential, and its association with the channel migration zone of Sequalitchew Creek. Per the DMC, setbacks for each hazard should be based on the findings of a qualified professional. We provide additional discussion on each hazard, including an overview of current setbacks in the sections below.

Landslide Hazard

Soil conditions at the site, including the steep slope areas, comprise dense glacial deposits. Typically, deep-seated failures on these types of glacial slopes inclined at about ¾H:1V, or shallower, are rare. Based on our studies, explorations, and site experience, it is our opinion that there is a low risk of large-scale global instability occurring on the southward facing slope below the proposed development. It is also our opinion that landslide hazards designated at this site should not be considered a limiting factor for the proposed development, provided that proper design, setbacks, and engineering controls are implemented.

The southward facing steep slope will be at risk for relatively shallow sloughing, slow “creep” movement and/or local surficial failures. We observed evidence of these features, as described above. These are natural processes that occur with or without development. Mitigation measures are often limited to appropriate setbacks and monitoring and maintenance. The amount and magnitude of sloughing is typically due to natural processes that can include weathering, seepage, saturation during heavy rain events, decay of roots, downed trees, and activity of burrowing animals. The addition of human design elements, such as fill scattering, mis-directed stormwater sheet flow, and irrigation, can also increase this risk.

Site plans reviewed indicate the closest improvement to the top of the steep slope will be the paved parking and driveway areas, which are 50 feet away. Proposed Building A is shown to be setback more than 100 feet from the top of the slope. The stormwater pond proposed is at least 100 feet away from the top of the slope. It should be noted that this pond location is consistent with the 100-foot setback guidance as described in Volume V, Section 1.2 of the 2019 Washington State Department of Ecology’s Stormwater Management Manual for Western Washington.

Based on our studies, we recommend a non-improvement area/buffer/setback of 50 feet be established and maintained from the top of the slope to address landslide hazard considerations described. Review of the project Site Plan indicates that this recommended setback has been established as a part of the project design, and as such we take no issue with this. Other requirements presented in the DMC related to development near landslide hazard areas, such as construction methods, erosion control, site disturbance, etc., should also be considered, and incorporated, where necessary.

Erosion Hazard

Based on our studies, it is our opinion that there is the potential for shallow erosion and surficial failures/sloughing within the south slope face, particularly in areas where vegetation is sparse or non-existent. We observed these features during our site visit and should be expected to continue. These are natural processes that occur with or without development. Areas with thicker weathered and organic or forest duff materials that have undergone several weather cycles are also subject to shallow erosion and surficial failures, especially if it becomes oversaturated. Areas of the slope that are more exposed and contain less vegetation are more likely subject to erosion, compared to areas that contain denser vegetation.

Based on our studies, it is our opinion that erosion hazards, as defined in the DMC, as well as the other potential erosion hazards described above, should not be considered a limiting factor for the proposed development. It is our opinion that the 50-foot setback buffer established for the project is adequate to protect structures and improvements from the erosion hazards expected at this site. We further conclude that the risk of toe erosion caused by significant stream meandering of Sequilitchew Creek along base of slope is low. This creek appears to be relatively dry for most of the time of the year, contains a relatively large channel, has a linear alignment through the project area, and overall, not expected to develop stream velocities that would compromise the toe of the slope.

Temporary and permanent site development should include provisions to protect steep slopes from erosion. Engineering controls to mitigate erosion by limiting soil disturbance in steep slope areas, controlling surface water management, and re-establishment of ground cover and vegetation should be included in design and planning. Stormwater facilities and other site drainage should be designed such that they do not discharge directly over or within the buffers and the steep slope areas. Other provisions in the DMC for development in erosion hazard areas should also be considered during design and planning. In addition, discussions on erosion control have been provided in the “Erosion and Sedimentation Control” section of our 2011 Report and should be considered as a part project development and design.

LIMITATIONS

We have prepared this report for Avenue 55, LLC, for the DuPont-West project located at 1700 Center Drive in DuPont, Washington and is intended to provide supplemental geotechnical design recommendations to our previous studies at this site for this project. Avenue 55, LLC may distribute copies of this report to authorized agents and regulatory agencies as may be required for the project.

Our services were provided to assist in the design of foundations for a planned structure to be located on or near sloping property. Our recommendations are intended to improve the overall stability of the site and to reduce the potential for future property damage related to earth movements, drainage, or erosion. Qualified engineering and construction practices can help mitigate the risks inherent in construction on slopes, although those risks cannot be eliminated completely. Favorable performance of structures in the near term is useful information for anticipating future performance, but it cannot predict or imply a certainty of long-term performance, especially under conditions of adverse weather or seismic activity.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. The conclusions, recommendations, and opinions presented in this report are based on our professional knowledge, judgment, and experience. No warranty or other conditions, express or implied, should be understood.

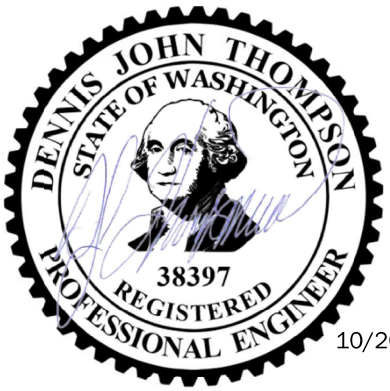
Any electronic form, facsimile or hard copy of the original document (email, text, table and/or figure), if provided, and any attachments should be considered a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

Please refer to Appendix A titled "Report Limitations and Guidelines for Use" provided in our "Revised Report Addendum 2, Geotechnical Engineering Services, DuPont 243, DuPont, Washington" dated August 1, 2023 (August 2023 Addendum) for additional limitations and information pertaining to use of this report. The recommendations, limitations, and information presented in the August 2023 Addendum also apply to this letter. Except as modified herein, our August 2023 letter is still applicable and should be considered a part of this study and reviewed for our complete geotechnical recommendations.

Sincerely,
GeoEngineers, Inc.

Christopher R. Newton, PE
Geotechnical Engineer

10/20/23



Dennis (DJ) Thompson, PE
Associate

10/20/23

CRN:DJT:atk

Attachments
Figure 1. Vicinity Map
Figure 2. Site Plan

Source(s):
- ESRI

Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Disclaimer: This figure was created for a specific purpose and project. Any use of this figure for any other project or purpose shall be at the user's sole risk and without liability to GeoEngineers. The locations of features shown may be approximate. GeoEngineers makes no warranty or representation as to the accuracy, completeness, or suitability of the figure, or data contained therein. The file containing this figure is a copy of a master document, the original of which is retained by GeoEngineers and is the official document of record.

Vicinity Map

DuPont - West
DuPont, Washington

GeoEngineers

Figure 1

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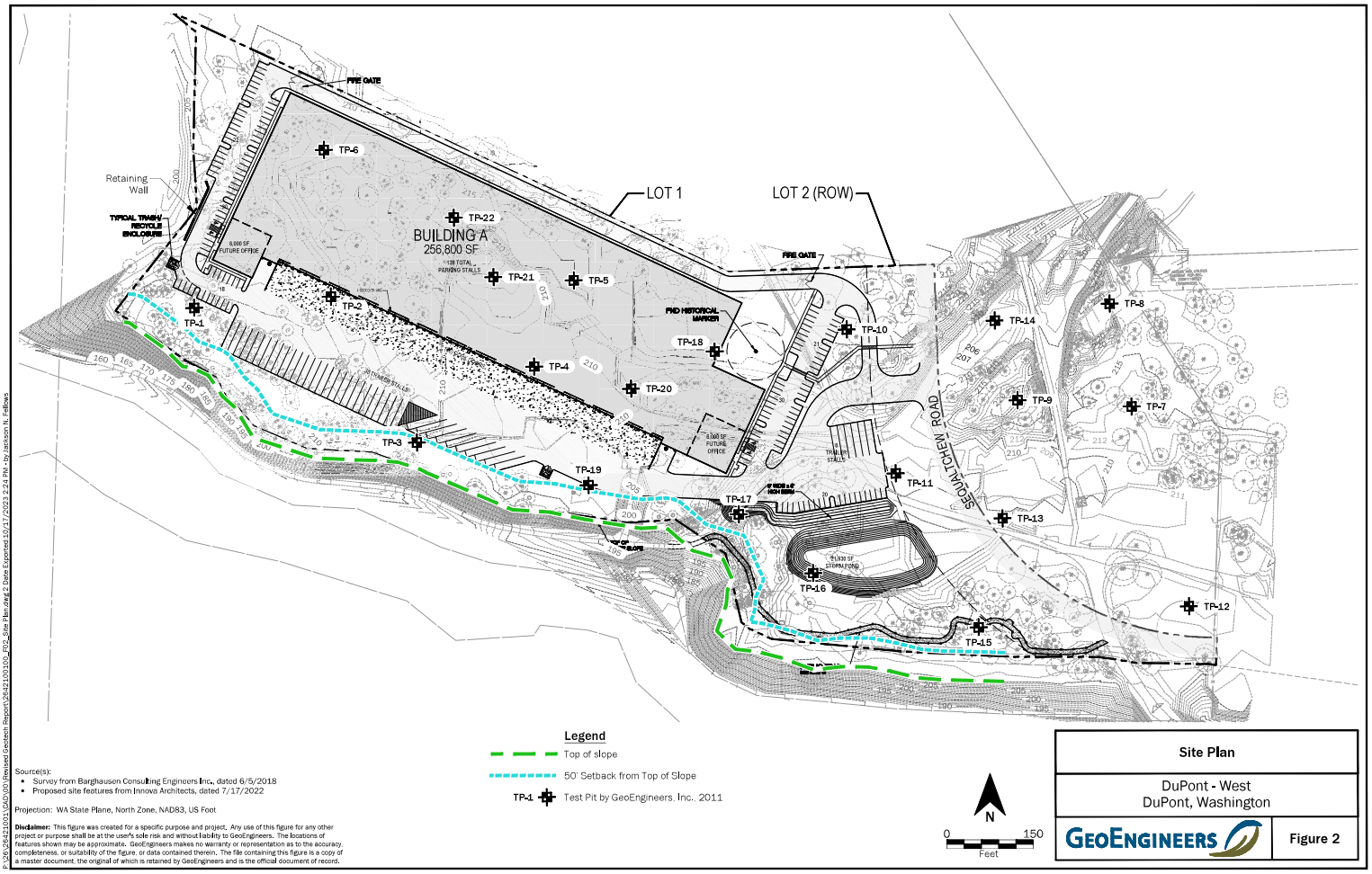

Source(s):
- Survey from Barghausen Consulting Engineers Inc., dated 6/5/2018
- Proposed site features from Innova Architects, dated 7/17/2022

Projection: WA State Plane, North Zone, NAD83, US Foot

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Site Plan

DuPont - West
DuPont, Washington

GeoEngineers | Figure 2

Attachment 1y

CULTURAL RESOURCES ADDENDUM MEMO FOR THE AVENUE 55, LLC DUPONT WEST PROJECT CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

Prepared for:

Avenue 55, LLC
601 Union Street, Ste. 2930
Seattle, WA 98101

Prepared by:
John A. Nadolski, MA

NATURAL INVESTIGATIONS COMPANY

3104 O Street, #221
Sacramento, CA 95816

October 2023

EXECUTIVE SUMMARY

DuPont Industrial Partners, LLC in 2011 proposed the development of aapproximately 25.3-acres of private land at 1700 Center Drive in the City of DuPont, Pierce County, Washington. The parcel of land proposed for development is identified as Lot Y, Assessor's Property Tax Parcel No. 011926-2019. DuPont Industrial Partners, LLC had proposed construction of a multi-building industrial park on Lot Y that included a maximum of twelve 12 buildings, parking spaces, roadways, installation of underground utilities, and construction of a trail along Sequalitchew Creek to the south of the proposed development. Parus Consulting, Inc. (PCI) was retained by DuPont Industrial Partners, LLC to conduct cultural resources investigations to facilitate construction of the project and comply with all Washington State Department of Archaeology & Historic Preservation (DAHP) regulations and the State Environmental Protection Act (SEPA). However, DuPont Industrial Partners, LLC did not construct any buildings or develop Lot Y.

Avenue 55, LLC is currently proposing to develop a section of Lot Y, defined as: Lot 1, which is 17.72 acres and 1.93 acres in Lot 2, totally 19.65, that was originally part of DuPont Industrial Partners, LLC proposed 2011 development. Avenue 55, LLC proposes to construct a warehouse distribution facility, parking spaces, and associated underground utilities on approximately 19.65 acres of Lot Y west of Sequalitchew Road, that they are now calling DuPont West. Avenue 55, LLC retained Natural Investigations Company, Inc. (Natural Investigations) to review PCI's report and present any new findings and/or recommendations to facilitate construction of the new project on Lot Y and comply with all state regulations (e.g., DAHP and SEPA) for the identification and protection of cultural resources. The purpose of this addendum is to present the results of Natural Investigations review of PCI's 2011 report and its findings, including any changes to the report or findings and/or any new recommendations for the protection of cultural resources.

PCI conducted cultural resources investigations for the proposed originally project on Lot Y in 2011. The investigations included a pedestrian survey and excavation of 125 shovel test probes and 22 geotechnical exploration pits. PCI's cultural resources investigations were conducted under Archaeological Excavation Permit (Permit) No. 2010-54 approved by the DAHP on February 7, 2011 and were monitored by a member of the Nisqually Tribe.

PCI's pedestrian survey and excavations did not identify any evidence of previously recorded sites and isolates on Lot Y including sites 45PI66, the site of a Methodist Episcopal Mission and 45PI455, the site of a 9th U.S. Cavalry Bivouac, and a flaked stone isolate, 45PI773. In addition, PCI cultural resources investigations confirmed previous reports that two sites 45PI63, Railroad Dump #3, and 45PI64, Burning Ground Dump, formerly located on Lot Y were completely destroyed/removed over twenty years ago as part of hazardous materials remediation across Lot Y. PCI did identify two new historic sites, 45PI01224, a segment of railroad track, and 45PI01225, a concrete platform and one isolated kerosene can on Lot Y.

Sites 45PI455 and 45PI66 were previously determined eligible for the National Register of Historic Places (NRHP) at 36 Code of Federal Regulations (CFR) Part 60.4 [a-d] under Criterion A because of their association with significant events in history, but there are no extant remnants of the sites on Lot Y. Sites 45PI01224 and 45PI01225 are not in the section of Lot Y currently proposed for development and do not meet any of the eligibility criteria for inclusion on the NRHP or the Washington Heritage Register (WHR) as described in Revised Code of Washington (RCW) 27.34.200. Consequently, PCI determined that no historic properties would be affected by development of Lot Y and because of the archaeological sensitivity of the area also recommended and prepared an Unanticipated Cultural Resources Discovery Plan for the project. PCI's report was filed with the DAHP and sent to the appropriate Tribes.

Natural Investigations reviewed PCI's 2011 report and the results of their cultural resources investigations. The cultural resources investigations and findings presented in the report for development of Lot Y are adequate and remain valid for Avenue 55, LLC's currently proposed project, DuPont West. Indeed, reduction in the size of the current project places sites 45PI01224 and 45PI01225 outside project

boundaries. Therefore, Natural Investigations confirms the findings presented in PCI's 2011 report, does not recommend any additional investigations, and pursuant to DAHP regulations and SEPA Checklist Section B, Number 13, determines that construction of the project currently proposed by Avenue 55, LLC would not affect any historic properties (i.e., properties eligible for or listed on the NRHP) or properties that could be eligible for the WHR.

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APPENDIX A: Archaeological Survey, Testing, and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington.Report prepared by Parus Consulting, Inc. 2011

INTRODUCTION

DuPont Industrial Partners, LLC in 2011 proposed the development of aapproximately 25.3-acres of private land at 1700 Center Drive in the City of DuPont, Pierce County, Washington. The parcel of land proposed for development is currently identified as Lot Y, Assessor's Property Tax Parcel No. 011926-6005, 011926-6006, and 011926-6007. DuPont Industrial Partners, LLC proposed construction of a multi-building industrial park on Lot Y that included a maximum of twelve 12 buildings totaling approximately 340,000 square feet of building space, roadways, loading areas, approximately 650 parking spaces, installation of underground utilities, and construction of a trail along Sequalitchew Creek to the south of the proposed development. PCI was retained by DuPont Industrial Partners, LLC to conduct cultural resources investigations to facilitate construction of the project and comply with all DAHP regulations and SEPA. However, DuPont Industrial Partners, LLC did not construct any buildings or develop Lot Y.

Avenue 55, LLC is currently proposing to develop part of Lot Y that was originally part of DuPont Industrial Partners, LLC proposed 2011 development. Avenue 55, LLC retained Natural Investigations to review PCI's report and present any new findings to facilitate construction of the new project on Lot Y and comply with all state regulations (e.g., DAHP and SEPA) for the identification and protection of cultural resources. The purpose of this addendum is to present the results of Natural Investigations review of PCI's 2011 report and its findings, including any changes to the report or findings and/or any new recommendations for the protection of cultural resources.

PROJECT LOCATION AND DESCRIPTION

Avenue 55, LLC proposes to develop an approximately 19.65 acres parcel of land identified as Lot Y, Assessor's Property Tax Parcel No. 011926-6005, 011926-6006 in the City of DuPont, Pierce County, Washington (Figure 1). The proposed development includes construction of one warehouse distribution facility totaling approximately 256,800 square feet, 141 parking spaces, 44 trailer stalls, a 27,130 square foot storm pond located in the southwest corner of Lot 1, public trails along the southern border, and associated underground utilities west of Sequalitchew Road (Figure 2).

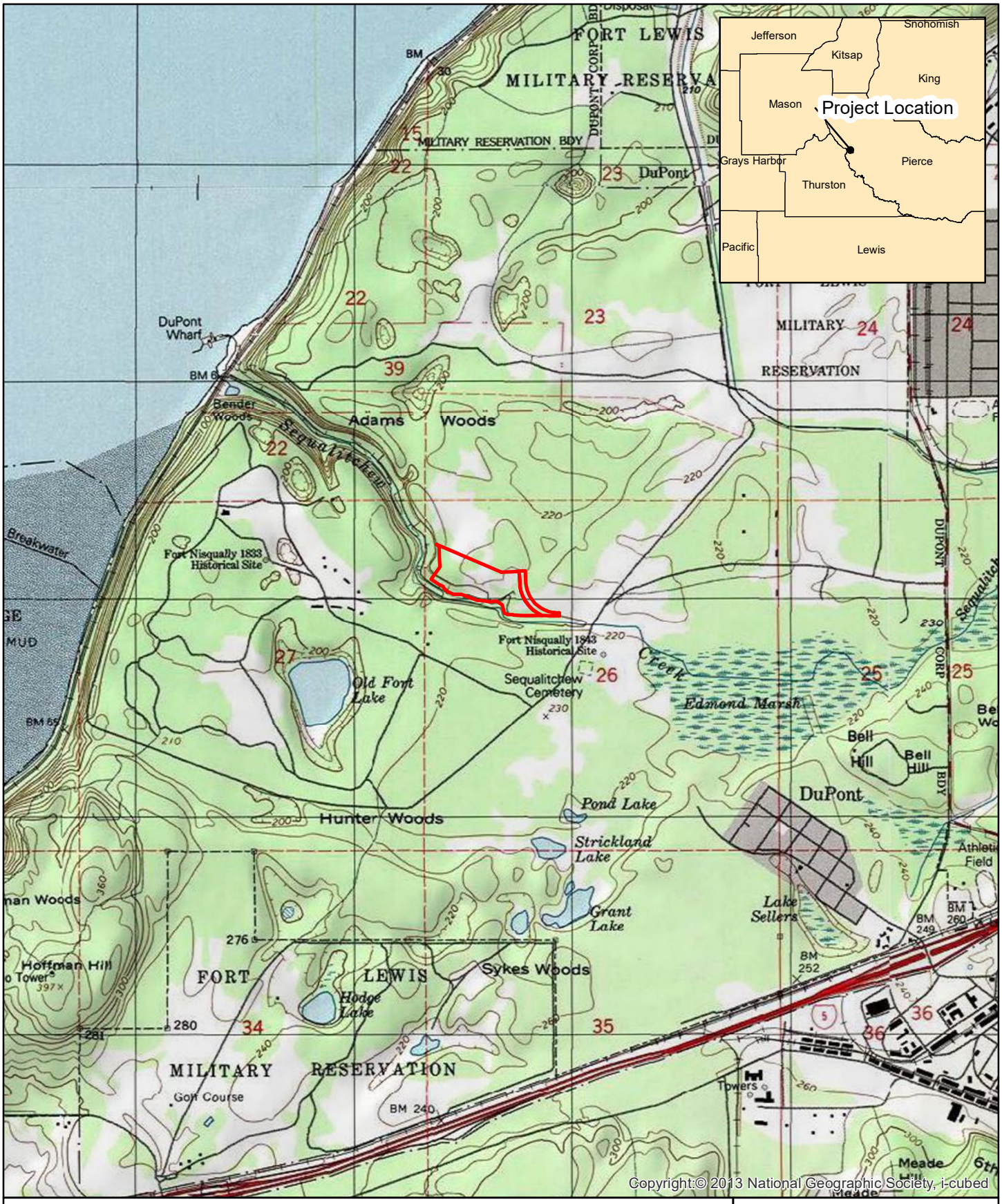
REGULATORY SETTING

There is no federal involvement in the project as currently proposed. PCI's and Natural Investigations cultural resources investigations for the proposed project were conducted under prevailing Washington state laws that protect cultural resources (e.g., prehistoric archaeological sites, historic sites, historic buildings, and Native American sites and graves). These laws include Executive Order 05-05 (currently revised as Executive Order 21-02), Indian Graves and Records (RCW 27.44), Archaeological Sites and Resources (RCW 27.53), Archaeological Excavation and Removal Permit (Washington Administrative Code [WAC] 25-48), and Discovery of Human Remains (RCW 27.44). In addition, PCI obatined a permit to conduct cultural resources investigations including excavations within boundaries of known archaeological sites. The Permit (No. 2010-54) was completed pursuant to requirements at WAC 25-48-060.

REPORT ADDENDUM PREPARATION

John A. Nadolski, MA was the Principal Investigator for this project and is primary author of this report addendum. Mr. Nadolski has more than thirty-five years of experience in archaeology and exceeds all

requirements of the *Secretary of Interior's Qualifications Standard*s (36 CFR Part 61; National Park Service 1983) and the DAHP. The format of this report addendum follows DAHP guidance.



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Study Area

0 0.5 1 Kilometers

0 0.5 1 Miles

1:24,000

DuPont West Project
Figure 1 - Project Location

Natural Investigations Company

Map Date 7/19/2023

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26

SITE DETAILS

Site Address:	1700 Center Drive Dupont, WA
Parcels:	011926-2019
Zoning:	Manufacturing and Research (MRP)
Proposed Use:	Warehouse Distribution
Site Areas:	
Lot 1 =	771,859 SF (17.72± Acres)
Lot 2 (ROW) =	84,028 SF (1.93± Acres)
Total =	855,877 SF (19.65± Acres)
Proposed Building Areas:	
Building A (Lot 1) =	256,800 SF
Total Building Area =	256,800 SF
Building Coverage (Lot 1) =	33.3±%

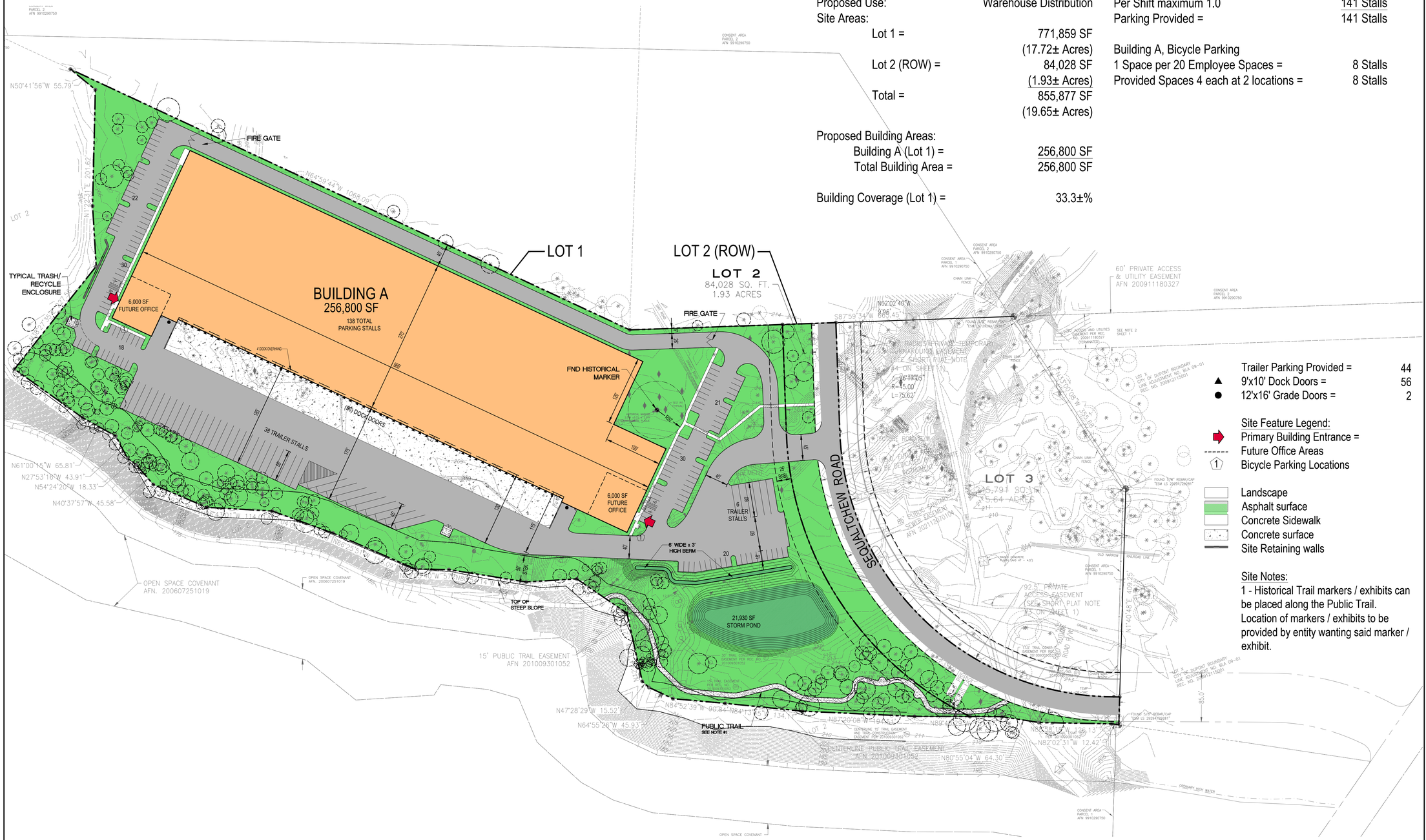
Parking Analysis	
Building A, Assumes 12,000 SF Future Office	
Total 256,800 SF	
Per Shift minimum 0.3	43 Stalls
Per Shift maximum 1.0	141 Stalls
Parking Provided =	141 Stalls
Building A, Bicycle Parking	
1 Space per 20 Employee Spaces =	8 Stalls
Provided Spaces 4 each at 2 locations =	8 Stalls

Trailer Parking Provided =	44
▲ 9'x10' Dock Doors =	56
● 12'x16' Grade Doors =	2

Site Feature Legend:
- Primary Building Entrance =
- Future Office Areas
- ① Bicycle Parking Locations

- Landscape
- Asphalt surface
- Concrete Sidewalk
- Concrete surface
- Site Retaining walls

Site Notes:
1 - Historical Trail markers / exhibits can be placed along the Public Trail. Location of markers / exhibits to be provided by entity wanting said marker / exhibit.



SITE PLAN

Scale: 1" = 80'

1

NOTE:
SITE BOUNDARY AND SURVEY PROVIDED BY BARGHAUSEN CONSULTING ENGINEERS, INC. DATED 06/05/2018. RECEIVED 01/22/2022.

INNOVA architects
950 Pacific Avenue, Suite 450
Tacoma, WA 98402
253-572-4903

Project Title:
DuPont - West
1700 Center Drive
DuPont, WA

Client:
AVENUE55
600 University Street, Suite 2305
Seattle, WA 98101
206-707-9696

Job Number:
22-012

Issue Set and Date:
SEPA Permit
July 11, 2023

NOT FOR CONSTRUCTION

REUSE OF DOCUMENTS
THIS DOCUMENT HAS BEEN SIGNED ELECTRONICALLY IN ACCORDANCE WITH WAC 196-27A-025 AND CHAPTER 19.34 RCW. THE DIGITAL SIGNATURE AND ANY OTHER INFORMATION ON THIS DOCUMENT WILL INVALIDATE THE DOCUMENT, MY CERTIFICATION AND SIGNATURE. THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF THE PROFESSIONAL SERVICE, IS THE PROPERTY OF INNOVA ARCHITECTS AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT WRITTEN AUTHORIZATION OF INNOVA ARCHITECTS.

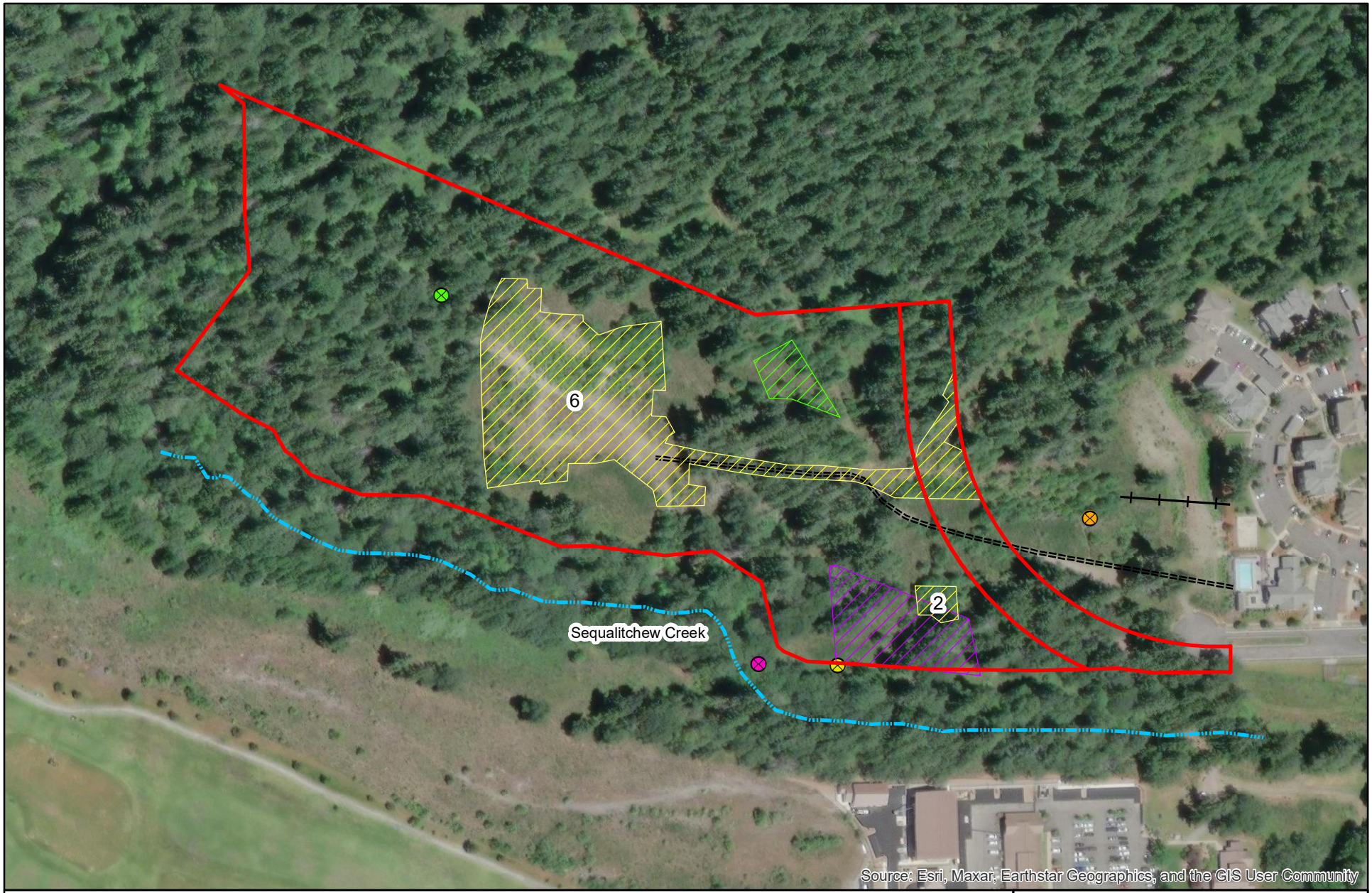
3 _____
2 _____
1 _____
1 City Comments - Letter Dated, February 17, 2023

Revisions:

Sheet Title:
SEPA
Site Plan

Designed by: B. Ludwig, J. Eaves
Drawn by: B. Ludwig, J. Eaves
Checked by: P. McCormick

Sheet Number:
A0.1
of Sheets



DuPont West Boundary
Hot Spot Excavations
45-PI-66
45-PI-455
45-PI-773
45-PI-01226
45-PI-00064
45-PI-01225
45-PI-01224
Existing Gravel Road

0 100 200 Meters

0 400 800 Feet

N W E S

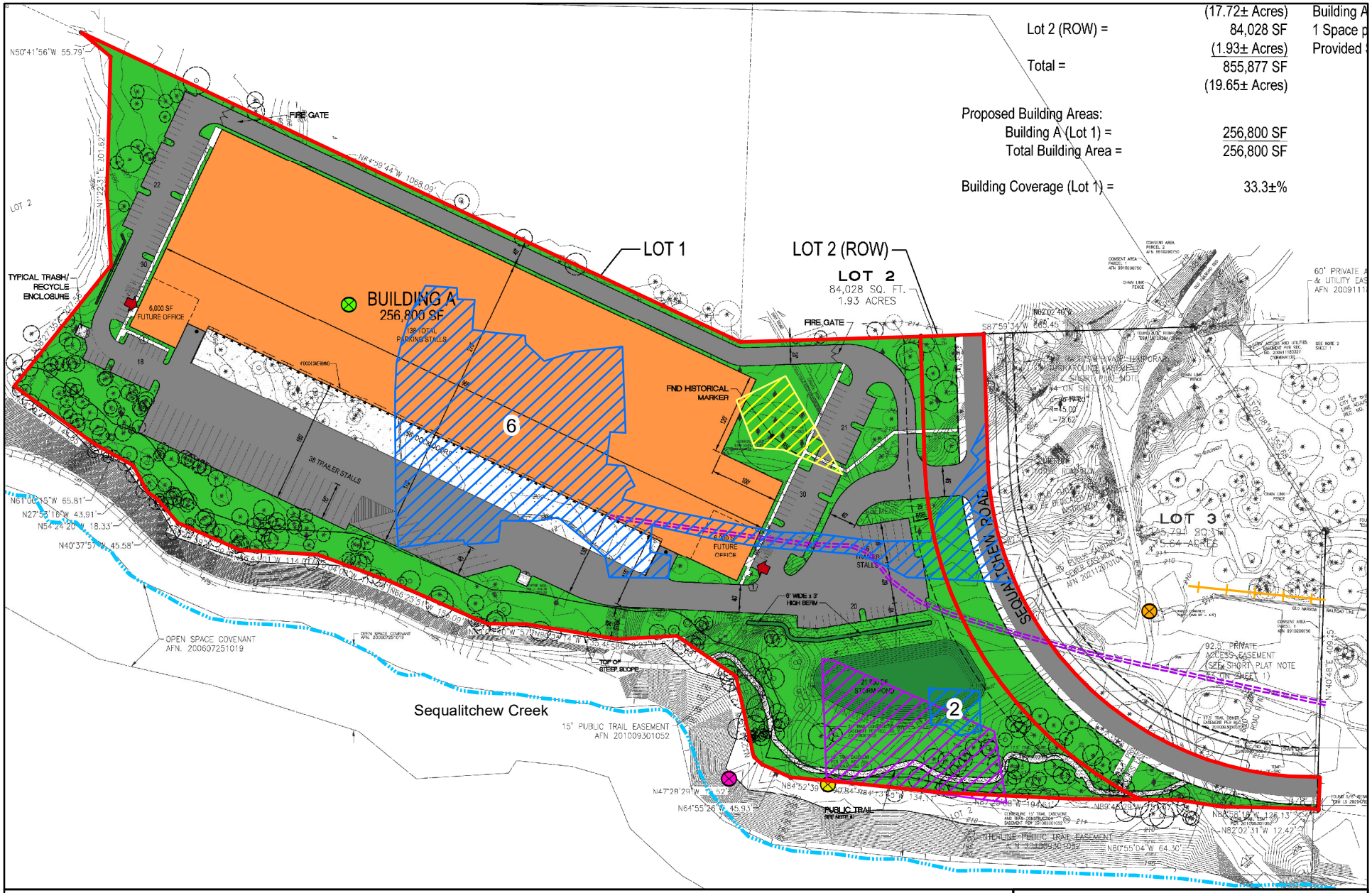
1:3,000

DuPont West Project
Figure 3:
Archaeological Resource and Remediation

Natural Investigations Company

Map Date 7/20/2023

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26



Map Date 10/9/2023

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26

RESEARCH METHODS AND FINDINGS

PCI conducted a cultural resources records search for the project on October 21, 2010 using the DAHP electronic GIS database to identify previously recorded sites and previously conducted surveys on and near Lot Y (Tables 1 and 2). PCI also conducted tribal consultation (i.e., cultural representatives or Tribal Historic Preservation Officers for the Nisqually, Puyallup and Squaxin Tribes were contacted regarding the project), a pedestrian survey, subsurface testing, and monitoring of geotechnical subsurface exploration on Lot Y in February and March 2011. All PCI investigations were conducted under DAHP Permit No. 2010-54.

Table 1. Previous Studies on or near Lot Y

Year	Author(s)	Report Title	Proximity to Lot Y
1977	Onat, A.R., Lee A. Bennett, and Timothy Riordan	Cultural Resources Survey: DuPont Site, Volume I, Survey of Archaeological and Ethnographical Resources at the DuPont Site	Within and near Lot Y
1977	Stratton, David H., and Glen W Lindeman	Cultural Resource Survey, DuPont Site, Volume II: Survey of Historical Resources at the DuPont Site	Within and near Lot Y
1989	Welch, Jeanne	A Cultural Overview and Comprehensive Management Plan for the DuPont Property, Pierce County, Washington	Within and near Lot Y
1990	Stilson, M. Leland	A Data Recovery Study of 45PI401, Hudson's Bay Dwellings at Northwest Landing, Pierce County, Washington	0.1 mile east
1991	Moura, Guy F.	Missions, War Games, and Railroad Dumps: 1989 Explorations and Excavations, Northwest Landing, DuPont, Washington	Within
1991	Stilson, M. Leland	A Data Recovery Study of 45PI405, the 1843 Fort Nisqually Village at Northwest Landing, Pierce County, Washington	0.1 mile east
2000	Daugherty, Richard, and Mary Condon	Archaeological Monitoring of the “Hot Spot” Removal Program, the Hazardous Waste Stockpile Areas, and Sand Stockpile Laydown Areas at the Former DuPont Works Site, DuPont, Washington	Within
2001	Daugherty, Richard, and Mary Condon	An Update on the Archaeological Status of Sites 45PI63 (A Trash Dump Located Along a Railroad Spur), 45PI64 (Burning Ground Dump), 45PI66 (Methodist Episcopal Mission), and 45PI455 (Part of the 9th Cavalry Bivouac Area)	Within and near Lot Y
2002	Maass, Alex	Interim Archaeological Monitoring Report for the Former DuPont Works Site, Parcel 1	Adjacent (to west)
2003	Maass, Alex	2002 Field Season Archaeological Monitoring Report for the Former DuPont Works Site, Parcel 1	Adjacent (to west)
2003	Wessen, Gary	Exploring the Boundary and Possible Interpretation of 45PI485	South of creek
2004	Wessen, Gary	Archaeological Testing at 45PI576, Former DuPont Works Site, City of DuPont, Pierce County, Washington	South of creek
2005	Dampf, Steven	Archaeological Monitoring Report for the 2003 and 2004 Field Seasons at the Former Dupont Works Site Parcel 1, City of DuPont, Pierce County, Washington	Adjacent (to west)
2005	Wessen, Gary, Cathy Bialas and Gail Thompson	Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near Lot Y
2006	Thompson, Gail	Archaeological Implementation Report for Remediation of Soils at the Former DuPont Works Site Parcel 1, City of DuPont, Pierce County, Washington	Adjacent (to west)
2008	Wessen, Gary, Cathy Bialas, Derek Shaw and Gail Thompson	Revised Cultural Resources Assessment for the Glacier Northwest North Sequalitchew Creek SEIS Project, City of DuPont, Pierce County, Washington	Within and near Lot Y

Table 2. Previously Recorded Sites on Lot Y

Site No.	Brief Description	Recorded By/Year	Prior Reports	NRHP Eligibility
45PI00063	Historic debris deposit, two loci along railroad, 1910- 1930; removed during soil remediation	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Moura, 1991a; Daugherty and Condon, 2001	Not eligible
45PI00064	Historic DuPont Powder Works burning ground dump, 1930s-1945; removed during soil remediation	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Daugherty and Condon, 2000, 2001	Not eligible
45PI00066	Historic 1840-1842 Methodist Episcopal Mission	Riordan, 1977; Daugherty, 1993 NRHP form	Blukis Onat et al., 1977; Welch, 1989a; Moura, 1991a; Daugherty and Condon, 2000, 2001	Eligible, included in proposed Nisqually- Sequalitchew Historic District
45PI00455	Historic 9th U.S. Cavalry Bivouac, Camp Nisqually, 1904; partially removed during soil remediation	Daugherty, 1997; Daugherty, 1997 NRHP form	Moura, 1991a, 1991b; Daugherty and Condon, 2000, 2001	Potentially eligible, included in proposed Nisqually-Sequalitchew Historic District
45PI00773	Prehistoric chipped stone isolate	Wessen, 2005	Wessen et al., 2005, 2008	Not eligible

SURVEY

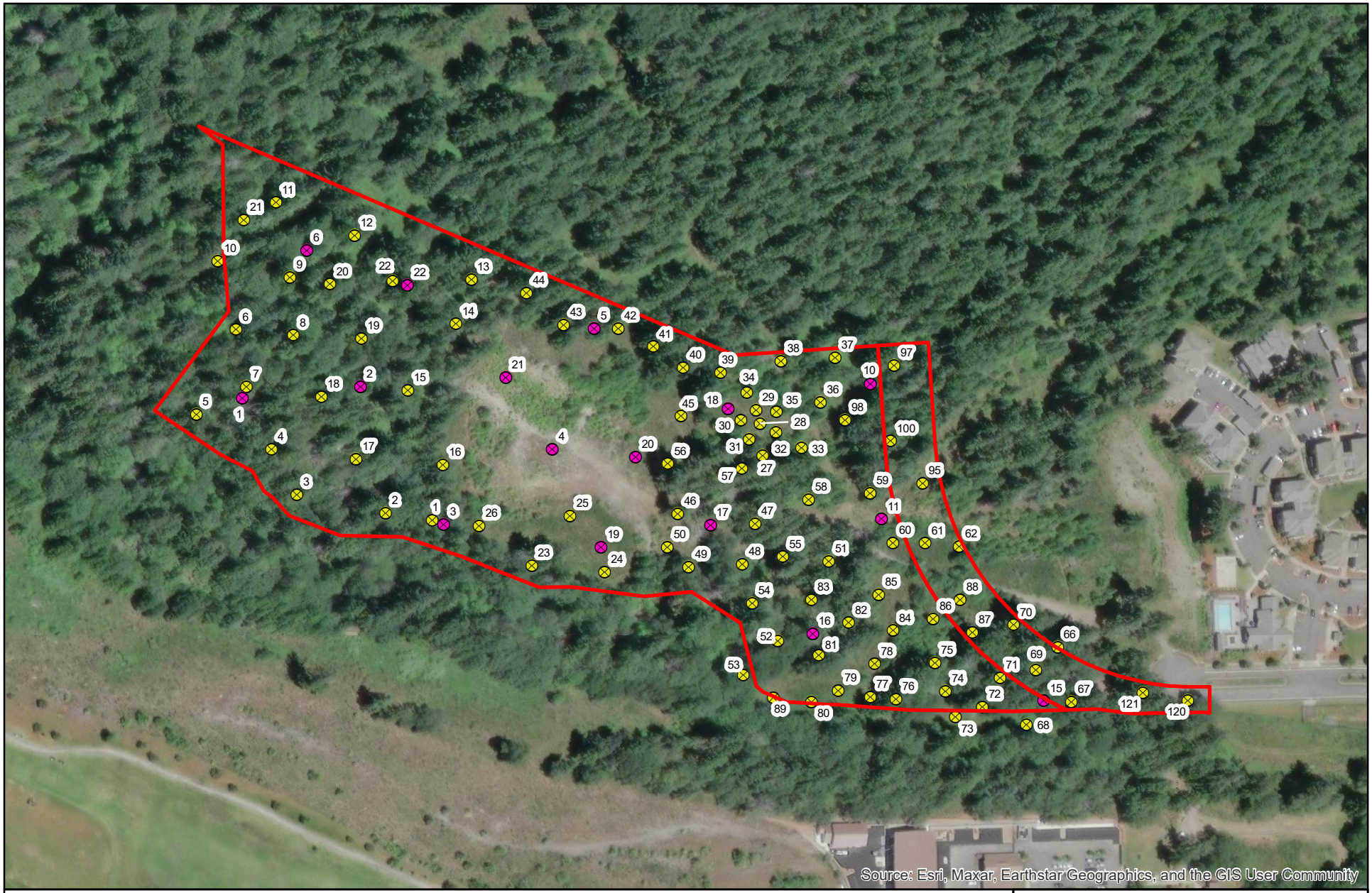
PCI conducted a pedestrian surface survey across the original 25.3-acre original project area. Transect spacing was no greater than 15 meters apart and survey was accomplished on an east-to-west bearing.

EXCAVATIONS

Following the pedestrian survey, 125 shovel test probes (STPs) and 22 geotechnical excavations (GTEs) were excavated across Lot Y at random intervals as shown on Figure 4. At the request of the City of DuPont and the DAHP, no STPs were placed in existing trails, pedestrian paths, or gravel roadways. Additionally, all STPs were backfilled and compacted daily. The STPs and GTEs were excavated using a backhoe with a 2-foot bucket attachment and smooth plate. The excavation of the STPs and GTEs totaled approximately 450 cubic meters of soil.

Each of the 125 STPs measured 3 feet in length and 2.5 feet in width. STP levels were dug in 7-cm (3- inch) increments or until sterile gravels were encountered. Soils taken from the STPs were screened through 1/8-inch hardware cloth. No STPs were placed in three hot spots, HS-3, HS-4, and HS-6, that include the former locations of sites 45PI00063 and 45PI00064 where prior soil remediation efforts removed contaminated soils and where sterile gravel is now exposed across these areas of Lot Y (Figures 2 and 4). Sterile gravel was encountered in 123 of 125 STPs between 35 and 130 centimeters below the surface (cmbs) (1.1-4.3 feet) and mixed stratigraphy or fill was present in two STPs. Records for the individual STPs, detailing levels, soil texture, color, and comments are included in Appendix C of PCI's 2011 report included as Appendix A of this memo.

Each of the 22 GTEs measured 3 feet wide by 5 feet long. GTE upper levels were dug in 3-inch (7 centimeter) increments or until sterile gravels were encountered. Lower levels of the GTEs, after encountering sterile gravels, were dug in 1-foot increments. Four of the GTEs were excavated in hot spot removal areas (Figures 2 and 4). Soils taken from the GTEs at 4 feet, 6 feet, and 10 feet were screened through 1/8-inch hardware cloth. Twenty GTEs were excavated to 305 cmbs (10 feet); one GTE with mixed stratigraphy was terminated at 250 cmbs (8.2 feet); one GTE filled with water at 244 cmbs (8 feet). Records for the individual GTEs, detailing levels, soil texture, color, and comments, are included in Appendix C of PCI's 2011 report included as Appendix A of this memo.



DuPont West Project
Figure 4: Subsurface Testing Map

Natural Investigations Company

Map Date 7/20/2023

Nisqually 1997 Quadrangle:Township 19N, Range 1E, Section 26

Surface Survey Results

All undeveloped ground surface areas in the boundaries of Lot Y were examined for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools, fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, fire pits, soil depressions, and features indicative of the former presence of structures or buildings (e.g., postholes, foundations), or historic debris (e.g., metal, glass, ceramics). Ground disturbances, including a graveled dirt road and dirt two-track, were visually inspected.

Surface survey did not identify any remnants of sites 45PI00063, 45PI00064, 45PI00455, or isolate 45PI00773. Survey did identify two brick fragments at the recorded location of site 45PI00066, three new historic sites, and a historic isolate. The three sites include 45PI01224, a segment of a previously identified narrow-gauge railroad track and grade, 45PI01225, a concrete railroad loading platform, and 45PI01226, a set of railroad bridge abutments. The isolate, 45PI00064, is a galvanized kerosene can. Only the isolated kerosene can, 45PI00064, is in the new Avenue 55, LLC project boundaries. No artifacts were collected. PCI archaeologists completed the appropriate Washington Archaeological Site Inventory and Isolate forms for all archaeological materials identified during the survey.

Subsurface Testing Results

The subsurface stratigraphy was consistent in 123 of the 125 STPs and all 22 GTEs excavated in the boundaries of DuPont West (Figure 4). The soil throughout the project area is consistent with the description for the Spanaway series developed on glacial outwash sediments. There are three soil horizons, though horizon 2 is not present in all STPs or GTEs. The depth of the horizons varies across the Lot Y landscape in relation to the topography and prior human disturbance. Horizon 1 is a moist, very dark brown (10 YR 2/2) gravelly sandy loam with weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots with a very high organic matter content. Horizon 2 is a moist very fine crumb dark gray brown (10 YR 3/2) gravelly sandy loam with little distinction in texture from horizon 1. Horizon 3 is moist and fluctuates between a dark gray brown (2 YR 4/2) and an olive brown (2YR 4/4) gravelly sand with no soil matrix. The single grained, loose sand is the prominent content with some rounded to sub-rounded cobbles; it is also very compact.

Only two of the subsurface units (STPs 28 and 115) contained cultural material. A brick fragment, measuring 3x4x2 inches, was located at 20 cmbs (8 inches) in STP 28 within site 45PI66 (Methodist Episcopal Mission). The brick was not handmade and no maker's marks were located on the fragment. Additionally, a smaller brick fragment was located at ground level within inches of STP 35 (also within 45PI66). STP 115 is located 18.5 feet due east of a concrete platform and the soil is entirely mixed down to a level of 200 cmbs (6.6 feet). A flat iron bar with four bolts protruding was located at 160 cmbs (5.2 feet). The iron bar measured 24 inches long by 3 inches wide and 1/8th inch thick, and has four 3.5-inch metal bolts spaced roughly 7 to 8 inches apart. The iron bar appears to be associated with the concrete platform, given its close proximity and the paint on the bolt heads matches the metal on the platform.

All but two of the 125 STPs (STP 89 and 115) were excavated until sterile gravel was encountered. Although the presence of the Spanaway series soil horizons was consistent, the depth of sterile gravel varied from 35 cmbs to 130 cmbs (1.1-4.3 feet) across Lot Y. STP 115 had mixed stratigraphy and was excavated to a depth of 200 cmbs (6.6 feet). The soil in STP 89 is a moist, brown (7.5 YR 4/4) silty loam until the typical underlying horizon appears at 110 cmbs (3.6 feet) as a moist, dark green brown (2.5 YR 4/4) gravelly sand. The typical upper horizon of gravelly sandy loam appears to have been removed near STP 89 and replaced with imported soil. The STP was placed 66 feet northeast of the set of bridge abutments. It seems likely that more stable soil was imported for the approach to the narrow-gauge bridge that once crossed Sequalitchew Creek.

Six of the STPs located in the eastern portion of the project (STPs 113, 116-119) near the gravel road display a gray upper horizon not noted in any other portion of the project area. The moist, dark gray (2.5 YR 3/1) soil is similar in structure to the typical horizon 1, but is noticeably different in color and is relatively thin (0-25 cm [0-9.8 inches]), and is likely related to prior disturbance.

STPs 120 through 125, located in the southeastern portion of the project area, all show evidence of a grass fire. Small flecks of charcoal are noted in the upper 5 cm of each unit. Of these six STPs, only STP 120 that is nearest to the creek extending to a depth of 95 cmbs (3.1 feet) and exhibited horizon 2.

In summary, only two artifacts were identified during excavation of the STPs. The two artifacts are the brick fragment recovered from STP 28 and the iron bar from STP 115. No other cultural material was identified as a result of excavation across Lot Y.

Geotechnical Subsurface Exploration Results

Twenty-two GTEs were excavated across Lot Y (Figure 4-only shows DuPont West GTEs, 16 total) to a depth of 305 cmbs (10 feet). Two GTEs, 9 and 14, were excavated to depths of 250 cmbs (8.2 feet) and 244 cmbs (8 feet), respectively. The soils throughout the GTEs are relatively consistent with the Spanaway series, although only five GTEs, 1, 3, 5, 12, 13, and 15, exhibit horizon 2. In the eastern section of Lot Y, GTE 9 has mixed stratigraphy and was excavated to a depth of 250 cmbs (8.2 feet). The upper horizon is a thin layer of sand (0-20 cmbs [0-8 inches]) followed by a mix of horizon 1 very dark brown (10 YR 2/2) gravelly sandy loam and sand with very few cobbles. It appears to be imported fill material. This unit is in close proximity to two of the hot spots, HS-3 and HS-4. In the northeastern section of Lot Y, GTE 14 was terminated at 244 cmbs (8 feet) when water entered the unit and began to fill rapidly. No cultural material was located in any of the 22 GTEs excavated across Lot Y.

CONCLUSIONS AND RECOMMENDATIONS

PCI completed an intensive-level pedestrian survey, subsurface testing (i.e., excavation of approximately 450 cubic meters of soil), monitored excavation of geotechnical exploration pits, and prepared an Unanticipated Cultural Resources Discovery Plan. PCI's investigations did not identify any evidence of site 45PI66, the Methodist Episcopal Mission, site 45PI455, a 9th U.S. Cavalry Bivouac, isolate 45PI773, a piece of chipped stone, or sites 45PI63 and 45PI64 that are reported as being destroyed as part of the hazardous materials remediation project that occurred across Lot Y. PCI did identify two new sites, 45PI1224, a segment of railroad track, and 45PI01225, a concrete platform, and isolate 45PI00064, a kerosene can.

Site 45PI66, the Methodist Episcopal Mission, is eligible for the NRHP under Criterion A for its association with significant events and also contributes to the proposed Nisqually-Sequalitchew Historic District, but the site is not eligible under Criterion D because there are no physical remains of the mission present on Lot Y. Similarly, site 45PI455, the location of the brief occupation of the area by the 9th U.S. Cavalry Buffalo Soldiers, is potentially eligible for the NRHP as a contributing element to the proposed Nisqually-Sequalitchew Historic District under Criterion A, but is not eligible under Criterion D because there are no physical remains of the bivouac area present on Lot Y. The two new sites in Lot Y, 45PI1224, a railroad track segment, and 45PI01225, a concrete platform, are recommended ineligible for the NRHP. The two isolates, 45PI773 and 45PI00064, are not eligible for the NRHP. In addition, new site 45PI01226, bridge abutments, located immediately outside the boundaries of Lot Y, is also recommended ineligible for the NRHP.

Lot Y has been extensively disturbed beginning with historic period settlement in the early 1880s, operation of the DuPont Powder Works in the early to mid-1900s (including use of part of Lot Y as a burning ground

dump from the 1930s until 1945), subsurface archaeological investigations and related artifact collection between 1989 and 2005, and environmental remediation activities in 1999 and 2000. In addition, survey and excavation by PCI did not identify any significant cultural resources. Therefore, PCI determined that no further cultural resources investigations were warranted prior to the development of Lot Y and that the development of the property would not affect any historic properties.

Regardless, the results of the literature research, local ethnographic settlement and subsistence patterns, the prehistory and history of the vicinity, and DAHP's predictive model, the project area is considered highly sensitive for prehistoric, ethnohistoric, and historic-era cultural resources. Consequently, PCI completed an Unanticipated Cultural Resources Discovery Plan for the development of Lot Y (Appendix E of PCI's report attached as Appendix A to this memo).

Natural Investigations reviewed PCI's cultural resources report titled *Archaeological Survey, Testing and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington* for the currently proposed development of Lot Y by Avenue 55, LLC and

- finds that the report is adequate for the currently proposed development of DuPont West Project;
- does not recommend any additional investigations for the currently proposed project because of the scale (e.g., excavation of 450 cubic meters of soil) and nature (e.g., soils remediation) of the previous investigations conducted across Lot Y;
- concurs with the findings in the report that sites 45PI00063, 45PI00064, 45PI00455, 45PI01224, and 45PI01225 do not meet the eligibility criteria for inclusion on the NRHP or the WHR;
- finds that sites 45PI01224 and 45PI01225 are not in the boundaries of the currently proposed DuPont West project on Lot Y;
- concurs with PCI that implementation of the previously proposed project that includes areas of Lot Y currently proposed for development would not affect any historic properties as defined at 36 CFR 800, the SEPA Checklist Section B, Number 13, and the DAHP;
- recommends that the inadvertent discovery plan prepared by PCI should be updated to include current contact information for individuals and agencies identified in the plan and be implemented for the currently proposed project as recommended in PCI's 2011 report; and
- pursuant to Washington state guidance recommends that appropriate representatives of the Native American community be contacted and informed of the currently proposed project.

In summary, Natural Investigations review of PCI's 2011 report determined that previous investigations and PCI's investigations are adequate for Avenue 55, LLC's currently proposed development of DuPont West on Lot Y and implementation of the DuPont West project would not affect any historic properties as defined at 36 CFR 800 and SEPA.

REFERENCES CITED

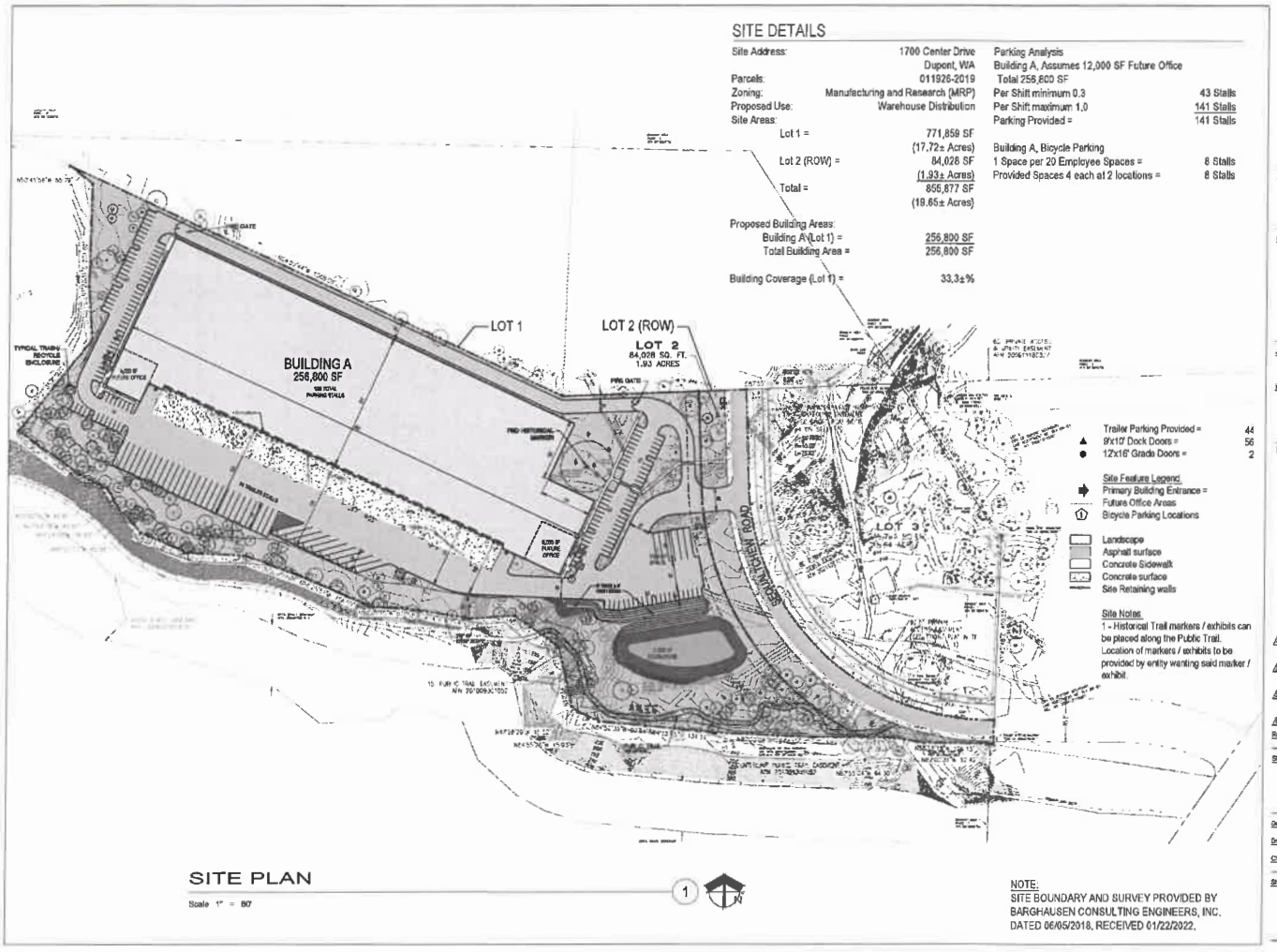
Sikes, Nancy E., and Cindy J. Arrington
2011 *Archaeological Survey, Testing and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington*. Report prepared by Parus Consulting, Inc. for DuPont Industrial Partners, LLC.

APPENDIX A:

Archaeological Survey, Testing, and Monitoring at 45PI66, 45PI455 and 45PI773, DuPont Industrial Partners, LLC, Lot Y Project, City of DuPont, Pierce County, Washington. Report prepared by Parus Consulting, Inc. 2011

Attachment 1z

Approved - 10/30/23



INNOVA architects
950 Pacific Avenue, Suite 450
Tacoma, WA 98402
253-572-4903

Project Title:
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600 University Street, Suite 2305
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October 10, 2023

NOT FOR CONSTRUCTION

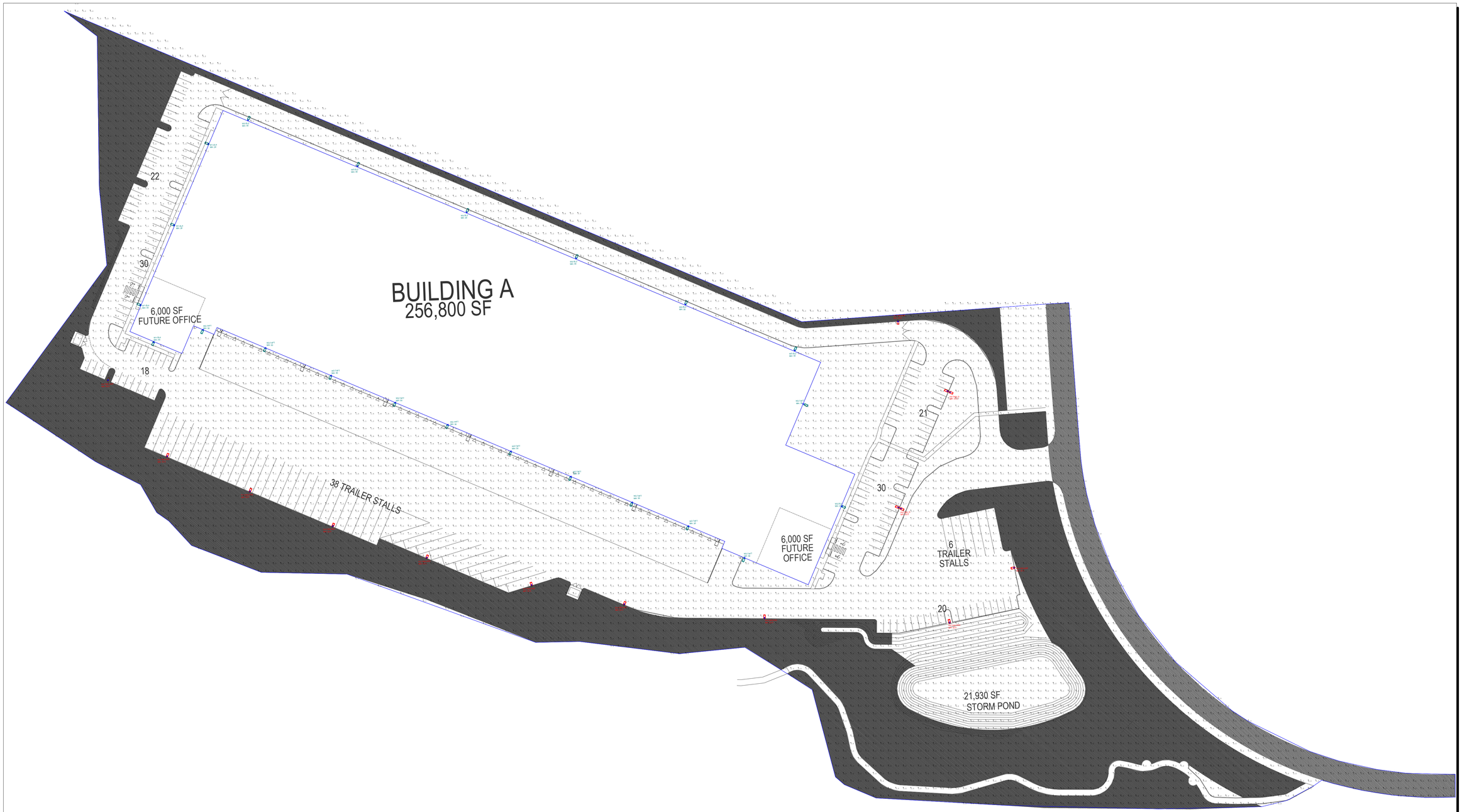
Revisions:

Sheet Title:
SEPA
Site Plan

Designed by: B. Ludwig, J. Eaves
Drawn by: B. Ludwig, J. Eaves
Checked by: P. McCormick

Sheet Number:
A0.1
of Sheets

Attachment 1aa



RANGE
ELECTRIC COMPANY

#	Date	Comments

Revisions

Drawn By: Range Electric Company

Date:11/2/2023

Dupont 1700 Center Drive

Luminaire Schedule				
Symbol	Qty	Description	Tag	Mounting Height
	2	GLEON-SA2C-740-U-T3R-HSS	P3-T3R-HSS	32.5
	9	GLEON-SA2C-740-U-T4W-HSS	P4-T4W-HSS	32.5
	4	GLEON-SA2C-740-U-T4W	P5-T4W-D	32.5
	4	GLEON-SA2C-740-U-SL4	W1-SL4	30
	11	GLEON-SA2C-740-U-T4FT	W2-T4FT	30
	7	GLEON-SA2C-740-U-SL2	W3-SL2	30

Calculation Summary		
Label	Units	Avg
Site 20' Of North Property Line	Fc	0.39
Site Calculation Points	Fc	0.61

RANGE ELECTRIC COMPANY

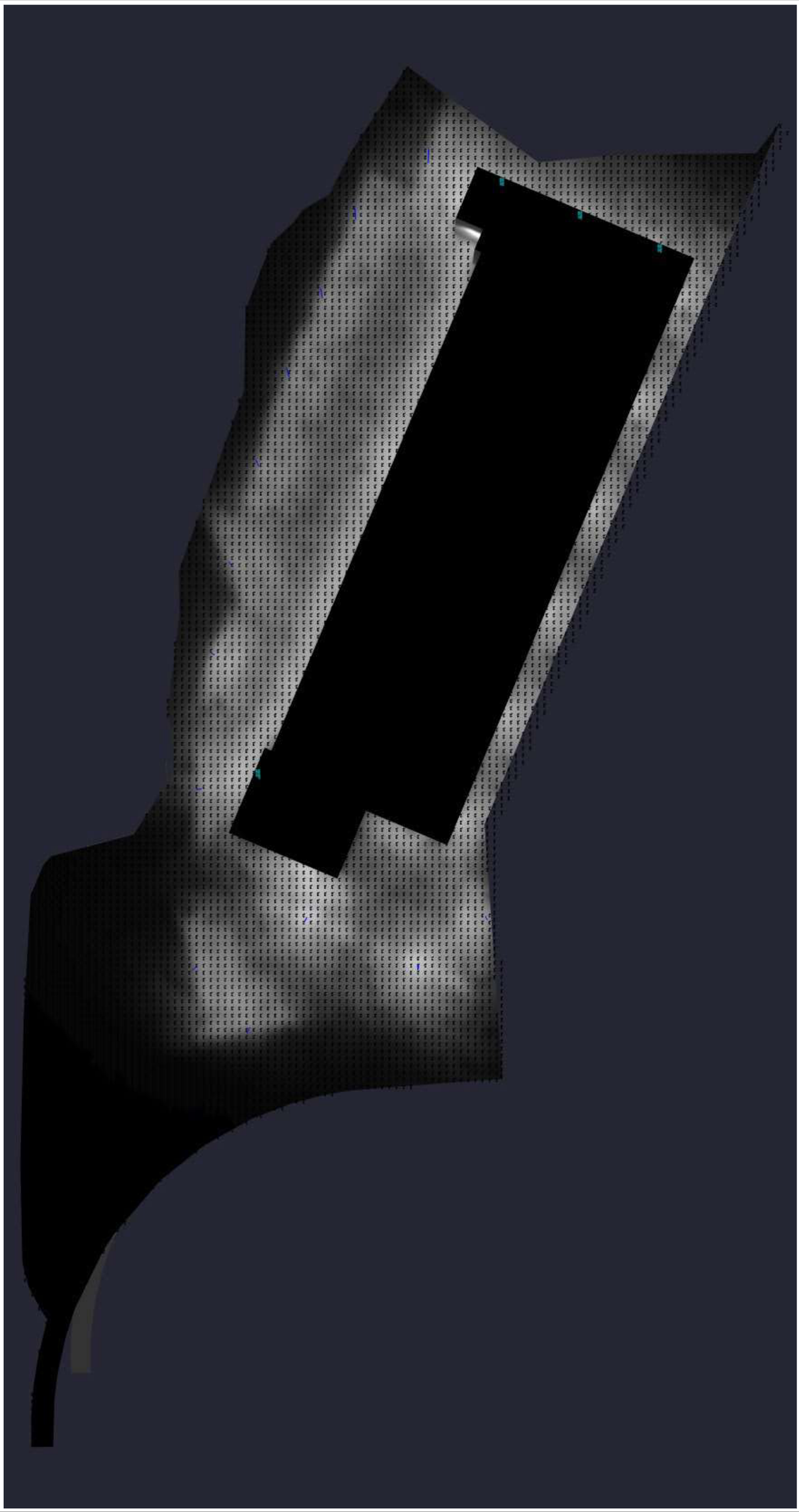
#	Date	Comments

Revisions

Drawn By: Range Electric Company

Date:11/2/2023

Dupont 1700 Center Drive



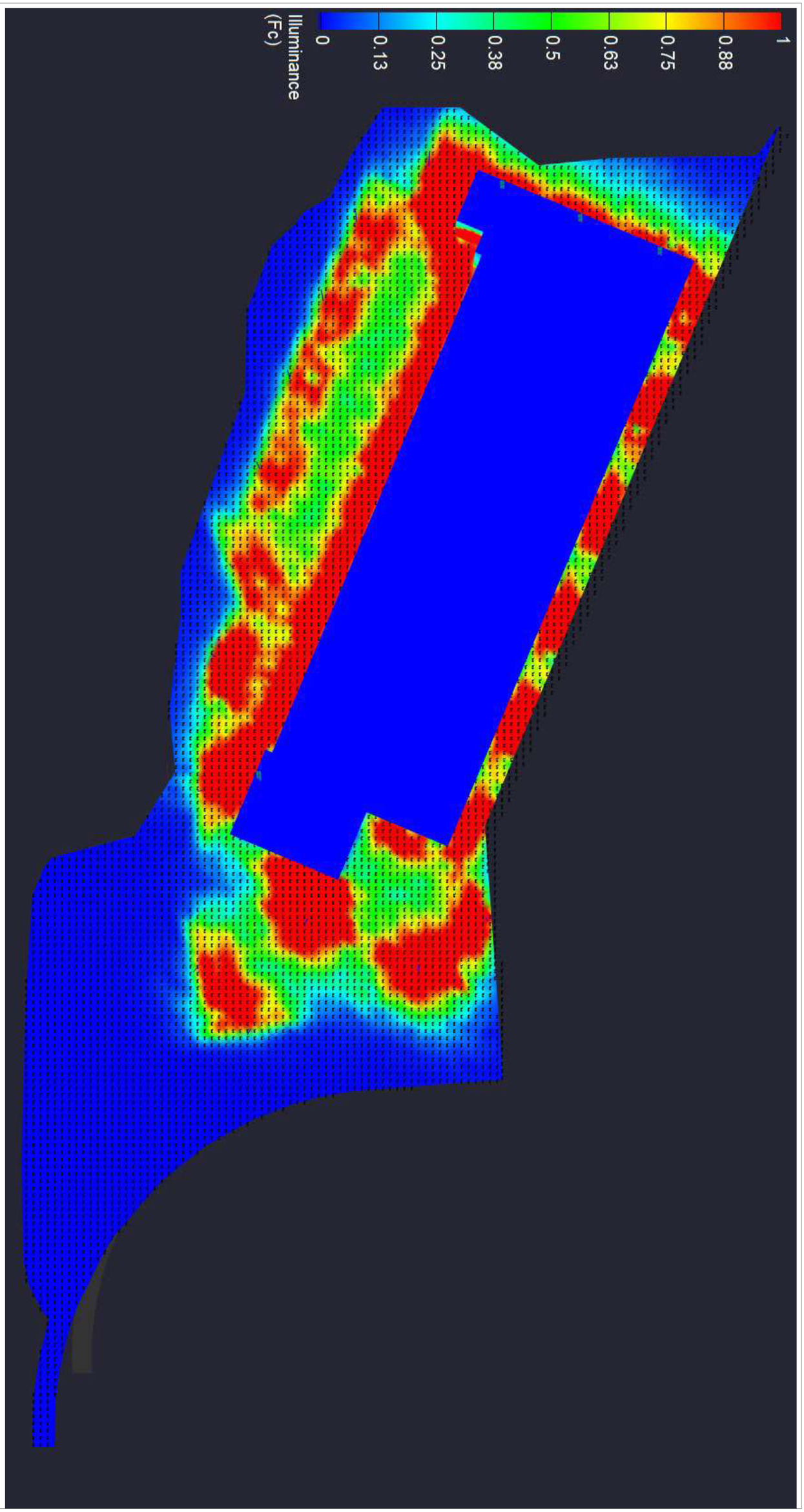
Dupont 1700 Center Drive

Drawn By: Range Electric Company

Date:11/2/2023

Revisions	#	Date	Comments

RANGE
ELECTRIC COMPANY



Dupont 1700 Center Drive

Drawn By: Range Electric Company

Date:11/2/2023

Revisions	#	Date	Comments

RANGE ELECTRIC COMPANY

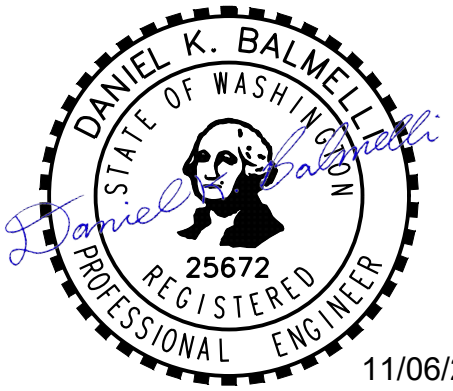
Attachment 1bb

BARGHAUSEN

STORMWATER SITE PLAN

DuPont - West

DuPont, Washington



11/06/2023

Prepared for:
Avenue 55, LLC
601 Union Street, Suite 2930
Seattle, WA 98101

November 6, 2023
Our Job No. 18666

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH KENT, WA 98032 P) 425-251-6222 F) 425-251-8782
BRANCH OFFICES: TUMWATER, WA KLAMATH FALLS, OR LONG BEACH, CA ROSEVILLE, CA SAN DIEGO, CA
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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This 19.65 acre site is located within a portion of the Northwest quarter of Section 26, Township 19 North, Range 1 East, Willamette Meridian, Pierce County, Washington. Of these 19.65 acres, 15.25 acres will be cleared, graded, and developed into a commercial building site and new public roadway. There are no known wetlands on the project site.

All Minimum Requirements apply to this project site and the following pages of this report describe how those Minimum Requirements will be met with this development. Flow control will be provided by an infiltration pond which has been sized to serve the proposed development of Lot 1 under this permit as well as any potential future development of Lot 3. In addition, a separate infiltration gallery has been provided to serve the new public road on Lot 2. Water quality will be provided by three Modular Wetland Systems which have General Use Level Designation for Enhanced, Phosphorus, and Basic Water Quality treatment per the Department of Ecology.

According to the topographic survey, there are no upstream basins that contribute runoff to this site.

A new infiltration pond will be constructed to provide stormwater flow control for the proposed development. This pond has been sized to serve the proposed development of Lot 1 under this permit as well as any potential future development of Lot 3. In addition, a separate infiltration gallery has been provided to serve the new public road on Lot 2. Per Pierce County requirements, the pond and gallery been sized to infiltrate all stormwater runoff from the site up to the 100-year storm event. The conveyance system for this project has been sized using Santa Barbara Urban Hydrograph (SBUH) methodology to convey the 25-year storm event in all conveyance elements without surcharging any manholes or catch basins. Please see the following pages of this report for stormwater facility details and sizing calculations.

1.0 ANALYSIS OF THE MINIMUM REQUIREMENTS

1.0 ANALYSIS OF THE MINIMUM REQUIREMENTS

Per Figure 1.1, the Flow Chart for Determining the Minimum Requirements for New Developments, all Minimum Requirements 1 through 9 apply to this project. The following is a list of each of the Minimum Requirements and how this Stormwater Site Plan and site development project meet those requirements.

Minimum Requirement No. 1: Preparation of Stormwater Site Plan.

Response: This document meets the requirements for preparation of a Stormwater Site Plan.

Minimum Requirement No. 2: Stormwater Pollution Prevention Plan.

Response: Please see Section 6.0 of this report for the Stormwater Pollution Prevention Plan prepared for this project.

Minimum Requirement No. 3: Source Control of Pollution.

Response: All known, available, and reasonable Source Control BMPs will be applied to this project. At a minimum the owner will be educated about the proper use of pesticides and fertilizers, the parking lot will be swept on a regular basis, and the trash enclosure will be covered.

Minimum Requirement No. 4: Preservation of Natural Drainage Systems and Outfalls.

Response: Under existing conditions, all stormwater onsite infiltrates into the ground. Because the development proposes to infiltrate all stormwater runoff onsite, the existing drainage system will be preserved.

Minimum Requirement No. 5: On-Site Stormwater Management.

Response: Per the attached geotechnical report in section 7.0, soils on site will provide a minimum infiltration rate of 15 inches per hour. For this reason, an infiltration pond and gallery are proposed to provide onsite stormwater management.

Minimum Requirement No. 6: Runoff Treatment.

Response: Three Modular Wetland Systems are proposed to provide water quality treatment for all runoff from this project. This system has General Use Level Designation (GULD) from the Department of Ecology for enhanced water quality treatment.

Minimum Requirement No. 7: Flow Control.

Response: Flow control will be provided for this site by an onsite stormwater infiltration pond. In addition, a separate infiltration gallery is proposed to serve the improvements to Sequalitchew Drive. Per Pierce County Requirements, these facilities have been designed to infiltrate 100% of runoff from the project site up to and including the 100-year storm event.

Minimum Requirement No. 8: Wetlands Protection.

Response: There are no known wetlands on or adjacent to this site.

Minimum Requirement No. 9: Operation and Maintenance.

Response: An Operations and Maintenance Manual is included in this report and meets the requirements of the Pierce County stormwater manual.

FIGURE 1.1 - MINIMUM REQUIREMENTS SUMMARY

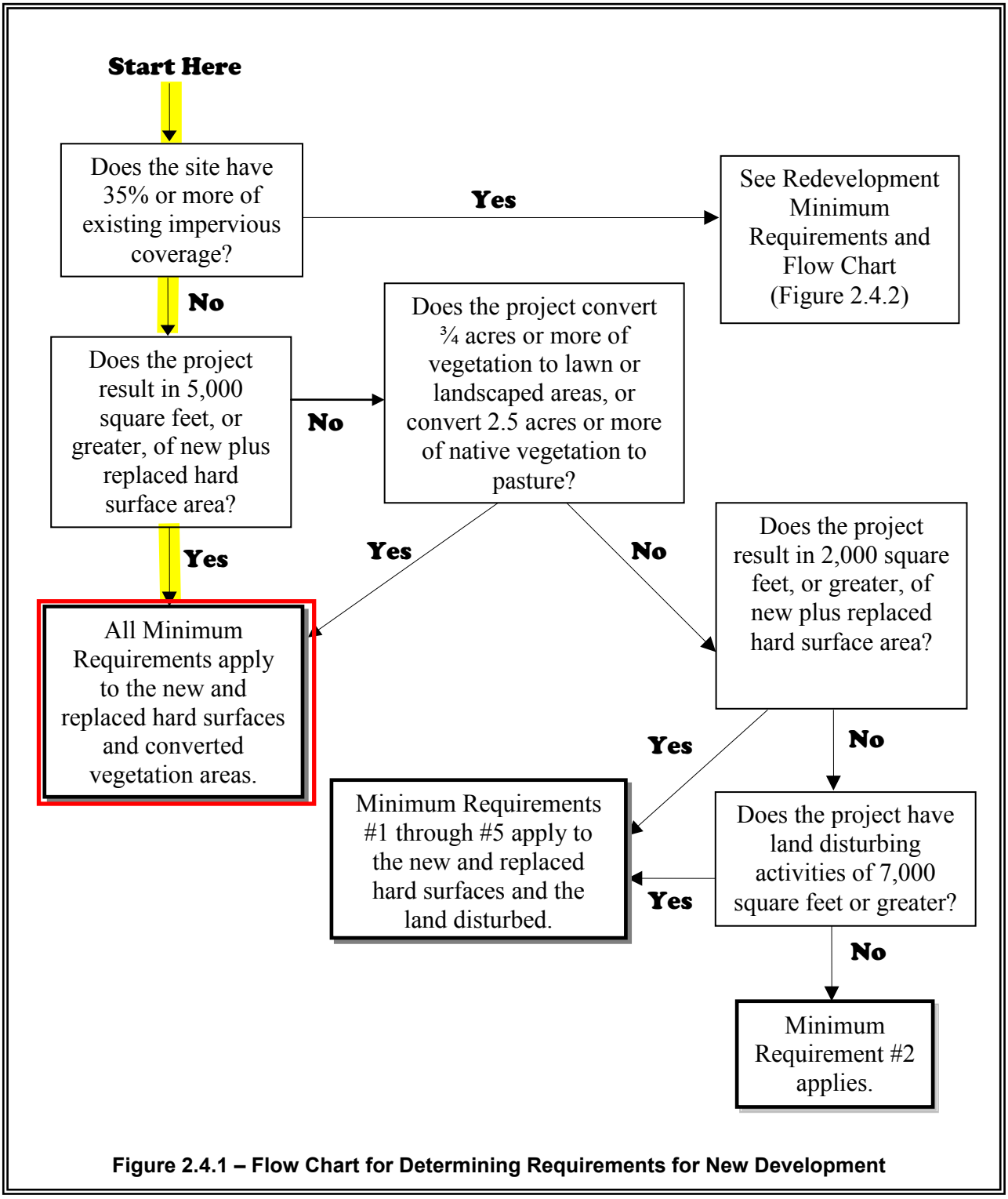


Figure 2.4.1 – Flow Chart for Determining Requirements for New Development

2.0 PROJECT OVERVIEW

2.0 PROJECT OVERVIEW

The site is located within a portion of the Northwest quarter of section 26, Township 19 North, Range 1 East, Willamette Meridian, Pierce County, Washington. The address of this site is 1700 Center Drive DuPont, WA 98327

The proposal of this project is to construct one new warehouse building approximately 256,800 SF in size along with a loading dock, paved drive aisles, and new utilities. Half street construction is also proposed to connect into the existing portion of Sequalitchew Drive to the southeast of the site. The remaining eastern side of Sequalitchew Drive will be constructed when Lot 3 is developed. Improvements under this permit include 13.10 acres of impervious surfaces while the remaining site area will consist of pervious surfaces in the form of landscaping, pond area, and undisturbed land, which total 6.55 acres.

For stormwater flow control, a new infiltration pond is proposed. This pond has been sized to serve the proposed development of Lot 1 under this permit as well as any potential future development of Lot 3. In addition, a separate infiltration gallery has been provided to serve the new public road on Lot 2. These facilities have been sized to handle the 100-year storm event for site. Stormwater quality treatment will be provided by three Modular Wetland Units which have General Use Level Designation (GULD) from the Department of Ecology for enhanced water quality treatment. Please see the following pages of this report for sizing of these facilities.

3.0 EXISTING CONDITIONS SUMMARY

3.0 EXISTING CONDITIONS SUMMARY

Under existing conditions, the eastern and western portions of the site are thickly forested. The center of the site is an open area of gravel with downward slopes of approximately 3:1. To the west of the gravel area, the site is relatively flat, other than a few areas of moderate slopes. On the east of the gravel area, the site is moderately steep, where it generally slopes downward to the southwest at a minimum of 7% and at most 30% on the far east side of the site. Overall, the site slopes downward to the southwest.

Per the geotechnical report, groundwater levels in the area are at an elevation of roughly 140' and none is expected to be encountered during construction. A minimum infiltration rate of 15 inches per hour can be used to size the proposed infiltration pond.

4.0 OFF-SITE ANALYSIS REPORT

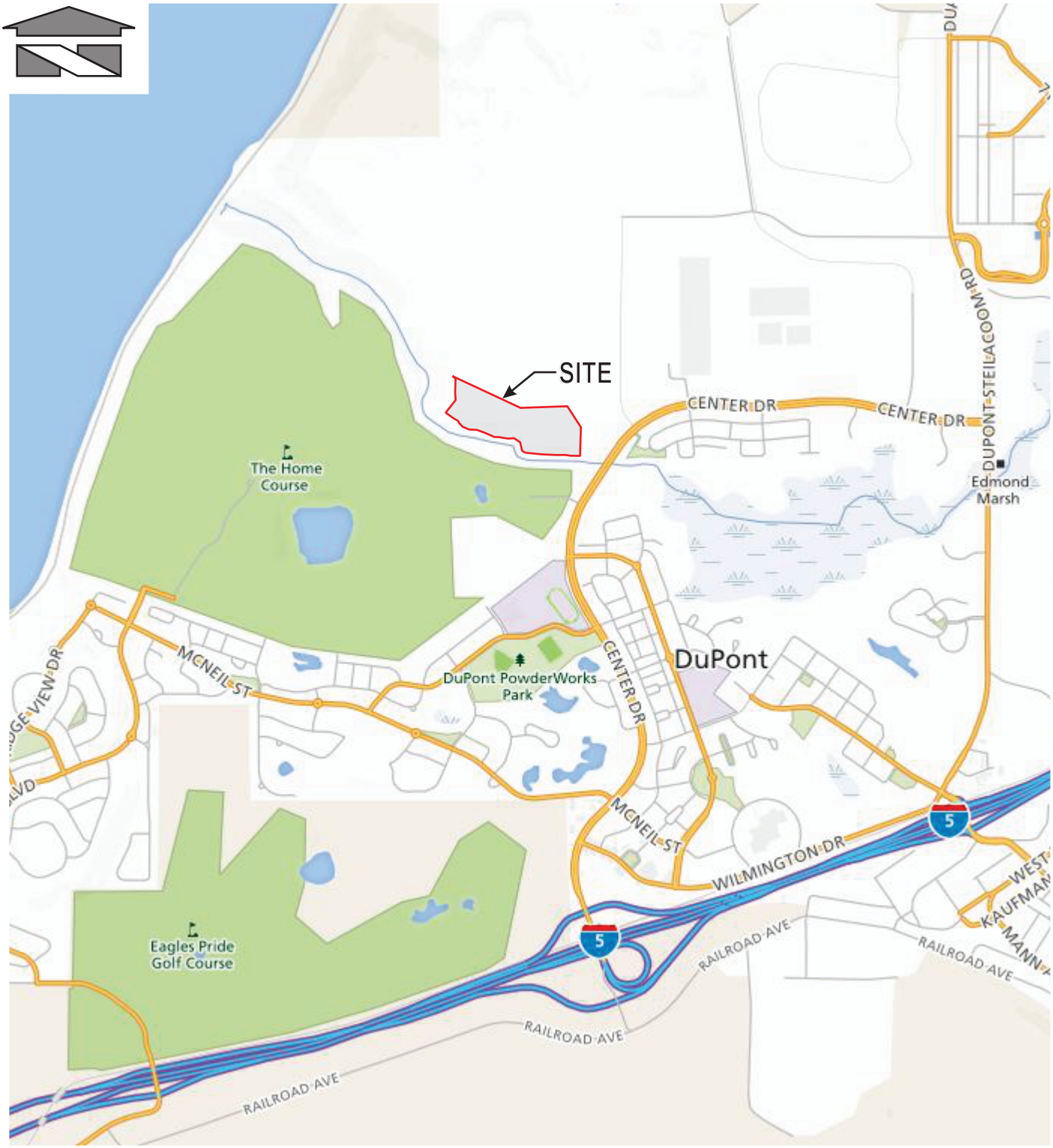
4.0 OFF-SITE ANALYSIS REPORT

An Off-Site Analysis Report will be included with the final Stormwater Site Plan.

Upstream Basin Analysis

There do not appear to be any upstream basins that contribute runoff to this project.

VICINITY MAP



REFERENCE: Rand McNally (2017)

Scale:
Horizontal: **N.T.S.** Vertical: **N/A**

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For:
Dupont Industrial Warehouse
Dupont, Washington

Title:
VICINITY MAP

Job Number
18666

DATE: 12/19/17

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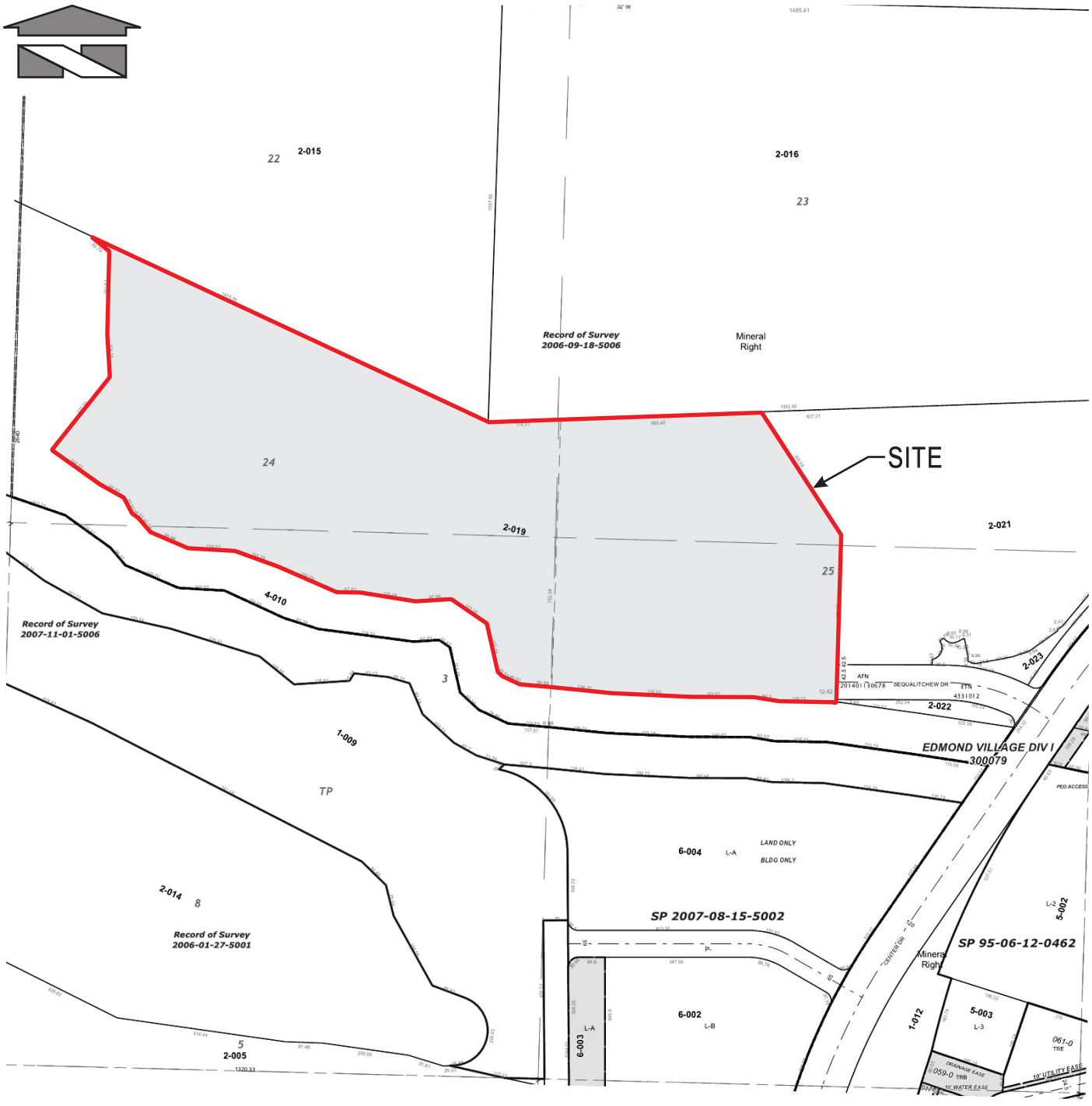
ASSESSOR'S MAP



REFERENCE: Pierce County Department of Assessments (Dec. 2015)

Scale: Horizontal: **N.T.S.** Vertical: **N/A**	*For:* Dupont Industrial Warehouse Dupont, Washington	Job Number 18666
BARGHAUSEN CONSULTING ENGINEERS, INC. 18215 72ND AVENUE SOUTH KENT, WA 98032 (425) 251-6222 (425) 251-8782 CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES	*Title:* ASSESSOR MAP	DATE: 12/19/17

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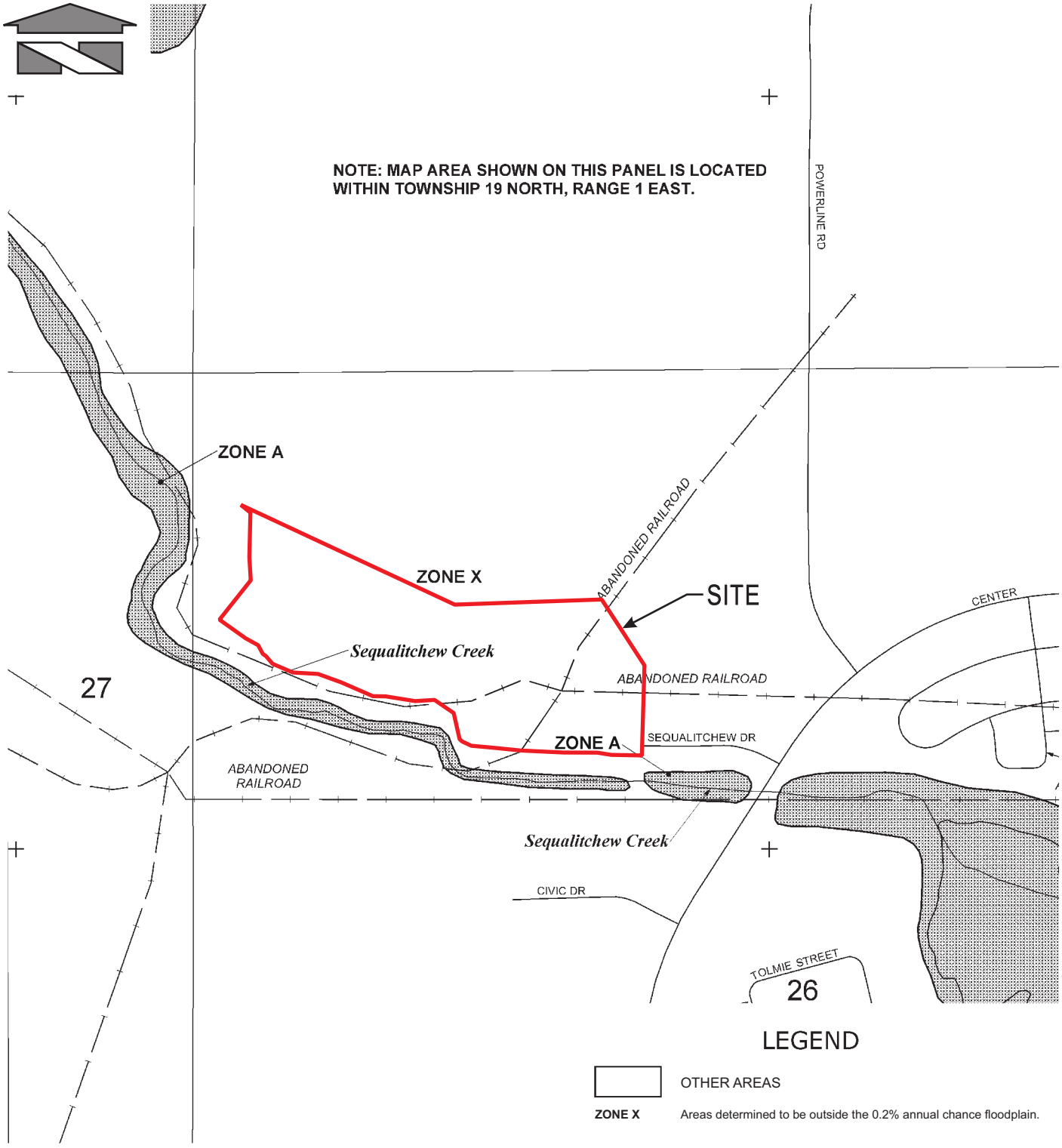
FEMA MAP



REFERENCE: Federal Emergency Management Agency (Portion of Map 53053C0507E, March 2017)

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For:
Dupont Industrial Warehouse
Dupont, Washington

Title:
FEMA MAP

Job Number
18666

DATE: 12/19/17

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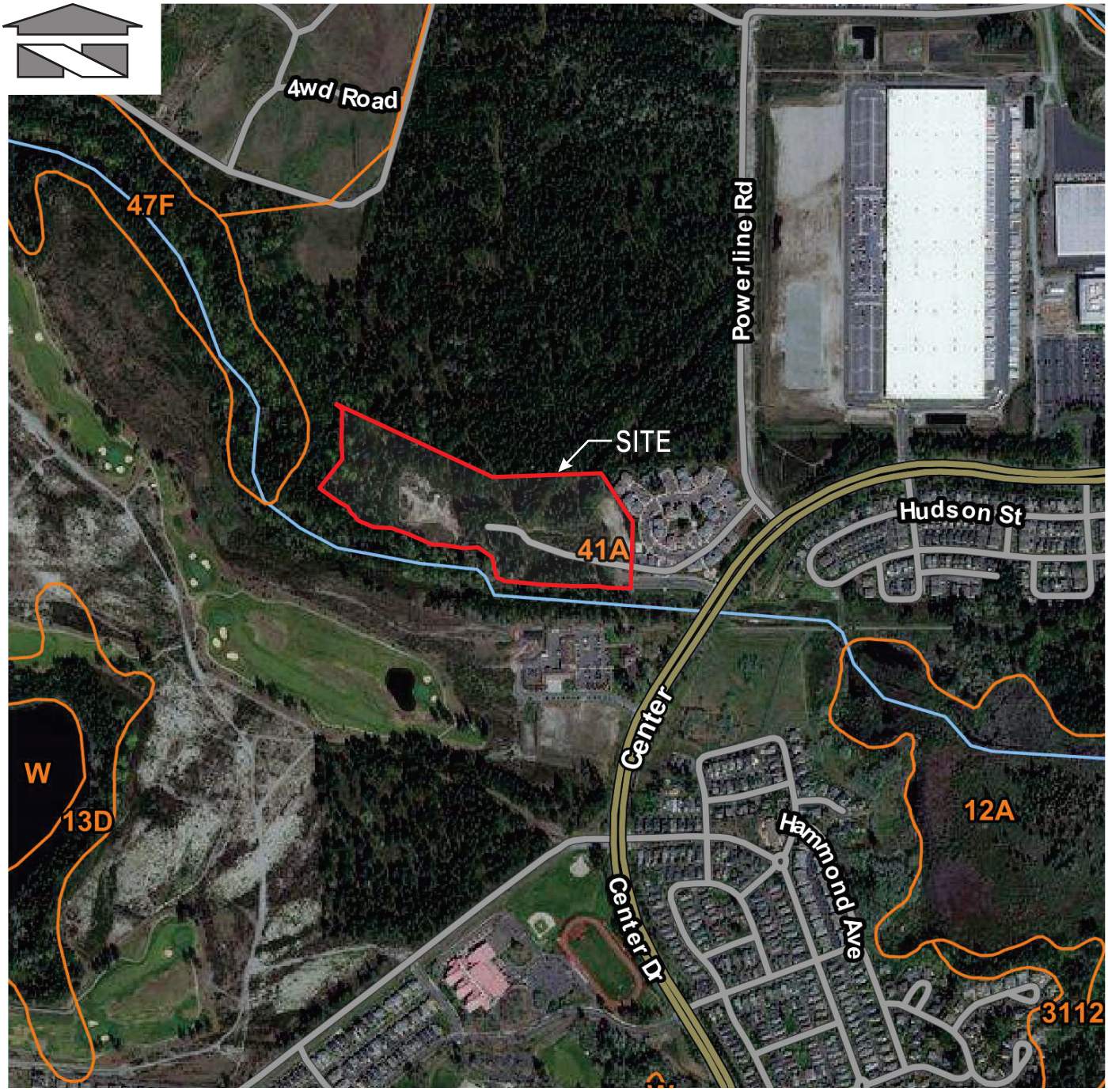
SOILS MAP



REFERENCE: USDA, Natural Resources Conservation Service

LEGEND:

41A = Spanaway gravelly sandy loam

Scale:

Horizontal: **N.T.S.** Vertical: **N/A**

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For:

Dupont Industrial Warehouse
Dupont, Washington

Title:

SOIL SURVEY MAP

Job Number

18666

DATE: 12/19/17

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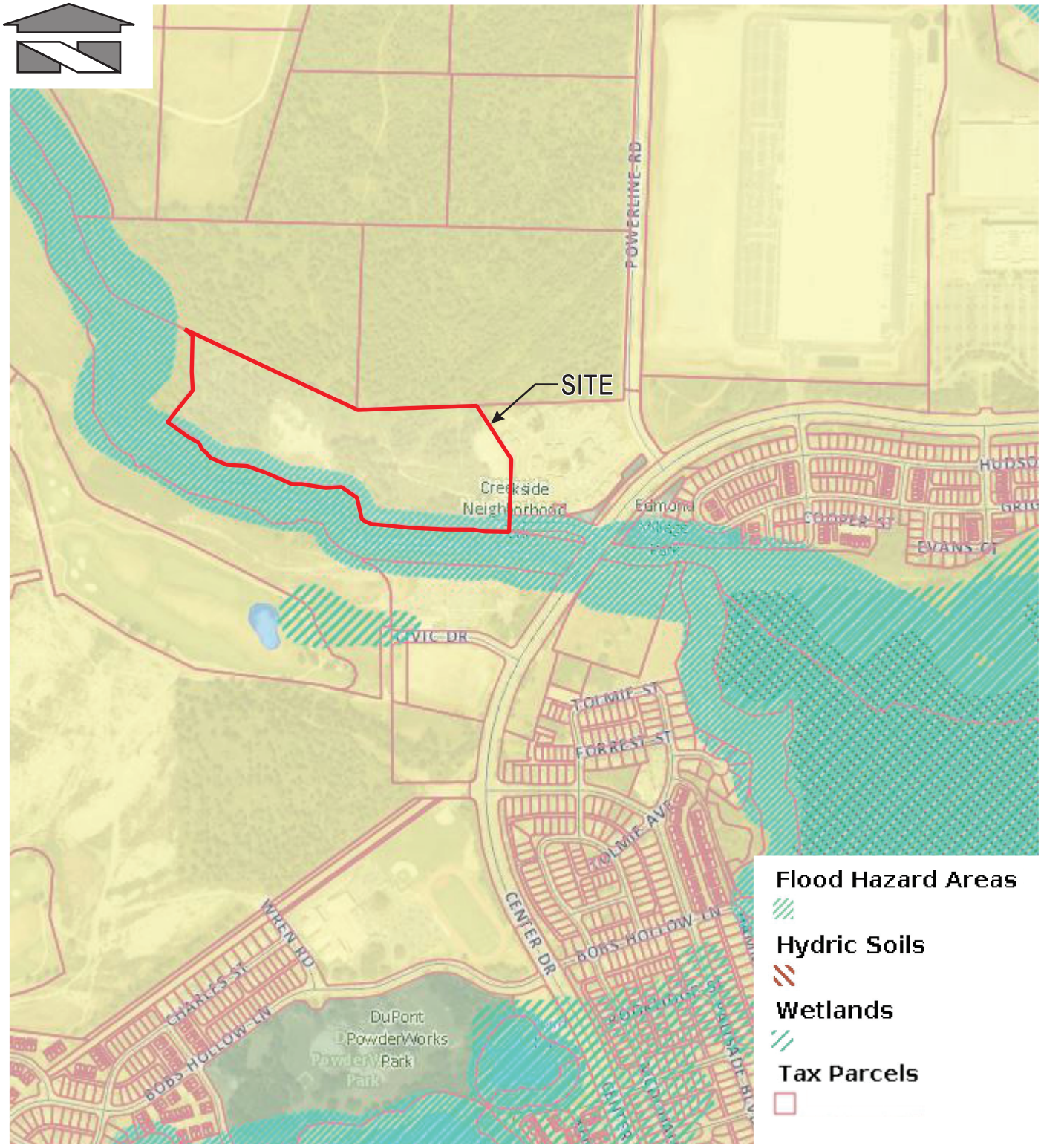
SENSITIVE AREAS MAP



REFERENCE: Pierce County PublicGIS

Scale:
Horizontal: **N.T.S.** Vertical: **N/A**

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CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

For:
Dupont Industrial Warehouse
Dupont, Washington

Job Number
18666

Title:
SENSITIVE AREAS MAP

DATE: 12/19/17

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5.0 PERMANENT STORMWATER CONTROL PLAN

5.0 PERMANENT STORMWATER CONTROL PLAN

Part A Existing Site Hydrology

The existing project site consists of approximately 19.65 acres of forested land. There is an existing gravel area near the center of the site, which depresses at a slopes ranging from 30% to 45%. There are existing 1:1 slopes to the south of the property. The majority of the site is moderately steep, with slopes ranging from 2% to 20%. The east side of the site has slopes ranging from 13% to 70%. The site generally slopes southwest. This site lies within Spanaway gravelly sandy loam, according to the USDA Web Soil survey.

Under existing conditions, all stormwater onsite infiltrates into the ground. Full infiltration is also the proposed means of stormwater flow control for the project, preserving the natural site discharge.

Part B Developed Site Hydrology

The developed site will include approximately 13.10 acres of impervious surfaces and 6.55 acres of pervious landscaped and undeveloped areas. Of the impervious areas, the proposed building roof area will be approximately 5.90 acres while the remaining 7.20 acres will consist of asphalt and concrete paving. An infiltration pond and two modular wetland units are proposed to serve the development of Lot 1 under this permit. These facilities have been sized to handle any additional runoff that would potentially be generated from the future development of Lot 3. In addition, a separate infiltration gallery and Modular Wetland Unit are proposed to serve runoff from the public roadway on Lot 2. Because roof area is a non-pollution generating surface, roof runoff will be discharged directly into the infiltration pond, bypassing the water quality system.

As required by the Pierce County Stormwater Management and Site Development Manual, the infiltration pond and gallery were sized using WWHM 2012 to handle runoff from the 100-year storm event. However, in the unlikely occurrence of a storm beyond the 100-year storm event, additional storage is provided onsite. Once 0.60’ of freeboard is reached in the pond above the maximum water surface, water will also begin to pond in the truck court area, providing emergency storage for events beyond the 100-year storm.

Part C Performance Standards and Goals

The flow control standard for this project is 100% infiltration of all stormwater runoff up to and including the 100-year storm event. The water quality devices have been sized to treat 91% of total stormwater volume across all modeled storm events. The Santa Barbara Urban Hydrograph (SBUH) methodology will be used in the final report to size all conveyance elements for the 25-year storm event.

Part D Low Impact Development Features

Flow control for this project will be provided by a new infiltration pond and gallery which will infiltrate 100% of stormwater runoff from the project onsite, eliminating any discharge from the property.

Part E Flow Control System

Flow control for the project will be provided by a new infiltration pond and gallery which have been sized using WWHM 2012 to process 100% of stormwater runoff from the development of Lots 1 and 2 proposed under this permit as well as any runoff from the potential future development of Lot 3.

Part F Water Quality System

Water quality for this project will be provided by three Modular Wetland Systems which have General use Level Designation (GULD) for enhanced water quality treatment from the Department of Ecology. These units have been sized using WWHM 2012 to treat 91% of the total runoff volume across all storm events per the Pierce County Stormwater Management and Site Development Manual.

Part G Conveyance System Analysis and Design

The conveyance system for this project has been sized to convey the 25-year storm event per the requirements of the Pierce County stormwater manual using a 5-minute time of concentration and a Manning's 'n' value of 0.013 for all pipes. Conveyance calculations will be provided in the final storm report.

FLOW CONTROL AND WATER QUALITY SIZING CRITERIA

FLOW CONTROL AND WATER QUALITY SIZING CRITERIA

Lot 1

Roof Tops	=	5.90 Acres
Pavement	=	5.75 Acres
Pond	=	0.50 Acres
Landscape	=	5.57 Acres
Total	=	17.72 Acres

Lot 2 (Sequalitchew Drive)

Pavement	=	1.45 Acres
Landscape	=	0.48 Acres
Total	=	1.93 Acres

Lot 3 (Future development under separate permit)

Roof Tops	=	1.30 Acres
Pavement	=	2.26 Acres
Landscape	=	2.08 Acres
Total	=	5.64 Acres

BASIN MAP

Pipe Conveyance Calculations will be included in the final Stormwater Site Plan.

GRADING PLAN

PRELIMINARY GRADING AND STORM DRAINAGE PLAN-WEST
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

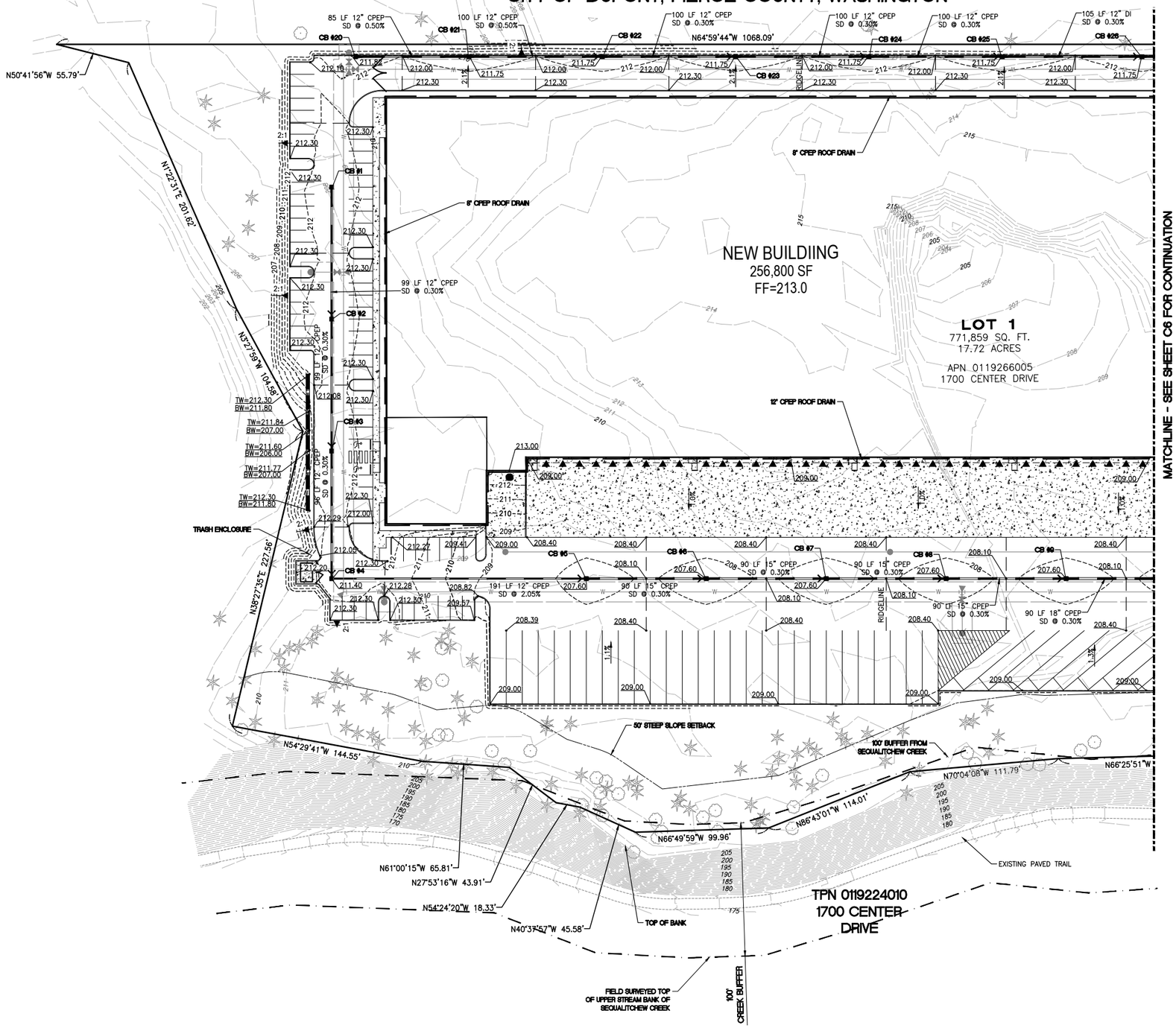
1"=40'
0 20 40 80

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

NOTE:
ALL TREES SHOWN ON THIS SHEET ARE TO REMAIN DURING DEMOLITION



No.	Date	By	Ckd.	Appr.	Revision
2	11/06/23	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title: PRELIMINARY GRADING AND STORM DRAINAGE PLAN-WEST FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELLI — STATE OF WASHINGTON — 25672 — REGISTERED PROFESSIONAL ENGINEER
11/06/2023

Scale: Horizontal 1"=40' Vertical N/A

Designed JAT Drawn JAT Checked DKB Approved DKB Date 11/06/23 JTOWNE Xref: -----

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Job Number 18666

Sheet C5 of 13

PRELIMINARY GRADING AND STORM DRAINAGE PLAN-EAST
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80

APPROVED FOR CONSTRUCTION

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NOTE:
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MATCHLINE - SEE SHEET C5 FOR CONTINUATION

NEW BUILDING
256,800 SF
FF=213.0

LOT 1
771,859 SQ. FT.
17.72 ACRES
APN 0119266005
1700 CENTER DRIVE

APN 0119266007
1700 CENTER DRIVE

LOT 2
84,028 SQ. FT.
1.93 ACRES
APN 0119266006
1700 CENTER DRIVE

TPN 0119224010
1700 CENTER DRIVE

100 LF 12" DI SD @ 0.30%
57 LF 12" CPEP SD @ 0.30%
75 LF 12" CPEP SD @ 0.30%
117 LF 12" CPEP SD @ 0.30%
87 LF 12" CPEP SD @ 0.30%
134 LF 12" CPEP SD @ 0.30%
122 LF 12" CPEP SD @ 0.50%
159 LF 18" CPEP SD @ 0.30%
113 LF 18" CPEP SD @ 0.30%
85 LF 18" CPEP SD @ 0.30%
121 LF 18" CPEP SD @ 0.30%
21 LF 24" CPEP SD @ 0.30%
30 LF 12" RCP SD @ 0.30%
115 LF 18" CPEP SD @ 0.30%
144 LF 18" CPEP SD @ 0.30%
99 LF 12" CPEP SD @ 0.30%
56 LF 12" CPEP SD @ 0.30%
128 LF 18" CPEP SD @ 0.30%
83 LF 24" CPEP SD @ 0.30%
90 LF 18" CPEP SD @ 0.30%
76 LF 18" CPEP SD @ 0.30%
69 LF 12" CPEP SD @ 0.50%
97 LF 12" CPEP SD @ 0.50%
32 LF 12" CPEP SD @ 0.50%
58 LF 12" CPEP SD @ 0.50%
97 LF 12" CPEP SD @ 0.50%
97 LF 12" CPEP SD @ 0.50%
97 LF 12" CPEP SD @ 0.50%

CB #27, CB #26, CB #30, CB #29, CB #31, CB #32, CB #33, CB #34, CB #35, CB #36, CB #10, CB #11, CB #12, CB #13, CB #14, CB #15, CB #16, CB #17, CB #18, CB #R1, CB #R2, CB #R3, CB #R4, CB #R5, CB #R6, CB #R7, CB #R8, CB #R9

SDMH #2, SDMH #1, SDMH #3, SDMH #4, SDMH #5, SDMH #6

MW #2, MW #1, MW #3

8" CPEP ROOF DRAIN
12" CPEP ROOF DRAIN

S87°59'34"W 665.45'
S87°59'34"W 308.23'
S87°59'34"W 92.50'
N02°02'40"W 9.96'
N02°02'40"W 188.40'
TEMPORARY 45' RADIUS CUL-DE-SAC
45' RADIUS PRIVATE TEMPORARY TURNAROUND EASEMENT (SEE SHORT PLAT NOTE #4 ON SHEET 1)
Δ=96°17'05" R=45.00' L=75.62'
TEST PIT (TYPICAL)
EDGE OF FUTURE ROW
DRIVER LINE OF SIGHT
92.5' PRIVATE ACCESS EASEMENT (TO BE RELEASED)
(TITLE PARCEL 8) 92.5' PRIVATE ACCESS EASEMENT (SEE SHORT PLAT NOTE #3 ON SHEET 1)
STUB FOR POTENTIAL FUTURE STORM CONNECTION
PROPOSED 45' DRIVEWAY
PROPOSED 5' SIDEWALK
CENTERLINE OF PROPOSED SEQUALITCHEW ROAD
SEQUALITCHEW ROAD
85' PUBLIC SANITARY SEWER EASEMENT AFN 2021120701O4
REMAINDER OF SEQUALITCHEW ROAD TO BE CONSTRUCTED UNDER SEPARATE PLAN AND PERMIT
PROPOSED HALF STREET IMPROVEMENTS SEE SHEETS C9 AND C10 FOR DETAILS
STUB FOR FUTURE HALF STREET IMPROVEMENTS
Δ=8°14'08" R=477.00' L=68.60'
Δ=45°34'52" R=589.50' L=468.90'
20'x120' INFILTRATION GALLERY BOTTOM EL=204.0
42.5' FUTURE ROW
42.5' PROPOSED ROW
REMAINING 50' OF LOT 2 TO MAINTAIN PRIVATE OWNERSHIP
EX. CUL-DE-SAC
PROPOSED 30' DRIVEWAY

PROPOSED INFILTRATION POND
TOP OF POND = 208.0
MAX. WATER SURFACE = 207.0
BOTTOM OF POND = 201.0
BOTTOM AREA REQUIRED = 10,000 SF
BOTTOM AREA PROVIDED = 10,680 SF
STORAGE VOLUME REQUIRED = 85,400 CF
STORAGE VOLUME PROVIDED = 92,550 CF
PER RECD NO. 201009301052

50' STEEP SLOPE SETBACK
TRASH ENCLOSURE
EX. MONITOR WELL RIM=212.78 TOP_PVC=212.08
100' BUFFER FROM SEQUALITCHEW CREEK
6' WIDE, 8' TALL BERM TOP = 214.0
PROPOSED SEQUALITCHEW TRAIL CONNECTION
EXISTING PAVED TRAIL
TOP OF BANK
EXISTING SLOPE
100' CREEK BUFFER
PROPOSED 8' WIDE SEQUALITCHEW CREEK TRAIL
FIELD SURVEYED TOP OF UPPER STREAM BANK OF SEQUALITCHEW CREEK
EX. OREGON WHITE OAK TO REMAIN
30' PUBLIC TRAIL EASEMENT AND TRAIL CONSTRUCTION EASEMENT PER 201009301052
15' PUBLIC TRAIL EASEMENT PER REC. NO. 201009301052
17.5' PUBLIC TRAIL CONSTRUCTION EASEMENT PER REC. NO. 201009301052
WOOD FENCE
DRIVE, ROAD
(3) BOLLARDS
SIGN (TYP.)

N89°05'40"W 57.87'
N80°54'14"W 135.48'
S86°29'27"W 87.56'
N55°38'41"W 105.16'
N27°44'18"W 121.19'
N47°28'29"W 15.52'
N64°55'26"W 45.93'
N84°52'39"W 90.84'
N84°13'45"W 134.11'
N87°20'08"W 194.51'
N89°48'29"W 95.90'
N89°48'29"W 55.77'
N89°43'57"W 10.00'
N88°58'18"W 126.13'
N80°55'04"W 64.30'
N82°02'31"W 12.42'

LEFT TURN SIGHT DISTANCE

Design vehicle	Time gap (t_g) (seconds) at design speed of major road
Passenger car	7.5
Single-unit truck	9.5
Combination truck	11.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and grades 3 percent or less. The table values require adjustment as follows:
For multilane highways:
For left turns onto two-way highways with more than two lanes, add 0.5 seconds for passenger cars or 0.7 seconds for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
For minor road approach grades:
If the approach grade is an upgrade that exceeds 3 percent; add 0.2 seconds for each percent grade for left turns

Exhibit 9-54. Time Gap for Case B1—Left Turn from Stop

FROM AASHTO – GEOMETRIC DESIGN OF HIGHWAYS AND STREETS

ISD = SPEED x TG
ISD = 73.3 ft/s x 11.5 s
ISD = 843 ft

RIGHT TURN SIGHT DISTANCE

Design vehicle	Time gap (t_g) (seconds) at design speed of major road
Passenger car	6.5
Single-unit truck	8.5
Combination truck	10.5

Note: Time gaps are for a stopped vehicle to turn right onto or cross a two-lane highway with no median and grades 3 percent or less. The table values require adjustment as follows:
For multilane highways:
For crossing a major road with more than two lanes, add 0.5 seconds for passenger cars and 0.7 seconds for trucks for each additional lane to be crossed and for narrow medians that cannot store the design vehicle.
For minor road approach grades:
If the approach grade is an upgrade that exceeds 3 percent, add 0.1 seconds for each percent grade.

Exhibit 9-57. Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

FROM AASHTO – GEOMETRIC DESIGN OF HIGHWAYS AND STREETS

ISD = SPEED x TG
ISD = 73.3 ft/s x 10.5 s
ISD = 770 ft

SEQUALITCHEW TRAIL TYPICAL SECTION

NOT TO SCALE

2:1 MAX.
2" COMPACTED DEPTH HMA PAVEMENT
2" COMPACTED DEPTH CRUSHED ROCK BASE
1.5%
2:1 MAX.
12" COMPACTED SUBGRADE PER GEOTECH RECOMMENDATIONS

NOTE:
SUBGRADE SHALL CONSIST OF FIRM AND UNYIELDING NATIVE MATERIAL OR STRUCTURAL FILL COMPACTED TO 95% MAXIMUM DRY DENSITY SEE GEOTECHNICAL REPORT PREPARED BY GEOENGINEERS DATED OCTOBER 10, 2011 FOR PAVEMENT AND SUBGRADE RECOMMENDATIONS

No.	Date	By	Ckd.	Appr.	Revision
2	11/06/23	DKB	DKB	DKB	REVISED PER CITY COMMENTS

Title: PRELIMINARY GRADING AND STORM DRAINAGE PLAN-EAST FOR DUPONT - WEST

For: AVENUE 33, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELI — STATE OF WASHINGTON — 25672 — REGISTERED PROFESSIONAL ENGINEER
11/06/2023

Scale: Horizontal 1"=40' Vertical N/A
Designed MAT Drawn MAT Checked DKB Approved DKB Date 11/06/23
JTOWNE Xref: -----

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 18666
Sheet C6 of 13

File:P:\18000s\18666\preliminary\18666-pgin.dwg Date/Time:11/7/2023 11:44 AM Scale:1 = 1

FLOW CONTROL CALCULATIONS

WWHM2012

PROJECT REPORT

18666 - DuPont West
Pond Flow Control Calculations

General Model Information

Project Name:	18666 FC Pond3
Site Name:	
Site Address:	
City:	
Report Date:	11/6/2023
Gage:	40 IN WEST
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	7.65
Pervious Total	7.65

Impervious Land Use	acre
ROOF TOPS FLAT	7.2
PARKING FLAT	8.01
POND	0.5
Impervious Total	15.71
Basin Total	23.36

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	100.00 ft.	
Bottom Width:	100.00 ft.	
Depth:	7 ft.	
Volume at riser head:	1.9612 acre-feet.	
Infiltration On		
Infiltration rate:	15	
Infiltration safety factor:	1	
Total Volume Infiltrated (ac-ft.):		6749.59
Total Volume Through Riser (ac-ft.):		0
Total Volume Through Facility (ac-ft.):		6749.59
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	18 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

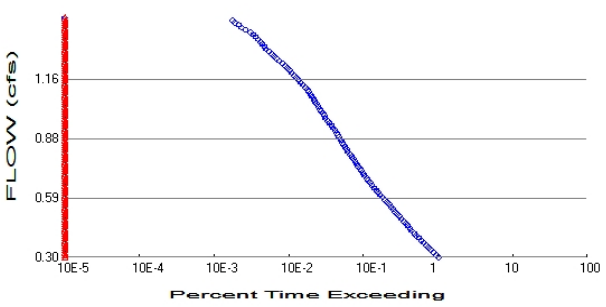
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.229	0.000	0.000	0.000
0.0778	0.231	0.017	0.000	3.472
0.1556	0.233	0.036	0.000	3.472
0.2333	0.236	0.054	0.000	3.472
0.3111	0.238	0.072	0.000	3.472
0.3889	0.240	0.091	0.000	3.472
0.4667	0.242	0.110	0.000	3.472
0.5444	0.244	0.129	0.000	3.472
0.6222	0.247	0.148	0.000	3.472
0.7000	0.249	0.167	0.000	3.472
0.7778	0.251	0.187	0.000	3.472
0.8556	0.253	0.206	0.000	3.472
0.9333	0.256	0.226	0.000	3.472
1.0111	0.258	0.246	0.000	3.472
1.0889	0.260	0.266	0.000	3.472
1.1667	0.262	0.287	0.000	3.472
1.2444	0.265	0.307	0.000	3.472
1.3222	0.267	0.328	0.000	3.472
1.4000	0.269	0.349	0.000	3.472
1.4778	0.272	0.370	0.000	3.472
1.5556	0.274	0.391	0.000	3.472
1.6333	0.276	0.412	0.000	3.472
1.7111	0.279	0.434	0.000	3.472
1.7889	0.281	0.456	0.000	3.472
1.8667	0.283	0.478	0.000	3.472
1.9444	0.286	0.500	0.000	3.472
2.0222	0.288	0.522	0.000	3.472

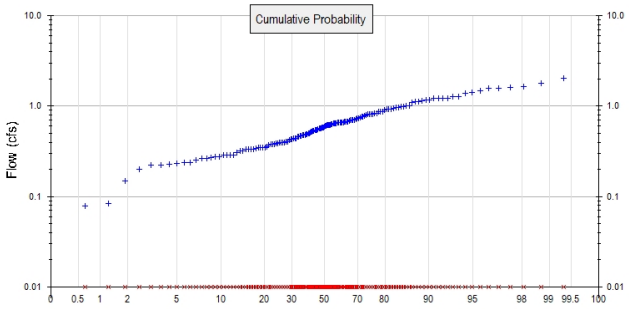
2.1000	0.291	0.545	0.000	3.472
2.1778	0.293	0.568	0.000	3.472
2.2556	0.295	0.591	0.000	3.472
2.3333	0.298	0.614	0.000	3.472
2.4111	0.300	0.637	0.000	3.472
2.4889	0.303	0.660	0.000	3.472
2.5667	0.305	0.684	0.000	3.472
2.6444	0.308	0.708	0.000	3.472
2.7222	0.310	0.732	0.000	3.472
2.8000	0.313	0.756	0.000	3.472
2.8778	0.315	0.781	0.000	3.472
2.9556	0.318	0.805	0.000	3.472
3.0333	0.320	0.830	0.000	3.472
3.1111	0.323	0.855	0.000	3.472
3.1889	0.325	0.881	0.000	3.472
3.2667	0.328	0.906	0.000	3.472
3.3444	0.330	0.932	0.000	3.472
3.4222	0.333	0.958	0.000	3.472
3.5000	0.336	0.984	0.000	3.472
3.5778	0.338	1.010	0.000	3.472
3.6556	0.341	1.036	0.000	3.472
3.7333	0.343	1.063	0.000	3.472
3.8111	0.346	1.090	0.000	3.472
3.8889	0.349	1.117	0.000	3.472
3.9667	0.351	1.144	0.000	3.472
4.0444	0.354	1.172	0.000	3.472
4.1222	0.357	1.199	0.000	3.472
4.2000	0.359	1.227	0.000	3.472
4.2778	0.362	1.255	0.000	3.472
4.3556	0.365	1.284	0.000	3.472
4.4333	0.367	1.312	0.000	3.472
4.5111	0.370	1.341	0.000	3.472
4.5889	0.373	1.370	0.000	3.472
4.6667	0.376	1.399	0.000	3.472
4.7444	0.378	1.428	0.000	3.472
4.8222	0.381	1.458	0.000	3.472
4.9000	0.384	1.488	0.000	3.472
4.9778	0.387	1.518	0.000	3.472
5.0556	0.390	1.548	0.000	3.472
5.1333	0.392	1.578	0.000	3.472
5.2111	0.395	1.609	0.000	3.472
5.2889	0.398	1.640	0.000	3.472
5.3667	0.401	1.671	0.000	3.472
5.4444	0.404	1.702	0.000	3.472
5.5222	0.406	1.734	0.000	3.472
5.6000	0.409	1.765	0.000	3.472
5.6778	0.412	1.797	0.000	3.472
5.7556	0.415	1.830	0.000	3.472
5.8333	0.418	1.862	0.000	3.472
5.9111	0.421	1.895	0.000	3.472
5.9889	0.424	1.928	0.000	3.472
6.0667	0.427	1.961	0.273	3.472
6.1444	0.430	1.994	0.869	3.472
6.2222	0.433	2.028	1.636	3.472
6.3000	0.435	2.061	2.501	3.472
6.3778	0.438	2.095	3.386	3.472
6.4556	0.441	2.130	4.216	3.472
6.5333	0.444	2.164	4.924	3.472

6.6111	0.447	2.199	5.468	3.472
6.6889	0.450	2.234	5.848	3.472
6.7667	0.453	2.269	6.205	3.472
6.8444	0.456	2.304	6.512	3.472
6.9222	0.459	2.340	6.805	3.472
7.0000	0.462	2.376	7.086	3.472
7.0778	0.465	2.412	7.357	3.472

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 25.29
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 7.65
Total Impervious Area: 15.71

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.603392
5 year	0.928695
10 year	1.116774
25 year	1.320514
50 year	1.451587
100 year	1.565325

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.425	0.000
1903	0.398	0.000
1904	0.648	0.000
1905	0.322	0.000
1906	0.148	0.000
1907	0.925	0.000
1908	0.677	0.000
1909	0.660	0.000
1910	0.916	0.000
1911	0.622	0.000

1912	2.022	0.000
1913	0.940	0.000
1914	0.238	0.000
1915	0.408	0.000
1916	0.618	0.000
1917	0.230	0.000
1918	0.651	0.000
1919	0.508	0.000
1920	0.617	0.000
1921	0.662	0.000
1922	0.665	0.000
1923	0.551	0.000
1924	0.266	0.000
1925	0.337	0.000
1926	0.581	0.000
1927	0.383	0.000
1928	0.461	0.000
1929	0.922	0.000
1930	0.595	0.000
1931	0.565	0.000
1932	0.432	0.000
1933	0.471	0.000
1934	1.211	0.000
1935	0.571	0.000
1936	0.528	0.000
1937	0.817	0.000
1938	0.524	0.000
1939	0.042	0.000
1940	0.547	0.000
1941	0.305	0.000
1942	0.835	0.000
1943	0.435	0.000
1944	0.872	0.000
1945	0.699	0.000
1946	0.402	0.000
1947	0.278	0.000
1948	1.277	0.000
1949	1.130	0.000
1950	0.333	0.000
1951	0.370	0.000
1952	1.642	0.000
1953	1.494	0.000
1954	0.548	0.000
1955	0.445	0.000
1956	0.221	0.000
1957	0.815	0.000
1958	1.592	0.000
1959	0.978	0.000
1960	0.286	0.000
1961	0.988	0.000
1962	0.567	0.000
1963	0.289	0.000
1964	0.285	0.000
1965	1.131	0.000
1966	0.333	0.000
1967	0.493	0.000
1968	0.503	0.000
1969	0.505	0.000

1970	0.792	0.000
1971	1.172	0.000
1972	0.772	0.000
1973	1.017	0.000
1974	0.557	0.000
1975	1.229	0.000
1976	0.675	0.000
1977	0.268	0.000
1978	1.100	0.000
1979	0.319	0.000
1980	0.643	0.000
1981	0.626	0.000
1982	0.266	0.000
1983	0.997	0.000
1984	0.475	0.000
1985	0.726	0.000
1986	0.616	0.000
1987	1.155	0.000
1988	0.731	0.000
1989	0.663	0.000
1990	0.771	0.000
1991	0.605	0.000
1992	0.783	0.000
1993	0.810	0.000
1994	1.179	0.000
1995	0.253	0.000
1996	1.289	0.000
1997	0.481	0.000
1998	0.654	0.000
1999	0.079	0.000
2000	0.480	0.000
2001	0.227	0.000
2002	0.870	0.000
2003	0.757	0.000
2004	0.662	0.000
2005	1.235	0.000
2006	0.382	0.000
2007	0.339	0.000
2008	0.645	0.000
2009	0.444	0.000
2010	0.391	0.000
2011	0.290	0.000
2012	0.519	0.000
2013	0.345	0.000
2014	0.279	0.000
2015	0.529	0.000
2016	0.221	0.000
2017	0.867	0.000
2018	1.627	0.000
2019	1.585	0.000
2020	0.489	0.000
2021	0.817	0.000
2022	0.349	0.000
2023	0.703	0.000
2024	1.810	0.000
2025	0.636	0.000
2026	1.000	0.000
2027	0.399	0.000

2028	0.348	0.000
2029	0.666	0.000
2030	1.223	0.000
2031	0.397	0.000
2032	0.238	0.000
2033	0.379	0.000
2034	0.353	0.000
2035	1.411	0.000
2036	0.729	0.000
2037	0.200	0.000
2038	0.578	0.000
2039	0.083	0.000
2040	0.384	0.000
2041	0.444	0.000
2042	1.378	0.000
2043	0.691	0.000
2044	0.925	0.000
2045	0.605	0.000
2046	0.704	0.000
2047	0.540	0.000
2048	0.706	0.000
2049	0.624	0.000
2050	0.458	0.000
2051	0.671	0.000
2052	0.395	0.000
2053	0.673	0.000
2054	0.837	0.000
2055	0.348	0.000
2056	0.337	0.000
2057	0.467	0.000
2058	0.578	0.000
2059	0.969	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	2.0225	0.0000
2	1.8101	0.0000
3	1.6419	0.0000
4	1.6272	0.0000
5	1.5923	0.0000
6	1.5850	0.0000
7	1.4944	0.0000
8	1.4107	0.0000
9	1.3781	0.0000
10	1.2890	0.0000
11	1.2770	0.0000
12	1.2348	0.0000
13	1.2287	0.0000
14	1.2234	0.0000
15	1.2113	0.0000
16	1.1790	0.0000
17	1.1724	0.0000
18	1.1549	0.0000
19	1.1306	0.0000
20	1.1297	0.0000
21	1.1001	0.0000
22	1.0165	0.0000

23	1.0003	0.0000
24	0.9967	0.0000
25	0.9880	0.0000
26	0.9777	0.0000
27	0.9689	0.0000
28	0.9399	0.0000
29	0.9249	0.0000
30	0.9247	0.0000
31	0.9222	0.0000
32	0.9160	0.0000
33	0.8716	0.0000
34	0.8701	0.0000
35	0.8675	0.0000
36	0.8374	0.0000
37	0.8355	0.0000
38	0.8171	0.0000
39	0.8171	0.0000
40	0.8147	0.0000
41	0.8103	0.0000
42	0.7916	0.0000
43	0.7827	0.0000
44	0.7721	0.0000
45	0.7715	0.0000
46	0.7568	0.0000
47	0.7314	0.0000
48	0.7289	0.0000
49	0.7258	0.0000
50	0.7063	0.0000
51	0.7036	0.0000
52	0.7027	0.0000
53	0.6988	0.0000
54	0.6911	0.0000
55	0.6772	0.0000
56	0.6747	0.0000
57	0.6733	0.0000
58	0.6705	0.0000
59	0.6655	0.0000
60	0.6647	0.0000
61	0.6627	0.0000
62	0.6620	0.0000
63	0.6619	0.0000
64	0.6595	0.0000
65	0.6543	0.0000
66	0.6514	0.0000
67	0.6475	0.0000
68	0.6453	0.0000
69	0.6428	0.0000
70	0.6363	0.0000
71	0.6255	0.0000
72	0.6236	0.0000
73	0.6223	0.0000
74	0.6177	0.0000
75	0.6168	0.0000
76	0.6163	0.0000
77	0.6051	0.0000
78	0.6051	0.0000
79	0.5949	0.0000
80	0.5811	0.0000

81	0.5782	0.0000
82	0.5776	0.0000
83	0.5715	0.0000
84	0.5672	0.0000
85	0.5645	0.0000
86	0.5572	0.0000
87	0.5506	0.0000
88	0.5477	0.0000
89	0.5469	0.0000
90	0.5402	0.0000
91	0.5292	0.0000
92	0.5282	0.0000
93	0.5239	0.0000
94	0.5186	0.0000
95	0.5082	0.0000
96	0.5047	0.0000
97	0.5029	0.0000
98	0.4928	0.0000
99	0.4888	0.0000
100	0.4805	0.0000
101	0.4799	0.0000
102	0.4745	0.0000
103	0.4715	0.0000
104	0.4673	0.0000
105	0.4606	0.0000
106	0.4581	0.0000
107	0.4446	0.0000
108	0.4445	0.0000
109	0.4436	0.0000
110	0.4345	0.0000
111	0.4321	0.0000
112	0.4250	0.0000
113	0.4083	0.0000
114	0.4023	0.0000
115	0.3986	0.0000
116	0.3976	0.0000
117	0.3968	0.0000
118	0.3953	0.0000
119	0.3914	0.0000
120	0.3842	0.0000
121	0.3828	0.0000
122	0.3817	0.0000
123	0.3786	0.0000
124	0.3703	0.0000
125	0.3531	0.0000
126	0.3493	0.0000
127	0.3482	0.0000
128	0.3477	0.0000
129	0.3451	0.0000
130	0.3385	0.0000
131	0.3374	0.0000
132	0.3365	0.0000
133	0.3334	0.0000
134	0.3329	0.0000
135	0.3225	0.0000
136	0.3187	0.0000
137	0.3054	0.0000
138	0.2897	0.0000

139	0.2890	0.0000
140	0.2864	0.0000
141	0.2851	0.0000
142	0.2785	0.0000
143	0.2784	0.0000
144	0.2685	0.0000
145	0.2656	0.0000
146	0.2656	0.0000
147	0.2527	0.0000
148	0.2385	0.0000
149	0.2381	0.0000
150	0.2302	0.0000
151	0.2274	0.0000
152	0.2214	0.0000
153	0.2211	0.0000
154	0.2003	0.0000
155	0.1485	0.0000
156	0.0829	0.0000
157	0.0793	0.0000
158	0.0420	0.0000

Mitigated Schematic

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Local (360)943-0304

www.clearcreeksolutions.com

WWHM2012

PROJECT REPORT

18666 - DuPont West
Road Gallery Flow Control Calculations

General Model Information

Project Name:	18666 FC Road
Site Name:	
Site Address:	
City:	
Report Date:	11/6/2023
Gage:	40 IN WEST
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.48
Pervious Total	0.48

Impervious Land Use	acre
PARKING FLAT	1.45
Impervious Total	1.45
Basin Total	1.93

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 1	Gravel Trench Bed 1	

Mitigated Routing

Gravel Trench Bed 1

Bottom Length:	120.00 ft.
Bottom Width:	20.00 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	1
Pour Space of material for first layer:	0.3
Material thickness of second layer:	2.5
Pour Space of material for second layer:	0.7
Material thickness of third layer:	1
Pour Space of material for third layer:	0.3
Infiltration On	
Infiltration rate:	6
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	622.167
Total Volume Through Riser (ac-ft.):	0
Total Volume Through Facility (ac-ft.):	622.167
Percent Infiltrated:	100
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	4.5 ft.
Riser Diameter:	18 in.
Element Flows To:	
Outlet 1	Outlet 2

Gravel Trench Bed Hydraulic Table

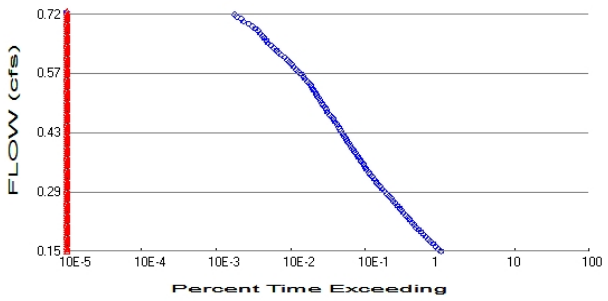
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.055	0.000	0.000	0.000
0.0611	0.055	0.001	0.000	0.333
0.1222	0.055	0.002	0.000	0.333
0.1833	0.055	0.003	0.000	0.333
0.2444	0.055	0.004	0.000	0.333
0.3056	0.055	0.005	0.000	0.333
0.3667	0.055	0.006	0.000	0.333
0.4278	0.055	0.007	0.000	0.333
0.4889	0.055	0.008	0.000	0.333
0.5500	0.055	0.009	0.000	0.333
0.6111	0.055	0.010	0.000	0.333
0.6722	0.055	0.011	0.000	0.333
0.7333	0.055	0.012	0.000	0.333
0.7944	0.055	0.013	0.000	0.333
0.8556	0.055	0.014	0.000	0.333
0.9167	0.055	0.015	0.000	0.333
0.9778	0.055	0.016	0.000	0.333
1.0389	0.055	0.018	0.000	0.333
1.1000	0.055	0.020	0.000	0.333
1.1611	0.055	0.023	0.000	0.333
1.2222	0.055	0.025	0.000	0.333
1.2833	0.055	0.027	0.000	0.333
1.3444	0.055	0.030	0.000	0.333
1.4056	0.055	0.032	0.000	0.333

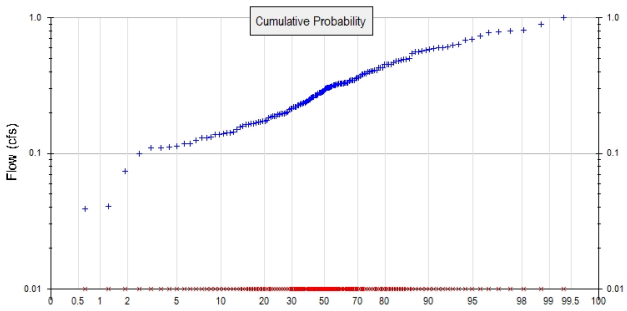
1.4667	0.055	0.035	0.000	0.333
1.5278	0.055	0.037	0.000	0.333
1.5889	0.055	0.039	0.000	0.333
1.6500	0.055	0.042	0.000	0.333
1.7111	0.055	0.044	0.000	0.333
1.7722	0.055	0.046	0.000	0.333
1.8333	0.055	0.049	0.000	0.333
1.8944	0.055	0.051	0.000	0.333
1.9556	0.055	0.053	0.000	0.333
2.0167	0.055	0.056	0.000	0.333
2.0778	0.055	0.058	0.000	0.333
2.1389	0.055	0.060	0.000	0.333
2.2000	0.055	0.063	0.000	0.333
2.2611	0.055	0.065	0.000	0.333
2.3222	0.055	0.068	0.000	0.333
2.3833	0.055	0.070	0.000	0.333
2.4444	0.055	0.072	0.000	0.333
2.5056	0.055	0.075	0.000	0.333
2.5667	0.055	0.077	0.000	0.333
2.6278	0.055	0.079	0.000	0.333
2.6889	0.055	0.082	0.000	0.333
2.7500	0.055	0.084	0.000	0.333
2.8111	0.055	0.086	0.000	0.333
2.8722	0.055	0.089	0.000	0.333
2.9333	0.055	0.091	0.000	0.333
2.9944	0.055	0.093	0.000	0.333
3.0556	0.055	0.096	0.000	0.333
3.1167	0.055	0.098	0.000	0.333
3.1778	0.055	0.101	0.000	0.333
3.2389	0.055	0.103	0.000	0.333
3.3000	0.055	0.105	0.000	0.333
3.3611	0.055	0.108	0.000	0.333
3.4222	0.055	0.110	0.000	0.333
3.4833	0.055	0.112	0.000	0.333
3.5444	0.055	0.113	0.000	0.333
3.6056	0.055	0.114	0.000	0.333
3.6667	0.055	0.115	0.000	0.333
3.7278	0.055	0.116	0.000	0.333
3.7889	0.055	0.117	0.000	0.333
3.8500	0.055	0.118	0.000	0.333
3.9111	0.055	0.119	0.000	0.333
3.9722	0.055	0.120	0.000	0.333
4.0333	0.055	0.121	0.000	0.333
4.0944	0.055	0.122	0.000	0.333
4.1556	0.055	0.123	0.000	0.333
4.2167	0.055	0.124	0.000	0.333
4.2778	0.055	0.125	0.000	0.333
4.3389	0.055	0.126	0.000	0.333
4.4000	0.055	0.127	0.000	0.333
4.4611	0.055	0.129	0.000	0.333
4.5222	0.055	0.132	0.052	0.333
4.5833	0.055	0.135	0.382	0.333
4.6444	0.055	0.139	0.869	0.333
4.7056	0.055	0.142	1.461	0.333
4.7667	0.055	0.145	2.123	0.333
4.8278	0.055	0.149	2.819	0.333
4.8889	0.055	0.152	3.509	0.333
4.9500	0.055	0.155	4.160	0.333

5.0111	0.055	0.159	4.737	0.333
5.0722	0.055	0.162	5.218	0.333
5.1333	0.055	0.166	5.592	0.333
5.1944	0.055	0.169	5.870	0.333
5.2556	0.055	0.172	6.159	0.333
5.3167	0.055	0.176	6.404	0.333
5.3778	0.055	0.179	6.639	0.333
5.4389	0.055	0.182	6.866	0.333
5.5000	0.055	0.186	7.086	0.333

Analysis Results

POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 12.47
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.48
Total Impervious Area: 1.45

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.29752
5 year	0.457921
10 year	0.550659
25 year	0.651119
50 year	0.715749
100 year	0.771831

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1902	0.210	0.000
1903	0.196	0.000
1904	0.319	0.000
1905	0.159	0.000
1906	0.073	0.000
1907	0.456	0.000
1908	0.334	0.000
1909	0.325	0.000
1910	0.452	0.000
1911	0.307	0.000

1912	0.997	0.000
1913	0.463	0.000
1914	0.117	0.000
1915	0.201	0.000
1916	0.305	0.000
1917	0.113	0.000
1918	0.321	0.000
1919	0.251	0.000
1920	0.304	0.000
1921	0.326	0.000
1922	0.328	0.000
1923	0.271	0.000
1924	0.131	0.000
1925	0.166	0.000
1926	0.287	0.000
1927	0.189	0.000
1928	0.227	0.000
1929	0.455	0.000
1930	0.293	0.000
1931	0.278	0.000
1932	0.213	0.000
1933	0.232	0.000
1934	0.597	0.000
1935	0.282	0.000
1936	0.260	0.000
1937	0.403	0.000
1938	0.258	0.000
1939	0.021	0.000
1940	0.270	0.000
1941	0.151	0.000
1942	0.412	0.000
1943	0.214	0.000
1944	0.430	0.000
1945	0.345	0.000
1946	0.198	0.000
1947	0.137	0.000
1948	0.630	0.000
1949	0.557	0.000
1950	0.164	0.000
1951	0.183	0.000
1952	0.810	0.000
1953	0.737	0.000
1954	0.270	0.000
1955	0.219	0.000
1956	0.109	0.000
1957	0.402	0.000
1958	0.785	0.000
1959	0.482	0.000
1960	0.141	0.000
1961	0.487	0.000
1962	0.280	0.000
1963	0.142	0.000
1964	0.141	0.000
1965	0.557	0.000
1966	0.164	0.000
1967	0.243	0.000
1968	0.248	0.000
1969	0.249	0.000

1970	0.390	0.000
1971	0.578	0.000
1972	0.381	0.000
1973	0.501	0.000
1974	0.275	0.000
1975	0.606	0.000
1976	0.333	0.000
1977	0.132	0.000
1978	0.542	0.000
1979	0.157	0.000
1980	0.317	0.000
1981	0.308	0.000
1982	0.131	0.000
1983	0.491	0.000
1984	0.234	0.000
1985	0.358	0.000
1986	0.304	0.000
1987	0.569	0.000
1988	0.361	0.000
1989	0.327	0.000
1990	0.380	0.000
1991	0.298	0.000
1992	0.386	0.000
1993	0.400	0.000
1994	0.581	0.000
1995	0.125	0.000
1996	0.636	0.000
1997	0.237	0.000
1998	0.323	0.000
1999	0.039	0.000
2000	0.237	0.000
2001	0.112	0.000
2002	0.429	0.000
2003	0.373	0.000
2004	0.326	0.000
2005	0.609	0.000
2006	0.188	0.000
2007	0.167	0.000
2008	0.318	0.000
2009	0.219	0.000
2010	0.193	0.000
2011	0.143	0.000
2012	0.256	0.000
2013	0.170	0.000
2014	0.137	0.000
2015	0.261	0.000
2016	0.109	0.000
2017	0.428	0.000
2018	0.802	0.000
2019	0.782	0.000
2020	0.241	0.000
2021	0.403	0.000
2022	0.172	0.000
2023	0.346	0.000
2024	0.893	0.000
2025	0.314	0.000
2026	0.493	0.000
2027	0.197	0.000

2028	0.172	0.000
2029	0.328	0.000
2030	0.603	0.000
2031	0.196	0.000
2032	0.118	0.000
2033	0.187	0.000
2034	0.174	0.000
2035	0.696	0.000
2036	0.359	0.000
2037	0.099	0.000
2038	0.285	0.000
2039	0.041	0.000
2040	0.189	0.000
2041	0.219	0.000
2042	0.680	0.000
2043	0.341	0.000
2044	0.456	0.000
2045	0.298	0.000
2046	0.347	0.000
2047	0.266	0.000
2048	0.348	0.000
2049	0.307	0.000
2050	0.226	0.000
2051	0.331	0.000
2052	0.195	0.000
2053	0.332	0.000
2054	0.413	0.000
2055	0.171	0.000
2056	0.166	0.000
2057	0.230	0.000
2058	0.285	0.000
2059	0.478	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

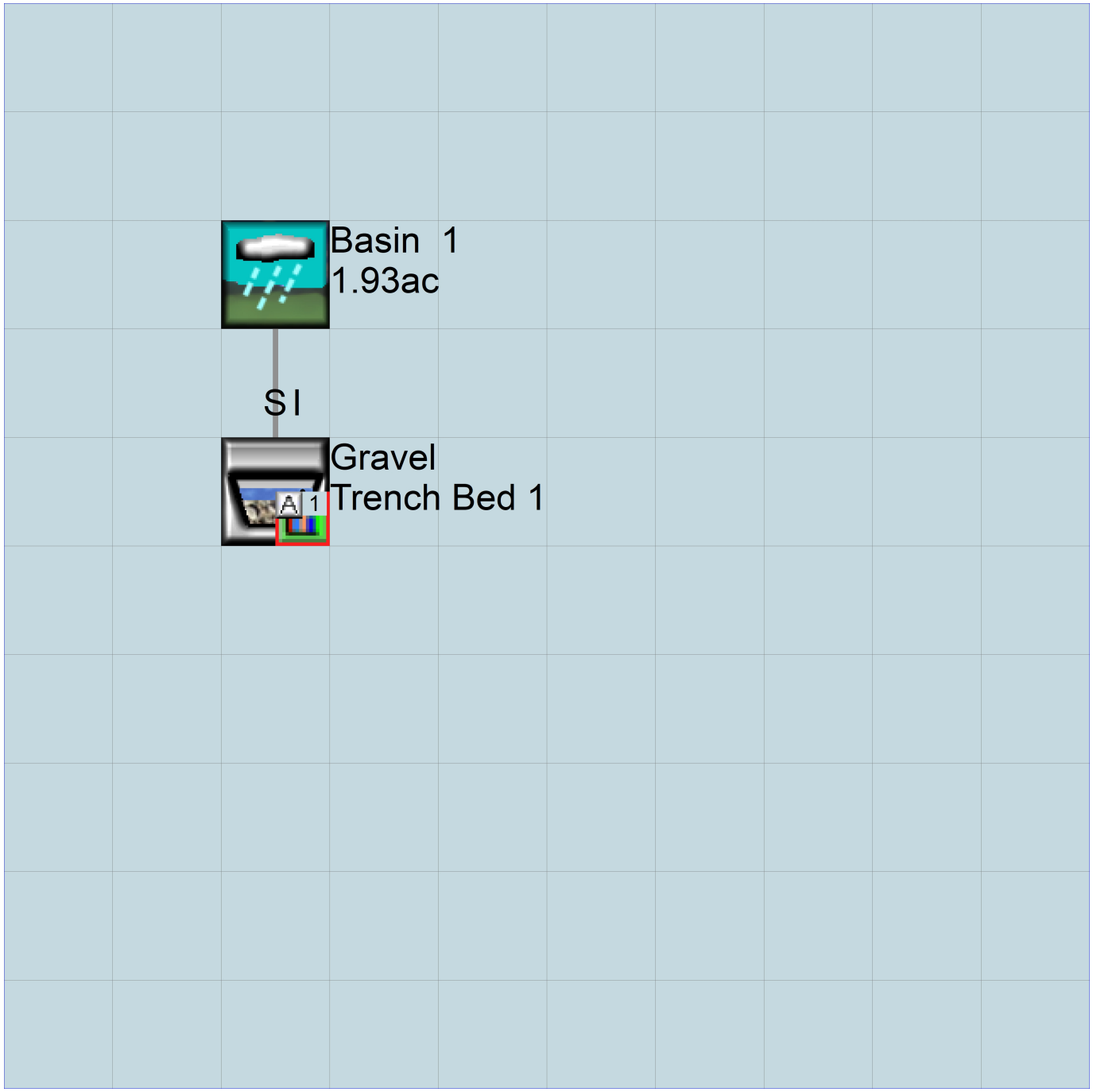
Rank	Predeveloped	Mitigated
1	0.9972	0.0000
2	0.8925	0.0000
3	0.8096	0.0000
4	0.8023	0.0000
5	0.7851	0.0000
6	0.7815	0.0000
7	0.7369	0.0000
8	0.6956	0.0000
9	0.6795	0.0000
10	0.6356	0.0000
11	0.6296	0.0000
12	0.6088	0.0000
13	0.6059	0.0000
14	0.6032	0.0000
15	0.5973	0.0000
16	0.5813	0.0000
17	0.5781	0.0000
18	0.5695	0.0000
19	0.5575	0.0000
20	0.5570	0.0000
21	0.5425	0.0000
22	0.5012	0.0000

23	0.4932	0.0000
24	0.4914	0.0000
25	0.4872	0.0000
26	0.4821	0.0000
27	0.4777	0.0000
28	0.4635	0.0000
29	0.4560	0.0000
30	0.4559	0.0000
31	0.4547	0.0000
32	0.4517	0.0000
33	0.4298	0.0000
34	0.4290	0.0000
35	0.4277	0.0000
36	0.4129	0.0000
37	0.4120	0.0000
38	0.4029	0.0000
39	0.4029	0.0000
40	0.4017	0.0000
41	0.3996	0.0000
42	0.3903	0.0000
43	0.3859	0.0000
44	0.3807	0.0000
45	0.3804	0.0000
46	0.3732	0.0000
47	0.3607	0.0000
48	0.3594	0.0000
49	0.3579	0.0000
50	0.3483	0.0000
51	0.3469	0.0000
52	0.3465	0.0000
53	0.3445	0.0000
54	0.3408	0.0000
55	0.3339	0.0000
56	0.3327	0.0000
57	0.3320	0.0000
58	0.3306	0.0000
59	0.3282	0.0000
60	0.3277	0.0000
61	0.3267	0.0000
62	0.3264	0.0000
63	0.3264	0.0000
64	0.3252	0.0000
65	0.3226	0.0000
66	0.3212	0.0000
67	0.3193	0.0000
68	0.3182	0.0000
69	0.3170	0.0000
70	0.3137	0.0000
71	0.3084	0.0000
72	0.3075	0.0000
73	0.3068	0.0000
74	0.3046	0.0000
75	0.3042	0.0000
76	0.3039	0.0000
77	0.2984	0.0000
78	0.2984	0.0000
79	0.2933	0.0000
80	0.2865	0.0000

81	0.2851	0.0000
82	0.2848	0.0000
83	0.2818	0.0000
84	0.2797	0.0000
85	0.2784	0.0000
86	0.2748	0.0000
87	0.2715	0.0000
88	0.2701	0.0000
89	0.2697	0.0000
90	0.2664	0.0000
91	0.2609	0.0000
92	0.2605	0.0000
93	0.2583	0.0000
94	0.2557	0.0000
95	0.2506	0.0000
96	0.2489	0.0000
97	0.2479	0.0000
98	0.2430	0.0000
99	0.2410	0.0000
100	0.2369	0.0000
101	0.2366	0.0000
102	0.2340	0.0000
103	0.2325	0.0000
104	0.2304	0.0000
105	0.2271	0.0000
106	0.2259	0.0000
107	0.2192	0.0000
108	0.2192	0.0000
109	0.2187	0.0000
110	0.2143	0.0000
111	0.2131	0.0000
112	0.2095	0.0000
113	0.2013	0.0000
114	0.1984	0.0000
115	0.1965	0.0000
116	0.1960	0.0000
117	0.1957	0.0000
118	0.1949	0.0000
119	0.1930	0.0000
120	0.1894	0.0000
121	0.1888	0.0000
122	0.1882	0.0000
123	0.1867	0.0000
124	0.1826	0.0000
125	0.1741	0.0000
126	0.1722	0.0000
127	0.1717	0.0000
128	0.1715	0.0000
129	0.1702	0.0000
130	0.1669	0.0000
131	0.1664	0.0000
132	0.1659	0.0000
133	0.1644	0.0000
134	0.1641	0.0000
135	0.1590	0.0000
136	0.1571	0.0000
137	0.1506	0.0000
138	0.1429	0.0000

139	0.1425	0.0000
140	0.1412	0.0000
141	0.1406	0.0000
142	0.1373	0.0000
143	0.1373	0.0000
144	0.1324	0.0000
145	0.1310	0.0000
146	0.1309	0.0000
147	0.1246	0.0000
148	0.1176	0.0000
149	0.1174	0.0000
150	0.1135	0.0000
151	0.1121	0.0000
152	0.1092	0.0000
153	0.1090	0.0000
154	0.0987	0.0000
155	0.0732	0.0000
156	0.0409	0.0000
157	0.0391	0.0000
158	0.0207	0.0000

Mitigated Schematic



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WATER QUALITY CALCULATIONS

WWHM2012

PROJECT REPORT

18666 - DuPont West
Pond Water Quality Calculations

General Model Information

Project Name:	18666 FC Pond3
Site Name:	
Site Address:	
City:	
Report Date:	11/6/2023
Gage:	40 IN WEST
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	7.65
Pervious Total	7.65

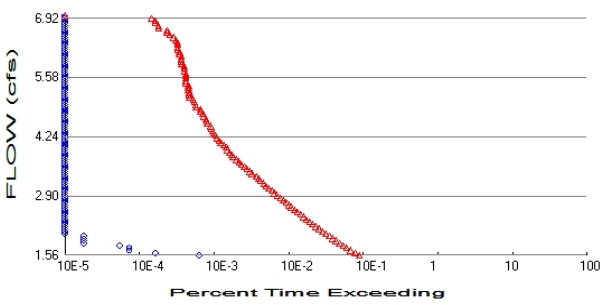
Impervious Land Use	acre
PARKING FLAT	8.01
POND	0.5
Impervious Total	8.51
Basin Total	16.16

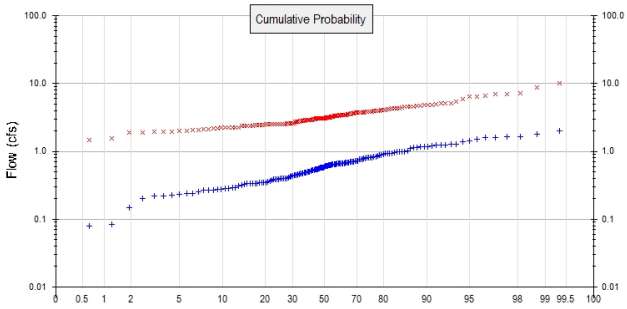
Element Flows To:

Surface	Interflow	Groundwater

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 25.29
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 7.65
Total Impervious Area: 8.51

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.603392
5 year	0.928695
10 year	1.116774
25 year	1.320514
50 year	1.451587
100 year	1.565325

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	3.12261
5 year	4.198647
10 year	4.981738
25 year	6.054631
50 year	6.916497
100 year	7.833775

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.425	3.672
1903	0.398	4.045
1904	0.648	4.597
1905	0.322	2.073
1906	0.148	2.262
1907	0.925	3.082
1908	0.677	2.539
1909	0.660	3.133
1910	0.916	2.986
1911	0.622	3.359

1912	2.022	7.053
1913	0.940	2.437
1914	0.238	10.208
1915	0.408	2.103
1916	0.618	3.888
1917	0.230	1.456
1918	0.651	3.135
1919	0.508	1.962
1920	0.617	2.568
1921	0.662	2.183
1922	0.665	3.488
1923	0.551	2.418
1924	0.266	4.354
1925	0.337	1.903
1926	0.581	3.586
1927	0.383	3.052
1928	0.461	2.217
1929	0.922	4.419
1930	0.595	4.580
1931	0.565	2.280
1932	0.432	2.440
1933	0.471	2.400
1934	1.211	3.880
1935	0.571	2.018
1936	0.528	2.906
1937	0.817	3.891
1938	0.524	2.118
1939	0.042	2.543
1940	0.547	4.677
1941	0.305	5.086
1942	0.835	3.452
1943	0.435	3.410
1944	0.872	4.912
1945	0.699	3.715
1946	0.402	2.884
1947	0.278	2.268
1948	1.277	3.117
1949	1.130	4.774
1950	0.333	2.748
1951	0.370	4.164
1952	1.642	5.070
1953	1.494	4.314
1954	0.548	2.526
1955	0.445	2.402
1956	0.221	2.348
1957	0.815	2.514
1958	1.592	3.404
1959	0.978	3.376
1960	0.286	2.558
1961	0.988	7.000
1962	0.567	3.047
1963	0.289	2.224
1964	0.285	6.503
1965	1.131	3.089
1966	0.333	2.457
1967	0.493	3.434
1968	0.503	2.893
1969	0.505	2.606

1970	0.792	2.943
1971	1.172	2.890
1972	0.772	8.854
1973	1.017	5.454
1974	0.557	3.977
1975	1.229	4.160
1976	0.675	4.373
1977	0.268	1.919
1978	1.100	3.525
1979	0.319	3.464
1980	0.643	3.333
1981	0.626	3.218
1982	0.266	2.549
1983	0.997	3.419
1984	0.475	3.390
1985	0.726	3.882
1986	0.616	1.975
1987	1.155	3.214
1988	0.731	2.070
1989	0.663	1.930
1990	0.771	2.525
1991	0.605	3.767
1992	0.783	3.593
1993	0.810	4.010
1994	1.179	2.785
1995	0.253	2.156
1996	1.289	2.913
1997	0.481	2.594
1998	0.654	3.082
1999	0.079	3.556
2000	0.480	2.909
2001	0.227	2.361
2002	0.870	4.318
2003	0.757	2.609
2004	0.662	3.710
2005	1.235	7.289
2006	0.382	3.364
2007	0.339	3.754
2008	0.645	3.114
2009	0.444	2.372
2010	0.391	3.014
2011	0.290	3.109
2012	0.519	2.960
2013	0.345	2.766
2014	0.279	2.764
2015	0.529	4.533
2016	0.221	2.830
2017	0.867	4.514
2018	1.627	3.093
2019	1.585	4.054
2020	0.489	3.291
2021	0.817	2.776
2022	0.349	4.680
2023	0.703	5.853
2024	1.810	6.669
2025	0.636	3.070
2026	1.000	3.709
2027	0.399	3.713

2028	0.348	1.469
2029	0.666	2.417
2030	1.223	4.880
2031	0.397	1.546
2032	0.238	2.537
2033	0.379	3.205
2034	0.353	2.511
2035	1.411	3.097
2036	0.729	2.525
2037	0.200	3.386
2038	0.578	3.192
2039	0.083	6.510
2040	0.384	2.528
2041	0.444	3.195
2042	1.378	3.670
2043	0.691	4.067
2044	0.925	2.841
2045	0.605	2.238
2046	0.704	2.515
2047	0.540	3.082
2048	0.706	2.553
2049	0.624	3.779
2050	0.458	2.844
2051	0.671	3.961
2052	0.395	3.084
2053	0.673	2.575
2054	0.837	5.127
2055	0.348	2.906
2056	0.337	4.021
2057	0.467	1.998
2058	0.578	3.830
2059	0.969	4.863

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	2.0225	10.2079
2	1.8101	8.8544
3	1.6419	7.2889
4	1.6272	7.0526
5	1.5923	7.0000
6	1.5850	6.6694
7	1.4944	6.5102
8	1.4107	6.5030
9	1.3781	5.8529
10	1.2890	5.4538
11	1.2770	5.1267
12	1.2348	5.0861
13	1.2287	5.0701
14	1.2234	4.9121
15	1.2113	4.8798
16	1.1790	4.8626
17	1.1724	4.7744
18	1.1549	4.6796
19	1.1306	4.6772
20	1.1297	4.5973
21	1.1001	4.5803
22	1.0165	4.5331

23	1.0003	4.5135
24	0.9967	4.4195
25	0.9880	4.3728
26	0.9777	4.3540
27	0.9689	4.3182
28	0.9399	4.3142
29	0.9249	4.1645
30	0.9247	4.1598
31	0.9222	4.0671
32	0.9160	4.0539
33	0.8716	4.0451
34	0.8701	4.0210
35	0.8675	4.0101
36	0.8374	3.9772
37	0.8355	3.9614
38	0.8171	3.8914
39	0.8171	3.8882
40	0.8147	3.8819
41	0.8103	3.8796
42	0.7916	3.8299
43	0.7827	3.7795
44	0.7721	3.7670
45	0.7715	3.7543
46	0.7568	3.7150
47	0.7314	3.7130
48	0.7289	3.7101
49	0.7258	3.7094
50	0.7063	3.6716
51	0.7036	3.6700
52	0.7027	3.5928
53	0.6988	3.5861
54	0.6911	3.5561
55	0.6772	3.5248
56	0.6747	3.4883
57	0.6733	3.4638
58	0.6705	3.4521
59	0.6655	3.4342
60	0.6647	3.4195
61	0.6627	3.4100
62	0.6620	3.4043
63	0.6619	3.3905
64	0.6595	3.3863
65	0.6543	3.3763
66	0.6514	3.3643
67	0.6475	3.3585
68	0.6453	3.3327
69	0.6428	3.2907
70	0.6363	3.2176
71	0.6255	3.2142
72	0.6236	3.2047
73	0.6223	3.1951
74	0.6177	3.1920
75	0.6168	3.1347
76	0.6163	3.1330
77	0.6051	3.1172
78	0.6051	3.1144
79	0.5949	3.1092
80	0.5811	3.0968

81	0.5782	3.0928
82	0.5776	3.0889
83	0.5715	3.0844
84	0.5672	3.0821
85	0.5645	3.0820
86	0.5572	3.0817
87	0.5506	3.0704
88	0.5477	3.0519
89	0.5469	3.0474
90	0.5402	3.0138
91	0.5292	2.9863
92	0.5282	2.9599
93	0.5239	2.9426
94	0.5186	2.9126
95	0.5082	2.9093
96	0.5047	2.9061
97	0.5029	2.9061
98	0.4928	2.8926
99	0.4888	2.8904
100	0.4805	2.8836
101	0.4799	2.8441
102	0.4745	2.8409
103	0.4715	2.8297
104	0.4673	2.7845
105	0.4606	2.7763
106	0.4581	2.7658
107	0.4446	2.7638
108	0.4445	2.7480
109	0.4436	2.6087
110	0.4345	2.6058
111	0.4321	2.5945
112	0.4250	2.5752
113	0.4083	2.5683
114	0.4023	2.5583
115	0.3986	2.5531
116	0.3976	2.5487
117	0.3968	2.5428
118	0.3953	2.5395
119	0.3914	2.5373
120	0.3842	2.5283
121	0.3828	2.5256
122	0.3817	2.5249
123	0.3786	2.5245
124	0.3703	2.5148
125	0.3531	2.5138
126	0.3493	2.5110
127	0.3482	2.4566
128	0.3477	2.4396
129	0.3451	2.4366
130	0.3385	2.4179
131	0.3374	2.4169
132	0.3365	2.4021
133	0.3334	2.3998
134	0.3329	2.3721
135	0.3225	2.3607
136	0.3187	2.3481
137	0.3054	2.2798
138	0.2897	2.2675

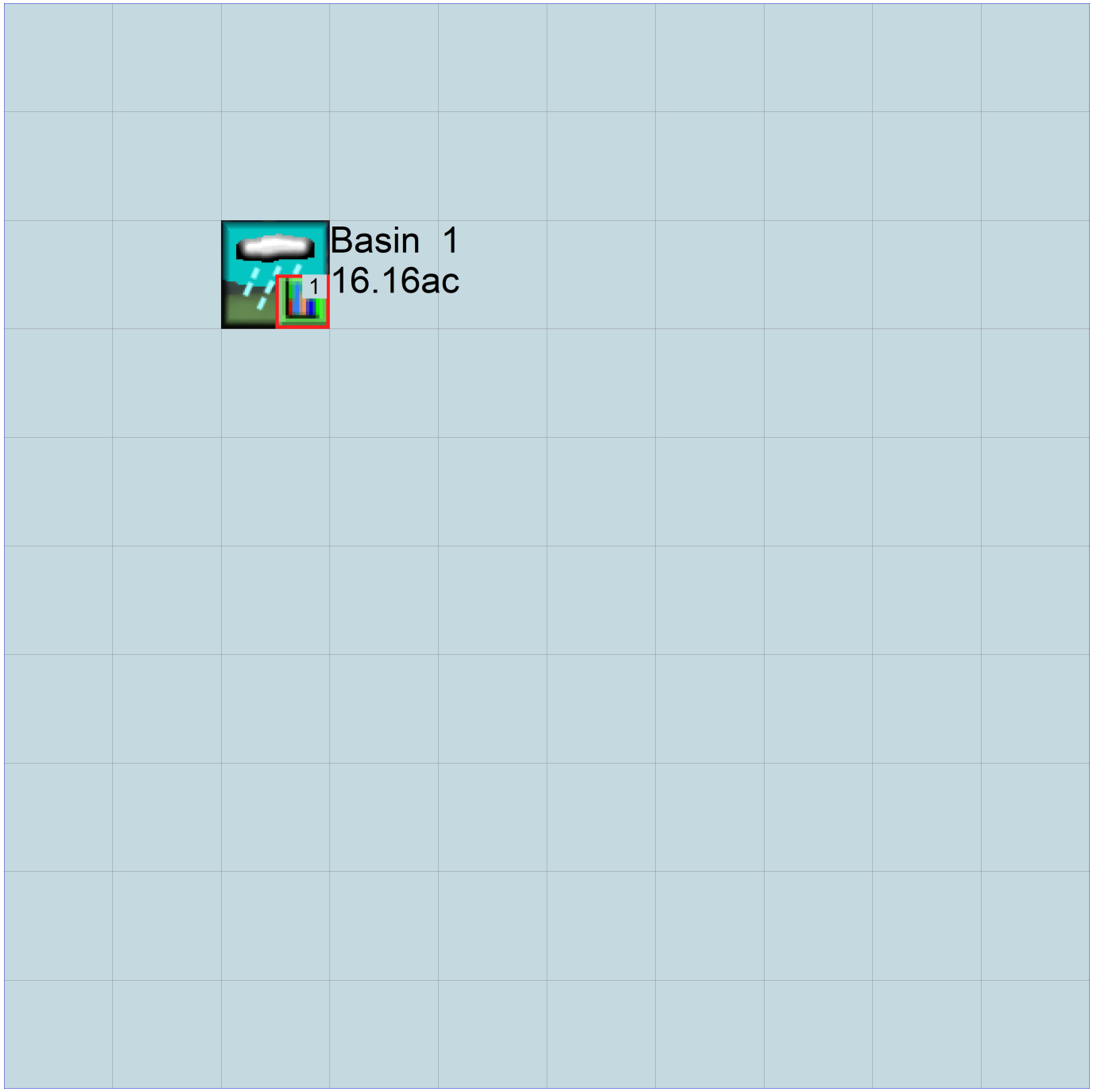
139	0.2890	2.2622
140	0.2864	2.2377
141	0.2851	2.2244
142	0.2785	2.2173
143	0.2784	2.1834
144	0.2685	2.1558
145	0.2656	2.1183
146	0.2656	2.1029
147	0.2527	2.0729
148	0.2385	2.0704
149	0.2381	2.0179
150	0.2302	1.9979
151	0.2274	1.9749
152	0.2214	1.9624
153	0.2211	1.9299
154	0.2003	1.9187
155	0.1485	1.9034
156	0.0829	1.5460
157	0.0793	1.4688
158	0.0420	1.4557

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.9784 acre-feet
On-line facility target flow:	1.3232 cfs.
Adjusted for 15 min:	1.3232 cfs.
Off-line facility target flow:	0.7668 cfs.
Adjusted for 15 min:	0.7668 cfs.

