Exhibit I

Drainage Report for:

TSC TRACTOR SUPPLY CO

THE STUFF YOU NEED OUT HERE

Intersection of Hwy 26 and Champion Way
Sandy, Or

I hereby certify that this Stormwater Management Report has been prepared by me and meets minimum standards of the City of Sandy and normal standards of engineering practice. I hereby acknowledge and agree the jurisdiction does not and will not assume liability of the sufficiency, suitability, or performance of the drainage facilities designed by me.

REGISTERED PROFESSIONAL ENGINEER
92989PE
4/27/18
OREGON
JUNE 30, 2019
PERRY CLYDE JINRIGHT, III

EXPIRES:

Owner:

Hix Snedeker Compaines, LLC
P.O. Box 130
Daphne, Al 36526
251-243-0708

Engineer:

JADE CONSULTING, LLC

208 GREENO ROAD NORTH, SUITE C
POST OFFICE BOX 1929
FAIRHOPE, ALABAMA 36533
TELEPHONE: 251-928-3443 ● FAX: 251-928.3665

Submittal: April 27, 2018

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B- FIRM Map

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F- Geotechnical Report

G- Water Quality Treatment Device

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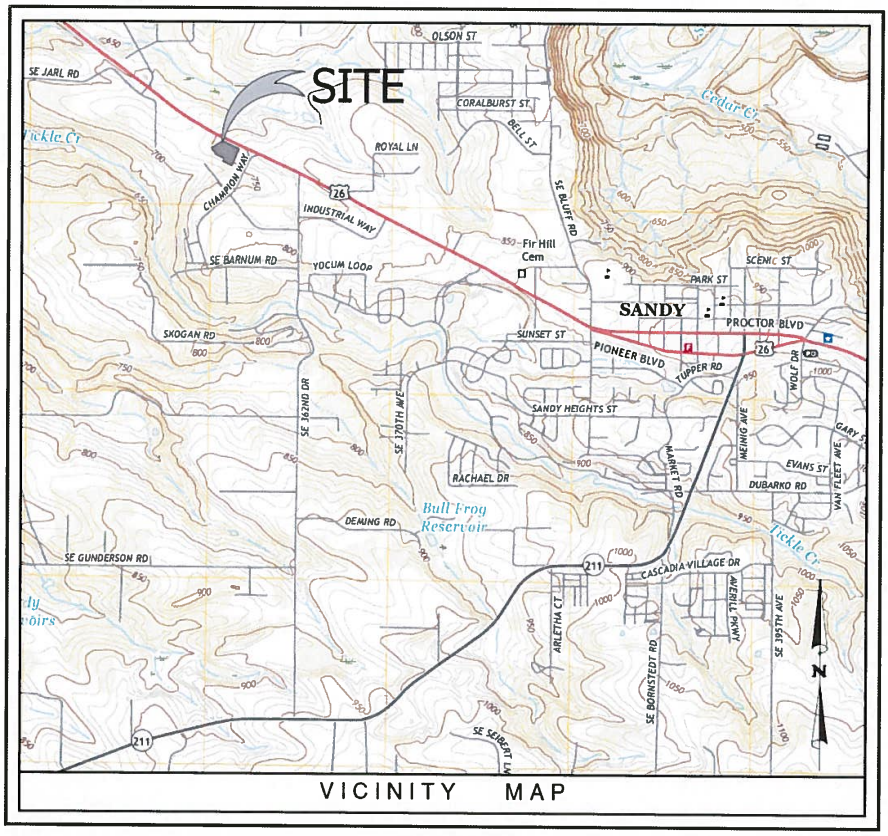
I- Design Storm Rainfall Charts and Runoff Coefficients

I GENERAL LOCATION AND DESCRIPTION

I.A Site Location

I.A.1 Site Vicinity Map

The 2.63 acre vacant Tract of land lies in the SE 1/4 of Section 10, Township 2 South, Range 4 East, W.M., City of Sandy, Clackamas County, Oregon



Not to Scale

Vicinity Map

I.A.2 Local/Regional Surroundings

The 2.63-acre site is located on the South side of Hwy 26, just west of the intersection with Champion Way. The 2.63-acre parcel is currently being subdivided from a 8.07 acre parent tract by a 2 lot portion. The 2

parcels will have a shared access on to Industrial way and Champion Way. There is a convenience store to the east, a proposed mini storage facility to the south and a transmission power line to the west.

I.B Description of Property and Development

I.B.1 Vegetation and Soils

The 2.63-acre property currently is a grass filed with only two evergreen trees. The site has approximately 40 feet of relieve from Hwy 26 to industrial way. Appendix C indicates the NRCS Soils Classification Map. The following table list the Hydraulic ratings of the native soils found on this site.

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
15B	Cazadero silty clay loam, 0 to 7 percent slopes	C	3.4	83.3%
15C	Cazadero silty clay loam, 7 to 12 percent slopes	C	0.7	16.7%
Totals for Area of Interest			**4.0**	**100.0%**

The enclosed geotechnical report indicates the native soils have essentially no infiltration capabilities. As such the storm water management system will no included any features that rely on infiltration.

I.B.2 Drainage and Floodplains

The subject property drains in one primary direction. The properties stormwater runoff drains into the upper tributary of Trickle Creek. From here the site drains towards the South under Industrial Way toward the primary channel of Trickle Creek

The Subject property does not lie within any 100-year flood plan per FIRM Map 41005 C 0093 D Dated June 17,2008. A copy of this FIRM map in enclosed as appendix B of this report.

I.B.3 Proposed Land Use

This project proposes to develop a single tenant retail facility and its respective parking improvements on the referenced 2.63-acre property plus 0.386 acres that will be used as shared access/roadway improvements that bring total development area to 3.016 acres. This property is currently zoned from Industrial. All storm water runoff on the site will be collected by both Type G-2, GC-2 and GC-2 MA inlets. Storm water will then be routed by HDPE pipe to a 60" CMP underground detention system. A City of Sandy flow control MH will be used to regulate post development release rates. Storm water runoff from the 0.386 acre shared access road that bypasses the detention system is included in the hydrologic routing calculations.

II DRAINAGE DESIGN CRITERIA

II.A Regulations

Storm drainage analysis and design criteria are to be taken from the *City of Sandy's* Design Standards; Per section *13.18 Storm Water Management* of the City's Municide, and the *Storm Water Management Manual* for the City of Portland. Due to the native soils having no infiltration, Category 1 and 2 storm water systems are not applicable for this site. The project will use underground detention with a manufactured stormwater treatment technology under the Category 3 Storm System Requirements.

II.B Drainage Studies, Master Plans, Site Constraints

The development criteria of the 3.016-acre project shall be in accordance with City of Sandy's requirements.

II.C Hydrology and Hydraulic Criteria

The Rational Method was used to determine design storm runoff for the pipe network system. All facilities calculated in this report are designed to accept 25-year flows. The IDF curve for the project as indicated in Table 6.11 of *Storm Water Management Manual* for the City of Portland was incorporated in to the Rational Method storm water runoff volumes.

Run off values generated by these IDF Curves where used to design the pipe network of the project. The pipe network for the project used Bentley StormCAD V8i for drainage pipe calculations. The summary form from this design software indicates the hydraulic grade line for the design storm. 25 year storm flow rate values are presented in the drainage map and detailed calculations are presented in appendix D. These tables contain input data and summary of calculations used to effectively size facilities that will allow for the safe conveyance to adequate outfall systems.

The Detention Pond system has been designed using the City of Sandy's table of Rainfall distribution values for a NRCS Type 1A 24- hour storm as posted on the City's website. Pre-development storm water runoff rates have been compared to post development runoff rates. The routing calculations have been performed using Haestad Method's, Pond Pack Version V8i. The supporting routing calculation have been included in appendix E of this report.

II.D Water Quality Management

The strom water quality treatment has been designed in accordance with Chapter 13.18.60 of the City of Sandy's Municode. The project contains a single primary drainage basin with its respective underground detention system. The water quality treatment system will be designed using the *flow- though based storm water quality control* method. The on-line facility has been designed using a rainfall intensity of 0.2 inches per hour. We have enclosed a map in the report that illustrates the impervious areas for each respective drainage basin.

Reqd. Water Quality drainage area	= 2.63 + 0.386 = 3.016 acres
Reqd. Water Quality intensity rate	= 0.2 inches per hour
Drainage area runoff Coef.	= (2.366 x 0.9 + 0.65 x 0.3)/ 3.016=0.77
Reqd. Water Quality Treatment Flow Rate	= 3.016 x 0.2 x 0.77= 0.46 CFS

Reqd. Water Quality Treatment Flow Rate = 0.46 CFS

The project will use a water quality treatment devise that is similar to previously approved projects in the city of Sandy. This project will use a CDS2015-4-C online water quality treatment device. Details and manufactures design calculations have been enclosed within this report.

III STORMWATER MANAGEMENT FACILITY DESIGN

III.A Stormwater Conveyance Facilities

The general concept is to convey storm water via curb and gutter, and storm pipe to the combination detention /water quality facilities that ultimately discharge into a downstream tributary of Trickle Creek. The site is comprised of a single underground detention pipe system. The project will be constructed as a single phase. These basins consist of building surfaces, parking lots, storage areas, and open space.

III.B Storm Sewer Design

Storm water runoff from the 16 ea. sub basins is collected by a combination of 16 ea inlets that are interconnected by 22 drainage pipes that route the storm drainage into and out of a 60" diameter CMP underground storage chamber. We have enclosed StormCAD Calculations for the design of the pipe network to be incompliance with the initial 25-year storm The pipe calculation tables, respective drainage map, and supporting profiles have been included in appendix D of this report

III.C Storm Water Storage Facilities

The 60" diameter CMP underground storage chamber has been designed using the City's design standards. for minimum volume, max water depth, and maximum allowable release rates. The work footprint of these improvements covers approximately 3.016 acres. The pre and post development drainage area was analyzed to determine the probable impacts to the developments drainage basin. The drainage basin's surfaces were then broken down into pervious and impervious surfaces to determine their respective weighted runoff coefficient and/or Curve Number. The predevelopment drainage basin's surface areas have been compared to the post development drainage basin's surface areas. Respective maps are included in this report to help illustrate the areas used for calculations.

The following tables will indicate all pre vs. post release rates. Due to the complex hydrograph computations used to calculate the underground detention system's routings, with multiple drainage basins creating their respective hydrograph, we used the SCS Hydrograph Method for detention calculations. The NRCS Type 1A Hydrograph with the City's respective runoff volumes have been used for the calculations.

A City of Sandy flow control MH will be used to regulate post development release rates. Storm water runoff from the 0.386 acre shared access road that bypasses the detention system is included in the hydrologic routing calculations.

Sites Project Outfall

Strom Event	Pre-Dev. Q (cfs)	Routed Post-Dev. Q (cfs)
2 year	1.07	0.98
5 year	1.72	1.41
10 year	1.93	1.72
25 year	2.42	2.36
100 year	3.16	4.31

60" Dia. Underground Chamber Stage-Storage

Elevation (feet)	Storage Depth (feet)	Storage Volume (ac-ft)	Comments
745.00	5.0000	0.155	Top of 60" dia. Chamber
744.99	4.9900	0.155	100 year HW Elev.
744.43	4.4300	0.145	25 year HW Elev
744.00	4.0000	0.133	
743.87	3.8700	0.128	10 year HW Elev
743.67	3.6700	0.121	5 year HW Elev
743.00	3.0000	0.097	
742.80	2.8000	0.089	2 year HW Elev
742.00	2.0000	0.058	
741.00	1.0000	0.022	
740.00	0.0000	0.000	Invert of 60" dia. Chamber

The information provided above illustrates that the post development storm water runoff rate for the project's drainage basin is less than its respective predevelopment rate. The supporting routing calculation have been included in appendix E of this report. Based upon these results from our computations, we can state that there is no adverse impact to storm water drainage from the development of this project.

IV WATER QUALITY ENHANCEMENT BEST MANAGEMENT PRACTICES

IV.A SITE DESCRIPTION

a) The proposed construction activity includes all related infrastructure improvements required for the development of a single tenant retail facility and its respective parking lot. Improvements include but are not limited to parking lots, building pad, utilities, and drainage improvements.

b) The anticipated sequence of construction is as follows:

1. Installation of perimeter erosion control measures
2. Site clearing
3. Detention pond construction
4. Installation of temporary onsite erosion control measures and temporary traps
5. Mass grading of site
6. Drainage improvements construction including sediment traps at inlets and erosion protection at outfall locations.
7. Final grading of site and installation of temporary grassing.
8. Utility construction
9. Installation of curb-gutter, and parking lot paving
10. Final landscaping and permanent stabilization of all disturbed areas
11. Removal of temporary erosion control appurtenances after site is stabilized

c) The total area of the work site is approximately 3.016 acres.

d) NRCS Soils data are identified in the Appendix C.

e) Permanent vegetation on the site will be in accordance with the approved landscape plan.

f) Potential pollution sources include equipment refueling and maintenance, grading operations, and concrete wash water.

g) No significant non-storm waters of runoff are anticipated.

IV.B EROSION AND SEDIMENT CONTROL

1. Structural Practices:
   Grading operations present the greatest opportunity for pollution of State waters. Disturbed areas shall be contained by a perimeter silt fence at downslope conditions which shall remain at the downstream perimeter of all overland flow until nonstructural ways and means are established. Upon completion of the grading, surface erosion shall be protected by a combination of slope reduction, erosion control blankets and the use of wattles as check dams. The grading improvements will generally direct runoff toward surface inlets and the detention pond that will service as a sediment basin. The detention pond will serve as the central point of site release. Maintenance procedures shall be recorded by the developer's construction manager in a log book.

2. Non-structural Practices:
   Upon completion of the building and paving areas, all exposed portions of the site not slated for construction shall be seeded and mulched. Silt and sediment deposits shall be removed and spread evenly in open areas and shall be seeded and mulched as necessary. The parking lot and service drive will be sweep and maintained in an orderly manner. All litter will be collected in a routine manner. Upon establishment of surface vegetation, structural erosion control measures shall then be removed whereby non-structural methods shall be practiced.

IV.C MATERIALS HANDLING AND SPILL PREVENTION

Potential pollutant materials brought onsite would be fuels for earthmoving and trenching equipment. Berms shall be provided at the fueling site as a containment measure. Other potential pollutant materials include concrete wash water. This shall be done in either a constructed concrete washout BMP or designated manufactured device designated by the developer's construction manager. Either of these two methods shall prevent any runoff and, after hydration, be disposed of off-site in a legal waste disposal facility in accordance with all local, state and federal guidelines. Building materials shall be protected by storage outside of runoff areas. No additional materials handling measures will be taken. Waste building materials shall be collected by a reputable waste management company and transported to an off-site legal waste disposal facility in accordance with all local, state and federal guidelines. Site inspections shall be performed weekly to assure onsite collection. No dedicated concrete or asphalt batch plants are proposed on the site.

IV.D FINAL STABILIZATION AND LONG TERM STORMWATER MANAGEMENT

After infrastructure construction is complete, runoff will be collected by surface inlets and routed by a storm sewer system to the detention pond and released. After completion of this project, the open space/ disturbed areas will be landscaped and maintained by the occupant of the commercial facility.

IV.E OTHER CONTROLS

Offsite soil tracking is limited by restriction of construction traffic to one access point and by periodic street sweeping. Implementation of the controls shall be by the erosion control plan which is a part of the contract documents.

IV.F INSPECTION AND MAINTENANCE

Maintenance procedures are outlined in the notes contained on the grading and erosion control plans and respective details. A log record noting all inspections and mitigation efforts shall be kept with the construction manager.

V. FLOODPLAIN MODIFICATION

There are no floodplain modifications proposed with this development

VI ADDITIONAL PERMITTING REQUIREMENTS

There are no known threatened or endangered species within project area.

V CONCLUSIONS

V.B Drainage Concept

The drainage designs and facilities presented in this report adequately convey developed runoff through the site and into existing drainage ways without increasing the existing discharge.

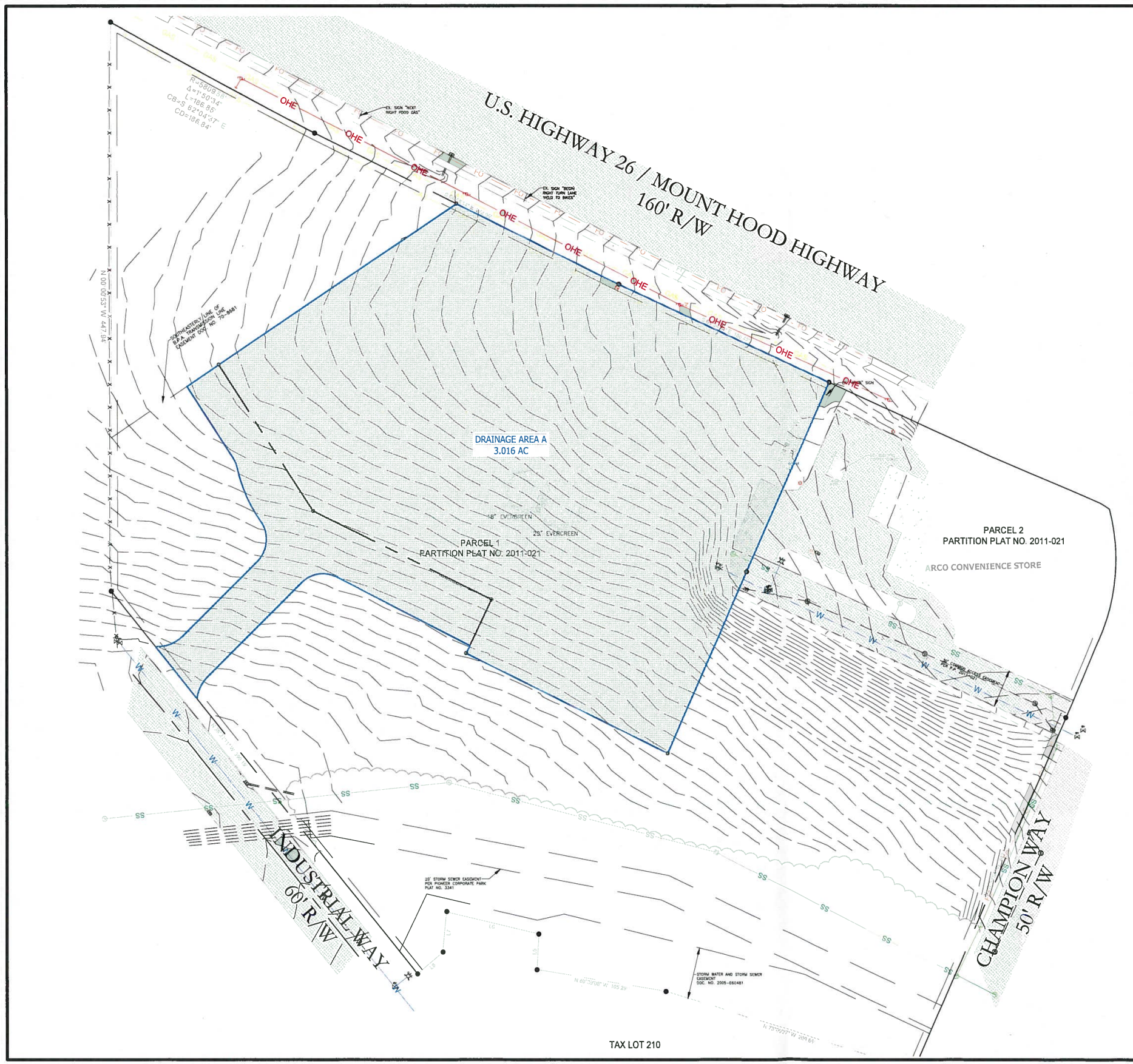
V. C Summary

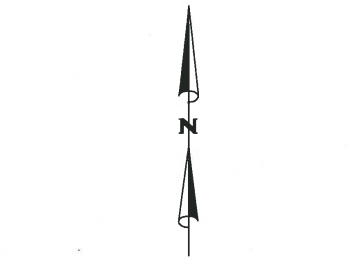
The report provides sufficient information to indicate the that the projects design will be in accordance with City of Sandy's Design Standards;

APPENDIX A –

Existing Topographic Survey
Pre-Development and Post-Development Drainage Area Maps
Water Quality Map

JADE CONSULTING, LLC
Jinright & Associates Development Engineers
208 Greeno Road North Fairhope, Alabama 36532
P.O. Box 1929 Fairhope, Alabama 36533
251.928.3443(tel) 251.928.8669(fax)
jadengineers.com



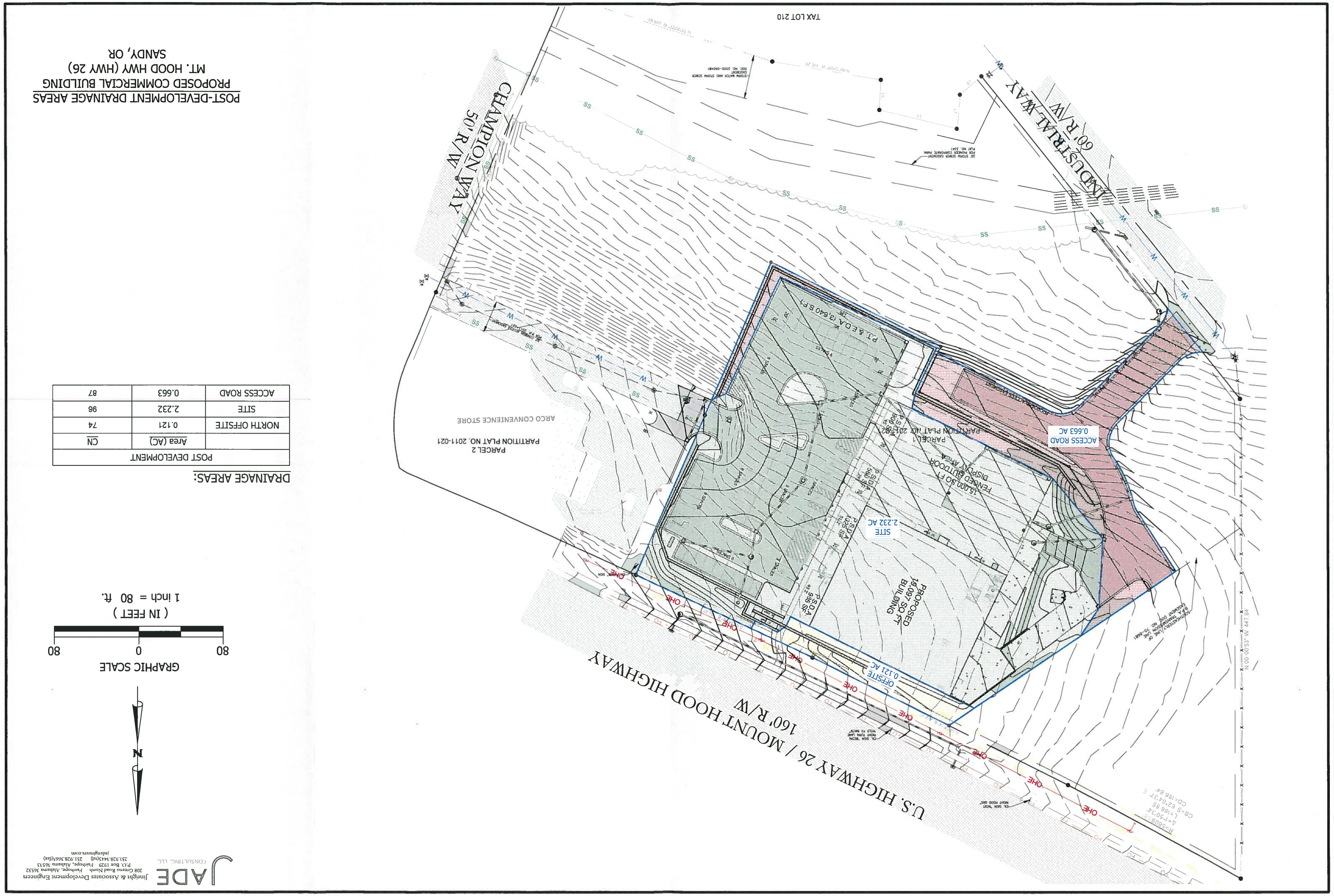


DRAINAGE AREA A:

PRE DEVELOPMENT		
	Area (AC)	CN
AREA 'A'	3.016	79

PRE-DEVELOPMENT DRAINAGE AREAS
PROPOSED COMMERCIAL BUILDING
MT. HOOD HWY (HWY 26)
SANDY, OR

POST-DEVELOPMENT DRAINAGE AREAS
PROPOSED COMMERCIAL BUILDING
MT. HOOD HWY (HWY 26)
SANDY, OR



GRAPHIC SCALE
80 0 80
(IN FEET)
1 inch = 80 ft.