Mitigated Schematic



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WWHM2012

PROJECT REPORT

18666 - DuPont West
Road Gallery Water Quality Calculations

General Model Information

Project Name:	18666 FC Road
Site Name:	
Site Address:	
City:	
Report Date:	11/6/2023
Gage:	40 IN WEST
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.48
Pervious Total	0.48

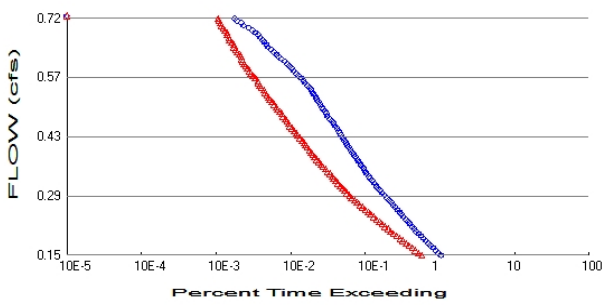
Impervious Land Use	acre
PARKING FLAT	1.45
Impervious Total	1.45
Basin Total	1.93

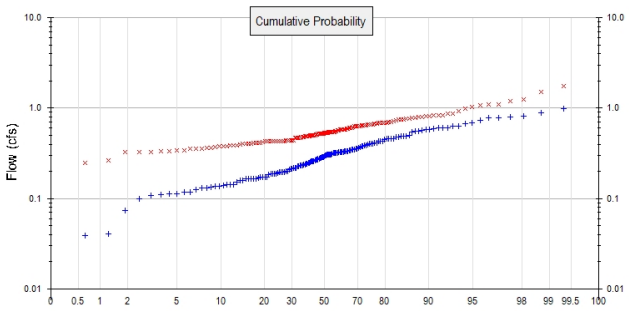
Element Flows To:

Surface	Interflow	Groundwater

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 12.47
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.48
Total Impervious Area: 1.45

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.29752
5 year	0.457921
10 year	0.550659
25 year	0.651119
50 year	0.715749
100 year	0.771831

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.529777
5 year	0.710348
10 year	0.841475
25 year	1.020818
50 year	1.164666
100 year	1.317576

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.210	0.626
1903	0.196	0.689
1904	0.319	0.782
1905	0.159	0.353
1906	0.073	0.385
1907	0.456	0.525
1908	0.334	0.433
1909	0.325	0.533
1910	0.452	0.509
1911	0.307	0.572

1912	0.997	1.027
1913	0.463	0.415
1914	0.117	1.739
1915	0.201	0.358
1916	0.305	0.662
1917	0.113	0.248
1918	0.321	0.533
1919	0.251	0.334
1920	0.304	0.438
1921	0.326	0.372
1922	0.328	0.586
1923	0.271	0.404
1924	0.131	0.742
1925	0.166	0.324
1926	0.287	0.611
1927	0.189	0.520
1928	0.227	0.378
1929	0.455	0.753
1930	0.293	0.780
1931	0.278	0.387
1932	0.213	0.416
1933	0.232	0.409
1934	0.597	0.661
1935	0.282	0.343
1936	0.260	0.495
1937	0.403	0.663
1938	0.258	0.361
1939	0.021	0.433
1940	0.270	0.797
1941	0.151	0.867
1942	0.412	0.588
1943	0.214	0.581
1944	0.430	0.837
1945	0.345	0.633
1946	0.198	0.491
1947	0.137	0.386
1948	0.630	0.531
1949	0.557	0.813
1950	0.164	0.468
1951	0.183	0.710
1952	0.810	0.809
1953	0.737	0.726
1954	0.270	0.430
1955	0.219	0.409
1956	0.109	0.400
1957	0.402	0.428
1958	0.785	0.549
1959	0.482	0.545
1960	0.141	0.436
1961	0.487	1.193
1962	0.280	0.519
1963	0.142	0.379
1964	0.141	1.107
1965	0.557	0.505
1966	0.164	0.419
1967	0.243	0.585
1968	0.248	0.493
1969	0.249	0.444

1970	0.390	0.500
1971	0.578	0.490
1972	0.381	1.508
1973	0.501	0.929
1974	0.275	0.678
1975	0.606	0.701
1976	0.333	0.745
1977	0.132	0.327
1978	0.542	0.562
1979	0.157	0.590
1980	0.317	0.568
1981	0.308	0.548
1982	0.131	0.434
1983	0.491	0.583
1984	0.234	0.578
1985	0.358	0.661
1986	0.304	0.336
1987	0.569	0.548
1988	0.361	0.353
1989	0.327	0.329
1990	0.380	0.430
1991	0.298	0.642
1992	0.386	0.612
1993	0.400	0.683
1994	0.581	0.474
1995	0.125	0.367
1996	0.636	0.493
1997	0.237	0.442
1998	0.323	0.525
1999	0.039	0.606
2000	0.237	0.496
2001	0.112	0.402
2002	0.429	0.730
2003	0.373	0.444
2004	0.326	0.632
2005	0.609	1.241
2006	0.188	0.573
2007	0.167	0.640
2008	0.318	0.530
2009	0.219	0.404
2010	0.193	0.514
2011	0.143	0.529
2012	0.256	0.504
2013	0.170	0.471
2014	0.137	0.471
2015	0.261	0.772
2016	0.109	0.482
2017	0.428	0.769
2018	0.802	0.486
2019	0.782	0.688
2020	0.241	0.560
2021	0.403	0.473
2022	0.172	0.797
2023	0.346	0.997
2024	0.893	1.084
2025	0.314	0.523
2026	0.493	0.632
2027	0.197	0.633

2028	0.172	0.250
2029	0.328	0.409
2030	0.603	0.831
2031	0.196	0.263
2032	0.118	0.432
2033	0.187	0.546
2034	0.174	0.427
2035	0.696	0.527
2036	0.359	0.430
2037	0.099	0.577
2038	0.285	0.544
2039	0.041	1.109
2040	0.189	0.431
2041	0.219	0.544
2042	0.680	0.625
2043	0.341	0.693
2044	0.456	0.478
2045	0.298	0.381
2046	0.347	0.428
2047	0.266	0.525
2048	0.348	0.435
2049	0.307	0.644
2050	0.226	0.485
2051	0.331	0.675
2052	0.195	0.525
2053	0.332	0.439
2054	0.413	0.873
2055	0.171	0.495
2056	0.166	0.685
2057	0.230	0.340
2058	0.285	0.653
2059	0.478	0.828

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.9972	1.7392
2	0.8925	1.5083
3	0.8096	1.2412
4	0.8023	1.1926
5	0.7851	1.1093
6	0.7815	1.1075
7	0.7369	1.0842
8	0.6956	1.0268
9	0.6795	0.9972
10	0.6356	0.9292
11	0.6296	0.8734
12	0.6088	0.8666
13	0.6059	0.8369
14	0.6032	0.8313
15	0.5973	0.8285
16	0.5813	0.8135
17	0.5781	0.8088
18	0.5695	0.7973
19	0.5575	0.7969
20	0.5570	0.7823
21	0.5425	0.7804
22	0.5012	0.7723

23	0.4932	0.7690
24	0.4914	0.7530
25	0.4872	0.7446
26	0.4821	0.7419
27	0.4777	0.7302
28	0.4635	0.7258
29	0.4560	0.7095
30	0.4559	0.7009
31	0.4547	0.6929
32	0.4517	0.6892
33	0.4298	0.6883
34	0.4290	0.6851
35	0.4277	0.6833
36	0.4129	0.6776
37	0.4120	0.6749
38	0.4029	0.6630
39	0.4029	0.6625
40	0.4017	0.6614
41	0.3996	0.6609
42	0.3903	0.6525
43	0.3859	0.6440
44	0.3807	0.6418
45	0.3804	0.6397
46	0.3732	0.6330
47	0.3607	0.6326
48	0.3594	0.6321
49	0.3579	0.6318
50	0.3483	0.6256
51	0.3469	0.6253
52	0.3465	0.6122
53	0.3445	0.6110
54	0.3408	0.6059
55	0.3339	0.5902
56	0.3327	0.5882
57	0.3320	0.5861
58	0.3306	0.5851
59	0.3282	0.5826
60	0.3277	0.5810
61	0.3267	0.5777
62	0.3264	0.5770
63	0.3264	0.5732
64	0.3252	0.5722
65	0.3226	0.5678
66	0.3212	0.5624
67	0.3193	0.5599
68	0.3182	0.5488
69	0.3170	0.5482
70	0.3137	0.5476
71	0.3084	0.5457
72	0.3075	0.5449
73	0.3068	0.5444
74	0.3046	0.5436
75	0.3042	0.5335
76	0.3039	0.5334
77	0.2984	0.5311
78	0.2984	0.5302
79	0.2933	0.5293
80	0.2865	0.5268

81	0.2851	0.5251
82	0.2848	0.5251
83	0.2818	0.5250
84	0.2797	0.5247
85	0.2784	0.5227
86	0.2748	0.5200
87	0.2715	0.5192
88	0.2701	0.5135
89	0.2697	0.5088
90	0.2664	0.5052
91	0.2609	0.5043
92	0.2605	0.5001
93	0.2583	0.4957
94	0.2557	0.4952
95	0.2506	0.4951
96	0.2489	0.4928
97	0.2479	0.4926
98	0.2430	0.4913
99	0.2410	0.4895
100	0.2369	0.4864
101	0.2366	0.4846
102	0.2340	0.4821
103	0.2325	0.4775
104	0.2304	0.4741
105	0.2271	0.4730
106	0.2259	0.4712
107	0.2192	0.4709
108	0.2192	0.4682
109	0.2187	0.4445
110	0.2143	0.4440
111	0.2131	0.4421
112	0.2095	0.4388
113	0.2013	0.4376
114	0.1984	0.4359
115	0.1965	0.4347
116	0.1960	0.4343
117	0.1957	0.4327
118	0.1949	0.4327
119	0.1930	0.4323
120	0.1894	0.4308
121	0.1888	0.4303
122	0.1882	0.4302
123	0.1867	0.4297
124	0.1826	0.4285
125	0.1741	0.4277
126	0.1722	0.4275
127	0.1717	0.4186
128	0.1715	0.4157
129	0.1702	0.4150
130	0.1669	0.4089
131	0.1664	0.4088
132	0.1659	0.4087
133	0.1644	0.4038
134	0.1641	0.4038
135	0.1590	0.4022
136	0.1571	0.3996
137	0.1506	0.3865
138	0.1429	0.3858

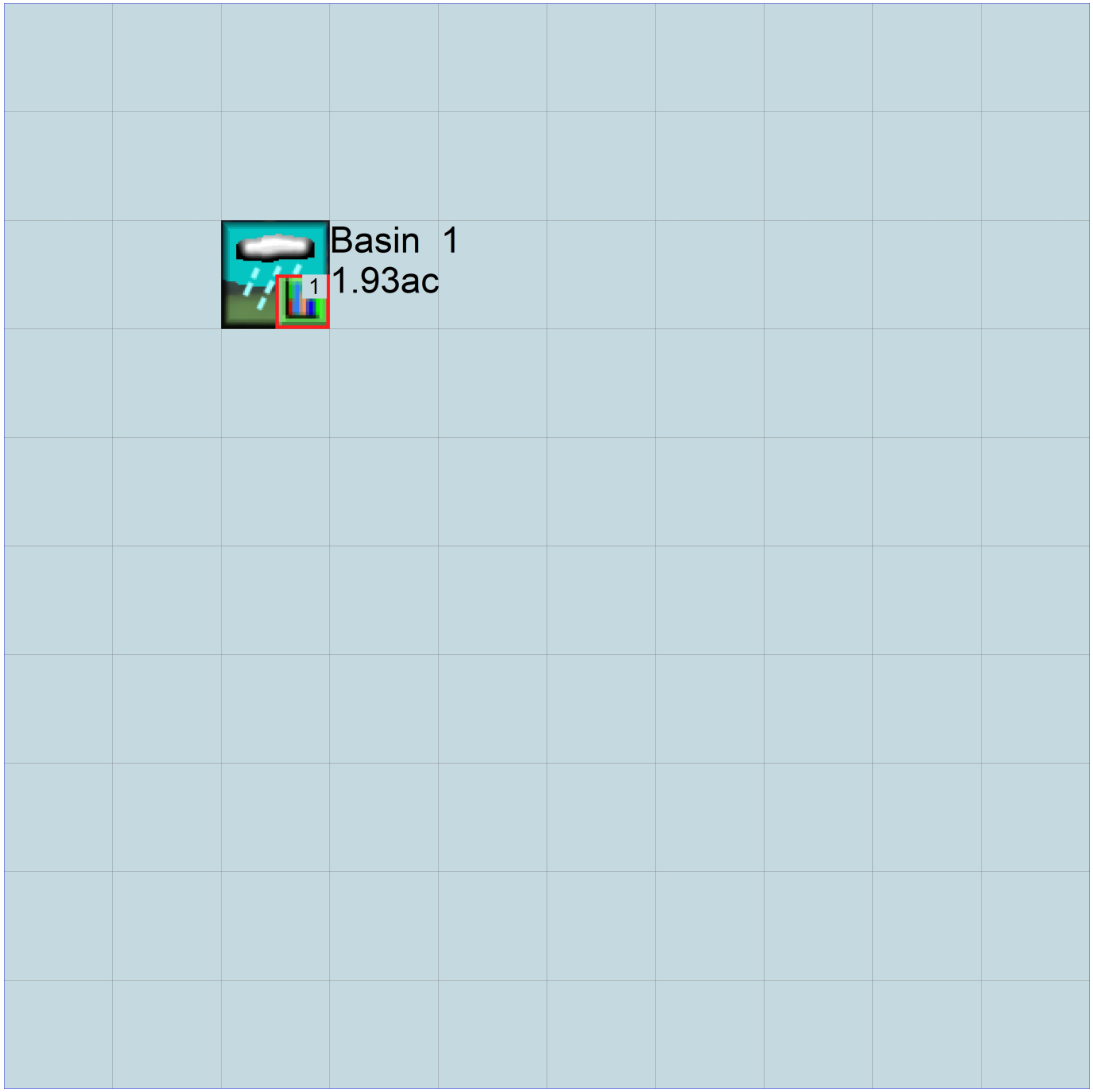
139	0.1425	0.3854
140	0.1412	0.3809
141	0.1406	0.3788
142	0.1373	0.3777
143	0.1373	0.3716
144	0.1324	0.3673
145	0.1310	0.3609
146	0.1309	0.3583
147	0.1246	0.3528
148	0.1176	0.3527
149	0.1174	0.3432
150	0.1135	0.3402
151	0.1121	0.3364
152	0.1092	0.3344
153	0.1090	0.3288
154	0.0987	0.3267
155	0.0732	0.3243
156	0.0409	0.2628
157	0.0391	0.2500
158	0.0207	0.2479

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.1665 acre-feet
On-line facility target flow:	0.2251 cfs.
Adjusted for 15 min:	0.2251 cfs.
Off-line facility target flow:	0.1303 cfs.
Adjusted for 15 min:	0.1303 cfs.

Mitigated Schematic



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PIPE CONVEYANCE BASIN MAP

Pipe Conveyance Calculations will be included in the final Stormwater Site Plan.

PIPE CONVEYANCE CALCULATIONS

Pipe Conveyance Calculations will be included in the final Stormwater Site Plan.

6.0 STORMWATER POLLUTION PREVENTION PLAN

Construction Stormwater General Permit

Stormwater Pollution Prevention Plan (SWPPP)

for

Proposed DuPont West

Prepared for:

The Washington State Department of Ecology

Southwest Regional Office

Permittee / Owner	Developer	Operator / Contractor
Avenue 55, LLC 601 Union Street, Suite 2930 Seattle, WA 98101	Avenue 55, LLC 601 Union Street, Suite 2930 Seattle, WA 98101	TBD

Certified Erosion and Sediment Control Lead (CESCL)

Name	Organization	Contact Phone Number
TBD by contractor	TBD	TBD

SWPPP Prepared By

Name	Organization	Contact Phone Number
Josh Towne	Barghausen Consulting Engineers, Inc.	(425) 251-6222

SWPPP Preparation Date

11/06/2023

Project Construction Dates

Activity / Phase	Start Date	End Date
Phase 1	May 2024	September 2025

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List of Acronyms and Abbreviations

Acronym / Abbreviation	Explanation
303(d)	Section of the Clean Water Act pertaining to Impaired Waterbodies
BFO	Bellingham Field Office of the Department of Ecology
BMP(s)	Best Management Practice(s)
CESCL	Certified Erosion and Sediment Control Lead
CO_2	Carbon Dioxide
CRO	Central Regional Office of the Department of Ecology
CSWGP	Construction Stormwater General Permit
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ERO	Eastern Regional Office of the Department of Ecology
ERTS	Environmental Report Tracking System
ESC	Erosion and Sediment Control
GULD	General Use Level Designation
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
NWRO	Northwest Regional Office of the Department of Ecology
pH	Power of Hydrogen
RCW	Revised Code of Washington
SPCC	Spill Prevention, Control, and Countermeasure
su	Standard Units
SWMMEW	Stormwater Management Manual for Eastern Washington
SWMMWW	Stormwater Management Manual for Western Washington
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
SWRO	Southwest Regional Office of the Department of Ecology
TMDL	Total Maximum Daily Load
VFO	Vancouver Field Office of the Department of Ecology
WAC	Washington Administrative Code
WSDOT	Washington Department of Transportation
WWHM	Western Washington Hydrology Model

1 Project Information

Project/Site Name: DuPont West
Street/Location: 1700 Center Drive
City: DuPont State: WA Zip code: 98327
Subdivision: N/A
Receiving waterbody: N/A

1.1 Existing Conditions

Total acreage (including support activities such as off-site equipment staging yards, material storage areas, borrow areas).

Total acreage:	19.65
Disturbed acreage:	15.25
Existing structures:	0
Landscape topography:	The existing site is approximately 19.65 acres of forested land. There is an existing gravel area near the center of the site, which depresses at a slopes ranging from 30% to 45%. There are existing1:1 slopes to the south of the property. The majority of the site is moderately steep, with slopes ranging from 2% to 20%. The east side of the site has slopes ranging from 13% to 70%. The site generally slopes southwest. This site lies within Spanaway gravelly sandy loam, according to the USDA Web Soil survey.
Drainage patterns:	The site currently infiltrates, as it is undeveloped land.
Existing Vegetation:	The site is grassy with numerous trees.
Critical Areas (wetlands, streams, high erosion risk, steep or difficult to stabilize slopes):	There are no known sensitive areas on this site, according to Pierce County PublicGIS.

List of known impairments for 303(d) listed or Total Maximum Daily Load (TMDL) for the receiving waterbody: This does not apply to this project

Table 1 includes a list of suspected and/or known contaminants associated with the construction activity.

Table 1 – Summary of Site Pollutant Constituents

Constituent (Pollutant)	Location	Depth	Concentration
Hydraulic Fluid	Spill from equipment maintenance	Surface	

1.2 Proposed Construction Activities

Description of site development (example: subdivision):
The proposed conditions for this site will include one warehouse building with impervious paving, utilities, and an infiltration pond and gallery.

Description of construction activities (example: site preparation, demolition, excavation):
This project is proposing to construct one warehouse building of approximately 256,800 square feet. Half street improvements are also proposed to connect into the existing portion of Sequalitchew Drive to the southeast of the site. This project also proposes sidewalks, asphalt and concrete pavement, utilities, landscaping, and a retaining wall. These improvements will include a total of 13.10 acres of impervious surfaces. The remaining site area will consist of pervious surfaces in the form of landscaping and undisturbed land, which total 6.55 acres.

Description of site drainage including flow from and onto adjacent properties. Must be consistent with Site Map in Appendix A:
The existing sites surrounding this project are undeveloped, so they are expected to infiltrate all stormwater. The surrounding properties also generally slope away from this site, so there are no upstream basins that contribute runoff to this site.

Description of final stabilization (example: extent of revegetation, paving, landscaping):
At the completion of construction the proposed site will be approximately 67% impervious surfaces and 33% pervious areas. The building will be approximately 30% of the site area while roughly 37% of the site will be paved.

Contaminated Site Information:
Proposed activities regarding contaminated soils or groundwater (example: on-site treatment system, authorized sanitary sewer discharge):
No contaminated groundwater is anticipated to be encountered during construction. If contaminated groundwater is encountered, the groundwater will be pumped to a Baker Tank where it will be treated and discharged to sanitary sewer.

2 Construction Stormwater Best Management Practices (BMPs)

The SWPPP is a living document reflecting current conditions and changes throughout the life of the project. These changes may be informal (i.e., hand-written notes and deletions). Update the SWPPP when the CESCL has noted a deficiency in BMPs or deviation from original design.

2.1 The 13 Elements

2.1.1 Element 1: Preserve Vegetation / Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Areas that are to be preserved, as well as all sensitive areas and their buffers, shall be clearly delineated, both in the field and on the plans. A silt fence will be installed around the perimeter of the project site to mark the limits of construction as well as protect surrounding properties from any possible sediment laden runoff. As this site has contaminated soils present, the existing topsoils will be left in place with imported clean fill placed on top.

List and describe BMPs:

- High Visibility Plastic or Metal Fence (BMP C103)

Installation Schedules: TBD

Inspection and Maintenance plan:

Silt Fence Maintenance

- Repair any damage immediately.
- Intercept and convey all evident concentrated flows uphill of the silt fence to a sediment pond.
- Check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.
- Remove sediment deposits when the deposit reaches approximately one-third the height of the silt fence, or install a second silt fence.
- Replace filter fabric that has deteriorated due to ultraviolet breakdown.

Responsible Staff: Contractor/CESL

2.1.2 Element 2: Establish Construction Access

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters. A temporary construction entrance will be installed at the southeast corner of the site from Sequalitchew Drive. Wheel washing will occur onsite if necessary in order to prevent sediment from leaving the site. Street sweeping and street cleaning may be necessary if the stabilized construction access is not effective. Roads shall be swept daily if any sediment collects on them. All wheel wash wastewater shall be controlled on-site and will not be discharged into waters of the State.

List and describe BMPs:

- Stabilized Construction Entrance/ Exit (BMP C105)

Installation Schedules: TBD

Inspection and Maintenance plan:

Stabilized Construction Entrance Maintenance

- Quarry spalls shall be added if the pad is no longer in accordance with the specifications.
- If the entrance is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include replacement/cleaning of the existing quarry spalls, street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when high efficiency sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump to contain the wash water shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Perform street sweeping by hand or with a high efficiency sweeper. Do not use a non-high efficiency mechanical sweeper because this creates dust and throws soils into storm systems or conveyance ditches.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see BMP C103) shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

Responsible Staff: Contractor/CESL

2.1.3 Element 3: Control Flow Rates

In order to protect the properties and waterways downstream of the project site, stormwater discharges from the site will be controlled by construction of a sediment pond as one of the first items of construction as well as a silt fence around the property boundary. Stormwater during construction will be captured through v-ditches with rock check dams in order to control the flow of stormwater runoff before reaching the sediment pond. The sediment pond has been sized with adequate surface area for sediment settlement per the DOE requirements from BMP C240 and C241.

Detention facilities must be functioning property before construction of site improvements.

Will you construct stormwater retention and/or detention facilities?
☒ Yes ☐ No

Will you use permanent infiltration ponds or other low impact development (example: rain gardens, bio-retention, porous pavement) to control flow during construction?
☐ Yes ☒ No

List and describe BMPs:

- Sediment Pond (BMP C241)
- Check Dams (BMP C207)

Installation Schedules: TBD

Inspection and Maintenance plan:

Sediment Pond/Trap Maintenance

- Sediment shall be removed from the pond when it reaches 1-foot in depth.
- Any damage to the pond embankments or slopes shall be repaired.

Check Dam Maintenance

- Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall.
- Sediment shall be removed when it reaches one half the sump depth.
- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel

Responsible Staff: Contractor/CESL

2.1.4 Element 4: Install Sediment Controls

All stormwater runoff from disturbed areas shall pass through an appropriate sediment removal BMP before leaving the construction site or prior to being discharged to the downstream drainage course. Constructing the sediment control pond is one of the first steps of grading and must be done before other land disturbing activities take place. Rock check dams and v-ditches will be used to convey stormwater runoff into the sediment pond to settle out sediment as well. There are no juvenile Salmonids attempting to enter off-channel areas or drainages within the vicinity. The surface area requirements for the TESC pond are met with the designed TESC plan and it is not expected that further treatment or other sediment controlling measures are necessary.

However, if the proposed sediment controls are ineffective as determined by the CESCL, they will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix B.

List and describe BMPs:

- Silt Fence (BMP C233)
- Temporary Sediment Pond (BMP C241)
- Check Dams (BMP C207)

Installation Schedules: TBD

Inspection and Maintenance plan:

Silt Fence Maintenance

- Repair any damage immediately.
- Intercept and convey all evident concentrated flows uphill of the silt fence to a sediment pond.
- Check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.
- Remove sediment deposits when the deposit reaches approximately one-third the height of the silt fence, or install a second silt fence.
- Replace filter fabric that has deteriorated due to ultraviolet breakdown.

Sediment Pond/Trap Maintenance

- Sediment shall be removed from the pond when it reaches 1-foot in depth.
- Any damage to the pond embankments or slopes shall be repaired.

Check Dam Maintenance

- Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall.
- Sediment shall be removed when it reaches one half the sump depth.

- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel.

Responsible Staff: Contractor/CESL

2.1.5 Element 5: Stabilize Soils

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. Temporary seeding shall occur on all areas to remain unworked pursuant to below. In general, cut and fill slopes will be stabilized as soon as possible and soil stockpiles will be temporarily covered with plastic sheeting. All stockpiled soils shall be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels. To the northwest of the site, there is an area that will be used for stockpiling any contaminated soils uncovered during the project. These stockpiles will be covered with plastic sheeting while being stored and waiting for testing to determine any present contaminants before disposal or reuse depending on the testing outcome. To minimize the amount of soil exposed through the life of the project, grading will be completed within a reasonable time frame after the preloading of the building footprints is completed. To minimize soil compaction, a construction entrance will be used as well as keeping heavy equipment and machinery off unpaved areas as much as possible.

West of the Cascade Mountains Crest

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	May 1 – September 30	7 days
During the Wet Season	October 1 – April 30	2 days

Soils must be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast.

Anticipated project dates: Start date: October 2017 End date: October 2018

Will you construct during the wet season?
☒ Yes ☐ No

List and describe BMPs:

- Temporary and Permanent Seeding (BMP C120)
- Mulching (BMP C121)
- Dust Control (BMP C140)

Installation Schedules: TBD

Inspection and Maintenance plan: Temporary and Permanent Seeding Maintenance

- Reseed any seeded areas that fail to establish at least 80 percent cover (100 percent cover for areas that receive sheet or concentrated flows). If reseeding is ineffective, use an alternate method such as sodding, mulching, or nets/blankets. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the local authority when sensitive areas would otherwise be protected.
- Reseed and protect by mulch any areas that experience erosion after achieving adequate cover. Reseed and protect by mulch any eroded area.
- Supply seeded areas with adequate moisture, but do not water to the extent that it causes runoff.

Mulching Maintenance

- The thickness of the cover must be maintained.
- Any areas that experience erosion shall be remulched and/or protected with a net or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area remulched.

Dust Control Maintenance

- Respray area as necessary to keep dust to a minimum.

Responsible Staff: Contractor/CESL

2.1.6 Element 6: Protect Slopes

All cut and fill slopes will be designed, constructed, and protected in a manner that minimizes erosion. It is required that any temporary pipe slope drains must handle the peak 10-minute flow rate from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. For modeling the condition with the Western Washington Hydrology Model (WWHM) to predict flows, bare soil areas have been modeled as “landscaped area”. Scouring will be reduced by using v-ditches with rock check dams to convey stormwater to the sediment pond and trap on site. However, if the proposed BMPs to protect slopes are ineffective as determined by the CESCL, they will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix B.

Will steep slopes be present at the site during construction?
☒ Yes ☐ No

List and describe BMPs:

- Temporary and Permanent Seeding (BMP C120)

Installation Schedules: TBD

Inspection and Maintenance plan:

Temporary and Permanent Seeding Maintenance

- Reseed any seeded areas that fail to establish at least 80 percent cover (100 percent cover for areas that receive sheet or concentrated flows). If reseeding is ineffective, use an alternate method such as sodding, mulching, or nets/blankets. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the local authority when sensitive areas would otherwise be protected.
- Reseed and protect by mulch any areas that experience erosion after achieving adequate cover. Reseed and protect by mulch any eroded area.
- Supply seeded areas with adequate moisture, but do not water to the extent that it causes runoff.

Check Dam Maintenance

- Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall.
- Sediment shall be removed when it reaches one half the sump depth.
- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.

- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel.

Responsible Staff: Contractor/CESL

2.1.7 Element 7: Protect Drain Inlets

All storm drain inlets and culverts made operable during construction shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. However, the first priority is to keep all access roads clean of sediment and keep wash water separate from entering storm drains until treatment can be provided. Storm Drain Inlet Protection (BMP C220) will be implemented for all drainage inlets and culverts that could potentially be impacted by sediment-laden runoff on and near the project site. The temporary sediment pond and trap on site will function to settle out sediment particles before discharge to the existing storm system in order to prevent sediment from entering the system. If this is deemed ineffective by the CESCL, additional BMPs may be necessary, as listed in Appendix B. Inlet protection is the last component of a treatment train and protection of drain inlets include additional sediment and erosion control measures. Inlet protection devices will be cleaned (or removed and replaced), when sediment has filled the device by one third (1/3) or as specified by the manufacturer.

List and describe BMPs:

- Storm Drain Inlet Protection (BMP C220)

Installation Schedules: TBD

Inspection and Maintenance plan:

Storm Drain Inlet Protection Maintenance

- Inspect catch basin filters frequently, especially after storm events. Clean and replace clogged inserts. For systems with clogged stone filters: pull away the stones from the inlet and clean or replace. An alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.
- Inlets to be inspected weekly and a minimum of daily during storm events

Responsible Staff: Contractor/CESL

2.1.8 Element 8: Stabilize Channels and Outlets

Where site runoff is to be conveyed in channels, or discharged to a stream or some other natural drainage point, efforts will be taken to prevent downstream erosion. For construction stormwater conveyance, v-ditches with rock check dams will be installed to stabilize channels. Stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent streambanks, slopes, and downstream reaches shall be provided at the outlets of all conveyance systems. The project site is located west of the Cascade Mountain Crest. As such, all temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the expected peak 10 minute velocity of flow from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the WWHM to predict flows, bare soil areas should be modeled as "landscaped area".

Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches, will be installed at the outlets of all conveyance systems.

List and describe BMPs:

- Check Dams (BMP C207)

Installation Schedules: TBD

Inspection and Maintenance plan:

Check Dam Maintenance

- Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall. Sediment shall be removed when it reaches one half the sump depth.
- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel.

Responsible Staff: Contractor/CESL

2.1.9 Element 9: Control Pollutants

The following pollutants are anticipated to be present on-site:

Table 2 – Pollutants

Pollutant (List pollutants and source, if applicable)
Hydraulic fluid- May be present on sie with construct ion equipment.
Diesel – May be present on site with construction equipment.
Motor Oil – May be presne on site with construction equipment.

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well organized, and free of debris. If required, BMPs to be implemented to control specific sources of pollutants are discussed below. Vehicles, construction equipment, and/or petroleum product storage/dispensing:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- On-site fueling tanks and petroleum product storage containers shall include secondary containment.
- Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
- In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.
- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

Demolition:

- Dust released from demolished sidewalks, buildings, or structures will be controlled using Dust Control measures (BMP C140).
- Storm drain inlets vulnerable to stormwater discharge carrying dust, soil, or debris will be protected using Storm Drain Inlet Protection (BMP C220 as described above for Element 7).
- Process water and slurry resulting from sawcutting and surfacing operations will be prevented from entering the waters of the State by implementing Sawcutting and Surfacing Pollution Prevention measures (BMP C152).

Concrete and grout:

- Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures (BMP C151).

List and describe BMPs:

- Concrete Handling (BMP C151)

Installation Schedules: TBD

Inspection and Maintenance plan:

Concrete Handling Maintenance

- Check containers for holes in the liner daily during concrete pours and repair the same day.

Responsible Staff: Contractor/CESL

Will maintenance, fueling, and/or repair of heavy equipment and vehicles occur on-site?
☒ Yes ☐ No

In order to prevent spills and minimize risk, the following list should be applied

- Temporary storage area should be located away from vehicular traffic, near the construction entrance(s), and away from waterways or storm drains.
- Material Safety Data Sheets (MSDS) should be supplied for all materials stored. Chemicals should be kept in their original labeled containers.
- Hazardous material storage on-site should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- During the wet weather season (Oct 1 – April 30), consider storing materials in a covered area.
- Materials should be stored in secondary containments, such as earthen dike, horse trough, or even a children's wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, and within secondary containment.
- If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids to reduce corrosion. Domed plastic covers are inexpensive and snap to the top of drums, preventing water from collecting.

Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 shall be stored in approved containers and drums and shall not be overfilled. Containers and drums shall be stored in temporary secondary containment facilities.

List and describe BMPs:

- Material Delivery, Storage and Containment (BMP C153)

Installation Schedules: TBD

Inspection and Maintenance plan: The spill kit should include, at a minimum:

- 1-Water Resistant Nylon Bag
- 3-Oil Absorbent Socks 3”x 4’
- 2-Oil Absorbent Socks 3”x 10’
- 12-Oil Absorbent Pads 17”x19”
- 1-Pair Splash Resistant Goggles
- 3-Pair Nitrile Gloves
- 10-Disposable Bags with Ties
- Instructions

Responsible Staff: Contractor/CESL

Will wheel wash or tire bath system BMPs be used during construction?
☐ Yes ☒ No

If yes, provide disposal methods for wastewater generated by BMPs.

If discharging to the sanitary sewer, include the approval letter from your local sewer district under Correspondence in Appendix C.

List and describe BMPs: N/A

Installation Schedules: N/A

Inspection and Maintenance plan: N/A

Responsible Staff: N/A

Will pH-modifying sources be present on-site?
☐ Yes ☒ No

Table 3 – pH-Modifying Sources

☒	None
☐	Bulk cement
☐	Cement kiln dust
☐	Fly ash
☐	Other cementitious materials
☐	New concrete washing or curing waters
☐	Waste streams generated from concrete grinding and sawing
☐	Exposed aggregate processes
☐	Dewatering concrete vaults

☐	Concrete pumping and mixer washout waters
☐	Recycled concrete
☐	Recycled concrete stockpiles
☐	Other (i.e., calcium lignosulfate) [please describe:]

Describe BMPs you will use to prevent pH-modifying sources from contaminating stormwater.

List and describe BMPs: N/A

Installation Schedules: N/A

Inspection and Maintenance plan: N/A

Responsible Staff: N/A

Concrete trucks must not be washed out onto the ground, or into storm drains, open ditches, streets, or streams. Excess concrete must not be dumped on-site, except in designated concrete washout areas with appropriate BMPs installed.

Will uncontaminated water from water-only based shaft drilling for construction of building, road, and bridge foundations be infiltrated provided the wastewater is managed in a way that prohibits discharge to surface waters?
☐ Yes ☒ No

List and describe BMPs: N/A

Installation Schedules: N/A

Inspection and Maintenance plan: N/A

Responsible Staff: N/A

2.1.10 Element 10: Control Dewatering

Because soils onsite are highly infiltrative and no groundwater was encountered during geotechnical investigations, no construction dewatering is anticipated for this project.

If BMP C250: Construction Stormwater Chemical Treatment and BMP C251: Construction Stormwater Filtration are required for treatment, approval from Ecology is required prior.

Table 4 – Dewatering BMPs

☒	Infiltration
☐	Transport off-site in a vehicle (vacuum truck for legal disposal)
☐	Ecology-approved on-site chemical treatment or other suitable treatment technologies
☐	Sanitary or combined sewer discharge with local sewer district approval (last resort)
☐	Use of sedimentation bag with discharge to ditch or swale (small volumes of localized dewatering)

List and describe BMPs:

- Construciton Stormwater Chemical Treatement (BMP C250)
- Construction Stormwater Filtration (BMP C251)

Installation Schedules: TBD

Inspection and Maintenance plan:

Construction Stormwater Chemical Treatment Maintenance

Monitoring: At a minimum, the following monitoring shall be conducted. Test results shall be recorded on a daily log kept on site. Additional testing may be required by the NPDES permit based on site conditions.

Operational Monitoring:

- Total volume treated and discharged.
- Flow must be continuously monitored and recorded at not greater than 15-minute intervals.
- Type and amount of chemical used for pH adjustment.
- Amount of polymer used for treatment.
- Settling time.

Compliance Monitoring:

- Influent and effluent pH, flocculent chemical concentration, and turbidity must be continuously monitored and recorded at not greater than 15-minute intervals. pH and turbidity of the receiving water.
-

Biomonitoring:

Treated stormwater must be non-toxic to aquatic organisms. Treated stormwater must be tested for aquatic toxicity or residual chemicals. Frequency of biomonitoring will be determined by Ecology.

Residual chemical tests must be approved by Ecology prior to their use.

If testing treated stormwater for aquatic toxicity, you must test for acute (lethal) toxicity. Bioassays shall be conducted by a laboratory accredited by Ecology, unless otherwise approved by Ecology. Acute toxicity tests shall be conducted per the CTAPE protocol.

Discharge Compliance: Prior to discharge, treated stormwater must be sampled and tested for compliance with pH, flocculent chemical concentration, and turbidity limits. These limits may be established by the Construction Stormwater General Permit or a site-specific discharge permit. Sampling and testing for other pollutants may also be necessary at some sites. pH must be within the range of 6.5 to 8.5 standard units and not cause a change in the pH of the receiving water of more than 0.2 standard units. Treated stormwater samples and measurements shall be taken from the discharge pipe or another location representative of the nature of the treated stormwater discharge. Samples used for determining compliance with the water quality standards in the receiving water shall not be taken from the treatment pond prior to decanting. Compliance with the water quality standards is determined in the receiving water.

Operator Training: Each contractor who intends to use chemical treatment shall be trained by an experienced contractor . Each site using chemical treatment must have an operator trained and certified by an organization approved by Ecology.

Standard BMPs: Surface stabilization BMPs should be implemented on site to prevent significant erosion. All sites shall use a truck wheel wash to prevent tracking of sediment off site.

Sediment Removal and Disposal:

- Sediment shall be removed from the storage or treatment cells as necessary. Typically, sediment removal is required at least once during a wet season and at the decommissioning of the cells. Sediment remaining in the cells between batches may enhance the settling process and reduce the required chemical dosage.
- Sediment that is known to be non-toxic may be incorporated into the site away from drainages.

Construction Stormwater Filtration Maintenance

Rapid sand filters typically have automatic backwash systems that are triggered by a pre-set pressure drop across the filter. If the backwash water volume is not large or substantially more turbid than the untreated stormwater stored in the holding pond or tank, backwash return to the untreated stormwater pond or tank may be appropriate. However, other means of treatment and disposal may be necessary.

- Screen, bag, and fiber filters must be cleaned and/or replaced when they become clogged.
- Sediment shall be removed from the storage and/or treatment ponds as necessary. Typically, sediment removal is required once or twice during a wet season and at the decommissioning of the ponds.

Responsible Staff: Contractor/CESL

2.1.11 Element 11: Maintain BMPs

All temporary and permanent Erosion and Sediment Control (ESC) BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function.

Maintenance and repair shall be conducted in accordance with each particular BMP specification (see *Volume II of the SWMMWW or Chapter 7 of the SWMMEW*).

Visual monitoring of all BMPs installed at the site will be conducted at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site. If the site becomes inactive and is temporarily stabilized, the inspection frequency may be reduced to once every calendar month.

All temporary ESC BMPs shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed.

Trapped sediment shall be stabilized on-site or removed. Disturbed soil resulting from removal of either BMPs or vegetation shall be permanently stabilized.

Additionally, protection must be provided for all BMPs installed for the permanent control of stormwater from sediment and compaction. BMPs that are to remain in place following completion of construction shall be examined and restored to full operating condition. If sediment enters these BMPs during construction, the sediment shall be removed and the facility shall be returned to conditions specified in the construction documents.

2.1.12 Element 12: Manage the Project

The project will be managed based on the following principles:

- Projects will be phased to the maximum extent practicable and seasonal work limitations will be taken into account.
- Inspection and monitoring:
    - Inspection, maintenance and repair of all BMPs will occur as needed to ensure performance of their intended function.
    - Site inspections and monitoring will be conducted in accordance with Special Condition S4 of the CSWGP. Sampling locations are indicated on the Site Map. Sampling station(s) are located in accordance with applicable requirements of the CSWGP.
- Maintain an updated SWPPP.
    - The SWPPP will be updated, maintained, and implemented in accordance with Special Conditions S3, S4, and S9 of the CSWGP.

As site work progresses the SWPPP will be modified routinely to reflect changing site conditions. The SWPPP will be reviewed monthly to ensure the content is current.

Table 5 – Management

☒	Design the project to fit the existing topography, soils, and drainage patterns
☒	Emphasize erosion control rather than sediment control
☒	Minimize the extent and duration of the area exposed
☒	Keep runoff velocities low
☒	Retain sediment on-site
☒	Thoroughly monitor site and maintain all ESC measures
☒	Schedule major earthwork during the dry season
☐	Other (please describe)

Table 6 – BMP Implementation Schedule

Phase of Construction Project	Stormwater BMPs	Date	Wet/Dry Season
TBD			

2.1.13 Element 13: Protect Low Impact Development (LID) BMPs

Low Impact Developed (LID) BMPs are practices that emphasize pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration integrated into project design. The idea behind these is to emphasize conservation, use of on-site natural features, and site planning to minimize impervious surfaces, native vegetation loss, and stormwater runoff. At this time, there are no LID BMPs in place, however the following shall apply in the event of additional LID BMPs added to the project:

- Permittees must protect all Bioretention and Rain Garden facilities from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the Bioretention and/or Rain Garden facilities. Restore the facilities to their fully functioning condition if they accumulate sediment during construction. Restoring the facility must include removal of sediment and any sediment-laden Bioretention/Rain Garden soils, and replacing the removed soils with soils meeting the design specification.
- Permittees must maintain the infiltration capabilities of Bioretention and Rain Garden facilities by protecting against compaction by construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.
- Permittees must control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff onto permeable pavements.
- Permittees must clean permeable pavements fouled with sediments or no longer passing an initial infiltration test using local stormwater manual methodology or the manufacturer's procedures.
- Permittees must keep all heavy equipment off existing soils under LID facilities that have been excavated to final grade to retain the infiltration rate of the soils.

3 Pollution Prevention Team

Table 7 – Team Information

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	TBD	
Resident Engineer	Dan Balmelli	(425) 251-6222
Emergency Ecology Contact	TBD	TBD
Emergency Permittee/ Owner Contact	TBD	TBD
Non-Emergency Owner Contact	TBD	TBD
Monitoring Personnel	TBD	TBD
Ecology Regional Office	Northwest Regional Office	425-649-7000

4 Monitoring and Sampling Requirements

Monitoring includes visual inspection, sampling for water quality parameters of concern, and documentation of the inspection and sampling findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Stormwater sampling data

File a blank form under Appendix D.

The site log book must be maintained on-site within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

Numeric effluent limits may be required for certain discharges to 303(d) listed waterbodies. See CSWGP Special Condition S8 and Section 5 of this template.

4.1 Site Inspection

Site inspections will be conducted at least once every calendar week and within 24 hours following any discharge from the site. For sites that are temporarily stabilized and inactive, the required frequency is reduced to once per calendar month.

The discharge point(s) are indicated on the Site Map (see Appendix A) and in accordance with the applicable requirements of the CSWGP.

4.2 Stormwater Quality Sampling

4.2.1 Turbidity Sampling

Requirements include calibrated turbidity meter or transparency tube to sample site discharges for compliance with the CSWGP. Sampling will be conducted at all discharge points at least once per calendar week.

Method for sampling turbidity:

Table 8 – Turbidity Sampling Method

☒	Turbidity Meter/Turbidimeter (required for disturbances 5 acres or greater in size)
☐	Transparency Tube (option for disturbances less than 1 acre and up to 5 acres in size)

The benchmark for turbidity value is 25 nephelometric turbidity units (NTU) and a transparency less than 33 centimeters.

If the discharge's turbidity is 26 to 249 NTU **or** the transparency is less than 33 cm but equal to or greater than 6 cm, the following steps will be conducted:

1. Review the SWPPP for compliance with Special Condition S9. Make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.

2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.
3. Document BMP implementation and maintenance in the site log book.

If the turbidity exceeds 250 NTU **or** the transparency is 6 cm or less at any time, the following steps will be conducted:

1. Telephone or submit an electronic report to the applicable Ecology Region's Environmental Report Tracking System (ERTS) within 24 hours.
    - **Central Region** (Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima): (509) 575-2490 or http://www.ecy.wa.gov/programs/spills/forms/nerts_online/CRO_nerts_online.html
    - **Eastern Region** (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400 or http://www.ecy.wa.gov/programs/spills/forms/nerts_online/ERO_nerts_online.html
    - **Northwest Region** (King, Kitsap, Island, San Juan, Skagit, Snohomish, Whatcom): (425) 649-7000 or http://www.ecy.wa.gov/programs/spills/forms/nerts_online/NWRO_nerts_online.html
    - **Southwest Region** (Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, Wahkiakum,): (360) 407-6300 or http://www.ecy.wa.gov/programs/spills/forms/nerts_online/SWRO_nerts_online.html
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period
3. Document BMP implementation and maintenance in the site log book.
4. Continue to sample discharges daily until one of the following is true:
    - Turbidity is 25 NTU (or lower).
    - Transparency is 33 cm (or greater).
    - Compliance with the water quality limit for turbidity is achieved.
        - 1 - 5 NTU over background turbidity, if background is less than 50 NTU
        - 1% - 10% over background turbidity, if background is 50 NTU or greater
    - The discharge stops or is eliminated.

4.2.2 pH Sampling

pH monitoring is required for "Significant concrete work" (i.e., greater than 1000 cubic yards poured concrete over the life of the project). The use of recycled concrete or engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD] or fly ash) also requires pH monitoring.

For significant concrete work, pH sampling will start the first day concrete is poured and continue until it is cured, typically three (3) weeks after the last pour.

For engineered soils and recycled concrete, pH sampling begins when engineered soils or recycled concrete are first exposed to precipitation and continues until the area is fully stabilized.

If the measured pH is 8.5 or greater, the following measures will be taken:

1. Prevent high pH water from entering storm sewer systems or surface water.
2. Adjust or neutralize the high pH water to the range of 6.5 to 8.5 su using appropriate technology such as carbon dioxide (CO_2) sparging (liquid or dry ice).
3. Written approval will be obtained from Ecology prior to the use of chemical treatment other than CO_2 sparging or dry ice.

Method for sampling pH:

Table 9 – pH Sampling Method

☒	pH meter
☐	pH test kit
☐	Wide range pH indicator paper

5 Discharges to 303(d) or Total Maximum Daily Load (TMDL) Waterbodies

5.1 303(d) Listed Waterbodies

Is the receiving water 303(d) (Category 5) listed for turbidity, fine sediment, phosphorus, or pH?

☐ Yes ☒ No

List the impairment(s):

N/A

5.2 TMDL Waterbodies

Waste Load Allocation for CWSGP discharges:

N/A

List and describe BMPs:

N/A

Discharges to TMDL receiving waterbodies will meet in-stream water quality criteria at the point of discharge.

The Construction Stormwater General Permit Proposed New Discharge to an Impaired Water Body form is included in Appendix F.

6 Reporting and Record Keeping

6.1 Record Keeping

6.1.1 Site Log Book

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Sample logs

6.1.2 Records Retention

Records will be retained during the life of the project and for a minimum of three (3) years following the termination of permit coverage in accordance with Special Condition S5.C of the CSWGP.

Permit documentation to be retained on-site:

- CSWGP
- Permit Coverage Letter
- SWPPP
- Site Log Book

Permit documentation will be provided within 14 days of receipt of a written request from Ecology. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with Special Condition S5.G.2.b of the CSWGP.

6.1.3 Updating the SWPPP

The SWPPP will be modified if:

- Found ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site.
- There is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

The SWPPP will be modified within seven (7) days if inspection(s) or investigation(s) determine additional or modified BMPs are necessary for compliance. An updated timeline for BMP implementation will be prepared.

6.2 Reporting

6.2.1 Discharge Monitoring Reports

Cumulative soil disturbance is less than one (1) acre; therefore, Discharge Monitoring Reports (DMRs) will not be submitted to Ecology because water quality sampling is not being conducted at the site.

6.2.2 Notification of Noncompliance

If any of the terms and conditions of the permit is not met, and the resulting noncompliance may cause a threat to human health or the environment, the following actions will be taken:

1. Ecology will be notified within 24-hours of the failure to comply by calling the applicable Regional office ERTS phone number (Regional office numbers listed below).
2. Immediate action will be taken to prevent the discharge/pollution or otherwise stop or correct the noncompliance. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Anytime turbidity sampling indicates turbidity is 250 NTUs or greater, or water transparency is 6 cm or less, the Ecology Regional office will be notified by phone within 24 hours of analysis as required by Special Condition S5.A of the CSWGP.

- **Central Region** at (509) 575-2490 for Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, or Yakima County
- **Eastern Region** at (509) 329-3400 for Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, or Whitman County
- **Northwest Region** at (425) 649-7000 for Island, King, Kitsap, San Juan, Skagit, Snohomish, or Whatcom County
- **Southwest Region** at (360) 407-6300 for Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, or Wahkiakum

Include the following information:

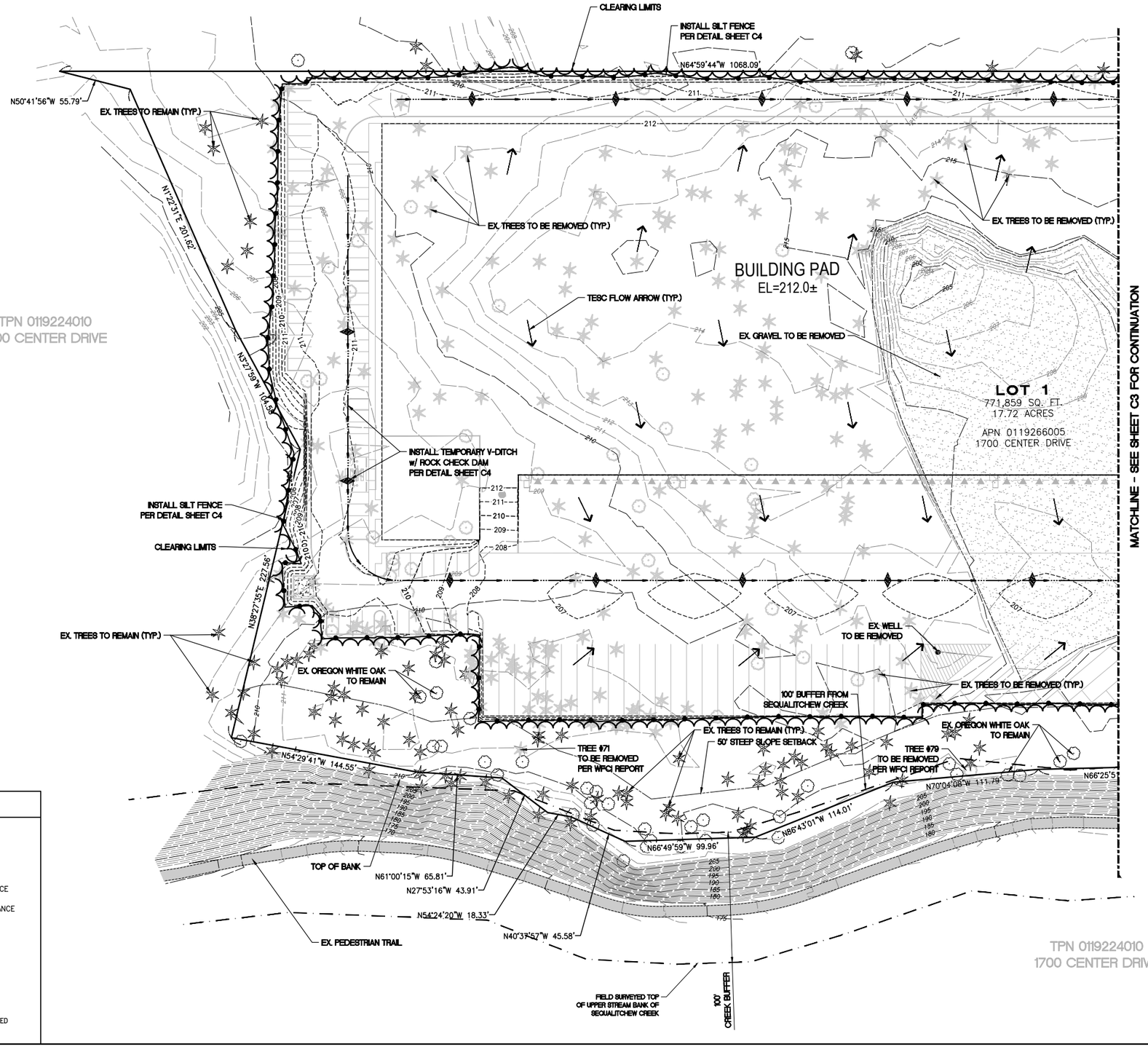
1. Your name and / Phone number
2. Permit number
3. City / County of project
4. Sample results
5. Date / Time of call
6. Date / Time of sample
7. Project name

In accordance with Special Condition S4.D.5.b of the CSWGP, the Ecology Regional office will be notified if chemical treatment other than CO_2 sparging is planned for adjustment of high pH water.

A. Site Map

PRELIMINARY TESC AND DEMOLITION PLAN-WEST
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80



TESC LEGEND:

- INLET PROTECTION
- SILT FENCE
- LIMITS OF DISTURBANCE
- CONSTRUCTION ENTRANCE
- TEMPORARY V-DITCH
- ROCK CHECK DAM
- EX. TREE TO REMAIN
- EX. TREE TO BE REMOVED

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

No.	Date	By	Ckd.	Appr.	Revision
2	11/06/23	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title:
PRELIMINARY
TESC AND DEMOLITION PLAN-WEST
FOR
DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELLI
STATE OF WASHINGTON
25672
REGISTERED PROFESSIONAL ENGINEER
11/06/2023

Scale: Horizontal 1"=40' Vertical N/A

Designed JAT
Drawn JAT
Checked DKB
Approved DKB
Date 11/06/23

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 18666
Sheet C2 of 13

P:\18000s\18666\predimlnary\18666-pe.dwg 11/7/2023 10:24 AM JTOWNE

PRELIMINARY TESC AND DEMOLITION PLAN-EAST
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80

TPN 0119262016
1700 CENTER DRIVE

MATCHLINE - SEE SHEET C2 FOR CONTINUATION

CLEARING LIMITS
INSTALL SILT FENCE PER DETAIL SHEET C4
EX. WELL TO BE REMOVED
EX. GRAVEL TO BE REMOVED
BUILDIING PAD
EL=212.0±
EX. HISTORICAL MARKER 2.0' W x3.0'L x2.5'H w/ COMMEMORATIVE PLAQUE TO REMAIN
LOT 1
771,859 SQ. FT.
17.72 ACRES
APN 0119266005
1700 CENTER DRIVE
EX. TREES TO BE REMOVED (TYP.)
DIRT ROAD
EX. SIGN TO BE REMOVED
INSTALL TEMPORARY V-DITCH w/ ROCK CHECK DAM PER DETAIL SHEET C4
EX. GRAVEL ROAD TO BE REMOVED
GRAVEL ROAD
SIGN
EX. TRAIL TO BE REMOVED TO PROPERTY LINE
EX. GRAVEL ROAD TO BE REMOVED
50' STEEP SLOPE SETBACK
100' BUFFER FROM SEQUALITCHEW CREEK
N89°05'40"W 57.87'
N80°54'14"W 135.48'
S86°29'27"W 87.56'
N59°38'14"W 105.16'
EX. PEDESTRIAN TRAIL
EX. MONITOR WELL TO REMAIN RIM=212.78 TOP PVC=212.08
N24°18'12"W 121.19'
LOT 2
84,028 SQ. FT.
1.93 ACRES
APN 0119266006
1700 CENTER DRIVE
S87°59'34"W 92.50'
S87°59'34"W 665.45'
S87°59'34"W 308.23'
N2°00'40"W 188.40'
N2°22'40"W 188.34'
45' RADIUS PRIVATE TEMPORARY TURNAROUND EASEMENT (SEE SHORT PLAT NOTE #4 ON SHEET 1)
TEST PIT (TYPICAL)
EX. GRAVEL ROAD TO BE REMOVED
(TITLE PARCEL B) 92.5' PRIVATE ACCESS EASEMENT (SEE SHORT PLAT NOTE #3 ON SHEET 1)
92.5' PRIVATE ACCESS EASEMENT
APPROXIMATE CENTERLINE TEMPORARY PRIVATE ACCESS EASEMENT PER REC. NOs. 200906040666 AND 200911190365 (18)
INSTALL SILT FENCE PER DETAIL SHEET C4
CLEARING LIMITS
85' PUBLIC SANITARY SEWER EASEMENT AFN 202112070104
EX. GRAVEL ROAD EAST OF CLEARING LIMITS TO REMAIN
Δ=9°14'08" R=589.50' L=95.06'
GRAVEL ROAD / TRAIL
R=577.00'
42.5' PROPOSED ROW
SIGN
TEMPORARY PUBLIC CUL-DE-SAC EASEMENT REC. NO. 201401300091
42.5' FUTURE ROW
EX. CUL-DE-SAC TO BE REMOVED
EX. OREGON WHITE OAK IN POPOSED ROW TO BE REMOVED
WOOD FENCE
GRAVEL ROAD
(3) BOLLARDS
SIGN (TYP.)
TEMPORARY CONSTRUCTION ENTRANCE PER DETAIL SHEET C4
EX. CB TO REMAIN INSTALL CB PROTECTION PER DETAIL SHEET C4
EX. SSMH TO REMAIN
N89°43'57"W 10.00'
N88°58'18"W 126.13'
TPOB PUBLIC TRAIL ESMT PER 201009301052
N80°55'04"W 64.30'
N82°02'31"W 12.42'
FOUND 5/8" ESM LS 292
42.5'
4.72

PROPOSED TESC POND /FUTURE INFILTRATION POND
TOP OF POND = 206.0
MAX. WATER SURFACE = 205.0
BOTTOM OF POND = 203.0
SURFACE AREA REQUIRED = 22,800 SF
SURFACE AREA PROVIDED = 23,200 SF
NOTE: BOTTOM OF POND SHALL NOT BE EXCAVATED LOWER THAT 203' UNTIL ALL TESC ACTIVITIES ARE COMPLETED AND THE SITE IS STABILIZED. 2' OF SEPARATION FROM THE FINAL POND BOTTOM OF 201' SHALL BE MAINTAINED UNTIL ALL TESC WORK IS COMPLETED.
RIPRAP
TREE #18 TO BE REMOVED PER WFCI REPORT
30' PUBLIC TRAIL ACCESS EASEMENT PER REC. NO. 201009301052 (24)
EX. TREES TO REMAIN (TYP.)
15' PUBLIC TRAIL EASEMENT PER REC. NO. 201009301052 (24)
17.5' PUBLIC TRAIL CONST. EASEMENT PER REC. NO. 201009301052
N84°52'39"W 90.84'
N84°13'45"W 134.11'
N87°20'08"W 194.51'
N89°48'29"W 95.90'
N89°48'29"W 55.77'
N47°28'29"W 15.52'
N64°55'26"W 45.93'
EX. OREGON WHITE OAK TO REMAIN
100' CREEK BUFFER
CENTERLINE 15' PUBLIC TRAIL EASEMENT AND TRAIL CONSTRUCTION EASEMENT PER 201009301052 (24)
15' PUBLIC TRAIL EASEMENT PER REC. NO. 201009301052
17.5' PUBLIC TRAIL CONST. EASEMENT PER REC. NO. 201009301052
FIELD SURVEYED TOP OF UPPER STREAM BANK OF SEQUALITCHEW CREEK

TPN 0119224010
1700 CENTER DRIVE

TESC LEGEND:
- INLET PROTECTION
- SILT FENCE
- LIMITS OF DISTURBANCE
- CONSTRUCTION ENTRANCE
- TEMPORARY V-DITCH
- ROCK CHECK DAM
- EX. TREE TO REMAIN
- EX. TREE TO BE REMOVED

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

No.	Date	By	Ckd.	Appr.	Revision
2	11/06/23	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title:
PRELIMINARY
TESC AND DEMOLITION PLAN-EAST
FOR
DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELI
STATE OF WASHINGTON
25672
REGISTERED
PROFESSIONAL ENGINEER
11/06/2023

Scale: Horizontal 1"=40' Vertical N/A
Designed JAT Drawn JAT Checked DKB Approved DKB Date 11/06/23

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 18666
Sheet C3 of 13

P:\18000s\18666\preliminary\18666-pe.dwg 11/7/2023 10:24 AM JTOWNE

B. BMP Detail

Please see following pages for appropriate BMP details.

Below is a list of Alternative BMPs the be used if the BMPs listed in the body of this document are deemed ineffective by the CESCL.

Element #1 - Mark Clearing Limits
BMP C101: Preserving Natural Vegetation
BMP C102: Buffer Zones
BMP C103: High Visibility Fence

Element #2 - Establish Construction Access
BMP C107: Construction Road/Parking Area Stabilization

Element #3 - Control Flow Rates
BMP C203: Water Bars
BMP C209: Outlet Protection
BMP C235: Wattles

Element #4 - Install Sediment Controls
BMP C231: Brush Barrier
BMP C232: Gravel Filter Berm
BMP C234: Vegetated Strip
BMP C235: Wattles
BMP C250: Construction Stormwater Chemical Treatment
BMP C251: Construction Stormwater Filtration
Other Proprietary Sediment Control Technologies

Element #5 - Stabilize Soils
BMP C122: Nets and Blankets
BMP C124: Sodding
BMP C125 Compost
BMP C126: Topsoiling
BMP C127: Polyacrylamide for Soil Erosion Protection
BMP C130: Surface Roughening
BMP C131: Gradient Terraces

Element #6 - Protect Slopes
BMP C121: Mulching
BMP C122: Nets and Blankets
BMP C131: Gradient Terraces
BMP C200: Interceptor Dike and Swale
BMP C201: Grass-Lined Channels
BMP C203: Water Bars
BMP C204: Pipe Slope Drains
BMP C205: Subsurface Drains
BMP C206: Level Spreader
BMP C208: Triangular Silt Dike (Geotextile-Encased Check Dam)

Element #7 - Protect Drain Inlets
BMP C220: Storm Drain Inlet Protection

Element #8 - Stabilize Channels and Outlets
BMP C122: Nets and Blankets
BMP C202: Channel Lining
BMP C209: Outlet Protection

Element #9 - Control Pollutants
BMP C152: Sawcutting and Surface Pollution Prevention
BMP C153: Material Delivery, Storage, Containment
BMP C154: Concrete Washout Area
BMP C250: Construction Stormwater Chemical Treatment
BMP C251: Construction Stormwater Filtration
BMP C252: High pH Neutralization Using Co_2
BMP C253: pH Control for High pH Water
Source Control BMPs As Appropriate

Element #10 - Control Dewatering
BMP C203: Water Bars
BMP C226: Vegetative Filtration

Element #11 - Maintain BMPs
BMP C150: Materials on Hand
BMP C160 Erosion and Sedimentation Control Lead

Element #12 - Manage the Project
BMP C150: Materials on Hand
BMP C160: Erosion and Sediment Control Lead
BMP C162: Scheduling

Element #13: Protect Low Impact Development
BMP C102: Buffer Zone
BMP C103: High Visibility Fence
BMP C200: Interceptor Dike and Swale
BMP C201: Grass-Lined Channels
BMP C207: Check Dams
BMP C208: Triangular Silt Dike (TSD) (Geotextile-Encased Check Dam)
BMP C231: Brush Barrier
BMP C233: Silt Fence
BMP C234: Vegetated Strip

BMP C103: High Visibility Fence

Purpose

Fencing is intended to:

1. Restrict clearing to approved limits.
2. Prevent disturbance of sensitive areas, their buffers, and other areas required to be left undisturbed.
3. Limit construction traffic to designated construction entrances, exits, or internal roads.
4. Protect areas where marking with survey tape may not provide adequate protection.

Conditions of Use

To establish clearing limits plastic, fabric, or metal fence may be used:

- At the boundary of sensitive areas, their buffers, and other areas required to be left uncleared.
- As necessary to control vehicle access to and on the site.

Design and Installation Specifications

High visibility plastic fence shall be composed of a high-density polyethylene material and shall be at least four feet in height. Posts for the fencing shall be steel or wood and placed every 6 feet on center (maximum) or as needed to ensure rigidity. The fencing shall be fastened to the post every six inches with a polyethylene tie. On long continuous lengths of fencing, a tension wire or rope shall be used as a top stringer to prevent sagging between posts. The fence color shall be high visibility orange. The fence tensile strength shall be 360 lbs./ft. using the ASTM D4595 testing method.

If appropriate install fabric silt fence in accordance with BMP C233 to act as high visibility fence. Silt fence shall be at least 3 feet high and must be highly visible to meet the requirements of this BMP.

Metal fences shall be designed and installed according to the manufacturer's specifications.

Metal fences shall be at least 3 feet high and must be highly visible.

Fences shall not be wired or stapled to trees.

Maintenance Standards

If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.

BMP C105: Stabilized Construction Entrance / Exit

Purpose

Stabilized Construction entrances are established to reduce the amount of sediment transported onto paved roads by vehicles or equipment. This is done by constructing a stabilized pad of quarry spalls at entrances and exits for construction sites.

Conditions of Use

Construction entrances shall be stabilized wherever traffic will be entering or leaving a construction site if paved roads or other paved areas are within 1,000 feet of the site.

For residential construction provide stabilized construction entrances for each residence, rather than only at the main subdivision entrance. Stabilized surfaces shall be of sufficient length/width to provide vehicle access/parking, based on lot size/configuration.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow for additional stabilized entrances not shown in the initial Construction SWPPP. It is difficult to determine exactly where access to these projects will take place; additional materials will enable the contractor to install them where needed.

Design and Installation Specifications

See Figure 4.1.1 for details. Note: the 100' minimum length of the entrance shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').

Construct stabilized construction entrances with a 12-inch thick pad of 4-inch to 8-inch quarry spalls, a 4-inch course of asphalt treated base (ATB), or use existing pavement. Do not use crushed concrete, cement, or calcium chloride for construction entrance stabilization because these products raise pH levels in stormwater and concrete discharge to surface waters of the State is prohibited.

A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the following standards:

Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will paved; this can be used as a stabilized entrance. Also consider the installation of excess concrete as a stabilized entrance. During large concrete pours, excess concrete is often available for this purpose.

- Fencing (see BMP C103) shall be installed as necessary to restrict traffic to the construction entrance.
- Whenever possible, the entrance shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.
- Construction entrances should avoid crossing existing sidewalks and back of walk drains if at all possible. If a construction entrance must cross a sidewalk or back of walk drain, the full length of the sidewalk and back of walk drain must be covered and protected from sediment leaving the site.

Maintenance Standards

Quarry spalls shall be added if the pad is no longer in accordance with the specifications.

- If the entrance is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include replacement/cleaning of the existing quarry spalls, street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when high efficiency sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump to contain the wash water shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Perform street sweeping by hand or with a high efficiency sweeper. Do not use a non-high efficiency mechanical sweeper because this creates dust and throws soils into storm systems or conveyance ditches.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see BMP C103) shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

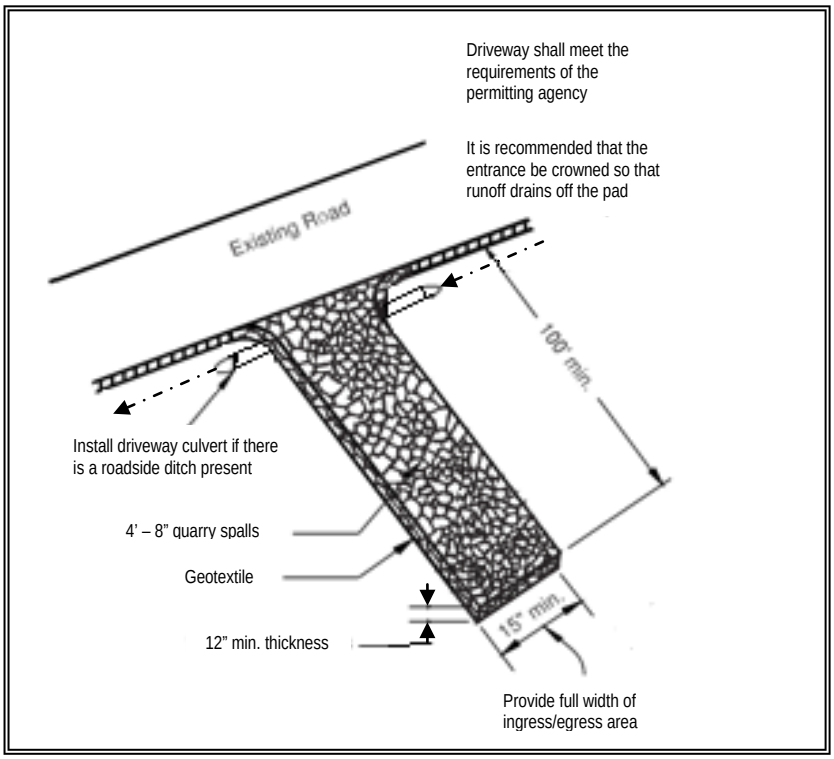


Figure 4.1.1 – Stabilized Construction Entrance

Approved as Equivalent

Ecology has approved products as able to meet the requirements of BMP C105. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology's website at http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html

BMP C106: Wheel Wash

Purpose

Wheel washes reduce the amount of sediment transported onto paved roads by motor vehicles.

Conditions of Use

When a stabilized construction entrance (see BMP C105) is not preventing sediment from being tracked onto pavement.

- Wheel washing is generally an effective BMP when installed with careful attention to topography. For example, a wheel wash can be detrimental if installed at the top of a slope abutting a right-of-way where the water from the dripping truck can run unimpeded into the street.
- Pressure washing combined with an adequately sized and surfaced pad with direct drainage to a large 10-foot x 10-foot sump can be very effective.
- Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland land application, or to the sanitary sewer with local sewer district approval.
- Wheel wash or tire bath wastewater should not include wastewater from concrete washout areas.

Design and Installation Specifications

Suggested details are shown in Figure 4.1.2. The Local Permitting Authority may allow other designs. A minimum of 6 inches of asphalt treated base (ATB) over crushed base material or 8 inches over a good subgrade is recommended to pave the wheel wash.

Use a low clearance truck to test the wheel wash before paving. Either a belly dump or lowboy will work well to test clearance.

Keep the water level from 12 to 14 inches deep to avoid damage to truck hubs and filling the truck tongues with water.

Midpoint spray nozzles are only needed in extremely muddy conditions.

Wheel wash systems should be designed with a small grade change, 6- to 1-inches for a 10-foot-wide pond, to allow sediment to flow to the low side of pond to help prevent re-suspension of sediment. A drainpipe with a 2- to 3-foot riser should be installed on the low side of the pond to allow for easy cleaning and refilling. Polymers may be used to promote coagulation and flocculation in a closed-loop system. Polyacrylamide (PAM) added to the wheel wash water at a rate of 0.25 - 0.5 pounds per 1,000 gallons of water increases effectiveness and reduces cleanup time. If PAM is already being used for dust or erosion control and is being applied by a water truck, the same truck can be used to change the wash water.

Maintenance Standards

The wheel wash should start out the day with fresh water.

The wash water should be changed a minimum of once per day. On large earthwork jobs where more than 10-20 trucks per hour are expected, the wash water will need to be changed more often.

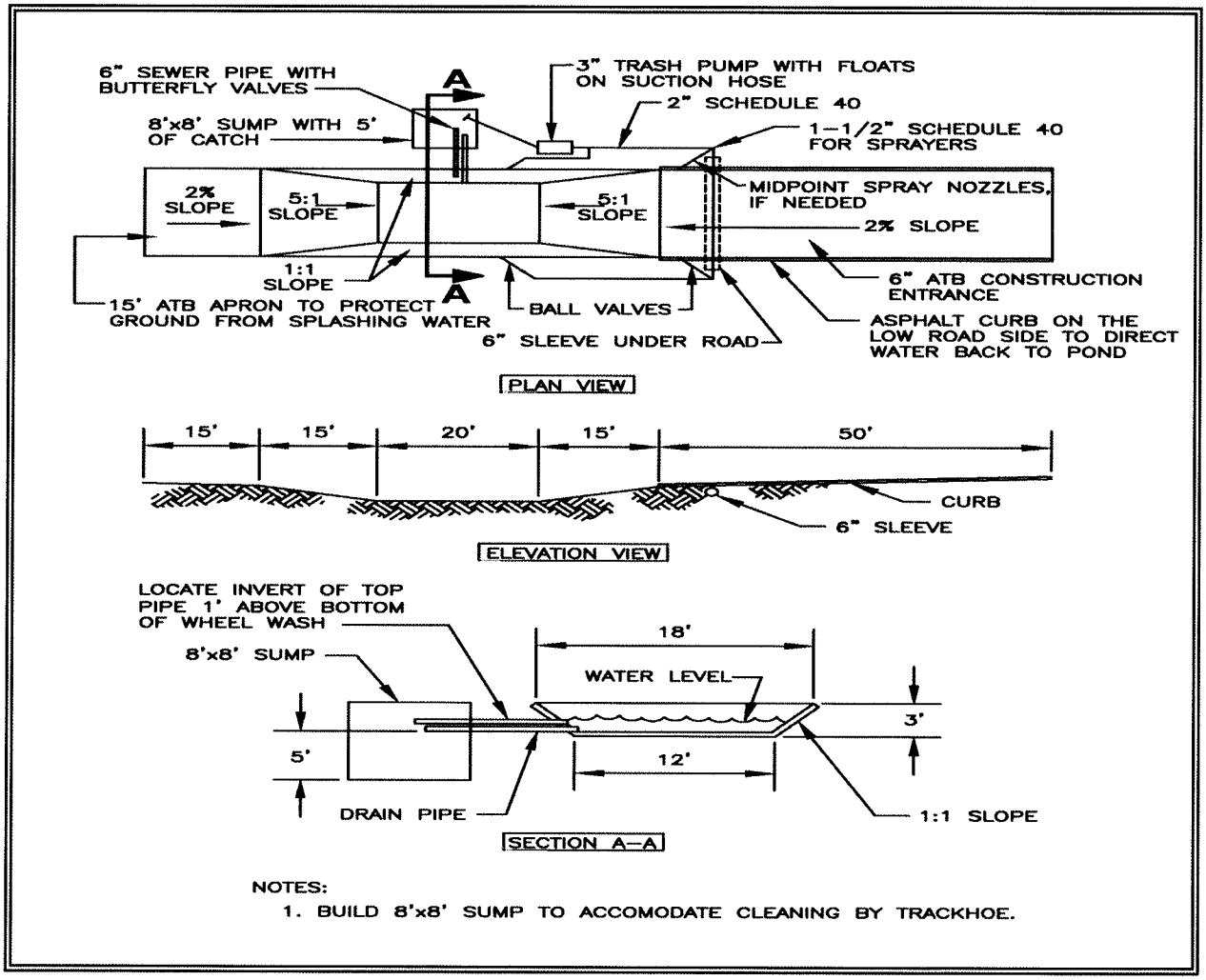


Figure 4.1.2 – Wheel Wash

Notes:

1. Asphalt construction entrance 6 in. asphalt treated base (ATB).
2. 3-inch trash pump with floats on the suction hose.
3. Midpoint spray nozzles, if needed.
4. 6-inch sewer pipe with butterfly valves. Bottom one is a drain. Locate top pipe's invert 1 foot above bottom of wheel wash.
5. 8 foot x 8 foot sump with 5 feet of catch. Build so the sump can be cleaned with a trackhoe.
6. Asphalt curb on the low road side to direct water back to pond.
7. 6-inch sleeve under road.
8. Ball valves.
9. 15 foot. ATB apron to protect ground from splashing water.

BMP C107: Construction Road/Parking Area Stabilization

Purpose

Stabilizing subdivision roads, parking areas, and other on-site vehicle transportation routes immediately after grading reduces erosion caused by construction traffic or runoff.

Conditions of Use

Roads or parking areas shall be stabilized wherever they are constructed, whether permanent or temporary, for use by construction traffic.

- High Visibility Fencing (see BMP C103) shall be installed, if necessary, to limit the access of vehicles to only those roads and parking areas that are stabilized.

Design and Installation Specifications

- On areas that will receive asphalt as part of the project, install the first lift as soon as possible.
- A 6-inch depth of 2- to 4-inch crushed rock, gravel base, or crushed surfacing base course shall be applied immediately after grading or utility installation. A 4-inch course of asphalt treated base (ATB) may also be used, or the road/parking area may be paved. It may also be possible to use cement or calcium chloride for soil stabilization. If cement or cement kiln dust is used for roadbase stabilization, pH monitoring and BMPs (BMPs C252 and C253) are necessary to evaluate and minimize the effects on stormwater. If the area will not be used for permanent roads, parking areas, or structures, a 6-inch depth of hog fuel may also be used, but this is likely to require more maintenance. Whenever possible, construction roads and parking areas shall be placed on a firm, compacted subgrade.
- Temporary road gradients shall not exceed 15 percent. Roadways shall be carefully graded to drain. Drainage ditches shall be provided on each side of the roadway in the case of a crowned section, or on one side in the case of a super-elevated section. Drainage ditches shall be directed to a sediment control BMP.
- Rather than relying on ditches, it may also be possible to grade the road so that runoff sheet-flows into a heavily vegetated area with a well-developed topsoil. Landscaped areas are not adequate. If this area has at least 50 feet of vegetation that water can flow through, then it is generally preferable to use the vegetation to treat runoff, rather than a sediment pond or trap. The 50 feet shall not include wetlands or their buffers. If runoff is allowed to sheetflow through adjacent vegetated areas, it is vital to design the roadways and parking areas so that no concentrated runoff is created.
- Storm drain inlets shall be protected to prevent sediment-laden water entering the storm drain system (see BMP C220).

Maintenance Standards

Inspect stabilized areas regularly, especially after large storm events.

Crushed rock, gravel base, etc. shall be added as required to maintain a

BMP C120: Temporary and Permanent Seeding

Purpose

Seeding reduces erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Conditions of Use

Use seeding throughout the project on disturbed areas that have reached final grade or that will remain unworked for more than 30 days.

The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1.

Between July 1 and August 30 seeding requires irrigation until 75 percent grass cover is established.

Between October 1 and March 30 seeding requires a cover of mulch with straw or an erosion control blanket until 75 percent grass cover is established.

Review all disturbed areas in late August to early September and complete all seeding by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.

- Mulch is required at all times for seeding because it protects seeds from heat, moisture loss, and transport due to runoff. Mulch can be applied on top of the seed or simultaneously by hydroseeding. See BMP C121: Mulching for specifications.
- Seed and mulch, all disturbed areas not otherwise vegetated at final site stabilization. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions or geotextiles) which will prevent erosion.

Design and Installation Specifications

Seed retention/detention ponds as required.

Install channels intended for vegetation before starting major earthwork and hydroseed with a Bonded Fiber Matrix. For vegetated channels that will have high flows, install erosion control blankets over hydroseed. Before allowing water to flow in vegetated channels, establish 75 percent vegetation cover. If vegetated channels cannot be established by seed before water flow; install sod in the channel bottom—over hydromulch and erosion control blankets.

- Confirm the installation of all required surface water control measures to prevent seed from washing away.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 percent tackifier. See BMP C121: Mulching for specifications.
- Areas that will have seeding only and not landscaping may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Re-install native topsoil on the disturbed soil surface before application.
- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. To overcome this, consider increasing seed quantities by up to 50 percent.
- Enhance vegetation establishment by dividing the hydromulch operation into two phases:

  1. Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift.
  2. Phase 2- Install the rest of the mulch and tackifier over the first lift.

  Or, enhance vegetation by:

  1. Installing the mulch, seed, fertilizer, and tackifier in one lift.
  2. Spread or blow straw over the top of the hydromulch at a rate of 800-1000 pounds per acre.
  3. Hold straw in place with a standard tackifier.

  Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:

  - Irrigation.
  - Reapplication of mulch.
  - Repair of failed slope surfaces.

  This technique works with standard hydromulch (1,500 pounds per acre minimum) and BFM/MBFMs (3,000 pounds per acre minimum).
- Seed may be installed by hand if:
  - Temporary and covered by straw, mulch, or topsoil.
  - Permanent in small areas (usually less than 1 acre) and covered with mulch, topsoil, or erosion blankets.
- The seed mixes listed in the tables below include recommended mixes for both temporary and permanent seeding.

- Apply these mixes, with the exception of the wetland mix, at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slow-release fertilizers are used.
- Consult the local suppliers or the local conservation district for their recommendations because the appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used.
- Other mixes may be appropriate, depending on the soil type and hydrology of the area.

- Table 4.1.2 lists the standard mix for areas requiring a temporary vegetative cover.

Table 4.1.2
Temporary Erosion Control Seed Mix

	% Weight	% Purity	% Germination
Chewings or annual blue grass *Festuca rubra var. commutata* or *Poa anna*	40	98	90
Perennial rye - *Lolium perenne*	50	98	90
Redtop or colonial bentgrass *Agrostis alba* or *Agrostis tenuis*	5	92	85
White dutch clover *Trifolium repens*	5	98	90

- Table 4.1.3 lists a recommended mix for landscaping seed.

Table 4.1.3
Landscaping Seed Mix

	% Weight	% Purity	% Germination
Perennial rye blend *Lolium perenne*	70	98	90
Chewings and red fescue blend *Festuca rubra var. commutata* or *Festuca rubra*	30	98	90

- Table 4.1.4 lists a turf seed mix for dry situations where there is no need for watering. This mix requires very little maintenance.

Table 4.1.4
Low-Growing Turf Seed Mix

	% Weight	% Purity	% Germination
Dwarf tall fescue (several varieties) *Festuca arundinacea var.*	45	98	90
Dwarf perennial rye (Barclay) *Lolium perenne var. barclay*	30	98	90
Red fescue *Festuca rubra*	20	98	90
Colonial bentgrass *Agrostis tenuis*	5	98	90

- Table 4.1.5 lists a mix for bioswales and other intermittently wet areas.

Table 4.1.5
Bioswale Seed Mix*

	% Weight	% Purity	% Germination
Tall or meadow fescue *Festuca arundinacea* or *Festuca elatior*	75-80	98	90
Seaside/Creeping bentgrass *Agrostis palustris*	10-15	92	85
Redtop bentgrass *Agrostis alba* or *Agrostis gigantea*	5-10	90	80

* *Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix*

- Table 4.1.6 lists a low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands. Apply this mixture at a rate of 60 pounds per acre. Consult Hydraulic Permit Authority (HPA) for seed mixes if applicable.

Table 4.1.6
Wet Area Seed Mix*

	% Weight	% Purity	% Germination
Tall or meadow fescue *Festuca arundinacea* or *Festuca elatior*	60-70	98	90
Seaside/Creeping bentgrass *Agrostis palustris*	10-15	98	85
Meadow foxtail *Alepocurus pratensis*	10-15	90	80
Alsike clover *Trifolium hybridum*	1-6	98	90
Redtop bentgrass *Agrostis alba*	1-6	92	85

** Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix*

- Table 4.1.7 lists a recommended meadow seed mix for infrequently maintained areas or non-maintained areas where colonization by native plants is desirable. Likely applications include rural road and utility right-of-way. Seeding should take place in September or very early October in order to obtain adequate establishment prior to the winter months. Consider the appropriateness of clover, a fairly invasive species, in the mix. Amending the soil can reduce the need for clover.

Table 4.1.7
Meadow Seed Mix

	% Weight	% Purity	% Germination
Redtop or Oregon bentgrass *Agrostis alba* or *Agrostis oregonensis*	20	92	85
Red fescue *Festuca rubra*	70	98	90
White dutch clover *Trifolium repens*	10	98	90

- **Roughening and Rototilling:**
  - The seedbed should be firm and rough. Roughen all soil no matter what the slope. Track walk slopes before seeding if engineering purposes require compaction. Backblading or smoothing of slopes greater than 4H:1V is not allowed if they are to be seeded.
  - Restoration-based landscape practices require deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical, initially rip the subgrade to improve long-term permeability, infiltration, and water inflow qualities. At a minimum, permanent areas shall use soil amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches complete the rototilling process in multiple lifts, or prepare the engineered soil system per specifications and place to achieve the specified depth.
- **Fertilizers:**
  - Conducting soil tests to determine the exact type and quantity of fertilizer is recommended. This will prevent the over-application of fertilizer.
  - Organic matter is the most appropriate form of fertilizer because it provides nutrients (including nitrogen, phosphorus, and potassium) in the least water-soluble form.
  - In general, use 10-4-6 N-P-K (nitrogen-phosphorus-potassium) fertilizer at a rate of 90 pounds per acre. Always use slow-release fertilizers because they are more efficient and have fewer environmental impacts. Do not add fertilizer to the hydromulch machine, or agitate, more than 20 minutes before use. Too much agitation destroys the slow-release coating.
  - There are numerous products available that take the place of chemical fertilizers. These include several with seaweed extracts that are beneficial to soil microbes and organisms. If 100 percent cottonseed meal is used as the mulch in hydroseed, chemical fertilizer may not be necessary. Cottonseed meal provides a good source of long-term, slow-release, available nitrogen.
- **Bonded Fiber Matrix and Mechanically Bonded Fiber Matrix:**
  - On steep slopes use Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products. Apply BFM/MBFM products at a minimum rate of 3,000 pounds per acre of mulch with approximately 10 percent tackifier. Achieve a minimum of 95 percent soil coverage during application. Numerous products are available commercially. Installed products per manufacturer's instructions. Most products require 24-36 hours to cure before rainfall and cannot be installed on wet or saturated soils.

Generally, products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.

- BFMs and MBFMs provide good alternatives to blankets in most areas requiring vegetation establishment. Advantages over blankets include:
  - BFM and MBFMs do not require surface preparation.
  - Helicopters can assist in installing BFM and MBFMs in remote areas.
  - On slopes steeper than 2.5H:1V, blanket installers may require ropes and harnesses for safety.
  - Installing BFM and MBFMs can save at least $1,000 per acre compared to blankets.

Maintenance Standards

Reseed any seeded areas that fail to establish at least 80 percent cover (100 percent cover for areas that receive sheet or concentrated flows). If reseeding is ineffective, use an alternate method such as sodding, mulching, or nets/blankets. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the local authority when sensitive areas would otherwise be protected.

- Reseed and protect by mulch any areas that experience erosion after achieving adequate cover. Reseed and protect by mulch any eroded area.
- Supply seeded areas with adequate moisture, but do not water to the extent that it causes runoff.

Approved as Equivalent

Ecology has approved products as able to meet the requirements of BMP C120. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology's website at http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html

BMP C121: Mulching

Purpose

Mulching soils provides immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. There is an enormous variety of mulches that can be used. This section discusses only the most common types of mulch.

Conditions of Use

As a temporary cover measure, mulch should be used:

- For less than 30 days on disturbed areas that require cover.
- At all times for seeded areas, especially during the wet season and during the hot summer months.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief.

Mulch may be applied at any time of the year and must be refreshed periodically.

- For seeded areas mulch may be made up of 100 percent: cottonseed meal; fibers made of wood, recycled cellulose, hemp, kenaf; compost; or blends of these. Tackifier shall be plant-based, such as guar or alpha plantago, or chemical-based such as polyacrylamide or polymers. Any mulch or tackifier product used shall be installed per manufacturer's instructions. Generally, mulches come in 40-50 pound bags. Seed and fertilizer are added at time of application.

Design and Installation Specifications

For mulch materials, application rates, and specifications, see Table 4.1.8. Always use a 2-inch minimum mulch thickness; increase the thickness until the ground is 95% covered (i.e. not visible under the mulch layer). Note: Thickness may be increased for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.

Mulch used within the ordinary high-water mark of surface waters should be selected to minimize potential flotation of organic matter. Composted organic materials have higher specific gravities (densities) than straw, wood, or chipped material. Consult Hydraulic Permit Authority (HPA) for mulch mixes if applicable.

Maintenance Standards

- The thickness of the cover must be maintained.
- Any areas that experience erosion shall be remulched and/or protected with a net or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area remulched.

BMP C123: Plastic Covering

Purpose

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

Conditions of Use

Plastic covering may be used on disturbed areas that require cover measures for less than 30 days, except as stated below.

- Plastic is particularly useful for protecting cut and fill slopes and stockpiles. Note: The relatively rapid breakdown of most polyethylene sheeting makes it unsuitable for long-term (greater than six months) applications.
- Due to rapid runoff caused by plastic covering, do not use this method upslope of areas that might be adversely impacted by concentrated runoff. Such areas include steep and/or unstable slopes.
- Plastic sheeting may result in increased runoff volumes and velocities, requiring additional on-site measures to counteract the increases. Creating a trough with wattles or other material can convey clean water away from these areas.
- To prevent undercutting, trench and backfill rolled plastic covering products.
- While plastic is inexpensive to purchase, the added cost of installation, maintenance, removal, and disposal make this an expensive material, up to $1.50-2.00 per square yard.
- Whenever plastic is used to protect slopes install water collection measures at the base of the slope. These measures include plastic-covered berms, channels, and pipes used to covey clean rainwater away from bare soil and disturbed areas. Do not mix clean runoff from a plastic covered slope with dirty runoff from a project.
- Other uses for plastic include:
    1. Temporary ditch liner.
    2. Pond liner in temporary sediment pond.
    3. Liner for bermed temporary fuel storage area if plastic is not reactive to the type of fuel being stored.
    4. Emergency slope protection during heavy rains.
    5. Temporary drainpipe (“elephant trunk”) used to direct water.

Design and Installation Specifications

- Plastic slope cover must be installed as follows:
    1. Run plastic up and down slope, not across slope.
    2. Plastic may be installed perpendicular to a slope if the slope length is less than 10 feet.
    3. Minimum of 8-inch overlap at seams.

4. On long or wide slopes, or slopes subject to wind, tape all seams.
5. Place plastic into a small (12-inch wide by 6-inch deep) slot trench at the top of the slope and backfill with soil to keep water from flowing underneath.
6. Place sand filled burlap or geotextile bags every 3 to 6 feet along seams and tie them together with twine to hold them in place.
7. Inspect plastic for rips, tears, and open seams regularly and repair immediately. This prevents high velocity runoff from contacting bare soil which causes extreme erosion.
8. Sandbags may be lowered into place tied to ropes. However, all sandbags must be staked in place.

- Plastic sheeting shall have a minimum thickness of 0.06 millimeters.
- If erosion at the toe of a slope is likely, a gravel berm, riprap, or other suitable protection shall be installed at the toe of the slope in order to reduce the velocity of runoff.

Maintenance Standards

- Torn sheets must be replaced and open seams repaired.
- Completely remove and replace the plastic if it begins to deteriorate due to ultraviolet radiation.
- Completely remove plastic when no longer needed.
- Dispose of old tires used to weight down plastic sheeting appropriately.

Approved as Equivalent

Ecology has approved products as able to meet the requirements of BMP C123. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology's website at http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html

BMP C124: Sodding

Purpose

The purpose of sodding is to establish permanent turf for immediate erosion protection and to stabilize drainage ways where concentrated overland flow will occur.

Conditions of Use

Sodding may be used in the following areas:

- Disturbed areas that require short-term or long-term cover.
- Disturbed areas that require immediate vegetative cover.
- All waterways that require vegetative lining. Waterways may also be seeded rather than sodded, and protected with a net or blanket.

Design and Installation Specifications

Sod shall be free of weeds, of uniform thickness (approximately 1-inch thick), and shall have a dense root mat for mechanical strength.

The following steps are recommended for sod installation:

- Shape and smooth the surface to final grade in accordance with the approved grading plan. The swale needs to be overexcavated 4 to 6 inches below design elevation to allow room for placing soil amendment and sod.
- Amend 4 inches (minimum) of compost into the top 8 inches of the soil if the organic content of the soil is less than ten percent or the permeability is less than 0.6 inches per hour. See http://www.ecy.wa.gov/programs/swfa/organics/soil.html for further information.
- Fertilize according to the supplier's recommendations.
- Work lime and fertilizer 1 to 2 inches into the soil, and smooth the surface.
- Lay strips of sod beginning at the lowest area to be sodded and perpendicular to the direction of water flow. Wedge strips securely into place. Square the ends of each strip to provide for a close, tight fit. Stagger joints at least 12 inches. Staple on slopes steeper than 3H:1V. Staple the upstream edge of each sod strip.
- Roll the sodded area and irrigate.
- When sodding is carried out in alternating strips or other patterns, seed the areas between the sod immediately after sodding.

Maintenance Standards

If the grass is unhealthy, the cause shall be determined and appropriate action taken to reestablish a healthy groundcover. If it is impossible to establish a healthy groundcover due to frequent saturation, instability, or some other cause, the sod shall be removed, the area seeded with an appropriate mix, and protected with a net or blanket.

BMP C125: Topsoiling / Composting

Purpose

Topsoiling and composting provide a suitable growth medium for final site stabilization with vegetation. While not a permanent cover practice in itself, topsoiling and composting are an integral component of providing permanent cover in those areas where there is an unsuitable soil surface for plant growth. Use this BMP in conjunction with other BMPs such as seeding, mulching, or sodding.

Native soils and disturbed soils that have been organically amended not only retain much more stormwater, but they also serve as effective biofilters for urban pollutants and, by supporting more vigorous plant growth, reduce the water, fertilizer and pesticides needed to support

installed landscapes. Topsoil does not include any subsoils but only the material from the top several inches including organic debris.

Conditions of Use

- Permanent landscaped areas shall contain healthy topsoil that reduces the need for fertilizers, improves overall topsoil quality, provides for better vegetal health and vitality, improves hydrologic characteristics, and reduces the need for irrigation.
- Leave native soils and the duff layer undisturbed to the maximum extent practicable. Stripping of existing, properly functioning soil system and vegetation for the purpose of topsoiling during construction is not acceptable. Preserve existing soil systems in undisturbed and uncompacted conditions if functioning properly.
- Areas that already have good topsoil, such as undisturbed areas, do not require soil amendments.
- Restore, to the maximum extent practical, native soils disturbed during clearing and grading to a condition equal to or better than the original site condition's moisture-holding capacity. Use on-site native topsoil, incorporate amendments into on-site soil, or import blended topsoil to meet this requirement.
- Topsoiling is a required procedure when establishing vegetation on shallow soils, and soils of critically low pH (high acid) levels.
- Beware of where the topsoil comes from, and what vegetation was on site before disturbance, invasive plant seeds may be included and could cause problems for establishing native plants, landscaped areas, or grasses.
- Topsoil from the site will contain mycorrhizal bacteria that are necessary for healthy root growth and nutrient transfer. These native mycorrhiza are acclimated to the site and will provide optimum conditions for establishing grasses. Use commercially available mycorrhiza products when using off-site topsoil.

Design and Installation Specifications

Meet the following requirements for areas requiring disruption and topsoiling:

- Maximize the depth of the topsoil wherever possible to provide the maximum possible infiltration capacity and beneficial growth medium. Topsoil shall have:
    - A minimum depth of 8-inches. Scarify subsoils below the topsoil layer at least 4-inches with some incorporation of the upper material to avoid stratified layers, where feasible. Ripping or re-structuring the subgrade may also provide additional benefits regarding the overall infiltration and interflow dynamics of the soil system.

- A minimum organic content of 10% dry weight, and 5% organic matter content in turf areas. Incorporate organic amendments to a minimum 8-inch depth except where tree roots or other natural features limit the depth of incorporation.
- A pH between 6.0 and 8.0 or matching the pH of the undisturbed soil.
- If blended topsoil is imported, then fines should be limited to 25 percent passing through a 200 sieve.

- Accomplish the required organic content and pH by either returning native topsoil to the site and/or incorporating organic amendments.
  - To meet the organic content use compost that meets the definition of "composted materials" in WAC 173-350-220. This code is available online at: http://apps.leg.wa.gov/WAC/default.aspx?cite=173-350-220.

    The compost must also have an organic matter content of 35% to 65%, and a carbon to nitrogen ratio below 25H:1V.

    The carbon to nitrogen ratio may be as high as 35H:1V for plantings composed entirely of plants native to the Puget Sound Lowlands region.
  - For till soils use a mixture of approximately two parts soil to one part compost. This equates to 4 inches of compost mixed to a depth of 12 inches in till soils. Increasing the concentration of compost beyond this level can have negative effects on vegetal health, while decreasing the concentrations can reduce the benefits of amended soils.
  - Gravel or cobble outwash soils, may require different approaches. Organics and fines easily migrate through the loose structure of these soils. Therefore, the importation of at least 6 inches of quality topsoil, underlain by some type of filter fabric to prevent the migration of fines, may be more appropriate for these soils.
- The final composition and construction of the soil system will result in a natural selection or favoring of certain plant species over time. For example, incorporation of topsoil may favor grasses, while layering with mildly acidic, high-carbon amendments may favor more woody vegetation.
- Allow sufficient time in scheduling for topsoil spreading prior to seeding, sodding, or planting.
- Take care when applying top soil to subsoils with contrasting textures. Sandy topsoil over clayey subsoil is a particularly poor combination, as water creeps along the junction between the soil layers and causes the topsoil to slough. If topsoil and subsoil are not properly bonded, water will not infiltrate the soil profile evenly and it will be difficult to

establish vegetation. The best method to prevent a lack of bonding is to actually work the topsoil into the layer below for a depth of at least 6 inches.

- Field exploration of the site shall be made to determine if there is surface soil of sufficient quantity and quality to justify stripping. Topsoil shall be friable and loamy (loam, sandy loam, silt loam, sandy clay loam, and clay loam). Avoid areas of natural ground water recharge.
- Stripping shall be confined to the immediate construction area. A 4-inch to 6-inch stripping depth is common, but depth may vary depending on the particular soil. All surface runoff control structures shall be in place prior to stripping.
- Do not place topsoil while in a frozen or muddy condition, when the subgrade is excessively wet, or when conditions exist that may otherwise be detrimental to proper grading or proposed sodding or seeding.
- In any areas requiring grading remove and stockpile the duff layer and topsoil on site in a designated, controlled area, not adjacent to public resources and critical areas. Stockpiled topsoil is to be reapplied to other portions of the site where feasible.
- Locate the topsoil stockpile so that it meets specifications and does not interfere with work on the site. It may be possible to locate more than one pile in proximity to areas where topsoil will be used.

Stockpiling of topsoil shall occur in the following manner:

- Side slopes of the stockpile shall not exceed 2H:1V.
- Between October 1 and April 30:
  - An interceptor dike with gravel outlet and silt fence shall surround all topsoil.
  - Within 2 days complete erosion control seeding, or covering stockpiles with clear plastic, or other mulching materials.
- Between May 1 and September 30:
  - An interceptor dike with gravel outlet and silt fence shall surround all topsoil if the stockpile will remain in place for a longer period of time than active construction grading.
  - Within 7 days complete erosion control seeding, or covering stockpiles with clear plastic, or other mulching materials.
- When native topsoil is to be stockpiled and reused the following should apply to ensure that the mycorrhizal bacterial, earthworms, and other beneficial organisms will not be destroyed:
  1. Re-install topsoil within 4 to 6 weeks.

2. Do not allow the saturation of topsoil with water.
3. Do not use plastic covering.

Maintenance Standards

- Inspect stockpiles regularly, especially after large storm events. Stabilize any areas that have eroded.
- Establish soil quality and depth toward the end of construction and once established, protect from compaction, such as from large machinery use, and from erosion.
- Plant and mulch soil after installation.
- Leave plant debris or its equivalent on the soil surface to replenish organic matter.
- Reduce and adjust, where possible, the use of irrigation, fertilizers, herbicides and pesticides, rather than continuing to implement formerly established practices.

BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection

Purpose

Polyacrylamide (PAM) is used on construction sites to prevent soil erosion.

Applying PAM to bare soil in advance of a rain event significantly reduces erosion and controls sediment in two ways. First, PAM increases the soil's available pore volume, thus increasing infiltration through flocculation and reducing the quantity of stormwater runoff. Second, it increases flocculation of suspended particles and aids in their deposition, thus reducing stormwater runoff turbidity and improving water quality.

Conditions of Use

PAM shall not be directly applied to water or allowed to enter a water body.

In areas that drain to a sediment pond, PAM can be applied to bare soil under the following conditions:

- During rough grading operations.
- In Staging areas.
- Balanced cut and fill earthwork.
- Haul roads prior to placement of crushed rock surfacing.
- Compacted soil roadbase.
- Stockpiles.
- After final grade and before paving or final seeding and planting.
- Pit sites.

- Sites having a winter shut down. In the case of winter shut down, or where soil will remain unworked for several months, PAM should be used together with mulch.

Design and Installation Specifications

PAM may be applied with water in dissolved form. The preferred application method is the dissolved form.

PAM is to be applied at a maximum rate of 2/3 pound PAM per 1,000 gallons water (80 mg/L) per 1 acre of bare soil. Table 4.1.9 can be used to determine the PAM and water application rate for a disturbed soil area. Higher concentrations of PAM **do not** provide any additional effectiveness.

Table 4.1.9
PAM and Water Application Rates

Disturbed Area (ac)	PAM (lbs)	Water (gal)
0.50	0.33	500
1.00	0.66	1,000
1.50	1.00	1,500
2.00	1.32	2,000
2.50	1.65	2,500
3.00	2.00	3,000
3.50	2.33	3,500
4.00	2.65	4,000
4.50	3.00	4,500
5.00	3.33	5,000

The Preferred Method:

- Pre-measure the area where PAM is to be applied and calculate the amount of product and water necessary to provide coverage at the specified application rate (2/3 pound PAM/1000 gallons/acre).
- PAM has infinite solubility in water, but dissolves very slowly. Dissolve pre-measured dry granular PAM with a known quantity of clean water in a bucket several hours or overnight. Mechanical mixing will help dissolve the PAM. Always add PAM to water - not water to PAM.
- Pre-fill the water truck about 1/8 full with water. The water does not have to be potable, but it must have relatively low turbidity – in the range of 20 NTU or less.
- Add PAM /Water mixture to the truck
- Completely fill the water truck to specified volume.
- Spray PAM/Water mixture onto dry soil until the soil surface is uniformly and completely wetted.

An Alternate Method:

PAM may also be applied as a powder at the rate of 5 lbs. per acre. This must be applied on a day that is dry. For areas less than 5-10 acres, a hand-held “organ grinder” fertilizer spreader set to the smallest setting will work. Tractor-mounted spreaders will work for larger areas.

The following shall be used for application of powdered PAM:

- Powered PAM shall be used in conjunction with other BMPs and not in place of other BMPs.
- Do not use PAM on a slope that flows directly into a stream or wetland. The stormwater runoff shall pass through a sediment control BMP prior to discharging to surface waters.
- Do not add PAM to water discharging from site.
- When the total drainage area is greater than or equal to 5 acres, PAM treated areas shall drain to a sediment pond.
- Areas less than 5 acres shall drain to sediment control BMPs, such as a minimum of 3 check dams per acre. The total number of check dams used shall be maximized to achieve the greatest amount of settlement of sediment prior to discharging from the site. Each check dam shall be spaced evenly in the drainage channel through which stormwater flows are discharged off-site.
- On all sites, the use of silt fence shall be maximized to limit the discharges of sediment from the site.
- All areas not being actively worked shall be covered and protected from rainfall. PAM shall not be the only cover BMP used.
- PAM can be applied to wet soil, but dry soil is preferred due to less sediment loss.
- PAM will work when applied to saturated soil but is not as effective as applications to dry or damp soil.
- Keep the granular PAM supply out of the sun. Granular PAM loses its effectiveness in three months after exposure to sunlight and air.
- Proper application and re-application plans are necessary to ensure total effectiveness of PAM usage.
- PAM, combined with water, is very slippery and can be a safety hazard. Care must be taken to prevent spills of PAM powder onto paved surfaces. During an application of PAM, prevent over-spray from reaching pavement as pavement will become slippery. If PAM powder gets on skin or clothing, wipe it off with a rough towel rather than washing with water-this only makes cleanup messier and take longer.
- Some PAMs are more toxic and carcinogenic than others. Only the most environmentally safe PAM products should be used.

The specific PAM copolymer formulation must be anionic. **Cationic PAM shall not be used in any application because of known aquatic toxicity problems.** Only the highest drinking water grade PAM, certified for compliance with ANSI/NSF Standard 60 for drinking water treatment, will be used for soil applications. Recent media attention and high interest in PAM has resulted in some entrepreneurial exploitation of the term "polymer." All PAM are polymers, but not all polymers are PAM, and not all PAM products comply with ANSI/NSF Standard 60. PAM use shall be reviewed and approved by the local permitting authority.

- PAM designated for these uses should be "water soluble" or "linear" or "non-crosslinked". Cross-linked or water absorbent PAM, polymerized in highly acidic (pH<2) conditions, are used to maintain soil moisture content.
- The PAM anionic charge density may vary from 2-30 percent; a value of 18 percent is typical. Studies conducted by the United States Department of Agriculture (USDA)/ARS demonstrated that soil stabilization was optimized by using very high molecular weight (12-15 mg/mole), highly anionic (>20% hydrolysis) PAM.

- PAM tackifiers are available and being used in place of guar and alpha plantago. Typically, PAM tackifiers should be used at a rate of no more than 0.5-1 lb. per 1000 gallons of water in a hydromulch machine. Some tackifier product instructions say to use at a rate of 3 –5 lbs. per acre, which can be too much. In addition, pump problems can occur at higher rates due to increased viscosity.

Maintenance Standards

- PAM may be reapplied on actively worked areas after a 48-hour period.
- Reapplication is not required unless PAM treated soil is disturbed or unless turbidity levels show the need for an additional application. If PAM treated soil is left undisturbed a reapplication may be necessary after two months. More PAM applications may be required for steep slopes, silty and clayey soils (USDA Classification Type "C" and "D" soils), long grades, and high precipitation areas. When PAM is applied first to bare soil and then covered with straw, a reapplication may not be necessary for several months.
- Loss of sediment and PAM may be a basis for penalties per RCW 90.48.080.

BMP C130: Surface Roughening

Purpose

Surface roughening aids in the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and provides for sediment trapping through the provision of a rough soil surface. Horizontal depressions are

created by operating a tiller or other suitable equipment on the contour or by leaving slopes in a roughened condition by not fine grading them.

Use this BMP in conjunction with other BMPs such as seeding, mulching, or sodding.

Conditions for Use

- All slopes steeper than 3H:1V and greater than 5 vertical feet require surface roughening to a depth of 2 to 4 inches prior to seeding..
- Areas that will not be stabilized immediately may be roughened to reduce runoff velocity until seeding takes place.
- Slopes with a stable rock face do not require roughening.
- Slopes where mowing is planned should not be excessively roughened.

Design and Installation Specifications

There are different methods for achieving a roughened soil surface on a slope, and the selection of an appropriate method depends upon the type of slope. Roughening methods include stair-step grading, grooving, contour furrows, and tracking. See Figure 4.1.5 for tracking and contour furrows. Factors to be considered in choosing a method are slope steepness, mowing requirements, and whether the slope is formed by cutting or filling.

- Disturbed areas that will not require mowing may be stair-step graded, grooved, or left rough after filling.
- Stair-step grading is particularly appropriate in soils containing large amounts of soft rock. Each "step" catches material that sloughs from above, and provides a level site where vegetation can become established. Stairs should be wide enough to work with standard earth moving equipment. Stair steps must be on contour or gullies will form on the slope.
- Areas that will be mowed (these areas should have slopes less steep than 3H:1V) may have small furrows left by disking, harrowing, raking, or seed-planting machinery operated on the contour.
- Graded areas with slopes steeper than 3H:1V but less than 2H:1V should be roughened before seeding. This can be accomplished in a variety of ways, including "track walking," or driving a crawler tractor up and down the slope, leaving a pattern of cleat imprints parallel to slope contours.
- Tracking is done by operating equipment up and down the slope to leave horizontal depressions in the soil.

Maintenance Standards

- Areas that are graded in this manner should be seeded as quickly as possible.
- Regular inspections should be made of the area. If rills appear, they should be re-graded and re-seeded immediately.

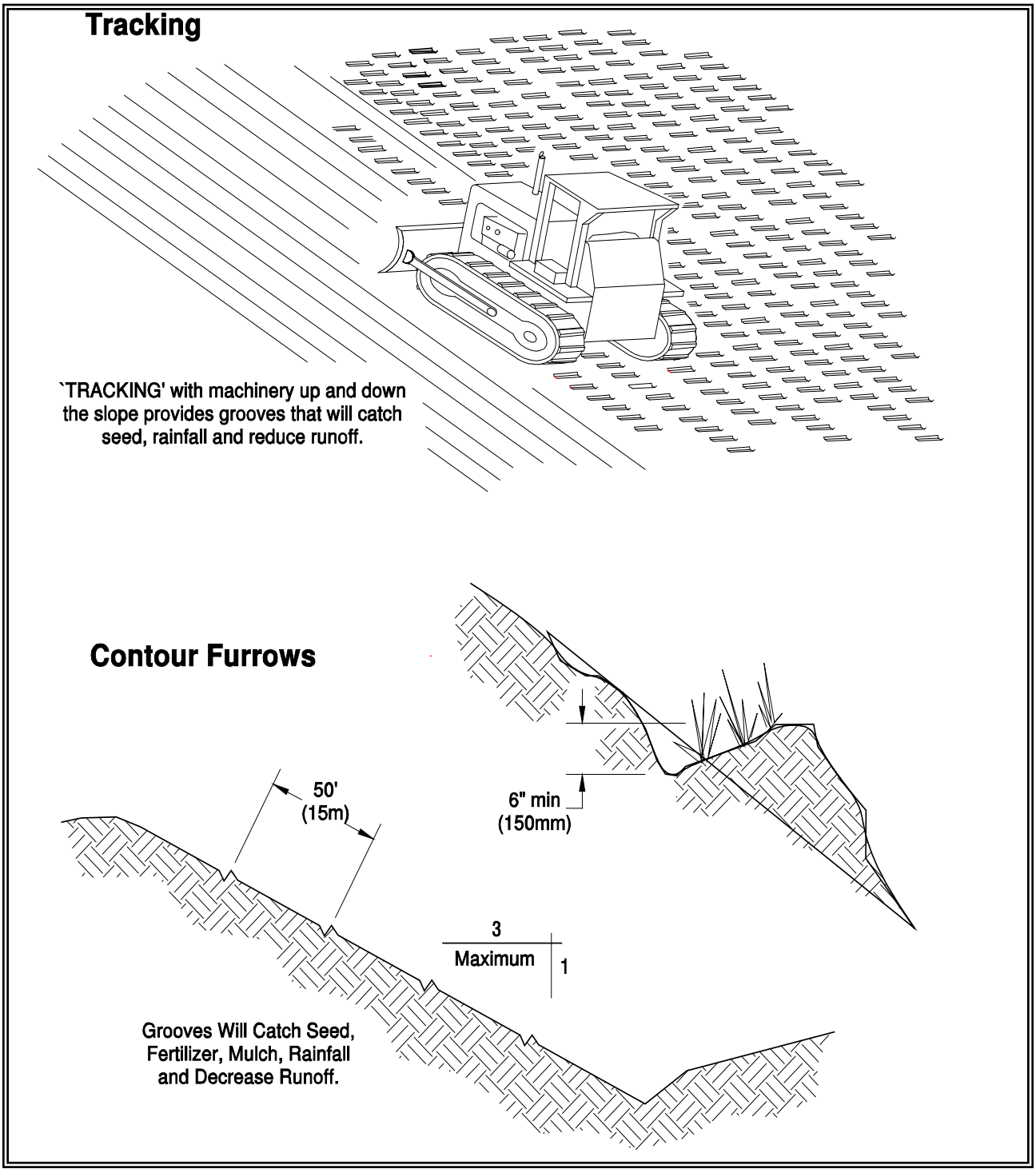


Figure 4.1.5 – Surface Roughening by Tracking and Contour Furrows

BMP C124: Sodding

Purpose

The purpose of sodding is to establish permanent turf for immediate erosion protection and to stabilize drainage ways where concentrated overland flow will occur.

Conditions of Use

Sodding may be used in the following areas:

- Disturbed areas that require short-term or long-term cover.
- Disturbed areas that require immediate vegetative cover.
- All waterways that require vegetative lining. Waterways may also be seeded rather than sodded, and protected with a net or blanket.

Design and Installation Specifications

Sod shall be free of weeds, of uniform thickness (approximately 1-inch thick), and shall have a dense root mat for mechanical strength.

The following steps are recommended for sod installation:

- Shape and smooth the surface to final grade in accordance with the approved grading plan. The swale needs to be overexcavated 4 to 6 inches below design elevation to allow room for placing soil amendment and sod.
- Amend 4 inches (minimum) of compost into the top 8 inches of the soil if the organic content of the soil is less than ten percent or the permeability is less than 0.6 inches per hour. See http://www.ecy.wa.gov/programs/swfa/organics/soil.html for further information.
- Fertilize according to the supplier's recommendations.
- Work lime and fertilizer 1 to 2 inches into the soil, and smooth the surface.
- Lay strips of sod beginning at the lowest area to be sodded and perpendicular to the direction of water flow. Wedge strips securely into place. Square the ends of each strip to provide for a close, tight fit. Stagger joints at least 12 inches. Staple on slopes steeper than 3H:1V. Staple the upstream edge of each sod strip.
- Roll the sodded area and irrigate.
- When sodding is carried out in alternating strips or other patterns, seed the areas between the sod immediately after sodding.

Maintenance Standards

If the grass is unhealthy, the cause shall be determined and appropriate action taken to reestablish a healthy groundcover. If it is impossible to establish a healthy groundcover due to frequent saturation, instability, or some other cause, the sod shall be removed, the area seeded with an appropriate mix, and protected with a net or blanket.

BMP C125: Topsoiling / Composting

Purpose

Topsoiling and composting provide a suitable growth medium for final site stabilization with vegetation. While not a permanent cover practice in itself, topsoiling and composting are an integral component of providing permanent cover in those areas where there is an unsuitable soil surface for plant growth. Use this BMP in conjunction with other BMPs such as seeding, mulching, or sodding.

Native soils and disturbed soils that have been organically amended not only retain much more stormwater, but they also serve as effective biofilters for urban pollutants and, by supporting more vigorous plant growth, reduce the water, fertilizer and pesticides needed to support

installed landscapes. Topsoil does not include any subsoils but only the material from the top several inches including organic debris.

Conditions of Use

- Permanent landscaped areas shall contain healthy topsoil that reduces the need for fertilizers, improves overall topsoil quality, provides for better vegetal health and vitality, improves hydrologic characteristics, and reduces the need for irrigation.
- Leave native soils and the duff layer undisturbed to the maximum extent practicable. Stripping of existing, properly functioning soil system and vegetation for the purpose of topsoiling during construction is not acceptable. Preserve existing soil systems in undisturbed and uncompacted conditions if functioning properly.
- Areas that already have good topsoil, such as undisturbed areas, do not require soil amendments.
- Restore, to the maximum extent practical, native soils disturbed during clearing and grading to a condition equal to or better than the original site condition's moisture-holding capacity. Use on-site native topsoil, incorporate amendments into on-site soil, or import blended topsoil to meet this requirement.
- Topsoiling is a required procedure when establishing vegetation on shallow soils, and soils of critically low pH (high acid) levels.
- Beware of where the topsoil comes from, and what vegetation was on site before disturbance, invasive plant seeds may be included and could cause problems for establishing native plants, landscaped areas, or grasses.
- Topsoil from the site will contain mycorrhizal bacteria that are necessary for healthy root growth and nutrient transfer. These native mycorrhiza are acclimated to the site and will provide optimum conditions for establishing grasses. Use commercially available mycorrhiza products when using off-site topsoil.

Design and Installation Specifications

Meet the following requirements for areas requiring disruption and topsoiling:

- Maximize the depth of the topsoil wherever possible to provide the maximum possible infiltration capacity and beneficial growth medium. Topsoil shall have:
    - A minimum depth of 8-inches. Scarify subsoils below the topsoil layer at least 4-inches with some incorporation of the upper material to avoid stratified layers, where feasible. Ripping or re-structuring the subgrade may also provide additional benefits regarding the overall infiltration and interflow dynamics of the soil system.

- A minimum organic content of 10% dry weight, and 5% organic matter content in turf areas. Incorporate organic amendments to a minimum 8-inch depth except where tree roots or other natural features limit the depth of incorporation.
- A pH between 6.0 and 8.0 or matching the pH of the undisturbed soil.
- If blended topsoil is imported, then fines should be limited to 25 percent passing through a 200 sieve.

- Accomplish the required organic content and pH by either returning native topsoil to the site and/or incorporating organic amendments.
  - To meet the organic content use compost that meets the definition of "composted materials" in WAC 173-350-220. This code is available online at: http://apps.leg.wa.gov/WAC/default.aspx?cite=173-350-220.

    The compost must also have an organic matter content of 35% to 65%, and a carbon to nitrogen ratio below 25H:1V.

    The carbon to nitrogen ratio may be as high as 35H:1V for plantings composed entirely of plants native to the Puget Sound Lowlands region.
  - For till soils use a mixture of approximately two parts soil to one part compost. This equates to 4 inches of compost mixed to a depth of 12 inches in till soils. Increasing the concentration of compost beyond this level can have negative effects on vegetal health, while decreasing the concentrations can reduce the benefits of amended soils.
  - Gravel or cobble outwash soils, may require different approaches. Organics and fines easily migrate through the loose structure of these soils. Therefore, the importation of at least 6 inches of quality topsoil, underlain by some type of filter fabric to prevent the migration of fines, may be more appropriate for these soils.
- The final composition and construction of the soil system will result in a natural selection or favoring of certain plant species over time. For example, incorporation of topsoil may favor grasses, while layering with mildly acidic, high-carbon amendments may favor more woody vegetation.
- Allow sufficient time in scheduling for topsoil spreading prior to seeding, sodding, or planting.
- Take care when applying top soil to subsoils with contrasting textures. Sandy topsoil over clayey subsoil is a particularly poor combination, as water creeps along the junction between the soil layers and causes the topsoil to slough. If topsoil and subsoil are not properly bonded, water will not infiltrate the soil profile evenly and it will be difficult to

establish vegetation. The best method to prevent a lack of bonding is to actually work the topsoil into the layer below for a depth of at least 6 inches.

- Field exploration of the site shall be made to determine if there is surface soil of sufficient quantity and quality to justify stripping. Topsoil shall be friable and loamy (loam, sandy loam, silt loam, sandy clay loam, and clay loam). Avoid areas of natural ground water recharge.
- Stripping shall be confined to the immediate construction area. A 4-inch to 6-inch stripping depth is common, but depth may vary depending on the particular soil. All surface runoff control structures shall be in place prior to stripping.
- Do not place topsoil while in a frozen or muddy condition, when the subgrade is excessively wet, or when conditions exist that may otherwise be detrimental to proper grading or proposed sodding or seeding.
- In any areas requiring grading remove and stockpile the duff layer and topsoil on site in a designated, controlled area, not adjacent to public resources and critical areas. Stockpiled topsoil is to be reapplied to other portions of the site where feasible.
- Locate the topsoil stockpile so that it meets specifications and does not interfere with work on the site. It may be possible to locate more than one pile in proximity to areas where topsoil will be used.

Stockpiling of topsoil shall occur in the following manner:

- Side slopes of the stockpile shall not exceed 2H:1V.
- Between October 1 and April 30:
  - An interceptor dike with gravel outlet and silt fence shall surround all topsoil.
  - Within 2 days complete erosion control seeding, or covering stockpiles with clear plastic, or other mulching materials.
- Between May 1 and September 30:
  - An interceptor dike with gravel outlet and silt fence shall surround all topsoil if the stockpile will remain in place for a longer period of time than active construction grading.
  - Within 7 days complete erosion control seeding, or covering stockpiles with clear plastic, or other mulching materials.
- When native topsoil is to be stockpiled and reused the following should apply to ensure that the mycorrhizal bacterial, earthworms, and other beneficial organisms will not be destroyed:
  1. Re-install topsoil within 4 to 6 weeks.

2. Do not allow the saturation of topsoil with water.
3. Do not use plastic covering.

Maintenance Standards

- Inspect stockpiles regularly, especially after large storm events. Stabilize any areas that have eroded.
- Establish soil quality and depth toward the end of construction and once established, protect from compaction, such as from large machinery use, and from erosion.
- Plant and mulch soil after installation.
- Leave plant debris or its equivalent on the soil surface to replenish organic matter.
- Reduce and adjust, where possible, the use of irrigation, fertilizers, herbicides and pesticides, rather than continuing to implement formerly established practices.

stable driving surface and to stabilize any areas that have eroded.

Following construction, these areas shall be restored to pre-construction condition or better to prevent future erosion.

Perform street cleaning at the end of each day or more often if necessary.

BMP C150: Materials on Hand

Purpose

Keep quantities of erosion prevention and sediment control materials on the project site at all times to be used for regular maintenance and emergency situations such as unexpected heavy summer rains. Having these materials on-site reduces the time needed to implement BMPs when inspections indicate that existing BMPs are not meeting the Construction SWPPP requirements. In addition, contractors can save money by buying some materials in bulk and storing them at their office or yard.

Conditions of Use

- Construction projects of any size or type can benefit from having materials on hand. A small commercial development project could have a roll of plastic and some gravel available for immediate protection of bare soil and temporary berm construction. A large earthwork project, such as highway construction, might have several tons of straw, several rolls of plastic, flexible pipe, sandbags, geotextile fabric and steel "T" posts.
- Materials are stockpiled and readily available before any site clearing, grubbing, or earthwork begins. A large contractor or developer could keep a stockpile of materials that are available for use on several projects.
- If storage space at the project site is at a premium, the contractor could maintain the materials at their office or yard. The office or yard must be less than an hour from the project site.

Design and Installation Specifications

Depending on project type, size, complexity, and length, materials and quantities will vary. A good minimum list of items that will cover numerous situations includes:

Material
Clear Plastic, 6 mil
Drainpipe, 6 or 8 inch diameter
Sandbags, filled
Straw Bales for mulching,
Quarry Spalls
Washed Gravel
Geotextile Fabric
Catch Basin Inserts
Steel "T" Posts
Silt fence material
Straw Wattles

Maintenance Standards

- All materials with the exception of the quarry spalls, steel "T" posts, and gravel should be kept covered and out of both sun and rain.
- Re-stock materials used as needed.

BMP C151: Concrete Handling

Purpose

Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. Concrete spillage or concrete discharge to surface waters of the State is prohibited. Use this BMP to minimize and eliminate concrete, concrete process water, and concrete slurry from entering waters of the state.

Conditions of Use

Any time concrete is used, utilize these management practices. Concrete construction projects include, but are not limited to, the following:

- Curbs
- Sidewalks
- Roads
- Bridges
- Foundations
- Floors
- Runways

Design and Installation

- Wash out concrete truck chutes, pumps, and internals into formed areas only. Assure that washout of concrete trucks is performed off-

Specifications

site or in designated concrete washout areas. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Refer to BMP C154 for information on concrete washout areas.

- Return unused concrete remaining in the truck and pump to the originating batch plant for recycling. Do not dump excess concrete on site, except in designated concrete washout areas.
- Wash off hand tools including, but not limited to, screeds, shovels, rakes, floats, and trowels into formed areas only.
- Wash equipment difficult to move, such as concrete pavers in areas that do not directly drain to natural or constructed stormwater conveyances.
- Do not allow washdown from areas, such as concrete aggregate driveways, to drain directly to natural or constructed stormwater conveyances.
- Contain washwater and leftover product in a lined container when no formed areas are available,. Dispose of contained concrete in a manner that does not violate ground water or surface water quality standards.
- Always use forms or solid barriers for concrete pours, such as pilings, within 15-feet of surface waters.
- Refer to BMPs C252 and C253 for pH adjustment requirements.
- Refer to the Construction Stormwater General Permit for pH monitoring requirements if the project involves one of the following activities:
  - Significant concrete work (greater than 1,000 cubic yards poured concrete or recycled concrete used over the life of a project).
  - The use of engineered soils amended with (but not limited to) Portland cement-treated base, cement kiln dust or fly ash.
  - Discharging stormwater to segments of water bodies on the 303(d) list (Category 5) for high pH.

Maintenance Standards

Check containers for holes in the liner daily during concrete pours and repair the same day.

BMP C152: Sawcutting and Surfacing Pollution Prevention

Purpose

Sawcutting and surfacing operations generate slurry and process water that contains fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. Concrete spillage or concrete discharge to surface waters of the State is prohibited. Use this BMP to minimize and eliminate process water and slurry created through sawcutting or surfacing from entering waters of the State.

Conditions of Use

Utilize these management practices anytime sawcutting or surfacing operations take place. Sawcutting and surfacing operations include, but are not limited to, the following:

- Sawing
- Coring
- Grinding
- Roughening
- Hydro-demolition
- Bridge and road surfacing

Design and Installation Specifications

- Vacuum slurry and cuttings during cutting and surfacing operations.
- Slurry and cuttings shall not remain on permanent concrete or asphalt pavement overnight.
- Slurry and cuttings shall not drain to any natural or constructed drainage conveyance including stormwater systems. This may require temporarily blocking catch basins.
- Dispose of collected slurry and cuttings in a manner that does not violate ground water or surface water quality standards.
- Do not allow process water generated during hydro-demolition, surface roughening or similar operations to drain to any natural or constructed drainage conveyance including stormwater systems. Dispose process water in a manner that does not violate ground water or surface water quality standards.
- Handle and dispose cleaning waste material and demolition debris in a manner that does not cause contamination of water. Dispose of sweeping material from a pick-up sweeper at an appropriate disposal site.

Maintenance Standards

Continually monitor operations to determine whether slurry, cuttings, or process water could enter waters of the state. If inspections show that a violation of water quality standards could occur, stop operations and immediately implement preventive measures such as berms, barriers, secondary containment, and vacuum trucks.

BMP C153: Material Delivery, Storage and Containment

Purpose

Prevent, reduce, or eliminate the discharge of pollutants to the stormwater system or watercourses from material delivery and storage. Minimize the storage of hazardous materials on-site, store materials in a designated area, and install secondary containment.

Conditions of Use

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Petroleum products such as fuel, oil and grease
- Soil stabilizers and binders (e.g. Polyacrylamide)
- Fertilizers, pesticides and herbicides
- Detergents
- Asphalt and concrete compounds
- Hazardous chemicals such as acids, lime, adhesives, paints, solvents and curing compounds
- Any other material that may be detrimental if released to the environment

Design and Installation Specifications

The following steps should be taken to minimize risk:

- Temporary storage area should be located away from vehicular traffic, near the construction entrance(s), and away from waterways or storm drains.
- Material Safety Data Sheets (MSDS) should be supplied for all materials stored. Chemicals should be kept in their original labeled containers.
- Hazardous material storage on-site should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- During the wet weather season (Oct 1 – April 30), consider storing materials in a covered area.
- Materials should be stored in secondary containments, such as earthen dike, horse trough, or even a children's wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, and within secondary containment.
- If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids to reduce corrosion. Domed plastic covers are inexpensive and snap to the top of drums, preventing water from collecting.

Material Storage Areas and Secondary Containment Practices:

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 shall be stored in approved containers and drums and shall not be overfilled. Containers and drums shall be stored in temporary secondary containment facilities.
- Temporary secondary containment facilities shall provide for a spill containment volume able to contain 10% of the total enclosed container volume of all containers, or 110% of the capacity of the largest container within its boundary, whichever is greater.
- Secondary containment facilities shall be impervious to the materials stored therein for a minimum contact time of 72 hours.
- Secondary containment facilities shall be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills shall be collected and placed into drums. These liquids shall be handled as hazardous waste unless testing determines them to be non-hazardous.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- During the wet weather season (Oct 1 – April 30), each secondary containment facility shall be covered during non-working days, prior to and during rain events.
- Keep material storage areas clean, organized and equipped with an ample supply of appropriate spill clean-up material (spill kit).
- The spill kit should include, at a minimum:
    - 1-Water Resistant Nylon Bag
    - 3-Oil Absorbent Socks 3”x 4’
    - 2-Oil Absorbent Socks 3”x 10’
    - 12-Oil Absorbent Pads 17”x19”
    - 1-Pair Splash Resistant Goggles
    - 3-Pair Nitrile Gloves
    - 10-Disposable Bags with Ties
    - Instructions

BMP C154: Concrete Washout Area

Purpose

Prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout off-site, or performing on-site washout in a designated area to prevent pollutants from entering surface waters or ground water.

Conditions of Use

Concrete washout area best management practices are implemented on construction projects where:

- Concrete is used as a construction material
- It is not possible to dispose of all concrete wastewater and washout off-site (ready mix plant, etc.).
- Concrete trucks, pumpers, or other concrete coated equipment are washed on-site.
- Note: If less than 10 concrete trucks or pumpers need to be washed out on-site, the washwater may be disposed of in a formed area awaiting concrete or an upland disposal site where it will not contaminate surface or ground water. The upland disposal site shall be at least 50 feet from sensitive areas such as storm drains, open ditches, or water bodies, including wetlands.

Design and Installation Specifications

Implementation

The following steps will help reduce stormwater pollution from concrete wastes:

- Perform washout of concrete trucks off-site or in designated concrete washout areas only.
- Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated concrete washout areas.
- Concrete washout areas may be prefabricated concrete washout containers, or self-installed structures (above-grade or below-grade).
- Prefabricated containers are most resistant to damage and protect against spills and leaks. Companies may offer delivery service and provide regular maintenance and disposal of solid and liquid waste.
- If self-installed concrete washout areas are used, below-grade structures are preferred over above-grade structures because they are less prone to spills and leaks.
- Self-installed above-grade structures should only be used if excavation is not practical.

Education

- Discuss the concrete management techniques described in this BMP with the ready-mix concrete supplier before any deliveries are made.
- Educate employees and subcontractors on the concrete waste management techniques described in this BMP.
- Arrange for contractor's superintendent or Certified Erosion and Sediment Control Lead (CESCL) to oversee and enforce concrete waste management procedures.
- A sign should be installed adjacent to each temporary concrete washout facility to inform concrete equipment operators to utilize the proper facilities.

Contracts

Incorporate requirements for concrete waste management into concrete supplier and subcontractor agreements.

Location and Placement

- Locate washout area at least 50 feet from sensitive areas such as storm drains, open ditches, or water bodies, including wetlands.
- Allow convenient access for concrete trucks, preferably near the area where the concrete is being poured.
- If trucks need to leave a paved area to access washout, prevent track-out with a pad of rock or quarry spalls (see BMP C105). These areas should be far enough away from other construction traffic to reduce the likelihood of accidental damage and spills.
- The number of facilities you install should depend on the expected demand for storage capacity.
- On large sites with extensive concrete work, washouts should be placed in multiple locations for ease of use by concrete truck drivers.

On-site Temporary Concrete Washout Facility, Transit Truck Washout Procedures:

- Temporary concrete washout facilities shall be located a minimum of 50 ft from sensitive areas including storm drain inlets, open drainage facilities, and watercourses. See Figures 4.1.7 and 4.1.8.
- Concrete washout facilities shall be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
- Approximately 7 gallons of wash water are used to wash one truck chute.
- Approximately 50 gallons are used to wash out the hopper of a concrete pump truck.

- Washout of concrete trucks shall be performed in designated areas only.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed of off-site.
- Once concrete wastes are washed into the designated area and allowed to harden, the concrete should be broken up, removed, and disposed of per applicable solid waste regulations. Dispose of hardened concrete on a regular basis.
- Temporary Above-Grade Concrete Washout Facility
  - Temporary concrete washout facility (type above grade) should be constructed as shown on the details below, with a recommended minimum length and minimum width of 10 ft, but with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.
  - Plastic lining material should be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
- Temporary Below-Grade Concrete Washout Facility
  - Temporary concrete washout facilities (type below grade) should be constructed as shown on the details below, with a recommended minimum length and minimum width of 10 ft. The quantity and volume should be sufficient to contain all liquid and concrete waste generated by washout operations.
  - Lath and flagging should be commercial type.
  - Plastic lining material shall be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
  - Liner seams shall be installed in accordance with manufacturers' recommendations.
  - Soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.

Maintenance Standards

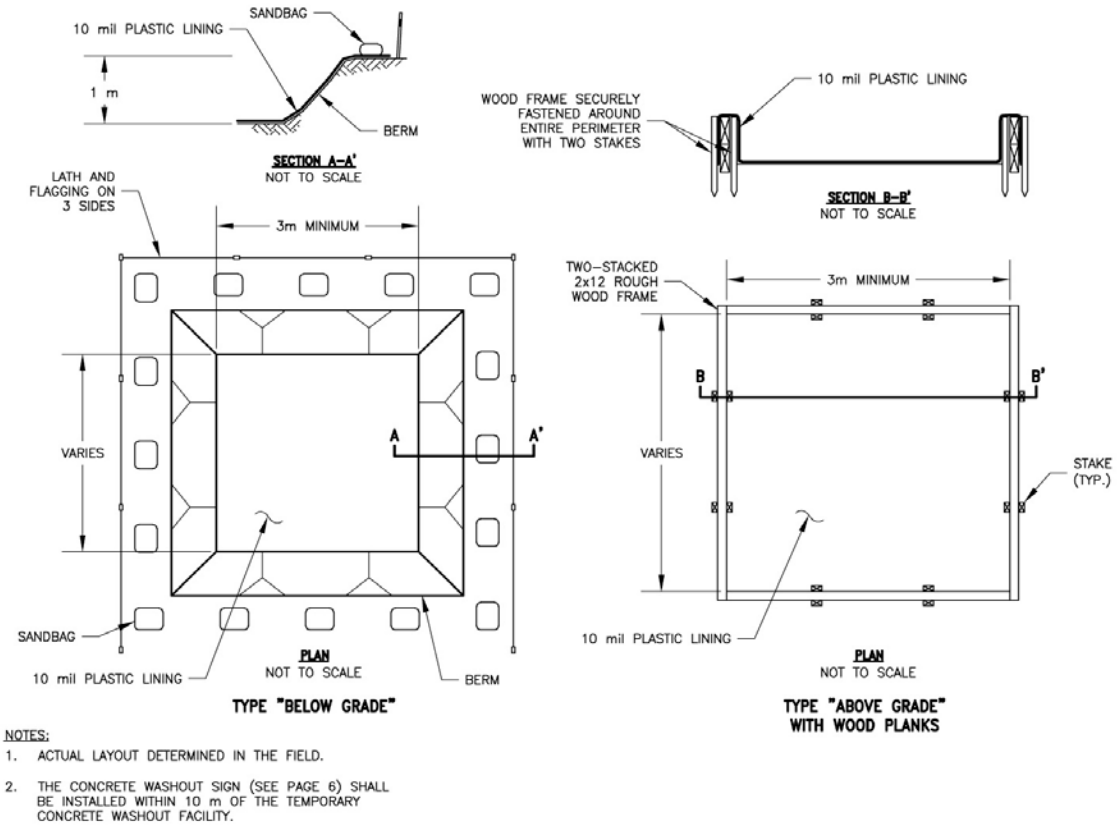
Inspection and Maintenance

- Inspect and verify that concrete washout BMPs are in place prior to the commencement of concrete work.
- During periods of concrete work, inspect daily to verify continued performance.
  - Check overall condition and performance.
  - Check remaining capacity (% full).

    - If using self-installed washout facilities, verify plastic liners are intact and sidewalls are not damaged.
    - If using prefabricated containers, check for leaks.
- Washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 12 inches.
- Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
- If the washout is nearing capacity, vacuum and dispose of the waste material in an approved manner.
    - Do not discharge liquid or slurry to waterways, storm drains or directly onto ground.
    - Do not use sanitary sewer without local approval.
    - Place a secure, non-collapsing, non-water collecting cover over the concrete washout facility prior to predicted wet weather to prevent accumulation and overflow of precipitation.
    - Remove and dispose of hardened concrete and return the structure to a functional condition. Concrete may be reused on-site or hauled away for disposal or recycling.
- When you remove materials from the self-installed concrete washout, build a new structure; or, if the previous structure is still intact, inspect for signs of weakening or damage, and make any necessary repairs. Re-line the structure with new plastic after each cleaning.

Removal of Temporary Concrete Washout Facilities

- When temporary concrete washout facilities are no longer required for the work, the hardened concrete, slurries and liquids shall be removed and properly disposed of.
- Materials used to construct temporary concrete washout facilities shall be removed from the site of the work and disposed of or recycled.
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled, repaired, and stabilized to prevent erosion.



NOTES:

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN (SEE PAGE 6) SHALL BE INSTALLED WITHIN 10 m OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

Figure 4.1.7a – Concrete Washout Area

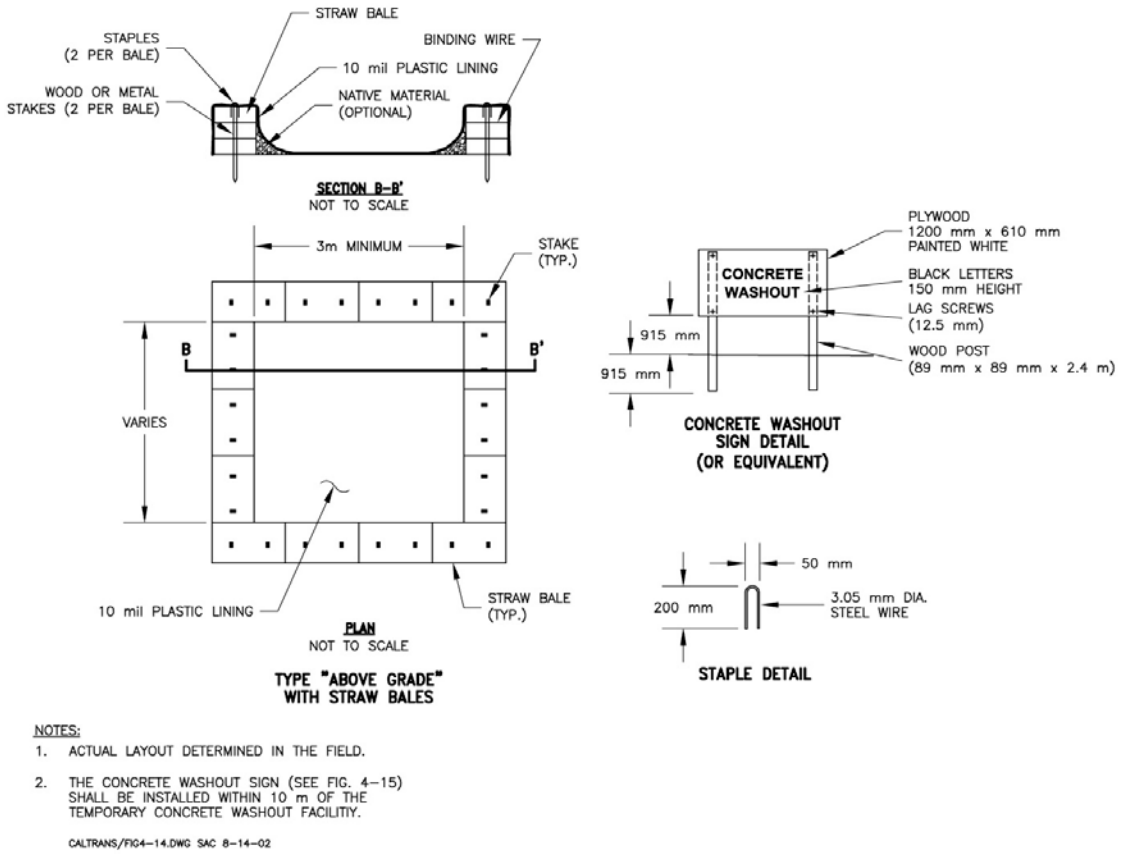


Figure 4.1.7b – Concrete Washout Area

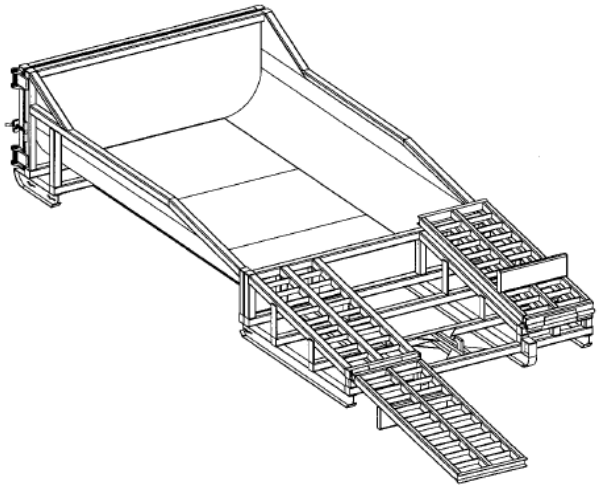


Figure 4.1.8 – Prefabricated Concrete Washout Container w/Ramp

BMP C200: Interceptor Dike and Swale

Purpose

Provide a ridge of compacted soil, or a ridge with an upslope swale, at the top or base of a disturbed slope or along the perimeter of a disturbed construction area to convey stormwater. Use the dike and/or swale to intercept the runoff from unprotected areas and direct it to areas where erosion can be controlled. This can prevent storm runoff from entering the work area or sediment-laden runoff from leaving the construction site.

Conditions of Use

Where the runoff from an exposed site or disturbed slope must be conveyed to an erosion control facility which can safely convey the stormwater.

- Locate upslope of a construction site to prevent runoff from entering disturbed area.
- When placed horizontally across a disturbed slope, it reduces the amount and velocity of runoff flowing down the slope.
- Locate downslope to collect runoff from a disturbed area and direct water to a sediment basin.

Design and Installation Specifications

- Dike and/or swale and channel must be stabilized with temporary or permanent vegetation or other channel protection during construction.
- Channel requires a positive grade for drainage; steeper grades require channel protection and check dams.
- Review construction for areas where overtopping may occur.
- Can be used at top of new fill before vegetation is established.
- May be used as a permanent diversion channel to carry the runoff.
- Sub-basin tributary area should be one acre or less.
- Design capacity for the peak flow from a 10-year, 24-hour storm, assuming a Type 1A rainfall distribution, for temporary facilities. Alternatively, use 1.6 times the 10-year, 1-hour flow indicated by an approved continuous runoff model. For facilities that will also serve on a permanent basis, consult the local government's drainage requirements.

Interceptor dikes shall meet the following criteria:

Top Width	2 feet minimum.
Height	1.5 feet minimum on berm.
Side Slope	2H:1V or flatter.
Grade	Depends on topography, however, dike system minimum is 0.5%, and maximum is 1%.
Compaction	Minimum of 90 percent ASTM D698 standard proctor.

Horizontal Spacing of Interceptor Dikes:

Average Slope	Slope Percent	Flowpath Length
20H:1V or less	3-5%	300 feet
(10 to 20)H:1V	5-10%	200 feet
(4 to 10)H:1V	10-25%	100 feet
(2 to 4)H:1V	25-50%	50 feet

Stabilization depends on velocity and reach

Slopes <5% Seed and mulch applied within 5 days of dike construction (see BMP C121, Mulching).

Slopes 5 - 40% Dependent on runoff velocities and dike materials. Stabilization should be done immediately using either sod or riprap or other measures to avoid erosion.

- The upslope side of the dike shall provide positive drainage to the dike outlet. No erosion shall occur at the outlet. Provide energy dissipation measures as necessary. Sediment-laden runoff must be released through a sediment trapping facility.
- Minimize construction traffic over temporary dikes. Use temporary cross culverts for channel crossing.

Interceptor swales shall meet the following criteria:

Bottom Width	2 feet minimum; the cross-section bottom shall be level.
Depth	1-foot minimum.
Side Slope	2H:1V or flatter.
Grade	Maximum 5 percent, with positive drainage to a suitable outlet (such as a sediment pond).
Stabilization	Seed as per BMP C120, *Temporary and Permanent Seeding*, or *BMP C202, Channel Lining*, 12 inches thick riprap pressed into the bank and extending at least 8 inches vertical from the bottom.

- Inspect diversion dikes and interceptor swales once a week and after every rainfall. Immediately remove sediment from the flow area.
- Damage caused by construction traffic or other activity must be repaired before the end of each working day.

Check outlets and make timely repairs as needed to avoid gully formation. When the area below the temporary diversion dike is permanently stabilized, remove the dike and fill and stabilize the channel to blend with the natural surface.

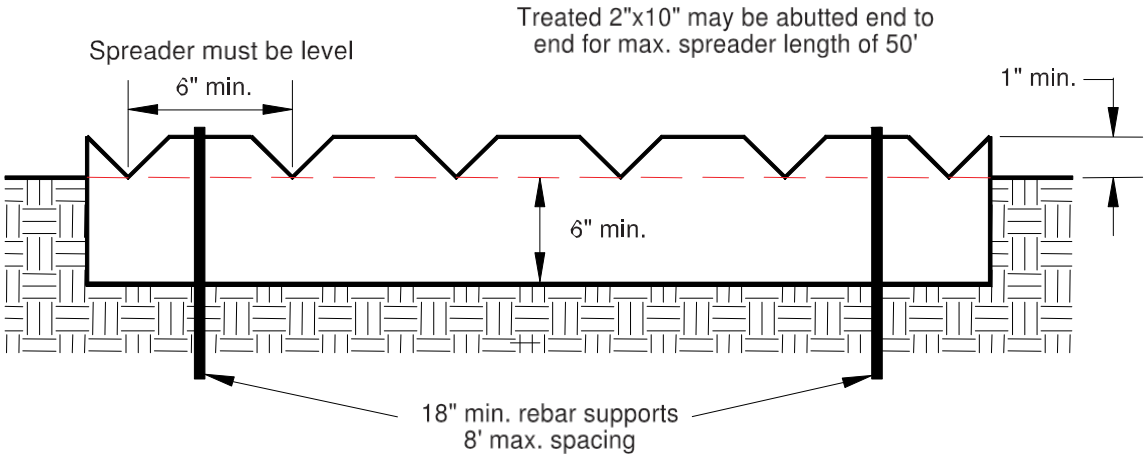


Figure 4.2.6 – Detail of Level Spreader

BMP C207: Check Dams

Purpose Construction of small dams across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam.

Conditions of Use Where temporary channels or permanent channels are not yet vegetated, channel lining is infeasible, and/or velocity checks are required.

- Check dams may not be placed in streams unless approved by the State Department of Fish and Wildlife. Check dams may not be placed in wetlands without approval from a permitting agency.
- Do not place check dams below the expected backwater from any salmonid bearing water between October 1 and May 31 to ensure that there is no loss of high flow refuge habitat for overwintering juvenile salmonids and emergent salmonid fry.
- Construct rock check dams from appropriately sized rock. The rock used must be large enough to stay in place given the expected design flow through the channel. The rock must be placed by hand or by mechanical means (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the dam is lower than the edges.
- Check dams may also be constructed of either rock or pea-gravel filled bags. Numerous new products are also available for this purpose. They tend to be re-usable, quick and easy to install, effective, and cost efficient.
- Place check dams perpendicular to the flow of water.
- The dam should form a triangle when viewed from the side. This prevents undercutting as water flows over the face of the dam rather than falling directly onto the ditch bottom.

- Before installing check dams impound and bypass upstream water flow away from the work area. Options for bypassing include pumps, siphons, or temporary channels.
- Check dams in association with sumps work more effectively at slowing flow and retaining sediment than just a check dam alone. A deep sump should be provided immediately upstream of the check dam.
- In some cases, if carefully located and designed, check dams can remain as permanent installations with very minor regrading. They may be left as either spillways, in which case accumulated sediment would be graded and seeded, or as check dams to prevent further sediment from leaving the site.
- The maximum spacing between the dams shall be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.
- Keep the maximum height at 2 feet at the center of the dam.
- Keep the center of the check dam at least 12 inches lower than the outer edges at natural ground elevation.
- Keep the side slopes of the check dam at 2H:1V or flatter.
- Key the stone into the ditch banks and extend it beyond the abutments a minimum of 18 inches to avoid washouts from overflow around the dam.
- Use filter fabric foundation under a rock or sand bag check dam. If a blanket ditch liner is used, filter fabric is not necessary. A piece of organic or synthetic blanket cut to fit will also work for this purpose.
- In the case of grass-lined ditches and swales, all check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale - unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.
- Ensure that channel appurtenances, such as culvert entrances below check dams, are not subject to damage or blockage from displaced stones. Figure 4.2.7 depicts a typical rock check dam.

Maintenance Standards

Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall. Sediment shall be removed when it reaches one half the sump depth.

- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel.

Approved as Equivalent

Ecology has approved products as able to meet the requirements of BMP C207. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology's website at http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html

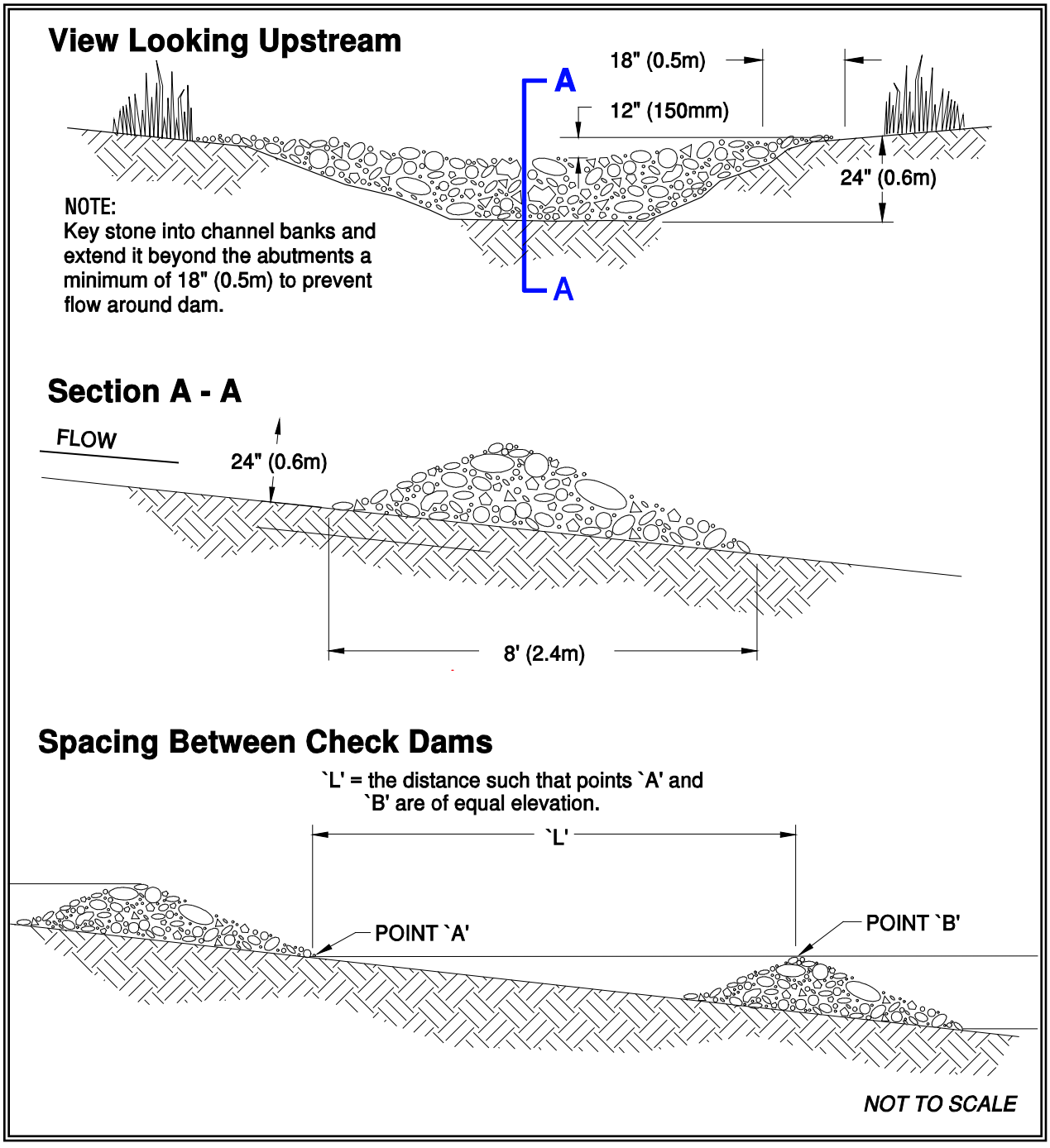


Figure 4.2.7 – Rock Check Dam

BMP C220: Storm Drain Inlet Protection

Purpose

Storm drain inlet protection prevents coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area.

Conditions of Use

Use storm drain inlet protection at inlets that are operational before permanent stabilization of the disturbed drainage area. Provide protection for all storm drain inlets downslope and within 500 feet of a disturbed or construction area, unless conveying runoff entering catch basins to a sediment pond or trap.

Also consider inlet protection for lawn and yard drains on new home construction. These small and numerous drains coupled with lack of gutters in new home construction can add significant amounts of sediment into the roof drain system. If possible delay installing lawn and yard drains until just before landscaping or cap these drains to prevent sediment from entering the system until completion of landscaping. Provide 18-inches of sod around each finished lawn and yard drain.

Table 4.2.2 lists several options for inlet protection. All of the methods for storm drain inlet protection tend to plug and require a high frequency of maintenance. Limit drainage areas to one acre or less. Possibly provide emergency overflows with additional end-of-pipe treatment where stormwater ponding would cause a hazard.

Table 4.2.2
Storm Drain Inlet Protection

Type of Inlet Protection	Emergency Overflow	Applicable for Paved/ Earthen Surfaces	Conditions of Use
Drop Inlet Protection			
Excavated drop inlet protection	Yes, temporary flooding will occur	Earthen	Applicable for heavy flows. Easy to maintain. Large area Requirement: 30' X 30'/acre
Block and gravel drop inlet protection	Yes	Paved or Earthen	Applicable for heavy concentrated flows. Will not pond.
Gravel and wire drop inlet protection	No		Applicable for heavy concentrated flows. Will pond. Can withstand traffic.
Catch basin filters	Yes	Paved or Earthen	Frequent maintenance required.
Curb Inlet Protection			
Curb inlet protection with a wooden weir	Small capacity overflow	Paved	Used for sturdy, more compact installation.
Block and gravel curb inlet protection	Yes	Paved	Sturdy, but limited filtration.
Culvert Inlet Protection			
Culvert inlet sediment trap			18 month expected life.

Design and Installation Specifications

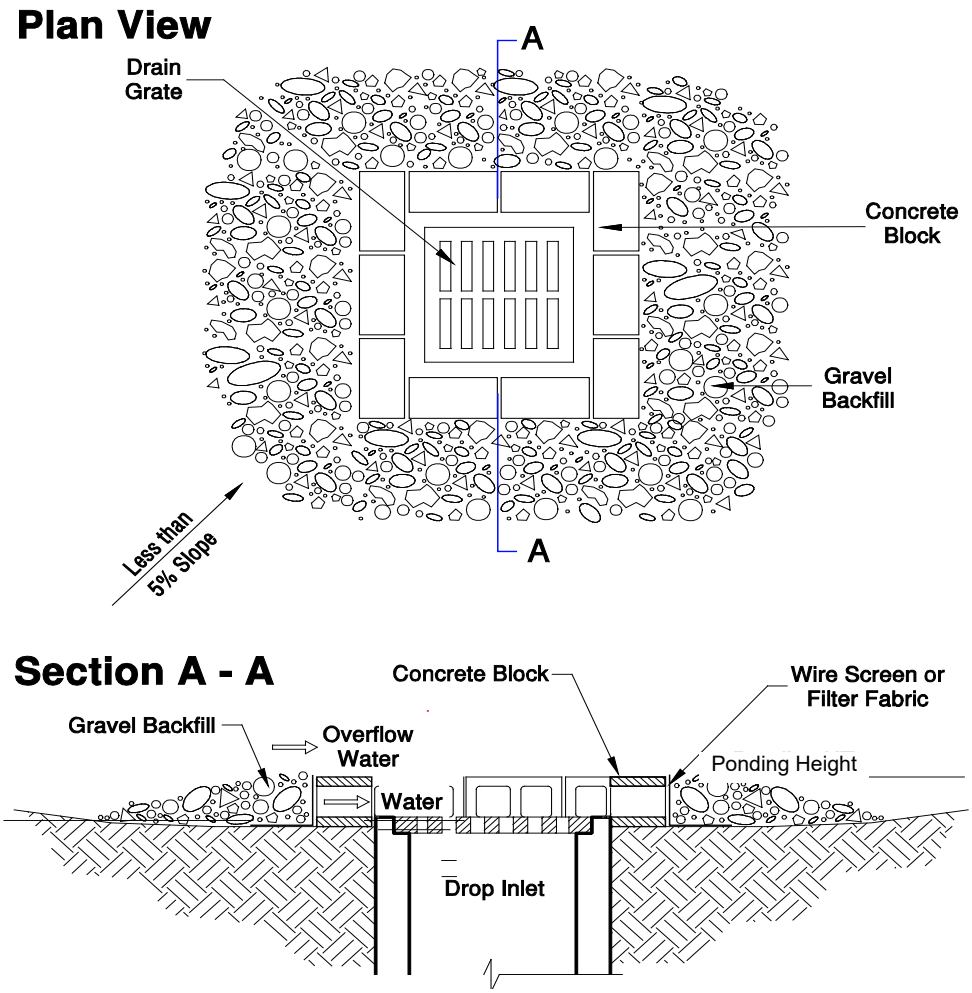
Excavated Drop Inlet Protection - An excavated impoundment around the storm drain. Sediment settles out of the stormwater prior to entering the storm drain.

- Provide a depth of 1-2 ft as measured from the crest of the inlet structure.
- Slope sides of excavation no steeper than 2H:1V.
- Minimum volume of excavation 35 cubic yards.
- Shape basin to fit site with longest dimension oriented toward the longest inflow area.
- Install provisions for draining to prevent standing water problems.
- Clear the area of all debris.
- Grade the approach to the inlet uniformly.
- Drill weep holes into the side of the inlet.
- Protect weep holes with screen wire and washed aggregate.
- Seal weep holes when removing structure and stabilizing area.

- Build a temporary dike, if necessary, to the down slope side of the structure to prevent bypass flow.

Block and Gravel Filter - A barrier formed around the storm drain inlet with standard concrete blocks and gravel. See Figure 4.2.8.

- Provide a height of 1 to 2 feet above inlet.
- Recess the first row 2-inches into the ground for stability.
- Support subsequent courses by placing a 2x4 through the block opening.
- Do not use mortar.
- Lay some blocks in the bottom row on their side for dewatering the pool.
- Place hardware cloth or comparable wire mesh with ½-inch openings over all block openings.
- Place gravel just below the top of blocks on slopes of 2H:1V or flatter.
- An alternative design is a gravel donut.
- Provide an inlet slope of 3H:1V.
- Provide an outlet slope of 2H:1V.
- Provide a1-foot wide level stone area between the structure and the inlet.
- Use inlet slope stones 3 inches in diameter or larger.
- Use gravel ½- to ¾-inch at a minimum thickness of 1-foot for the outlet slope.



Notes:
1. Drop inlet sediment barriers are to be used for small, nearly level drainage areas. (less than 5%)
2. Excavate a basin of sufficient size adjacent to the drop inlet.
3. The top of the structure (ponding height) must be well below the ground elevation downslope to prevent runoff from bypassing the inlet. A temporary dike may be necessary on the downslope side of the structure.

Figure 4.2.8 – Block and Gravel Filter

Gravel and Wire Mesh Filter - A gravel barrier placed over the top of the inlet. This structure does not provide an overflow.

- Use a hardware cloth or comparable wire mesh with ½-inch openings.
- Use coarse aggregate.
- Provide a height 1-foot or more, 18-inches wider than inlet on all sides.
- Place wire mesh over the drop inlet so that the wire extends a minimum of 1-foot beyond each side of the inlet structure.
- Overlap the strips if more than one strip of mesh is necessary.

- Place coarse aggregate over the wire mesh.
- Provide at least a 12-inch depth of gravel over the entire inlet opening and extend at least 18-inches on all sides.

Catchbasin Filters – Use inserts designed by manufacturers for construction sites. The limited sediment storage capacity increases the amount of inspection and maintenance required, which may be daily for heavy sediment loads. To reduce maintenance requirements combine a catchbasin filter with another type of inlet protection. This type of inlet protection provides flow bypass without overflow and therefore may be a better method for inlets located along active rights-of-way.

- Provides 5 cubic feet of storage.
- Requires dewatering provisions.
- Provides a high-flow bypass that will not clog under normal use at a construction site.
- Insert the catchbasin filter in the catchbasin just below the grating.

Curb Inlet Protection with Wooden Weir – Barrier formed around a curb inlet with a wooden frame and gravel.

- Use wire mesh with ½-inch openings.
- Use extra strength filter cloth.
- Construct a frame.
- Attach the wire and filter fabric to the frame.
- Pile coarse washed aggregate against wire/fabric.
- Place weight on frame anchors.

Block and Gravel Curb Inlet Protection – Barrier formed around a curb inlet with concrete blocks and gravel. See Figure 4.2.9.

- Use wire mesh with ½-inch openings.
- Place two concrete blocks on their sides abutting the curb at either side of the inlet opening. These are spacer blocks.
- Place a 2x4 stud through the outer holes of each spacer block to align the front blocks.
- Place blocks on their sides across the front of the inlet and abutting the spacer blocks.
- Place wire mesh over the outside vertical face.
- Pile coarse aggregate against the wire to the top of the barrier.

Curb and Gutter Sediment Barrier – Sandbag or rock berm (riprap and aggregate) 3 feet high and 3 feet wide in a horseshoe shape. See Figure 4.2.10.

- Construct a horseshoe shaped berm, faced with coarse aggregate if using riprap, 3 feet high and 3 feet wide, at least 2 feet from the inlet.
- Construct a horseshoe shaped sedimentation trap on the outside of the berm sized to sediment trap standards for protecting a culvert inlet.

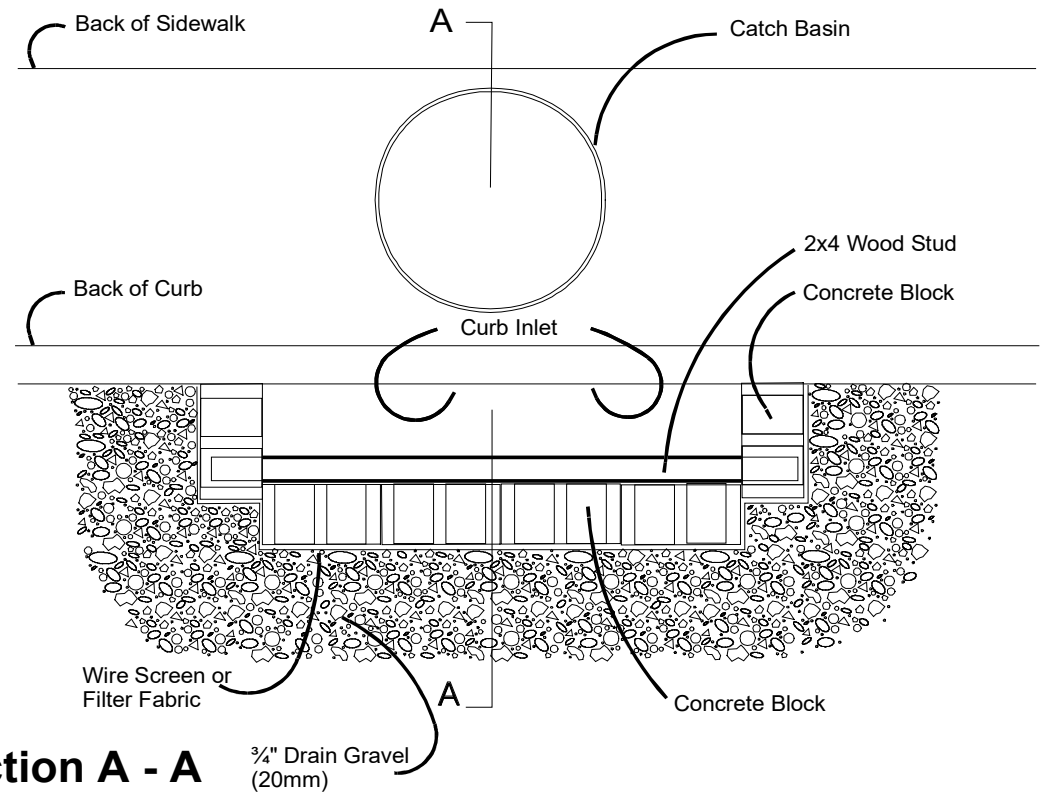
Maintenance Standards

- Inspect catch basin filters frequently, especially after storm events. Clean and replace clogged inserts. For systems with clogged stone filters: pull away the stones from the inlet and clean or replace. An alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.

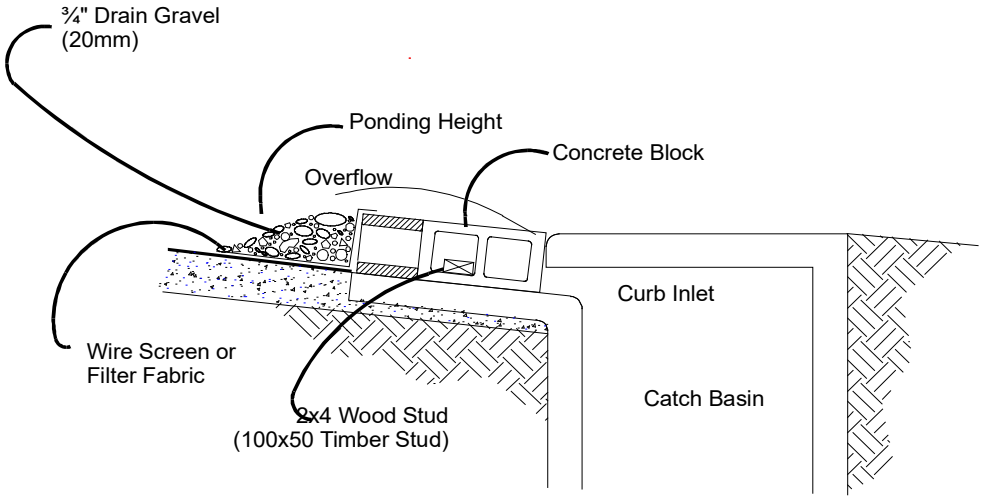
Approved as Equivalent

Ecology has approved products as able to meet the requirements of BMP C220. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology's website at http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html

Plan View



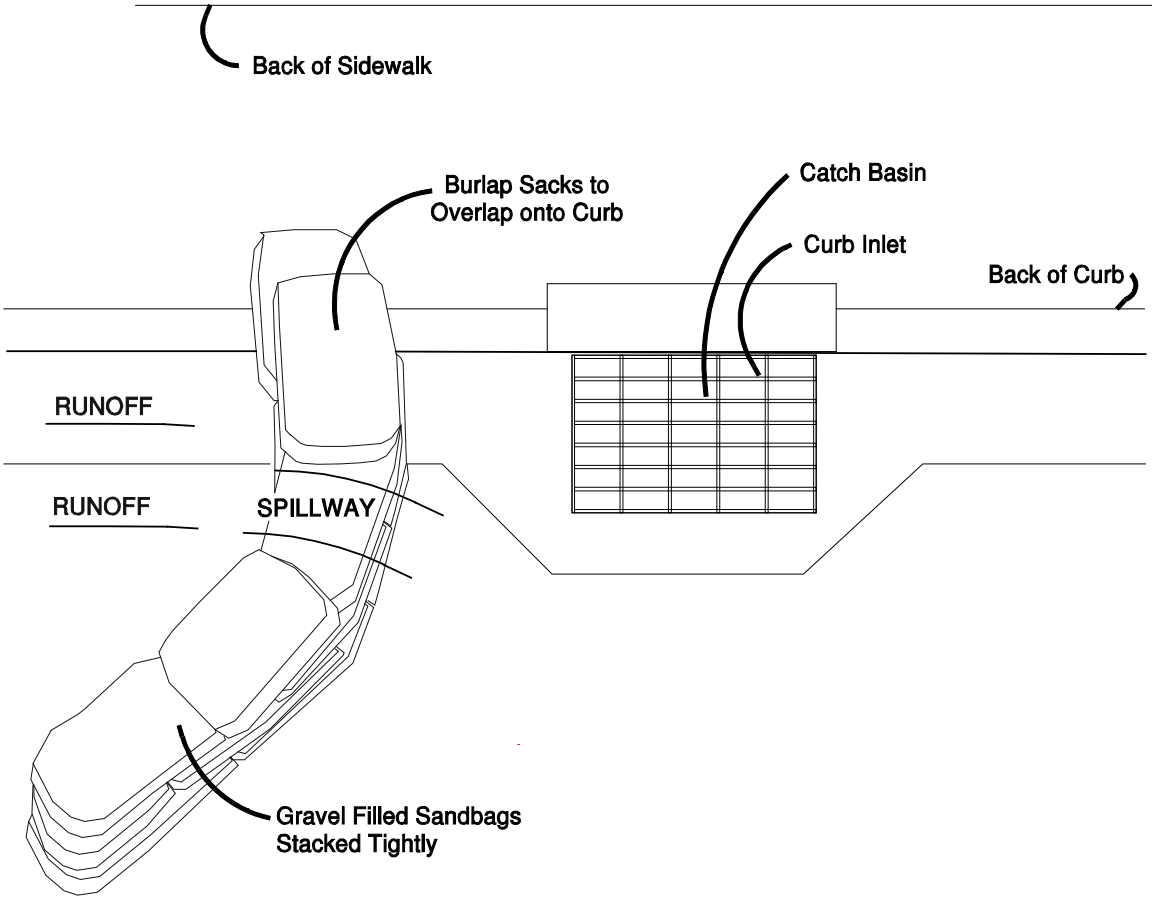
Section A - A



NOTES:
1. Use block and gravel type sediment barrier when curb inlet is located in gently sloping street segment, where water can pond and allow sediment to separate from runoff.
2. Barrier shall allow for overflow from severe storm event.
3. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

Figure 4.2.9 – Block and Gravel Curb Inlet Protection

Plan View



NOTES:
1. Place curb type sediment barriers on gently sloping street segments, where water can pond and allow sediment to separate from runoff.
2. Sandbags of either burlap or woven `geotextile' fabric, are filled with gravel, layered and packed tightly.
3. Leave a one sandbag gap in the top row to provide a spillway for overflow.
4. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

Figure 4.2.10 – Curb and Gutter Barrier

BMP C233: Silt Fence

Purpose Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow. See Figure 4.2.12 for details on silt fence construction.

Conditions of Use Silt fence may be used downslope of all disturbed areas.

- Silt fence shall prevent soil carried by runoff water from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.
- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Convey any concentrated flows through the drainage system to a sediment pond.
- Do not construct silt fences in streams or use in V-shaped ditches. Silt fences do not provide an adequate method of silt control for anything deeper than sheet or overland flow.

BMP C241: Temporary Sediment Pond

Purpose

Sediment ponds remove sediment from runoff originating from disturbed areas of the site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm). Consequently, they usually reduce turbidity only slightly.

Conditions of Use

Prior to leaving a construction site, stormwater runoff must pass through a sediment pond or other appropriate sediment removal best management practice.

A sediment pond shall be used where the contributing drainage area is 3 acres or more. Ponds must be used in conjunction with erosion control practices to reduce the amount of sediment flowing into the basin.

Design and Installation Specifications

- Sediment basins must be installed only on sites where failure of the structure would not result in loss of life, damage to homes or buildings, or interruption of use or service of public roads or utilities. Also, sediment traps and ponds are attractive to children and can be very dangerous. Compliance with local ordinances regarding health and safety must be addressed. If fencing of the pond is required, the type of fence and its location shall be shown on the ESC plan.
- Structures having a maximum storage capacity at the top of the dam of 10 acre-ft (435,600 ft^3) or more are subject to the Washington Dam Safety Regulations (Chapter 173-175 WAC).
- See Figures 4.2.18, 4.2.19, and 4.2.20 for details.
- If permanent runoff control facilities are part of the project, they should be used for sediment retention. The surface area requirements of the sediment basin must be met. This may require temporarily enlarging the permanent basin to comply with the surface area requirements. The permanent control structure must be temporarily replaced with a control structure that only allows water to leave the pond from the surface or by pumping. The permanent control structure must be installed after the site is fully stabilized. .
- Use of infiltration facilities for sedimentation basins during construction tends to clog the soils and reduce their capacity to infiltrate. If infiltration facilities are to be used, the sides and bottom of the facility must only be rough excavated to a minimum of 2 feet above final grade. Final grading of the infiltration facility shall occur only when all contributing drainage areas are fully stabilized. The infiltration pretreatment facility should be fully constructed and used with the sedimentation basin to help prevent clogging.
- Determining Pond Geometry

  Obtain the discharge from the hydrologic calculations of the peak flow for the 2-year runoff event (Q_2). The 10-year peak flow shall be used if

the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection. If no hydrologic analysis is required, the Rational Method may be used.

Determine the required surface area at the top of the riser pipe with the equation:

$SA = 2 \times Q_2/0.00096$ or
2080 square feet per cfs of inflow

See BMP C240 for more information on the derivation of the surface area calculation.

The basic geometry of the pond can now be determined using the following design criteria:

- Required surface area SA (from Step 2 above) at top of riser.
- Minimum 3.5-foot depth from top of riser to bottom of pond.
- Maximum 3H:1V interior side slopes and maximum 2H:1V exterior slopes. The interior slopes can be increased to a maximum of 2H:1V if fencing is provided at or above the maximum water surface.
- One foot of freeboard between the top of the riser and the crest of the emergency spillway.
- Flat bottom.
- Minimum 1-foot deep spillway.
- Length-to-width ratio between 3:1 and 6:1.
- Sizing of Discharge Mechanisms.

The outlet for the basin consists of a combination of principal and emergency spillways. These outlets must pass the peak runoff expected from the contributing drainage area for a 100-year storm. If, due to site conditions and basin geometry, a separate emergency spillway is not feasible, the principal spillway must pass the entire peak runoff expected from the 100-year storm. However, an attempt to provide a separate emergency spillway should always be made. The runoff calculations should be based on the site conditions during construction. The flow through the dewatering orifice cannot be utilized when calculating the 100-year storm elevation because of its potential to become clogged; therefore, available spillway storage must begin at the principal spillway riser crest.

The principal spillway designed by the procedures contained in this standard will result in some reduction in the peak rate of runoff. However, the riser outlet design will not adequately control the basin discharge to the predevelopment discharge limitations as stated in Minimum Requirement #7: Flow Control. However, if the basin for a permanent stormwater detention pond is used for a temporary

sedimentation basin, the control structure for the permanent pond can be used to maintain predevelopment discharge limitations. The size of the basin, the expected life of the construction project, the anticipated downstream effects and the anticipated weather conditions during construction, should be considered to determine the need of additional discharge control. See Figure 4.2.21 for riser inflow curves.

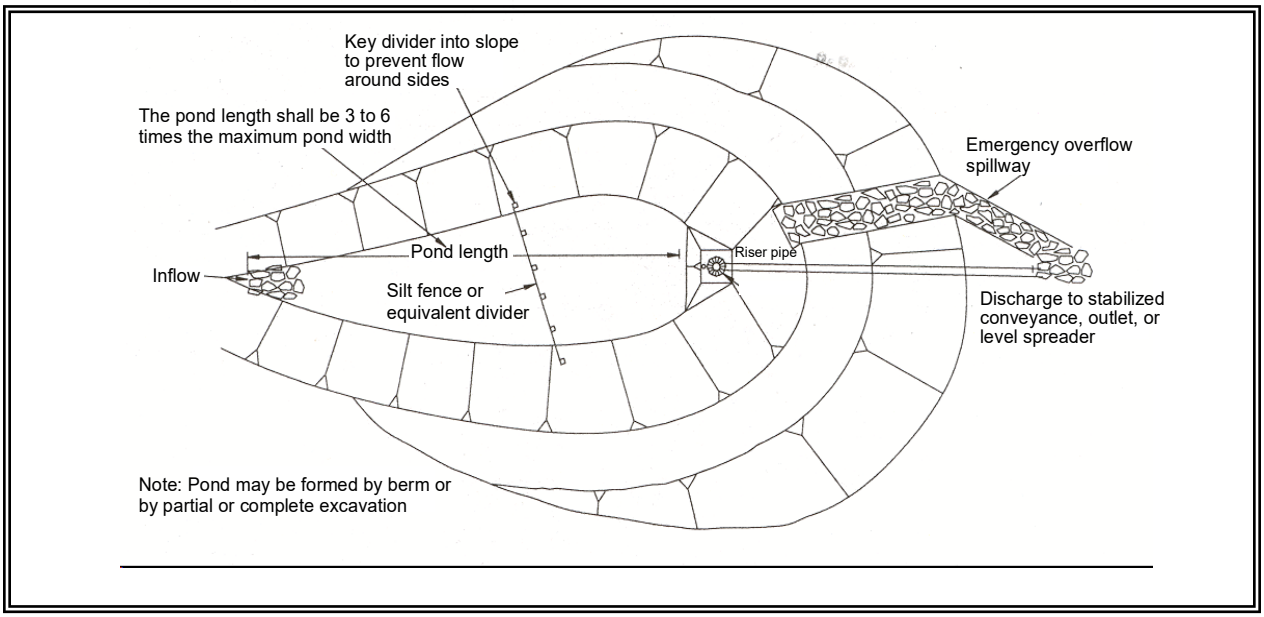


Figure 4.2.18 – Sediment Pond Plan View

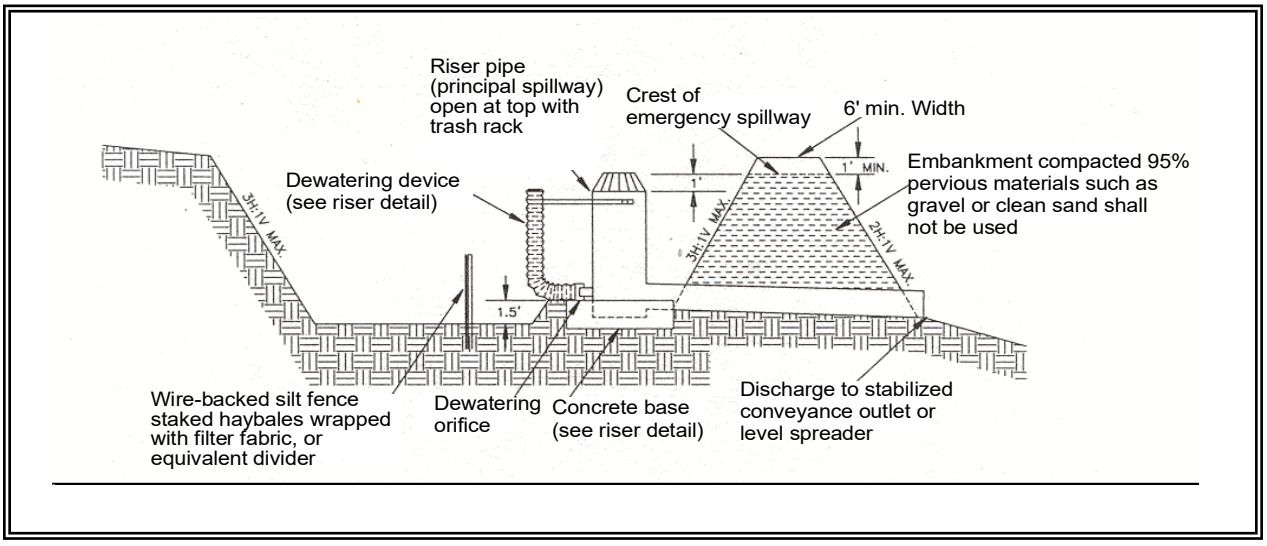


Figure 4.2.19 – Sediment Pond Cross Section

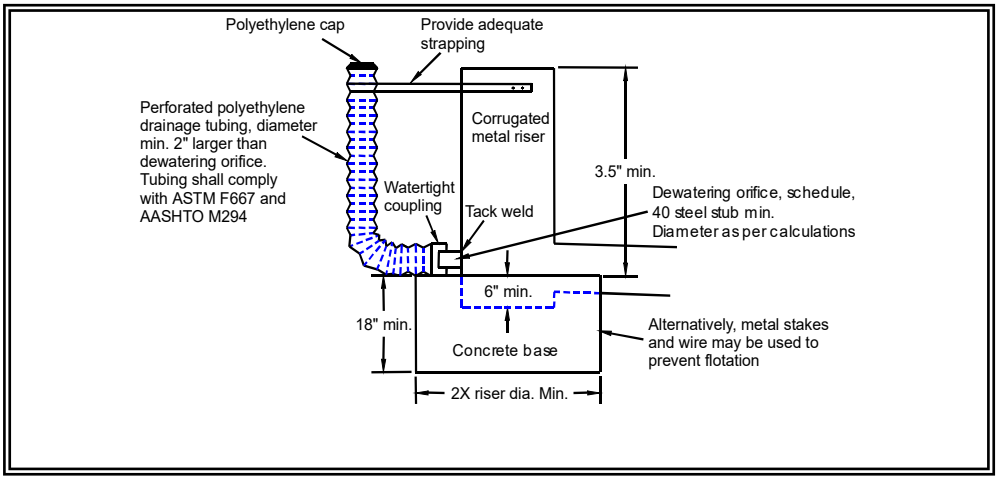


Figure 4.2.20 – Sediment Pond Riser Detail

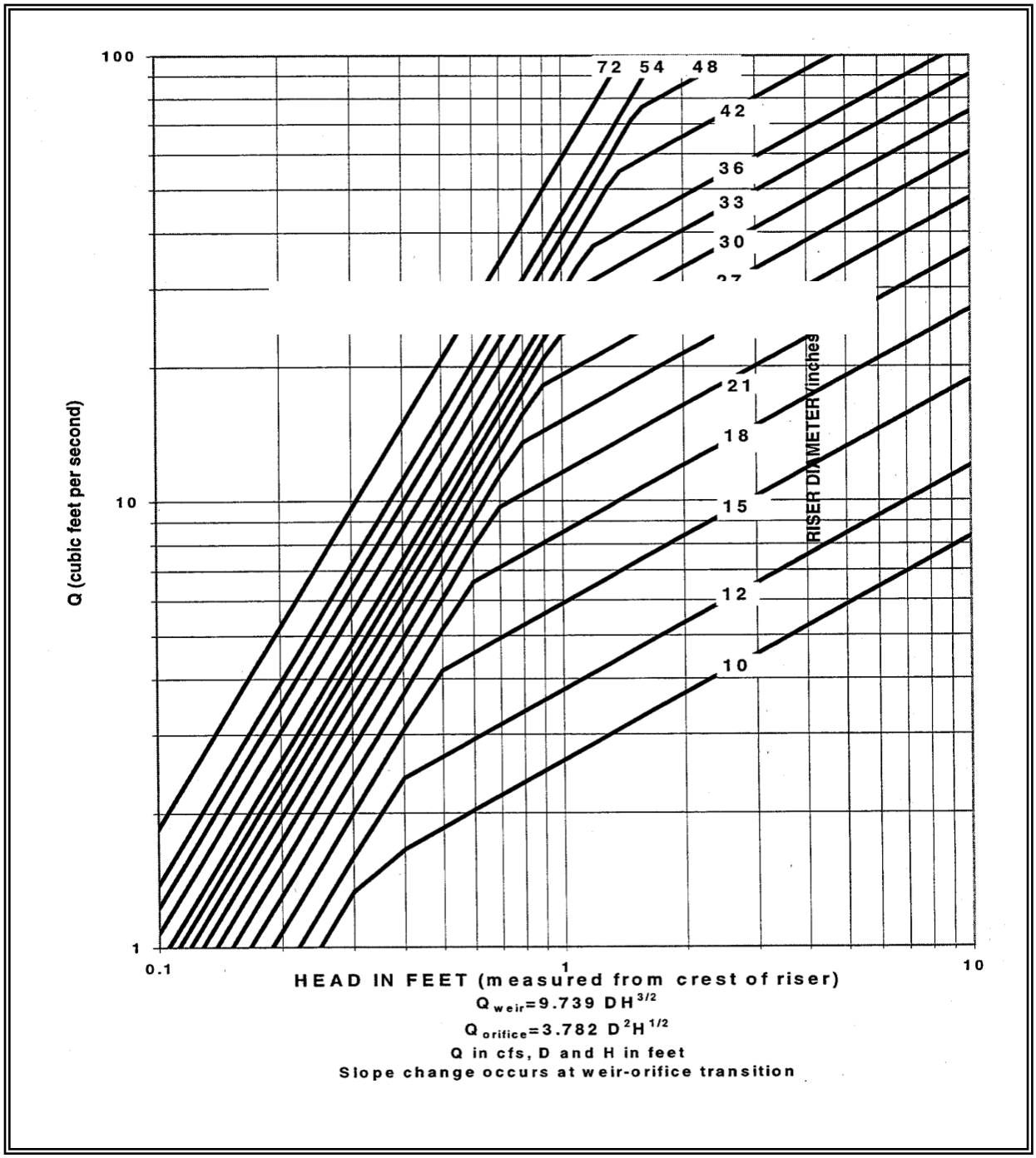


Figure 4.2.21 – Riser Inflow Curves

Principal Spillway: Determine the required diameter for the principal spillway (riser pipe). The diameter shall be the minimum necessary to pass the site's 15-minute, 10-year flowrate. If using the Western Washington Hydrology Model (WWHM), Version 2 or 3, design flow is the 10-year (1 hour) flow for the developed (unmitigated) site, multiplied by a factor of 1.6. Use Figure 4.2.21 to determine this diameter (h = 1-foot). *Note: A permanent control structure may be used instead of a temporary riser.*

Emergency Overflow Spillway: Determine the required size and design of the emergency overflow spillway for the developed 100-year peak flow using the method contained in Volume III.

Dewatering Orifice: Determine the size of the dewatering orifice(s) (minimum 1-inch diameter) using a modified version of the discharge equation for a vertical orifice and a basic equation for the area of a circular orifice. Determine the required area of the orifice with the following equation:

$$A_o = \frac{A_s (2h)^{0.5}}{0.6\text{x}3600Tg^{0.5}}$$

where A_O = orifice area (square feet)
A_S = pond surface area (square feet)
h = head of water above orifice (height of riser in feet)
T = dewatering time (24 hours)
g = acceleration of gravity (32.2 feet/second^2)

Convert the required surface area to the required diameter D of the orifice:

$$D = 24\text{x}\sqrt{\frac{A_o}{\pi}} = 13.54\text{x}\sqrt{A_o}$$

The vertical, perforated tubing connected to the dewatering orifice must be at least 2 inches larger in diameter than the orifice to improve flow characteristics. The size and number of perforations in the tubing should be large enough so that the tubing does not restrict flow. The orifice should control the flow rate.

- Additional Design Specifications

  The pond shall be divided into two roughly equal volume cells by a permeable divider that will reduce turbulence while allowing movement of water between cells. The divider shall be at least one-half the height of the riser and a minimum of one foot below the top of the riser. Wire-backed, 2- to 3-foot high, extra strength filter fabric supported by treated 4"x4"s can be used as a divider. Alternatively, staked straw bales wrapped with filter fabric (geotextile) may be used. If the pond is more than 6 feet deep, a different mechanism must be proposed. A riprap embankment is one acceptable method of

separation for deeper ponds. Other designs that satisfy the intent of this provision are allowed as long as the divider is permeable, structurally sound, and designed to prevent erosion under or around the barrier.

To aid in determining sediment depth, one-foot intervals shall be prominently marked on the riser.

If an embankment of more than 6 feet is proposed, the pond must comply with the criteria contained in Volume III regarding dam safety for detention BMPs.

- The most common structural failure of sedimentation basins is caused by piping. Piping refers to two phenomena: (1) water seeping through fine-grained soil, eroding the soil grain by grain and forming pipes or tunnels; and, (2) water under pressure flowing upward through a granular soil with a head of sufficient magnitude to cause soil grains to lose contact and capability for support.

  The most critical construction sequences to prevent piping will be:

  1. Tight connections between riser and barrel and other pipe connections.
  2. Adequate anchoring of riser.
  3. Proper soil compaction of the embankment and riser footing.
  4. Proper construction of anti-seep devices.

Maintenance Standards

- Sediment shall be removed from the pond when it reaches 1–foot in depth.
- Any damage to the pond embankments or slopes shall be repaired.

BMP C252: High pH Neutralization Using CO_2

Purpose

When pH levels in stormwater rise above 8.5 it is necessary to lower the pH levels to the acceptable range of 6.5 to 8.5, this process is called pH neutralization. pH neutralization involves the use of solid or compressed carbon dioxide gas in water requiring neutralization. Neutralized stormwater may be discharged to surface waters under the General Construction NPDES permit.

Neutralized process water such as concrete truck wash-out, hydro-demolition, or saw-cutting slurry must be managed to prevent discharge to surface waters. Any stormwater contaminated during concrete work is considered process wastewater and must not be discharged to surface waters.

Reason for pH Neutralization:

A pH level range of 6.5 to 8.5 is typical for most natural watercourses, and this neutral pH is required for the survival of aquatic organisms. Should the pH rise or drop out of this range, fish and other aquatic organisms may become stressed and may die.

Calcium hardness can contribute to high pH values and cause toxicity that is associated with high pH conditions. A high level of calcium hardness in waters of the state is not allowed.

The water quality standard for pH in Washington State is in the range of 6.5 to 8.5. Ground water standard for calcium and other dissolved solids in Washington State is less than 500 mg/l.

Conditions of Use

Causes of High pH:

High pH at construction sites is most commonly caused by the contact of stormwater with poured or recycled concrete, cement, mortars, and other Portland cement or lime containing construction materials. (See BMP C151: Concrete Handling for more information on concrete handling procedures). The principal caustic agent in cement is calcium hydroxide (free lime).

Advantages of CO_2 Sparging:

- Rapidly neutralizes high pH water.
- Cost effective and safer to handle than acid compounds.
- CO_2 is self-buffering. It is difficult to overdose and create harmfully low pH levels.
- Material is readily available.

The Chemical Process:

When carbon dioxide (CO_2) is added to water (H_2O), carbonic acid (H_2CO_3) is formed which can further dissociate into a proton (H^+) and a bicarbonate anion (HCO_3^-) as shown below:

$$CO_2 + H_2O \leftrightarrow H_2CO_3 \leftrightarrow H^+ + HCO_3^-$$

The free proton is a weak acid that can lower the pH. Water temperature has an effect on the reaction as well. The colder the water temperature is the slower the reaction occurs and the warmer the water temperature is the quicker the reaction occurs. Most construction applications in Washington State have water temperatures in the 50°F or higher range so the reaction is almost simultaneous.

Design and Installation Specifications

Treatment Process:

High pH water may be treated using continuous treatment, continuous discharge systems. These manufactured systems continuously monitor influent and effluent pH to ensure that pH values are within an acceptable range before being discharged. All systems must have fail safe automatic shut off switches in the event that pH is not within the acceptable discharge range. Only trained operators may operate manufactured systems. System manufacturers often provide trained operators or training on their devices.

The following procedure may be used when not using a continuous discharge system:

1. Prior to treatment, the appropriate jurisdiction should be notified in accordance with the regulations set by the jurisdiction.
2. Every effort should be made to isolate the potential high pH water in order to treat it separately from other stormwater on-site.
3. Water should be stored in an acceptable storage facility, detention pond, or containment cell prior to treatment.
4. Transfer water to be treated to the treatment structure. Ensure that treatment structure size is sufficient to hold the amount of water that is to be treated. Do not fill tank completely, allow at least 2 feet of freeboard.
5. The operator samples the water for pH and notes the clarity of the water. As a rule of thumb, less CO_2 is necessary for clearer water. This information should be recorded.
6. In the pH adjustment structure, add CO_2 until the pH falls in the range of 6.9-7.1. Remember that pH water quality standards apply so adjusting pH to within 0.2 pH units of receiving water (background pH) is recommended. It is unlikely that pH can be adjusted to within 0.2 pH units using dry ice. Compressed carbon dioxide gas should be introduced to the water using a carbon dioxide diffuser located near

the bottom of the tank, this will allow carbon dioxide to bubble up through the water and diffuse more evenly.

7. Slowly discharge the water making sure water does not get stirred up in the process. Release about 80% of the water from the structure leaving any sludge behind.
8. Discharge treated water through a pond or drainage system.
9. Excess sludge needs to be disposed of properly as concrete waste. If several batches of water are undergoing pH treatment, sludge can be left in treatment structure for the next batch treatment. Dispose of sludge when it fills 50% of tank volume.

Sites that must implement flow control for the developed site must also control stormwater release rates during construction. All treated stormwater must go through a flow control facility before being released to surface waters which require flow control.

Maintenance Standards

Safety and Materials Handling:

- All equipment should be handled in accordance with OSHA rules and regulations.
- Follow manufacturer guidelines for materials handling.

Operator Records:

Each operator should provide:

- A diagram of the monitoring and treatment equipment.
- A description of the pumping rates and capacity the treatment equipment is capable of treating.

Each operator should keep a written record of the following:

- Client name and phone number.
- Date of treatment.
- Weather conditions.
- Project name and location.
- Volume of water treated.
- pH of untreated water.
- Amount of CO_2 needed to adjust water to a pH range of 6.9-7.1.
- pH of treated water.
- Discharge point location and description.

A copy of this record should be given to the client/contractor who should retain the record for three years.

BMP C253: pH Control for High pH Water

Purpose

When pH levels in stormwater rise above 8.5 it is necessary to lower the pH levels to the acceptable range of 6.5 to 8.5, this process is called pH neutralization. Stormwater with pH levels exceeding water quality standards may be treated by infiltration, dispersion in vegetation or compost, pumping to a sanitary sewer, disposal at a permitted concrete batch plant with pH neutralization capabilities, or carbon dioxide sparging. BMP C252 gives guidelines for carbon dioxide sparging.

Reason for pH Neutralization:

A pH level range of 6.5 to 8.5 is typical for most natural watercourses, and this pH range is required for the survival of aquatic organisms. Should the pH rise or drop out of this range, fish and other aquatic organisms may become stressed and may die.

Conditions of Use

Causes of High pH:

High pH levels at construction sites are most commonly caused by the contact of stormwater with poured or recycled concrete, cement, mortars, and other Portland cement or lime containing construction materials. (See BMP C151: Concrete Handling for more information on concrete handling procedures). The principal caustic agent in cement is calcium hydroxide (free lime).

Design and Installation Specifications

Disposal Methods:

Infiltration

- Infiltration is only allowed if soil type allows all water to infiltrate (no surface runoff) without causing or contributing to a violation of surface or ground water quality standards.
- Infiltration techniques should be consistent with Volume V, Chapter 7

Dispersion

Use BMP T5.30 Full Dispersion

Sanitary Sewer Disposal

- Local sewer authority approval is required prior to disposal via the sanitary sewer.

Concrete Batch Plant Disposal

- Only permitted facilities may accept high pH water.
- Facility should be contacted before treatment to ensure they can accept the high pH water.

Stormwater Discharge

Any pH treatment options that generate treated water that must be discharged off site are subject to flow control requirements. Sites that must implement flow control for the developed site must also control

stormwater release rates during construction. All treated stormwater must go through a flow control facility before being released to surface waters which require flow control.

C. Correspondence

Any pertinent correspondence regarding this project will be included in this section.

D. Site Inspection Form

Please see the following pages for the site intspection form.

Construction Stormwater Site Inspection Form

Project Name _____ Permit # _____ Inspection Date _____ Time _____

Name of Certified Erosion Sediment Control Lead (CESCL) or qualified inspector if *less than one acre*
Print Name: _____

Approximate rainfall amount since the last inspection (in inches): _____

Approximate rainfall amount in the last 24 hours (in inches): _____

Current Weather Clear ☐ Cloudy ☐ Mist ☐ Rain ☐ Wind ☐ Fog ☐

A. Type of inspection: Weekly ☐ Post Storm Event ☐ Other ☐

B. Phase of Active Construction (*check all that apply*):

Pre Construction/installation of erosion/sediment controls	☐	Clearing/Demo/Grading	☐	Infrastructure/storm/roads	☐
Concrete pours	☐	Vertical Construction/buildings	☐	Utilities	☐
Offsite improvements	☐	Site temporary stabilized	☐	Final stabilization	☐

C. Questions:

1. Were all areas of construction and discharge points inspected? Yes ___ No ___
2. Did you observe the presence of suspended sediment, turbidity, discoloration, or oil sheen Yes ___ No ___
3. Was a water quality sample taken during inspection? (*refer to permit conditions S4 & S5*) Yes ___ No ___
4. Was there a turbid discharge 250 NTU or greater, or Transparency 6 cm or less?* Yes ___ No ___
5. If yes to #4 was it reported to Ecology? Yes ___ No ___
6. Is pH sampling required? pH range required is 6.5 to 8.5. Yes ___ No ___

If answering yes to a discharge, describe the event. Include when, where, and why it happened; what action was taken, and when.

_____

_____

_____

_____

*If answering yes to # 4 record NTU/Transparency with continual sampling daily until turbidity is 25 NTU or less/ transparency is 33 cm or greater.

Sampling Results: Date: _____

Parameter	Method (circle one)	Result			Other/Note
		NTU	cm	pH	
Turbidity	tube, meter, laboratory				
pH	Paper, kit, meter				

Construction Stormwater Site Inspection Form

D. Check the observed status of all items. Provide "Action Required "details and dates.

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
1 Clearing Limits	Before beginning land disturbing activities are all clearing limits, natural resource areas (streams, wetlands, buffers, trees) protected with barriers or similar BMPs? (high visibility recommended)						
2 Construction Access	Construction access is stabilized with quarry spalls or equivalent BMP to prevent sediment from being tracked onto roads?						
	Sediment tracked onto the road way was cleaned thoroughly at the end of the day or more frequent as necessary.						
3 Control Flow Rates	Are flow control measures installed to control stormwater volumes and velocity during construction and do they protect downstream properties and waterways from erosion?						
	If permanent infiltration ponds are used for flow control during construction, are they protected from siltation?						
4 Sediment Controls	All perimeter sediment controls (e.g. silt fence, wattles, compost socks, berms, etc.) installed, and maintained in accordance with the Stormwater Pollution Prevention Plan (SWPPP).						
	Sediment control BMPs (sediment ponds, traps, filters etc.) have been constructed and functional as the first step of grading.						
	Stormwater runoff from disturbed areas is directed to sediment removal BMP.						
5 Stabilize Soils	Have exposed un-worked soils been stabilized with effective BMP to prevent erosion and sediment deposition?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
5 Stabilize Soils Cont.	Are stockpiles stabilized from erosion, protected with sediment trapping measures and located away from drain inlet, waterways, and drainage channels?						
	Have soils been stabilized at the end of the shift, before a holiday or weekend if needed based on the weather forecast?						
6 Protect Slopes	Has stormwater and ground water been diverted away from slopes and disturbed areas with interceptor dikes, pipes and or swales?						
	Is off-site storm water managed separately from stormwater generated on the site?						
	Is excavated material placed on uphill side of trenches consistent with safety and space considerations?						
	Have check dams been placed at regular intervals within constructed channels that are cut down a slope?						
7 Drain Inlets	Storm drain inlets made operable during construction are protected.						
	Are existing storm drains within the influence of the project protected?						
8 Stabilize Channel and Outlets	Have all on-site conveyance channels been designed, constructed and stabilized to prevent erosion from expected peak flows?						
	Is stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes and downstream conveyance systems?						
9 Control Pollutants	Are waste materials and demolition debris handled and disposed of to prevent contamination of stormwater?						
	Has cover been provided for all chemicals, liquid products, petroleum products, and other material?						
	Has secondary containment been provided capable of containing 110% of the volume?						
	Were contaminated surfaces cleaned immediately after a spill incident?						
	Were BMPs used to prevent contamination of stormwater by a pH modifying sources?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
9 Cont.	Wheel wash wastewater is handled and disposed of properly.						
10 Control Dewatering	Concrete washout in designated areas. No washout or excess concrete on the ground.						
	Dewatering has been done to an approved source and in compliance with the SWPPP.						
	Were there any clean non turbid dewatering discharges?						
11 Maintain BMP	Are all temporary and permanent erosion and sediment control BMPs maintained to perform as intended?						
12 Manage the Project	Has the project been phased to the maximum degree practicable?						
	Has regular inspection, monitoring and maintenance been performed as required by the permit?						
	Has the SWPPP been updated, implemented and records maintained?						
13 Protect LID	Is all Bioretention and Rain Garden Facilities protected from sedimentation with appropriate BMPs?						
	Is the Bioretention and Rain Garden protected against over compaction of construction equipment and foot traffic to retain its infiltration capabilities?						
	Permeable pavements are clean and free of sediment and sediment laden-water runoff. Muddy construction equipment has not been on the base material or pavement.						
	Have soiled permeable pavements been cleaned of sediments and pass infiltration test as required by stormwater manual methodology?						
	Heavy equipment has been kept off existing soils under LID facilities to retain infiltration rate.						

E. Check all areas that have been inspected. ✔

All in place BMPs ☐ All disturbed soils ☐ All concrete wash out area ☐ All material storage areas ☐
All discharge locations ☐ All equipment storage areas ☐ All construction entrances/exits ☐

F. Elements checked "Action Required" (section D) describe corrective action to be taken. List the element number; be specific on location and work needed. Document, initial, and date when the corrective action has been completed and inspected.

Element #	Description and Location	Action Required	Completion Date	Initials

Attach additional page if needed

Sign the following certification:

"I certify that this report is true, accurate, and complete, to the best of my knowledge and belief"

Inspected by: (print) _____ (Signature) _____ Date: _____

Title/Qualification of Inspector: _____

E. Construction Stormwater General Permit (CSWGP)

The CSWGP will be included in the final SWPPP.

F. 303(d) List Waterbodies / TMDL Waterbodies Information

There are no 303(d) List Waterbodies in this project, so this section is not required.

G. Contaminated Site Information

There is no contaminated site at this time.

H. Engineering Calculations

Please see the following for calculations.

WWHM2012

PROJECT REPORT

18666 - DuPont 243
TESC Calculations

General Model Information

Project Name:	18666 ESC
Site Name:	
Site Address:	
City:	
Report Date:	3/10/2023
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Mitigated Land Use

Basin 1

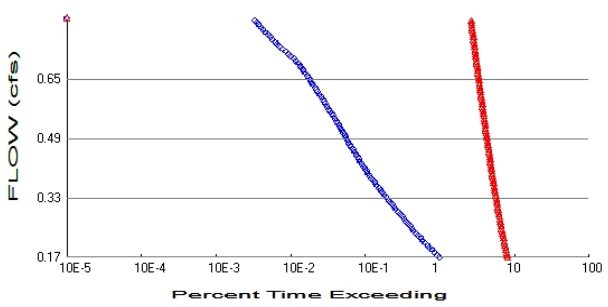
Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
PARKING FLAT	19.65
Impervious Total	19.65
Basin Total	19.65

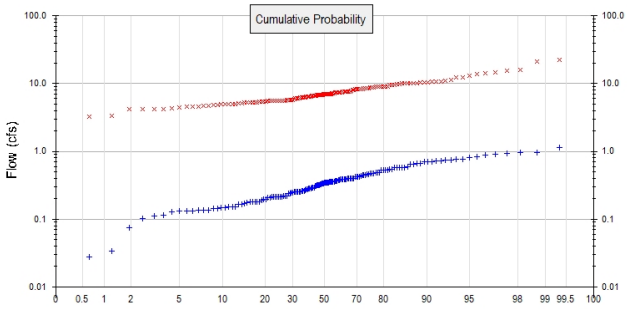
Element Flows To:

Surface	Interflow	Groundwater

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 16.37
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0
Total Impervious Area: 19.65

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.344962
5 year	0.536659
10 year	0.64082
25 year	0.746836
50 year	0.80985
100 year	0.861666

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	6.886359
5 year	9.243738
10 year	10.957095
25 year	13.302061
50 year	15.184052
100 year	17.185574

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.253	8.143
1903	0.210	9.026
1904	0.344	10.217
1905	0.166	4.580
1906	0.074	5.122
1907	0.529	6.852
1908	0.392	5.634
1909	0.388	6.951
1910	0.535	6.642
1911	0.348	7.454

1912	1.148	12.353
1913	0.550	5.383
1914	0.134	22.596
1915	0.222	4.634
1916	0.344	8.669
1917	0.115	3.274
1918	0.369	6.942
1919	0.272	4.247
1920	0.351	5.651
1921	0.392	4.847
1922	0.394	7.603
1923	0.316	5.298
1924	0.145	10.026
1925	0.179	4.185
1926	0.334	8.168
1927	0.217	6.654
1928	0.267	4.935
1929	0.548	9.849
1930	0.352	10.310
1931	0.326	4.968
1932	0.255	5.363
1933	0.246	5.318
1934	0.722	8.639
1935	0.335	4.579
1936	0.291	6.409
1937	0.465	9.532
1938	0.284	4.659
1939	0.018	5.859
1940	0.314	10.339
1941	0.150	10.215
1942	0.473	7.684
1943	0.244	7.609
1944	0.446	10.939
1945	0.394	8.290
1946	0.213	6.433
1947	0.135	5.017
1948	0.742	6.902
1949	0.636	10.660
1950	0.180	6.031
1951	0.222	9.124
1952	0.968	10.227
1953	0.873	9.465
1954	0.315	5.605
1955	0.257	5.211
1956	0.126	5.140
1957	0.447	5.556
1958	0.934	6.893
1959	0.577	6.906
1960	0.154	5.483
1961	0.580	15.646
1962	0.312	6.727
1963	0.149	4.997
1964	0.164	14.487
1965	0.650	6.499
1966	0.182	5.437
1967	0.279	7.619
1968	0.285	6.422
1969	0.284	5.791

1970	0.445	6.583
1971	0.701	6.378
1972	0.454	21.093
1973	0.579	12.252
1974	0.313	8.867
1975	0.735	9.150
1976	0.389	9.759
1977	0.131	4.191
1978	0.655	7.067
1979	0.180	7.429
1980	0.371	7.326
1981	0.355	6.894
1982	0.145	5.617
1983	0.581	7.617
1984	0.237	7.573
1985	0.385	8.615
1986	0.345	4.375
1987	0.659	7.683
1988	0.418	4.582
1989	0.375	4.192
1990	0.425	5.537
1991	0.333	8.275
1992	0.476	7.868
1993	0.461	8.991
1994	0.692	6.150
1995	0.133	4.780
1996	0.758	6.407
1997	0.291	5.744
1998	0.346	6.825
1999	0.028	7.417
2000	0.263	6.520
2001	0.135	5.229
2002	0.481	9.493
2003	0.419	5.540
2004	0.385	8.311
2005	0.709	15.879
2006	0.214	7.450
2007	0.215	8.335
2008	0.366	6.868
2009	0.251	5.241
2010	0.214	6.728
2011	0.173	7.079
2012	0.251	6.570
2013	0.196	6.197
2014	0.146	5.994
2015	0.279	10.075
2016	0.111	6.295
2017	0.532	10.103
2018	0.967	6.052
2019	0.902	8.958
2020	0.294	7.333
2021	0.479	6.183
2022	0.198	10.513
2023	0.403	12.989
2024	0.757	13.888
2025	0.355	6.761
2026	0.580	7.425
2027	0.209	8.283

2028	0.181	3.242
2029	0.393	5.322
2030	0.729	10.669
2031	0.241	3.352
2032	0.131	5.679
2033	0.211	7.134
2034	0.208	5.585
2035	0.823	6.873
2036	0.427	5.576
2037	0.102	7.501
2038	0.341	7.118
2039	0.034	14.305
2040	0.189	5.599
2041	0.255	7.104
2042	0.801	8.197
2043	0.387	9.065
2044	0.522	6.228
2045	0.355	5.040
2046	0.416	5.590
2047	0.306	6.900
2048	0.396	5.689
2049	0.354	8.441
2050	0.254	6.287
2051	0.369	8.860
2052	0.212	6.768
2053	0.380	5.751
2054	0.483	11.415
2055	0.150	6.990
2056	0.168	9.018
2057	0.261	4.434
2058	0.330	8.489
2059	0.584	10.585

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	1.1483	22.5964
2	0.9676	21.0934
3	0.9666	15.8792
4	0.9338	15.6458
5	0.9016	14.4866
6	0.8729	14.3048
7	0.8229	13.8879
8	0.8006	12.9886
9	0.7581	12.3531
10	0.7570	12.2518
11	0.7421	11.4151
12	0.7352	10.9387
13	0.7295	10.6685
14	0.7223	10.6600
15	0.7092	10.5854
16	0.7005	10.5126
17	0.6918	10.3387
18	0.6585	10.3100
19	0.6546	10.2265
20	0.6496	10.2165
21	0.6358	10.2154
22	0.5836	10.1029

23	0.5805	10.0745
24	0.5804	10.0257
25	0.5803	9.8493
26	0.5789	9.7594
27	0.5773	9.5322
28	0.5502	9.4932
29	0.5479	9.4649
30	0.5346	9.1501
31	0.5316	9.1244
32	0.5294	9.0649
33	0.5216	9.0259
34	0.4831	9.0178
35	0.4809	8.9909
36	0.4787	8.9579
37	0.4758	8.8667
38	0.4734	8.8599
39	0.4653	8.6694
40	0.4612	8.6394
41	0.4542	8.6149
42	0.4470	8.4888
43	0.4461	8.4408
44	0.4449	8.3347
45	0.4273	8.3110
46	0.4249	8.2901
47	0.4187	8.2831
48	0.4175	8.2747
49	0.4161	8.1969
50	0.4026	8.1677
51	0.3964	8.1427
52	0.3943	7.8681
53	0.3935	7.6836
54	0.3933	7.6828
55	0.3924	7.6190
56	0.3921	7.6173
57	0.3893	7.6085
58	0.3878	7.6035
59	0.3866	7.5729
60	0.3852	7.5012
61	0.3849	7.4541
62	0.3801	7.4497
63	0.3754	7.4295
64	0.3707	7.4250
65	0.3694	7.4171
66	0.3686	7.3328
67	0.3664	7.3256
68	0.3554	7.1336
69	0.3552	7.1179
70	0.3549	7.1043
71	0.3544	7.0789
72	0.3521	7.0670
73	0.3508	6.9896
74	0.3481	6.9511
75	0.3460	6.9418
76	0.3452	6.9065
77	0.3444	6.9021
78	0.3442	6.8998
79	0.3408	6.8939
80	0.3353	6.8934

81	0.3341	6.8731
82	0.3327	6.8680
83	0.3305	6.8517
84	0.3257	6.8249
85	0.3163	6.7684
86	0.3150	6.7612
87	0.3142	6.7280
88	0.3134	6.7272
89	0.3117	6.6541
90	0.3063	6.6425
91	0.2941	6.5829
92	0.2915	6.5705
93	0.2908	6.5200
94	0.2847	6.4988
95	0.2841	6.4334
96	0.2836	6.4218
97	0.2795	6.4095
98	0.2790	6.4065
99	0.2725	6.3782
100	0.2674	6.2948
101	0.2632	6.2874
102	0.2610	6.2278
103	0.2574	6.1970
104	0.2554	6.1833
105	0.2550	6.1495
106	0.2544	6.0525
107	0.2530	6.0311
108	0.2514	5.9938
109	0.2508	5.8594
110	0.2460	5.7907
111	0.2435	5.7513
112	0.2410	5.7439
113	0.2365	5.6888
114	0.2217	5.6787
115	0.2217	5.6508
116	0.2167	5.6336
117	0.2151	5.6174
118	0.2145	5.6051
119	0.2140	5.5988
120	0.2132	5.5900
121	0.2125	5.5850
122	0.2110	5.5758
123	0.2104	5.5559
124	0.2085	5.5404
125	0.2076	5.5370
126	0.1982	5.4834
127	0.1958	5.4371
128	0.1894	5.3826
129	0.1821	5.3634
130	0.1807	5.3220
131	0.1802	5.3180
132	0.1795	5.2976
133	0.1794	5.2407
134	0.1729	5.2294
135	0.1679	5.2114
136	0.1656	5.1397
137	0.1643	5.1220
138	0.1536	5.0405

139	0.1497	5.0167
140	0.1497	4.9968
141	0.1494	4.9679
142	0.1459	4.9349
143	0.1450	4.8465
144	0.1445	4.7804
145	0.1347	4.6595
146	0.1347	4.6341
147	0.1344	4.5818
148	0.1327	4.5803
149	0.1312	4.5793
150	0.1311	4.4336
151	0.1262	4.3751
152	0.1149	4.2468
153	0.1112	4.1922
154	0.1021	4.1905
155	0.0741	4.1848
156	0.0342	3.3516
157	0.0279	3.2742
158	0.0177	3.2422

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TESC Calculations

Project: DuPont Industrial

BCE #: 18666

REQUIRED SURFACE AREA

$SA = (2{,}080)(Q_{10})$	=	**22797**	SF

Flow	cfs
Q2*	**6.89**
Q10	**10.96**
Q100	**17.19**

PRINCIPAL SPILLWAY SIZING

$D = [(Q_{10}) / (3.782)(H)^{0.5}]^{0.5}$	=	1.702	FT
	=	**20.43**	IN
**H MIN (DEFAULT 1)*	=	*1*	*FT*

∴ USE RISER DIAMETER 12 INCHES

KEY

INPUT
OUTPUT
CHECK

EMERGENCY OVERFLOW SPILLWAY

$L = [Q_{100} / (3.21)(H)^{1.5}] - 2.4H$	=	13.95	FT
**H MIN (DEFAULT .5)*	=	*0.5*	*FT*

∴ USE SPILLWAY LENGTH 5 FEET

DEWATERING ORIFICE

$A_0 = (S.A.)(2H)^{0.5}/(0.6)(3{,}600)(T)(g)^{0.5}$	=	0.205	SF
$DIAM. = 13.54\ (A_0)^{0.5}$	=	**6.13**	IN
**H MIN (DEFAULT 3.5')*	=	*3.5*	*FT*

∴ USE ORIFICE DIAMETER 1"

*IF CONSTRUCTION TAKES PLACE OUTSIDE THE WET SEASON IN SUMMER MONTHS, Q2 IS ALLOWED TO SIZE POND S.A.

7.0 SPECIAL REPORTS AND STUDIES

7.0 SPECIAL REPORTS AND STUDIES

- Geotechnical Report by GeoEngineers dated October 10, 2011
- Geotechnical Report Addendum by GeoEngineers dated May 11, 2018
- Geotechnical Report Addendum 2 by GeoEngineers dated August 1, 2023
- Geotechnical Report Addendum 3 by GeoEngineers dated October 20, 2023

Geotechnical Engineering Services

DuPont Apartment Complex/Lot X
DuPont, Washington

for
Creekside DuPont Partners, LLC

May 10, 2011

GeoEngineers
Earth Science + Technology

Geotechnical Engineering Services

DuPont Apartment Complex/Lot X
DuPont, Washington

for
Creekside DuPont Partners, LLC

May 10, 2011

GeoEngineers

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30 YEARS 2010

Geotechnical Engineering Services

DuPont Apartment Complex/Lot X
DuPont, Washington

File No. 16785-002-00

May 10, 2011

Prepared for:

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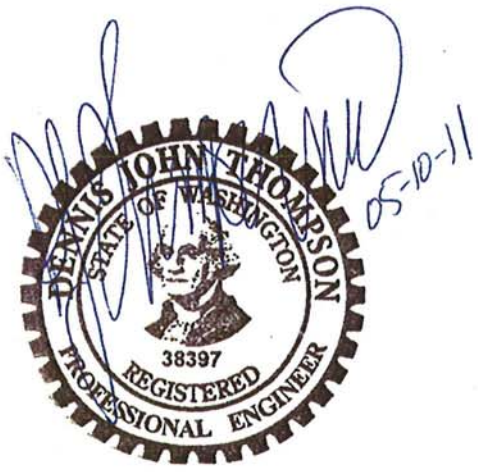

Dennis (D.J.) Thompson, PE
Senior Geotechnical Engineer

Garry Squires

Garry H. Squires, PE, LG, LEG
Principal

DJT:GHS:tt

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GeoEngineers

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INTRODUCTION AND PROJECT UNDERSTANDING

GeoEngineers is pleased to present this proposal to provide geotechnical engineering services to support development and construction of the apartment complex to be constructed at 14464 Center Drive in DuPont, Washington, otherwise referred to as Lot X. A Vicinity Map is included as Figure 1. Our understanding of the project is based on our discussion with you and the project civil engineer (Barghausen Consulting Engineers), project architect (BCRA), and our review of preliminary site plans and a topographic survey.

The final site layout and number of apartment units has not been determined. At this time, proposed plans might include construction of approximately 180 apartment units in 14 to 15 buildings. Balanced cuts and fills are anticipated. We understand the buildings will be constructed near existing grade and deep excavations are not anticipated. Additional improvements will include construction of parking areas and installation of underground utilities. Stormwater will be conveyed to on-site infiltration galleries or ponds. Stormwater facilities will be designed in accordance with the 2005 Washington State Department of Ecology (Ecology) Stormwater Management Manual.

SCOPE OF SERVICES

The purpose of our services is to conduct subsurface investigations to use as a basis for developing geotechnical recommendations for the proposed site improvements. Our specific scope of services includes:

1. Reviewing readily available published geologic data, select in-house files, and existing subsurface information on soil and groundwater conditions in the site vicinity.
2. Coordinating clearance and location of existing utilities in the project area. We contacted the Washington Utilities Coordinating Council "One Call" service prior to beginning explorations.
3. Exploring subsurface conditions at the project site by observing nine test pits. The explorations extended to depths between 10 and 12 feet below surrounding grade.
4. Performing laboratory tests on selected soil samples obtained from the explorations to assist in evaluating the physical and engineering properties of the site soils. Laboratory testing consisted of eight moisture content and grain size analyses.
5. Providing a general discussion of site soil and groundwater conditions based on our review, explorations and testing.
6. Evaluating the results of the sieve analyses with the infiltration criteria presented in the 2005 Ecology Stormwater Management Manual. We include preliminary infiltration rates for the samples tested.
7. Providing recommendations for site preparation and earthwork. We discuss clearing and stripping, temporary and permanent slopes, suitability of on-site soils for use as structural fill, including constraints for wet weather construction, specifications for imported soil for use as structural fill, and fill placement and compaction requirements.

8. Providing general recommendations for site drainage and control of groundwater.
9. Classifying the Seismic Site Class and soil profile in accordance with Table 1613.5.2 of the International Building Code (IBC) and providing our opinion of soil liquefaction susceptibility based on the results of our review and explorations.
10. Providing recommendations for design of shallow foundations and conventional below grade and retaining wall structures. We provide allowable soil bearing pressures, settlement (total and differential) estimates, lateral earth pressures (active and passive) and coefficient of friction for evaluating sliding resistance. We discuss suitable foundation material and bearing surface preparation, including removal of uncontrolled fill, soft, organic or otherwise unsuitable material, and backfill compaction.
11. Providing recommendations for support of on-grade floor slabs including capillary break, vapor retarder, underslab drainage, and modulus of subgrade reaction, as appropriate.
12. Providing recommendations for asphalt concrete pavement (ACP) design, including base and subbase requirements for proposed parking areas. We provide typical minimum ACP section recommendations based on our experience. We can provide other recommendations based on actual traffic data, if requested.

SITE CONDITIONS

Published Literature

Based on review of geologic maps in our files, Vashon recessional outwash sand and gravel is the dominant, near-surface, geologic material mapped in the immediate project area. This material is commonly known as Steilacoom gravel. Vashon recessional outwash was deposited by melt water streams in front of the most recent glacier during its retreat from the Puget Sound region approximately 10,000 to 15,000 years ago. These deposits generally consist of permeable sand, or sand and gravel. Cobbles and boulders can also be encountered in this deposit, depending on the depositional history. Glacial till and/or advance outwash is commonly encountered at depth below the recessional outwash.

The United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey of Pierce County Area, Washington, maps the project area as Spanaway gravelly sandy loam (41A). This soil unit is described as being formed in glacial outwash. It is further described as somewhat excessively drained with moderately rapid permeability, slow surface runoff and little erosion hazard.

Surface Conditions

The project area is located west of the intersection of Center Drive and Power Line Road in DuPont, Washington. Power Line Road and Center Drive make up the eastern boundary of the site. Sequalitchew Creek flows along the southern boundary of the site. A chain link fence is located along the northern and western edges of the site.

The project area is irregular in shape and is flat or slightly sloping down to the southwest. A gravel road extends generally east-west in the southern part of the site. Overhead power lines extend

north-south within the property near the eastern border of the site. Sewer, power and water manholes and junction boxes were observed within the property near the intersection of Center Drive and Power Line Road. Vegetation in the approximate southeast half of the property is low growing and sparse to moderately thick and is mostly grasses and scotch broom. The approximate northwest half of the property is densely forested with large evergreen fir trees and some oak trees. We did not observe standing water or indications of wet surface conditions during our time on site.

Subsurface Explorations

Our understanding of subsurface conditions at the project site is based on conditions disclosed in nine test pits excavated at the approximate locations shown in Figure 2. Details of the exploratory program, laboratory testing program and test pit logs completed for this study are presented in Appendix A.

Subsurface Conditions

We observed approximately 3 inches of forest duff or sod at the surface in all of the explorations with the exception of test pit TP-3. From the surface to a depth of 1 foot in test pit TP-3 we observed fill consisting of gravel with silt and sand. Underlying the duff or fill, we observed a weathered zone of soil, consisting of silty sand with gravel and traces of organic material in a medium dense condition. Underlying the weathered zone we typically observed glacial outwash consisting of gravel with sand and trace silt and variable cobbles. Exceptions to this include test pit TP-1 where gravel with silt and sand was observed below a depth of 7½ feet and in test pit TP-9 where sand with gravel and trace silt was observed from below a depth of 7 feet. The outwash was observed to be in a dense condition. Caving was typically noted below a depths of about 4 feet.

No groundwater seepage was observed during exploration. Groundwater conditions should be expected to vary as a result of season, precipitation and other factors. Based on our observations and previous explorations completed in the project vicinity, static groundwater elevation is expected to be well below the depths of the test pit explorations completed for this project.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the results of our study, it is our opinion that the site is generally suitable for the proposed development with regard to geotechnical considerations. A summary of the primary geotechnical considerations for the proposed development is provided below, and is followed by our detailed recommendations

- Organic-rich surficial material should be stripped from all areas to be improved.
- Granular soils were generally encountered; however, we did observe that some of the near-surface site soil has a higher fines (silt and clay-sized particles passing the U.S. Standard No. 200 sieve) content. Soil with a higher fines content is more sensitive to small changes in moisture content and may be difficult, if not impossible, to work and compact during wet weather conditions. This material can also be susceptible to disturbance from construction traffic when wet, or if earthwork is performed during wet weather.

- The proposed structures may be satisfactorily supported on continuous and isolated shallow foundations supported on the medium dense or dense native soils or on structural fill that extends to native soil.
- Floor slabs may be supported on compacted fill or native soils.
- The glacial outwash deposits can contain cobbles and boulders. The contractor should be prepared for this possibility.
- On-site stormwater infiltration appears feasible based on the subsurface conditions observed. We provide preliminary infiltration rate recommendations below.

Stormwater Infiltration

General

Soil consisting of gravel with sand or gravel with silt and sand was typically encountered below a depth of 1 to 2 feet in the explorations completed in the project area. In general, it is our opinion that the natural soils encountered in our explorations should have adequate permeability to infiltrate stormwater from the site. We did not encounter groundwater seepage, staining or other indications of seasonal shallow groundwater in the explorations.

Soil Infiltration Rates

Stormwater infiltration rates for the site soils were established based on the 2005 Ecology Stormwater Management Manual for Western Washington Volume III in conjunction with the sieve analysis results presented in Appendix A, Figures A-11 and A-12.

TABLE 1. SOIL INFILTRATION RATES[1]

Test Pit No.	Soil Sample No.	Soil Sample Depth (feet)	Percent Fines[2]	D10 Size (mm)[3]	USCS[4] Soil Classification	Long-term Design Infiltration Rate[6] (Inches per Hour)
1	5	7.5	7.5	0.14	GP-GM	2.0
2	3	5.5	2.6	0.49	GP	9
3	4	5.5	3.8	0.44	GP	9
5	2	3.5	3.0	0.82	GW	9
7	3	5.5	2.5	0.51	GP	9
8	3	7.5	4.7	0.25	GW	3.5
9	3	5.5	1.7	0.48	GP	9
9	4	7.5	2.2	0.25	SP	3.5

Notes:

[1] For selected soil samples.

[2] Fines = Silt and clay-sized particles passing U.S. No. 200 (0.75 mm) sieve.

[3] Based on ASTM C 136 Soil Gradation Test.

[4] Unified Soil Classification System (USCS).

[5] Based on grain-size analysis and the procedures outlined in the 2005 Ecology Stormwater Management Manual for Western Washington Volume III Table 3.8.

These rates are an estimate of subsurface infiltration properties. We expect that the relatively clean gravel soils encountered in the test pits should have adequate permeability and storage capacity to infiltrate stormwater. We did not complete explorations at specific pond locations because this information was not available at the time of our explorations. We recommend that the project plans include provisions for GeoEngineers to observe subsurface explorations during construction to check that the preliminary infiltration rate(s) used for design are appropriate for the conditions encountered. Site- and location-specific testing may also be required by local jurisdictions. It should be noted that infiltration through fill is not permissible according to the 2005 Ecology Stormwater Management Manual for Western Washington Volume III.

Stormwater should be treated in accordance with current regulations prior to infiltration. To help reduce clogging of infiltration facilities, we recommend they be protected during construction with siltation control facilities such as temporary settling basins, silt fences and hay bales. Suspended solids can clog the soil and reduce the infiltration rate. Periodic sweeping of paved areas, during and following construction, will help extend the life of the infiltration facilities. Equipment should not be permitted in the infiltration areas after they are excavated to grade because of the potential for compaction of the subgrade that could reduce the infiltration rate of the soil.

Site Development and Earthwork

General

We anticipate that site development and earthwork will include clearing and stripping of surface vegetation, constructing foundations and then placing and compacting fill and backfill materials. We expect that the majority of site grading can be accomplished with conventional earthmoving equipment. The following sections provide recommendations for stripping, excavation, erosion control, subgrade development, fill materials, fill placement and compaction.

Clearing and Stripping

Based on our observations at the site, we estimate that the depth of stripping could be on the order of 3 to 6 inches. Greater stripping depths may be required to remove localized zones of loose or organic-rich soil. In addition, the primary root systems of shrubs should be completely removed. Stripped material should be transported off site for disposal or processed and used as fill in landscaping areas.

Although we did not encounter boulders during our subsurface investigation, it is our experience they can be present in the glacial deposits in the area. Accordingly, the contractor should be prepared to remove boulders, if encountered during grading or utility excavations. Boulders may be removed from the site or buried in landscape areas. Voids caused by boulder removal should be backfilled with structural fill.

Temporary Excavations, Support and Dewatering

Excavations deeper than 4 feet should be shored or laid back at a stable slope if workers are required to enter. Shoring and temporary slope inclinations must conform to the provisions of Title 296 Washington Administrative Code (WAC), Part N, "Excavation, Trenching and Shoring." Regardless of the soil type encountered in the excavation, shoring, trench boxes or sloped sidewalls will be required under Washington Industrial Safety and Health Act (WISHA). The contract

documents should specify that the contractor is responsible for selecting excavation and dewatering methods, monitoring the excavations for safety and providing shoring, as required, to protect personnel and structures. We provide additional recommendations in regard to temporary and permanent shoring below.

In general, temporary cut slopes should be inclined no steeper than about 1-1/2H to 1V (horizontal to vertical). This guideline assumes that all surface loads are kept at a minimum distance of at least one-half the depth of the cut away from the top of the slope and that seepage is not present on the slope face. Flatter cut slopes will be necessary where seepage occurs or if surcharge loads are anticipated. We observed caving in our explorations; therefore, some sloughing and raveling of cut slopes should be expected. Temporary covering with heavy plastic sheeting should be used to protect these slopes during periods of wet weather.

Based on our explorations, we do not expect groundwater to be a major factor during shallow excavations and earthwork. However, some perched groundwater could occur in the near-surface soil depending on the time of year of construction. We anticipate that groundwater handling needs will typically be lower during the late summer and early fall months. We anticipate that shallow perched groundwater can typically be handled adequately with sumps, pumps, and/or diversion ditches, as necessary. Ultimately, we recommend that the contractor performing the work be made responsible for controlling and collecting groundwater encountered.

Permanent Cut and Fill Slopes

Based on site grades and the proposed construction, we anticipate that only minor cutting and filling will be required for this project. However, if permanent slopes are necessary, we recommend they be constructed at a maximum inclination of 2H to 1V. Where 2H to 1V permanent slopes are not feasible, protective facings and/or retaining structures should be considered.

To achieve uniform compaction, we recommend that fill slopes be overbuilt slightly and subsequently cut back to expose well-compacted fill. Fill placement on slopes steeper than 5H to 1V should be benched into the slope face and include keyways. The configuration of the bench and keyway depends on the equipment being used. Bench excavations should be level and extend into the slope face. We recommend that a vertical cut of about 3 feet be maintained for benched excavations. Keyways should be about 1-1/2 times the width of the equipment used for grading or compaction.

Exposed areas should be re-vegetated as soon as practical to reduce the surface erosion and sloughing. Temporary protection should be used until permanent protection is established.

Surface Drainage

Surface water from roofs, driveways and landscape areas should be collected and controlled. Curbs or other appropriate measures such as sloping pavements, sidewalks and landscape areas should be used to direct surface flow away from the buildings, erosion sensitive areas and from behind retaining structures. Roof and catchment drains should not be connected to wall or foundation drains.

Erosion and Sedimentation Control

Potential sources or causes of erosion and sedimentation can be influenced by construction methods, slope length and gradient, amount of soil exposed and/or disturbed, soil type, construction sequencing and weather. Implementing an erosion and sedimentation control plan will reduce the project impact on erosion-prone areas. The plan should be designed in accordance with applicable city, county and/or state standards. The plan should incorporate basic planning principles, including:

- Scheduling grading and construction to reduce soil exposure.
- Re-vegetating or mulching denuded areas.
- Directing runoff away from denuded areas.
- Reducing the length and steepness of slopes with exposed soils.
- Decreasing runoff velocities.
- Preparing drainage ways and outlets to handle concentrated or increased runoff.
- Confining sediment to the project site.
- Inspecting and maintaining control measures frequently.

Some sloughing and raveling of exposed or disturbed soil on slopes should be expected. We recommend that disturbed soil be restored promptly so that surface runoff does not become channeled.

Temporary erosion protection should be used and maintained in areas with exposed or disturbed soils to help reduce erosion and reduce transport of sediment to adjacent areas and receiving waters. Permanent erosion protection should be provided by paving, structure construction or landscape planting.

Until the permanent erosion protection is established and the site is stabilized, site monitoring may be required by qualified personnel to evaluate the effectiveness of the erosion control measures and to repair and/or modify them as appropriate. Provision for modifications to the erosion control system based on monitoring observations should be included in the erosion and sedimentation control plan.

Subgrade Preparation and Evaluation

Subgrade areas should be thoroughly compacted with heavy, smooth-drum vibratory equipment to a uniformly dense and unyielding condition prior to placement of structural fill or structural elements. We recommend that prepared subgrades be observed by a member of our firm, who will evaluate the suitability of the subgrade and identify any areas of yielding which are indicative of soft or loose soil. The exposed subgrade soil should be proof-rolled with heavy rubber-tired equipment or probed with a 1/2-inch-diameter steel rod, as appropriate depending on prevailing conditions. If soft or otherwise unsuitable areas revealed during probing or proof-rolling cannot be compacted to a stable and uniformly firm condition, we recommend that: 1) the subgrade soils be scarified (e.g., with a ripper or a farmer's disc), aerated and recompacted; or 2) the unsuitable soils be removed and replaced with structural fill, as needed.

Subgrade Protection and Wet Weather Considerations

The wet weather season generally begins in October and continues through May in western Washington; however, periods of wet weather can occur during any month of the year. In our opinion, site grading and fill placement could be considered during wet weather, but it should be noted that some of the soils encountered in our explorations contain a significant amount of fines and will be susceptible to disturbance during extended periods of wet weather. Soil with high fines content is very sensitive to small changes in moisture and is susceptible to disturbance from construction traffic when wet or if earthwork is performed during wet weather. If wet weather earthwork is unavoidable, we recommend that the following steps be taken.

- The ground surface in and around the work area should be sloped so that surface water is directed away from the work area. The ground surface should be graded so that areas of ponded water do not develop. Measures should be taken by the contractor to prevent surface water from collecting in excavations and trenches. Measures should be implemented to remove surface water from the work area.
- Earthwork activities should not take place during periods of heavy precipitation.
- Slopes with exposed soils should be covered with plastic sheeting.
- The contractor should take necessary measures to prevent on-site soils and other soils to be used as fill from becoming wet or unstable. These measures may include the use of plastic sheeting, sumps with pumps and grading. The site soils should not be left uncompacted and exposed to moisture. Sealing the surficial soils by rolling with a smooth-drum roller prior to periods of precipitation will help reduce the extent to which these soils become wet or unstable.
- Construction traffic should be restricted to specific areas of the site, preferably areas that are surfaced with working pad materials not susceptible to wet weather disturbance.
- Construction activities should be scheduled so that the length of time that soils are left exposed to moisture is reduced to the extent practical.
- Protective surfacing such as placing asphalt-treated base (ATB) or haul roads made of quarry spalls or a layer of free-draining material such as well graded pit-run sand and gravel may be necessary to protect completed areas. Typically, minimum gravel thicknesses on the order of 24 inches are necessary to provide adequate subgrade protection.
- During periods of wet weather, concrete should be placed as soon as practical after preparation of the footing excavations. Foundation bearing surfaces should not be exposed to standing water. Should water infiltrate and pool in the excavation, it should be removed before placing structural fill or reinforcing steel. Subgrade protection for foundations consisting of a lean concrete mat should be considered if footing excavations are exposed to extended wet weather conditions.

Fill Materials

General

Material used for structural fill should be free of debris, organic contaminants and rock fragments larger than 6 inches. The workability of material for use as structural fill will depend on the

gradation and moisture content of the soil. As the amount of fines increases, soil becomes increasingly more sensitive to small changes in moisture content. We recommend that select granular fill or crushed rock be used for structural fill during the rainy season. If prolonged dry weather prevails during the earthwork phase of construction, materials with a somewhat higher fines content may be acceptable. The following paragraphs summarize the material requirements for fill and backfill.

Select Granular Fill

We recommend select granular fill for construction during wet weather conditions, consist of well-graded sand and gravel or crushed rock with a maximum particle size of 6 inches and less than 5 percent fines by weight based on the minus 3/4-inch fraction. Organic matter, debris or other deleterious material should not be present. In our opinion, material conforming to Washington State Department of Transportation (WSDOT) Specification 9-03.9 (Aggregates for Ballast and Crushed Surfacing), 9-03.10 (Aggregate for Gravel Base), or 9-03.14 (Borrow) is suitable for use as import fill material during wet weather with the exception that the fines content should be less than 5 percent based on the minus 3/4-inch fraction. In addition, some larger particle sizes are acceptable, as described above.

On-Site Soil

During dry weather and periods of light rain fall any non-organic on-site soil may be considered for use as fill provided it meets the criteria described above and can be compacted as recommended. When the fines content in the soil exceeds about 5 percent, the soil becomes more sensitive to moisture. Portions of the on-site soil contain enough fines to be moisture sensitive and may not be suitable for use as fill during extended periods of wet weather and/or if exposed to wet conditions. Even when properly compacted, this material can be easily disturbed and will soften when exposed to moisture. Based on our subsurface explorations, on-site material will typically not be suitable for use as drainage material, for use behind retaining walls or as a capillary break material.

Fill Placement and Compaction

General

To obtain proper compaction, fill soil should be compacted near optimum moisture content and in uniform horizontal lifts. Lift thickness and compaction procedures will depend on the moisture content and gradation characteristics of the soil and the type of equipment used. The maximum allowable moisture content varies with the soil gradation and should be evaluated during construction. Silty soil and other fine granular soil may be difficult or impossible to compact during persistent wet conditions. Generally, 12-inch loose lifts are appropriate for steel-drum vibratory roller compaction equipment. Compaction should be achieved by mechanical means. During fill and backfill placement, sufficient testing of in-place density should be conducted to check that adequate compaction is being achieved.

Area Fills and Bases

Fill placed to raise site grades and materials under pavements should be placed on subgrades prepared as previously recommended. In general, area fills and bases should be compacted to at

least 95 percent of the maximum dry density (MDD) determined by ASTM International (ASTM) Test Method D 1557 (modified Proctor).

Trench Backfill

For utility excavations, we recommend that the initial lift of fill over the pipe be thick enough to reduce the potential for damage during compaction but generally should not be greater than about 18 inches. In addition, rock fragments greater than about 1 inch in maximum dimension should be excluded from this lift.

In paved and structural areas, trench backfill should be uniformly compacted in horizontal lifts to at least 95 percent of the MDD in the upper 2 feet below subgrade. Fill placed below a depth of 2 feet from subgrade in paved areas must be compacted to at least 90 percent of the MDD. In nonstructural areas, trench backfill should be compacted to a firm condition that will support construction equipment, as necessary.

Seismic Design Considerations

General

The site is located within the Puget Sound region, which is seismically active. Seismicity in this region is attributed primarily to the interaction between the Pacific, Juan de Fuca, and North American plates. The Juan de Fuca plate is subducting beneath the North American plate. It is thought that the resulting deformation and breakup of the Juan de Fuca plate might account for the deep focus earthquakes in the region. Hundreds of earthquakes have been recorded in the Puget Sound area. In recent history, four of these earthquakes were large events: 1) in 1946, a Richter magnitude 7.2 earthquake occurred in the Vancouver Island, British Columbia area; 2) in 1949, a Richter magnitude 7.1 earthquake occurred in the Olympia area; 3) in 1965, a Richter magnitude 6.5 earthquake occurred between Seattle and Tacoma; and 4) on February 28, 2001, a magnitude 6.8 earthquake occurred at Nisqually near Olympia.

Research is currently underway regarding historical large magnitude subduction-related earthquake activity along the Washington and Oregon coasts. Geologists are reporting evidence that suggests several large magnitude earthquakes (Richter magnitude 8 to 9) have occurred in the last 1,500 years, the most recent of which occurred about 300 years ago. No earthquakes of this magnitude have been documented during the recorded history of the Pacific Northwest. Local design practice in Puget Sound assumes that the magnitude felt from such an earthquake is about the same as from the existing design earthquake because of the distance.

Seismic Design Criteria

Seismic design may be performed using the equivalent static force procedure outlined in the 2009 IBC using the design parameters provided below.

TABLE 2. SEISMIC DESIGN PARAMETERS

2009 IBC
Spectral Response Accel. at Short Periods (SS) = 1.18
Spectral Response Accel. at 1 Second Periods (S1) = 0.42
Site Class = C
Site Coefficient (FA) = 1.0
Site Coefficient (FV) = 1.38

Liquefaction Potential

Liquefaction refers to a condition where vibration or shaking of the ground, usually from earthquake forces, results in development of excess pore pressures in loose, saturated soils and subsequent loss of strength in the deposit of soil so affected. In general, soils that are susceptible to liquefaction include loose to medium dense "clean" to silty sands that are below the water table. In our opinion, the potential for liquefaction at this site is low.

Shallow Foundations

Foundation Support

Proposed structures can be satisfactorily founded on continuous wall or isolated column footings supported on undisturbed native soils, or on structural fill placed over native soils. If the bearing surface is loose or disturbed it must be compacted to a dense, unyielding condition and the loose soil removed and replaced with compacted structural fill. The exterior footings should be established at least 18 inches below the lowest adjacent grade. The recommended minimum footing depth is greater than the anticipated frost depth. Interior footings can be founded a minimum of 12 inches below the top of the floor slab. Isolated column and continuous wall footings should have minimum widths of 24 and 18 inches, respectively.

Bearing Capacity

We recommend that footings founded as recommended be proportioned using an allowable soil bearing pressure of 3,500 pounds per square foot (psf). The allowable soil bearing pressure may be increased to 4,500 psf for footings greater than 4 feet in width. The bearing pressures apply to the total of dead and long-term live loads and may be increased by one third when considering total loads, including earthquake or wind loads. These are net bearing pressures. The weight of the footing and overlying backfill can be ignored in calculating footing sizes.

Footing Bearing Surface Preparation

Footing excavations should be performed using a smooth-edged bucket to limit bearing surface disturbance. The foundation bearing surface should be recompacted as necessary to a dense, non-yielding condition. Loose or disturbed materials present at the base of footing excavations should be removed or compacted. Foundation bearing surfaces should not be exposed to standing water. Should water infiltrate and pool in the excavation, it should be removed before placing structural fill or reinforcing steel.

We recommend that a member from our firm observe foundation excavations before placing reinforcing steel in order to confirm that adequate bearing surfaces have been prepared or provide recommendations for removal of unsuitable soil. Unsuitable bearing materials should be recompacted or removed and replaced with compacted structural fill as recommended by the geotechnical engineer.

Foundation Settlement

We estimate that settlement of footings designed and constructed as recommended will be less than 1 inch, for an assumed loading condition of up to 300 kips per column. Differential settlements between comparably loaded isolated column footings or along 50 feet of continuous footing should be less than 1/2 inch. Settlement is expected to occur rapidly as loads are applied. Settlements could be larger than estimated if footings are placed on loose or disturbed soil.

Lateral Resistance

The ability of the soil to resist lateral loads is a function of frictional resistance, which can develop on the base of footings and slabs and the passive resistance, which can develop on the face of below-grade elements of the structure as these elements tend to move into the soil. For footings and floor slabs founded in accordance with the recommendations presented above, the allowable frictional resistance may be computed using a coefficient of friction of 0.40 applied to vertical dead-load forces. The allowable passive resistance on the face of footings, grade beams or other embedded foundation elements may be computed using an equivalent fluid density of 300 pounds per cubic foot (pcf) for undisturbed on-site soils or structural fill extending out from the face of the foundation element a distance at least equal to two and one-half times the depth of the element.

The passive earth pressure and friction components may be combined provided that the passive component does not exceed two-thirds of the total. The passive earth pressure value is based on the assumptions that the adjacent grade is level and that groundwater remains below the base of the footing throughout the year. The top foot of soil should be neglected when calculating passive lateral earth pressures unless the foundation area is covered with pavement or slab-on-grade. The lateral resistance values include a safety factor of approximately 1.5.

Conventional Subgrade and Retaining Walls

Drainage

Positive drainage is imperative behind any retaining structure. This can be accomplished by providing a zone of free-draining material behind the wall with perforated pipes to collect seepage water. The drainage material should consist of coarse sand and gravel containing less than 5 percent fines based on the fraction of material passing the 3/4-inch sieve. The wall drainage zone should extend horizontally at least 18 inches from the back of the wall.

Perforated smooth-walled rigid PVC pipe having a minimum diameter of 4 inches should be placed at the bottom of the drainage zone along the entire length of the wall, with the pipe invert at or below the elevation of the base of the wall footing. The drainpipes should discharge to a tightline leading to an appropriate collection and disposal system. An adequate number of cleanouts should be incorporated into the design of the drains in order to provide access for regular

maintenance. In general, roof downspouts, perimeter drains or other types of drainage systems should not be connected to retaining wall drain systems.

Design Parameters

The pressures presented assume that backfill placed within 2 feet of the wall is compacted by hand-operated equipment to a density of 90 percent of the MDD and that wall drainage measures are included as previously recommended. For walls constructed as described above, we recommend using an active lateral earth pressure corresponding to an equivalent fluid density of 35 pcf for the level backfill condition. For walls with backfill sloping upward behind the wall at 2H to 1V, an equivalent fluid density of 55 pcf should be used. This assumes that the tops of the walls are not structurally restrained and are free to rotate. For the at-rest condition (walls restrained from movement at the top) an equivalent fluid density of 55 pcf should be used for design. For seismic conditions, we recommend a uniform lateral pressure of 6H (where H is the height of the wall) psf be added to these lateral pressures. Note that if the retaining system is designed as a braced system but is expected to yield a small amount during a seismic event, an active earth pressure condition may be assumed and combined with the uniform seismic surcharge pressure.

The recommended pressures do not include the effects of surcharges from surface loads. If vehicles will be operated within one-half the height of the wall, a traffic surcharge should be added to the wall pressure. The traffic surcharge can be approximated by the equivalent weight of an additional 2 feet of backfill behind the wall. Additional surcharge loading conditions should also be considered on a case-by-case basis.

Retaining walls founded on native soil or structural fill extending to these materials may be designed using the allowable soil bearing values and lateral resistance values presented above in the "Shallow Foundations" section of this report. We estimate settlement of retaining structures will be similar to the values previously presented for building foundations.

Building Pads and Floor Slabs

A modulus of subgrade reaction of 300 pounds per cubic inch (pci) can be used for designing the building floor slab provided that the subgrade consists of dense native soil or structural fill and has been prepared in accordance with the "Site Development and Earthwork" section of this report. Settlement for floor slabs designed and constructed as recommended are estimated to be less than 3/4 inch for a floor load of 500 psf. We estimate that differential settlement of floor slabs will be 1/2 inch or less over a span of 50 feet providing that the fill below the slab is compacted as specified. The subgrade soils are non-expansive, so heave is not anticipated beneath the floor slab.

We recommend that on-grade slabs be underlain by a minimum 6-inch-thick capillary break layer to reduce the potential for moisture migration into the slab. The capillary break material should consist of a well-graded sand and gravel or crushed rock with a maximum particle size of 3/4 inch and less than 5 percent fines. The material should be placed as recommended in the "Fill Placement and Compaction" section of this report. If dry slabs are required (e.g., where adhesives are used to anchor carpet or tile to the slab), a waterproof liner may be placed as a vapor barrier below the slab.

Pavement Recommendations

Asphaltic Concrete Pavement

Pavement subgrades and fill should be prepared and placed as previously described. The crushed rock base course should be moisture conditioned near the optimum moisture content and compacted to at least 95 percent of the MDD determined in accordance with ASTM D 1557 test procedures. An appropriate number of in-place density tests should be conducted on the compacted base course to check that adequate compaction has been obtained. Crushed rock base course should conform to applicable sections of 4-04 and 9-03.9(3) of the WSDOT Standards.

For this project, we based the recommended pavement sections described below on an assumed in-situ California Bearing Ratio (CBR) between 15 and 20. The heavy-duty pavement section thickness is based on a traffic loading of about 1,000,000, 18-kip equivalent single-axle loads (ESALs); we used a design life of 10 years. The standard-duty section is appropriate for areas that will not be exposed to heavy truck loads. Hot mix asphalt (HMA) should conform to applicable sections of 5-04, 9-02 and 9-03 of the WSDOT Standards. The recommended pavement sections assume that final improvements surrounding the pavement will be designed and constructed such that stormwater or excess irrigation water from landscape areas does not infiltrate below the pavement section into the crushed base.

STANDARD-DUTY ASPHALTIC CONCRETE PAVEMENT

- 2 inches of hot mix asphalt.
- 3 inches of crushed surfacing base course and/or top course compacted as recommended.
- 12 inches compacted depth of native subgrades and/or existing fill compacted to 95 percent MDD (ASTM D 1557) and in a firm and unyielding condition.

HEAVY-DUTY ASPHALTIC CONCRETE PAVEMENT

- 3 inches of hot mix asphalt.
- 4 inches of crushed surfacing base course and/or top course compacted as recommended.
- 12 inches compacted depth of native subgrades and/or existing fill at 95 percent MDD (ASTM D 1557) and in a firm and unyielding condition.

LIMITATIONS

We have prepared this report for the exclusive use by Creekside DuPont Partners, LLC and their authorized agents for the DuPont Apartment Complex/Lot X to be located west of the intersection of Center Drive and Power Line Road in DuPont, Washington. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix B titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report.

T19N, R 1W, Section 26
USGS 7.5' Topographic Map Series, Nisqually (1981) Quad.

N
W E
S

2,000 0 2,000
Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

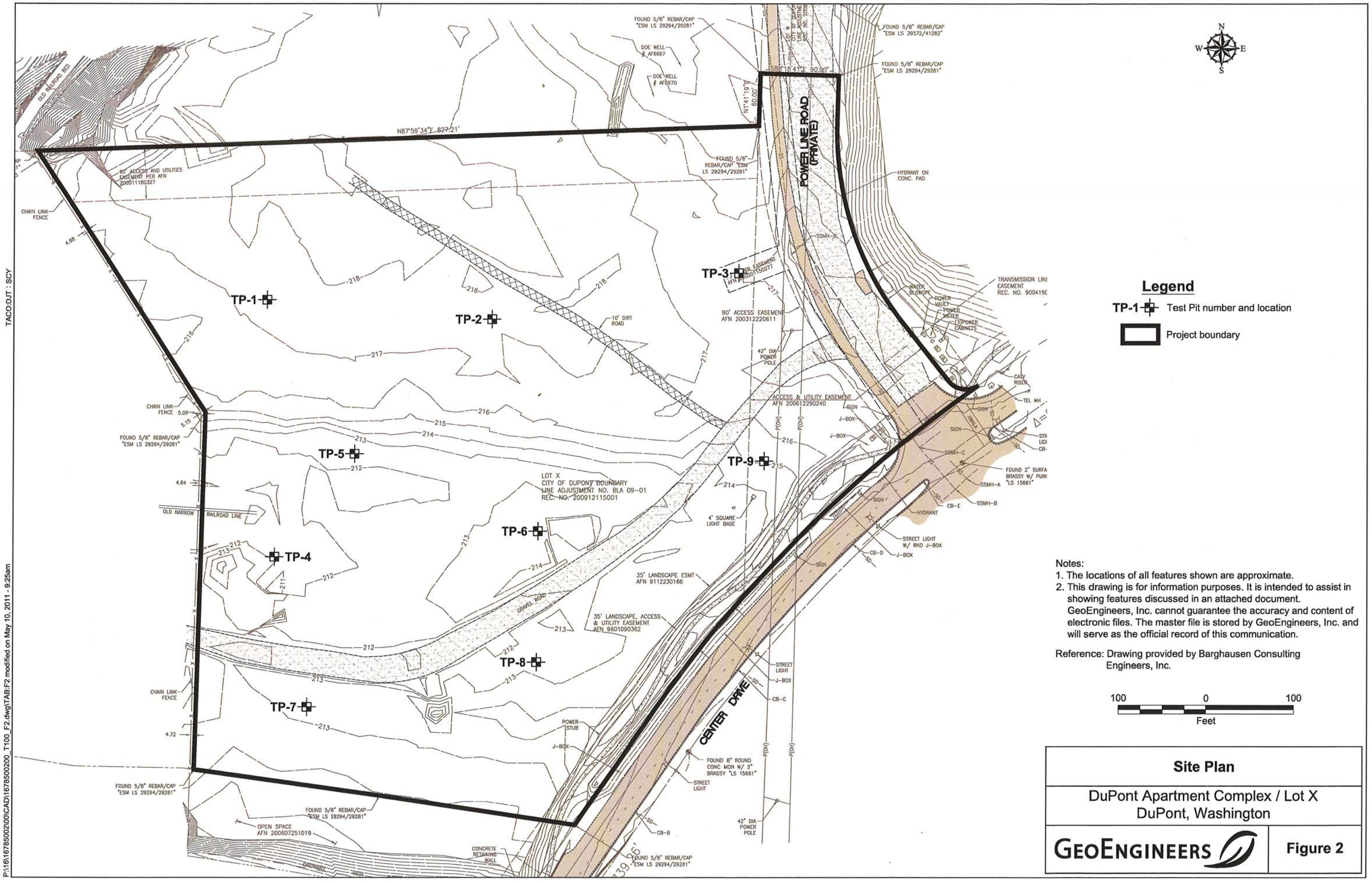
Vicinity Map

DuPont Apartment Complex / Lot X
DuPont, Washington

GeoEngineers

Figure 1

Office: Tacoma Path: W:\Tacoma\Projects\16116785002\GIS\16785000200_F1.mxd Map Revised: 05/11/2011 EL:SCY



TACO:DJT : SCY

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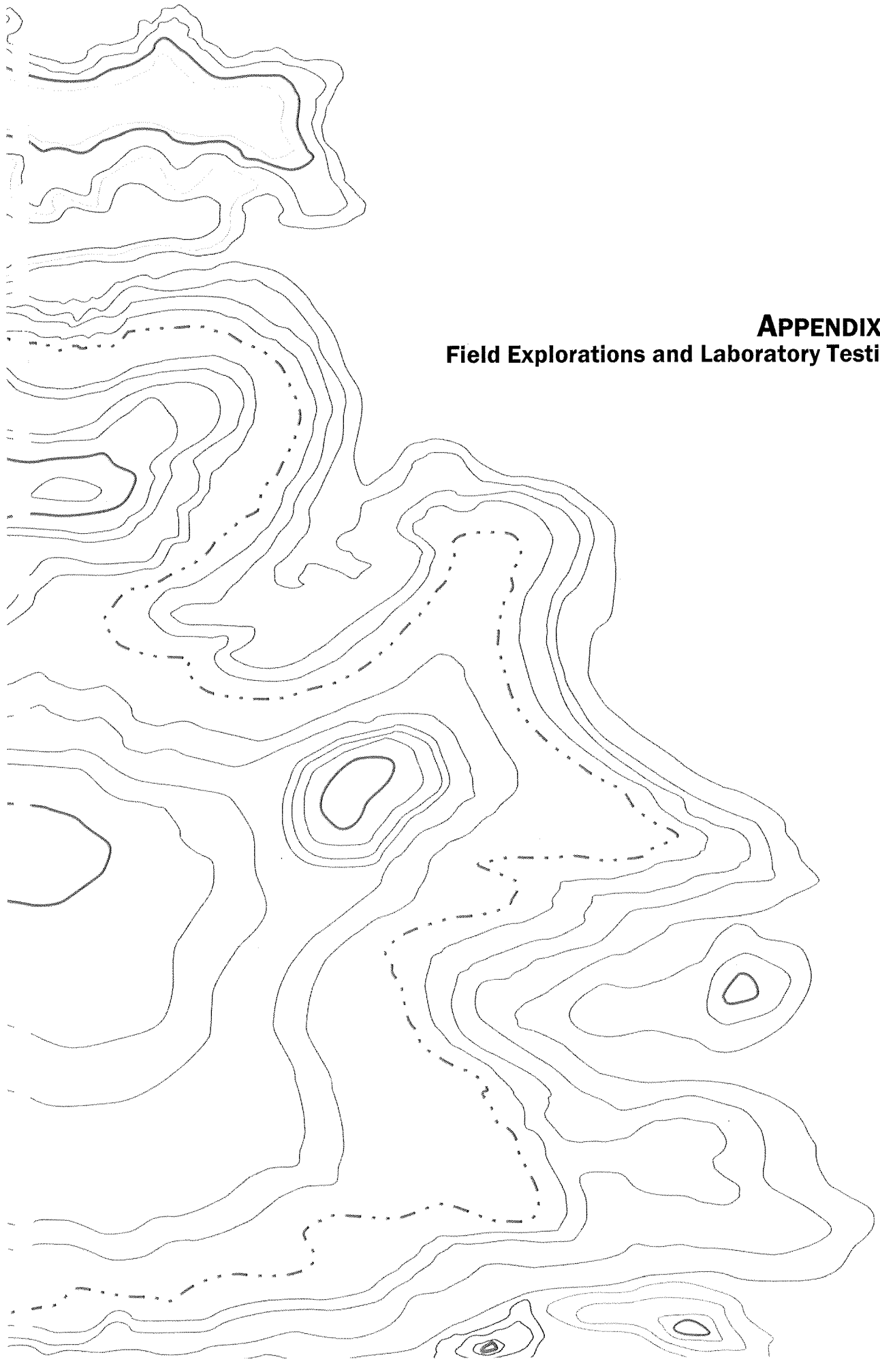


APPENDIX A
Field Explorations and Laboratory Testing

APPENDIX A
FIELD EXPLORATIONS AND LABORATORY TESTING

Subsurface Explorations

Soil and groundwater conditions at the proposed development site were explored by excavating nine test pits on August 26, 2010. Subsurface exploratory services were subcontracted to GeoEngineers, Inc. The test pit explorations extended to depths between 10 and 12 feet below surrounding site grades.

The locations of the test pits were determined by electronic global positioning system (GPS) where available and by pacing and visual triangulation from existing site features such as roadways and property corners.. The elevations presented on the test pit logs are based on a site plan obtained from Barghausen Consulting Engineers. The locations and elevations of the explorations should be considered approximate. Locations of the explorations are provided on the Site Plan, Figure 2.

Our field representative obtained samples, classified the soils, maintained a detailed log of each exploration and observed groundwater conditions where applicable. The samples were retained in sealed plastic bags to prevent moisture loss. The soils were classified visually in general accordance with the system described in Figure A-1, which includes a key to the exploration logs. Summary logs of the explorations are included as Figures A-2 through A-10. The densities noted on the test pit exploration logs are based on the difficulty of excavation, observations of caving and our experience and judgment.

Laboratory Testing

Soil samples obtained from the test pits were transported to our laboratory and examined to confirm or modify field classifications, as well as to evaluate engineering properties of the soil. Representative samples were selected for laboratory testing. Laboratory testing included moisture content determination conducted in general accordance with ASTM International (ASTM) D 2216 and grain-size analyses conducted in general accordance with ASTM C 136. The sample test depths and moisture content test results are shown on the exploration logs. Sieve analysis results are presented in Figures A-11 and A-12.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	CC	Cement Concrete
	AC	Asphalt Concrete
	CR	Crushed Rock/ Quarry Spalls
	TS	Topsoil/ Forest Duff/Sod

Measured groundwater level in exploration, well, or piezometer

Groundwater observed at time of exploration

Perched water observed at time of exploration

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Material Description Contact

Distinct contact between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

A "P" indicates sampler pushed using the weight of the drill rig.

Laboratory / Field Tests

%F	Percent fines
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
OC	Organic content
PM	Permeability or hydraulic conductivity
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
NT	Not Tested

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

KEY TO EXPLORATION LOGS

GeoEngineers

FIGURE A-1

Date Excavated: 8/26/2010 Logged By: EAW

Equipment: Case 580 Super M Total Depth (ft) 12.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
217					DUFF		3 inches duff		
	1	X	1		SM		Dark brown silty fine to coarse sand with gravel, trace organics (medium dense, moist)		
216					GP		Brown fine to coarse gravel with sand, trace silt, occasional cobbles (dense, moist)		
	2	X	2						
215									
	3								
214		X	3						
	4								
213									
	5								
212		X	4						
	6								
211									
	7								
210		X	5 SA		GP-GM		Brown fine to coarse gravel with silt and sand, occasional cobbles (dense, moist)	4	
	8								
209									
	9								
208		X	6						
	10								
207									
	11								
206		X	7						
	12								

Test pit completed at 12 feet on 8/26/10
No groundwater seepage observed
Moderate caving observed at approximately 4+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-1

GeoEngineers

Project: DuPont Apartment Complex/Lot X
Project Location: DuPont, Washington
Project Number: 16785-002-00

Figure A-2
Sheet 1 of 1

Tacoma: Date:5/10/11 Path:P:\16\16785002\GINT\16785002000.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 8/26/2010 Logged By: EAW

Equipment: Case 580 Super M Total Depth (ft) 12.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
217	0				DUFF		3 inches duff		
		X	1		SM		Dark brown silty fine to coarse sand with gravel, occasional cobbles (medium dense, moist)		
216	1				GP		Brown fine to coarse gravel with sand, trace silt, occasional cobbles (dense, moist)		
		X	2						
215	2								
214	3								
213	4								
212	5								
		X	3 SA					3	
211	6								
210	7								
209	8								
208	9								
		X	4						
207	10								
206	11								
		X	5						
	12								

Test pit completed at 12 feet on 8/26/10
No groundwater seepage observed
Moderate caving observed at 8+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-2

GeoEngineers

Project: DuPont Apartment Complex/Lot X
Project Location: DuPont, Washington
Project Number: 16785-002-00

Figure A-3
Sheet 1 of 1

Tacoma: Date:5/10/11 Path:P:\16\16785002\GINT\16785002OO.GPJ DBTemplate\LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 8/26/2010 Logged By: EAW

Equipment: Case 580 Super M Total Depth (ft) 12.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
216	1	X	1		GP-GM		Gray fine to coarse gravel with silt and sand, occasional cobbles (medium dense, moist) (fill)		
215	2	X	2		SM		Dark brown silty fine to coarse sand with gravel, occasional cobbles, trace organics (medium dense, moist)		
214	3				GP		Brown fine to coarse gravel with sand, trace silt, occasional cobbles (dense, moist)		
213	4	X	3						
212	5								
211	6	X	4 SA					3	
210	7								
209	8	X	5						
208	9								
207	10								
206	11								
205	12	X	6						

Test pit completed at 12 feet on 8/26/10
No groundwater seepage observed
Moderate caving observed at 4+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-3

GeoEngineers

Project: DuPont Apartment Complex/Lot X
Project Location: DuPont, Washington
Project Number: 16785-002-00

Figure A-4
Sheet 1 of 1

Tacoma: Date:5/10/11 Path:P:\16\16785002\GINT\16785002OO.GPJ DBTemplate\LibTemplate\GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 8/26/2010 Logged By: EAW

Equipment: Case 580 Super M Total Depth (ft) 10.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
211	1		1		DUFF		3 inches duff		
					SM		Dark brown silty fine to coarse sand with gravel (medium dense, moist)		
					GP		Brown fine to coarse gravel with sand, trace silt, occasional cobbles (dense, moist)		
210	2								
209	3								
208	4		2						
207	5								
206	6		3						
205	7								
204	8								
203	9								
202	10		4						

Test pit completed at 10 feet on 8/26/10
No groundwater seepage observed
Minor caving observed at 6+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-4

GeoEngineers

Project: DuPont Apartment Complex/Lot X
Project Location: DuPont, Washington
Project Number: 16785-002-00

Figure A-5
Sheet 1 of 1

Tacoma: Date:5/10/11 Path:P:\16\16785002\GINT\16785002GPJ DBTemplate\LibTemplate\GEOENGINEERS8.GDT\GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 8/26/2010 Logged By: EAW

Equipment: Case 580 Super M Total Depth (ft) 10.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
212	0				DUFF		3 inches duff		
					SM		Dark brown silty fine to coarse sand with gravel, trace organics (medium dense, moist)		
211	1				GW		Brown fine to coarse gravel with sand, trace silt (dense, moist)		
210	2								
	3	X	1						
209		X	2 SA					2	
208	4								
	5								
207		X	3						
206	6								
	7								
205	8								
204	9								
203	10	X	4						

Test pit completed at 10 feet on 8/26/10
No groundwater seepage observed
Minor caving observed at approximately 4+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-5

GeoEngineers

Project: DuPont Apartment Complex/Lot X
Project Location: DuPont, Washington
Project Number: 16785-002-00

Figure A-6
Sheet 1 of 1

Tacoma: Date:5/10/11 Path:P:\16\16785002\GINT\16785002200.GPJ DBTemplate\LibTemplate\GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 8/26/2010 Logged By: EAW

Equipment: Case 580 Super M Total Depth (ft) 10.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
213					SOD		3 inches sod		
					SM		Dark brown silty fine to coarse sand with gravel, trace organics (medium dense, moist) (topsoil)		
212	1				GP		Brown fine to coarse gravel with sand, trace silt (dense, moist)		
211	2	X	1						
210	3								
209	4								
208	5	X	2						
207	6								
206	7								
205	8	X	3						
204	9								
	10	X	4						

Test pit completed at 10 feet on 8/26/10
No groundwater seepage observed
Minor caving observed at approximately 4+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-6

GeoEngineers

Project: DuPont Apartment Complex/Lot X
Project Location: DuPont, Washington
Project Number: 16785-002-00

Figure A-7
Sheet 1 of 1

Tacoma: Date:5/10/11 Path:P:\16\16785002\GINT\16785002OO.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 8/26/2010 Logged By: EAW

Equipment: Case 580 Super M Total Depth (ft) 12.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
212	1	X	1		DUFF		3 inches duff		
					SM		Dark brown silty fine to coarse sand with gravel (medium dense, moist)		
211	2				GP		Brown fine to coarse gravel with sand, trace silt (dense, moist)		
210	3	X	2						
209	4								
208	5								
207	6	X	3 SA					3	
206	7								
205	8	X	4						
204	9								
203	10	X	5						
202	11								
201	12	X	6						

Test pit completed at 12 feet on 8/26/10
No groundwater seepage observed
Moderate caving observed at approximately 4+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-7

GeoEngineers

Project: DuPont Apartment Complex/Lot X
Project Location: DuPont, Washington
Project Number: 16785-002-00

Figure A-8
Sheet 1 of 1

Tacoma: Date:5/10/11 Path:P:\16\16785002\GINT\16785002GPJ DBTemplate\LibTemplate\GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 8/26/2010 Logged By: EAW

Equipment: Case 580 Super M Total Depth (ft) 12.0

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
212	0				DUFF		3 inches duff		
					SM		Dark brown silty fine to coarse sand with gravel, trace organics (medium dense, moist) (topsoil)		
211	1				GP		Brown fine to coarse gravel with sand, trace silt (dense, moist)		
210	2	X	1						
209	3								
208	4								
207	5	X	2						
206	6								
205	7				GW		Brown fine to coarse gravel with sand, trace silt (dense, moist)		
	8	X	3 SA					4	
204	9								
203	10	X	4						
202	11								
201	12	X	5						

Test pit completed at 12 feet on 8/26/10
No groundwater seepage observed
Moderate caving observed at approximately 4+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-8

GeoEngineers

Project: DuPont Apartment Complex/Lot X
Project Location: DuPont, Washington
Project Number: 16785-002-00

Figure A-9
Sheet 1 of 1

Tacoma: Date:5/10/11 Path:P:\16\16785002\GINT\16785002GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

Date Excavated: 8/26/2010 Logged By: EAW

Equipment: Case 580 Super M Total Depth (ft) 12.0

Elevation (feet)	Depth (feet)	Sample: Testing Sample	Sample: Sample Name Testing	Graphic Log	Group Classification	Encountered Water	MATERIAL DESCRIPTION	Moisture Content, %	REMARKS
					DUFF		3 inches duff		
214	1	X	1		SM		Dark brown silty fine to coarse sand with gravel (medium dense, moist) (topsoil)		
					GP		Brown fine to coarse gravel with sand, trace silt (dense, moist)		
213	2	X	2						
212	3								
211	4								
210	5								
209	6	X	3 SA					3	
208	7				SP		Brown fine to coarse sand with gravel, trace silt (dense, moist)		
207	8	X	4 SA					5	
206	9								
205	10	X	5						
204	11						Grades to without gravel		
203	12	X	6						

Test pit completed at 12 feet on 8/26/10
No groundwater seepage observed
Moderate caving observed at approximately 4+ feet

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

Log of Test Pit TP-9

GeoEngineers

Project: DuPont Apartment Complex/Lot X
Project Location: DuPont, Washington
Project Number: 16785-002-00

Figure A-10
Sheet 1 of 1

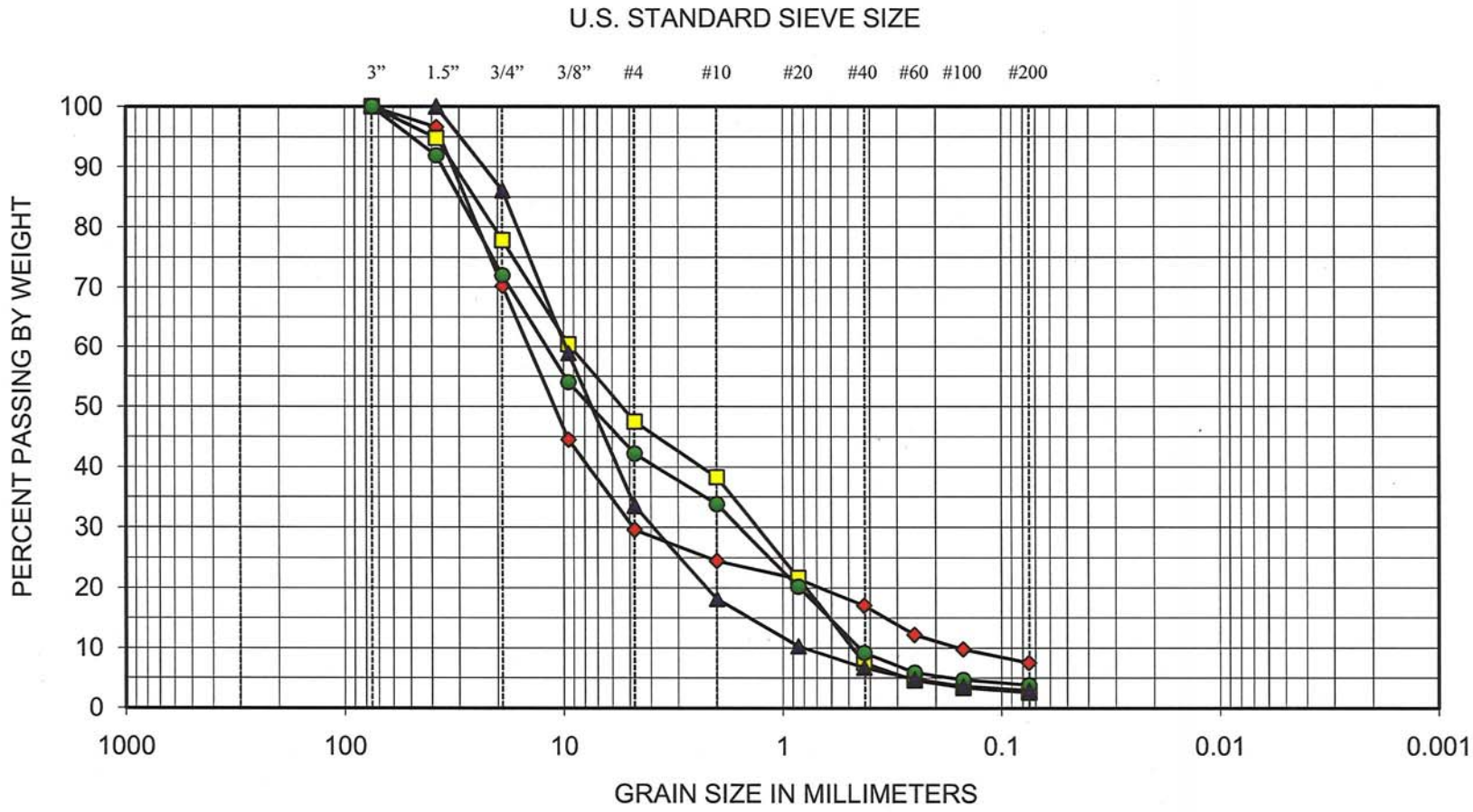
Tacoma: Date:5/10/11 Path:P:\16\16785002\GINT\16785002.GPJ DBTemplate/LibTemplate\GEOENGINEERS8.GDT/GEI8_TESTPIT_1P_GEOTEC

16785-002-00 MJH:AMD:tt 051011

GeoEngineers

SIEVE ANALYSIS RESULTS

FIGURE A-11



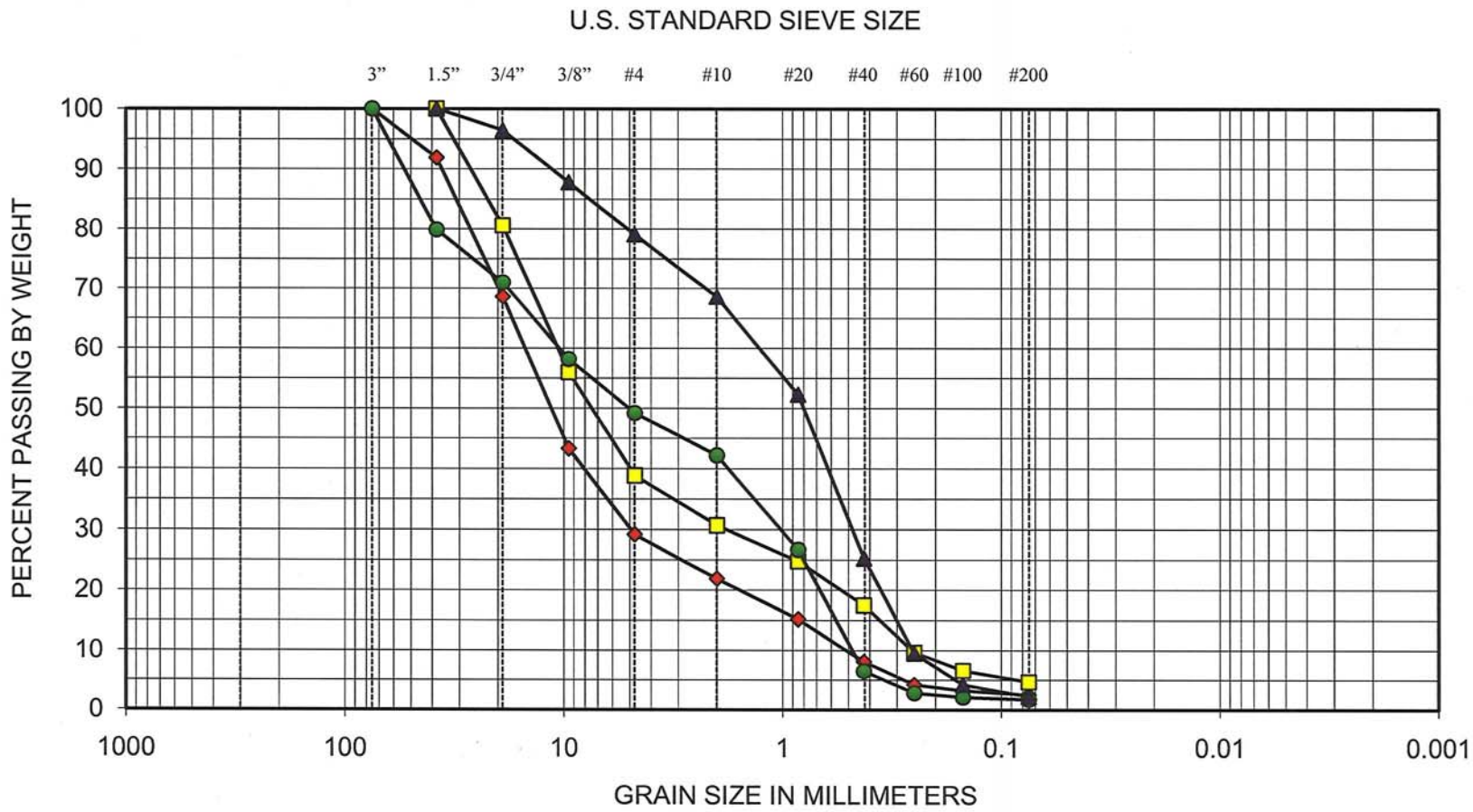
BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	EXPLORATION NUMBER	DEPTH (ft)	SOIL CLASSIFICATION
◆	TP-1	7.5	Gravel with silt and sand (GP-GM)
■	TP-2	5.5	Gravel with sand (GP)
●	TP-3	5.5	Gravel with sand (GP)
▲	TP-5	3.5	Gravel with sand (GW)

GEOENGINEERS

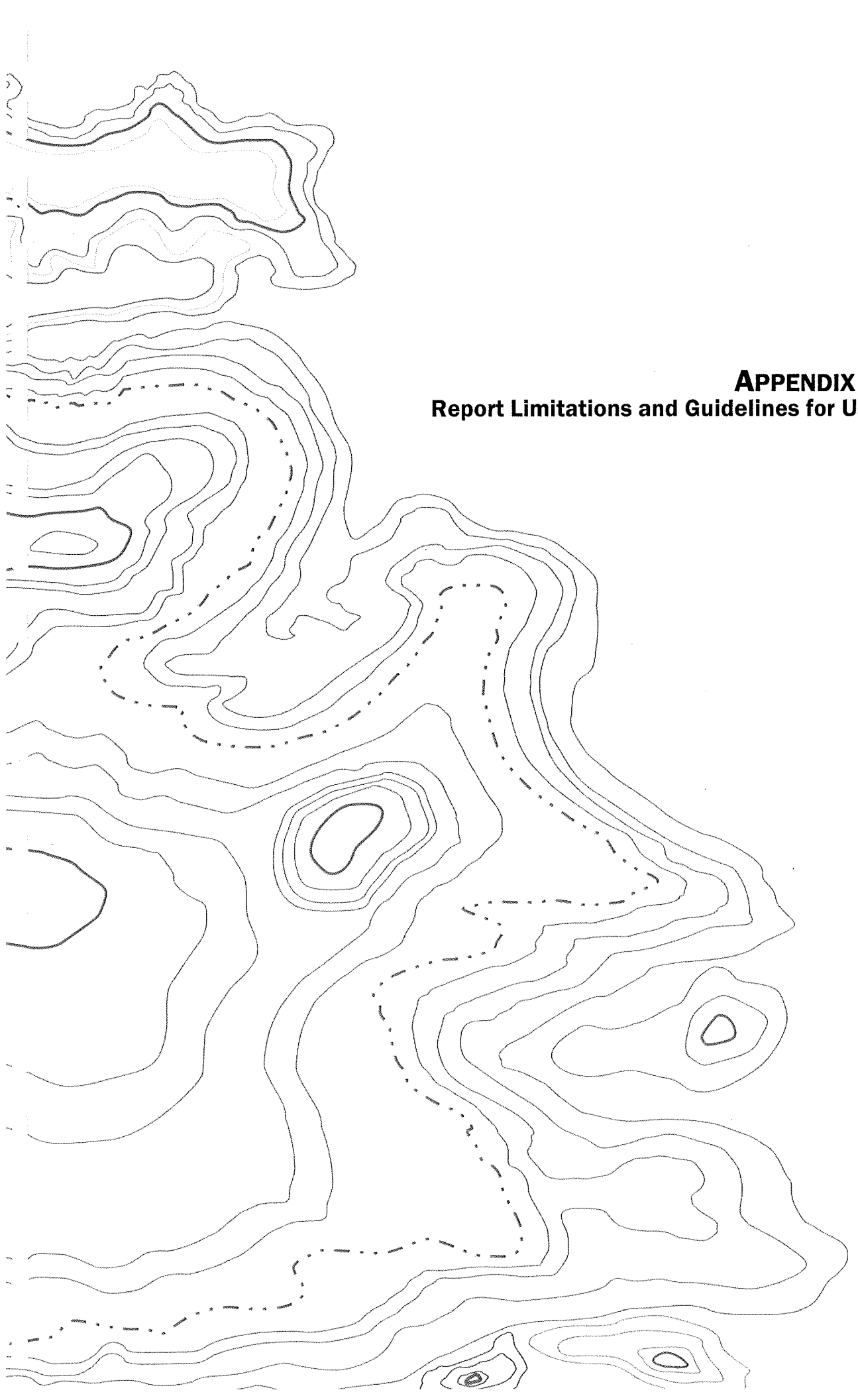
FIGURE A-12

SIEVE ANALYSIS RESULTS



BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	EXPLORATION NUMBER	DEPTH (ft)	SOIL CLASSIFICATION
◆	TP-7	5.5	Gravel with sand (GP)
■	TP-8	7.5	Gravel with sand (GW)
●	TP-9	5.5	Gravel with sand (GP)
▲	TP-9	7.5	Sand with gravel (SP)



APPENDIX B
Report Limitations and Guidelines for Use

APPENDIX B
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Geotechnical Services are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the exclusive use of Creekside DuPont Partners, LLC and their authorized agents. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, a geotechnical or geologic study conducted for a civil engineer or architect may not fulfill the needs of a construction contractor or even another civil engineer or architect that are involved in the same project. Because each geotechnical or geologic study is unique, each geotechnical engineering or geologic report is unique, prepared solely for the specific client and project site. Our report is prepared for the exclusive use of our Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted geotechnical practices in this area at the time this report was prepared. This report should not be applied for any purpose or project except the one originally contemplated.

A Geotechnical Engineering or Geologic Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the DuPont Apartment Complex/Lot X. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;

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[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

- composition of the design team; or
- project ownership.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

Topsoil

For the purposes of this report, we consider topsoil to consist of generally fine-grained soil with an appreciable amount of organic matter based on visual examination, and to be unsuitable for direct support of the proposed improvements. However, the organic content and other mineralogical and gradational characteristics used to evaluate the suitability of soil for use in landscaping and agricultural purposes was not determined, nor considered in our analyses. Therefore, the information and recommendations in this report, and our logs and descriptions should not be used as a basis for estimating the volume of topsoil available for such purposes.

Most Geotechnical and Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Geotechnical Engineering Report Recommendations Are Not Final

Do not over-rely on the preliminary construction recommendations included in this report. These recommendations are not final, because they were developed principally from GeoEngineers' professional judgment and opinion. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for this report's recommendations if we do not perform construction observation.

Sufficient monitoring, testing and consultation by GeoEngineers should be provided during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction

observation for this project is the most effective method of managing the risks associated with unanticipated conditions.

A Geotechnical Engineering or Geologic Report Could be Subject to Misinterpretation

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

Give Contractors a Complete Report and Guidance

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering or geologic report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

Contractors are Responsible for Site Safety on their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and to adjacent properties.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers

if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical, Geologic and Environmental Reports Should not be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention, or assessment of the presence of Biological Pollutants in or around any structure. Accordingly, this report includes no interpretations, recommendations, findings, or conclusions for the purpose of detecting, preventing, assessing, or abating Biological Pollutants. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

GeoEngineers
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May 11, 2018

DuPont Industrial Partners, LLC
C/O Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, Washington 98032

Attention: Dan Balmelli, PE

Subject: Report Addendum
Geotechnical Engineering Services
DuPont Industrial Warehouse
DuPont, Washington
File No. 16785-003-01

INTRODUCTION AND PROJECT UNDERSTANDING

This report addendum presents supplemental geotechnical recommendations and considerations for the DuPont Industrial Warehouse (previously titled as Lot "Y" Industrial Park). As part of this addendum, we are addressing comments in the City of DuPont Type III Site Plan Review and SEPA Environmental Review (PLNG 2018-008, -009) letter dated February 23, 2018. We have prepaired a geotechnical study dated October 10, 2011 for this project (October report). We understand that plans are underway to design and construct two (approximately 130,000 square feet each) industrial buildings (Building A and Building B) in the west portion of the site. Finished floor will be near Elevation 214 to 215 feet (NGVD29). Additional improvements will include site grading, installation of utilities, asphalt paving and construction of retaining structures. We include a revised and updated Site Plan with the proposed buildings and construction, attached as Figure 1.

We have reviewed preliminary civil engineering plan sheets C1 through C13 (civil plans). We understand that a retaining wall will be constructed south of Building B. The retaining wall will be located in a current ravine/depression area that will retain fill as part of site grading. The retaining wall is also just north of the border of a 50-foot setback boundary or buffer from the steep slopes located north of the property. The wall foundations of the retaining wall may encroach into the buffer. From the grading plan, it appears that the retaining wall will retain approximately 7 feet of fill at it's deepest point and taper off in the east and west direction.

CONCLUSIONS AND RECOMMENDATIONS

Encroachment Into Buffer Setback Area

Based on our review of proposed plans and subsurface explorations completed as part of our October study, we provide the following:

- It is our opinion that the proposed final site development condition, as reviewed, will not create a hazard to the subject property, surrounding properties, erosion, or sedimentation to off-site properties or bodies of water. The property will be paved and stormwater will be managed and directed into stormwater infiltration galleries. The proposed construction appears to eliminate the potential for erosion and channeling of water onto the slope area.
- Proper erosion and sedimentation will be required during construction. A temporary erosion and sedimentation control (TESC) plan has been developed for the subject site (sheets C2, C3, and C4 of the civil plans). This plan includes TESC measures that surround the proposed retaining structure. Temporary slope inclinations, protection of temporary slopes and erosion control recommendations are provided in our report and should be followed during construction.
- Additional construction recommendations presented in DMC 25.105.04(2)(c) should be implemented during physical grading and site development. These include minimizing erosion and landslide potential and minimizing disruption of the existing topography and natural vegetation. Care should be taken to cut slopes at inclinations recommended in our report and disturb only areas required to complete the work. Contractors completing earthwork should be made aware of the requirements presented in the DMC 25.105.02(2)(c).
- Final erosion control measures, once construction is complete, should include provisions as described in our October report.
- Because the retaining wall will be constructed between a sloping ravine, foundation elements for the retaining wall should be embeded deep enough such that a 2H to 1V (horizontal:vertical) slope from the lowest outermost foundation element is maintained from the toe of surrounding slopes. This may require additional excavation for the foundation and subsequent burying of portions of the retaining wall. Subgrade and bearing surface preparation recommendations presented in our October report should be followed.

UPDATED SEISMIC DESIGN CONSIDERATIONS

During preparation of our report, the 2009 International Building Code (IBC) was cited for seismic design criteria. Based on the 2015 IBC, we still conclude that the site may be characterized as Class C. Seismic design parameters in accordance with the 2015 IBC are provided in Table 1 below.

TABLE 1. 2015 IBC SEISMIC DESIGN VALUES

Site Coefficient	Site Factor	MCE[1] Spectral Response	Design Spectral Response
S_s = 1.304 g	F_a = 1.000	S_{MS} = 1.304 g	S_{DS} = 0.869 g
S_1 = 0.520 g	F_v = 1.300	S_{M1} = 0.676 g	S_{D1} = 0.451 g

Note:

[1] MCE = Maximum Considered Earthquake

Based on our understanding of site conditions, we recommend using a peak ground acceleration (PGA) equal to 0.5g as determined in accordance with Section 11.8.3 of American Society of Civil Engineers (ASCE) Standard 7-10. This is the same value as sited in the 2009 IBC.

USE OF PREVIOUS REPORT

Except as modified herin, we conclude that the recommendations and design considerations presented in our Ocbober 10, 2011 are still appropriate for this site and may be used for this project.

LIMITATIONS

We have prepared this report addendum for DuPont Industrial Partners LLC and Barghausen Engineers Inc. for the DuPont Industrial Warehouse project. The client may distribute copies of this report addendum to owner and owner's authorized agents and regulatory agencies as may be required for the project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices for geotechnical engineering services in this area at the time this report addendum was prepared. The conclusions, recommendations, and opinions presented in this report addendum are based on our professional knowledge, judgment and experience. No warranty, express or implied, applies to the services or this report addendum.

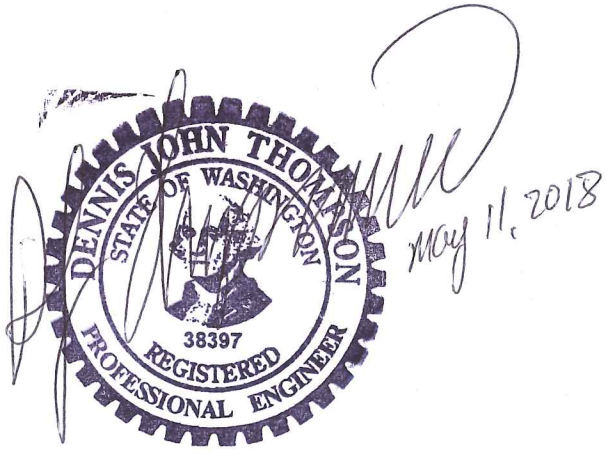
The limitations presented in our October 11, 2011 report apply to this addendum. Please refer to Appendix B titled "Report Limitations and Guidelines for Use" of our October 11, 2011 Geotechnical Engineering Services Report for additional information pertaining to use of this report addendum.

Respectfully Submitted,
GeoEngineers, Inc.

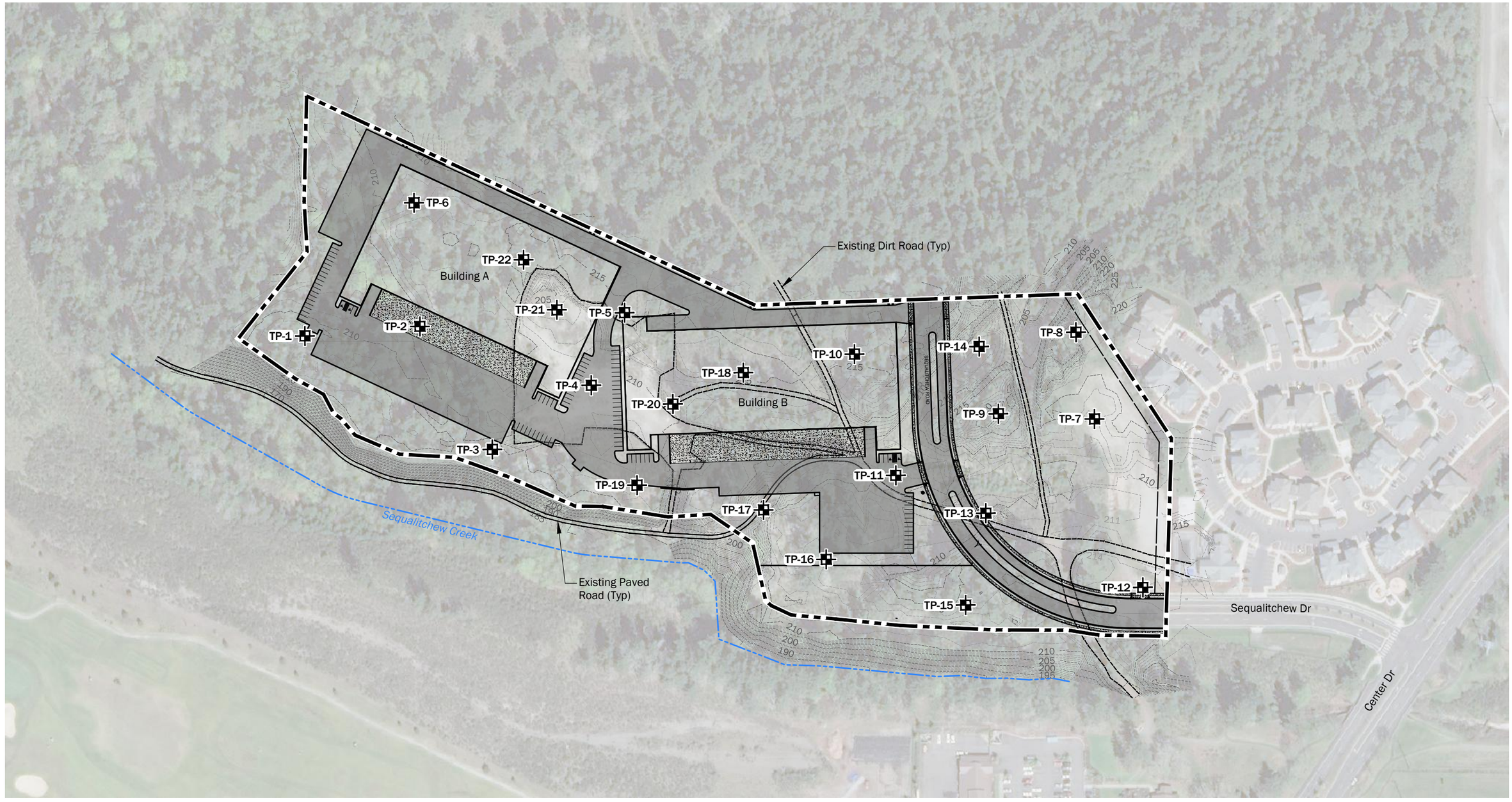
Dennis (DJ) Thompson, PE
Associate

DJT:tt

Attachment:
Figure 1 – Vicinity Map



Disclaimer: Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.



Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Aerial from Microsoft Bing. Survey background from Barghausen Consulting Engineers, Inc dated 8/8/2011. Proposed Plan from Barghausen Consulting Engineers, Inc dated 9/17/17.

Projection: Washington State Plane, South Zone, NAD83, US Foot

Legend

Site Boundary

TP-X Test Pit

N W E S

200 0 200
Feet

Site Plan

Lot Y Industrial Park
DuPont, Washington

GeoEngineers

Figure 1

P:\16\16785003\CAD\00\GeoTech Report\16785003_F02_Site Plan.dwg TAB:F02 Date Exported: 05/04/18 - 12:49 by cstickel

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253.383.4940

August 1, 2023

Avenue 55, LLC
601 Union Street, Suite 2930
Seattle, Washington 98101

Attention: Ben Varin

Subject: Revised Report Addendum 2
Geotechnical Engineering Services
DuPont 243
DuPont, Washington
File No. 26421-001-00

INTRODUCTION AND PROJECT UNDERSTANDING

This revised report addendum presents supplemental geotechnical recommendations and considerations for the proposed DuPont 243 project and is intended to replace our Report Addendum dated November 8, 2022 (2022 Addendum[1]). The purpose of this revision is to reflect the updated site plan layout described below and review final geotechnical design considerations presented in that study. The site is located at 1700 Center Drive in DuPont, Washington. An overview of the property and surrounding area is shown on the Figure 1, Vicinity Map.

Our experience at the site includes involvement with the previous owner, Dupont Station Partners, LLC. for the proposed DuPont Industrial Warehouse (also referred to as Lot "Y" Industrial Park). We understand you have been given permission by Dupont Station Partners, LLC and have the full use of studies held by GeoEngineers, Inc. (GeoEngineers) and as related to the site address. Our previous geotechnical deliverables for the site consist of:

- "Geotechnical Engineering Services, Lot 'Y' Industrial Park, DuPont, Washington" dated October 10, 2011 (2011 Report). As part of our services, we advanced 22 test pit explorations in the project area to develop an understanding of subsurface conditions. The 2011 Report presents

[1] "Report Addendum, Geotechnical Engineering Services, DuPont Industrial Park, DuPont, Washington", prepared for Avenue 55, LLC, dated November 8, 2022.

a summary of our findings, conclusions and recommendations regarding geotechnical engineering aspects of the proposed industrial park development.

- "Report Addendum, Geotechnical Engineering Services, DuPont Industrial Warehouse, DuPont, Washington" dated May 11, 2018 (2018 Addendum), which includes our review of a proposed development site plan and updated recommended seismic design parameters.

Our understanding of the current project is based on discussions and correspondence with Avenue 55, LLC, Barghausen Consulting Engineers, Inc. (project civil engineer) and Innova Architects (project architect). We were provided an updated site plan sheet A0.1 "SEPA Permit Date July 17, 2023". The overall project will include construction of an approximate 243,000 square foot, dock-high slab, warehouse building, referred to as Building A. Surrounding improvements will include paved parking and driveway areas, hardscaping, new utility installation, landscaping and stormwater management facilities, including an approximate 27,000 square foot infiltration pond (inferred from above plans). Additional elements may or may not include relatively short retaining walls (less than 8 feet tall) along the south property area, which will be considered as landscaping elements, to separate the project site from the Lower Sequalitchew Creek and associated buffers.

This report addendum is intended to provide recommendations to accommodate the proposed current design but also, some slight variations to the site planning and design (e.g., addition or elimination of retaining walls, small outbuilding structures, changes to roadway alignments, etc.). As such, we support the use of this geotechnical report for slight variations in site design. We would still recommend our review and comment on the variations, once established.

PURPOSE AND SCOPE OF SERVICES

The purpose of our services is to review site conditions and our previously provided geotechnical recommendations for the site. Based on the currently proposed improvements, we provide our opinion on the suitability of our previous recommendations and provide updated/revised recommendations (if necessary). Our services have been provided in accordance with our signed agreement with Avenue 55, LLC (signed October 17, 2022). Details regarding our specific scope of services for the project can be reviewed in our agreement or provided upon request.

SUBSURFACE CONDITIONS

Subsurface Explorations

We previously explored subsurface conditions at the site by excavating 22 test pits to depths between about 8 and 11 feet below ground surface (bgs), corresponding to Elevation 209 to 183.5 feet. Approximate locations of each test pit relative to currently proposed improvements are shown on the Figure 2, Site Plan. A detailed summary of the test pit explorations, including completed laboratory testing and test pit logs, is presented in our 2011 Geotechnical Report. A brief overview is provided below.

Soil Conditions

We interpret native soils encountered in the test pits to be recessional glacial outwash deposits, consisting of medium dense to very dense sand and gravel with varying amounts of silt and cobble. The upper few

feet were occasionally weathered and loose to medium dense. Fill consisting of medium dense sand with gravel and trace silt was observed in one test pit (TP-9) extending to the full depths explored (8 feet bgs).

Based on our understanding of geologic conditions and experience in the area, we anticipate recessional outwash soils are underlain by dense to very dense glacially consolidated soils at depth (glacial till and/or advance outwash).

Groundwater Conditions

Groundwater seepage was observed in one test pit (TP-14) at about 8 feet bgs, corresponding to Elevation 196 feet. Seepage and/or wet soils were not observed in remaining test pit excavations (as deep as about Elevation 183.5 feet).

We reviewed published groundwater maps and well information available online from the United States Geological Survey (USGS) National Water Information System (NWIS). Our review indicates groundwater elevations in the vicinity decrease from east to west, between about Elevation 200 feet (east of site, near Interstate 5) to Elevation 10 feet (west of site, near Puget Sound). The nearest readily available and most recently discovered information reviewed consisted of five groundwater wells within an approximate 1-mile radius of the project site; measured groundwater depths at these locations were below Elevation 140 feet.

In addition to the regional groundwater, areas of shallow perched groundwater could also be present throughout the site. It is common for perched groundwater to be present near contacts where soil that is more permeable overlies soil that is less permeable (i.e., sand over silt). The quantity and location of perched groundwater, if encountered, at this site is expected to be dependent on infiltration of surface water. Site grading can affect infiltration and therefore, the quantity and location of perched groundwater. Slow to moderate groundwater seepage should be expected if perched groundwater conditions are encountered. Slow seepage is defined as less than 1 gallon per minute (gpm) while moderate seepage is between 1 and 3 gpm.

GEOTECHNICAL DESIGN RECOMMENDATIONS

General

Except as modified in this addendum, the conclusions and recommendations presented in our 2011 Report and 2018 Addendum are appropriate for project design and construction. This includes but is not limited to site development and earthwork, fill placement and compaction, shallow foundation support and bearing surface preparation, retaining walls and stormwater designs. Updated and/or revised geotechnical design recommendations to these reports are provided in the sections below. The recommendations provided in this addendum supersede the recommendations presented in all our past studies, where applicable.

Seismic Design

Seismic Design Approach

Proposed structures will be designed in accordance with seismic design requirements presented in the 2018 or 2021 International Building Code (IBC). The 2018 and 2021 IBC both state that structures shall be designed and constructed to resist the effects of earthquake ground motions in accordance with the

American Society of Civil Engineers (ASCE) "Minimum Design Loads and Associated Criteria for Buildings and Other Structures, ASCE/SE 7-2016" (ASCE 7-16).

Seismic Design Parameters

We used map-based values available online as recommended by the USGS to determine the seismic design spectrum in accordance with ASCE 7-16.

Soils encountered in the test pits (as deep as about 11 feet bgs) consisted of medium dense to very dense sand and gravel recessional outwash deposits. We anticipate these soils are underlain by dense to very dense glacially consolidated soils at depth. We anticipate soils below the explorations and extending to depths of 100 feet bgs consist of dense to very dense glacially consolidated deposits. Based on subsurface conditions encountered, our review and our experience in similar soil conditions, we recommend using a design response spectrum for Site Class C. In our opinion, the parameters provided in Table 1 below are suitable for seismic design and analysis.

TABLE 1. RECOMMENDED SEISMIC DESIGN CRITERIA (2018 OR 2021 IBC PER ASCE 7-16)

ASCE 7-16 Seismic Design Parameters	
Site Class	C
Mapped Spectral Response Acceleration at Short Periods (S_S)	1.371 g
Mapped Spectral Response Acceleration at 1-Second Periods (S_1)	0.487 g
Site Amplification Factor at 0.2 Seconds (F_a)	1.2
Site Amplification Factor at 1.0 Seconds (F_v)	1.5
Design Spectral Response Acceleration at Short Periods (S_{DS})	1.097 g
Design Spectral Response Acceleration at 1-Second Periods (S_{D1})	0.487 g
Site Modified Peak Ground Acceleration (PGA_M)	0.632 g

Liquefaction Potential

DESCRIPTION

Liquefaction refers to the condition by which vibration or shaking of the ground, usually from earthquake forces, disturbs the soil structure (i.e., the arrangement of individual soil particles) within saturated and unconsolidated soils. This rearrangement of particles results in the development of excess pore pressures in saturated soils with subsequent loss of strength. Liquefaction susceptibility is difficult to predict and not all soils are susceptible to liquefaction. In general, soils that are susceptible to liquefaction include very loose to medium dense, "clean" to silty sands below the water table.

Ground settlement, lateral spreading and/or sand boils may result from soil liquefaction. Structures, such as buildings, supported on liquefied soils may suffer loss of bearing capacity, foundation settlement and/or lateral movement that can be damaging to the buildings.

SEISMIC HAZARD MAP REVIEW

We re-reviewed the "Liquefaction Susceptibility Map of Pierce County, Washington" (Palmer et al. 2004[2]) and the Washington State Department of Natural Resources (DNR) Interactive Natural Hazards Map. According to the maps, the site has "very low to low" potential for liquefaction.

ESTIMATED LIQUEFACTION POTENTIAL

Based on the soil and groundwater conditions observed in our explorations, our interpretation of the regional geology and review of hazard maps in the area, it is still our opinion the potential for liquefaction at the site is low.

Lateral Spreading Potential

Lateral spreading related to seismic activity typically involves lateral displacement of large, surficial blocks of non-liquefied soil when an underlying soil layer loses strength during seismic shaking. Lateral spreading usually develops in areas where sloping ground or large grade changes (including retaining walls) are present. Based on our understanding of the subsurface conditions, liquefaction risk, current site topography and proposed site grading, it is our opinion the risk of lateral spreading at the site is low.

Surface Rupture Potential

We reviewed published geologic seismic feature maps of the project vicinity, including maps available online from the DNR, USGS and the Washington Department of Geology and Earth Sciences map "Faults and Earthquakes in Washington State" (Czajkowski and Bowman 2014[3]). The nearest mapped faults to the project site are the Tacoma fault zone (approximately 10 miles northeast of the site) and the Olympia structure (approximately 10 miles southwest). Locations of these fault zones have been inferred from geophysical studies and there are no known surface expressions of the fault. Based on our understanding of local geology, bedrock in the project area is covered by several hundred feet of glacial soils. Based on this information and the fault distance from the project site, it is our opinion the risk for seismic surface rupture at the site is low.

Conventional Retaining Walls and Below-grade Structures

We recommend the following updates to the lateral earth pressures be used for design of conventional retaining walls and below-grade structures in Table 2 below. The parameters below include additional conditions not presented in our 2011 Report that we typically provide in today's studies, for use as needed. Our design pressures assume two conditions: level backfill and 2H:1V (horizontal: vertical) sloping backfill. If drained design parameters are used, drainage systems must be included in the design in accordance with the recommendations presented in our 2011 Report. Our 2011 Report also provides descriptions for the active and at-rest conditions, including surcharge loading, and should be used as part of retaining wall design.

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[2] Palmer, Stephen P., Magsino, Sammantha L., Bilderback, Eric L., Poelstra, James L., Folger, Derek S., and Niggemann, Rebecca A. 2004. Liquefaction Susceptibility Map of Pierce County, Washington. Washington state Department of Natural Resources. Dated September 1, 2004.

[3] Czajkowski, Jessica L. and Bowman, Jeffrey D. 2014. Faults and Earthquakes in Washington State. Washington State Department of Natural Resources. Open File Report 2014-05, 1 sheet, scale 1:750,000.

TABLE 2. LATERAL SOIL PRESSURE PARAMETERS FOR RETAINING WALLS AND BELOW-GRADE STRUCTURES

Soil Parameter	EFD[1] (Level Backfill Condition) (pounds per cubic foot [pcf])	EFD[1] (2H:1V Backfill Condition) (pcf)
Active Earth Pressure	35 pcf drained; 80 pcf undrained[2]	55 pcf drained; 90 pcf undrained[2]
At-rest Earth Pressure	55 pcf drained; 90 pcf undrained[2]	80 pcf drained; 100 pcf undrained[2]
Seismic Loading[3]	14*H pounds per square foot (psf)	22*H psf

Notes:

[1] Equivalent fluid density in pcf.

[2] This value includes hydrostatic pressures.

[3] If the retaining wall is to be designed for seismic forces, we recommend that the seismic loading be approximated using a uniform lateral pressure based on backfill condition, where H is the height (in feet) of the structure. This seismic lateral pressure is in addition to the static soil load and any anticipated hydrostatic pressures. This assumes that the wall is free to yield somewhat during a seismic event.

Infiltration Feasibility Assessment

Infiltration Approach

Stormwater management facilities at the site could include bioretention and on-site infiltration areas. We understand stormwater facilities will be designed in accordance with the City of DuPont 2022 Municipal Code. Per Section 22.01.090 of the DuPont Code, the Washington State Department of Ecology (Ecology) *Stormwater Management Manual for Western Washington* (SWMMWW), shall be used for stormwater drainage design.

According to the 2019 SWMMWW, infiltration rate of on-site soils can be determined by either in-situ testing (e.g., pilot infiltration tests [PIT]) or correlation to grain-size distribution from soil samples. Grain-size analysis is only appropriate for soils unconsolidated by glacial advance. We interpret soils encountered in test pits at the site to consist of recessional outwash deposits, which are unconsolidated by glacial advance. Therefore, it is our opinion that the grain-size analysis method is appropriate for the site.

Where necessary, we also refer to the *2021 Pierce County Stormwater and Site Development Manual* (SMSDM).

Soil Grain-Size Analysis

Using the recommended procedures in the 2019 SWMMWW, we estimated initial saturated hydraulic conductivity ($K_{sat,initial}$) of selected soil samples based on grain-size analysis results using the Massmann method. Calculated $K_{sat,initial}$ was then reduced through correction factors to produce a preliminary long-term design infiltration rate ($K_{sat,design}$). Correction factors in the SWMMWW are based on site variability and number of tests conducted (C_{Fv}), uncertainty of the test method (C_{Ft}), and the potential for long-term clogging due to siltation and bio-buildup (C_{Fm}). Recommended correction factors are outlined in Section V-5.4 of the SWMMWW.

Table 3 below summarizes the partial and total correction factor(s) we considered in our analysis.

TABLE 3. GRAIN-SIZE ANALYSIS CORRECTION FACTOR SUMMARY

Issue	Correction Factor Value
Site Variability and Number of Locations Tested (CF_v)	0.80
Test Method (CF_t)	0.40
Siltation and Bio-Buildup (CF_m)	0.90
Total Correction Factor = CF_v x CF_r x CF_m	**CF_T = 0.29**

Table 4 below summarizes selected samples for grain-size analysis, calculated initial (short-term) infiltration rates and calculated design (long-term, with correction factors applied) infiltration rates. We considered a maximum initial infiltration rate of 100 inches per hour (in/hr) (corresponding to a maximum design rate of 29 in/hr) in our analysis. This is consistent with guidance presented in the Pierce County SMSDM, which allows a maximum design infiltration rate of 30 in/hr.

TABLE 4. ESTIMATED INFILTRATION RATE SUMMARY

Exploration	Depth (feet)	Elevation (feet)	Geologic Unit	USCS Soil Type	Percent Fines	$K_{sat,initial}$ (in/hr) [1]	$K_{sat,design}$ (in/hr) [2]
TP-2	6	203	Recessional Outwash	GP	1.7	100	29
TP-4	4	206	Recessional Outwash	SP	1.0	100	29
TP-7	4	207	Recessional Outwash	GP	1.1	100	29
TP-11	4	190	Recessional Outwash	GP	1.5	100	29
TP-12	6	196	Recessional Outwash	GP	1.0	100	29
TP-14	6	198	Recessional Outwash	GW	2.0	100	29
TP-15	4	199	Recessional Outwash	GP	1.2	54.7	15.7
TP-16	6	209	Recessional Outwash	GW	0.6	100	29
TP-20	6	192	Recessional Outwash	GP	4.2	94.1	27.1
TP-22	4	206	Recessional Outwash	GP	1.1	100	29

Notes:

[1] We considered a maximum initial (measured) infiltration rate of 100 in/hr.

[2] Per Pierce County, maximum allowable design infiltration rate is 30 in/hr.

USCS = Unified Soil Classification System

Recommended Design Infiltration Rate

Calculated design infiltration rates for the selected samples vary between about 15 and 29 in/hr, when also considering Pierce County SMSDM design criteria, and the limit of 30 in/hr. The upper few feet of soil encountered in the test pits were occasionally weathered and somewhat siltier. We anticipate slower infiltration rates within these upper siltier soils. Somewhat "cleaner" soils (fewer fines) were typically observed at depth, on average of about 3 feet bgs. We anticipate, and the data supports, faster infiltration rates in these soils at depth, compared to the upper weathered soils.