N

DRAINAGE AREAS:

POST DEVELOPMENT		
	Area (AC)	CN
NORTH OFFSITE	0.121	74
SITE	2.232	96
ACCESS ROAD	0.663	87

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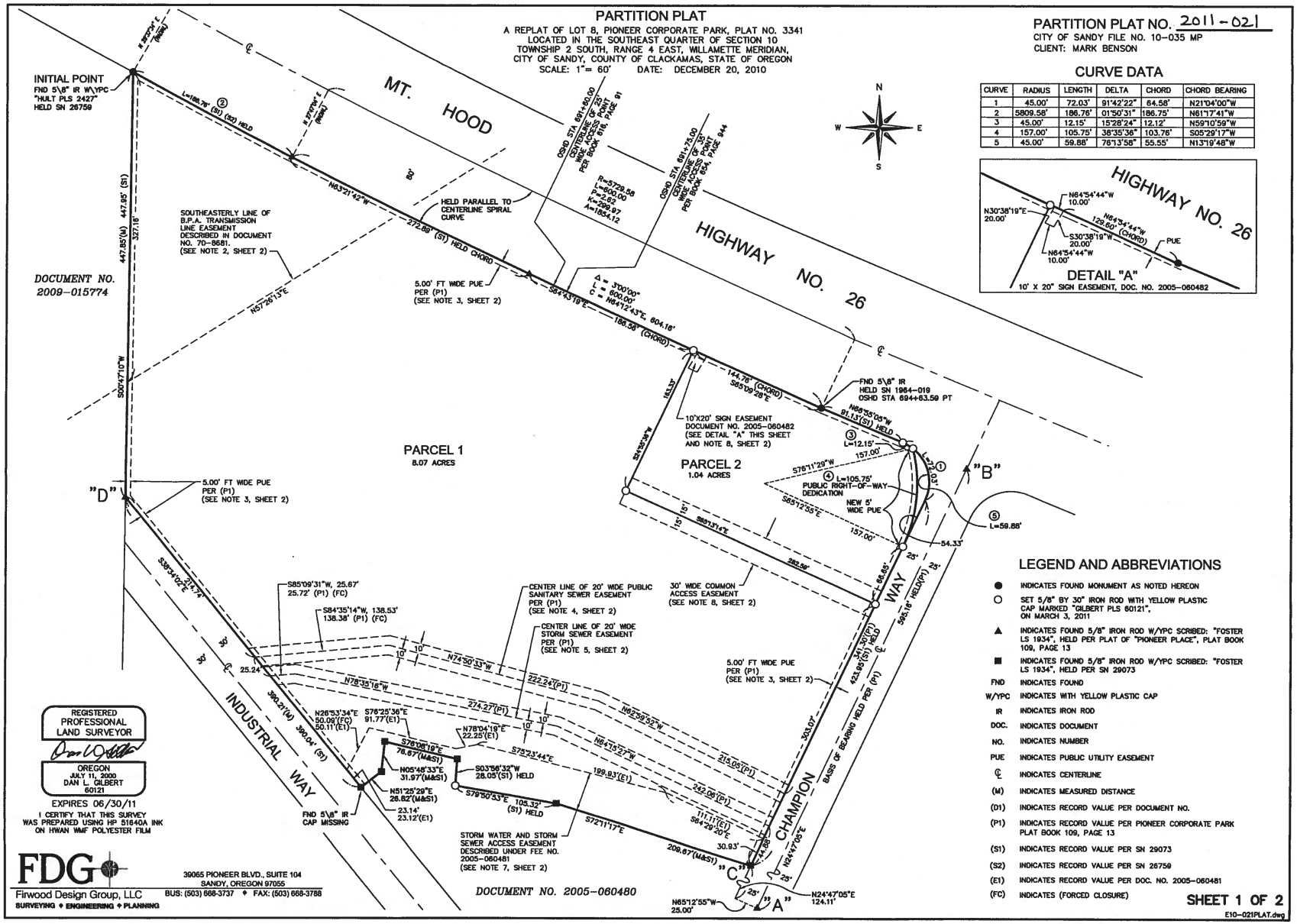
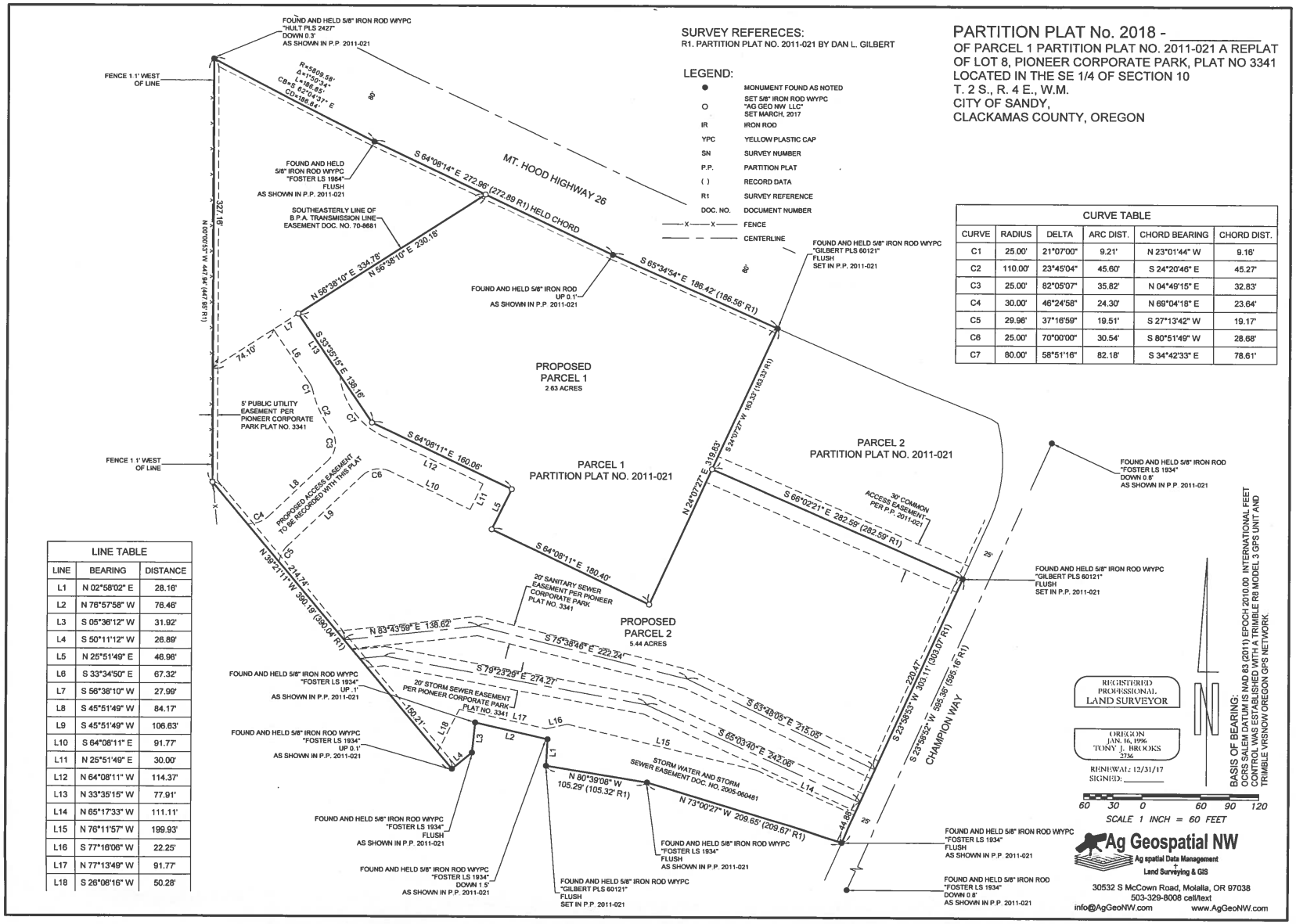
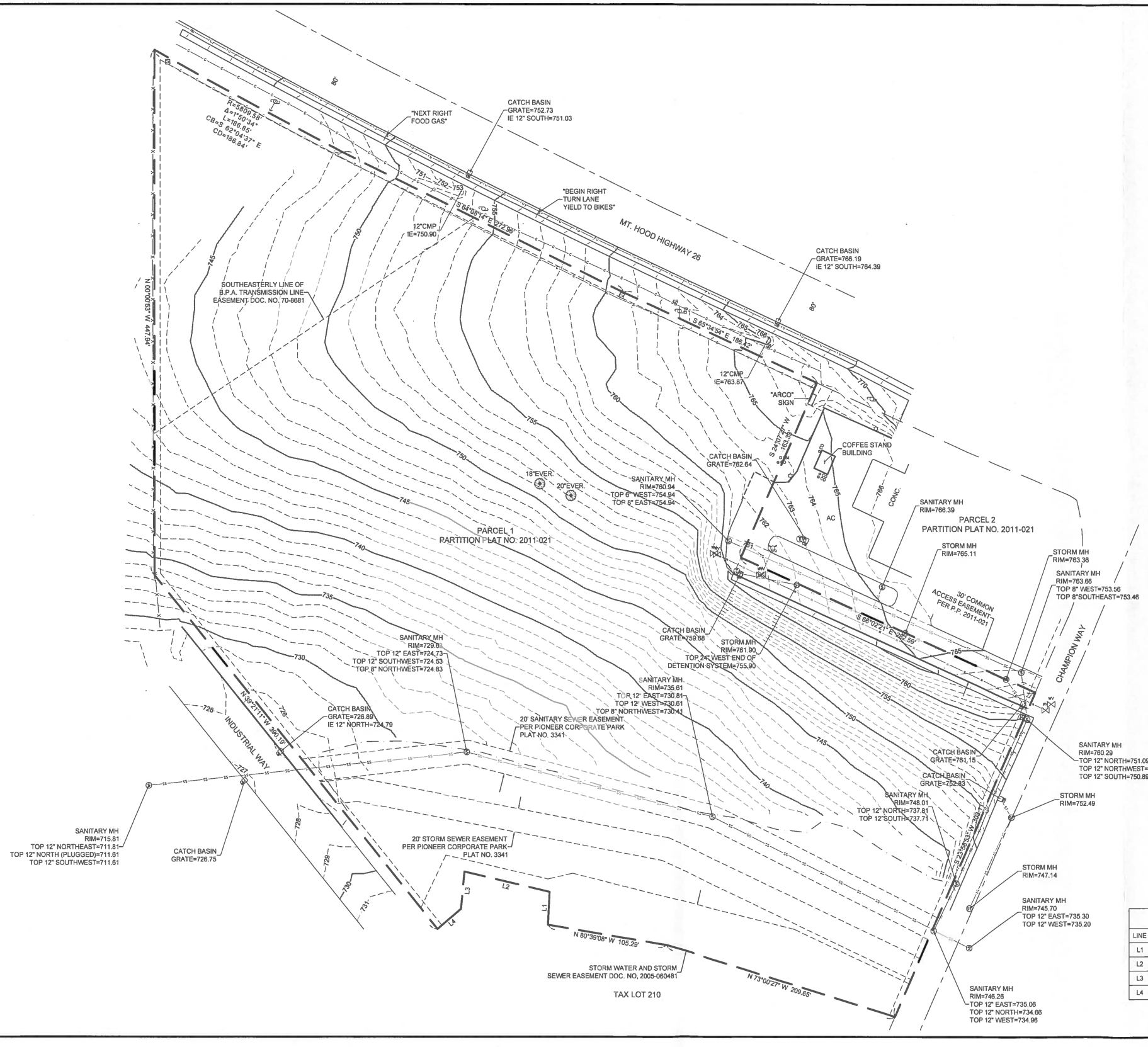

PARTITION PLAT
A REPLAT OF LOT 8, PIONEER CORPORATE PARK, PLAT NO. 3341
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 10
TOWNSHIP 2 SOUTH, RANGE 4 EAST, WILLAMETTE MERIDIAN,
CITY OF SANDY, COUNTY OF CLACKAMAS, STATE OF OREGON
SCALE: 1"= 60' DATE: DECEMBER 20, 2010
PARTITION PLAT NO. 2011-021
CITY OF SANDY FILE NO. 10-035 MP
CLIENT: MARK BENSON
CURVE DATA
CURVE | RADIUS | LENGTH | DELTA | CHORD | CHORD BEARING
1 | 45.00' | 72.03' | 91°42'22" | 64.58' | N21°04'00"W
2 | 5809.58' | 186.76' | 01°50'31" | 186.75' | N61°17'41"W
3 | 45.00' | 12.15' | 15°28'24" | 12.12' | N59°10'59"W
4 | 157.00' | 105.75' | 38°35'36" | 103.76' | S05°29'17"W
5 | 45.00' | 59.88' | 76°13'58" | 55.55' | N13°19'48"W
HIGHWAY NO. 26
N64°54'44"W 10.00'
N30°38'19"E 20.00'
N64°54'44"W 129.60' (CHORD)
S30°38'19"W 20.00'
N64°54'44"W 10.00'
PUE
DETAIL "A"
10' X 20' SIGN EASEMENT, DOC. NO. 2005-060482
INITIAL POINT
FND 5\8" IR W\YPC
"HULT PLS 2427"
HELD SN 26750
MT. HOOD
HIGHWAY NO. 26
INDUSTRIAL WAY
CHAMPION WAY
DOCUMENT NO. 2009-015774
SOUTHEASTERLY LINE OF B.P.A. TRANSMISSION LINE EASEMENT DESCRIBED IN DOCUMENT NO. 70-8681. (SEE NOTE 2, SHEET 2)
HELD PARALLEL TO CENTERLINE SPIRAL CURVE
5.00' FT WIDE PUE PER (P1) (SEE NOTE 3, SHEET 2)
10'X20' SIGN EASEMENT DOCUMENT NO. 2005-060482 (SEE DETAIL "A" THIS SHEET AND NOTE 8, SHEET 2)
FND 5\8" IR HELD SN 1984-019 OSHD STA 694+63.59 PT
PARCEL 1
8.07 ACRES
PARCEL 2
1.04 ACRES
PUBLIC RIGHT-OF-WAY DEDICATION
NEW 5' WIDE PUE
30' WIDE COMMON ACCESS EASEMENT (SEE NOTE 8, SHEET 2)
CENTER LINE OF 20' WIDE PUBLIC SANITARY SEWER EASEMENT PER (P1) (SEE NOTE 4, SHEET 2)
CENTER LINE OF 20' WIDE STORM SEWER EASEMENT PER (P1) (SEE NOTE 5, SHEET 2)
STORM WATER AND STORM SEWER ACCESS EASEMENT DESCRIBED UNDER FEE NO. 2005-060481 (SEE NOTE 7, SHEET 2)
FND 5\8" IR CAP MISSING
BASIS OF BEARING HELD PER (P1)
DOCUMENT NO. 2005-060480
"A" "B" "C" "D"
N
S
E
W
LEGEND AND ABBREVIATIONS
● INDICATES FOUND MONUMENT AS NOTED HEREON
○ SET 5/8" BY 30" IRON ROD WITH YELLOW PLASTIC CAP MARKED "GILBERT PLS 60121", ON MARCH 3, 2011
▲ INDICATES FOUND 5/8" IRON ROD W/YPC SCRIBED: "FOSTER LS 1934", HELD PER PLAT OF "PIONEER PLACE", PLAT BOOK 109, PAGE 13
■ INDICATES FOUND 5/8" IRON ROD W/YPC SCRIBED: "FOSTER LS 1934", HELD PER SN 29073
FND INDICATES FOUND
W/YPC INDICATES WITH YELLOW PLASTIC CAP
IR INDICATES IRON ROD
DOC. INDICATES DOCUMENT
NO. INDICATES NUMBER
PUE INDICATES PUBLIC UTILITY EASEMENT
℄ INDICATES CENTERLINE
(M) INDICATES MEASURED DISTANCE
(D1) INDICATES RECORD VALUE PER DOCUMENT NO.
(P1) INDICATES RECORD VALUE PER PIONEER CORPORATE PARK PLAT BOOK 109, PAGE 13
(S1) INDICATES RECORD VALUE PER SN 29073
(S2) INDICATES RECORD VALUE PER SN 26750
(E1) INDICATES RECORD VALUE PER DOC. NO. 2005-060481
(FC) INDICATES (FORCED CLOSURE)
REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON JULY 11, 2000 DAN L. GILBERT 60121
EXPIRES 06/30/11
I CERTIFY THAT THIS SURVEY WAS PREPARED USING HP 51640A INK ON HWAN WMF POLYESTER FILM
FDG
Firwood Design Group, LLC
SURVEYING ♦ ENGINEERING ♦ PLANNING
39065 PIONEER BLVD., SUITE 104
SANDY, OREGON 97055
BUS: (503) 668-3737 ♦ FAX: (503) 668-3788
SHEET 1 OF 2
E10-021PLAT.dwg


PARTITION PLAT No. 2018 - _____
OF PARCEL 1 PARTITION PLAT NO. 2011-021 A REPLAT
OF LOT 8, PIONEER CORPORATE PARK, PLAT NO 3341
LOCATED IN THE SE 1/4 OF SECTION 10
T. 2 S., R. 4 E., W.M.
CITY OF SANDY,
CLACKAMAS COUNTY, OREGON
SURVEY REFERECES:
R1. PARTITION PLAT NO. 2011-021 BY DAN L. GILBERT
LEGEND:
MONUMENT FOUND AS NOTED
SET 5/8" IRON ROD WYPC "AG GEO NW LLC" SET MARCH, 2017
IRON ROD
YELLOW PLASTIC CAP
SURVEY NUMBER
PARTITION PLAT
RECORD DATA
SURVEY REFERENCE
DOC. NO. DOCUMENT NUMBER
FENCE
CENTERLINE
MT. HOOD HIGHWAY 26
PROPOSED PARCEL 1
2.63 ACRES
PROPOSED PARCEL 2
5.44 ACRES
PARCEL 1 PARTITION PLAT NO. 2011-021
PARCEL 2 PARTITION PLAT NO. 2011-021
CHAMPION WAY
5' PUBLIC UTILITY EASEMENT PER PIONEER CORPORATE PARK PLAT NO. 3341
PROPOSED ACCESS EASEMENT TO BE RECORDED WITH THIS PLAT
30' COMMON ACCESS EASEMENT PER P.P. 2011-021
20' SANITARY SEWER EASEMENT PER PIONEER CORPORATE PARK PLAT NO. 3341
20' STORM SEWER EASEMENT PER PIONEER CORPORATE PARK PLAT NO. 3341
STORM WATER AND STORM SEWER EASEMENT DOC. NO. 2005-080481
FENCE 1.1' WEST OF LINE
FOUND AND HELD 5/8" IRON ROD WYPC "HULT PLS 2427" DOWN 0.3' AS SHOWN IN P.P. 2011-021
FOUND AND HELD 5/8" IRON ROD WYPC "FOSTER LS 1984" FLUSH AS SHOWN IN P.P. 2011-021
SOUTHEASTERLY LINE OF B.P.A. TRANSMISSION LINE EASEMENT DOC. NO. 70-8681
FOUND AND HELD 5/8" IRON ROD UP 0.1' AS SHOWN IN P.P. 2011-021
FOUND AND HELD 5/8" IRON ROD WYPC "GILBERT PLS 60121" FLUSH SET IN P.P. 2011-021
FOUND AND HELD 5/8" IRON ROD WYPC "FOSTER LS 1934" UP .1' AS SHOWN IN P.P. 2011-021
FOUND AND HELD 5/8" IRON ROD WYPC "FOSTER LS 1934" UP 0.1' AS SHOWN IN P.P. 2011-021
FOUND AND HELD 5/8" IRON ROD WYPC "FOSTER LS 1934" FLUSH AS SHOWN IN P.P. 2011-021
FOUND AND HELD 5/8" IRON ROD WYPC "FOSTER LS 1934" DOWN 1.5' AS SHOWN IN P.P. 2011-021
FOUND AND HELD 5/8" IRON ROD WYPC "GILBERT PLS 60121" FLUSH SET IN P.P. 2011-021
FOUND AND HELD 5/8" IRON ROD WYPC "FOSTER LS 1934" FLUSH AS SHOWN IN P.P. 2011-021
FOUND AND HELD 5/8" IRON ROD "FOSTER LS 1934" DOWN 0.8' AS SHOWN IN P.P. 2011-021
FOUND AND HELD 5/8" IRON ROD WYPC "GILBERT PLS 60121" FLUSH SET IN P.P. 2011-021
FOUND AND HELD 5/8" IRON ROD "FOSTER LS 1934" DOWN 0.8' AS SHOWN IN P.P. 2011-021
R=5809.58'
Δ=1°50'34"
L=186.85'
CB=S 62°04'37" E
CD=186.84'
S 64°08'14" E 272.96' (272.89' R1) HELD CHORD
N 56°38'10" E 334.78'
N 56°38'10" E 230.16'
N 00°05'53" W 447.94' (447.95' R1)
S 33°35'15" E 138.16'
S 64°08'11" E 160.06'
S 64°08'11" E 180.40'
S 24°07'27" E 319.63'
S 24°07'27" W 163.33' (163.33' R1)
S 66°02'21" E 282.59' (282.59' R1)
N 39°21'11" W 390.19' (390.04' R1)
N 83°43'59" E 136.62'
S 75°38'46" E 222.24'
S 79°23'29" E 274.27'
S 63°48'05" E 215.08'
S 65°03'40" E 242.06'
S 23°38'53" W 293.11' (303.07' R1)
S 23°56'32" W 595.38' (595.16' R1)
N 80°39'06" W 105.29' (105.32' R1)
N 73°00'27" W 209.65' (209.67' R1)
74.10'
214.14'
150.21'
220.47'
44.68'
CURVE TABLE
CURVE | RADIUS | DELTA | ARC DIST. | CHORD BEARING | CHORD DIST.
C1 | 25.00' | 21°07'00" | 9.21' | N 23°01'44" W | 9.16'
C2 | 110.00' | 23°45'04" | 45.60' | S 24°20'46" E | 45.27'
C3 | 25.00' | 82°05'07" | 35.82' | N 04°49'15" E | 32.83'
C4 | 30.00' | 46°24'58" | 24.30' | N 69°04'18" E | 23.64'
C5 | 29.98' | 37°16'59" | 19.51' | S 27°13'42" W | 19.17'
C6 | 25.00' | 70°00'00" | 30.54' | S 80°51'49" W | 28.68'
C7 | 80.00' | 58°51'16" | 82.18' | S 34°42'33" E | 78.61'
LINE TABLE
LINE | BEARING | DISTANCE
L1 | N 02°58'02" E | 28.16'
L2 | N 76°57'58" W | 76.46'
L3 | S 05°36'12" W | 31.92'
L4 | S 50°11'12" W | 26.89'
L5 | N 25°51'49" E | 46.98'
L6 | S 33°34'50" E | 67.32'
L7 | S 56°38'10" W | 27.99'
L8 | S 45°51'49" W | 84.17'
L9 | S 45°51'49" W | 106.63'
L10 | S 64°08'11" E | 91.77'
L11 | N 25°51'49" E | 30.00'
L12 | N 64°08'11" W | 114.37'
L13 | N 33°35'15" W | 77.91'
L14 | N 65°17'33" W | 111.11'
L15 | N 76°11'57" W | 199.93'
L16 | S 77°16'06" W | 22.25'
L17 | N 77°13'49" W | 91.77'
L18 | S 26°06'16" W | 50.28'
REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON JAN. 16, 1996 TONY J. BROOKS 2736
RENEWAL 12/31/17
SIGNED: _____
60 30 0 60 90 120
SCALE 1 INCH = 60 FEET
BASIS OF BEARING:
OCRS SALEM DATUM IS NAD 83 (2011) EPOCH 2010.00 INTERNATIONAL FEET
CONTROL WAS ESTABLISHED WITH A TRIMBLE R8 MODEL 3 GPS UNIT AND TRIMBLE VRSNOW OREGON GPS NETWORK
Ag Geospatial NW
Ag spatial Data Management & Land Surveying & GIS
30532 S McCown Road, Molalla, OR 97038
503-329-8006 cell/text
info@AgGeoNW.com www.AgGeoNW.com

EXISTING CONDITIONS SURVEY

OF PARCEL 1
PARTITION PLAT NO. 2011-021
IN THE SE 1/4 OF SECTION 10
T. 2 S., R. 4 E., W.M.
CITY OF SANDY,
CLACKAMAS COUNTY, OREGON
SHEET 1 OF 1



LEGEND:

- INDICATES WATER VALVE
- INDICATES FIRE HYDRANT
- INDICATES TELEPHONE PEDESTAL
- INDICATES SIGN (SEE SIGN TABLE FOR DESC.)
- INDICATES POWER POLE
- INDICATES GUY ANCHOR
- INDICATES LIGHT POLE
- INDICATES GAS VAULT
- INDICATES GAS RISER
- INDICATES ELECTRIC VAULT
- INDICATES TELEPHONE PEDESTAL
- INDICATES TELEPHONE MANHOLE
- INDICATES SANITARY SEWER MANHOLE
- INDICATES STORM SEWER MANHOLE
- INDICATES SANITARY CLEANOUT
- INDICATES CATCH BASIN
- INDICATES BOUNDARY
- INDICATES EDGE OF ASPHALT
- INDICATES EDGE OF CONCRETE
- INDICATES 5 FOOT INTERVAL CONTOUR
- INDICATES 1 FOOT INTERVAL CONTOUR
- INDICATES FENCE LINE
- INDICATES EDGE OF BRUSH
- INDICATES FIBER OPTIC LOCATE
- INDICATES GAS LOCATE
- INDICATES SANITARY LOCATE
- INDICATES STORM LOCATE

NOTES:
1. BOUNDARY CALCULATED PER FOUND MONUMENTS OF PARTITION PLAT NO. 2011-021

HORIZONTAL DATUM:
OCRS SALEM DATUM IS NAD 83 (2011) EPOCH 2010.00 INTERNATIONAL FEET CONTROL WAS ESTABLISHED WITH A TRIMBLE R8 MODEL 3 GPS UNIT AND TRIMBLE VRSNOW OREGON GPS NETWORK.