Due to the presence of surface weathered recessional outwash deposits, we recommend a design infiltration rate of 15 in/hr be used as an average value across the site for this project. This value may be

considered somewhat conservative. It is likely higher rates can be considered for deeper facilities. This rate would have to be considered on a case-by-case basis.

Stormwater Facility Code Assessment and Additional Design Considerations

Per Section V-5.6.SSC-5 of the SWMMWW, the base of the infiltration facility shall be no less than 5 feet above seasonal high water, bedrock or other low permeability layer. A reduced 3-foot minimum separation can be considered if groundwater mounding analysis and other design factors indicate the prevention of overtopping and that the other site suitability criteria specified in Section V-5.6 are met. Per Section V-5.2.7 of the SWMMWW, the minimum required vertical separation increases to 15 feet if the infiltration facility has a contributing drainage area exceeding 1-acre, otherwise an analytical groundwater model would be required to determine the final design infiltration rate.

- We anticipate static groundwater elevations to be below the depths of the completed test pits, and as deep as 20 feet below surrounding grade, based on recent review of published information and our work in the nearby area.
- Soils encountered in the explorations at depth were observed to consist of recessional outwash deposits and are relatively uniform across exploration locations. No clear demarcation was observed between high or low permeable layers, and in general, low permeability soils were not observed.
- It is our opinion a detailed groundwater analysis will not be required for relatively shallow infiltration facilities anticipated for this project. We suggest we be consulted for further review if infiltration facilities will be more than about 15 feet deep (below existing site grade).
- Additional field infiltration testing, such as PITs, could be considered as a part of this project design and review, especially if site-specific and/or faster rates were desired. At this time, it is our opinion that a PIT study would not provide much more benefit to this project. Additionally, maintaining enough water in the hole for this test may also prove difficult. If PIT studies are desired/required, we recommend the process also be observed with Regulatory Stormwater Agencies in the field so they can directly observe the infiltration process.
- Other considerations such as separation limits from structures, pond locations, security, set-backs, treatments or other requirements presented in the SWMMWW should also be reviewed and considered as a part of the final stormwater facility design.
- To help reduce clogging of infiltration facilities, we recommend they be protected during construction with siltation elimination/siltation control facilities, such as sweeping, temporary settling basins, silt fences and hay bales.
- Compaction of infiltration pond subgrade should be avoided, and equipment should not be permitted in the infiltration areas after they are excavated to design grade.
- We recommend we review project plans and specifications regarding infiltration and be retained during construction to observe soil conditions at the base of the infiltration facilities and verify exposed soil conditions are as anticipated for the proposed design.

Additional Geotechnical Services

Recommendations provided in this report are based on the assumptions and design information stated herein. We welcome the opportunity to review and discuss construction plans and specifications for this project as they are being developed. In addition, GeoEngineers should be retained to review the project plans and specifications when complete to confirm that our design recommendations have been implemented as intended.

Satisfactory foundation and earthwork performance depend to a large degree on quality of construction. Sufficient monitoring of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated.

We recommend that GeoEngineers be retained to observe construction at the site to confirm that subsurface conditions are consistent with the site explorations and to confirm that the intent of project plans and specifications relating to earthwork, pavement and foundation construction are being met.

LIMITATIONS

We have prepared this letter for the exclusive use by Avenue 55, LLC and their authorized agents for the proposed DuPont 243 project in DuPont, Washington. Avenue 55, LLC may distribute copies of this report to the owner and owner's authorized agents and regulatory agencies as may be required for the project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this letter was prepared. The conclusions, recommendations and opinions presented in this report are based on our professional knowledge, judgment and experience. No warranty or other conditions, express or implied, should be understood. Please refer to Appendix A, Report Limitations and Guidelines for Use for additional information pertaining to the use of this report.

Sincerely,
GeoEngineers, Inc.

8/1/2023

Christopher R. Newton, PE
Geotechnical Engineer

Dennis (DJ) Thompson, PE
Associate

CRN:DJT:tlm:mce

Attachments
Figure 1. Vicinity Map
Figure 2. Site Plan
Appendix A. Report Limitations and Guidelines for Use

One electronic copy submitted

P:\26\26421001\GIS\26421001_Project\26421001_Project.aprx\2642100100_F01_VicinityMap Date Exported: 08/01/23 by glohrmeyer

Source(s):
- ESRI

Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet

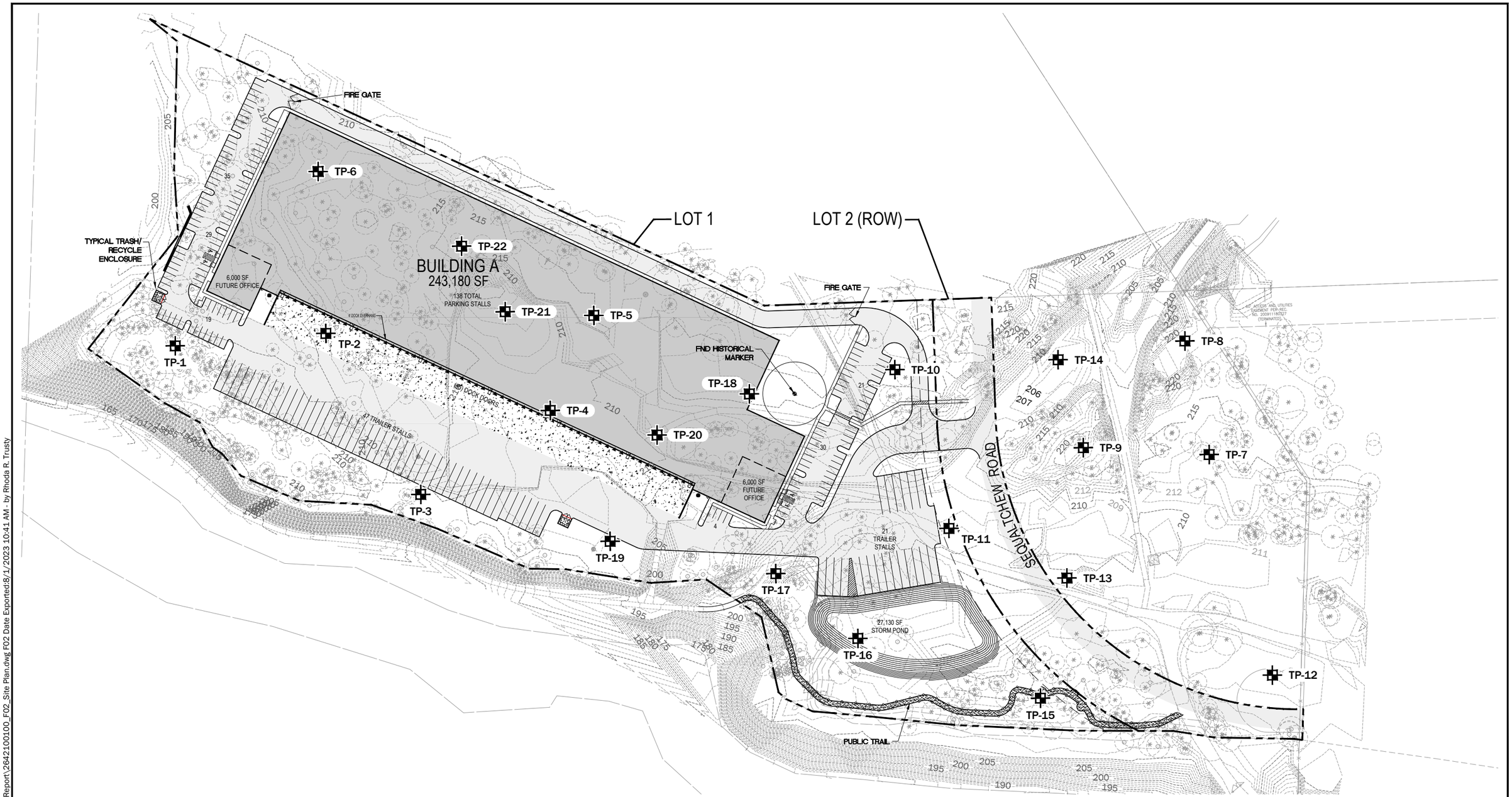
Disclaimer: This figure was created for a specific purpose and project. Any use of this figure for any other project or purpose shall be at the user's sole risk and without liability to GeoEngineers. The locations of features shown may be approximate. GeoEngineers makes no warranty or representation as to the accuracy, completeness, or suitability of the figure, or data contained therein. The file containing this figure is a copy of a master document, the original of which is retained by GeoEngineers and is the official document of record.

Vicinity Map

DuPont 243
DuPont, Washington

GeoEngineers

Figure 1



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Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Existing Grade Surface from Barghausen Consulting Engineers, Inc dated 6/5/2018.
Designs from Innova Architechts dated 7/17/2023.

Projection: NAD83 Washington State Planes, South Zone, US Foot

Legend

TP-1 Test Pit by GeoEngineers, Inc., 2011

N W E S

150 0 150
Feet

Site Plan

DuPont 243
DuPont, Washington

GeoEngineers

Figure 2

APPENDIX A
Report Limitations and Guidelines for Use

APPENDIX A
REPORT LIMITATIONS AND GUIDELINES FOR USE[4]

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its reports. Please confer with GeoEngineers if you need to know more how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services are Performed for Specific Purposes, Persons and Projects

This report has been prepared for Avenue 55, LLC for the Project(s) specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our agreement with Avenue 55, LLC authorized October 17, 2022 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

A Geotechnical Engineering or Geologic Report is based on a Unique Set of Project-Specific Factors

This report has been prepared for the proposed DuPont 243 project located in DuPont, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- Not prepared for you,
- Not prepared for your project,
- Not prepared for the specific site explored, or
- Completed before important project changes were made.

[4] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

For example, changes that can affect the applicability of this report include those that affect:

- The function of the proposed structure;
- Elevation, configuration, location, orientation or weight of the proposed structure;
- Composition of the design team; or
- Project ownership.

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Information Provided by Others

GeoEngineers has relied upon certain data or information provided or compiled by others in the performance of our services. Although we use sources that we reasonably believe to be trustworthy, GeoEngineers cannot warrant or guarantee the accuracy or completeness of information provided or compiled by others.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Geotechnical Engineering Report Recommendations are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- Advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- Encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

Contractors are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

GeoEngineers
1101 Fawcett Ave, Suite 200
Tacoma, Washington 98402
253.383.4940

October 20, 2023

Avenue 55, LLC
601 Union Street, Suite 2930
Seattle, Washington 98101

Attention: Ben Varin

Subject: Report Addendum 3
Geotechnical Engineering Services
DuPont-West
DuPont, Washington
File No. 26421-001-00

INTRODUCTION AND PROJECT UNDERSTANDING

This report addendum (Addendum 3) presents geotechnical recommendations and considerations for the proposed DuPont-West project and is intended to provide supplemental geotechnical design recommendations to our previous studies at the site. The purpose of this addendum is to reflect the updated site plan layout described below and provide discussion on critical areas, specifically geologically hazardous areas consisting of landslide and erosion hazards near the site. The site is located at 1700 Center Drive in DuPont, Washington. An overview of the property and its surrounding area is shown on the Figure 1, Vicinity Map.

Our experience at the site includes involvement with the previous owner, Dupont Station Partners, LLC for the proposed DuPont Industrial Warehouse (also referred to as Lot "Y" Industrial Park). We understand Avenue 55, LLC has been given permission by Dupont Station Partners, LLC to have the full use of studies held by GeoEngineers, Inc. (GeoEngineers) and as related to the site address. Our previous geotechnical deliverables for the site include:

- "Geotechnical Engineering Services, Lot 'Y' Industrial Park, DuPont, Washington" dated October 10, 2011 (2011 Report). As part of our services, we advanced 22 test pit explorations in the project area to develop an understanding of subsurface conditions. The 2011 Report presents a summary of our findings, conclusions, and recommendations regarding geotechnical engineering aspects of the proposed industrial park development.
- "Report Addendum, Geotechnical Engineering Services, DuPont Industrial Warehouse, DuPont, Washington" dated May 11, 2018 (2018 Addendum), which includes our review of a proposed development site plan and updated recommended seismic design parameters.

- Report Addendum, Geotechnical Engineering Services, DuPont Industrial Park, DuPont, Washington", dated November 8, 2022 (November 2022 Addendum).
- "Revised Report Addendum 2, Geotechnical Engineering Services, DuPont 243, DuPont, Washington" dated August 1, 2023 (August 2023 Addendum), which includes our review of an updated development site plan and confirmation of previously provided geotechnical design recommendations.

We have also reviewed the following document by GeoEngineers, prepared for others, nearby:

- GeoEngineers, Inc. 2011. Stream Habitat Assessment Summary, Creekside Village Development, DuPont, Washington. Prepared for Creekside DuPont Partners, LLC, on October 12, 2011. (GeoEngineers File No. 16785-002-01).

Our understanding of the current project is based on discussions and correspondence with Avenue 55, LLC and review of an updated site plan sheet A0.1 "SEPA Site Plan" dated July 11, 2023 (Site Plan). The project will include construction of a 256,800-square-foot, dock-high slab, warehouse building, referred to as Building A. Surrounding improvements will include paved parking and driveway areas, hardscaping, new utility installation, landscaping, and stormwater management facilities, including a 21,930-square-foot stormwater pond (inferred from above Site Plan). A relatively short retaining wall (up to 6 feet tall) is proposed along the west parking lot and adjacent to the west property boundary. The site development features are shown on the attached Figure 2, Site Plan.

The south property boundary runs near parallel and above a southward facing slope that leads down to Sequalitchew Creek Trail and Sequalitchew Creek. The slope is typically in excess of 25 feet tall, with height increasing up to or even greater than 50 feet toward the west. The slope is inclined downward from the site between about 1H:1V (horizontal:vertical) and 3½H:1V. Some local areas are on the order of ¾H:1V. The Sequalitchew Creek Trail bisects the approximate center of the slope and runs approximately parallel with the top of the slope. The eastern half of the trail varies in elevation and essentially rises near the elevation of the top of the slope.

PURPOSE AND SCOPE OF SERVICES

The purpose of our services is to complete a limited slope reconnaissance and to provide discussion on critical areas (geologically hazardous areas) at the site. The terms of our services have been provided in accordance with our signed agreement with Avenue 55, LLC (signed October 17, 2022). We have been requested to address the City of DuPont Comments provided in their review letter dated September 22, 2023, as follows: "Provide a letter from the geotechnical engineer that address the City's Geologic Hazard assessment requirements, makes a recommendation for a protective buffer, and depict the protective buffer on the plans."

LITERATURE REVIEW AND ASSESSMENT

Geology Review

We include our geology literature review from our past studies (2011 Report) which states:

"Based on review of the Geologic Map of the Nisqually 7.5 Minute Quadrangle, Thurston and Pierce Counties, Washington (Walsh et al., 2003). Vashon recessional outwash sand and gravel is the dominant, near-surface, geologic material mapped in the immediate project area. This material is commonly known as Steilacoom gravel. Vashon recessional outwash was deposited by melt water streams in front of the most recent glacier during its retreat from the Puget Sound region approximately 10,000 to 15,000 years ago. These deposits generally consist of permeable sand, or sand and gravel. Cobbles and boulders can also be encountered in this deposit, depending on the depositional history. Glacial till and/or advance outwash is commonly encountered at depth below the recessional outwash."

We also provide the following contained in our 2011 report: "The United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey of Pierce County Area, Washington, maps the project area as Spanaway gravelly sandy loam (41A). This soil unit is described as being formed in glacial outwash. It is further described as somewhat excessively drained with moderately rapid permeability, slow surface runoff and little erosion hazard."

Based on our current review and studies, it is our opinion that the soil descriptions in the published literature documents are still appropriate for this project.

Washington State DNR Geologic Information Portal

We reviewed the Washington State Department of Natural Resources (Washington State DNR) Geologic Information Portal (accessed October 16, 2023), which provides maps of landslides and areas susceptible to landslides. Based on our review, the southward facing slope near the southern property boundary is mapped as having a susceptibility to shallow landsliding. No active landslides appear to be mapped in the project vicinity.

DuPont Municipal Code

General

We reviewed the City of DuPont "DuPont Municipal Code" (DMC). Specifically, we reviewed Chapter 25.105 "Critical Areas" of the DMC which provides criteria for Geologically Hazardous Areas consisting of Landslide and Erosion Hazards. Seismic design and opinions have been provided in our past studies. In summary, we concluded that seismic hazards (liquefaction, lateral spreading, surface fault ruptures) do not appear to be present at this site and in our opinion, are at a low risk of occurring.

Landslide Hazard Areas

Based on our review of the Site Plan and understanding of the site, the southward facing slope meets the following criteria provided in the DMC for landslide hazard areas based on the following:

- Slope is mapped by the Washington State DNR as having a susceptibility to shallow landsliding.
- A majority of the slope grade is 40 percent or steeper and has vertical relief of 10 feet or more.

Erosion Hazard Areas

Per the DMC, the southward facing slope would be designated as an erosion hazard area, primarily because it is associated with the Sequalitchew Creek "channel migration zone". The DMC states that "Channel migration zones, also known as riverine erosion areas, are defined as the areas along a river or stream within which the channel(s) can be reasonably predicted to migrate over time. This is a result of natural and normally occurring geomorphic, hydrological, and related processes when considered with the characteristics of the river or stream and its surroundings, and in consideration of river and stream management plans. Channel migration hazard areas shall include potential channel migration, channel avulsion, bank erosion, and stability of slopes along the river or stream".

Slope Reconnaissance

We completed a limited slope reconnaissance on October 12, 2023, of the southward facing slope between the upland part of the site and Sequilitchew Creek. Our slope reconnaissance was focused primarily on the central to western half of the site, where the slope is generally steepest and closest to proposed parking and building improvements. Our observations were made from hiking the top of the slope and at the approximate midline-base of the slope along the Sequalitchew Creek Trail.

The slope is generally forested with deciduous and coniferous trees, and densely vegetated with underbrush (i.e., small shrubs and trees, sword ferns, etc.). "Horse tails", plant vegetation typically formed in the presence of constant wet surface water, were also observed in isolated, clustered sections (approximately 50 feet or less in length) along the northern edge of the Sequalitchew Creek trail below the project area. The ground appeared wet where horse tails were present, and intermittently outside of areas containing horse tails. We did not observe the presence of groundwater seepage flow in this area during our reconnaissance.

We probed the slope surfaces around the trail area, primarily to north of the trail, with a ½-inch diameter steel probe rod and through forest duff and/or vegetative matter, where accessible and as needed. Typical probe depths were generally less than 6 inches, with isolated locations between 12 and 18 inches, before firmer underlying soil conditions were encountered. Similarly, near the top of the slope, probe depths were generally between about 12 and 18 inches before reaching firm soil conditions.

Natural soil along the slope surfaces was observed to be intermittently exposed and generally consisted of sand and gravel with varying silt content. Probe depths were generally less than 2 inches in these exposed soils and were noted to be in a dense condition. We interpret the soil conditions, where exposed, along the slope surfaces to generally be consistent with the glacial recessional outwash deposits recorded in our 2011 Report and the overall geologic conditions reported in the project vicinity. Some of the exposures could be indicative of a glacial till or glacial drift material, and generally comprised very dense, glacially consolidated silty sand with gravel. It is common for glacial till and drift materials to underly recessional outwash deposits in the project area.

Where accessible, we did not observe tension cracks or signs of movement near the top of the slope. Periodic and isolated "pistol butting" of tree trunks, at their base, were observed along the slope faces, but were typically surrounded by well-established mature trees growing vertically. Pistol butting of trees can indicate past or current slope movements; however, based on the soil conditions observed and the vertical growth patterns for surrounding trees, the pistol butting observed is, in our opinion, likely attributed to the tree germinating on a slope, potential damage incurred early in the tree's life, and/or due to slow colluvial creep of the duff and upper weathered soil zone. In some isolated areas of exposed soil, we observed minor surface raveling, shallow surficial slumps, and sloughing.

We consider the surface raveling, shallow surficial slumps, and sloughing observed to be associated with minor erosion and surficial failures common to natural slopes in the project vicinity and region. We did not observe any indications of significant seepage or global slope instability. Since our field efforts were completed in 2011, and in some instances prior to 2011 (studies completed for nearby projects), we have not observed any indications of landsliding or received reports of soil movements within the slope below the project area.

CONCLUSIONS AND RECOMMENDATIONS

General

Except as modified in this addendum, the conclusions and recommendations presented in our 2011 Report and subsequent addenda are appropriate for geotechnical project design and construction. In this addendum, we provide additional geotechnical considerations for the project, specifically relating to geologically hazardous areas south of the proposed development.

Based on definitions presented in the DMC, it is our opinion that the southward facing slope can be designated as both a landslide hazard and erosion hazard area due to characteristics of a steep slope, shallow landslide potential, and its association with the channel migration zone of Sequalitchew Creek. Per the DMC, setbacks for each hazard should be based on the findings of a qualified professional. We provide additional discussion on each hazard, including an overview of current setbacks in the sections below.

Landslide Hazard

Soil conditions at the site, including the steep slope areas, comprise dense glacial deposits. Typically, deep-seated failures on these types of glacial slopes inclined at about ¾H:1V, or shallower, are rare. Based on our studies, explorations, and site experience, it is our opinion that there is a low risk of large-scale global instability occurring on the southward facing slope below the proposed development. It is also our opinion that landslide hazards designated at this site should not be considered a limiting factor for the proposed development, provided that proper design, setbacks, and engineering controls are implemented.

The southward facing steep slope will be at risk for relatively shallow sloughing, slow “creep” movement and/or local surficial failures. We observed evidence of these features, as described above. These are natural processes that occur with or without development. Mitigation measures are often limited to appropriate setbacks and monitoring and maintenance. The amount and magnitude of sloughing is typically due to natural processes that can include weathering, seepage, saturation during heavy rain events, decay of roots, downed trees, and activity of burrowing animals. The addition of human design elements, such as fill scattering, mis-directed stormwater sheet flow, and irrigation, can also increase this risk.

Site plans reviewed indicate the closest improvement to the top of the steep slope will be the paved parking and driveway areas, which are 50 feet away. Proposed Building A is shown to be setback more than 100 feet from the top of the slope. The stormwater pond proposed is at least 100 feet away from the top of the slope. It should be noted that this pond location is consistent with the 100-foot setback guidance as described in Volume V, Section 1.2 of the 2019 Washington State Department of Ecology’s Stormwater Management Manual for Western Washington.

Based on our studies, we recommend a non-improvement area/buffer/setback of 50 feet be established and maintained from the top of the slope to address landslide hazard considerations described. Review of the project Site Plan indicates that this recommended setback has been established as a part of the project design, and as such we take no issue with this. Other requirements presented in the DMC related to development near landslide hazard areas, such as construction methods, erosion control, site disturbance, etc., should also be considered, and incorporated, where necessary.

Erosion Hazard

Based on our studies, it is our opinion that there is the potential for shallow erosion and surficial failures/sloughing within the south slope face, particularly in areas where vegetation is sparse or non-existent. We observed these features during our site visit and should be expected to continue. These are natural processes that occur with or without development. Areas with thicker weathered and organic or forest duff materials that have undergone several weather cycles are also subject to shallow erosion and surficial failures, especially if it becomes oversaturated. Areas of the slope that are more exposed and contain less vegetation are more likely subject to erosion, compared to areas that contain denser vegetation.

Based on our studies, it is our opinion that erosion hazards, as defined in the DMC, as well as the other potential erosion hazards described above, should not be considered a limiting factor for the proposed development. It is our opinion that the 50-foot setback buffer established for the project is adequate to protect structures and improvements from the erosion hazards expected at this site. We further conclude that the risk of toe erosion caused by significant stream meandering of Sequilitchew Creek along base of slope is low. This creek appears to be relatively dry for most of the time of the year, contains a relatively large channel, has a linear alignment through the project area, and overall, not expected to develop stream velocities that would compromise the toe of the slope.

Temporary and permanent site development should include provisions to protect steep slopes from erosion. Engineering controls to mitigate erosion by limiting soil disturbance in steep slope areas, controlling surface water management, and re-establishment of ground cover and vegetation should be included in design and planning. Stormwater facilities and other site drainage should be designed such that they do not discharge directly over or within the buffers and the steep slope areas. Other provisions in the DMC for development in erosion hazard areas should also be considered during design and planning. In addition, discussions on erosion control have been provided in the “Erosion and Sedimentation Control” section of our 2011 Report and should be considered as a part project development and design.

LIMITATIONS

We have prepared this report for Avenue 55, LLC, for the DuPont-West project located at 1700 Center Drive in DuPont, Washington and is intended to provide supplemental geotechnical design recommendations to our previous studies at this site for this project. Avenue 55, LLC may distribute copies of this report to authorized agents and regulatory agencies as may be required for the project.

Our services were provided to assist in the design of foundations for a planned structure to be located on or near sloping property. Our recommendations are intended to improve the overall stability of the site and to reduce the potential for future property damage related to earth movements, drainage, or erosion. Qualified engineering and construction practices can help mitigate the risks inherent in construction on slopes, although those risks cannot be eliminated completely. Favorable performance of structures in the near term is useful information for anticipating future performance, but it cannot predict or imply a certainty of long-term performance, especially under conditions of adverse weather or seismic activity.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. The conclusions, recommendations, and opinions presented in this report are based on our professional knowledge, judgment, and experience. No warranty or other conditions, express or implied, should be understood.

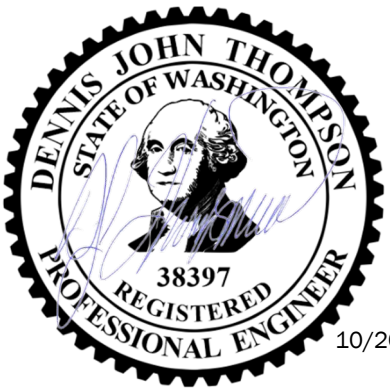
Any electronic form, facsimile or hard copy of the original document (email, text, table and/or figure), if provided, and any attachments should be considered a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

Please refer to Appendix A titled "Report Limitations and Guidelines for Use" provided in our "Revised Report Addendum 2, Geotechnical Engineering Services, DuPont 243, DuPont, Washington" dated August 1, 2023 (August 2023 Addendum) for additional limitations and information pertaining to use of this report. The recommendations, limitations, and information presented in the August 2023 Addendum also apply to this letter. Except as modified herein, our August 2023 letter is still applicable and should be considered a part of this study and reviewed for our complete geotechnical recommendations.

Sincerely,
GeoEngineers, Inc.

Christopher R. Newton, PE
Geotechnical Engineer

10/20/23



Dennis (DJ) Thompson, PE
Associate

10/20/23

CRN:DJT:atk

Attachments
Figure 1. Vicinity Map
Figure 2. Site Plan

P:\26\26421001\GIS\26421001_Project\26421001_Project.aprx\2642100100_F01_VicinityMap Date Exported: 10/16/23 by Jfellows

Source(s):
- ESRI

Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet

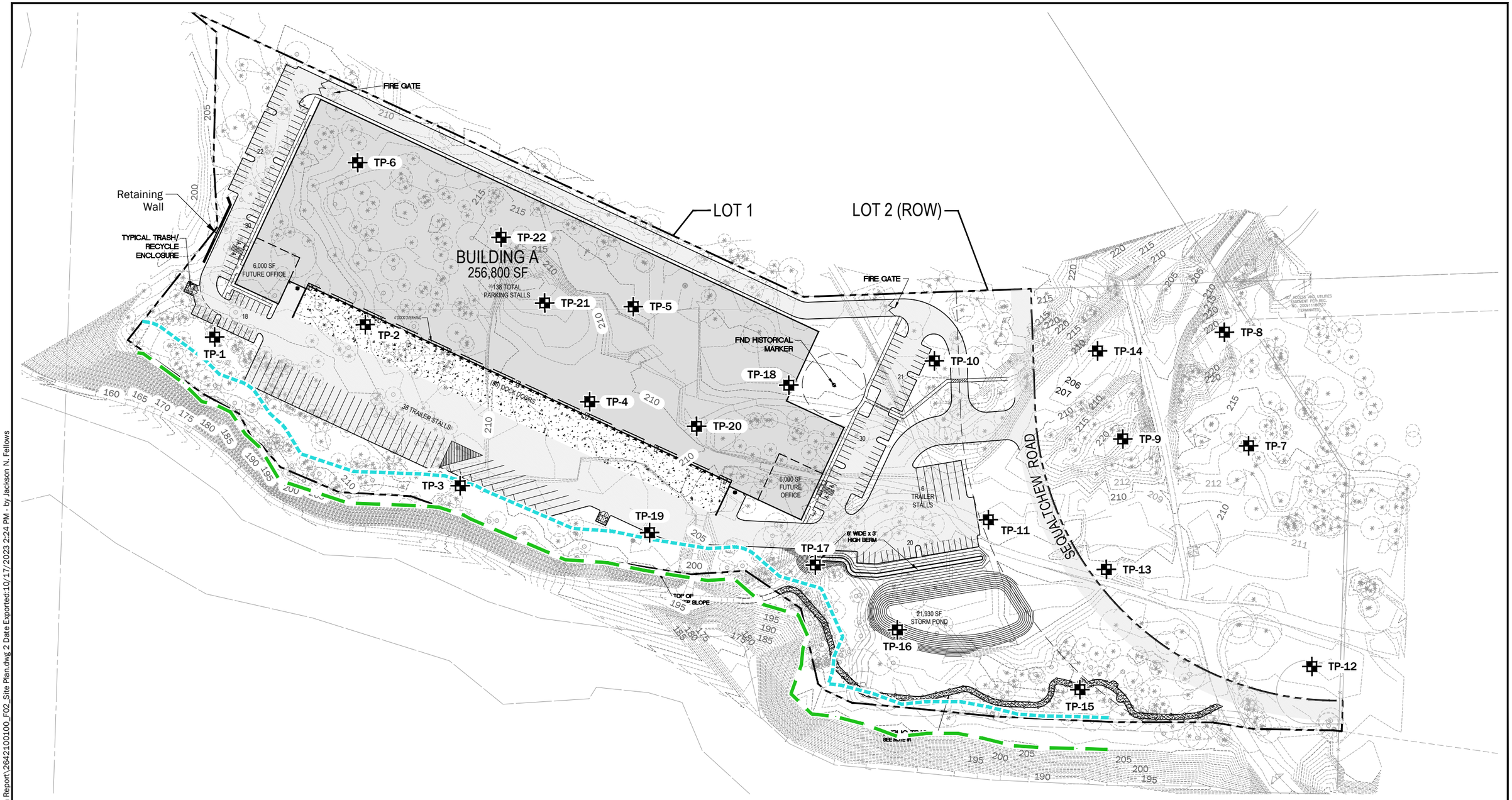
Disclaimer: This figure was created for a specific purpose and project. Any use of this figure for any other project or purpose shall be at the user's sole risk and without liability to GeoEngineers. The locations of features shown may be approximate. GeoEngineers makes no warranty or representation as to the accuracy, completeness, or suitability of the figure, or data contained therein. The file containing this figure is a copy of a master document, the original of which is retained by GeoEngineers and is the official document of record.

Vicinity Map

DuPont - West
DuPont, Washington

GeoEngineers

Figure 1



Legend

- Top of slope
- 50' Setback from Top of Slope
- TP-1 Test Pit by GeoEngineers, Inc., 2011

N

0 150

Feet

Source(s):

- Survey from Barghausen Consulting Engineers Inc., dated 6/5/2018
- Proposed site features from Innova Architects, dated 7/17/2022

Projection: WA State Plane, North Zone, NAD83, US Foot

Disclaimer: This figure was created for a specific purpose and project. Any use of this figure for any other project or purpose shall be at the user's sole risk and without liability to GeoEngineers. The locations of features shown may be approximate. GeoEngineers makes no warranty or representation as to the accuracy, completeness, or suitability of the figure, or data contained therein. The file containing this figure is a copy of a master document, the original of which is retained by GeoEngineers and is the official document of record.

Site Plan

DuPont - West
DuPont, Washington

GeoEngineers

Figure 2

P:\26\26421001\CAD\00\Revised Geotech Report\26421001100_F02_Site Plan.dwg 2 Date Exported:10/17/2023 2:24 PM - by Jackson N. Fellows

8.0 OTHER PERMITS

8.0 OTHER PERMITS

Other permits for this project site include:

- NPDES General Permit from the Department of Ecology for construction on sites with areas of disturbance over an acre of land which this site qualifies for
- Site Development Permit
- Clear and Grade Permit
- Building Permit
- Right-of-Way Use Permit
- Forest Practices Permit
- Water Line Extension Permit
- Sanitary Sewer Extension Permit

9.0 OPERATIONS AND MAINTENANCE MANUAL

No. 2 – Infiltration

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
General	Trash & Debris	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Poisonous/Noxious Vegetation	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Contaminants and Pollution	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Rodent Holes	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1)
Storage Area	Sediment	Water ponding in infiltration pond after rainfall ceases and appropriate time allowed for infiltration. Treatment basins should infiltrate Water Quality Design Storm Volume within 48 hours, and empty within 24 hours after cessation of most rain events. (A percolation test pit or test of facility indicates facility is only working at 90% of its designed capabilities. Test every 2 to 5 years. If two inches or more sediment is present, remove).	Sediment is removed and/or facility is cleaned so that infiltration system works according to design.
Filter Bags (if applicable)	Filled with Sediment and Debris	Sediment and debris fill bag more than 1/2 full.	Filter bag is replaced or system is redesigned.
Rock Filters	Sediment and Debris	By visual inspection, little or no water flows through filter during heavy rain storms.	Gravel in rock filter is replaced.
Side Slopes of Pond	Erosion	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
Emergency Overflow Spillway and Berms over 4 feet in height.	Tree Growth	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Piping	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
Emergency Overflow Spillway	Rock Missing	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Erosion	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
Pre-settling Ponds and Vaults	Facility or sump filled with Sediment and/or debris	6" or designed sediment trap depth of sediment.	Sediment is removed.

No. 5 – Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
General	Trash & Debris	Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%.	No Trash or debris located immediately in front of catch basin or on grate opening.
		Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe.	No trash or debris in the catch basin.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Inlet and outlet pipes free of trash or debris.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within the catch basin.
	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	No sediment in the catch basin
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch (Intent is to make sure no material is running into basin).	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Frame is sitting flush on the riser rings or top slab and firmly attached.
	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound.	Basin replaced or repaired to design standards.
		Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Pipe is regrouted and secure at basin wall.
	Settlement/ Misalignment	If failure of basin has created a safety, function, or design problem.	Basin replaced or repaired to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the basin opening.	No vegetation blocking opening to basin.
		Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation or root growth present.
	Contamination and Pollution	See "Detention Ponds" (No. 1).	No pollution present.

No. 5 – Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Catch basin cover is closed
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. (Intent is keep cover from sealing off access to maintenance.)	Cover can be removed by one maintenance person.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
Metal Grates (If Applicable)	Grate opening Unsafe	Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

No. 6 – Debris Barriers (e.g., Trash Racks)

Maintenance Components	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Trash and Debris	Trash or debris that is plugging more than 20% of the openings in the barrier.	Barrier cleared to design flow capacity.
Metal	Damaged/ Missing Bars.	Bars are bent out of shape more than 3 inches.	Bars in place with no bends more than 3/4 inch.
		Bars are missing or entire barrier missing.	Bars in place according to design.
		Bars are loose and rust is causing 50% deterioration to any part of barrier.	Barrier replaced or repaired to design standards.
	Inlet/Outlet Pipe	Debris barrier missing or not attached to pipe	Barrier firmly attached to pipe

No. 15 – Manufactured Media Filters)

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Below Ground Vault	Sediment Accumulation on Media.	Sediment depth exceeds 0.25-inches.	No sediment deposits which would impede permeability of the compost media.
	Sediment Accumulation in Vault	Sediment depth exceeds 6-inches in first chamber.	No sediment deposits in vault bottom of first chamber.
	Trash/Debris Accumulation	Trash and debris accumulated on compost filter bed.	Trash and debris removed from the compost filter bed.
	Sediment in Drain Pipes/Clean-Outs	When drain pipes, clean-outs, become full with sediment and/or debris.	Sediment and debris removed.
	Damaged Pipes	Any part of the pipes that are crushed or damaged due to corrosion and/or settlement.	Pipe repaired and/or replaced.
	Access Cover Damaged/Not Working	Cover cannot be opened; one person cannot open the cover using normal lifting pressure, corrosion/deformation of cover.	Cover repaired to proper working specifications or replaced.
	Vault Structure Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab	Cracks wider than 1/2-inch or evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determine that the vault is not structurally sound.	Vault replaced or repairs made so that vault meets design specifications and is structurally sound.
		Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks.	Vault repaired so that no cracks exist wider than 1/4-inch at the joint of the inlet/outlet pipe.
	Baffles	Baffles corroding, cracking warping, and/or showing signs of failure as determined by maintenance/inspection person.	Baffles repaired or replaced to specifications.
	Access Ladder Damaged	Ladder is corroded or deteriorated, not functioning properly, not securely attached to structure wall, missing rungs, cracks, and misaligned.	Ladder replaced or repaired and meets specifications, and is safe to use as determined by inspection personnel.
Below Ground Cartridge Type	Media	Drawdown of water through the media takes longer than 1 hour, and/or overflow occurs frequently.	Media cartridges replaced.
	Short Circuiting	Flows do not properly enter filter cartridges.	Filter cartridges replaced.

No. 18 – Catchbasin Inserts

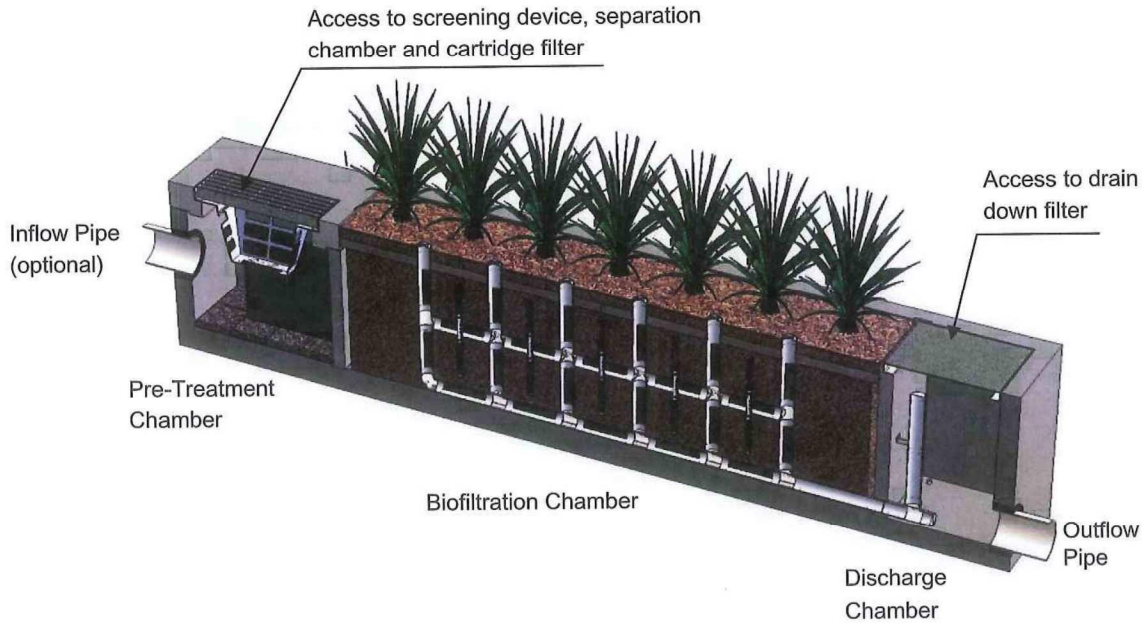
Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Sediment Accumulation	When sediment forms a cap over the insert media of the insert and/or unit.	No sediment cap on the insert media and its unit.
	Trash and Debris Accumulation	Trash and debris accumulates on insert unit creating a blockage/restriction.	Trash and debris removed from insert unit. Runoff freely flows into catch basin.
	Media Insert Not Removing Oil	Effluent water from media insert has a visible sheen.	Effluent water from media insert is free of oils and has no visible sheen.
	Media Insert Water Saturated	Catch basin insert is saturated with water and no longer has the capacity to absorb.	Remove and replace media insert
	Media Insert-Oil Saturated	Media oil saturated due to petroleum spill that drains into catch basin.	Remove and replace media insert.
	Media Insert Use Beyond Normal Product Life	Media has been used beyond the typical average life of media insert product.	Remove and replace media at regular intervals, depending on insert product.

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



www.modularwetlands.com

Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Maintenance Procedure Illustration

Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.

Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.

Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

BIO CLEAN ENVIRONMENTAL SERVICES, INC.

Inspection Report
Modular Wetlands System

MODULAR WETLANDS

Project Name _____

Project Address _____ (city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

BIO CLEAN ENVIRONMENTAL SERVICES, INC.

Cleaning and Maintenance Report
Modular Wetlands System

MODULAR WETLANDS

Project Name _____

Project Address _____ (city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date) Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments: _____

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

Ecology's Conditions of Use:

Applicants shall comply with the following conditions:

1. Design, assemble, install, operate, and maintain the MWS – Linear Modular Wetland Stormwater Treatment System units, in accordance with Modular Wetland Systems, Inc. applicable manuals and documents and the Ecology Decision.
2. Each site plan must undergo Modular Wetland Systems, Inc. review and approval before site installation. This ensures that site grading and slope are appropriate for use of a MWS – Linear Modular Wetland Stormwater Treatment System unit.
3. MWS – Linear Modular Wetland Stormwater Treatment System media shall conform to the specifications submitted to, and approved by, Ecology.
4. The applicant tested the MWS – Linear Modular Wetland Stormwater Treatment System with an external bypass weir. This weir limited the depth of water flowing through the media, and therefore the active treatment area, to below the root zone of the plants. This GULD applies to MWS – Linear Modular Wetland Stormwater Treatment Systems whether plants are included in the final product or not.
5. Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of manufactured filter treatment device.

    - Typically, Modular Wetland Systems, Inc. designs MWS - Linear Modular Wetland systems for a target prefilter media life of 6 to 12 months.
    - Indications of the need for maintenance include effluent flow decreasing to below the design flow rate or decrease in treatment below required levels.
    - Owners/operators must inspect MWS - Linear Modular Wetland systems for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.
    - Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.
    - When inspections are performed, the following findings typically serve as maintenance triggers:
        - Standing water remains in the vault between rain events, or
        - Bypass occurs during storms smaller than the design storm.
        - If excessive floatables (trash and debris) are present (but no standing water or excessive sedimentation), perform a minor maintenance consisting of gross solids removal, not prefilter media replacement.
        - Additional data collection will be used to create a correlation between pretreatment chamber sediment depth and pre-filter clogging (see *Issues to be Addressed by the Company* section below)
6. Discharges from the MWS - Linear Modular Wetland Stormwater Treatment System units shall not cause or contribute to water quality standards violations in receiving waters.

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision- making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. BACKGROUND

1. Name of proposed project, if applicable:

   DuPont 243

2. Name of applicant:

   Ben Varin
   Avenue 55
   601 Union Street, Suite 2930
   Seattle, WA 98101

3. Address and phone number of applicant and contact person:

   Ben Varin
   Avenue 55
   601 Union Street, Suite 2930
   Seattle, WA 98101
   206-707-9696

   Agent: *Dan Balmelli, P.E.*
   Barghausen Engineers
   18215-72nd Avenue South
   Kent, WA 98032
   425-251-6222

4. Date checklist prepared:

   November 18, 2022
   Revised March 30, 2023
   Revised August 4, 2023
   Revised November 9, 2023

5. Agency requesting checklist:

   City of DuPont

6. Proposed timing or schedule (including phasing, if applicable):

   Project is anticipated to start Summer of 2024 or as soon as applicable permits are issued.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

   There are no plans for future additions or expansions beyond the scope of work identified in this application.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

   Previous environmental information prepared for the project under a previous Land Use application includes the following:

   Environmental Checklist
   Cultural Resources Report
   Geotechnical Engineering Report
   Geotechnical Engineering Report Addendum

Technical Information Report
Traffic Impact Analysis
Tree Retention Plan / Arborist Report
Consent Decree between Washington State DOE and Weyerhaeuser Company and DuPont Company

New or revised environmental information prepared for the current proposed project includes the following:

Environmental Checklist
Updated Cultural Resources Study
Updated Geotechnical Engineering Addendum Letter
Stormwater Pollution Prevention Plan
Updated Technical Information Report
Updated Traffic Impact Analysis
Updated Tree Retention Plan / Arborist Report
Noise Study
Bat Habitat Reconnaissance

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

There are no pending applications to our knowledge.

10. List any government approvals or permits that will be needed for your proposal, if known.

Building Permit by City of DuPont
Plumbing/Electrical/Mechanical Permits by City of DuPont
Fire Suppression and Alarm Permits by City of DuPont
Environmental Determination by City of DuPont
Site Plan Approval by City of DuPont
Site Work Permit by City of DuPont
Grading Permit by City of DuPont
Forest Practice Application by Department of Natural Resources
Water Main Extension by City of DuPont
Right-of-Way Use Permit by City of DuPont
Pre-Treatment Approval by Pierce County Utilities
Sanitary Sewer Extension by Pierce County Utilities
NPDES Permit by Department of Ecology
Trash Location Approval by LeMay, Inc.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

SEPA and Land Use applications were previously submitted and processed through the City of Dupont for a similar project in 2018. A SEPA decision was issued for the project in February of 2019 and was subsequently appealed on issues relative to the relocation of the existing Mission Marker and the location of the project adjacent to a public road. The project

has been revised to maintain the location of the existing Mission Marker and a short plat has been processed to address the location of the project relative to the public roadway.

*The project proposes to construct **one** office/warehouse building totaling approximately **256,800** square feet on an approximate 19.65-acre vacant parcel of land located on the west side of Sequalitchew Drive. In addition to construction of the new building, the project will include grading activities, paved truck maneuvering and truck and vehicular parking areas, landscaping, water and sanitary sewer extensions, stormwater collection and infiltration facility, extension of Sequalitchew Drive, franchise utility improvements, relocation and reconstruction of a portion of the existing Sequalitchew Trail and protection of an existing Mission Marker with a 50-foot buffer located within the middle east portion of the site.*

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The site is located to the west of Center Drive and to the west of the proposed extension of Sequalitchew Drive and is a portion of the NW 1/4 of Section 26, Township 19 North, Range 1 East, W.M.

Site Address: 1700 Center Drive

Tax Parcel No: 011926-6005 and 6006

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

The site is predominantly flat however, an area classified as slopes greater than 40% is located at the southern edge of the site.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

According to the (USDA) United States Department of Agriculture (SCS) Soil Survey of Pierce County the soil type is Spanaway gravelly sandy loam (41a). Based on review of the Geologic Map of the Nisqually 7.5 Minute Quadrangle, Thurston and Pierce County, Washington (Walsh et al., 2003) Vashon recessional outwash sand and gravel is the dominant, near-surface geologic material mapped in the immediate project area. Refer to the Geotechnical Engineering Report prepared by GeoEngineers for more detailed information.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

None are known to exist to our knowledge.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Approximately 32,400 cubic yards of cut and 24,600 cubic yards of fill will be used to prepare the site for building construction. Approximately 6,500 cubic yards of stripping material will be removed from the site.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Yes, erosion could occur as a result of construction activities, however a temporary erosion and sedimentation control plan will be designed and implemented according to City of DuPont standards to control erosion on the site.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Approximately 69 percent of the site will be impervious surface upon project completion.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

A temporary erosion and sedimentation control plan will be implemented during construction to reduce and control erosion impacts.

2. **Air**

a. What types of emissions to the air would result from the proposal (i.e. dust, automobile, odors, industrial wood smoke) during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities, if known.

During construction, emissions from construction equipment would be present After construction, emissions from truck and vehicular traffic to and from the site would be present.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

Emissions from vehicular traffic on area roadways could be present but would not be anticipated to affect the project.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Construction equipment will be maintained to be in good working condition. No other specific measures are proposed.

3. **Water**

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes, Sequalitchew Creek is located to the south of the site and flows to the west to discharge to Puget Sound.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes, work will be conducted within 200 feet of Sequalitchew Creek.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No fill of dredge material will be placed in or removed from surface waters.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities, if known.

No surface water withdrawals or diversions are proposed.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Per FIRM Map Panel 53053C0570E, dated March 7, 2017, the site is located adjacent to Zone A associated with Sequalitchew Creek.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No waste materials will be discharged to surface water under this proposal.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximately quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

No groundwater will be withdrawn, or water discharged to groundwater under this proposal.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be discharged to the ground. All sanitary sewer effluent will be collected and conveyed via tightline pipe to the existing sanitary sewer system.

c. Water Runoff (including storm water):

a) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The source of runoff will be rainfall from building roof tops and pavement areas. Stormwater will be collected and conveyed through catch basins and storm pipe for water quality treatment prior to entering the proposed infiltration system.

b) Could waste materials enter ground or surface waters? If so, generally describe.

No waste materials would enter groundwater under this proposal. All sanitary sewer effluent will be collected and conveyed to the existing sanitary sewer system.

c) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

Infiltration is proposed for the site and will not alter the current drainage pattern of the area.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

A storm drainage system will be designed and constructed per city of DuPont standards to control runoff from the proposed project.

4. **Plants**

a. Check or circle types of vegetation found on the site:

__X__ deciduous tree: alder, maple, Aspen, other
__X__ evergreen tree: fir, cedar, pine
_____ Shrubs
__X__ Grass
_____ pasture
_____ crop or grain
_____ orchards, vineyards, or other permanent crops.
_____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
_____ water plants: water lily, eelgrass, milfoil, other
_____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Most of the existing trees and vegetation will be removed for development of the proposed project. Existing landmark trees will be retained as required. Please refer to the Arborist Report/Tree Retention Plan prepared by Washington Forestry Consultants included in this submittal.

c. List threatened or endangered species known to be on or near the site.

None are known to exist to our knowledge.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Landscaping and tree retention plans will be prepared per City of DuPont standards and as recommended in the arborist's Tree Retention Plan and will be implemented to preserve and enhance vegetation.

e) List all noxious weeds and invasive species known to be on or near the site.

None are known to exist to our knowledge.

5. **Animals**

a. Circle any birds or other animals which have been observed on or near the site or are known to be on or near the site:

Examples include:

birds: hawk, heron, eagle, songbirds, other: **bats**
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened or endangered species known to be on or near the site.

None are known to be on or near the site to our knowledge.

c. Is the site part of a migration route? If so, explain.

Yes, the site is part of the Pacific Flyway for Migratory Birds.

d. Proposed measures to preserve or enhance wildlife, if any:

Landscaping plan will be designed and implemented per City of DuPont standards to preserve and enhance wildlife. A study prepared by Soundview Consultants regarding Priority Habitat Species of bats to include big brown bat, little brown bat and Yuma myotis, found no evidence of bat activity or roosting bat concentrations on the site.

e. List any invasive animal species known to be on or near the site.

None are known to exist on or near the site to our knowledge.

6. **Energy and Natural Resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Natural gas will be used for heating and electricity will be used for lighting and overall energy needs.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe:

It is not anticipated that the project could affect the use of solar energy by an adjacent site and the height of the proposed buildings will not exceed the maximum height allowed by current zoning.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The project will comply with all state energy code requirements. No other specific measures are proposed.

7. **Environmental Health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

1) Describe any known or possible contamination at the site from present or past uses.

The site contains shallow soil contaminated with arsenic and lead from aerial deposition associated with the regional ASARCO release. The site has a Restrictive Covenant that was put into place pursuant to Pierce County Superior

Court Consent Decree No. 03-2-10484-7 between Weyerhaeuser Company and El DuPont De Nemours and company, which is binding on all their successors.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.:

Previous site investigations identified buried containers and anthropogenic material at the site. An Environmental Media Management Plan will be in place for the planned construction excavation work.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

During construction, chemicals associated with construction equipment would be on the site. Upon project completion, it is not anticipated that hazardous materials would be present.

4) Describe special emergency services that might be required.

Other than normal fire, medical and police services already available in the area, no special services are anticipated.

5) Proposed measures to reduce or control environments health hazards, if any:

Hazardous Waste Operations and Emergency Response (HAZWOPER)-trained personnel will be utilized when working around contaminated soil. Workers will follow a HAZWOPER-compliant health and safety plan (HASP) and wear the HASP-specified personal protective equipment for tasks performed in the vicinity of contaminated soil. Engineering controls will be implemented when practical to mitigate exposure risks to workers. Contaminated soil left on site will be permanently capped beneath the buildings and parking areas and subject to an institutional control.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Noise from Center Drive to the east and from surrounding businesses would exist but would not be anticipated to affect the proposed development.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

On a short-term basis, noise from construction equipment would be present from approximately 6 am to 6 pm, Monday through Friday. On a long-term basis, noise from vehicular traffic to and from the site would be daily. Please refer to the Noise Study for additional information.

3) Proposed measures to reduce or control noise impacts, if any:

During the construction phase of the project, construction equipment will be maintained and meet the city noise ordinance. Per the attached noise study, noise generated by proposed vehicular and truck traffic on the site will be within City of DuPont noise ordinance levels except for a portion of Sequalitchew trail during the hour of 6am-7am. However, this is based on a lower nighttime limit which does not apply to the trail as no one should be sleeping there. The use of on-site and perimeter landscaping will also help to reduce and control noise created by the proposed development. Please refer to the Noise Study for additional information.

8. **Land and Shoreline Use**

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The site is undeveloped. Property to the east is a multi-family complex. Property to the north is undeveloped. Property to the south and west of the site is a golf course and property directly south contains an office building development.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if an? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

To our knowledge, the site has not been used as working farmlands or forest lands and no lands of commercial significance will be converted to other uses.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

There are no working farm or forest lands near the site.

c. Describe any structures on the site.

There are no structures on the site.

d. Will any structures be demolished? If so, what?

No structures will be demolished.

e. What is the current zoning classification of the site?

The current zoning designation is Manufacturing Research Park (MRP).

f. What is the current comprehensive plan designation of the site?

The current comprehensive plan designation is Sequalitchew Village Planning Area.

g. If applicable, what is the current shoreline master program designation of the site?

N/A

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

An area of steep slopes has been identified on the southern portion of the site per city of DuPont classification.

i. Approximately how many people would reside or work in the completed project?

Approximately 90 to 120 persons are anticipated to work at the completed development depending on the type of tenants.

j. Approximately how many people would the completed project displace?

No persons will be displaced.

k. Proposed measures to avoid or reduce displacement impacts, if any:

No specific measures are proposed.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project will be designed to comply with current City of DuPont code and design standards.

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

There are no farms or forest lands near the site.

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

N/A

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

N/A

c. Proposed measures to reduce or control housing impacts, if any:

N/A

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The tallest height of any building structure will 45-foot . The proposed building will be concrete tilt-up construction.

b. What views in the immediate vicinity would be altered or obstructed?

Views from east of the site looking to the west would be altered but it is not anticipated that any views would be entirely obstructed.

c. Proposed measures to reduce or control aesthetic impacts, if any:

The project will be designed to meet current City of DuPont design standards. The use of architectural detailing on the buildings and the use of on-site and perimeter landscaping will reduce and control aesthetic impacts of the development.

11. **Light and Glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Glare from building window glass could be present during daylight hours and light and glare from building and parking lot lighting and vehicular traffic to and from the site could be present in early morning and evening hours.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

It is not anticipated that light or glare created by the proposed project would be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

Lot and building lights from the developments to the east of the site would be present but not anticipated to affect the proposed development.

d. Proposed measures to reduce or control light and glare impacts, if any:

Building glass will be non-glare and lighting will be directed appropriately. The use of perimeter landscaping and the retention of trees where possible will help to contain any light or glare created to within the site.

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

The Home Course Golf Course is located adjacent to the site to the south and west and the Sequalitchew Creek Trail is located to the south.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The project will not displace any recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

The Sequalitchew Trail extends through the project site. A portion of the trail on the east side will be relocated and reconstructed as part of the project. No other specific measures are proposed.

13. **Historic and Cultural Preservation**

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.

There are no structures located on the site. There are known historic archeological sites in the vicinity of the proposal and a Cultural Resource Study and Unanticipated Cultural Resource Discovery Plan prepared in 2011 by Parus Consulting have been completed for this site along with a Cultural Resources Addendum prepared by Natural Investigations Company dated October 2022 .

b. Are there any landmarks, features or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

The Cultural Resource Report including Archeological Survey, Monitoring and Testing work completed by Parus Consulting concluded that there was no evidence of two previously recorded archaeological sites 1) the Methodist Episcopal Missions Site and the 9th U.S. Cavalry Bivouac site and 2) one flaked stone isolate except for two brick fragments. There was also no evidence of two other archaeological sites including railroad dump #3 site and Burning Ground Dump site that were removed a decade ago. Two surface historic archaeological sites 1) railroad track segment and concrete platform and 2) one isolated kerosene can were identified during the fieldwork. In addition, one set of bridge fragments were identified during the fieldwork. The study concluded that no significant cultural properties will be affected by the proposed project and no further cultural resource action is warranted. Should any cultural resources be discovered during the project construction an Unanticipated Cultural Resources Discovery Plan has also been prepared and will be followed. (Please refer to the updated Cultural Resource Study and Unanticipated Cultural Resource Discovery Plan documents included with this application.)

c. Describe the methods used to access the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archaeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Methods used to access the potential impacts to cultural and historic resources included fieldwork consisting of a pedestrian survey and examination of subsurface sediments in a series of 125 shovel probes and 22 geotechnical test pits. The work was monitored by a member of the Nisqually Tribe. The work also included consultation with DAHP and the

Nisqually, Puyallup and Squaxin Tribes and research of archaeological surveys, maps and GIS information.

d) Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

The proposed development will comply with the Unanticipated Cultural Resources Discovery Plan and Consent Decree. If any artifacts were uncovered on the site, work would be halted, and any discovery would comply with the Unanticipated Cultural Resources Discovery Plan.

14. **Transportation**

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Access to the site will be via one driveway on to Sequalitchew Drive from Center Drive.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No. The nearest transit stop is located at DuPont Station.

c. Will the proposal require any new or improvements to existing roads or streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

The extension of Sequalitchew Drive as a public road will be constructed as part of the proposed development.

d. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

e. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

Approximately 462 total daily trips are expected to be generated on a typical weekday with 56 trips during the AM peak hour and 59 trips during the PM peak hour. . Peak volumes are anticipated to occur between the 7:00 – 9:00 AM and 4:00 – 6:00 PM timeframes. Moreover, it is estimated that the development may generate approximately 5 AM peak hour truck trips (2 in / 3 out) and 8 PM peak hour truck trips (4 in / 4 out). ITE data from the 11th Edition Manual was referenced to derive the proposed trip generation. Please refer to the Traffic Impact Analysis for additional information.

f) Will the proposal interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

There are no working farms or forest lands near the site.

g) Proposed measures to reduce or control transportation impacts, if any:

The proposed extension of Sequalitchew Drive to include new pavement, stormwater system, curb, gutter and sidewalk will reduce and control impacts to transportation.

15. **Public Services**

a. Would the project result in an increased need for public services (for example, fire protection, police protection public transit, health care, schools, other)? If so, generally describe.

Yes, the proposed development will increase the need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Payment of City of DuPont fire impact fees and construction of additional new fire hydrants, payment of stormwater and water system development charges and construction of the extension of Sequalitchew Drive are all measures that will reduce and control impacts to public services.

16. Utilities

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Electricity:	*Puget Sound Energy*
Natural Gas:	*Puget Sound Energy*
Water:	*City of DuPont*
Sanitary Sewer:	*Pierce County Public Works and Utilities*
Telephone:	*CenturyLink*
Cable:	*Comcast*
Refuse Service:	*LeMay, Inc.*

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Daniel K. Balmelli

Type name of signee: *Daniel K. Balmelli, P.E.*

Position and agency/organization: *Barghausen Consulting Engineers / Executive Vice President*

Date submitted: November 18, 2022, *Revised March 30, 2023, Revised August 4, 2023*, ***Revised November 9, 2023***

Attachment 1dd

BARGHAUSEN

November 10, 2023

Barb Kincaid
City of DuPont
Department of Community Development
1700 Civic Drive
DuPont, WA 98327

RE: DuPont 243
Response to September 22, 2023 Comment Letter from City of DuPont and the September 21, 2023 letter from Gray & Osborne, Inc.
for the DuPont 243 Project
City File Numbers: PLNG2022-031 and -032
Our Job No. 18666

Dear Ms. Kincaid:

We have revised the plans and technical documents for the above-referenced project to address the comments in your letter dated September 22, 2023 and the September 21, 2023 letter from Gray & Osborne, Inc. Enclosed are the following plans and documents for your review and approval:

1. One (1) each electronic file revised Photometric Plan
2. One (1) each electronic file Preliminary Landscape and Irrigation Plan
3. One (1) each electronic file revised Preliminary Civil Engineering Design Plans
4. One (1) each electronic file revised Architectural Site Plan
5. One (1) each electronic file revised Noise Study
6. One (1) each electronic file Geotechnical Report Addendum 3
7. One (1) each electronic file revised Tree Retention Plan
8. One (1) each electronic file Water Availability Form
9. One (1) each electronic file revised SEPA Checklist
10. One (1) each electronic file revised TIA
11. One (1) each electronic file updated Dumpster Location Approval
12. One (1) each electronic file revised Stormwater Site Plan (includes SWPPP)
13. One (1) each electronic file Cultural Resources Report Addendum

The following outline provides each of your comments in italics, along with a narrative response describing how each comment was addressed:

A. Civil and landscape plan review

1. *The current Photometrics Plan depicts light spill exceeding 1.0 FC along the development footprint, however the property boundary lines are not depicted. The City regulates light spill along the boundary lines.* ***An updated Photometrics Plan should be provided to demonstrate that less than 1.0 FC of light spill will occur at all property boundaries****.*

   Response: An updated photometric plan is included with this resubmittal showing lighting levels 5-foot and 10-foot past the property boundary.

2. *The Architectural Site Plan indicates that 138 standard vehicle parking stalls are provided plus 68 trailer stalls. The landscape plans (Sheet L-3) provide that 140 standard vehicle parking spaces are proposed, which require one tree per six stalls for a total of 23 required parking lot trees. 33 parking lot trees are proposed to be provided. The provided number of standard vehicle parking stalls is not consistent between the Architectural Site Plan and the Landscape Plans.* ***Update the plans to be consistent in the provided number of parking spaces.***

   Response: All plans have been updated to show a total of 141 standard parking stalls per the updated site plan.

3. *A landscape buffer is proposed between the northeastern parking areas and Sequalitchew Drive. The landscape plans (Sheet L-4) provide nine 2-inch caliper Honey Locust trees adjacent to the right-of-way along the perimeter of the landscaped area, and the addition of 2.5" caliper Oregon white oak trees adjacent to the parking lot with the remaining area to be hydro-seeded/lawn or shrubs and groundcover.* ***The Honey Locust trees shall be a minimum of 6 feet in height at planting. Update landscape plans to be compliant****.*

   Response: Tree size at planting for 'Skyline' honey locust revised as noted.

4. *Moderate screening is provided on landscape plans (Sheets L-5) between the east trailer parking/storage area and Sequalitchew Drive, but is not provided between the trailer parking area and the relocated Sequalitchew Creek Trail, where it will be visible to trail users. Moderate screening (50% minimum visual screening) will be required. The definition of a moderate buffer includes treatments such as walls, which in this case is the desired screening of the trailer parking area.* ***Provide a wall at the south side of the eastern trailer parking area to screen the trailer parking from view of the trail users. The wall shall also meeting the blank wall requirements per DMC 25.24.030(5).***

   Response: Berm and moderate screening added between car parking and pond.

5. *Landscape plans depict a stormwater pond south of the southeastern trailer storage area. The landscape plans depict erosion-control hydroseeding throughout the stormwater pond and plantings along the east perimeter. Per DMC 25.90.030(3)(b) the city may require the pond be landscaped to mitigate incompatibility with the adjacent Sequalitchew Creek trail.* ***Provide moderate buffer type landscaping around the south side of the infiltration pond to screen the pond from the trail.***

   Response: Moderate screening has been added between pond and trail.

6. *The Noise Study depicts a sound wall along the southern boundary of the development area. The sound wall is not depicted on the civil plans.* ***Add the sound wall to the civil plans. Make sure the wall meets the blank wall requirements of DMC 25.24.030(5).***

   Response: An updated noise study is included with this resubmittal. No sound wall is proposed. However, a berm is proposed along the southeast parking area for noise mitigation and visual screening.

B. DMC 25.105 Critical Areas

1. *The grading and landscape plans depict a small amount of grading within the 100-foot Sequalitchew Creek buffer. This may be permitted as an Exception per DMC 25.105.070, provided it can be clearly demonstrated that the project is needed for the benefit of the public; and no feasible alternative exists; there is not a feasible alternative to the proposed locations; and the proposed location results in no net loss in a critical areas' functional value.* ***Review the grading plans for this area and either (a) revise the grading to avoid any disturbance to the Sequalitchew Creek buffer, or (b) respond to the Exception requirements detailed in DMC 25.105.070(2) to clearly demonstrate there are no alternatives****. Per DMC 25.105.070(2)(c), exception request shall be made in writing and subject to the administrative authority of the director.*

   Response: Plans have been revised so that no grading is proposed within the Sequalitchew Creekbuffer.

2. *The civil plans include a note for "Field Surveyed Top of Upper Stream Bank of Sequalitchew Creek". It appears as though the 100-foot Sequalitchew Creek Buffer depicted on the plans has been located from this top of bank. Per DMC 25.105.050(2)(g)(i), the location of the ordinary high water mark (OHWM) is to be the location the buffer shall be extended from.* ***Provide the location of the OHWM on the civil plans and extend the 100-foot Sequalitchew Creek buffer from this location. Provide documentation that the OHWM has been field verified by a qualified biologist****.*

   Response: The OHWM is now indicated with the 100-foot creek buffer located from this line.

3. *The site has steep slopes that are regulated by the City's Critical Areas Chapter DMC 25.105. DMC 25.105.050(3)(a)(i) defines Landslide Hazard areas and (ii) defines Erosion Hazard areas. DMC 25.105.050(3)(b)(i) provides standards for proposals located within or adjacent to landslide hazard areas. DMC 25.105.30(3)(c) provides that the size of the setback shall be based on the findings of a qualified professional. Finally DMC 25,105.030(d)(v) requires review of potential geologic hazard areas by a qualified professional. The following geotechnical reports were submitted with the DuPont 243 application:*

   a. *Geotechnical Engineer Report prepared by GeoEngineers dated Oct. 10, 2011*
   b. *Report Addendum prepared by GeoEngineers dated May 11, 2018*
   c. *Report Addendum prepared by GeoEngineers dated Nov. 8, 2022*
   d. *Revised Report Addendum 2 prepared by GeoEngineers dated August 1, 2023*

Neither of these reports address the evaluation of the presence of landslide or erosion hazard areas nor do they make a recommendation for the size of setback from the top of slope. ***Provide a letter from the geotechnical engineer that address the City's Geologic Hazard assessment requirements, makes a recommendation for a protective buffer, and depict the protective buffer on the plans.***

Response: A third addendum to the geotechnical report addressing these issues is provided with this resubmittal. A 50-foot setback has been maintained from the top of slope for all improvements.

4. *If any portions of the relocated Sequalitchew Creek trail (or grading for the trail) are to be located within the geologic hazard protective setback area, DMC 25.105.050 (3)(b)(i)(A)(III) provides that it shall be clearly demonstrated that no other feasible alternative exists. Provide a letter from the civil engineer that demonstrates that the trail is or will be designed to standards and no other feasible alternative exists.*

Response: The existing Sequalitchew Creek Trail crosses the 50-foot steep slope setback. Because of this, any new trail connecting to it must also cross the setback. The proposed location of the new trail has been coordinated with the city and opposition group in order to provide screening from the site and impact as few trees as possible.

C. DMC 25.120 Tree Retention

1. *The submitted Tree Protection Plan prepared by WFC dated August 6, 2023, identifies that there are a total of four (4) landmark Oregon white oak trees on site (Tree numbers 9, 12, 80 and 81; see List of Landmark Trees on DuPont 243 provided as Attachment 3 to the WFC Plan). In the description of cover type 1 in Table 1 it lists that there are six (6) health Landmark Oregon white oak trees onsite. The Table in Attachment 3 of the WFC Plan indicates that landmark Oregon white oak trees #9 and #12 are to be removed and trees #80 and #81 are to be retained. The WFC Plan further provides in the narrative that two (2) Oregon white oak landmark trees are proposed to be removed (page 4) consistent with Attachment 3. The Tree Map included as Attachment 2 in the WFC Plan depicts the location and removal of tree #12 but does not depict the location and removal of tree #9. The civil and landscape plans both provide notes that state that one landmark Oregon white oak tree will be removed. Revisions/corrects are needed as follow:*

    i. ***Correct the WFC Plan and the civil and landscape plans to be consistent in the number of Landmark Oregon white oak trees to be removed****.*

    Response: The number of landmark Oregon white oak trees is consistent in Table 1 and in Attachment 3. There are six healthy landmark white oak trees (#'s 9, 12, 22, 65, 80, & 81) and two unhealthy landmark white oak trees (#'s 18 & 79). All eight trees are shown on the map in Attachment 2. Five of the six healthy landmark white oak trees will be retained and one in the future right-of-way will be removed.

    ii. ***Correct Attachment 1 of the WFC Plan to correctly depict the 19.65-acre project boundary****.*

    Response: Report was updated using parcels 0119266005 & 0119266006. Total project acreage is 19.65-acres.

iii. ***Provide the location of Tree #9 to be removed on all plans (and any other landmark Oregon white oak trees to be removed)****.*

Response: After reviewing the site plan it was determined that the tree identified as #12 in previous reports was actually tree #9. This tree (#9) is located in the future street right-of-way and will be removed. Tree #12 is located approximately 100-foot west of tree #9 and will be retained. The update is reflected on the site plan in Attachment 2 and on the table in Attachment 3.

iv. *Tree #12 can be removed because it is in the right of way. However, city code provides that it must represent no more that 30% of all Landmark Oregon white oak trees to be removed, which if it is the only Landmark Oregon white oak to be removed (and there are either six or four trees as described in the WFC Plan) meets code****. If Tree #9 cannot be retained, however, per DMC 25.120.050 you are to submit an application for a Tree Modification Request (Type III, which requires an application form, full documentation and justification, and a $3,000 application fee)****. Note that a Type III Tree Modification request was not included in the Notice of Application and will require a new Notice of Application and comment period.*

Response: Of the six healthy landmark Oregon white oak trees on-site, only tree #9, in the road right-of-way, will be removed for the project. The remaining five healthy white oak trees will be retained as shown in Attachments 2 & 3.

We have revised the plans and technical documents for the above-referenced project in accordance with the comment letter prepared by Gray & Osborne, LLC dated September 21, 2023.

GENERAL

1. *The site plan shall reflect all easements, site restrictions, and encumbrances from the short plat and any other recorded documents. Proposed site improvements, within the easements on the project sites, shall comply with the conditions of said easements.*

   Response: Comment acknowledged. All existing and proposed easements are shown on the plans.

2. *The project activities shall comply with the requirements of the Washington State Department of Ecology National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges associated with construction activity will be required for this project prior to issuance of a grading permit.*

   Response: Comment acknowledged. An NPDES permit will be acquired prior to issuance of the grading permit.

3. *In accordance with Section 2.21 Street Frontage Improvements, all commercial and residential developments, plats, or short plats shall install frontage improvements at the time of construction as required by the City. Such improvements include curb and gutter, sidewalk, street, storm drainage, street lighting systems, utility relocations, landscaping and irrigation (2.21.1) and all frontage improvements shall be made across the full frontage of property from Centerline to right-of-way line (2.21.2). For purposes of this review, the proposed 85-foot wide*

right-of-way is classified as an arterial with features and dimensions as defined in the City's Public Work Standards.

Response: Half street improvements along with a 42.5-foot right-of-way dedication are proposed on these plans consistent with City of Dupont standards.

4. *An analysis of sight distance triangles to verify that safe stopping and turning movements to and from the site at all points of access to the site shall be provided.*

   Response: Sight distance triangles have been added to sheet C6 of the plans.

5. *Following construction, a City of DuPont Agreement for Inspection and Maintenance of Privately Maintained Storm Drainage Facilities will be required for any onsite storm water system.*

   Response: A Stormwater Maintenance Agreement will be completed for this project prior to engineering approval.

6. *The City's Stormwater System Development charge (SDC) will apply to this project.*

   Response: Comment Acknowledged.

7. *The Applicant shall address any applicable mitigation measures associated with this project.*

   Response: All applicable mitigation measures have been applied per City of Dupont standards.

8. *All easements identified in the Title Report shall be delineated and labeled on the plans (i.e., width, type, and recording number). Callouts with numbers corresponding with the Title Report Exception Numbers should be provided.*

   Response: All easements identified in the title report are shown onsite with exception numbers listed.

9. *Documentation of Pierce County Public Works and Utilities approval of the Sanitary Sewer Plans for this project will be required prior to issuance of a construction permit.*

   Response: Comment acknowledged. Engineering approval will be obtained from the utility districts.

10. *This project is subject to the Geographic Information System (GIS) requirements as stated in the City of DuPont Municipal Code, Chapter 24.09, and Ordinance No. 97-559.*

    Response: Comment acknowledged.

LAND USE APPLICATION

11. *Item No, 14, Letter of Water Availability from City of DuPont. A completed City of DuPont Water Availability Form identifying the proposed water usage in gallons per day should be submitted.*

Response: Comment acknowledged. A water availability certificate will be submitted for this project.

SEPA CHECKLIST

12. *The Environmental Media Management Plan, identified Item B.7.a.2., should be provided.*

    Response: An environmental media management plan will be provided prior to engineering approval.

13. *Item No B.14.a should be revised to reference Sequalitchew Drive.*

    Response: This section has been revised to reference Sequalitchew Drive.

TRAFFIC IMPACT ANALYSIS

14. *The Transportation Impact Study comments should be provided to the City by Ms. Geralyn Reinart, P.E.*

    Response: Comment acknowledged.

SEWER AVAILABILITY

15. *The submitted Pierce County Utilities information appears acceptable for Land Use Application approval. Documentation of Pierce County Public Works and Utilities approval of the Sanitary Sewer Plans for this project will be required prior to issuance of a construction permit.*

    Response: Comment acknowledged. Engineering approval will be obtained from Pierce County for the proposed sewer improvements.

TRASH ENCLOSURE LOCATION

16. *The submitted plan from LeMay Pierce County Refuse for the refuse container location appears to be sufficient for Land Use approval. The project shall demonstrate compliance with DMC 25.100 Recycling.*

    Response: An updated dumpster location approval from LeMay is included with this resubmittal.

STORMWATER SITE PLAN

17. *The final Stormwater Site Plan shall include:*

    - *An off-site analysis report.*
    - *An analysis of pipe capacity.*
    - *A pipe conveyance basin map.*

    Response: Comment acknowledged. These items will be included in the final stormwater site plan.

18. *A separate storm facility intended to treat and detain runoff from the proposed Sequalitchew Road public right-of-way shall be provided.*

    Response: A separate infiltration gallery to serve Sequalitchew Drive has been added to the plans.

19. *The potential overflow route from the infiltration facilities should be discussed and shown and labeled on the plans.*

    Response: Because the pond is much deeper than the surrounding area, any overflow would begin at the catch basins in the truck court. This is now noted in the storm report.

20. *The party responsible for maintenance of the proposed facilities should be identified.*

    Response: The party responsible for maintenance will be identified in the final Operations and Maintenance Manual.

21. *Specific maintenance documentation regarding the Contech Stormfilter Cartridges should be provided in the Operations and Maintenance Plan for reference.*

    Response: Maintenance information for the proposed Modular Wetland Units has been added to the Operations and Maintenance Manual.

22. *The Stormwater Pollution Prevention Plan (SWPPP) should include:*

    - *BMP sheets for each specific BMP to be used on the project site.*
    - *A template site inspection sheet.*

    Response: This information has been added to the SWPPP.

GEOTECHNICAL REPORT

We have no comments on the Geotechnical Report at this time.

Response: Comment acknowledged.

CULTURAL REPORT

We have no comments on the Cultural Report at this time.

Response: Comment Acknowledged.

NOISE STUDY

We have no comments on the Noise Study at this time.

Response: Comment acknowledged.

ARCHITECTURAL SITE PLAN

23. *Two fire gates are identified along the north side of the building. The City Fire Department should evaluate for acceptance.*

    Response: Comment acknowledged.

PHOTOMETRIC DRAWINGS

24. *Street lighting drawings in accordance with Section 6 (Illumination) of the City Standards, shall be submitted to the City for approval of all street light installations (i.e. Sequalitchew Road). The westerly end of Sequalitchew Drive should be incorporated with the proposed Sequalitchew Road to ensures sufficient lighting coverage is provided. Provide supporting street lighting design information from PSE/Intolight. Both street and on-site lighting drawings shall include photometrics in compliance with City Standard lighting levels. Site lighting shall conform to the requirements of DMC 25.70.070(12). The lighting plan shall include photometric design information for the site and building exterior lighting of the project to demonstrate code compliance with zoning, street, and building code standards.*

    Response: An updated photometric plan is included with this resubmittal.

25. *The walkways within the commercial area shall be shown and included in the photometrics with lighting levels averaging at least on foot-candle in accordance with DMC 25.70.070(12)(d).*

    Response: This information has been added to the photometric plan.

26. *The Applicant should note that DMC 25.70.070 allows 25-foot-tall lighting fixtures in parking lots, except at entries and for parking adjacent to building, where lighting remains restricted to 15 feet in height. All lighting shall be baffled to minimize glare. The heights of the proposed parking area lighting shall be stated on the drawings to demonstrate compliance with City code requirements.*

    Response: This information has been added to the photometric plan.

PRELIMINARY CIVIL ENGINEERING DESIGN PLANS

27. *On Sheet C1, the following should be addressed:*

    A. *Sequalitchew Drive should be labeled in the Vicinity Map.*

       Response: Sequalitchew Drive is now labeled on the vicinity map.

    B. *Parcel Number 0119262019 appears to be in error.*

       Response: The parcel number has been corrected.

28. *All easement labels should include indication of either "Public" or "Private".*

    Response: All easements are now labeled as public or private.

29. *The approximate cut and fill quantities shall be added to the plans.*

    Response: Cut and fill quantities have been added to the cover sheet.

30. *Per DMC 25.70.060(10)(c), all on-site service areas (i.e., loading zones, dumpster, transformer, utility vaults, etc.) shall be located in an area not visible from a public street or open space.*

    Response: All service areas have been moved out of sight of the public right-of-way wherever possible and landscape screening provided.

31. *Retaining walls shall comply with City Standard 5.5. The design of structural walls shall be by a professional engineer qualified in retaining wall design. Design calculations shall be submitted to the City.*

    Response: Comment acknowledged. Retaining wall design and calculations will be provided at the time of engineering review.

32. *A composite utility sheet should be added to the plans.*

    Response: A combined water and sewer plan showing the locations of all proposed utilities is included on sheets C7-C8.

33. *Locations of proposed onsite and offsite curb ramps and detectable warning patterns should be shown and labeled.*

    Response: All proposed curbs ramps are shown and labeled.

34. *A pedestrian connection from the sidewalk on the south side of Sequalitchew Road to the Sequalitchew Creek Trail shall be provided.*

    Response: A pedestrian connection from Sequalitchew Drive to the trail has been added.

35. *Indicate the improvements to the Sequalitchew trail. The new trail shall be extended across Lot 2 to connect to the existing trail/gravel road at the southeasterly property line of Lot 2. Provide a cross section of the proposed trial. Show and label the existing trail/gravel road at the east end of Lot 2. Connection to the new trail from the existing trail on the north side of the existing cul-de-sac at the west end of Sequalitchew Drive should be provided.*

    Response: The existing trail and proposed trail improvements are now indicated on the plans. A connection from the proposed trail to the existing trail is now shown. A typical trail section has been added to sheet C6.

36. *Any existing trail easements that do not coincide with the new trail alignment will need to be extinguished and a new trail easement provided across Lots 1 and 2.*

    Response: Comment acknowledged.

37. *A City Standard driveway approach with bollards should be provided on south side of Sequalitchew Road at the easterly existing gravel road for City maintenance access. Label the gravel road and width.*

    Response: A driveway has been added to the plans to serve this access road.

38. *Identify and add the building setbacks demonstrating compliance with DMC 25.45.*

    Response: Distances between the building and property line have been added to sheet C1.

39. *On Sheet C3, provide protection measures for the existing sanitary sewer manhole located at the proposed construction entrance locations.*

    Response: The temporary construction entrance has been moved so that the existing manhole will remain outside the entrance.

40. *On Sheet C4, the temporary Construction Entrance Detail shall show geotextile and 100-foot length per Figure II-4.1.1 of the DOE Stormwater Management Manual for Western Washington. Label the length on Sheet C3.*

    Response: The construction entrance detail on sheet C4 has been replaced with Figure II-3.1 from the DOE manual.

41. *On Sheet C4, Erosion Control Notes #4 and #5 shall indicate Sequalitchew Drive and Center Drive.*

    Response: The road names have been added.

42. *Show and label the centerline and stationing of the proposed Sequalitchew Road right-of-way in all applicable sheets.*

    Response: The proposed centerline stationing for Sequalitchew Drive is shown on sheets C9 and C10.

43. *Right-of-way for the Sequalitchew Road, located on Lot 2, shall be dedicated to the City as part of the development of Lot 1 and/or Lot 3. This road is required for consistency with the City's Comprehensive Plan.*

    Response: Comment acknowledged. 42.5-foot of the future 85-foot right-of-way is proposed to be dedicated from Lot 2 for half street improvements under this development. The remaining 42.5-foot will be dedicated during the future development of Lot 3.

44. *The project proposed half street improvements for Sequalitchew Road right-of-way. A road cross-section and channelization of the proposed half street improvements shall be added to the plans. The functional classification for the proposed Sequalitchew Drive extension is an arterial. The road cross-section shall meet City Public Works Standards and should match the existing road cross-section. Although half-street improvements may be allowed, the design of the full width of the Sequalitchew right-of-way and utilities shall be provided.*

    Response: Half street improvements for Sequalitchew Drive are shown on the plans and the proposed road section is shown on sheet C11. Proposed channelization is also shown.

45. *Channelization drawings shall include the locations of:*

    - *Signage and relocation of existing signage, where necessary.*
    - *City of DuPont Trail Designation Signs.*
    - *Pavement markings.*
    - *Detectable Warning Patterns.*
    - *Crosswalks.*

    Response: All of the required items including pavement marking are shown on the plans. Channelization sheets will be included in the plans at the time of engineering review.

46. *The full width of the 85 foot wide right-of-way (i.e. 42.5 feet of Lot 2 and 42.5 feet of Lot 3) should be dedicated to the City. The remaining 50 feet of the 92.5 feet of Lot 2 should be owned and maintained by Lot 1. The City should not share maintenance responsibility for this portion of land.*

    Response: Comment acknowledged. The east 42.5-foot of Lot 2 is proposed to be dedicated as RIGHT-OF-WAY with this project. The remaining west 50-foot of Lot 2 will share ownership and maintenance with Lot 1.

47. *On Sheet C2, a 92.5 foot access easement is labeled. The plans should clarify the future intent and ownership of Lot 2; excluding the proposed right-of-way.*

    Response: Notes have been added to the plans indicating that the remaining 50-foot of Lot 2 will maintain private ownership.

48. *Sheet C3 indicates existing cul-de-sac to be removed. The plans shall show the proposed right-of-way upon removal of the cul-de-sac which includes transition of the existing sidewalk on the north side of the Sequalitchew Drive right-of-way and westbound traffic from Center Drive.*

    Response: Plans show the proposed right-of-way upon removal of the cul-de-sac. A sidewalk connection from the north side of Sequalitchew Drive will be shown on the final channelization plans.

49. *One Sheet C9, it appears the proposed right-of-way does not align to the existing Sequalitchew Drive right-of-way. The proposed right-of-way should match and be consistent with the cross-section of the existing Sequalitchew Drive right-of-way.*

Response: The proposed right-of-way dedication and road improvements for the future extension of Sequalitchew Drive are shown centered on the lot line between Lots 2 and 3 in order to align with the existing right-of-way dedication to the east.

50. *Add sight triangles to the driveway entering the proposed Sequalitchew Drive right-of-way.*

    Response: Sight triangles have been added to sheet C6.

51. *The plans shall demonstrate compliance with the underlying Short Plat No. PLNG2020-017. Per Short Plat Notes No. 4, the existing 45-foot radius private temporary turnaround easement on the northerly end of Lot 2 is for the benefit of Lots 1, 2, and 3. The easement will automatically extinguish once Sequalitchew Road is dedicated to the City for public use. At that time a new temporary easement dedicated to the City will be required for the proposed Temporary cul-de-sac at the end of Sequalitchew Road extension. The easement shall remain in effect until the development of Lot 3.*

    Response: Comment acknowledged. A temporary cul-de-sac is shown within the existing easement. This easement will be released once road improvements are completed on the east side of Sequalitchew Drive and the new cul-de-sac will be constructed.

52. *The temporary cul-de-sac should be consistent with the City Standard Cul-de-sac Detail, which includes a 45-foot minimum radius to edge of pavement.*

    Response: A temporary 45-foot radius cul-de-sac is shown at the north end of Sequalitchew Drive per city standards.

53. *A 45-foot side driveway approach is proposed. Per City Standard Driveway Approach Detail, the maximum driveway is 35-feet for commercial. Driveways wider than 35 feet may be approved by the City considering both traffic safety and the activity being served. If the Applicant proposes to keep the driveway greater the 35 feet in width, written justification shall be provided to the City.*

    Response: Comment acknowledged. A deviation request will be made for the increased driveway width.

54. *The parking lot shall be designed in accordance with DMC 25.70.030, DMC 25.95, and Ordinance No. 03-752, which includes, but limited to, screening as approved by the City. Add the dimensions to the parking lot stalls and loading spaces to demonstrate compliance.*

    Response: The parking lot has been designed in accordance with all City of Dupont standards. Proposed berms and landscape screening are now included on the plans.

55. *Parking stalls and pedestrian ramps shall meet current building code and ADA requirements.*

    Response: All parking stalls and curb ramps have been designed per ADA standards. Grading details will be included on the final engineering plans.

56. *The operation of the existing water main shall be maintained while making connections. For extension of the water main, a gate valve shall be provided at the point of connection to the existing water main for isolation and to facilitate disinfection and testing requirements.*

Response: Connection to the existing main is shown at an existing gate valve.

57. *Label the 15-foot wide water easement dedicated to the City. The easements shall be dedicated to the City following construction and prior to final acceptance of this project.*

    Response: The proposed 15-foot water main easement is now labeled on sheets C7 and C8.

58. *The Applicant shall furnish meter sizing calculations for domestic and fire water services. The sprinkler system design, including confirmation of the provided sizing for the fireline components shall be reviewed and approved by the City Building Department and Fire Department as part of the building permit process.*

    Response: Comment acknowledged. Meter sizing calculations will be provided at the time of engineering review and sizing of the fire sprinkler system provided at the time of building permit review.

59. *Label the domestic, fire, and irrigation water service connections. Show separate symbols for the proposed water meters and DCVA's located within the 15-foot water easement. Include the size.*

    Response: All proposed meters, backflow devices, and connections are now shown and labeled on the plans.

60. *Cross-connection control, in accordance with WAC 246-290-490, shall be provided by installation of an approved backflow preventer commensurate with the degree of hazard for protection of the public water system.*

    Response: Comment acknowledged. Backflow prevention devices are shown at all private connections to the public water main.

61. *Drains to daylight, infiltration sump, or to the onsite storm system shall be provided for the water service vaults and meter boxes as required per City Standard Details.*

    Response: Connections from the water service vaults to the proposed storm system are now shown.

62. *The City Fire Department shall confirm that the number and locations of existing and proposed fire hydrants on or near the project site are adequate for purposes of providing the required fire flow for the proposed building.*

    Response: Comment acknowledged.

63. *The proposed development shall be provided with fire lanes, as required by the City of DuPont Fire Department.*

    Response: Fire lanes are provided around the building in accordance with City of Dupont standards.

64. *A turning exhibit demonstration sufficient turning movement of the largest Fire Department apparatus can navigate through the site, ingress/egress to Sequalitchew Road, and access to FDCs and hydrants shall be submitted. City of DuPont apparatus specifications available upon request.*

    Response: Fire truck turning diagrams will be included with the final engineering design plans.

65. *Per City Water Standards for water services, all water service lines under paved roads between the water main and the water meter shall be sleeved with 2-inch Schedule 80 PVC pipe. Add a note to this effect.*

    Response: This note has been added to sheets C7 and C8.

66. *Per City Standard 8.7.2.1, air and vacuum relief assemblies shall be located at all high points of water mains and shall be installed per Standard Details.*

    Response: Comment acknowledged. Air release valves will be added at high points once the water main profiles are completed at the time of engineering review.

67. *Per City Standard 8.8.1, a sampling station shall be set at a location approved by the City and shall be installed per Standard Details. Locations will be provided by the City.*

    Response: Comment acknowledged. A sampling station will be provided as directed by the city.

68. *The construction plans shall include profiles for water mains to include proposed utility crossings.*

    Response: Water main profiles with utility crossing information will be included on the final engineering design plans.

69. *Two water valves are required for all tees.*

    Response: Additional valves have been provided at major tees. Hydrant tees include valves only on the hydrant run.

70. *An automatic flushing station with a 2-inch water service connection and 2-inch water meter was installed at the proposed point of connection to the existing water system on Sequalitchew Drive. The station and the associated appurtenances shall be relocated to the northerly end of the proposed waterline stub.*

    Response: The existing flushing station and meter are now called out to be relocated.

71. *In accordance with City policies of required looping of water mains or providing future looping of water mains via extension of property boundaries, the existing 12-inch water main at the northwest corner of the Creekside Village Apartments will be required to be extended to the west as part of the development to provide sufficient fire protection. The number and locations of hydrants shall be coordinated with the City Fire Department.*

Response: Extension of the existing 12-inch main is proposed along the length of the new Sequalitchew Drive improvements. In addition, a new 12-inch main and hydrants are shown around the proposed building. Hydrant locations have been coordinated with the fire department.

72. *Per City Standard 8.6.1.1, fire hydrants shall be installed at intervals not to exceed 300 feet or as required the City Fire Chief.*

    Response: Proposed fire hydrant locations have been coordinated with the fire department.

73. *Include fire hydrant locations along Sequalitchew Drive.*

    Response: Proposed hydrant location on Sequalitchew Drive are now shown.

74. *Include the length, type, and size of pipe to the fire hydrant runs. Add identifying numbers to the fire hydrants (i.e. FH#1, FH#2, etc.).*

    Response: All proposed hydrants are now numbered. Design information will be included on the final engineering plans.

75. *Clearances, in accordance with City standards, will be reviewed for compliance during construction review. A minimum 3-foot clearance and level area is required around fire hydrants.*

    Response: A level 3-foot clear area will be provided for all proposed hydrants.

76. *The alignment of the sewer line along the proposed Sequalitchew Road right-of-way shall be 5-feet south or west of the centerline of the right-of-way.*

    Response: The proposed sewer main in Sequalitchew Drive has been placed to align with the existing main for connection purposes.

77. *The sewer line at the north end of the proposed Sequalitchew Road right-of-way should end with a sanitary sewer manhole with a stub for future connection.*

    Response: SSMH #R6 has been moved to the north end of Sequalitchew Drive and includes a stub to the north.

78. *The plans shall demonstrate compliance with the underlying Short Plan No. PLNG2020-017. Sanitary Sewer Notes No. 2 requires each lot to be serviced by an individual side sewer stub unless otherwise approved by Pierce County. A sewer stub shall be provided to Lot 3.*

    Response: A sewer stub to Lot 3 has been added to the plans.

79. *Sheet C6 shows stormwater conveyance from the Sequalitchew Road right-of-way (Lot 2) and the site (Lot 1) to a proposed infiltration pond with a Stormwater Biofiltration System. Storm facilities intended to treat and detain runoff from public rights-of-way shall be placed in a separate tract identified as "Public Storm Facility" and the tract dedicated to City. The right-of-way stormwater facility will require a driveway approach with asphalt access road, 6-foot high fence, and a double posted access gate.*

Response: A separate storm system to serve the road has been added. All elements required for the public storm facility tract will be included on the final plans.

80. *Subgrade shall be firm and unyielding native material or structural fill. Add a note to this effect and the compaction percent to the pavement section details on Sheet C11. The recommendations from the geotechnical report should be added to the pavement section for both onsite and Sequalitchew Road.*

    Response: These notes have been added to sheet C11.

81. *Add all City Standard Details, applicable to this project, to the plans.*

    Response: All applicable city standard details have been added to the plans.

PRELIMINARY TREE RETENTION PLANS

82. *The composite utility sheet should be shown on the plans to identify any potential conflicts.*

    Response: All proposed utilities are shown on the landscaping sheets.

83. *An existing tree to be retained (13" F) appears to be in conflict with the proposed walkway from the site to Sequalitchew Road.*

    Response: The walkway has been relocated to avoid this tree.

PRELIMINARY LANDSCAPE AND IRRIGATION PLANS

84. *The plans shall demonstrate compliance with the Street Tree requirements of DMC 25.90.030(1).*

    Response: Plans meet street tree requirements; annotation added to landscape plan sheets.

85. *Trees should be located outside of the 15-foot wide water easement.*

    Response: All trees have been located outside of the water easement.

86. *The proposed trees along Sequalitchew Road shall comply with City Street Tree Standards Detail (Drawing No. 5.7-1) and Street Tree Planting and Staking Detail (Drawing No. 5.7-2).*

    Response: Street trees specified comply with street tree requirements and City details have been added to L4.

87. *Per City Standard 5.7.5, all tree plantings shall include the installation of an approved root barrier adjacent to walks and curb for each tree.*

    Response: Root barrier specified for all trees adjacent to curbs and walks and detail has been added to L4.

88. *Street tree species shall be selected from the City's most current recommended street tree list. The City should review the tree schedule on Sheet L6 for acceptance.*

    Response: Root barrier specified for all trees adjacent to curbs and walks and detail has been added to L4.

89. *The proposed street trees will most likely require watering for establishment. Identify how this will be accomplished.*

    Response: Street tree irrigation measures (GatorBags OAE) specified for trees in right-of-way.

TREE PROTECTION PLAN

We have no comments on the Tree Protection Plan at this time.

Response: Comment acknowledged.

We believe that the above responses, together with the enclosed revised plans and technical documents, to address the comments in your letter dated September 22, 2023 and the September 21, 2023 letter from Gray & Osborne, Inc. Please review and approve the enclosed at your earliest convenience. If you have questions or need additional information, please do not hesitate to contact me at this office. Thank you.

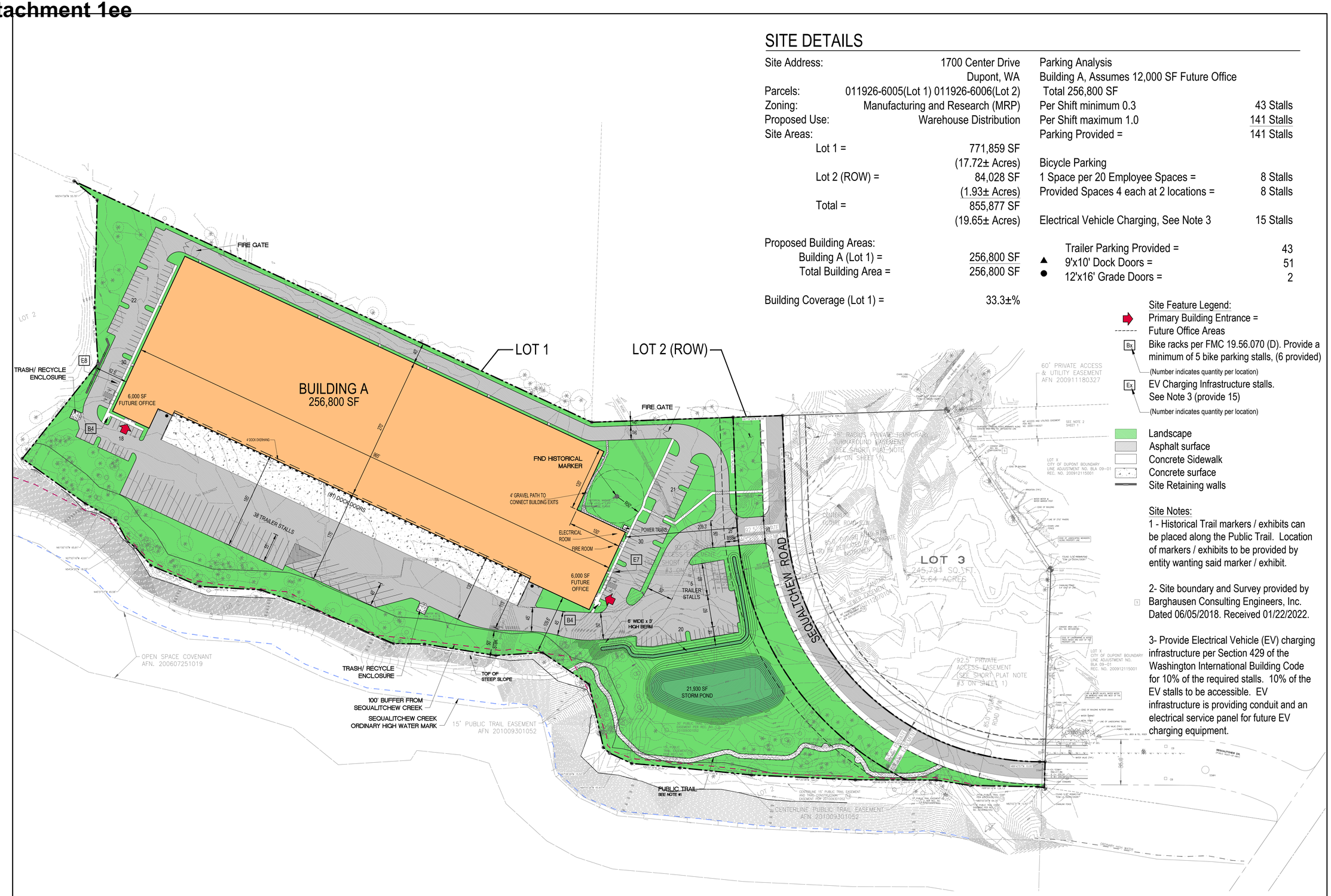
Sincerely,

Daniel K. Balmelli

Daniel K. Balmelli, P.E.
Executive Vice President

DKB/bd
18666c.013
enc: As noted
cc: Ben Varin, Avenue 55
Drew Zaborowski, Avenue 55
Brian Ludwig, Innova Architects
Josh Towne, Barghausen Consulting Engineers
Betsy Dyer, Barghausen Consulting Engineers

Attachment 1ee



SITE PLAN

Scale: 1" = 80'

1

N

SITE DETAILS

Site Address:	1700 Center Drive Dupont, WA
Parcels:	011926-6005(Lot 1) 011926-6006(Lot 2)
Zoning:	Manufacturing and Research (MRP)
Proposed Use:	Warehouse Distribution
Site Areas:	
Lot 1 =	771,859 SF (17.72± Acres)
Lot 2 (ROW) =	84,028 SF (1.93± Acres)
Total =	855,877 SF (19.65± Acres)
Proposed Building Areas:	
Building A (Lot 1) =	256,800 SF
Total Building Area =	256,800 SF
Building Coverage (Lot 1) =	33.3±%

Parking Analysis	
Building A, Assumes 12,000 SF Future Office	
Total 256,800 SF	
Per Shift minimum 0.3	43 Stalls
Per Shift maximum 1.0	141 Stalls
Parking Provided =	141 Stalls
Bicycle Parking	
1 Space per 20 Employee Spaces =	8 Stalls
Provided Spaces 4 each at 2 locations =	8 Stalls
Electrical Vehicle Charging, See Note 3	15 Stalls
Trailer Parking Provided =	43
▲ 9'x10' Dock Doors =	51
● 12'x16' Grade Doors =	2

Site Feature Legend:

- Primary Building Entrance =
- Future Office Areas
- Bx — Bike racks per FMC 19.56.070 (D). Provide a minimum of 5 bike parking stalls, (6 provided) (Number indicates quantity per location)
- Ex — EV Charging Infrastructure stalls. See Note 3 (provide 15) (Number indicates quantity per location)
- Landscape
- Asphalt surface
- Concrete Sidewalk
- Concrete surface
- Site Retaining walls

Site Notes:

1 - Historical Trail markers / exhibits can be placed along the Public Trail. Location of markers / exhibits to be provided by entity wanting said marker / exhibit.

2- Site boundary and Survey provided by Barghausen Consulting Engineers, Inc. Dated 06/05/2018. Received 01/22/2022.

3- Provide Electrical Vehicle (EV) charging infrastructure per Section 429 of the Washington International Building Code for 10% of the required stalls. 10% of the EV stalls to be accessible. EV infrastructure is providing conduit and an electrical service panel for future EV charging equipment.

INNOVA architects

950 Pacific Avenue, Suite 450
Tacoma, WA 98402
253-572-4903

Project Title:

DuPont - West
1700 Center Drive
DuPont, WA

Client:

AVENUE 55
600 University Street, Suite 2305
Seattle, WA 98101
206-707-9696

Job Number:

22-012

Issue Set and Date:

SEPA Permit
March 18, 2024

NOT FOR CONSTRUCTION

21004059 REGISTERED ARCHITECT SCOTT E. SALADIS STATE OF WASHINGTON

REUSE OF DOCUMENTS
THIS DOCUMENT HAS BEEN SIGNED ELECTRONICALLY IN ACCORDANCE WITH WAC 196-23-070 AND CHAPTER 19.34 RCW. UNAUTHORIZED ALTERATION OF ANY OF THE INFORMATION ON THIS DOCUMENT WILL INVALIDATE THE DOCUMENT, MY CERTIFICATION AND SIGNATURE. THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF SERVICE, ARE THE PROPERTY OF INNOVA ARCHITECTS AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT WRITTEN AUTHORIZATION OF INNOVA ARCHITECTS.

4 _____

3 _____

2 City Comments - Letter Dated, May 10, 2024

1 City Comments - Letter Dated, February 17, 2023

Revisions:

Sheet Title:

SEPA
Site Plan

Designed by: B. Ludwig, J. Eaves

Drawn by: B. Ludwig, J. Eaves

Checked by: P. McCormick

Sheet Number:

A0.1

of Sheets

Attachment 1ff

Received 12-8-2022

CITY OF DuPONT
1700 Civic Drive, DuPont, WA 98327
Phone: (253) 912-5381, Fax: (253) 964-1455
www.dupontwa.gov

Water Availability Form

Part A
To Be Completed By Applicant

Project Address: 1700 Center Dr. DuPont WA 98327 Application Number: ?

Subdivision/Project Name: DuPont 243 Parcel: 011926-6005 & 6006

Proposed Water Usage: Manufacturing (Commercial) Residential # of Units: N/A

Customer Type (circle one) Rural Residential Residential Multi-family (Commercial) Industrial

I, the undersigned, or my appointed representative have requested the following purveyor to certify willingness and ability to provide the indicated service. I have read and understand the information provided by the water purveyor on this Certificate, and acknowledge that the proposed project may require improvements to the water system which would incur my financial obligation. Prior to final approval for water service, operational responsibility, and financial obligation may be required.

Print Name Ben Varin Signature

Address 601 Union Street, Ste 2930 City Seattle State WA Zip 98101

Part B
To be completed by Water Purveyor

Water system to provide service: **CITY OF DUPONT** State ID# **20500P**

The proposed development is / is not within our approved service area (circle one).

This water utility will / will not be providing service (circle one).

Approved number of connections: **Unspecified**

Number of current/existing users: **3,129** (1) Existing Storage: **4,000,000 gallons**

Water service will be provided by:

_____ Direct connection to approved, existing water main

_____ Extension of existing water main(s)

_____ New water system in accordance with WAC 246-290

Water Purveyor Signature Date

(1) Per City of DuPont, as of October 1, 2014.

Revised: 10/1/2014

Attachment 1gg

Soundview Consultants LLC
Environmental Assessment • Planning • Land Use Solutions
2907 Harborview Dr., Suite D, Gig Harbor, WA 98335
Phone: (253) 514-8952 Fax: (253) 514-8954

Technical Memorandum

To: **Ben Varin, Avenue 55** **File Number: 1184.0010**

From: **Alex Murphy, Soundview Consultants LLC** **Date: March 19, 2024**

Re: **Response to City Comments Regarding OHWM Verification**
DuPont Business Park – DuPont, Washington

Dear Mr. Varin,

Soundview Consultants (SVC) completed an Ordinary High Water Mark (OHWM) verification of Sequalitchew Creek south of the 5.64-acre site located at 1700 Center Drive in DuPont, Washington (Pierce County Tax Parcel Number 0119266007). The verification was performed in response to the City's planning and SEPA review as documented in their January 8, 2024, letter *Review Comments and Request for Additional Information* for the DuPont West (formerly DuPon 234) PLNG 2022-031 (Type III Site Plan Review and PLNG 2022-032 (SEPA). Below are the City's applicable critical area comments (italicized) followed by SVC's response.

1. *Per DMC 25.105.050(2)(g) a 100-foot buffer is required on each side of a stream as measured from the ordinary high water mark (OHWM). In the Request for Additional Information Letter from the City dated September 22, 2023, it was requested that the OHWM be shown on the civil plans and to extend the 100-foot Sequalitchew Creek buffer from the OHWM. It was also requested that documentation is provided to verify the OHWM location by a qualified biologist. In the most recent submittal on November 13, 2023, the OHWM was depicted on the civil plans and was used as the starting point for the 100-foot Sequalitchew Creek buffer. However, verification by a qualified biologist was not provided and the survey referenced on the civil plan cover sheet is dated May 2011.* ***Provide documentation that the OHWM has been field verified by a qualified biologist.***

   On March 7, 2024, qualified SVC biologists completed a site investigation to verify the northern ordinary high water mark (OHWM) of Sequalitchew Creek depicted on the most recently submitted plans. The OHWM line that appears on the plans is a surveyed line from May 2011.

   Sequalitchew Creek originates from a culvert under a walking trail to the south of the site. The area upgradient and east of the culvert crossing appears to act as a swale and flood storage area, but does not exhibit any indication of stream channel criteria such as defined bed or bank. Rather, the upgradient area is vegetated by upland plant species and mosses, and shows

little to no evidence of flowing water, even during the wet season. Scouring and sorting of substrates was observed immediately upgradient of the culvert inlet, but still lacked channel definition, and was dry during this investigation.

Flow for Sequalitchew Creek appears to originate largely from underneath the culvert itself, as the upgradient area and the culvert were dry, but flow was observed trickling in from under the culvert pipe. The beginning of the channel is relatively low flow, with poorly defined bed and bank. However, evidence of historical manipulation was observed in the upstream portions of the stream, including what appeared to be the remnants of an old boardwalk or wooden trail of some kind situated north of and parallel to the channel. Due to its location situated within a ravine feature and the presence of the old trail which creates a nearly vertical drop, the channel is relatively well defined. As the channel continues west and flow velocity increases and the wooden trail feature recedes, the bed and bank become more well defined, and habitat features such as riffles and pools become more prevalent.

Sequalitchew Creek ranges from approximately 2 feet wide to 15 feet wide throughout the observed reach, with an average of approximately 8 feet. Substrate includes cobble, gravel, and sand, with some areas exhibiting higher silt and organic matter accumulations. Big leaf maple (*Acer macrophyllum*), vine maple (*Acer circinatum*), osoberry (*Oemleria cerasiformis*), swordfern (*Polystichum munitum*), and English icy (*Hedera helix*) are dominant throughout the ravine and lining the creek. Many seeps were also observed discharging groundwater to the stream along the northern bank. Given its width, suitable potential habitat, and surface water connection directly to the Puget Sound, Sequalitchew Creek is a Type F water per WAC 222-16-030 and would be regulated as a stream and subject to a 100-foot buffer under DuPont Municipal Code (DMC) 25.105.050(2)(g).

In preparation for the site investigation, the OHWM utilized on the civil site plans was converted to a shapefile and uploaded to a mobile GIS application to verify in the field. As the OHWM line feature data had to be converted from CAD to GIS and potentially across different datum and/or projections, some margin of error in the conversion is expected, but is likely minimal. SVC found that once translated into GIS, the OHWM line generally aligned with the topographic low point that correlates to the stream on topographic maps and lidar data.

Once onsite, the biologist used a handheld GPS device to co-locate their physical location in comparison to the OHWM line feature. Various colored flagging was observed at several locations throughout the ravine and along the channel, however, it was not consistently present, was not labeled, and did not necessarily appear to correlate with OHWM. As such, the observed flagging was not considered to represent the OHWM and was not assessed as part of the OHWM verification. Based on these conditions, biologists walked the stream and continued to co-locate the OHWM with their location throughout the entire reach of the stream that parallels the site. Furthermore, the channel does not appear to have moved significantly over the past 13 years since the original survey data was collected in 2011. Given its location within the ravine, its shallow depth, and relatively low flow, no major changes to the channel would be expected unless abnormal or historical flows or flooding had occurred.

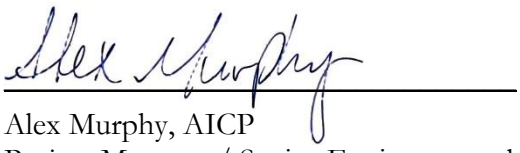
Only one location was noted to deviate from the original OHWM line. This area is situated south of approximately the middle of the site, where Sequalitchew Creek turns north and then

abruptly west. The OHWM line depicted on the plans appears to cut across a slope to the south of the channel. The most likely cause of this difference in the OHWM is due to a missed OHWM flag situated at the north corner of the channel meander during the original delineation. This location can easily be rectified utilizing topographic maps or lidar for a more reliable OHWM location, or utilizing the GPS data SVC collected at this location. Rectification of this OHWM point location is not anticipated to result in any buffer impacts or major modifications to the site design. Furthermore, a 50-foot steep slope setback extends beyond the 100-foot stream buffer in this location, even with this adjustment to the OHWM, providing addition insulation and protection to Sequalitchew Creek.

Conclusion

As requested by the City of Dupont, SVC field verified the location of Sequalitchew Creek's OHWM. SVC converted available CAD data of the prior OHWM line feature for the northern bank of Sequalitchew Creek into GIS. Utilizing a handheld GPS device, qualified SVC biologists compared the location of Sequalitchew Creek in the field with the OHWM surveyed in 2011. With the exception of one location near a bend in the channel, the OHWM line feature generally aligns with the northern OHWM of Sequalitchew Creek. Please feel free to contact me at (253) 514-8952 or amurphy@soundviewconsultants.com if you have any questions.

Sincerely,



Alex Murphy, AICP
Project Manager / Senior Environmental Planner

Attachment 1hh

WASHINGTON FORESTRY CONSULTANTS, INC.

FORESTRY AND VEGETATION MANAGEMENT SPECIALISTS

W F C I

O: 360/943-1723
C: 360/561-4407

9136 Yelm Hwy SE
Olympia, WA 98513

- Tree Retention Plan-

DuPont West

1700 Center Drive
DuPont, WA

Prepared for: Barghausen Consulting Engineers

Prepared by: Washington Forestry Consultants, Inc.

Report Date: March 20, 2024

Introduction

The project proponent is planning to build a warehouse project on two parcels totaling 19.65-acres in DuPont, Washington. The proponent has retained WFCI to:

- Evaluate and inventory all trees on the site pursuant to **DuPont Municipal Code 25.120 Tree Retention**.
- Make recommendations for tree retention, along with any required protection and cultural measures.

Observations

Methodology

WFCI has evaluated all surveyed and mapped trees. Generally, these were trees that are 4 inches diameter at breast height (DBH) and larger in the proposed project area. We then assessed their potential to be incorporated into the new project. A 100% inventory of all landmark trees was conducted to determine the location and condition of the landmark trees on the parcel. Tree locations and species information was gathered from survey data.

The tree evaluation phase used methodology developed by Nelda Matheny and Dr. James Clark in their 1998 publication Trees and Development: A Technical Guide to Preservation of Trees during Land Development.

Site Description

The site consists of two tax parcels, 0119266005 and 0119266006. It is relatively flat with some rolling hills and small depressions. The Sequalitchew Creek Trail passes through the southern portion of the parcel. There are no buildings on the site. Access to the site is by Sequalitchew Dr. The parcel is bordered by Sequalitchew Creek on the south and west, forested parcels to the north, and a multi-family residential development to the east.

Soil Depth and Productivity

According to the USDA Web Soil Survey, there is one soil type on the parcel, the Spanaway gravelly sandy loam.

The Spanaway gravelly sandy loam is a very deep, somewhat excessively drained soil found on terraces. It is formed in glacial outwash and volcanic ash. Permeability is moderately rapid in the subsoil and very rapid in the substratum. Available water capacity is low. The effective rooting depth for trees is 48 inches or more. The potential for windthrow of trees is slight under normal conditions. New trees require irrigation for establishment.

Tree Conditions

There are 2 cover types on this 19.65-acre property for the purposes of description. Type I was the forested area of the site and Type II is non-forest brush land (see Attachment #1). We found and evaluated a total of 669 trees in the project area. Most of the trees were considered to be healthy, long-term trees if they were saved. The following is a description of the forest cover types:

Type I. – This type is a mixed stand of deciduous and conifer trees. It covers 13.55-acres and includes all the Specimen, Landmark, and Significant trees on the site that are 4 inches and larger in diameter. There are 669 trees in this type that had their tree location surveyed. The tree species include Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), Oregon white oak (*Quercus garryana*), Pacific yew (*Taxus brevifolia*), Pacific madrone (*Arbutus menziesii*), and bigleaf maple (*Acer macrophyllum*). Tree size ranges from 4 to over 50 inches DBH. Tree condition ranges from 'Poor' to 'Good', with most trees described as being in the 'Fair' or 'Good' condition class. Table 1 is a summary of trees located on the project site. A complete list of Landmark trees located on-site is found in Attachment 3.

Table 1: Summary of Trees in Cover Type I

Species	DBH Range (in)	# of Healthy Landmark Trees*	# of Unhealthy Landmark Trees**	# of Healthy Non-Landmark Trees*	# of Unhealthy Non-Landmark Trees**	Total
Douglas-fir	4 – 50	50	5	287	33	375
Oregon White Oak	4 – 42	6	2	176	15	199
Western Redcedar	12 – 36	6	0	64	6	76

Species	DBH Range (in)	# of Healthy Landmark Trees*	# of Unhealthy Landmark Trees**	# of Healthy Non-Landmark Trees*	# of Unhealthy Non-Landmark Trees**	Total
Bigleaf Maple	18 – 41	5	0	4	1	10
Pacific Madrone	12 – 18	0	0	4	0	4
Pacific Yew	13 – 17	0	0	3	0	3
Western Hemlock	13 – 33	1	0	1	0	2
Total	**4 – 50**	**68**	**7**	**539**	**55**	**669**

***Trees in 'Fair' or 'Good' Condition**
****Trees in 'Poor' or 'Very Poor' Condition**

Understory shrubs include salal (*Gaultheria shallon*), sword fern (*Polystichum munitum*), trailing blackberry, (*Rubus ursinus*), bracken fern (*Pteridium aquilinum*), Indian plum (*Oemleria cerasiformis*), red huckleberry (*Vaccinium parvifolium*), western hazelnut (*Corylus cornuta*), grasses, and broadleaved weeds.

Photo 1: View of typical trees in Cover Type I

Type II. – This 6.10-acre cover type consists of mostly open, highly disturbed ground with only small thickets of young Douglas-fir trees. No trees were inventoried or surveyed in this Type. Other vegetation in this area includes abundant Scotch broom (*Cytisus scoparius*), grasses, and broadleaf weeds.

Photo 2: Non-forest Cover Type II

Landmark Trees

There are a total of 75 landmark trees in the project area. Landmark trees include Oregon white oak, Pacific yew, and Pacific madrone 24 inches DBH and larger, or Douglas-fir, western redcedar, bigleaf maple, and western hemlock that are 30 inches DBH and larger. *Landmark Oregon White Oak trees are not allowed to be removed without approval from the City of Dupont under a Type I Tree Removal Permit application.* One healthy white oak Landmark tree (#9) located in the future Sequalitchew Street rights-of-way is proposed to be removed.

Locations of landmark trees are indicated on the site plan (Attachment #2). A total of **19** healthy landmark trees can be retained on the site. Fifty-six **(56)** landmark trees will need to be removed because they are either unhealthy or located under the footprint of proposed buildings, roads, storm ponds, or parking lots. Other than Oregon white oak, there is no requirement to retain these landmark trees under the footprint of the buildings, storm ponds, and parking lots, as long as tree retention is achieved in the street boundaries and abutting a residential district. All landmark trees are labeled with a blue number at the base corresponding to the table in Attachment 3.

Potential Tree Retention

The property is in the Manufacturing/Research Park zoning district of DuPont. The DuPont Municipal Code (DMC) requires that a minimum of 1.5 trees per acre shall be retained on the 19.65-acre site. Therefore, at least 29 healthy trees will need to be retained.

The site plan shows that the new construction will extend to the northern edge of the parcel, leaving open space for tree retention in the southern, southwestern, and western areas. The following is a summary of the proposed tree retention:

Total Project Acreage:	19.65 acres
Total # of Healthy Trees:	607 trees
Tree Retention Requirement (1.5 Trees per Acre):	29 trees
Projected Tree Retention:	
Tree Retention Area A	80 trees
Tree Retention Area B	119 trees
Tree Retention Area C	6 trees
Tree Retention Area D	6 trees
Total Projected Trees in Tree Retention Areas	211 trees
Excess of Tree Retention over the Tree Requirement	182 trees
Projected # of Healthy Trees to be Removed	396 trees

Tree Replacement

Planned tree retention exceeds the minimum requirement by 182 trees, so no tree replacement is required beyond that required by the landscape code requirements.

Tree Protection Measures

Trees to be saved must be protected during construction by a six-foot-high temporary chain link fencing (Attachment #4), located 5 feet outside of the drip line of the trees. Placards shall be placed on the fencing every 50 feet indicating the words, "NO TRESPASSING - Protected Trees". The individual CRZ is a radius of one foot for each one inch of DBH (6 feet minimum), unless otherwise delineated by WFCI.

Tree protection fences should be placed around the edge of the critical root zone. The fence should be erected after logging but prior to the start of clearing. The fences should be maintained until the start of the landscape installation.

There should be no equipment activity (including rototilling) within the critical root zone (CRZ). No irrigation lines, trenches, or other utilities should be installed within the CRZ. Cuts or fills should impact no more than 25% of a tree's root system. If topsoil is added to the root zone of a

protected tree, the depth should not exceed 2 inches of a sandy loam or loamy fine sand topsoil and should not cover more than 25% of the root system.

If roots are encountered outside the CRZ during construction, they should be cut cleanly with a saw and covered immediately with moist soil. Noxious vegetation within the critical root zone should be removed by hand. If a proposed save tree must be impacted by grading or fills, then the tree should be re-evaluated by WFCI to determine if the tree can be saved with mitigating measures, or if the tree should be removed.

The proposed location and paving of the proposed Sequalitchew Creek Trail bisects the CRZ of multiple trees in Tree Retention Area A. A Certified Arborist© should be on-site during work in this area to re-evaluate the health of the trees and assess the path alignment to determine the proper method to protect the roots of the save trees. The path follows the existing grade so little soil disturbance will occur. The overall impact of the trail withing the CRZ of the save trees is minimal compared to the entire root zones of the trees. If the trees are healthy, they will be able to tolerate some root impact.

Root impact could be reduced using root protection strategies such as structural soil under the pathway or installing a passive aeration under the path. Structural soils are soils that are specially designed to provide nutrients, space, and porosity to accommodate root growth while also allowing for compaction to support pavement without settling. This will protect the roots of the tree and allow for the pathway.

The work on the pathway should be confined only to the path area. Tree protection fences should be placed along the sides of the path. The path should be constructed with structural soils as progress is made to prevent root compaction and damage. The on-site arborist should prescribe any pruning or other tree maintenance on a tree-by-tree basis to promote tree health. The health of the trees should be monitored for 3 years after the path has been constructed.

Pruning and Thinning

All individual trees to be saved near or within developed areas should have their crowns raised to provide a minimum of 8 feet of ground clearance over sidewalks and landscape areas, 15 feet over parking lots or streets, and at least 10 feet of building clearance.

All pruning should be done according to the ANSI A300 standards for proper pruning and be completed by an International Society of Arboriculture Certified Arborist® or be supervised by a Certified Arborist®.

Conclusions and Timeline for Activity

1. At least 29 trees (1.5 healthy trees per acre) need to be retained in the project area. A total of 211 trees are projected to be retained within the 4 tree protection areas, exceeding the requirement by 182 trees. No tree replacement should be required.
2. The final, approved tree protection plan map should be included in the construction drawings for bid and construction of the project and should be labeled as such.
3. Stake and heavily flag the clearing limits.
4. Contact WFCI to attend pre-job conference and discuss tree protection issues with contractors. WFCI can verify all trees to be saved and/or removed are adequately marked for retention. A tally of the trees within the final tree retention area boundaries can be done at this time to confirm that the minimum 29 tree retention requirement is met.
5. Complete logging. Complete necessary hazard tree removals and invasive plant removals from the tree protection areas. No equipment should enter the tree protection areas during logging.
6. Install tree protection fences along the 'limits of construction'. The fences should be located at the limits of construction or 5 feet outside of the drip line of the save tree or as otherwise specified by WFCI. Maintain fences throughout construction.
7. Complete clearing of the project.
8. Do not excavate stumps within 10’ of trees to be saved. These should be individually evaluated by WFCI to determine the method of removal.
9. Complete all necessary pruning on save trees or stand edges to provide at least 8’ of ground clearance near sidewalks and trails, and 15’ above all driveways or access roads.
10. Complete grading and construction of the project.

Summary

We found 607 healthy significant trees in the project area, including 75 Landmark trees. The City of DuPont requires that 1.5 healthy trees per acre are retained in a Manufacturing/Research Park zoned site. Therefore, at least 29 trees will need to be retained as part of this 19.65-acre project. This plan retains 211 trees within 4 tree retention areas. No tree replacement plan should be required.

Please give us a call if you have further questions.

Respectfully submitted,

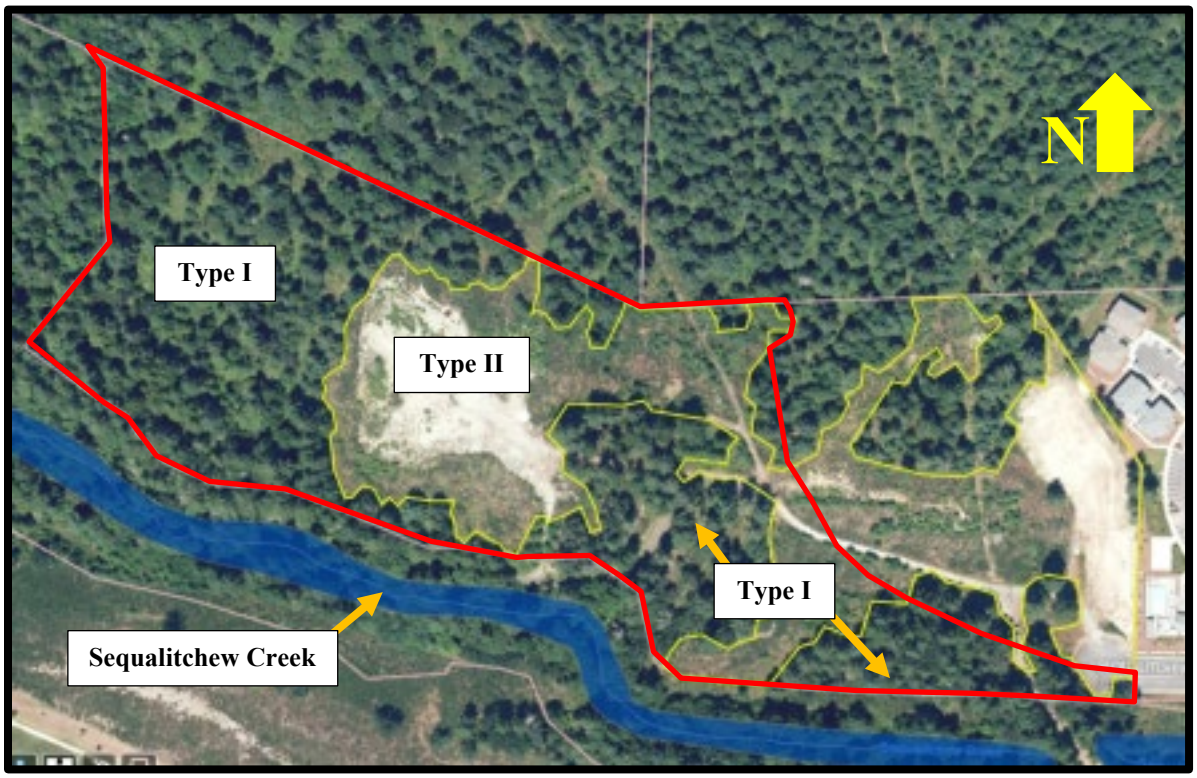
Washington Forestry Consultants

Galen M. Wright, ACF, ASCA
ISA Bd. Certified Master Arborist PN-129BU
Certified Forester No. 44
ISA Tree Risk Assessor Qualified
ASCA Tree and Plant Appraisal Qualified

Joshua Sharpes
Professional Forester
ISA Certified Arborist
Municipal Specialist, PN-5939AM
ISA Tree Risk Assessor Qualified

Attachment 1. Aerial Photo of DuPont West with Cover Types

(Pierce County GIS)

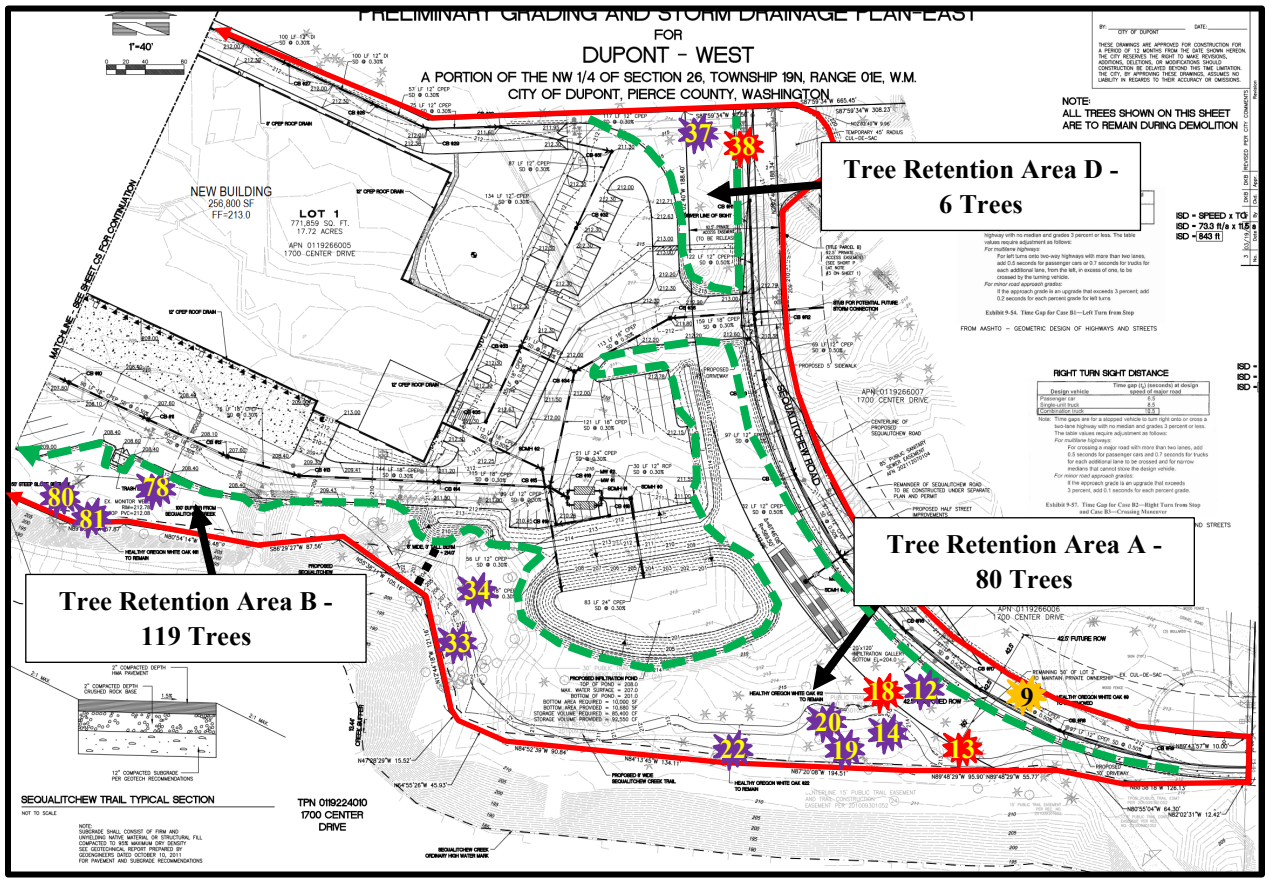


Project Boundary

Cover Type Boundary

Attachment 2. DuPont West Site Plan/Tree Map with Landmark Tree Locations Indicated

(2 Pages)



Site Boundary

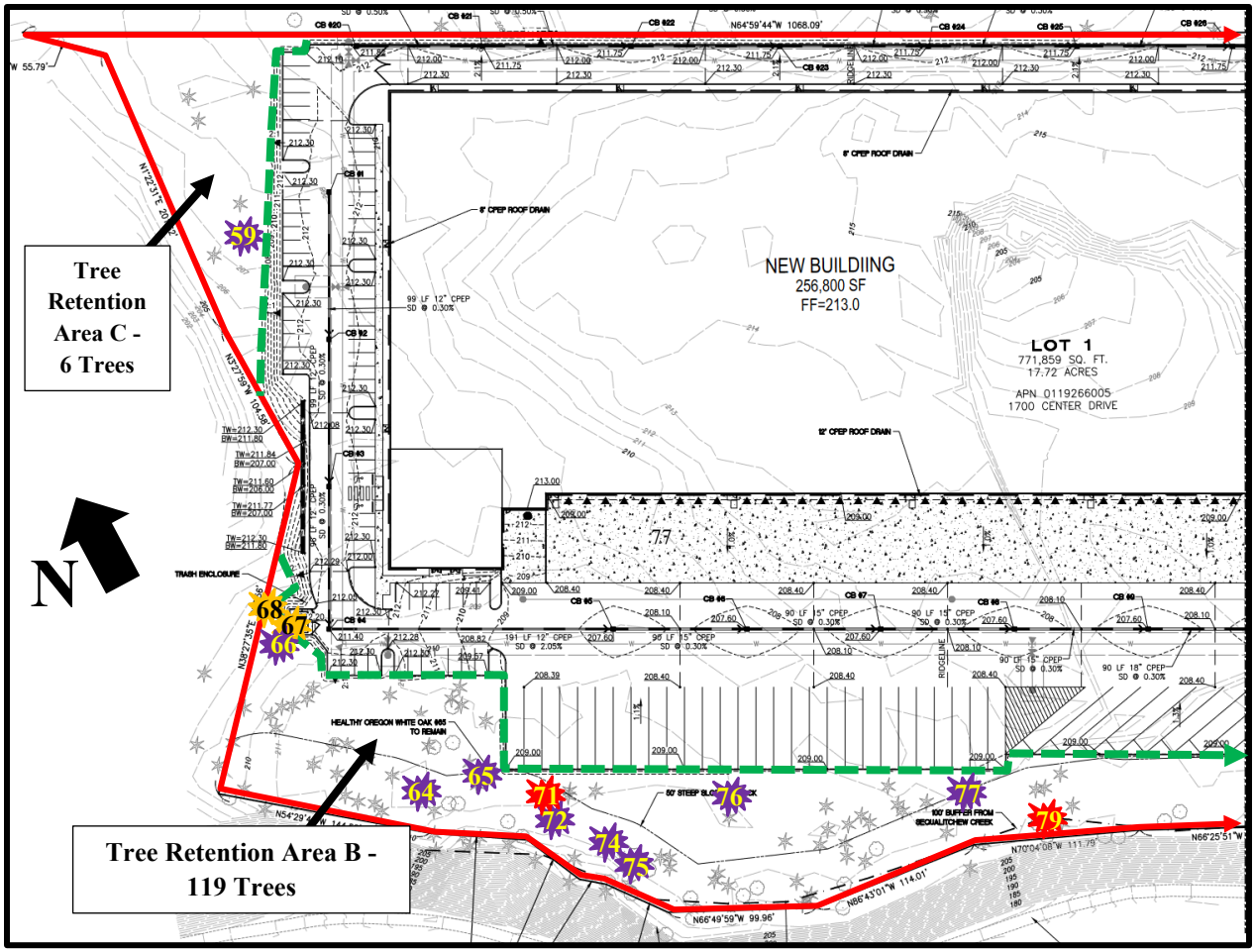
Healthy Landmark Tree to Retain

Unhealthy Landmark Tree

Healthy Landmark Tree to Remove

Tree Protection Fence Location

Tracts A & B Separation Line


Tree Retention Area C - 6 Trees
Tree Retention Area B - 119 Trees
NEW BUILDIING
256,800 SF
FF=213.0
LOT 1
771,859 SQ. FT.
17.72 ACRES
APN 011266005
1700 CENTER DRIVE
N
59
68
67
66
64
65
71
72
74
75
76
77
79
Site Boundary
Healthy Landmark Tree to Retain
Unhealthy Landmark Tree
Healthy Landmark Tree to Remove
Tree Protection Fence Location

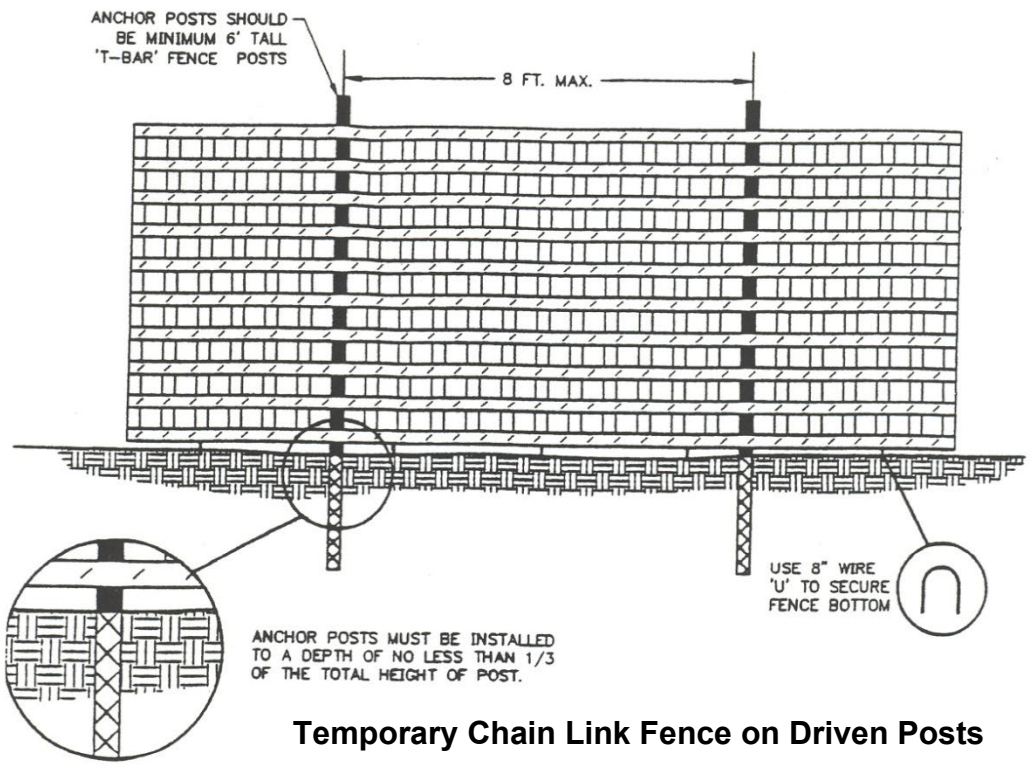
Attachment 3. List of Landmark Trees on DuPont West Site

Tree #	Species	DBH (in.)	Condition	Savable Based on Tree Condition Alone? Yes or No	Project Plan? Save or Remove	Minimum Recommended Root Protection Zone Radius (ft.)	Comment
4	Douglas-fir	33	Fair	Yes	Remove	26	
5	Douglas-fir	28	Good	Yes	Remove	28	
6	Douglas-fir	14, 9, 10, 16, 10, 10	Fair	Yes	Remove		
7	Douglas-fir	48	Good	Yes	Remove	36	
9	Oregon white oak	19, 18, 15, 16, 14, 15	Fair	Yes	Remove	42	
10	Douglas-fir	33, 33	Good	Yes	Remove	30	
11	Douglas-fir	35	Fair	Yes	Remove	30	
12	Oregon white oak	42	Fair	Yes	Save	40	
13	Douglas-fir	34	Poor	No	Remove		Stem Decay
14	Douglas-fir	32	Fair	Yes	Save	28	
15	Douglas-fir	42	Good	Yes	Remove	36	
16	Douglas-fir	33	Fair	Yes	Remove	28	
17	Douglas-fir	30	Fair	Yes	Remove	26	
18	Oregon white oak	18, 19	Poor	No	Remove		Stem Defect, Decay
19	Douglas-fir	41	Fair	Yes	Save	30	
20	Douglas-fir	37	Good	Yes	Save	30	
21	Douglas-fir	31.5	Fair	Yes	Remove	28	
22	Oregon white oak	16, 23, 13	Fair	Yes	Save	30	
23	Douglas-fir	33	Poor	No	Remove		1 dead stem
24	Douglas-fir	33	Fair	Yes	Remove	28	
25	Douglas-fir	41	Good	Yes	Remove	32	
26	Douglas-fir	41, 28	Fair	Yes	Remove		
27	Douglas-fir	40	Good	Yes	Remove		
28	Douglas-fir	37	Good	Yes	Remove		
29	Douglas-fir	50	Good	Yes	Remove		
30	Douglas-fir	35	Fair	Yes	Remove		
31	Douglas-fir	41	Fair	Yes	Remove		
32	Douglas-fir	32	Fair	Yes	Remove	26	
33	Douglas-fir	19, 19, 17	Fair	Yes	Save	28	
34	Douglas-fir	37	Fair	Yes	Save	28	

Tree #	Species	DBH (in.)	Condition	Savable Based on Tree Condition Alone? Yes or No	Project Plan? Save or Remove	Minimum Recommended Root Protection Zone Radius (ft.)	Comment
35	Douglas-fir	31	Fair	Yes	Remove		
36	Douglas-fir	41	Good	Yes	Remove		
37	Douglas-fir	31	Good	Yes	Save		
38	Douglas-fir	34	Fair	Yes	Remove		
42	Douglas-fir	28, 22, 28	Fair	Yes	Remove		
43	Douglas-fir	50, 50, 30	Poor	No	Remove		Stem defect, Red ring rot
44	Douglas-fir	38	Good	Yes	Remove		
45	Douglas-fir	40	Fair	Yes	Remove		
46	Douglas-fir	35	Fair	Yes	Remove		
47	Douglas-fir	42.5	Good	Yes	Remove		
48	Douglas-fir	33	Good	Yes	Remove		
49	Douglas-fir	35	Fair	Yes	Remove		
50	Douglas-fir	34	Fair	Yes	Remove		
51	Douglas-fir	32	Fair	Yes	Remove		
52	Douglas-fir	30	Good	Yes	Remove		
53	Douglas-fir	33	Good	Yes	Remove		
54	Douglas-fir	37	Good	Yes	Remove		
55	Bigleaf maple	33	Good	Yes	Remove		
56	Douglas-fir	34	Poor	No	Remove		Red ring rot
57	Douglas-fir	36	Good	Yes	Remove		
58	Bigleaf maple	41	Good	Yes	Remove		
59	Hemlock	33	Fair	Yes	Save	28E	
60	Douglas-fir	38.5	Fair	Yes	Remove		
61	Bigleaf maple	36	Good	Yes	Remove		
62	Bigleaf maple	24, 24	Good	Yes	Remove		
63	Douglas-fir	31.5	Good	Yes	Remove		
64	Western redcedar	36	Fair	Yes	Save	30	
65	Oregon white oak	16, 14	Fair	Yes	Save		
66	Western redcedar	31	Fair	Yes	Save	22	
67	Western redcedar	31.5	Fair	Yes	Remove	22	
68	Western redcedar	35	Fair	Yes	Remove	26	
69	Western redcedar	31	Good	Yes	Remove		

Tree #	Species	DBH (in.)	Condition	Savable Based on Tree Condition Alone? Yes or No	Project Plan? Save or Remove	Minimum Recommended Root Protection Zone Radius (ft.)	Comment
70	Douglas-fir	31.5	Fair	Yes	Remove		
71	Douglas-fir	31.5	Poor	No	Remove		Dead top
72	Western redcedar	31	Fair	Yes	Save	26	
73	Douglas-fir	37	Good	Yes	Remove		
74	Douglas-fir	36	Good	Yes	Save	24	
75	Bigleaf maple	22, 14, 16	Good	Yes	Save		
76	Douglas-fir	31.5	Fair	Yes	Save	24	
77	Douglas-fir	42	Fair	Yes	Save	30	
78	Douglas-fir	38	Good	Yes	Save	32	
79	Oregon white oak	18,8	Poor	No	Remove		suppressed
80	Oregon white oak	24	Good	Yes	Save	28	
81	Oregon white oak	24.8	Good	Yes	Save	30	
82	Douglas-fir	34	Good	Yes	Remove		

Attachment 4. Tree Protection Fence Detail



Temporary Chain Link Fence on Driven Posts

THE TREE PROTECTION FENCE SHOULD BE MAINTAINED THROUGHOUT THE CONSTRUCTION AND GRADING, AND NOT TO BE REMOVED UNTIL FINAL LANDSCAPING IS IN PROGRESS. AT NO TIME SHALL EQUIPMENT ENTER INTO THE ROOT PROTECTION ZONE (RPZ). ALL BRUSH CLEANUP WITHIN THE RPZ SHOULD BE COMPLETED BY HAND TO PREVENT DISTURBANCE OF NATIVE GROUND COVERS NO CUTS OR FILLS, UTILITY TRENCHING, MODIFICATIONS TO DRAINAGE, OR CONCRETE RISE WATER SHOULD IMPACT THE RPZ. NO WIRES, CABLES, OR OTHER DEVICES SHOULD BE ATTACHED TO PROTECTED TREES DURING CONSTRUCTION.

IF IMPACTS MUST OCCUR WITHIN THE RPZ, CONTACT WFCI PRIOR TO THE OPERATIONS TO DETERMINE THE PROPER PROCEDURE TO PROTECT THE TREE'S HEALTH.

Attachment 5. Individual Tree Rating Key for Tree Condition

RATING	SYMBOL	DEFINITION
Very Good	**VG**	• Balanced crown that is characteristic of the species • Normal lateral and terminal branch growth rates for the species and soil type • Stem sound, normal bark vigor • No root problems • No insect or disease problems • Long-term, attractive tree
Good	**G**	• Crown lacking symmetry but nearly balanced • Normal lateral and terminal branch growth rates for the species and soil type • Minor twig dieback O.K. • Stem sound, normal bark vigor • No root problems • No or minor insect or disease problems – insignificant • Long-term tree
Fair	**F**	• Crown lacking symmetry due to branch loss • Slow lateral and terminal branch growth rates for the species and soil type • Minor and major twig dieback – starting to decline • Stem partly unsound, slow diameter growth and low bark vigor • Minor root problems • Minor insect or disease problems • Short-term tree 10-30 years
Poor	**P**	• Major branch loss – unsymmetrical crown • Greatly reduced growth • Several structurally import dead or branch scaffold branches • Stem has bark loss and significant decay with poor bark vigor • Root damage • Insect or disease problems – remedy required • Short-term tree 1-10 years
Very Poor	**VP**	• Lacking adequate live crown for survival and growth • Severe decline • Minor and major twig dieback • Stem unsound, bark sloughing, previous stem or large branch failures, very poor bark vigor • Severe root problems or disease • No or minor insect or disease problems • Mortality expected within the next few years
Dead	**DEAD**	• Dead

Attachment 6. Description of Tree Evaluation Methodology

The evaluation of the tree condition on this site included the visual assessment of:

1. Live-crown ratio,
2. Lateral and terminal branch growth rates,
3. Presence of dieback in minor and major scaffold branches and twigs,
4. Foliage color,
5. Stem soundness and other structural defects,
6. Visual root collar examination,
7. Presence of insect or disease problems.
8. Windfirmness: if tree removal will expose this tree to failure.

In cases where signs of internal defect or disease were suspected, a core sample was taken to look for stain, decay, and diameter growth rates. Also, root collars were exposed to look for the presence of root disease.

In all cases, the overall appearance of the tree was considered relative to its ability to add value to either an individual lot or the entire subdivision. Also, the scale of the tree and its proximity to both proposed and existing houses was considered.

Lastly, the potential for incorporation into the project design is evaluated, as well as potential site plan modifications that may allow otherwise removed tree(s) to be both saved and protected in the development.

Trees that are preserved in a development must be carefully selected to make sure that they can survive construction impacts, adapt to a new environment, and perform well in the landscape. Healthy, vigorous trees are better able to tolerate impacts such as root injury, changes in soils moisture regimes, and soil compaction than are low vigor trees.

Structural characteristics are also important in assessing suitability. Trees with significant decay and other structural defects that cannot be treated are likely to fail. Such trees should not be preserved in areas where damage to people or property could occur.

Trees that have developed in a forest stand are adapted to the close, dense conditions found in such stands. When surrounding trees are removed during clearing and grading, the remaining trees are exposed to extremes in wind, temperature, solar radiation, which causes sunscald, and other influences. Young, vigorous trees with well-developed crowns are best able to adapt to these changing site conditions.

Attachment 7. Glossary of Forestry and Arboricultural Terminology

DBH: Diameter at Breast Height (measured 4.5 ft. above the ground line on the high side of the tree).

Live Crown Ratio: Ratio of live foliage on the stem of the tree. Example: A 100' tall tree with 40 feet of live crown would have a 40% live crown ratio. Conifers with less than 30% live crown ratio are generally not considered to be long-term trees in forestry.

Crown: Portion of a trees stem covered by live foliage.

Crown Position: Position of the crown with respect to other trees in the stand.

Dominant Crown Position: Receives light from above and from the sides.

Codominant Crown Position: Receives light from above and some from the sides.

Intermediate Crown Position: Receives little light from above and none from the sides. Trees tend to be slender with poor live crown ratios.

Suppressed Crown Position: Receives no light from above and none from the sides. Trees tend to be slender with poor live crown ratios.

Attachment 8. Assumptions and Limiting Conditions

1) Any legal description provided to the Washington Forestry Consultants, Inc. is assumed to be correct. Any titles and ownership's to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.

2) It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other governmental regulations, unless otherwise stated.

3) Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, Washington Forestry Consultants, Inc. can neither guarantee nor be responsible for the accuracy of information.

4) Washington Forestry Consultants, Inc. shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.

5) Loss or alteration of any part of this report invalidated the entire report.

6) Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior expressed written or verbal consent of Washington Forestry Consultants, Inc.

7) Neither all or any part of the contents of this report, nor copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales or other media, without the prior expressed written or verbal consent of Washington Forestry Consultants, Inc. -- particularly as to value conclusions, identity of Washington Forestry Consultants, Inc., or any reference to any professional society or to any initialed designation conferred upon Washington Forestry Consultants, Inc. as stated in its qualifications.

8) This report and any values expressed herein represent the opinion of Washington Forestry Consultants, Inc., and the fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence neither of a subsequent event, nor upon any finding in to reported.

9) Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.

10) Unless expressed otherwise: 1) information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and 2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the tree or other plant or property in question may not arise in the future.

Note: Even healthy trees can fail under normal or storm conditions. The only way to eliminate all risk is to remove all trees within reach of all targets. Annual monitoring by an ISA Certified Arborist or Certified Forester will reduce the potential of tree failures. It is impossible to predict with certainty that a tree will stand or fail, or the timing of the failure. It is considered an 'Act of God' when a tree fails, unless it is directly felled or pushed over by man's actions.

Attachment 1ii

GeoEngineers
1101 Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

March 22, 2024

Avenue 55, LLC
601 Union Street, Suite 2930
Seattle, Washington 98101

Attention: Ben Varin

Subject: Report Addendum 4
Geotechnical Engineering Services
DuPont-West
DuPont, Washington
File No. 26421-001-00

This report addendum (Addendum 4) documents our plan review and response to a geotechnical-related comment in the City of DuPont's "Review Comments and Request for Additional Information" letter addressed to Avenue 55 LLC, and dated January 8, 2024 (City Letter). Our services have been provided in accordance with the terms in our signed agreement with Avenue 55, LLC (signed October 17, 2022).

Most recently, we prepared "Report Addendum 3, Geotechnical Engineering Services, Dupont-West, Dupont, Washington dated October 20, 2023 (Addendum 3) that provides a discussion on critical areas (geologically hazardous areas) at the project site located at 1700 Center Drive in DuPont, Washington. Our other previous geotechnical deliverables for the site include:

- "Geotechnical Engineering Services, Lot 'Y' Industrial Park, DuPont, Washington" dated October 10, 2011 (2011 Report). As part of our services, we advanced 22 test pit explorations in the project area to develop an understanding of subsurface conditions. The 2011 Report presents a summary of our findings, conclusions, and recommendations regarding geotechnical engineering aspects of the proposed industrial park development.
- "Report Addendum, Geotechnical Engineering Services, DuPont Industrial Warehouse, DuPont, Washington" dated May 11, 2018 (2018 Addendum), which includes our review of a proposed development site plan and updated recommended seismic design parameters.
- "Report Addendum, Geotechnical Engineering Services, DuPont Industrial Park, DuPont, Washington," dated November 8, 2022 (November 2022 Addendum).
- "Revised Report Addendum 2, Geotechnical Engineering Services, DuPont 243, DuPont, Washington" dated August 1, 2023 (August 2023 Addendum), which includes our review of an updated development site plan and confirmation of previously provided geotechnical design recommendations.

Per the City Letter, they requested additional input from the geotechnical engineer regarding critical areas, as they relate to geologically hazardous areas and the planned Sequalitchew Creek Trail easement that runs through the southeast half of the project property. Specifically, under section "A. DMC 25.105 Critical Areas 1." of the City Letter, the City of DuPont requested to "provide a letter from the geotechnical engineer that the proposed trail design within the 50-foot landslide hazard area buffer has been specifically evaluated and can be constructed to ensure at least 100 years of useful life for the trail."

Additional clarification was provided by Barbara Kincaid of the City of Dupont regarding this request in an email to Ben Varin at Avenue 55, LLC on March 12, 2024. Regarding the above comment related to the Sequalitchew Creek Trail, Barbara's email clarified that "we will accept a letter from your Geologist confirming that they conducted an evaluation of the landslide and/or erosion hazard as to the proposed trail location and find there are no potential landslide or erosion issues with the trail placement that would cause the trail to fail and thus endanger the public."

For this request, we reviewed Sheet C6 "PRELIMINARY GRADING AND STORM DRAINAGE PLAN-EAST" of the Project Civil Plans prepared by Barghausen Consulting Engineers, Inc. dated November 6, 2023. The trail easement encroaches the 50-foot "top of slope" buffer at two locations, both are near the west end of the trail easement where it connects to the rest of the trail running off-site. Site grading appears to be minimal in the southeast corner of the property and is generally limited to the Sequalitchew Creek Trail easement and some landscaping.

Based on our review of Civil Plan Sheet C6, our previous geotechnical studies and our experience, it is our opinion that the new trail encroachment as described poses a low risk to overall global slope stability related to landslide and erosion hazards and any accompanying buffers. We take no issue with the proposed trail as it relates to geotechnical considerations.

LIMITATIONS

We have prepared this report for Avenue 55, LLC, for the DuPont-West project located at 1700 Center Drive in DuPont, Washington and is intended to provide supplemental geotechnical design recommendations to our previous studies at this site for this project. Avenue 55, LLC may distribute copies of this report to authorized agents and regulatory agencies as may be required for the project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. The conclusions, recommendations, and opinions presented in this report are based on our professional knowledge, judgment, and experience. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix A titled "Report Limitations and Guidelines for Use" provided in our "Revised Report Addendum 2, Geotechnical Engineering Services, DuPont 243, DuPont, Washington" dated August 1, 2023, for additional limitations and information pertaining to use of this report. Except as modified herein, the recommendations, limitations, and information presented in the August 2023 Addendum and subsequent Addendum 3 also apply to this project and should be reviewed for our complete geotechnical recommendations.

Sincerely,
GeoEngineers, Inc.

Christopher R. Newton, PE
Geotechnical Engineer

Dennis (DJ) Thompson, PE
Associate Geotechnical Engineer

CN:DJT:jes

One copy submitted electronically

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Attachment 1jj

BARGHAUSEN

March 29, 2024

Barb Kincaid
City of DuPont
Department of Community Development
1700 Civic Drive
DuPont, WA 98327

RE: DuPont 243 - Response to January 8, 2024 Letter from City of DuPont
City File Numbers: PLNG2022-031 and -032
Our Job No. 18666

Dear Ms. Kincaid:

We have revised the plans and technical documents for the above-referenced project to address the comments in your letter dated January 8, 2024. Enclosed are the following plans and documents for your review and approval:

1. One (1) each electronic file revised Architectural Site Plan
2. One (1) each electronic file revised Preliminary Civil Engineering Design Plans
3. One (1) each electronic file revised Preliminary Landscape and Irrigation Plan
4. One (1) each electronic file revised Geotechnical Addendum 4
5. One (1) each electronic file revised Tree Retention Plan
6. One (1) each electronic file Response Letter prepared by JLS to address Peer Review comments regarding Noise Study
7. One (1) each electronic file Response Letter prepared by Soundview Consultants to address Peer Review comment regarding OHWM Verification

The following outline provides each of your comments in italics, along with a narrative response describing how each comment was addressed:

A. DMC 25.105 Critical Areas.

1. *Provide a letter from the geotechnical engineer that the proposed trail design within the 50-foot landslide hazard area buffer has been specifically evaluated and can be constructed to ensure at least 100 years of useful life for the trail.*

   Response: A letter from the geotechnical engineer (Addendum #4) is provided with this resubmittal.

2. *Provide documentation that the OHWM has been field verified by a qualified biologist.*

   Response: The OHWM has been verified by Soundview Consultants resulting in a minor adjustment that will not affect the site improvements. A memo from SVC is included with the resubmittal.

B. DMC 25.120 Tree Retention

1. *Update the site plan and grading plan to ensure that the trail improvements and all proposed grading is outside of the dripline of any tree to be retained. Alternatively, if the trail alignment and grading cannot be modified so as to avoid encroachment into the dripline of trees to be retained, you can apply for a Type III Tree Modification Request.*

   Response: The trail has been adjusted so that it is located outside the dripline of the Oregon white oak identified as tree #33 in the tree retention report.

2. *Updated Sheet L-1 to include the most recent Tree Protection Measures.*

   Response: The most recent tree protection measures are now included on Sheet L-1.

C. DMC 25.90 Landscaping

1. *Update the landscape plan to only include the landscapes percentage of the gross area total minus the 1.93 acres to be dedicated to ROW.*

   Response: The landscaping areas and percentages have been updated per this comment.

2. *Updated landscape and grading plans to include a berm between the trailer storage area and Sequalitchew Drive and plant as a moderate buffer with 6-foot height trees similar to the berm and buffer provided south of the vehicle parking area.*

   Response: The proposed berm and landscape buffer have been extended north to screen the trailer parking area.

D. Other

1. *Provide a proposed section for Sequalitchew Trail.*

   Response: A proposed section for the Sequalitchew Trail has been added to sheet C6.

GENERAL

8. *The Title Report Exception Numbers called out on the Plans do not appear to correspond with the last Title Report (dated September 3, 2020) received for the project.*

   Response: All title exception numbers shown on the plans have been updated to correspond with the most recent Title Report.

We believe that the above responses, together with the enclosed revised plans and technical documents, address the comments in your letter dated January 8, 2024. Please review and approve the enclosed at your earliest convenience. If you have questions or need additional information, please do not hesitate to contact me at this office. Thank you.

Sincerely,

Daniel K. Balmelli

Daniel K. Balmelli, P.E.
Executive Vice President

DKB/bd
18666c.014
enc: As noted
cc: Ben Varin, Avenue 55
Drew Zaborowski, Avenue 55
Brian Ludwig, Innova Architects
Josh Towne, Barghausen Consulting Engineers
Betsy Dyer, Barghausen Consulting Engineers

March 1, 2024

Avenue 55
601 Union Street, Ste. 2930
Seattle, WA 98101

Attention: Ben Varin
Subject: Dupont 243 Noise Study Response to Landau Peer Review

Ladies & Gentlemen:

This report presents responses to the comments and questions posed in the December 8, 2023 peer review report prepared by Landau Associates. These comments and questions are based on their review of my updated noise study report dated October 18, 2023.

Noise Standards

- The FHWA noise impact criterion of 67 dBA peak hour Leq is the threshold for consideration of a noise barrier, but it much too high of a threshold to mention for this project. Ambient noise measurements conducted in October 2018 about 1/2-mile east of this site (for a different project) revealed an L_{dn} of 54.7 at a distance of 150 feet from the centerline of Center Drive.

City of DuPont Noise Ordinance

- Assuming the Class A EDNA for all areas adjacent to the project site, except the property north of the project site which is Class B ENDA is the safest (conservative) way to proceed.

- Since the noise-sensitive properties south and east of the project are being considered as Class A EDNA, motor vehicle noise on private property must comply with the noise ordinance.

Ambient Noise Measurements

- As noted in the Figure 3 title, this noise measurement location is on the Sequalitchew Creek Trail, so the steady background noise is likely due to water flowing in the creek.

5266 NW Village Park Drive
Issaquah, WA 98027

Phone: (425) 649-9344
email: jerry@jglacoustics.com

Predicted Site-Generated Noise Levels -Traffic data

- There is a question as to why the 6 AM hour was selected as the worst-case hour, and why the 7 AM and 5 PM hours were not considered. This question is answered on pages 9, 10, and 11 in the noise study. While the 7 AM and 5 PM peak traffic hours might represent the worst-case scenario for traffic impacts on the area streets, it is not the worst-case scenario for this noise study. I should point out that if the 7 AM or 5 PM hour was incorrectly selected as the worst-case hour, the delivery truck volume would be much lower (see Table 4) and the allowable project noise levels would be 10 dBA higher making compliance with the noise ordinance easier to achieve.

Predicted Site-Generated Noise Levels - Onsite noise sources

- Landau is correct that the noise model does not include noise associated with trucks starting their engines, or the noise of opening and closing doors. The model also does not include any noise due to objects being dropped on the ground or vehicles accidentally bumping into the loading docks. All of these sounds are so brief in duration and in frequency that they dwarf in comparison to the noise generated by the trucks and the air brake release that is included in the noise study.

- Landau asked to clarify how the number, distribution, and duration of idling trucks were determined. The location and number of idling trucks was estimated based on the proposed truck traffic volumes. Not all arriving trucks will be left idling after arriving at the loading docks, so it was arbitrarily assumed that 50% of the arriving trucks would be left at idle after arriving at the loading dock. Parked trailers in the 38 slots south of the loading docks were not included in the model since they would provide an additional barrier to sound transmission from the loading docks toward the trail.

Predicted Site-Generated Noise Levels – Receivers

- Landau asked about the selection of receiver locations. The receiver locations were selected along the existing trail when there were two delivery vehicle entrances and a second building near the southeast corner of the site. Locating receivers south of the property line would put them off the trail, into the woods, and farther from the noise sources.

Noise Ordinance Compliance

- Landau has detected that the 10/18/23 noise model report has slightly different noise contours than the 7/21/24 report in the vicinity of T8 and T9. This is because one of the two idling trucks in the southeast parking lot was moved to the north side of the parking lot. In the prior location, the trailer was shielding the truck engine noise from the south property line. In the new location the truck engine noise is allowed to radiate toward the trail without any shielding from the trailer. Table 5 was not changed from the previous report because there was no known change in traffic volumes, and I did not notice the slight change in the noise contours. I have since received the updated traffic study dated October 9, 2023, and I see that the expected average number of delivery trucks has actually decreased from 152 to 146, so the noise levels in the report would be slightly lower if Table 5 would be revised to match the latest traffic study.

- Landau is correct that Receiver 4 is currently a Class B EDNA, which has higher allowable noise levels compared to the other Class A receivers.

- Table 5 presents the CadnaA predicted L_{eq}, L_{max}, and time over threshold statistics for each receiver. Compliance with the noise ordinance is only determined by the time over threshold statistics and the L_{max} during the worst-case hour. All other hours of the day will have lower sound levels.

- I agree with Landau regarding the use of the trail during all hours of the day. The noise study report shows that the off-site receiver locations on the trail are expected to be in compliance with the noise ordinance during all hours of the day and night.

Noise Impact Analysis

- The noise impact analysis section of the 10/18/23 noise model report addresses only the 4 receiver locations included in the noise study. None of these 4 receiver locations are less than 800 feet from the intersection of Center Drive and Sequalitchew Road, so they will not be significantly impacted by traffic turning noise at that intersection.

- The project noise levels in Table 6 were determined from the CadnaA model analysis at each of the 4 selected receiver locations. The procedure required taking the CadnaA predicted L_{eq} values including traffic noise on Sequalitchew

Road and adjusting the L_{eq} for all of the other hours of the day using the hourly distribution of traffic volumes presented in Table 4. The hourly L_{eq} values were then used to calculate L_{dn} and the average day and night L_{eq} values.

- The project L_{dn} values shown in Table 6 are based on the worst-case condition. This is confirmed by recognizing that the basis of the analysis is the L_{eq} computed at 6 AM where the traffic volume used in the model is 1.18 times the average traffic volume (see page 9 of the noise study report). When the 6 AM hour L_{eq} is the basis for the other hours of the day, this procedure essentially assumes that traffic volumes for every hour of the day are 18% above the average traffic volume.
- The maximum sound level (L_{max}) at each receiver location (and the time over threshold value) was determined in the CadnaA model using the Pass-by-Level tool for each vehicle path at each receiver location and adjusting the value by the number of vehicles using that path. Both the maximum sound level and the time above threshold were determined using this technique.
- I suppose that I could have introduced the FTA criteria earlier in the report, and then repeated it again during the noise impact analysis.

Impulsive Noise Sources

- The impulsive noise levels assumed in the analysis are presented on page 15 of the noise study report (L_{wA} = 120 dB re 1 picowatt) for the air brake release and 20 dB lower (L_{wA} = 100 dB re. 1 picowatt) for the backup beeper. Although these noise sources are intermittent, they can occur at any time, day or night, at the same source sound power level. The resulting sound level at the receiver will vary depending upon the distance from the source, taking into account any shielding provided by the building or site topography.
- I cannot confirm the reason for the changes in the Table 7 sound levels between the July and the October reports, because those reports did not identify the precise source locations assumed in the analysis. To correct that error, I have revised Table 7 which now includes nighttime average ambient L_{max} values and predicted project L_{max} noise levels at Receiver T14, all evaluated with the specific source and source locations closest to the receivers listed on the following page:

Backup Beeper #1: 128 feet south of the warehouse at the closest loading dock
Air Brake Release #1: 44 feet from the warehouse at the closest loading dock
Backup Beeper #2: 60 feet north of the south edge of SE parking lot
Air Brake Release #2: 132 feet north of the south edge of SE parking lot

Table 7 (revised). Predicted maximum sound levels of impulsive noise sources (dBA)

Impulsive Source	P1	P2/T9	P3	P4	T10	T13	T14	T15
Backup Beeper #1, L_{max}	13.0	39.0	44.6	22.1	39.2	38.6	41.6	38.7
Air Brake Release #1, L_{max}	25.7	57.8	51.0	15.7	58.4	58.0	61.3	56.0
Backup Beeper #2, L_{max}	39.2	46.1	34.9	15.5	39.2	41.7	37.8	34.4
Air Brake Release#2, L_{max}	49.6	66.1	30.4	30.7	65.4	63.1	55.4	51.7
Noise Ordinance Daytime Limit, L_{max}	72	72	72	75	72	72	72	72
Noise Ordinance Nighttime Limit, L_{max}	62	62	62	75	62	62	62	62
Hourly Average Day Ambient, L_{max}	62.9	61.8	70.0	N/A	N/A	N/A	N/A	N/A
Hourly Average Night Ambient, L_{max}	53.7	52.8	55.7	N/A	N/A	N/A	N/A	N/A

- I agree with Landau that backup beepers are exempt from the noise ordinance, and that air brake noise is not exempt. Is clear from the revised Table 7 that the predicted air brake noise from trucks at the loading docks will meet the noise ordinance limits (day or night). However, as noted by the sound levels highlighted in red text in the revised Table 7, the air brake release noise from trucks in the overflow parking lot southeast of the warehouse building could exceed the nighttime maximum limit of 62 dBA at Position 2 (T9) by as much as 4 dBA if a truck releases its air brakes in this lot during the nighttime hours. Note that air brake release noise at Receivers T10 through T13 are also expected to exceed the 62 dBA nighttime L_{max} limit, but these trail locations are on the source property and not subject to the noise ordinance.
- A brief discussion of the tonal nature of backup beepers is provided on page 15 of the noise study report.

Summary and Mitigation

- Landau has made good comments and posed reasonable questions regarding the need for additional clarification of how the sound levels were determined in this report. I believe that this response has provided the information that was missing in the most recent noise study report.

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- This study has shown the project is not expected to create a noise impact in accordance with FTA guidelines at any of the 4 selected receiver locations surrounding the site. In addition, the project is expected to meet the noise ordinance at all of the 19 selected receiver locations, with only one minor exception: if a delivery truck were to move into the overflow trailer parking lot and release the air brakes during the nighttime hours (10 PM to 7 AM), this brief noise could exceed the 62 dBA nighttime noise ordinance limit along the south property line near Position 2 (T9). Having a truck use this overflow trailer parking lot during the nighttime hours is expected to be a very rare occurrence because of its remote location and because nighttime activity would typically be focused on the loading docks. To ensure full compliance with the noise ordinance, I recommend adding signage behind the trailer parking stalls prohibiting trailer movements between the hours of 10 PM and 7 AM. Releasing the air brakes during the daytime hours would not violate the noise ordinance at any source location.

If you have any questions or comments concerning my response to these peer review comments, do not hesitate to contact me.

Very truly yours,
JGL Acoustics, Inc,

Jerry G. Lilly, P.E., President, FASA
Member INCE (*Bd. Cert.*), ASTM, ASHRAE, NCAC

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Attachment 1ll

DuPont West
Noise Study

Prepared for:

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May 20, 2024

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Preamble

This report differs from the previous (20 October 2023) report because it has been updated to the hourly traffic volumes for warehouse projects presented in the 11th Edition of the Trip Generation Manual published by the Institute of Traffic Engineers (ITE). This updated hourly traffic distribution data from ITE shows less traffic during the nighttime hours and more traffic during the daytime hours compared to the hourly data presented in the previous report. This change in hourly traffic volume results in changes to the predicted noise ordinance compliance statistics at most receiver locations as shown in Table 5, but the overall noise ordinance compliance and overall noise impacts remain nearly the same as in the previous report. Table 5A below presents the noise ordinance compliance statistics for the busiest daytime hour (11 AM). This data was not presented in the main body of the report because compliance with the noise ordinance is more difficult to meet during the nighttime hours because of the lower allowable sound level limits.

Table 5A. Predicted project noise ordinance compliance statistics (11 AM hour).

Receiver Location	Night L_{eq} (dBA)	Night L_{max} (dBA)	Time Over 57 dBA (15 min. max.)	Time Over 62 dBA (5 min. max.)	Time Over 67 dBA (1.5 min. max.)
P1	42.7	47.4	0 min	0 min	0 min
P2	50.1	53.4	0 min	0 min	0 min
P3	41.0	50.4	0 min	0 min	0 min
P4	36.8	49.3	0 min	0 min	0 min
T1	43.8	44.2	0 min	0 min	0 min
T2	44.4	45.2	0 min	0 min	0 min
T3	45.0	46.3	0 min	0 min	0 min
T4	46.5	47.2	0 min	0 min	0 min
T5	47.5	48.4	0 min	0 min	0 min
T6	48.7	48.4	0 min	0 min	0 min
T7	48.8	49.5	0 min	0 min	0 min
T8	50.1	51.7	0 min	0 min	0 min
T9	50.1	53.4	0 min	0 min	0 min
T10	49.9	53.0	0 min	0 min	0 min
T11	50.1	53.3	0 min	0 min	0 min
T12	50.8	54.9	0 min	0 min	0 min
T13	52.8	61.7	3.13 min	0 min	0 min
T14	49.1	54.8	0 min	0 min	0 min
T15	45.6	49.1	0 min	0 min	0 min
T16	43.1	49.1	0 min	0 min	0 min

Introduction

This report addresses the issue of noise impacts related to the proposed DuPont West Warehouse/Distribution Center project, which is a proposed light-industrial business park planned for the property located on the north side of the Sequalitchew Creek Trail next to DuPont City Hall, in DuPont, WA. A site plan for the project is presented in Figure 1 on page 2 of this report. The site is bordered on the north by undeveloped woods for future residential development), on the east by an existing apartment complex, and on the south and west by the Sequalitchew Creek Trail. The project site and the property north of the site is zoned MRP (manufacturing and research). The property to the west (existing apartments) is zoned R12, and the property to the south and west is zoned OS (open space, sensitive area). From an environmental noise perspective, the primary areas with a potential noise impact are the Sequalitchew Creek Trail and the apartment complex to the east.

Noise Standards

Noise is always present in the environment. Noise is generated by both natural phenomena (e.g. wind, water flowing in a stream or river) and by man-made machinery (e.g. motor vehicles, aircraft, ventilation fans). Noise can have both positive and negative impacts on the environment. The steady sound of a distant waterfall or a quiet fan can provide a soothing background noise to promote sleep and/or "mask" other annoying sounds that may be in the environment. Sounds that are too loud, too abrupt, or simply unwanted (e.g. music from someone else's property) may disrupt sleep, impede speech communication, or simply create annoyance.

The level (which is proportional to loudness as perceived by humans) of environmental noise is typically measured in terms of A-weighted decibels, abbreviate dBA. Most outdoor environments have noise levels that fall into the 30 to 100 dBA range. Occasionally you will find noise levels outside this range, but it is a very rare occurrence. A noise level of 0 dBA is the approximate threshold of human hearing. Noise at or below this level exists only inside specially designed acoustical test chambers. At the other extreme: the approximate threshold of pain for most humans is 120 dBA. The noise of gunfire at close range can exceed this level for a brief period of time. A level above 120 dBA is also typical of a military jet engine during take-off, if the listener is within 100 feet of the aircraft. Table 1 presents a summary of typical sound levels associated with various sources of noise.

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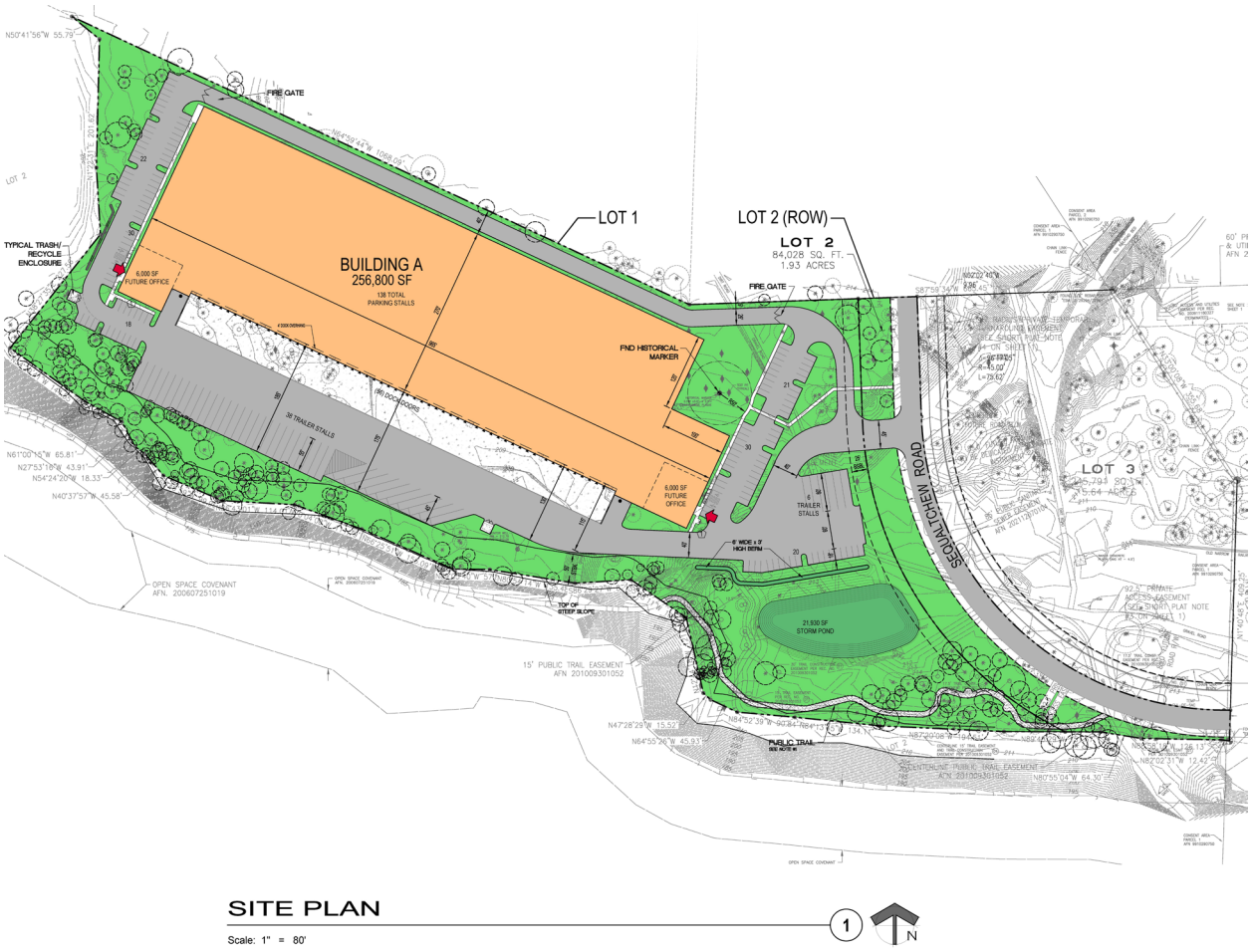


Figure 1. Project site plan.

Table 1. Typical Sound Levels

Noise Source	Distance (feet)	Noise Level (dBA)
Military Jet @ Takeoff	100	100 to 120
Chain Saw	5	90 to 100
Heavy Truck @ 50 mph	50	80 to 90
Automobile @ 50 mph	50	65 to 75
Normal Speech	5	55 to 65
Indoor Air-Conditioner	5	45 to 55
Refrigerator	5	35 to 45
Ticking Clock	5	25 to 35

It is also important to understand the importance of a change in noise level, particularly when evaluating noise impacts. In general, it takes an increase of 10 dBA to create a perceived doubling of the loudness of a noise. This relationship applies to all types of noise (except for very low frequency noise). Therefore, increasing the level of noise from 40 dBA to 50 dBA would be perceived as a doubling of the loudness, as would an increase from 78 dBA to 88 dBA. Conversely, reducing a given noise level from 94 dBA to 84 dBA would be perceived as a 50% reduction in the loudness. A 5 dBA increase or decrease is generally perceived as clearly noticeable and significant. A change in level of only 1 dBA is generally too small to be detected, except under very special (laboratory-like) conditions. In general, it takes a 3 dBA change to be noticed by the casual listener, unless the "character" or "quality" of the sound is changed significantly.

In general, the noise level at any location is almost never constant. The noise level will typically fluctuate with time and location. However, when averaged over a significant time period (e.g. several minutes or an hour), most outdoor environments will exhibit a reasonably steady noise level. The most significant outdoor noise level statistic is the average noise level, abbreviated L_{eq} (which stands for equivalent sound level). The L_{eq} is defined as the steady (constant) sound level that has the same total acoustic energy as the actual time-varying sound level. The L_{eq} can be measured over any time interval, but usually an interval somewhere in the range of 1 second to 1 hour is used. Other important noise level statistics include the L_{max} (which is the maximum sound level during an interval of time), the L_{min} (which is the minimum sound level during an interval of time), and the L_{90}. The L_{90} is a statistic defined as the sound level that is exceeded 90% of the time interval (i.e. the noise level is below the L_{90} value only 10% of the time interval). It is usually controlled by noise sources very far from the measurement location. The L_{90} is often called the "background noise level" as opposed to the ambient noise level (which includes all noise sources, both near and far).

There is one other important noise level statistic that must be mentioned: the day-night sound level, abbreviated L_{dn} or DNL. The L_{dn} is a 24-hour average noise level (with a built-in penalty of 10 dB for nighttime noise) that is most often used in reference to land use compatibility. In terms of DNL or L_{dn}, nighttime is defined as 10 PM to 7 AM. By convention, the day-night sound level is expressed in units of dB (not dBA like L_{eq} or L_{max}) even though the measured values are A-weighted decibels. Most federal government noise guidelines are defined in terms of the L_{dn} statistic. For example, in 1972 the U.S. Environmental Protection Agency identified an L_{dn} of 55 dB as the maximum recommended outdoor ambient noise level for residential areas to protect the health and safety of the general public with an adequate margin of safety[1]. The EPA standard is only a guideline – it is not regulatory. In fact, the same report admitted that over 50% of the U.S. population, living in urban areas, does not meet this sound level.

[1] Protective Noise Levels, U.S. Environmental Protection Agency Report No. 550/9-79-100, 1978.

The U.S. Department of Housing and Urban Development (HUD) has identified an L_{dn} of 65 dB as the maximum allowable exterior noise level recommended for residential development. If a building site exceeds an L_{dn} of 65 dB, then special noise mitigating measures should be included in the design to further control noise. According to HUD, residential development should be seriously discouraged at sites where the existing L_{dn} is above 75 dB, regardless of the special noise control measures that are implemented.

The Federal Highway Administration (FHWA) has slightly different noise standards that relate specifically to highway noise. The FHWA has identified an average (L_{eq}) noise level of 67 dBA, measured over a one-hour period (typically during peak traffic flow), as the threshold of acceptance. For example, the FHWA will not fund highway noise barriers to reduce traffic noise in residential neighborhoods unless the peak hour L_{eq} is above 67 dBA. There are also other factors related to the construction of noise barriers (including number of residents impacted, construction feasibility, availability of funds, etc.), but the first requirement is a peak hour L_{eq} greater than 67 dBA.

City of DuPont Noise Ordinance

Chapter 9.09 of the DuPont Municipal Code contains the maximum allowable noise levels which will regulate this project. The DuPont noise level limits are the same as those in the Washington State Noise Ordinance (WAC 173-60). The maximum allowable noise level depends upon the zoning of the source and receive properties. The proposed development is on property zoned MRP, which is considered a commercial zone (Class B EDNA from the noise ordinance), and the receiving properties range from Class B to the north to Class A to the east, south, and west. With these current zonings, the maximum allowable continuous sound level on the Class B property to the north is 60 dBA. The maximum allowable continuous sound level on the Class A properties to the east, south, and west is 57 dBA during the day and 47 dBA during the nighttime (10 PM to 7 AM). The noise ordinance also allows the noise level to exceed these limits, but only for limited durations. If the cumulative duration of the noise does not exceed 15 minutes per hour the allowable noise level is 5 dBA higher than the continuous (steady) limit. If the cumulative duration of the noise does not exceed 5 minutes per hour the maximum allowable noise level is 10 dBA higher than the steady-level limit, and if the cumulative duration of the noise does not exceed 1.5 minutes per hour the maximum allowable noise level is 15 dBA higher than the steady level limit. Table 2 summarizes the maximum allowable noise levels from the proposed project at the residential properties on the south side of Center Drive. It is important to remember than noise from all traffic on public roa ds as well as aircraft noise is exempt from the noise ordinance. It is also important to note that the absolute maximum allowable noise level (even for time periods less than 1 second) is 75 dBA on Class B receiving property and 72 dBA during the day and 62 dBA at night on Class A receiving property.

Table. 2. Maximum allowable project noise levels at receiving properties

Receive Property	Steady Noise	< 15 minutes/hr	< 5 minutes/hr	< 1.5 minutes/hr
Class B	60	65	70	75
Class A (day)	57	62	67	72
Class A (night)	47	52	57	62

Note that many noise sources are exempt from the noise level limits specified in the noise ordinance, including but not limited to:

- Motor vehicles operating on public streets and highways,
- Aircraft in flight,
- Surface carriers engaged in interstate commerce by railroad, and
- Emergency equipment, including warning devices (e.g., backup beepers).

This means that motor vehicles on public streets are exempt from the noise ordinance limits, but once these vehicles enter onto private property, they must comply with the noise limits listed above. Also, note that warning devices, which includes back-up beepers are also exempt from the noise ordinance limits.

Existing Noise Levels

Environmental noise in the vicinity of this project is impacted primarily from traffic on Center Drive, aircraft flyovers from JBLM, and people walking the Sequalitchew Creek Trail. Other sounds noted in the area are birds, the sound of wind blowing through the trees, and the sound of water flowing in Sequalitchew Creek. Noise from emergency vehicles entering and leaving the fire and police stations near City Hall are also likely to be heard, although not noted during my time on site.

Measurements of existing ambient noise were collected at 3 different locations in the vicinity of the proposed project from 3 PM on Sunday, April 8, 2019 through 3 PM on Tuesday, April 30, 2019. Figure 2 presents an aerial view showing the location of each noise measurement. Position 1 was located 5 feet above grade at the northwest corner of the property line adjacent to the existing apartment complex. Position 2 was located 5 feet above existing grade near the proposed new trail approximately 350 feet southwest of the proposed warehouse building. Position 3 was located 5 feet above grade on the south side of the existing paved Sequalitchew Creek Trail approximately 665 feet past the posted 0.25 mile marker.

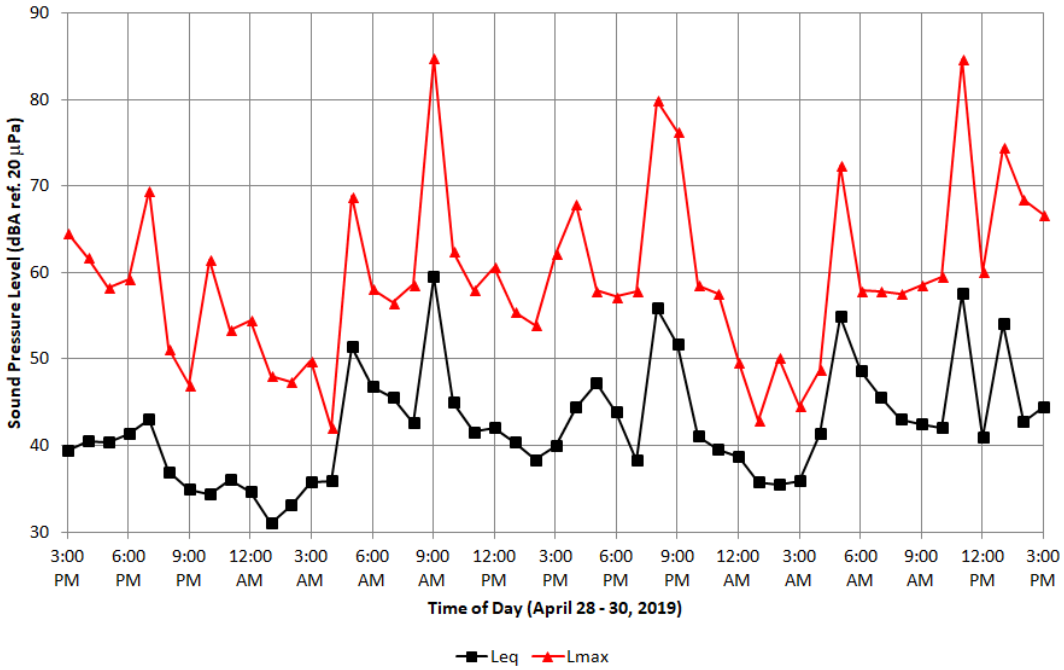
Three different instruments were used to collect the data. The instrument at Position 1 was a Bruel & Kjaer model 2238 data logging sound level meter. The instrument used at Position 2 was a Bruel & Kjaer model 2250 sound level meter running the BZ-7224 logging software. The instrument used at Positions 3 was a Larson Davis model 700 data logging sound level meter.

Figure 2. Aerial view of project site showing noise monitoring locations.

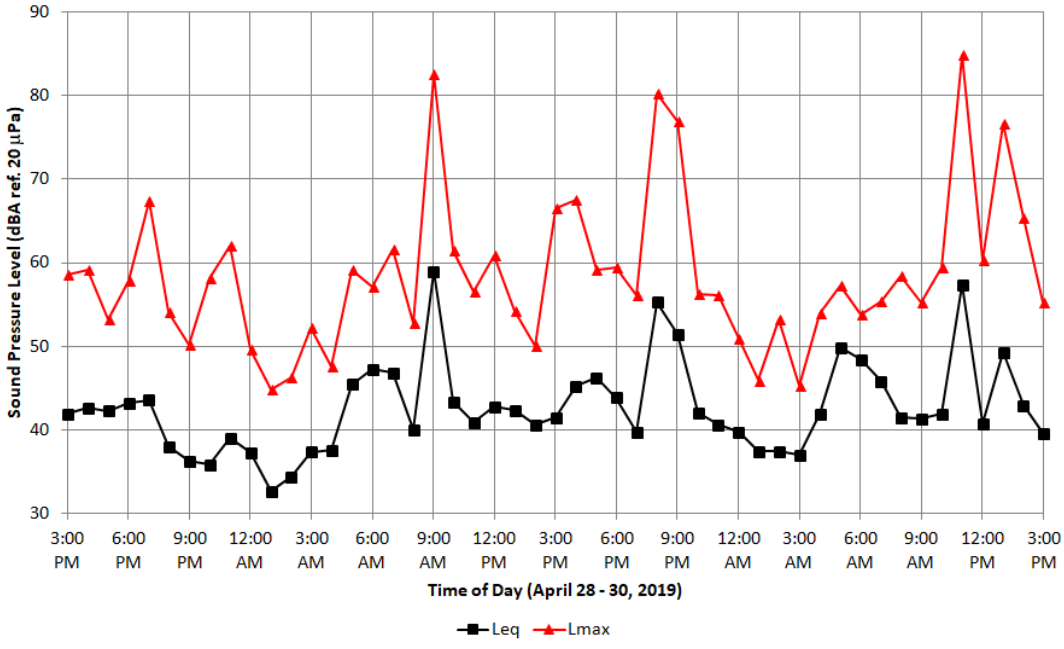
All three instruments were calibrated with the same Bruel & Kjaer model 4230 portable calibrator, and the internal clocks in each instrument were synchronized prior to starting the measurements so the sound level results could be correlated in time. All three microphones were covered with a foam windscreen for all measurements. Weather conditions during the measurements were excellent with no precipitation, warm temperatures, and little wind.

Figure 3 presents the measured hourly average and maximum ambient noise levels at Position 1 during the 2-day measurement period. The hourly average (L_{eq}) noise level was usually between 30 dBA and 50 dBA, with the exception of a few hours when military aircraft flew over the site, causing the maximum noise levels (L_{max}) to exceed 70 dBA. Note that the hourly average (L_{eq}) noise levels were below 40 dBA and the hourly maximum (L_{max}) noise levels were below 60 dBA during the nighttime hours of 11 PM and 4 AM. The overall day-night sound level (L_{dn}) for the two day measurement period was 52.8 dB. Figures 4 and 5 present the same test results from Position 2 and 3, respectively. Note that all 3 locations show high L_{max} sound levels on Monday during the 9 AM and 8 PM hours, and Tuesday morning during the 11 AM and 1 PM hours. This noise is caused by military aircraft flying over or near the site. Position 3 experienced high sound levels (above 70 dBA L_{max}) during the 3 PM, 4 PM, and 5 PM hours on Sunday, and the 1 PM, 2 PM, and 5 PM hours on Monday. This noise was generated by people using the trail.

DuPont Industrial Partners Warehouse
Figure 3. Hourly ambient noise statistics at Apartment Complex (Position 1)
(Ldn = 52.8 dB)



DuPont Industrial Partners Warehouse
Figure 4. Hourly ambient noise statistics new trail (Position 2)
(Ldn = 47.6 dB)



DuPont Industrial Partners Warehouse
Figure 5. Ambient noise on Sequalitchew Creek Trail (Position 3)
(Ldn = 53.3 dB)

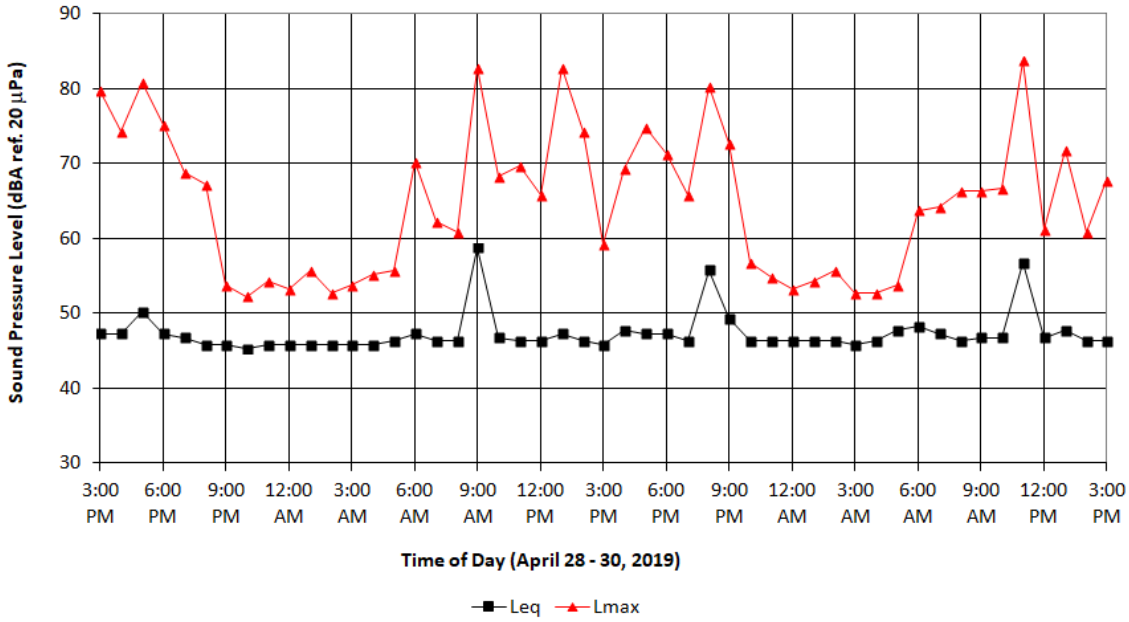


Table 3 presents a summary of the measured ambient noise level statistics at the 3 ambient noise measurement locations. Note that all 3 locations exhibit day-night average sound levels (L_{dn}) below the EPA recommended guideline of 55 dB. The daytime average sound level (L_{eq}) is remarkably uniform between the 3 measurement locations, with a range of only 1 dBA and an average level of 49.4 dBA. During the nighttime hours (10 PM to 7 AM) there is a little more variation between the 3 locations, with a range of 3.4 dBA and an average value of 45 dBA. The daytime hourly average maximum level (L_{max}) is much higher at Position 3 than Positions 1 and 2, because people walking the trail come within 10 feet of the microphone as they pass by. Groups of teens were noticed as being quite noisy as they walk along on the trail.

Table 3. Measured ambient noise level statistics.

Noise Level Statistic	Pos. 1	Pos. 2	Pos. 3
Average Day-Night Level, L_{dn} (dB)	52.8	47.6	53.3
Average Daytime L_{eq} (dBA)	49.4	48.9	49.9
Average Nighttime L_{eq} (dBA)	45.5	43.0	46.4
Average Daytime L_{max} (dBA)	62.9	61.8	70.0
Average Nighttime L_{max} (dBA)	53.7	52.8	55.7

There are several potential new sources of environmental noise that will be associated with the proposed project. The most notable are the delivery trucks and automobiles that will frequent the site. As mentioned above, noise generated by motor vehicles entering and leaving the site are exempt from the noise ordinance sound level limits while they are operating on public streets and highways. However, once on private property all noise sources (except for back-up beepers and emergency vehicles) must comply with the noise level limits specified in the noise ordinance.

In addition to vehicles entering and leaving the site, there will also be mechanical and electrical equipment serving the building. At the present time there are no specific plans for this equipment, but noise from this equipment is easily controlled by selecting quiet units and locating them far enough from the property lines so as not to be a concern. In most cases, warehouse buildings are not air-conditioned, so the mechanical units are often only small ventilation fans that would not be audible beyond the perimeter of each building. If certain areas are upgraded to include typical office space with air-conditioning, it is not difficult to design these systems so that they will comply with the noise ordinance (taking into consideration the other noise sources associated with the project) and not become an annoyance to the neighbors.

Predicted Site-Generated Noise Levels

The expected noise levels that will be generated by the proposed project have been computed using the computer model CadnaA (ver. 2022). Noise levels were calculated at 20 selected off-site locations. These locations include ambient noise measurement Positions 1, 2, and 3, plus calculated receiver Positions T1 through T16 (shown in Figure 6), which represent locations along the new Sequalitchew Creek Trail, and at the north property line near the center of the warehouse building (Position 4).

Table 4 summarizes the expected hourly truck and automobile volume as a function of the hour of the day. The average daily traffic (ADT) volumes were obtained from Table 3 of the traffic study[2], titled Project Trip Generation. These values represent the average for all days of the week. It turns out that some days of the week are busier than others, and according to the Texas Transportation Institute[3], Wednesdays and Thursdays are the busiest days of the week, each with 118% of the average daily traffic volumes. Sunday is the lightest day of the week, averaging only about 72% of the weekly average. Hourly traffic volumes were also obtained from the 11th Edition of the ITE Trip Generation Manual. In order to assess the worst-case condition, all noise calculations in this report are based on Wednesday or Thursday traffic volumes, which are 18% higher than the average daily values presented in Table 3 of the traffic study. The worst case total daily truck and automobile volumes are 172 and 351, respectively.

[2] DuPont Industrial Traffic Impact Analysis, Heath & Associates, Inc., October 9, 2023
[3] Trip Generation, 11th Edition, Institute of Transportation Engineers

Project noise levels were calculated for the worst-case hour 6 AM, which has the highest truck traffic volume of any hour of the day. Noise levels during any other hour of the day would be lower, because of lower traffic volumes. In addition to trucks and automobiles moving on the site, the noise analysis also assumes eight trucks idling (15 minutes per hour) at the loading dock, two trucks idling (15 minutes per hour) at the new 21-trailer parking stall area, plus four HVAC rooftop units that could be exhaust fans or self-contained air conditioning units operating continuously on the roof of the building. Each rooftop unit has an assumed A-weighted sound power level of 90 dB (ref. 1 picowatt). The overall A-weighted sound power level of each of the moving delivery trucks is 100 dB (ref. 1 picowatt), and the assumed overall A-weighted sound power level of each automobile is 80 dB (ref. 1 picowatt). The noise level contours in Figure 6 represent the hourly average (L_{eq}) project noise level, ranging from 40 dBA to 60 dBA.

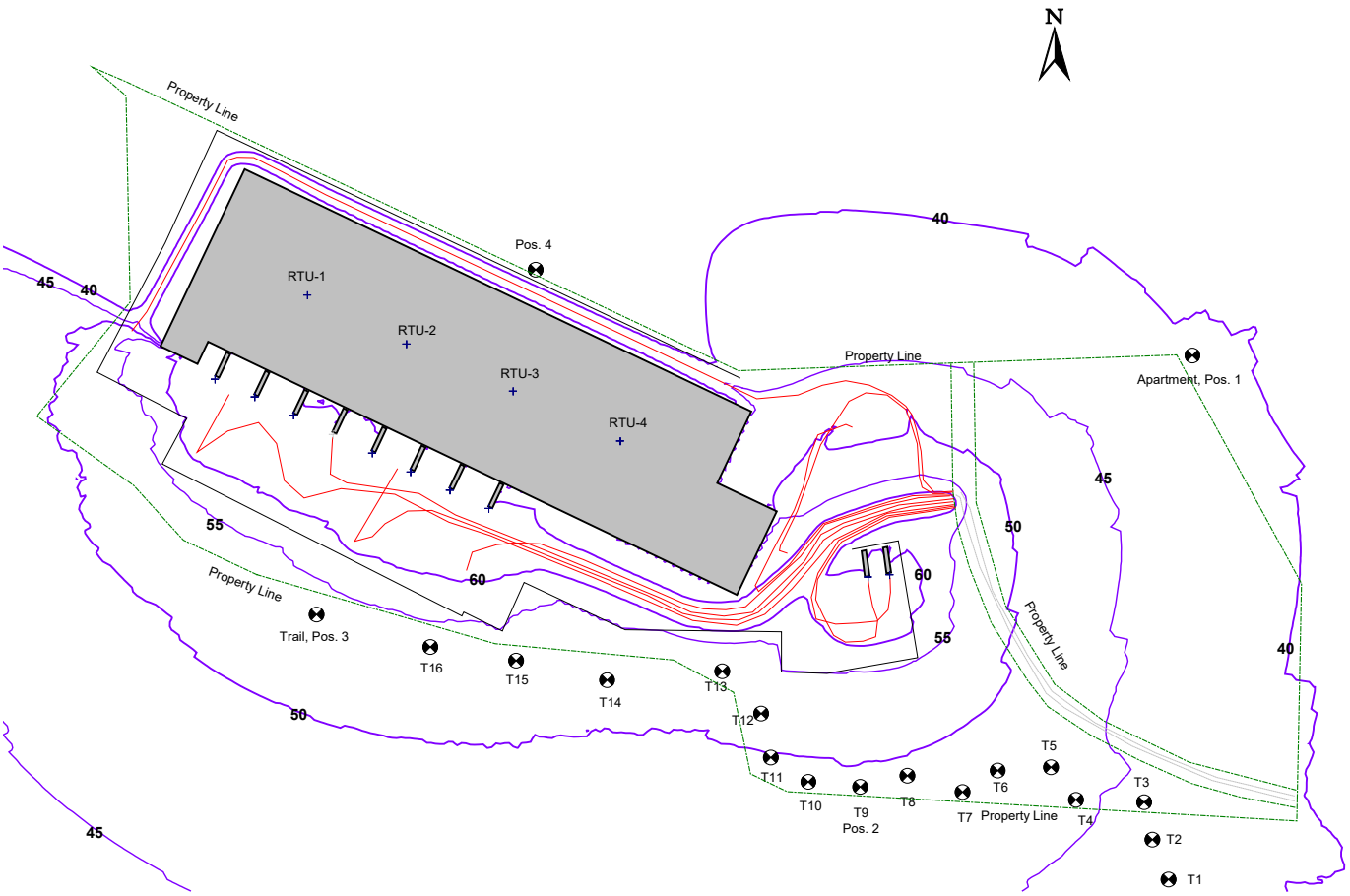


Figure 6. Noise level contours (dBA) and receiver locations for the 6 AM hour. Noise contours are evaluated at an elevation that is 5 feet above the pavement elevation at the loading docks.

Table 4. Projected average daily traffic volume entering and leaving site by hour.

Start Time	Trucks In	Trucks Out	Autos In	Autos Out
12:00 AM	0.25	0.30	0.34	0.68
1:00 AM	0.25	0.00	0.31	1.44
2:00 AM	0.99	1.20	0.42	0.76
3:00 AM	1.49	0.60	0.94	0.83
4:00 AM	1.49	2.69	2.18	2.12
5:00 AM	2.97	2.99	6.88	3.89
6:00 AM	4.46	2.99	15.87	5.00
7:00 AM	2.72	6.88	15.06	8.01
8:00 AM	3.71	5.98	13.36	8.64
9:00 AM	10.40	6.28	15.41	9.94
10:00 AM	6.93	10.17	10.63	10.50
11:00 AM	9.16	10.17	12.64	13.00
12:00 PM	6.93	4.49	16.88	13.71
1:00 PM	7.18	6.58	11.87	9.91
2:00 PM	5.45	5.08	13.92	10.94
3:00 PM	9.16	6.58	11.25	20.12
4:00 PM	6.44	5.38	8.79	17.08
5:00 PM	2.97	3.89	8.19	15.53
6:00 PM	0.74	0.90	3.31	9.93
7:00 PM	0.50	0.60	1.71	2.70
8:00 PM	1.49	1.20	1.40	1.52
9:00 PM	0.25	1.20	1.17	6.65
10:00 PM	0.00	0.00	2.21	0.84
11:00 PM	0.25	0.00	1.09	2.07
Total ADT	**86**	**86**	**176**	**176**

It is important to note that the busiest hours of the day are 9 AM until 12:00 noon (shaded gray in Table 4), and the busiest nighttime hours is 6 AM to 7 AM (shaded green in Table 4). From a noise perspective, the 6 AM hour is the most troublesome because that hour is included in the nighttime hours for noise ordinance compliance and calculating noise impact using the day-night sound level (L_{dn}). In this study it is assumed that all trucks are traveling at 10 mph and all cars are traveling at 20 mph while on site.

Noise Ordinance Compliance

As mentioned previously, the DuPont Municipal Code specifies that the maximum allowable noise level generated by activities on the proposed project site must not exceed 57 dBA during

the day and 47 dBA at night at nearby Class A properties. On Class B properties (the property north of the site) the limit is 60 dBA (day or night). Noise levels are allowed to exceed these levels for short periods of time as specified in Table 2 of this report.

Table 5 presents the predicted project generated average and maximum noise levels at each of the 20 receiver locations. Note that the Trail Receivers P2 and T3 through T13 (these rows are shaded in Table 5) are on the source property and therefore not subject to the noise ordinance limits. The predicted hourly average (L_{eq}) and hourly maximum (L_{max}) noise levels from the CadnaA model are all within the limits specified by the noise ordinance (both day and night) for all receivers located off-site, except for the portion of the Sequalitchew Creek Trail near T14 where the average (L_{eq}) noise is expected to exceed the 47 dB nighttime limit by 0.3 dBA. This, however, is not a violation of the noise ordinance because the sound level is allowed to exceed the specified limit by no more than 5 dBA for up to 15 minutes per hour. The predicted total duration over 47 dBA at T14 is only 5.45 minutes. The Table 5 value at T13 shown in black **bold** exceeds the limit, but this location is on-site, and not subject to the noise ordinance.

Table 5. Predicted project noise ordinance compliance statistics (6 AM nighttime hour).

Receiver Location	Night L_{eq} (dBA)	Night L_{max} (dBA)	Time Over 47 dBA (15 min. max)	Time Over 52 dBA (5 min. max.)	Time Over 57 dBA (1.5 min. max)
P1	41.0	47.4	0.01 min	0 min	0 min
P2	49.2	53.4	5.94 min	0 min	0 min
P3	40.3	50.4	0.04 min	0 min	0 min
P4	35.9	49.3	0.81 min	0 min	0 min
T1	43.0	44.2	0.0 min	0 min	0 min
T2	43.7	45.2	0.0 min	0 min	0 min
T3	44.2	46.3	0.0 min	0 min	0 min
T4	45.7	47.2	0.0 min	0 min	0 min
T5	46.7	48.4	1.86 min	0 min	0 min
T6	47.9	48.4	1.74 min	0 min	0 min
T7	47.9	49.5	1.19 min	0 min	0 min
T8	49.3	51.7	5.91 min	0 min	0 min
T9	49.2	53.4	5.94 min	0 min	0 min
T10	48.8	53.0	6.39 min	3.15 min	0 min
T11	48.7	53.3	6.21 min	3.6 min	0 min
T12	48.9	54.9	6.23 min	3.68 min	0 min
T13	50.1	61.7	5.64 min	3.4 min	**2.04 min**
T14	47.3	54.8	5.45 min	3.0 min	0.39 min
T15	43.6	49.1	3.84 min	1.31 min	0.04 min
T16	42.1	49.1	0.75 min	0.04 min	0 min

Noise Impact Analysis

Noise generated by this or any new project will radiate additional noise to the surrounding environment. A noise impact analysis compares the anticipated project noise with the existing ambient noise. This analysis is independent from the noise ordinance compliance analysis, and unlike the noise ordinance, all noise sources (including vehicles traveling on public roads and emergency vehicles) must be included. The most important sound level statistics for a noise impact analysis are the average daytime and nighttime L_{eq}, the L_{max}, and the L_{dn}.

In this project the maximum project noise level in any hour is caused by trucks entering and leaving the facility. Trucks and automobiles moving on the Sequalitchew Drive are assumed to be moving at 25 mph. While on site, the trucks are assumed to be moving at 10 mph and automobiles at 20 mph. As in the noise ordinance compliance analysis, the rooftop HVAC units are assumed to be operating continuously, 24 hours per day. Table 6 presents the results of the noise impact analysis for the 3 receiver locations where ambient noise measurements were taken, plus one additional location at the north property line (P4). Because P1 is closest to P4, this analysis assumes that the ambient statistics for P1 (the apartments) are the same as P4.

Table 6. Predicted project noise impact analysis at 4 receiver locations (dBA)

	P1	P2	P3	P4
Project Day L_{eq}	39.8	47.2	38.1	33.9
Ambient Day L_{eq}	49.4	48.9	49.9	49.4
Future Day L_{eq}	49.9	51.2	50.2	49.5
Day L_{eq} Increase	0.5	2.3	0.3	0.1
Project Night L_{eq}	36.3	44.5	35.6	31.2
Ambient Night L_{eq}	45.5	43.0	46.4	45.5
Future Night L_{eq}	46.0	46.8	46.7	45.7
Night L_{eq} Increase	0.5	3.8	0.3	0.2
Project Day L_{max}	44.6	54.8	52.5	50.7
Ambient Day L_{max}	62.9	61.8	70.0	62.9
Future Day L_{max}	62.9	61.8	70.0	62.9
Day L_{max} Increase	0.0	0.0	0.0	0.0
Project Night L_{max}	44.6	54.8	52.5	50.7
Ambient Night L_{max}	53.7	52.8	55.7	53.7
Future Night L_{max}	53.7	54.8	55.7	53.7
Night L_{max} Increase	0.0	2.0	0.0	0.0
Project L_{dn}	37.9	45.3	36.2	32.0
Ambient L_{dn}	52.8	47.6	53.3	52.8
Future L_{dn}	52.9	49.6	53.4	52.8
L_{dn} Increase	0.1	2.0	0.1	0.0

When assessing noise impacts the obvious question that always arises is how much of a noise level increase is acceptable. The U.S. Federal Transit Authority[4] has established a criterion based on the average day-night noise level (L_{dn}) that has been widely accepted for many years in assessing the impacts of transit projects on residential receiving properties. As illustrated in Figure 7, the allowable increase in the L_{dn} is primarily dependent upon the pre-existing L_{dn} at the receiver location. As evidenced from Table 6 the predicted project Ldn is below 40 for receiving locations P1, P3, and P4, so they are well below the no impact criterion. The projected Ldn for P2 is 45.3 with an existing Ldn of 47.6 which puts it clearly in the no impact area of the graph.

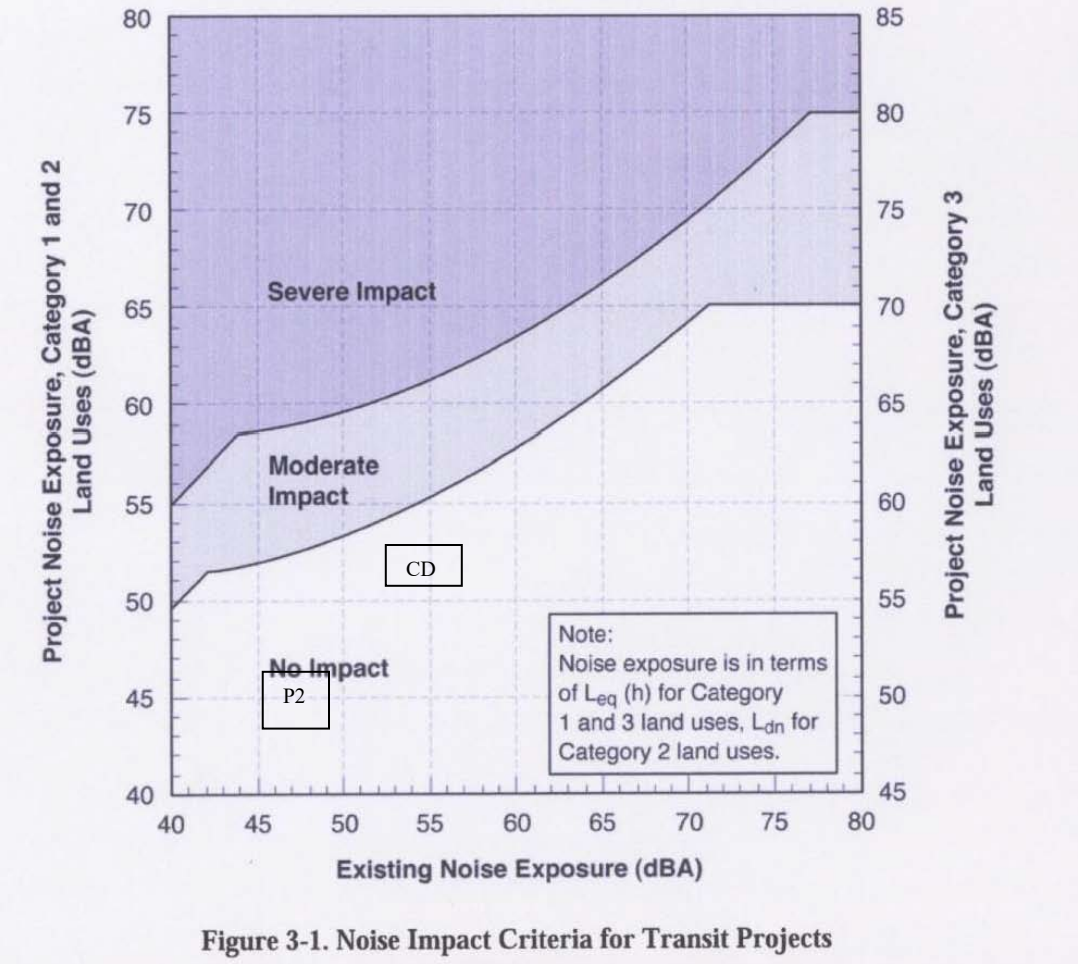


Figure 3-1. Noise Impact Criteria for Transit Projects

Figure 7. FTA Noise Impact Criteria showing the expected noise impacts.

[4] Federal Transit Authority in the Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06, May 2006.

The other noise impact that should be addressed is the impact of the additional truck traffic on the residential properties adjacent to Center Drive between the DuPont Steilacoom Road and the project access road, Sequalitchew Drive. While ambient noise measurements along Center Drive were not taken for this project, ambient noise measurements were taken in 2017 along Center Drive, approximately ½ mile from the DuPont Steilacoom Road for another warehouse project. The results of those measurements revealed that the ambient L_{dn} at the existing 90 ft. setback from the nearest lane was 54.7 dB. The calculated L_{dn} from the traffic associated with this project using the TNM 2.5 model is 51.9 dB at this same location assuming a vehicle speed of 35 mph. The predicted future L_{dn} (ambient + project) is 55.8 dB, which is an increase of 1.8 dB in the L_{dn}. This is shown as the mark CD in Figure 7, which clearly has no noise impact.

Impulsive Noise Sources

In addition to the noise generated by trucks, automobiles, and rooftop HVAC equipment, the project will also occasionally generate impulsive sounds that may be heard off-site. These sounds include the abrupt release of air pressure associated with the air brakes on tractor trailers, and the sound of backup beepers found on most trucks. These sounds typically last less than 1 second, but can be loud enough to be heard off-site. In the case of the standard backup beeper, the pulsing tone is typically at a single frequency above 1,000 Hz at a level of approximately 100 dB (ref. 1 picowatt). Although each pulse of sound is brief, it is repetitive – often lasting for several seconds. The pulsing tonal feature of this sound is such that it can be audible at distant locations even if the maximum level of the beeper is below the ambient noise level. When the air pressure in the air brake system is abruptly released after the truck comes to a stop, it typically generates an impulsive, broad-band sound level of approximately 120 dB (ref. 1 picowatt), which is about 20 dBA louder than a conventional backup beeper. Because this sound is broadband, it generally cannot be heard at sound levels below the ambient noise level.

Table 7 presents the predicted maximum sound levels of a standard backup beeper and a standard air brake release from trucks accessing the loading docks on the south side of the warehouse building. Note that noise levels are very low at P1 and P4 because these receive locations are shielded by the warehouse building from the impulsive noise sources. Noise levels at receiving locations south of the warehouse building are much higher due to the close proximity and the reflection of sound off the south face of the warehouse building. Note that the predicted maximum sound levels from these impulsive sources are all less than the existing 6 AM L_{max} measured at Position 3 on the trail (see Figure 5 on page 8 of this report).

Table 7. Predicted maximum sound levels of impulsive noise sources (dBA)

Impulsive Source	P1	P2	P3	P4	T10	T13	T15
Backup Beeper at Loading Dock, L_{max}	13.0	39.0	34.9	15.7	39.2	38.6	38.7
Air Brake Release at Loading Dock, L_{max}	30.8	63.1	55.4	42.1	63.8	63.4	61.2
6 AM Hour Ambient, L_{max}	58.1	57.2	70.3	N/A	N/A	N/A	N/A

Construction Noise

There will be some additional noise generated by this project during the construction phase. Noise will be generated by earth moving equipment to grade the site, and dig the foundations for each building. Noise will also be generated by construction equipment including concrete trucks, portable generators, delivery vehicles, and power tools. During the framing process there will be noise generated by construction workers using power tools, hammers, and portable radios. Noise from these construction activities is very similar to that found during the construction or remodel of any single-family residence in a residential development.

Construction noise levels at the nearest receiver locations could be as high as 70 dBA (L_{eq}) and 85 dBA (L_{max}) during construction hours when activity is close to the property lines. This is a worse case scenario. Noise levels will be at least 10 dBA lower than these levels during most of the construction period when activity is farther from the apartments and the trail. Noise from construction work is exempt from the noise ordinance during the daytime hours. Construction work is likely to be limited to daytime hours only (7:00 am to 6:00 pm), so there should be no violations of the noise ordinance during construction.

Summary & Noise Mitigation

This study has shown that the noise impacts of this project will be negligible on all surrounding properties when evaluated against FTA noise criteria. The study has also shown that the operational noise of the proposed project will meet the requirements of the DuPont Noise Ordinance during all hours of the day on all adjacent properties.

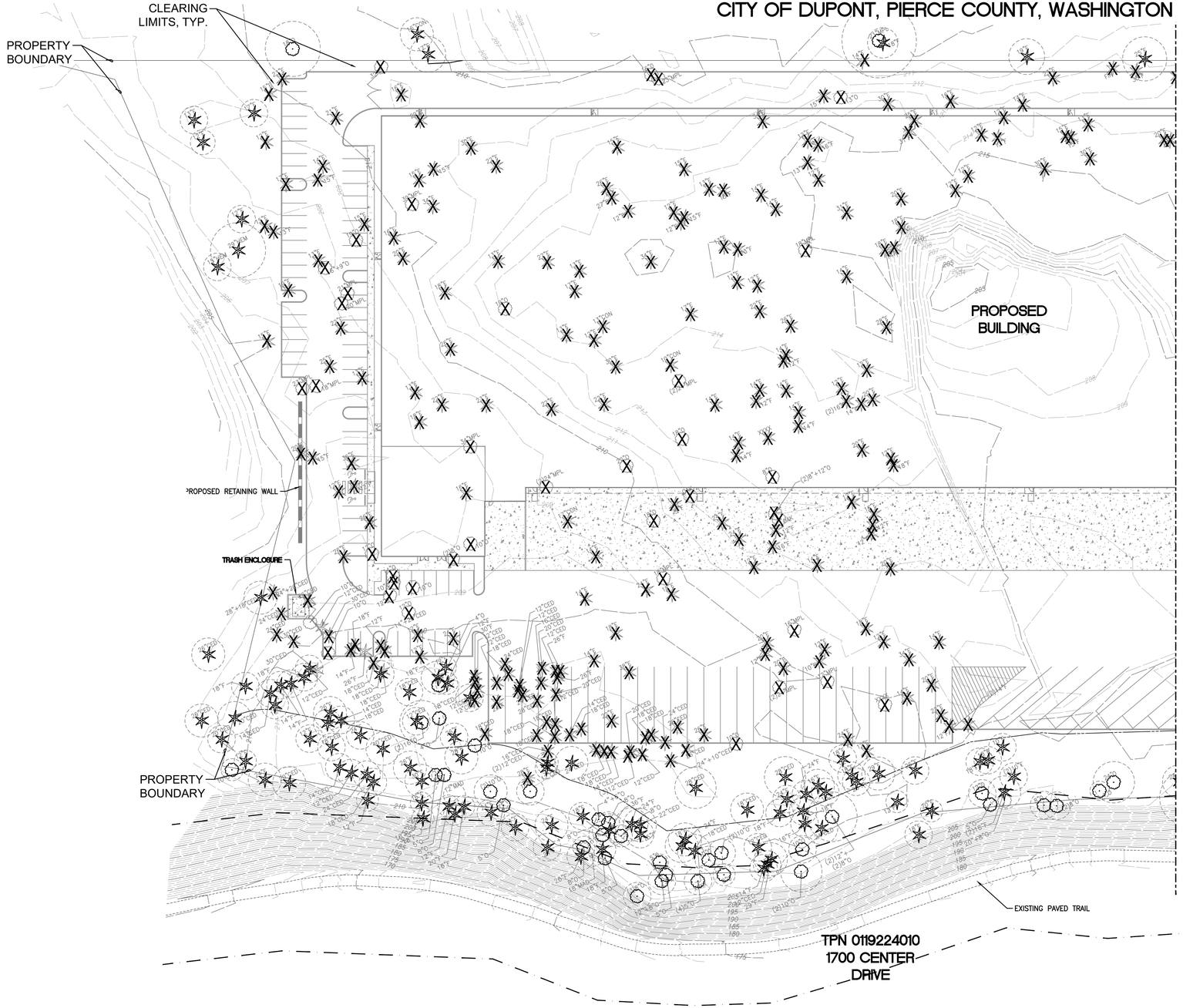
Even though the project is expected to be in compliance with the DuPont noise ordinance and no significant noise impacts are expected, the following additional noise mitigation measures are recommended to further reduce project noise levels off-site:

1. **Air Brake Release Silencers**. Small, inexpensive pneumatic silencers are available (e.g., Allied Witan Company) for reducing the noise level created by the pressure release of air brake systems. These devices typically weigh less than 2 pounds and can reduce impulsive sound levels from air brakes as much as 20 dBA.

2. **Broadband Backup Alarms**. Broadband backup alarms are now becoming more commonplace in replacing conventional backup beepers. These warning devices generate approximately the same sound level as the conventional pulsing tonal beepers, but because they are not tonal, they cannot be heard at distances where the sound level of the warning device is less than the ambient noise level. If trucks accessing this facility were equipped with broadband backup alarms (e.g., BBK-TEK) it would be very unlikely that users of the trail or tenants in the apartment complex would complain about noise from these warning devices.

PRELIMINARY TREE RETENTION PLAN
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80



MATCHLINE - SEE SHEET L2 FOR CONTINUATION

LEGEND

EXISTING TREE TO BE RETAINED PROTECT DURING CONSTRUCTION

EXISTING TREE TO BE REMOVED

TREE RETENTION

TOTAL PROJECT ACREAGE:	19.65 ACRES
TOTAL # OF HEALTHY TREES:	607 TREES
TREE RET. REQ. (1.5 TREES PER ACRE):	29 TREES
PROJECTED TREE RETENTION:	211 TREES
EXCESS OF TREE RET. OVER TREE REQ.	182 TREES
HEALTHY TREES TO BE REMOVED	396 TREES

SOURCE: WASHINGTON FORESTRY CONSULTANTS TREE RETENTION PLAN, 3/20/2024

TREE REPLACEMENT

ONE LANDMARK EXISTING OREGON WHITE OAK IS PROPOSED TO BE REMOVED. OREGON OAK REPLACEMENT TREES PROPOSED, SEE PLANT SCHEDULE.

TREE PROTECTION MEASURES

SOURCE: WASHINGTON FORESTRY CONSULTANTS, INC. TREE RETENTION PLAN, 3/20/24

TREES TO BE SAVED MUST BE PROTECTED DURING CONSTRUCTION BY A SIX-FOOT-HIGH TEMPORARY CHAIN LINK FENCING (SEE BELOW), LOCATED 5 FEET OUTSIDE OF THE DRIP LINE OF THE TREES. PLACARDS SHALL BE PLACED ON THE FENCING EVERY 50 FEET INDICATING THE WORDS, "NO TRESPASSING – PROTECTED TREES". THE INDIVIDUAL CRZ IS A RADIUS OF ONE FOOT FOR EACH ONE INCH OF DBH (6 FEET MINIMUM), UNLESS OTHERWISE DELINEATED BY WFCI.

TREE PROTECTION FENCES SHOULD BE PLACED AROUND THE EDGE OF THE CRITICAL ROOT ZONE. THE FENCE SHOULD BE ERECTED AFTER LOGGING BUT PRIOR TO THE START OF CLEARING. THE FENCES SHOULD BE MAINTAINED UNTIL THE START OF THE LANDSCAPE INSTALLATION.

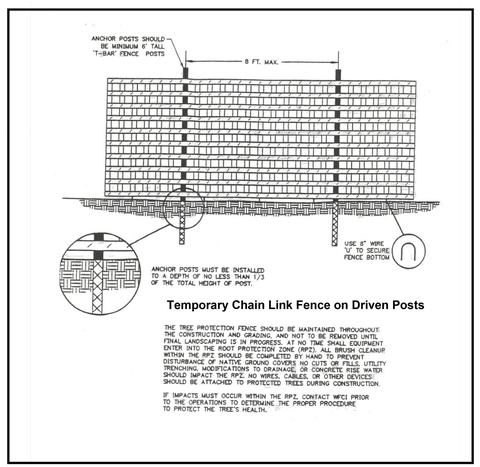
THERE SHOULD BE NO EQUIPMENT ACTIVITY (INCLUDING ROTOTILLING) WITHIN THE CRITICAL ROOT ZONE (CRZ). NO IRRIGATION LINES, TRENCHES, OR OTHER UTILITIES SHOULD BE INSTALLED WITHIN THE CRZ. CUTS OR FILLS SHOULD IMPACT NO MORE THAN 25% OF A TREE'S ROOT SYSTEM. IF TOPSOIL IS ADDED TO THE ROOT ZONE OF A PROTECTED TREE, THE DEPTH SHOULD NOT EXCEED 2 INCHES OF A SANDY LOAM OR LOAMY FINE SAND TOPSOIL AND SHOULD NOT COVER MORE THAN 25% OF THE ROOT SYSTEM.

IF ROOTS ARE ENCOUNTERED OUTSIDE THE CRZ DURING CONSTRUCTION, THEY SHOULD BE CUT CLEANLY WITH A SAW AND COVERED IMMEDIATELY WITH MOIST SOIL. NOXIOUS VEGETATION WITHIN THE CRITICAL ROOT ZONE SHOULD BE REMOVED BY HAND. IF A PROPOSED SAVE TREE MUST BE IMPACTED BY GRADING OR FILLS, THEN THE TREE SHOULD BE RE-EVALUATED BY WFCI TO DETERMINE IF THE TREE CAN BE SAVED WITH MITIGATING MEASURES, OR IF THE TREE SHOULD BE REMOVED.

THE PROPOSED LOCATION AND PAVING OF THE PROPOSED SEQUALITCHEW CREEK TRAIL BISECTS THE CRZ OF MULTIPLE TREES IN TREE RETENTION AREA A. A CERTIFIED ARBORIST SHOULD BE ON-SITE DURING WORK IN THIS AREA TO RE-EVALUATE THE HEALTH OF THE TREES AND ASSESS THE PATH ALIGNMENT TO DETERMINE THE PROPER METHOD TO PROTECT THE ROOTS OF THE SAVE TREES. THE PATH FOLLOWS THE EXISTING GRADE SO LITTLE SOIL DISTURBANCE WILL OCCUR. THE OVERALL IMPACT OF THE TRAIL WITHING THE CRZ OF THE SAVE TREES IS MINIMAL COMPARED TO THE ENTIRE ROOT ZONES OF THE TREES. IF THE TREES ARE HEALTHY, THEY WILL BE ABLE TO TOLERATE SOME ROOT IMPACT.

ROOT IMPACT COULD BE REDUCED USING ROOT PROTECTION STRATEGIES SUCH AS STRUCTURAL SOIL UNDER THE PATHWAY OR INSTALLING A PASSIVE AERATION UNDER THE PATH. STRUCTURAL SOILS ARE SOILS THAT ARE SPECIALLY DESIGNED TO PROVIDE NUTRIENTS, SPACE, AND POROSITY TO ACCOMMODATE ROOT GROWTH WHILE ALSO ALLOWING FOR COMPACTION TO SUPPORT PAVEMENT WITHOUT SETTLING. THIS WILL PROTECT THE ROOTS OF THE TREE AND ALLOW FOR THE PATHWAY.

THE WORK ON THE PATHWAY SHOULD BE CONFINED ONLY TO THE PATH AREA. TREE PROTECTION FENCES SHOULD BE PLACED ALONG THE SIDES OF THE PATH. THE PATH SHOULD BE CONSTRUCTED WITH STRUCTURAL SOILS AS PROGRESS IS MADE TO PREVENT ROOT COMPACTION AND DAMAGE. THE ON-SITE ARBORIST SHOULD PRESCRIBE ANY PRUNING OR OTHER TREE MAINTENANCE ON A TREE-BY-TREE BASIS TO PROMOTE TREE HEALTH. THE HEALTH OF THE TREES SHOULD BE MONITORED FOR 3 YEARS AFTER THE PATH HAS BEEN CONSTRUCTED.



TREE PROTECTION FENCE DETAIL

DMC 25.120.030:

(5) NO CLEARING, GRADING, TRENCHING, CUTTING, IMPERVIOUS SURFACING, OR OTHER CONSTRUCTION SHALL BE ALLOWED WITHIN THE DRIP LINE OF ANY TREE TO BE RETAINED, OR WITHIN ONE AND ONE-HALF TIMES THE RADIUS OF THE CANOPY IN THE CASE OF OAK TREES TO BE RETAINED, NOR SHALL GRADES BE LOWERED OR RAISED SO NEAR AS TO JEOPARDIZE SAID TREES; UNLESS THERE IS NO OTHER ALTERNATIVE AND THE INTRUSION IS THE MINIMUM POSSIBLE AS DETERMINED BY THE ADMINISTRATOR. TEMPORARY BARRIERS SHALL BE INSTALLED AROUND TREES REQUIRING PROTECTION DURING CONSTRUCTION.

(7) ALL TREES RETAINED BY MEANS OF DMC 25.120.030, INCLUDING THOSE ON SINGLE-FAMILY RESIDENTIAL LOTS, SHALL REMAIN PROTECTED FOR THEIR LIFE, EXCEPT AS NOTED IN SUBSECTION (8) OF THIS SECTION. THE PLAT OR SITE PLAN ON WHICH THE TREE IS LOCATED SHALL CONTAIN THE FOLLOWING NOTE: "THIS PLAT IS ALSO SUBJECT TO AN APPROVED TREE RETENTION PLAN WHICH REQUIRES THAT CERTAIN TREES BE PRESERVED. THAT PLAN, WHICH IS BINDING ON ALL OWNERS, IS ON FILE WITH THE CITY PLANNING DEPARTMENT." TO FURTHER INFORM FUTURE LOT OWNERS, A COPY OF THE APPROVED TREE RETENTION PLAN SHALL BE PROVIDED EACH OWNER AT CLOSING ON EACH LOT.

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

No.	Date	By	Chkd.	Appr.	Revision
6	5/29/24	TCR	JMV	JMV	PER CITY COMMENTS
5	3/27/24	TCR	JMV	JMV	PER CITY COMMENTS

Title: PRELIMINARY TREE RETENTION PLAN FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

STATE OF WASHINGTON
THOMAS C ROBERTS
No. 23031374 EXP. 04/12/2025
LICENSED LANDSCAPE ARCHITECT

Scale: Horizontal 1"=40' Vertical N/A
Designed TCR
Drawn TCR
Checked JMV
Approved JMV
Date 3/27/24
ROBERTS Xref: 18666 DUPONT WA WAREHOUSE

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com

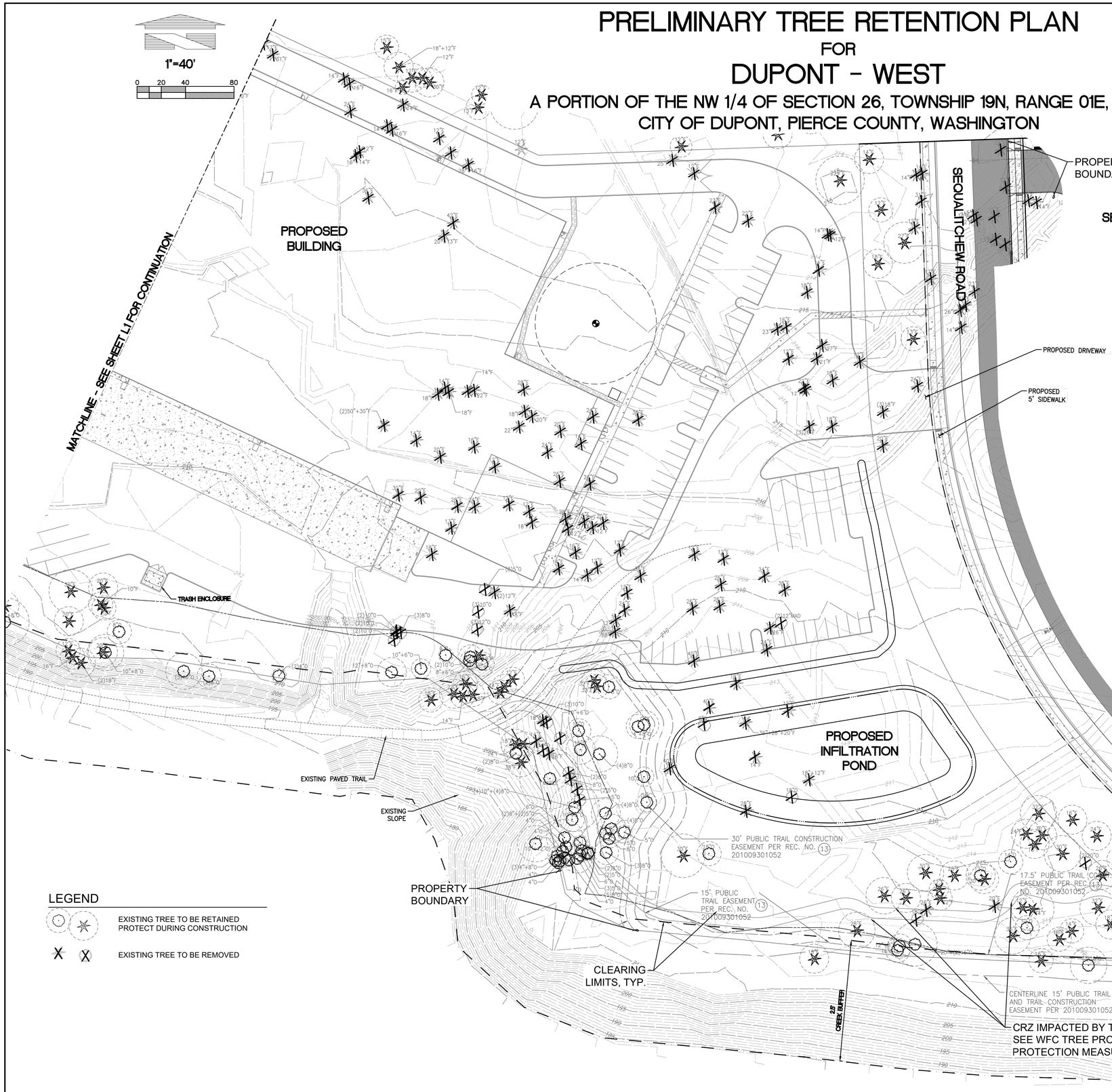
Job Number 18666
Sheet L1 of 12

File=\18000s\18666\preliminary\18666-pl.dwg Date/Time=5/30/2024 12:35 PM Scale=1 = 1

Attachment 1mm

PRELIMINARY TREE RETENTION PLAN
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80



LEGEND

EXISTING TREE TO BE RETAINED PROTECT DURING CONSTRUCTION

EXISTING TREE TO BE REMOVED

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

No.	Date	By	Ckd.	Appr.	Revision
6	5/29/24	TCR	JMV	JMV	PER CITY COMMENTS
5	3/27/24	TCR	JMV	JMV	PER CITY COMMENTS

Title: PRELIMINARY TREE RETENTION PLAN FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

STATE OF WASHINGTON · THOMAS C ROBERTS · LICENSED LANDSCAPE ARCHITECT · No. 20911274 EXP. 04/12/2025

Scale: Horizontal 1"=40' Vertical N/A

Designed TCR Drawn TCR Checked JMV Approved JMV Date 3/27/24

PROBERTS Xref: 18666

DUPONT WA WAREHOUSE

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222 barghausen.com

Job Number 18666

Sheet L2 of 12

File:P:\18000s\18666\preliminary\18666-pl.dwg Date/Time:5/30/2024 12:35 PM Scale:1" = 1

PRELIMINARY LANDSCAPE PLAN
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=30'

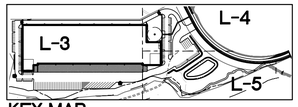
0 15 30 60

CODE REQUIREMENTS

SITE AREA = 17.72 ACRES
DMC 25.90.090: 20% OF SITE AREA MUST BE LANDSCAPE
LANDSCAPE AREA = 8.18 ACRES (46.2%)

DMC 25.90.030: ONE PARKING LOT TREE REQUIRED PER EACH 6 PARKING SPACES (141 SPACES SHOWN)
141 / 6 = 24 PARKING LOT TREES REQUIRED, 36 PROVIDED

DMC 25.90.030: LANDSCAPE BUFFER REQUIRED BETWEEN PARKING LOTS AND R/W (SEE LANDSCAPE PLAN)



KEY MAP 1" = 500'

LEGEND

EXISTING TREE TO BE RETAINED
PROTECT DURING CONSTRUCTION

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

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EROSION-CONTROL HYDROSEED AREAS OF PROPOSED GRADING, TYP.

PROPERTY BOUNDARY

CLEARING LIMITS, TYP.

PER CITY STANDARD 5.7.5 ALL TREE PLANTINGS SHALL INCLUDE THE INSTALLATION OF AN APPROVED ROOT BARRIER (DEEPROOT UB 18-2 OAE) ADJACENT TO WALKS AND CURBS FOR EACH TREE, TYP. SEE DETAIL, SHEET L4

SEE 'PARKING LOT PLANTER GRADING DETAIL' FOR PARKING LOT PLANTERS NOT ABUTTING LARGER LANDSCAPE AREAS, TYP.

PROPOSED BUILDING

MATCHLINE - SEE SHEET L4 FOR CONTINUATION

PROPERTY BOUNDARY

RETAINING WALL

TRASH ENCLOSURE

NO TREES OR SHRUBS WITHIN 3' OF HYDRANT

EXISTING LANDSCAPE TO REMAIN BEYOND LIMIT OF GRADING IN ALL AREAS WHERE NEW LANDSCAPING IS NOT PROPOSED, TYP.

MIN. 1 TREE PER 6 TRUCK STALLS
ADJUST TREE SPACING AS NECESSARY TO AVOID INSTALLING TREES WITHIN DRIPLINE OF EXISTING TREES

MATCHLINE - SEE SHEET L5 FOR CONTINUATION

TRASH ENCLOSURE

PROPERTY BOUNDARY

No.	Date	By	Ckd.	Appr.	Revision
6	5/15/24	TCR	JMV	JMV	PER CITY COMMENTS
5	3/27/24	TCR	JMV	JMV	PER CITY COMMENTS

Title:
PRELIMINARY LANDSCAPE PLAN FOR DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

STATE OF WASHINGTON
THOMAS C ROBERTS
No. 23031374 Exp. 04/12/2025
LICENSED LANDSCAPE ARCHITECT

Scale: Horizontal 1"=30' Vertical N/A

Designed TCR Drawn TCR Checked JMV Approved JMV Date 3/27/24

TROBERTS Xref: 18666 DUPONT WA WAREHOUSE

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com

Job Number 18666

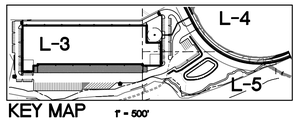
Sheet L3 of 12

File: I:\18000s\18666\preliminary\18666-pL.dwg Date: mmc 5/30/2024 12:35 PM Scale: 1 = 1

PRELIMINARY LANDSCAPE PLAN
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=30'

0 15 30 60



KEY MAP 1" = 500'

LEGEND

EXISTING TREE TO BE RETAINED PROTECT DURING CONSTRUCTION

STREET TREES 40' O.C., TYP. LOCATE WITHIN R/W ADJUST LOCATIONS AS REQUIRED TO ACCOMODATE SIGHT DISTANCE REQUIREMENTS FOR DRIVEWAY SEE DUPONT DETAILS, RIGHT

EXISTING LANDSCAPE TO REMAIN BEYOND LIMIT OF GRADING IN ALL AREAS WHERE NEW LANDSCAPING IS NOT PROPOSED, TYP.

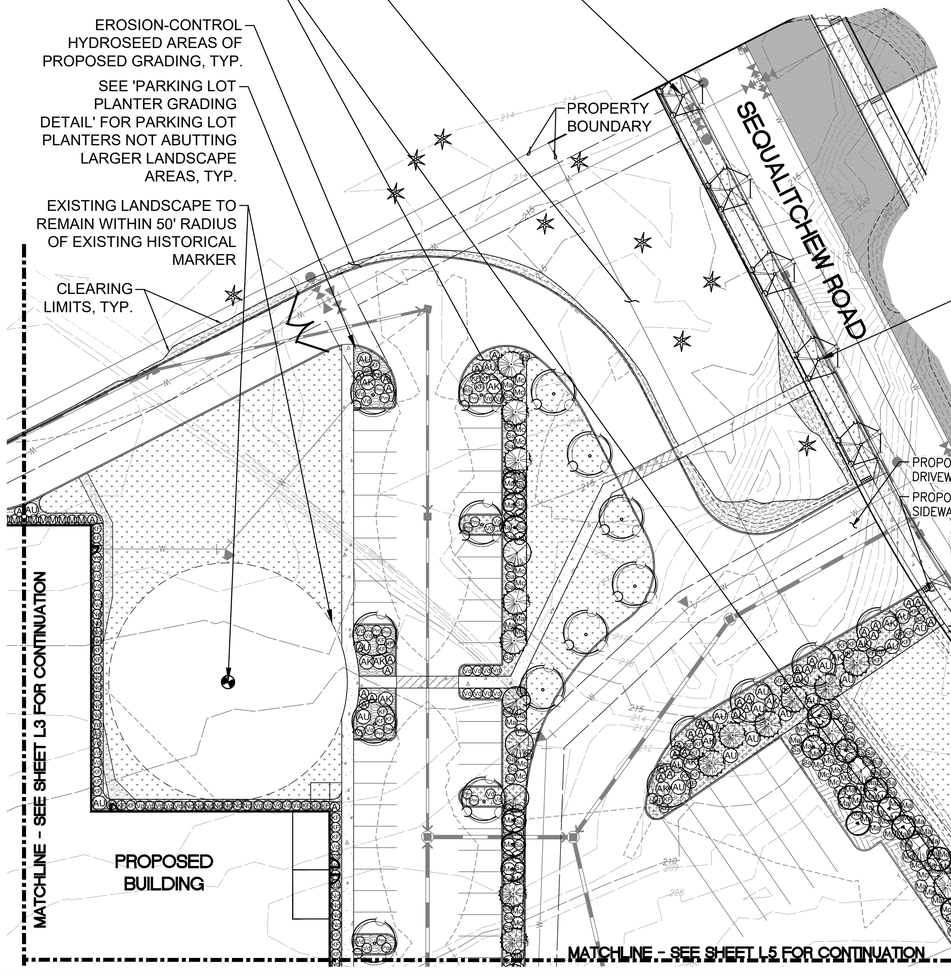
BERM AND MODERATE BUFFER PER DMC 25.90.030(3) BETWEEN PARKING LOT AND R/W, TREES MAX. 20' O.C.

EROSION-CONTROL HYDROSEED AREAS OF PROPOSED GRADING, TYP.

SEE 'PARKING LOT PLANTER GRADING DETAIL' FOR PARKING LOT PLANTERS NOT ABUTTING LARGER LANDSCAPE AREAS, TYP.

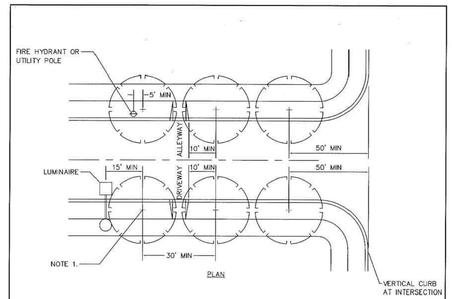
EXISTING LANDSCAPE TO REMAIN WITHIN 50' RADIUS OF EXISTING HISTORICAL MARKER

CLEARING LIMITS, TYP.



PER CITY STANDARD 5.7.5 ALL TREE PLANTINGS SHALL INCLUDE THE INSTALLATION OF AN APPROVED ROOT BARRIER (DEEPROOT UB 18-2 OAE) ADJACENT TO WALKS AND CURBS FOR EACH TREE, TYP. SEE DETAIL, RIGHT

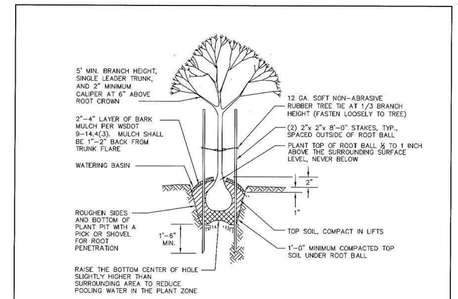
NO IRRIGATION PROPOSED IN R/W. STREET TREES TO BE INSTALLED WITH GATORBAGS OAE AND REFILLED REGULARLY FOR 1 GROWING SEASON BY OWNER



GENERAL NOTES:

1. TREES SHALL GENERALLY BE PLANTED IN THE CENTER OF THE PLANTING STRIPS.
2. TREES SHALL BE STAKED IN A MANNER NOT TO OBSTRUCT SIDEWALK TRAFFIC.
3. IN CASE OF BLOCK-OUTS, MIN. CLEAR SIDEWALK WIDTH SHALL BE 5 FEET IN RESIDENTIAL OR 8 FEET IN BUSINESS DISTRICTS.
4. TREES SHALL BE PLANTED A MINIMUM OF 5 FEET FROM UNDERGROUND UTILITIES AND 15 FEET FROM STREET LIGHTS.
5. TREES SHALL NOT BE PLANTED WITHIN THE CLEAR ZONE SIGHT TRIANGLE.
6. FOR ADDITIONAL REQUIREMENTS, SEE SECTION 5.7 OF THE PUBLIC WORKS STANDARDS AND DWG. NO. 5.7-2.

CITY OF DUPONT			
STREET TREE STANDARDS			
APPROVED: CITY OF DUPONT 9/21/11 DATE			DWG. NO. 5.7-1
DATE: 9/11	DRWN: L.G.	CHKD: T.N.	SCALE: NO SCALE



GENERAL NOTES:

1. PLANT ALL TREES ONE INCH HIGHER THAN LEVEL AT WHICH GROWN IN NURSERY.
2. TAKE CARE TO AVOID ROOTS WITH STAKES.
3. PLANT PIT SHALL BE AT LEAST 2 TIMES THE WIDTH OF THE ROOT BALL, BUT SHALL BE ONLY AS DEEP AS THE ROOT BALL.
4. ROOT BARRIER SHALL BE INSTALLED A MINIMUM OF 3' EACH SIDE OF CENTER OF ROOT BALL AT OR BELOW HARDSCAPE SURFACE ADJACENT TO CURBS AND PAVED SURFACES. ROOT BARRIER SHALL BE NDS PANEL EP-2450 (24"H X 24"L), OR CITY APPROVED EQUAL, INSTALLED PER MANUFACTURERS SPECIFICATIONS.
5. REMOVE ALL TAGS, WIRES, STRING, STRAPS, BURLAP, AND WIRE BASKETS FROM THE ROOT BALL. BEFORE PLANTING.
6. STAKING AND GUYING WIRES SHALL BE REMOVED AFTER (1) YEAR, FOLLOWING INSPECTION FOR WOOR. REPLACE AS REQUIRED.
7. THE CITY SHALL APPROVE ALL STREET TREES AND PLANTING LOCATIONS ON SITE PRIOR TO PLANTING.
8. FOR ADDITIONAL REQUIREMENTS, SEE SECTION 5.7 AND DWG. NO. 5.7-1 OF THE PUBLIC WORKS STANDARDS.

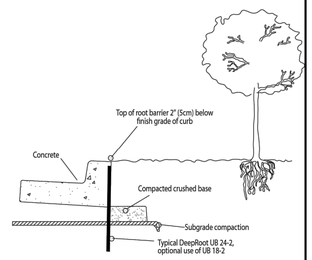
CITY OF DUPONT			
STREET TREE PLANTING AND STAKING DETAIL			
APPROVED: CITY OF DUPONT 9/21/11 DATE			DWG. NO. 5.7-2
DATE: 9/11	DRWN: E.S.T.	CHKD: D.J.M.	SCALE: NO SCALE

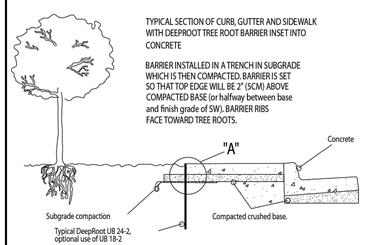
Linear Application of DeepRoot Tree Root Barriers at Time of Installing Concrete Sidewalks and Curbs

TYPICAL SECTION OF CURB AND GUTTER WITH DEEPROOT TREE ROOT BARRIER INSET INTO CONCRETE.
BARRIER INSTALLED IN A TRENCH IN SUBGRADE WHICH IS THEN COMPACTED. BARRIER IS SET SO THAT TOP EDGE WILL BE 2" (5CM) BELOW FINISH GRADE OF CURB, AND SET FLUSH WITH EDGE OF CURB. BARRIER RIBS FACE TOWARD TREE ROOTS.

INSTALLATION SEQUENCE:

1. Prepare base and subgrade
2. Trench to appropriate depth for installation of root barrier so that top of barrier is 2" (5cm) below finish grade of top of curb.
3. Place root barrier in trench, vertical ribs must face toward tree roots.
4. Backfill and compact to requirements.
5. Place form material against barrier (It may be nailed from the outside of the form)



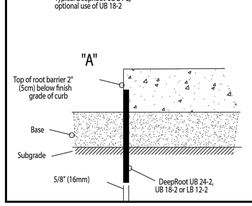


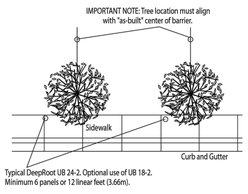
TYPICAL SECTION OF CURB, GUTTER AND SIDEWALK WITH DEEPROOT TREE ROOT BARRIER INSET INTO CONCRETE

BARRIER INSTALLED IN A TRENCH IN SUBGRADE WHICH IS THEN COMPACTED. BARRIER IS SET SO THAT TOP EDGE WILL BE 2" (5CM) ABOVE COMPACTED BASE (or halfway between base and finish grade of SW). BARRIER RIBS FACE TOWARD TREE ROOTS.

INSTALLATION SEQUENCE:

1. Prepare base and subgrade
2. Trench to appropriate depth for installation of root barrier so that top of barrier is 2" (5cm) below finish grade of top of sidewalk (or halfway between top of compacted base and finish grade of SW)
3. Place root barrier in trench, vertical ribs must face toward tree roots.
4. Backfill and compact to requirements.
5. Place form material against barrier (It may be nailed from the outside of the form)





APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

No.	Date	By	Ckd.	Appr.	Revision
6	5/29/24	TCR	JMV	JMV	PER CITY COMMENTS
5	3/27/24	TCR	JMV	JMV	PER CITY COMMENTS

Title: PRELIMINARY LANDSCAPE PLAN FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

STATE OF WASHINGTON
THOMAS C ROBERTS
No. 29051274 EXP. 04/12/2025
LICENSED LANDSCAPE ARCHITECT

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com

Scale: Horizontal 1"=30' Vertical N/A
Designed TCR Drawn TCR Checked JMV Approved JMV Date 3/27/24
TROBERTS Xref: 18666 DUPONT WA WAREHOUSE
Date/Time:5/30/2024 12:35 PM Scale:1 = 1
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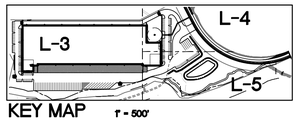
Job Number 18666
Sheet L4 of 12

PRELIMINARY LANDSCAPE PLAN
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=30'

0 15 30 60



KEY MAP 1" = 500'

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LEGEND

EXISTING TREE TO BE RETAINED
PROTECT DURING CONSTRUCTION

UNDERGROUND STORM WATER FACILITY SEE CIVIL

MODERATE BUFFER PER DMC 25.90.030(3) BETWEEN POND AND R/W, TREES MAX. 20' O.C.

BERM AND MODERATE BUFFER PER DMC 25.90.030(3) BETWEEN PARKING LOT AND R/W, TREES MAX. 20' O.C.

BERM AND MODERATE BUFFER PER DMC 25.90.030(3) BETWEEN PARKING LOT AND POND, TREES MAX. 20' O.C.

SEE 'PARKING LOT PLANTER GRADING DETAIL' FOR PARKING LOT PLANTERS NOT ABUTTING LARGER LANDSCAPE AREAS, TYP.

STREET TREES 40' O.C., TYP. LOCATE WITHIN R/W ADJUST LOCATIONS AS REQUIRED TO ACCOMODATE SIGHT DISTANCE REQUIREMENTS FOR DRIVEWAY SEE DUPONT DETAILS, SHEET L4

PER CITY STANDARD 5.7.5 ALL TREE PLANTINGS SHALL INCLUDE THE INSTALLATION OF AN APPROVED ROOT BARRIER (DEEPROOT UB 18-2 OAE) ADJACENT TO WALKS AND CURBS FOR EACH TREE, TYP. SEE DETAIL, SHEET L4

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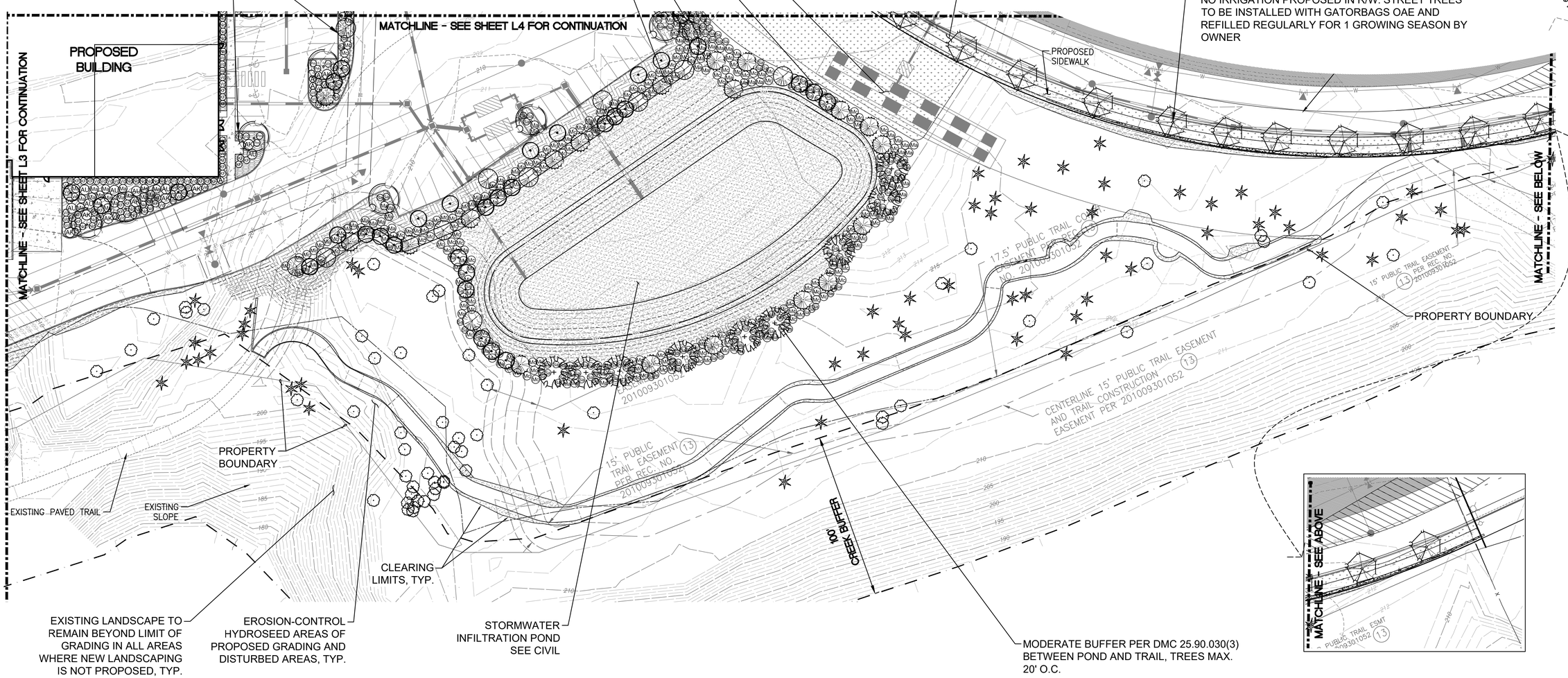

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Title: PRELIMINARY LANDSCAPE PLAN FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

STATE OF WASHINGTON
THOMAS C ROBERTS
No. 23031474 Exp. 04/12/2026
LICENSED LANDSCAPE ARCHITECT

Scale: Horizontal 1"=30' Vertical N/A

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TROBERTS Xref: 18666 DUPONT WA WAREHOUSE

Barghausen
Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
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barghausen.com

Job Number 18666

Sheet L5 of 12

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PLANT SCHEDULE
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

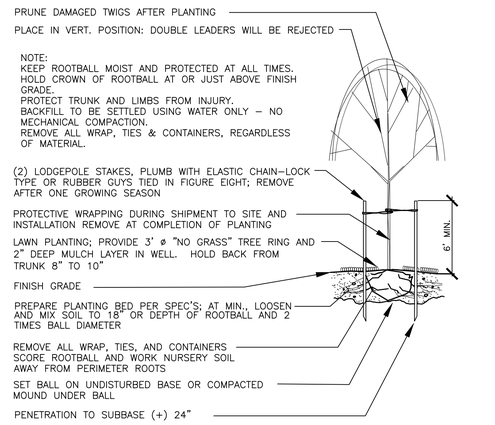
PLANT SCHEDULE

SYMBOL	QTY	BOTANICAL / COMMON NAME	CONT.	SIZE
TREES				
	52	ACER CIRCINATUM / VINE MAPLE	B & B	2" CAL
	23	CORNUS KOUSA / KOUSA DOGWOOD	B & B	2" CAL
	45	GLEDITSIA TRIACANTHOS INERMIS 'SKYCOLE' / HONEY LOCUST	B & B	2" CAL
	18	PINUS CONTORTA VAR. CONTORTA / SHORE PINE	B & B	6` MIN. HT.
	9	QUERCUS GARRYANA / OREGON WHITE OAK	B & B	2.5" CAL
	35	THUJA PLICATA 'EXCELSA' / EXCELSA CEDAR	B & B	6` MIN. HT.

SYMBOL	QTY	BOTANICAL / COMMON NAME	CONT.
SHRUBS			
A	44	ABELIA X GRANDIFLORA 'KALEIDOSCOPE' / KALEIDOSCOPE ABELIA	1 GAL.
AU	31	ARBUTUS UNEDO 'COMPACTA' / DWARF STRAWBERRY TREE	1 GAL.
Cs	72	CORNUS STOLONIFERA 'KELSEYI' / DWARF REDTWIG DOGWOOD	1 GAL.
Gs	76	GAULTHERIA SHALLON / SALAL	1 GAL.
Ma	222	MAHONIA AQUIFOLIUM / OREGON GRAPE	1 GAL.
M	92	MAHONIA AQ	1 GAL.
Mc	165	MYRICA CALIFORNICA / PACIFIC WAX MYRTLE	1 GAL.
Nd	99	NANDINA DOMESTICA 'GULF STREAM' / DWARF HEAVENLY BAMBOO	1 GAL.
Pm	18	PINUS MUGO 'PUMILIO' / DWARF MUGO PINE	1 GAL.
AK	25	RHODODENDRON X 'ANAH KRUSCHKE' / RHODODENDRON	1 GAL.
Sa	226	SYMPHORICARPOS ALBUS / SNOWBERRY	1 GAL.
Vd	123	VIBURNUM DAVIDII / DAVID VIBURNUM	1 GAL.
FERNS AND GRASSES			
KF	117	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / FEATHER REED GRASS	1 GAL.

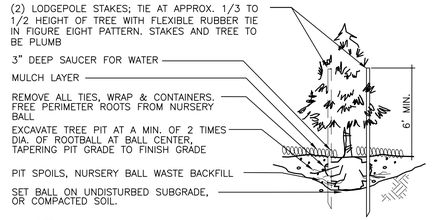
SYMBOL	QTY	BOTANICAL / COMMON NAME	CONT.	SPACING
GROUND COVERS				
	AS REQ.	ARCTOSTAPHYLOS UVA-URSI 'MASSACHUSETTS' / KINNIKINNICK	1 GAL.	36" o.c.
	AS REQ.	FRAGARIA CHILOENSIS / BEACH STRAWBERRY	1 GAL.	36" o.c.
	AS REQ.	GAULTHERIA SHALLON / SALAL	1 GAL.	48" o.c.
	AS REQ.	RUBUS CALYCINOIDES 'EMERALD CARPET' / CREEPING BRAMBLE	1 GAL.	36" o.c.
	AS REQ.	VINCA MINOR 'BOWLES' / PERIWINKLE	1 GAL.	36" o.c.

	TURFGRASS LAWN SOD OR HYDROSEED. COUNTRY GREEN LOW GROW SEED MIX OAE, 5 LBS. PER 1,000 SF (220 LBS. PER ACRE)	42,250 SF
	EROSION-CONTROL HYDROSEED WA. ST. D.O.T. EROSION CONTROL MIX OAE, 80-120 LBS. PER ACRE	48,157 SF



DECIDUOUS TREE PLANTING/STAKING DETAIL

NOT TO SCALE



NOTE:
LIGHT FERTILIZER OVER PLANTING BED AFTER BACKFILL ONLY; NO FERTILIZER IN PLANTING PIT.
WORK PERIMETER ROOTS FREE OF NURSERY BALL.
BALL & PIT TO BE COURSELY SCARIFIED.

EVERGREEN TREE PLANTING/STAKING DETAIL

NOT TO SCALE

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

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6	5/29/24	TCR	JMV	JMV	PER CITY COMMENTS
5	3/27/24	TCR	JMV	JMV	PER CITY COMMENTS

Title:
PRELIMINARY
PLANT SCHEDULE
FOR
DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

STATE OF WASHINGTON
THOMAS C ROBERTS
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Scale: Horizontal N/A Vertical N/A

Designed TCR Drawn TCR Checked JMV Approved JMV Date 3/27/24

DUPONT WA WAREHOUSE
PROBERTS Xref: 18666

Barghausen
Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222 barghausen.com

Job Number 18666

Sheet L6 of 12

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LANDSCAPE NOTES AND DETAILS
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

LANDSCAPE PLANTING NOTES AND MATERIALS

SCOPE OF WORK

FURNISH ALL MATERIALS, LABOR, EQUIPMENT AND RELATED ITEMS NECESSARY TO ACCOMPLISH TOPSOIL, TREATMENT AND PREPARATION OF SOIL, FINISH GRADING, PLACEMENT OF SPECIFIED PLANT MATERIALS, FERTILIZER, STAKING, MULCH, CLEAN-UP, DEBRIS REMOVAL, AND 30-DAY MAINTENANCE.

QUALIFICATIONS:
LANDSCAPE CONTRACTOR TO BE SKILLED AND KNOWLEDGEABLE IN THE FIELD OF WORK AND HAVE A MINIMUM OF FIVE (5) YEAR'S EXPERIENCE INSTALLING SIMILAR WORK. CONTRACTOR TO BE LICENSED TO PERFORM THE WORK SPECIFIED WITHIN THE PRESIDING JURISDICTION.

JOB CONDITIONS:
IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE SITE AND REPORT ANY DISCREPANCIES TO THE OWNER OR THE OWNER'S REPRESENTATIVES. ALL PLANT MATERIAL AND FINISH GRADES ARE SUBJECT TO APPROVAL BY THE OWNER.

PROTECTION:
SAVE AND PROTECT ALL EXISTING PLANTINGS SHOWN TO REMAIN. DO NOT PLANT UNTIL OTHER CONSTRUCTION OPERATIONS WHICH CONFLICT HAVE BEEN COMPLETED. IF AN IRRIGATION SYSTEM IS TO BE INSTALLED DO NOT PLANT UNTIL THE SYSTEM HAS BEEN INSTALLED, TESTED, AND APPROVED BY THE OWNER. HANDLE PLANTS WITH CARE – DO NOT DAMAGE OR BREAK ROOT SYSTEM, BARK, OR BRANCHES. REPAIR AND/OR REPLACE ITEMS DAMAGED AS A RESULT OF WORK, OR WORK NOT IN COMPLIANCE WITH PLANS AND SPECIFICATIONS, AS DIRECTED BY OWNER AT NO ADDITIONAL COST TO THE OWNER.

REPAIR OF EXISTING PLANTINGS:
DURING THE COURSE OF WORK, REPAIR ALL EXISTING PLANTING AREAS BY PRUNING DEAD GROWTH, RE-ESTABLISHING FINISH GRADE AND RE-MULCHING TO SPECIFIED DEPTH.

GUARANTEE:
GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF THE JOB BY OWNER.

30-DAY MAINTENANCE:
CONTRACTOR TO PROVIDE OWNER WITH A SCOPE OF WORK AT TIME OF INITIAL PROJECT BID TO PROVIDE LANDSCAPE AND IRRIGATION MAINTENANCE FOR 30 DAYS FOLLOWING STORE OPENING. WORK TO INCLUDE MAINTENANCE AS DESCRIBED BELOW, IN PLANTING AND IRRIGATION MAINTENANCE.

SUBMITTALS:
SUBMIT THE FOLLOWING TO THE LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO THE START OF ANY WORK:
- A) DOCUMENTATION THAT ALL PLANT MATERIAL HAS BEEN ORDERED.
- B) TOPSOIL ANALYSIS AND RECOMMENDED AMENDMENTS.
- C) TREE STAKING AND GUYING MATERIALS.
- D) ONE (1) QUART SIZE OF TOPSOIL AND MULCH.
- E) PLANTING SCHEDULE INCLUDING DATES AND TIMES.
- F) MAINTENANCE INSTRUCTIONS FOR ONE (1) FULL YEAR.

MATERIALS:

PLANT MATERIALS:
PLANT MATERIALS TO BE GRADE NO. 1, SIZED IN ACCORDANCE WITH (AAN) AMERICAN STANDARDS FOR NURSERY STOCK (ANSI Z60.1-2004). PRUNE PLANTS RECEIVED FROM THE NURSERY ONLY UPON AUTHORIZATION BY THE LANDSCAPE ARCHITECT. "B & B" INDICATES BALLED AND BURLAPPED; "CONT." INDICATES CONTAINER; "BR" INDICATES BARE ROOT; "CAL" INDICATES CALIPER AT 6" ABOVE SOIL LINE; "GAL" INDICATES GALLON.
- A) SPECIFIED PLANT CANOPY SIZE OR CALIPER IS THE MINIMUM ACCEPTABLE CONTAINER OR BALL SIZE AND ESTABLISHES MINIMUM PLANT CONDITION TO BE PROVIDED.
- B) QUALITY:
  PLANT MATERIAL TO COMPLY WITH STATE AND FEDERAL LAWS FOR DISEASE INSPECTION, PLANTS TO BE FULLY LIVE, VIGOROUS, WELL FORMED, WITH WELL DEVELOPED FIBROUS ROOT SYSTEMS. ROOT BALLS OF PLANTS TO BE SOLID AND FIRMLY HELD TOGETHER, SECURELY CONTAINED AND PROTECTED FROM INJURY AND DESICCATION. PLANTS DETERMINED BY LANDSCAPE ARCHITECT TO HAVE BEEN DAMAGED; HAVE DEFORMITIES OF STEM, BRANCHES, OR ROOTS; LACK SYMMETRY, HAVE MULTIPLE LEADERS OR "Y" CROTCHES LESS THAN 30 DEGREES IN TREES, OR DO NOT MEET SIZE OR ANSI STANDARDS WILL BE REJECTED. PLANT MATERIAL TO BE FROM A SINGLE NURSERY SOURCE FOR EACH SPECIFIED SPECIES/HYBRID. NURSERY SOURCES TO BE THOSE LOCATED IN THE SAME REGION AS THE JOB SITE.
- C) SUBSTITUTION:
  NO SUBSTITUTION OF PLANT MATERIAL, SPECIES OR VARIETY, WILL BE PERMITTED UNLESS WRITTEN EVIDENCE IS SUBMITTED TO THE OWNER FROM TWO QUALIFIED PLANT BROKERAGE OFFICES. SUBSTITUTIONS WHICH ARE PERMITTED TO BE IN WRITING FROM THE OWNER AND LANDSCAPE ARCHITECT. THE SPECIFIED SIZE, SPECIES AND NEAREST VARIETY, AS APPROVED, TO BE FURNISHED. SUBSTITUTIONS MAY REQUIRE SUBMITTAL TO REVISED LANDSCAPE PLAN TO CITY FOR APPROVAL.
- D) LABEL AT LEAST ONE (1) TREE, SHRUB, AND GROUNDCOVER OF EACH VARIETY WITH A SECURELY ATTACHED WATERPROOF TAG BEARING LEGIBLE DESIGNATION OF BOTANICAL AND COMMON NAMES.
- E) DELIVER PLANT MATERIAL AFTER PREPARATION OF PLANTING AREAS HAVE BEEN COMPLETED AND PLANT IMMEDIATELY. IF PLANTING IS DELAYED MORE THAN SIX (6) HOURS AFTER DELIVERY, SET MATERIAL IN SHADE, PROTECT FOR WEATHER AND MECHANICAL DAMAGE, AND KEEP ROOT BALLS MOIST BY COVERING WITH MULCH, BURLAP OR OTHER ACCEPTABLE MEANS OF RETAINING MOISTURE.

SOIL PREPARATION:
TOPSOIL, AMENDMENT, AND BACKFILL, ARE GENERAL REQUIREMENTS FOR ALL LANDSCAPE AREAS, UNLESS NOTED OTHERWISE ON THE PLANS. SOIL AMENDMENTS AND FERTILIZER NOTED BELOW ARE TO BE USED FOR BID PRICE BASIS ONLY. SPECIFIC AMENDMENTS AND FERTILIZERS WILL BE MADE AFTER SOIL SAMPLES ARE LABORATORY TESTED BY THE CONTRACTOR. PROVIDE CHANGE ORDER FOR ADDITIONAL OR REDUCTION OF MATERIALS REQUIRED OR NOT REQUIRED BY THE SOILS REPORT.

SOIL FERTILITY AND AGRICULTURAL SUITABILITY ANALYSIS:
AFTER ROUGH GRADING AND PRIOR TO SOIL PREPARATION, CONTRACTOR TO OBTAIN TWO REPRESENTATIVE SOIL SAMPLES, FROM LOCATIONS AS DIRECTED BY THE LANDSCAPE ARCHITECT, TO A SOIL TESTING LABORATORY. SUBMIT RESULTS TO LANDSCAPE ARCHITECT FOR REVIEW. TESTS TO INCLUDE FERTILITY AND SUITABILITY ANALYSIS WITH WRITTEN RECOMMENDATIONS FOR SOIL AMENDMENT, FERTILIZER, CONDITIONERS, APPLICATION RATES, AND POST-CONSTRUCTION MAINTENANCE PROGRAM. TESTS TO BE CONTRACTED WITH AND PAID FOR BY THE CONTRACTOR.

- A) TOPSOIL:
  CONTRACTOR IS RESPONSIBLE FOR SUPPLYING ALL TOPSOIL AND FOR DETERMINING THE VOLUME OF TOPSOIL REQUIRED PER THE INFORMATION ON PLANS AND NOTED HERE-IN. CONTRACTOR IS RESPONSIBLE FOR ANY NECESSARY WEED CONTROL RESULTING FROM CONTAMINATED OFF SITE SOURCES.
- B) TOPSOIL TO CONSIST OF 1/3 BY VOLUME SANDY LOAM, 1/3 BY VOLUME COMPOSTED GARDEN MULCH, AND 1/3 BY VOLUME COARSE WASHED SAND OR EQUIVALENT.
- C) TOPSOIL PREPARATION AND INSTALLATION:
  1. VERIFY SUBGRADES TO -9 INCHES IN LANDSCAPE AREAS OR AS INDICATED ON PLANS. THIS ACCOMMODATES, TOPSOIL, AMENDMENTS, AND MULCH. 6" IMPORTED TOPSOIL FOR LANDSCAPE BEDS.
  2. ERADICATE ANY SURFACE VEGETATION ROOTED IN THE SUB-GRADE PRIOR TO SUB-GRADE PREPARATION.
  3. REMOVE SOIL LUMPS, ROCK, VEGETATION AND/OR DEBRIS LARGER THAN 2 INCHES FROM ALL SUB-GRADE PRIOR TO PLACEMENT OF SPECIFIED TOPSOIL.
  4. REMOVE ANY ASPHALT EXTENDING BEYOND 6 INCHES FROM CURBS INTO ADJACENT LANDSCAPE AREAS.
- D) TOPSOIL PLACEMENT:
  1. PROVIDE A TOTAL FINISH COURSE OF 6 INCHES OF TOPSOIL FOR LANDSCAPE AREAS.
  2. PLACE ADDITIONAL TOPSOIL AND SOIL MIX AS REQUIRED TO MEET FINISH ELEVATIONS.

MULCH (TOPDRESSING):
ONE-HALF-INCH (1/2") SIZE, TO ONE-QUARTER (1/4"), HEMLOCK/FIR BARK. FINE TEXTURED AND DARK BROWN IN COLOR.

STAKES:
2-INCH DIAMETER BY 8-FOOT MINIMUM LODGEPOLE PINE STAKES.

GUY MATERIAL:
1-INCH WIDE POLYETHYLENE CHAIN LOCK TYPE TIES; OR, 3/8" DIAMETER RUBBER. NO WIRE.

EXECUTION:

CONTAMINANTS:
VERIFY THAT ALL SOIL CONTAMINANTS (E.G., PAINT, SEALANTS, SOLVENTS, OILS, GREASES, CONCRETE/ASPHALT SPOILS, ETC.) HAVE BEEN SATISFACTORY REMOVED FROM ALL PLANTING AREAS. DO NOT BEGIN WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

FINISH GRADES:
FINE GRADE AND REMOVE ROCKS, DEBRIS, AND FOREIGN OBJECTS OVER 2 INCHES DIAMETER FROM TOP SURFACE OF PREPARED LANDSCAPE AREAS. FINISH ELEVATIONS TO BE DEFINED AS 3 INCHES BELOW CURBS, WALKS AND/OR OTHER ADJACENT HARDSCAPE FOR ALL PLANTING BED AREAS AND 1-INCH BELOW CURBS, WALKS AND/OR OTHER ADJACENT HARDSCAPE FOR ALL LAWN AREAS. FINISH GRADE REFER TO GRADES PRIOR TO INSTALLATION OF MULCH OR LAWN. ALL FINISH GRADES TO BE SMOOTH EVEN GRADES, LIGHTLY COMPACTED, AS SHOWN ON THE PLAN AND DETAILED. PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDINGS AND STRUCTURES. SITE CIVIL DRAWINGS IDENTIFY FINAL ELEVATIONS. MOISTEN PREPARED AREAS BEFORE PLANTING IF SOIL IS DRY. WATER THOROUGHLY AND ALLOW SURFACE TO DRY BEFORE PLANTING. DO NOT CREATE MUDDY SOIL.

TREES AND SHRUBS:
ARRANGE TREES AND SHRUBS ON SITE IN PROPOSED LOCATIONS PER DRAWINGS. EXCAVATE PIT, PLANT AND STAKE OR GUY, AS CALLED OUT AND DETAILED. ALL TREES, SHRUBS, AND SUPPORTS TO STAND VERTICAL. BACKFILL SHALL BE PIT SPOILS. SETTLE BACKFILL USING WATER ONLY. NO MECHANICAL COMPACTION.

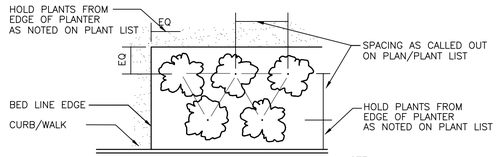
GROUNDCOVERS:
EXCAVATE PITS TO A MINIMUM OF 3 INCHES BELOW, AND TWICE THE ROOT BALL DIAMETER. WATER THOROUGHLY AND TAKE CARE TO ENSURE THAT ROOT CROWN IS AT PROPER GRADE, AS DETAILED.

MULCH:
MULCH ALL LANDSCAPE AREAS. MATCH DEPTH OF EXISTING MULCH. AT A MINIMUM, APPLY SUFFICIENT QUANTITY TO PROVIDE A 4-INCH DEPTH.

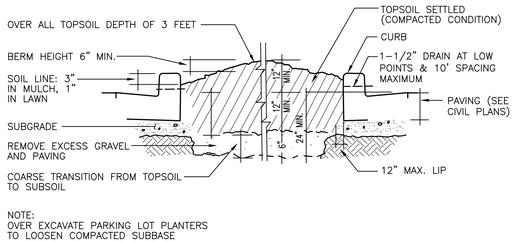
UTILITY CLEARANCES:
FIELD ADJUST PLANT LOCATIONS FOR 8-FOOT SEPARATION OF TREES/SHRUBS AND 2-FOOT SEPARATION FOR GROUNDCOVER FROM FIRE HYDRANTS AND UTILITY VAULTS.

CLEANUP AND PROTECTION:
DURING LANDSCAPE WORK, KEEP ALL PAVEMENT CLEAN AND WORK AREAS IN AN ORDERLY CONDITION. PROTECT LANDSCAPE WORK AND MATERIALS FROM DAMAGE DUE TO LANDSCAPE OPERATIONS AND TRESPASSERS. MAINTAIN PROTECTION DURING INSTALLATION AND MAINTENANCE PERIOD. TREAT, REPAIR, OR REPLACE DAMAGE LANDSCAPE WORK AS DIRECTED BY THE OWNER.

PLANTING MAINTENANCE:
PROVIDE FULL MAINTENANCE BY SKILLED EMPLOYEES OF LANDSCAPE INSTALLERS. CONTRACTOR TO MAINTAIN PLANTINGS THROUGH COMPLETED INSTALLATION, AND UNTIL ACCEPTANCE OF LANDSCAPE INSTALLATION. PLANTING MAINTENANCE TO INCLUDE WATERING, WEEDING, CULTIVATING, TIGHTENING AND REPAIRING OF TREE GUYS, RESETTING PLANTS TO PROPER GRADES OR POSITION, RE-ESTABLISHING SETTLED GRADES; AND MOWING LAWNS WEEKLY AFTER LAWN ESTABLISHMENT. HERBICIDE IS NOT RECOMMENDED FOR ONE YEAR FOLLOWING LANDSCAPE INSTALLATION. INCLUDED IS REPLACEMENT OF DEAD PLANTS AND PLANTS SHOWING LOSS OF 40 PERCENT OR MORE OF CANOPY.

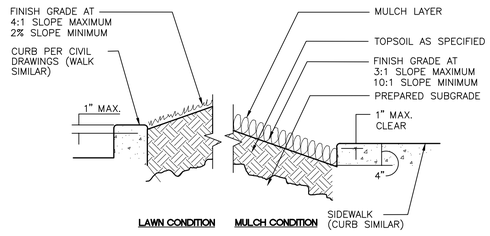


PLANT MATERIAL SPACING DETAIL
NOT TO SCALE

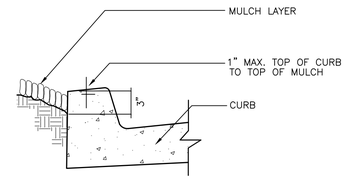


PARKING LOT PLANTER GRADING DETAIL
NOT TO SCALE

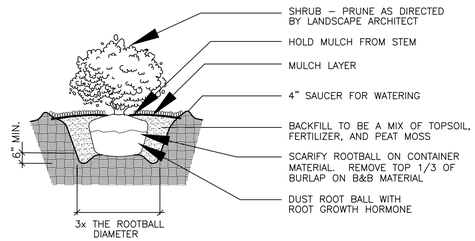
DEDUCT ALT #1: IF LANDSCAPE CONTRACTOR CAN DEMONSTRATE THAT PLANTER ISLANDS ARE NOT FULL OF NON-SOIL MATERIALS (CONCRETE WASTE, LUMBER, ROAD BASE, GRAVEL), FULL EXCAVATION AND REPLACE WITH 18"-21" OF TOPSOIL CAN BE ELIMINATED AND IN ITS PLACE, 6" OF COMPOST CAN BE PLACED ON SUB-GRADE AND CULTIVATED INTO TOP 12" OF EXISTING SOIL. TOP OF FINISH GRADE AND DEPTH OF MULCH STILL APPLIES



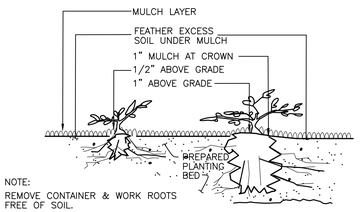
PLANTER SECTION DETAIL
NOT TO SCALE



MULCH AT CURB DETAIL
NOT TO SCALE



SHRUB PLANTING DETAIL
NOT TO SCALE



GROUNDCOVER PLANTING DETAIL
NOT TO SCALE

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

No.	Date	By	Chkd.	Appr.	Revision
6	5/29/24	TCR	JMV	JMV	PER CITY COMMENTS
5	3/27/24	TCR	JMV	JMV	PER CITY COMMENTS

Title: PRELIMINARY
LANDSCAPE NOTES AND DETAILS
FOR
DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

STATE OF WASHINGTON
THOMAS C ROBERTS
No. 23001274 EXP. 04/12/2025
LICENSED LANDSCAPE ARCHITECT

DUPONT WA WAREHOUSE

Scale: Horizontal N/A Vertical N/A

Designed TCR Drawn TCR Checked JMV Approved JMV Date 3/27/24

TROBERTS Xref: 18666

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com

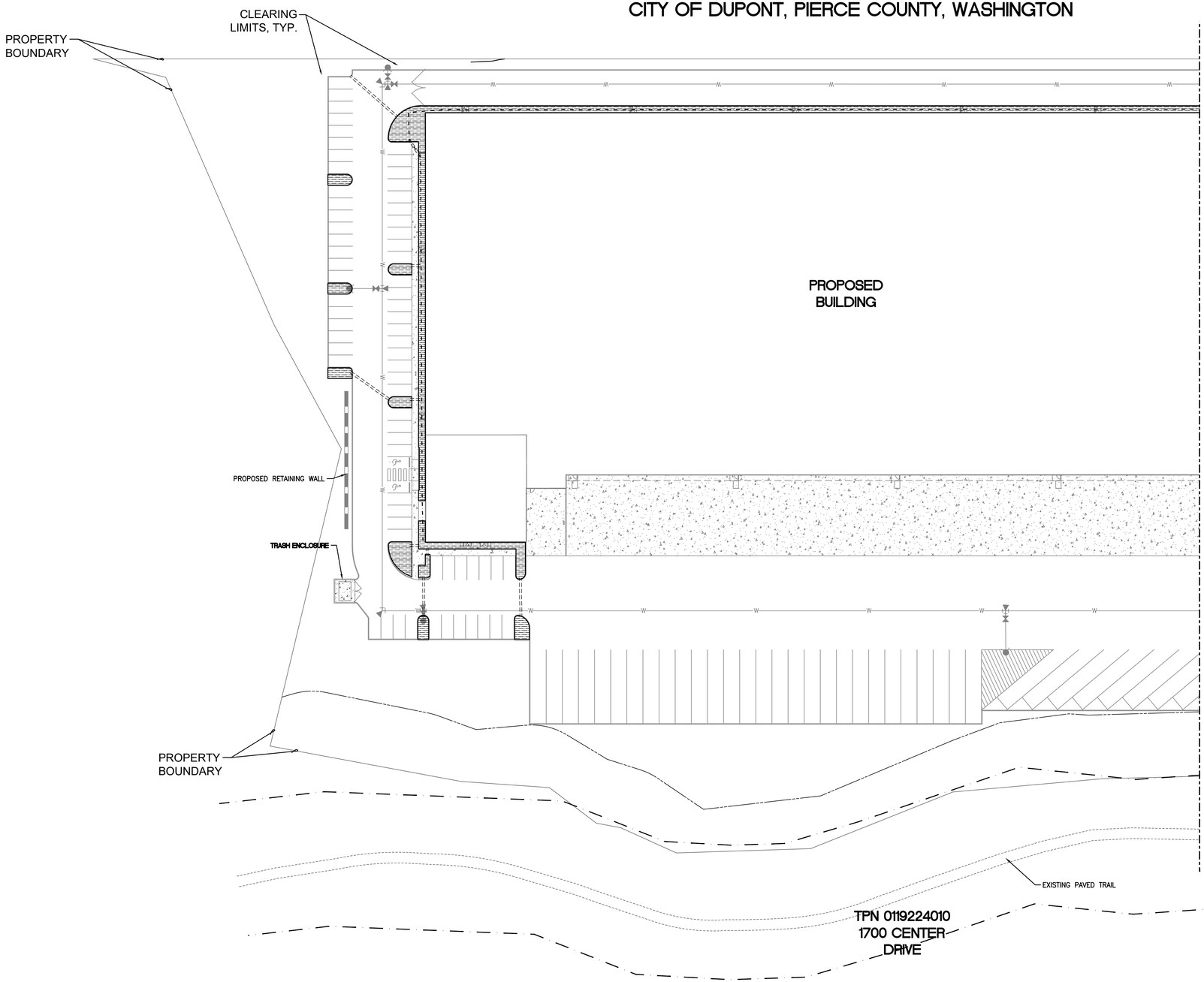
Job Number 18666

Sheet L7 of 12

File:P:\18000s\18666\preliminary\18666-pl.dwg Date/Time:5/30/2024 12:35 PM Scale:1 = 1

PRELIMINARY IRRIGATION PLAN
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80



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CITY OF DUPONT

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IRRIGATION CALCULATIONS

MAX. RATE OF FLOW: 30 GPM

ANNUAL WATER USAGE
TOTAL IRRIGATED AREA (NOT INCL. EROSION CONTROL HYDROSEED)
=43,542 SQUARE FEET

TOTAL LANDSCAPE AREA (INCL. EROSION CONTROL HYDROSEED):
=119,012 SQUARE FEET

ESTIMATED ANNUAL WATER USAGE (SEE FORMULA BELOW):
EWU = (14.49 X 0.3 X 43,542 X 0.62) / 0.81
EWU = 117,351.8 / 0.81
EWU = 144,878.7 GALLONS PER YEAR
144,878.7 / 119,012 = 0.97 GAL/SF PER YEAR (DMC 25.90.040.3)

FORMULA: EWU = (ET X PF X HA X CF) / IE
EWU: ESTIMATED WATER USE
ET: EVAPOTRANSPIRATION RATE = 14.49 INCHES
PF: PLANT FACTOR VALUE = 0.3
HA: LANDSCAPE AREA IN SQUARE FEET = 43,542
CF: CONVERSION FACTOR OF 0.62 (INCHES TO GALLONS PER SQUARE FOOT)
IE: IRRIGATION EFFICIENCY VALUE = 0.81

WATER CONSERVATION TECHNIQUES

PER DMC 25.90.040.1

- MULCH SPECIFIED FOR ALL TREE/SHRUB BEDS
- LAWN AREAS MINIMAL (14.7% OF LANDSCAPE AREA)
- DROUGHT-TOLERANT LAWN, SHRUBS SPECIFIED (SEE PLANT SCHEDULE)
- IRRIGATION SYSTEM PER 25.90.040.1(e)

No.	Date	By	Ckd.	Appr.	Revision
6	5/29/24	TCR	JMV	JMV	PER CITY COMMENTS
5	3/27/24	TCR	JMV	JMV	PER CITY COMMENTS

Title: PRELIMINARY IRRIGATION PLAN FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

STATE OF WASHINGTON · THOMAS C ROBERTS · No. 22031274 EXP. 04/12/2025 · LICENSED LANDSCAPE ARCHITECT

Scale: Horizontal 1"=40' Vertical N/A
Designed TCR Drawn TCR Checked JMV Approved JMV Date 3/27/24
TROBERTS Xref: 18666 DUPONT WA WAREHOUSE

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222 barghausen.com

Job Number 18666
Sheet L8 of 12

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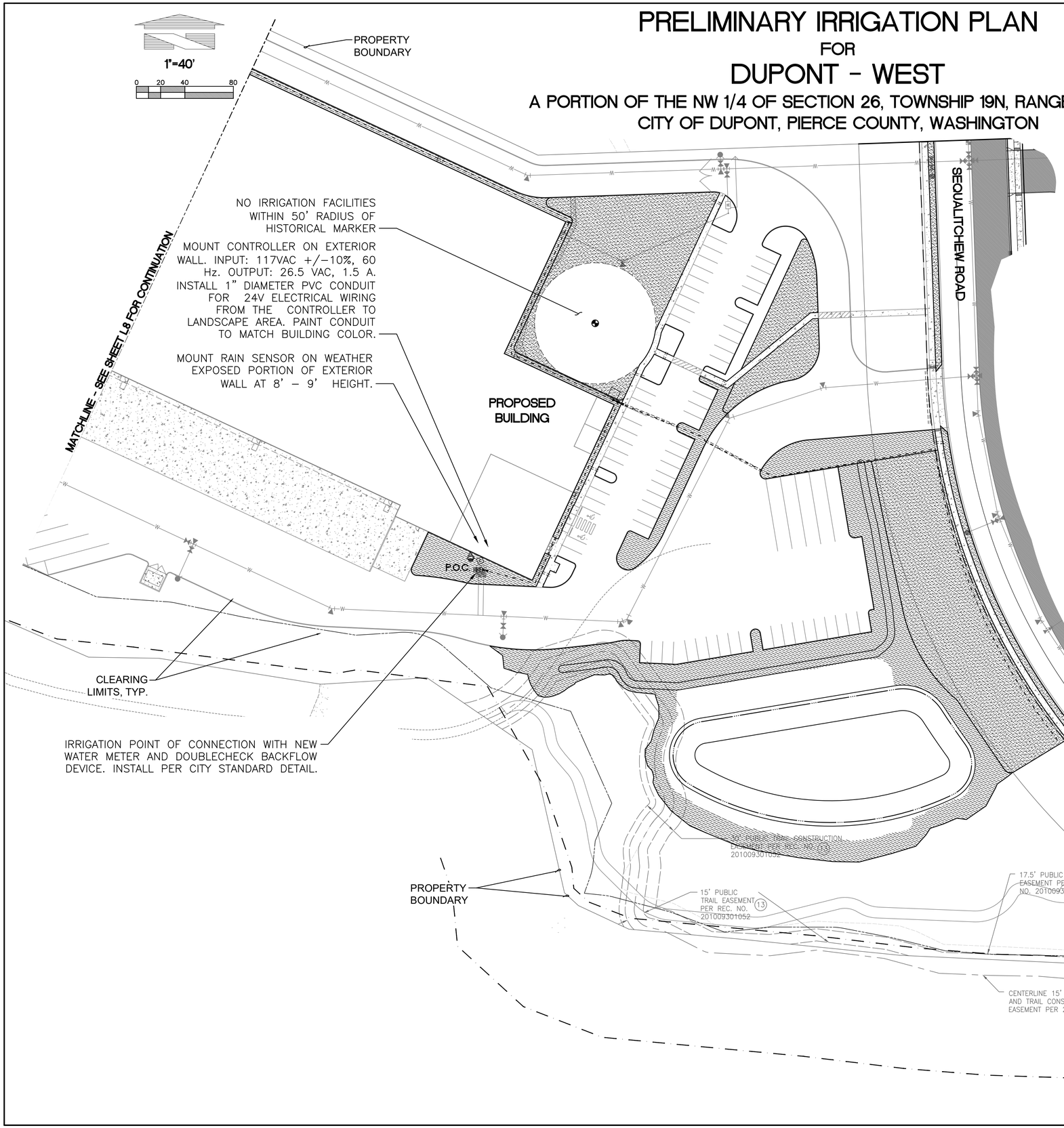
PRELIMINARY IRRIGATION PLAN
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80



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CITY OF DUPONT

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No.	Date	By	Ckd.	Appr.	Revision
6	5/29/24	TCR	JMV	JMV	PER CITY COMMENTS
5	3/27/24	TCR	JMV	JMV	PER CITY COMMENTS

Title: PRELIMINARY IRRIGATION PLAN FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

STATE OF WASHINGTON · THOMAS C ROBERTS · No. 23031274 EXP. 04/12/2025 · LICENSED LANDSCAPE ARCHITECT

Scale: Horizontal 1"=40' Vertical N/A

Designed TCR Drawn TCR Checked JMV Approved JMV Date 3/27/24

DUPONT WA WAREHOUSE

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222 barghausen.com

Job Number 18666

Sheet L9 of 12

File: \\18000s\18666\preliminary\18666-pl.dwg Date/Time: 5/30/2024 12:35 PM Scale: 1 = 1 TROBERTS Xref: 18666

IRRIGATION NOTES AND DETAILS
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

APPROVED FOR CONSTRUCTION

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CITY OF DUPONT

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IRRIGATION LEGEND

DESCRIPTION

DRIP IRRIGATION:

HUNTER LANDSCAPE DRIPLINE COMPONENTS

HDL-06-12-250-CV SUB-SURFACE DRIPLINE TUBING 0.6 GPH PRESSURE COMPENSATING EMITTERS WITH CHECK VALVE AT 12" ON-CENTER SPACING - ALL TUBING SHALL BE INSTALLED ON GRADE W/ 9" WIRE STAKES FOUR (4) FEET ON-CENTER; VERIFY THE LAYOUT AND 18" ON-CENTER SPACING IN THE FIELD PRIOR TO STARTING WORK. INSTALL ALL COMPONENTS PER MANUF. SPECIFICATIONS.

USE HUNTER PLD-LOC FITTINGS FOR CONNECTION BETWEEN PVC LATERAL LINES AND INLINE DRIP TUBING

SPRINKLER HEADS:
HUNTER MP ROTATOR WITH PRO-SPRAY POP-UP BODY AND CV DRAIN CHECK VALVE, 4" LAWN, 6" SHRUB

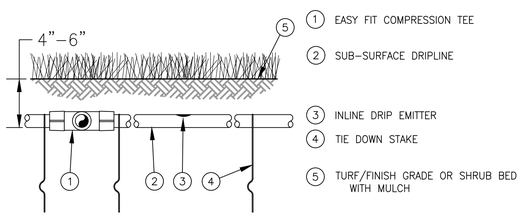
SYMBOL	NOZZLE	PSI	GPM	RADIUS
	HUNTER-6Q and 6H H, Q SERIES	30	0.98, 0.51	6'
	HUNTER-1000 8-15 F, TH, TT, H, Q SERIES	35	0.65, 0.48, 0.37, 0.32, 0.16	8'
	HUNTER-1000 8-15 F, TH, TT, H, Q SERIES	35	0.65, 0.48, 0.37, 0.32, 0,16	10'
	HUNTER-1000 8-15 F, TH, TT, H, Q SERIES	35	0.65, 0.48, 0.37, 0.32, 0,16	12'
	HUNTER-2000 13-21 F, TQ, TT, H, Q SERIES	30	1.29, 0.95, 0.74, 0.63, 0.33	15'
	HUNTER ES515, SS530 SERIES	35	1.41, 0.65	5'x30' 5'x15'
	HUNTER-3000 22-30 F, TQ, TT, H, Q SERIES	35	2.88, 2.19, 1.68, 1.44, 0.69 0.43	22'

- SPRAY IRRIGATION: HUNTER ICV 101/151G REMOTE CONTROL VALVE, IN VALVE BOX, ONE VALVE PER BOX MAXIMUM 2 VALVES PER BOX
- DRIP IRRIGATION: ICZ-101/151-XL REMOTE CONTROL DRIP ZONE KIT WITH FILTER AND PRESSURE REGULATOR MAXIMUM 2 VALVES PER BOX
- HUNTER SOLAR SYNC WIRE RAIN SENSOR COMBO
- HUNTER PRO-C CONTROLLER 3 TO 15 STATIONS, (HARDWIRE CONNECTION); PROVIDE GROUND AND BATTERIES PER MANUFACTURER'S SPECIFICATIONS
- P.O.C. WILKINS 950 XLT- 1" DOUBLE CHECK VALVE (STATE APPROVED); TEST AND CERTIFICATION BY LICENSED BACKFLOW TESTER
  WILKINS 850 - BALL VALVE, SIZE TO MATCH PIPE
  CARSON INDUSTRIES #1730 (TWO AT P.O.C.) GRADE LEVEL VAULT WITH BOLT LOCK LID
- PLASTIC BALL VALVE, MATCH LINE SIZE, IN VALVE BOX
- HUNTER HQ-33DLRC 3/4" QUICK COUPLING VALVE, IN VALVE BOX, PROVIDE TWO KEYS AND SWIVELS
- MAINLINE - SCH 40 PVC (18" COVER); SIZE PER PLAN, 1-1/2" SIZE MINIMUM
- LATERAL - SCH 40 PVC (12" COVER); SIZE PER PLAN, 3/4" SIZE MINIMUM
- SLEEVE - SCH 40 PVC; 24" MINIMUM COVER AT VEHICLE CROSSINGS AND 18" MINIMUM COVER IN LANDSCAPE AREAS, 6" SIZE WHERE IRRIGATION MAINLINE TRAVELS THROUGH PIPE. 4" SIZE WHERE ONLY LATERALS TRAVEL THROUGH PIPE

IRRIGATION SHOWN DIAGRAMATICALLY FOR PLAN CLARITY. COMMON TRENCH AND PLACE EQUIPMENT IN LANDSCAPE; MANIFOLD GROUPED VALVES IN ADJACENT SHRUB AREAS WHERE FEASIBLE.

SCH 40 PIPE SIZING CHART

PIPE SIZE	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	
FLOW GPM	1-8	8.1-13	13.1-23	23.1-32	32.1-53	53.1-74	GPM (MAX.)



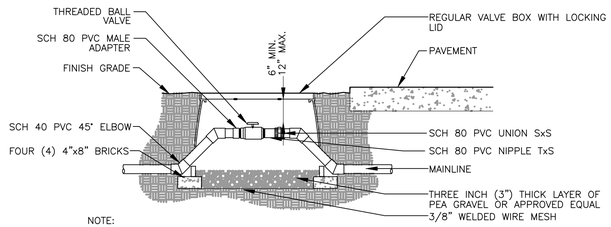
NOTES:
1. PLACE TIE DOWN STAKES EVERY THREE FEET IN SAND, FOUR FEET IN LOAM, AND FIVE FEET IN CLAY.
2. AT FITTINGS WHERE THERE IS A CHANGE OF DIRECTION SUCH AS TEES OR ELBOWS, USE TIE-DOWN STAKES ON EACH LEG OF THE CHANGE OF DIRECTION.
3. INSERTION PLOW AND TRENCHED INSTALLATIONS DO NOT REQUIRE TIE DOWN STAKES.

DRIPLINE BURIAL

NOT TO SCALE

LANDSCAPE IRRIGATION NOTES

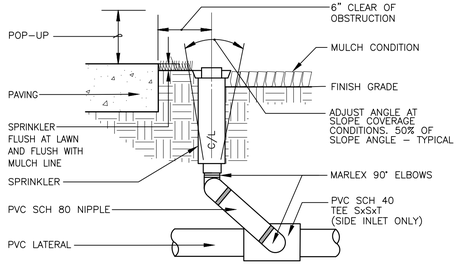
1. GENERAL CONTRACTOR AND LANDSCAPE CONTRACTOR TO COORDINATE:
   - A) INSTALLATION OF 110V ELECTRICAL SERVICE FROM ELECTRICAL SOURCE TO AUTOMATIC CONTROLLER, INCLUDING WIRE HOOK-UP INTO MOUNTED CONTROLLER. IRRIGATION CONTRACTOR WILL MOUNT CONTROLLER PER DESIGN AND COORDINATE WITH GENERAL CONTRACTOR.
   - B) INSTALLATION OF IRRIGATION/SERVICE METER AND STUB TO IRRIGATION POINT OF CONNECTION, PER UTILITY PLAN(S). PROVIDE STANDARD THREADED STUB-OUT WITH THREADED CAP ON DISCHARGE SIDE OF METER. STUB-OUT TO BE INSTALLED APPROXIMATELY 18 INCHES BELOW FINISH GRADE.
   - C) VERIFICATION OF STATIC WATER PRESSURE AT POINT-OF-CONNECTION (P.O.C.) CONTRACTOR SHALL NOTIFY OWNER AND BARGHAUSEN CONSULTING ENGINEERS, INC., OF ANY VARIATION IN STATIC PRESSURE OVER 5 PSI GREATER/LESS THAN DESIGN PRESSURE.
   - D) INSTALLATION OF SLEEVING.
2. PROVIDE ALL LABOR, MATERIALS, TRANSPORTATION, AND SERVICES NECESSARY TO FURNISH AND INSTALL A COMPLETE IRRIGATION SYSTEM AS INDICATED ON THE DRAWINGS AND/OR NOTES. PROVIDE A ONE (1) YEAR WARRANTY/GUARANTEE FROM FINAL ACCEPTANCE AGAINST ALL DEFECTS IN MATERIALS, EQUIPMENT, AND WORKMANSHIP.
3. COORDINATE IRRIGATION INSTALLATION WITH GENERAL CONTRACTOR, ELECTRICAL CONTRACTOR, LANDSCAPE CONTRACTOR, OWNER, ARCHITECT, AND LANDSCAPE ARCHITECT.
4. **LANDSCAPE CONTRACTOR TO TEST AVAILABLE WATER PRESSURE PRIOR TO BEGINNING ANY WORK. PROVIDE LANDSCAPE ARCHITECT WITH WRITTEN PSI RESULTS.**
5. ALL WORK PER LOCAL CODE. INSTALLATION PER MANUFACTURER'S WRITTEN SPECIFICATIONS.
6. CONTRACTOR TO OBTAIN AND PAY FOR ALL PERMITS, FEES, AND REQUIRED CITY INSPECTIONS.
7. SUBMITTALS:
   - A) SUBMIT EACH ITEM LISTED BELOW FOR LANDSCAPE ARCHITECT'S REVIEW AND APPROVAL,
   - B) PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED,
   - C) CONTROL WIRING PATH DIAGRAM,
   - D) "AS-BUILT" DRAWINGS.
   - E) OPERATION AND MAINTENANCE MANUALS.
8. PROVIDE AND KEEP UP TO DATE A COMPLETE "AS-BUILT" RECORD SET OF PRINTS WHICH ARE TO BE CORRECTED DAILY AND SHOW EVERY CHANGE FROM THE ORIGINAL DRAWINGS AND NOTES AND EXACT "AS-BUILT" LOCATIONS, SIZES AND KIND OF EQUIPMENT. THIS SET OF DRAWINGS. ARE TO BE KEPT ON SITE AND ARE TO BE USED ONLY AS THE RECORD SET. ALL WORK IS TO BE NEAT AND LEGIBLE ANNOTATIONS THEREON DAILY AS THE WORK PROCEEDS, SHOWING WORK AS ACTUALLY INSTALLED.
   DIMENSION FORM TWO (2) PERMANENT POINTS OF REFERENCE, BUILDING CORNERS, WALKS, OR ROAD INTERSECTIONS, ETC., THE LOCATION OF THE FOLLOWING:
   - A) CONNECTION TO WATER LINES (P.O.C.),
   - B) CONNECTIONS TO ELECTRICAL POWER,
   - C) GATE VALVE, QUICK COUPLERS, AND REMOTE CONTROL VALVE,
   - D) ROUTING OF MAINLINE (DIMENSION MAXIMUM 100' ALONG ROUTING),
   - E) ROUTING OF CONTROL WIRING,
   - F) OTHER RELATED EQUIPMENT AS DIRECTED BY THE LANDSCAPE ARCHITECT.
9. PREPARE AND PROVIDE PRIOR TO COMPLETION OF CONSTRUCTION, A THREE RING BINDER CONTAINING THE FOLLOWING INFORMATION:
   - A) INDEX SHEET STATING CONTRACTOR'S ADDRESS, TELEPHONE NUMBER, FAX, E-MAIL AND A, LIST OF EQUIPMENT WITH NAME AND ADDRESS OF LOCAL MANUFACTURER'S REPRESENTATIVES,
   - B) CATALOG AND PARTS SHEETS ON EVERY MATERIAL AND EQUIPMENT INSTALLED UNDER THIS, CONTRACT,
   - C) GUARANTEE STATEMENT,
   - D) COMPLETE OPERATING AND MAINTENANCE INSTRUCTIONS ON ALL MAJOR EQUIPMENT.
   - E) CONSTRUCTION DETAILS FROM THE PROJECT,
   - F) COMPLETE TROUBLE-SHOOTING GUIDE TO COMMON IRRIGATION PROBLEMS,
   - G) WINTERIZATION AND SPRING START-UP PROCEDURES,
   - H) CHART OF APPROXIMATE WATERING TIMES FOR SPRING, SUMMER, AND FALL,
   - I) A COPY OF THE "AS-BUILT" DRAWINGS AND CONTROLLER CHART.
10. ALL VALVES TO BE PLACED IN "CARSON" GRADE LEVEL BOXES WITH BOLT-LOCK LIDS (OR APPROVED EQUIVALENT). SET BOXES 2 INCHES HIGHER THAN FINISH GRADE IN MULCH AREAS AND FLUSH WITH FINISH GRADE IN LAWN AREAS. JUMBO BOX FOR CHECK VALVE, 10" ROUND BOX FOR GATE/QUICK COUPLER/WIRE SPLICES, AND 12" STANDARD FOR CONTROL VALVES. PROVIDE BOX EXTENSIONS AS REQUIRED.
11. MAINLINE PIPE TO BE BURIED 18 INCHES, LATERALS 12 INCHES, AND SLEEVES 24" INCHES BELOW FINISH GRADE. NO ROCK OR DEBRIS TO BE BACKFILLED OVER PIPE.
12. HEAD AND LINE POSITIONING IS DIAGRAMMATIC ON PLAN. ADJUST IN FIELD AS NECESSARY FOR 100 PERCENT COVERAGE. VALVES TO BE POSITIONED ADJACENT TO PAVEMENT/CURBS, IN SHRUB BEDS WHERE POSSIBLE.
13. FAMILIARIZE OWNERS FACILITY OPERATOR WITH IRRIGATION SYSTEM FUNCTION, CONTROLLER PROGRAMMING, SYSTEM OPERATION AND MAINTENANCE REQUIREMENTS.
14. SPRINKLERS ON RISERS WILL NOT BE ALLOWED UNLESS NOTED ON PLANS.
15. RADIUS REDUCTION TO BE MADE BY USE OF PRESSURE ADJUSTMENT, SCREENS, AND/OR ALTERNATE NOZZLES. IN-NOZZLE ADJUSTMENT IS LIMITED TO 10 PERCENT FOR SPRAY HEADS AND PER MANUFACTURER'S LIMITS FOR OTHER SPRINKLERS. SPRINKLER SPACING NOT EXCEED 60% OF THE DIAMETER OF THE PUBLISHED DATA.
16. ALL CONTROL WIRE SPLICES TO BE MADE AT VALVE BOXES WITH WATER TIGHT ELECTRICAL SPLICES, 3M, SCOTT'S LOCK SEAL TACK 3576-78, OR EQUIVALENT.
17. EACH VALVE BOX TO CONTAIN A MINIMUM OF TWO (2) SPARE ORANGE CONTROL WIRES FOR JACKETED WIRE. ROUTE SPARE WIRES FROM THE CONTROLLER TO THE LAST VALVE OF EACH MAINLINE BRANCH. COMMON WIRE TO BE WHITE. SINGLE STRAND WIRE TO BE A MINIMUM OF 14 GAUGE.
18. ALL ELECTRICAL EQUIPMENT TO BE U.L. TESTED AND APPROVED, AND BEAR THE U.L. LABEL.
19. CROSS CONNECTION PROTECTION INSPECTION REQUIRED. THE BACKFLOW DEVICE TO BE TESTED UPON THE ORIGINAL INSTALLATION. THE TESTING TO BE PERFORMED BY A PERSON HOLDING A CURRENT CERTIFICATE AS A BACKFLOW TESTER. THE TEST REPORT TO BE SUBMITTED TO THE LOCAL WATER DISTRICT, OR PURVEYOR, AND OWNER WITH A COPY TO BARGHAUSEN CONSULTING ENGINEERS, INC. CONTRACTOR TO INCLUDE TESTING IN THE SCOPE OF WORK. OWNER IS RESPONSIBLE FOR ANNUAL INSPECTIONS AFTER THE INTIAL INSPECTION.
20. CONTRACTOR TO PROVIDE SYSTEM WINTERIZATION/SPRING SERVICE WHEN INSTALLATION HAS BEEN COMPLETED WITHIN 90 DAYS OF NOVEMBER 1 FOR WINTERIZATION, OR MAY 15 FOR SPRING SERVICE. SERVICE TO BE PERFORMED AS NEAR AS PRACTICAL



NOTE:
1. LOCATE VALVE BOXES IN PLANTING AREAS.
2. WRAP VALVE BOX WITH A MINIMUM OF 3 MIL THICK PLASTIC AND SECURE IT USING DUCT TAPE OR ELECTRICAL TAPE.
3. ALL THREADED CONNECTIONS TO BE MADE USING TEFLON TAPE.
4. ALL CHANGES IN ELEVATION SHALL BE MADE USING SCH 40 PVC 45° ELBOWS.

BALL VALVE DETAIL

NOT TO SCALE

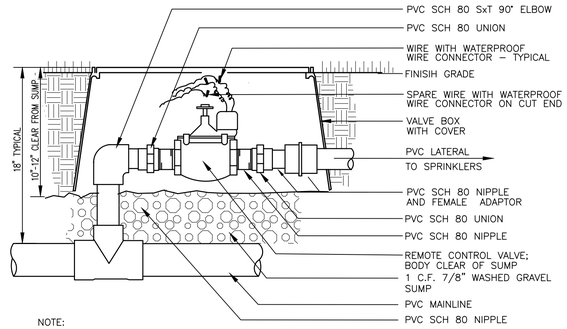


NOTE:
MANUFACTURER'S LIMITS PREVAIL FOR INSTALLATION AND ADJUSTMENTS.

PROVIDE SWING JOINT RISERS AT WALKS AND CURBS. 24" FLEXIBLE RISERS ACCEPTABLE ELSEWHERE.

POP-UP RISER ASSEMBLY

NOT TO SCALE



NOTE:
ONE VALVE PER BOX.
PROVIDE EXTRA COILS (18") OF EACH WIRE IN VALVE BOX.
COMPACT SOIL AROUND VALVE BOX.
USE TEFLON OR FLOWABLE SEALANT IN ALL THREADED FITTINGS, PER MANUFACTURES SPEC'S.

REMOTE CONTROL VALVE ASSEMBLY

NOT TO SCALE

No.	Date	By	Chkd.	Appr.	Revision
6	5/29/24	TCR	JMV	JMV	PER CITY COMMENTS
5	3/27/24	TCR	JMV	JMV	PER CITY COMMENTS

Title: PRELIMINARY
IRRIGATION NOTES AND DETAILS
FOR
DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

STATE OF WASHINGTON
THOMAS C ROBERTS
No. 23001274 EXP. 04/12/2025
LICENSED LANDSCAPE ARCHITECT

DUPONT WA WAREHOUSE

Scale: Horizontal N/A Vertical N/A

Designed TCR Drawn TCR Checked JMV Approved JMV Date 3/27/24

TROBERTS Xref: 18666

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com

Job Number 18666

Sheet L10 of 12

IRRIGATION DETAILS
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

APPROVED FOR CONSTRUCTION

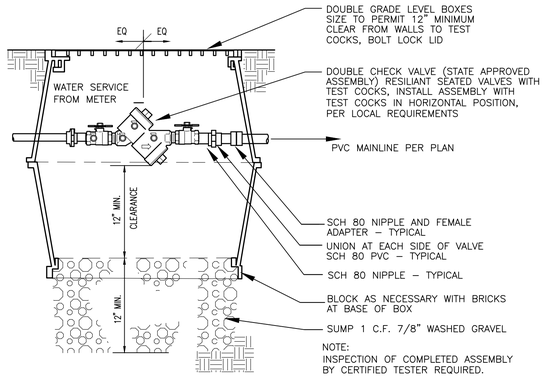
BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

Revision

No.	Date	By	Ckd.	Appr.	
6	5/29/24	TCR	JMV	JMV	PER CITY COMMENTS
5	3/27/24	TCR	JMV	JMV	PER CITY COMMENTS

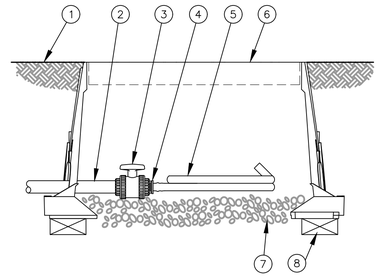
Title: PRELIMINARY IRRIGATION DETAILS FOR DUPONT - WEST



NOTE:
INSPECTION OF COMPLETED ASSEMBLY BY CERTIFIED TESTER REQUIRED.

CHECK VALVE ASSEMBLY DETAIL

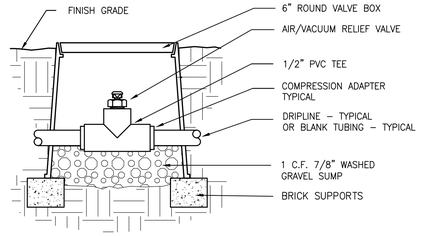
NOT TO SCALE



1. FINISH GRADE
2. PVC DRIP MANIFOLD PIPE
3. PVC 1" X 3/4" TRUE UNION BALL VALVE
4. EASY FIT MALE X BARB ADAPTER
5. SUB-SURFACE DRIPLINE:
6. 12-INCH VALVE BOX WITH COVER
7. 3-INCH MINIMUM DEPTH OF 3/4" WASHED GRAVEL
8. BRICK (1 OF 2)

FLUSH POINT WITH BALL VALVE

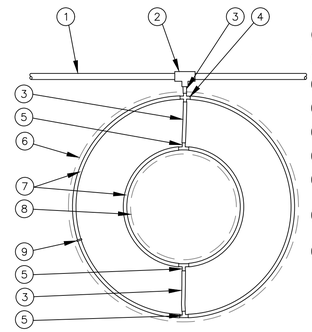
NOT TO SCALE



NOTE:
AIR/VACUUM RELIEF VALVE CANNOT BE CONNECTED LOWER THAN DRIPLINE LATERALS. FOR USE ON ZONES OF 7 GPM OR LESS ONLY (PLUMBED TO TUBING).

1/2" AIR/VACUUM RELIEF VALVE DETAIL

NOT TO SCALE

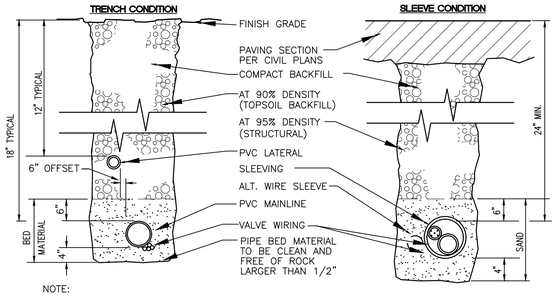


1. PVC DRIP MANIFOLD PIPE
2. PVC SCH 40 TEE OR EL
3. BLANK TUBING
4. BARB CROSS INSERT FITTING
5. BARB TEE INSERT FITTING
6. PROJECTED CANOPY LINE OF TREE
7. SUB-SURFACE DRIPLINE: SEE IRRIGATION SCHEDULE
8. PLACE AS SHOWN (LENGTH AS REQUIRED) ROOT BALL
9. TIE DOWN STAKE: QUANTITY AS REQUIRED, SEE NOTES 2-3 BELOW)

NOTES:
1. DISTANCE BETWEEN LATERAL RINGS AND EMITTER SPACING TO BE BASED ON SOIL TYPE, AND TREE CANOPY. SEE MANUFACTURER DRIPLINE INSTALLATION GUIDE FOR SUGGESTED SPACINGS.
2. PLACE TIE DOWN STAKES EVERY THREE FEET IN SAND, FOUR FEET IN LOAM, AND FIVE FEET IN CLAY.
3. AT FITTINGS WHERE THERE IS A CHANGE OF DIRECTION SUCH AS TEES OR ELBOWS, USE TIE-DOWN STAKES ON EACH LEG OF THE CHANGE OF DIRECTION.

DRIPLINE AROUND TREE

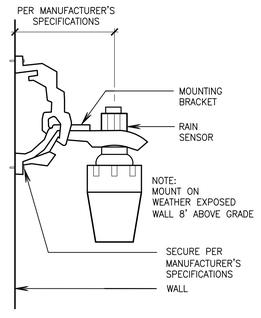
NOT TO SCALE



NOTE:
SLEEVING MATERIAL SHALL BE PVC CLASS 160(SDR-26).
DIMENSIONS ARE MIN. CLEARANCES.
ALL IRRIGATION SLEEVING TRENCH BACKFILL MATERIAL SHALL BE CLASS "B" OR BETTER (MAX. OF 10% PASSING NO.40 SCREEN) AND BE COMPACTED TO MIN. 95% OPTIMUM DENSITY PER ASTM D-1557-70 (MODIFIED PROCTOR)

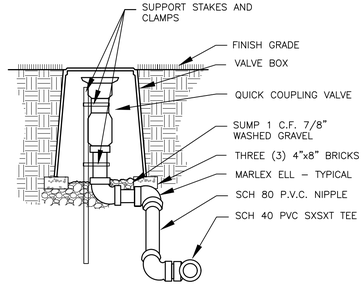
SLEEVE/TRENCHING DETAIL

NOT TO SCALE



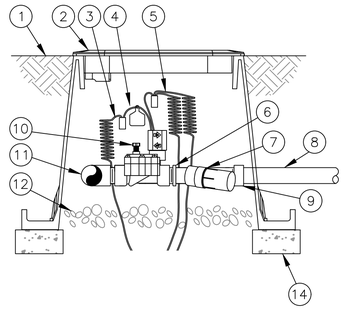
RAIN SENSOR DETAIL

NOT TO SCALE



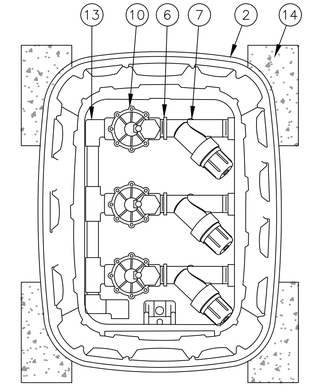
QUICK COUPLING VALVE DETAIL

NOT TO SCALE



SIDE VIEW

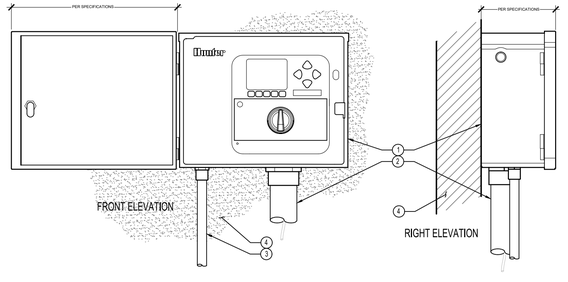
1. FINISH GRADE
2. STANDARD VALVE BOX WITH COVER: RAIN BIRD VB-STD
3. WATERPROOF CONNECTION: RAIN BIRD DB SERIES
4. VALVE ID TAG
5. 30-INCH LINEAR LENGTH OF WIRE, COILED
6. 1" X ¾" REDUCING COUPLING (INCLUDED IN XCZ-LF-100-PRF KIT)
7. PRESSURE REGULATING FILTER: RAIN BIRD PRF-100-RBY (INCLUDED IN XCZ-LF-100-PRF KIT)
8. LATERAL PIPE
9. PVC SCH 40 FEMALE ADAPTOR OR REDUCER
10. REMOTE CONTROL VALVE: RAIN BIRD LFV-100 (INCLUDED IN XCZ-LF-100-PRF KIT)
11. PVC SCH 40 TEE OR ELL TO MANIFOLD
12. 3-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL
13. MANIFOLD PIPE AND FITTINGS
14. MINIMUM FOUR (4) 4"x8" BRICKS



TOP VIEW

DRIP IRRIGATION VALVE

NOT TO SCALE



LEGEND:
1. IRRIGATION CONTROLLER (ACC) PER PLAN
2. IRRIGATION CONTROL WIRE IN CONDUIT SIZE AND TYPE PER LOCAL CODES
3. ELECTRICAL SUPPLY CONDUIT CONNECT TO POWER SOURCE, J-BOX INSIDE CONTROLLER
4. ADJACENT SURFACE TO MOUNT CONTROLLER PER PLAN

NOTE
MOUNT CONTROLLER LCD SCREEN AT EYE LEVEL
CONTROLLER SHALL BE HARD-WIRED TO GROUNDED 110 VAC POWER SOURCE

IRRIGATION CONTROLLER, WALL MOUNT

NOT TO SCALE

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com

STATE OF WASHINGTON
THOMAS C ROBERTS
No. 23031274
EXP. 04/12/2025
LICENSED LANDSCAPE ARCHITECT

DUPONT WA WAREHOUSE

Scale: Horizontal N/A Vertical N/A

Designed TCR Drawn TCR Checked JMV Approved JMV Date 3/27/24

TROBERTS Xref: 18666

Job Number 18666

Sheet L11 of 12

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IRRIGATION DETAILS
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

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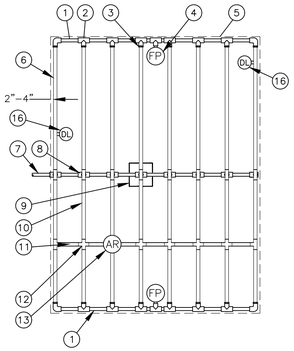
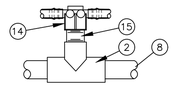


1. PVC EXHAUST HEADER
2. PVC SCH 40 TEE OR EL (TYPICAL)
3. BARB X MALE FITTING
4. FLUSH POINT (TYPICAL) SEE DETAIL
5. PERIMETER OF AREA
6. PERIMETER DRIPLINE PIPE TO BE INSTALLED 2"–4" FROM PERIMETER OF AREA
7. PVC SUPPLY PIPE FROM CONTROL ZONE KIT (SIZED TO MEET LATERAL FLOW DEMAND)
8. PVC SUPPLY MANIFOLD
9. CONNECTION FROM SUPPLY MANIFOLD TO DRIPLINE (TYPICAL)– SEE INSET A
10. SUB–SURFACE DRIPLINE
11. BLANK TUBING
12. BARB X BARB INSERT TEE OR CROSS:
13. ½" AIR RELIEF VALVE
14. BARB X FEMALE FITTING:
15. ¾" PVC NIPPLE, LENGTH AS NECESSARY
16. DRIPLINE INDICATOR. SEE DETAIL FOR ADDITIONAL INFORMATION

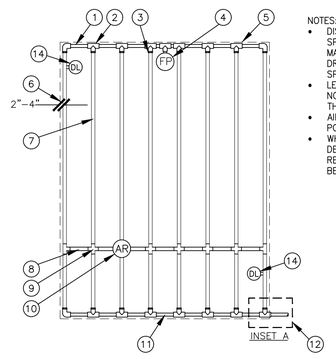


Dripline Maximum Lateral Lengths (Feet)

Inlet Pressure psi	12" Spacing Nominal Flow (gph)		18" Spacing Nominal Flow (gph)		24" Spacing Nominal Flow (gph)	
	0.6	0.9	0.6	0.9	0.6	0.9
15	273	155	314	250	424	322
20	318	169	353	294	508	368
30	360	230	413	350	586	414
40	395	255	465	402	652	474
50	417	285	528	420	720	488
60	460	290	596	455	780	514

NOTES:
1. DISTANCE BETWEEN LATERAL ROWS AND EMITTER SPACING TO BE BASED ON SOIL TYPE, PLANT MATERIALS AND CHANGES IN ELEVATION. SEE IRRIGATION SCHEDULE FOR SPACING.
2. LENGTH OF LONGEST DRIPLINE LATERAL SHOULD NOT EXCEED THE MAXIMUM LENGTH SHOWN IN THE ACCOMPANYING TABLE.
3. AIR RELIEF VALVE TO BE INSTALLED AT HIGH POINT OF AREA.
4. WHEN USING 17MM INSERT FITTINGS WITH DESIGN PRESSURE OVER 50PSI, IT IS RECOMMENDED THAT STAINLESS STEEL CLAMPS BE INSTALLED ON EACH FITTING.