VERTICAL DATUM:
NAVD 88 ESTABLISHED WITH A TRIMBLE R8 MODEL 3 GPS UNIT AND TRIMBLE VRSNOW OREGON GPS NETWORK.

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 02°58'02" E	28.16'
L2	N 76°57'58" W	76.46'
L3	S 05°36'12" W	31.92'
L4	S 50°11'12" W	26.89'

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JAN. 16, 1996
TONY J. BROOKS
2756

RENEWAL: 12/31/19
SIGNED: _____

N

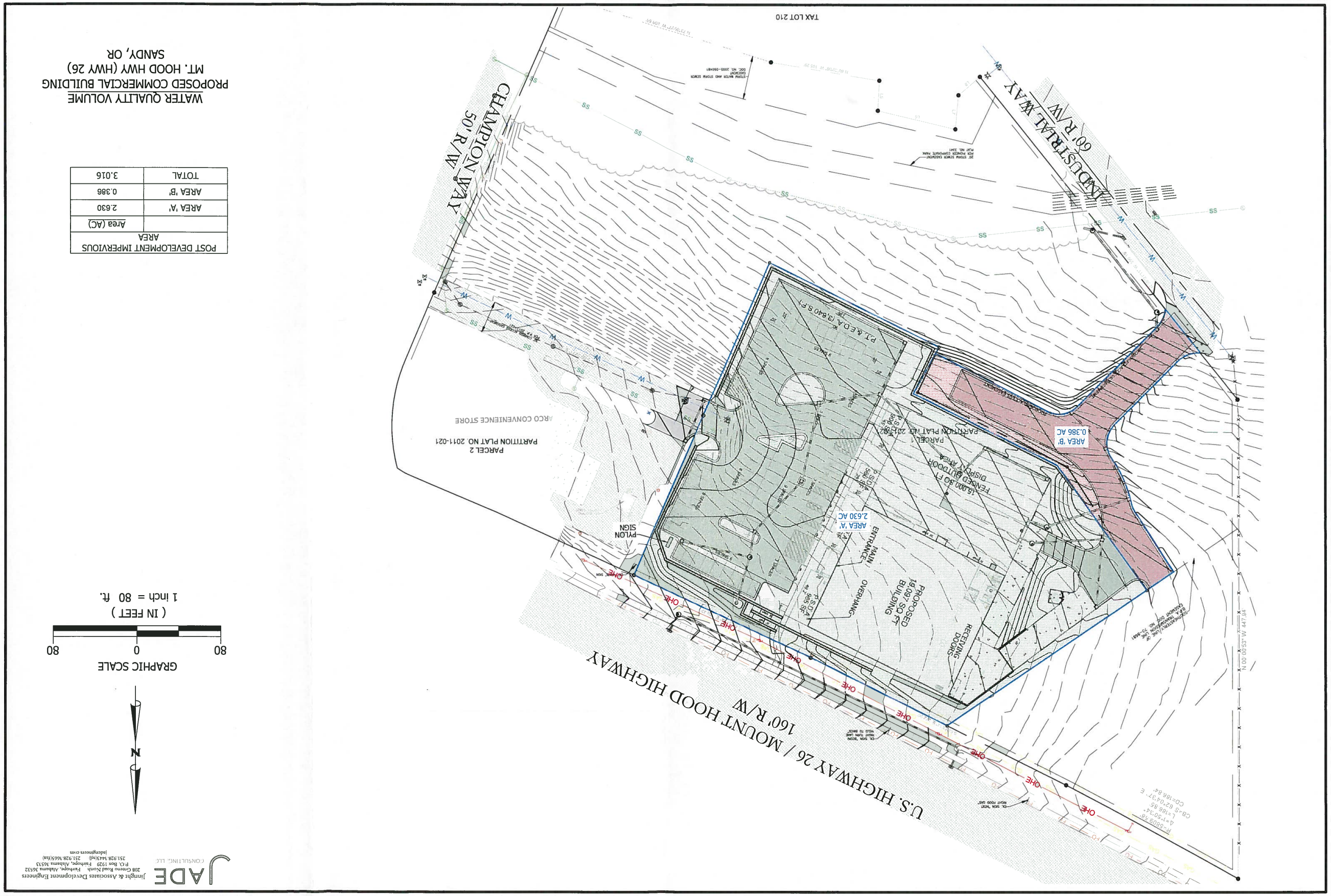
40 20 0 40 60 80
SCALE 1 INCH = 40 FEET

Client: 18-002

Ag Geospatial NW
Ag spatial Data Management
+
Land Surveying & GIS
30532 S McCown Road, Molalla, OR 97038
503-329-8008 cell/text
info@AgGeoNW.com www.AgGeoNW.com

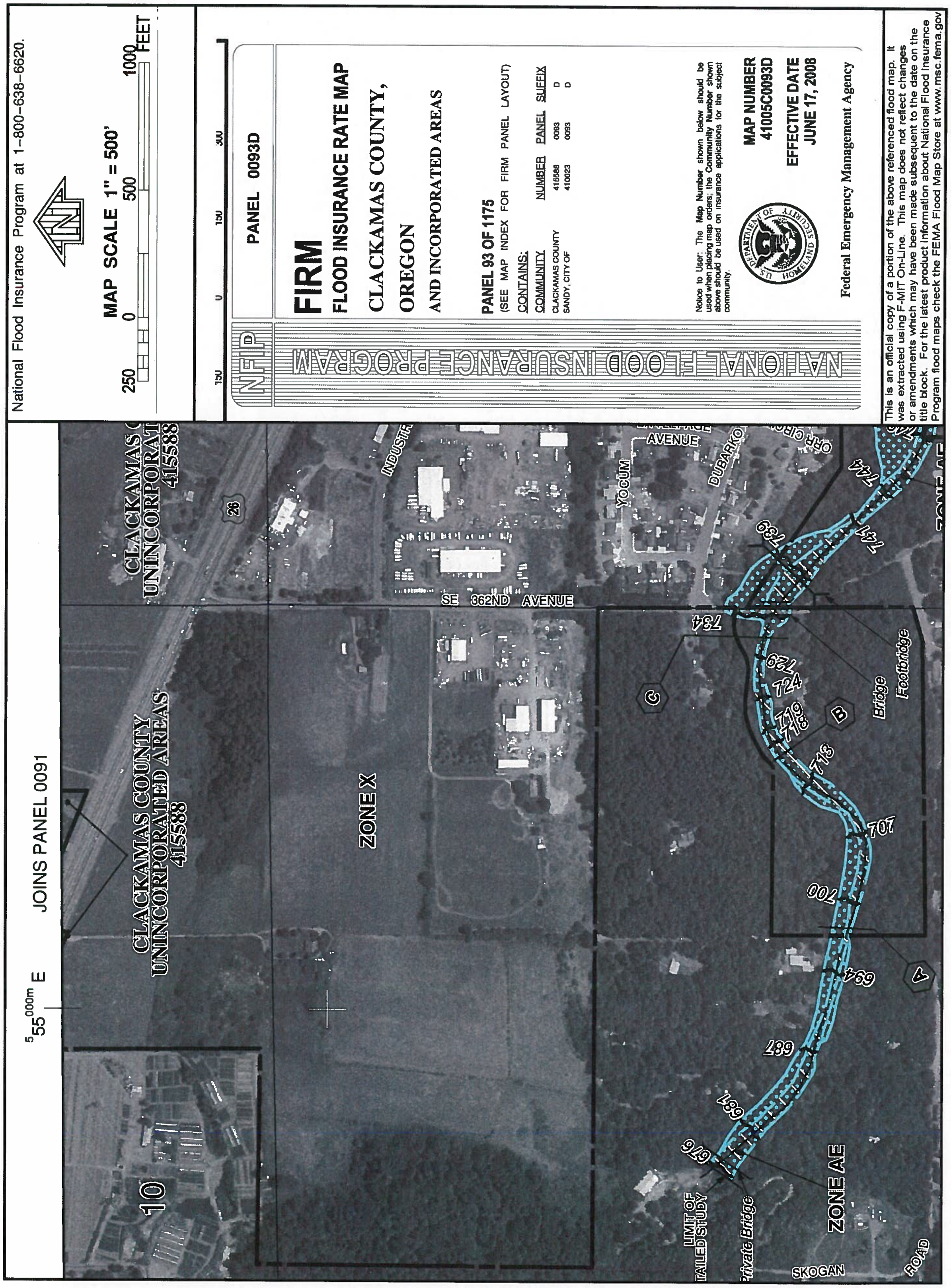
WATER QUALITY VOLUME
PROPOSED COMMERCIAL BUILDING
MT. HOOD HWY (HWY 26)
SANDY, OR

POST DEVELOPMENT IMPERVIOUS AREA	
	Area (AC)
AREA 'A'	2.630
AREA 'B'	0.386
TOTAL	3.016



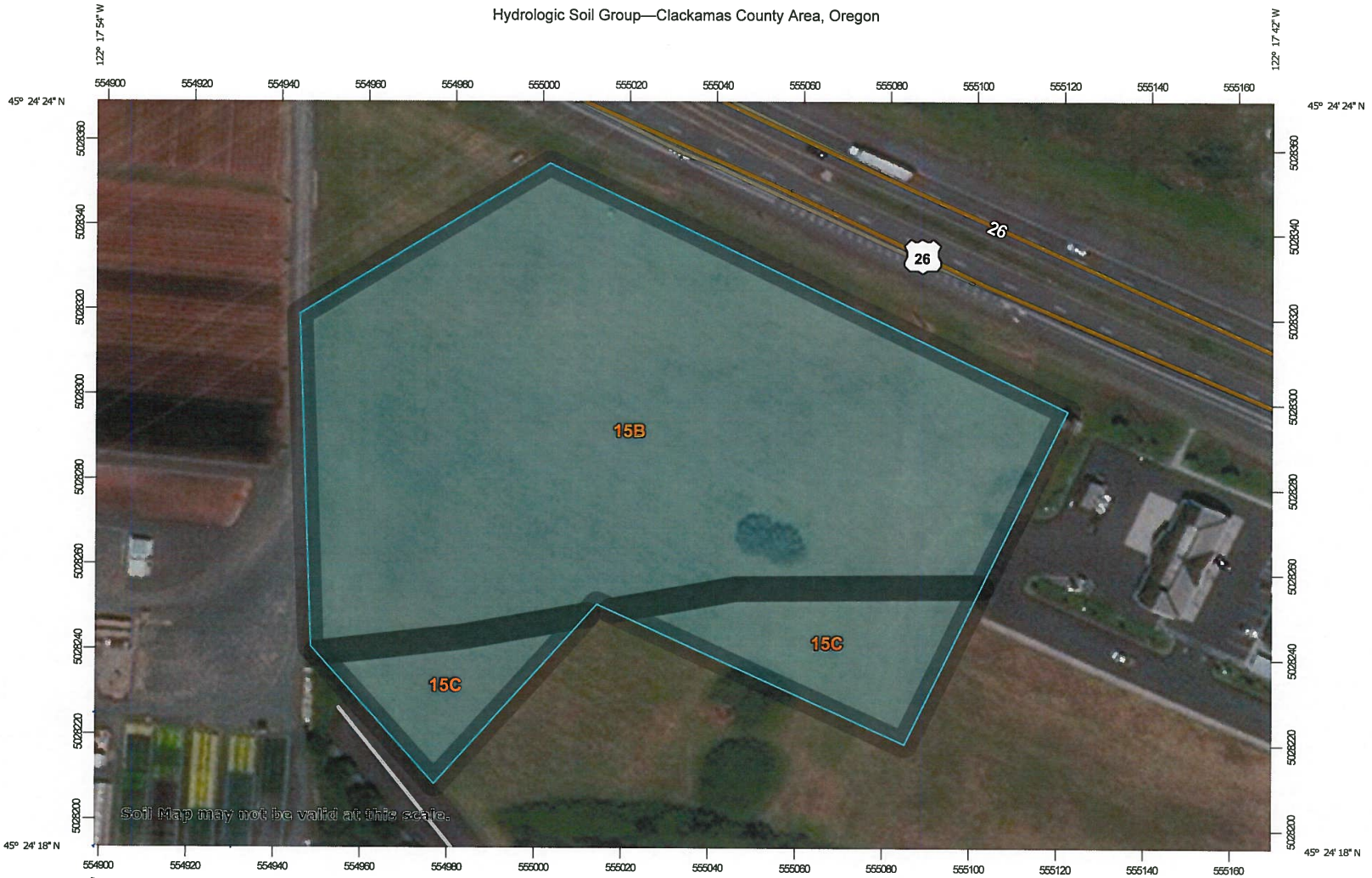
JADE CONSULTING, LLC
Jinright & Associates Development Engineers
208 Cypress Road North Pinehope, Alabama 36513
P.O. Box 1929 Fairhope, Alabama 36533
251.928.3443(tel) 251.928.3665(fax)
jadeengineers.com

APPENDIX B – FIRM Map


National Flood Insurance Program at 1-800-638-6620.
MAP SCALE 1" = 500'
250 0 500 1000
FEET
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0093D
FIRM
FLOOD INSURANCE RATE MAP
CLACKAMAS COUNTY,
OREGON
AND INCORPORATED AREAS
PANEL 93 OF 1175
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
CLACKAMAS COUNTY 415588 0093 D
SANDY, CITY OF 410023 0093 D
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
41005C0093D
EFFECTIVE DATE
JUNE 17, 2008
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov
JOINS PANEL 0091
CLACKAMAS COUNTY
UNINCORPORATED AREAS
415588
ZONE X
ZONE AE
SE 362ND AVENUE
YOCUM
DUBARKO
AVENUE
Bridge
Footbridge
Private Bridge
SKOGAN
ROAD
10
734
739
741
744
729
724
719
718
707
700
694
687
681
676

APPENDIX C – NRCS Soils Map

Hydrologic Soil Group—Clackamas County Area, Oregon



Map Scale: 1:1,240 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 12, Sep 19, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 2, 2015—Sep 21, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
15B	Cazadero silty clay loam, 0 to 7 percent slopes	C	3.4	83.3%
15C	Cazadero silty clay loam, 7 to 12 percent slopes	C	0.7	16.7%
Totals for Area of Interest			**4.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

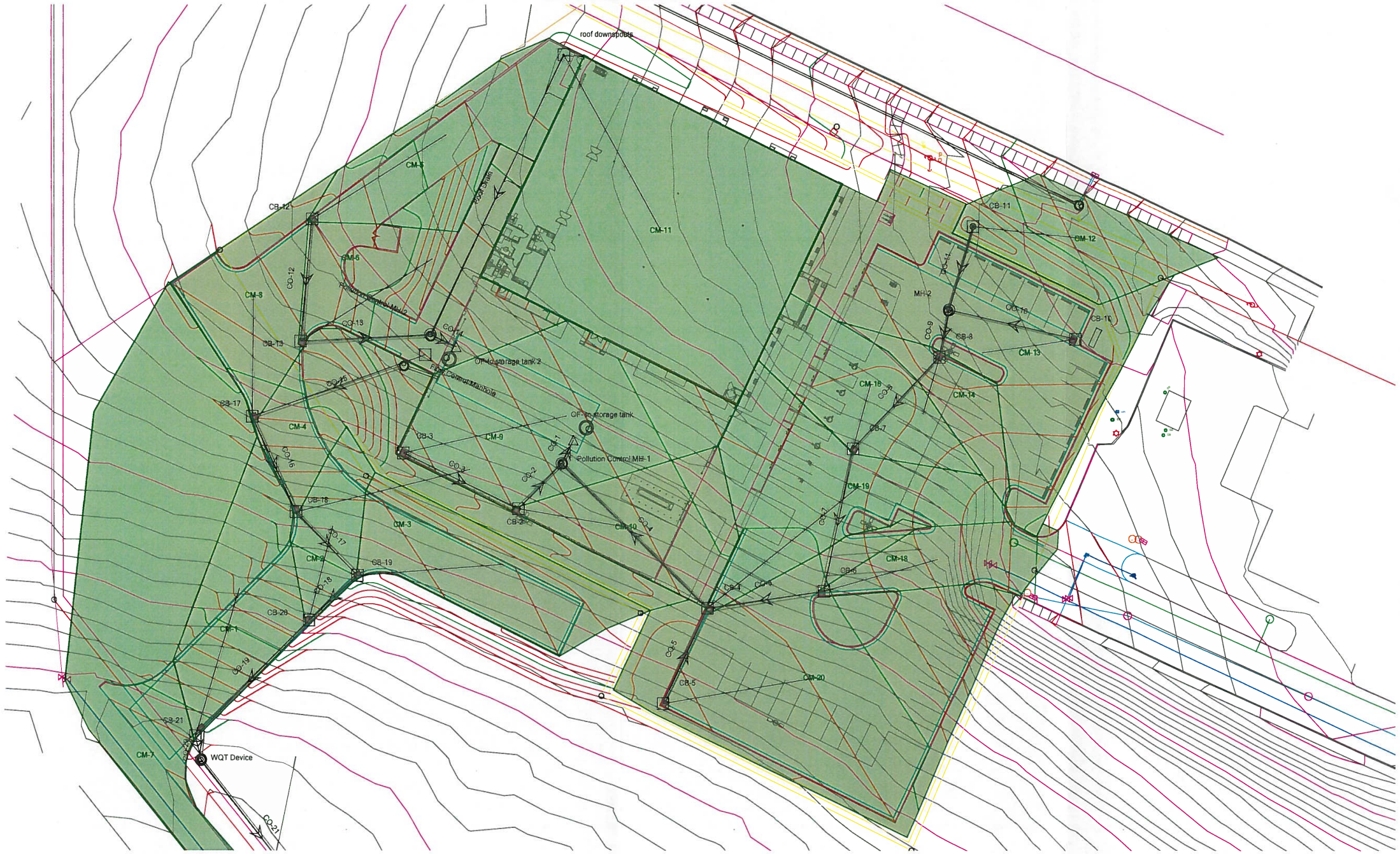
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

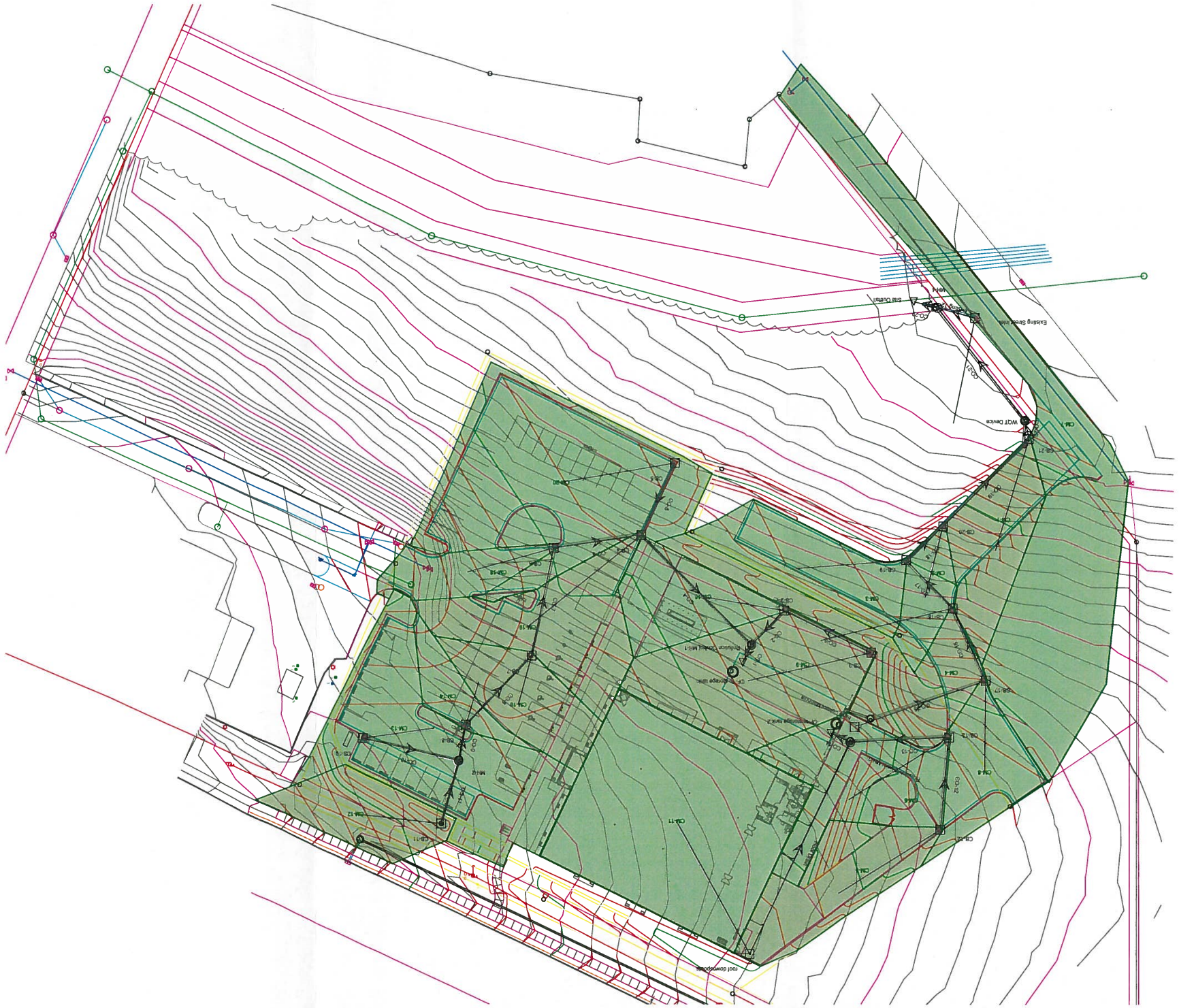
Tie-break Rule: Higher

APPENDIX D – Pipe Network Calculations

Scenario: Base



Bentley Systems, Inc. Haestad Methods Solution Center
27 Siemon Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666