DRIPLINE CENTER FEED LAYOUT
NOT TO SCALE



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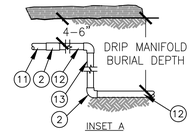

1. PVC EXHAUST HEADER
2. PVC SCH 40 TEE OR EL (TYPICAL)
3. BARB X MALE FITTING:
4. FLUSH POINT (TYPICAL) SEE RAIN BIRD DETAIL 'FLUSH POINT WITH BALL VALVE'
5. PERIMETER OF AREA
6. PERIMETER DRIPLINE PIPE TO BE INSTALLED 2"–4" FROM PERIMETER OF AREA
7. SUB–SURFACE DRIPLINE
8. BLANK TUBING
9. BARB X BARB INSERT TEE OR CROSS:
10. ½" AIR RELIEF VALVE
11. PVC SUPPLY HEADER
12. PVC DRIP MANIFOLD FROM CONTROL ZONE VALVE KIT (SIZED TO MEET LATERAL FLOW DEMAND)
13. PVC SCH 40 RISER PIPE
14. DRIPLINE INDICATOR. SEE DETAIL FOR ADDT'L INFO

Dripline Maximum Lateral Lengths (Feet)

Inlet Pressure psi	12" Spacing Nominal Flow (gph)		18" Spacing Nominal Flow (gph)		24" Spacing Nominal Flow (gph)	
	0.6	0.9	0.6	0.9	0.6	0.9
15	273	155	314	250	424	322
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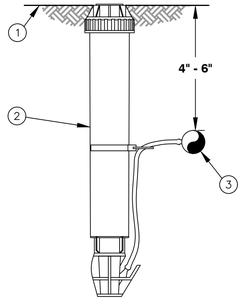
40	395	255	465	402	652	474
50	417	285	528	420	720	488
60	460	290	596	455	780	514

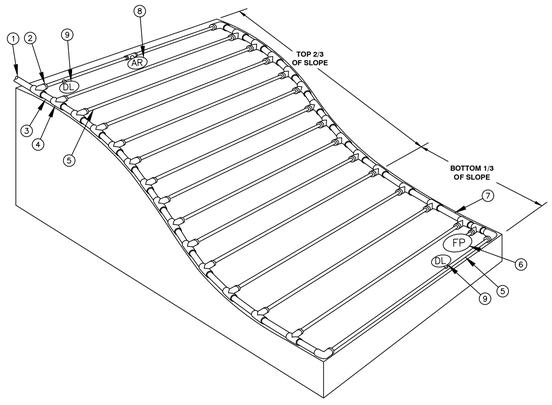
DRIPLINE END FEED LAYOUT
NOT TO SCALE



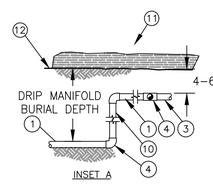
1. FINISH GRADE/TURF
2. OPERATION INDICATOR
3. SUB–SURFACE DRIPLINE: SEE IRRIGATION SCHEDULE

NOTE:
1. INSERT BARB TRANSFER FITTING DIRECTLY INTO DRIPLINE TUBING.
2. VAN NOZZLE MAY BE SET TO CLOSED, OR IF IT IS DESIRED TO SEE SPRAY FROM THE NOZZLE, SET THE ARC TO ¼ PATTERN. THE FLOW FROM THE NOZZLE, 0.3 GPM, SHOULD BE ACCOUNTED FOR IN THE SYSTEM DESIGN.

DRIP IRRIGATION DRIPLINE INDICATOR
NOT TO SCALE

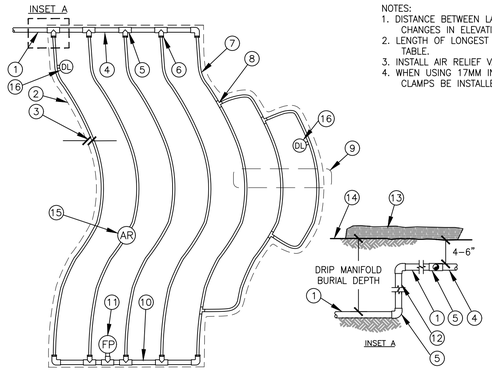


NOTES:
- DISTANCE BETWEEN LATERAL ROWS AND EMITTER SPACING TO BE BASED ON SOIL TYPE, PLANT MATERIALS AND CHANGES IN ELEVATION. DISTANCE BETWEEN LATERAL ROWS FOR BOTTOM 1/3 OF SLOPE TO BE SPACED GREATER THAN OPTIMAL ROW DISTANCE. SEE MANUFACTURER DRIPLINE INSTALLATION GUIDE FOR SUGGESTED SPACING.
- LENGTH OF LONGEST DRIPLINE LATERAL SHOULD NOT EXCEED THE MAXIMUM LENGTH SHOWN IN THE ACCOMPANYING TABLE.
- WHEN ELEVATION CHANGE EXCEEDS 8 FEET IT IS RECOMMENDED THAT A NEW DRIPLINE ZONE BE CREATED.
- INSTALL AIR RELIEF VALVE AT HIGH POINTS IN DRIP LATERAL.
- WHEN USING 17MM INSERT FITTINGS WITH DESIGN PRESSURE OVER 50PSI, IT IS RECOMMENDED THAT STAINLESS STEEL CLAMPS BE INSTALLED ON EACH FITTING.



1. PVC DRIP MANIFOLD FROM CONTROL ZONE VALVE KIT (SIZED TO MEET LATERAL FLOW DEMAND)
2. BARB X MALE FITTING
3. PVC SUPPLY HEADER
4. PVC SCH 40 TEE OR EL (TYPICAL)
5. SUB–SURFACE DRIPLINE: SEE IRRIGATION SCHEDULE
6. FLUSH POINT: SEE DETAIL
7. PVC FLUSH HEADER
8. ½" AIR RELIEF VALVE: RSEE DETAIL
9. DRIPLINE INDICATOR. SEE DETAIL FOR ADDITIONAL INFORMATION
10. PVC RISER PIPE
11. TURF OR MULCH
12. FINISH GRADE

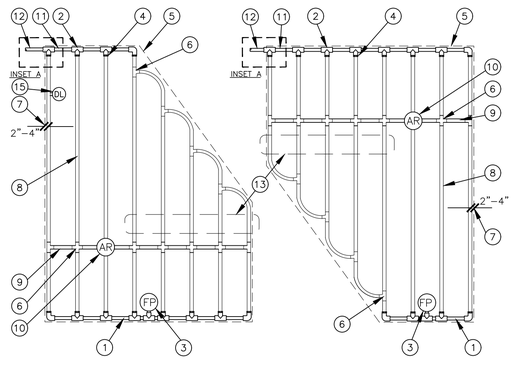
DRIPLINE SLOPED LAYOUT
NOT TO SCALE



NOTES:
1. DISTANCE BETWEEN LATERAL ROWS AND EMITTER SPACING TO BE BASED ON SOIL TYPE, PLANT MATERIALS AND CHANGES IN ELEVATION. SEE INSTALLATION SPECIFICATIONS FOR SPACING
2. LENGTH OF LONGEST DRIPLINE LATERAL SHOULD NOT EXCEED THE MAXIMUM SPACING SHOWN IN THE ACCOMPANYING TABLE.
3. INSTALL AIR RELIEF VALVE AT HIGH POINTS IN DRIP LATERAL.
4. WHEN USING 17MM INSERT FITTINGS WITH DESIGN PRESSURE OVER 50PSI, IT IS RECOMMENDED THAT STAINLESS STEEL CLAMPS BE INSTALLED ON EACH FITTING.

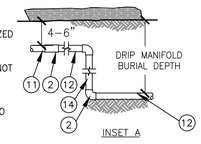
1. PVC SUPPLY PIPE FROM RAIN BIRD CONTROL ZONE KIT (SIZED TO MEET LATERAL FLOW DEMAND)
2. PERIMETER OF AREA
3. PERIMETER DRIPLINE PIPE TO BE INSTALLED 2"–4" FROM PERIMETER OF AREA
4. PVC SUPPLY MANIFOLD
5. PVC SCH 40 TEE OR EL (TYPICAL)
6. BARB X MALE FITTING
7. SUB–SURFACE DRIPLINE: SEE IRRIGATION SCHEDULE
8. ARB X BARB INSERT TEE
9. TOTAL LENGTH OF SELECTED DRIPLINE SHOULD NOT EXCEED LENGTH SHOWN IN TABLE
10. PVC FLUSH HEADER
11. FLUSH POINT: SEE DETAIL
12. PVC RISER PIPE
13. TURF OR MULCH
14. FINISH GRADE
15. ½" AIR RELIEF VALVE: SEE DETAIL
16. DRIPLINE INDICATOR. SEE DETAIL FOR ADDT'L INFO

DRIPLINE ODD CURVES LAYOUT
NOT TO SCALE



1. PVC EXHAUST HEADER
2. PVC SCH 40 TEE OR EL (TYPICAL)
3. FLUSH POINT (TYPICAL) SEE DETAIL
4. BARB X MALE FITTING
5. PERIMETER OF AREA
6. BARB X BARB INSERT TEE OR CROSS
7. PERIMETER DRIPLINE PIPE TO BE INSTALLED 2"–4" FROM PERIMETER OF AREA
8. SUB–SURFACE DRIPLINE: SEE IRRIGATION SCHEDULE
9. BLANK TUBING
10. ½" AIR RELIEF VALVE: SEE DETAIL
11. PVC SUPPLY MANIFOLD
12. PVC SUPPLY PIPE FROM CONTROL ZONE KIT (SIZED TO MEET LATERAL FLOW DEMAND)
13. TOTAL LENGTH OF SELECTED DRIPLINE SHOULD NOT EXCEED LENGTH SHOWN IN TABLE
14. PVC SCH 40 RISER PIPE
15. DRIPLINE INDICATOR. SEE DETAIL FOR ADDT'L INFO

NOTES:
- DISTANCE BETWEEN LATERAL ROWS AND EMITTER SPACING TO BE BASED ON SOIL TYPE, PLANT MATERIALS AND CHANGES IN ELEVATION. SEE MANUFACTURER DRIPLINE INSTALLATION GUIDE FOR SUGGESTED SPACINGS.
- LENGTH OF LONGEST DRIPLINE LATERAL SHOULD NOT EXCEED THE MAXIMUM LENGTH SHOWN IN THE ACCOMPANYING TABLE.
- AIR RELIEF VALVE TO BE INSTALLED AT HIGH POINT OF AREA.
- WHEN USING 17MM INSERT FITTINGS WITH DESIGN PRESSURE OVER 50PSI, IT IS RECOMMENDED THAT STAINLESS STEEL CLAMPS BE INSTALLED ON EACH FITTING.



DRIPLINE IRREGULAR SHAPED LAYOUT
NOT TO SCALE

No.	Date	By	Ckd.	Appr.	Revision
6	5/29/24	TCR	JMV	JMV	PER CITY COMMENTS
5	3/27/24	TCR	JMV	JMV	PER CITY COMMENTS

Title: PRELIMINARY IRRIGATION DETAILS FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222 barghausen.com

STATE OF WASHINGTON · THOMAS C ROBERTS · No. 22031374 EXP. 04/12/2025 · LICENSED LANDSCAPE ARCHITECT

Scale: Horizontal N/A Vertical N/A
Designed TCR Drawn TCR Checked JMV Approved JMV Date 3/27/24
DUPONT WA WAREHOUSE
ROBERTS Xref: 18666

Job Number 18666
Sheet L12 of 12

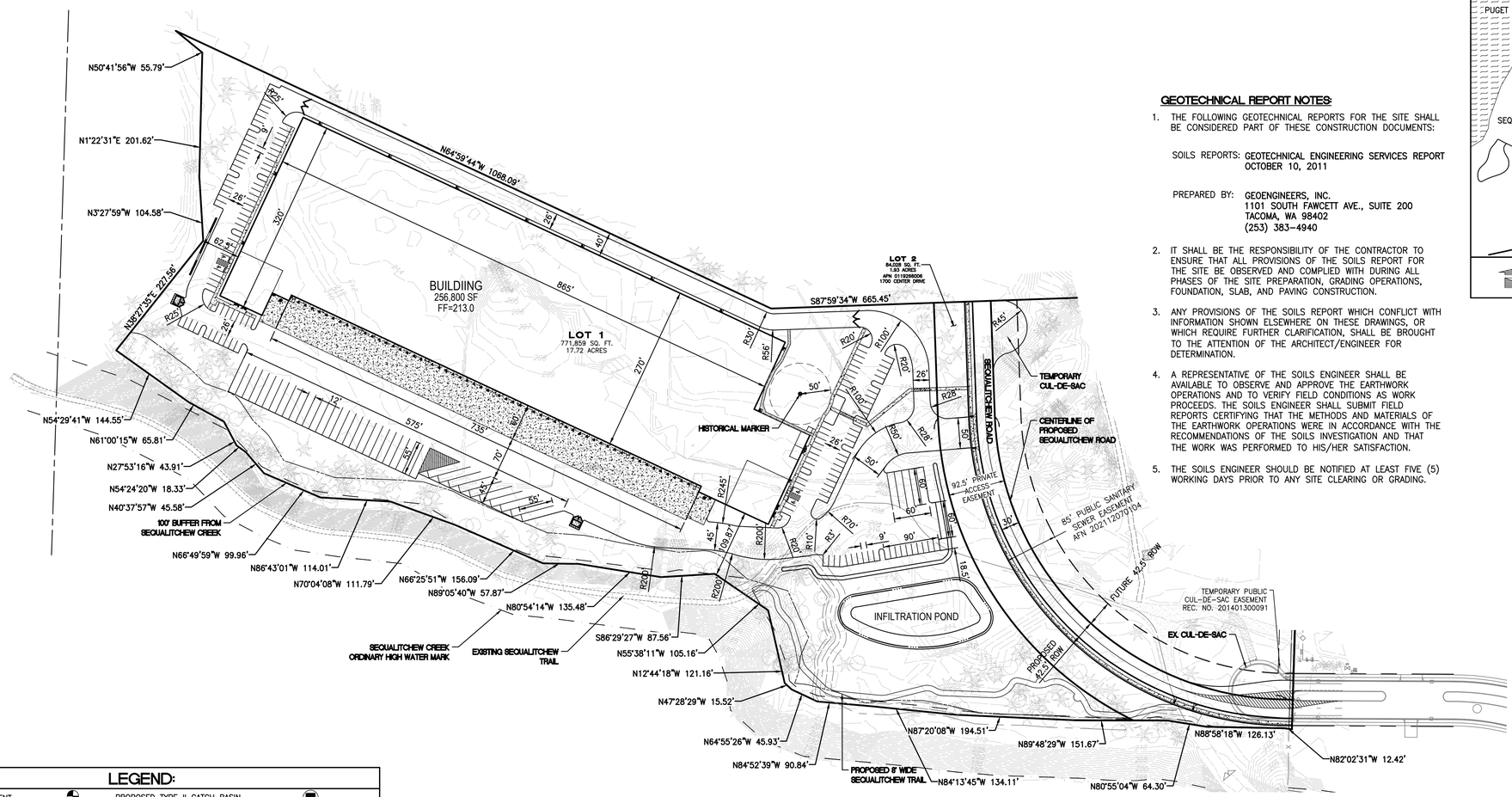
File: P:\18000s\18666\preliminary\18666-pl.dwg Date/Time: 5/30/2024 12:35 PM Scale:1 = 1

Attachment 1nn

PRELIMINARY COVER SHEET
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=100'

0 50 100 200



LEGEND:

SURVEY MONUMENT	PROPOSED TYPE II CATCH BASIN
EX. POWER VAULT	PROPOSED TYPE I CATCH BASIN
EX. LUMINAIRE (LUM.)	PROPOSED STORM DRAIN FLOW ARROW
EX. LOT LIGHT	PROPOSED STORM DRAINAGE LINE
EX. POWER POLE	PROPOSED TRENCH DRAIN
EX. JUNCTION BOX	PROPOSED SANITARY SEWER LINE
EX. CATCH BASIN (CB)	PROPOSED SANITARY SEWER CLEANOUT
EX. CATCH BASIN (CB) TYPE 2	PROPOSED WATERMAIN W
EX. SANITARY SEWER MANHOLE (SSMH)	PROPOSED FIRE HYDRANT
EX. GAS METER	PROPOSED WATER VALVE
EX. GAS VALVE	PROPOSED CONCRETE BLOCKING
EX. WATER VALVE (WV)	PROPOSED 90° BEND
EX. FIRE HYDRANT (FH)	PROPOSED SPOT ELEVATIONS 23.20
MAIL BOX	MATCH EXISTING ELEVATION 23.20± ME
EX. WATER METER	
EX. SIGN	TOP OF WALL ELEVATION TW=23.20
EX. WATER LINE	MATCH EXISTING ELEVATION BW=23.20
EX. SANITARY SEWER LINE	
EX. STORM DRAINAGE LINE	MATCH EXISTING ELEVATION 23.20± ME
EX. POWER UNDERGROUND P(UG)	
EX. POWER OVERHEAD P(OH)	PROPOSED CONTOURS 220
EX. METAL FENCE	PROPOSED PAVEMENT
EX. WOOD FENCE	
EXISTING SPOT ELEVATIONS x 100.0	PROPOSED CONCRETE
EXISTING CONTOURS 220	

INDEX TO SHEETS:

C1 OF 13	PRELIMINARY COVER SHEET
C2 OF 13	PRELIMINARY TESC AND DEMOLITION PLAN-WEST
C3 OF 13	PRELIMINARY TESC AND DEMOLITION PLAN-EAST
C4 OF 13	PRELIMINARY TESC NOTES AND DETAILS
C5 OF 13	PRELIMINARY GRADING AND STORM DRAINAGE PLAN-WEST
C6 OF 13	PRELIMINARY GRADING AND STORM DRAINAGE PLAN-EAST
C7 OF 13	PRELIMINARY WATER AND SEWER PLAN-WEST
C8 OF 13	PRELIMINARY WATER AND SEWER PLAN-EAST
C9 OF 13	PRELIMINARY SEQUALITCHEW ROAD PLAN AND PROFILE
C10 OF 13	PRELIMINARY SEQUALITCHEW ROAD PLAN AND PROFILE (CONT.)
C11 OF 13	PRELIMINARY CONSTRUCTION NOTES AND DETAILS
C12 OF 13	PRELIMINARY CONSTRUCTION NOTES AND DETAILS
C13 OF 13	PRELIMINARY CONSTRUCTION NOTES AND DETAILS
L1 OF 12	PRELIMINARY TREE RETENTION PLAN
L2 OF 12	PRELIMINARY TREE RETENTION PLAN
L3 OF 12	PRELIMINARY LANDSCAPE PLAN
L4 OF 12	PRELIMINARY LANDSCAPE PLAN
L5 OF 12	PRELIMINARY LANDSCAPE PLAN
L6 OF 12	PRELIMINARY PLANT SCHEDULE
L7 OF 12	PRELIMINARY LANDSCAPE NOTES AND DETAILS
L8 OF 12	PRELIMINARY IRRIGATION PLAN
L9 OF 12	PRELIMINARY IRRIGATION PLAN
L10 OF 12	PRELIMINARY IRRIGATION NOTES AND DETAILS
L11 OF 12	PRELIMINARY IRRIGATION DETAILS
L12 OF 12	PRELIMINARY IRRIGATION DETAILS

GEOTECHNICAL REPORT NOTES:

1. THE FOLLOWING GEOTECHNICAL REPORTS FOR THE SITE SHALL BE CONSIDERED PART OF THESE CONSTRUCTION DOCUMENTS:

   SOILS REPORTS: GEOTECHNICAL ENGINEERING SERVICES REPORT OCTOBER 10, 2011

   PREPARED BY: GEOENGINEERS, INC.
   1101 SOUTH FAWCETT AVE., SUITE 200
   TACOMA, WA 98402
   (253) 383-4940

2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL PROVISIONS OF THE SOILS REPORT FOR THE SITE BE OBSERVED AND COMPLIED WITH DURING ALL PHASES OF THE SITE PREPARATION, GRADING OPERATIONS, FOUNDATION, SLAB, AND PAVING CONSTRUCTION.

3. ANY PROVISIONS OF THE SOILS REPORT WHICH CONFLICT WITH INFORMATION SHOWN ELSEWHERE ON THESE DRAWINGS, OR WHICH REQUIRE FURTHER CLARIFICATION, SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR DETERMINATION.

4. A REPRESENTATIVE OF THE SOILS ENGINEER SHALL BE AVAILABLE TO OBSERVE AND APPROVE THE EARTHWORK OPERATIONS AND TO VERIFY FIELD CONDITIONS AS WORK PROCEEDS. THE SOILS ENGINEER SHALL SUBMIT FIELD REPORTS CERTIFYING THAT THE METHODS AND MATERIALS OF THE EARTHWORK OPERATIONS WERE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SOILS INVESTIGATION AND THAT THE WORK WAS PERFORMED TO HIS/HER SATISFACTION.

5. THE SOILS ENGINEER SHOULD BE NOTIFIED AT LEAST FIVE (5) WORKING DAYS PRIOR TO ANY SITE CLEARING OR GRADING.

ESTIMATED EARTHWORK QUANTITIES

CUT = 32,400 CY

FILL = 24,600 CY

NET = 7,800 CY (CUT)

AREA TO BE DISTURBED = 15.25 AC

CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT DATED 10/10/2011 FOR THIS SITE PREPARED BY GEOENGINEERS, INC. FOR GRADING RECOMMENDATIONS. EARTHWORK QUANTITIES ARE FOR PERMITTING PURPOSES ONLY AND SHALL NOT BE USED FOR BIDDING PURPOSES. CONTRACTOR SHALL PERFORM AN INDEPENDENT ANALYSIS FOR THE PURPOSES OF PREPARING THEIR BID.

ENGINEER/SURVEYOR
BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
PHONE: (425) 251-6222
FAX: (425) 251-8782
CONTACT: DAN BALMELLI, P.E.

ARCHITECT
INNOVA ARCHITECTS
950 PACIFIC AVENUE, SUITE 450
TACOMA, WA 98402
PHONE: (253) 572-4903
CONTACT: BRIAN LUDWIG

PROJECT INFORMATION
PROJECT AREA = 19.65 ACRES
(LOT 1 = 17.72 ACRES, LOT 2 = 1.93 ACRES)

LANDSCAPING/TREE RETENTION AREA = 6.05 ACRES

POND AREA = 0.50 ACRES

TOTAL IMPERVIOUS AREA = 13.10 ACRES
(LOT 1 = 11.65 ACRES, LOT 2 = 1.45 ACRES)

811 Know what's below. Call before you dig.

CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR OBTAINING PERMITS FROM THE WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES FOR REMOVING AND REPLACING ALL SURVEY MONUMENTATION THAT MAY BE AFFECTED BY CONSTRUCTION ACTIVITY, PURSUANT TO WAC 332-120. APPLICATIONS MUST BE COMPLETED BY A REGISTERED LAND SURVEYOR. APPLICATIONS FOR PERMITS TO REMOVE MONUMENTS MAY BE OBTAINED FROM THE WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES, OR BY CONTACTING THEIR OFFICE BY TELEPHONE AT (206) 902-1190.

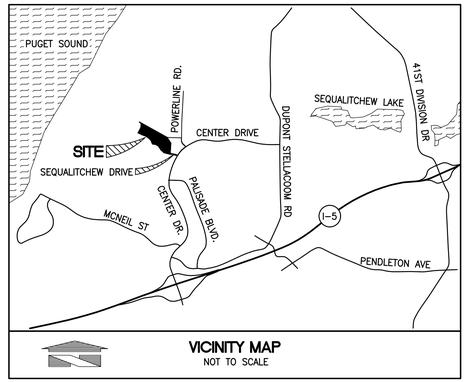
WASHINGTON STATE DEPARTMENT OF NATURAL
RESOURCES PUBLIC LAND SURVEY OFFICE
1111 WASHINGTON STREET S.E. P.O. BOX 47060
OLYMPIA, WASHINGTON 98504-7060

UPON COMPLETION OF CONSTRUCTION, ALL MONUMENTS DISPLACED, REMOVED, OR DESTROYED SHALL BE REPLACED BY A REGISTERED LAND SURVEYOR, AT THE COST AND AT THE DIRECTION OF THE CONTRACTOR, PURSUANT TO THESE REGULATIONS. THE APPROPRIATE FORMS FOR REPLACEMENT OF SAID MONUMENTATION SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR.

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.



VICINITY MAP
NOT TO SCALE

SITE ADDRESS
1700 CENTER DRIVE DUPONT, WA 98327

PARCEL NUMBER
0119266005

PARCEL LEGAL DESCRIPTION:

LOTS 1 AND 2, CITY OF DUPONT SHORT PLAT NO. PLNG2020-017, RECORDED UNDER RECORDING NUMBER 202203015001, RECORDS OF PIERCE COUNTY, WASHINGTON.

PROCEDURE / NARRATIVE

A FIELD TRAVERSE USING A "TRIMBLE S6" ROBOTIC TOTAL STATION, AND "TRIMBLE TSC2" DATA COLLECTOR SUPPLEMENTED WITH FIELD NOTES WAS PERFORMED, ESTABLISHING THE ANGULAR, DISTANCE, AND VERTICAL RELATIONSHIPS BETWEEN THE MONUMENTS, PROPERTY LINES, AND TOPOGRAPHIC FEATURES AS SHOWN HEREON. A "TOPCON GR3" GPS ROVER AND BASE WAS USED TO CHECK AND ESTABLISH THE ELEVATION OF BENCHMARKS AND CONTROL POINTS. THE RESULTING DATA MEETS OR EXCEEDS THE STANDARDS FOR LAND BOUNDARY SURVEYS AS SET FORTH IN WAC 332-130-090.

DATES OF SURVEYS

FIELD SURVEYS BY BARGHAUSEN CONSULTING ENGINEERS, INC. CONDUCTED MAY, 2011 AND ALL MONUMENTS SHOWN AS FOUND WERE VISITED AT THAT TIME.

HORIZONTAL DATUM - BASIS OF BEARINGS

THE BEARING OF THE LINE BETWEEN THE FOUND MONUMENT ID'S WSDOT 5552-WSDOT 776 BEARING TAKEN AS SOUTH 73° 08' 35" WEST

VERTICAL DATUM - NGVD29

PROJECT BENCHMARK
WSDOT MONUMENT DESIGNATION 5552 APPROXIMATELY 300' EAST OF THE SOUTHWEST CORNER OF SITE. NGVD29 ELEVATION WAS DERIVED BY CONVERTING PUBLISHED WSDOT NAVD88 ELEVATION USING CORPSCON SOFTWARE. (NAVD88= NGVD+3.44')
NGVD29 ELEV. = 259.173 FEET

HORIZONTAL DATUM - BASIS OF BEARINGS

THE BEARING OF THE LINE BETWEEN THE FOUND MONUMENT ID'S WSDOT 5552-WSDOT 776 BEARING TAKEN AS SOUTH 73° 08' 35" WEST

VERTICAL DATUM - NGVD29

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WSDOT MONUMENT DESIGNATION 5552 APPROXIMATELY 300' EAST OF THE SOUTHWEST CORNER OF SITE. NGVD29 ELEVATION WAS DERIVED BY CONVERTING PUBLISHED WSDOT NAVD88 ELEVATION USING CORPSCON SOFTWARE. (NAVD88= NGVD+3.44')
NGVD29 ELEV. = 259.173 FEET

CONSTRUCTION SEQUENCE
1. INSTALL FILTER FABRIC AND N.G.P.E. FENCE WHERE INDICATED.
2. IDENTIFY LIMITS OF CLEARING.
3. INSTALL ROCK-LINED CONSTRUCTION ENTRANCE.
4. CLEAR TO LIMITS SHOWN ON DRAWINGS.
5. ROUGH GRADE ROADWAY AS DESIGNED AND INSTALL INTERCEPTOR DITCHES.
6. INSTALL SEDIMENT TRAPS AND PONDS.
7. INSTALL SANITARY SEWER SYSTEM.
8. INSTALL DOMESTIC WATER SYSTEM.
9. INSTALL STORM DRAINAGE SYSTEM.

UTILITY CONFLICT NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DIMENSION, AND DEPTH OF ALL EXISTING UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT BY POTHOLING THE UTILITIES AND SURVEYING THE HORIZONTAL AND VERTICAL LOCATION PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE CALLING UTILITY LOCATE @ 811 AND THEN POTHOLING ALL OF THE EXISTING UTILITIES AT LOCATIONS OF NEW UTILITY CROSSINGS TO PHYSICALLY VERIFY WHETHER OR NOT CONFLICTS EXIST. LOCATIONS OF SAID UTILITIES AS SHOWN ON THESE PLANS ARE BASED UPON THE UNVERIFIED PUBLIC INFORMATION AND ARE SUBJECT TO VARIATION. IF CONFLICTS SHOULD OCCUR, THE CONTRACTOR SHALL CONSULT BARGHAUSEN CONSULTING ENGINEERS, INC. TO RESOLVE ALL PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.

No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title: PRELIMINARY COVER SHEET FOR DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELLI — STATE OF WASHINGTON — 25672 — REGISTERED PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontal 1"=100' Vertical N/A

Designed JAT Drawn JAT Checked DKB Approved DKB Date 05/30/24

18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING; LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

BARGHAUSEN CONSULTING ENGINEERS, INC.

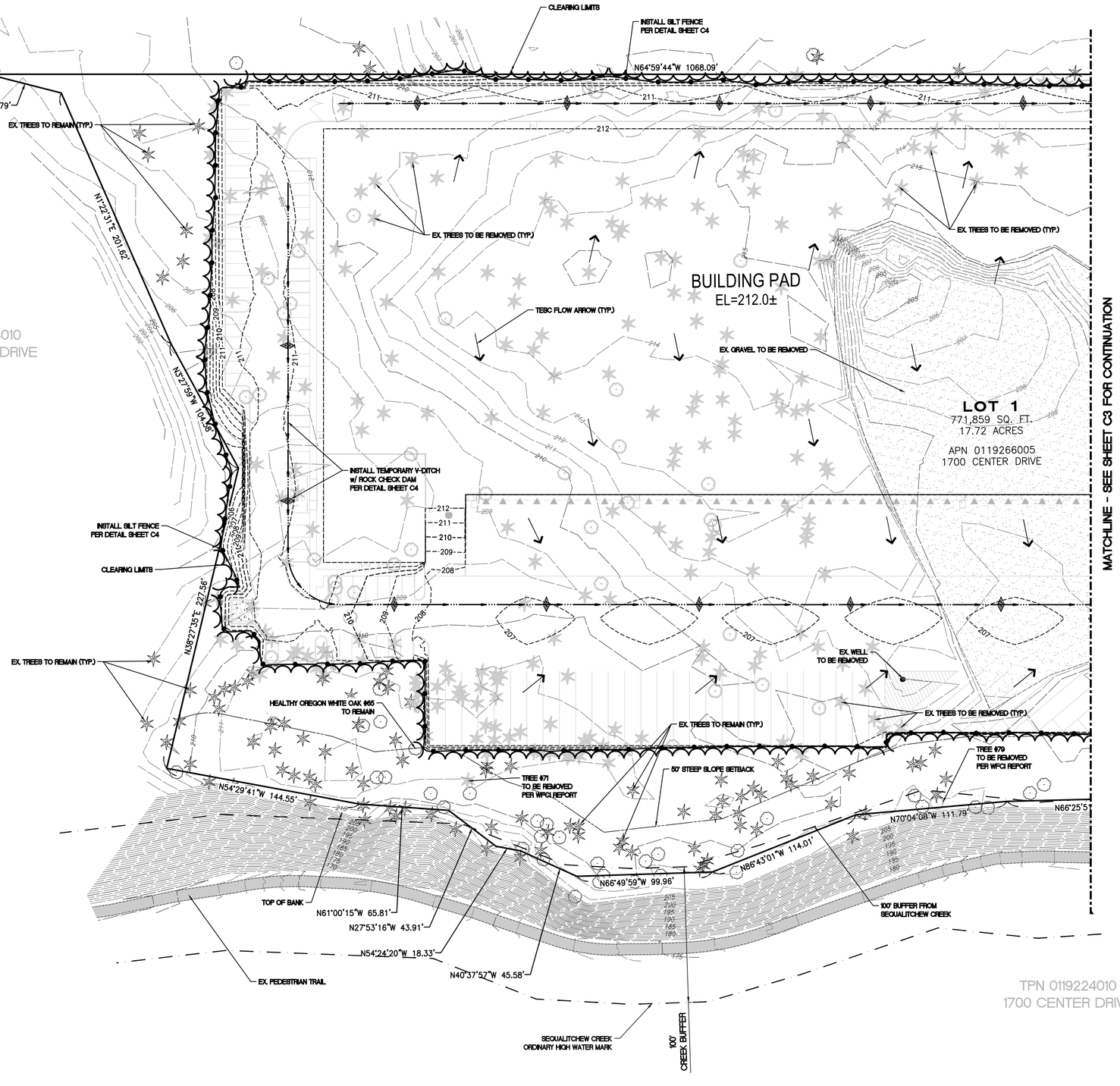
Job Number 18666

Sheet C1 of 13

File: P:\18000s\18666\preliminary\18666-po.dwg Date/Time: 5/31/2024 11:48 AM Scale: 1 = 1 JTOWNE Xref: ----

PRELIMINARY TESC AND DEMOLITION PLAN-WEST
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80



TESC LEGEND:

- INLET PROTECTION
- SILT FENCE
- LIMITS OF DISTURBANCE
- CONSTRUCTION ENTRANCE
- TEMPORARY V-DITCH
- ROCK CHECK DAM
- EX. TREE TO REMAIN
- EX. TREE TO BE REMOVED

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title:
PRELIMINARY
TESC AND DEMOLITION PLAN-WEST
FOR
DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELI
STATE OF WASHINGTON
25672
REGISTERED
PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontal 1"=40' Vertical N/A
Designed JAT Drawn JAT Checked DKB Approved DKB Date 05/30/24

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 18666
Sheet C2 of 13

P:\18000s\18666\preliminary\18666-pte.dwg 5/30/2024 8:21 PM JTOWNE

PRELIMINARY TESC AND DEMOLITION PLAN-EAST
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80

TPN 0119262016
1700 CENTER DRIVE

MATCHLINE - SEE SHEET C2 FOR CONTINUATION

CLEARING LIMITS
INSTALL SILT FENCE PER DETAIL SHEET C4
EX. WELL TO BE REMOVED
BUILDIING PAD EL=212.0±
EX. GRAVEL TO BE REMOVED
EX. HISTORICAL MARKER 2.0' W x3.0'L x2.5'H w/ COMMEMORATIVE PLAQUE TO REMAIN
LOT 1
771,859 SQ. FT.
17.72 ACRES
APN 0119266005
1700 CENTER DRIVE
EX. TREES TO BE REMOVED (TYP.)
DIRT ROAD
EX. SIGN TO BE REMOVED
EX. GRAVEL ROAD TO BE REMOVED
INSTALL TEMPORARY V-DITCH w/ ROCK CHECK DAM PER DETAIL SHEET C4
EX. TRAIL TO BE REMOVED TO PROPERTY LINE
EX. GRAVEL ROAD TO BE REMOVED
50' STEEP SLOPE SETBACK
HEALTHY OREGON WHITE OAK #61 TO REMAIN
100' BUFFER FROM SEQUALITCHEW CREEK
N89°05'40"W 57.87'
N80°54'14"W 135.48'
S86°29'27"W 87.56'
N55°38'11"W 108.16'
EX. PEDESTRIAN TRAIL
EX. MONITOR WELL TO REMAIN RIM=212.78 TOP PVC=212.08
N43°44'21"W 121.16'
13.44' CREEK BUFFER
N47°28'29"W 15.52'
N64°55'26"W 45.93'
SEQUALITCHEW CREEK ORDINARY HIGH WATER MARK

LOT 2
84,028 SQ. FT.
1.93 ACRES
APN 0119266006
1700 CENTER DRIVE
S87°59'34"W 2.50'
S87°59'34"W 665.45'
S87°59'34"W 308.23'
N22°22'40"W 188.40'
N22°22'40"W 188.34'
45' RADIUS PRIVATE TEMPORARY TURNAROUND EASEMENT (SEE SHORT PLAT NOTE #4 ON SHEET 1)
TEST PIT (TYPICAL)
(TITLE PARCEL B) 92.5' PRIVATE ACCESS EASEMENT (SEE SHORT PLAT NOTE #3 ON SHEET 1)
92.5' PRIVATE ACCESS EASEMENT
GRAVEL ROAD
EX. GRAVEL ROAD TO BE REMOVED
EX. SIGN TO BE REMOVED
APPROX. CENTERLINE OF 30' PRIVATE ACCESS EASEMENT PER REC. NO. 200906040666 AND 201009301052 (18)
INSTALL SILT FENCE PER DETAIL SHEET C4
CLEARING LIMITS
85' PUBLIC SANITARY SEWER EASEMENT AFN 202112070104
EX. GRAVEL ROAD EAST OF CLEARING LIMITS TO REMAIN
Δ=59°46'08" R=369.50' L=385.46'
GRAVEL ROAD/TRAIL
N25°54'18"E 97.06'
42.5' PROPOSED ROW
SIGN
TEMPORARY PUBLIC CUL-DE-SAC EASEMENT REC. NO. 201401300091 (15)
42.5' FUTURE ROW
WOOD FENCE
GRAVEL ROAD
(3) BOLLARDS
EX. OREGON WHITE OAK #9 IN POPOSED ROW TO BE REMOVED
EX. CUL-DE-SAC TO BE REMOVED
SIGN (TYP.)
TEMPORARY CONSTRUCTION ENTRANCE PER DETAIL SHEET C4
EX. CB TO REMAIN INSTALL CB PROTECTION PER DETAIL SHEET C4
EX. SSMH TO REMAIN
N89°43'57"W 10.00'
N88°58'18"W 126.13'
TPOB PUBLIC TRAIL ESMT PER 201009301052 (13)
N80°55'04"W 64.30'
N82°02'31"W 12.42'
17.5' PUBLIC TRAIL CONST. EASEMENT PER REC. NO. 201009301052 (13)
FOUND 5/8" REBAR W/ YELLOW PLASTIC CAP "ESM LS 29216"
42.5'

PROPOSED TESC POND /FUTURE INFILTRATION POND
TOP OF POND = 206.0
MAX. WATER SURFACE = 205.0
BOTTOM OF POND = 203.0
SURFACE AREA REQUIRED = 22,800 SF
SURFACE AREA PROVIDED = 23,200 SF
NOTE: BOTTOM OF POND SHALL NOT BE EXCAVATED LOWER THAT 203' UNTIL ALL TESC ACTIVITIES ARE COMPLETED AND THE SITE IS STABILIZED. 2' OF SEPARATION FROM THE FINAL POND BOTTOM OF 201' SHALL BE MAINTAINED UNTIL ALL TESC WORK IS COMPLETED.
RIPRAP
TREE #18 TO BE REMOVED PER WFCI REPORT
30' PUBLIC TRAIL EASEMENT PER REC. NO. 201009301052 (13)
HEALTHY OREGON WHITE OAK #12 TO REMAIN
15' PUBLIC TRAIL EASEMENT PER REC. NO. 201009301052 (13)
EX. TREES TO REMAIN (TYP.)
15' PUBLIC TRAIL EASEMENT PER REC. NO. 201009301052 (13)
N84°52'39"W 90.84'
N84°13'45"W 134.11'
N87°20'08"W 194.51'
N89°48'29"W 95.90'
N89°48'29"W 55.77'
HEALTHY OREGON WHITE OAK #22 TO REMAIN
CENTERLINE 15' PUBLIC TRAIL EASEMENT AND TRAIL CONSTRUCTION EASEMENT PER 201009301052 (13)
15' PUBLIC TRAIL EASEMENT PER REC. NO. 201009301052 (13)

TPN 0119224010
1700 CENTER DRIVE

TESC LEGEND:
- INLET PROTECTION
- SILT FENCE
- LIMITS OF DISTURBANCE
- CONSTRUCTION ENTRANCE
- TEMPORARY V-DITCH
- ROCK CHECK DAM
- EX. TREE TO REMAIN
- EX. TREE TO BE REMOVED

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title: PRELIMINARY TESC AND DEMOLITION PLAN-EAST FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELLI — STATE OF WASHINGTON — 25672 — REGISTERED PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontal 1"=40' Vertical N/A

Designed JAT Drawn JAT Checked DKB Approved DKB Date 05/30/24

18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES
BARGHAUSEN CONSULTING ENGINEERS, INC.

5/30/2024 8:45 PM JTOWNE
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Job Number 18666
Sheet C3 of 13

PRELIMINARY TESC NOTES AND DETAILS
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

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EROSION CONTROL NOTES:

THE CONTRACTOR SHALL PROVIDE EROSION CONTROL METHODS ACCORDING TO THE WASHINGTON STATE DEPARTMENT OF ECOLOGY'S (WDOE) "STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON." THE FOLLOWING NOTES ARE ONLY A FEW OF THE MINIMUM REQUIREMENTS AND SHOULD NOT BE INTERPRETED TO EXCLUDE ANY EROSION CONTROL PRACTICES AS SPECIFIED IN THE WDOE STORMWATER MANUAL.

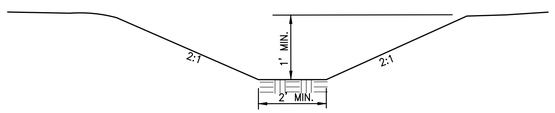
1. ALL LIMITS OF CLEARING AND AREAS OF VEGETATION PRESERVATION AS PRESCRIBED ON THE PLAN SHALL BE CLEARLY FLAGGED BY THE ENGINEER IN THE FIELD AND OBSERVED DURING CONSTRUCTION.
2. ALL REQUIRED SEDIMENTATION/EROSION CONTROL FACILITIES MUST BE IN OPERATION PRIOR TO LAND CLEARING AND/OR OTHER CONSTRUCTION TO INSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER THE NATURAL DRAINAGE SYSTEM. ALL EROSION AND SEDIMENT FACILITIES SHALL BE MAINTAINED IN A SATISFACTORY CONDITION UNTIL SUCH TIME THAT CLEARING AND/OR CONSTRUCTION IS COMPLETED AND POTENTIAL FOR ON-SITE EROSION HAS PASSED. THE IMPLEMENTATION, MAINTENANCE, REPLACEMENT AND ADDITIONS TO EROSION/SEDIMENTATION CONTROL SYSTEMS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. THE EROSION AND SEDIMENTATION CONTROL SYSTEMS DEPICTED ON THIS DRAWING ARE INTENDED TO BE MINIMUM REQUIREMENTS TO MEET ANTICIPATED SITE CONDITIONS. AS CONSTRUCTION PROGRESSES AND AS UNEXPECTED OR SEASONAL CONDITIONS DICTATE, THE CONTRACTOR SHOULD ANTICIPATE THAT MORE EROSION AND SEDIMENTATION CONTROL FACILITIES WILL BE NECESSARY TO INSURE COMPLETE SILTATION CONTROL ON THE PROPOSED SITE. DURING THE COURSE OF CONSTRUCTION, IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE CONTRACTOR TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED BY HIS ACTIVITIES AND TO PROVIDE ADDITIONAL FACILITIES, OVER AND ABOVE MINIMUM REQUIREMENTS, AS MAY BE NEEDED TO PROTECT ADJACENT PROPERTIES AND WATER QUALITY OF THE RECEIVING DRAINAGE SYSTEM.
4. AT NO TIME SHALL MORE THAN 1 FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND DISPOSING OF THE SEDIMENT. ALL CATCH BASINS, CONVEYANCE LINES AND DITCHES ALONG SEQUALITCHEW DRIVE AND CENTER DRIVE SHALL BE CLEANED PRIOR TO PAVING.
5. THE CONTRACTOR SHALL REMOVE MATERIAL DROPPED, WASHED OR TRACKED FROM VEHICLES ONTO THE CITY RIGHT-OF-WAY OR INTO THE STORM DRAINAGE SYSTEM ON SEQUALITCHEW DRIVE AND CENTER DRIVE. DEBRIS SHALL NOT BE WASHED INTO THE STORM DRAINAGE SYSTEM.
6. TEMPORARY EROSION CONTROL FACILITIES SHALL BE INSPECTED WEEKLY AND MAINTAINED WITHIN 24 HOURS FOLLOWING A STORM EVENT. SEDIMENT SHALL BE REMOVED TO ENSURE THE FACILITIES WILL FUNCTION PROPERLY. THE FACILITIES SHALL BE SATISFACTORILY MAINTAINED UNTIL CONSTRUCTION IS COMPLETED AND THE POTENTIAL FOR ON-SITE EROSION HAS PASSED.
7. ALL STORM DRAIN INLETS MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT STORMWATER RUNOFF SHALL NOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.
8. NO DISTURBED SOIL SHALL REMAIN UNSTABILIZED FOR MORE THAN TWO DAYS.
9. SEDIMENT TRAP/POND BAFFLES SHALL BE EMBEDDED IN SIDE SLOPES.

INLET PROTECTION NOTE:

CONTRACTOR SHALL PROVIDE INLET PROTECTION FOR ALL CATCH BASINS WITHIN CONSTRUCTION ZONE.

CLEARING NOTES:

- SCHEDULE AND LIMIT REMOVAL OF EXISTING VEGETATION AND GROUND COVER TO THE MINIMUM EXTENT FEASIBLE WITHIN ACTIVE WORK AREA.
- ALL TOPSOIL (IF FOUND) SHALL REMAIN ON-SITE AND BE UTILIZED FOR SITE RESTORATION FOLLOWING COMPLETION OF GRADING ACTIVITIES.
- GEOTECHNICAL ENGINEER SHALL BE ON-SITE DURING ALL STRIPPING AND GRUBBING OPERATIONS TO VERIFY CONDITION OF SUBGRADE AND REMOVAL OF ALL ORGANIC MATERIAL, STUMPS, UNCONTROLLED FILL, ETC.
- GEOTECHNICAL ENGINEER SHALL OBSERVE AND TEST FILL MATERIAL AS REQUIRED TO CERTIFY THE COMPLETED FILLS.



TEMPORARY "V" DITCH

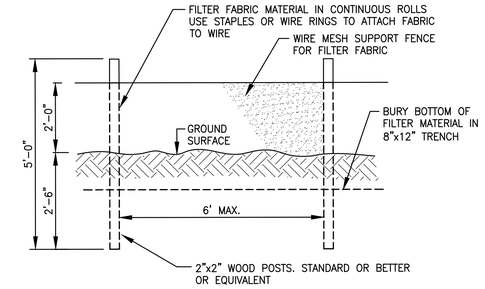
NOT TO SCALE

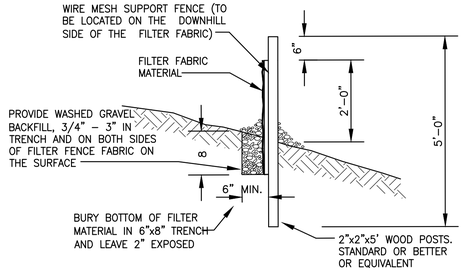
TEMPORARY DIKES AND SWALES:

1. SEED AND MULCH SHALL BE APPLIED WITHIN 5 DAYS OF DIKE CONSTRUCTION (SEE VEGETATION).
2. THE UPSLOPE SIDE OF THE DIKE SHALL PROVIDE POSITIVE DRAINAGE TO THE DIKE OUTLET.
3. NO EROSION SHALL OCCUR AT THE DIKE OUTLET. PROVIDE ENERGY DISSIPATION MEASURES AS NECESSARY.
4. SEDIMENT LADEN RUNOFF MUST BE RELEASED THROUGH A SEDIMENT TRAPPING FACILITY SUCH AS A POND, TRAP, OR SILT FENCE AS APPROPIATE TO DRAINAGE AREA SIZE.

MULCHING:

1. MULCH MATERIALS USED SHALL BE HAY OR STRAW, AND SHALL BE APPLIED AT THE RATE OF 1 BALE PER 200 S.F.
2. MULCHES SHALL BE APPLIED IN ALL AREAS WITH EXPOSED SLOPES GREATER THAN 2:1.
3. MUCLCHING SHALL BE USED IMMEDIATELY AFTER SEEDING OR IN AREAS WHICH CANNOT BE SEEDED BECAUSE OF THE SEASON.
4. ALL AREAS NEEDING MULCH SHALL BE COVERED BY NOVEMBER 1.

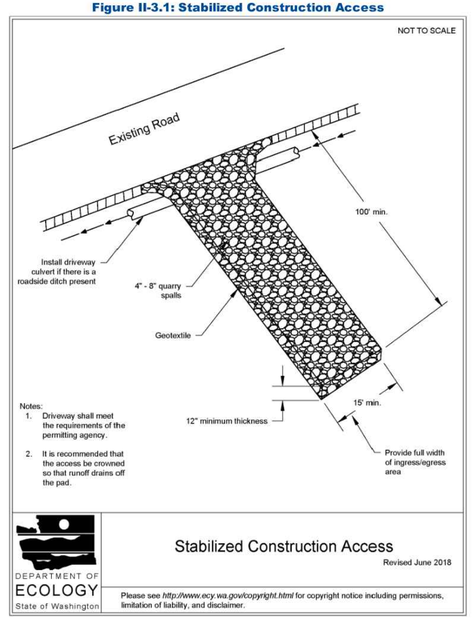




SILT FENCE NOTES:

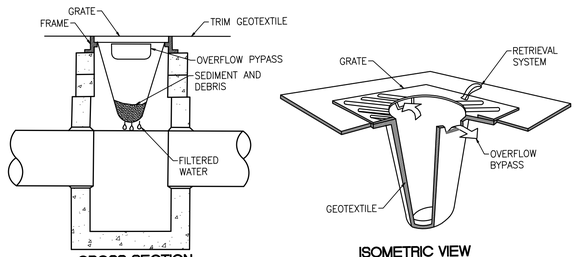
1. FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL AND CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY FASTENED AT BOTH ENDS TO POSTS.
2. POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 30 INCHES).
3. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 8 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER. THIS TRENCH SHALL BE BACKFILLED WITH WASHED GRAVEL.
4. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 4 INCHES AND SHALL NOT EXTEND MORE THAN 24 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
5. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 20 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 24 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
6. WHEN EXTRA-STRENGTH FILTER FABRIC AND CLOSER POST SPACING IS USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS WITH ALL OTHER PROVISIONS OF ABOVE NOTES APPLYING.
7. FILTER FABRIC FENCES SHALL NOT BE REMOVED BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
8. FILTER FABRIC FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
9. SILT FENCES WILL BE INSTALLED PARALLEL TO ANY SLOPE CONTOURS.
10. CONTRIBUTING LENGTH TO FENCE WILL NOT BE GREATER THAN 100 FEET.
11. DO NOT INSTALL BELOW AN OUTLET PIPE OR WEIR.
12. INSTALL DOWNSLOPE OF EXPOSED AREAS.
13. DO NOT DRIVE OVER OR FILL OVER SILT FENCES.

Figure II-3.1: Stabilized Construction Access



2019 Stormwater Management Manual for Western Washington

Volume II - Chapter 3 - Page 279



PREFABRICATED BELOW GATE INLET DEVICE DETAILS

NOTES:
1. SIZE THE BELOW GRATE INLET DEVICE(BGID) FOR THE STORM WATER STRUCTURE.
2. THE BGID SHALL HAVE A BUILT-IN HIGH-FLOW RELIEF SYSTEM(OVERFLOW BYPASS)
3. THE RETRIEVAL SYSTEM MUST ALLOW REMOVAL OF THE BGID WITHOUT SPILLING THE COLLECTED MATERIAL.

STORM DRAIN INLET PROTECTION

NOT TO SCALE

No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title: PRELIMINARY TESC NOTES AND DETAILS FOR DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELLI
STATE OF WASHINGTON
25672
REGISTERED
PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontal N/A Vertical N/A

Designed JAT Drawn JAT Checked DKB Approved DKB Date 05/30/24

18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES
BARGHAUSEN CONSULTING ENGINEERS, INC.

Job Number 18666

Sheet C4 of 13

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PRELIMINARY GRADING AND STORM DRAINAGE PLAN-WEST
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

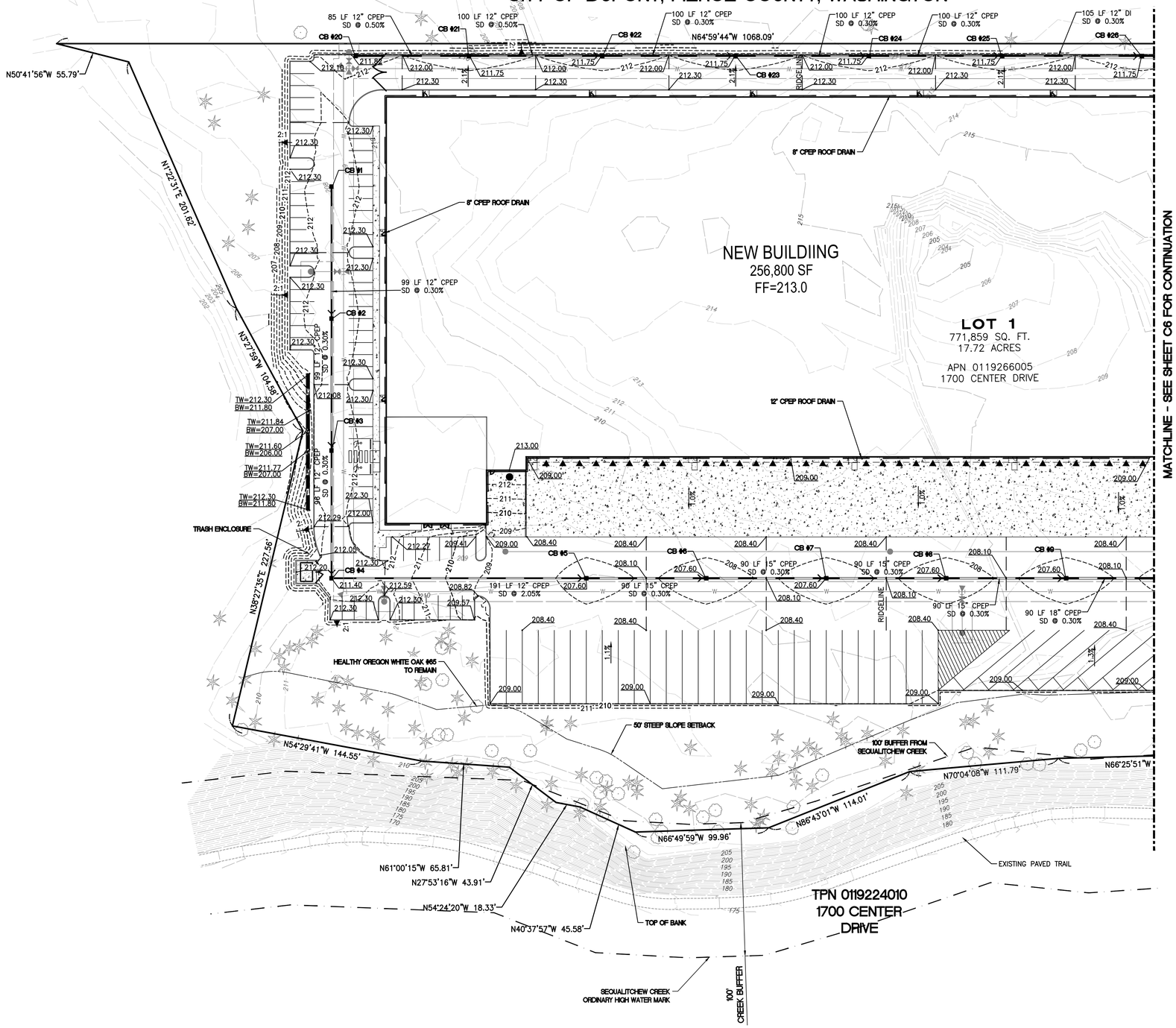
1"=40'
0 20 40 80

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

NOTE:
ALL TREES SHOWN ON THIS SHEET ARE TO REMAIN DURING DEMOLITION



No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title: PRELIMINARY GRADING AND STORM DRAINAGE PLAN-WEST FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMER — STATE OF WASHINGTON — 25672 — REGISTERED PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontal 1"=40' Vertical N/A

Designed JAT Drawn JAT Checked DKB Approved DKB Date 05/30/24

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
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CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 18666

Sheet C5 of 13

File: P:\18000s\18666\preliminary\18666-pgm.dwg Date/time: 5/30/2024 1:31 PM Scale: 1" = 40' JTOWNE Xref: ----

PRELIMINARY GRADING AND STORM DRAINAGE PLAN-EAST
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

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NOTE:
ALL TREES SHOWN ON THIS SHEET ARE TO REMAIN DURING DEMOLITION

NEW BUILDING
256,800 SF
FF=213.0

LOT 1
771,859 SQ. FT.
17.72 ACRES
APN 0119266005
1700 CENTER DRIVE

MATCHLINE - SEE SHEET C5 FOR CONTINUATION

APN 0119266007
1700 CENTER DRIVE

LOT 2
84,028 SQ. FT.
1.93 ACRES
APN 0119266006
1700 CENTER DRIVE

TPN 0119224010
1700 CENTER DRIVE

LEFT TURN SIGHT DISTANCE

Design vehicle	Time gap (t_g) (seconds) at design speed of major road
Passenger car	7.5
Single-unit truck	9.5
Combination truck	11.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and grades 3 percent or less. The table values require adjustment as follows:
For multilane highways:
For left turns onto two-way highways with more than two lanes, add 0.5 seconds for passenger cars or 0.7 seconds for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
For minor road approach grades:
If the approach grade is an upgrade that exceeds 3 percent; add 0.2 seconds for each percent grade for left turns

Exhibit 9-54. Time Gap for Case B1—Left Turn from Stop

FROM AASHTO – GEOMETRIC DESIGN OF HIGHWAYS AND STREETS

ISD = SPEED x TG
ISD = 73.3 ft/s x 11.5 s
ISD = 843 ft

RIGHT TURN SIGHT DISTANCE

Design vehicle	Time gap (t_g) (seconds) at design speed of major road
Passenger car	6.5
Single-unit truck	8.5
Combination truck	10.5

Note: Time gaps are for a stopped vehicle to turn right onto or cross a two-lane highway with no median and grades 3 percent or less. The table values require adjustment as follows:
For multilane highways:
For crossing a major road with more than two lanes, add 0.5 seconds for passenger cars and 0.7 seconds for trucks for each additional lane to be crossed and for narrow medians that cannot store the design vehicle.
For minor road approach grades:
If the approach grade is an upgrade that exceeds 3 percent, add 0.1 seconds for each percent grade.

Exhibit 9-57. Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

FROM AASHTO – GEOMETRIC DESIGN OF HIGHWAYS AND STREETS

ISD = SPEED x TG
ISD = 73.3 ft/s x 10.5 s
ISD = 770 ft

SEQUALITCHEW TRAIL TYPICAL SECTION

NOT TO SCALE

2" COMPACTED DEPTH HMA PAVEMENT
2" COMPACTED DEPTH CRUSHED ROCK BASE
2:1 MAX.
1.5%
2:1 MAX.
12" COMPACTED SUBGRADE PER GEOTECH RECOMMENDATIONS

NOTE:
SUBGRADE SHALL CONSIST OF FIRM AND UNYIELDING NATIVE MATERIAL OR STRUCTURAL FILL COMPACTED TO 95% MAXIMUM DRY DENSITY
SEE GEOTECHNICAL REPORT PREPARED BY GEOENGINEERS DATED OCTOBER 10, 2011 FOR PAVEMENT AND SUBGRADE RECOMMENDATIONS

No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	DKB	DKB		REVISED PER CITY COMMENTS

Title: PRELIMINARY GRADING AND STORM DRAINAGE PLAN-EAST FOR DUPONT - WEST

For: AVENUE 33, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELLI
STATE OF WASHINGTON
25672
REGISTERED PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontal 1"=40' Vertical N/A

Designed JAT Drawn JAT Checked DKB Approved DKB Date 05/30/24

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 18666
Sheet C6 of 13

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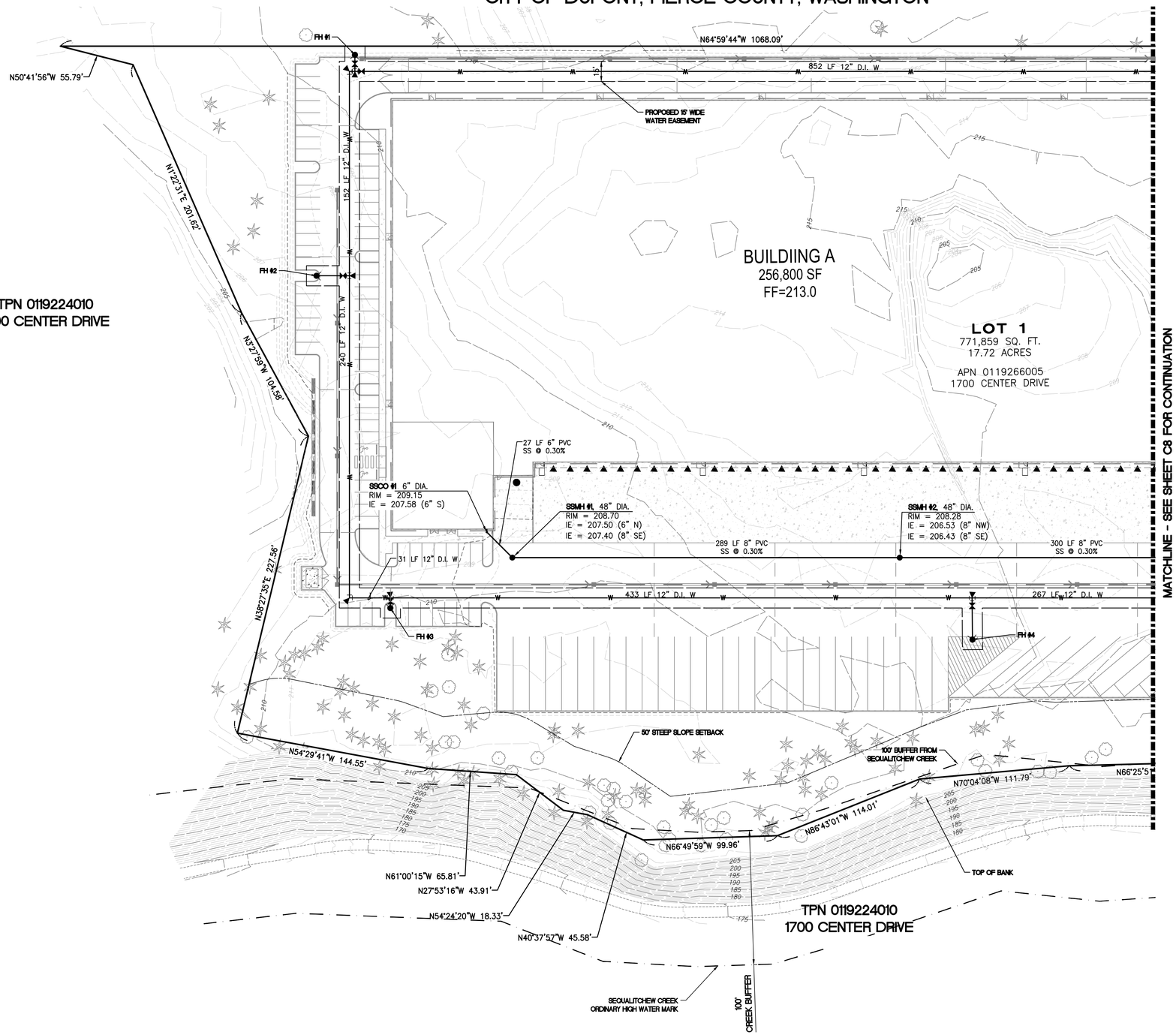
PRELIMINARY WATER AND SEWER PLAN-WEST
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80



APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

CONSTRUCTION NOTES:

1. ALL WATER MAINS SHALL BE CONSTRUCTED WITH A MINIMUM 42" OF COVER.
2. A MINIMUM 10 FEET OF HORIZONTAL SEPARATION SHALL BE MAINTAINED BETWEEN ALL WATER MAINS AND SANITARY SEWER FORCE MAINS.
3. OPERATION OF THE EXISTING WATER MAIN IN SEQUALITCHEW DRIVE SHALL BE MAINTAINED DURING WHILE THE NEW CONNECTION IS MADE.
4. ALL WATER SERVICE LINES UNDER PAVED ROADS SHALL BE SLEEVED BETWEEN THE MAIN AND METER WITH 2 INCH SCHEDULE 80 PVC PIPE.

No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title:
PRELIMINARY
WATER AND SEWER PLAN-WEST
FOR
DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELLI
STATE OF WASHINGTON
25672
REGISTERED
PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontal 1"=40' Vertical N/A

Designed JAT
Drawn JAT
Checked DKB
Approved DKB
Date 05/30/24

JTOWNE Xref: ~~~~

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

File:P:\18000s\18666\preliminary\18666-pws.dwg Date/time:5/31/2024 10:30 AM Scale:1 = 1

Job Number 18666
Sheet C7 of 13

PRELIMINARY WATER AND SEWER PLAN-EAST
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=40'
0 20 40 80

MATCHLINE - SEE SHEET C7 FOR CONTINUATION

BUILDIING A
256,800 SF
FF=213.0

LOT 1
771,859 SQ. FT.
17.72 ACRES
APN 0119266005
1700 CENTER DRIVE

852 LF 12" D.I. W

159 LF 12" D.I. WATER

169 LF 12" D.I. WATER

FH #7

FDC

42 8" D.I. FDC LINE

STUB FOR FUTURE CONNECTION

6 LF 8" PVC SS @ 0.40%

S87°59'34"W 92.50'

INSTALL RELOCATED FLUSHING W/ 2" SERVICE AND METER

S87°59'34"W 665.45'

S87°59'34"W 308.23'

N02°02'40"W 9.96'

31 8" D.I. FDC LINE

SEQUALITCHEW ROAD

N2°02'40"W 188.34'

N2°02'40"W 188.34'

45' RADIUS PRIVATE TEMPORARY TURNAROUND EASEMENT (SEE SHORT PLAT NOTE #4 ON SHEET 1)

Δ=96°17'05"
R=45.00'
L=75.62'

SSMH #R6 48" DIA.
RIM = 214.38
IE = 204.89 (8" N)
IE = 204.79 (8" S)

179 LF 8" PVC SS @ 0.40%

PIV

8" DDCVA FOR FIRE SPRINKLER SUPPLY PER CITY OF DUPONT DETAIL 8.4-8

96 LF 8" D.I. FIRE SPRINKLER SUPPLY LINE

56 LF 8" D.I. FIRE SPRINKLER SUPPLY LINE

92.5' PRIVATE ACCESS EASEMENT

(TITLE PARCEL B)
92.5' PRIVATE ACCESS EASEMENT (SEE SHORT PLAT NOTE #3 ON SHEET 1)

SSMH #R5 48" DIA.
RIM = 212.96
IE = 204.07 (8" N)
IE = 203.97 (8" S)

178 LF 12" D.I. W

127 LF 12" D.I. W

81 LF 12" D.I. W

31 LF 12" D.I. W

93 LF 8" PVC SS @ 0.40%

85 LF 12" D.I. W

SSMH #4, 48" DIA.
RIM = 208.53
IE = 204.93 (8" NW)
IE = 204.83 (8" E)

SSMH #3, 48" DIA.
RIM = 208.17
IE = 205.53 (8" NW)
IE = 205.43 (8" SE)

W 267 LF 12" D.I. W

167 LF 8" PVC SS @ 0.30%

PROPOSED 15' WIDE WATER EASEMENT

126 LF 12" D.I. W

IRRIGATION METER w/DCVA

WATER METER w/DCVA

SSCO #2, 6" DIA.
RIM = 212.42
IE = 205.23 (6" S)

165 LF 12" D.I. W

SSMH #R4 48" DIA.
RIM = 212.10
IE = 203.60 (8" N)
IE = 203.50 (8" S)

94 LF 12" D.I. W

SSMH #6, 48" DIA.
RIM = 210.94
IE = 203.74 (8" W)
IE = 203.64 (8" E)

111 LF 8" PVC SS @ 0.40%

85' PUBLIC SANITARY SEWER EASEMENT AFN 20211207010 4

133 LF 8" PVC SS @ 0.30%

12 LF 6" PVC SS @ 3.47%

197 LF 8" PVC SS @ 0.30%

197 LF 8" PVC SS @ 0.30%

SSMH #R3 48" DIA.
RIM = 211.06
IE = 203.05 (8" N)
IE = 203.05 (8" W)
IE = 202.95 (8" SE)

REMAINDER OF SEQUALITCHEW ROAD TO BE CONSTRUCTED UNDER SEPARATE PLAN AND PERMIT

PROPOSED HALF STREET IMPROVEMENTS SEE SHEETS C9 AND C10 FOR DETAILS

94 LF 12" D.I. W

Δ=145°08'
R=589.50'
L=1494.00'

Δ=87°41'16"
R=177.00'
L=270.90'

189 LF 8" PVC SS @ 0.40%

LOT 2
84,028 SQ. FT.
1.93 ACRES
APN 0119266006
1700 CENTER DRIVE

SIGN

CENTERLINE OF PROPOSED SEQUALITCHEW ROAD

94 LF 12" D.I. W

42.5' FUTURE ROW

42.5

42.5

42.5' PROPOSED ROW

190 LF 8" PVC SS @ 0.40%

SSMH #R2 48" DIA.
RIM = 210.60
IE = 202.20 (8" NW)
IE = 202.10 (8" SE)

GRAVEL ROAD

EX. 12" WATER LINE w/ CAP

EX. FLUSHING STATION W/ 2" SERVICE AND METER TO BE RELOCATED TO NORTH END OF SEQUALITCHEW DRIVE

147 LF 12" D.I. W

93 LF 12" D.I. W

EX. SSMH
RIM=211.86
IE E= 208.24
IE We 208.34

131 LF 8" PVC SS @ 0.40%

SSMH #R1 48" DIA.
RIM = 211.52
IE = 201.34 (8" NW)
IE = 201.24 (8" E)

SSMH #R0 48" DIA.
RIM = 212.33
IE = 200.72 (8" W)
IE = 200.72 (8" N)
IE = 200.62 (8" E)

N89°48'57"W 10.00'

56 LF 8" PVC SS @ 0.50%

N88°58'18"W 126.13'

N80°55'04"W 64.30'

N82°02'31"W 12.42'

N89°48'29"W 95.90'N89°48'29"W 55.77'

N87°20'08"W 194.51'

N84°13'45"W 134.11'

N84°52'39"W 90.84'

N47°28'29"W 15.52'

N64°55'26"W 45.93'

N89°05'40"W 57.87'

N80°54'14"W 135.48'

S86°29'27"W 87.56'

N55°38'11"W 105.16'

N12°44'18"W 121.16'

6.09'

50' STEEP SLOPE SETBACK

100' BUFFER FROM SEQUALITCHEW CREEK

EX. SEQUALITCHEW CREEK TRAIL

TOP OF BANK

15' TRAIL EASEMENT PER REC. NO. 201009301052

13.44' CREEK BUFFER

SEQUALITCHEW CREEK ORDINARY HIGH WATER MARK

TPN 0119224010
1700 CENTER DRIVE

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

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No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title:
PRELIMINARY
WATER AND SEWER PLAN-EAST
FOR
DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELI
STATE OF WASHINGTON
25672
REGISTERED
PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontal 1"=40' Vertical N/A

Designed JAT Drawn JAT Checked DKB Approved DKB Date 05/30/24

J:\DWNE Xref: ~~~~

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

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Job Number 18666

Sheet C8 of 13

PRELIMINARY SEQUALITCHEW ROAD PLAN AND PROFILE
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=20'
0 10 20 40

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

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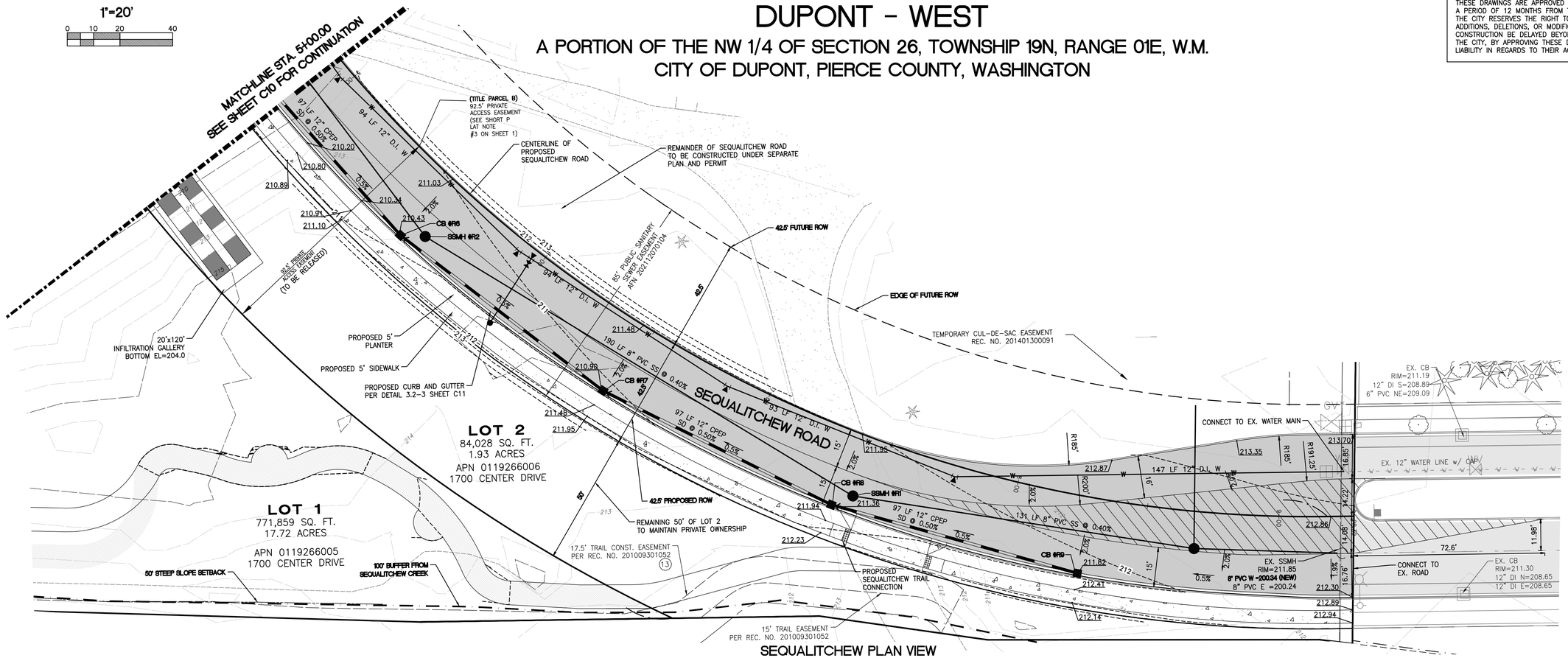
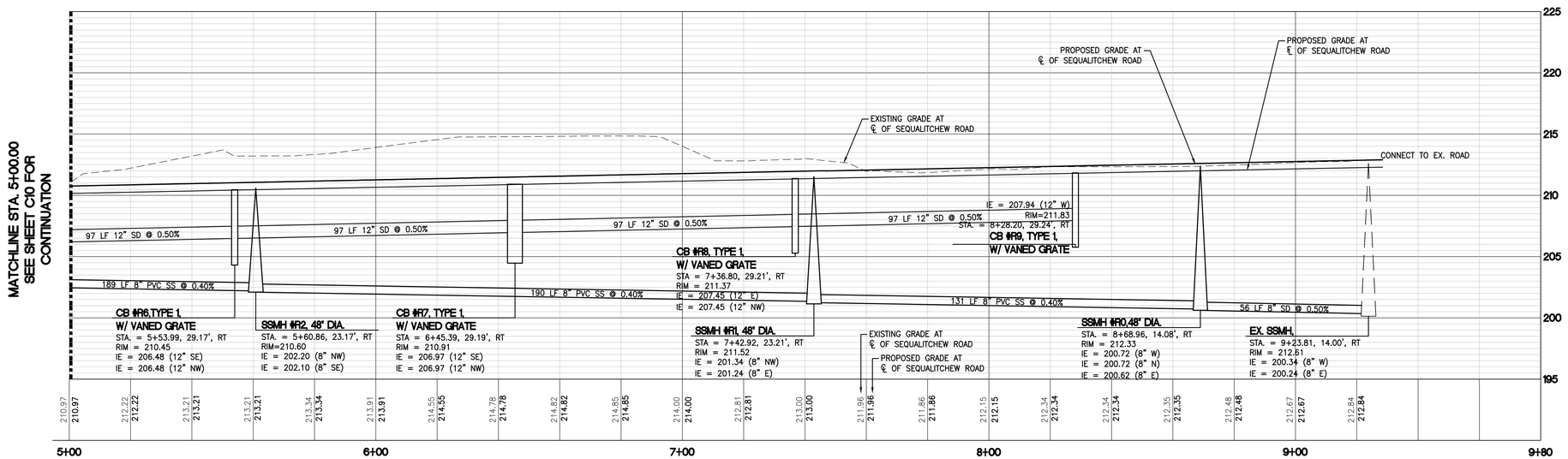


SEQUALITCHEW PLAN VIEW
SCALE: 1"=20'



SEQUALITCHEW PROFILE VIEW
SCALE: 1"=20' HORIZONTAL 1"=5' VERTICAL

No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title: PRELIMINARY SEQUALITCHEW ROAD PLAN AND PROFILE FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELLI
STATE OF WASHINGTON
25672
REGISTERED PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontal 1"=20' Vertical AS NOTED
Designed JAT Drawn JAT Checked DKB Approved DKB Date 05/30/24

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
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CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 18666
Sheet C9 of 13

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PRELIMINARY SEQUALITCHEW ROAD PLAN AND PROFILE (CONT.)

FOR

DUPONT - WEST

A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

1"=20'

0 10 20 40

APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

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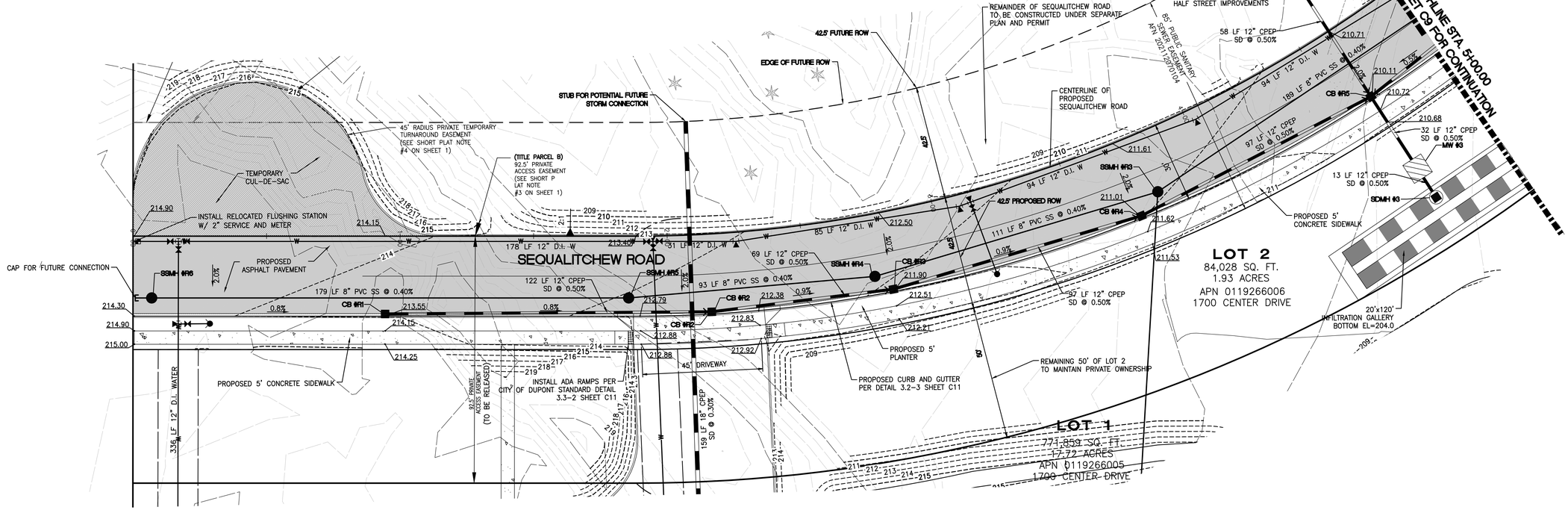
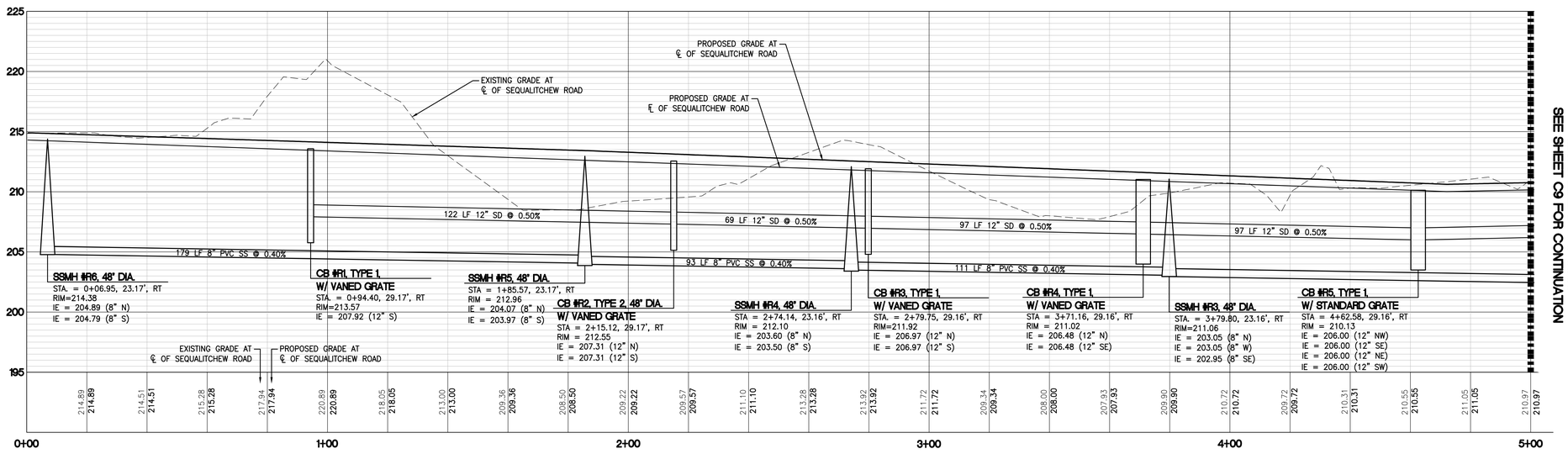


SEQUALITCHEW PLAN VIEW

SCALE: 1"=20'



SEQUALITCHEW PROFILE VIEW

SCALE: 1"=20' HORIZONTAL 1"=5' VERTICAL

No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title: PRELIMINARY SEQUALITCHEW ROAD PLAN AND PROFILE (CONT.) FOR DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELI — STATE OF WASHINGTON — 25672 — REGISTERED PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontal 1"=20' Vertical AS NOTED

Designed MAT. Drawn MAT. Checked DKB Approved DKB Date 05/30/24

18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES
BARGHAUSEN CONSULTING ENGINEERS, INC.

Job Number 18666

Sheet C10 of 13

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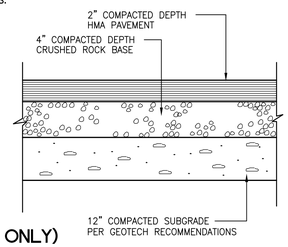
PRELIMINARY CONSTRUCTION NOTES AND DETAILS
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

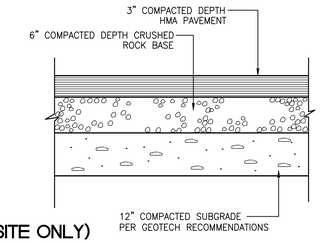
BCE GENERAL SITE DEVELOPMENT NOTES:

1. THE CONTRACTOR SHALL OBTAIN AND HAVE AVAILABLE COPIES OF THE APPLICABLE GOVERNING AGENCY STANDARDS AT THE JOB SITE DURING THE RELATED CONSTRUCTION OPERATIONS.
2. CONTRACTOR SHALL ASSURE THAT ALL NECESSARY PERMITS HAVE BEEN OBTAINED PRIOR TO COMMENCING WORK.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DIMENSION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION WHETHER SHOWN ON THESE PLANS OR NOT. UTILITIES OTHER THAN THOSE SHOWN MAY EXIST ON THIS SITE. ONLY THOSE UTILITIES WITH EVIDENCE OF THEIR INSTALLATION VISIBLE AT GROUND SURFACE OR SHOWN ON RECORD DRAWING PROVIDED BY OTHERS ARE SHOWN HEREON. EXISTING UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE ONLY AND ARE SUBJECT TO A DEGREE OF UNKNOWN VARIATION. SOME UNDERGROUND LOCATIONS SHOWN HEREON MAY HAVE BEEN TAKEN FROM PUBLIC RECORDS. BARGHAUSEN CONSULTING ENGINEERS, INC. ASSUMES NO LIABILITY FOR THE ACCURACY OF PUBLIC RECORDS OR RECORDS OF OTHERS. IF CONFLICTS SHOULD OCCUR, THE CONTRACTOR SHALL CONSULT BARGHAUSEN CONSULTING ENGINEERS, INC., TO RESOLVE ALL PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.
4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THE PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE SPECIFICATIONS OR THE RELATIVE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE PROJECT ENGINEER OF RECORD IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE PROJECT ENGINEER SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL COMPLIANCE WITH LOCAL REGULATIONS AND CODES.
5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE APPROPRIATE UTILITIES INVOLVED PRIOR TO CONSTRUCTION.
6. INSPECTION OF SITE WORK WILL BE ACCOMPLISHED BY A REPRESENTATIVE OF THE GOVERNING JURISDICTION. INSPECTION OF PRIVATE FACILITIES WILL BE ACCOMPLISHED BY A REPRESENTATIVE OF THE OWNER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE INSPECTOR 24 HOURS IN ADVANCE OF BACKFILLING ALL CONSTRUCTION.
7. PRIOR TO ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY THE CONTRACTOR SHALL CONTACT THE AGENCY AND/OR UTILITY INSPECTION PERSONNEL AND ARRANGE ANY REQUIRED PRE-CONSTRUCTION MEETING(S). CONTRACTOR SHALL PROVIDE ONE WEEK MIN. ADVANCE NOTIFICATION TO OWNER, FIELD ENGINEER AND ENGINEER OF PRE-CONSTRUCTION MEETINGS.
8. THE CONTRACTOR IS RESPONSIBLE FOR WORKER AND SITE SAFETY AND SHALL COMPLY WITH THE LATEST OSHA STANDARDS AND REGULATIONS, OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE "MEANS AND METHODS" REQUIRED TO MEET THE INTENT AND PERFORMANCE CRITERIA OF OSHA, AS WELL AS ANY OTHER ENTITY THAT HAS JURISDICTION FOR EXCAVATION AND/OR TRENCHING PROCEDURES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER NEEDED ACTIONS TO PROTECT THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC, AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACTOR. ANY WORK WITHIN THE TRAVELED RIGHT-OF-WAY THAT MAY INTERRUPT NORMAL TRAFFIC FLOW SHALL REQUIRE AT LEAST ONE FLAGGER FOR EACH LANE OF TRAFFIC AFFECTED.
10. PROTECTIVE MEASURES SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT ALL ADJACENT PUBLIC AND PRIVATE PROPERTIES AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ALL EXISTING UTILITY SERVICES THAT ARE TO REMAIN OPERATIONAL WITHIN THE CONSTRUCTION AREA WHETHER SHOWN OR NOT SHOWN ON THE PLANS.
11. TWO (2) COPIES OF THESE APPROVED PLANS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS. ONE (1) SET WITH RECORDS OF AS-BUILT INFORMATION SHALL BE SUBMITTED TO BARGHAUSEN CONSULTING ENGINEERS, INC. AT COMPLETION OF PROJECT.
12. CONTRACTOR SHALL OBTAIN SERVICES OF A LICENSED LAND SURVEYOR TO STAKE HORIZONTAL CONTROL FOR ALL NEW IMPROVEMENTS. STAKING CONTROL SHALL BE TAKEN FROM ELECTRONIC PLAN FILES PROVIDED BY BARGHAUSEN CONSULTING ENGINEERS INC..
13. CONTRACTOR SHALL REQUEST FROM BARGHAUSEN CONSULTING ENGINEERS INC., PRIOR TO ANY CONSTRUCTION STAKING OR CONSTRUCTION WORK, A FORMAL CONSTRUCTION RELEASE IN WRITING. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE APPROVED CITY OF AUBURN PERMIT DRAWINGS.



NOTE:
SUBGRADE SHALL CONSIST OF FIRM AND UNYIELDING NATIVE MATERIAL OR STRUCTURAL FILL COMPACTED TO 95% MAXIMUM DRY DENSITY SEE GEOTECHNICAL REPORT PREPARED BY GEOENGINEERS DATED OCTOBER 10, 2011 FOR PAVEMENT AND SUBGRADE RECOMMENDATIONS

(ON-SITE ONLY)
TYPICAL LIGHT DUTY ASPHALT PAVEMENT SECTION
NOT TO SCALE



NOTE:
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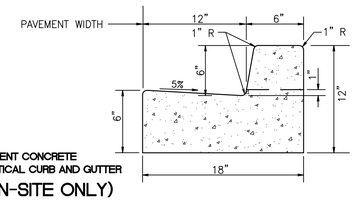
(ON-SITE ONLY)
TYPICAL HEAVY DUTY ASPHALT PAVEMENT SECTION
NOT TO SCALE

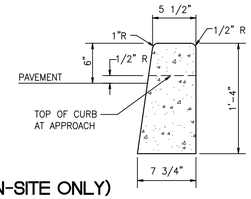
GENERAL NOTES (WATER SYSTEM CONSTRUCTION)

1. ALL IRRIGATION CROSSINGS SHALL HAVE SCHEDULE 80 SLEEVES AND THE SIZE SHALL BE PER THE APPROVED IRRIGATION DRAWINGS.
2. LIGHT POLES SHALL BE LOCATED A MINIMUM OF 3 FEET FROM ALL UNDERGROUND UTILITIES, INCLUDING WATER METERS. LIGHT POLES SHALL BE LOCATED A MINIMUM OF 5 FEET FROM FIRE HYDRANTS.
3. WATER MAINS AND FITTINGS TO BE INSTALLED SHALL BE DUCTILE IRON FOR ALL SIZES, UNLESS SPECIFICALLY NOTED OTHERWISE. THE CLASS OF THE DUCTILE IRON PIPE SHALL BE THICKNESS CLASS 52 FOR ALL DIAMETERS.
4. WATER MAINS SHALL MAINTAIN A MINIMUM OF 3 FEET AND A MAXIMUM OF 5 FEET OF COVER.
5. UTILITY CROSSINGS HAVING LESS THAN 1 FOOT OF VERTICAL SEPARATION SHALL BE CONSTRUCTED WITH CONTROLLED DENSITY FILL (CDF) TO PREVENT POSSIBLE DAMAGE TO EITHER UTILITY.
6. WATER MAIN DEFLECTIONS AT JOINTS ARE NOT TO EXCEED MANUFACTURER'S RECOMMENDATIONS PLUS AN ADDITIONAL FACTOR OF SAFETY OF 50 PERCENT.
7. IDENTIFY A MINIMUM HORIZONTAL SEPARATION OF 10 FEET BETWEEN SANITARY SEWER MAINS AND WATER MAINS, BOTH EXISTING AND PROPOSED.
8. FOR PROPOSED WATER MAINS, IDENTIFY RESTRAINED JOINT FITTINGS AND PUSH-ON JOINTS AT LOCATIONS WHERE THRUST BLOCKS WILL NOT HAVE SUFFICIENT UNDISTURBED ADJACENT AREA FOR BEARING.
9. WATER SERVICE CONNECTIONS SHALL BE MADE PERPENDICULAR TO THE MAIN.
10. THE WATER MAIN PIPES SHALL BE DISINFECTED AND TESTED BEFORE BEING PLACE IN SERVICE. ALL WATER MAIN TESTING AND DISINFECTION SHALL BE PER CITY OF DUPONT PUBLIC WORKS STANDARDS.
11. WATER MAIN STUBOUTS THAT ARE NOT USED SHALL BE DISCONNECTED AT THE MAIN, WITH A BLIND FLANGE INSTALLED AT THE TEE.
12. TEE CONNECTIONS TO EXISTING WATER MAINS SHALL BE WET TAPS.
13. SEPARATE WATER CONNECTIONS WILL BE REQUIRED FOR DOMESTIC, FIRE, AND IRRIGATION. ALL SERVICES SHALL INCLUDE BACKFLOW PREVENTION DEVICES LOCATED OUTSIDE OF ANY PROPOSED BUILDINGS.
14. ALL FIRE PROTECTION SYSTEM INSTALLATIONS, INCLUDING PIPELINES AND DOUBLE DETECTOR CHECK ASSEMBLIES, ARE SUBJECT TO THE CONSTRUCTION STANDARDS OF NFPA 24 AND TO THE INSPECTION AND TESTING REQUIREMENTS OF THE CITY OF DUPONT FIRE DEPARTMENT.
15. THE FIRE PROTECTION SYSTEMS, INCLUDING THE BACKFLOW PREVENTION DEVICES, UNDERGROUND FIRE SERVICE LINES, AND FIRE DEPARTMENT CONNECTIONS, ARE SUBJECT TO SEPARATE REVIEW, PERMITTING, AND APPROVAL BY THE CITY OF DUPONT FIRE DEPARTMENT.
16. RELOCATE THE FIRE DEPARTMENT CONNECTIONS (FDCS) TO PLANTER ISLANDS OR OTHER LOCATIONS, AS FEASIBLE, TO BE OUTSIDE OF THE BUILDING COLLAPSE ZONES.
17. THE APPLICANT SHALL FURNISH METER SIZING CALCULATIONS FOR DOMESTIC AND FIRE WATER SERVICES. THE SPRINKLER SYSTEM DESIGN, INCLUDING CONFIRMATION OF THE PROVIDED SIZING FOR THE FIRE LINE COMPONENTS SHALL BE REVIEWED AND APPROVED BY THE CITY BUILDING DEPARTMENT AND FIRE DEPARTMENT AS PART OF THE BUILDING PERMIT PROCESS. EACH FIRE LINE CONNECTION TO A CITY WATER MAIN WILL REQUIRE A DOUBLE DETECTOR CHECK VALVE ASSEMBLY (DDCVA) IN AN UNDERGROUND VAULT AND A FIRE DEPARTMENT CONNECTION (FDC) WITHIN 50 FEET OF A FIRE HYDRANT.

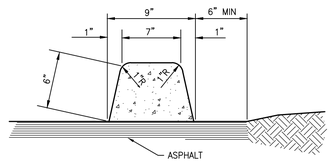


CEMENT CONCRETE
VERTICAL CURB AND GUTTER

(ON-SITE ONLY)
CURB AND GUTTER DETAIL
WSDOT STANDARD PLAN F-10.12-00
NOT TO SCALE



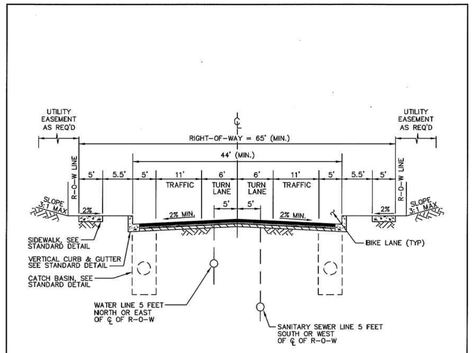
(ON-SITE ONLY)
6" X 18" VERTICAL CURB
NOT TO SCALE



EXTRUDED CONCRETE CURB DETAIL
NOT TO SCALE

GENERAL NOTES (STREET CONSTRUCTION)

1. A PRECONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION.
2. A COPY OF THE APPROVED ROADWAY DRAWINGS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
3. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH CITY OF DUPONT'S PUBLIC WORKS STANDARDS AND STORMWATER MANAGEMENT MANUAL AND THE MOST CURRENT EDITION OF THE STATE OF WASHINGTON STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION.
4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ADEQUATE TEMPORARY TRAFFIC CONTROL TO ENSURE TRAFFIC SAFETY DURING CONSTRUCTION ACTIVITIES. THEREFORE, THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE PUBLIC WORKS DEPARTMENT AT LEAST 48 HOURS PRIOR TO STARTING ANY WORK IN THE RIGHT-OF-WAY. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD).
5. ALL CURB AND GUTTER, STREET GRADES, SIDEWALK GRADES, AND ANY OTHER VERTICAL AND/OR HORIZONTAL ALIGNMENT SHALL BE STAKED BY A PROFESSIONAL ENGINEER OR SURVEYING FIRM CAPABLE OF PERFORMING SUCH WORK.
6. ANY ROADWAY SIGNAGE OR STRIPING REMOVED OR TEMPORARILY MOVED BY THE CONTRACTOR SHALL BE RESTORED SO AS TO MEET THE CURRENT MUTCD STANDARDS.
7. WHERE NEW ASPHALT JOINS EXISTING, THE EXISTING ASPHALT SHALL BE CUT TO A NEAT VERTICAL EDGE AND TACKED WITH ASPHALT EMULSION TYPE CSS-1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE JOINT SHALL BE SEALED WITH GRADE AR-4000W PAVING ASPHALT.
8. COMPACTION OF SUBGRADE, ROCK, AND ASPHALT SHALL BE IN ACCORDANCE WITH THE WSDOT/APWA STANDARD SPECIFICATIONS. SEE CITY OF DUPONT PUBLIC WORKS STANDARDS TABLE 10.2-1 FOR TESTING AND SAMPLING FREQUENCIES. DENSITY TEST REPORTS WILL BE REQUIRED FOR ALL PUBLIC ROADWAYS.
9. FORM AND SUBGRADE INSPECTION BY THE CITY IS REQUIRED BEFORE PLACING CONCRETE. TWENTY-FOUR HOURS ADVANCE NOTICE IS REQUIRED FOR THE SCHEDULING OF INSPECTION.
10. CALL UNDERGROUND UTILITY LOCATE LINE, 1-800-424-5555, PRIOR TO ANY EXCAVATION.
11. DEAD-END STREETS SHALL BE APPROPRIATELY SIGNED AND BARRICADED.
12. WHERE A SIDEWALK IS TO BE CONSTRUCTED ABOVE A SLOPE OR ADJACENT TO A ROCKERY OR RETAINING WALL, WHERE THE LOWEST FINISHED ELEVATION OF THE SLOPE, ROCKERY, OR RETAINING WALL IS TO BE 30 INCHES OR MORE BELOW THE FINISHED ELEVATION OF THE SIDEWALK, A SAFETY RAILING SHALL BE REQUIRED WHEN:
    (A) THE PLANE OF THE WALL FACE IS LESS THAN 4 FEET IN HORIZONTAL DISTANCE FROM THE OUTSIDE EDGE OF THE SIDEWALK.
    (B) THE PLANE OF THE WALL FACE IS GREATER THAN 4-FEET HORIZONTAL DISTANCE TO THE OUTSIDE EDGE OF THE SIDEWALK, BUT THE SLOPE DOWN TO THE WALL TOP EXCEEDS THREE TO ONE.
    (C) THE SLOPES ADJACENT TO THE SIDEWALK AVERAGE GREATER THAN TWO TO ONE.



GENERAL NOTES:
1. FOR ADDITIONAL REQUIREMENTS, SEE TABLE 2.4-2 OF THE PUBLIC WORKS STANDARDS.
2. PAVEMENT DESIGN SHALL BE BY A LICENSED ENGINEER.
3. FOR STREETS ADJACENT TO OPEN SPACE/SENSITIVE AREAS SEE DWG. No. 2.4-2.4

CITY OF DUPONT			
COMMERCIAL ACCESS STREET BUSINESS AND TECHNOLOGY PARK			
APPROVED: CITY OF DUPONT / DATE 9/21/11			DWG. NO. 2.4-2.3
DATE: 9/11	DRWN: E.T.	CHKD: T.N.	SCALE: NO SCALE

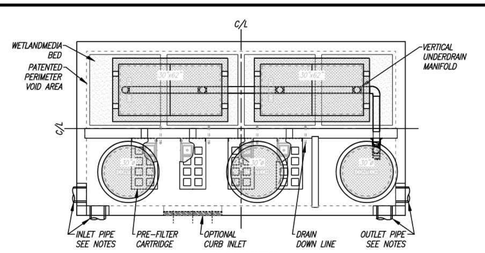
APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

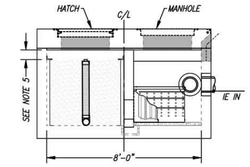
THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

SITE SPECIFIC DATA			
PROJECT NUMBER	18666		
PROJECT NAME	Dupont 243		
PROJECT LOCATION	Dupont, WA		
STRUCTURE ID	A, B		
TREATMENT REQUIRED			
TREATMENT FLOW (CFS)	0.383		
PRETREATMENT LOADING RATE (GPM/SF)	2.1 GPM/S		
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0		
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE	3.917		
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	203.59	CPEP	12"
INLET PIPE 2			
OUTLET PIPE	202.26	CPEP	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION		210.70	
SURFACE LOAD	HS-20		
NOTES:			

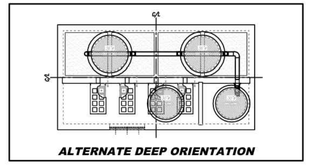
* PRELIMINARY ONLY - NOT FOR CONSTRUCTION



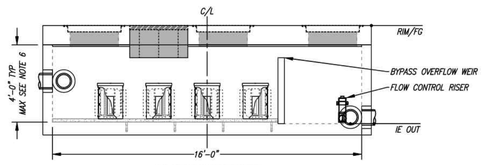
PLAN VIEW



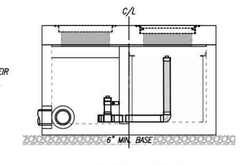
LEFT END VIEW



ALTERNATE DEEP ORIENTATION



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
4. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.
5. ALTERNATE DEEP FRAME & COVER ORIENTATION USED WHEN CEILING TO MEDIA DISTANCE IS 2.5' OR GREATER.
6. VERTICAL HEIGHT VARIES BASED ON SITE SPECIFIC REQUIREMENTS.

MODULAR WETLANDS — FOR PATENT INFORMATION, GO TO www.ContechES.com/IP

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CONTECH ENGINEERED SOLUTIONS LLC — www.ContechES.com

MWS-L-8-16-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title: PRELIMINARY CONSTRUCTION NOTES AND DETAILS FOR DUPONT - WEST

For: AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELLI — STATE OF WASHINGTON — 25672 — REGISTERED PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontal N/A Vertical N/A
Designed JAT Drawn JAT Checked DKB Approved DKB Date 05/30/24
JTWONE Xref: ----

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

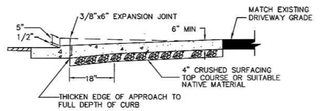
Job Number 18666
Sheet C11 of 13
File:P:\18000s\18666\preliminary\18666-d.dwg Date/time:3/28/2024 10:10 PM Scale:1 = 1

PRELIMINARY CONSTRUCTION NOTES AND DETAILS
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

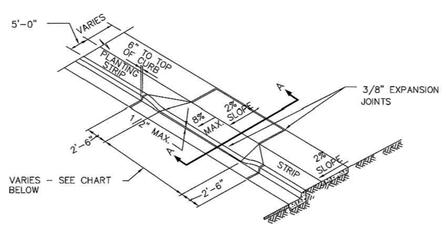
APPROVED FOR CONSTRUCTION

BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.



SECTION A–A

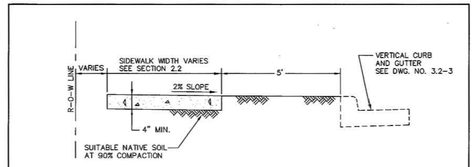


DRIVEWAY WIDTHS	MAX.(FT)	MIN.(FT)
COMM./INDUS	35'	25'
RESIDENTIAL	20'	10'

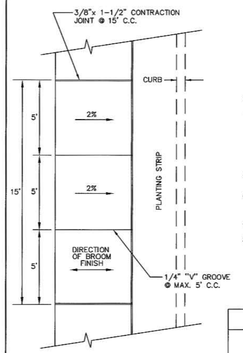
GENERAL NOTES:

1. FOR ADDITIONAL REQUIREMENTS, SEE SECTION 3.1 OF THE PUBLIC WORKS STANDARDS.
2. ALL COMMERCIAL/INDUSTRIAL DRIVEWAYS SHALL HAVE AN EXPANSION JOINT LOCATED MID-WIDTH.

CITY OF DUPONT			
DRIVEWAY APPROACH			
APPROVED: CITY OF DUPONT DATE 9/21/11			DWG. NO. 3.1–1
DATE: 9/11	DRWN: L.G.	CHKD: T.N.	SCALE: NO SCALE



SECTION



PLAN

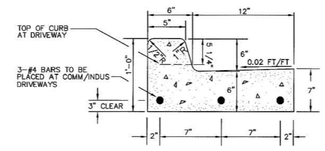
GENERAL NOTES:

1. JOINTS THRU AND DUMMY JOINTS SHALL BE AS SHOWN ABOVE. THRU JOINTS SHALL ALSO BE PLACED IN THE SIDEWALK SECTION AT DRIVE-WAY AND ALLEY RETURNS. ALL JOINTS SHALL BE CLEAN AND EDGED WITH AN EDGE HAVING 1/4" RADIUS. JOINTS SHALL BE FLUSH WITH THE FINISHED SURFACE.
2. PREMOLDED JOINT FILLER SHALL BE 3/16" x 2" ASPHALT SATURATED FELT OR PAPER.
3. FORMS SHALL BE EITHER WOOD OR STEEL AND SHALL MEET ALL REQUIREMENTS OF THESE SPECIFICATIONS.
4. CONCRETE SHALL BE CLASS 3000.
5. FOR ADDITIONAL REQUIREMENTS, SEE SECTION 3.2 OF THE PUBLIC WORKS STANDARDS.

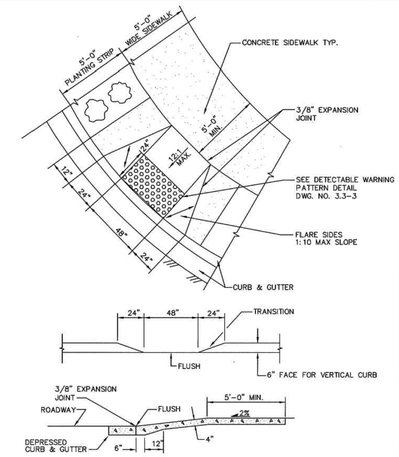
CITY OF DUPONT			
SIDEWALK SECTION			
APPROVED: CITY OF DUPONT DATE 9/21/11			DWG. NO. 3.2–1
DATE: 9/11	DRWN: L.G.	CHKD: T.N.	SCALE: NO SCALE

GENERAL NOTES:

1. THE CURBS, GUTTERS AND SIDEWALKS SHALL HAVE CONTRACTION JOINTS (3/8" x 1-1/2") AT INTERVALS OF NOT GREATER THAN 15'-0".
2. CEMENT CONCRETE SHALL BE CLASS 3000.
3. FOR ADDITIONAL REQUIREMENTS, SEE SECTION 3.2 OF THE PUBLIC WORKS STANDARDS.



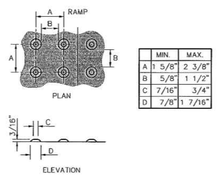
CITY OF DUPONT			
VERTICAL CURB AND GUTTER			
APPROVED: CITY OF DUPONT DATE 9/21/11			DWG. NO. 3.2–3
DATE: 9/11	DRWN: L.G.	CHKD: T.N.	SCALE: NO SCALE



GENERAL NOTES:

1. CURB RAMPS SHALL BE PROVIDED AT ALL INTERSECTIONS, WHERE SIDEWALKS OCCUR.
2. FOR ADDITIONAL REQUIREMENTS, SEE SECTION 3.3 OF THE PUBLIC WORKS STANDARDS.

CITY OF DUPONT			
CURB RAMP			
APPROVED: CITY OF DUPONT DATE 9/21/11			DWG. NO. 3.3–2
DATE: 9/11	DRWN: J.C.	CHKD: D.M.	SCALE: NO SCALE

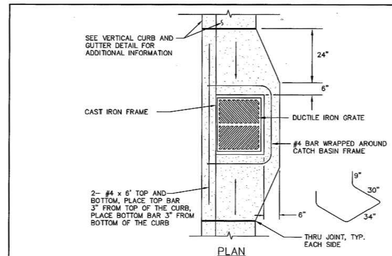


	MIN.	MAX.
A	1 5/8"	2 3/8"
B	5/8"	1 1/2"
C	7/16"	3/4"
D	7/8"	1 7/16"

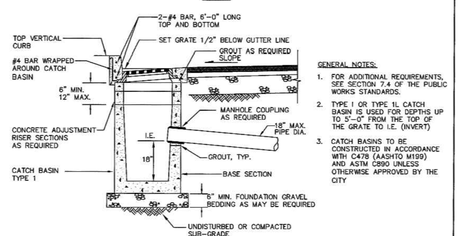
GENERAL NOTES:

1. PATTERN AREA SHALL BE YELLOW IN COLOR.
2. PRODUCT AND METHOD OF INSTALLATION SHALL BE APPROVED BY THE CITY AND MEET CURRENT MUTCD, ADA, ADAAG STANDARDS.
3. FOR ADDITIONAL REQUIREMENTS, SEE SECTION 3.3 OF THE PUBLIC WORKS STANDARDS.

CITY OF DUPONT			
DETECTABLE WARNING PATTERN DETAIL (TRUNCATED DOMES)			
APPROVED: CITY OF DUPONT DATE 9/21/11			DWG. NO. 3.3–3
DATE: 9/11	DRWN: J.C.	CHKD: D.M.	SCALE: NO SCALE



PLAN



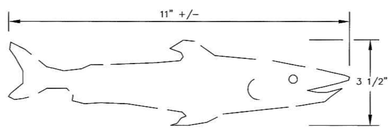
GENERAL NOTES:

1. FOR ADDITIONAL REQUIREMENTS, SEE SECTION 7.4 OF THE PUBLIC WORKS STANDARDS.
2. TYPE I OR TYPE 1L CATCH BASIN IS USED FOR DEPTHS UP TO 5'-0" FROM THE TOP OF THE GRATE TO I.E. (INVERT)
3. CATCH BASINS TO BE CONSTRUCTED IN ACCORDANCE WITH C478 (AASHTO M199) AND ASTM C890 UNLESS OTHERWISE APPROVED BY THE CITY

ELEVATION

CITY OF DUPONT			
CATCH BASIN TYPE I			
APPROVED: CITY OF DUPONT DATE 9/21/11			DWG. NO. 7.4–1
DATE: 9/11	DRWN: L.T.	CHKD: T.N.	SCALE: NO SCALE

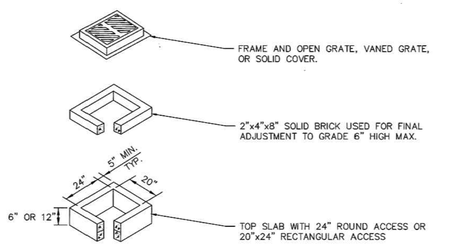
DUMP NO WASTE



GENERAL NOTES:

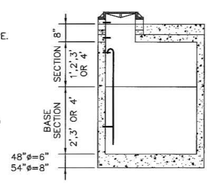
1. LETTERING SHALL BE TWO INCHES HIGH AND PROPORTIONAL IN WIDTH.
2. LETTERING SHALL BE PAINTED WHITE.
3. CONTACT CITY HALL FOR STENCIL AVAILABILITY.

CITY OF DUPONT			
CATCH BASIN STENCIL			
APPROVED: CITY OF DUPONT DATE 9/21/11			DWG. NO. 7.4–2
DATE: 9/11	DRWN: L.G.	CHKD: T.N.	SCALE: NO SCALE



NOTES:

1. ALL TYPE 2 CB'S EQUIPPED WITH OPEN GRATES SHALL BE LOCKING TYPE.
2. ALL TYPE 2 CB'S NOT IN PAVED AREAS SHALL BE EQUIPPED WITH LOCKING LIDS.
3. CB'S SHALL BE SET SO THAT STEPS ARE DIRECTLY UNDER OPENING.
4. ALL TYPE 2 CB'S SHALL BE EQUIPPED WITH STEPS AND LADDER.
5. CONCRETE SHALL BE CLASS 4000.
6. MINIMUM DISTANCE FROM INVERT TO CB BOTTOM SHALL BE 2.0'.
7. CB SECTIONS AND LID WILL BE HS20 TRAFFIC LOAD CERTIFIED BY MFG.
8. HOLE SIZE – PIPE O.D. + 5" MAX
   MAX HOLE SIZE – 36" (28" CB)
   MAX HOLE SIZE – 42" (54" CB)
9. FOR ADDITIONAL REQUIREMENTS, SEE SECTION 7.4 OF THE PUBLIC WORKS STANDARDS.



CATCH BASIN TYPE 2

CITY OF DUPONT			
CATCH BASIN TYPE 2			
APPROVED: CITY OF DUPONT DATE 9/21/11			DWG. NO. 7.4–3
DATE: 9/11	DRWN: M.C.	CHKD: D.J.M.	SCALE: NO SCALE

No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS

Title: PRELIMINARY CONSTRUCTION NOTES AND DETAILS FOR DUPONT - WEST

For: 601 UNION STREET, SUITE 2930 SEATTLE, WA 98101 (206) 707-9696 AVENUE 55, LLC

DANIEL K. BALMELLI STATE OF WASHINGTON 25672 REGISTERED PROFESSIONAL ENGINEER 05/30/2024

Scale: Horizontal N/A Vertical N/A

Designed MAT Drawn MAT Checked DKB Approved DKB Date 05/30/24

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

JTOWNE Xref: -----

Job Number 18666

Sheet C12 of 13

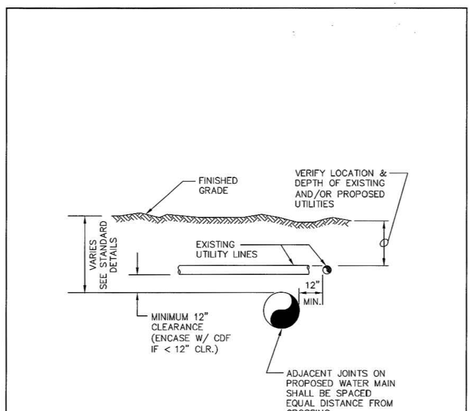
PRELIMINARY CONSTRUCTION NOTES AND DETAILS
FOR
DUPONT - WEST
A PORTION OF THE NW 1/4 OF SECTION 26, TOWNSHIP 19N, RANGE 01E, W.M.
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON

APPROVED FOR CONSTRUCTION

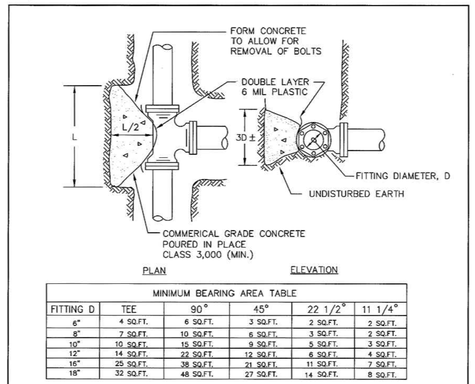
BY: _____ DATE: _____
CITY OF DUPONT

THESE DRAWINGS ARE APPROVED FOR CONSTRUCTION FOR A PERIOD OF 12 MONTHS FROM THE DATE SHOWN HEREON. THE CITY RESERVES THE RIGHT TO MAKE REVISIONS, ADDITIONS, DELETIONS, OR MODIFICATIONS SHOULD CONSTRUCTION BE DELAYED BEYOND THIS TIME LIMITATION. THE CITY, BY APPROVING THESE DRAWINGS, ASSUMES NO LIABILITY IN REGARDS TO THEIR ACCURACY OR OMISSIONS.

No.	Date	By	Ckd.	Appr.	Revision
4	03/30/24	JT	DKB	DKB	REVISED PER CITY COMMENTS



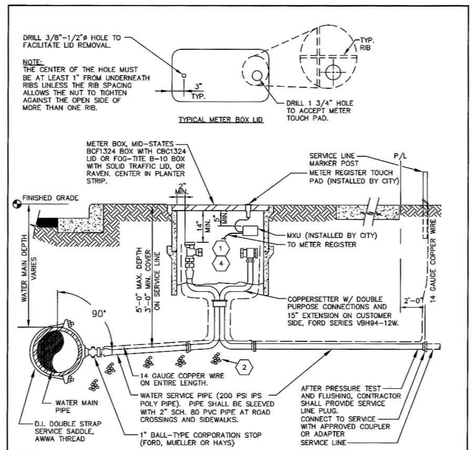
CITY OF DUPONT
TYPICAL UTILITY CROSSING
APPROVED: _____ CITY OF DUPONT _____ DATE
DWG. NO. 8.2-3
DATE: 9/11 | DRWN: L.L. | CHKD: T.N. | SCALE: NO SCALE



MINIMUM BEARING AREA TABLE					
FITTING D	TEE	90°	45°	22 1/2°	11 1/4°
6"	4 SQ.FT.	6 SQ.FT.	3 SQ.FT.	2 SQ.FT.	2 SQ.FT.
8"	7 SQ.FT.	10 SQ.FT.	6 SQ.FT.	3 SQ.FT.	2 SQ.FT.
10"	10 SQ.FT.	15 SQ.FT.	9 SQ.FT.	5 SQ.FT.	3 SQ.FT.
12"	14 SQ.FT.	22 SQ.FT.	12 SQ.FT.	6 SQ.FT.	4 SQ.FT.
16"	25 SQ.FT.	38 SQ.FT.	21 SQ.FT.	11 SQ.FT.	7 SQ.FT.
18"	32 SQ.FT.	48 SQ.FT.	27 SQ.FT.	14 SQ.FT.	8 SQ.FT.

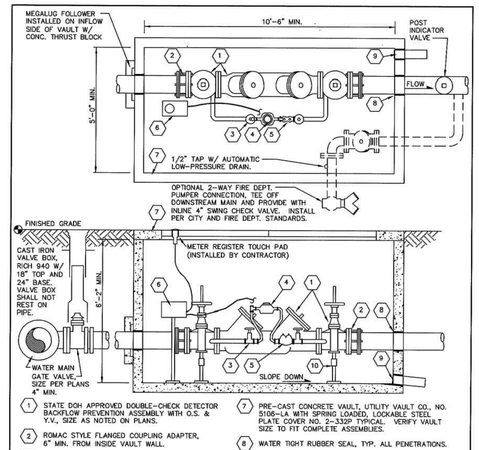
NOTES:
1) BEARING AREA TABLE BASED ON 250 PSI PRESSURE AND 2000 PSF SOIL BEARING. IF PRESSURE IS GREATER OR SOIL BEARING IS LESS, THE THRUST BLOCK SIZE SHALL BE INCREASED. DESIGN FOR THRUST BLOCK TO BE PROVIDED BY THE DEVELOPER.
2) THIS TABLE REPRESENTS THE "MINIMUM" CONSTRUCTION STANDARDS. THE DEVELOPER'S ENGINEER SHALL BE RESPONSIBLE FOR THE DESIGN AND SIZING OF ALL BLOCKING BASED ON SOIL CONDITIONS, TEST PRESSURES, AND OTHER RELEVENT CONDITIONS, AND SHALL SUBMIT THE PROPOSED DESIGN AND SIZING TO THE CITY FOR REVIEW AND APPROVAL.
3) FOR ADDITIONAL REQUIREMENTS, SEE SECTION 8.3.5 OF THE PUBLIC WORKS STANDARDS.

CITY OF DUPONT
THRUST BLOCKS
APPROVED: _____ CITY OF DUPONT _____ DATE
DWG. NO. 8.3-1
DATE: 9/11 | DRWN: L.L. | CHKD: T.N. | SCALE: NO SCALE



NOTES:
1) METER NOT SHOWN FOR CLARITY. REFERENCE SENSUS WATER METER STANDARDS FOR TYPE AND DIMENSIONS FOR REQUIRED METER.
2) TRENCH BACKFILL FOR SERVICE PIPE SHALL CONSIST OF SAND AND PEA GRAVEL.
3) ANY METERS DAMAGED OR CLOGGED DURING CONSTRUCTION SHALL BE REPLACED BY THE CITY AND THE COSTS SHALL BE REIMBURSED BY DEVELOPER.
4) "JUMPER" SHALL BE PROVIDED BY THE CITY.
5) THE CITY SHALL INSTALL THE METER TRANSCEIVER UNIT (MXU) AND CONNECT THE MXU WIRING WITHIN THE METER ENCLOSURE.
6) FOR ADDITIONAL REQUIREMENTS, SEE SECTION 8.4 OF THE PUBLIC WORKS STANDARDS.

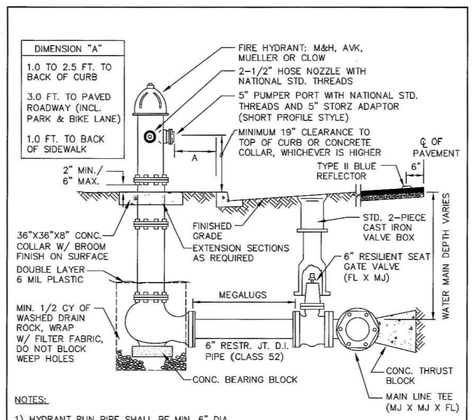
CITY OF DUPONT
3/4" & 1" SERVICE CONNECTION
APPROVED: _____ CITY OF DUPONT _____ DATE
DWG. NO. 8.4-1
DATE: 9/11 | DRWN: L.L. | CHKD: T.N. | SCALE: NO SCALE



1. STATE DOH APPROVED DOUBLE-CHECK DETECTOR BACKFLOW PREVENTION ASSEMBLY WITH O.S. & Y.V., SIZE AS NOTED ON PLANS.
2. ROMAC STYLE FLANGED COUPLING ADAPTER, 6" MIN. FROM INSIDE VAULT WALL.
3. SHUT-OFF VALVES PER STATE REQUIREMENTS.
4. 5/8"x3/4" SENSUS SRII-TRPL BYPASS METER (PER CITY WATER METER STANDARDS).
5. STATE DOH APPROVED 3/4" DOUBLE CHECK VALVE ASSEMBLY.
6. METER TRANSCEIVER UNIT WITH TOUCH PAD, INSTALLED BY CITY ON CONTRACTOR PROVIDED 1" SCH. 80 PVC SUPPORT.
7. PRE-CAST CONCRETE VAULT, UTILITY VAULT CO., NO. 5106-LA WITH SPRING LOADED, LOCKABLE STEEL PLATE COVER NO. 2-332P TYPICAL. VERIFY VAULT SIZE TO FIT COMPLETE ASSEMBLIES.
8. WATER TIGHT RUBBER SEAL, TYP. ALL PENETRATIONS.
9. 6" PVC DRAIN TO DAYLIGHT OR TO STORM SYSTEM.
10. ADJUSTABLE STANCHIONS (2 TOTAL).

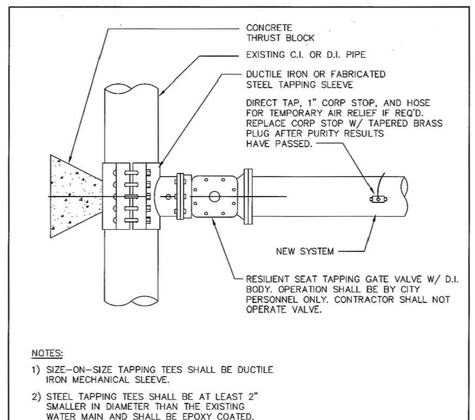
NOTES:
1) PROVIDE FLEXIBLE COUPLINGS ON BOTH INLET AND OUTLET PIPES OUTSIDE VAULT.
2) A CERTIFIED TEST REPORT SHALL BE SUPPLIED TO THE CITY FOR EACH BACKFLOW ASSEMBLY.
3) ALL PIPE SHALL BE DUCTILE IRON EXCEPT FOR BYPASS (BRASS OR TYPE K COPPER).

CITY OF DUPONT
3" & LARGER DOUBLE CHECK VALVE ASSEMBLY
APPROVED: _____ CITY OF DUPONT _____ DATE
DWG. NO. 8.4-8
DATE: 9/11 | DRWN: P.E. | CHKD: T.N. | SCALE: NO SCALE



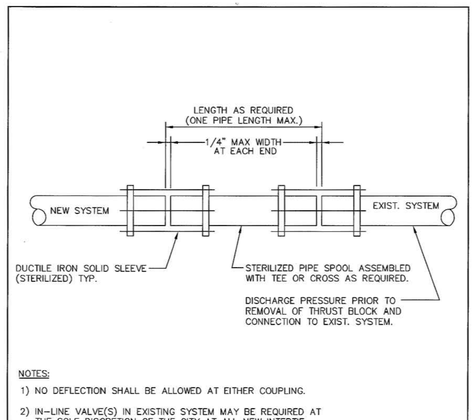
NOTES:
1) HYDRANT RUN PIPE SHALL BE MIN. 6" DIA.
2) MAXIMUM LENGTH OF 6" DIA. HYDRANT RUNS SHALL BE 50 FT. FOR HYDRANT RUNS GREATER THAN 6" DIA. OR LONGER THAN 50 FT., THE DEVELOPER'S ENGINEER SHALL SUBMIT FLOW CALCS. FOR REVIEW AND APPROVAL BY CITY.
3) ALL JOINTS ON HYDRANT RUN SHALL BE RESTRAINED PER CITY STDS.
4) INSTALL GUARD POSTS AS RQD. BY CITY.
5) PROVIDE MIN. 3 FT. CLR. AND LEVEL AREA AROUND HYDRANT.
6) ORIENT PUMPER PORT AS APPROVED BY CITY.
7) FOR ADDITIONAL REQUIREMENTS, SEE SECTION 8.6 OF THE PUBLIC WORKS STANDARDS.

CITY OF DUPONT
FIRE HYDRANT INSTALLATION
APPROVED: _____ CITY OF DUPONT _____ DATE
DWG. NO. 8.6-1
DATE: 9/11 | DRWN: J.C. | CHKD: D.J.M. | SCALE: NO SCALE



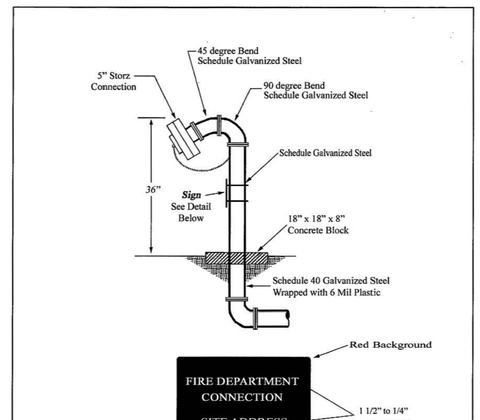
NOTES:
1) SIZE-ON-SIZE TAPPING TEES SHALL BE DUCTILE IRON MECHANICAL SLEEVE.
2) STEEL TAPPING TEES SHALL BE AT LEAST 2" SMALLER IN DIAMETER THAN THE EXISTING WATER MAIN AND SHALL BE EPOXY COATED.
3) TAPPING TEES SHALL BE PRESSURE TESTED TO 200 PSI
4) PLACE 2" PVC PIPE IN VALVE BOX TO INDICATE USE BY CITY STAFF ONLY
5) FOR ADDITIONAL REQUIREMENTS, SEE SECTION 8.10 OF THE PUBLIC WORKS STANDARDS.

CITY OF DUPONT
WET TAP WATER MAIN CONNECTION
APPROVED: _____ CITY OF DUPONT _____ DATE
DWG. NO. 8.10-1
DATE: 9/11 | DRWN: L.L. | CHKD: D.J.M. | SCALE: NO SCALE



NOTES:
1) NO DEFLECTION SHALL BE ALLOWED AT EITHER COUPLING.
2) IN-LINE VALVE(S) IN EXISTING SYSTEM MAY BE REQUIRED AT THE SOLE DISCRETION OF THE CITY AT ALL NEW INTERTIE LOCATIONS. VALVE(S) ARE NOT SHOWN ABOVE FOR CLARITY.
3) FOR ADDITIONAL REQUIREMENTS, SEE SECTION 8.10 OF THE PUBLIC WORKS STANDARDS.

CITY OF DUPONT
CUT IN WATER MAIN CONNECTION
APPROVED: _____ CITY OF DUPONT _____ DATE
DWG. NO. 8.10-2
DATE: 9/11 | DRWN: L.L. | CHKD: D.J.M. | SCALE: NO SCALE



CITY OF DUPONT
FIRE DEPARTMENT CONNECTION
APPROVED: _____ CITY OF DUPONT _____ DATE
DWG. NO. 11.3
DATE: 9/11 | DRWN: J.C. | CHKD: D.J.M. | SCALE: NO SCALE

Title: PRELIMINARY CONSTRUCTION NOTES AND DETAILS FOR DUPONT - WEST

For:
AVENUE 55, LLC
601 UNION STREET, SUITE 2930
SEATTLE, WA 98101
(206) 707-9696

DANIEL K. BALMELLI — STATE OF WASHINGTON — 25672 — REGISTERED PROFESSIONAL ENGINEER
05/30/2024

Scale: Horizontol N/A; Vertical N/A
Designed MAT | Drawn MAT | Checked DKB | Approved DKB | Date 05/30/24

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

JTOWNE Xref: ~~~~~
File:P:\18000s\18666\preliminary\18666-d.dwg Date/Time:3/28/2024 10:10 PM Scale:1 = 1

Job Number 18666
Sheet C13 of 13

Attachment 1oo

BARGHAUSEN

May 31, 2024

Barb Kincaid
City of DuPont
Department of Community Development
1700 Civic Drive
DuPont, WA 98327

RE: DuPont West
Response to May 10, 2024 Comment Letter from City of DuPont
for the DuPont West Project
City File Numbers: PLNG2022-031 and -032
Our Job No. 18666

Dear Ms. Kincaid:

We have revised the plans and technical documents for the above-referenced project to address the comments in your letter dated May 10, 2024. Enclosed are the following plans and documents for your review and approval:

1. One (1) each electronic file revised Architectural Site Plan
2. One (1) each electronic file revised Preliminary Civil Engineering Design Plans
3. One (1) each electronic file revised Preliminary Landscape and Irrigation Plan
4. One (1) each electronic file revised Noise Study Report

The following outline provides each of your comments in italics, along with a narrative response describing how each comment was addressed:

A. DMC 25.105 Critical Area

1. *There is a small area of Sequalitchew Creek Trail encroachment into the Sequalitchew Creek buffer where it is needed to connect to the existing trail, also located in the buffer. This encroachment may be allowed as an Exception to the requirements of DMC 25.105 Critical Areas.* ***The applicant shall submit an Exception Request in writing to the Director for approval of the portion of the trail that falls within the stream buffer in accordance with DMC 25.105.070(2). The Exception Request shall demonstrate that the trail location cannot be feasibly moved****. The Director may include additional mitigation for impact to the critical areas in accordance with DMS 25.105.*

   Response: The layout of the new trail has been revised so that the connection to the existing trail occurs outside the Sequalitchew Creek buffer. No work is proposed inside the creek buffer.

B. Noise

1. *The revised Noise Report has been reviewed by the City's consultant. There is one significant missing piece of information: the hourly distribution of trucks shown in Table 4 of the report. The report cites Table 3 of the Heath & Associates traffic study as the source of this data, but the traffic study only provides average weekday daily traffic and AM and PM peak hours, not hourly data****. Provide the source of the hourly percentage breakdown shown in Table 4.***

   Response: A revised noise study report addressing this item is included with this resubmittal.

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH KENT, WA 98032 P) 425-251-6222 F) 425-251-8782
BRANCH OFFICES: TUMWATER, WA KLAMATH FALLS, OR LONG BEACH, CA ROSEVILLE, CA SAN DIEGO, CA
barghausen.com

C. Landscaping

1. *DMC 25.090.030(2) requires that the interior of surface parking lots with 10 or more stalls be landscaped with at least one tree per six stalls. The trailer parking located south of the proposed building does not include any interior parking lot landscaping other than hydroseeding and is therefore not compliant. Staff interpretation is that this is a type of parking area and that it shall be landscaped in accordance with DMC 25.090.030(2).* ***Update the landscape plans to include interior parking lot landscaping for the proposed trailer parking stalls south of the proposed building.***

   Response: Revised landscaping plans are included with this resubmittal showing the required trees south of the proposed trailer parking.

D. Transportation

1. *The City's transportation consultant provides the following comment: Sheet C9 of the civil plans shows what appears to be at least a 20-foot offset from the existing westbound lane at the existing temporary cul-de-sac to the new pavement section serving the site****. Provide an appropriate transition between these two cross-sections with appropriate channelization (centerline and edge line) and possibly additional pavement to safely guide westbound motorists between the two sections.***

   Response: The proposed connection at the existing cul-de-sac has been revised to allow traffic to transition from the two lanes proposed on Sequalitchew road to the existing section with a median south of the development.

2. *We are in receipt of your email dated April 23, 2024, which provided an exhibit detailing truck turning movements from Sequalitchew Drive and Center Drive. We understand that the prohibition of truck movement on Center Drive will require a modification of the median. This City will review this matter under a separate permit and comments associated with the median are not addressed in this letter.*

   Response: Comment acknowledged. Modification of the median to accommodate truck turns will be handled under a separate permit.

E. Building Code

1. *Washington International Building Code Section 429.1 requires EV charging stations. We did not see any EV charging stations or their electrical systems on the plans. Revised the plans to include EV infrastructure.*

   Response: An updated architectural site plan is included with this resubmittal which indicates 15 parking stalls to be provided with EV charging stations.

We believe that the above responses, together with the enclosed revised plans and technical documents, to address the comments in your letter dated May 10, 2024. Please review and approve the enclosed at your earliest convenience. If you have questions or need additional information, please do not hesitate to contact me at this office. Thank you.

Sincerely,

Daniel K. Balmelli

Daniel K. Balmelli, P.E.
Executive Vice President

DKB/bd
18666c.015
enc: As noted
cc: Ben Varin, Avenue 55
Drew Zaborowski, Avenue 55
Brian Ludwig, Innova Architects
Josh Towne, Barghausen Consulting Engineers
Betsy Dyer, Barghausen Consulting Engineers

Attachment 2a

CITY OF DUPONT

Department of Community Development
1700 Civic Drive, DuPont, WA 98327
Telephone: (253) 964-8121
www.dupontwa.gov

February 17, 2023

Sent via email only to:

Dan Balmelli/Betsy Dyer
Barghausen Consulting Engineers
18215 – 72nd Ave South
Kent, WA 98032

Ben Varin, Avenue 55
601 Union Street, Suite 2930
Seattle, WA 98101

Project: DuPont 243
Subject: Notice of Complete Application, First Comment Letter and Request for Additional Information
City file number PLNG2022-031 and -032

Dear Mr. Balmelli, Ms. Dyer, and Mr. Varin,

On Nov. 21, 2022 the City received the following plans and documents as part of an application for Type III Site Plan Review and SEPA Environmental Review:

- Cover Letter dated Nov. 18, 2022
- Land Use Application Form signed Nov. 18, 2022
- SEPA Checklist dated Nov. 18, 2022
- Cultural Resources Addendum Memo dated Oct. 17, 2022
- Archaeological Survey, Testing and Monitoring Report dated April 14, 2011
- Authorization to Act as Agent signed October 25, 2022
- Civil Plans including Grading, TESC, Utilities and Road Details stamped Nov. 18, 2022
- Communications with LeMay for Dumpster Location dated Nov. 14, 2022
- 300-foot radius Map and Addresses
- Vicinity Map
- Geotechnical Report Addendum dated Nov. 8, 2022
- Geotechnical Report dated October 10, 2011
- Geotechnical Report Addendum dated May 11, 2018
- Tree Retention Plan, Landscape Plans and Irrigation Plans dated Nov. 18, 2022
- Pierce County Sewer Availability Letter dated March 28, 2018
- Building Elevations prepared by Innova dated Nov. 14, 2022
- Architectural Site Plan prepared by Innova dated Nov. 14, 2022
- Stormwater Site Plan dated Nov. 18, 2022
- Traffic Impact Analysis prepared by Heath & Associates dated October 2022
- Title Report dated October 11, 2022

- Tree Retention Plan Report prepared by WFCI dated Nov. 11, 2022

We subsequently received the following on December 8, 2022:

- Water Availability Form

We subsequently received the following on January 17, 2023:

- Pierce County Sewer Availability Letter dated December 20, 2022

A preapplication meeting was requested, payment received on December 12, 2022 and the preapplication meeting was held on January 17, 2023 as required per DMC 25.175.020(1), to review the proposal (PLNG2022-031 and -032). In lieu of providing written comments from that preapplication meeting, this letter includes pertinent comments as well as a request for additional information required to continue review of your application.

The project is now deemed complete for processing. We intend to issue a Notice of Application on February 23, 2023. **The site will need to be posted with a new public notice sign by that date**. **Please contact Janet Howald at (253) 912-5232 or jhowald@dupontwa.gov for more information on the posting requirements.**

Additional Information Required
The following additional information is required to continue our review of the proposal.

A. Outdated Submittal Items

1. The Title Report is required to be less than 30 days old at the time of application. **Submit a current title report.**

2. The Communications with LeMay for Dumpster Location dated Nov. 14, 2022, does not demonstrate that they have approved the location. **Provide the LeMay approval of the dumpster location.**

B. DMC 25.45 Performance Standards

1. The civil cover sheet and landscape plans describe the site as being 18.49 acres. The WFCI report describes the site as 19.38 acres. The 2022 recorded short plat describes Lot 1 as 17.79 acres, Lot 2 as 1.93 acres, which is 19.65 acres. **Please reconcile the property area and confirm the correct area.**

2. DMC 25.45.030 Provides the required performance standards:

   (a) A minimum 15-foot rear yard is required. The City interprets the rear yard to be the lot line opposite the front, so the west property line. There is a wall that appears to be greater than 6 feet in height proposed within the 15-foot setback. **The wall must be less than 6 feet in height when within the setback area. The proposal is currently non-compliant for rear setbacks**.

   (b) Outdoor storage (supplies, materials, or products not contained in a structure) shall not cover more than two percent of the total site area and shall be screened from streets and adjoining properties by a 100 percent sight obscuring wall or fence. The city interprets the trailer parking area as outdoor storage, which is therefore required to meet these size limitations and screening requirements. **Provide the area of the trailer parking demonstrating that it represents no more than two percent of the total site area and provide screening in the form of a screen wall. The exterior of the wall will also need landscaping to meet the City's blank wall requirements.**

(c) Trash enclosures shall be provided as required by Chapter 25.100 DMC. **The trash enclosure for Building B is located adjacent to Sequalitchew Creek Trail and needs to be relocated. See also Landscaping, below.**

(d) Noise levels shall not exceed the maximum allowed in Chapter 9.09 DMC (Sound and Vibration) for Class B (commercial) environmental designations. **A Noise Study will be required to demonstrate noise impacts to Sequalitchew Creek Trail are within permissible levels. Note that the city strongly prefers a site plan with the truck maneuver and dock locations on the north side to minimize noise impacts. Alternatively, a sound wall may be required to buffer noise impacts. See also, SEPA below.**

(e) Outdoor lighting shall be designed to minimize light escapement beyond the site. **Submit a photometrics plan for the site demonstrating compliance**. **See also SEPA, below**

C. Cultural, Historical and Archaeological Resources, DMC 25.80

3. Per DMC 25.80.020 and 030 the site of the Methodist/Episcopal Mission is a designated cultural resource site, and no structure, roads or utilities are permitted within 50 feet of the markers identifying cultural resource sites. The site plan indicates the marker will remain in its existing location with a 50-foot buffer. It appears irrigation is depicted within the 50-foot radius. **Revise the irrigation plan to remove irrigation facilities from within the 50-foot radius of the marker.**

D. Landscaping, DMC 25.90

4. Per DMC 25.90.030(1) requires street trees be planted within the right of way at a distance of 40 to 50 feet; be of the same species as others within the same streetscape and at least two inches caliper and minimum branch height of six feet. You are proposing Acer Rubrum/Armstrong Gold Maple for the street trees with a 2-inch caliper. This type of tree is prohibited as a street tree. **Revise the street tree type per the Tree Care Manual and of a type consistent with the trees planted within the existing Sequalitchew Drive right of way. Note, the City has recently listed all maple trees to the "prohibited" tree list.**

5. Per DMC 25.90.030(3)(b), trash receptacles are required to be screened from high-use areas. The receptacle located south of Building B is directly adjacent to Sequalitchew Creek Trail, a high-use area and no screening is provided. **The enclosure shall be moved to a lesser used/visible area. Depending on the location and its visibility to either public right of way, screening may be required along all sides of the enclosure.**

6. DMC 25.90.040 requires that the landscaping require minimal irrigation. **A statement is required as to the technique to conserve water and the amount of irrigation required.**

E. Parking, DMC 25.95

7. The proposal provides 199 vehicle parking spaces and 47 trailer parking spaces. A Parking Analysis is provided on the Architectural Site Plan that is based on building size. DMC 25.95.030 requires the parking quantity to be based on a range of 0.3 and 1.0 spaces per the number of workers at maximum shift. The City typically applies this standard to the entire building (i.e. not a separate/added requirement for office space) as it is assumed that warehouse type uses would contain some office space. You will be required to estimate the number of workers anticipated at maximum shift to demonstrate compliance with DMC 25.95.030. **Revise the parking analysis that is based on the parking requirements per DMC 25.95.030.** Note: the City does not include the trailer parking spaces in the total code required parking calculation.

8. Per DMC 25.95.040(5) the parking shall not be located in required front yards or within five feet of any property line. It appears that the parking area located east of Building B is within the 25-foot front setback area and is not compliant. **Revise the proposal to remove parking in the front setback area.**

F. Critical Areas, DMC 25.105

9. Confirm/ensure that all grading is located outside of the 100-foot Sequalitchew Creek buffer.

10. The proposal is located within an area of the City that is mapped by WDFW as containing several terrestrial state priority habitat and species. **The City will require verification of the presence of the priority habitats and species within and adjacent to the development area in accordance with DMC 25.105.050(2)(e). If nests are found, the proposal shall meet the recommendations provided by WDFW.**

G. Tree Retention, DMC 25.120

DMC 25.120 Tree Retention applies to all new development projects that require Site Plan Approval. You provided Tree Retention Plans and a Tree Protection Report/Plan prepared by WFCI that were reviewed.

11. Review of the WFCI Tree Report finds that trees were evaluated in the project and adjacent non-project area (Lot 3). The report states there are a total of 76 landmark trees *in the project area* and a total of 20 can be retained. The other 56 landmark trees are either unhealthy or located within the footprint of proposed buildings, roads, storm ponds, or parking lots. A total of 227 trees are noted as to be retained *in the project area*. The following additional information is needed within the WFCI report to complete Site Plan Review:
    (a) Table 1 provides a summary of trees in cover type 1 but does not provide a listing of trees that meet the definition of landmark trees, which are the tree types that are regulated per DMC 25.120.030. **Revise the table (or clarify) that the listed trees are only within the DuPont 243 West project area. Revise or provide an additional table that lists how many landmark OWOs and landmark non-oaks are within the project area**.

12. DMC 25.120.030(3) requires a minimum of 1.5 tees per acres to be retained, which is 37 trees. The landscape plans indicate that there are 770 trees within the project boundary and 397 trees will be removed, leaving 373 trees. The WFCI tree report provides that there are 682 healthy trees, which requires retention of 29 trees. The proposal will retain 225 trees, exceeding the minimum tree retention requirement. **Please reconcile the landscape plan and WFCI report so that the same statistics are provided.**

H. Transportation Concurrency

13. DMC Chapter 25.115 describes the compliance requirements of the State Growth Management Act (GMA) for consistency between City and county-wide planning policies under the GMA, specifically related to adequacy of transportation facilities and level of service standards for new development. **In your comment response letter, include a request to complete concurrency evaluation concurrent with the Site Plan Approval process**.

I. SEPA Requirements

The proposal will be subject to SEPA environmental review. **Please submit the following**:

1. Update the SEPA Checklist as follows:

(a) Effective January 20, 2023 there is a new WA State SEPA Checklist that needs to be used for the application. It can be located at this link:

SEPA document templates - Washington State Department of Ecology

(b) Section A.8, add the new studies that are required to be submitted and listed below.

(c) Section A.10, will a Forest Practices Permit be required for the proposal? If so, add to the list of permits.

(d) Update Section B.5.a, and 5.d with the findings of the Priority Habitat & Species Reconnaissance.

(e) Update Section B.7.b with the findings of the Noise Study.

2. As described above, update the Arborists Report meeting the requirements of DMC Chapter 25.120.

3. Verification of the presence of, and, if needed, mitigation for the protection of, Priority Habitats and Species per DMC 25.105.050(2)(e).

4. Provide a Photometric Analysis in compliance with DMC 25.45.030(15) demonstrating no light spill to the Sequalitchew Creek Trail.

5. Noise Study describing existing ambient noise and predicted noise impacts to the Sequalitchew Creek Trail (see previous SEPA MDNS for specifics).

6. Documentation from the Department of Ecology with guidance to what they will require regarding soil contamination. Alternatively, you may provide a letter from Ecology that states that Ecology will provide their comments and conditions as part of their SEPA environmental review process.

BUILDING DEPARTMENT COMMENTS. Contact Roy Shipman at (253) 912-5216 or rshipman@dupontwa.gov.

FIRE DEPARTMENT COMMENTS. Contact Mike Turner at (253) 666-2760 or mturner@dupontwa.gov.

ENGINEERING AND WATER DEPARTMENT COMMENTS. Contact Shukri at (253) 912.5393, or bkincaid@dupontwa.gov.

If you have any questions, please call me at 253-912-5393.

Sincerely,

Barb Kincaid, AICP
Director of Public Services
City of DuPont

Cc: File No. PLNG2022-031 and -032
Ben Varin, Avenue 55, 601 Union Street, Suite 2930, Seattle, WA 98101

Lisa Klein, AHBL, Inc. (representing the City of DuPont)
Ray Shipman, Building Department
Scott Hein, City of DuPont Public Works
Shukri Sharabi, DuPont City Engineer
Larry Clark, City of DuPont Public Works

Attachment 2b

CITY OF DUPONT

Department of Community Development
1700 Civic Drive, DuPont, WA 98327
Telephone: (253) 964-8121
www.dupontwa.gov

NOTICE OF APPLICATION
DuPont 243 Proposal

The City of DuPont has received permit applications for the DuPont 243 Proposal that may be of interest to you, and you are invited to comment on the proposal.

Project Description: Construct two office/warehouse buildings totaling approximately 268,380 square feet, to include grading, paved truck maneuvering and truck and vehicular parking areas, landscaping, water and sanitary sewer extensions, stormwater collection, and infiltration facility, extension of Sequalitchew Drive, relocation and reconstruction of the onsite portion of Sequalitchew Creek Trail and protection of an existing historical marker with a 50-foot buffer.

City File Nos.: PLNG2022-031(Site Plan Review); and PLNG2022-032 (SEPA)
Date of Submission: Nov. 21, 2022
Date of Complete Application: Dec. 19, 2022
Date of Notice of Application: Feb. 23, 2023
Comments Due: March 9, 2023
Project Location: 1700 Center Drive, DuPont, WA. Pierce County Tax Parcel No. 011926-6005 and 6006. Located in the NW ¼ of Scn 26, Twn 19N, Rge 1E, W.M.

Project Applicant:
Ben Varin
Avenue 55
601 Union Street, Suite 2930
Seattle, WA 98101

Project Representative:
Dan Balmelli
Barghausen Consulting Engineers
18215 – 72nd Ave South
Kent, WA 98032

City Permits, Approvals, Procedures: Type II Site Plan Review (PLNG2022-031), and SEPA Environmental Review (PLNG2022-032). Type III procedures (per DMC 25.175.010(4)) require a public hearing and final decision by the City's Hearing Examiner. Public notice of the hearing date will be provided separately, a hearing date has not been scheduled at this time. A SEPA Determination has not been made and, when issued, will include a comment and appeal period.

Other Potential Permits and Approvals: Building Permit, Grading Permit, Sewer Line Extension Permit (Pierce County), Sanitary Sewer Service Permit (Pierce County), NPDES Permit (Ecology) and potentially Forest Practices Permit.

Consistency Review: Pursuant to DMC 25.175.040, City staff will review the proposed project permit application for consistency with applicable regulations and the comprehensive plan by evaluating the following: (i) The type of land use permitted at the site, including uses that may be allowed if the criteria for their approval have been satisfied; (ii) The level of development, such as units per acre, density of residential development in urban growth areas, or other measures of density; (iii) Availability and adequacy of infrastructure and public facilities identified in the comprehensive plan; (iv) Whether the plan or development regulations provide for funding of these facilities as required by Chapter 36.70A RCW; and (v) The character of the proposed development, as authorized by development regulations, including Title 12, Buildings and Construction; Title 14, Streets, Sidewalks, Curbs, Driveways and Parking Strips; Title 21, Water & Sewer Utilities; Title 22,

Stormwater Utility; Title 23, Environment; and Title 25 Land Use Code. Based on the consistency evaluation, a recommendation on the proposal will be prepared for the City Hearing Examiner's consideration.

Submitted Studies: Cultural Resources Report, Building Elevations, Geotechnical Engineering Study, Letters of Sewer Availability, Preliminary Civil and Landscaping Plans, Preliminary Stormwater Management Report, SEPA Checklist, Transportation Impact Analysis, Tree Report, and Water Availability. Additional studies are required to evaluate noise, Priority Habitats and Species, and lighting impacts.

Public Comment: Copies of all application plans and documents may be viewed at City Hall at the location listed below or at the following website location: https://www.dupontwa.gov/697/DuPont-243. The public may comment on the proposal by submitting written comments to the City of DuPont by 5 p.m. March 9, 2023. They may be submitted via email to bkincaid@dupontwa.gov or mailed or dropped off to City Hall at the following address:

Barb Kincaid, AICP
Director of Public Services
City of DuPont
1700 Civic Drive
DuPont, WA 98327
(253) 912-5393 / bkincaid@dupontwa.gov

FILE NO.: PLNG2023-031 & 032
APPLICANT: Ben Varin
Avenue 55
REPRESENTATIVE: Dan Balmelli
Barghausen Consulting Engineers

DECLARATION OF POSTING
CITY HALL NOTICE BOARD

On the 23rd of February, 2023, the attached Notice of Application related to City of DuPont File No.s PLNG2023-031 & 032, DuPont 243 was posted on the City of DuPont public notice board.

I, Janet Howald hereby declare under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct this of 23rd of February, 2023 at DuPont, Washington.

Signed: Janet Howald

CITY OF DUPONT

Department of Community Development
1700 Civic Drive, DuPont, WA 98327
Telephone: (253) 964-8121
www.dupontwa.gov

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Avenue 55
601 Union Street, Suite 2930
Seattle, WA 98101

Project Representative:
Dan Balmelli
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18215 – 72nd Ave South
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Stormwater Utility; Title 23, Environment; and Title 25 Land Use Code. Based on the consistency evaluation, a recommendation on the proposal will be prepared for the City Hearing Examiner's consideration.

Submitted Studies: Cultural Resources Report, Building Elevations, Geotechnical Engineering Study, Letters of Sewer Availability, Preliminary Civil and Landscaping Plans, Preliminary Stormwater Management Report, SEPA Checklist, Transportation Impact Analysis, Tree Report, and Water Availability. Additional studies are required to evaluate noise, Priority Habitats and Species, and lighting impacts.

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Barb Kincaid, AICP
Director of Public Services
City of DuPont
1700 Civic Drive
DuPont, WA 98327
(253) 912-5393 / bkincaid@dupontwa.gov

Attachment 2c

Geralyn Reinart, P.E.
831 Sprague Street
Edmonds, WA. 98020
(425) 530-0064
Traffic & Transportation Engineering Services

MEMORANDUM

April 17, 2024

TO: Barbara Kincaid,
Community Development Director

FROM: Geralyn Reinart, P.E.

SUBJECT: DuPont 243, PLNG 2022-031 and -032;
Transportation Concurrency

I have received the '*Transportation Concurrency'* request dated March 31, 2023, item 'H.13.' from Barghausen Consulting Engineers for the proposed DuPont 243 development (a.k.a. DuPont Industrial) located on the southwesterly side of the future extension of Sequalitchew Drive west of Center Drive as required by *DMC 25.115*.

Based on the most recent Traffic Impact Analysis prepared by Heath and Associates dated October 9, 2023 and my review comments dated December 21, 2023, adequate capacity is (or will be) available on the major facilities in the vicinity (i.e., DuPont-Steilacoom Road and Center Drive) to support the additional trips associated with the level of development that would be generated by the project. All level of service standards will be met; as such, I recommend that the project be issued a 'certificate of concurrency', when appropriate.

Please let me know if you have any questions.

Attachment 1d

CITY OF DUPONT

Department of Community Development
1700 Civic Drive, DuPont, WA 98327
Telephone: (253) 964-8121
www.dupontwa.gov

SEPA ENVIRONMENTAL POLICY ACT
WITHDRAWAL AND ISSUANCE OF NEW
MITIGATED DETERMINATION OF NONSIGNIFICANCE
DuPont West (formerly DuPont 243)

City File Number: SEPA2022-032 SEPA)
Related File Numbers: PLNG2022-031 (Site Plan Review), PLNG 2018-008 (SEPA)
Public Comment Period: August 29 – September 12, 2024

Description of proposal: The proposal is to construct a 256,800 square foot office/warehouse building on approximately 19.65-acres of vacant land located on the west side of Sequalitchew Drive. The proposal includes grading, paved truck maneuvering, truck and vehicular parking, landscaping, water and sanitary sewer extensions, franchise utility improvements, and a stormwater collection and infiltration facility. The project proposes the extension of Sequalitchew Drive through dedication and construction of public right-of-way. Additionally, the proposal includes the relocation and reconstruction of a portion of the existing Sequalitchew Trail within a revised trail easement. The proposal will retain the existing Mission Marker as located in the northeastern portion of the site.

The property is known to contain contaminated soil above current MTCA Method A cleanup levels for unrestricted land use. It is subject to the terms of a Consent Decree between Washington State Dept. of Ecology and Weyerhaeuser Company and DuPont Company entered by Thurston County Superior Court on July 22, 1991 pertaining to cleanup of the contamination on the property. It is also subject to a Restrictive Covenant that is binding on all successors and limits the use of the property to industrial type uses.

Environmental Review History: SEPA and Land Use applications were previously submitted and processed through the City of Dupont for a similar project in 2018 (PLNG 2018-008 (SEPA), -009 (Type III Site Plan Review, -047 (Tree Modification)). A SEPA Mitigated Determination of Nonsignificance (MDNS) was issued for the project in February of 2019 and was subsequently appealed on issues relative to the relocation of the existing Mission Marker. The project has been revised to maintain the location of the existing Mission Marker and a short plat has been processed to address the location of the project relative to Sequalitchew Drive, a "main street". The original parcel has been segregated into three parcels, Lots 1 – 3, of which Lot 3 is not a part of this proposal. **Due to project changes and pursuant to WAC 197-11-340(3)(c), the City is withdrawing its February 2019 SEPA Determination and issuing this new SEPA MDNS**.

Project Location: 1700 Center Drive, Section 26, Township 19 North, Range 1 East, W.M, in the City of DuPont, Tax Parcel Nos. 011926-6005 and -6006.

Proponent: Ben Varin, Avenue 55
601 Union Street, Suite 2930
Seattle, WA 98101

Lead Agency: City of DuPont

Responsible Official: Barb Kincaid, AICP
Director of Public Services, City of DuPont

Contact Information: Barb Kincaid, City of DuPont | 1700 Civic Drive, DuPont, WA 98327 | 253-912-5393

The Responsible Official hereby makes the following findings and conclusions based on a review of the revised environmental checklist and attachments; comments received from City Departments and peer review consultants; public comments received on the land use application during the public comment period, other information on file with the City and the policies, plans and regulations designated by the City of DuPont as a basis for the exercise of substantive authority under RCW 43.21C.060.

The lead agency has determined that the requirements for environmental analysis and protection have been adequately addressed in the development regulations and comprehensive plan adopted under Chapter 36.70A RCW, and/or mitigating measures have been applied that ensure no significant adverse impacts will be created.

A. FINDINGS

This determination is based on the following findings and conclusions:

1. The site of the proposal is currently vacant land comprised of two tax parcels: 011926-6005 (Lot 1) and -6006 (Lot 2) that were created through a short plat in 2022 (recording no. 202203015001). The two parcels comprise 19.65 acres. Lot 1 contains a historical marker and a portion of the Sequalitchew Creek Trail. Lot 2 has a private access easement for the benefit of Lot 1. Lot 3 of the Short Plat is not a part of the proposal.

2. The city received numerous public comments during the public notice period for the project's land use application. Many of the comments are related to concerns for impacts to plants, animals, transportation, environmental health, noise, air, aesthetics, water, land use, and cultural resources and were, therefore reviewed and considered in the preparation of this SEPA Determination.

3. Earth – GeoEngineers has completed a Geotechnical Study dated 2011 and four (4) Addendums to the study through the course of project review. The site is generally flat with slopes greater than 40% along the south perimeter. The slopes are classified as a critical slope/geologic hazard area and require a 50-foot steep slope setback at the top of slope, which is provided on the plans. All work will be located outside of the steep slope buffer with the exception of a small area of the relocated Sequalitchew Creek Trail. In Addendum #4 the geotechnical engineer provides an opinion that the new trail encroachment poses a low risk to overall global slope stability.

   Soils are generally recessional glacial outwash deposits consisting of sand and gravel with varying amounts of silt and cobble. and there are no indications of unstable soils in the vicinity. Approximately 32,400 CY of cut, 24,600 CY of fill and removal of 6,500 CY of stripping material will be removed. If any fill is imported to the site, it shall be from an approved source and clean. Approximately 69% of the site will be impervious surface upon completion. A temporary erosion and sedimentation control (TESC) plan will be implemented during construction to reduce and control erosion impacts. Design and construction will be required to follow the recommendations of the geotechnical engineer.

4. Air – Air emissions will result from vehicles and dust generated during construction of the proposal. The City will require construction equipment be maintained and in good working condition. Watering down areas during construction will assist in controlling dust. Post construction emissions will be related to vehicular traffic entering and exiting the site.

5. Water – The property is adjacent to the north of Sequalitchew Creek, a fish-bearing stream. The proposed building, parking and access driveways, relocated trail, and grading limits are located outside of the City code-required 100-foot stream buffer. The required TESC plan and Construction

Stormwater Pollution Prevention Plan (SWPPP) will provide mitigation measures to ensure construction activities do not cause erosion impacts, including to the stream.

No groundwater will be withdrawn for the proposal and no waste materials will be discharged to groundwater. The geotechnical report describes that 22 test pits were excavated at depths between 8 and 11 feet below surrounding grade (BGS). Groundwater was observed in one test pit at a depth of about 8 feet BGS at the time of exploration. Groundwater conditions should be expected to vary as a result of season, precipitation and other factors. The report states it expects groundwater to be below the depths of the test pit explorations. They do not expect groundwater to be a major factor during shallow excavations and earthwork. If shallow perched groundwater is encountered, it can typically be handled with sumps, pumps and/or diversion ditches. The contractor shall be made responsible for controlling and collecting groundwater encountered.

A Stormwater Site Plan report was prepared dated November 2023. Stormwater runoff will be generated by rainfall from building roof tops and pavement areas and conveyed through catch basins and storm pipe. The stormwater runoff will be infiltrated onsite in a new infiltration pond and water quality treatment provided by three modular wetland systems. In addition, a separate infiltration gallery will serve the new public road on Lot 2 (Sequalitchew Drive). The storm drainage system will be designed and constructed per City of DuPont standards and in accordance with the requirements of the 2019 Ecology Stormwater Manual. Specific Best Management Practices for erosion control are included as Mitigation Measures.

6. Plants – A Tree Retention Plan was prepared by Washington Forestry Consultants (WFC) dated March 2024 that describes the existing trees in detail and their locations. A Landscape Plan was prepared by Barghausen Consulting Engineers dated March 27, 2024. The property contains grass, shrubs, and deciduous and evergreen trees, including significant 607 healthy significant trees and 75 Landmark trees. The reports and plans indicate that all vegetation within the grading limits will be removed for development of the proposal. The plan retains 211 trees, which is in excess of the city tree retention requirements.

   One significant Oregon white oak tree that is located within the future Sequalitchew Drive right of way will be removed, which is allowed by DMC 25.120.030(2) because the right of way is integral to the neighborhood and cannot easily be moved. The site will be replanted with new landscaping in the parking lot and the east and southeast portions of the site to screen the site parking and stormwater pond from the public right of way and trail.

   Tree protection measures are outlined in DuPont Municipal Code (DMC) 25.120.030(5) and the WFC Tree Retention Plan and are required to be implemented for the proposal. The measures are to be provided on the approved Landscaping and Grading Plans for the project at the time of site development permit approval.