Conduit FlexTable: Combined Pipe/Node Report (TSC Sandy Or.stc)

Label	Start Node	Stop Node	Length (User Defined) (ft)	Diameter (in)	Number of Barrels	Slope (ft/ft)	Upstream Inlet Area (acres)	Upstream Inlet C	Upstream Intensity (in/h)	Upstream Structure Flow (Total Surface) (ft³/s)	Total Flow (ft³/s)	Invert (Downstream) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation Ground (Stop) (ft)	Invert (Upstream) (ft)	Hydraulic Grade Line (In) (ft)	Elevation Ground (Start) (ft)	Velocity (Average) (ft/s)
CO-5	CB-5	CB-4	52.0	15.0	1	0.010	0.398	0.900	3.320	1.20	1.20	749.19	749.94	753.20	749.71	750.14	752.75	4.02
CO-10	CB-10	MH-2	64.0	12.0	1	0.005	0.311	0.900	3.320	0.94	0.94	751.68	752.15	755.70	752.00	752.42	755.15	2.97
CO-11	CB-11	MH-2	42.0	8.0	1	0.010	0.107	0.900	3.320	0.32	0.32	752.00	752.24	755.70	752.42	752.68	761.50	2.93
CO-9	MH-2	CB-8	20.0	12.0	1	0.010	(N/A)	(N/A)	3.248	0.00	1.23	751.48	751.98	755.70	751.68	752.15	755.70	4.12
CO-8	CB-8	CB-7	64.0	12.0	1	0.010	0.049	0.900	3.232	0.15	1.37	750.84	751.27	755.50	751.48	751.98	755.70	4.24
CO-7	CB-7	CB-6	73.0	15.0	1	0.010	0.111	0.900	3.182	0.33	1.67	749.77	750.31	754.85	750.50	751.01	755.50	4.42
CO-6	CB-6	CB-4	58.0	15.0	1	0.010	0.070	0.900	3.127	0.21	1.84	749.19	749.94	753.20	749.77	750.31	754.85	4.53
CO-4	CB-4	Pollution Control MH-1	104.0	15.0	1	0.010	0.183	0.900	3.084	0.55	3.44	748.15	748.80	753.25	749.19	749.94	753.20	5.35
CO-3	CB-3	CB-2	64.0	12.0	1	0.010	0.238	0.900	3.320	0.72	0.72	746.86	747.29	752.00	747.50	747.85	750.50	3.55
CO-2	CB-2	Pollution Control MH-1	30.0	12.0	1	0.010	0.116	0.900	3.260	0.35	1.05	746.56	746.93	753.25	746.86	747.29	752.00	3.95
CO-1	Pollution Control MH-1	OF- to storage tank	10.0	18.0	1	0.010	(N/A)	(N/A)	3.019	0.00	4.33	743.00	744.43	753.60	743.10	744.48	753.25	3.54
CO-12	CB-12	CB-13	60.0	12.0	1	0.010	0.146	0.900	3.320	0.44	0.44	743.50	744.52	746.50	744.10	744.51	748.00	3.09
CO-13	CB-13	Pollution Control MH-2	65.0	12.0	1	0.005	0.179	0.900	3.255	0.54	0.96	743.17	744.47	752.30	743.50	744.52	746.50	1.22
Roof Drain	roof downspouts	Pollution Control MH-2	160.0	8.0	1	0.030	0.432	0.900	3.320	1.30	1.30	746.20	746.58	752.30	751.00	751.54	756.90	6.32
CO-14	Pollution Control MH-2	OF-to storage tank 2	12.0	12.0	1	0.010	(N/A)	(N/A)	3.078	0.00	2.11	743.00	744.43	752.50	743.12	744.47	752.30	2.69
CO-15	Flow Control Manhole	CB-17	95.0	15.0	1	0.010	(N/A)	(N/A)	3.320	0.00	1.74	739.05	739.62	744.00	740.00	740.52	752.00	4.47
CO-16	CB-17	CB-18	50.0	15.0	1	0.050	0.105	0.900	3.249	0.32	2.05	736.55	737.23	740.50	739.05	739.62	744.00	8.33
CO-17	CB-18	CB-19	44.0	12.0	1	0.050	0.160	0.900	3.229	0.48	2.52	734.35	735.04	740.00	736.55	737.23	740.50	8.98
CO-18	CB-19	CB-20	33.0	15.0	1	0.050	0.136	0.900	3.213	0.41	2.91	732.70	733.09	737.00	734.35	735.04	740.00	9.21
CO-19	CB-20	CB-21	80.0	15.0	1	0.050	0.058	0.900	3.201	0.18	3.07	726.00	726.39	729.50	730.00	730.71	737.00	9.35
CO-20	CB-21	WQT Device	10.0	15.0	1	0.010	0.125	0.900	3.172	0.38	3.42	724.42	725.09	728.90	724.52	725.27	729.50	5.34
CO-21	WQT Device	MH-4	94.0	15.0	1	0.005	(N/A)	(N/A)	3.166	0.00	3.42	723.85	724.60	727.30	724.32	725.13	728.90	4.08
existing 12"	Existing Street inlet	MH-4	24.0	12.0	1	0.017	0.503	0.900	3.320	1.51	1.51	724.37	724.77	727.30	724.79	725.31	726.89	5.34
CO-22	MH-4	Site Outffall	10.0	18.0	1	0.010	(N/A)	(N/A)	3.089	0.00	4.79	723.50	724.25	727.00	723.60	724.44	727.30	5.81

25 year

FlexTable: Catchment Table (TSC Sandy Or.stc)

Label	Use Scaled Area?	Scaled Area (acres)	Area (Unified) (acres)	Rational C	Catchment CA (acres)	Time of Concentration (min)	Outflow Node	Catchment Intensity (in/h)	Catchment Rational Flow (ft^3/s)
CM-1	True	0.125	0.125	0.900	0.113	5.000	CB-21	3.320	0.38
CM-2	True	0.058	0.058	0.900	0.053	5.000	CB-20	3.320	0.18
CM-3	True	0.136	0.136	0.900	0.123	5.000	CB-19	3.320	0.41
CM-4	True	0.160	0.160	0.900	0.144	5.000	CB-18	3.320	0.48
CM-5	True	0.146	0.146	0.900	0.131	5.000	CB-12	3.320	0.44
CM-6	True	0.179	0.179	0.900	0.162	5.000	CB-13	3.320	0.54
CM-7	True	0.503	0.503	0.900	0.452	5.000	Existing Street inlet	3.320	1.51
CM-8	True	0.105	0.105	0.900	0.094	5.000	CB-17	3.320	0.32
CM-9	True	0.238	0.238	0.900	0.215	5.000	CB-3	3.320	0.72
CM-10	True	0.116	0.116	0.900	0.104	5.000	CB-2	3.320	0.35
CM-11	True	0.432	0.432	0.900	0.389	5.000	roof downspouts	3.320	1.30
CM-12	True	0.107	0.107	0.900	0.096	5.000	CB-11	3.320	0.32
CM-13	True	0.311	0.311	0.900	0.280	5.000	CB-10	3.320	0.94
CM-14	True	0.049	0.049	0.900	0.044	5.000	CB-8	3.320	0.15
CM-16	True	0.111	0.111	0.900	0.099	5.000	CB-7	3.320	0.33
CM-18	True	0.070	0.070	0.900	0.063	5.000	CB-6	3.320	0.21
CM-19	True	0.183	0.183	0.900	0.164	5.000	CB-4	3.320	0.55
CM-20	True	0.398	0.398	0.900	0.358	5.000	CB-5	3.320	1.20

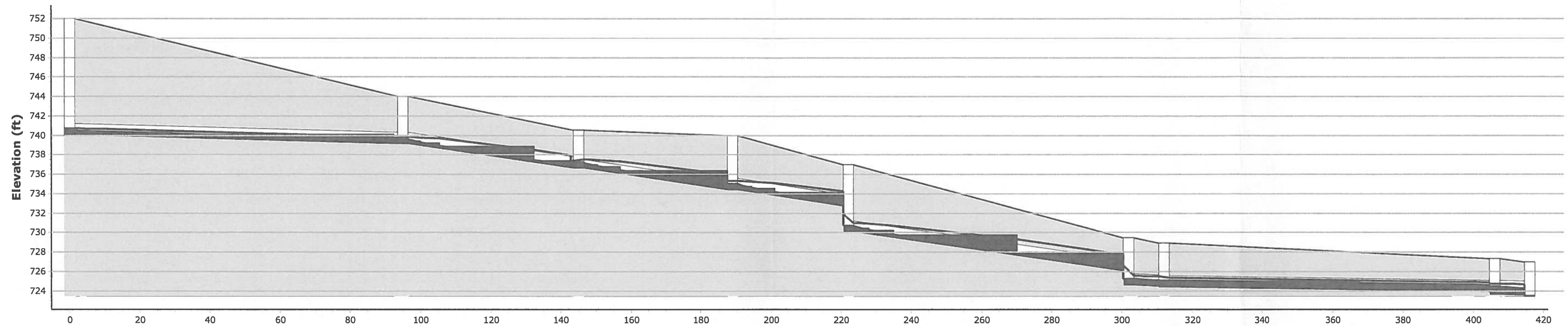
25 YEAR

Bentley Systems, Inc. Haestad Methods Solution Center
27 Siemon Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666

FlexTable: Outfall Table (TSC Sandy Or.stc)

Label	Station (ft)	Elevation (Ground) (ft)	Set Rim to Ground Elevation	Elevation (Invert) (ft)	Boundary Condition Type	Elevation (Tailwater) (ft)
OF- to storage tank	0+00	753.60	True	743.00	User Defined Tailwater	744.43
OF-to storage tank 2	0+00	752.50	True	743.00	User Defined Tailwater	744.43
Site Outffall	0+00	727.00	True	723.50	Free Outfall	0.00

Flow Control Str to Outfall - Base

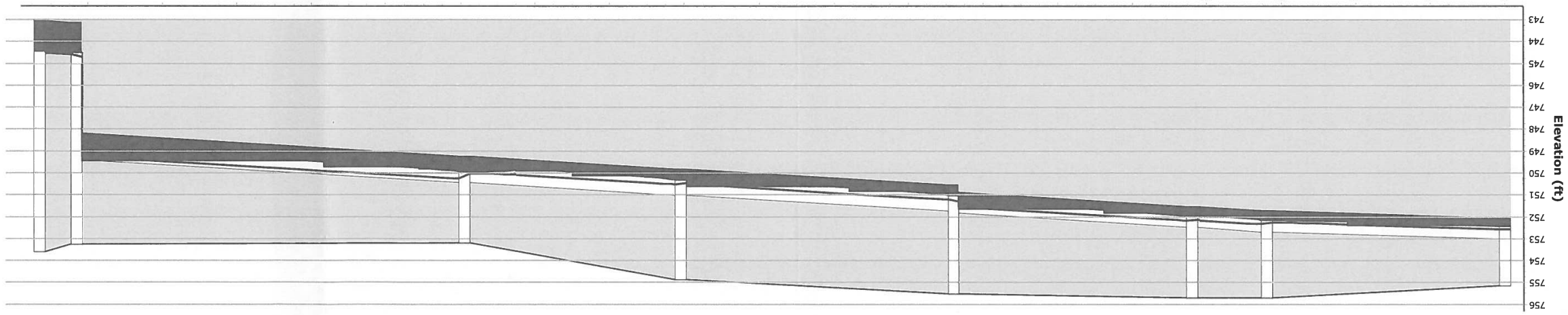


ID\Label	51 \ CO-15	53 \ CO-16	55 \ CO-17	57 \ CO-18	59 \ CO-19	61 \ CO-20	63 \ CO-21	65 \ CO-22
Link Length (ft)	92.0	47.0	41.0	30.0	77.0	7.0	91.0	7.0
Rise (in)\Material	15.0 \	15.0 \	12.0 \	15.0 \	15.0 \	15.0 \	15.0 \	18.0 \
Flow (ft³/s)	1.74	2.05	2.52	2.91	3.07	3.42	3.42	4.79
Slope (ft/ft)	0.010	0.050	0.050	0.050	0.050	0.010	0.005	0.010

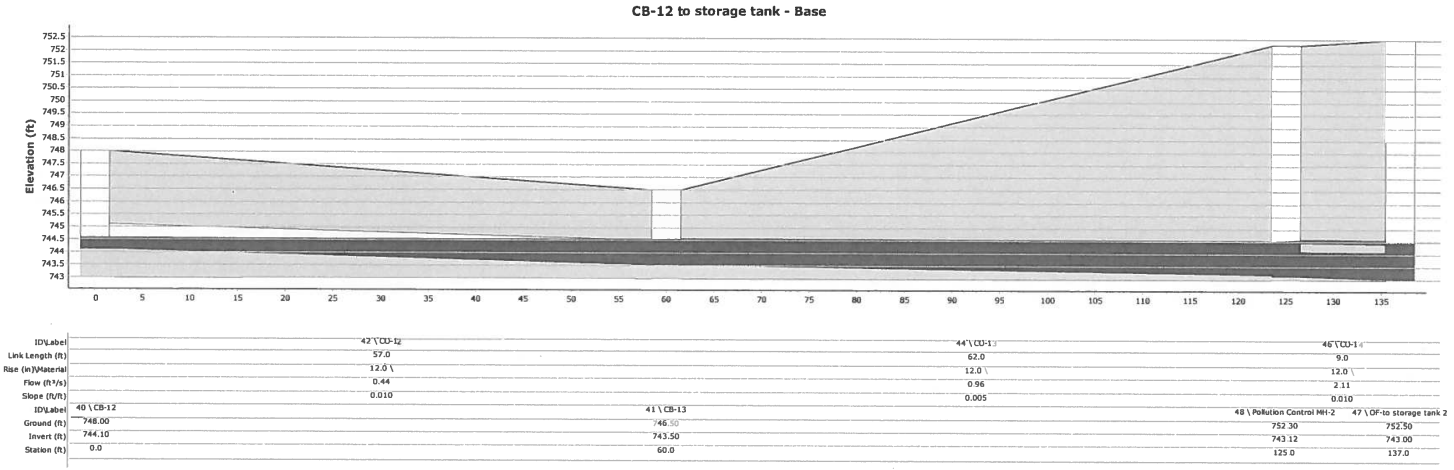
ID\Label	49 \ Flow Control Manhole	50 \ CB-17	52 \ CB-18	54 \ CB-19	56 \ CB-20	58 \ CB-21	WQT Device	67 \ MH-4	Site Outfall
Ground (ft)	752.00	744.00	740.50	740.00	737.00	729.50	728.90	727.30	727.00
Invert (ft)	740.00	739.05	736.55	734.35	730.00	724.52	724.32	723.60	723.50
Station (ft)	0.0	95.0	145.0	189.0	222.0	302.0	312.0	406.0	416.0

25yr

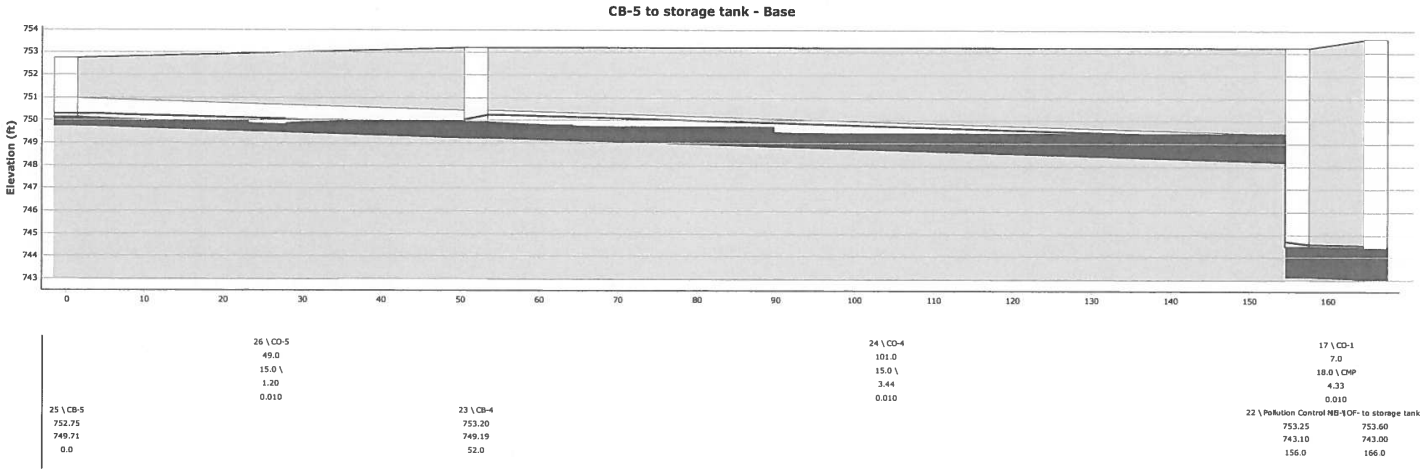
System

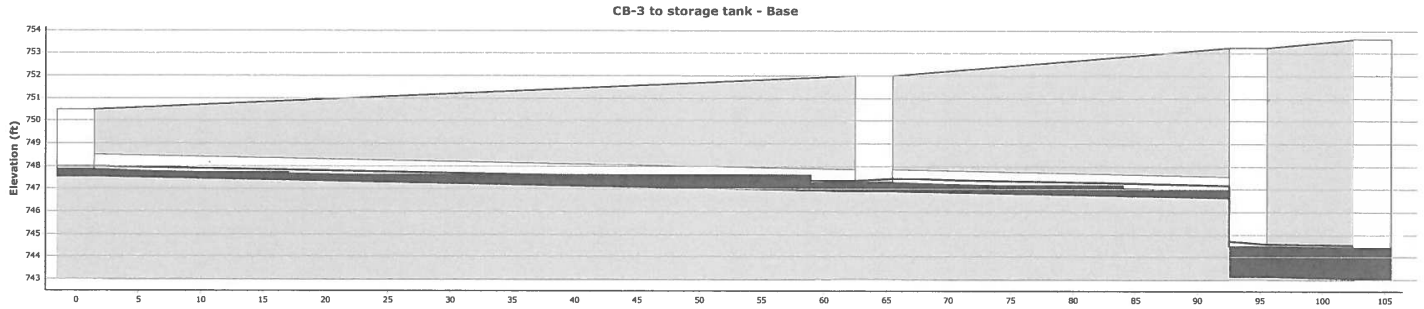


ID\Label	36 \ CO-10	34 \ CO-9	32 \ CO-8	30 \ CO-7	28 \ CO-6	24 \ CO-4	17 \ CO-1
Link Length (ft)	61.0	17.0	61.0	70.0	55.0	101.0	7.0
Rise (in)\Material	12.0 \	12.0 \	12.0 \	15.0 \	15.0 \	15.0 \	18.0 \ CMP
Flow (ft^3/s)	0.94	1.23	1.37	1.67	1.84	3.44	4.33
Slope (ft/ft)	0.005	0.010	0.010	0.010	0.010	0.010	0.010
ID\Label	35 \ CB-10	37 \ MH-2	31 \ CB-8	29 \ CB-7	27 \ CB-6	23 \ CB-4	22 \ Pollutrol Control storage tank
Ground (ft)	755.15	755.70	755.70	755.50	754.85	753.20	753.25 753.60
Invert (ft)	752.00	751.68	751.48	750.50	749.77	749.19	743.10 743.00
Station (ft)	0.0	64.0	84.0	148.0	221.0	279.0	383.0 393.0


CB-12 to storage tank - Base
Elevation (ft)
752.5
752
751.5
751
750.5
750
749.5
749
748.5
748
747.5
747
746.5
746
745.5
745
744.5
744
743.5
743
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
ID\Label
Link Length (ft)
Rise (in)\Material
Flow (ft³/s)
Slope (ft/ft)
ID\Label
Ground (ft)
Invert (ft)
Station (ft)
42 \ CO-12
57.0
12.0 \
0.44
0.010
40 \ CB-12
748.00
744.10
0.0
41 \ CB-13
746.50
743.50
60.0
44 \ CO-13
62.0
12.0 \
0.96
0.005
46 \ CO-14
9.0
12.0 \
2.11
0.010
48 \ Pollution Control MH-2
752.30
743.12
125.0
47 \ OF-to storage tank 2
752.50
743.00
137.0

25 year


CB-5 to storage tank - Base
Elevation (ft)
754
753
752
751
750
749
748
747
746
745
744
743
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
26 \ CO-5
49.0
15.0 \
1.20
0.010
24 \ CO-4
101.0
15.0 \
3.44
0.010
17 \ CO-1
7.0
18.0 \ CMP
4.33
0.010
25 \ CB-5
752.75
749.71
0.0
23 \ CB-4
753.20
749.19
52.0
22 \ Pollution Control NB-1\OF- to storage tank
753.25
743.10
156.0
753.60
743.00
166.0

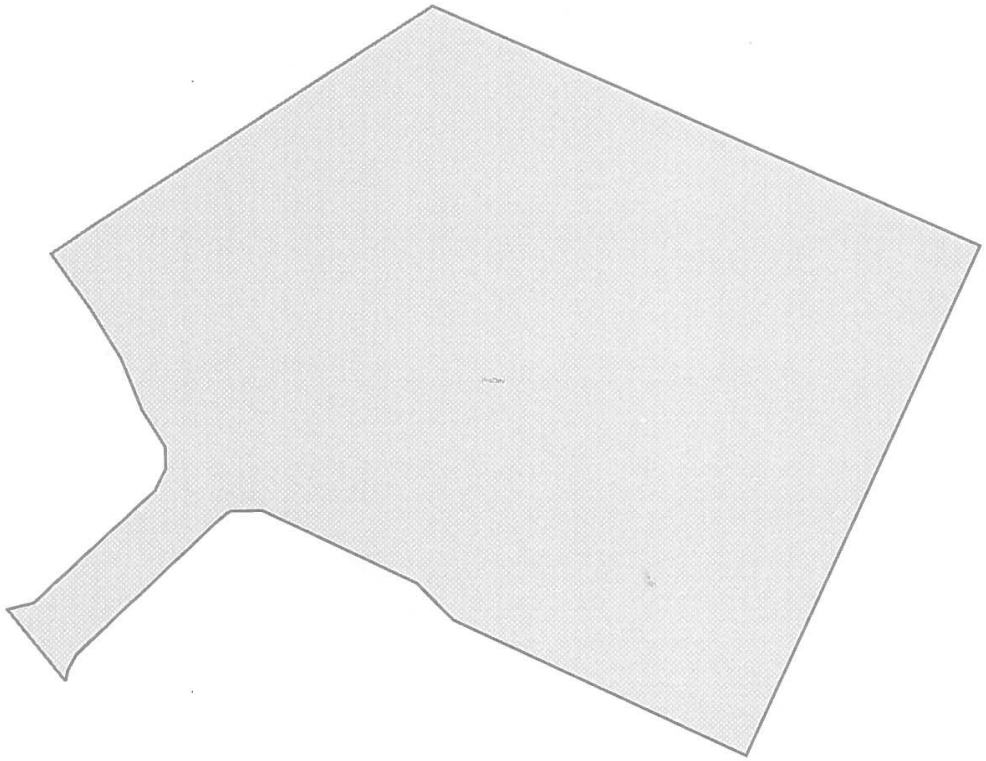


ID\Label		21 \ CO-3		19 \ CO-2	17 \ CO-1	
Link Length (ft)		61.0		27.0	7.0	
Rise (in)\Material		12.0 \		12.0 \	18.0 \ CMP	
Flow (ft³/s)		0.72		1.05	4.33	
Slope (ft/ft)		0.010		0.010	0.010	
ID\Label	20 \ CB-3		18 \ CB-2		22 \ Pollution Control MH-1	15 \ OF- to storage tank
Ground (ft)	750.50		752.00		753.25	753.60
Invert (ft)	747.50		746.86		743.10	743.00
Station (ft)	0.0		64.0		94.0	104.0

25400

APPENDIX E – Pre-Development Vs. Post-Development Routing Calculations

Scenario: Post-Development 2 Year



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Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
PreDev	Pre-Development 2 Year	2	0.392	8.000	1.07
PreDev	Pre-Development 5 Year	5	0.595	7.950	1.72
PreDev	Pre-Development 10 Year	10	0.659	7.900	1.93
PreDev	Pre-Development 25 Year	25	0.811	7.900	2.42
PreDev	Pre-Development 100 Year	100	1.034	7.900	3.16

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
O-1	Pre-Development 2 Year	2	0.392	8.000	1.07
O-1	Pre-Development 5 Year	5	0.595	7.950	1.72
O-1	Pre-Development 10 Year	10	0.659	7.900	1.93
O-1	Pre-Development 25 Year	25	0.811	7.900	2.42
O-1	Pre-Development 100 Year	100	1.034	7.900	3.16

Subsection: Time of Concentration Calculations
Label: PreDev

Return Event: 25 years
Storm Event: 2 Year 24 hour Type 1A

Time of Concentration Results

Segment #1: SCS Lag	
Hydraulic Length	380.00 ft
CN	79.000
Slope	0.103 ft/ft
Average Velocity	1.34 ft/s
Segment Time of Concentration	0.079 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: PreDev

Return Event: 25 years
Storm Event: 2 Year 24 hour Type 1A

==== SCS Lag

Tc = 0.000877 * (Lf**0.8) * ((1000/CN)-9)**0.7) * (Sf**-0.5)

Where:
Tc= Time of concentration, hours
Lf= Flow length, feet
CN= SCS Curve Number
Sf= Slope, ft/ft

Subsection: Unit Hydrograph Summary
Label: PreDev

Return Event: 25 years
Storm Event: 25 Year 24 Hour Type 1A

Storm Event	25 Year 24 Hour Type 1A
Return Event	25 years
Duration	24.000 hours
Depth	5.5 in
Time of Concentration (Composite)	0.083 hours
Scaled Area	3.011 acres
Computational Time Increment	0.011 hours
Time to Peak (Computed)	7.922 hours
Flow (Peak, Computed)	2.43 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	7.900 hours
Flow (Peak Interpolated Output)	2.42 ft³/s
Drainage Area	
SCS CN (Composite)	79.000
Scaled Area	3.011 acres
Maximum Retention (Pervious)	2.7 in
Maximum Retention (Pervious, 20 percent)	0.5 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.2 in
Runoff Volume (Pervious)	0.812 ac-ft

Subsection: Unit Hydrograph Summary
Label: PreDev

Return Event: 25 years
Storm Event: 25 Year 24 Hour Type 1A

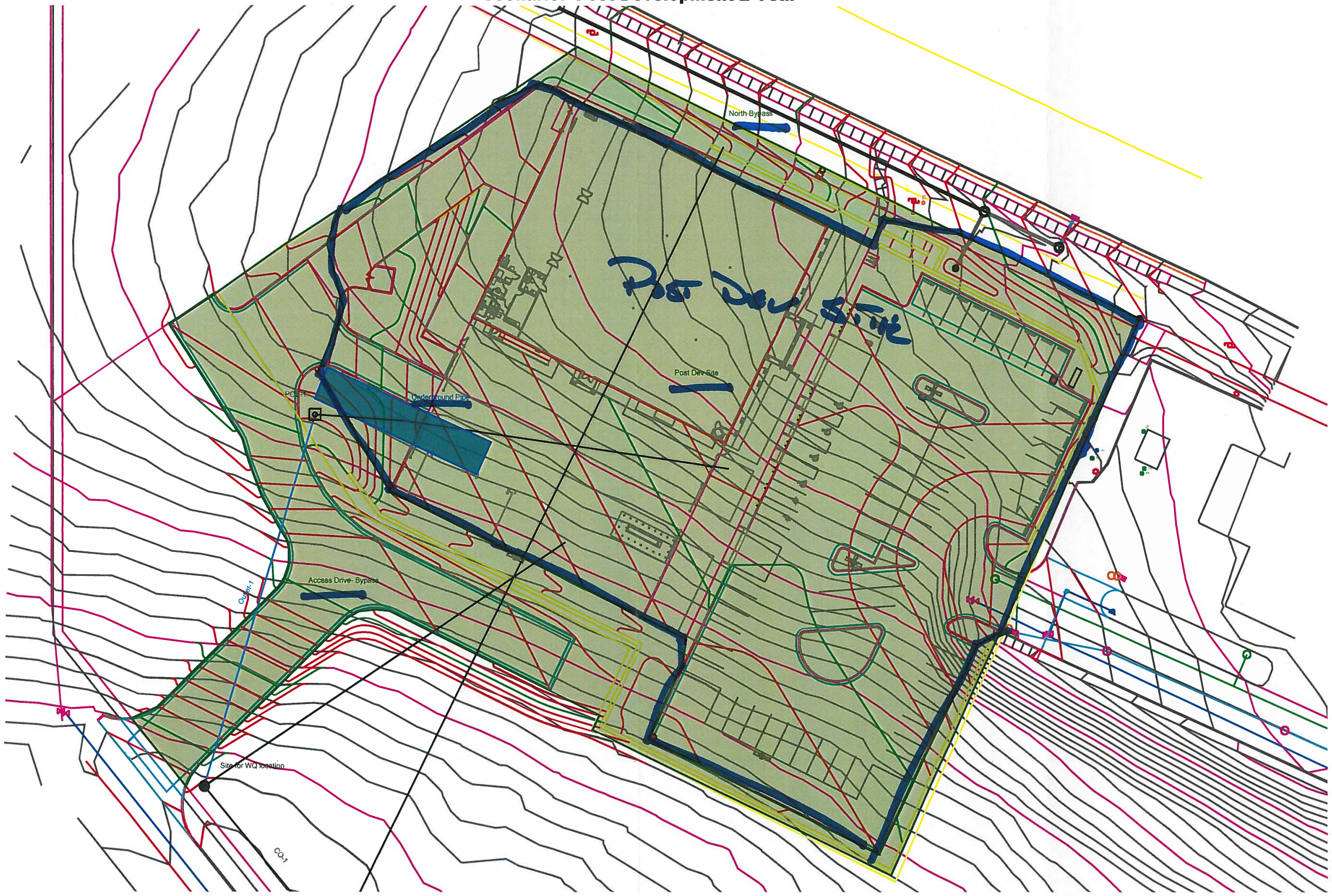
Cumulative Runoff	

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.811 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	40.94 ft^3/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Index

Scenario: Post-Development 2 Year



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Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
Post Dev Site	Post-Development 2 Year	2	0.566	7.850	1.76
Post Dev Site	Post-Development 5 Year	5	0.750	7.850	2.32
Post Dev Site	Post-Development 10 Year	10	0.805	7.850	2.49
Post Dev Site	Post-Development 25 Year	25	0.934	7.850	2.87
Post Dev Site	Post-Development 100 Year	100	1.119	7.850	3.42
Access Drive- Bypass	Post-Development 2 Year	2	0.120	7.900	0.37
Access Drive- Bypass	Post-Development 5 Year	5	0.171	7.900	0.53
Access Drive- Bypass	Post-Development 10 Year	10	0.186	7.900	0.58
Access Drive- Bypass	Post-Development 25 Year	25	0.223	7.900	0.70
Access Drive- Bypass	Post-Development 100 Year	100	0.276	7.900	0.87
North Bypass	Post-Development 2 Year	2	0.012	8.000	0.03
North Bypass	Post-Development 5 Year	5	0.020	8.000	0.05
North Bypass	Post-Development 10 Year	10	0.022	8.000	0.06
North Bypass	Post-Development 25 Year	25	0.028	7.950	0.08
North Bypass	Post-Development 100 Year	100	0.036	7.950	0.11

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
O-1	Post-Development 2 Year	2	0.692	8.000	0.98
O-1	Post-Development 5 Year	5	0.932	8.200	1.41
O-1	Post-Development 10 Year	10	1.003	8.100	1.72
O-1	Post-Development 25 Year	25	1.171	8.050	2.36
O-1	Post-Development 100 Year	100	1.412	8.000	4.31
Site for WQ location	Post-Development 2 Year	2	0.680	8.000	0.95
Site for WQ location	Post-Development 5 Year	5	0.913	8.200	1.38
Site for WQ location	Post-Development 10 Year	10	0.982	8.050	1.68

PRE DEV
cfs
1.07
1.73
1.93
2.42
POST < PRE
ok.

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
Site for WQ location	Post-Development 25 Year	25	1.144	8.000	2.29
Site for WQ location	Post-Development 100 Year	100	1.376	7.950	4.28

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Underground Pipe (IN)	Post-Development 2 Year	2	0.566	7.850	1.76	(N/A)	(N/A)
Underground Pipe (OUT)	Post-Development 2 Year	2	0.560	8.700	0.64	742.80	0.089
Underground Pipe (IN)	Post-Development 5 Year	5	0.750	7.850	2.32	(N/A)	(N/A)
Underground Pipe (OUT)	Post-Development 5 Year	5	0.742	8.300	1.10	743.67	0.121
Underground Pipe (IN)	Post-Development 10 Year	10	0.805	7.850	2.49	(N/A)	(N/A)
Underground Pipe (OUT)	Post-Development 10 Year	10	0.796	8.200	1.32	743.87	0.128
Underground Pipe (IN)	Post-Development 25 Year	25	0.934	7.850	2.87	(N/A)	(N/A)
Underground Pipe (OUT)	Post-Development 25 Year	25	0.921	8.150	1.74	744.43	0.145
Underground Pipe (IN)	Post-Development 100 Year	100	1.119	7.850	3.42	(N/A)	(N/A)
Underground Pipe (OUT)	Post-Development 100 Year	100	1.101	7.950	3.43	744.99	0.155

TOP OF PIPE 745.00

Subsection: Time of Concentration Calculations
Label: Access Drive- Bypass

Return Event: 25 years
Storm Event: 2 Year 24 hour Type 1A

Time of Concentration Results

Segment #1: SCS Lag	
Hydraulic Length	250.00 ft
CN	88.000
Slope	0.080 ft/ft
Average Velocity	1.48 ft/s
Segment Time of Concentration	0.047 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

==== SCS Lag

Tc = 0.000877 * (Lf**0.8) * ((1000/CN)-9)**0.7) * (Sf**-0.5)

Where:
Tc= Time of concentration, hours
Lf= Flow length, feet
CN= SCS Curve Number
Sf= Slope, ft/ft

Subsection: Time of Concentration Calculations
Label: North Bypass

Return Event: 25 years
Storm Event: 2 Year 24 hour Type 1A

Time of Concentration Results	
Segment #1: SCS Lag	
Hydraulic Length	400.00 ft
CN	74.000
Slope	0.100 ft/ft
Average Velocity	1.16 ft/s
Segment Time of Concentration	0.096 hours
Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	400.00 ft
Is Paved?	False
Slope	0.100 ft/ft
Average Velocity	5.10 ft/s
Segment Time of Concentration	0.022 hours
Time of Concentration (Composite)	
Time of Concentration (Composite)	0.118 hours

==== SCS Lag

Tc = 0.000877 * (Lf**0.8) * ((1000/CN)-9)**0.7) * (Sf**-0.5)

Where:
Tc= Time of concentration, hours
Lf= Flow length, feet
CN= SCS Curve Number
Sf= Slope, ft/ft

==== SCS TR-55 Shallow Concentration Flow

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Tc =

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

Subsection: Time of Concentration Calculations
Label: Post Dev Site

Return Event: 10 years
Storm Event: 2 Year 24 hour Type 1A

Time of Concentration Results

Segment #1: SCS Lag	
Hydraulic Length	300.00 ft
CN	96.000
Slope	0.020 ft/ft
Average Velocity	1.10 ft/s
Segment Time of Concentration	0.076 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

==== SCS Lag

Tc = 0.000877 * (Lf**0.8) * ((1000/CN)-9)**0.7) * (Sf**-0.5)

Where:
Tc= Time of concentration, hours
Lf= Flow length, feet
CN= SCS Curve Number
Sf= Slope, ft/ft

Subsection: Unit Hydrograph Summary
Label: Access Drive- Bypass

Return Event: 25 years
Storm Event: 25 Year 24 Hour Type 1A

Storm Event	25 Year 24 Hour Type 1A
Return Event	25 years
Duration	24.000 hours
Depth	5.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	0.663 acres
Computational Time Increment	0.011 hours
Time to Peak (Computed)	7.911 hours
Flow (Peak, Computed)	0.70 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	7.900 hours
Flow (Peak Interpolated Output)	0.70 ft³/s
Drainage Area	
SCS CN (Composite)	87.000
Area (User Defined)	0.663 acres
Maximum Retention (Pervious)	1.5 in
Maximum Retention (Pervious, 20 percent)	0.3 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.0 in
Runoff Volume (Pervious)	0.223 ac-ft

Subsection: Unit Hydrograph Summary
Label: Access Drive- Bypass

Return Event: 25 years
Storm Event: 25 Year 24 Hour Type 1A

Cumulative Runoff	

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.223 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	9.01 ft^3/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph Summary
Label: North Bypass

Return Event: 25 years
Storm Event: 25 Year 24 Hour Type 1A

Storm Event	25 Year 24 Hour Type 1A
Return Event	25 years
Duration	24.000 hours
Depth	5.5 in
Time of Concentration (Composite)	0.118 hours
Scaled Area	0.121 acres
Computational Time Increment	0.016 hours
Time to Peak (Computed)	7.954 hours
Flow (Peak, Computed)	0.08 ft^3/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	7.950 hours
Flow (Peak Interpolated Output)	0.08 ft^3/s
Drainage Area	
SCS CN (Composite)	74.000
Scaled Area	0.121 acres
Maximum Retention (Pervious)	3.5 in
Maximum Retention (Pervious, 20 percent)	0.7 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.8 in
Runoff Volume (Pervious)	0.028 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.028 ac-ft
SCS Unit Hydrograph Parameters	

Subsection: Unit Hydrograph Summary
Label: North Bypass

Return Event: 25 years
Storm Event: 25 Year 24 Hour Type 1A

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.118 hours
Computational Time Increment	0.016 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1.16 ft^3/s
Unit peak time, Tp	0.079 hours
Unit receding limb, Tr	0.314 hours
Total unit time, Tb	0.393 hours

Subsection: Unit Hydrograph Summary
Label: Post Dev Site

Return Event: 25 years
Storm Event: 25 Year 24 Hour Type 1A

Storm Event	25 Year 24 Hour Type 1A
Return Event	25 years
Duration	24.000 hours
Depth	5.5 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	2.232 acres
Computational Time Increment	0.011 hours
Time to Peak (Computed)	7.833 hours
Flow (Peak, Computed)	2.88 ft^3/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	7.850 hours
Flow (Peak Interpolated Output)	2.87 ft^3/s
Drainage Area	
SCS CN (Composite)	96.000
Area (User Defined)	2.232 acres
Maximum Retention (Pervious)	0.4 in
Maximum Retention (Pervious, 20 percent)	0.1 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.0 in
Runoff Volume (Pervious)	0.936 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.934 ac-ft
SCS Unit Hydrograph Parameters	

Subsection: Unit Hydrograph Summary
Label: Post Dev Site

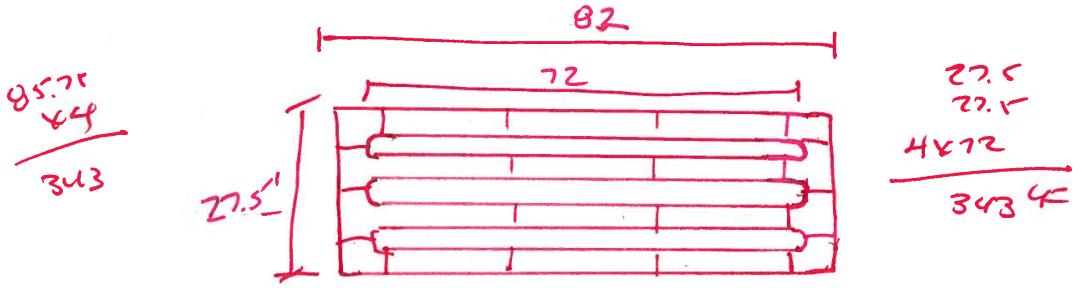
Return Event: 25 years
Storm Event: 25 Year 24 Hour Type 1A

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	30.35 ft^3/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Pipe Volume
Label: Underground Pipe

Return Event: 25 years
Storm Event: 2 Year 24 hour Type 1A

Volume Results (Pipe)	
Pipe Storage Upstream Invert	740.00 ft
Pipe Storage Downstream Invert	740.00 ft
Pipe Storage Length	85.75 ft
Pipe Storage Diameter	60.0 in
Pipe Storage Number of Barrels	4
Pipe Storage Slice Width	0.25 ft
Pipe Storage Vertical Increment	0.25 ft



Elevation (ft)	Perpendicular Downstream Depth (ft)	Perpendicular Downstream Area (ft²)	Wetted Length (ft)	Filled Length (ft)	Perpendicular Upstream Depth (ft)	Perpendicular Upstream Area (ft²)	Total Volume (ac-ft)
740.00	0.00	0.0	85.75	0.00	0.00	0.0	0.000
740.25	0.25	0.4	85.75	0.00	0.25	0.4	0.003
740.50	0.50	1.0	85.75	0.00	0.50	1.0	0.008
740.75	0.75	1.8	85.75	0.00	0.75	1.8	0.015
741.00	1.00	2.8	85.75	0.00	1.00	2.8	0.022
741.25	1.25	3.8	85.75	0.00	1.25	3.8	0.030
741.50	1.50	5.0	85.75	0.00	1.50	5.0	0.039
741.75	1.75	6.1	85.75	0.00	1.75	6.1	0.048
742.00	2.00	7.3	85.75	0.00	2.00	7.3	0.058
742.25	2.25	8.6	85.75	0.00	2.25	8.6	0.067
742.50	2.50	9.8	85.75	0.00	2.50	9.8	0.077
742.75	2.75	11.1	85.75	0.00	2.75	11.1	0.087
743.00	3.00	12.3	85.75	0.00	3.00	12.3	0.097
743.25	3.25	13.5	85.75	0.00	3.25	13.5	0.106
743.50	3.50	14.7	85.75	0.00	3.50	14.7	0.116
743.75	3.75	15.8	85.75	0.00	3.75	15.8	0.124
744.00	4.00	16.8	85.75	0.00	4.00	16.8	0.133
744.25	4.25	17.8	85.75	0.00	4.25	17.8	0.140
744.50	4.50	18.6	85.75	0.00	4.50	18.6	0.147
744.75	4.75	19.3	85.75	0.00	4.75	19.3	0.152
745.00	5.00	19.6	85.75	85.75	5.00	19.6	0.155

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1

Return Event: 25 years
Storm Event: 2 Year 24 hour Type 1A

Requested Pond Water Surface Elevations	
Minimum (Headwater)	740.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	745.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 2	Forward	Culvert - 1	743.20	745.00
Stand Pipe	Riser - 1	Forward	Culvert - 1	744.75	745.00
Orifice-Circular	Orifice - 1	Forward	Culvert - 1	740.00	745.00
Culvert-Circular	Culvert - 1	Forward	TW	740.00	745.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1

Return Event: 25 years
Storm Event: 2 Year 24 hour Type 1A

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	15.0 in
Length	200.00 ft
Length (Computed Barrel)	200.25 ft
Slope (Computed)	0.050 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.023
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.070
T2 ratio (HW/D)	1.172
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	741.34 ft	T1 Flow	4.80 ft³/s
T2 Elevation	741.47 ft	T2 Flow	5.49 ft³/s

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 1

Return Event: 25 years
Storm Event: 2 Year 24 hour Type 1A

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	740.00 ft
Orifice Diameter	4.0 in
Orifice Coefficient	0.600

Structure ID: Riser - 1 Structure Type: Stand Pipe	
Number of Openings	1
Elevation	744.75 ft
Diameter	15.0 in
Orifice Area	1.2 ft²
Orifice Coefficient	0.600
Weir Length	3.93 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	False

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	743.20 ft
Orifice Diameter	6.0 in
Orifice Coefficient	0.600

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30

Convergence Tolerances	
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft^3/s
Flow Tolerance (Maximum)	10.000 ft^3/s

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APPENDIX F – Geotechnical Report

Carlson Geotechnical

A division of Carlson Testing, Inc.
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Eugene Office	(541) 345-0289
Salem Office	(503) 589-1252
Tigard Office	(503) 684-3460

Report of
Geotechnical Investigation &
Infiltration Testing Services
TSC Sandy
Mt. Hood Highway & Champion Way
Sandy, Oregon

CGT Project Number G1804765

Prepared for

Hix Snedeker Companies
Attn: Ms. Lindsay Gadd
805 Trione Street
Daphne, Alabama 36526

February 16, 2018

Carlson Geotechnical

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Report of
Geotechnical Investigation &
Infiltration Testing Services
TSC Sandy
Mt. Hood Highway & Champion Way
Sandy, Oregon

CGT Project Number G1804765

Dear Ms. Gadd:

Carlson Geotechnical (CGT), a division of Carlson Testing, Inc. (CTI), is pleased to submit this report summarizing the results of our geotechnical investigation and infiltration testing services for the TSC Sandy project. The site consists of Tax Parcel 01786197, located southwest of the intersection of Mt. Hood Highway and Champion Way in Sandy, Oregon. We performed our work in general accordance with CGT Proposal GP7823, dated December 1, 2017. Written authorization for our services was provided on January 12, 2018.

We appreciate the opportunity to work with you on this project. Please contact us at 503.601.8250 if you have any questions regarding this report.

Respectfully Submitted,
CARLSON GEOTECHNICAL

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ATTACHMENTS

1.0 INTRODUCTION

Carlson Geotechnical (CGT), a division of Carlson Testing, Inc. (CTI), is pleased to submit this report summarizing the results of our geotechnical investigation and infiltration testing services for the TSC Sandy project. The site consists of Tax Parcel 01786197, located southwest of the intersection of Mt. Hood Highway and Champion Way in Sandy, Oregon, as shown on the attached Figure 1.

1.1 Project Information

Based on our correspondence and review of the provided conceptual grading plan dated December 14, 2017, we understand the project will include:

- Construction of an approximate 19,000-square-foot, one-story, commercial building at the northwest portion of the site. The building will be supported on conventional shallow foundations, masonry- and steel-framed, and incorporate concrete slab-on-grade floors. No below-grade levels (basements) are anticipated. Although no structural information has been provided, we have assumed maximum column, continuous wall, and uniform floor slab loads will be on the order of 50 kips, 3 kips per lineal foot (klf), and 200 pounds per square foot (psf).
- Construction of an approximate 15,000-square-foot, concrete slab-on-grade, outdoor display area. We understand a dry-storage building/shed will be located in the display area. The building/shed will be supported on conventional shallow foundations, masonry- and steel-framed, and incorporate concrete slab-on-grade floors. We have assumed maximum column, continuous wall, and uniform floor slab loads associated with this building will be on the order of 30 kips, 2 klf, and 200 psf.
- We understand permanent grade changes will include cuts of up to about 11 feet and fills up to about 20 feet in depth in order to achieve design grades. The majority of site cuts will occur within the north portion of the site, while the majority of structural fills will be placed within the southeast portion of the site. Retaining walls will be incorporated to achieve the desired grades. Based on preliminary discussions, we understand retaining walls will likely consist of concrete, cast-in-place, cantilevered walls. Design of the retaining walls will rest with others.
- Stormwater runoff from the new development may, in part, be managed on site. Details of the type of system and design, provided by others, are not known at this time. One infiltration test was performed at a depth of about 8 feet below ground surface (bgs) at the location requested by the project civil engineer.