   The proposed location and paving of the relocated Sequalitchew Creek Trail crosses the critical root zone (CRZ) of several trees, including one significant Douglas fir tree (Tree #33) that is proposed to be retained. The alignment follows the existing grade so little soil disturbance should occur. Root impacts could be reduced using root protection strategies such as structural soil under the pathway or installing a passive aeration under the path. Structural soils are soils that are specially designed to provide nutrients, space, and porosity to accommodate root growth while also allowing for compaction to support pavement without settling. This will protect the roots of the tree and allow for the pathway construction. According to the project arborist, the overall impact of the trail within the CRZ of the save trees is minimal compared to the entire root zone of the trees. If the trees are healthy, they will be able to tolerate some root impact.

The non-oak trees located in the relocated trail grading limits are not required to be retained by the city's Tree Retention code, however mitigation proposed by the applicant is to retain them with tree-specific measures, including construction observation by the arborist and three years of monitoring for tree health following construction. The recommendations of the arborist report for tree protection are included as Mitigation Measures.

7. Animals – Songbirds, deer and other animals common in urbanized forests are known to be present onsite. There are three bat species mapped on the Washington Dept. of Fish and Wildlife (PHS) maps. A Bat Habitat Reconnaissance was completed for the proposal by Soundview Consultants dated March 2023. The biologist did not observe any bat activity or evidence of roosting bat concentrations and confirmed with WDFW that there are no documented occurrences of any priority species on or within the vicinity. No impacts to the species are anticipated.

   The property is also located within the Pacific Flyway, a bird migration route. Perimeter landscaping will be provided, and vegetation retained where possible. The proposal is not anticipated to have any significant impacts on wildlife habitat, and therefore no mitigation measures are required.

8. Environmental Health – The site is the former location of the DuPont Powder Works Company and is located within the Asarco plume boundary and contains soils contaminated with arsenic and lead that are above the MTCA cleanup levels for unrestricted land use. The site has a Restrictive Covenant that was put into place pursuant to Pierce County Superior Court Consent Decree No. 03-2-10484-7 between Weyerhaeuser Company and El DuPont De Nemours and company, which is binding on all successors and limits the use of the property to industrial use. The landowner submitted a letter from the Attorney General of Washington dated Oct. 17, 2018, describing the restrictive covenants recorded on the property. It confirms the property may be developed and used only for industrial use as allowed under the City of DuPont zoning regulations and Comprehensive Land Use Plan and under MTCA; provided that the property shall not be developed and used for any of the following: residential uses, schools, daycares, parks, recreational uses, or any other use in which the likelihood of children having sustained access to soils can be reasonably anticipated. It is not clear if the required public access along the trail and to the historical marker complies with the Open Space Restrictive Covenant. The applicant shall provide the city with assurances that the trail use and public access to the historical monument can be accommodated in accordance the Consent Decree and Restrictive Covenant.

   Previous site soils investigations identified buried containers and anthropogenic material at the site. An Environmental Media Management Plan will be in place for the planned construction excavation work. Hazardous Waste Operations and Emergency Response (HAZWOPER)-trained personnel will be utilized when working around contaminated soil. Workers will follow a HAZWOPER-compliant health and safety plan (HASP) and wear the HASP-specified personal protective equipment for tasks performed in the vicinity of contaminated soil. Engineering controls will be implemented when practical to mitigate exposure risks to workers. Contaminated soil left onsite will be permanently capped beneath the buildings and parking areas and subject to an institutional control. The City will require approval of the construction activities from Dept. of Ecology prior to issuance of permits associated with ground disturbing activity.

9. Noise – A Noise Study was prepared by JGL Acoustics dated January 27, July 21, October 2023, and May 20, 2024. Each Noise Study and update were Peer Reviewed by Landau Associates. The applicant submitted a letter in response to Peer Review of the Noise Study on March 1, 2024, and a fourth/final revised Noise Study (Study) was provided dated May 20, 2024. In Landau's final peer review letter dated June 14, 2024, the conclusions of the Study were deemed adequate information to deem the Study as valid and acceptable.

On a long-term basis, noise will be generated by the project from vehicular and truck circulation onsite and to and from the site. The Study has shown that the noise will be negligible on all surrounding properties when evaluated against FTA criteria. The study has also shown that the operational noise of the proposal will meet the requirements of the DuPont Noise Ordinance during all hours of the day on all adjacent properties. The Study proposes additional noise mitigation measures to further reduce project noise levels offsite, which include the use of truck air brake release silencers and broadband backup alarms, which the city acknowledges will be difficult to enforce. Therefore, the city will require an Agreement that is recorded against the property requiring all future tenants to require all trucks entering and leaving the site to be equipped with air brake release silencers and broadband backup alarms. The retention of existing mature vegetation along the south perimeter, berming and additional plantings will also buffer noise impacts to some extent. In addition, the city will restrict late night truck movements.

On a short-term basis, noise from construction equipment would be audible from approximately 7 am to 6 pm, Monday through Friday as regulated by DuPont Municipal Code (DMC) Chapter 9.09. During the construction hours noise from construction work is exempt from the noise ordinance limitations.

10. Land Use – The site is currently vacant land. To the east is vacant land, further east is a multifamily use, the Creekside Apartments. To the north is undeveloped property that is part of an application for a gravel mine expansion, which is also zoned Manufacturing Research Park. To the south is Sequalitchew Creek trail and Sequalitchew Creek. South of Sequalitchew Creek is City Hall. The property is zoned Manufacturing Research Park. The property contains critical areas including geologic hazard areas which require a 50-foot steep slope buffer. A portion of the Sequalitchew Creek 100-foot buffer falls on the subject property, however no work is proposed within the buffer. According to the SEPA Checklist, 90 to 120 persons are anticipated to work at the completed development. The proposal is being evaluated for compliance with applicable city codes and regulations, therefore no mitigations are required.

11. Aesthetics – The building will be 45 feet in height and of concrete tilt-up construction. The applicant submitted a View Analysis that demonstrates that that views of the building will not be visible from the trail lower trail locations because the existing vegetation, new landscaping, and site topography all serve to mitigate views of the project from the trail. The proposal provides berming together with enhanced plantings to screen parking areas from the public right of way and the relocated Sequalitchew Creek Trail. Extension of the berm and landscaping an additional 55 feet to the west would further screen the view of the building and drive aisles from the trail.

12. Light and Glare – Building and site/parking lot lighting will be provided. Light and glare could be present in early morning and evening hours but is not anticipated to be a safety hazard or interfere with views. The photometric analysis prepared by Range Electric Company dated November 2023 indicates that light spill will be minimal to none at the property line and there will be no light spill to Sequalitchew Creek Trail. Updated photometric analysis and light fixture specifications shall be provided at the time of construction permit that demonstrate no light spill beyond the property boundaries, fixtures are full cut-off types with shields and lights are directed downward.

    Trucks and vehicle lights will be visible from Sequalitchew Drive to the adjacent apartment building. The street section adjacent to the apartment building is constructed to include a landscape strip and sidewalk. The landscape strip currently contains street trees spaced intermittently according to the City's Street tree spacing requirements. Additional infill plantings or other treatments are required to further mitigation light impacts from trucks and vehicles to the apartments.

13. Recreation – The Sequalitchew Creek Trail currently extends through the site (on private property) and outside of the existing trail easement. The trail will be relocated with the project and the easement

modified to correspond to the new location. The city will require temporary safety measures and restrictions on the use of the trail during relocation as needed for public safety purposes. The city will require the trail be relocated prior to the start of building construction so that the temporary construction-related limitations on the use of the trail will be minimized to the greatest extent possible. Where feasible, the trail reconstruction shall match the existing trail in regards to signage, width, and surfacing, except where the trail initially extends off Sequalitchew Drive in which it shall be widened to converge with the existing trail from City Hall. Directional signage will be required on Sequalitchew Drive at the intersection of Sequalitchew Drive and Center Drive.

14. Historic and Cultural Preservation – The property has historical significance and has been the subject of numerous archaeological and cultural resources studies due to the documented history of events and activities that occurred either on the site or nearby. A previous cultural resources investigation was conducted by Parus Consulting Inc. (PCI) in 2011. The current application submitted a Cultural Resources Addendum Memo prepared by Natural Investigations Company dated July 2023 and Addendum dated October 2023. Historical events that are known to have occurred either onsite or within the immediate vicinity that are listed in the 2011 PCI report include, among others:

    - Historic 1843 Fort Nisqually
    - Historic DuPont munitions plant, ca.1906
    - Historic Hudson's Bay house, ca. 1845-1869
    - Pre-Contact Nisqually Indian Burial Site
    - Historic 1840-1842 Methodist Episcopal Mission
    - Historic 9th U.S. Cavalry Bivouac, Camp Nisqually, 1904

    The subject property is the former location of a Methodist Episcopal Mission and the 9th U.S. Cavalry Bivouac. These sites were previously determined eligible for the National Register of Historic Places under Criterion A because of their associate with significant events in history, but there are no extant remnants of the sites on the property. PCI determined that no historic properties would be affected by development of the property and recommended the implementation of an Unanticipated Cultural Resources Discovery Plan. PCI's report was filed with Washington Dept. of Historic and Archaeologic Preservation (DAHP) and sent to the appropriate Tribes. Natural Investigations Company confirmed PCI's findings, and does not recommend any additional investigations, and determined that construction of the proposal would not affect any historic properties or properties that could be eligible for the Washington Heritage Register.

    A historic marker is located on the subject property marking the location of the Methodist Episcopal Mission. Under a previous development proposal, the applicant convened a stakeholder group of interested parties to discuss interest in permanent commemoration of the history onsite. That application was ultimately denied by Washington Superior Court which opined that City code did not allow for the historical marker to be moved.

    With the subject proposal, the marker is proposed to remain in place together with a 50-foot protective radius where, per DMC 25.80.030, no structures, roads or utilities are permitted. Access for the public to view the marker is provided via a pedestrian connection from Sequalitchew Drive and the project's parking lot via a concrete path. For ongoing preservation, the marker and its buffer will be dedicated to the City. The public parking space must be denoted on the plans.

    The City will require the addition of interpretive signage along the relocated Sequalitchew Creek Trail that describes and commemorates the site's unique history.

    The proposal entails new excavation of soil; therefore it is required to adhere to the requirements of the 1989 Memorandum of Agreement for the discovery of cultural and historic resources, which requires

monitoring during construction and procedural requirements should artifacts be found. The Agreement also requires notification of the construction activities in advance to the Nisqually Tribe so that they may be present to observe. With the implementation of these measures and the protection of the Methodist Episcopal Mission marker, development of the property would not affect any historic properties.

15. Transportation – A Traffic Impact Analysis was prepared by Heath & Associates dated October 9, 2023, which was reviewed by the City's traffic consultant. The proposal will dedicate right of way and construct partial street improvements (two travel lanes plus the eastern bike lane, curb, gutter and sidewalk) for Sequalitchew Drive, which will be located on the existing Lot 2 of the Short Plat. The remaining portion of the roadway will be completed upon development of the adjacent lot to the east (Lot 3 of Short Plat).

    The proposal will be accessed via the construction of a driveway off Sequalitchew Drive that will extend through Lot 2 via a private access easement. The proposal will generate approximately 444 daily trips, with 54 during the AM peak hour (7:00 to 9:00 AM) and 57 during the PM peak hour (4:00 to 6:00 PM). It is estimated that at 5 AM (3 in/2 out) and 8 PM (4 in/4 out) peak hour trips will be truck trips. The trip generation estimates were derived from the 11th Edition of the ITE *Trip Generation* Manual using the assumed Warehousing land use type (LUC 150). The results of the analyses indicate that all affected intersections should operate at an acceptable level of service upon completion of the project. A user has not been identified at this time, therefore if any user should propose a use type that is different from a Warehouse land use type, as defined by the ITE manual, additional transportation study and if needed potential mitigations will be required.

    The City will require an autoturn analysis of the intersection of Center Drive and Sequalitchew Drive and improvements to accommodate truck turning movements as needed. (Mitigation Measure #33)

    The City will require signage at the exit of Sequalitchew Drive to Center Drive indicating left turn only for exiting truck traffic.

    Sequalitchew Drive will eventually carry a significant amount of traffic when the remainder of Sequalitchew Village to the north is developed. An exclusive left-turn lane on Sequalitchew Drive at the site access shall be constructed to serve entering vehicles as part of the street construction for this project.

    A pedestrian crossing at Sequalitchew Drive is needed to get to the Sequalitchew Creek Trail and historical marker from the east side of Sequalitchew Drive to the west side. The location shall be proposed by the applicant at the time of site development permit and shall demonstrate adequate sight distance. A rapid flashing beacon shall be provided at both sides of the crossing.

    A haul route plan for clearing and grading and a Construction Transportation Management Plan shall be approved by the City. The Construction Transportation Management Plan shall demonstrate that construction activities will not impact Sequalitchew Drive, Center Drive, or access to Creekside Apartments

16. Public Services – The proposed development will need public services and all utilities are available to serve the proposal. The development will be required to pay fire impact fees, sewer, stormwater and water system development charges, and install new fire hydrants. These are code requirements; therefore mitigation measures are not needed.

B. MITIGATION MEASURES

The following mitigation measures are required:

Earth Mitigation

1. No disturbance or grading activity shall occur in the stream buffer, with the exception of the installation of required trail signage.

2. Any fill that is imported to the site shall be from an approved source and shall be clean structural fill.

3. The project design and construction shall comply with the recommendations of the Geotechnical Engineer as described in the October 2011 Geotechnical Report and Addendums and as subsequently updated. The final report shall comply with the City's current stormwater manual and update any stormwater-related compliance measures.

Air Mitigation

4. Construction equipment shall be maintained to meet emission standards and turned off when not in use to limit emissions caused by idling and unnecessary noise.

5. Best Management Practices to minimize dust during construction shall be used, including temporary paving of certain roads, street sweeping, and watering the site as needed.

6. Obtain permit approval from the Puget Sound Clean Air Agency (if required).

Surface and Groundwater Mitigation

7. If during earthwork or excavation groundwater is discovered, the contractor shall be responsible for controlling and collecting groundwater encountered. Typical BMPs for handling groundwater during construction include the use of sumps, pumps and/or diversion ditches.

8. A temporary erosion and sedimentation control plan (TESC) and Stormwater Pollution Control Plan (SWPPP) shall be prepared in accordance with the City's current stormwater manual to reduce and control construction-related stormwater impacts.

9. The project will be required to obtain a Construction General Permit (CSWGP) from the Washington State Department of Ecology. When applying for coverage under the CSWGP, check the appropriate boxes for known contamination of soil on the Notice of Intent (CSWGP application) and provide Ecology with any additional required information. The contractor shall provide a Certified Erosion and Sediment Control Lead (CESCL) for the duration of the CSWGP and submit monthly construction reports to the City.

10. The following best management practices are required to minimize development impacts to Sequalitchew Creek and shall be provided (but not limited to) in the TESC and final design:

    a. All new, untreated runoff shall be routed away from the stream and slopes.
    b. Channelized flow from landscaping shall be prevented from entering the stream buffer.
    c. New runoff from impervious surfaces and new landscaping shall be infiltrated, treated, detained and/or dispersed. No runoff from the trail may cause erosion.
    d. Dust control measures shall be in place prior to construction.

Plants/Tree Protection Mitigation

11. Retained trees are to be protected following the measures outlined in the WFC Tree Protection Plan dated March 2024. The measures shall be included in the construction documents and implemented with the proposal. They include:

    a. Trees to be saved must be protected during construction by a six-foot-high temporary chain link fence (Attachment #4 of the WFC Plan), located around the edge of the CRZ. Placards shall be placed on the fencing every 50 feet indicating the words, "NO TRESPASSING – Protected Trees". The individual critical root zone (CRZ) is a radius of one foot for each one inch of DBH (6 feet minimum), unless otherwise delineated by WFCI. The fences should be placed around the edge of the CRZ. The fence should be erected after logging but prior to the start of clearing. The fences should be maintained until the start of the landscape installation.
    b. There should be no equipment activity, including rototilling within the CRZ of trees to be saved. No irrigation lines, trenches, or other utilities should be installed within the CRZ. Cuts or fills should impact no more than 25% of a tree's root system. If topsoil is added to the root zone of a protected tree, the depth should not exceed 2 inches of sandy loam or loamy fine sand topsoil and should not cover more than 25% of the root system.
    c. If roots are encountered outside the CRZ during construction, they should be cut cleanly with a saw and covered immediately with moist soil. Noxious vegetation within the CRZ should be removed by hand. If a proposed save tree must be impacted by grading or fills, then the tree should be re-evaluated by WFCI to determine if the tree can be saved with mitigating measures, or if the tree should be removed.
    d. No significant Oregon white oak trees shall be impacted during construction with the exception of oak tree #9 located within the Sequalitchew Drive right of way. This includes no clearing, grading, trenching or other work inside the CRZ.
    e. Stumps located within 10 feet of trees to be saved should not be excavated where possible. If removal is necessary for the project, these stumps shall be individually evaluated by WFCI to determine the method of removal.
    f. A Certified Arborist shall be onsite during site work in the area of trees to be retained. The project arborist shall provide a closing report describing the construction observation, impacts to the critical root zone of any trees intended to be retained, and procedural steps for ongoing monitoring and management of the impacted trees for overall health and retention.
    g. The health of the trees to be saved shall be monitored for three years after the path has been constructed. The city will require a monitoring and maintenance bond be in place for the three-year period.

<u>Environmental Health Mitigation</u>

12. The Owner must maintain and develop the Property consistent with the Restrictive Covenant(s). It is not clear if the required public access along the trail and to the historical marker complies with the Open Space Restrictive Covenant. The applicant shall provide the city with assurances that the trail use and public access to the historical monument can be accommodated in accordance the Consent Decree and Restrictive Covenant.

13. An Environmental Media Management Plan is required to be in place for the planned construction excavation work. Hazardous Waste Operations and Emergency Response (HAZWOPER)-trained personnel shall be utilized when working around contaminated soil. Workers will follow a HAZWOPER-compliant health and safety plan (HASP) and wear the HASP-specified personal protective equipment for tasks performed in the vicinity of contaminated soil.

14. Extra precaution shall be taken to avoid escaping dust, soil erosion, and runoff during grading and site construction. Contaminated soils generated during site construction shall be managed and disposed of in accordance with state and local regulations, including the Solid Waste Handling Standards regulations

(Chapter 173-350) and with the terms of the Restrictive Covenant dated July 24, 2006 and recorded on July 25, 2006.

Noise Mitigation

15. An Agreement shall be drafted by the applicant for city review and approval that stipulates that all trucks entering and leaving the site be equipped with air brake release silencers and broadband backup alarms. The Agreement shall be recorded with Pierce County and enforceable by the city.

16. Operational mitigation requirements include keeping bay doors closed and requiring all industrial activities that generate noise to occur inside the building.

17. Noise at the property line shall not exceed the existing ambient noise levels post development. Within six months of occupancy, the noise levels shall be retested from the three points that were tested for existing ambient noise levels shown in Figure 2 of the Noise Study. If needed, additional sound mitigation measures may be required as recommended and approved by the city.

Aesthetics Mitigation

18. To further screen the view of the building and drive aisles from the proposed trail relocation, the proposed landscaped berm located north of the stormwater pond shall be extended an additional 55 feet to the west to the property line (where the proposed trail relocation begins on the property).

Light Mitigation

19. No light spill shall be allowed to the trail or outside of the development footprint, other than spill caused by street lighting on Sequalitchew Drive. Lights shall be LED and fixtures shall have full cut-offs and shields and be directed downward and inward to the site development. An updated photometric analysis shall be provided with the site development permit application demonstrating that no light spill occurs outside of the property.

20. Additional infill plantings or other treatments are required along the planter strip on Sequalitchew Drive adjacent to the Creekside Apartments to mitigate light impacts from trucks and vehicles to the apartments. At the time of site development permit, the applicant shall provide a plan for this area for review and approval by the City.

Recreation Mitigation

21. During construction of the re-aligned trail, the existing trail will be open to public use. The portions under construction will be fenced off for safety purposes prior to opening. It is anticipated that final connection of the trail may require closure for a small period of time. The City shall be notified and approve of any trail closure with at least 24 hours of notice.

22. The relocated Sequalitchew Creek Trail shall match, where feasible, the width and surfacing of the existing paved section of the trail. The trail details shall be provided for City approval at the time of submittal of site development permit.

23. Where the relocated trail initially extends off Sequalitchew Drive, the trail shall be widened at its connection point with the sidewalk in Sequalitchew Drive to incorporate the remnant area to the south so that the existing trail from City Hall will converge and match the alignment.

24. Signage shall be placed on either side of the relocated trail denoting users to stay on the trail similar to the existing signs located along the trail. They shall be provided at intervals to be approved by the City.

The signage details shall be submitted to the City for review and approval prior to issuance of the site development permit.

25. Directional signage for the trail shall be provided on Sequalitchew Drive at Center Drive intersection and at the point where the trail extends from the public road. The signs and their locations shall be reviewed and approved by the Public Works Director prior to issuance of site development permit.

Historic and Cultural Resources Mitigation

26. The area comprising the historical monument and its 50-foot buffer shall be dedicated to the City for ongoing preservation prior to certificate of occupancy.

27. The trail provided around the marker shall be revised to connect to the vehicle parking area rather than the truck drive aisle.

28. At least two of the onsite parking spaces located east of the historical marker shall be allowed for public use for access to the marker, with one of the spaces meeting ADA requirements. These parking spaces shall be denoted on the plans.

29. A permanent interpretive sign shall be installed along the relocated Sequalitchew Creek trail describing the unique history of the area. The sign details shall be approved by the city and the DuPont Historical Society. A sign permit will be required.

30. The Applicant shall fully implement the Memorandum of Agreement dated August 7, 1989, between Weyerhaeuser Real Estate Company (WRECO), the City of DuPont and the Washington State Historic Preservation Officer regarding the discovery of cultural resources within the City of DuPont, customary professional standards for archaeology, and applicable state and federal laws.

    a. The Applicant shall provide a professional archaeologist to monitor onsite soil disturbance activities.

    b. The project Archaeologist shall notify and allow a Nisqually Indian Tribe representative to be present during soil disturbance activities.

    c. The Project Archaeologist shall notify the Nisqually Indian Tribe representative if Native American cultural resources are discovered during any soil disturbance activities. Construction activities that might disturb or affect such resources are to stop until the Tribal representative has had the opportunity to examine the find.

    d. Native American artifacts recovered during construction activities shall be donated to the Nisqually Indian Tribe. Hudson's Bay Company-era artifacts should be donated to the Fort Nisqually Living History Museum, located in the City of Tacoma's Point Defiance Park. DuPont-era artifacts should be donated to the DuPont Historical Museum.

    e. The archaeologist shall forward a closing report to the City of DuPont and the Nisqually Indian Tribe. The report shall discuss contact with the Nisqually Indian Tribe, implemented procedures and observed conditions and be submitted prior to issuance of any permanent Certificate of Occupancy for the project.

31. A note shall be placed on the civil plans informing the contractor that construction activities are subject to the Unanticipated Cultural Resources Discovery Plan, Appendix E, of the Cultural Resources Report prepared by Parus Consulting dated April 14, 2011.

Transportation Mitigation

32. The submitted traffic study was prepared using an assumption of Warehousing LUC 150 from the 11th Edition of the ITE Manual. A user has not been identified at this time, however, therefore if any user should propose a use type that is different from a Warehouse land use type, as defined by the ITE manual, additional transportation study and if needed, potential mitigations may be required.

33. An Autoturn Analysis shall be provided demonstrating that truck turning movements entering and exiting Sequalitchew Drive can be accommodated without impacting the Center Drive or Sequalitchew Drive center medians. If impacts are unavoidable, revisions to the median(s) are required to accommodate truck turning radius.

34. Signage shall be provided at the intersection of Sequalitchew Drive and Center Drive restricting truck traffic exiting Sequalitchew Drive from turning right onto Center Drive (left turn only). The signage and locations shall be reviewed and approved by the Director prior to issuance of site development permit.

35. An exclusive left-turn lane shall be provided on Sequalitchew Drive at the site driveway to serve entering vehicles. The location and design shall be reviewed and approved by the Director.

36. A pedestrian crossing of Sequalitchew Drive shall be provided to include trail signs and markings. The location and design shall be reviewed and approved by the Director prior to issuance of site development permit and shall demonstrate adequate sight distance. A rapid flashing beacon shall be provided at both sides of the crossing.

37. A haul route plan for the clearing and grading shall be approved by the City prior to issuance of construction permits.

38. Construction may not impact access to the Creekside Apartments. A Construction Transportation Management Plan shall be prepared for city review that demonstrates that construction activities will not impact Sequalitchew Drive or Center Drive.

CONCLUSIONS OF THE RESPONSIBLE OFFICIAL: The Responsible Official has determined, with the mitigation measures listed above, that the proposal will not have a probable significant adverse impact on the environment, and an Environmental Impact Statement is not required under RCW 43.21c.030(2)(c). The mitigation measures described are recommended as conditions of project approval.

PUBLIC COMMENT: Copies of all application plans and documents may be viewed at City Hall at the location listed below or at the following website location: https://www.dupontwa.gov/697/DuPont-243. The public may comment on the proposal by submitting written comments to the City of DuPont by 5 p.m. September 12, 2024. They may be submitted via email to bkincaid@dupontwa.gov or mailed or dropped off to City Hall at the above address.

APPEAL PERIOD: Consistent with DMC 25.175.060(4) and WAC 197-11-680, this Determination may be appealed to the City hearing examiner. Pursuant to DMC 25.175.060(3), only parties of record may file an administrative appeal. **Per DMC 23.01.210(b)(1)(C), appeals must be filed within 14 days after the conclusion of the comment period (no later than 5:00 pm on September 26, 2024)**. Instructions for filing an appeal are found in DMC 25.175.060(4). Appeals shall be in writing, be accompanied by the required appeal fee, and contain the information detailed in DMC 25.175.060(4) (d). You should be prepared to make specific factual objections. Contact Barb Kincaid at the City to read or ask about the procedures for SEPA appeals.

Signature: _____ 8/29/2024
SEPA Responsible Official Date
Barb Kincaid, AICP
Director of Public Services
City of DuPont

Issue Date: August 29, 2024
End of Public Comment Period: September 12, 2024

FILE NO.: SEPA2022-032
APPLICANT: Ben Varin, Avenue 55
LEAD AGENCY/CITY REPRESENTATIVE: Barb Kincaid
Director of Public Services

DECLARATION OF POSTING
CITY HALL NOTICE BOARD

On the 29th of August 2024, the attached Notice of SEPA MDNS, DuPont West (formerly DuPont 243) City of DuPont File No. SEPA2022-032, related to PLNG2022-031, was posted on the City of DuPont public notice board.

I, Janet Howald hereby declare under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct this of 29th of August, 2024 at DuPont, Washington.

Signed: Janet Howald

SEPA ENVIRONMENTAL POLICY ACT
WITHDRAWAL AND ISSUANCE OF NEW
MITIGATED DETERMINATION OF NONSIGNIFICANCE
DuPont West (formerly DuPont 243)

City File Number: SEPA2022-032 SEPA)
Related File Numbers: PLNG2022-031 (Site Plan Review), PLNG 2018-008 (SEPA)
Public Comment Period: August 29 – September 12, 2024

Description of proposal: The proposal is to construct a 256,800 square foot office/warehouse building on approximately 19.65-acres of vacant land located on the west side of Sequalitchew Drive. The proposal includes grading, paved truck maneuvering, truck and vehicular parking, landscaping, water and sanitary sewer extensions, franchise utility improvements, and a stormwater collection and infiltration facility. The project proposes the extension of Sequalitchew Drive through dedication and construction of public right-of-way. Additionally, the proposal includes the relocation and reconstruction of a portion of the existing Sequalitchew Trail within a revised trail easement. The proposal will retain the existing Mission Marker as located in the northeastern portion of the site. The property is known to contain contaminated soil above current MTCA Method A cleanup levels for unrestricted land use. It is subject to the terms of a Consent Decree between Washington State Dept. of Ecology and Weyerhaeuser Company and DuPont Company entered by Thurston County Superior Court on July 22, 1991 pertaining to cleanup of the contamination on the property. It is also subject to a Restrictive Covenant that is binding on all successors and limits the use of the property to industrial type uses.

Environmental Review History: SEPA and Land Use applications were previously submitted and processed through the City of Dupont for a similar project in 2018 (PLNG 2018-008 (SEPA), -009 (Type III Site Plan Review, -047 (Tree Modification)). A SEPA Mitigated Determination of Nonsignificance (MDNS) was issued for the project in February of 2019 and was subsequently appealed on issues relative to the relocation of the existing Mission Marker. The project has been revised to maintain the location of the existing Mission Marker and a short plat has been processed to address the location of the project relative to Sequalitchew Drive, a "main street". The original parcel has been segregated into three parcels, Lots 1 – 3, of which Lot 3 is not a part of this proposal. **Due to project changes and pursuant to WAC 197-11-340(3)(c), the City is withdrawing its February 2019 SEPA Determination and issuing this new SEPA MDNS**.

Project Location: 1700 Center Drive, Section 26, Township 19 North, Range 1 East, W.M, in the City of DuPont, Tax Parcel Nos. 011926-6005 and -6006.

Proponent: Ben Varin, Avenue 55,601 Union Street, Suite 2930, Seattle, WA 98101

Lead Agency: City of DuPont

Responsible Official: Barb Kincaid, Director of Public Services, City of DuPont

Contact Info: Barb Kincaid, City of DuPont | 1700 Civic Drive, DuPont, WA 98327 | 253-912-5393

The Responsible Official has made findings and conclusions based on a review of the revised environmental checklist and attachments; comments received from City Departments and peer review consultants; public comments received on the land use application during the public comment period, other information on file with the City and the policies, plans and regulations designated by the City of DuPont as a basis for the exercise of substantive authority under RCW 43.21C.060.

CONCLUSIONS OF THE RESPONSIBLE OFFICIAL: The Responsible Official has determined, with the mitigation measures provided, that the proposal will not have a probable significant adverse impact on the environment, and an Environmental Impact Statement is not required under RCW 43.21c.030(2)(c). The mitigation measures provided are recommended as conditions of project approval.

PUBLIC COMMENT: Copies of all application plans and documents, including a copy of the full MDNS, may be viewed at City Hall at the location listed below or at the following website location: https://www.dupontwa.gov/697/DuPont-243. The public may comment on the proposal by submitting

written comments to the City of DuPont by 5 p.m. Sept. 12, 2024. They may be submitted via email to bkincaid@dupontwa.gov or mailed or dropped off to City Hall at the above address.

APPEAL PERIOD: Consistent with DMC 25.175.060(4) and WAC 197-11-680, this Determination may be appealed to the City hearing examiner. Pursuant to DMC 25.175.060(3), only parties of record may file an administrative appeal. **Per DMC 23.01.210(b)(1)(C), appeals must be filed within 14 days after the conclusion of the comment period (no later than 5:00 pm on September 26, 2024)**. Instructions for filing an appeal are found in DMC 25.175.060(4). Appeals shall be in writing, be accompanied by the required appeal fee, and contain the information detailed in DMC 25.175.060(4) (d). You should be prepared to make specific factual objections. Contact Barb Kincaid at the City to read or ask about the procedures for SEPA appeals.

PUBLIC HEARING: A public hearing will be held on the Type III Site Plan Review application (PLNG2022-031). The hearing has been tentatively scheduled for October 9, 2024, at 3:00 pm at City Hall. An official public hearing notice will be issued no later than 15 days prior to the hearing.

From: Janet Howald
To: Barbara Kincaid; Lisa Klein
Subject: [EXTERNAL] FW: SEPA record published
Date: Thursday, August 29, 2024 7:56:12 AM

Good morning,

For your information.
Janet

Janet Howald
Administrative Specialist|Public Services Department
City of DuPont

Direct 253.912.5232
City Hall 253.964.8121
Jhowald@dupontwa.gov

From: NoReply@ecy.wa.gov <NoReply@ecy.wa.gov>
Sent: Thursday, August 29, 2024 7:17 AM
To: Janet Howald <JHowald@dupontwa.gov>
Subject: SEPA record published

The SEPA admin reviewed and published SEPA record number 202403769, "DuPont West (formerly DuPont 243)".
Lead Agency File Number: SEPA2022-032.
It will now be available to the public.

From: Marjorie Jordan-Sabo
Email: separegister@ecy.wa.gov
Phone number: (564) 669-3418

Attachment 2e

CITY OF DUPONT

Department of Community Development
1700 Civic Drive, DuPont, WA 98327
Telephone: (253) 964-8121
www.dupontwa.gov

Notice of Public Hearing
DuPont West (formerly DuPont 243)

City File Nos: PLNG2022-031 (Site Plan Review); PLNG2022-032 (SEPA)

Project Description: The proposal is to construct a 256,800 square foot office/warehouse building on approximately 19.65-acres of vacant land located on the west side of Sequalitchew Drive. The proposal includes grading, paved truck maneuvering, truck and vehicular parking, landscaping, water and sanitary sewer extensions, franchise utility improvements, and a stormwater collection and infiltration facility. The project proposes the extension of Sequalitchew Drive through dedication and construction of public right-of-way. Additionally, the proposal includes the relocation and reconstruction of a portion of the existing Sequalitchew Trail within a revised trail easement. The proposal will retain the existing Mission Marker as located in the northeastern portion of the site. The property is known to contain contaminated soil above current MTCA Method A cleanup levels for unrestricted land use. It is subject to the terms of a Consent Decree between Washington State Dept. of Ecology and Weyerhaeuser Company and DuPont Company entered by Thurston County Superior Court on July 22, 1991 pertaining to cleanup of the contamination on the property. It is also subject to a Restrictive Covenant that is binding on all successors and limits the use of the property to industrial type uses.

Project Location: 1700 Center Drive, Section 26, Township 19 North, Range 1 East, W.M, in the City of DuPont, Tax Parcel Nos. 011926-6005 and -6006

Public Hearing Date and Time: October 15, 2024 at 3:00 pm
Public Hearing Location: DuPont City Hall / Council Chambers
1700 Civic Drive
Dupont, WA 98327

Project Applicant:
Ben Varin
Avenue 55
601 Union Street, Suite 2930
Seattle, WA 98101

Project Representative:
Dan Balmelli / Betsy Dyer
Barghausen Consulting Engineers
18215 – 72nd Ave South
Kent, WA 98032
Phone: (425) 251-6222

A public hearing will be held with the City of DuPont Hearing Examiner on October 15, 2024 at 3:00 PM following the procedures outlined in DMC 25.175.050. Anyone who wishes to testify/comment on the proposal may do so in person or via the following ZOOM link: https://us02web.zoom. us/j/81555 752918?pwd=fDoZD 12WbbgTl2G4uYeA YAlaxcWsxh.1 or by dialing in to 1.253.205.0468; and entering the following Meeting ID when prompted: 815 5575 2918 and Passcode: 779495.

Public Comments: Anyone wishing to comment on the proposal may do so in writing by submitting written comments up to the date of the hearing (submit by 2:00 pm on October 15, 2024). The comments should be submitted either by email to Janet Howald at jhowald@dupontwa.gov or by dropping off at DuPont City Hall at the address above. For questions, contact Janet Howald at her email address or at (253) 912-5232.

Staff Report & Recommendations: A determination of consistency with DMC 25.150 Site Plan will be completed per DMC 25.175.040(1). The evaluation will be summarized in a staff report available for review

approximately seven (7) days prior to the public hearing. The application materials and staff report may be viewed on the City's website as follows:

- Application materials: https://www.dupontwa.gov/697/DuPont-243-DuPont-West
- Staff report: The staff report will be available for review approximately 7 days prior to the public hearing at the same link.

From: Janet Howald
To: Barbara Kincaid; Lisa Klein
Subject: [EXTERNAL] FW: Order modified confirmation IPL0196415
Date: Thursday, September 26, 2024 8:52:46 AM

Good morning,

Here is a modified ad that will run tomorrow.
Janet

From: The Legals Adportal <orders@mcclatchy.com>
Sent: Thursday, September 26, 2024 8:50 AM
To: Karri Muir <KMuir@dupontwa.gov>
Cc: Marci Miess <mmiess@dupontwa.gov>; Janet Howald <JHowald@dupontwa.gov>
Subject: Order modified confirmation IPL0196415

THANK YOU for your business.

This is your confirmation that your order has been changed. Below are the details of your transaction. Please save this confirmation for your records.

Job Details

Order Number:
IPL0196415
External Number:
596750
Classification:
Legals & Public Notices
Package:
TAC - Legal Ads
Order Cost:
$653.23

Account Details

CITY OF DUPONT
*LEGALS IP
1700 CIVIC DR
DUPONT, WA
98327-9603
253-964-8121
kmuir@dupontwa.gov
CITY OF DUPONT
*LEGALS

Schedule for ad number IPL01964150

Fri Sep 27, 2024
The News Tribune (Tacoma)
All Zones

Notice of Public Hearing
DuPont West (formerly DuPont 243)

City File Nos: PLNG2022-031 (Site Plan Review); PLNG2022-032 (SEPA)

Project Description: The proposal is to construct a 256,800 square foot office/warehouse building on approximately 19.65-acres of vacant land located on the west side of Sequalitchew Drive. The proposal includes grading, paved truck maneuvering, truck and vehicular parking, landscaping, water and sanitary sewer extensions, franchise utility improvements, and a stormwater collection and infiltration facility. The project proposes the extension of Sequalitchew Drive through dedication and construction of public right-of-way. Additionally, the proposal includes the relocation and reconstruction of a portion of the existing Sequalitchew Trail within a revised trail easement. The proposal will retain the existing Mission Marker as located in the northeastern portion of the site. The property is known to contain contaminated soil above current MTCA Method A cleanup levels for unrestricted land use. It is subject to the terms of a Consent Decree between Washington State Dept. of Ecology and Weyerhaeuser Company and DuPont Company entered by Thurston County Superior Court on July 22, 1991 pertaining to cleanup of the contamination on the property. It is also subject to a Restrictive Covenant that is binding on all successors and limits the use of the property to industrial type uses.

Project Location: 1700 Center Drive, Section 26, Township 19 North, Range 1 East, W.M, in the City of DuPont, Tax Parcel Nos. 011926-6005 and -6006

Public Hearing Date and Time: October 15, 2024, at 3:00 pm

Public Hearing Location: DuPont City Hall / Council Chambers, 1700 Civic Drive, Dupont, WA 98327

Project Applicant: Ben Varin, Avenue 55, 601 Union Street, Suite 2930, Seattle, WA 98101

Project Representative: Dan Balmelli / Betsy Dyer, Barghausen Consulting Engineers, 18215 – 72nd Ave South, Kent, WA 98032, Phone: (425) 251-6222

A public hearing will be held with the City of DuPont Hearing Examiner on October 15, 2024, at 3:00 pm following the procedures outlined in DMC 25.175.050. Anyone who wishes to testify/comment on the proposal may do so in person or via the following ZOOM link: https://us02web.zoom.us/j/81555752918?pwd=f-DoZD12WbbgTl2G4uYeAYAlaxcWsxh.1

or by dialing in to 1.253.205.0468; and entering the following Meeting ID when prompted: 815 5575 2918 and Passcode: 779495.

Public Comments: Anyone wishing to comment on the proposal may do so in writing by submitting written comments up to the date of the hearing (submit by 2:00 pm on October 15, 2024). The comments should be submitted either by email to Janet Howald at jhowald@dupontwa.gov or by dropping off at DuPont City Hall at the address above. For questions, contact Janet Howald at her email address or at (253) 912-5232.

Staff Report & Recommendations: A determination of consistency with DMC 25.150 Site Plan will be completed per DMC 25.175.040(1). The evaluation will be summarized in a staff report available for review approximately seven (7) days prior to the public hearing. The application materials and staff report may be viewed on the City's website as follows:

- Application materials: https://www.dupontwa.gov/697/DuPont-243-DuPont
- WestStaff report: The staff report will be available for review approximately 7 days prior to the public hearing at the same link.

IPL0196415
Sep 27 2024

FILE NO.: PLNG2022-031(Site Plan Review), PLNG2022-032(SEPA)
APPLICANT: Ben Varin
Avenue 55

DECLARATION OF POSTING
CITY HALL NOTICE BOARD

On the 27th of September 2024, the attached a Notice of Public Hearing Related to City of DuPont, DuPont West (formerly DuPont 243) File No.s PLNG2022-031, PLNG2022-032, was posted on the City of DuPont public notice board.

I, Janet Howald, hereby declare under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct this of 27th of September, 2024 at DuPont, Washington.

Signed: Janet Howald

Notice of Public Hearing
DuPont West (formerly DuPont 243)

City File Nos: PLNG2022-031 (Site Plan Review); PLNG2022-032 (SEPA)

Project Description: The proposal is to construct a 256,800 square foot office/warehouse building on approximately 19.65-acres of vacant land located on the west side of Sequalitchew Drive. The proposal includes grading, paved truck maneuvering, truck and vehicular parking, landscaping, water and sanitary sewer extensions, franchise utility improvements, and a stormwater collection and infiltration facility. The project proposes the extension of Sequalitchew Drive through dedication and construction of public right-of-way. Additionally, the proposal includes the relocation and reconstruction of a portion of the existing Sequalitchew Trail within a revised trail easement. The proposal will retain the existing Mission Marker as located in the northeastern portion of the site. The property is known to contain contaminated soil above current MTCA Method A cleanup levels for unrestricted land use. It is subject to the terms of a Consent Decree between Washington State Dept. of Ecology and Weyerhaeuser Company and DuPont Company entered by Thurston County Superior Court on July 22, 1991 pertaining to cleanup of the contamination on the property. It is also subject to a Restrictive Covenant that is binding on all successors and limits the use of the property to industrial type uses.

Project Location: 1700 Center Drive, Section 26, Township 19 North, Range 1 East, W.M, in the City of DuPont, Tax Parcel Nos. 011926-6005 and -6006

Public Hearing Date and Time: October 15, 2024, at 3:00 pm

Public Hearing Location: DuPont City Hall / Council Chambers, 1700 Civic Drive, Dupont, WA 98327

Project Applicant: Ben Varin, Avenue 55, 601 Union Street, Suite 2930, Seattle, WA 98101

Project Representative: Dan Balmelli / Betsy Dyer, Barghausen Consulting Engineers, 18215 – 72nd Ave South, Kent, WA 98032, Phone: (425) 251-6222

A public hearing will be held with the City of DuPont Hearing Examiner on October 15, 2024, at 3:00 pm following the procedures outlined in DMC 25.175.050. Anyone who wishes to testify/comment on the proposal may do so in person or via the following ZOOM link:
https://us02web.zoom.us/j/81555752918?pwd=fDoZD12WbbgTl2G4uYeAYAlaxcWsxh.1
or by dialing in to 1.253.205.0468; and entering the following Meeting ID when prompted: 815 5575 2918 and Passcode: 779495.

Public Comments: Anyone wishing to comment on the proposal may do so in writing by submitting written comments up to the date of the hearing (submit by 2:00 pm on October 15, 2024). The comments should be submitted either by email to Janet Howald at jhowald@dupontwa.gov or by dropping off at DuPont City Hall at the address above. For questions, contact Janet Howald at her email address or at (253) 912-5232.

Staff Report & Recommendations: A determination of consistency with DMC 25.150 Site Plan will be completed per DMC 25.175.040(1). The evaluation will be summarized in a staff report available for review approximately seven (7) days prior to the public hearing. The application materials and staff report may be viewed on the City's website as follows:

Application materials: https://www.dupontwa.gov/697/DuPont-243-DuPont-West

Staff report: The staff report will be available for review approximately 7 days prior to the public hearing at the same link.

FILE NO.: PLNG2022-031(Site Plan Review), PLNG2022-032(SEPA)
APPLICANT: Ben Varin
Avenue 55

DECLARATION OF MAILING NOTICE OF PUBLIC HEARING

On the 27th day of September 2024 the attached Notice of Public Hearing, related to DuPont West (formerly DuPont 243) File No.s PLNG2022-031 and PLNG2022-032, was mailed by the City to property owners within 300 feet of the property for the above-referenced application. The names of which were provided by the applicant.

I, Janet Howald, hereby declare under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct this 27th day of September, 2024 at DuPont, Washington.

Signed: Janet Howald

FILE NO.: PLNG2022-031(Site Plan Review), PLNG2022-032(SEPA)
APPLICANT: Ben Varin
Avenue 55

DECLARATION OF MAILING NOTICE OF PUBLIC HEARING

On the 27th day of September 2024 the attached Notice of Public Hearing, related to DuPont West (formerly DuPont 243) File No.s PLNG2022-031 and PLNG2022-032, was mailed by the City to those who submitted comments on the Notice of Application and/or the Environmental (SEPA) Determination for the above-referenced file numbers.

I, Janet Howald, hereby declare under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct this 27th day of September, 2024 at DuPont, Washington.

Signed: Janet Howald

FILE NO.: PLNG2022-031(Site Plan Review), PLNG2022-032(SEPA)
APPLICANT: Ben Varin
Avenue 55

DECLARATION OF EMAILING NOTICE OF PUBLIC HEARING

On the 27th day of September 2024 the attached Notice of Public Hearing, related to DuPont West (formerly DuPont 243) File No.s PLNG2022-031 and PLNG2022-032, was emailed by the City to those who submitted comments on the Notice of Application and/or the Environmental (SEPA) Determination for the above-referenced file numbers.

I, Janet Howald, hereby declare under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct this 27th day of September, 2024 at DuPont, Washington.

Signed: Janet Howald

CITY OF DUPONT

Department of Community Development
1700 Civic Drive, DuPont, WA 98327
Telephone: (253) 964-8121
www.dupontwa.gov

Notice of Public Hearing
DuPont West (formerly DuPont 243)

City File Nos: PLNG2022-031 (Site Plan Review); PLNG2022-032 (SEPA)

Project Description: The proposal is to construct a 256,800 square foot office/warehouse building on approximately 19.65-acres of vacant land located on the west side of Sequalitchew Drive. The proposal includes grading, paved truck maneuvering, truck and vehicular parking, landscaping, water and sanitary sewer extensions, franchise utility improvements, and a stormwater collection and infiltration facility. The project proposes the extension of Sequalitchew Drive through dedication and construction of public right-of-way. Additionally, the proposal includes the relocation and reconstruction of a portion of the existing Sequalitchew Trail within a revised trail easement. The proposal will retain the existing Mission Marker as located in the northeastern portion of the site. The property is known to contain contaminated soil above current MTCA Method A cleanup levels for unrestricted land use. It is subject to the terms of a Consent Decree between Washington State Dept. of Ecology and Weyerhaeuser Company and DuPont Company entered by Thurston County Superior Court on July 22, 1991 pertaining to cleanup of the contamination on the property. It is also subject to a Restrictive Covenant that is binding on all successors and limits the use of the property to industrial type uses.

Project Location: 1700 Center Drive, Section 26, Township 19 North, Range 1 East, W.M, in the City of DuPont, Tax Parcel Nos. 011926-6005 and -6006

Public Hearing Date and Time: October 15, 2024 at 3:00 pm
Public Hearing Location: DuPont City Hall / Council Chambers
1700 Civic Drive
Dupont, WA 98327

Project Applicant:
Ben Varin
Avenue 55
601 Union Street, Suite 2930
Seattle, WA 98101

Project Representative:
Dan Balmelli / Betsy Dyer
Barghausen Consulting Engineers
18215 – 72nd Ave South
Kent, WA 98032
Phone: (425) 251-6222

A public hearing will be held with the City of DuPont Hearing Examiner on October 15, 2024 at 3:00 pm following the procedures outlined in DMC 25.175.050. Anyone who wishes to testify/comment on the proposal may do so in person or via the following ZOOM link:
https://us02web.zoom.us/j/81555752918?pwd=fDoZD12WbbgTI2G4uYeAYAlaxcWsxh.1
or by dialing in to 1.253.205.0468; and entering the following Meeting ID when prompted: 815 5575 2918 and Passcode: 779495 .

Public Comments: Anyone wishing to comment on the proposal may do so in writing by submitting written comments up to the date of the hearing (submit by 2:00 pm on October 15, 2024). The comments should be submitted either by email to Janet Howald at jhowald@dupontwa.gov or by dropping off at DuPont City Hall at the address above. For questions, contact Janet Howald at her email address or at (253) 912-5232.

Staff Report & Recommendations: A determination of consistency with DMC 25.150 Site Plan will be completed per DMC 25.175.040(1). The evaluation will be summarized in a staff report available for review approximately seven (7) days prior to the public hearing. The application materials and staff report may be viewed on the City's website as follows:

- Application materials: https://www.dupontwa.gov/697/DuPont-243-DuPont-West
- Staff report: The staff report will be available for review approximately 7 days prior to the public hearing at the same link.

#18666

AFFIDAVIT OF POSTING

CITY OF DUPONT
1700 Civic Drive, DuPont, WA 98327
Telephone 253.964.8121
www.dupontwa.gov

Application #_____ and City File No. PLNG2022-031 AND 032

I, JEFF CURRIE applicant/applicant's agent for the above referenced project number, being duly sworn on oath, deposes and says: That on the 1ST day of OCTOBER, 2024 posted a notice, prominently displayed, at the site.

Site/Project Description: PARCEL NOS. 011926-6005 AND -6006 WEST SIDE OF SEQUALITCHEW DRIVE

Signed By

JEFF CURRIE
Print Name

BARGHAUSEN CONSULTING ENGINEERS
Company Name

Submit Form and Photos of Posting

Rev.2021

CITY OF DUPONT
Department of Community Development
1700 Civic Drive, DuPont, WA 98327
Telephone: (253) 964-8121
www.dupontwa.gov

Notice of Public Hearing
DuPont West (formerly DuPont 243)

City File Nos: PLNG2022-031 (Site Plan Review), PLNG2022-032 (SEPA)

Project Description: The proposal is to construct a 256,800 square foot office/warehouse building on approximately 19.65-acres of vacant land located on the west side of Sequalitchew Drive. The proposal includes grading, paved truck maneuvering, truck and vehicular parking, landscaping, water and sanitary sewer extensions, franchise utility improvements, and a stormwater collection and infiltration facility. The project proposes the extension of Sequalitchew Drive through dedication and construction of public right-of-way. Additionally, the proposal includes the relocation and reconstruction of a portion of the existing Sequalitchew Trail within a revised trail easement. The proposal will retain the existing Mission Marker as located in the northeastern portion of the site. The property is known to contain contaminated soil above current MTCA Method A cleanup levels for unrestricted land use. It is subject to the terms of a Consent Decree between Washington State Dept. of Ecology and Weyerhaeuser Company and DuPont Company entered by Thurston County Superior Court on July 22, 1991 pertaining to cleanup of the contamination on the property. It is also subject to a Restrictive Covenant that is binding on all successors and limits the use of the property to industrial type uses.

Project Location: 1700 Center Drive, Section 26, Township 19 North, Range 1 East, W.M. in the City of DuPont, Tax Parcel Nos. 011926-6005 and -6006

Public Hearing Date and Time: October 15, 2024 at 3:00 pm
Public Hearing Location: DuPont City Hall / Council Chambers
1700 Civic Drive
Dupont, WA 98327

Project Applicant:
Ben Varin
Avenue 55
601 Union Street, Suite 2930
Seattle, WA 98101

Project Representative:
Dan Balmelli / Betsy Dyer
Barghausen Consulting Engineers
18215 – 72nd Ave South
Kent, WA 98032
Phone: (425) 251-6222

A public hearing will be held with the City of DuPont Hearing Examiner on October 15, 2024 at 3:00 pm following the procedures outlined in DMC 25.175.050. Anyone who wishes to testify/comment on the proposal may do so in person or via the following ZOOM link:
https://us02web.zoom.us/j/81557518418?pwd=Sm201Z4Wbm1TQlAyNk4AUmxWeah3
or by dialing in to 1 253 205 0468; and entering the following Meeting ID when prompted: 815 5575 2918 and Passcode: 779495 .

Public Comments: Anyone wishing to comment on the proposal may do so in writing by submitting written comments up to the date of the hearing (submit by 2:00 pm on October 15, 2024). The comments should be submitted either by email to Janet Howald at jhowald@dupontwa.gov or by dropping off at DuPont City Hall at the address above. For questions, contact Janet Howald at her email address or at (253) 912-5232.

Staff Report & Recommendations: A determination of consistency with DMC 25.150 Site Plan will be completed per DMC 25.175.040(1). The evaluation will be summarized in a staff report available for review approximately seven (7) days prior to the public hearing. The application, review and staff report may be viewed on the City's website as follows:

- **Application materials:** https://www.dupontwa.gov/693/DuPont-243-DuPont-West
- **Staff report:** The staff report will be available for review approximately 7 days prior to the public hearing at the same link.

Site Posting

Notice along site frontage of Center Drive
SITE
DuPont
REFERENCE: Rand McNally (2017)

For: Dupont Industrial Warehouse
Dupont, Washington
Title: VICINITY MAP
Job Number: 18666
DATE: 12/19/17

BARGHAUSEN CONSULTING ENGINEERS
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425) 251-6222
(425) 251-8782
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

SEPA ENVIRONMENTAL POLICY ACT
WITHDRAWAL AND ISSUANCE OF NEW
MITIGATED DETERMINATION OF NONSIGNIFICANCE
DuPont West (formerly DuPont 243)

City File Number: SEPA2022-032 SEPA
Related File Numbers: PLNG2022-031 (Site Plan Review), PLNG 2018-008 (SEPA)
Public Comment Period: August 29 – Septe 024
Description of proposal: The proposal is to cons square foot office/warehouse building on approximately 19.65-acres of vacant land located e of Sequalitchew Drive. The proposal includes grading, paved truck maneuvering, truck ing, landscaping, water and sanitary sewer extensions, franchise utility improvements, stru collection and infiltration facility. The project proposes the extension of Sequalitchew Drive thro dedication and construction of public right-of-way. Additionally, the proposal includes the relocation and reconstruction of a portion of the existing Sequalitchew Trail within a revised trail easement. The proposal will retain the existing Mission Marker as located in the northeastern portion of the site. The property is known to contain contaminated soil above current MTCA Method A cleanup levels for unrestricted land use. It is subject to the terms of a Consent Decree between Washington State Dept. of Ecology and Weyerhaeuser Company and DuPont Company entered by Thurston County Superior Court on July 22, 1991 pertaining to cleanup of the contamination on the property. It is also subject to a Restrictive Covenant that is binding on all successors and limits the use of the property to industrial type uses.
Environmental Review History: SEPA and Land Use applications were previously submitted and processed through the City of Dupont for a similar project as 2018 (PLNG 2018-008 (SEPA). -009 (Type III Site Plan Review; -047 (Tree Modification)). A SEPA Mitigated Determination of Nonsignificance (MDNS) was issued for the project in February of 2019 and was subsequently appealed on issues relative to the relocation of the existing Mission Marker. The project has been revised to maintain the location of the existing Mission Marker and a short plat has been processed to address the location of the relative to Sequalitchew Drive, a "main street". The original parcel has been segregated into three parcels: Lots 1 – 3, of which Lot 3 is not a part of this proposal. **Due to project changes and pursuant to WAC 197-11-340(3)(c), the City is withdrawing its February 2019 SEPA Determination and issuing this new SEPA MDNS.**
Project Location: 1700 Center Drive, Section 26, Township 19 North, Range 1 East, W.M. in the City of DuPont, Tax Parcel Nos. 011926-6005 and -6006 Suite 2930, Seattle, WA 98101
Proponent: Ben Varin, Avenue 55,601 Union Street
Lead Agency: City of DuPont Public Services, City of DuPont
Responsible Official: Barb Kincaid, Director of Public Services, City of DuPont 1700 Civic Drive, DuPont, WA 98327 | 253-912-5393
Contact Info: Barb Kincaid, City of DuPont | bkincaid@dupontwa.gov
The Responsible Official has made findings and conclusions based on a review of the revised environmental checklist and attachments, comments received on the Notice of Application, City Departments and peer review consultants, public comments received during the public comment period, applicable regulations, and other information on file with the City and the City's SEPA rules under RC & 43.21C 060. DuPont as a basis for the exercise of substantive authority pursuant to RCW 43.21C.060. The Responsible Official has determined,
CONCLUSIONS OF THE RESPONSIBLE OFFICIAL: The proposal will have a probable significant adverse with the mitigation measures provided, that the proposal will not have a probable significant adverse impact on the environment and an Environmental Impact Statement is not required under RCW 43.21c.030(2)(c). The determination measures proposed by staff are recommended as conditions of project approval.
PUBLIC COMMENT. Copies of all applicable documents, including a copy of the full MDNS, may be viewed at City Hall at the locations listed below or at the following website location: https://www.dupontwa.gov/693/DuPont-243. The City may comment on the proposal by submitting

PLNG2022-032 DuPont 243 MDNS Sep 2023

Attachment 3a

From:	Barbara Kincaid
To:	Rebecca Chapman
Cc:	Lisa Klein; Janet Howald
Subject:	[EXTERNAL] RE: Project 243
Date:	Tuesday, March 7, 2023 12:32:53 PM

Dear Rebecca,

Thank you for taking time to write comments on the proposed DuPont 243 development project. Your comments have been received and we will consider them as we continue our review process. The Notice of Application is just the first step in the process. The City is also conducting a SEPA review for this proposal and will publish a separate comment period focused on environmental impacts. Input on both will be considered concurrently.

Sincerely,
Barb

From: Rebecca Chapman [mailto:rebecca_hawaii@live.com]
Sent: Saturday, March 4, 2023 1:44 PM
To: Barbara Kincaid
Subject: Project 243

Ms. Kincaid,
Hi, I recently heard about this project and am concerned about the damage to the environment. Including loss of plants and trees, loss of animal habitat as well as traffic, noise, and pollution which would impact the area. DuPont is a nice place to live and people enjoy walking in the nature nearby, it would be a terrible idea to ruin the environment here with excessive industry. If DuPont becomes an industrial area it would ruin the town and force people to move, which would also ruin the local businesses nearby. I hope that these things will be considered and that DuPont will remain a nice place to live.
Sincerely,
The Chapman's

Attachment 3b

From:	Barbara Kincaid
To:	Bridget King
Cc:	Lisa Klein; Janet Howald
Subject:	[EXTERNAL] RE: Comments Re: Project 243
Date:	Tuesday, March 7, 2023 12:27:52 PM

Hello Ms. King,

Thank you for taking time to write comments on the proposed DuPont 243 development project. Your comments have been received and we will consider them as we continue our review process. The Notice of Application is just the first step in the process. The City is also conducting a SEPA review for this proposal and will publish a separate comment period focused on environmental impacts. Input on both will be considered concurrently.

Sincerely,
Barb

From: Bridget King [mailto:bkking3@hotmail.com]
Sent: Monday, March 6, 2023 8:54 PM
To: Barbara Kincaid
Subject: Comments Re: Project 243

Ms. Kincaid,

I am writing to express my concern about the warehouse project planned for the plot of land between Sequalitchew Creek and the Creekside apartments; to ask that you deny permits for the destruction of 56 landmark trees; that the development comply with the definition "small industrial scale' and that access to historic sites in the area promotes pedestrian safety as well as the City's ability to exploit them for tourism.

Background:

1. The tree protection plan proposes killing a large grove of trees rather than building around them. This is inconsistent with updated science re: climate change and reduces our tree canopy at the same time increasing impervious, heat enhancing surface. It also indicates the inadequacy of our city codes for climate adaptation with retention rate of only 1.5 trees per acre, for even though the developer states they are exceeding the 1.5/acre, more than 60% of the trees are being culled.

2. Of the noted 76 landmark tree noted in the area, 56 or 73% are scheduled for destruction and include Oregon White Oaks which are part of newly identified for endangered status grey squirrel habitat. This requires City approval: Do not approve this destructive plan for the area!

https://wdfw.wa.gov/publications/02410

"An assessment of change in availability of Western Gray Squirrel primary habitat between 1993 (listing) and 2017 found gains from successional processes (e.g., tree recruitment and tree growth) did not compensate for habitat loss."

3. While the historical marker has been preserved, the public would have to cross 3 streets to reach it while the developer has an intent to have tractor trailer sized vehicles maneuvering; not much thought given to being a community partner and not much the city could do to promote it for tourism safely.

4. While the developer plan may propose this as an unspecified 'building', the warehouse purpose is apparent with 47 tractor trailer truck bays and that they are using Barghausen Engineering who has built the proliferation of gargantuan warehouses we already have. That is not the intent of the 'small scale' industrial use; even for a warehouse, it is large scale:

https://www.wh1.com/warehouse-square-footage-tips/ "How Big is the Average Warehouse?The truth is, this is an ever-changing number. In the past, most warehouses were smaller than 10,000 square feet. However, these days, the average American warehousing unit is larger than 25,000 square feet. Only an estimated 35% of warehouses are smaller than this, and about half of the current existing warehouses are 50,001 square feet or larger.
Small warehouses (those typically smaller than 25,000 square feet) are cost-effective storage facilities that are often used by e-commerce businesses. They enable business owners to store inventory in areas that don't require an excessive footprint.

Large warehouse operations (those greater than 100,000 square feet) are usually used by importers, exporters, manufacturers and wholesalers. These larger buildings are usually located in industrial parks or on the outskirts of towns or ports to provide easy access to highways and loading docks."

Thank you for your consideration.

Bridget King

1473 Kittson St.

Sent from Mail for Windows

Attachment 3c

From:	Barbara Kincaid
To:	Karen Burch
Cc:	Lisa Klein; Janet Howald
Subject:	[EXTERNAL] RE: Dupont 243 Proposal
Date:	Thursday, March 9, 2023 7:58:00 AM

Dear Kate,

Thank you for taking time to write this email given what you are going through. Your comments have been received.

Thank you,

Barb

From: Karen Burch [mailto:burchtrees1_@hotmail.com]
Sent: Wednesday, March 8, 2023 11:23 PM
To: Barbara Kincaid
Subject: Dupont 243 Proposal

Dear Ms. Kincaid,

As Iie in my hospital bed, having just received a kidney transplant, I feel it is my duty to voice my great concern about another warehouse nightmare. How many times do we have to repeat this scenario. We do not want, nor deserve to have our beautiful city turned into warehouse haven. As we were heading out for Swedish Hospital on Monday evening at 11:00pm, a big rig was going down on Center Drive and McNeil St. It had just come off I-5 at exit 18. They Blatantly cruse our streets and disobey our city ordinances. Please don't allow this to happen again. We love our city and want the best for it and it's citizens. Sorry for any misspelling or grammar errors. Pain and meds taking effect.

Thank you for reviewing this. Kate Burch

Sent from my Verizon, Samsung Galaxy smartphone
Get Outlook for Android

Attachment 3d

From: Barbara Kincaid
To: BRYAN BRIGHT
Cc: Janet Howald; Lisa Klein
Subject: [EXTERNAL] RE: Project 243
Date: Thursday, March 9, 2023 7:42:20 AM

Dear Bryan and Leslie,

That was my error – my email should have been addressed to both of you that your comments have been received.

Sincerely,
Barb

From: BRYAN BRIGHT [mailto:lbbright@comcast.net]
Sent: Wednesday, March 8, 2023 7:54 PM
To: Barbara Kincaid
Subject: RE: Project 243

Ms. Kincaid,

This is a shared email address. Please, count our emails separately.

Respectfully,

Leslie Bright

> On 03/08/2023 3:01 PM Barbara Kincaid <bkincaid@dupontwa.gov> wrote:
>
> Dear Bryan,
>
> Thank you for taking time to write comments on the proposed DuPont 243 development project. Your comments have been received and we will consider them as we continue our review process. The Notice of Application is just the first step in the process. The City is also conducting a SEPA review for this proposal and will publish a separate comment period focused on environmental impacts. Input on both will be considered concurrently.
>
> Sincerely,
> Barb
>
> ---
>
> **From:** BRYAN BRIGHT [mailto:lbbright@comcast.net]
> **Sent:** Wednesday, March 8, 2023 1:57 PM
> **To:** Barbara Kincaid

Subject: Project 243

Ms. Kincaid,

After reviewing *Notice of Application* for Project 243, it is my opinion that Project 243 does not comply with our Comprehensive Plan and DuPont Municipal Code 25.040.020, and the permits should be denied.

Project 243 is proposed to be developed in the Manufacturing/Research Park area of DuPont. This will require that the development align with the 2015 Comprehensive Plan and the DuPont Municipal Code.

The 2015 Comprehensive Plan, LU (Land Use)-9.3 states: *Limit uses that front on the access road extending from Center Drive to the residential areas in Sequalitchew Village to those uses permitted in the Business and Technology Park area.* The Project 243 plans do not align with the Comprehensive Plan and show that the project ***will*** front this access road.

DuPont Municipal Code 25.040.020 lists permitted uses in the Business Tech Park District: *(1) All uses that are permitted in the commercial, office, and manufacturing/research park districts**, except freestanding warehouse/distribution facilities.*** The *Notice of Application* for Project 243 proposal specifically lists warehouses specifically, "... Construct two office/warehouse buildings totaling approximately 268,380 square feet..." in violation of DuPont Municipal Code 25.040.020.

Project 243 is in the Manufacturing/Research Park area, the Comprehensive Plan states: *The Manufacturing and Research Park designation is located adjacent to Center Drive and includes office uses and less intense, generally smaller-scale industrial uses. S*mall-scale usually means on the low end 5,000 square feet, and on the high end 30,000 square feet. A warehouse of 268,380 square feet **is not small-scale**.

As I have shown, Project 243 does not comply with our Comprehensive Plan and DuPont Municipal Code 25.040.020, and the permits should be denied.

Respectfully,

Leslie Bright

Attachment 3e

March 6, 2023

Dear Director Kincaid,

I am writing today as a concerned citizen and not as a City Council member.

The 2015 Comprehensive Plan Land Use Goals and Policies says: "These goals and policies are drawn from the complete policy framework and included here because of their direct relationship to land use."

1. **Industrial and Technology** (Manufacturing and Research is included in this category)
   Goal LU-9: Encourage development of a mix of long-term viable uses in the Business and Technology Park land use designation while maintaining the small town charm of DuPont.
   LU-9.2: Ensure development standards limit standalone warehousing and establish limitations on uses adjacent to main streets in order to ensure the small town aesthetic of DuPont is maintained.
   LU-9.3: Limit uses that front on the access road extending from Center Drive to the residential areas in Sequalitchew Village to those uses permitted in the **Business and Technology park area**.

   Chapter 25.40 Business Tech Park District (this is still listed in our DMC)
   25.40.020 Permitted Uses: (1) All uses that are permitted in the commercial, office and manufacturing/research park districts, **except freestanding warehouse/distribution facilities.**

I do not understand how a 243,180 sq. ft. warehouse can be permitted based on the 2015 Comprehensive Plan Land Use Goals coupled with DMC 25.40.020 permitted uses in the Business Tech Park.

2. **The 2015 Comprehensive Plan: Manufacturing/Research Park and Industrial Area states the following**: "The Manufacturing and Research Park designation is located adjacent to Center Drive and includes office uses and **less intense, generally smaller scale industrial uses".** (LOT 243 is located in the Manufacturing/Research Park Area)

- According to www.strongtowns.org, July 16, 2021, in an article written by Ilana Preuss, Founder and CEO of Recast City she writes: “Small-scale manufacturing businesses have fewer than fifty employees; most of the time they have fewer than twenty. Their space needs are smaller, too; **they generally need less than 5,000 square feet of space, and most need less than 1,000 to 2,000 square feet”.**
  She also says that Small-scale manufacturing includes those businesses producing at scale for broad distribution. In this classification, the producers top out at about fifty employees, but some of these businesses continue to expand in the same space. **These businesses generally use 5,000 to 30,000 square feet of space.**
- According to Warehouse1 (www.wh1.com) Small warehouses (those typically smaller than 25,000 square feet are cost- effective storage facilities that are often used by e-commerce businesses. They enable business owners to store inventory in areas that don’t require an excessive footprint. **Large warehouse operations (those greater than 100,000 square feet) are usually used by importers, exporters, manufacturers and wholesalers. These larger buildings are usually located in industrial parks or on the outskirts of towns or ports to provide easy access to highways and loading docks.**

Based on the 2015 Comprehensive Plan: Manufacturing and Research Park, I do not understand how a building this large can be permitted in this area designed for generally smaller scale uses. As noted above most large scale industrial or warehouse uses are greater than 100,000 square feet and they belong in the Industrial area of our city to the North and the East.

3. I am concerned about the number of Landmark Trees that will be cut down in the area above Sequalitchew Creek. These 56 trees offer a refuge for wildlife and the threatened Western Gray Squirl. These trees provide a large canopy which helps lower the temperature in the environment. As our temperatures steadily increase, we need trees with canopies to help reduce temperatures.

4. I am concerned about the lack of water infiltration into our groundwater because of the impervious nature of this proposed large warehouse.

5. I am concerned about the noise, light, vibration, and air pollution that will be generated by the trucks coming to and going from this facility.

In conclusion, this large warehouse does not belong in this area. I believe the original intent of the zoning for this property was for a smaller scale sized facility that would not be harmful to the environment and that would fit into the small-town character of DuPont, as is emphasized throughout the 2015 Comprehensive Plan.

Sincerely,
Beth Elliott
1485 Kittson Street
DuPont, WA 98327

Attachment 3f

From:	Barbara Kincaid
To:	Tanya Klipppert
Cc:	Lisa Klein; Janet Howald
Subject:	[EXTERNAL] RE: Dupont warehouse comments
Date:	Tuesday, March 7, 2023 12:30:48 PM

Dear Tanya,

Thank you for taking time to write comments on the proposed DuPont 243 development project. Your comments have been received and we will consider them as we continue our review process. The Notice of Application is just the first step in the process. The City is also conducting a SEPA review for this proposal and will publish a separate comment period focused on environmental impacts. Input on both will be considered concurrently.

Sincerely,
Barb

From: Tanya Klipppert [mailto:strykerm6@yahoo.com]
Sent: Saturday, March 4, 2023 8:51 AM
To: Barbara Kincaid
Subject: Dupont warehouse comments

Hello,
My comments are that a large, over 30,000 sq ft warehouse does not belong along a beautiful peaceful creek like Sequalichew creek. The chances of salmon returning will surely be diminished by this project during construction and after. The community will not be able to enjoy the serene trails along the creek. The eagles and owls that I enjoy in the area will likely leave the area. Not to mention the detriment to the community aesthetic and traffic flow. Lastly I am very concerned for the safety of the children attending the nearby Pioneer Middle School, the bicyclists and pedestrians enjoying Center drive and the EMS and police having to contend with big rigs interfering with their access to the majority of the community.
Sincerely, Tanya Klippert
2088 Charles Street, Dupont

Sent from Yahoo Mail on Android

Attachment 3g

From: Barbara Kincaid
To: Judy Norris
Cc: Lisa Klein; Janet Howald
Subject: [EXTERNAL] RE: Public Comment for Project 243
Date: Tuesday, March 7, 2023 12:35:31 PM

Dear Judy,

Thank you for taking time to write comments on the proposed DuPont 243 development project. Your comments have been received and we will consider them as we continue our review process. The Notice of Application is just the first step in the process. The City is also conducting a SEPA review for this proposal and will publish a separate comment period focused on environmental impacts. Input on both will be considered concurrently.

Sincerely,
Barb

From: Judy Norris [mailto:piebaldsatil@gmail.com]
Sent: Monday, March 6, 2023 9:38 AM
To: Barbara Kincaid
Subject: Public Comment for Project 243

Good morning, Barb

With this email, I submit my comments for Project 243.

Project 243 is in the Manufacturing/Research Park area of DuPont.

In our 2015 Comprehensive Plan, LU (Land Use)-9.3 states: *Limit uses that front on the access road extending from Center Drive to the residential areas in Sequalitchew Village to those uses permitted in the Business and Technology Park area.* Project 243 plans show that the project will front this access road. We already have a residential area in this area- the Creekside Village Apartments.

Our DuPont Municipal Code 25.040.020 lists permitted uses in the Business Tech Park District: *(1) All uses that are permitted in the commercial, office, and manufacturing/research park districts, except freestanding warehouse/distribution facilities.*

Since Project 243 is in the Manufacturing/Research Park area, the comp plan states: *The Manufacturing and Research Park designation is located adjacent to Center Drive and includes office uses and less intense, generally smaller-scale industrial uses.*

Based on industry research, small-scale usually means on the low end of 5,000 square feet, and the high end of 30,000 square feet. A warehouse of 268,380 square feet is not small-scale.

Based on land use alone, how can Project 243 comply with our comp plan and city codes? Also, the proposed size of 263,380 for the warehouse is too large for the Manufacturing/Research Park area.

Unfortunately, the prior administration argued to the Hearing Examiner in 2019, when the virtually identical application was called Lot Y, that he didn't know what the use of the 250,000-square-foot building would be. The developer clearly labeled the structure on the architectural drawings "DuPont Industrial Warehouse." Obfuscating the intended use of the building in a legal hearing and deeming the project to be of non-significant environmental impact in 2019 has led us down the path on which we find ourselves today. Citizens are once again fighting against a determined developer who has mocked the legal findings of the Hearing Examiner as well as the Pierce County Superior Court judge.

I will lay out my concerns about the environmental impact when we have a SEPA comment period.

Sincerely,

Judy Norris
1485 Kittson Street
DuPont, WA 98327

--
"Be well, be love, be loved"
"Faith is the bird that feels the light when the dawn is still dark."
Sir Rabindranath Tagore

Attachment 3h

From:	Barbara Kincaid
To:	denise reed
Cc:	Lisa Klein; Janet Howald
Subject:	[EXTERNAL] RE: Dupont 243 Proposal
Date:	Tuesday, March 7, 2023 12:32:14 PM

Dear Mr. and Mrs. Reed,

Thank you for taking time to write comments on the proposed DuPont 243 development project. Your comments have been received and we will consider them as we continue our review process. The Notice of Application is just the first step in the process. The City is also conducting a SEPA review for this proposal and will publish a separate comment period focused on environmental impacts. Input on both will be considered concurrently.

Sincerely,
Barb

-----Original Message-----
From: denise reed [mailto:denise.reed@outlook.com]
Sent: Saturday, March 4, 2023 11:24 AM
To: Barbara Kincaid
Subject: Dupont 243 Proposal

I Jonathon Reed and my wife Bertha Reed are In opposition to proposal 243. This place should remain untouched as there's a historical marker in that area as well as being so close to the proximity to protected area for sensitive species of flora.

Respectfully,

Jon and Bertha Reed

Sent from my iPhone

Attachment 3i

From:	Barbara Kincaid
To:	Tim Mills
Cc:	Lisa Klein; Janet Howald
Subject:	[EXTERNAL] RE: NO New Warehouses
Date:	Tuesday, March 7, 2023 12:32:31 PM

Dear Tim,

Thank you for taking time to write comments on the proposed DuPont 243 development project. Your comments have been received and we will consider them as we continue our review process. The Notice of Application is just the first step in the process. The City is also conducting a SEPA review for this proposal and will publish a separate comment period focused on environmental impacts. Input on both will be considered concurrently.

Sincerely,
Barb

-----Original Message-----
From: Tim Mills [mailto:timmillsdw@comcast.net]
Sent: Saturday, March 4, 2023 9:53 AM
To: Barbara Kincaid
Subject: NO New Warehouses

This warehouse issue is becoming a frustrating reoccurring attack on our small community.

I have lived in Dupont for 20 years and have NEVER heard anyone say they moved here because of the warehouses / potential for more warehouses! We enjoy the safety of a small residential community with great hiking trails, good schools, nice parks and minimal traffic.

The message is still the same-We don’t need any new warehouses and don’t want any.

Tim Mills
3064 Ridge View Place
Dupont, WA

Sent from my iPhone

Attachment 3j

From:	Barbara Kincaid
To:	Cary Harlow
Cc:	Lisa Klein; Janet Howald
Subject:	[EXTERNAL] RE: Project 243 warehouse proposal
Date:	Thursday, March 9, 2023 8:01:05 AM

Dear Cary,

Thank you for taking time to write comments on the proposed DuPont 243 development project. Your comments have been received and we will consider them as we continue our review process. The Notice of Application is just the first step in the process. The City is also conducting a SEPA review for this proposal and will publish a separate comment period focused on environmental impacts. Input on both will be considered concurrently.

Sincerely,
Barb

From: Cary Harlow [mailto:cebchar@gmail.com]
Sent: Wednesday, March 8, 2023 7:24 PM
To: Barbara Kincaid
Subject: Project 243 warehouse proposal

Mz. Kincaid,
As longtime homeowners in our beautiful city, my wife and I would like to express our strong displeasure in the proposal of yet additional warehouses. Knowing full well, freestanding distribution warehouses are not allowed and especially in an area that is both environmentally precious and in need of sanctuary. DuPont has already paid the price for allowing this blight to get a foothold. We most strongly urge our city government to fight these proposals and stick by our comprehensive plan to the letter.
Thank you for your time!

Cary Harlow
2648 Arnold St
Sent from Mail for Windows

Attachment 3k

From: Barbara Kincaid
To: Krista Novak
Cc: Lisa Klein; Janet Howald
Subject: [EXTERNAL] RE: Project 243
Date: Tuesday, March 7, 2023 12:35:35 PM

Dear Krista,

Thank you for taking time to write comments on the proposed DuPont 243 development project. Your comments have been received and we will consider them as we continue our review process. The Notice of Application is just the first step in the process. The City is also conducting a SEPA review for this proposal and will publish a separate comment period focused on environmental impacts. Input on both will be considered concurrently.

Sincerely,
Barb

From: Krista Novak [mailto:kristamnovak@yahoo.com]
Sent: Monday, March 6, 2023 12:16 PM
To: Barbara Kincaid
Subject: Project 243

Good morning Ms. Kincaid,

I will do my best to keep this an objective email, but I would be lying if I said my heart doesn't hurt to see another proposal come in for the Lot Y area, especially when it feels as if the proposal is similar to one already deemed out of line with our comp plan.

It is my understanding that the current proposal includes a large-scale 268,380 square foot warehouse, which is not an approved use in a Manufacturing and Research Park area. Although I cannot find a specific definition for "small scale" as mentioned in our comp plan, I would guess that the Project 243 proposal is way beyond small, not to mention it contains a prohibited warehouse.

I am also greatly concerned with the environmental impact on the apartments that will be subject to the noise, air and light pollution of the hundreds of semi-trucks going through the area. Has a SEPA study been done? Also, the Sequalitchew Creek trail, one of the gems of our city, will be compromised with these same environmental factors.

Lastly, I think it is insulting and laughable to see the developers plan for the historical marker right up against a warehouse and next to a parking lot. So, visitors would need to come off the trail, through parking lots, dodging semi trucks, to see the Mission marker?

I have seen your February 17th letter to the developers and appreciate your detailed analysis of the numerous faults of their proposal. I will remain vigilant and work against any resemblance of more warehouses here in DuPont.

Thank you for your time.
Krista Novak
1449 Kittson Street

Attachment 3l

From:	Barbara Kincaid
To:	Kate Walsh
Cc:	Janet Howald; Lisa Klein
Subject:	[EXTERNAL] RE: A 55 proposed warehouses
Date:	Friday, March 10, 2023 1:05:54 PM

Hello Kate,

The applicant is not who would eventually occupy the structure, so we do not know the answer to this question at this time.

Sincerely,
Barb

From: Kate Walsh [mailto:3mcwals@gmail.com]
Sent: Friday, March 10, 2023 10:02 AM
To: Barbara Kincaid
Subject: Re: A 55 proposed warehouses

On Sun, Mar 5, 2023 at 9:29 PM Kate Walsh <3mcwals@gmail.com> wrote:

> Hello Ms Kincaid,
> Do we know whether the warehouses that A55 is proposing run 24/7 or less than that?
> Thank you
> Kate Walsh

Attachment 3m

From:	Barbara Kincaid
To:	marcella velazquez
Cc:	Lisa Klein; Janet Howald
Subject:	[EXTERNAL] RE: (Another) Sequalitchew Creek proposal
Date:	Tuesday, March 7, 2023 12:31:17 PM

Dear Marcella,

Thank you for taking time to write comments on the proposed DuPont 243 development project. Your comments have been received and we will consider them as we continue our review process. The Notice of Application is just the first step in the process. The City is also conducting a SEPA review for this proposal and will publish a separate comment period focused on environmental impacts. Input on both will be considered concurrently.

Sincerely,
Barb

From: marcella velazquez [mailto:tuangelmjv2@yahoo.com]
Sent: Saturday, March 4, 2023 8:39 AM
To: Barbara Kincaid
Subject: (Another) Sequalitchew Creek proposal

Dear Barbara Kincaid,

I have been a resident of Dupont for the past 6 years. One of the main reasons we chose to buy in DuPont specifically was due to its natural beauty and the "strict" codes regarding the city's use of land. We live near the cube warehouses, which we're NEVER supposed to have been approved in the first place, and now we have to contend with semi's and a concrete "oasis" along with many varieties of pollution from all the trucks that drive by daily, and are only going to increase from my understanding. This IS NOT the Dupont that was advertised. I understand that things can't remain the same and that there are land use code on what is and IS NOT ALLOWED and I strongly hope that those codes will be followed and enforced.

Every single year it seems that I have to write letter about NOT wanting to build additional warehouses here. And EVERY SINGLE YEAR this comes up.THE RESIDENTS DO NOT WANT ANOTHER WEARHOUSE HERE. In fact, it was encouraged by our prior mayor, who outright went against the citizens wishes and resulted in a legal battle which thankfully halted that from happening. But yet here we are again.

There are so many thing to take into account when something like this is proposed but my main concern is safety. This site is located near a middle school, which my child will be attending next year. These buildings will be in such close proximity to the school, again I live near the cubes and see how these semi's drive and how hard it is to stop one of these. What if a kid runs across the street and the driver isn't able to stop in time? The amount of trucks driving in and out are only going to increase the chances of a major accident. Not to mention the pollution this will bring to the area which is also very close to our beloved Sequalitchew trail -a very sensitive environmental area.

My suggestion would be to stick to the land use codes, not a "variation" of it, as it seems like these developers like to do. I know light manufacturing warehouses are allowed and what this company is proposing is NOT that. We have been through this with them before and they have been denied but yet here we are again.

DuPont is unique in that it doesn't look like most cities. If I wanted to live in an area dominated by warehouses, concrete buildings and pollution in its many forms we could have chosen anywhere else, but we didn't. We bought our home HERE because of it's NATURAL BEAUTY and the codes that were set in place TO PRESERVE this, and also to preserve the values our homes for those of us that reside here and most importantly the quality of life.

Thank You.
Marcella Velazquez

Sent from Yahoo Mail on Android

Attachment 4a

From:	Barbara Kincaid
To:	Brad Beach
Cc:	Annette Bullchild; Lisa Klein
Subject:	[EXTERNAL] RE: MDNS for DuPont Project "DuPont 243"
Date:	Friday, September 13, 2024 11:31:37 AM

Thanks Brad – we would welcome the Tribe's participation.
Hope you have a wonderful weekend.
Barb

From: Brad Beach <beach.brad@nisqually-nsn.gov>
Sent: Friday, September 13, 2024 8:44 AM
To: Barbara Kincaid <bkincaid@dupontwa.gov>
Cc: Annette Bullchild <bullchild.annette@nisqually-nsn.gov>
Subject: RE: MDNS for DuPont Project "DuPont 243"

Good morning, Barb,

For a site that has been so heavily disturbed, these mitigation measures seem reasonable. My request is that the Tribe is invited to participate in the creation of the Sequalithcew Creek signage so we can make sure an appropriate message is provided.

Thank you,
Brad Beach, THPO
Nisqually Indian Tribe
360-456-5221 x 1277
360-528-1084

From: Barbara Kincaid <bkincaid@dupontwa.gov>
Sent: Wednesday, August 28, 2024 2:45 PM
To: Brad Beach <beach.brad@nisqually-nsn.gov>
Cc: Annette Bullchild <bullchild.annette@nisqually-nsn.gov>
Subject: RE: MDNS for DuPont Project "DuPont 243"

CAUTION! - This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello Brad,
The attached is out for comments. Would you kindly review and let me know if you have comments or concerns?
Thanks,
Barb

Barb Kincaid, AICP
Director of Public Services

City of DuPont
253.912.5393

Attachment 4b

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775, Olympia, WA 98504-7775 • 360-407-6300

September 11, 2024

Janet Howald, SEPA Contact
City of DuPont
1700 Civic Drive
DuPont, WA 98327

Dear Janet Howald:

Thank you for the opportunity to comment on the mitigated determination of non-significance for the DuPont West (formerly DuPont 243) Project (SEPA2022-032) located at 1700 Center Drive as proposed by Ben Varin. The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

SOLID WASTE MANAGEMENT: Derek Rockett (360) 995-3176

All grading and filling of land must utilize only clean fill. All other materials may be considered solid waste and permit approval may be required from your local jurisdictional health department prior to filling. All removed debris resulting from this project must be disposed of at an approved site. Contact the local jurisdictional health department or Department of Ecology for proper management of these materials.

TOXICS CLEANUP/TACOMA SMELTER PLUME: Diana Ison (360) 999-9593

The MDNS for this project indicates awareness that this property is part of the former DuPont Work Site where manufacturing of explosives led to extensive soil and groundwater contamination. It is also located in an area that was impacted by the air emissions originating from the old Asarco smelter in north Tacoma. As a result of the contamination, this parcel is subject to the terms of a Consent Decree filed with Pierce County Superior Court on July 22, 1991, and restrictions in an environmental covenant filed with Pierce County on October 29, 1999. The restrictions were set forth to protect human health and were due to the fact that interim cleanup action on this parcel brought the levels of contamination to industrial levels only. The levels of contaminants in the soil are still above the MTCA Method A cleanup levels for unrestricted land use. The covenant prohibits the use of this parcel for residential, school, daycare, recreational, or park uses. The covenants also restricts public access to the property, therefore the improvements to the public trail or the construction of the public plaza are inconsistent with the allowed use for this parcel. The applicant shall provide the city with assurances that the trail use and public access to the historical monument can be accommodated in a accordance with the Consent Decree and Restrictive Covenant.

Ecology also recommends that the lead agency include the following as conditions of approval, prior to issuance of site development permits or the initiation of grading, filling, or clearing:

1) Develop soil remediation plan and enter into the Voluntary Cleanup Program with Ecology. For more information on the Voluntary Cleanup Program, visit Ecology website at: https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanupprocess/Cleanup-options/Voluntary-cleanup-program.

2) Obtain an opinion letter from stating that the proposed soil remediation plan will likely result in no further action under MTCA. The applicant shall provide to the local land use permitting agency the opinion letter from Ecology.

3) Prior to finalizing site development permits, provide to the local land use permitting agency "No Further Action" determination from Ecology indicating that the remediation plans were successfully implemented under MTCA.

Contaminated soils generated during site construction shall be managed and disposed of in accordance with state and local regulations, including the Solid Waste Handling Standards regulation (Chapter 173-350 WAC). For information about soil disposal contact the local health department in the jurisdiction where soils will be placed.

The link below provides a fact sheet that explains more how the arsenic and lead clean-up levels were set and why Ecology sees that they are protective for human health: https://fortress.wa.gov/ecy/publications/SummaryPages/1109095.html

For assistance and information about Tacoma Smelter Plume and soils contamination, contact Diana Ison with the Toxic Cleanup Program at 360-999-9593 or via email at Diana.Ison@ecy.wa.gov.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(JKT:202403769)

cc: Derek Rockett, SWM
Diana Ison, TCP

Attachment 4c

From:	Barbara Kincaid
To:	Janet Howald; Lisa Klein
Subject:	[EXTERNAL] FW: Warehouse
Date:	Wednesday, September 11, 2024 4:49:06 PM

From: Christopher Fletcher <fletcher4hwang@yahoo.com>
Sent: Wednesday, September 11, 2024 12:34 PM
To: Barbara Kincaid <bkincaid@dupontwa.gov>
Subject: Warehouse

Barb

Just want to go on record to oppose the building of a warehouse/light manufacturing in the location proposed in the attached document.

I am a property owner at 2872 Cox St here in DuPont. We moved here because we fell in love with the town. I think we have our share of warehouses and don't need anymore.

One of the draws to this town is the walks and nature. Kids are safe walking to school. More industrial type facilities with the heavy truck traffic will certainly affect that negatively.

Proposing a warehouse near the crown jewel of our trail the Sequalitchew Creek Trail is unbelievable, what are these people thinking of.

Will this be a benefit for DuPont? I seriously doubt it. Most people in DuPont are in high tech or the military. Meaning more people commuting to our city.

I have faith in our city government and this proposal should be stopped.

Thanks
Chris Fletcher

Attachment 4d

September 11, 2024

Beth Elliott
1485 Kittson Street
DuPont, WA 98327

Subject: DuPont West (formerly Lot Y, DuPont 243)

Dear Director Kincaid:

I am writing as a concerned citizen and not as a DuPont Council Member.

I am perplexed as to how this project could have gotten this far. The 2015 DuPont Comprehensive Plan and DuPont Municipal Code (DMC) 24.40.020 clearly state a warehouse is prohibited in this area.

According to #8 in your Findings in the Mitigated Determination of Non-significance, you state that “the landowner submitted a letter from the Attorney General of Washington dated Oct. 17, 2018, describing the restrictive covenants recorded on the property. It confirms the property may be developed and used only for industrial use as allowed under the City of DuPont zoning regulations and Comprehensive Land Use Plan and under MTCA”.

While this area is permitted for industrial use, it is not permitted to house a freestanding warehouse distribution facility. Our 2015 Comprehensive Code states on page 71**, LU 9.3 Limit uses that front on the access road extending from Center Drive to the residential areas in Sequalitchew Village to those uses permitted in the Business and Technology Park area.**

Municipal Code DMC 25.40.20 Business Tech Park Permitted uses states (1) All uses that are permitted in the Commercial, Office and Manufacturing/research parks districts, *except freestanding warehouse/distribution facilities* and those listed in DMC 25.40.040.

Furthermore, **LU 9.4 states, Limit heavy industrial uses to the two existing industrial areas (west of JBLM and between Intel and DuPont Steilacoom Road) as they are likely to attract uses that require more material inputs, processes, and finished products and therefore likely to produce a greater volume of truck traffic.**

The proponents of this proposal are using deceptive techniques by creating a short plat to circumvent the intent of our DMC and Comprehensive Plan. Adding a green space and putting a parking lot with lots of trailer stalls in front of this distribution warehouse,

will do nothing to limit the amount of tractor trailer traffic on this access road to the future Sequalitchew Village.

This facility should not be allowed if our codes and comprehensive plan are followed.

Thank you for providing this opportunity to comment.

Sincerely,
Beth Elliott

Attachment 4e

From:	Barbara Kincaid
To:	Lisa Klein
Subject:	[EXTERNAL] FW: DuPont West SEPA MDNS
Date:	Wednesday, September 11, 2024 9:16:56 AM
Attachments:	image001.png

Here is another comment for MDNS.

From: Janet Howald <JHowald@dupontwa.gov>
Sent: Wednesday, September 11, 2024 8:26 AM
To: Barbara Kincaid <bkincaid@dupontwa.gov>
Subject: FW: DuPont West SEPA MDNS

Hi Barb,

For your information. I have placed the comment into the folder.
Janet

From: DNR RE SPS Forest Practices <southpuget.forestpractices@dnr.wa.gov>
Sent: Wednesday, September 11, 2024 8:11 AM
To: Janet Howald <JHowald@dupontwa.gov>
Subject: RE: DuPont West SEPA MDNS

Good morning Janet,

Pursuant to Chapter 76.09 RCW and Title 222 WAC, I have the following comments:

The proposal may require a Washington State Department of Natural Resources Class IV-General Forest Practices Application/Notification (FPA/N).

- RCW 76.09 defines forest practices as any activity conducted on or directly pertaining to forestland.
- Forestland is considered any land, which is capable of supporting a merchantable stand of timber.
    - Based on the information provided and aerial photos, the proposal appears to be removing merchantable timber.
- Class IV-General FPA/Ns are forest practices on lands that are being converted to another use or within an Urban Growth Area or City boundary.

For additional information and resources, please visit the Forest Practices page at www.dnr.wa.gov.

Respectfully,

Meredith Dessens
Forest Practices Permit Specialist
South Puget Sound Region | WA DNR
meredith.dessens@dnr.wa.gov
(360) 688-3010
Office Hours: 7:00am – 3:30pm

From: DNR RE SOUTHPUGET REGION <southpuget.region@dnr.wa.gov>
Sent: Thursday, August 29, 2024 11:33 AM
To: DNR RE SPS Forest Practices <southpuget.forestpractices@dnr.wa.gov>
Subject: FW: DuPont West SEPA MDNS

From South Puget Sound Region mailbox.

From: Janet Howald <JHowald@dupontwa.gov>
Sent: Thursday, August 29, 2024 11:13 AM
To: Janet Howald <JHowald@dupontwa.gov>
Subject: DuPont West SEPA MDNS

External Email

Hello,

For your information, attached is a SEPA Mitigated Determination of Nonsignificance for DuPont West (formerly DuPont 243), File No. SEPA2022-032

Respectfully,

Janet Howald
Administrative Specialist|Public Services Department
City of DuPont

Direct 253.912.5232
City Hall 253.964.8121
Jhowald@dupontwa.gov

Attachment 4f

Judy Norris

1485 Kittson Street

DuPont WA 98327

253 370 6246

piebaldsatil@gmail.com

September 8, 2024

Subject: EPA ENVIRONMENTAL POLICY ACT WITHDRAWAL AND ISSUANCE OF NEW MITIGATED DETERMINATION OF NONSIGNIFICANCE DuPont West (formerly DuPont 243)

Dear Director Kincaid,

In #8 of your Findings in the Mitigated Determination of Nonsignificance, you state:

"The landowner submitted a letter from the Attorney General of Washington dated Oct. 17, 2018, describing the restrictive covenants recorded on the property. It confirms the property may be developed and used only for industrial use as allowed under the City of DuPont zoning regulations and Comprehensive Land Use Plan and under MTCA…"

However, according to the 2015 DuPont Comprehensive Plan and DuPont Municipal Code (DMC) 24.40.020, I believe the DuPont West industrial warehouse proposal is prohibited.

Relevant sections from the 2015 DuPont Comprehensive Plan emphasize maintaining DuPont's small-town aesthetic. Specifically, **LU-9.2** on Page 70 and **LU-9.3** on Page 71 limit uses adjacent to main streets, such as Sequalitchew Drive, to those permitted in the Business and Technology Park area. Since DuPont West fronts Sequalitchew Drive, its development must comply with these restrictions.

Industrial and Technology	
Goal LU-9	**Encourage development of a mix of long-term viable uses in the Business and Technology Park land use designation while maintaining the small town charm of DuPont.**
LU-9.1	Explore innovative approaches to site remediation, land development, and infrastructure improvements through strategies such as public-private partnerships, private-private partnerships and strategic capital investments.
LU-9.2	Ensure development standards limit standalone warehousing and establish limitations on uses adjacent to main streets in order to ensure the small town aesthetic of DuPont is maintained.

LU-9.3	Limit uses that front on the access road extending from Center Drive to the residential areas in Sequalitchew Village to those uses permitted in the Business and Technology park area.

DMC 25.40.020 further clarifies that freestanding warehouse/distribution facilities are not allowed in the Business and Technology Park District, and **LU-9.4** limits warehouse uses to the industrial area.

25.40.020 Permitted uses.

(1) All uses that are permitted in the commercial, office and manufacturing/research park districts except freestanding warehouse/distribution facilities and those listed in DMC 25.40.040.

LU-9.4	Limit heavy industrial uses to the two existing industrial areas (west of JBLM and between Intel and DuPont Steilacoom Road) as they are likely to attract uses that require more material inputs, processes, and finished products and therefore likely to produce a greater volume of truck traffic.

In 2018, following a citizen-led effort, the city council upheld code 25.40.020 to prevent warehouses on the Old Fort Lake property (The Business Tech Park District.) In 2019, the Nisqually Delta Association appealed the city's determination of non-significance of the same project (then called Lot Y) on one ground of the fact that DMC 25.45.030 (17) prohibited warehouses abutting main roads. The Hearing Examiner ruled (with the Pierce County Superior Court upholding) that DMC 25.45.030(17) did prohibit warehouses from abutting main roads. The developer's 2022 short plat (Recording No. 202203015001) attempts to circumvent this by creating the illusion that the proposed industrial warehouse does not abut Sequalitchew Drive. This action undermines the intent of our Comprehensive Plan and our city's code, and the original ruling by the Hearing Examiner in 2019.

Additionally, in #7 of your findings, the probable existence of the endangered Western Gray Squirrel is not mentioned. In November 2023, the Washington State Fish and Wildlife Commission upgraded the Western Gray Squirrel's status from threatened to endangered. These squirrels, with a range of 7-14 miles, were introduced to JBLM in 2007, and the DuPont West area contains the necessary habitat to support them. DuPont must include mitigations to protect the Western Gray Squirrel and preserve their habitat.

To address these concerns, I suggest reducing the development footprint and shifting it to light manufacturing, which is in line with the Comprehensive Plan and current codes.

Sincerely,

Judy Norris

Attachment 4g

From: Barbara Kincaid
To: Janet Howald
Cc: Lisa Klein
Subject: [EXTERNAL] FW: Opposition to the Proposed Development (DuPont West/PLNG2022-032 SEPA)
Date: Monday, September 9, 2024 11:14:16 AM

Please file in DuPont West.

Thanks

From: Kaleigh Kinsella <kaleighkinsella@yahoo.com>
Sent: Saturday, September 7, 2024 6:27 PM
To: Barbara Kincaid <bkincaid@dupontwa.gov>
Subject: Opposition to the Proposed Development (DuPont West/PLNG2022-032 SEPA)

Kaleigh Kinsella
1660 Sequalitchew Dr. #204
Dupont, WA 98327
kaleighkinsella@yahoo.com

City of DuPont
Attention: Barb Kincaid, Director of Public Services
1700 Civic Drive
DuPont, WA 98327
bkincaid@dupontwa.gov

Dear Ms. Kincaid,

I am writing to express my strong opposition to the proposed development of the 256,800-square-foot office/warehouse building on 19.65 acres of vacant land located on the west side of Sequalitchew Drive.

Under the prior administration of Mayor Mike Courts, the mineral overlay that existed on this property was removed, paving the way for this project. This decision has left the current administration with a plan that many in the community strongly oppose. In fact, the Nisqually Delta Association filed an appeal when the Courts administration issued an immediate SEPA Mitigated Determination of Non-Significance (MDNS) in 2019. The appeal went all the way to the state appellate court, and if not for that challenge, the development would likely be even more intrusive, directly up against Sequalitchew Drive.

It is alarming that, despite the community's concerns, developers are pressing forward with such a large-scale project. DuPont already has many vacant warehouses that sit unused, creating unsightly areas in what is otherwise a beautiful and well-preserved community. We do not need any more of these environmentally destructive eyesores, especially when they contribute little to the character or value of our town.

In addition to the environmental damage this project would cause, particularly the destruction of the nesting grounds of the Endangered Western Gray Squirrel, there is another significant concern: the impact of semi-truck traffic. The scale of this warehouse suggests that it will attract a large volume of truck traffic, which will increase noise, pollution, and wear and tear on local roads. This increase in industrial traffic is entirely incompatible with the community's character and will harm the quality of life for DuPont residents, particularly those living near the affected areas.

Increased semi-truck traffic will also raise safety concerns, especially in areas where families and pedestrians frequent. The development's proximity to Sequalitchew Creek and nearby recreational areas makes this a potentially dangerous addition to our town.

I strongly urge the City of DuPont to reconsider this project and instead prioritize the well-being of our community and its natural environment. Protecting these areas and avoiding unnecessary industrial development is critical to maintaining the integrity and beauty of our town. There must be a balance between progress and preservation, and I believe this development does not serve the best interests of our community.

Thank you for your consideration of this important matter.

Sincerely,
Kaleigh Kinsella

Attachment 4h

To: Director Barb Kincaid
Director of Public Services
City of DuPont

Date: 09/06/2024

Dear Director Kincaid,
This letter is in reference to the SEPA Environmental Policy Act for DuPont West (formerly DuPont243).

The latest update on the project has neglected to include the impact the build will have on the Western Gray Squirrel. In November 2023 the Washington State fish and Wildlife commission up-listed the Western Gray Squirrel from Threatened to Endangered. There are less than 1400 of these squirrels in all of Washington. The main reason for the decline in numbers is the lack of and destruction of their habitat. The Western Gray Squirrel is a tree squirrel. They nest and forage within the trees rather than on the ground. The Western Gray Squirrel is the largest Washington native squirrel. The primary tree habitat for the Western Gray Squirrel is the Oregon White Oak, Douglas fir, and Big Leaf Maple. All of these trees appear and are identified in the Tree Retention Plan Document, as well as other smaller plants that produce seeds and nuts like the Hazel Nut. The combination of these mature trees to include the Oregon White Oak can only be found on the west side of the Cascade Mountains here in DuPont and JBLM.
The Western Gray Squirrel has been spotted within the DuPont City Limits. This squirrel is difficult to spot because it stays well up in our mature trees. They are known to travel anywhere from 8 to 14 miles from the nest to forage. This population of squirrel was introduced to the southern Puget Trough in 2007 on Joint Base Lewis McCord. The Washington Fish and Wildlife have worked closely with the Forest Management on the base and the population of the squirrel is stable. However, as an Endangered Species we must continue to protect this valuable habitat. The mature trees on the DuPont West Parcel are the perfect mix of habitat for the Western Gray Squirrel and should not be disturbed. The Western Gray Squirrel sleeps in tree nests during the winter and only venture out in the early morning and evening. Instead of hibernating, they rely on sheltered nests in trees and fat reserves and stored food to survive the long winter. In this area the winters are not as harsh as mountain regions such as east of the Cascade Mountains. This allows for better habitat survival. With the help of the WDFW and JBLM Forestry Management we can increase the habitat of the Western Gray Squirrel and ensure its survival in the Puget Sound area. To help preserve their habitat we must protect oak and conifers such as the Douglas fir tree stands from development, wildfires and harmful timber practices. No Landmark trees should be removed for any purpose. Use signing to reduce road mortality and educate our community on how to protect these squirrels. We can provide shelters by leaving large trees for them to nest in. Roads can be diverted around groups of trees. Buildings can have a smaller foot print to protect the surrounding forest and be placed in the more barren portion of the parcel in Type II of the Tree Protection Plan. The DuPont Municipal Code 25.120 needs to be updated to include a requirement of a Washington State Department of Fish and Wildlife evaluation of the habitat, and that the number of tree retention requirements increased to an acceptable limit to protect the wildlife habitat. No species needs to be present at the time of any evaluation to warrant protection. It is the tree habitat that needs to be protected for the survival of the species. The Western Gray Squirrel like all animals will travel and forage where food is present.

The current proposal plans remove more than 360 healthy mature trees. This foot print is unacceptable for the co-habitation with the endangered Western Gray Squirrel.
It is very important that we respect the decision made by the Washington Fish and Wildlife Commission to up-list the Western Gray Squirrel to Endangered and do what we can to protect the necessary habitat for its survival.
Thank you

Robin Barrow
3102 McAllister St.
DuPont, WA. 98327
206-437-5582

Attachment 4i

From: Barbara Kincaid
To: Janet Howald
Cc: Lisa Klein
Subject: [EXTERNAL] FW: DuPont west project
Date: Monday, September 9, 2024 11:19:57 AM

For the DuPont west SEPA file.

Thanks

From: Amanda Childers <amanda.y.childers@gmail.com>
Sent: Friday, September 6, 2024 2:48 PM
To: Barbara Kincaid <bkincaid@dupontwa.gov>
Subject: DuPont west project

Hello Barb,
I am a resident living in the Edmonds Village. I am highly opposed to anymore warehouses being built in DuPont. Additionally, based on studies of the immediate area surrounding the Sequalitchew creek, I am opposed to development near the creek and trail theses are sensitive habitat areas and development would cause irreparable harm. These developments are destroying the town, we struggle to hold onto small businesses and bringing warehouses further strains the local economy. We want a community free of major shipping and unsightly warehouses.
Thank you for your time,
Amanda Childers

Attachment 5a

PIERCE COUNTY, WA
9910290750
10-29-1999 11:39 am
Fee Amt: $17.00

Return Address

Weyerhaeuser Company
P. O. Box 100
DuPont, WA 98327
Attn: Vern Moore

Please print or type information.

Document Title(s) (or transactions contained therein):
1. Declaration of Restrictive Covenant
2.
3.

Grantor(s) (Last name first, then first name and initials)
1. Weyerhaeuser Company
2. Weyerhaeuser Real Estate Company
3.
4. ☐ Additional Names on Page _____ of Document.

Grantee(s) (Last name first, then first name and initials)
1. The Public
2.
3.
4. ☐ Additional Names on Page _____ of Document.

Legal Description (abbreviated: *i.e.*, lot, block, plat or section, township, range)
Portions of Sections 22, 23, 26, and 27, Township 19 North, Range 1 East, W.M. Pierce County, Washington

Full Legal Description on Pages 5-7 of Document.

Reference Number(s) of Documents Assigned or Released:

N/A

☐ Additional Reference Numbers on Page _____ of Document.

Assessor's Property Tax Parcel/Account Number
01-19-22-3002; 01-19-26-2004; 01-19-26-3007; 01-19-27-1001;
01-19-23-3005; 01-19-26-2005; 01-19-22-3001

The Auditor/Recorder will rely on the information provided on this cover sheet. The staff will not read the document to verify the accuracy or completeness of the indexing information provided herein.

For reference only, not for re-sale.

Document Copy

9910290750

DECLARATION OF RESTRICTIVE COVENANT

This Declaration of Restrictive Covenant is made this 26th day of October, 1999, by Weyerhaeuser Company and by Weyerhaeuser Real Estate Company, the fee title owners of the real property described below (collectively, the "Owners").

1. Property. The collective real property located in DuPont, Washington, legally described on Exhibit A, and commonly referred to as "Parcel One" and "Parcel Two" of the "Former DuPont Works Site," is the subject of remedial action under the Washington Model Toxics Control Act, Chapter 70.105D RCW (the "Property"). Remedial action is currently in process on Parcel One and has been completed on Parcel Two, and is described in the Consent Decree entered in State of Washington v. Weyerhaeuser Co., Inc. and DuPont Co., Inc., Thurston County Cause No. 91-2-01073-1.

2. Restrictions on Use. Parcel Two and, as shown on the map attached as Exhibit B, the Portion of Parcel One north of Sequalitchew Creek, shall be developed and used only for industrial uses. In no event shall any of the Property be developed or used for any of the following activities: residential uses, schools, daycares, or parks, or recreational uses; provided that golf courses and related amenities shall be allowed on Parcel One.

3. Reservation of Rights. The Owners reserve unto themselves, and their successors and assigns, all rights and privileges in and to the use of the Property which are not incompatible with the restrictions and rights granted in this Restrictive Covenant.

4. No Public Access. No right of access or use by the general public to any portion of the Property is conveyed by this instrument.

5. Run with the Land. To the extent that this instrument is construed as a restrictive covenant, it shall run with the land, and shall be binding on the Owners, their successors and assigns, of all or any portion of the Property, without whose consent it cannot be released, modified or amended.

6. Easement in Gross. To the extent that this instrument creates a negative easement, it shall be construed as an easement in gross, for the sole benefit of Weyerhaeuser Company and Weyerhaeuser Real Estate Company, without whose consent it cannot be released, modified or amended.

7. Enforcement. Weyerhaeuser Company, Weyerhaeuser Real Estate Company, and any other fee title holder to all or any portion of the Property, shall have the right to enforce, by any proceedings at law or in equity, all restrictions imposed by the provisions of this Restrictive Covenant. Should Weyerhaeuser Company, Weyerhaeuser Real Estate Company, or any other fee title holder employ legal counsel to enforce this Restrictive Covenant, all costs incurred in such enforcement, including a reasonable fee for legal counsel, shall be paid by the Owner found to be in violation of this document.

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For reference only, not for re-sale.

8. Severability. Invalidation of any provision or application of a provision of this Restrictive Covenant by any court shall not affect any other provisions or applications.

9. Interpretation. The singular may also include the plural and the masculine may include the feminine, or visa versa, where the context so admits or requires. Captions are included for convenience only.

WEYERHAEUSER COMPANY

By: Robert A. Dowdy
Vice President and General Counsel
(name printed or typed)
Its:
Dated: 10/26/99

WEYERHAEUSER REAL ESTATE COMPANY

By: Thomas B. Miller
Thomas B. Miller
Its: Vice President
Dated: 10/10/99

STATE OF WASHINGTON)
) ss.
County of King)

I certify that I know or have satisfactory evidence that Robert A. Dowdy is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as the Vice President of WEYERHAEUSER COMPANY to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

DATED this 26th day of October, 1999.

KATHLEEN T. DRAHOS NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES SEPT 15, 2002

Kathleen T. Drahos
Kathleen T. Drahos
(Type/Print Name above)
Notary Public in and for the State of Washington, residing at Orting
My appointment expires: Sept. 15, 2002

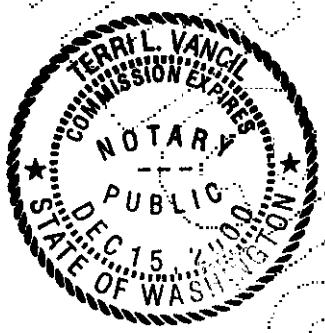
STATE OF WASHINGTON)
) ss.
County of King)

9910290750

For reference only, not for re-sale.

I certify that I know or have satisfactory evidence that THOMAS B. MILLER is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as the VICE PRESIDENT of WEYERHAEUSER REAL ESTATE COMPANY to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

DATED this 10 day of October, 1999.



Terri L. Vancil
(Type/Print Name above)
Notary Public in and for the State of Washington, residing at Olalla.
My appointment expires: 12/15/00.

UNOFFICIAL DOCUMENT

For reference only, not for re-sale.

9910290750

Unofficial Document

For reference only, not for re-sale.

EXHIBIT A
TO
DECLARATION OF RESTRICTIVE COVENANT

LEGAL DESCRIPTION FOR
CONSENT AREA (PARCEL 1)

That portion of the South half of Section 22 AND that portion of the West half of Section 26 AND that portion of Section 27, ALL in Township 19 North, Range 1 East, W.M., Pierce County, Washington, being more particularly described as follows:

COMMENCING at the West quarter corner of said Section 26, being a 6" x 6" concrete monument with "X";

THENCE along the West line of said Section, N 01°47'39" E, 2635.01 feet to the Northwest corner of said Section, being a 6" x 6" concrete monument with "X";

THENCE along the West line of said Section, S 01°47'39" W, 554.70 feet to the TRUE POINT OF BEGINNING;

THENCE S 88°47'08" E, 1504.71 feet;

THENCE S 33°00'19" E, 901.00 feet;

THENCE S 01°40'37" W, 1140.43 feet;

THENCE S 39°35'03" W, 1290.96 feet to an existing 7 foot high chain link fence with barb wire atop;

THENCE along said fence line, the following bearings and distances:

S 54°01'26" W, 1898.35 feet;

N 82°31'10" W, 1797.29 feet;

N 68°34'59" W, 3235.77 feet;

N 02°55'12" W, 203.54 feet;

N 14°26'10" E, 386.38 feet;

N 16°58'22" E, 557.84 feet;

N 22°03'49" E, 1918.07 feet;

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N 30°51'26" E, 610.41 feet;

N 60° 43'57" E, 203.50 feet;

N 45°11'21" E, 1390.65 feet;

N 35°14'28" E, 45.20 feet;

N 12°10'36" E, 20.58 feet;

THENCE N 44°40'54" E, 20.34 feet to a point on the Southerly monumented line of Sequalitchew Creek as shown on that Record of Survey by ESM, Inc. as filed under Recording No. 8907170351, Records of Pierce County, Washington.

THENCE along said monumented line, the following bearings and distances:

N 44°40'54" E, 70.26 feet;

S 53°19'01" E, 95.14 feet;

S 72°27'15" E, 108.17 feet;

S 73°26'19" E, 170.31 feet;

S 09°01'31" E, 75.90 feet;

S 59°28'35" E, 86.92 feet;

N 27°03'38" E, 55.73 feet;

S 56°01'12" E, 77.30 feet;

S 42°37'43" E, 145.44 feet;

S 46°02'34" E, 265.02 feet;

S 55°18'22" E, 186.10 feet;

THENCE leaving said monument line, S 76°12'57" E, 188.49 feet;

THENCE N 52°52'30" E, 75.60 feet;

THENCE N 80°48'55" E, 77.99 feet;

THENCE S 75°01'48" E, 55.61 feet;

THENCE S 81°24'05" E, 39.01 feet;

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THENCE S 22°37'33" E, 83.02 feet to said monumented line of Sequalitchew Creek;

THENCE along said monumented line, the following the bearings and distances:

S 61°16'46" E, 243.97 feet;

S 50°59'49" E, 193.72 feet;

S 35°32'26" E, 215.85 feet;

S 26°05'39" E, 165.29 feet;

S 36°52'17" E, 143.38 feet;

S 20°09'56" E, 96.99 feet;

S 15°40'54" E, 191.12 feet;

S 33°57'49" E, 65.28 feet;

S 35°33'50" E, 126.48 feet;

S 44°41'41" E, 147.28 feet;

S 54°34'32" E, 70.01 feet;

THENCE leaving said monumented line and running, S 88°47'08" E, 240.62 feet to the TRUE POINT OF BEGINNING.

Containing 636.183 acres (27,712,128 square feet), more or less.

LEGAL DESCRIPTION FOR CONSENT AREA (PARCEL 2)

That portion of the Southeast quarter of Section 22 AND that portion of the South half of Section 23 AND that portion of the North half of Section 26 AND that portion of the Northeast quarter of Section 27, ALL in Township 19 North, Range 1 East, W.M., Pierce County, Washington, being more particularly described as follows:

COMMENCING at the West quarter corner of said Section 26, being a 6" x 6" concrete monument with "X";

THENCE along the West line of said Section, N 01°47'39" E, 2635.01 feet to the Northwest quarter of said Section, being a 6" x 6" concrete monument with "X";

THENCE along the West line of said Section, S 01°47'39" W, 554.70 feet;

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THENCE S 88°47'08" E, 65.36 feet to the TRUE POINT OF BEGINNING;

THENCE continuing S 88°47'08" E, 1439.35 feet;

THENCE S 33°00'19" E, 543.91 feet;

THENCE N 87°59'15" E, 833.12 feet to the Westerly margin of the Puget Sound Power and Light Company Easement;

THENCE along said Westerly margin, N 01°40'37" E, 957.55 feet;

THENCE continuing along said Westerly margin, N 02°06'15" E, 1275.17 feet to an angle point on said easement;

THENCE along the Northerly extension of said Westerly margin N 02°06'15" E, 298.36 feet to an existing 7 foot high chain link fence with barb wire atop;

THENCE along said fence line, N 86°38'04" W, 549.37 feet;

THENCE N 00°00'00" W, 78.68 feet;

THENCE S 90°00'00" W, 262.85 feet;

THENCE N 00°00'00" W, 397.09 feet;

THENCE S 90°00'00" W, 970.32 feet;

THENCE N 00°00'00" W, 438.74 feet;

THENCE S 90°00'00" W 286.79 feet;

THENCE S 00°00'00" E, 226.33 feet;

THENCE S 90°00'0" W, 231.85 feet;

THENCE S 00°00'00" E. 249.16 feet;

THENCE S 89°50'39" W. 1734.93 feet;

THENCE N 00°00'00" W, 258.53 feet;

THENCE S 90°00'00" W, 264.30 feet;

THENCE S 00°00'00" E, 511.38 feet;

THENCE N 90°00'00" E, 261.44 feet;

THENCE S 00°00'00" E, 239.63 feet;

9910290750

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THENCE N 90°00'00" E, 223.81 feet;

THENCE S 00°00'00" E, 252.97 feet;

THENCE N 90°00'00" E, 238.20 feet;

THENCE S 00°00'00" E, 266.87 feet;

THENCE N 90°00'00" E, 300.47 feet;

THENCE S 00°00'00" E, 496.73 feet;

THENCE N 90°00'00" E, 230.46 feet;

THENCE S 00°00'00" E, 224.71 feet;

THENCE N 90°00'00" E, 207.44 feet;

THENCE S 00°00'00" E, 673.76 feet;

THENCE N 90°00'00" E, 134.26 feet to the monumented line of Sequalitchew Creek per that Record of Survey by ESM, Inc. as filed under Recording No. 8907170351, Records of Pierce County, Washington;

THENCE along said monumented line, S 20°43'37" E, 140.33 feet to the TRUE POINT OF BEGINNING.

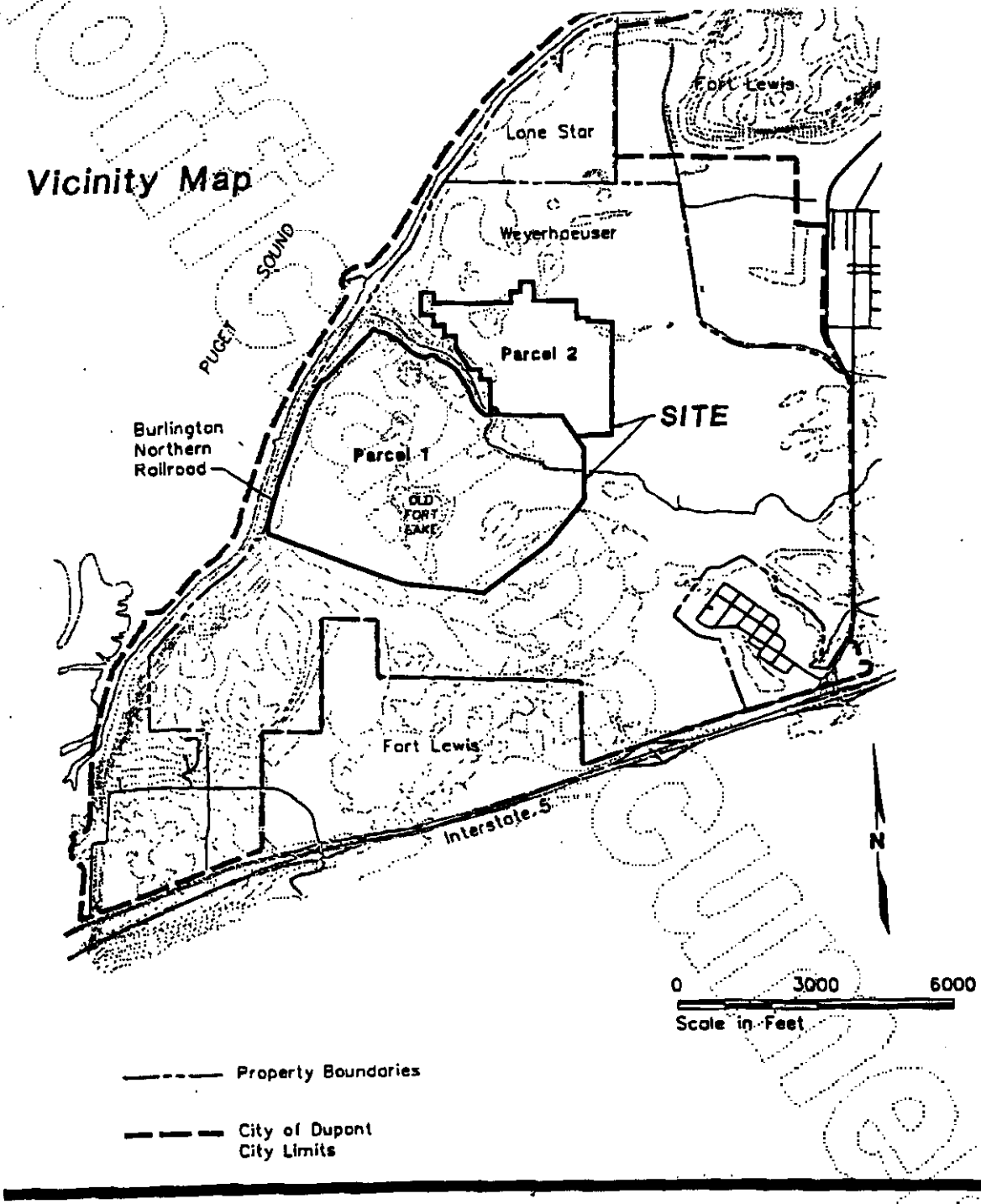
Containing 205.100 acres (8,934,137 S.F.), more or less.

See attached Exhibit "B".

For reference only, not for re-sale.

Unofficial Document

EXHIBIT B



9910290750

For reference only, not for re-sale.

Attachment 5b

200607251019 14 PGS
07/25/2006 2:39pm $45.00
PIERCE COUNTY, WASHINGTON

Name & Return Address:

Polly McNeill
Summit Law Group
315 Fifth Ave S Suite 1000
Seattle, WA 98104

Document Title(s) Declaration of Restrictive Covenant –Open Spaces
Grantor(s) -- Weyerhaeuser Company
Grantee(s) -- State of Washington, Department of Ecology
Legal Description (Abbreviated: i.e., lot, block & subdivision name or number OR section/township/range and quarter/quarter section) Lot 6 and a portion of Lot 3 of that Record of Survey recorded under Recording No. 200601275001, Records of Pierce County, Washington Complete Legal Description in Exhibit A of the Document
Auditor's Reference Number -- 200601275001
Assessor's Property Tax Parcel/Account Number(s) – 0119224001, 0119274007
The Auditor/Recorder will rely on the information provided on this cover sheet. The Staff will not read the document to verify the accuracy or completeness of the indexing information provided herein. I am requesting an emergency nonstandard recording for an additional fee as provided in RCW 36.18.010. I understand that the recording processing requirements may cover up or otherwise obscure some part of the text of the original document. _____ Signature of Requesting Party (Required for non-standard recordings only)

DECLARATION OF RESTRICTIVE COVENANT

OPEN SPACES

This Declaration of Restrictive Covenant ("Restrictive Covenant") is made pursuant to RCW 70.105D.030(1)(f) and (g) and WAC 173-340-440 this 24th day of July, 2006, by the Weyerhaeuser Company ("Weyerhaeuser"), its successors and assigns, and the State of Washington, Department of Ecology ("Department of Ecology"), and its successors and assigns.

The undersigned, Weyerhaeuser, covenants that it is the fee owner of real property in Pierce County, Washington, legally described in Exhibit A and depicted in Exhibit B, attached hereto and incorporated herein by this reference ("Property").

The Property is within an area commonly referred to as "Parcel One" of the "Former DuPont Works Site" that was the subject of work to clean up the Property ("Remedial Action") under the Washington Model Toxics Control Act ("MTCA"), Chapter 70.105D RCW. The Remedial Action is described in the Consent Decree entered in *State of Washington, Department of Ecology v. Weyerhaeuser Company and E.I. DuPont de Nemours and Company* (Thurston County Cause No. 03-2-10484-7), in attachments to the Decree and in documents referenced in the Decree, including without limitation the Cleanup Action Plan attached to the Consent Decree as Exhibit A, and incorporated therein by reference. The Cleanup Action Plan is on file and available for inspection at the Washington State Department of Ecology, Toxics Cleanup Program, P.O. Box 47775, Olympia, WA 98504-7775. The boundary of Parcel One is depicted in Exhibit B, attached hereto.

This Restrictive Covenant is required because the Remedial Action resulted in residual concentrations at portions of the Property of hazardous substances which exceed the soil and groundwater cleanup levels specified in MTCA for unrestricted land uses.

Weyerhaeuser makes the following declaration as to limitations, conditions, restrictions, and uses to which the Property may be put and specifies that such declarations shall run with the land as provided by law and shall be binding on Weyerhaeuser, its successors and assigns, and any and all parties and persons claiming under them, including all current and future owners of any portion of or interest in the Property (hereafter, "Owner").

Section 1: Restrictions on Use of Property. The Property shall be permanently designated and used only as Open Space. For purposes of this Restrictive Covenant, the term "Open Space" means a natural area or parcel which may be developed only for transitory uses such as paved and unpaved trails, and tables, benches, signs and waste receptacles incidental to such uses, as allowed under the City of DuPont zoning regulations and Comprehensive Land Use Plan and under MTCA; provided, however, in no event shall the Property be developed and used for any of the following: residential uses, schools, daycares, parks, recreational uses other than Open Space, or any other use in which the likelihood of children having sustained access to soils can be reasonably anticipated.

Section 2: Restrictions on Activities. The Owner may maintain the Property consistent with its intended use for transitory uses within the Open Space designations. Normal construction and maintenance for permitted development is not restricted by this Section. Maintenance of any impervious surfaces is expressly permitted without prior approval so long as appropriate health and safety protocols are followed. For development activities permitted under this Restrictive Covenant, excavated soils must be managed properly and unless put back in place, must be either placed back in the Open Space, removed to an area within the boundaries of the Former DuPont Works Site, or disposed off-site in accordance with applicable regulations. Excavated soils shall be managed to minimize exposure to workers and other adults, including but not limited to the use of best management practices to control dust and surface water runoff; and to prevent exposure to children. Any activity on the Property that could interfere with the continued protection of human health and the environment is prohibited without prior written approval from the Department of Ecology.

Section 3: Change of Use. The Owner must notify and obtain approval from the Department of Ecology prior to any use of the Property that is inconsistent with the terms of this Restrictive Covenant. The Department of Ecology may approve any inconsistent use only after public notice and comment; provided, however, in no event may any change in use be approved that would allow for residential uses, schools, daycares, parks, recreational uses other than Open Space, or any other use in which the likelihood of children having sustained access to soils can be reasonably anticipated.

Section 4: Notice of Conveyance. The Owner must give thirty (30) days' advance written notice to the Department of Ecology of the Owner's intent to convey any interest in the Property. Within thirty (30) days of the date any instrument conveying a fee title interest is executed, grantor must provide the Department of Ecology with a certified true copy of the instrument and, if it has been recorded in the public land records, its recording reference. No conveyance of title, easement, lease, or other interest in the Property shall be consummated by the Owner without adequate and complete provision for continued monitoring, operation, and maintenance of the Remedial Action.

Section 5: Leasehold Interests. The Owner must restrict leases to uses and activities consistent with this Restrictive Covenant and notify all lessees of the restrictions on the use of the Property.

Section 6: Recordation. Within thirty (30) days of the date of execution, the Owner shall record this Restrictive Covenant with the Pierce County Assessor's Office, and provide evidence of recordation to the Department of Ecology.

Section 7: Notice Requirement. The Owner shall include in any instrument conveying any interest in any portion of the Property, including but not limited to deeds, leases, and mortgages a notice which is in substantially the following form:

NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO THE EFFECT OF A RESTRICTIVE COVENANT, DATED _____, RECORDED IN THE PUBLIC LAND RECORDS ON _____, IN BOOK _____, PAGE _____, IN FAVOR OF, AND ENFORCEABLE BY THE STATE OF WASHINGTON.

Section 8: Notices. Any notice, demand, request, consent, approval, or communication that either party desires or is required to give the other shall be in writing and shall be served personally or sent by first class mail postage prepaid, addresses as follows:

To Weyerhaeuser:

Director, Environmental Affairs
Mail Stop EC2 2C1
P.O. Box 9777
Federal Way, WA 98063-9777

To the Department of Ecology:

Washington State Department of Ecology
Toxics Cleanup Program
P.O. Box 47775
Olympia, WA 98504-7775

Section 9: Groundwater Withdrawal. The Owner of the Property must not permit withdrawal of groundwater from the Property for drinking water purposes, unless authorized by the Department of Ecology. Withdrawal of groundwater from monitoring wells for the purpose of extracting samples for analysis is expressly permitted.

Section 10: Access. The Owner shall allow authorized representatives of the Department of Ecology, E.I. DuPont de Nemours Company and Weyerhaeuser the right to enter the Property at reasonable times for the purposes of monitoring compliance with the terms of this Restrictive Covenant, evaluating the Remedial Action, taking samples, inspecting remedial actions conducted at the Property, and inspecting records that are related to the Remedial Action.

Section 11: No Public Access and Use. No right of access or use by the general public to any portion of the Property is conveyed by this Restrictive Covenant; provided, however, that public access may be permitted so long as the Property is designated Open Space by the City of DuPont.

Section 12: Enforcement. Weyerhaeuser, the E.I. DuPont de Nemours Company, and the Department of Ecology shall each have the right, but not the obligation, to enforce the terms of this Restrictive Covenant by resort to specific performance or any legal process; provided, however, that no provision of this Restrictive Covenant shall be construed or intended to impose

any obligations, by law or by contract, on the Department of Ecology or Weyerhaeuser or E.I. DuPont de Nemours Company to take action to enforce said restrictions. Neither the right nor authority of the Department of Ecology and Weyerhaeuser and E.I. DuPont de Nemours Company to enforce this Restrictive Covenant nor a decision made to exercise or not to exercise such authority to right shall give rise to any duty or responsibility on the party of the Department of Ecology or Weyerhaeuser or E.I. DuPont de Nemours Company to exercise or not exercise this right on behalf of any Party or other person or entity. All remedies available hereunder shall be in addition to any and all remedies at law or in equity, including MTCA. Any forbearance, delay or omission to exercise the enforcement rights under this Restrictive Covenant in the event of a breach of any term of this Restrictive Covenant shall not be deemed to be a waiver of such term or of any subsequent breach of the same or any other term, or of any of the rights under this Restrictive Covenant. Should legal counsel be employed to enforce this Restrictive Covenant, all costs incurred in such enforcement, including reasonable attorneys' fees shall be paid by the Owner found to be in violation.

Section 13: No Third Party Beneficiary. This Restrictive Covenant is intended for the sole and exclusive benefit of the Parties hereto and their respective successors and assigns, including all current and future owners of any portion or interest in the property. The Parties to this Restrictive Covenant expressly do not intend to benefit any other person or entity, and expressly do not intend to create any third-party beneficiaries to any provision of this Restrictive Covenant, including but not limited to any enforcement provisions.

Section 14: Run with the Land. To the extent that this Restrictive Covenant is construed as a restrictive covenant, it shall run with the land, and shall be binding on the Owners, their successors and assigns, of all or any portion of the Property. No conveyance of title, easement, lease, or other interest in the Property shall be consummated by the property owner without adequate and complete provision for the continued observation of this Restrictive Covenant.

Section 15: Severability. Invalidation of any provision or application of a provision of this Restrictive Covenant by any court shall not affect any other provisions or applications.

Section 16: Easement in Gross. To the extent that this Restrictive Covenant creates a negative easement, it shall be construed as an easement in gross for the sole benefit of Weyerhaeuser, without whose consent it cannot be released, modified or amended.

Section 17: Reserved Rights. Weyerhaeuser reserves unto itself and its successors and assigns all rights and privileges in and to the use of the Property which are not incompatible with the restrictions, and rights granted herein.

Weyerhaeuser Company has caused this Restrictive Covenant to be signed in its name.

EXECUTED this 13th day of July, 2006.

WEYERHAEUSER COMPANY

By: Richard E. Hanson

Richard E. Hanson
Executive Vice President and Chief
Operating Officer

STATE OF WASHINGTON)
) ss.
County of Pierce)

On this 13th day of July, 2006, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Richard E. Hanson, known to be the Executive Vice President and Chief Operating Officer of Weyerhaeuser Company, the corporation that executed the foregoing Restrictive Covenant, and acknowledged the said Restrictive Covenant to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that he is authorized to execute said Restrictive Covenant.

WITNESS my hand and official seal hereto affixed the day and year written above.

DALENE D. DASCHOFSKY NOTARY PUBLIC COMMISSION EXPIRES SEPT 30, 2007 STATE OF WASHINGTON

Dalene D. Daschofsky
NOTARY PUBLIC in and for the State of
Washington. My commission expires:
Sept. 30, 2007

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

By: Dated: July 17, 2006

Mike Blum
Project Coordinator

Attachments: Exhibit A – Legal description of Property
Exhibit B – Depiction of Property & Parcel One Boundary

Weyerhaeuser Company
Job No. 129-044-004-0960
May 25, 2006
Revised June 26, 2006

EXHIBIT A

LEGAL DESCRIPTION FOR OPEN SPACES

Lot 6 of that Record of Survey recorded under Recording No. 200601275001, Records of Pierce County, Washington.

TOGETHER WITH that portion of Lot 3, of said Record of Survey, more particularly described as follows:

BEGINNING at the northeast corner of said Lot 3, said point being coincident with the northwesterly margin of Center Drive;

THENCE along the northern boundary of said Lot 3 N 81°24'09" W, 176.06 feet;

THENCE continuing along said northern boundary N 82°02'47" W, 208.44 feet to the TRUE POINT OF BEGINNING;

THENCE continuing along said northern boundary the following courses:

N 82°02'47" W, 12.34 feet;

N 88°58'34" W, 127.11 feet;

N 80°55'20" W, 63.57 feet;

N 89°48'45" W, 146.05 feet;

N 87°20'24" W, 199.38 feet;

N 84°14'01" W, 136.26 feet;

N 84°52'55" W, 107.87 feet;

N 64°55'42" W, 78.86 feet;

N 47°28'45" W, 62.14 feet;

N 12°44'34" W, 113.16 feet;

N 55°38'27" W, 31.57 feet;

S 86°29'11" W, 62.97 feet;

N 82°24'23" W, 234.52 feet;

N 72°20'47" W, 87.28 feet;

N 65°14'01" W, 159.98 feet;

N 86°43'17" W, 112.57 feet;

N 66°50'15" W, 140.76 feet;

N 40°38'13" W, 56.77 feet;

N 54°24'36" W, 135.57 feet;

N 70°55'03" W, 247.37 feet;

N 41°50'55" W, 94.30 feet;

N 19°30'09" W, 141.38 feet;

N 09°58'47" E, 165.75 feet;

N 60°10'47" E, 105.65 feet;

N 15°04'32" E, 149.21 feet;

N 11°16'53" W, 99.61 feet;

THENCE leaving said northern boundary N 88°47'13" W, 145.41 feet;

THENCE N 54°34'37" W, 70.01 feet;

THENCE N 44°41'46" W, 147.28 feet;

THENCE N 35°33'55" W, 126.48 feet;

THENCE N 33°57'56" W, 65.28 feet;

THENCE N 15°40'59" W, 191.12 feet;

THENCE N 20°10'01" W, 96.99 feet;

THENCE N 36°52'22" W, 143.38 feet;

THENCE N 26°05'44" W, 165.29 feet;

THENCE N 35°32'31" W, 215.85 feet;

THENCE N 50°59'54" W, 193.72 feet;

THENCE N 61°16'51" W, 243.97 feet;

THENCE N 22°37'38" W, 83.02 feet;

THENCE N 81°24'10" W, 39.01 feet;

THENCE N 75°01'53" W, 55.61 feet;

THENCE S 80°48'50" W, 77.99 feet;

THENCE S 52°52'25" W, 75.60 feet;

THENCE N 76°13'02" W, 188.49 feet;

THENCE N 55°18'27" W, 186.10 feet;

THENCE N 46°02'39" W, 265.02 feet;

THENCE N 42°37'48" W, 145.44 feet;

THENCE N 56°01'17" W, 77.30 feet;

THENCE S 27°03'33" W, 55.73 feet;

THENCE N 59°28'40" W, 86.92 feet;

THENCE N 09°01'36" W, 75.90 feet;

THENCE N 73°26'24" W, 170.31 feet;

THENCE N 72°27'20" W, 108.17 feet;

THENCE N 53°19'06" W, 95.14 feet;

THENCE S 44°40'49" W, 90.60 feet;

THENCE S 12°10'31" W, 20.58 feet to the southerly boundary of said Lot 3;

THENCE along said southerly boundary the following courses:

N 35°14'22" E, 42.57 feet;

N 89°24'52" E, 74.82 feet;

S 35°43'38" E, 42.79 feet;

S 85°39'27" E, 55.90 feet;

S 53°19'45" E, 50.25 feet;

S 76°18'47" E, 101.33 feet;

S 49°20'32" E, 172.29 feet;

S 61°23'35" E, 54.32 feet;

S 74°19'50" E, 88.60 feet;

S 41°26'58" E, 143.56 feet;

S 45°37'04" E, 145.55 feet;

S 55°23'05" E, 100.50 feet;

N 53°19'12" E, 26.53 feet;

S 51°52'31" E, 96.99 feet;

S 46°10'11" E, 122.07 feet;

S 39°48'43" E, 75.30 feet;

S 19°26'43" E, 124.94 feet to a point of curvature;

Southerly, 40.81 feet along the arc of a tangent curve to the right, having a radius of 35.50 feet, through a central angle of 65°52'24";

S 22°56'06" E, 25.62 feet;

S 46°10'51" E, 61.76 feet;

S 19°52'31" E, 100.81 feet;

S 16°34'41" E, 157.82 feet;

N 57°50'23" E, 65.15 feet;

N 26°36'28" E, 52.16 feet;

N 13°59'53" E, 37.81 feet;

N 01°08'04" W, 259.31 feet;

N 18°46'20" W, 48.92 feet;

N 02°30'42" E, 54.76 feet;

S 86°54'00" E, 90.44 feet;

S 62°04'20" E, 238.38 feet;

S 69°47'20" E, 57.28 feet;

S 44°06'36" E, 209.71 feet;

S 34°44'19" E, 192.77 feet;

S 27°35'16" E, 110.33 feet;

S 37°43'37" E, 131.19 feet;

S 19°23'11" E, 114.21 feet;

S 03°10'56" E, 116.95 feet;

S 17°00'17" E, 67.26 feet;

S 30°01'42" E, 57.79 feet;

S 41°57'59" E, 249.15 feet;

S 32°06'13" E, 81.14 feet;

S 41°59'44" W, 49.87 feet;

S 08°22'48" E, 74.15 feet;

S 25°53'50" E, 76.38 feet;

S 01°08'02" W, 348.96 feet;

S 27°00'43" E, 112.04 feet;

S 34°19'20" E, 87.42 feet;

S 49°11'02" E, 72.59 feet;

S 62°11'03" E, 69.39 feet;

S 24°28'05" E, 65.64 feet;

N 76°15'11" E, 48.33 feet;

S 53°43'56" E, 129.34 feet;

S 60°41'16" E, 162.72 feet;

S 77°20'02" E, 170.54 feet;

S 72°38'29" E, 226.91 feet;

S 50°58'05" E, 108.58 feet;

N 86°21'14" E, 135.81 feet;

N 32°18'51" E, 21.44 feet;

S 84°05'26" E, 82.17 feet;

S 73°54'16" E, 55.51 feet;

S 22°41'31" E, 82.14 feet;

S 47°38'05" E, 103.73 feet;

S 61°13'57" E, 62.70 feet;

S 72°03'32" E, 71.78 feet;

S 84°52'55" E, 107.30 feet;

S 84°14'01" E, 138.41 feet;

S 87°20'24" E, 204.25 feet;

S 89°48'45" E, 140.44 feet;

S 80°55'20" E, 62.83 feet;

S 88°58'34" E, 128.10 feet;

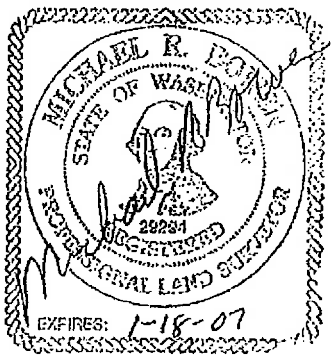
S 82°02'47" E, 17.29 feet;

THENCE leaving said southerly boundary N 01°40'32" E, 100.60 feet to the TRUE POINT OF BEGINNING.

See attached Exhibit "B".

Written by: M.R.B.
Checked by: R.J.W.

I:\ESM-JOBS\129\44\004\DOCUMENTS\129044-22.DOC

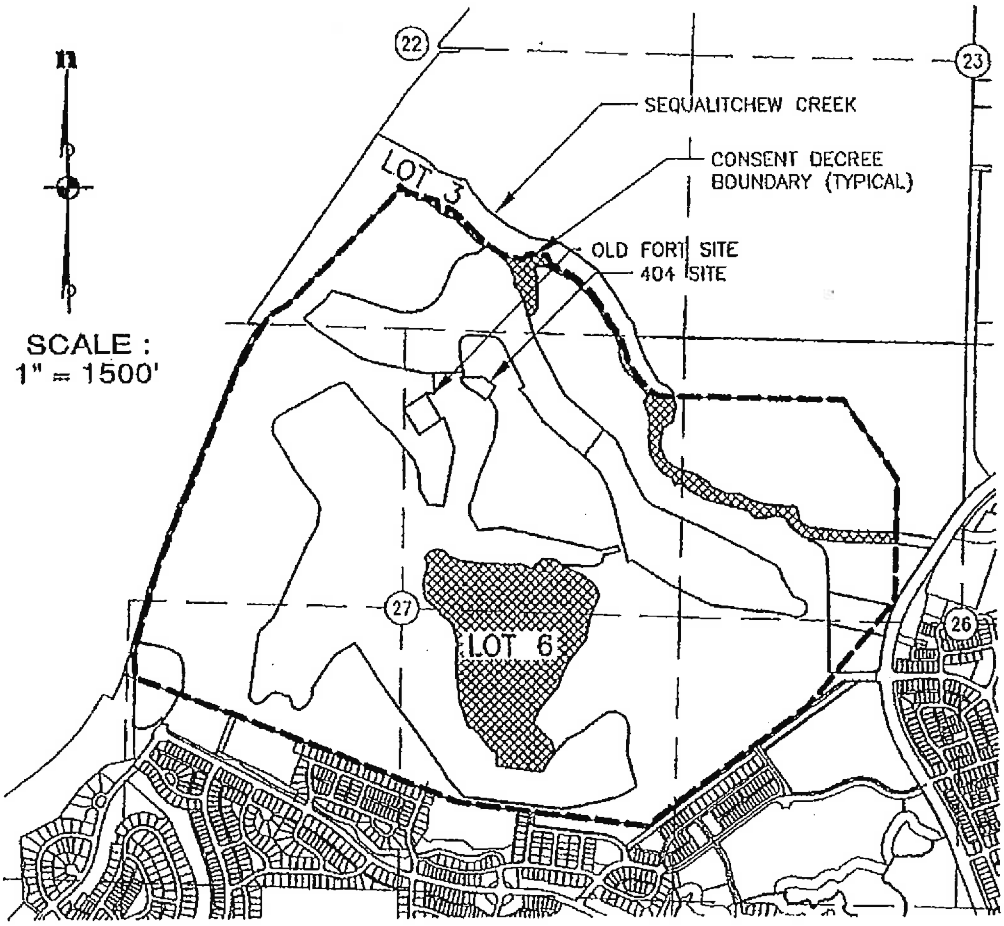


6/28/06

EXHIBIT "B"

TO ACCOMPANY LEGAL DESCRIPTION FOR OPEN SPACE PROPERTY

A PORTION OF SECTIONS 22, 26, 27, 28 AND 35, TOWNSHIP 19 NORTH, RANGE 1 EAST, W.M., CITY OF DUPONT, PIERCE COUNTY, WASHINGTON



LEGEND

SUBJECT AREA

ESM CONSULTING ENGINEERS LLC
720 S. 348th Street
Federal Way, WA 98003
FEDERAL WAY (253) 835-6113
OFFICE (425) 413-6144
www.esmcivil.com
Civil Engineering Public Works | Land Surveying Project Management | Land Planning Landscape Architecture

JOB NO. 129-044-004-0960
DWG: 129\44\004\EXHIBITS\SR-06.DWG
DATE : 05-01-06
DRAWN : MRB
SHEET 1 OF 1

Attachment 5c

200607251020 8 PGS
07/25/2006 2:39pm $39.00
PIERCE COUNTY, WASHINGTON

Name & Return Address:

Polly McNeill
Summit Law Group
315 Fifth Ave S Suite 1000
Seattle, WA 98104

Document Title(s) Declaration of Restrictive Covenant – Industrial
Grantor(s) Weyerhaeuser Company Additional Names on Page ____ of Document
Grantee(s) State of Washington, Department of Ecology Additional Names on Page _____ of Document
Legal Description (Abbreviated: i.e., lot, block & subdivision name or number OR section/township/range and quarter/quarter section) Lot 2 of that Record of Survey recorded under Recording No. 200601275001, Records of Pierce County, Washington Complete Legal Description in Exhibit A of the Document
Auditor's Reference Number – Recording No. 200601275001
Assessor's Property Tax Parcel/Account Number(s) -- 0119262013
The Auditor/Recorder will rely on the information provided on this cover sheet. The Staff will not read the document to verify the accuracy or completeness of the indexing information provided herein. I am requesting an emergency nonstandard recording for an additional fee as provided in RCW 36.18.010. I understand that the recording processing requirements may cover up or otherwise obscure some part of the text of the original document. _____ Signature of Requesting Party (Required for non-standard recordings only)

Unofficial Document
For reference only, not for re-sale.

Unofficial Document

For reference only, not for re-sale.

DECLARATION OF RESTRICTIVE COVENANT

INDUSTRIAL

This Declaration of Restrictive Covenant ("Restrictive Covenant") is made pursuant to RCW 70.105D.030(1)(f) and (g) and WAC 173-340-440 this 24th day of July, 2006, by the Weyerhaeuser Company ("Weyerhaeuser"), its successors and assigns, and the State of Washington, Department of Ecology ("Department of Ecology"), and its successors and assigns.

The undersigned, Weyerhaeuser, covenants that it is the fee owner of real property in Pierce County, Washington, legally described in Exhibit A and depicted in Exhibit B, attached hereto and incorporated herein by this reference ("Property").

The Property is within an area commonly referred to as "Parcel One" of the "Former DuPont Works Site" that was the subject of work to clean up the Property ("Remedial Action") under the Washington Model Toxics Control Act ("MTCA"), Chapter 70.105D RCW. The Remedial Action is described in the Consent Decree entered in *State of Washington, Department of Ecology v. Weyerhaeuser Company and E.I. DuPont de Nemours and Company* (Thurston County Cause No. 03-2-10484-7), in attachments to the Decree and in documents referenced in the Decree, including without limitation the Cleanup Action Plan attached to the Consent Decree as Exhibit A, and incorporated therein by reference. The Cleanup Action Plan is on file and available for inspection at the Washington State Department of Ecology, Toxics Cleanup Program, P.O. Box 47775, Olympia, WA 98504-7775. The boundary of Parcel One is depicted in Exhibit B, attached hereto.

This Restrictive Covenant is required because the Remedial Action resulted in residual concentrations at portions of the Property of hazardous substances which exceed the soil and groundwater cleanup levels specified in MTCA for unrestricted land uses.

Weyerhaeuser makes the following declaration as to limitations, conditions, restrictions, and uses to which the Property may be put and specifies that such declarations shall run with the land as provided by law and shall be binding on Weyerhaeuser, its successors and assigns, and any and all parties and persons claiming under them, including all current and future owners of any portion of or interest in the Property (hereafter, "Owner").

Section 1: Restrictions on Use of Property. The Property has been remediated to meet the soil cleanup levels specified in MTCA for industrial property. The Property may be developed and used only for industrial use as allowed under the City of DuPont zoning regulations and Comprehensive Land Use Plan and under MTCA; provided, however that the Property shall not be developed and used for any of the following: residential uses, schools, daycares, parks, recreational uses; or any other use in which the likelihood of children having sustained access to soils can be reasonably anticipated.

Section 2: Restrictions on Activities. The Owner may maintain and develop the Property consistent with this Restrictive Covenant. Normal construction and maintenance for permitted development is not restricted by this Section. Maintenance of any impervious surfaces is expressly permitted without prior approval so long as appropriate health and safety protocols are followed. For development activities permitted under this Restrictive Covenant, excavated soils must be managed properly and unless put back in place, must be either placed in an area within the boundaries of the Former DuPont Works Site that is zoned for industrial-type uses, or disposed off-site in accordance with applicable regulations. Excavated soils shall be managed to minimize exposure to workers and other adults, including but not limited to the use of best management practices to control dust and surface water runoff; and to prevent exposure to children. Any activity on the Property that could interfere with the continued protection of human health and the environment is prohibited without prior written approval from the Department of Ecology.

Section 3: Change of Use. The Owner must notify and obtain approval from the Department of Ecology prior to any use of the Property that is inconsistent with the terms of this Restrictive Covenant. The Department of Ecology may approve any inconsistent use only after public notice and comment; provided, however, in no event may any change in use be approved that would allow for residential uses, schools, daycares, parks, recreational uses, or any other use in which the likelihood of children having sustained access to soils can be reasonably anticipated.

Section 4: Notice of Conveyance. The Owner must give thirty (30) days' advance written notice to the Department of Ecology of the Owner's intent to convey any interest in the Property. Within thirty (30) days of the date any instrument conveying a fee title interest is executed, grantor must provide the Department of Ecology with a certified true copy of the instrument and, if it has been recorded in the public land records, its recording reference. No conveyance of title, easement, lease, or other interest in the Property shall be consummated by the Owner without adequate and complete provision for continued monitoring, operation, and maintenance of the Remedial Action.

Section 5: Leasehold Interests. The Owner must restrict leases to uses and activities consistent with this Restrictive Covenant and notify all lessees of the restrictions on the use of the Property.

For reference only, not for re-sale.

Section 6: Recordation. Within thirty (30) days of the date of execution, the Owner shall record this Restrictive Covenant with the Pierce County Assessor's Office, and provide evidence of recordation to the Department of Ecology.

Section 7: Notice Requirement. The Owner shall include in any instrument conveying any interest in any portion of the Property, including but not limited to deeds, leases, and mortgages a notice which is in substantially the following form:

NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO THE EFFECT OF A RESTRICTIVE COVENANT, DATED _____, RECORDED IN THE PUBLIC LAND RECORDS ON _____, IN BOOK _____, PAGE _____, IN FAVOR OF, AND ENFORCEABLE BY THE STATE OF WASHINGTON.

Section 8: Notices. Any notice, demand, request, consent, approval, or communication that either party desires or is required to give the other shall be in writing and shall be served personally or sent by first class mail postage prepaid, addresses as follows:

To Weyerhaeuser:

Director, Environmental Affairs
Mail Stop EC2 2C1
P.O. Box 9777
Federal Way, WA 98063-9777

To the Department of Ecology:

Washington State Department of Ecology
Toxics Cleanup Program
P.O. Box 47775
Olympia, WA 98504-7775

Section 9: Groundwater Withdrawal. The Owner of the Property must not permit withdrawal of groundwater from the Property for drinking water purposes, unless authorized by the Department of Ecology. Withdrawal of groundwater from monitoring wells for the purpose of extracting samples for analysis is expressly permitted.

Section 10: Access. The Owner shall allow authorized representatives of the Department of Ecology, E.I. DuPont de Nemours Company and Weyerhaeuser the right to enter the Property at reasonable times for the purposes of monitoring compliance with the terms of this Restrictive Covenant, evaluating the Remedial Action, taking samples, inspecting remedial actions conducted at the Property, and inspecting records that are related to the Remedial Action.

Section 11: No Public Access and Use. No right of access or use by the general public to any portion of the Property is conveyed by this Restrictive Covenant.

Section 12: Enforcement. Weyerhaeuser, the E.I. DuPont de Nemours Company, and the Department of Ecology shall each have the right, but not the obligation, to enforce the terms of this Restrictive Covenant by resort to specific performance or any legal process; provided, however, that no provision of this Restrictive Covenant shall be construed or intended to impose any obligations, by law or by contract, on the Department of Ecology or Weyerhaeuser or E.I. DuPont de Nemours Company to take action to enforce said restrictions. Neither the right nor

For reference only, not for re-sale.

authority of the Department of Ecology and Weyerhaeuser and E.I. DuPont de Nemours Company to enforce this Restrictive Covenant nor a decision made to exercise or not to exercise such authority to right shall give rise to any duty or responsibility on the party of the Department of Ecology or Weyerhaeuser or E.I. DuPont de Nemours Company to exercise or not exercise this right on behalf of any Party or other person or entity. All remedies available hereunder shall be in addition to any and all remedies at law or in equity, including MTCA. Any forbearance, delay or omission to exercise the enforcement rights under this Restrictive Covenant in the event of a breach of any term of this Restrictive Covenant shall not be deemed to be a waiver of such term or of any subsequent breach of the same or any other term, or of any of the rights under this Restrictive Covenant. Should legal counsel be employed to enforce this Restrictive Covenant, all costs incurred in such enforcement, including reasonable attorneys' fees shall be paid by the Owner found to be in violation.

Section 13: No Third Party Beneficiary. This Restrictive Covenant is intended for the sole and exclusive benefit of the Parties hereto and their respective successors and assigns, including all current and future owners of any portion or interest in the property. The Parties to this Restrictive Covenant expressly do not intend to benefit any other person or entity, and expressly do not intend to create any third-party beneficiaries to any provision of this Restrictive Covenant, including but not limited to any enforcement provisions.

Section 14: Run with the Land. To the extent that this Restrictive Covenant is construed as a restrictive covenant, it shall run with the land, and shall be binding on the Owners, their successors and assigns, of all or any portion of the Property. No conveyance of title, easement, lease, or other interest in the Property shall be consummated by the property owner without adequate and complete provision for the continued observation of this Restrictive Covenant.

Section 15: Severability. Invalidation of any provision or application of a provision of this Restrictive Covenant by any court shall not affect any other provisions or applications.

Section 16: Easement in Gross. To the extent that this Restrictive Covenant creates a negative easement, it shall be construed as an easement in gross for the sole benefit of Weyerhaeuser, without whose consent it cannot be released, modified or amended.

Section 17: Reserved Rights. Weyerhaeuser reserves unto itself and its successors and assigns all rights and privileges in and to the use of the Property which are not incompatible with the restrictions, and rights granted herein.

For reference only, not for re-sale.

Unofficial Document

Weyerhaeuser Company has caused this Restrictive Covenant to be signed in its name.

EXECUTED this 13th day of July, 2006.

WEYERHAEUSER COMPANY

By: Richard E. Hanson

Richard E. Hanson
Executive Vice President and Chief
Operating Officer

STATE OF WASHINGTON)
) ss.
County of Pierce)

On this 13th day of July, 2006, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Richard E. Hanson, known to be the Executive Vice President and Chief Operating Officer of Weyerhaeuser Company, the corporation that executed the foregoing Restrictive Covenant, and acknowledged the said Restrictive Covenant to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that he is authorized to execute said Restrictive Covenant.

WITNESS my hand and official seal hereto affixed the day and year written above.

DALENE D. DASCHOFSKY NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES SEPT 30, 2007

Dalene D. Daschofsky
NOTARY PUBLIC in and for the State of
Washington. My commission expires:
Sept. 30, 2007

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

By: Mike Blum

Dated: July 17, 2006

Mike Blum
Project Coordinator

Attachments: Exhibit A – Legal description of Property
Exhibit B – Depiction of Property & Parcel One Boundary

For reference only, not for re-sale.

UNOFFICIAL DOCUMENT

For reference only, not for re-sale.

ESM CONSULTING ENGINEERS LLC

Weyerhaeuser Company
Job No. 129-044-004-0960
May 25, 2006

EXHIBIT A

LEGAL DESCRIPTION FOR INDUSTRIAL PROPERTY

Lot 2 of that Record of Survey as recorded under Recording No. 200601275001, Records of Pierce County, Washington.

See attached Exhibit "B".

Written by: R.J.W.
Checked by: M.R.B.

I:\ESM-JOBS\129144\004\DOCUMENTS\129044-24.DOC

5/25/06

33915 1st Way South
Suite 200
Federal Way, WA 98003

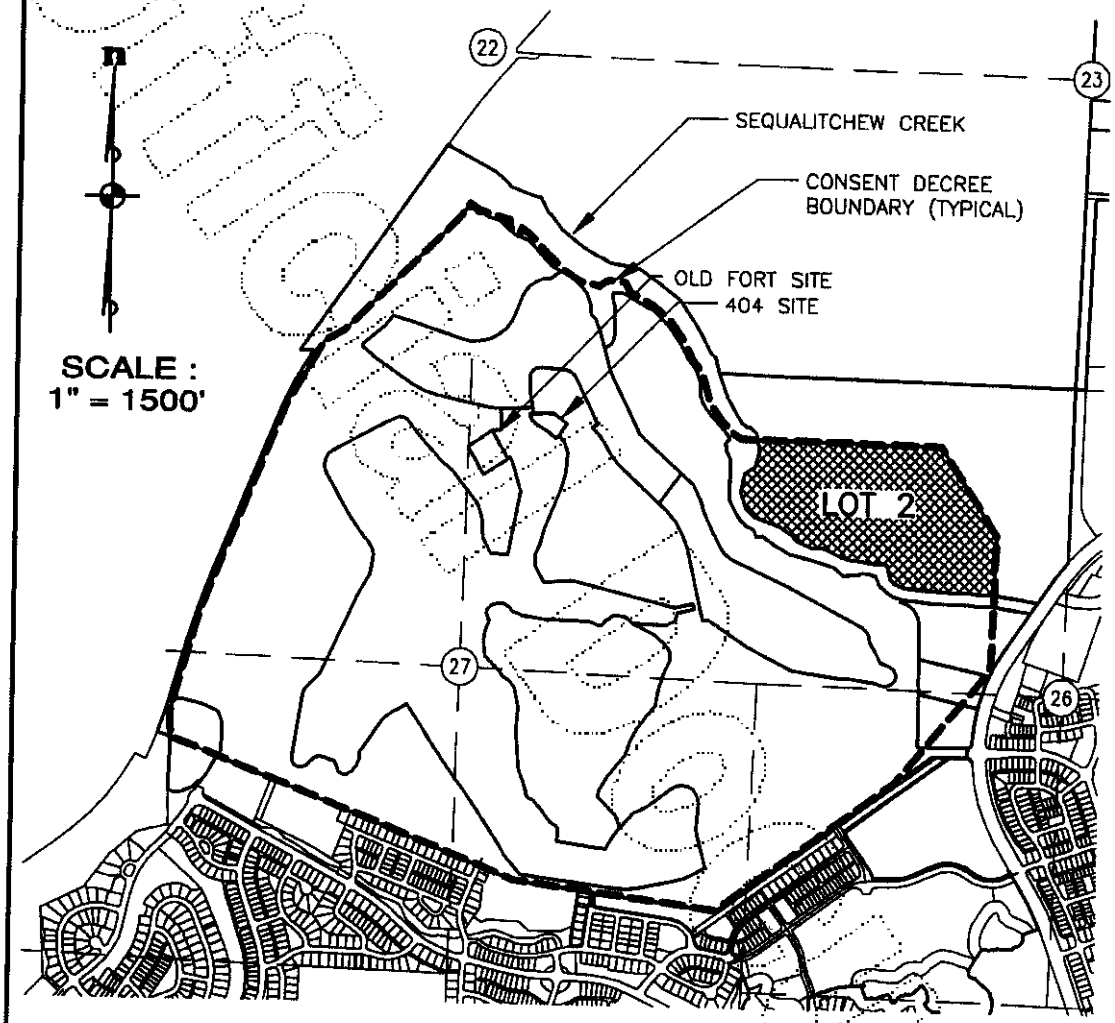
Tel (253) 838 6113
Fax (253) 838 7104
Toll Free (800) 345 5694

Bothell (425) 415 6144
Cle Elum (509) 674 1905
www.esmcivil.com

EXHIBIT "B"

TO ACCOMPANY LEGAL DESCRIPTION FOR INDUSTRIAL PROPERTY

A PORTION OF SECTIONS 22, 26, 27, 28 AND 35, TOWNSHIP 19 NORTH, RANGE 1 EAST, W.M., CITY OF DUPONT, PIERCE COUNTY, WASHINGTON



SCALE : 1" = 1500'

LEGEND

SUBJECT AREA

ESM CONSULTING ENGINEERS LLC
720 S. 348th Street
Federal Way, WA 98003
FEDERAL WAY (253) 838-6113
BOTHELL (425) 415-8144
www.esmcivil.com
Civil Engineering Public Works | Land Surveying Project Management | Land Planning Landscape Architecture

JOB NO. 129-044-004-0960
DWG: 129\44\004\EXHIBITS\SR-08.DWG
DATE : 05-19-06
DRAWN : MRB
SHEET 1 OF 1

For reference only, not for re-sale.

Attachment 5d

CITY OF DUPONT

Department of Community Development
1700 Civic Drive, DuPont, WA 98327
Telephone: (253) 964-8121
www.dupontwa.gov

STATE ENVIRONMENTAL POLICY ACT

MITIGATED DETERMINATION OF NONSIGNIFICANCE (MDNS)

DUPONT INDUSTRIAL PARK

City File Nos. PLNG 2018-008, -009, -047

Description of proposal: Construct one office/warehouse building totaling approximately 255,000 square feet on approximately 25.29 acres of vacant land. The proposal includes extending Sequalitchew Drive to the north through the property and dedication of the right of way to the City, effectively creating two parcels, one on each side of the right of way. Following dedication the east parcel will be approximately 5 acres and the west parcel will be approximately 16.91 acres. The proposed building and all associated improvements are located on the west side of Sequalitchew Drive with no improvements planned to the east. The project will include grading, drive aisles and vehicular parking areas, landscaping, water and sanitary sewer extensions, stormwater collection and infiltration facility, and franchise utility improvements. Tree removal will be required including removal of one landmark Oregon white oak tree located within the proposed right of way of Sequalitchew Drive.

The proposal will include the relocation of a portion of the existing Sequalitchew Creek Trail that is currently (informally) located on the property, to the location of an existing public trail easement. The new trail segment will be paved and fenced, restricting public access outside of its path, and dedicated to the City for ongoing ownership and maintenance.

The property is the location of a designated historical area and marker and there may be other potentially significant historical or cultural resources on the site or in vicinity. The applicant will dedicate approximately 1.53 acres to the City and construct a historical commemorative area adjacent to the new trail segment for public viewing.