1.2 Scope of Services

The purpose of our work was to explore subsurface conditions at the site in order to provide geotechnical engineering recommendations for design and construction of the proposed project. Our specific scope of services will include the following:

- Contact the Oregon Utilities Notification Center to mark the locations of public utilities within a 30-foot radius of our explorations at the site. CGT also subcontracted a private utility locator service to mark the locations of detectable private utilities within the same radius.
- Explore subsurface conditions at the site by observing the excavation of seven test pits to depths up to about 15 feet bgs. Details of the subsurface investigation are presented in Appendix A.
- Conduct one infiltration test at the site as requested by the project civil engineer. Infiltration test results are presented in Appendix B.
- Classify the materials encountered in the test pits in general accordance with American Society for Testing and Materials (ASTM) D2488 (Visual-Manual Procedure).

- Provide a technical narrative describing surface and subsurface deposits, and local geology of the site, based on the results of our explorations and published geologic mapping.
- Provide geotechnical recommendations for site preparation and earthwork.
- Provide geotechnical engineering recommendations for use in design and construction of shallow foundations, floor slabs, retaining walls, and pavements.
- Provide recommendations for the Seismic Site Class, mapped maximum considered earthquake spectral response accelerations, and site seismic coefficients.
- Provide a qualitative evaluation of seismic hazards at the site, including earthquake-induced liquefaction, landsliding, and surface rupture due to faulting or lateral spread.
- Provide this written report summarizing the results of our geotechnical investigation and recommendations for the project.

2.0 SITE DESCRIPTION

2.1 Site Geology

Available geologic mapping[1] indicates the site is underlain by Pliocene-Pleistocene Gravels. These include weakly indurated, cobbly and bouldery gravel and associated pyroclastic mudflows. Extensive weathering has produced a reddish-brown clayey soil. This soil is up to 400 feet thick and is exposed throughout Sandy, Estacada, and Damascus.

2.2 Site Surface Conditions

The approximate 3.6-acre site is bordered by Mt. Hood Highway to the north, Industrial Way and a vegetated area to the south, a grass-covered area to the west, and a grass-covered area, fuel station, and convenience mart to the east. At the time of our field investigation, the site was primarily grass-covered with a few small trees and shrubs, and descended gently to the south-southwest at gradients up to about 5H:1V (vertical:horizontal). The existing and proposed topography, as well as the planned development, are shown on the attached Site Plan, Figure 2. Photographs taken at the time of our investigation are shown on the attached Site Photographs, Figure 3.

2.3 Subsurface Conditions

2.3.1 Subsurface Investigation & Laboratory Testing

Our field investigation consisted of the excavation of seven test pits on January 23, 2018. The approximate exploration locations are shown on the Site Plan, Figure 2. Additional details of the explorations and laboratory testing performed on selected samples are presented in the attached Appendix A. Logs of the test pits are presented therein as Figures A3 through A9. Section 2.3.2 describes each of the subsurface materials encountered at the site.

2.3.2 Subsurface Materials

2.3.2.1 *Silt Topsoil Fill (OL FILL)*

Silt topsoil fill was encountered at the surface of the test pits and was about 8 inches thick. The silt topsoil fill was generally dark brown, moist, and contained organics.

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[1] Schlicker, H.G. and Finlayson, C.T., 1979, Geology and geologic hazards of northwest Clackamas County: Oregon Department of Geology and Mineral Industries, Bulletin 99, scale 1:24,000.

2.3.2.2 *Undocumented Silt Fill (ML FILL)*

Undocumented silt fill was encountered beneath the topsoil within TP-3 and extended to about 1½ feet bgs. Undocumented fill refers to materials placed without (available) records of subgrade conditions or evaluation of compaction. The silt fill was generally dark brown, moist, and exhibited low plasticity.

2.3.2.3 *Undocumented Fat Clay Fill (CH FILL)*

Undocumented fat clay fill was encountered beneath the silt fill within TP-3 and beneath the silt topsoil within the remaining test pits. The fat clay fill extended to depths ranging from about 2½ to 3½ feet bgs. The fat clay fill was generally red-brown, moist to wet, exhibited medium to high plasticity, and in some instances contained trace fine organics.

2.3.2.4 Fat Clay (CH)

Native fat clay (CH) was encountered beneath the undocumented fill within the test pits and extended to the full depths explored, up to about 15 feet bgs. This soil was typically medium stiff to hard, light to red-brown, moist to wet, and exhibited medium to high plasticity. This material was blocky in structure (resembling residual soils) below depths ranging from about 3 to 5 feet bgs in some of the test pits.

2.4 Groundwater

Groundwater was not encountered within the depths explored on January 23, 2018. To help assess local groundwater levels, we researched available well logs located within Section 10, Township 2 South, Range 4 East, Willamette Meridian on the Oregon Water Resources Department (OWRD)[2] website. Our review indicated that groundwater levels in the area varied with surface elevations and generally ranged from about 107 to 200 feet bgs. It should be noted that groundwater levels vary with local topography. In addition, the groundwater levels reported on the OWRD logs often reflect the purpose of the well, so water well logs may only report deeper, confined groundwater, while geotechnical or environmental borings will often report any groundwater encountered, including shallow, unconfined groundwater. Therefore, the levels reported on the OWRD well logs referenced above are considered generally indicative of local water levels and may not reflect actual groundwater levels at the project site. The depth to groundwater map for the Portland area[3] indicates groundwater is present at about 65 to 85 feet bgs in the vicinity of the site. It should be noted that the levels reported by the referenced map are average values for a given location and incorporate a degree of uncertainty, in this case described as "Low".

3.0 SEISMIC CONSIDERATIONS

3.1 Seismic Design

Section 1613.3.2 of the 2014 Oregon Structural Specialty Code (2014 OSSC) requires that the determination of the seismic site class be based on subsurface data in accordance with Chapter 20 of the American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures (ASCE 7). Based on the results of the explorations and review of geologic mapping, we have assigned the site as Site Class D for the subsurface conditions encountered. Earthquake ground motion parameters for the site were obtained based on the United States Geological Survey (USGS) Seismic Design Values for Buildings - Ground Motion

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[2] Oregon Water Resources Department, 2018. Well Log Records, *accessed February 2018*, from OWRD web site: http://apps.wrd.state.or.us/apps/gw/well_log/.

[3] Snyder, D.T., 2008. Estimated depth to ground water and configuration of the water table in the Portland, Oregon area: U.S. Geological Survey, Scientific Investigations Report SIR-2008-5059, scale 1:60,000. *Accessed February 2018* from USGS web site: https://or.water.usgs.gov/projs_dir/puz/.

Parameter Web Application[4]. The site Latitude 45.405976° North and Longitude 122.296282° West were input as the site location. The following table shows the recommended seismic design parameters for the site.

Table 1 Seismic Ground Motion Values (2014 OSSC)

Parameter		Value
Mapped Acceleration Parameters	Spectral Acceleration, 0.2 second (S_S)	0.784g
	Spectral Acceleration, 1.0 second (S_1)	0.341g
Coefficients (Site Class D)	Site Coefficient, 0.2 sec. (F_A)	1.186
	Site Coefficient, 1.0 sec. (F_V)	1.719
Adjusted MCE Spectral Response Parameters	MCE Spectral Acceleration, 0.2 sec. (S_{MS})	0.931g
	MCE Spectral Acceleration, 1.0 sec. (S_{M1})	0.586g
Design Spectral Response Accelerations	Design Spectral Acceleration, 0.2 seconds (S_{DS})	0.620g
	Design Spectral Acceleration, 1.0 second (S_{D1})	0.390g
Seismic Design Category		D

3.2 Seismic Hazards

3.2.1 Liquefaction

In general, liquefaction occurs when deposits of loose/soft, saturated, cohesionless soils, generally sands and silts, are subjected to strong earthquake shaking. If these deposits cannot drain quickly enough, pore water pressures can increase, approaching the value of the overburden pressure. The shear strength of a cohesionless soil is directly proportional to the effective stress, which is equal to the difference between the overburden pressure and the pore water pressure. When the pore water pressure increases to the value of the overburden pressure, the shear strength of the soil approaches zero, and the soil can liquefy. The liquefied soils can undergo rapid consolidation or, if unconfined, can flow as a liquid. Structures supported by the liquefied soils can experience rapid, excessive settlement, shearing, or even catastrophic failure.

For fine-grained soils, susceptibility to liquefaction is evaluated based on penetration resistance and plasticity, among other characteristics. Criteria for identifying non-liquefiable, fine-grained soils are constantly evolving. Current practice[5] to identify non-liquefiable, fine-grained soils is based on plasticity characteristics of the soils, as follows: (1) liquid limit greater than 47 percent, (2) plasticity index greater than 20 percent, and (3) moisture content less than 85 percent of the liquid limit. Soils identified as susceptible to liquefaction are analyzed using the industry standard "simplified procedure", originally published by Seed and Idriss[6] in 1971 and updated continually since that time. The susceptibility of sands, gravels, and sand-gravel mixtures to liquefaction is typically assessed based on penetration resistance, as measured using SPTs, CPTs, or Becker Hammer Penetration tests (BPTs).

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4 United States Geological Survey, 2018. Seismic Design Parameters determined using:, "U.S. Seismic Design Maps Web Application," *accessed February 2018*, from the USGS website http://earthquake.usgs.gov.

5 Seed, R.B. et al., 2003. Recent Advances in Soil Liquefaction Engineering: A Unified and Consistent Framework. Earthquake Engineering Research Center Report No. EERC 2003-06.

6 Seed, H.B., and Idriss, I.M., 1971, Simplified Procedure for Evaluating Soil Liquefaction Potential, Journal of Geotechnical Engineering Division, ASCE, 97(9), 1249-1273.

Based on the lack of saturated conditions and their medium to high plasticity, the fat clay soils encountered at the site are considered non-liquefiable within the depths explored. Earthquake mapping[7] indicates the site does not have a potential for liquefaction. Therefore, the risk of liquefaction at the site is considered very low to negligible.

3.2.2 Slope Instability

HazVu[7] indicates a low to moderate hazard due to landsliding for the site. No obvious signs of recent slope instability were noted during our field investigation. Provided the recommendations presented later in this report for grading and stormwater management are incorporated into construction, we conclude the risk of seismically-induced slope instability at the site is low.

3.2.3 Surface Rupture

3.2.3.1 Faulting

Although the site is situated in a region of the country with known active faults and historic seismic activity, no known faults exist on or immediately adjacent to the site. Therefore, the risk of surface rupture at the site due to faulting is considered low.

3.2.3.2 Lateral Spread

Surface rupture due to lateral spread can occur on sites underlain by liquefiable soils that are located on or immediately adjacent to slopes steeper than about 3 degrees (20H:1V), and/or adjacent to a free face, such as a stream bank or the shore of an open body of water. During lateral spread, the materials overlying the liquefied soils are subject to lateral movement downslope or toward the free face. Given the lack of liquefiable soils at the site, the risk of lateral spread is considered negligible.

4.0 CONCLUSIONS

4.1 Overview

Based on the results of our field explorations and analyses, the site may be developed as described in Section 1.1 of this report, provided the recommendations presented in this report are incorporated into the design and development. We conclude the primary geotechnical considerations at this site include:

- The presence of moderately compressible native soils and proposed grade changes, most notably the relatively deep fills proposed within the south portion of the site.
- The presence of approximately 2½ to 3½ feet of undocumented fill materials at the site.
- The presence of potentially expansive soils (high plasticity fine-grained soils) and requirement for mitigation (where encountered at design subgrade elevations) for building foundations, floor slabs, and pavements.
- The moisture sensitivity of the on-site soils and their susceptibility to disturbance during wet weather.

These considerations are described in more detail in the following sections.

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[7] Oregon Department of Geology and Mineral Industries, 2017. Oregon Statewide Geohazards Viewer, accessed February 2018, from DOGAMI web site: http://www.oregongeology.org/sub/hazvu/index.htm.

4.2 Proposed Grading Plans

Laboratory testing of the native, near-surface, fat clay (CH) indicated the material is moderately compressible. Based on review of the updated drawings, permanent grade changes in the area of the proposed building will be relatively minor, with cuts and fills up to about 5 feet and 3 feet in depth, respectively. Geotechnical recommendations for building pad preparation are presented in Section 5.1 of this report. Geotechnical recommendations for use in design and construction of shallow foundations associated with the proposed building are presented in Section 5.6 of this report. In the event that structural (column and continuous wall) loads for the building will be above those described in Section 1.1 of this report, the geotechnical engineer should be consulted to review the proposed construction.

Cuts up to about 8 feet in depth are planned within the northeast parking lot area and a retaining wall will be constructed to retain site cuts. Geotechnical recommendations for use in planning of temporary excavations at the site are presented in Section 5.2 of this report. Geotechnical recommendations for use in design and construction of the north site retaining wall are presented in Section 5.7 of this report.

The updated drawings indicate the south portion of the site will receive up to about 20 feet of structural fill in order to achieve design site grades, and a retaining wall of similar height will be constructed to retain site fills. Recognizing the presence of the moderately compressive fat clay and significant changes in site grades, supplemental (deeper) geotechnical investigation of the south portion of the site is recommended in order to develop finalized recommendations for site grading, as well as design and construction of the south site retaining wall. Supplemental geotechnical explorations are outside the scope of this current assignment, but can be provided, upon request, for an additional fee.

4.3 Undocumented Fill Materials

As indicated above, undocumented fill soils were encountered at the surface of each test pit and extended to depths of about 2½ to 3½ feet bgs. The undocumented fill consisted primarily of fat clay soils (CH FILL) and ranged from medium stiff to very stiff, based on pocket penetrometer readings taken within the test pit. Observation of digging effort during test pit excavation indicated variability in relatively compaction of the undocumented fill soils. To the best of our knowledge, there is no documentation available related to the placement and compaction of the existing fill materials at the site. Anecdotally, we anticipate the fill materials were placed as part of previous earthwork within the nearby commercial developments. Earthwork records could be sought to confirm these assumptions and provide more information. Due to its variable consistency, we conclude the existing fill materials were <u>not</u> compacted in accordance with typical code requirements for structural fill. Where encountered at design subgrade elevations for shallow foundations, floor slabs, pavements, or structural fills, we recommend existing fill materials be completely over-excavated and replaced with structural fill. Over-excavated, inorganic, fill materials may be re-used as structural fill at the site, provided they are prepared in conformance with Section 5.4.1 of this report.

4.4 Potentially Expansive Soils

Laboratory testing of the native fat clay (CH) showed plasticity indices ranging from 34 to 35, indicating the soil exhibits high plasticity and a high expansion potential[8]. This refers to the potential for changes in soil volume (shrinking or swelling) in response to changes in moisture content. Footings, floor slabs, and pavements directly supported on expansive soils are susceptible to differential movements, possibly resulting

[8] Drawn from Table 9.1 of Foundation Engineering Handbook,

in stress cracking, caused by the shrink/swell movements of this soil. Where encountered at design subgrade elevations, provisions to mitigate the effects of shrink/swell movements of this soil will need to be undertaken. Geotechnical recommendations for treatment of this potentially expansive soil are presented later in this report.

4.5 Moisture Sensitive Soils

Due to their fine-grained nature, the near surface clayey soils are susceptible to disturbance during wet weather. Trafficability of these soils may be difficult, and significant damage to the subgrade could occur, if earthwork is undertaken without proper precautions at times when the exposed soils are more than a few percentage points above optimum moisture content. In the event that construction occurs during wet weather, we recommend measures be implemented to protect the fine-grained subgrade in areas of repeated construction traffic and in foundation bearing areas. Geotechnical recommendations for wet weather construction are presented in Section 5.3 of this report. Re-use of these soils as structural fill during wet times of the year will require special consideration as discussed in Section 5.4.1.1 of this report.

5.0 RECOMMENDATIONS

The recommendations presented in this report are based on the information provided to us, results of our field investigation and analyses, laboratory data, and professional judgment. CGT has observed only a small portion of the pertinent subsurface conditions. The recommendations are based on the assumptions that the subsurface conditions do not deviate appreciably from those found during the field investigation. CGT should be consulted for further recommendations if the design of the proposed development changes and/or variations or undesirable geotechnical conditions are encountered during site development.

5.1 Site Preparation

5.1.1 Stripping & Fill Over-Excavation

Existing vegetation, rooted soils, and undocumented fill soils (OL FILL, ML FILL, CH FILL) should be removed from within, and for a minimum 5-foot margin around, proposed structural fill, building pad, and pavement areas. Based on the results of our field explorations, undocumented fill soils encountered at the site extended to depths of about 2½ to 3½ feet bgs. These materials may be deeper or shallower at locations away from the completed explorations. The geotechnical engineer or his representative should provide recommendations for actual stripping depths based on observations during site stripping. Stripped surface vegetation and rooted soils should be transported off-site for disposal, or stockpiled for later use in landscaped areas. Stripped, inorganic fill materials should be transported off-site for disposal, or may be stockpiled for later use as structural fill as described in Section 5.4.1 of this report.

5.1.2 Grubbing

Grubbing of trees and shrubs should include the removal of the root mass and roots greater than ½-inch in diameter. Grubbed materials should be transported off-site for disposal. Root masses from larger trees may extend greater than 3 feet bgs. Where root masses are removed, the resulting excavation should be properly backfilled with structural fill in conformance with Section 5.4 of this report.

5.1.3 Test Pit Backfills

The test pits conducted at the site were loosely backfilled during our field investigation. Where test pits are located within finalized building, structural fill, or pavement areas, the loose backfill materials should be re-

excavated. The resulting excavations should be backfilled with structural fill in conformance with Section 5.4 of this report.

5.1.4 Existing Utilities & Below-Grade Structures

All existing utilities at the site should be identified prior to excavation. Abandoned utility lines beneath the new building, pavements, and hardscaping features should be completely removed or grouted full. Soft, loose, or otherwise unsuitable soils encountered in utility trench excavations should be removed and replaced with structural fill in conformance with Section 5.4 this report. Buried structures (i.e. footings, foundation walls, retaining walls, slabs-on-grade, tanks, etc.), if encountered during site development, should be completely removed and replaced with structural fill in conformance with Section 5.4 of this report.

5.1.5 Subgrade Preparation – Building Pads, Pavement Areas & Areas to Receive Structural Fill

5.1.5.1 Dry Weather Construction

After site preparation as recommended above, but prior to placement of structural fill and/or aggregate base, the geotechnical engineer or his representative should observe a proof roll test of the exposed subgrade soils in order to identify areas of excessive yielding. Proof rolling of subgrade soils is typically conducted during dry weather conditions using a fully-loaded, 10- to 12-cubic-yard, tandem-axle, tire-mounted, dump truck or equivalent weighted water truck. Areas that appear too soft and wet to support proof rolling equipment should be prepared in general accordance with the recommendations for wet weather construction presented in Section 5.3 of this report. If areas of soft soil or excessive yielding are identified, the affected material should be over-excavated to firm, stable subgrade, and replaced with imported granular structural fill in conformance with Section 5.4.2.2 of this report.

5.1.5.2 Wet Weather Construction

Preparation of subgrade soils during wet weather should be in conformance with Section 5.3 of this report. As indicated therein, increased granular fill (working surfaces) and a geotextile separation fabric may be required in wet conditions in order to support construction traffic and protect the subgrade.

5.1.5.3 Treatment of High Plasticity Fat Clay

Where high plasticity (potentially expansive) fat clay (CH) is encountered at design subgrade elevations for building pads and pavements, the subgrade soils should be kept moist, near optimum moisture content, and not allowed to dry out. If allowed to dry below optimum moisture content, to a point where surface cracking appears in the subgrade, the affected material should be over-excavated and replaced with structural fill in conformance with Section 5.4 of this report.

5.1.6 Erosion Control

Erosion and sedimentation control measures should be employed in accordance with applicable City, County, and State regulations.

5.2 Temporary Excavations

5.2.1 Overview

Conventional earthmoving equipment in proper working condition should be capable of making necessary excavations for the anticipated site cuts as described earlier in this report. All excavations should be in accordance with applicable OSHA and state regulations. It is the contractor's responsibility to select the excavation methods, to monitor site excavations for safety, and to provide any shoring required to protect

personnel and adjacent improvements. A "competent person", as defined by OR-OSHA, should be on-site during construction in accordance with regulations presented by OR-OSHA. CGT's current role on the project does not include review or oversight of excavation safety.

5.2.2 OSHA Soil Type

For use in the planning and construction of temporary excavations up to 10 feet in depth, an OSHA soil type of "A" can be used for the fine-grained fat clay (CH) encountered near the surface of the site.

5.2.3 Utility Trenches

Temporary trench cuts should stand near vertical to depths of approximately 4 feet in the native, fat clay (CH) encountered near the surface of the site. If groundwater seepage undermines the stability of the trench, or if sidewall caving is observed during excavation, the sidewalls should be flattened or shored. Depending on the time of year trench excavations occur, trench dewatering may be required in order to maintain dry working conditions. Pumping from sumps located within the trench will likely be effective in removing water resulting from seepage. If groundwater is encountered, we recommend placing trench stabilization material at the base of the excavations. Trench stabilization material should be in conformance with Section 5.4.2.4.

5.2.4 Excavations Near Foundations

Excavations near footings should not extend within a 1½H:1V (horizontal:vertical) plane projected out and down from the outside, bottom edge of the footings. In the event excavation needs to extend below the referenced plane, temporary shoring of the excavation and/or underpinning of the subject footing may be required. The geotechnical engineer should be consulted to review proposed excavation plans for this design case to provide specific recommendations.

5.2.5 Draping of Cut Slopes

In wet weather conditions, we recommend temporary cut slopes in excess of 4 feet in height (created during construction) be draped with minimum 10-mil plastic sheeting (e.g. polyethylene). Draping of cut slopes less than 4 feet in height may also be performed. The draping should extend from the base of the cut slope and back from the top of the cut slope sufficient to limit runoff from flowing under the covering. The plastic sheets should be lapped sufficiently to prevent water from flowing directly onto the slope and should extend at least several feet beyond each side of the cut area. The plastic should be weighted or otherwise anchored so that it remains on the slope during construction. Runoff from the sheeting should not be allowed to pond or infiltrate into the subsurface at the toe of the slope, but should be collected and diverted away from the cut slope to a suitable discharge point.

5.3 Wet Weather Considerations

For planning purposes, the wet season should be considered to extend from late September to late June. It is our experience that dry weather working conditions should prevail between early July and mid-September. Notwithstanding the above, soil conditions should be evaluated in the field by the geotechnical engineer or their representative at the initial stage of site preparation to determine whether the recommendations within this section should be incorporated into construction.

5.3.1 Overview

Due to the fines content, the on-site fat clay (CH) soils are susceptible to disturbance during wet weather. Trafficability of these soils may be difficult, and significant damage to subgrade soils could occur, if earthwork is undertaken without proper precautions at times when the exposed soils are more than a few percentage points above optimum moisture content. For wet weather construction, site preparation activities may need to be accomplished using track-mounted equipment, loading removed material onto trucks supported on granular haul roads, or other methods to limit soil disturbance. The geotechnical engineer or their representative should evaluate the subgrade during excavation by probing rather than proof rolling. Soils that have been disturbed during site preparation activities, or soft or loose areas identified during probing, should be over-excavated to firm, stable subgrade, and replaced with imported granular structural fill in conformance with Section 5.4.2.2.

5.3.2 Geotextile Separation Fabric

We recommend a geotextile separation fabric be placed to serve as a barrier between the prepared subgrade and granular fill/base rock in areas of repeated or heavy construction traffic. The geotextile fabric should meet the requirements presented in the current Oregon Department of Transportation (ODOT) Standard Specification for Construction, Section 02320.

5.3.3 Granular Working Surfaces (Haul Roads & Staging Areas)

Haul roads subjected to repeated heavy, tire-mounted, construction traffic (e.g. dump trucks, concrete trucks, etc.) will require a minimum of 18 inches of imported granular material. For light staging areas, 12 inches of imported granular material is typically sufficient. Additional granular material, geo-grid reinforcement or cement amendment may be recommended based on site conditions and/or loading at the time of construction. The imported granular material should be in conformance with Section 5.4.2.2 and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. The prepared subgrade should be covered with geotextile fabric (Section 5.3.2) prior to placement of the imported granular material. The imported granular material should be placed in a single lift (up to 24 inches deep) and compacted using a smooth-drum, non-vibratory roller until well-keyed.