The property is a known to contain contaminated soil above current MTCA Method A cleanup levels for unrestricted land use. It is subject to the terms of a Consent Decree between Washington State Dept. of Ecology and Weyerhaeuser Company and DuPont Company entered by Thurston County Superior Court on July 22, 1991 pertaining to cleanup of the contamination on the property. It is also subject to a Restrictive Covenant that limits the use of the property.

Proponent: Eric Cederstrand, DuPont Industrial Partners, LLC

Location of proposal: 1700 Center Drive, tax parcel no. 011926-2019, in the NW ¼ of Sec. 26, Twn. 19N, Rg 1E, W.M. in Pierce County, Washington.

Lead agency: City of DuPont

The Responsible Official hereby makes the following findings and conclusions based on a review of the environmental checklist and attachments; comments received from City Departments; other information on file with the City and the policies, plans and regulations designated by the City of DuPont as a basis for the exercise of substantive authority under RCW 43.21C.060. The Optional DNS process in WAC 197-11-355 is being used. A Notice of Application was issued on August 22, 2018 with a 14-day comment period. Comments

received from agencies and the public were reviewed and considered in the findings and conclusions of this Determination.

The lead agency has determined that the requirements for environmental analysis and protection have been adequately addressed in the development regulations and comprehensive plan adopted under chapter 36.70A RCW, and in other applicable local, state, or federal laws or rules, as provided by RCW 43.21C.240 and WAC 197-11-158, and/or mitigating measures have been applied that ensure no significant adverse impacts will be created.

Responsible Official: Jeffrey S. Wilson, AICP
Community Development Director
City of DuPont

Contact Information: City of DuPont | 1700 Civic Drive, DuPont, WA 98327 | 253-912-5393

FINDINGS

This determination is based on the following findings and conclusions:

1. The site is currently vacant land comprised of one tax parcel totaling 25.29 acres. The proposal will create two lots through the dedication of right of way. The portion of the property west of the future right of way comprises the development footprint, which is approximately 16.3 acres (usable area).

2. Earth – The site is largely flat in the central areas and contains steep slopes greater than 40% along the south. The steep slopes are classified as a critical slope/geologic hazard area and require a 50-foot setback from the top of the slope. All industrial development is located outside of the setback with the exception of a retaining wall foundation. A portion of the relocated trail (in existing easement area) falls within the 50-foot slope setback. The soil type is Spanaway (41a) according to the Soil Survey of Pierce County. Approximately 9,800 CY of cut and 42,000 CY of fill will be used to prepare the site for building construction. Approximately 24,000 CY of stripping material will be removed from the site. Approximately 75 percent of the site (80 percent of the usable area) will be impervious surfaces. The City will require a temporary erosion and sedimentation control plan (TESC) be prepared with site development permits to control erosion on the site. Design and construction will be required to follow the recommendations of the geotechnical engineer. Additional geotechnical engineering recommendations are needed for new trail construction within the steep slope setback.

3. Air – Emissions during construction are related to construction vehicles and dust. Emissions post construction will be related to truck and vehicular traffic. The City will require construction equipment be maintained and in good working condition. Watering down areas during construction will assist in controlling dust.

4. Water – The property is adjacent to the north of Sequalitchew Creek, a fish-bearing stream. The proposed building, parking and access driveways are located outside of the City code-required 100-foot buffer.

   A small portion of the new trail segment falls within the 100-foot Sequalitchew Creek buffer. The alignment largely follows an existing trail easement that was established in 1990. DuPont Code 25.105.050.B.2(c) provides regulations for trail construction within stream buffers and requires that buffer expansion is provided equal to the amount of buffer disturbance. A Critical Areas Report will be required to be prepared by a qualified professional, which addresses the buffer disturbance/expansion and provides recommendations to ensure no net loss of stream functions due to approved alterations. The required TESC plan will provide mitigation measures to ensure construction activities do not cause erosion impacts to the stream.

Stormwater runoff will be collected and conveyed through catch basins and storm pipe for water quality treatment prior to entering the proposed infiltration system. The improvements will be designed following the requirements of the Department of Ecology Stormwater Management Manual for Western Washington (2012 version with 2014 amendments), as adopted by the City of DuPont.

Department of Ecology commented on the proposal on September 12, 2018 with specific recommendations for erosion control. The recommendations are included in the SEPA Mitigation Measures.

5. Plants – The property contains, grass, shrubs, and deciduous and evergreen trees, including Douglas fir and Oregon white oak trees. Vegetation around the building and parking areas will be removed and the new development will be landscaped in accordance with the City's landscaping requirements. The applicant submitted a Landscaping and Tree Retention, Removal and Replacement Plan set prepared by Barghausen Consulting Engineers that depicts tree locations, identifies trees proposed for removal and provides new landscaping and tree replacement. The applicant also provided a Tree Retention Plan prepared by Washington Forestry Consultant's (WFC). There are approximately 774 trees on the site; 76 are landmark trees (Oregon white oak, Pacific yew, and Pacific madrone 24 inches DBH and larger, or Douglas-fir, western redcedar, bigleaf maple, and western hemlock that are 30 inches DHB and larger). The proposal plans to retain approximately 27 healthy landmark trees and remove 49 landmark trees because they are unhealthy or located within the proposed development area or roadways. No tree removal is proposed on the remnant parcel east of the Sequalitchew Drive extension. One of the landmark trees to be removed is an Oregon white oak tree that is located within the proposed right of way of the roadway extension. Landmark oak tree removal is required to follow a Type III land use process with a decision ultimately made by the City's Hearing Examiner. Tree protection measures are required per City code, in addition to those included in the WFC Tree Retention Plan.

   Parking lot landscaping is provided and screening landscaping is provided between Sequalitchew Drive and the building and parking areas. Additional landscaping is required to buffer and mitigate impacts to the public trail, abutting residential areas and adjacent critical areas.

6. Animals – Washington Dept. of Fish and Wildlife lists several priority habitats and species as being located within or adjacent to the property. None of the species are federally-listed as endangered or threatened. Priority Habitat Species include the Big brown bat, Little brown bat, and Yuma myotis bat. Associated with Sequalitchew Creek are Coho salmon, Cutthroat trout, Resident coastal cutthroat trout, and Summer chum salmon. Additional information regarding potential nesting locations of Priority Habitat Species and Habitats onsite or within the vicinity is needed. If nests are found, WDFW shall be consulted prior to any site development for construction-related mitigation measures required for their protection.

7. Environmental Health – The site is the former location of the DuPont Powder Works Company and is located within the Asarco plume boundary. Excavation and remediation of contaminated soils has been completed at the project site in accordance with the terms outlined in the 1991 Department of Ecology Consent Decree No. 91-2-01703-1. The cleanup of the soils has resulted in residual concentrations in portions of the property of hazardous substances which exceed the soil and groundwater cleanup levels specified in the Washington Model Toxics Control Act ("MTCA"). Land use of the property is therefore limited to industrial purposes per the 1999 Department of Ecology Restrictive Covenant (Recording #9910290750).

   The proposed extension of City ROW (Sequalitchew Drive) will incorporate historical commemorative signage along the Sequalitchew Creek trail that is within the Consent Decree/Restrictive Covenant area. The trail will be paved, fenced and signed to restrict users to stay on the paved trail.

Department of Ecology commented on the proposal in their letter dated Sept. 12, 2018. Ecology recommends a soil remediation plan and entrance into the Voluntary Cleanup Program prior to issuance of site development permits, followed by obtaining a No Further Action Letter from Ecology.

8. Noise – On a short term basis, noise from construction activities would be present from approximately 7 am to 6 pm, Monday through Friday, as regulated by DuPont Municipal Code (DMC) Chapter 9.09. Construction noise will likely be audible to the public from the Sequalitchew Creek Trail. Construction equipment will be required to be maintained and the project shall meet the City's noise ordinance limitations. Restrictions on weekend construction will be required.

   On a long term basis, noise from vehicular and truck traffic to and from the site, and truck maneuvering onsite, will likely be audible to the public trail users during possible operation hours of 24 hours per day, 7 days a week. The adjacent and onsite trees and landscaping will buffer some noise impacts created by the development.

   A noise study should be completed to determine if additional noise mitigation measures are required to mitigate noise impacts to the trail users and wildlife from development. A sound wall and additional landscaping may be required as well as other operational limitations to ensure noise-generating activities are restricted to the interior of the building only. Truck back-up beepers are required to be minimized to the greatest extent possible while ensuring safety and meeting federal requirements.

9. Land Use – Property to the north is a gravel mine. To the west is vacant land and Sequalitchew Creek. To the south is Sequalitchew Creek. To the west is the Creekside Apartments, a large residential community. The proposal is a permitted use within the Manufacturing and Research Park (MRP) zoning district and is the type of use contemplated in the City of DuPont Comprehensive Plan and the 1999 Department of Ecology Restrictive Covenant. According to the SEPA Checklist, approximately 90 employees will work at the completed development.

10. Light and Glare – Building and parking lot lighting is proposed, however lighting details were not provided. Lighting shall be mitigated so as minimize to the greatest extent possible impacts to the use and enjoyment of the Sequalitchew Creek Trail. Lights shall have full cut-offs and shields and be directed downward and inward. A photometric analysis shall be provided demonstrating no light spill to the trail or outside of the developed portion of the property caused by onsite development. Exceptions shall be made for impacts caused by the street lighting of Sequalitchew Drive that is necessary for safety. Depending on the results of the photometric analysis, the height of light poles may need to be limited on the southern boundaries of the property.

11. Historic and Cultural Preservation – The site has been the subject of numerous archaeological and cultural resources studies due to the documented history of events and activities that occurred either on the site or nearby. It currently contains a historical marker commemorating the location of the c.1840-1842 Methodist Mission. Historical events that are known to have occurred either onsite or within the immediate vicinity that are listed in the Cultural Resources Report dated April 14, 2011 by Parus Consulting (Parus Study) include, among others:

    - Historic 1843 Fort Nisqually
    - Historic DuPont munitions plant, ca. 1906
    - Historic Hudsons's Bay house, ca. 1845-1869
    - Pre-Contact Nisqually Indian Burial Site
    - Historic 1840-1842 Methodist Episcopal Mission
    - Historic 9th U.S. Cavalry Bivouac, Camp Nisqually, 1904

    Archaeological monitoring occurred during soil remediation between 2001 and 2004. The Parus study included archaeological pedestrian and subsurface surveys to include 125 shovel probes and 22

geological test pits. The work was monitored by the Nisqually Tribe and produced minimal evidence. The study concluded that no significant cultural properties will be affected by the proposed project and no further cultural resource action is warranted with the exception of implementation of an Unanticipated Cultural Resources Discovery Plan for construction activities, which was provided as Exhibit E to the Parus Study.

The City received several comments during the public comment period on the application regarding the protection of historic and cultural resources. The Nisqually Tribe commented on August 28, 2018 that they have no further information or concerns and wished to be informed if there are any Inadvertent Discoveries of Archaeological Resources/Human Burials. The Tribe also commented after the conclusion of the comment period that the areas cultural resources, and others in the area, need to be recognized, documented, and protected both during project planning and any subsequent development. The Tribe will continue to consult with the City on planning and development issues that impact these resources. Washington State Department of Archaeological and Historic Preservation (DAHP) commented on the proposal after the close of the comment period on September 14, 2018 with questions regarding relocation of the Methodist Mission marker and interpretive signage proposals commemorating the 9th U.S. Calvary Buffalo Soldiers. They also questioned plans for retaining a section of narrow gauge railroad that is located on the property.

The applicant convened a stakeholder group of interested parties, including the Nisqually Tribe and DAHP, to discuss interest in permanent commemoration of the history onsite. The applicant is proposing to provide 1.53 acres to the City, a portion of which would be for a historical plaza that contains seating and signage commemorating the site's historical and cultural significance. The applicant would relocate the Methodist mission marker, provide benches for seating and viewing that would extend from the Sequalitchew Creek Trail and be visible from the future Sequalitchew Drive right of way. The applicant would also provide area for construction of a replica of the Methodist mission school to be completed by others. The land for the interpretive area would be dedicated to the City as part of the Sequalitchew Road right of way. The concept for the proposal was provided and is part of the SEPA record.

Signage is to be provided commemorating the six historical and cultural significant events listed above with final review and approval by the City in consultation with DAHP and the Nisqually Tribe. The applicant, City, the DuPont Historical Society and one recognized representative from each of the associations representing the historical events, will collaborate to develop the appropriate historical details and design of the signage.

The proposal entails new excavation of soil; therefore, the measures identified in the Memorandums of Agreement (MOAs) between (1) Weyerhaeuser Real Estate Company (WRECO), the City of DuPont, and the Washington State Historic Preservation Office (now DAHP) regarding the discovery of cultural resources within the City of DuPont, and (2) WRECO and the Nisqually Tribe regarding the discovery of Native American burials. The proponent shall follow the provisions of the MOAs during all construction phases of the development.

12. Transportation – The proposal will extend Sequalitchew Drive from the existing cul de sac northerly along the property frontage. Access will be provided via a single driveway from Sequalitchew Drive, which extends westerly from Center Drive. Sequalitchew Drive is a three lane, east-west roadway with curb, gutter and sidewalk that borders the east side of the property. Sound Transit currently stops at DuPont Station, approximately 2 miles east of the site.

    a. The proposal will provide approximately 215 vehicular parking spaces.
    b. A Traffic Impact Analysis (TIA) was prepared by Heath and Associates dated March 2018. The proposal will generate approximately 444 vehicular trips during the typical weekday with 43 trips during the AM peak hour and 49 trips during the PM peak hour. Approximately 39 to 129

heavy truck trips are anticipated on a typical weekday. The TIA does not recommend any mitigation measures for the proposal.

c. The TIA was peer reviewed by Geralyn Reinart, PE, the City's Traffic Engineering Consultant. In her memorandum dated June 6, 2018 she concludes that the impacts for the project will be fairly limited, i.e., the number of trips generated is relatively small thereby limiting the impacts to adjacent intersections. She recommends that an exclusive left-turn lane be provided on Sequalitchew Drive at the site access to serve the proposal's entering vehicles. Pedestrian signage and markings for crossing Sequalitchew Drive are also recommended.

13. Public Services – All utilities are available to serve the proposal. Fire impact fees, stormwater and water system development charges and new fire hydrants will reduce impacts to public services. Relocating and paving the Sequalitchew Creek Trail will provide needed access for emergency vehicles to the Trail, the Puget Sound Shoreline, and the Burlington Northern Railroad located adjacent to the shoreline.

MITIGATION MEASURES

1. The project design and construction shall comply with the recommendations of the Geotechnical Engineer as described in the October 2011 Geotechnical Report and May 11, 2018 Addendum, and as subsequently amended. The May 2018 Geotechnical Report Addendum shall be amended to provide recommendations for trail construction within the steep slope buffer. The May 11, 2018 memo shall also be updated to identify the City's current stormwater manual and to update any stormwater recommendations from the 2011 report.

2. Construction of the project shall ensure that at no time will any segment of the Sequalitchew Creek trail be closed to public access and at all times the trail will be safe for public use. The following is required:

    a. The new trail alignment shall be constructed and open for use prior to any site work.
    b. The new trail alignment shall be fully fenced and signed prior to opening to public use.

3. A noise study shall be prepared. Prior to construction the existing ambient noise levels shall be measured. Within six months of occupancy, the noise study shall be updated to include measurements taken from three points along the trail. Noise at the property line shall not exceed the existing ambient noise levels post development. If needed, additional sound mitigation measures may be required as recommended and approved by the City. Operational requirements include keeping bay doors closed, requiring all Industrial activities that generate noise to occur inside the building, and limiting the use or volume of rear back-up beepers on trucks to the greatest extent possible while meeting safety and federal requirements.

4. The area proposed for development is within an area that was the site of several significant historical and cultural events/activities and may contain both tribal and nontribal cultural resources. Together with the dedication of road right of way, approximately 1.53 acres to the west of Sequalitchew Drive shall be dedicated to the City as right of way (ROW) for the development of a public historic commemorative area consistent with the Right of Way Dedication Exhibit dated November 28, 2018. Dedication of the right of way and historic area shall occur prior to application of the site development/civil permit.

The following mitigation measures shall be provided for in the final design plans and approved by the City prior to issuance of any site development/construction permits:

5. The applicant has included in their proposal dedication of approximately 1.53 acres of land for a public historic commemorative area that will be viewed from the Sequalitchew Creek Trail. The following requirements pertain to the design and use of the commemorative area:

a. Public use of the historical commemorative area and trail will require additional parking. At least four of the onsite parking spaces shall be allowed for public use for trail commemorative plaza parking, with one of the spaces meeting ADA requirements. These parking spaces shall be located outside of the site's secured area for public access. Denote the public parking areas on the plans.

b. In the historical commemorative area, a 4-foot tall split rail fence shall be designed to accommodate viewing and support of the commemorative signage. The fence detail and design provided in the Historic Mitigation Exhibit shall be revised. The fence shall incorporate enlarged posts made of a solid base such as concrete or river rock to support the commemorative plaques. The fence slats shall be wood or wood in appearance, not galvanized chain. The fence detail, design and materials shall be submitted to the City for approval prior to issuance of the site development permit.

c. At least four benches shall be provided in the historical commemorative area. They shall be designed to reflect the historic and natural environment and materials of a type that minimize damage from vandalism. The design and materials shall be submitted to the City for approval prior to issuance of the site development permit.

d. The historical marker for the Methodist Mission shall be relocated from its existing location to the historical commemorative area where it can be easily viewed from the trail. The applicant shall work with DHAP regarding the relocation of the monument. A location for a future historical school house shall be provided, however the cost of construction will be provided by others. Per DMC 25.80.030, the Methodist Mission marker must be located greater than 50 feet from a road, structure or utilities. As a future structure, the location for the future school house will also need to be located at least 50 feet from the marker. Note that the definition of structure does not include walls or fences less than 6 feet in height.

e. Washington State Department of Historical and Archaeological Preservation has indicated an interest in retention of a section of narrow gauge railroad track that is located on the property. The track must be removed from the property for safety purposes. The applicant shall work with the DuPont Historical Society and DAHP for the relocation/removal of the track.

6. The following requirements pertain to the Sequalitchew Creek Trail design:

a. The Sequalitchew Creek trail shall be paved from the point it connects to the new Sequalitchew Drive extension to the existing improved City trail section and shall match the width of the existing paved trail. The trail shall be widened at its connection point with the sidewalk in Sequalitchew Drive to incorporate the remnant area to the south. Provide a trail cross section on the plans. The new trail design and construction shall follow any recommendations provided in the Critical Areas Report for protecting Sequalitchew Creek Trail and area wildlife from being impacted.

b. The new segments of the Sequalitchew Creek trail shall be fenced on both sides with a permanent 4-foot wide split rail fence made of wood or materials with a wood appearance to be reflective of the historical character and sensitive area. The fence details shall be provided by the applicant for approval by the City.

c. As determined by the City, the applicant may be required to install construction fencing to protect the public during site construction.

d. Any part of the construction site that is visible from the trail shall be screened by a 6-foot high sight obscuring chain link fence. Fence type shall be determined during the review of the project plans.

e. Signage shall be placed on either side of the trail denoting "Environmentally Sensitive Area, Do Not Enter" at intervals to be approved by the City. The signage details shall be submitted to the City for review and approval prior to issuance of the site development permit.

7. The following requirements pertain to protection of critical areas:

a. A Critical Areas Report shall be prepared by a qualified professional to address and calculate the stream buffer disturbance/expansion area required by trail construction and provide recommendations to ensure no net loss of stream buffer functions due to approved alterations. The report shall also address priority habitats and species within and adjacent to the development area including nests. If priority species nests are located on the property construction shall meet the recommendations provided by Washington Department of Fish and Wildlife. Buffer expansion areas shall be cleared of invasive species and planted with native vegetation. Plantings are encouraged adjacent to the edge of the trail to keep the public on the trail. The report shall include construction methods and equipment needed to mitigate impacts to the buffer area. The least impactful construction techniques and equipment shall be used. The report shall be reviewed and approved by the City prior to issuance of permits for trail construction.

b. As an alternative to the preparation of the Critical Areas Report and expansion area plantings, the proponent may propose relocating the trail so that it falls entirely outside of the stream buffer and within the area to be dedicated to the City. The alternative alignment shall be provided to the City for review and approval, and any other affected agencies, prior to issuance of the site development permit.

c. No disturbance or activity shall occur in the stream buffer, with the exception of the proposed trail construction, trail fencing and signage and the installation, maintenance and monitoring of the mitigation plantings (as recommended by a qualified biologist and as approved by the City).

d. The following best management practices are required to minimize development impacts to Sequalitchew Creek and shall be provided for in the TESC and final design:

i. All new, untreated runoff shall be routed away from the stream and slopes.
ii. Channelized flow from landscaping shall be prevented from entering the stream buffer.
iii. New runoff from impervious surfaces and new landscaping shall be infiltrated, treated, detained and/or dispersed. No runoff from the trail may cause erosion.
iv. Dust control measures shall be in place prior to construction.

8. To mitigate noise and light impacts to the users of the Sequalitchew Creek Trail and wildlife, screening and buffering of the project from the historic placard area and the trail shall be provided in the form of an 8-foot tall solid wall along the southern boundary of the easterly parking lot and drive aisle where the industrial activities will be visible and audible. The design and materials for the wall shall blend in with the natural environment. Wall heights shall be reduced to six feet where they are located either on the property line or within setbacks. Landscaping shall be provided to soften the appearance of the wall in the form of hedge-like trees and shrubs. The wall and landscaping shall extend from the driveway at Sequalitchew Drive to the point where the trail extends off-site, a distance of approximately 500 feet. Wall details and location shall be reviewed and approved by the City. Alternatively, the applicant may

propose other measures for noise and light mitigation for City approval that provides equivalent mitigation for light and noise impacts.

9. Site lighting shall not encroach outside of the hard surface area of site development. No light spill shall be allowed to the trail or outside of the development footprint, other than spill caused by street lighting on Sequalitchew Drive. Lights shall be LED and fixtures shall have full cut-offs and shields and be directed downward and inward to the site development. A photometric analysis shall be provided depicting light locations and light spill levels at the trail and development footprint. Depending on the results of the photometric analysis, the height of light poles on the southern boundaries of property may need to be limited to protect the trail from light spill caused by on-site lighting. The City shall approve the site lighting plan to ensure that no light spill occurs outside of the hard surface of site development.

10. City code requires tree retention adjacent to the right of way and residential areas. Tree retention adjacent to critical areas is also vital. Additional plantings are required between the south property line and the 10-foot grading buffer. The type of native vegetation to be provided shall be recommended by a qualified biologist.

11. Retained trees are to be protected following the measures outlined in the WFC Tree Retention Plan dated August 9, 2018 (or as updated) and as amended by the City, below. These mitigation measures shall be placed on the civil plans and the landscape plans:

    a. Trees to be saved ("save trees") must be protected during construction by a six foot high temporary chain link fence, located 5 feet outside of the drip line of the trees. Signage shall be placed on the fencing every 50 feet indicating the words, "No Trespassing- Protected Trees". The individual critical root zones (CRZ) are a radius of one foot for each one inch of diameter at breast height (DBH) (6 feet minimum), unless otherwise delineated by WFCI or the City arborist.
    b. Tree protection fences should be erected after logging but prior to the start of clearing. The fences should be maintained until the start of the landscape installation.
    c. There should be no equipment activity (including rototilling) within CRZ. No irrigation lines, trenches, or other utilities should be installed within the CRZ. No irrigation lines, trenches, or other utilities should be installed within the CRZ. Cuts or fills should impact no more than 25% of a tree's root system. If topsoil is added to the root zone of a protected tree, the depth should not exceed 2 inches of a sandy loam or loamy fine sand topsoils and should not cover more than 25% of the root system.
    d. If roots are encountered outside the CRZ during construction, they should be cut cleanly with a saw and covered immediately with moist soil. Noxious vegetation within the critical root zone should be removed by hand. If a proposed Save Tree must be impacted by grading or fills, then the tree should be re-evaluated by WFCI to determine if the tree can be saved with mitigating measures, or if the tree should be removed. No Save Trees may be removed without prior City approval.

12. The following requirements pertain to roadway improvements:

    a. An exclusive left-turn lane shall be provided on Sequalitchew Drive at the site driveway to serve entering vehicles. The locations and design shall be reviewed and approved by the Public Works Director.

    b. A pedestrian crossing of Sequalitchew Drive shall be provided at the west end of the existing cul-de-sac. The location and design shall be reviewed and approved by the Public Works Director prior to issuance of site development permit.

c. Directional signage for the trail shall be provided on Sequalitchew Drive. The signs and their locations shall be reviewed and approved by the Public Works Director prior to issuance of site development permit.

d. Signage shall be provided at the intersection of Sequalitchew Drive and Center Drive restricting truck traffic exiting Sequalitchew Drive from turning right onto Center Drive (Left Turn only). The signage and locations shall be reviewed and approved by the Public Works Director prior to issuance of site development permit.

e. An Autoturn Analysis shall be provided demonstrating that truck turning movements entering and exiting Sequalitchew Drive can be accommodated without impacting the Center Drive or Sequalitchew Drive center medians. If impacts are unavoidable, revisions to the median(s) are required to accommodate truck turning radius.

13. A note shall be placed on the civil plans informing the contractor that construction activities are subject to the Unanticipated Cultural Resources Discovery Plan, Appendix E, of the Cultural Resources Report prepared by Parus Consulting dated April 14, 2011. The signs and their locations shall be reviewed and approved by the Public Works Director.

The following mitigation measures shall be in place <u>prior to issuance of site development permits</u>:

14. A haul route plan for the clearing and grading shall be approved by the City prior to issuance of construction permits.

15. A temporary erosion control plan will be prepared per City of DuPont standards and implemented for the project to reduce and control erosion impacts. The recommendations in the Department of Ecology letter dated September 12, 2018 shall be addressed.

16. The project will be required to obtain a Construction Stormwater General Permit (CSWGP) from the Washington State Department of Ecology. When applying for coverage under the CSWGP, check the appropriate boxes for known contamination of soil and groundwater on the Notice of Intent (CSWGP application) and provide Ecology with the additional information outlined in their letter dated September 12, 2018.

17. A five-year maintenance, monitoring and contingency plan shall be prepared by a qualified biologist for the stream buffer enhancement plantings and shall contain the following elements:

    a. General goals of the mitigation/stream buffer replacement plan including a discussion of the function and values of impact and enhancement areas;
    b. Approximated site topography before and after alteration;
    c. Location of proposed mitigation area (include a north arrow and scale);
    d. General hydrologic patterns on the site before and after construction;
    e. General plant selection and justification, planting instructions, and approximate planting sequencing and schedule;
    f. A maintenance plan;
    g. A monitoring and contingency plan. Monitoring is to occur a minimum of five years.
    h. Estimated costs for the installation, maintenance, and monitoring phases of the project. Separate estimates shall be prepared for the installation phase and monitoring and maintenance phase of the project; and
    i. Address and phone number of person or organization responsible for monitoring requirements.

18. The applicant shall post a maintenance and monitoring financial guarantee in a form and amount determined sufficient to guarantee satisfactory performance of the mitigation plan. The city shall release the security upon determining that the effectiveness and success of the mitigation plan has been completed satisfactorily.

19. The following measures are required prior to issuance of site development permits or the initiation of grading, filling, or clearing:

    a. Develop soil remediation plan and enter into the Voluntary Cleanup Program with Ecology. For more information on the Voluntary Cleanup Program, visit Ecology website at: https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-process/Cleanup-options/Voluntary-cleanup-program.
    b. Obtain an opinion letter from Ecology stating that the proposed soil remediation plan will likely result in no further action under MTCA. The applicant shall provide to the local land use permitting agency the opinion letter from Ecology.
    c. Prior to finalizing site development permits, provide the City a copy of the "No Further Action" determination from Ecology indicating that the remediation plans were successfully implemented under MTCA. Contaminated soils generated during site construction shall be managed and disposed of in accordance with state and local regulations, including the Solid Waste Handling Standards regulation (Chapter 173-350 WAC). For further information about soil disposal.

The following mitigation measures shall be in place <u>during construction</u>:

20. Construction activity will be audible from the Sequalitchew Creek Trail, which is heavily used. No construction activity will be allowed on the weekends without prior City approval. Request shall be submitted at least two weeks in advance and if approved, the site posted with weekend construction hours at least one week in advance.

21. Best Management Practices to minimize dust during construction shall be used, including temporary paving of certain roads, street sweeping, and watering the site as needed.

22. Construction equipment shall be maintained to meet emission standards. Construction vehicles shall be turned off when not in use to limit emissions caused by idling and unnecessary noise.

23. The Applicant shall fully implement the Memorandum of Agreement dated August 7, 1989, between Weyerhaeuser Real Estate Company (WRECO), the City of DuPont and the Washington State Historic Preservation Officer regarding the discovery of cultural resources within the City of DuPont, customary professional standards for archaeology, and applicable state and federal laws.

    a. The Applicant shall provide a professional archaeologist to monitor onsite soil disturbance activities.
    b. The Project Archaeologist shall notify and allow a Nisqually Indian Tribe representative to be present during soil disturbance activities.
    c. The Project Archaeologist shall notify the Nisqually Indian Tribal representative if Native American cultural resources are discovered during any soil disturbance activities. Construction activities that might disturb or affect such resources are to stop until the Tribal representative has had the opportunity to examine the find.
    d. If the Tribal representative cannot be reached through reasonable efforts or does not come to the construction site within a reasonable period of time after being notified, construction does not need to stop. However, archaeological work shall to follow the 1989 Memo of Agreement, customary professional standards for archaeology, and applicable state and federal laws.

e. The City of DuPont requests Native American artifacts recovered during construction activities be donated to the Nisqually Indian Tribe. Hudson's Bay Company-era artifacts should be donated to the Fort Nisqually Living History Museum, located in the City of Tacoma's Point Defiance Park. DuPont-era artifacts should be donated to the DuPont Historical Museum.
f. The Project Archaeologist shall forward a closing report to the City of DuPont. The report shall discuss contact with the Nisqually Indian Tribe, implemented procedures and observed conditions and be submitted prior to issuance of any permanent Certificate of Occupancy for the project.

24. The Unanticipated Cultural Resources Discovery Plan shall be implemented by the contractor during site clearing and grading activities.

25. Installation of the stream buffer expansion area plantings shall be completed no later than 30 days of completion of trail construction. An extension of an additional 30 days may be granted due to conditions outside of applicant control, such as weather. The extension is to be approved by the City.

26. The trail construction shall follow any recommendations provided in the Critical Areas Report for protecting Sequalitchew Creek Trail and area wildlife from being impacted.

The following mitigation measures shall be in place <u>prior to issuance of building permits</u>:

27. All applicable Fire Impact fees (per DMC 26.05) and Storm and Water System Development Charges assessed for the proposed development will be required to be paid prior to the issuance of building permits for the proposed structures.

The following mitigation measures shall be in place <u>prior to issuance of Certificate of Occupancy</u>:

28. The proponent, at their sole expense, shall construct signage adjacent to the trail in the historic commemorative area, a minimum of one sign for each of the 6 the historical and cultural events/time periods which occurred on and near the site. The signage shall be designed in coordination with the applicant, the City of DuPont, the DuPont Historical Society and one recognized representative from each of the associations representing the historical events to develop the appropriate historical details and design (including but not limited to images and narratives) for each of the signs. The signage shall be made of durable, vandal-proof materials and placed in the locations identified in the Right of Way Dedication Exhibit. The signage design and details shall be reviewed and approved by the City of DuPont Community Development Department in consultation with Department of Archaeological and Historic Preservation (DAHP) and Nisqually Tribe. The signage, fencing and seating will become the personal property of the City and will be maintained by the City. The City may allow for a financial guarantee for the completion of these improvements.

CONCLUSIONS OF THE RESPONSIBLE OFFICIAL: The Responsible Official has determined, with the mitigation measures listed above, that the proposal will not have a probable significant adverse impact on the environment, and an Environmental Impact Statement is not required under RCW 43.21c.030(2). The mitigation measures described are recommended as conditions of project approval.

APPEAL PERIOD: This DNS is issued under WAC 197-11-355. You may appeal this determination to Jeffrey S. Wilson, Community Development Director/SEPA Responsible Official, at 1700 Civic Center, DuPont, WA 98327, by filing a written appeal citing the specific reasons for the appeal with the required appeal fee, by no later than 5:00 pm **March 6, 2018**. You should be prepared to make specific factual objections. Contact Jeff Wilson to read or ask about the procedures for SEPA appeals.

SEPA Responsible Official Signature: _____ 2/14/2019

Jeffrey S. Wilson, AICP
Community Development Director
City of DuPont

February 14, 2019

Issue Date: February 20, 2019
End of Appeal Period: March 6, 2019

SEPA Distribution List

XX Indicates notice mailed to the following: DuPont Industrial Park 2/2019

Dist.	Agency/Contact		Dist.	Agency/Contact
XX	WA State Dept. of Archaeology & Historic Preservation SEPA@dahp.wa.gov			WA State Dept. of Labor and Industries PO Box 44000 Olympia, WA 98504
	WA State Dept. of Commerce Anne Fritzel, AICP Anne.fritzel@commerce.wa.gov		xx	WA State Dept. of Natural Resources SEPA Center SEPACENTER@dnr.wa.gov
XX	WA State Dept. of Ecology SEPA Unit Separegister@ecy.wa.gov		xx	WA State Dept. of Natural Resources South Puget Sound Region Southpuget.region@dnr.wa.gov
XX	WA State Dept. of Ecology Environmental Review Section SEPAunit@ecy.wa.gov		XX	WA State Dept. of Social and Health Services Lands & Bldg Div Elizabeth McNagny PO Box 45848 Olympia, WA 98504-5848
XX	WA State Dept. of Archaeology & Historic Preservation Dennis Wardlaw Dennis.wardlaw@dahp.wa.gov			WA State Dept. of Social and Health Services Robert J. Hubenthal hubenbj@dshs.wa.gov
xx	WA State Dept. of Ecology SW Regional Office Toxic Clean-up Program Marian Abbett Marian.abbett@ecy.wa.gov		XX	WA State Dept. of Transportation OR-SEPA-REVIEW@wsdot.wa.gov
xx	WA. State Dept. of Ecology SW Regional Office Toxic Clean-up Program Eva Barber Evba461@ECY.WA.GOV			WA State Parks and Recreation Commission PO Box 42650 Olympia, WA 98504
xx	WA State Dept. of Ecology SW Regional Office Shorelands & Environmental Assistance Zachary Meyer ZMEY461@ECY.WA.GOV		xx	Puget Sound Partnership Heather Saunders Benson Environmental Planner Heather.benson@psp.wa.gov
xx	WA State Dept. of Ecology SW Regional Office Shorelands & Environmental Assistance Donna Joblonski dmca461@ECY.WA.GOV		xx	Puget Sound Clean Air Agency 1904 3rd Ave #105 Seattle, WA 98101 SEPA@pscleanair.org
xx	WA State Dept. of Fish & Wildlife(WDFW) SEPA Coordinator SEPAdesk@dfw.wa.gov			BNSF Railway General Manager 2454 Occidental Ave. South, Ste 1A Seattle, WA 98134-1451
	WA State Dept. of Fish & Wildlife (WDFW) Michele Culver Regional Director Teammontesano@dfw.wa.gov			FEMA John Graves John.graves1@dhs.gov
	WA State Dept. of Health Division of Drinking Water PO Box 47822 Olympia, WA 98504-7822		xx	DuPont City Clerk Karri Muir Kmuir@dupontwa.gov

xx	JBLM Public Works Charles Markham Deputy for Programs and Operations Charles.s.markham2.civ@mail.mil		xx	Nisqually Indian Tribe Joe Cushman Cushman.joe@nisqually-nsn.gov
xx	JBLM Steven Perrenot Director Public Works Steven.t.perrenot.civ@mail.mil		xx	Yakama Nation Elizabeth Sanchey Elizabeth_sanchey@yakama.com
	US Army Corps of Engineers (Regulatory Branch) Suzanne Anderson Suzanne.l.anderson@usace.army.mil		XX	Lakewood Community & Economic Development Frank Fiori Planning Manager ffiori@cityoflakewood.us
XX	USDA-Natural Resources Conservation Service 941 Powell Ave SW. Ste 102 Renton, WA 98057		XX	Steilacoom Community Development Doug Fortner Town Planner Doug.fortner@ci.steilacoom.wa.us
	DuPont Post Office Attn: Post Master 1313 Thompson Circle DuPont, WA 98327			Clover Park School District 10903 Gravelly Lake Dr. SW Lakewood, WA 98499
	National Marine Fisheries Service Northwest Regional Office 7600 Sand Point Way NE Seattle, WA 98115-0070			Steilacoom Historical School District Celeste Johnston cjohnston@steilacoom.k12.wa.us
XX	Nisqually Nat'l Wildlife Refuge Glynnis Nakai Glynnis Nakai@fws.gov		xx	LeMay Cust2180@wcnx.org
xx	Environmental Official-Pierce County Kathleen Larrabee Klarrab@co.pierce.wa.us		xx	PSE Jeff Payne Jeff.payne@pse.com
XX	Land Use Review Capital Development-Pierce Transit PO Box 99070 Lakewood, WA 98499-0070		xx	AHBL Lisa Klein Lklein@AHBL.com
xx	Pierce Co. Assessor/Treasurer-Commercial Dept. Darci Brandvold dbrandv@co.pierce.wa.us		xx	Gray & Osborne Dominic Miller, PE dmiller@g-o.com
xx	Pierce Co. Environmental Services Bldg Public Works Kip Julin 9850 64th St. West University Place, WA 98467		xx	Geri Reinart, P.E. greinart@msn.com
xx	Pierce Co. PALS Adonais Clark aclark@co.pierce.wa.us		xx	CalPortland Pete Stoltz Pstoltz@calportland.com
xx	Pierce Co. Public Works Debbie Germer dgermer@co.pierce.wa.us		xx	NWL Association Emily Griffith nwlassistdirector@reachone.com
xx	Tacoma Pierce Co. Health Dept. Sara Bird SEPA@tpchd.org		xx	NWL Associates Larry Ackerman nwldirector@reachone.com

xx	Nisqually Indian Tribe Annette Bullchild, THPO Bullchild.annette@nisqually-nsn.gov		xx	Nisqually Indian Tribe Jackie Wall, THPO Wall.jackie@nisqually-nsn.gov
xx	Carol Estep DuPont Historical Society estepcarol@gmail.com		xx	Roger Westman Rswestman@msn.com
xx	Maria Gudaitis mariagudaitis@gmail.com		xx	Don Dresser Norged@msn.com
XX	Nisqually Delta Association Tom Skjervold Tskjervold@gmail.com		XX	Jackie Jones-Hook Buffalo Soldiers Museum jjoneshook@aol.com
XX	United Methodist Church Kelvin Brown Kelvinator46@gmail.com		XX	United Methodist Church Rev.Dr. James D. Lewis Revjlewis43@gmail.com
XX	Jim Diamond shinodad@gmail.com		XX	Lizzy Sandstrom lizzyS@pscleanair.org
XX	Carol McDowell Barista43@comcast.net		XX	Diana Barbera dbarbera@mindspring.com
XX	Sara Bird Tacoma-Pierce County Health Dept sbird@tpchd.org		XX	Cynthia Callahan Tacoma-Pierce County Health Dept ccallahan@tpchd.org
XX	Kate Walsh 3mcwals@gmail.com		XX	Maxine Dunkelman maxdunk@comcast.net
XX	Bridget King Bkking3@hotmail.com		XX	Steve Thompson Stevethompson440@comcast.net
XX	Sam Merrill Black Hills Audubon Sammerrill3@comcast.net		XX	Karen Nolan fraukln@yahoo.com
XX	Cara Mitchell 2221 McDonald Ave DuPont, WA 98327		XX	ECY RE SWRO SEPA Morgan Dorner swosepacoordinator@ecy.wa.gov
XX	Laurie Foster 1975 A Garry Oaks Ave DuPont, WA 98327		XX	Jessica Fester 504 DuPont Ave DuPont, WA 98327
XX	R. Suzette Frederick 1148 Aldrich PL DuPont, WA 98327		XX	Ronald J. Frederick 1148 Aldrich PL DuPont, WA 98327
XX	Dennis Clarke 2237 Anderson Ave DuPont, WA 98327		XX	Kathy Clarke 2237 Anderson Ave DuPont, WA 98327

XX	Drew Zaborowski Avenue 55 Dzaborowski@avenue55.net		**XX**	Eric Cederstrand eric@combaydev.com
XX	Dan Balmelli Barghausen Consulting Engineers, Inc dbalmelli@barghausen.com		**XX**	Lia Estigoy lia@combaydev.com

Attachment 5e

BEFORE THE HEARING EXAMINER FOR THE CITY OF DUPONT

RE: DuPont Industrial Park **Site Plan and Tree Reduction** **File No. PLNG 2018-008, -009, -047**	**FINDINGS OF FACT, CONCLUSIONS OF LAW AND FINAL DECISION**

SUMMARY

The Applicant has requested site plan approval for a 255,000 square foot warehouse at 1700 Center Drive and approval of a Tree Modification to remove two Oregon White Oak trees for that project. The site plan permit is denied because DMC 25.45.030(17) prohibits warehouse use from abutting main streets. It is uncontested that the project site abuts a main road, specifically Sequalitchew Drive. Sequalitchew Drive currently serves as a stub road but will eventually serve as a main access road to the homes located in the Sequalitchew Village. About 150 feet[1] of parking and landscaping will separate the proposed warehouse building from Sequalitchew Drive. However, the massive warehouse building will still remain visible to Dupont residents on their commutes and other daily activities as they drive Sequalitchew Drive to and from their homes. This aesthetic is precisely what DMC 25.45.030(17) was intended to avoid, as the regulation implements Comprehensive Plan Land Use Goal 9.2, which encourages the adoption of regulations to "*...establish limitations on uses adjacent to main streets in order to ensure the small town aesthetic of the City of Dupont is maintain*ed." Aligning Dupont's main streets with massive 255,000 square foot warehouses does not maintain the small town aesthetic of the City of Dupont. Such a scenario is precisely what the City Council intended to avoid in its adoption of

[1] The separation is variously referred to as 150 feet or 200 feet in documents and testimony throughout the record. The 150 foot figure is taken from the Applicant's written response to the SEPA Appellant's Motion for Summary Judgment.

DMC 25.45.030(17) and for that reason must be denied. A detailed legal analysis of the meaning of DMC 25.45.030(17) is outlined in Conclusion of Law No. 5, p. 15-20.

Beyond the compliance problem with DMC 25.45.030(17), the project otherwise complies with all applicable development standards and would be approved. Notably, the State Environmental Policy Act ("SEPA") appeal from the Nisqually Delta Association is denied, as the proposal would not create any probable significant adverse impacts to historical resources. There is no question that the project site is of high historical significance. The issue for purposes of SEPA review is much narrower than that, as it is limited to the impacts of moving a historical marker a few hundred feet at the project site. The level of protection legislatively found acceptable to protect the historical significance of the site was the City's adoption of DMC 25.80.030, which prohibits development within 50 feet of a historical marker purportedly identifying the location of the first American building in the Puget Sound Region, an 1839 building for a Methodist-Episcopal Mission. The Mission building was located on the project site and no longer exists.

The Applicant proposes to move the marker a few hundred yards within the project site and build the warehouse at the current location of the marker. The marker is currently located in the middle of a large parcel of private property. The marker will be relocated to a site off a public trail that will be dedicated and improved for public use and appreciation/education of the site's historical significance. The prevailing archaeological opinion is skeptical that the current location of the marker accurately depicts the location of the 1839 building. The evidence is fairly conclusive that further site investigation will not expose any significant artifacts or information about the historical uses of the site. Consequently, the relevant environmental impact of the proposal is whether moving the marker a few hundred feet from what in a worst case analysis could be its accurate location creates probable significant adverse impacts. Since cultural/historical impacts are found to be acceptable for development located more than 50 feet from the marker, the environmental impacts are further limited to those that deprive the public from accessing a marker site that in a worst case analysis could accurately identify the location of the 1839 Mission building.

Whether it is truly "significant" from a SEPA standpoint that due to the relocation of the marker the public might have to appreciate the historical significance of the Mission building a few hundred feet from where it was actually located is a highly subjective and personal determination. State regulations require that "substantial weight" be given the findings of the Community Development Director in determining that the proposal will not create any probable significant adverse impacts. Given the subjective nature of the pertinent impacts, it must be concluded under the "substantial weight" standard that the proposal will not create probable significant adverse impacts to the historical and cultural resources of the site. A detailed analysis of the evidence regarding historical/cultural impacts is in Finding of Fact No. 6, p.11.

TESTIMONY

A summary of hearing testimony has been prepared for those interested in the content of testimony presented at the hearing. A copy of that summary is available from Jeff Wilson, Community Development Director, at the City of Dupont City Hall. The summary is for the convenience of

interested parties only and is not to be construed as placing any significance on what was or was not summarized.

EXHIBITS

A. City of DuPont Department of Community Development Staff Report with Attachments, dated May 8, 2019

B. E-mail from Karen Nolan received May 11, 2019 @ 4:36 pm

C. E-mail from Alina Pontynen received May 11, 2019 @ 9:11 pm

D. E-mail from Lauren Jelle received May 11, 2019 @ 9:39 pm

E. E-mail from Libby Fitzgerald received May 12, 2019 @ 6:01 am

F. E-mail from Rhonda Ogilvie received May 12, 2019 @ 8:56 am

G. E-mail from Christian Young received May 12, 2019 @ 9:02 am

H. E-mail from Eric Ogilvie received May 12, 2019 @ 9:19 am

I. E-mail from Pam Fisher received May 12, 2019 @ 12:59 pm

J. E-mail from Heather Eckstein received May 12, 2019 @ 3:20 pm

K. E-mail from Rex Bruce received May 13, 2019 @ 1:09 am

L. E-mail from Jennifer Fry McDonald received May 13, 2019 @ 8:50 am

M. E-mail (with attachments) from Linda M. Smith received May 13, 2019 @ 11:11 am

N. E-mail from Vicki Keys received May 13, 2019 @ 12:02 pm

O. E-mail (with attachment) from Krista Novak received May 13, 2019 @ 2:20 pm

P. E-mail (with attachments) from Bill Lynn, Applicant's representative, received May 13, 2019 @ 3:29 pm

Q. E-mail from Dennis Bernardy received May 13, 2019 @ 5:40 pm

R. E-mail from Trina McJunkins received May 13, 2019 @ 8:23 pm

S. E-mail from Carol McDowell received May 13, 2019 @ 11:07 p

T. E-mail from Kelly Schneider received May 14, 2019 @ 11:03 am

U. E-mail (with attachment) from Cary Harlow received May 14, 2019 @ 1:07 pm

V. E-mail (with attachment) from Beth Elliott received May 14, 2019 @ 3:01 pm

W. E-mail (with attachment) from Judy Norris received May 14, 2019 @ 3:01 pm

X. City Staff Report & Recommendation PowerPoint Presentation dated May 15, 2019

Y. E-mail from Lynn Okita received May 14, 2019 @ 8:30 pm

Z. E-mail from Montana Crosby received May 14, 2019 @ 9:47 pm

AA. E-mail from Bonnie Landes received May 14, 2019 @ 11:19 pm

BB. E-mail (with attachment) from Bridget King received May 15, 2019 @ 8:36 am

CC. E-mail from Angela Gesacion received May 15, 2019 @ 8:43 am

DD. E-mail from Pamela Foe received May 15, 2019 @ 9:06 am

EE. All email correspondence between the Hearing Examiner and SEPA Parties

FF. Applicants proposed "Revised Conditions of Approval, submitted 5/15/19

GG. Prepared comments submitted by Joe Lewis, received May 15, 2019

HH. Prepared comments and supporting documentation submitted by Maria Gudaitis

II. E-mail from Rick Patterson received May 15, 2019 @ 11:55 am

JJ. E-mail from Mike McJunkins received May 15, 2019 @ 11:59 am

KK. E-Mail from Maria Gudaitis received May 15, 2019 @ 2:38pm re: Testimony Part II

LL. Photos of Buffalo Soldiers from Bridget King received May 15, 2019 during hearing

MM. E-Mail from Maria Gudaitis received May 15,2019 @ 2:52pm

NN. E-Mail from Mike & Nanette Winkler received May 15, 2019 @ 5:57pm

OO. E-Mail from Dixie Grisham received May 15, 2019 @4:01 pm

PP. Written post-hearing closing arguments of SEPA parties.

QQ. Stipulations between City and Applicant, dated May 16, 2019

RR. Appellant May 29, 2019 Noise Study[2]

SS. Applicant June 1, 2019 Noise Study

[2] The Applicant objected to the admission of this document. Objection is overruled because the Applicant was given license to present its SEPA arguments in post-hearing briefing, which included new evidence for all parties involved in the Applicant's SEPA appeal.

FINDINGS OF FACT

Procedural:

1. Applicant/Appellants. The Applicant is DuPont Industrial Partners, LLC. The SEPA Appellants are the Nisqually Delta Association ("NDA").

2. Hearing**.** A hearing was held on the subject applications on May 15, 2018 at 9:00 am in the City of Dupont City Council Chambers. The hearing was left open for post-hearing briefing and closing argument through May 23, 2019. At the request of the parties, this was extended through June 3, 2019 by email order dated May 20, 2019.

3. Project Description. The Applicant has requested site plan approval for a 255,000 square foot warehouse and a Tree Modification for removal of landmark Oregon white oak trees at 1700 Center Drive. The proposal includes the dedication of public right-of-way to extend Sequalitchew Drive to the north through the property to connect and provide access to the property north of the subject site. This will effectively create two parcels, one on each side of the proposed right-of-way. Following dedication, the east parcel will be approximately 5 acres and the west parcel will be approximately 16.91 acres. The proposed building and all associated improvements are located on the west side of Sequalitchew Drive with no improvements planned to the east. The project will include grading, drive aisles and vehicular parking areas, landscaping, water and sanitary sewer extensions, stormwater collection and infiltration facility, and franchise utility improvements. Tree removal is proposed, which includes removal of landmark Oregon white oak trees located within the proposed right-of-way of Sequalitchew Drive and development footprint.

The proposal will also include the relocation of a portion of the existing Sequalitchew Creek Trail that is currently and temporarily (informally) located on the subject property, to the location of an existing public trail easement. The new trail segment will be paved and fenced, restricting public access outside of its path, and dedicated to the City for ongoing ownership and maintenance.

The property is the location of a designated historical marker for the 1838 Methodist/Episcopal Mission; additionally, other important historic and/or cultural events have occurred on or in the vicinity of the subject site. As part of the development proposal, the Applicant will dedicate approximately 1.53 additional acres or public right-of-way to the City and construct a historical commemorative area adjacent to the new trail segment for public viewing to recognize and promote the historical and cultural events which occurred in the vicinity.

The property is known to contain contaminated soil above current MTCA Method A cleanup levels for unrestricted land use which limits the property to commercial and/or industrial use only (parks are not permitted). It is subject to the terms of a Consent Decree between Washington State Dept. of Ecology and Weyerhaeuser Company and DuPont Company entered by Thurston County Superior Court on July 22, 1991 pertaining to cleanup of the contamination on the property. It is also subject to a Restrictive Covenant which limits the use of the property.

4. Conformity to Development Standards[3]. The project conforms to applicable development standards as follows:

A. Drainage. The drainage and conveyance system for the proposed development will be designed to meet City standards, which require conformance to the 2012 Washington State Department of Ecology Stormwater Management Manual for Western Washington with 2014 Amendments (2014 Manual). The Applicant has prepared a Preliminary Site Stormwater Site Plan (Ex. 1, att. (G)(1)(c) that has been reviewed by the City Engineer and found to be in compliance with stormwater manual standards if certain modifications are incorporated as required by the conditions of approval to this decision.

B. Chapter 25.115 Transportation. The City's Traffic Engineering Consultant, Gerilyn Reinhart, has reviewed the Traffic Impact Analysis submitted with the application and provided comments dated February 12, 2018, June 6, 2018, December 10, 2018 and January 13, 2019, which have been incorporated in the summary of record and made conditions of approval or SEPA mitigation measures, where warranted. (Attachment 10e).

Chapter 25.115 requires transportation concurrency review for nonexempt development. The conditions of approval require that the Applicant will be required to apply for and obtain a Transportation Concurrency certificate, as provided in DMC 25.115, at the time of building permit application.

C. Chapter 25.95 Parking. As detailed in the staff report, DMC 25.95.030 requires 30-90 spaces for the proposal based upon 90 employees projected for the proposed warehouse use. The Applicant proposes 215 parking spaces, which exceeds the maximum 90 spaces authorized for the project. The conditions of approval require that the Applicant address the excess number of parking spaces by applying for necessary modifications/variances or reducing the number of stalls.

D. Chapter 25.90 Landscaping. The proposal complies with the City's landscaping standards. DMC Chapter 25.90 regulates landscaping. DMC 25.90.020(2) requires 20% landscaping, which is 133,903 square feet for the western, developed parcel of the project site. As conditioned the proposal will provide for 20% landscaping.

DMC 25.90.030(2) requires that the interior of surface parking lots with 10 or more stalls be landscaped with at least one tree per six stalls. The Architectural Site Plan indicates that 215 standard vehicle parking stalls are provided plus 65 trailer stalls. The Landscape Plans

[3] Conformity to development standards is usually assessed via conclusions of law. However, site plan review standards are highly detailed and technical. In the absence of any disagreement over the application or any indication in the record of a code compliance issue, the examiner will rely upon assurances made by staff that standards are met, based upon the staff's exercise of professional judgment. Since these determinations of conformity are based upon staff expertise instead of application of law to fact, the determinations regarding conformance to development standards are treated as findings of fact.

(Attachment 8b) do not provide the parking lot tree calculation but the Planting Schedule on Sheet L2 provides a total of 66 trees over the entire site (it is not clear how many of these are parking lot trees). A condition of approval requires that the correct number of parking spaces and corresponding parking lot tree quantities should be corrected on the Landscape Plans and demonstrate that at least the minimum is provided per DMC 26.90.030(2). (Condition #12c)

DMC 25.90.030(3) requires that a moderate (50% screening) buffer be provided between parking lots and any adjacent public right-of-way. Sequalitchew Drive and Sequalitchew Trail are both adjacent public rights of way (the eastern portions of the trail are adjacent to the subject property). The vehicle parking area located east of the east/front building façade is required to be screened by a moderate buffer from Sequalitchew Drive. The two trailer storage areas located on the east end of the western parcel, which are not the same as vehicle parking areas, are required by the conditions of approval to be relocated to the west of the east elevation. Depending on their new location, they may be required to be screened from the trail.

The northeastern parking lot is diagonal in shape, which provides for a triangular shaped landscape buffer that varies in width from 10 to 150 feet. The landscaping plans provide a single row of seven 2.5-inch caliper Oregon white oak trees adjacent to the right-of-way with the remaining area to be hydro-seeded/lawn. All existing trees in the buffer are shown to be removed. The plans do not meet the moderate buffer requirements. The existing trees in this area are required to be retained by the City's tree retention standards and additional trees, shrubs and groundcover added. The conditions of approval require that the landscape plans shall be revised to meet the moderate buffer screening requirement and include the existing trees to be retained. (Condition 12d)

Eastern trailer storage area moderate buffer: This area depicts approximately eight trailer storage spaces between the vehicle parking area and Sequalitchew Drive. On Sheet L2 (Attachment 8.b) the trailer storage area is depicted as it is proposed to be hydro seeded so it is unclear of the intent. The trailer parking area is required to be removed/relocated from the front of the building (see Section D.1.a(11), above and D.2.b, below) and planted to meet the screening requirements. (Condition 12e)

Southeastern trailer storage area moderate buffer: The southeastern trailer storage/parking area provides a landscape buffer width of approximately 20 to 55 feet adjacent to Sequalitchew Drive. The landscape plan provides only hydro-seeding/lawn in this area. The plantings do not meet the moderate buffer requirements. The trailer storage area is required to be removed/relocated from the front of the building (see Section D.1.a(11), above and D.2.b, below).

The landscape plans depict a stormwater pond south of the southeastern trailer storage area. The pond is not depicted on the Architectural Site Plan, or the Civil Plans (Civil plans depict underground storm chambers) so it is not clear of the intent. If a pond is located within visibility of the public, it shall be screened with landscaping and fencing. (Condition 12f)

South/Central trailer parking buffer: The southern perimeter of the property contains trailer storage/parking areas. No landscape buffer is proposed, however the area is currently heavily vegetated with mature trees many of which are proposed to be retained. The area is on a bench and downslope a vertical drop that ranges between approximately 28 to 45 feet from the southern perimeter of the trailer storage area to the Sequalitchew Creek Trail. The western end of the trailer storage area will likely be visible from the Trail. Additional screening vegetation should be added in the open area east of the trailer storage area. (Condition 12g)

E. Chapter 25.45 Project Design/Zoning District Standards. The proposal is not subject to any specific set of design standards, but is consistent with design standards applicable to the manufacturing research park district. DMC 25.45.020(1)(a)(ii) requires the proposal to be designed for a campus-like setting with architectural detailing. The site plan and building elevations show general compliance with this standard due to the extensive landscaping required of the project for site plan design and due to the detailed building elements as detailed and required in the assessment of DMC 25.45.030.3(5) below.

DMC 25.45.030.3(5) requires that blank walls greater than 50 feet in length along the front and side of a building be softened through various architectural and/or landscaping measures. The blank wall requirements apply to the south and east elevations which face/ are visible from the public rights of way of Sequalitchew Trail and Sequalitchew Drive. The west and north elevations will not be visible to the public and therefore staff takes the position that the blank wall requirements do not apply to those elevations.

South elevations - The south elevation of the building is approximately 950 feet in length and anchored on each end with prominent architectural entries including glazing with 4-inch steel channels, storefront doors, and distinctive canopies for weather protection. A total of four colors are provided at the building entries. Landscaping at the southeast entry is comprised of a mix of shrubs and ground cover and four, 2-inch caliper western red maple trees. The grade change at the entry is accommodated with a small berm.

The majority of the south elevation is a long expanse of dock doors with blank walls greater than 50 feet. The lower 2/3 of the building is painted a dark gray and the upper third is a light gray. The span is broken up at intervals with a vertical trim element that is dark gray and a small area in blue. The distance between the vertical elements varies between 95 and 158 feet where there is no architecturally distinctive treatment provided. These areas are "blank walls" and are required to be softened with the menu of landscape design options provided in DMC 25.45.030(3)(b); however, they are not provided likely due to the prevalence of dock doors. Therefore, architectural treatments to address the blank walls will be required.

Staff sees several options for meeting the blank wall requirements, which are required for the eastern 200 feet of the building that will be visible from Sequalitchew Creek Trail as follows:

(a) The elevations provided with the original two-building application provided roof modulation and integration of color in vertical bands that served to break up the blank walls. The addition of these architectural elements could be added to the current proposal. Alternatively, color or textural changes within the upper one-third of the building at intervals of 50 feet or less are another architectural treatment option to consider for meeting the blank wall requirements.

(b) Alternatively, there is a potential that the building may not be fully visible from Sequalitchew Creek Trail once other required plantings are provided. Buildings that are not visible from the public right-of-way are not required to meet the blank wall requirements. SEPA Mitigation Measure No. 10 requires additional plantings be provided between the south property line and the 10-foot grading buffer. City code also requires a moderate landscape screening buffer per DMC 25.90.030(3). It is possible that the combination of these two requirements, together with the site topography, will fully screen the building from view from the trail.

In lieu of addressing the blank wall requirements in the eastern 200 feet of the building, the Applicant could prepare a 3D rendering of the site and trail depicting the topography and future building so that the visibility of the building from the trail can be addressed at a preliminary level. Those portions that are determined visible will then be required to either address the blank wall requirements or augment planting to fully screen the building from view.

(c) Another option for assessing the building's visibility from the trail and whether additional architectural or landscaping is required to meet the City's blank wall requirements is to assess the view of the building from the trail when the new trail alignment is constructed. The Applicant and City will walk the new trail segment when it is constructed and conduct a visual inspection to determine the visible areas of the building and the optimal requirements to screen those visible areas from the menu of options described above. (Condition 9)

East Elevations - The east elevation is approximately 360 feet in length and capped on each end with prominent building entries. The entries feature glazing with 4-inch steel channels, storefront doors, and distinctive steel canopies for weather protection. A total of four colors are provided at the building entries. There are no segments of blank walls greater than 50 feet in length. Landscaping is provided with a combination of shrubs and groundcover in 5-foot wide strip. The east elevation is compliant with the blank wall requirements.

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F. Chapter 25.105 Critical Areas. The subject property contains the following regulated critical areas:

Fish and Wildlife Habitat Conservation Area - Sequalitchew Creek's 100-foot stream buffer and Priority Habitat Species. The development footprint is located outside of the 100 foot stream buffer.. The property is mapped by Washington Department of

Fish and Wildlife as containing Priority Habitat Species for three bat species (all of DuPont is mapped as containing habitat). In addition, the nearby Sequalitchew Creek contains Priority Habitat fish species: Coho salmon, Cutthroat trout, Resident coastal cutthroat trout, and Summer chum salmon.

Geologically Hazardous Areas – Steep slopes are located along the southern and western perimeters. Portions of the new trail segment are located within and adjacent to the steep slopes. Additional geotechnical analysis is required to determine if the slopes are a landslide hazard or erosion hazard area.

Compliance with the City's critical areas ordinance assures no significant impacts to critical areas. Staff has evaluated the project for consistency with the City's critical area regulations and has adopted a series of mitigation measures incorporated into the MDNS to ensure compliance. Staff's findings of consistency with critical area regulations are consistent with the evidence in the administrative record and there is no evidence to the contrary. It is determined that the project is consistent with the City's critical area regulations and therefore the proposal will not significant adversely affect them.

G. Chapter 25.75 Commute Trip Reduction. The City's Commute Trip Reduction requirements, Chapter 25.75 DMC, only apply to employers with 100 or more employees. The Applicant indicates approximately 90 employees are anticipated.

H. Chapter 25.80 Cultural Resources. Chapter 25.80 DMC prohibits construction at or within 50 feet of markers designating cultural resource sites identified in DMC 25.80.020. The project site has one of those markers designating the site of the Methodist/Episcopal Mission. The project complies with this requirement as outlined in Conclusion of Law No. 10. The SEPA MDNS also provides for monitoring during construction by a professional archaeologist and the Nisqually Tribe and implementation of an Inadvertent Discover Plan should any new artifacts be found.

I. Chapter 25.85 Affordable Housing. Chapter 25.85 DMC, Affordable Housing, is inapplicable as that chapter only applies to housing projects.

J. Chapter 25.110 Street Corner Setbacks. Chapter 25.110 DMC imposes height limits on structures and landscaping that can be placed within the sight triangle of street corners. The project area does not include any street corners.

K. Chapter 25.116 Sign Code. The Applicant has not proposed any signs for this stage of review. Signs are regulated by Chapter 25.116 DMC and sign code compliance shall be assessed upon the submission of a sign permit application, as required by DMC 25.116.140.

L. Chapter 25.120 Tree Retention. Tree retention standards are governed by Chapter 25.120 DMC. Tree retention is a significant issue for the project, since hundreds of trees will be affected by the development. The Applicant has prepared a tree retention plan as required by

the City's tree retention regulations, but the plan was based upon a former iteration of the project that involved two warehouse buildings instead of one. The currently proposed single building will be located within the same footprint, so the number of trees removed is anticipated to be less than that identified in the tree retention plan. Conditions of approval require the Applicant to update its tree retention plan to account for the changes in building design pursuant to the requirements of Chapter 25.120 DMC.

The current tree retention plan identifies that the project site has 682 healthy significant trees and that 316 trees will be retained. Of particular relevance in the tree retention plan is that the Applicant originally proposed to remove three landmark trees, but has since revised its site plan to retain one of the three landmark trees by moving proposed right of way to retain what is designated as Tree No. 12 in the tree retention plan. The two remaining trees qualify as landmark trees because they are Oregon white oak trees with diameters exceeding 24 inches. See DMC 25.10.120.005.

DMC 25.120.030(2) requires all landmark trees to be retained. Those trees can only be removed through successful application for a Tree Modification pursuant to DMC 25.120.050. DMC 25.120.030(2) allows landmark trees to be removed if they are within a proposed street right-of-way which is integral to the neighborhood and cannot reasonably be moved. The Applicant seeks to remove one of the two trees, designated Tree No. 9, using that exception for Sequalitchew Drive. The Sequalitchew Drive right-of-way is integral to the neighborhood, in that it is planned to provide a future connection to the properties to the north, however its specific alignment is not permanently or formally established on a City planning document. It does not appear that the right-of-way could be adjusted to save Tree No. 9 while providing the required curve radius and design requirements per city road design standards. The staff report notes that if the Applicant can provide justification for the tree removal that demonstrates to the City's satisfaction that the alignment cannot reasonably be modified to retain the tree, the removal of Tree No. 9 should be allowed. At the same time, another part of the staff report recommends that the request to remove Tree No. 9 be approved without mentioning any need for further justification. The Applicant did not address the removal of Tree No. 9 at the hearing. Given staff's assessment of the curve radius and the importance of Sequalitchew Drive to the area's planned circulation system, the request to remove the tree is approved.

The second of the two trees requested for removal, Tree No. 65, is located on the southwestern edge of the trailer storage parking area. The reduction in one or more trailer parking spaces would be sufficient to save the tree and the Applicant has presented no reason why the loss of the removal of the tree is necessary due to special circumstances pertaining to that land or the trees on it as required by DMC 25.120.050. For this reason, the modification request for Tree No. 65 is denied.

M. Chapter 25.125 Wireless Communication Facilities. No wireless communication facilities are proposed, so Chapter 25.125 DMC, Wireless Communication Facilities, does not apply.

5. SEPA Appeals. A SEPA mitigated determination of non-significance ("MDNS") was issued for the proposal on February 20, 2019. Two timely appeals were filed against the MDNS. One by the Applicant on March 6, 2019 and one by the Nisqually Delta Association (Appellants) on March 6, 2019.

The Appellants raised several grounds for their appeal in their appeal document. However, they only pursued two of those grounds, specifically (1) the MDNS failed to analyze and disclose the need for a forest practices permit; (2) the MDNS failed to adequately address impacts to cultural and historical resources. None of the other grounds for appeal in the written appeal statement were pursued any further and for that reason are construed as abandoned. The Appellant's forest practices claim was found to not serve as a basis for overturning the MDNS in a summary judgment ruling dated May 5, 2019. In that same summary judgment proceeding the Appellant asserted that an alleged violation of DMC 25.45.030(17), which prohibits warehouses from "abutting a main street," also constituted a probable significant adverse impact that should have been assessed and mitigated in the MDNS. The Appellant did not identify this violation as a grounds for reversal in its letter of appeal, but no party voiced any objection to the argument on that basis until the City finally did so in its written closing argument after the summary judgment proceeding and after the close of the appeal hearing. The City's objection was untimely and deemed waived for that reason.

The Applicant's SEPA appeal challenges several mitigation measures. The City and Applicant stipulated to the modification of three of those mitigation measures, specifically Conditions 2, 3, 5 and 19. The modifications to 2, 5 and 19 are reasonable and do not materially reduce or detract from needed mitigation and are therefore found to be consistent with and necessary to eliminate probable significant adverse environmental impacts. The agreed upon mitigation to Condition No. 3 was determined to fall short of eliminating noise impacts for the reasons identified in Finding of Fact No. 5 and for that reason was subject to further revision as outlined in the Decision section of this decision. The Applicant did not pursue its arguments against the other mitigation measures identified in its appeal except for Condition No. 19 (addressed in the Appellant's prehearing brief). All other mitigation measures except those subject to stipulation and Condition No. 19 are deemed abandoned.

6. SEPA Appeal Issues. The findings below address the SEPA issues litigated at the appeal hearing:

A. Cultural/Historical Impact. The proposal will not create significant adverse impacts to cultural/historical resources. As determined below, the project site has unquestionable historic and cultural significance. The proposed warehouse will be constructed over a large portion of this historic site. However, the evidence also fairly clearly establishes

from exhaustive archaeological surveys that there are no more significant artifacts or other data of historical significance to be found from further investigation of the site. Historical impacts are limited to the loss of public access to the site. Currently, a marker located on private property purportedly identifies the location of one of the most historically significant buildings of the site. The Applicant proposes to move the marker to another part of the project site to a location of a public trail within a few hundred feet of the original marker location.

The assessment of public harm caused by the modest displacement of a historic marker that may not even be accurately located is a highly subjective determination. Since cultural/historical impact is solely a SEPA issue for this project, state regulations require that substantial weight must be given to the determination of the SEPA responsible official that impacts are not significantly adverse. Although relocation of the marker is not ideal from a purely historical perspective, there is ample room for reasonable minds to differ as to whether the modest relocation should be considered significant. Under these circumstances, the substantial weight due to the SEPA responsible official's determination of nonsignificant tips the balance to a determination that the adverse impacts are not significant.

a Historic/Cultural Significance of Project Site. The project site is of undisputed historical significance. The first American building in the Puget Sound Region was built at the site in 1839 for a Methodist-Episcopal Mission. According to the Appellant, the site served as the locale for a series of firsts in the region, including the first US settlers in Western Washington, the establishment of the first school for Native American and Euro-American children in the region, the first marriage of US citizens west of the Cascades, the first birth of a child to US citizens and the first Protestant mission to be established in Western Washington.

In 1904, a roughly 2,000-member contingent of the 9th US Cavalry, known as the "Buffalo Soldiers," camped in the area, built stables and played a role in the desegregation of the American military and formation of what became Joint Base Lewis-McChord.

b. Location of Existing "Marker". A marker currently identifies the location of the Mission building. Although the marker is located at the only physical evidence found for the Mission building, the prevailing academic opinion is that the physical evidence is not sufficient to conclusively identify the location of the building. The accuracy of the marker's location is questionable.

All above-ground traces of the Methodist-Episcopal Mission are missing from the project site. According to the Applicant, the project site has been subject to numerous land disturbances over many years. Between 1869 and 1906, the land was populated by American settlers, who used the land for farming and livestock grazing.

In 1906, the Dupont Powder Works began operating the property. During the construction and early operation of the Dupont Powder Works, buildings were frequently constructed and demolished. Logging and leveling of the land, the construction of roads and the railway network, the annual clearing and burning of underbrush and frequent and violent explosions resulted in extensive land disturbances.

In 1927 the Dupont Powder Works placed a plaque on the property commemorating the first Fourth of July celebration west of the Mississippi, which is understood to have been celebrated at the Mission.

The property was sold to the Weyerhauser Company in 1976. By that time many of the Dupont Powder Works production buildings were burned prior to Weyerhaeuser taking possession. Thereafter, contaminated soil remediation activities resulted in extensive soil disturbance.

In 1989, archeologist Guy Moura found two brick fragments near the plaque commemorating the first Fourth of July, as well as several nails and glass fragments, and what be believed to be hearth and chimney fragments. This led him to believe he had found the Mission site. At least three subsequent archaeological studies have questioned whether Mr. Moura had enough evidence to conclude he had found the exact location of the Mission building. At the hearing, Mr. Moura maintained his conclusion that he had found the accurate location of the Mission building. He also testified that the area still likely contained historical artifacts.

In 2011, an archaeological study known as the Parus report investigated several issues, including whether the project site is eligible for listing for the National Register of Historic Places under Criterion D. A property is not eligible for listing under Criterion D if the physical remains capable of yielding important information no longer exist at the site or cannot be found at the site. As to Criterion D, the Parus Report concluded that "*[t]he work further substantiates the opinion that the site 45P166 is not eligible under Criterion D (data potential*)." The conclusions of the Parus report were affirmed in the registration document certifying the site as eligible because of its association with historic events under for listing on the National Register of Historic Places the "Criterion A" registration criteria. However, the site was not found eligible for listing under Criterion D. *See* Section 8, NRHP Registration Form, Ex. B to Dimitra Zalarvis-Chase in Support of Applicant Response.

Ms. Zalarvais-Chase, an archaeologist testifying on behalf of the Applicant, mentioned that the Parus Report, in her opinion, reflected that the historical marker may not be accurately located and that there was not enough evidence to support the conclusions mentioned by other professionals in this hearing. Ms. Zalarvais-Chase believes that there is not enough evidence to support the idea that this site is of historical significance. Ms. Zalarvais-Chase noted that the site had already been exhaustively excavated meaning that the materials, even if they were there, would already be so seriously

diminished that they would not offer significant historical resources.

c Proposed Marker Relocation. The Applicant proposes to relocate the commemorative plaque identified in Finding of Fact No. 4 to a 1.53 acre portion of the project site that will be dedicated for public use. The current location of the plaque is on private property and inaccessible to the public. The 1.53 dedicated public area will be accessible from an existing public trail, the Sequalitchew Creek Trail.

d. Impact of Relocation. As identified in Finding of Fact No. 6Ab, the precise location of the marker is subject to disagreement amongst archaeologists, with the prevailing opinion appearing to be that there is insufficient evidence available to conclusively establish whether the marker accurately depicts the location of the Mission building. Although Mr. Moura, an Appellant archaeologist disagrees, it is also reasonable to conclude that the site is very unlikely to contain any additional significant artifacts given the results of several archaeological surveys and studies and the site's ineligibility for meeting Criterion D for listing on the National Register of Historic Places. *See* Section 8, NRHP Registration Form, Ex. B to Dimitra Zalarvis-Chase in Support of Applicant Response to Appellant's Motion for Summary Judgment. Given these factors, it is apparent that further study of the site will not reveal any further evidence on the Mission building's location or any other historically significant information about the project site. WAC 197-11-080(3)(b) requires a "worst case" analysis of project impacts when the means to acquire information about an impact are speculative or unknown. Given that theirs is no reasonably available information to further substantiate the location of the Mission building, it will be concluded for purposes of this review that the current location of the marker is accurate.

Treating the marker location as accurate, it is still determined that the relocation of the marker does not create probable significant adverse impacts. As previously noted, the site does not contain any additional artifacts that would be of historical significance. Consequently, the impacts of the relocation are limited to public access to the marker site. There is conflicting evidence in the record from experts and laypeople as to the significance of accessing the actual location of the Mission building verses viewing it from a few hundred feet away, with the Mission site under a warehouse. The impacts to the public are tempered by the fact that the current marker site is on private property and not open to public access, whereas the proposed relocation will be dedicated to the public at a site off a popular public trail and the Applicant will add more markers with historical information. It is also significant that although the project site qualifies as eligible for registration in the National Register of Historic Places, after all this time it still has actually been registered. Further, the Washington State Department of Archaeology and Historic Preservation did not object to relocation of the marker even though it was consulted on the issue.

Given the highly personal and subject nature of the impact of relocation, it is determined that the substantial weight due to the SEPA responsible official is

determinative. In order to issue his MDNS, the SEPA responsible official had to determine that the relocation of the marker as proposed and mitigated would not create any probable significant adverse impacts. The enhanced public accessibility to the historic Mission site as proposed by the Applicant and the proximity of the relocation to the historic activities of the project site form a reasonable basis for the SEPA responsible official's conclusions on this issue.

B. Noise. As mitigated, the proposal will not create significant noise impacts. The MDNS as issued requires noise monitoring and imposition of yet to be determined noise mitigation measures if noise levels exceed ambient levels of the adjoining Sequalitchew trail. The City and Applicant subsequently agreed to a revised MDNS Condition No. 3 that simply requires the project to comply with the City's adopted noise levels, Chapter 9.09 DMC. The SEPA Appellants contested this revision and submitted a noise study asserting that noises levels would be annoying and startling to trail users and that some activities would exceed code adopted noise levels. The Applicant submitted an expert report denying these claims and also noting that it's impossible to not add to ambient noise levels with any noise making activity.

The City's noise standards generally do set a legislatively acceptable level of noise. From this it is reasonable to conclude that noise levels below these standards are not significant. In this respect, the Applicant is correct in its SEPA briefing that RCW 43.21C.240 can be used to rely upon the City's noise ordinance to mitigate noise impacts. However, RCW 43.21C.240 only authorizes the use of development standards and the like to mitigate impacts if the City determines those regulations adequately mitigate the impacts. Since acceptable noise levels are set by the adoption of Chapter 9.09 DMC, it must be surmised whether there was legislative intent to extend those acceptable levels to situations where adverse noise levels can be mitigated through reasonable land use conditions of approval. There is nothing to suggest that the City Council intended its noise ordinance to preclude reasonable land use conditions that could reduce noise levels on a permanent basis. The Appellant's noise report identified several warehouse noises that can be highly annoying and startling to trail users and that can be mitigated as a part of project review. Further, that noise study raised the reasonable possibility that project activities could exceed adopted noise levels. For these reasons, the SEPA mitigation measure will still impose some reasonable noise reduction measures and will also require monitoring to ensure that the project complies with Chapter 9.09 DMC noise standards.

C. Environmental Clean Up. MDNS Condition No. 19 requires the Applicant to develop a soil remediation plan, enter into a Voluntary Cleanup Program with Ecology and obtain a "no further action" letter from Ecology. According to the staff report, excavation and remediation of contaminated soils has already been completed pursuant to a 1991 Department of Ecology Consent Decree No. 91-2-01703-1. The Applicant asserts that hazardous waste remediation is subject to the jurisdiction of the Department of Ecology, who has already taken action to require remediation of the site via the consent decree. However, staff assert that the site still has contaminated soils in need of remediation. The Applicant does not dispute the presence

of contaminated soils. The Applicant has not presented any evidence or explanation as to how or whether DOE regulations are designed to provide for safe use of the project site in the manner proposed by the Applicant. In the absence of any argument or convincing evidence that MDNS Condition No. 19 should be eliminated, under the substantial weight SEPA standard it is determined that the contaminated soils of the site are a probable significant environmental impact standard the condition will be retained with a minor revision agreed upon by the City and Applicant in Ex. QQ.

D. Abutting Violation. The Appellants assert that the proposal violates DMC 25.45.030(17) and for this reason creates a probable significant adverse impact. DMC 25.45.030(17) prohibits warehouse use from abutting main roads as outlined in the introduction to this Decision. The proposal is being denied because it fails to comply with DMC 25.45.030(17), so there are no probable significant adverse impacts associated with its denial. Should a reviewing court find that the proposal complies with DMC 25.45.030(17), there would be no adverse environmental impact based upon noncompliance.

CONCLUSIONS OF LAW

1. Authority. DMC 25.175.010 classifies site plan applications for Manufacturing Research Park development of more than 15 acres as Type III review. The western parcel of the project site is over 16 acres so Type III review applies to the site plan. DMC 25.120.050 classifies requests for modifications to Chapter 25.120 DMC tree retention standards as Type III review as well. DMC 25.175.010(2)(b) provides that the hearing examiner shall hold a hearing and issue a final decision for Type III permit applications.

2. Zoning/Comprehensive Plan Designations. The Comprehensive Plan Designation is Manufacturing and Research and it is located in the Sequalitchew Village planning area. The zoning district is Manufacturing and Research Park (MRP).

3. Review Criteria. DMC 25.150.030 governs the criteria for site plan review. DMC 25.105.070(1)(c) governs wetland buffer reduction criteria. Applicable criteria[4] are quoted below in italics and applied through associated conclusions of law.

[4] In addition to applying site plan and buffer reduction criteria, the staff report does an analysis of consistency with the City's comprehensive plan. The DMC site plan and wetland buffer reduction criteria do not require consistency with the comprehensive plan. However, RCW 36.70A.120 requires the City to perform its activities in conformity with its comprehensive plan. Arguably, since the City's site plan and wetland buffer reduction criteria are consistent with the City's comprehensive, any permitting decision made pursuant to those criteria would also be consistent. To the extent that a separate finding of consistency is required by RCW 36.70A.120, it is concluded that the proposal is consistent with the City's comprehensive plan for the reasons outlined in the staff report

DMC 25.150.030: *In order to obtain site plan approval, all of the development regulations and criteria specified in the district applicable to the property must be satisfied in addition to any general development requirements in Chapters 25.75 through 25.95 and 25.105 through 25.125 DMC.*

4. Proposal complies with site plan criteria except for DMC 25.45.030(17). Finding of Fact No. 4 assesses compliance with the DMC chapters referenced in the DMC 25.150.030 criterion above and finds the project conforms to each, except for compliance with "*criteria specified in the district applicable to the property*," specifically DMC 25.45.030(17), for the reasons identified in Conclusions of Law No. 5 below. The proposal is consistent with all other applicable Manufacturing/Research Park zoning standards for the reasons identified in Section D1a of the staff report, p. 14-19 and Conclusion of Law No. 6 below.

5. Proposal Fails to Comply with DMC 25.45.030(17). DMC 25.45.030(17) prohibits warehouse use from abutting main streets. Sequalitchew Drive is a main road as contemplated in DMC 25.45.030(17) and the proposed warehouse use abuts that road. For these reasons the proposal fails to comply with DMC 25.45.030(17).

It is uncontested that the project site abuts a main road[5], specifically Sequalitchew Drive. Sequalitchew Drive currently serves as a stub road but will eventually serve as a main access road to the homes located in the Sequalitchew Village. About 150 feet of parking and landscaping will separate the proposed warehouse building from Sequalitchew Drive. However, as acknowledged by the community development director during the hearing, the massive warehouse building will still remain visible to Dupont residents on their commutes and other daily activities as they drive Sequalitchew Drive to and from their homes. This aesthetic is precisely what DMC 25.45.030(17) was intended to avoid, as the regulation implements Comprehensive Plan Land Use Goal 9.2, which encourages the adoption of regulations to "…establish limitations on uses adjacent to main streets in order to ensure the small town aesthetic of the City of Dupont is maintained." Aligning Dupont's main streets with massive 255,000 square foot warehouses does not maintain the small town aesthetic of the City of Dupont. Such a scenario is precisely what the City Council intended to avoid in its adoption of DMC 25.45.030(17) and for that reason must be denied.

Interpreting DMC 25.45.030(17) has been extraordinarily difficult. Its meaning was partially addressed in a prior summary judgment ruling, where it was determined that additional information on legislative intent, past interpretations and aesthetic impacts was necessary to make a reasoned

[5] As accurately depicted in the Appellant's motion for summary judgment, p. 15-16: Specifically, the code requires that "Warehouses shall not be located abutting a main street (DuPont Steilacoom Road, Center Drive or the access road from Center Drive to Sequalitchew Village)." DMC 25.45.030(17). Under the Comprehensive Plan, "Sequalitchew Village includes the area of the City bounded by Puget Sound to the north and west, the manufacturing research park and industrial areas to the east and Sequalitchew Creek on the south." Comp. Plan at 61. Lot Y is in Sequalitchew Village. The referenced "access road from Center Drive to Sequalitchew Village," is now known as "Sequalitchew Drive." The road is depicted in the Comprehensive Plan map as a major arterial route planned to extend to Lot Y and then later to residential properties to be developed north and west of Lot Y.

interpretation. As shall be discussed, four interpretations have been presented through the course of the hearing process and each interpretation has had its shortcomings. Ultimately, it is concluded that the interpretation advocated by the SEPA Appellants' attorney, Mr. Golding, is the most compelling, with some modification. Mr. Golding's interpretation is simply that if a lot is developed for warehouse use, it must be deemed to abut a main road if the lot is contiguous with the main road. This interpretation most closely follows the plain meaning of the "abutting" standards that apply to the project, most effectively serves the objectives of Comprehensive Plan Land Use Goal 9.2 (quoted in the preceding paragraph) and, most important, implements the legislative intent of the City Council.

The goal in construing zoning ordinances is to determine legislative purpose and intent. 8 E. McQuillin, The Law of Municipal Corporations, § 25.77 at 244-46 (Revised 3d ed.2010); HJS Dev., Inc. v. Pierce County, 148 Wn.2d 451, 472 (2003). When the meaning of an ordinance is plain on its face, the plain language of that provision must be given effect. Dept. of Ecology v. Campbell & Gwinn LLC, 146 Wn.2d 1 (2002). Mr. Golding's interpretation meets that plain meaning standard. As previously noted, DMC 25.45.030(17) prohibits warehouse use from "abutting" main streets. DMC 25.10.20.010 defines "*warehouse/distribution*" as "a *building or land use in which goods, merchandise or equipment is stored for eventual distribution*." (emphasis added). DMC 25.10.210.015 defines "*use*" to mean the nature of the occupancy, the type of activity, or the character and form of improvements to which land is devoted or may be devoted. DMC 25.10.010.005 defines "abut" as "contiguous with or touching property lines or right-of-way." The Applicant's western parcel, to the extent it fronts a main road, is devoted to warehouse use – the space is composed of the warehouse building, its parking and associated landscaping. That warehouse use, i.e. the parcel upon which it's located, "abuts" Sequalitchew Drive because the lot is contiguous with the right of way of Sequalitchew Drive. In short, applying the plain meaning of DMC 25.45.030(17) and pertinent definitions directly and plainly leads to the conclusion that the Applicant is proposing a "warehouse" that abuts a main road. Further, for the reasons identified in the second paragraph of this Conclusion of Law, this plain meaning interpretation is fully consistent with the comprehensive plan policy the regulation is designed to implement as well as the Council's intent in adopting the regulation.

The weak link in Mr. Golding's interpretation is applying the "*warehouse/distribution*" definition to "*warehouses*" in DMC 25.45.030(17). The full term "*warehouse/distribution*" is only used in two places in Dupont's zoning code, specifically the permitted use sections of the Mixed Use Village zone, DMC 25.41.020(2)(g) and the Business Tech Park Zone, DMC 25.40.020(1). The term "*warehouse and distribution*" is used in the permitted use sections for the Community Business District, DMC 25.27.020(16) and the Industrial District, DMC 25.50.020(1)(f). Given that the full "*warehouse/distribution*" term is only used in code sections expressly and specifically addressing uses as opposed to buildings, there is a good argument to be made that the term "*warehouse*" in isolation doesn't implicated the "*warehouse/distribution*" term. However, construing "*warehouse*" as including "*warehouse use*" provides for a construction that implements legislative intent in a non-ambiguous manner. Given that preservation of small town aesthetics is the basis for DMC 25.45.030(17), excluding the improvements associated with warehouse use undermines that purpose. A warehouse that is separated from a main road by acres of parking is just as inimical to small town character as the proximity of massive warehouse building walls. Although certainly not perfect, as is evident from the discussion below, Mr. Goldings interpretation most closely and effectively

implements legislative intent compared to the other types of interpretations that could be made of DMC 25.45.030(17).

The most important alternative interpretation to consider in this regard is the City staff interpretation. This is because deference must be given to staff interpretations of ambiguous ordinances if staff can establish their interpretation was a matter of preexisting policy. *Ellensburg Cement Products, Inc. v. Kittitas County*, 179 Wash.2d 737 (2014). During the hearing staff arguably established that they were consistently following past interpretations of DMC 25.45.030(17), but even if such deference is due, that deference is superseded by the failure of the interpretation to conform to legislative intent as evidenced by nonconformance to more compelling rules of statutory construction. As to the interpretation itself, staff construes "warehouse" in DMC 25.45.030(17) as limited to a warehouse building, not warehouse use. Staff then applies the DMC 25.10.010.005 definition of "abut" to conclude that a warehouse building is only in violation of DMC 25.45.030(17) if the building is contiguous with the right of way of a main road.

City staff endeavored to establish that its interpretation of DMC 25.45.030(17) was due deference as a matter of existing policy by giving examples at the hearing of several warehouse buildings in the City of Dupont that have been constructed as close or closer to main roads than the proposal under consideration. Staff did not identify whether the warehouses were approved before or after the adoption of DMC 25.45.030(17) and whether any variances were involved. However, a declaration from Dan Balmelli, dated April 19, ,2019, shows two warehouses designed in the last year are closer to a main road than the proposal under consideration, which would be after the adoption of DMC 25.45.030(17) . From the general staff testimony and the declaration of Mr. Balmelli, it is determined that staff have consistently construed DMC 25.45.030(17) as only applying to warehouse buildings.

Although deference must be given to staff's interpretation, that deference does not overcome the inescapable conclusion that the interpretation violates legislative intent. Primarily, this conclusion is based upon the fact that the staff interpretation essentially repeals DMC 25.45.030(17) by rendering it completely useless. Statutes should be construed so that no clause, sentence, or word is made superfluous, void, or insignificant; however, in special cases the court can ignore statutory language that appears to be surplusage when necessary for a proper understanding of the provision. *State v. Evergreen Freedom Foundation*, 1 Wash.App.2d 288, 299 (2018). Staff posited at the hearing that under the DMC 25.10.010.005 "abutting" definition a warehouse building must actually be contiguous with the right of way of a main road in order to violate DMC 25.45.030(17). DMC 25.45.030(17) only applies to the MRP District, Chapter 25.45 DMC. That district imposes setbacks to property lines ranging from 15 to 25 feet. See DMC 25.45.030(3). For a warehouse to be contiguous to a right of way line in the MRP District, it would need a variance to the applicable setback. In the extraordinary circumstance where site constraints would justify a warehouse building to be built all the way up to a property line via a variance, it would likely also qualify for a variance to DMC 25.45.030(17). Practically speaking, it is extremely unlikely that there would ever be any set of circumstances where DMC 25.45.030(17) would operate to prevent a developer from placing a warehouse next to a main road – that restriction is already accomplished by the City's setback standards. Staff acknowledged at hearing that under their interpretation DMC 25.45.030(17) doesn't accomplish anything. In short, staff's interpretation renders DMC 25.45.030(17) entirely

meaningless and superfluous. In practical effect, the staff interpretation serves to repeal DMC 25.45.030(17). If the goal of statutory construction is to ascertain legislative intent, no interpretation that effectively repeals a legislative enactment, absent a statutory conflict, is supportable regardless of any required deference.

In addition to Mr. Golding's interpretation, the SEPA Appellants presented an alternative construction of DMC 25.45.030(17) formulated by an architect with considerable experience in conforming project drawings to code requirements, Michael Naucus. Mr. Naucus took the position that a building "abuts" the road closest to it. Mr. Naucus asserted this was based upon the common understanding of the term "abut" in land use codes by land use professionals, but did not give any examples of codes that use the "abut" term in any sense similar to that of DMC 25.45.030(17). Taking judicial notice of code adopted by other Washington cities and counties, one is hard pressed to find any other municipal codes that restrict specific land uses from "abutting" roads. What is fairly evident from Mr. Naucus' testimony is that he was equating "abutting" requirements with "frontage" requirements. While there are certainly similarities between the concepts in terms of aesthetic impacts, they do not serve precisely the same objectives. Practical applications of the Naucus interpretation can lead to results wholly inconsistent with legislative intent. As previously noted, the purpose of DMC 25.45.030(17) is to maintain the small town aesthetic. Under Mr. Naucus' interpretation, a thousand foot long warehouse that is 200 feet wide would be authorized to abut a main road along its 1000 foot length if its 200 foot side was closer to another road than its 1000 foot side. Whether or not a massive warehouse would be allowed along a main road would depend entirely upon the fortuitous circumstance of whether or not other roads were in closer proximity to the building. Such a random application of DMC 25.45.030(17) does not serve the aesthetic objectives of the DMC 25.45.030(17) as well as the interpretation presented by Mr. Golding.

The fourth and final interpretation presented by the parties to the hearing was the Applicant's common sense approach, simply pointing out that the proposed warehouse cannot be construed as "abutting" Sequalitchew Drive because it is separated from the road by 150 feet composed of "rows of parking spaces, two drive lanes, and a large landscaping area." Applicant's Opposition to Appellant's Motion for Summary Judgment, p. 14. The Applicant provides no code definition or even dictionary definition of "abut" to support its argument. Apparently, the Applicant simply takes the position that some indeterminate amount of separation between a warehouse and a main road, which is exceeded by the proposal, is sufficient to disqualify the use as "abutting." Such a facile "you know it when you see it" standard makes it very difficult to apply DMC 25.45.030(17) in a manner that is both predictable and consistent with legislative intent. As to predictability, the Applicant offers no suggestion as to what minimum separation is necessary to avoid "abutting" a main road, and certainly no set number is in any way ascertainable from the language of DMC 25.45.030(17) itself. Nor is the amount of separation necessary readily apparent when applying legislative intent, i.e. maintaining small town character. City staff testified that even with the 150- foot separation and excessive landscaping, the warehouse building would still probably be visible from Sequalitchew Drive. Staff's testimony is consistent with the landscaping required for the proposal, which is 50 percent screening. See DMC 25.90.030(3) and 25.10.020. Having to view warehouses separated by acres of parking and some 50% screening is just as inimical to small town character as warehouses located on road frontage

setbacks. Given the lack of code basis, ambiguity[6] and aesthetically adverse impacts associated with the Applicant's interpretation, it does not provide a compelling rational for finding compliance with DMC 25.45.030(17).

The Applicant argues that if "warehouse" in DMC 25.45.030(17) is construed to include the use as a whole that such a construction will also act as a de facto repeal of the provision because all lots in the Manufacturing and Research Park Zoning District abut main roads. If this assertion is correct, it still wouldn't act as a de facto repeal. As acknowledged by the community development director during the hearing, existing lots fronting main roads can be divided into two or more lots with a permitted use constructed on the lots fronting the main roads and warehouses located in the back. This is precisely the scenario encouraged by DMC 25.45.030(17). Further, some site features can very well qualify as separate uses even without creation of separate lots. If those site features are not a required amenity of the proposed use and are large enough to be reasonably construed as a separate use of the property, they would qualify to separate a proposed warehouse use from a main road. The historical viewing area proposed for this project is a prime example. If that view area were extended across the entire frontage of the western parcel, that would qualify as a different use that would separate the warehouse use from the main road. Similarly, large undeveloped areas that would qualify as vacant land could also qualify as a separate use. In contrast, the excess landscaping proposed by the Applicant probably wouldn't qualify as a separate use since it is simply a modest extension of a required site amenity that does little to maintain small town aesthetics.

On a final minor point, the City in its written closing argument asserted that it was not established that the proposed use was in fact a warehouse. This is a fairly surprising position to take given that the proposal was listed as an "office/warehouse" building in the land use application, Att. 1a and was advertised as an office/warehouse in the Notice of Application and the staff report. The traffic and parking analysis was based upon the use being entirely devoted to warehouse use. See Att. 2f (traffic study basing traffic counts in ITE warehouse land use designation); staff report p. 24-25 (parking requirements based upon number of employees, which applies to warehouse use, not office use). The color renderings presented by the Applicant, Att. 2c and 2d, depict at least 80% of the building length with the loading dock doors. The proposal is clearly for a building that is primarily devoted to warehouse use. If the Applicant was intending a building who's primary use was office, it would have to be completely re-evaluated.

6. Historical Markers Can Be Moved Under DMC 25.80.030. The Applicant was authorized to move the Mission historical markers as referenced under DMC 25.80.030 given the circumstances of this project.

[6] Appling a construction based upon a common sense understanding of what constitutes "abut" can lead to multiple reasonable interpretations of how much separation from a main road is necessary to satisfy DMC 25.45.030(17), serving as a basis for its invalidation as unconstitutionally vague. *See, Anderson v. Issaquah*, 70 Wn. App. 64 (1993) (an ordinance violates due process if its terms are so vague that persons of common intelligence must necessarily guess at its meaning and differ as to its application).

DMC 25.80.030 provides as follows:

> *No structures, roads or utilities are permitted within 50 feet of the markers identifying cultural resource sites designated under DMC 25.80.020.*

The issue presented in this case is what the Council had in mind if "the marker" were moved to another location. Most likely, the City Council never considered this possibility. When the Council adopted DMC 25.80.030 it was simply thinking of the location at which the markers were located at the time of adoption. However, the fact that the City Council may have understood the markers to remain in the same location does not mean they intended that the markers had to remain in the same location. If the latter were correct, the Council would have replaced "the markers" with verbiage similar to "the location of the markers." In point of fact, if NDA had subsequently presented the City Council with the idea of relocating the marker to a more accurate location, the City Council likely would have not found it necessary to amend DMC 25.80.030, since the 50 foot buffer was based upon the marker itself, not the location of the marker. The same rational should apply to a developer, even if the motivation for the relocation may not be as aligned with the public interest as those of NDA.

Given that DMC 25.80.030 is ambiguous as to whether and where a marker can be relocated, resort must be made to some case law maxims of zoning code construction. Zoning ordinances should be liberally construed to accomplish their plain purpose and intent; at the same time, since such ordinances are in derogation of the common law right to use property so as to realize its highest utility, they should not be extended by implication to cases not clearly within the scope of the purpose and intent manifest in their language. *Development Services of America, Inc. v. City of Seattle*, 18 Wn.2d 369 (1987).

Applying the maxim laid out in the *Development Services* case, the purpose of DMC 25.80.030 must first be ascertained and then be applied liberally to the marker at issue, while at the same time avoiding the placement of any burdens upon the Applicant that are not necessary to further that purpose. Fortunately, the purpose of DMC 25.80.030 is expressly identified in DMC 25.80.010, which provides that the purpose of Chapter 25.80 DMC is to

> "*encourage identification, protection, preservation and/or restoration of cultural resource sites. Important cultural resource sites are identified so that they may be incorporated into open space areas and connected to the recreational trail system*."

There are three important conclusions to be made from this provision: (1) accuracy in location is important, as only an accurate placement of a marker will assure that the 50 foot buffer adopted by the council will serve the functions of identification, protection, preservation and/or restoration; (2) integration into trail and open space systems is a factor in assessing location; and (3) use of the term "encourage" instead of more mandatory language such as "mandating" exhibits an intent to be somewhat flexible in how the objectives of Chapter 25.80 DMC are to be met.

Given the three factors above, the proposed relocation is well designed to meet the objectives of DMC 25.80.030. The proposed relocation site is likely close to the original location and will be publicly accessible via integration into a public trail. Under a worst case analysis, if the marker is currently located in the correct location, its relocation is still associated with the overall historical activities of the site and persons who access the marker will know they are close or within an area of

historical significance. The Applicant also proposes to integrate the relocated marker into the Sequalitchew trail system, which is a significant improvement for public accessibility over the current location in the middle of a large private parcel. Finally, the fact that DMC 25.80.010 only "encourages" meeting its recited objectives is likely a tacit understanding that the private property rights of the Applicant must play a factor in assessing the reasonableness of historic preservation efforts. Placing a publicly accessible historic marker on the borders of a private parcel as opposed to its center results in significantly lower encroachment of private property rights.

7. White Oak Retention. DMC 25.120.050 authorizes modification requests to the tree retention requirements of Chapter 25.120 DMC. Such modifications may be approved "*based on special circumstances pertaining to that land or the trees on it*." For the reasons identified in Finding of Fact No. 4L, the Applicant has identified no special circumstances for removing Tree No. 65 and for that reason the request is denied. Special circumstances were present for the removal of Tree No. 9 (in order to accommodate the curve radius necessary for Sequalitchew Drive) and that request is approved.

11. SEPA Appeal. The relevant inquiry for purposes of assessing whether the City correctly issued a DNS is whether the project as proposed has a probable significant environmental impact. See WAC 197-11-330(1)(b). WAC 197-11-782 defines "probable" as follows:

> *'Probable' means likely or reasonably likely to occur, as in 'a reasonable probability of more than a moderate effect on the quality of the environment' (see WAC 197-11-794). Probable is used to distinguish likely impacts from those that merely have a possibility of occurring, but are remote or speculative. This is not meant as a strict statistical probability test.*

If such impacts are created, conditions will have to be added to the DNS to reduce impacts so there are no probable significant adverse environmental impacts. In the alternative, an environmental impact statement would be required for the project. In assessing the validity of a MDNS, the determination made by the City's SEPA Responsible Official shall be entitled to substantial weight. WAC 197-11-680(3)(a)(viii).

The MDNS correctly assess the presence of probable significant adverse environmental impacts for the reasons found in Finding of Fact No. 6 and for that reason the MDNS is sustained, the SEPA appeal is denied and there is no reason for further mitigation or the preparation of an environmental impact statement.

DECISION

The Type III Site Plan Review is denied because the proposed warehouse use abuts a main road in violation of DMC 25.45.030(17).

The Applicant's request to remove Landmark Tree No. 9 is approved and Tree No. 65 is denied for the reasons identified in Conclusion of Law No. 7.

As to the SEPA appeal, the MDNS issued for the proposal is sustained subject to MDNS conditions No. 2a, 3, 5a and 19 revised as follows:

> Condition No. 2a: The new trail alignment shall be constructed and open for use prior to any site work that would interfere with the existing trail.
>
> Condition No. 3: Noise levels shall not exceed the maximum allowed in DMC 9.09. As a receiving property, the open space/recreational property shall be treated as a Class A EDNA (residential) and noise levels from the Applicant's property shall not exceed the permissible Class A EDNA noise levels in DMC 9.09.040(b) as measured from the trail or public-access area of the historical commemorative area. The Applicant shall conduct a noise monitoring study pre-approved by City staff to monitor compliance over the first year of operations and shall institute noise mitigation measures as reasonably directed by City staff to remedy any noncompliance. The Applicant shall institute reasonable measures to reduce noise impacts to trail users including limiting use and sound levels of rear back up beepers to the minimum reasonably necessary and required by applicable law and safety standards; keeping bay doors closed as reasonably necessary to keep loud noise from reaching trail users and conducting loud noise generating activities within the warehouse building to the extent reasonably practicable.
>
> Condition 5a: Applicant will provide four parking spaces along Sequalitchew Drive, with one of the spaces meeting ADA requirements for public use for trail commemorative plaza parking. Location of parking spaces must be denoted on any plans. Plans for and configuration of parking spaces must be approved by the City prior to issuance of any site development or construction permits.
>
> Condition 19 – add the following sentence to the end of the condition: In lieu of the mitigation described in 19 a-c, the City will accept a determination by the Department of Ecology as to the process that may occur as to soil management.

If a reviewing court should find the proposal in compliance with DMC 25.45.030(17), the proposal should be approved subject to the following conditions of approval:

1. The SEPA MDNS issued on February 20, 2019 (Attachment 9d) is incorporated herein by reference and all SEPA Mitigation Measures included in the MDNS are hereby adopted in full and included as Conditions of Approval, subject to the revisions of MDNS Conditions 3, 5a, and 19 as outlined above.

2. No development proposal is provided for the eastern residual parcel created by the dedication of Sequalitchew Drive. The area shall remain intact in its existing condition.

No clearing, grading, tree removal or other land disturbing activity shall occur in this area until such time a development proposal is submitted, reviewed and approved by the City. Minor tree removal may be allowed due to the alignment of Sequalitchew Drive when the Applicant demonstrates that there is no alternative. Removal of the narrow gauge railroad track on that parcel may only occur after consultation with DAHP and the DuPont Historical Society.

3. A sign permit will be required that meets the requirements of DMC 25.116.

4. Per DMC 25.45.030.3(13), air emissions shall meet applicable regulations of the Puget Sound Air Pollution Control Authority, and no visible, frequent, smoke, dust, or gases shall be emitted.

5. All existing trees within the tree retention areas shall be retained on an ongoing basis unless deemed unsafe or unhealthy by an arborist and with City Community Development Director approval. The tree retention areas shall be depicted and legally described in an easement to be recorded with the Pierce County Auditor. All tree protection requirements provided in DMC 25.120 and the WFC Tree Report shall be included in the easement. Any unhealthy or unsafe trees that are removed are to be replaced.

6. Construction of the development proposal must commence within 24 months from the date of the City's final decision on the site plan, otherwise the site plan approval expires.

7. Per DMC 25.75, at the time an individual business meets or exceeds 100 employees, the County Commute Trip Reduction (CTR) Department is to be notified within 30 days. The employer shall make a good faith effort, as defined in RCW 70.94.534(2) and DMC Chapter 25.75, to develop and implement a CTR program that will encourage their employees to reduce vehicle miles traveled per employee and single occupancy vehicle trips. The requirements of the CTR program are provided in DMC Chapter 25.75.

8. Trucks and vehicles are prohibited from parking on all public rights of way while waiting to access the property, unless temporary approval is granted by the City.

9. Revisions are required to the south elevation of the building or south side of the site to address the City's blank wall requirements in DMC 25.45.030(5). There are several options to address the blank walls, as follows:

    a. Additional architectural treatments may be provided to the south elevation from building segments B – E as shown on Sheet A3.3 of the Architectural Plans (Attachment XX). Options include roof modulation and integration of color in vertical bands; or adding color or textural changes within the upper one-third of the

building at intervals of 50 feet or less. The Applicant may propose other architectural treatments to reduce the areas of blank walls to 50 feet or less.

b. As an alternative to (a), the Applicant may provide a 3D rendering of the building and site topography to further assess visibility of the building from the trail and focus the blank wall requirements to a more defined/visible area. The areas where the building may be visible from the trail shall either be augmented with architectural elements as described in (a), or with additional screening landscaping between the trail and the building.

c. As an alternative to (a) and (b), or potentially subsequent to (b), the Applicant and City shall meet at the site after the new trail segment has been constructed to assess building visibility from the trail. Balloons may need to be floated in the location of the south elevation to assess the location, mass and scale of the building. The ability to see/view the building from the trail shall be assessed as well as optimal locations for new vegetation to be added as required per SEPA Mitigation Measure No. 10. If it is determined that as a result of the additional vegetation that the south elevation will not be visible from the trail, the additional blank wall treatments listed in (a) or screening landscaping as described in DMC 25.45.030(5) will not be required.

Prior to issuance of Site Development Permits

10. Geotechnical Report Requirements:

a. The 2011 Geotechnical Report was completed in accordance with the 2005 Washington State Department of Ecology Stormwater Management Manual. The City of DuPont has adopted the 2012 Washington State Department of Ecology Stormwater Management Manual, amended 2014. The May 11, 2018 memo shall be updated to identify the City's current stormwater manual and to update any stormwater recommendations from the 2011 report.

b. The 2011 Geotechnical Report was completed prior to the adoption of an updated DMC Chapter 25.105. The report shall be updated meeting the requirements of DMC 25.105.050(3) and the SEPA MDNS.

c. On-site infiltration tests are required for validation of the design infiltration rate.

11. Tree Retention Plan Revisions. The WFC Tree Retention Report and the Barghausen Tree Retention Removal and Replacement Plans shall be updated to incorporate the following revisions:

a. The WFC Tree Retention Report shall be updated to include the recent site plan. The narrative and table in Attachment 3 shall be consistent.

b. Tree retention is required along street boundaries per DMC 25.120.030(2). On the western parcel existing trees shall be retained in the landscape area between Sequalitchew Drive and the vehicle parking area. All trees within the eastern parcel shall be retained until a development proposal is provided and approved for that parcel. Minor tree removal on the eastern parcel may be allowed subject to City approval for the Sequalitchew Drive alignment.

c. Tree #12 and #65 shall be retained. Tree cluster #9 may be removed if it is demonstrated that the right of way cannot reasonably be moved to retain the tree.

d. The Barghausen Tree Plans and the WFC Tree Report shall be consistent in tree types, tree removal and retention, and matching tree identification numbers. The WFC Tree Report shall confirm in writing that they have reviewed the revised Barghausen Tree Plans and find them consistent with the revised WFC Tree Report.

e. Per DMC 25.120.030(7), a note shall be added to the Barghausen Tree Plans as follows: "This plan is subject to an approved tree retention plan which requires that certain trees be preserved. That plan, which is binding on all owners, is on file with the City Planning Department".

f. Per DMC 25.120.030(8), a note shall be added to the Barghausen Tree Plans as follows: "Retained trees are not to be removed unless the City administrator determines in writing that they have become hazardous or diseased or threaten to damage public or private property. Whoever removes a street tree or required tree shall replace it with a tree approved by the city." The tree retention areas shall be depicted and legally described in an easement to be recorded with the Pierce County Auditor. All tree protection requirements provided in DMC 25.120 and the WFC Tree Report shall be included in the easement.

g. The Oak Preserve protection measures listed in DMC 25.120.040(3) – (10) shall be added to the Barghausen Tree Plans and described in the Tree Retention Easement.

12. Landscape Plan Revisions:

a. The trash enclosure shall be screened with moderate buffer plantings per DMC 25.90.030(3)(b).

b. Provide the landscape area calculation demonstrating that at least 20 percent of the site will be landscaped per DMC 25.90.020(2)(c). The 20 percent shall be provided for each final lot configuration.

c. Provide the correct number of parking spaces and required parking lot trees on the plans demonstrating compliance with DMC 25.90.030(2).

d. The landscape area between the eastern vehicle parking lot and Sequalitchew Drive shall be landscaped to meet the moderate landscape buffer requirements of DMC 25.90.030(3). Additional shrubs, trees and groundcover are required to infill the

area around the existing trees, which are to remain. The Applicant shall provide the City with a revised landscape plan that provides the tree retention and supplemental plantings for City review. The City will then determine if additional plantings are required.

e. No trailer storage is allowed east of the front/east building elevation. The eastern trailer storage area depicted on the landscape plans (north of the drive aisle) shall be removed and replaced with landscaping that meets the requirements of a moderate landscape screen per DMC 25.90.030(3).

f. The southeastern trailer storage area shall be replaced with moderate buffer landscaping. If the intent is to provide a stormwater pond in the area, it shall be fenced and screened with landscaping.

g. Additional screening vegetation shall be added in the area depicted on Figure 1 in Section D.1.d.3, to screen the southern trailer storage area from the trail.

h. Irrigation plans shall be provided. Irrigation water use, in accordance with DMC 25.90.040 shall be identified on the Landscape Plans. Irrigation meter sizes and locations shall be labeled on the Landscape Plans.

i. Any removed parking spaces shall be replaced with plantings, the type and quantity shall be determined by staff based on the location of the removed spaces.

j. Tree #12 and #65 shall be retained with no clearing or grading within the tree protection radius. Tree cluster #9 may be removed.

k. Tree retention is required along street boundaries per DMC 25.120.030(2). On the western parcel existing trees shall be retained in the landscape area between Sequalitchew Drive and the vehicle parking area. All trees within the eastern parcel shall be retained until a development proposal is provided and approved for that parcel. Minor tree removal on the eastern parcel may be allowed subject to City approval for the Sequalitchew Drive alignment.

l. Add the City code-required tree protection measures to the civil and landscape site development permit plans. They are provided in DMC 25.120.030(5) and DMC 25.120.040(3) – (10). Also include the tree protection measures provide in the WFC Tree Retention Plan Report.

m. Trees shall be located outside of utility easements and alignments.

n. Add the 25-foot buffer that is depicted on the civil plans along the eastern property boundary (adjacent to residential area) to the landscape plans.

o. The Oak Preserve protection measures listed in DMC 25.120.040(3) – (10) shall be added to the Barghausen Tree Plans.

13. Civil Plan Revisions:

a. DMC 25.80.030 requires that no structures, roads, or utilities are permitted within 50 feet of the markers identifying cultural resource sites designated under DMC 25.80.020. This pertains to the relocation of the Methodist/Episcopal Mission marker which is to be relocated within the historical commemorative area. The final design plans for the dedication area shall provide a 50-foot radius from the

marker demonstrating that no structures, roads or utilities are located within it in compliance with DMC 25.80.030.

b. Provide the parking calculation on the civil and architectural plans. The calculation shall be based on DMC 25.95.030, which requires a minimum of 0.3 and maximum of 1 parking space per worker at maximum shift. If the number of employees at maximum shift requires a different quantity of parking spaces, the parking shall be modified accordingly or the Applicant shall apply for a variance from DMC 25.95.030 per DMC Chapter 25.160 and demonstrate the variance criteria can be met. The parking spaces provided to serve the historic commemorative area are not to be included in the parking area calculation for the proposal.

c. The site plan shall include supplemental exhibits to demonstrate that the City Fire Department's large apparatus can navigate the site (lane width, radius), including access to FDCs and hydrants. The Fire Department will confirm the adequacy of vehicle access points.

d. The functional classification for the proposed Sequalitchew Drive extension is an arterial. The road cross-section shall meet City Public Works Standards and should match the existing road cross-section.

e. A pedestrian crossing of Sequalitchew Drive shall be included near the proposed trail head/historic commemorative area.

f. Parking aisle and stall design shall meet the requirements of DMC 25.95.050.

g. High occupancy vehicle spaces shall be provided on the plans per DMC 25.95.060.

h. Loading areas shall meet the design requirements of DMC 25.95.070.

i. The site plan shall be modified to retain Tree #12 and #65 with no clearing or grading within their tree protection radius. Tree cluster #9 may be removed if it is demonstrated that the right of way cannot reasonably be moved to retain the tree. Provide an exhibit demonstrating how the alignment could be modified to retain the tree while meeting the City's road standards.

j. Tree retention is required along street boundaries per DMC 25.120.030(2). On the western parcel the existing trees shall be retained in the landscape area between Sequalitchew Drive and the vehicle parking area. Walls may be required for tree retention, however, they can be no greater than six feet in height within setbacks and shall not encroach within the tree protection radius. Where there are no trees, the area may be graded.

k. Add the City code-required tree protection measures to the civil and landscape site development permit plans. They are provided in DMC 25.120.030(5) and DMC 25.120.040(3) – (10). Also include the tree protection measures provide in the WFC Tree Retention Plan Report.

l. The civil construction drawings shall contain the following note: "This project is subject to an approved tree retention plan which requires that certain trees be preserved. That plan, which is binding on all owners, is on file with the City Planning Department." To further inform future lot owners, a copy of the approved tree retention plan shall be provided each owner at closing on each lot.

m. All comments on the civil engineering design plans dated August 13, 2018 detailed in the Gray & Osborne comment letter dated August 20, 2018 shall be addressed (Attachment 10.a).

n. The site plan should reflect all easements, site restrictions, and encumbrances from the short plat and any other recorded documents. Proposed site improvements, within the easements on the project sites, shall comply with the conditions of said easements.

o. Label the 15-foot-wide water easements dedicated to the City. The easements shall be dedicated to the City following construction and prior to final acceptance of this project.

p. The Applicant should identify the proposed land subdivision for creation of the lots and dedication of the Sequalitchew Drive right-of-way to the City. The proposed lots and tracts should be labeled.

14. Conditions for the protection of Critical Areas:

a. If new trail construction is located within the 100-foot Sequalitchew Creek stream buffer, a Critical Areas Report shall be prepared meeting the requirements of DMC 25.105.050(2) and the SEPA MDNS. The City will review the report and determine if it meets the criteria for an exception per DMC 25.105.070(2) or if it requires a Critical Area Permit. If it is determined that a Critical Area Permit is required, the Critical Area Permit shall be submitted and approved prior to issuance of site development permits.

b. The Applicant shall evaluate the potential for relocation of the trail to an area outside the critical area and buffer, but within the proposed right-of-way dedication area. If relocation is not feasible, provide the City with a response to the criteria listed in DMC 25.105.070(2)(a).

c. If any component of the development proposal is located in a Geologic Hazard Area, as determined by the revised Geotechnical Report prepared in accordance with DMC 25.105.050(3), the potential impacts and recommendations of the geotechnical engineer shall be provided. The City will review the report and determine if it meets the criteria for an exception per DMC 25.105.070(2) or if it requires a Critical Area Permit.

d. Habitat Management Plan for Marine and Terrestrial Priority Habitat Species shall be prepared meeting the requirements of DMC 25.105.050(2)(e) and (f) prior to issuance of site development permits. The City will review the report and determine if it meets the criteria for an exception per DMC 25.105.070(2) or if a Critical Area Permit is required.

e. The Applicant shall file for record with Pierce County a notice in form approved by the City providing notice of the presence of any critical area or buffer. The owner shall submit proof to the city that the notice has been filed for record within 30 days after the approval of a development permit.

15. The following conditions pertain to the Trash Enclosure:

a. Provide the design and dimension details to the building or civil plans depicting compliance with DMC 25.100.050.

b. The location of the trash enclosure was revised since submittal of the LeMay approval letter. Provide approval from the service provider of the new location.

c. Per DMC 25.100.050(3), the trash enclosure shall be sized for both general refuse and recycling bins. Trash enclosures shall be surfaced with concrete with a concrete apron and at the same grade as the service vehicle access. Refuse enclosures shall be sized to provide space for the storage of recycled materials, compost, and solid waste in conformance with WAC 51-50-009.

d. The trash enclosure shall be screened per the requirements of DMC 25.90.030(3)(b).

16. All walls and fences located within the building setback area shall be less than 6 feet in height.

17. The submitted Water Availability Form is incomplete. The form shall identify the proposed peak water demand for the domestic and irrigation water uses.

18. Per DMC 13.05.100, Emergency Vehicle Access Standards Section H (Dead End Road Access). An approved area for turning around fire apparatus shall be required at the end of Sequalitchew Dr.

19. Per DMC 13.05.100, Emergency Vehicle Access Standards Section I (Gates). Number one thru six shall be followed if gates are installed.

20. The project activities shall comply with the requirements of the Washington State Department of Ecology National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges associated with construction activity will be required for this project prior to issuance of a grading permit.

21. In accordance with Section 2.21 Street Frontage Improvements, all commercial and residential developments, plats, or short plats shall install frontage improvements at the time of construction as required by the City. Such improvements include curb and gutter, sidewalk, street, storm drainage, street lighting systems, utility relocations, landscaping and irrigation (2.21.1) and all frontage improvements shall be made across the full frontage of property from centerline to right-of-way line (2.21.2). For purposes of this short plat, the proposed 85-foot wide right-of-way is classified as an arterial with features and dimensions as defined in the City's Public Work Standards.

22. A parking lot lighting plan, which includes a photometric exhibit showing the lighting levels within the parking lot, will be required to demonstrate that parking areas are lit in accordance with City code requirements and lighting shall not escape property boundaries. The Applicant should note that DMC 25.70.070 allows 25-foot-tall lighting fixtures in

parking lots, except at entries and for parking adjacent to buildings, where lighting remains restricted to 15 feet in height.

23. The parking lot shall be designed in accordance with DMC 25.70.030 and Ordinance No. 03-752, which includes, but limited to, screening as approved by the City. The minimum stall widths shall be 8.75 feet (basic) and 9 feet (parallel to an access aisle). Add the dimensions to the parking lots on all sides of Building 'A' and to the west side of Building 'B' to demonstrate compliance.

24. An analysis of sight distance triangles to verify that safe stopping and turning movements to and from the site at all points of access to the site shall be provided.

25. The City's Stormwater System Development Charge (SDC) will apply to this project. The Stormwater SDC is $1,000 per 1,900 square feet of impervious surface.

26. The submitted Pierce County Utilities information appears acceptable for Land Use Application approval. Documentation of Pierce County Public Works and Utilities approval of the Sanitary Sewer Plans for this project will be required prior to issuance of a construction permit.

27. All comments on the December 23, 2017 Stormwater Site Plan that are provided in the Gray & Osborne comment letter dated August 20, 2018 (Attachment 10a) shall be addressed.

Prior to issuance of Building Permits

28. The Applicant shall submit the proposed uses with each building permit and/or tenant improvement application to ensure consistency with the performance standards in DMC 25.45. Each application for building permit shall be reviewed independently to ensure that the use does not create significant noise, a risk of explosion or radioactive release, or air or water pollution, per DMC 25.45.020(1)(a)(i) or DMC 25.45.030(12) – (16).

29. Staff will review each building permit application to ensure the use will comply with the noise limitations established in Chapter 9.09.

30. Revisions are required to the south elevation of the building or south side of the site to address the City's blank wall requirements in DMC 25.45.030(5). There are several options to address the blank walls, as follows:

    a. Additional architectural treatments may be provided to the south elevation from building segments B – E as shown on Sheet A3.3 of the Architectural Plans (Attachment XX). Options include roof modulation and integration of color in vertical bands; or adding color or textural changes within the upper one-third of the building at intervals of 50 feet or less.

b. As an alternative to (a), the Applicant may provide a 3D rendering of the building and site topography to further assess visibility of the building from the trail and focus the blank wall requirements to a smaller area. The areas where the building may be visible from the trail shall either be augmented with architectural elements as described in (a), or with additional screening landscaping between the trail and the building.

c. As an alternative to (a) and (b), or potentially subsequent to (b), the Applicant and City shall meet at the site after the new trail segment has been constructed to assess building visibility from the trail. Balloons may need to be floated in the location of the south elevation to assess the location, mass and scale of the building. The ability to see/view the building from the trail shall be assessed as well as optimal locations for new vegetation to be added as required per SEPA Mitigation Measure No. 10. If it is determined that as a result of the additional vegetation that the south elevation will not be visible from the trail, the additional blank wall treatments listed in (a) or screening landscaping as described in DMC 25.45.030(5) will not be required.

31. No exterior mechanical equipment are depicted on the plans. If added, all HVAC, equipment, pumps, heaters and other mechanical devices shall be fully screened from view from all public rights-of-way, including Sequalitchew Drive and the Sequalitchew Creek Trail.

32. No outdoor storage areas are depicted on the plans. If added, no more than 2 percent of the total site area may be covered with outdoor storage. Outdoor storage shall be screened from the street by a 100 percent sight obscuring fence or wall.

33. The project will be required to apply for and obtain a Transportation Concurrency certificate, as provided in DMC 25.115, at the time of building permit application.

34. An automatic fire sprinkler system shall be installed. The system shall comply with NFPA 13 Standard for Automatic Fire Sprinkler System. Three (3) sets of plans, hydraulic calculations, and material specification sheets for all equipment used in the system shall be submitted by a State of Washington Licensed Contractor for review, approval and permits issued prior to commencing work. Separate Permit Required.

35. If a fire pump is required. The system shall comply with NFPA 20. Three (3) sets of plans and material specification sheets for all equipment used in the system shall be submitted by a State of Washington Licensed Contractor for review, approval and permits issued prior to commencing work. Separate Permit Required.

36. An automatic fire alarm system shall be installed. The system shall comply with NFPA 72 Standard for Fire Alarm System. Three (3) sets of plans, material specifications sheet for all equipment used in the system shall be submitted by a State of Washington Licensed

Contractor for review, approval and permits issued prior to commencing work. Separate Permit Required.

37. A Knox key box system shall be required. Knox applications may be picked up at the DuPont Fire Department located at 1780 Civic Drive DuPont, WA 98327. A key shall be required to be placed in the Knox key box.

38. Fire extinguishers are required to be installed as directed by City of DuPont Fire Department. Prior to installation, the client is directed to request a fire inspection to confirm the locations of the fire extinguishers.

39. The proposed structures must be designed to meet the requirements of the building construction codes in effect at the time of building permit submittal. The following codes are currently enforced by the City of DuPont: the 2015 International Building Code, the 2015 International Residential Code, the 2015 International Fire Code, the 2015 International Mechanical Code, the 2015 International Fuel Gas Code, the 2015 Uniform Plumbing Code (each as amended and adopted by the State of Washington); and the 2015 Washington State Energy Code.

40. The project (or each project) will be required to receive all land use and civil construction approvals prior to issuance of building permits for the proposed structures.

41. All applicable Fire Impact and Storm System Development Charge fees assessed for the proposed development will be required to be paid prior to the issuance of building permit(s) associated with the proposed project.

42. Also prior to issuance of a building permit for the structure, the Applicant shall provide a copy of Pierce County Sewer Service Permits for City record. This permit (and authorization to connect to sewer service) is/may be independent from any sewer system extension that may also apply to the project. All sewer connection and permitting requirements must be coordinated with the utility purveyor. Please note that Pierce County Sewer Utility requires a pre-treatment review and approval be completed prior to their issuance of sewer extension or sewer service connection permit(s). Each subsequent tenant, for multi-tenant buildings, must also complete a separate pre-treatment review and provide copy of sewer service permitting, where applicable, prior to obtaining a building permit for associated improvements.

43. Fire Suppression and Fire Alarm permits associated with the structure(s) must be obtained through DuPont Fire Department prior to initiating any such work. All alarms systems will be required to obtain an alarm registration permit with the city, prior to full activation of the alarm system for operation; forms may be obtained at city hall.

44. Fire flow requirements and requirements for on –site hydrants and site access provisions will be determined by the DuPont Fire Chief or designee. Such requirements may be subject to additional review and requirements as future submittals come forward.

45. Addressing for building(s) within the project area will be assigned as the project scope progresses, and may be obtained from the building department as needed. Please note that in establishing and providing this information, the department will need to verify a clear scope and layout for the proposal – as minor adjustments to primary access points, inter-relation of use(s) of the buildings, or changes in building frontage may affect preliminary addressing assignment(s).

46. In conformance with IBC Section 427, new buildings serving Group B, Group R-1 hotel and motel only, and Group R-2 occupancies, served by 20 or more parking spaces, shall provide a minimum of 5% of the parking spaces with electric vehicle charging infrastructure in compliance with IBC Sections 427.3, 427.4 and 427.5.

47. Accessible parking spaces shall be provided in compliance with IBC Section 1106. Quantity of required stalls shall conform with Table 1106.1, except as required by IBC Sections 1106.2 through 1106.4 and locations as specified in Section 1106.6 as amended by the Washington State Building Code Council.

48. The Applicant shall furnish meter sizing calculations for domestic and fire water services. The sprinkler system design, including confirmation of the provided sizing for the fire line components shall be reviewed and approved by the City Building Department and Fire Department as part of the building permit process. Each fire line connection to a City water main will require a double detector check valve assembly (DDCVA) in an underground vault and a Fire Department Connection (FDC) within 50 feet of a fire hydrant. The double detector check valve assemblies (DDCVA) shall be located in underground vaults outside of the building to allow direct access by City staff.

49. The City Fire Department shall confirm that the number and location of existing and proposed fire hydrants on or near the project site are adequate for purposes of providing the required fire flow for the proposed building.

During Construction

50. A certified arborist shall monitor construction activities in the vicinity of the tree protection areas. The City may elect to also require the City arborist to monitor construction in these areas. The Applicant will be responsible for payment of the fees should the City arborist also be onsite to monitor construction activities.

Prior to the issuance of a Certificate of Occupancy

51. Prior to Fire Department approval for occupancy, an underground fire line shall be installed. The system shall comply with NFPA 24 Standard for Installation of Private Fire

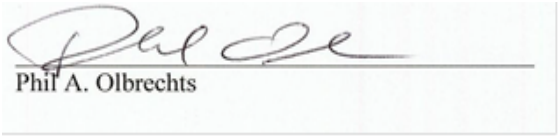
Service Mains. Three (3) sets of plans, material specifications sheets for all equipment used in the system shall be submitted by a State of Washington Licensed Contractor for review, approval, and permits issued prior to commencing work. The FDC shall be a minimum of 50 feet or 1&1/2 times the height of the structure away from the building. The FDC shall be within 50 feet of a hydrant and be 5 inch with a locking cap. (Fire Department approval for location) Separate Permit required.

52. All new building shall have approved emergency responder radio coverage per section 510 of the 2015 International Fire Code.

53. Following construction, a City of DuPont Agreement for Inspection and Maintenance of Privately Maintained Storm Drainage Facilities will be required for any onsite storm water system.

54. This project is subject to the Geographic Information System (GIS) requirements as stated in the City of DuPont Municipal Code, Chapter 24.10, and Ordinance No. 97-559.

Decision issued June 17, 2019.



Phil A. Olbrechts

Hearing Examiner

Appeal Right and Valuation Notices

DMC 25.175.010 provides that this decision, as a Type III decision, is final, subject to appeal to Pierce County Superior Court. Appeals are governed by Chapter 36.70C RCW.

Affected property owners may request a change in valuation for property tax purposes notwithstanding any program of revaluation.

Attachment 5f

Filed
Washington State
Court of Appeals
Division Two

March 29, 2022

IN THE COURT OF APPEALS OF THE STATE OF WASHINGTON

DIVISION II

NISQUALLY DELTA ASSOCIATION, Respondent, v. CITY OF DUPONT, Respondent, DUPONT INDUSTRIAL PARTNERS, LLC, Appellant.	No. 54893-3-II UNPUBLISHED OPINION

CRUSER, P.J. — DuPont Industrial Partners LLC (the Partners) sought a permit from the city of DuPont to build a warehouse on their property, which is located on historic land. After review pursuant to the State Environmental Policy Act (SEPA), ch. 43.21C RCW, the city initially recommended approval of the proposal and issued a mitigated determination of nonsignificance (MDNS). Nisqually Delta Association (the Association) challenged both the permit and the MDNS, and the case was heard before a city hearing examiner. The hearing examiner denied the permit but approved the MDNS. The Association and the Partners cross-appealed the hearing examiner's decision to the superior court, which affirmed the denial of the permit but reversed the examiner's decision on the MDNS. The Partners appeal the invalidation of the MDNS.

Pursuant to this court's General Order 2010-1,[1] the Association was responsible for opening briefing and oral argument on appeal. The Association asserts that (1) the Partners' failure to appeal the permit denial deprives this court of jurisdiction to hear the MDNS appeal; (2) the hearing examiner erroneously applied the DuPont Municipal Code protecting the historic land; (3) the hearing examiner erred in its analysis of the National Historic Preservation Act, Pub. L. No. 89–665, 80 Stat. 915 (1966); the hearing examiner erred in limiting the SEPA issues that the Association raised at the hearing; (5) the MDNS is clearly erroneous; and (6) the Association is entitled to attorney fees on appeal.

We hold that this court does not have jurisdiction to hear the MDNS appeal. Accordingly, we dismiss the Partners' appeal. We also award attorney fees to the Association.

FACTS

A. Historical Significance of the Property

The Partners sought approval from the city of DuPont for the construction of a warehouse. The land on which the Partners wished to build their warehouse is known as Lot Y. This land is within the traditional territory of local Indigenous peoples, such as the Nisqually Tribe and the Puyallup Tribe. The area is rich in historical significance, including, relevant to this appeal, the Methodist Episcopal Mission site (the Mission site).

The Mission site once held the first American settlement on Puget Sound. In 1834, the Mission and its school were founded to convert the local Indigenous communities to Christianity. The Mission buildings were constructed in 1839, and missionary services began in 1840. The site

[1] Gen. Order 2010–1 of Division II, *In Re: Modified Procedures For Appeals Under The Administrative Procedures Act, Chapter 34.05, and Appeals Under the Land Use Petition Act, Chapter 36.70C RCW* (Wash. Ct. App.), https://www.courts.wa.gov/appellate_trial_courts/.

held several historic events within the region, such as the first Independence Day celebration, the first wedding of U.S. citizens, and the first U.S. child born. Ultimately, "[t]he Mission was not successful, was abandoned in 1842, and later destroyed by fire." Clerk's Papers (CP) at 984. American settlers at the Mission site continued to use the land for agriculture. The Mission site was commemorated with a historical marker in the 1920s.

In 1904, the 9th U.S. Cavalry Buffalo Soldiers bivouacked in the area for three months, where they trained and practiced mock battles. The 9th U.S. Cavalry was an all-Black regiment and was one "of the most highly decorated units in American military history." CP at 2312. The soldiers joined five other units, leading to "the largest military gathering on the West Coast up to that time" and the creation of present-day Joint Base Lewis-McChord. *Id.* at 1881. The Mission site was in the middle of the campground.

B. Subsequent Land Ownership and Proposed Warehouse Development

In 1906, the DuPont Company established the DuPont Powder Works on the land containing these sites. The DuPont facilities included an explosives manufacturing plant, a company town, docks along the shoreline, and a railroad. There was "extensive land disturbance" caused by the construction and demolition of buildings, construction of roads and the railroad, and frequent explosions.[2] *Id.* at 975. DuPont Powder Works closed in 1976, and the property was purchased by the Weyerhaeuser Company.

Weyerhaeuser entered into several agreements for development on the property, including a "Memorandum of Agreement" with the city, the Association, and other citizen groups that

[2] It is not clear exactly when, but the historical marker was removed from the Mission site at one point and placed in a warehouse "for its protection." CP at 2079. It was returned to the site sometime later.

wanted to preserve portions of the property and form a historic district. Under this agreement, the Weyerhaeuser Real Estate Company would support the listing of the property in the National Register of Historic Places on certain conditions, including the ability to develop on "all developable portions of the Property." *Id.* at 2494. The agreement also provided an option for the Nisqually Point Defense Fund to purchase the Mission site and an Interpretive Center Site, though certain details were left to be determined, such as "actual location of sites and size." *Id.* The agreement was incorporated by reference into the "City of DuPont Comprehensive Plan" as encouraging "identification, protection, preservation and or restoration of cultural resource sites of documented significance." *Id.* at 3768. Apparently, this purchase never took place, and the Partners now own the parcel of land containing Lot Y.

The Partners' project proposal included a dedication of land and a right of way for the city to develop a commemorative area open to the public and visible from the Sequalitchew Creek Trail. This area would include commemorative signage, benches along the trail, and a replica Methodist Mission schoolhouse. In addition, the marker commemorating the Mission site would be relocated into the historical commemorative area "where it can be easily viewed from the trail." *Id.* at 2281.

The Partners retained Parus Consulting, Inc. to conduct an archaeological survey to provide "cultural clearance" for the area of proposed development (the Parus Report). *Id.* at 970. The Parus Report concluded that "the potential for discovery of buried archaeological materials, features or deposits by implementation of this project is considered low." *Id.* at 1002.

The city of DuPont recommended approval of the permit and issued an MDNS outlining the commemorative area.

C. Hearing and Examiner's Decision

The Association challenged both the permit approval and the MDNS. At the hearing, several archaeologists testified as to the accuracy of the marker identifying the Mission site. Guy Moura discussed that, in 1989, he found brick fragments near the marker, which he believed to be from the chimney from the Mission schoolhouse. Based on this finding, Moura concluded that the marker established an accurate location of the Mission site. Dimitra Zalarvis-Chase testified for the Partners. Based on her reading of the Parus Report and the lack of evidence at the sites, she concluded that the marker may not accurately locate the Mission site. "Ms. [Zalarvis]-Chase noted that the site had already been exhaustively excavated meaning that the materials, even if they were there, would already be so seriously diminished that they would not offer significant historical resources." *Id.* at 29-30.

The hearing examiner concluded that "[t]he proposal will not create significant adverse impacts to cultural/historical resources." *Id.* at 27. This was based on the examiner's conclusion of law regarding DuPont Municipal Code (DMC) 25.80.030, which prohibits structures within 50 feet of historical markers. The hearing examiner explained that DMC 25.80.030 was "ambiguous as to whether and where a marker can be relocated," and the examiner ultimately concluded that the provision allowed for the relocation of the marker. *Id.* at 38.

However, the hearing examiner denied the Partners' permit request due to violation of a different code provision that prohibited a warehouse from abutting a main road. *Id.* at 17 ("Beyond the compliance problem with DMC 25.45.030(17), the project otherwise complies with all applicable development standards and would be approved."). The city issued a notice of decision based on the hearing examiner's decision. The City indicated that the permit was "**denied** because

the proposed warehouse use abuts a main road." *Id.* at 14. However, "the SEPA MDNS issued by the City is **sustained** subject to revisions . . . as provided in the decision." *Id.*

D. Appeal

The Association and the Partners cross-appealed the hearing examiner's decision to the Pierce County Superior Court. The superior court affirmed the denial of the permit and reversed the MDNS decision, stating:

> The Hearing Examiner's affirmance of the City of DuPont's "mitigated determination of non-significance" under SEPA (the MDNS) was based in part on an incorrect interpretation of DMC 25.80.030. DMC 25.80.030 protects the designated cultural resources site identified as the "Site of Methodist/Episcopal Mission" in DMC 25.80.020(1)(c). That site is identified by the current location of the Mission Marker. Accordingly, the MDNS relies on an error of law and clearly erroneous application of law to facts. The MDNS is INVALIDATED and with respect to this issue only the appeal of Nisqually Delta Association is GRANTED.

Id. at 4409. This is the only portion of the superior court order that the Partners appealed.

DISCUSSION

I. STANDARD OF REVIEW

A. SEPA

"Under SEPA, before a local government processes a permit application for a private land use project, it must make a 'threshold determination' of whether the project is a 'major action significantly affecting the quality of the environment.' " *Anderson v. Pierce County*, 86 Wn. App. 290, 300-01, 936 P.2d 432 (1997) (quoting RCW 43.21C.030(2)(c)). When determining whether a proposal will significantly impact the quality of the environment, the SEPA responsible official shall take into account whether the proposal "[c]onflict[s] with local, state, or federal laws or requirements for the protection of the environment." WAC 197-11-330(3)(e)(iii). If the proposal is " 'likely to have a probable significant adverse environmental impact,' " the SEPA responsible

official issues a determination of significance and an environmental impact statement must be prepared. *Anderson*, 86 Wn. App. at 301 (quoting WAC 197-11-330(1)(b)). An environmental impact statement is not required when a determination of non-significance is issued. *Id.*

An MDNS "involves changing or conditioning a project to eliminate its significant adverse environmental impacts." *Id.*; WAC 197-11-350. An MDNS is reviewed under the clearly erroneous standard. *Anderson*, 86 Wn. App. at 302. "A finding is 'clearly erroneous' when, although there is evidence to support it, the reviewing court on the record is left with the definite and firm conviction that a mistake has been committed." *Id.*

B. LUPA

LUPA governs judicial review of land use decisions. Ch. 36.70C RCW; *Wells v. Whatcom County Water Dist. No. 10*, 105 Wn. App. 143, 149, 19 P.3d 453 (2001). "We stand in the shoes of the superior court and review the hearing examiner's action de novo on the basis of the administrative record." *Wells*, 105 Wn. App. at 150. The party seeking relief must establish that at least one of the standards listed in RCW 36.70C.130(1) has been met. RCW 36.70C.130(1); *Wells*, 105 Wn. App. at 149.

"Under LUPA a court reviews the decision to issue an MDNS under any one of the six standards set forth in RCW 36.70C.130(1)." *Wenatchee Sportsmen Ass'n v. Chelan County*, 141 Wn.2d 169, 176, 4 P.3d 123 (2000). Where, as here, the issue before the court is the proper interpretation of the law, the standard is whether the interpretation was erroneous. RCW 36.70C.130(1)(b).

II. SEPA'S LINKAGE REQUIREMENT

The Association argues that the Partners' failure to appeal the underlying government action—the denial of the permit—deprives this court of jurisdiction to hear the SEPA appeal. We agree.

A. LEGAL PRINCIPLES

RCW 43.21C.075(6)(c) states, "Judicial review under this chapter shall without exception be of the governmental action together with its accompanying environmental determinations." This is known as SEPA's linkage requirement, and it stands for the proposition that there must be a final agency decision before a court may review an environmental determination. *Int'l Longshore and Warehouse Union, Local 19 v. City of Seattle*, 176 Wn. App. 512, 519, 309 P.3d 654 (2013) ("This means that until an agency has taken final action on a proposal, judicial review of an agency's compliance with SEPA may not occur."); *State ex rel. Friend & Rikalo Contractor v. Grays Harbor County*, 122 Wn.2d 244, 250-51, 857 P.2d 1039 (1993).

Washington courts have previously turned to Professor Richard Settle, "a recognized authority on SEPA," for guidance on this rule as it relates to timing for appeals under RCW 43.21C.075. *Waterford Place Condo. Ass'n v. City of Seattle*, 58 Wn. App. 39, 45, 791 P.2d 908 (1990); *see also Grays Harbor County*, 122 Wn.2d at 250-51. Professor Settle has previously explained that "the purposes of the linkage requirement are to: preclude judicial review of SEPA compliance before an agency has taken final action on a proposal, foreclose multiple lawsuits challenging a single agency action[,] and deny the existence of 'orphan' SEPA claims unrelated to any government action." *Grays Harbor County*, 122 Wn.2d at 251.

B. ANALYSIS

The Association argues that we cannot hear the Partners' appeal because the Partners are only challenging the SEPA determination and not the permit denial. Although the facts of this case are unique, *Boss v. Department of Transportation*, 113 Wn. App. 543, 54 P.3d 207 (2002), is illustrative. *Boss* involved the development of a new Tacoma Narrows Bridge. *Boss*, 113 Wn. App. at 546. Boss, the appellant, filed a SEPA challenge to the adequacy of the environmental impact statement for the project and its lack of mitigation measures. *Id.* at 547. The superior court dismissed Boss' petition on summary judgment in part because Boss did not challenge the underlying governmental action, the approval of the bridge project. *Id.* On appeal to this court, the Department of Transportation again argued Boss' challenge should be dismissed because his failure to challenge the underlying governmental action did not comply with RCW 43.21C.075. *Id.* at 548.

We held that because the Department of Transportation based its project approval on the environmental impact statement, Boss' challenge to the environmental review was, in effect, a challenge to the project approval. *Id.* at 550. That is, a ruling in Boss' favor on the environmental impact statement would have defeated the entire project approval. Thus, we held that Boss did, in fact, challenge the underlying government action. We emphasized that appeals under RCW 43.21C.075 " 'must combine review of SEPA issues with the related government action.' " *Id.* at 549 (quoting *Grays Harbor County*, 122 Wn.2d at 249).

Conversely, the appeal of the SEPA decision in this case—the decision which allowed the moving of the marker—is not linked to the underlying government action. This is not only because the Partners did not appeal the denial of the permit, but also because the permit was denied for an

entirely different reason than the issue they raise on appeal: the warehouse abutted a main road in violation of DMC 25.45.030(17). Regardless of what we decide, the Partners still cannot obtain a permit based on the MDNS before us. Therefore, an appeal of the SEPA issue here is an "orphan" SEPA claim unrelated to a government action. *See Grays Harbor County*, 122 Wn.2d at 251.

The Partners assert that this is the only opportunity they have to appeal the marker issue because SEPA review materials "carry on" to future projects on the same site. Br. of the Partners at 32. However, "before a local government processes a permit application for a private land use project, it must make a 'threshold determination' " of whether the project will significantly affect the quality of the environment. *Anderson*, 86 Wn. App. at 300-01 (quoting RCW 43.21C.030(2)(c)). This determination is required for any proposal constituting an "action" (as

defined in WAC 197-11-704), unless the proposal is categorically exempt or when an agency is acting on the "same proposal." WAC 197-11-310(1),[3] WAC 197-11-600(3).[4]

The Partners do not demonstrate that any new proposal they submit will necessarily be deemed the "same proposal." Here, any new proposal submitted by the Partners will require the warehouse to be placed in such a way that it does not abut a main road, which means that its location, even if only slightly, will differ. In fact, at oral argument, the Partners indicated that they had already submitted a new proposal to comply with DMC 25.45.030(17). Therefore, the exception for the "same proposal" does not apply. Under WAC 197-11-310, the city must make a determination regarding the impacts of the new proposal. The city is "authorized" to use prior environmental documents "in whole or in part" if the documents adequately address the relevant environmental considerations. RCW 43.21C.034; *see also* WAC 197-11-600(4) (providing for adopting an existing environmental document or incorporating it by reference). And "[a]n agency *may* use environmental documents that have been previously prepared in order to evaluate proposed actions, alternatives, or environmental impacts," whether the proposals are the same or different. WAC 197-11-600(2) (emphasis added). But nothing in these regulations *requires* the city to use the same MDNS for a new proposal after a failed project.

The Partners argue, in passing, that "principles of res judicata and/or collateral estoppel" would prevent them from appealing the marker issue in the future, with no further discussion or

[3] WAC 197-11-310(1) provides:

> A threshold determination is required for any proposal which meets the definition of action and is not categorically exempt, subject to the limitations in WAC 197-11-600(3) concerning proposals for which a threshold determination has already been issued, or statutorily exempt as provided in chapter 43.21C RCW. A threshold determination is not required for a planned action (refer to WAC 197-11-164 through 197-11-172).

[4] WAC 197-11-600 provides:

> (1) This section contains criteria for determining whether an environmental document must be used unchanged and describes when existing documents may be used to meet all or part of an agency's responsibilities under SEPA.
> (2) An agency may use environmental documents that have previously been prepared in order to evaluate proposed actions, alternatives, or environmental impacts. The proposals may be the same as, or different than, those analyzed in the existing documents.
> (3) An agency acting on the same proposal shall use an environmental document unchanged, except in the following cases:
> (a) For DNSs, . . .
> (b) For DNSs and EISs, . . .
> . . . .
> (c) For EISs, . . .
> (4) Existing documents may be used for a proposal by employing one or more of the following methods:
> (a) "Adoption," where an agency may use all or part of an existing environmental document to meet its responsibilities under SEPA. Agencies acting on the same proposal for which an environmental document was prepared are not required to adopt the document; or
> (b) "Incorporation by reference," where an agency preparing an environmental document includes all or part of an existing document by reference.
> (c) An addendum, that adds analyses or information about a proposal but does not substantially change the analysis of significant impacts and alternatives in the existing environmental document.
> (d) Preparation of an SEIS if there are:
> (i) Substantial changes so that the proposal is likely to have significant adverse environmental impacts; or
> (ii) New information indicating a proposal's probable significant adverse environmental impacts.
> (e) If a proposal is substantially similar to one covered in an existing EIS, that EIS may be adopted; additional information may be provided in an addendum or SEIS (see (c) and (d) of this subsection).

citation to legal authority. Br. of the Partners at 32-33. However, "[p]assing treatment of an issue or lack of reasoned argument" does not merit our consideration. *Holland v. City of Tacoma*, 90 Wn. App. 533, 538, 954 P.2d 290 (1998). Accordingly, we do not address this argument.[5]

The Partners also argue that the marker issue is not "merely a SEPA question" because their proposal is required to meet city code requirements as part of the city's normal review process. Br. of the Partners at 30-31. However, the issue before us, which relates solely to the historical marker issue, comes directly from the MDNS and presents a question under SEPA. *See, e.g.*, CP at 4402 ("The Hearing Examiner's affirmance of the City of DuPont's 'mitigated determination of non-significance' under SEPA (the MDNS) was based in part on an incorrect interpretation of DMC 25.80.030."). A decision from us whether to affirm or reverse the decision of the superior court regarding the marker would, therefore, apply directly to the MDNS, a SEPA issue. As a result, although the Partners may be correct in that their appeal presents more than a SEPA question, we cannot separate the issue to avoid this jurisdictional barrier.

We hold that RCW 43.21C.075(6)(c) precludes our review of the Partners' appeal.

ATTORNEY FEES

The Association requests attorney fees under RCW 4.84.370, which provides for an award of attorney fees and costs to the prevailing party in an appeal of a land use decision. We hold that the Association is entitled to attorney fees.

[5] In the event that the Association attempts to bind the Partners to the superior court's ruling on the marker, nothing in this opinion affects the ability of a party to make any available equitable arguments in future proceedings. *See, e.g., Kucera v. Dep't of Transp.*, 140 Wn.2d 200, 224, 995 P.2d 63 (2000) ("As SEPA itself contemplates the balancing of economic and environmental factors, a trial court too must apply traditional equitable principles and weigh competing interests when asked to enjoin a challenged action.").

A. LEGAL PRINCIPLES

RCW 4.84.370(1) provides that a prevailing party on appeal of a land use decision by a county or city shall be awarded attorney fees and costs if "(a) The prevailing party on appeal was the prevailing or substantially prevailing party before the county, city, or town . . . ; and (b) The prevailing party on appeal was the prevailing party or substantially prevailing party in all prior judicial proceedings." A party need not prevail on the entire claim; they must simply "succeed in some manner to 'prevail.' This includes jurisdictional wins." *Durland v. San Juan County*, 182 Wn.2d 55, 78, 340 P.3d 191 (2014).

B. ANALYSIS

At the city level, although the MDNS was approved, the Partners' permit was denied. Because a party need not prevail on its entire claim, the Association was the substantially prevailing party before the hearing examiner. In addition, the Association was the prevailing party before the superior court. Before us, the Association has prevailed on the jurisdictional issue under RCW 43.21C.075.

Because the Association prevailed before the city, the superior court, and this court, it is entitled to attorney fees under RCW 4.84.370(1) in an amount to be determined by the court commissioner.

CONCLUSION

We hold that RCW 43.21C.075(6)(c) deprives this court of jurisdiction to hear the Partners' appeal of the superior court's decision. Accordingly, we dismiss the Partners' appeal. We also hold that the Association is entitled to attorney fees in an amount to be determined by the court commissioner.

A majority of the panel having determined that this opinion will not be printed in the Washington Appellate Reports, but will be filed for public record in accordance with RCW 2.06.040, it is so ordered.

CRUSER, P.J.

We concur:

VELJACIC, J.

PRICE, J.

Attachment 6a

Gray & Osborne, Inc.
CONSULTING ENGINEERS

June 10, 2024

Ms. Janet Howald
Administrative Specialist
City of DuPont
1700 Civic Drive
DuPont, Washington 98327

SUBJECT: REVIEW COMMENTS, DUPONT 243 (LOT Y)
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON
G&O #20303.00

Dear Ms. Howald:

Gray & Osborne, Inc. is in receipt of a submittal packet for the above-subject project. The packet included the following:

- Response Letter by Barghausen Consulting Engineers, Inc. (dated May 31, 2024) responding to City Comment Letter dated May 10, 2024;
- Architectural Site Plan by Innova Architects (1 sheet dated revised May 10, 2024);
- Preliminary Civil Engineering Design Plans by Barghausen Consulting Engineers, Inc. (13 sheets dated May 30, 2024);
- Preliminary Tree Retention, Landscape, and Irrigation Plans by Barghausen Consulting Engineers, Inc. (12 sheets revised May 29, 2024); and
- Revised DuPont West Noise Study by JGL Acoustics, Inc. (dated May 20, 2024).

We have reviewed this information for compliance with the current City of DuPont standards, codes, and policies and have the following comments:

ARCHITECTURAL SITE PLAN

1. The Electric Vehicle (EV) stalls should be posted with identification signage indicating the space is only for electric vehicle charging purposes.

PRELIMINARY CIVIL ENGINEERING DESIGN PLANS

2. Sequalitchew Road right-of-way pavement markings and signage shall be included in the Channelization plans during civil construction review, which includes any revisions to Sequalitchew Drive and Center Drive.

PRELIMINARY LANDSCAPE AND IRRIGATION PLANS

3. No comments at this time.

NOISE STUDY

4. The project should comply with the noise mitigation recommendations of air brake release silencers and broadband backup alarms to further reduce project noise levels off-site.

Thank you for the opportunity to provide these comments. Please contact the undersigned if you have any questions or comments regarding this review.

Sincerely,

GRAY & OSBORNE, INC.

Dominic J. Miller, P.E.

DJM/sp

cc: Mr. Shukri Sharabi, P.E., City Engineer, City of DuPont
Ms. Barbara Kincaid, Public Services Director, City of DuPont

Attachment 6b

City of DuPont Fire Department

Proudly serving the community of DuPont

1780 Civic Drive, DuPont, WA, 98327

Phone 253.964.8414 ▪ Fax 253.912.5240 ▪ www.ci.dupont.wa.us

January 16, 2023

TO: Barbara Kincaid

FROM: Mike Turner Fire Marshal

RE: PLNG 2022-027 DuPont 243

The DuPont Fire Department Prevention Division reviewed the above project and has the following comments.

Site Plan Related Comments

1. 1. Prior to Fire Department approval for occupancy, an underground fire line shall be installed. The system shall comply with NFPA 24 Standard for Installation of Private Fire Service Mains. Three (3) sets of plans, material specifications sheets for all equipment used in the system shall be submitted by a State of Washington Licensed Contractor for review, approval, and permits issued prior to commencing work. The FDC shall be a minimum of 50 feet or 1&1/2 times the height of the structure away from the building. The FDC shall be within 50 feet of a hydrant and be 5 inch with a locking cap. (Fire Department approval for location) **Separate Permit required.**

2. Per DMC 13.05.100, Emergency Vehicle Access Standards Section H. (Dead End Road Access) An approved area for turning around fire apparatus shall be required at the end of Sequalitchew Dr.

3. Per DMC 13.05.100, Emergency Vehicle Access Standards Section I. (Gates) Number one thru six shall be followed if gates are installed.

New Construction Comments

4. An automatic fire sprinkler system shall be installed. The system shall comply with NFPA 13 Standard for Automatic Fire Sprinkler System. Three (3) sets of plans, hydraulic calculations and material specification sheets for all equipment used in the system shall be submitted by a State of Washington Licensed Contractor for review, approval and permits issued prior to commencing work. **Separate Permit Required.**

City of DuPont Fire Department

Proudly serving the community of DuPont

1780 Civic Drive, DuPont, WA, 98327

Phone 253.964.8414 ▪ Fax 253.912.5240 ▪ www.ci.dupont.wa.us

5. If a fire pump is required. The system shall comply with NFPA 20. Three (3) sets of plans and material specification sheets for all equipment used in the system shall be submitted by a State of Washington Licensed Contractor for review, approval and permits issued prior to commencing work. **Separate Permit Required.**

6. An automatic fire alarm system shall be installed. The system shall comply with NFPA 72 Standard for Fire Alarm System. Three (3) sets of plans, material specifications sheet for all equipment used in the system shall be submitted by a State of Washington Licensed Contractor for review, approval and permits issued prior to commencing work. **Separate Permit Required.**

7. A Knox key box system shall be required. Knox applications may be picked up at the DuPont Fire Department located at 1780 Civic Drive DuPont, WA 98327. A key shall be required to be placed in the Knox key box.

8. Fire extinguishers are required to be installed as directed by City of DuPont Fire Department. Prior to installation the client is directed to request a fire inspection to confirm the locations of the fire extinguishers.

9. Make sure you follow Chapter 33 of the 2018 International Fire Code (Fire safety during construction and demolition.)

10. All new building shall have approved emergency responder radio coverage per section 510 of the 2018 International Fire Code. (Separate Permit Required).

If you have any questions, you may call Fire Marshal Mike Turner at (253) 666-2760 or e-mail mturner@dupontwa.gov.

Sincerely,

Fire Marshal

Mike Turner

Attachment 6c

From:	Ray Shipman
To:	Barbara Kincaid; Mike Turner
Cc:	Mickey Gillie; Lisa Klein; Janet Howald
Subject:	[EXTERNAL] RE: RE: Comments needed on development proposal
Date:	Thursday, January 4, 2024 2:27:58 PM

All,
Sorry, I did forget one thing.
We need to make sure that the civil work takes into account, and doesn't conflict, with the EV charging requirements regulated by the amended Washington State Building code.

Ray Shipman CBO/CFM
Building Official | City of DuPont
Direct (253) 912-5216 | 1700 Civic Drive, DuPont, WA 98327

From: Barbara Kincaid <bkincaid@dupontwa.gov>
Sent: Thursday, January 4, 2024 12:51 PM
To: Ray Shipman <RShipman@dupontwa.gov>; Mike Turner <MTurner@dupontwa.gov>
Cc: Mickey Gillie <MGillie@DupontWA.GOV>; Lisa Klein <LKlein@AHBL.com>; Janet Howald <JHowald@dupontwa.gov>
Subject: RE: Comments needed on development proposal

Greetings,

Below is a link to the revised plans and documents for SEPA and Land Use applications PLNG2022-031 and PLNG2022-032 for the DuPont 243 project.

DuPont 243 Resubmittal 2023-11-10

Would you please provide your comments asap? I have included the review letter from Dominic (G&O) who references that Fire might have input on this proposal.

Thanks,

Barb Kincaid, AICP
Director of Public Services
City of DuPont
253.912.5393

Attachment 6d

From: Geralyn Reinart
To: Lisa Klein
Cc: Barbara Kincaid
Subject: [EXTERNAL] Re: DuPont 243 SEPA and Land Use Resubmittal / PLNG2022-031 and 032 / BCE#18666
Date: Friday, April 26, 2024 12:44:50 PM

Lisa-

I took a look at the civil plans (sheet C9) and noted what appears to be at least a 20-foot offset from the existing westbound lane at the existing temporary cul-de-sac to the new pavement section serving the site. There needs to be an appropriate transition between these two cross-sections with appropriate channelization (centerline and edge line) and possibly additional pavement to safely guide westbound motorists between the two sections. Perhaps there are some channelization/signing plans that show this, but it isn't noted on the civil plans. Also, I had mentioned signage for the trail crossing in my prior TIA comments but didn't see any of that in the civil plans either (again, perhaps this is forthcoming or somewhere else). One final comment - I had recommended the installation of a left-turn lane for vehicles entering the site (a future need) and assume this will be handled when the north side of the street is developed.

That's it for now; call me if you need to discuss in more detail. Thanks!

geri
Geralyn Reinart, P.E.
831 Sprague Street
Edmonds, WA. 98020
(425) 530-0664 cell
greinart@msn.com

From: Lisa Klein <LKlein@AHBL.com>
Sent: Thursday, April 25, 2024 3:22 PM
To: Geri Reinart (greinart@msn.com) <greinart@msn.com>
Subject: FW: DuPont 243 SEPA and Land Use Resubmittal / PLNG2022-031 and 032 / BCE#18666

Geri,
If you scroll down there is a link to the resubmittal.
Lisa

Lisa Klein, AICP | Associate Principal
AHBL, Inc. | **TACOMA** • SEATTLE • SPOKANE • TRI-CITIES
253.383.2422 **TEL** | 253.284.0256 **DIRECT** | 253.651.7907 **MOBILE** | lklein@ahbl.com **EMAIL** | Send us a file.

Career Opportunities available | Learn more today!

From: Janet Howald <JHowald@dupontwa.gov>
Sent: Wednesday, April 17, 2024 9:18 AM
To: Dominic Miller, Gray & Osborne <dmiller@g-o.com>; Larry Clark <LKClark@dupontwa.gov>; Ray Shipman <RShipman@dupontwa.gov>; Shukri Sharabi <CityEngineer@dupontwa.gov>
Cc: Christine Shilley <PermitTech@dupontwa.gov>; Lisa Klein <LKlein@AHBL.com>; Barbara Kincaid <bkincaid@dupontwa.gov>
Subject: [EXTERNAL] FW: DuPont 243 SEPA and Land Use Resubmittal / PLNG2022-031 and 032 / BCE#18666

Good morning all,

Please submit comments for the resubmittal or kindly reply if you have no comments.

Thank you.

Janet Howald
Administrative Specialist|Public Services Department
City of DuPont

Direct 253.912.5232
City Hall 253.964.8121
Jhowald@dupontwa.gov

From: Janet Howald
Sent: Monday, April 1, 2024 4:35 PM
To: Dominic Miller, Gray & Osborne <dmiller@g-o.com>; Larry Clark <LKClark@DupontWA.GOV>; Mike Turner <MTurner@DupontWA.GOV>; Ray Shipman <RShipman@DupontWA.GOV>; Shukri Sharabi <CityEngineer@DupontWA.GOV>
Cc: Lisa Klein <LKlein@AHBL.com>; Barbara Kincaid <bkincaid@DupontWA.GOV>
Subject: FW: DuPont 243 SEPA and Land Use Resubmittal / PLNG2022-031 and 032 / BCE#18666

Hello,

Attached is a link to revised plans for DuPont 243.

Please provide your comments by April 16th.

Thank you.

Janet Howald
Administrative Specialist|Public Services Department
City of DuPont

Direct 253.912.5232
City Hall 253.964.8121
Jhowald@dupontwa.gov

From: Betsy Dyer <bdyer@barghausen.com>
Sent: Friday, March 29, 2024 11:54 AM
To: Permits <Permits@cityofdupont.onmicrosoft.com>; Janet Howald <JHowald@dupontwa.gov>
Cc: Josh Towne <jtowne@barghausen.com>; Dan Balmelli <dbalmelli@barghausen.com>
Subject: DuPont 243 SEPA and Land Use Resubmittal / PLNG2022-031 and 032 / BCE#18666

Hi,

Below is a link to the revised plans and documents for SEPA and Land Use applications PLNG2022-031 and PLNG2022-032 for the DuPont 243 project. A copy of the resubmittal letter addressing City comments and listing all enclosures is attached for reference (also included in link below). Please route for review at your earliest convenience and please feel free to contact me, Josh Towne or Dan Balmelli of our office with any questions or if you need any additional information. Thank you.

DuPont 243 Resubmittal 2024-03-29

Betsy Dyer | **Project Administrator**
Office: 425-251-6222 | Direct: 425-656-7427
Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South, Kent WA 98032
www.barghausen.com

Attachment 6e

LANDAU ASSOCIATES

June 14, 2024

Transmitted via email to: bkincaid@dupontwa.gov

City of DuPont
DuPont City Hall
1700 Civil Drive
DuPont, WA 98327

Attn: Barbara Kincaid, Director of Public Services

Re: Updated DuPont 243 Noise Study Peer Review
Permit Nos. PLNG2022-031 and PLNG2022-031-032
DuPont, Washington
Landau Project No. 1260016.010

Dear Ms. Kincaid:

This letter is an update of the June 21, August 25, and December 8, 2023, letters summarizing the peer review conducted by Landau Associates, Inc. (Landau) of the DuPont 243 Noise Studies prepared by JGL Acoustics, Inc. (JGL) on behalf of Avenue 55, dated January 27, July 21, and October 20, 2023, respectively. JGL and Avenue 55 submitted a letter in response to Landau's peer review on March 1, 2024, and a fourth revised Noise Study (Study) dated May 20, 2024. The City of DuPont (City) requested that Landau assist the City in evaluating the appropriateness of the Study's assumption and findings.

JGL's March 2024 letter provided adequate information for Landau to accept the conclusions of the noise study as valid, with the exception of the source of the hourly truck distribution data on which the noise study was based.

The revised May 2024 noise study implies that JGL used the 11th Edition of the Trip Generation Manual published by the Institute of Traffic Engineers to generate the 24-hour traffic distribution shown in Table 4 of the noise study from the average weekday daily traffic volumes presented in the traffic study by Heath & Associates. While the preferred source would be the project-specific traffic study, the Trip Generation Manual is an acceptable source in the absence of project-specific hourly traffic data.

Landau's opinion is that the March 2024 letter and May 2024 Study together adequately characterize potential project-related noise.

LANDAU ASSOCIATES, INC.

Amy Maule
Senior Scientist

Kristen Wallace
Principal

AEM/KLW/ccy
P:\1260\016\R\Noise Peer Review\Landau_Revised DuPont 243 Peer Review_ltrrpt - 06-14-24.docx

cc: Lisa Klein; lklein@ahbl.com