5.3.4 Footing Subgrade Protection

A minimum of 3 inches of imported granular material is recommended to protect fine-grained, footing subgrades from foot traffic during inclement weather. The imported granular material should be in conformance with Section 5.4.2.2. The maximum particle size should be limited to 1 inch. The imported granular material should be placed in one lift over the prepared, undisturbed subgrade, and compacted using non-vibratory equipment until well keyed.

5.4 Structural Fill

The geotechnical engineer should be provided the opportunity to review all materials considered for use as structural fill (prior to placement). Samples of the proposed fill materials should be submitted to the geotechnical engineer a minimum of 5 business days prior their use on site[9]. The geotechnical engineer or their representative should be contacted to evaluate compaction of structural fill as the material is being placed. Evaluation of compaction may take the form of in-place density tests and/or proof roll tests with

[9] Laboratory testing for moisture density relationship (Proctor) is required. Tests for gradation may be required.

suitable equipment. Structural fill should be evaluated at intervals not exceeding every 2 vertical feet as the fill is being placed.

5.4.1 On-Site Soils – General Use

5.4.1.1 Silt Fill (ML Fill)

Re-use of this soil as structural fill may be difficult because it is sensitive to small changes in moisture content and are difficult, if not impossible, to adequately compact during wet weather. We anticipate the moisture content of this soil will be higher than the optimum moisture content for satisfactory compaction. Therefore, moisture conditioning (drying) should be expected in order to achieve adequate compaction. If used as structural fill, this soil should be free of organic matter, debris, and particles larger than 4 inches. When used as structural fill, this soil should be placed in lifts with a maximum pre-compaction thickness of about 8 inches at moisture contents within -1 and +3 percent of optimum, and compacted to not less than 92 percent of the material's maximum dry density, as determined in general accordance with ASTM D1557 (Modified Proctor).

5.4.1.2 High Plasticity Fat Clay Soils (CH FILL, CH)

The recommendations presented in Section 5.4.1.1 of this report are applicable for re-using this on-site soil as structural fill, with the following considerations:

- The material should be capped with a minimum of 18 inches of granular fill where intended to support a structural feature (e.g. floor slabs, hardscaping feature, pavements).
- Treating this soil with Portland cement (if considered) may be difficult due to its high plasticity. If considered, we recommend supplemental testing of the fat clay blended with Portland cement be performed to evaluate the response of the soil to cement. Alternative treatment agent(s), such as lime, may be considered subject to review of the geotechnical engineer.

If the on-site materials cannot be properly moisture-conditioned and/or processed, we recommend using imported granular material for structural fill.

5.4.2 Imported Fill (General Use)

5.4.2.1 Imported Material(s) with Appreciable Fines Content

Imported fill materials with a relatively high concentration of fines (e.g. clay- to silt-sized particles) may be considered for use as structural fill during mass grading. For the purposes of discussion, a fill material containing more than 12 percent passing the U.S. Standard No. 200 Sieve constitutes a material with relatively high concentration of fines. Subject to the review of the geotechnical engineer, fill material(s) meeting this designation may be used as structural fill (general use) at the site, provided they can be moisture-conditioned and compacted in conformance with the recommendations presented in Section 5.4.1 of this report, and are free of organic matter, debris, and particles larger than 4 inches. Fill materials with a high concentration of fines are best suited for use during dry weather conditions, as they inherently are sensitive to changes in moisture content and are difficult, if not impossible, to adequately compact during wet weather. Specific recommendations for placement and compaction of imported fill materials with appreciable fines content can be provided by the geotechnical engineer on a case-by-case basis.

5.4.2.2 Imported Granular Fill with Low Fines Content

Imported granular fill should consist of angular pit or quarry run rock, crushed rock, or crushed gravel that is fairly well graded between coarse and fine particle sizes. The granular fill should contain no organic matter,

debris, or particles larger than 4 inches, and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. The percentage of fines can be increased to 12 percent of the material passing the U.S. Standard No. 200 Sieve if placed during dry weather, and provided the fill material is moisture-conditioned, as necessary, for proper compaction. As a guideline, grading of this material with particles up to about 4 inches in diameter may follow that presented in the following table.

Table 2 Guideline Gradation of Coarse-Grained Imported Granular Fill w/ Low Fines Content

Sieve Size	% Passing
4 inches	100
3 inches	88 – 100
¾-inch	70 – 90
U.S. Standard No. 4	40 – 60
U.S. Standard No. 40	20 – 40
U.S. Standard No. 200	Dry Weather: Less than 12
	Wet Weather: Less than 5

Imported granular fill material should be compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor). Granular fill materials with high percentages of particle sizes in excess of 1½ inches are considered non-moisture-density testable materials. As an alternative to conventional density testing, compaction of these materials should be evaluated by periodic deflection (proof roll) testing in accordance with ODOT Test Method 158. Proof roll tests should be performed at maximum intervals of every 1 vertical foot as the fill is being placed.

5.4.2.3 Floor Slab Base Rock

Floor slab base rock should consist of well-graded granular material (crushed rock) containing no organic matter or debris, have a maximum particle size of ¾ inch, and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. Floor slab base rock should be placed in one lift and compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor). We recommend "choking" the surface of the base rock with sand just prior to concrete placement. Choking means the voids between the largest aggregate particles are filled with sand, but does not provide a layer of sand above the base rock. Choking the base rock surface reduces the lateral restraint on the bottom of the concrete during curing.

5.4.2.4 Trench Base Stabilization Material

If groundwater is present at the base of utility excavations, trench base stabilization material should be placed. Trench base stabilization material should consist of a minimum of 1 foot of well-graded granular material with a maximum particle size of 4 inches and less than 5 percent material passing the U.S. Standard No. 4 Sieve. The material should be free of organic matter and other deleterious material, placed in one lift (up to 24 inches thick), and compacted until well-keyed.

5.4.2.5 Trench Backfill Material

Trench backfill for the utility pipe base and pipe zone should consist of granular material as recommended by the utility pipe manufacturer. Trench backfill above the pipe zone should consist of well-graded granular material containing no organic matter or debris, have a maximum particle size of ¾ inch, and have less than 8 percent material passing the U.S. Standard No. 200 Sieve. As a guideline, trench backfill should be placed in maximum 12-inch-thick lifts. The earthwork contractor may elect to use alternative lift thicknesses based on their experience with specific equipment and fill material conditions during construction in order to achieve

the required compaction. The following table presents recommended relative compaction percentages for utility trench backfill.

Table 3 Utility Trench Backfill Compaction Recommendations

Backfill Zone	Recommended Minimum Relative Compaction	
	Structural Areas[1]	Landscaping Areas
Pipe Base and Within Pipe Zone	90% ASTM D1557 or pipe manufacturer's recommendation	88% ASTM D1557 or pipe manufacturer's recommendation
Above Pipe Zone	92% ASTM D1557	90% ASTM D1557
Within 3 Feet of Design Subgrade	95% ASTM D1557	90% ASTM D1557

[1]Includes proposed building, pavement areas, structural fill areas, exterior hardscaping, etc.

5.4.3 Controlled Low-Strength Material (CLSM)

CLSM is a self-compacting, cementitious material that is typically considered when backfilling localized areas. CLSM is sometimes referred to as "controlled density fill" or CDF. Due to its flowable characteristics, CLSM typically can be placed in restricted-access excavations where placing and compacting fill is difficult. If chosen for use at this site, we recommend the CLSM be in conformance with Section 00442 of the most recent, State of Oregon, Standard Specifications for Highway Construction. The geotechnical engineer's representative should observe placement of the CLSM and obtain samples for compression testing in accordance with ASTM D4832. As a guideline, for each day's placement, two compressive strength specimens from the same CLSM sample should be tested. The results of the two individual compressive strength tests should be averaged to obtain the reported 28-day compressive strength. If CLSM is considered for use on this site, please contact the geotechnical engineer for site-specific and application-specific recommendations.

5.5 Permanent Slopes

5.5.1 Overview

Permanent cut or fill slopes constructed at the site, if any, should be graded at 2H:1V or flatter. Constructed slopes should be overbuilt by a few feet depending on their size and gradient so that they can be properly compacted prior to being cut to final grade. The surface of all slopes should be protected from erosion by seeding, sodding, or other acceptable means. Adjacent on-site and off-site structures should be located at least 5 feet from the top of slopes.

5.5.2 Placement of Fill on Slopes

New fill should be placed and compacted against horizontal surfaces. Where slopes exceed 5H:1V (horizontal to vertical), the slopes should be keyed and benched prior to structural fill placement in general accordance with the attached Fill Slope Detail, Figure 4. If subdrains are needed on benches, subject to the review of the geotechnical representative, they should be placed as shown on the attached Fill Slope Detail. In order to achieve well-compacted slope faces, slopes should be overbuilt by a few feet and then trimmed back to proposed final grades. The geotechnical engineer or his representative should observe the benches, keyways, and associated subdrains, if needed, prior to placement of structural fill.

The fat clay (CH) soils exposed on benches should be kept moist, near optimum moisture content, and not allowed to dry out. If allowed to dry below optimum moisture content, to a point where surface cracking appears in the subgrade, the affected material should be over-excavated and replaced with imported granular structural fill.

5.6 Shallow Foundations

The recommendations that follow are based, in part, on the maximum structural (column and continuous wall) loads described in Section 1.1 of this report. In the event that loads for the building will be above those listed therein, the geotechnical engineer should be consulted to review the proposed construction.

5.6.1 Subgrade Preparation

Satisfactory subgrade support for shallow foundations can be obtained from a minimum of 12 inches of imported granular structural fill that is properly placed and compacted on the native, medium stiff to better, fat clay (CH) during construction. The imported granular fill should be in conformance with Section 5.4.2.2 of this report, with maximum particle size limited to 1½ inches. During excavation, the fat clay (CH) soils should be kept moist, near optimum moisture content, and not allowed to dry out. If allowed to dry below optimum moisture content, to a point where surface cracking appears in the subgrade, the affected material should be over-excavated and replaced with imported granular structural fill.

The geotechnical engineer or their representative should be contacted to observe subgrade conditions prior to placement of the granular pad. If soft, loose, or otherwise unsuitable soils are encountered, they should be over-excavated as recommended by the geotechnical representative at the time of construction. The resulting over-excavation should be brought back to grade with imported granular structural fill in conformance with Section 5.4.2.2. The maximum particle size of over-excavation backfill should be limited to 1½ inches. All granular pads for footings should be constructed a minimum of 6 inches wider on each side of the footing for every vertical foot of over-excavation.

5.6.2 Minimum Footing Width & Embedment

Minimum footing widths should be in conformance with the current Oregon Structural Specialty Code (OSSC). As a guideline, we recommend individual spread footings have a minimum width of 24 inches. We recommend continuous wall footings have a minimum width of 18 inches. All footings should be founded at least 18 inches below the lowest, permanent adjacent grade to develop lateral capacity and for frost protection.

5.6.3 Bearing Pressure & Settlement

Footings founded as recommended above should be proportioned for a maximum allowable soil bearing pressure of 1,500 pounds per square foot (psf). This bearing pressure is a net bearing pressure, applies to the total of dead and long-term live loads, and may be increased by one-third when considering seismic or wind loads. For foundations founded as recommended above, total settlement of foundations is anticipated to be less than 1 inch. Differential settlements between adjacent columns and/or bearing walls should not exceed ½-inch. If an increased allowable soil bearing pressure is desired, the geotechnical engineer should be consulted.

5.6.4 Lateral Capacity

A maximum passive (equivalent fluid) earth pressure of 150 pounds per cubic foot (pcf) is recommended for design of footings cast neat into excavations in suitable native soil or confined by the structural fill that is properly placed and compacted during construction. The recommended earth pressure was computed using a factor of safety of 1½, which is appropriate due to the amount of movement required to develop full passive resistance. In order to develop the above capacity, the following should be understood:

- Concrete must be poured neat in excavations or the foundations must be backfilled with imported granular structural fill,
- The adjacent grade must be level,
- The static ground water level must remain below the base of the footings throughout the year.
- Adjacent floor slabs, pavements, or the upper 12-inch-depth of adjacent, unpaved areas should not be considered when calculating passive resistance.

An ultimate coefficient of friction equal to 0.45 may be used when calculating resistance to sliding for footings founded as recommended above.

5.6.5 Subsurface Drainage

Recognizing the fine-grained soils encountered at this site, placement of foundation drains is recommended at the outside base elevations of perimeter continuous wall footings. Foundation drains should consist of a minimum 4-inch diameter, perforated, PVC drainpipe wrapped with a non-woven geotextile filter fabric. The drains should be backfilled with a minimum of 2 cubic feet of open graded drain rock per lineal foot of pipe. The drain rock should also be encased in a geotextile fabric in order to provide separation from the surrounding fine-grained soils. Foundation drains should be positively sloped and should outlet to a suitable discharge point. The geotechnical engineer or their representative should observe the drains prior to backfilling. Roof drains should not be tied into foundation drains.

5.7 North Site Retaining Wall

The recommendations that follow are presented for the retaining wall proposed at the north portion of the site as shown on the attached Site Plan, Figure 2.

5.7.1 Footings

Retaining wall footings should be designed and constructed in conformance with the recommendations presented in Section 5.6, as applicable.

5.7.2 Wall Drains

We recommend placing a retaining wall drain at the base elevation of the heel of the retaining wall footing. Retaining wall drains should consist of a minimum 4-inch-diameter, perforated, HDPE (High Density Polyethylene) drainpipe wrapped with a non-woven geotextile filter fabric. The drains should be backfilled with a minimum of 2 cubic feet of open graded drain rock per lineal foot of pipe. The drain rock should be encased in a geotextile fabric in order to provide separation from the surrounding soils. Retaining wall drains should be positively sloped and should outlet to a suitable discharge point. The geotechnical engineer or their representative should be contacted to observe the drains prior to backfilling. Roof or area drains should not be tied into retaining wall drains.

5.7.3 Wall Backfill

Retaining walls should be backfilled with imported granular structural fill in conformance with Section 5.4.2.2 and contain less than 5 percent passing the U.S. Standard No. 200 Sieve. The backfill should be compacted to a minimum of 90 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor). When placing fill behind walls, care must be taken to minimize undue lateral loads on the walls. Heavy compaction equipment should be kept at least "H" feet from the back of the walls, where "H" is the height of the wall. Light mechanical or hand tamping equipment should be used for compaction of backfill materials within "H" feet of the back of the walls.

5.7.4 Design Parameters & Limitations

For rigid retaining walls founded, backfilled, and drained as recommended above, the following table presents parameters recommended for design.

Table 4 Design Parameters for Rigid Retaining Walls

Retaining Wall Condition	Modeled Backfill Condition	Static Equivalent Fluid Pressure (S_A)	Seismic Equivalent Fluid Pressure (S_{AE})
Not Restrained from Rotation	Level (i = 0)	29 pcf	39 pcf
Restrained from Rotation	Level (i = 0)	52 pcf	54 pcf

Note 1: Refer to the attached Figure 5 for a graphical representation of static and seismic loading conditions. Seismic component of active thrust acts at 0.6H above the base of the wall.

Note 2: Seismic (dynamic) lateral loads were computed using the Mononobe-Okabe Equation as presented in the 1997 Federal Highway Administration (FHWA) design manual.

The above design recommendations are based on the assumptions that:

- The wall consists of a concrete cantilevered retaining wall (β = 0 and δ = 24 degrees, see Figure 5).
- The wall is 10 feet or less in height.
- The backfill is drained and consists of imported granular structural fill (ϕ = 38 degrees).
- No area load, line load or point load surcharges are imposed behind the wall.
- The grade behind the wall is level, or sloping down and away from the wall, for a distance of 10 feet or more from the wall.
- The grade in front of the wall is level or sloping up for a distance of at least 5 feet from the wall.

Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project vary from these assumptions.

5.8 Floor Slabs

5.8.1 Subgrade Preparation

Satisfactory subgrade support for slabs constructed on grade, supporting up to 150 psf area loading, can be obtained from a minimum of 12 inches of imported granular structural fill that is properly placed and compacted on the native, medium stiff to better, fat clay (CH) during construction. The minimum 18-inch thick granular layer may be considered a "sub-base" in these areas. Floor slab subgrade preparation should

be in conformance with Section 5.1.5 of this report. During excavation, the fat clay subgrade soils should be kept moist, near optimum moisture content, and not allowed to dry out. If allowed to dry below optimum moisture content, to a point where surface cracking appears in the subgrade, the affected material should be over-excavated and replaced with imported granular structural fill.

5.8.2 Crushed Rock Base

Concrete floor slabs should be supported on a minimum 6-inch-thick layer of crushed rock (base rock) in conformance with Section 5.4.2.2. For design cases where a vapor barrier or retarder is not placed below the slab, the surface of the base rock should be choked with sand just prior to concrete placement. Choking means the voids between the largest aggregate particles are filled with sand, but does not provide a layer of sand above the base rock. Choking the base rock surface reduces the lateral restraint on the bottom of the concrete during curing.

5.8.3 Design Considerations

For floor slabs constructed as recommended, a modulus of subgrade reaction of 150 pounds per cubic inch (pci) is recommended for the design of the floor slab. Floor slabs constructed as recommended will likely settle less than ½-inch. For general floor slab construction, slabs should be jointed around columns and walls to permit slabs and foundations to settle differentially.

5.8.4 Subgrade Moisture Considerations

Liquid moisture and moisture vapor should be expected at the subgrade surface. The recommended crushed rock base is anticipated to provide protection against liquid moisture. Where moisture vapor emission through the slab must be minimized, e.g. impervious floor coverings, storage of moisture sensitive materials directly on the slab surface, etc., a vapor retarding membrane or vapor barrier below the slab should be considered. Factors such as cost, special considerations for construction, floor coverings, and end use suggest that the decision regarding a vapor retarding membrane or vapor barrier be made by the architect and owner.

If a vapor retarder or vapor barrier is placed below the slab, its location should be based on current American Concrete Institute (ACI) guidelines, ACI 302 Guide for Concrete Floor and Slab Construction. In some cases, this indicates placement of concrete directly on the vapor retarder or barrier. Please note that the placement of concrete directly on impervious membranes increases the risk of plastic shrinkage cracking and slab curling in the concrete. Construction practices to reduce or eliminate such risk, as described in ACI 302, should be employed during concrete placement.

5.9 Pavements

5.9.1 Subgrade Preparation

Satisfactory subgrade support for pavements constructed on grade can be obtained from a minimum of 12 inches of imported granular structural fill that is properly placed and compacted on the native, medium stiff to better, fat clay (CH) or structural fill placed during construction. The minimum 12-inch thick granular layer may be considered a "sub-base" in these areas. Pavement subgrade preparation should be in conformance with Section 5.1.5 of this report. Pavement subgrade surfaces should be crowned (or sloped) for proper drainage in accordance with specifications provided by the project civil engineer.

5.9.2 Traffic Classifications

Recognizing that traffic data has not been provided, we have considered two levels of traffic demand for review and design of pavement sections. We modeled the following design cases (traffic levels) developed from the Asphalt Pavement Association of Oregon (APAO):

- *APAO Level I (Very Light):* This design case considers typical average daily truck traffic (ADTT) of 1 per day over 20 years. Among others, examples under this loading consist of passenger car parking stalls, residential driveways, and seasonal recreational roads.
- *APAO Level II (Light):* This design case considers typical ADTT of 2 to 7 per day over 20 years. Examples under this loading consist of residential streets and parking lots of less than 500 stalls.

5.9.3 Input Parameters

Designs of the hot mixed asphalt concrete (HMAC) flexible pavement sections and the rigid Portland cement concrete (PCC) rigid slab section presented below were based on the parameters presented in the following table and design approaches from:

- The American Association of State Highway and Transportation Officials (AASHTO) 1993 "Design of Pavement Structures" manual,
- The Asphalt Pavement Association of Oregon (APAO) 2003 "Asphalt Pavement Design Guide", and
- The Oregon Department of Transportation (ODOT) 2011 "Pavement Design Guide".

If any of the items listed in Table 5 or Table 6 need to be revised, please contact us and we will reassess the pavement design sections presented below.

Table 5 Input Parameters Used in HMAC Pavement Design

Input Parameter	Design Value[1]	Input Parameter		Design Value[1]
Pavement Design Life	20 years	Resilient Modulus	Native Fat Clay (CH)[4]	4,000 psi
Annual Percent Growth	0 percent		Crushed Aggregate Base[2]	20,000 psi
Serviceability	4.2 initial, 2.5 terminal	Structural Coefficient[2]	Crushed Aggregate Base	0.10
Reliability[2]	75 percent		Asphalt	0.42
Standard Deviation[2]	0.49	Vehicle Traffic[5] (range in ESALs)	APAO Level I (Very Light)	Up to 10,000
Drainage Factor[3]	1.0		APAO Level II (Light)	Up to 50,000

[1] If any of the above parameters are incorrect, please contact us so that we may revise our recommendations, if warranted.
[2] Value based on guidelines presented in Section 5.3 of the 2011 ODOT Pavement Design Guide and APAO manual.
[3] Assumes good drainage away from pavement, base, and subgrade is achieved by proper crowning of subgrades.
[4] Values based on experience with similar soils prepared as recommended in this report.
[5] ESAL = Total 18-Kip equivalent single axle load. Traffic levels taken from Table 3.1 of APAO manual. If an increased traffic load is estimated, please contact us so that we may refine the traffic loading and revise our recommendations, if warranted.

Table 6 Input Parameters Used in PCC Pavement Design

Input Parameter	Design Value[1]	Input Parameter		Design Value[1]
Pavement Design Life	20 years	Modulus of Subgrade Reaction[4] (Min. 18 inches of Granular Fill Over CH soil)		100 pci
Annual Percent Growth	0 percent			
Serviceability	4.2 initial, 2.5 terminal	PCC Parameters[2]	Elastic Modulus	5,000 ksi
Reliability	75 percent		Modulus of Rupture	0.7 ksi
Standard Deviation[2]	0.39	Vehicle Traffic[5] (range in ESALs)	APAO Level II (Light)	Up to 50,000
Drainage Factor[3]	1.0			
Load Transfer Coefficient	3.2			

[1] If any of the above parameters are incorrect, please contact us so that we may revise our recommendations, if warranted.
[2] Value based on guidelines presented in the ODOT Pavement Design Guide for rigid pavements.
[3] Assumes good drainage away from pavement, base, and subgrade is achieved by proper crowning of subgrades.
[4] Values based on experience and published literature.
[5] ESAL = Total 18-Kip equivalent single axle load. Traffic levels taken from Table 3.1 of APAO manual. If an increased traffic load is estimated, please contact us so that we may refine the traffic loading and revise our recommendations, if warranted.

5.9.4 Recommended Minimum Pavement Sections

The following table presents the minimum HMAC pavement sections for the traffic levels indicated in the preceding table, based on the referenced design procedures.

Table 7 Recommended Minimum Flexible (HMAC) Pavement Sections

Material	APAO Traffic Loading	
	Level I (Passenger Car Traffic Only	Level II (Entrance/Service Drive Lanes)
Asphalt Pavement (inches)	3	3½
Crushed Aggregate Base (inches)	4	4
Granular Sub-Base (inches)	12	12
Geotextile Separation Fabric	Placed in conformance with Section 5.3.2 of this report	
Subgrade Soils	Prepared in conformance with Section 5.9.1 of this report	

The following table presents the recommended minimum concrete pavement sections based on the referenced AASHTO procedures. Jointing, reinforcement, and surface finish should be performed in accordance with the project civil engineer, architect, and owner requirements.

Table 8 Recommended Minimum Rigid (PCC) Pavement Sections

Material	APAO Traffic Loading
	Level II (Entrance/Service Drive Lanes)
PCC Slab (inches)	6
All Weather Base (inches)	2
Granular Sub-Base (inches)[1]	12
Geotextile Separation Fabric	Placed in conformance with Section 5.3.2 of this report.
Subgrade Soils	Prepared in accordance with Section 5.9.1 of this report.

5.9.5 Pavement Materials

5.9.5.1 HMAC Pavements

We recommend pavement aggregate sub-base consist of durable, relatively well-graded, granular fill in conformance with Section 00641.10.b of the most recent State of Oregon, Standard Specifications for Highway Construction (ODOT SSC), with the following considerations. We recommend the material have a maximum particle size of 4 inches and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. Aggregate sub-base should be compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor), or visual equivalent as identified by deflection (proof roll) testing.

We recommend pavement aggregate base consist of dense-graded aggregate in conformance with Section 02630.10 of the most recent ODOT SSC, with the following additional considerations. We recommend the material consist of crushed rock or gravel, have a maximum particle size of 1½ inches, and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. Aggregate base should be compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor).

We recommend asphalt pavement consist of Level 2, ½-inch, dense-graded HMAC in conformance with the most recent ODOT SSC. Asphalt pavement should be compacted to at least 91 percent of the material's theoretical maximum density as determined in general accordance with ASTM D2041 (Rice Specific Gravity).

5.9.5.2 PCC Pavements

We recommend pavement aggregate sub-base consist of durable, relatively well-graded, granular fill in conformance with Section 00641.10.b of the most recent ODOT SSC, with the following considerations. We recommend the material have a maximum particle size of 4 inches and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. Aggregate sub-base should be compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor), or visual equivalent as identified by deflection (proof roll) testing.

All-weather base should consist of dense-graded aggregate in conformance with Section 02630.10 of the most recent ODOT SSC, with the following additional considerations. We recommend the material consist have a maximum particle size of ¾-inch and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. Aggregate base should be compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor).

Portland cement concrete (PCC) pavement should be in conformance with Section 02001 of the most recent ODOT SSC and meet the properties detailed in Table 6 above.

5.10 Additional Considerations

5.10.1 Drainage

Subsurface drains should be connected to the nearest storm drain, on-site infiltration system (to be designed by others) or other suitable discharge point. Paved surfaces and grading near or adjacent to the building should be sloped to drain away from the building. Surface water from paved surfaces and open spaces

should be collected and routed to a suitable discharge point. Surface water should not be directed into foundation drains or onto site slopes.

5.10.2 Freezing Weather Considerations

For construction that occurs during extended periods of sub-freezing temperatures, the following special provisions are recommended:

- Structural fill should not be placed over frozen ground.
- Frozen soil should not be placed as structural fill.
- Fine-grained soils should not be placed as structural fill during sub-freezing temperatures.

Identification of frozen soils at the site should be in accordance with ASTM D4083-01 "Standard Practice for Description of Frozen Soils (Visual-Manual Procedure)" or other approved method. The geotechnical engineer can aid the contractor with supplemental recommendations for earthwork that will take place during extended periods of sub-freezing weather, as required.

6.0 RECOMMENDED ADDITIONAL SERVICES

6.1 Supplemental Geotechnical Investigation

As indicated in Section 4.2 of this report, supplemental geotechnical investigation of the south portion of the site (i.e. area of proposed deep fills and retaining wall) is recommended in order to develop final geotechnical recommendations for use in design and construction of those features. We recommend the geotechnical engineer be retained to perform the investigation and collaborate with the project design team on finalizing design concepts for that portion of the site.

6.2 Design Review

Geotechnical design review is of paramount importance. We recommend the geotechnical design review take place prior to releasing bid packets to contractors.

6.3 Observation of Construction

Satisfactory earthwork, foundation, floor slab, and pavement performance depends to a large degree on the quality of construction. Sufficient observation 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 subsurface explorations, and recognition of changed conditions often requires experience. We recommend that qualified personnel visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those observed to date and anticipated in this report. We recommend the geotechnical engineer or their representative attend a pre-construction meeting coordinated by the contractor and/or developer. The project geotechnical engineer or their representative should provide observations and/or testing of at least the following earthwork elements during construction:

- Site Stripping
- Subgrade Preparation for Shallow Foundations, Retaining Walls, Structural Fills, Floor Slabs, and Pavements
- Compaction of Structural Fill, Utility Trench Backfill, and Retaining Wall Backfill

- Placement of Foundation Drains, Retaining Wall Drains, and Other Site Drains, as appropriate
- Compaction of Base Rock for Floor Slabs & Pavements
- Compaction of HMAC for Pavements

It is imperative that the owner and/or contractor request earthwork observations and testing at a frequency sufficient to allow the geotechnical engineer to provide a final letter of compliance for the earthwork activities.

7.0 LIMITATIONS

We have prepared this report for use by the owner/developer and other members of the design and construction team for the proposed development. The opinions and recommendations contained within this report are not intended to be, nor should they be construed as a warranty of subsurface conditions, but are forwarded to assist in the planning and design process.

We have made observations based on our explorations that indicate the soil conditions at only those specific locations and only to the depths penetrated. These observations do not necessarily reflect soil types, strata thickness, or water level variations that may exist between or away from our explorations. If subsurface conditions vary from those encountered in our site explorations, CGT should be alerted to the change in conditions so that we may provide additional geotechnical recommendations, if necessary. Observation by experienced geotechnical personnel should be considered an integral part of the construction process.

The owner/developer is responsible for ensuring that the project designers and contractors implement our recommendations. When the design has been finalized, prior to releasing bid packets to contractors, we recommend that the design drawings and specifications be reviewed by our firm to see that our recommendations have been interpreted and implemented as intended. If design changes are made, we request that we be retained to review our conclusions and recommendations and to provide a written modification or verification. Design review and construction phase testing and observation services are beyond the scope of our current assignment, but will be provided for an additional fee.

The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design.

Geotechnical engineering and the geologic sciences are characterized by a degree of uncertainty. Professional judgments presented in this report are based on our understanding of the proposed construction, familiarity with similar projects in the area, and on general experience. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared; no warranty, expressed or implied, is made. This report is subject to review and should not be relied upon after a period of three years.

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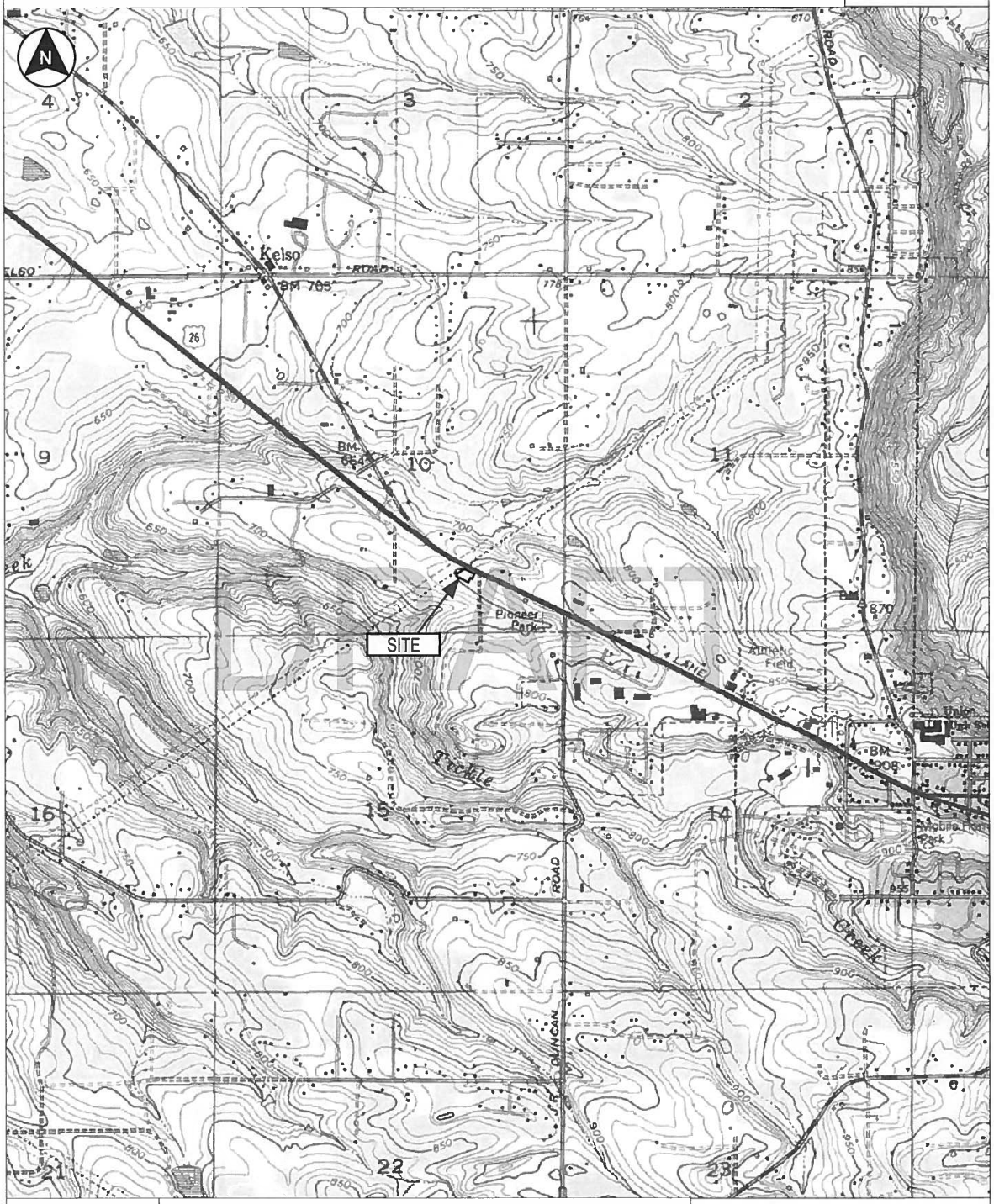
FIGURE 1
Site Location



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Map created with TOPO!™, © 2006 National Geographic Holdings
USGS 7.5 Minute Topographic Map Series, **Sandy, Oregon Quadrangle, 1981**

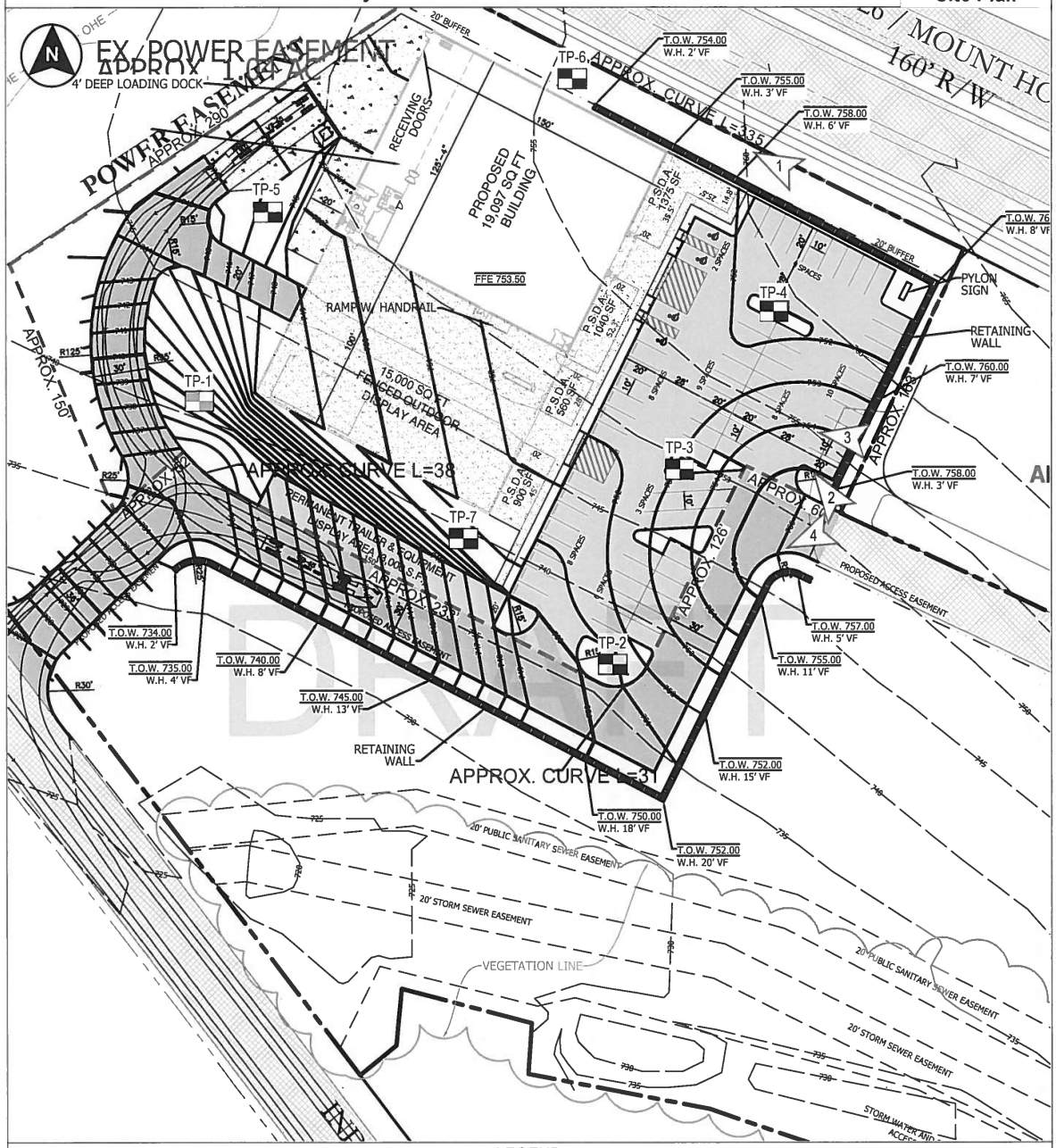
Township 2 South, Range 4 East, Section 10 Willamette Meridian

Latitude: 45.405976° North
Longitude: 122.296282° West

1 Inch = 2,000 feet
0 2000 4000

TSC SANDY - SANDY, OREGON
Project Number G1804765

FIGURE 2
Site Plan



LEGEND

TP-1 Infiltration test pit

TP-2 Test pit

1 Orientation of site photographs shown on Figure 3

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NOTES: Drawing based on observations made while on site and site plans provided by client. All exploration locations should be considered approximate.

1 Inch = 40 Feet

0 40 80

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FIGURE 3
Site Photographs

Photograph 1

Photograph 2

Photograph 3

Photograph 4

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See Figure 2 for approximate photograph locations and directions. Photographs were taken at the time of our fieldwork.

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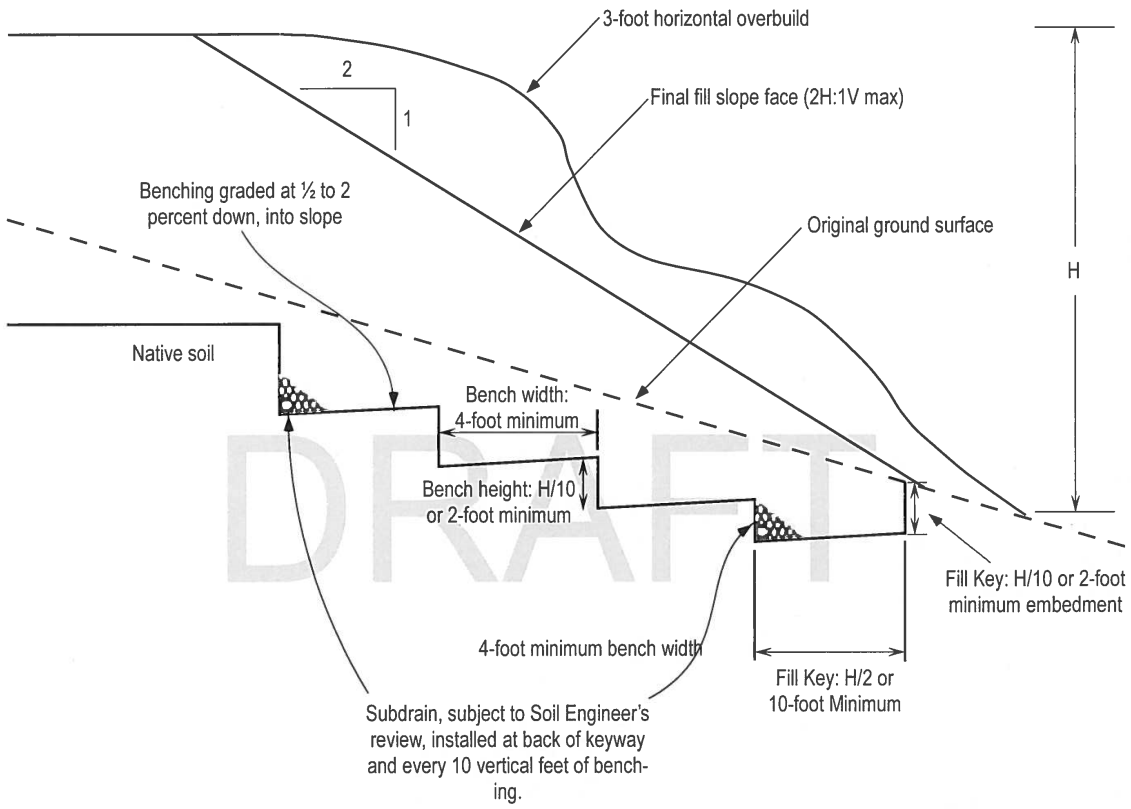
FIGURE 4
Fill Slope Detail



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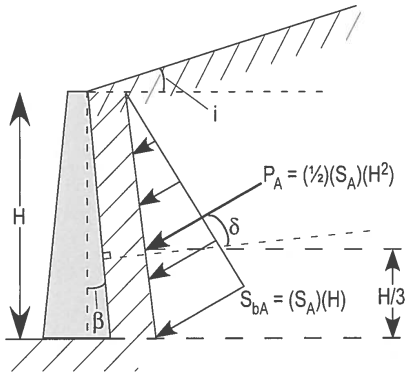
NOTE: Surfaces to receive fill with slopes steeper than 5H:1V (horizontal:vertical) should be benched and keyed as shown.

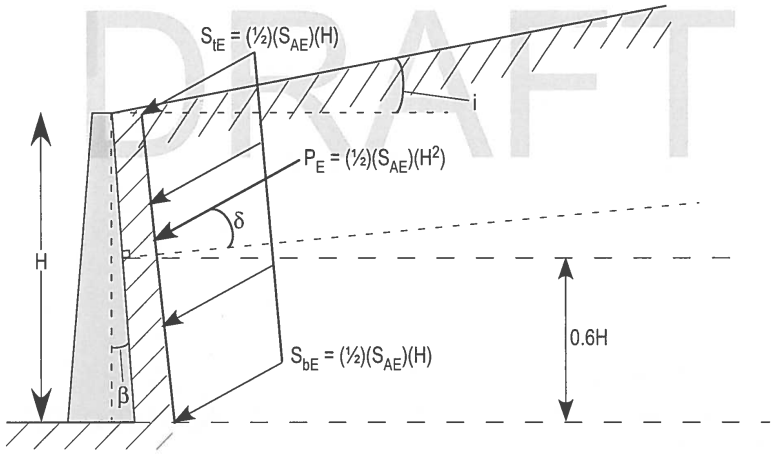
TSC SANDY - SANDY, OREGON Project Number G1804765	FIGURE 5 Retaining Walls

ACTIVE LATERAL PRESSURE DISTRIBUTION

STATIC LOADING CONDITIONS



SEISMIC LOADING CONDITIONS



LEGEND

P_A = Static active thrust force acting at a triangular distribution on wall (lb/ft^3)

P_E = Dynamic component of active thrust force acting at a uniform distribution on wall (lb/ft)

i = Slope of backfill (degrees)**

S_A = Active static equivalent fluid pressure (lb/ft^3)*

S_{tE} = Active earth pressure (dynamic) at the top of the wall (lb/ft^3)

S_{bA} = Active earth pressure (static) at the bottom of the wall (lb/ft^3)

ϕ = Internal angle of friction for backfill (degrees)**

δ = Angle from normal of back of wall (degrees). Based on friction developing between wall and backfill**

β = Slope of back of wall (degrees)**

S_{AE} = Seismic (static + dynamic) equivalent fluid pressure (lb/ft^3)*

$S_{bE} = S_{tE}$ = Active seismic (static + dynamic) pressure (lb/ft^3)

*Refer to report text for calculated values **Refer to report text for modeled/assumed values

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Notes

1. Uniform pressure distribution of seismic loading is based on empirical evaluations [Sherif et al, 1982 and Whitman, 1990].
2. Placement of seismic resultant force at 0.6H is based on wall behavior and model test results [Whitman, 1990].

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Appendix A: Subsurface Investigation and Laboratory Testing

TSC Sandy
Mt. Hood Highway & Champion Way
Sandy, Oregon

CGT Project Number G1804765

February 16, 2018

Prepared For:

Hix Snedeker Companies
Attn: Ms. Lindsay Gadd
805 Trione Street
Daphne, Alabama 36526

Prepared by
Carlson Geotechnical

A.1.0 SUBSURFACE INVESTIGATION

Our field investigation consisted of seven test pits completed in January 2018. The approximate exploration locations are shown on the Site Plan, attached to the geotechnical report as Figure 2. The locations were recorded in the office using desktop GIS software, located in the field using mobile GPS software[1], and are approximate (+/- 30 feet horizontally). Surface elevations indicated on the logs were estimated based on the topographic contours as shown on the referenced Site Plan and should be considered approximate.

A.1.1 Test Pits

CGT observed the excavation of seven test pits (TP-1 through TP-7) at the site on January 23, 2018, to depths of about 5 to 15 feet bgs. The test pits were excavated using a Cat C/2C track-mounted excavator provided and operated provided by our subcontractor, Tabert Trucking & Excavation of Sherwood, Oregon. The test pits were loosely backfilled with the excavated materials upon completion.

Pocket penetrometer readings were generally taken in the upper four feet of each test pit. The pocket penetrometer is a hand-held instrument that provides an approximation of the unconfined compressive strength of cohesive, fine-grained soils. The correlation between pocket penetrometer readings and the consistency of cohesive, fine-grained soils is provided on the attached Figure A2.

A.1.2 Material Classification & Sampling

Representative grab samples were obtained at select intervals within the test pits. In addition, thin-walled, steel (Shelby) tube samplers, detailed on Figure A1, were used to obtain relatively undisturbed samples of the site soils at selected depths within two of the test pits. A qualified member of CGT's staff collected the samples and logged the soils in general accordance with the Visual-Manual Procedure (ASTM D2488). An explanation of this classification system is attached as Figure A2. The grab samples were stored in sealable plastic bags and the Shelby tube samples were sealed with caps and tape and transported to our soils laboratory for further examination and testing. Our geotechnical staff visually examined all samples in order to refine the initial field classifications.

A.1.3 Subsurface Conditions

Subsurface conditions are summarized in Section 2.3 of the geotechnical report. Detailed logs of the explorations are presented on the attached Exploration Logs, Figures A3 through A9.

A.2.0 LABORATORY TESTING

Laboratory testing was performed on samples collected in the field to refine our initial field classifications and determine in-situ parameters. Results of the laboratory tests are shown on the exploration logs. Graphical results of the consolidation test are shown on the attached Figure A10.
Laboratory testing included the following:

- Seventeen moisture content determinations (ASTM D2216).
- Two Atterberg limits (plasticity) tests (ASTM D4318).
- Ones fines test to determine the percent passing the U.S. Standard No. 200 Sieve (ASTM D1140).
- Two shelby tube unit weight tests (weight-volume measurement)
- One consolidation test (ASTM D2435 / D2435M-11)

---

[1] Miocool Inc., 2016. Map Plus (GIS Editor + Offline Map + GPS Recorder) Mobile application software (Version 2.4.5). Retrieved from https://itunes.apple.com/ and installed on an Apple iPhone 5s.

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Project Number G1804765

FIGURE A1
Exploration Key

GEOTECHNICAL LABORATORY TESTING

PL — MC — LL	Atterberg limits (plasticity) test results (ASTM D4318): PL = Plastic Limit, LL = Liquid Limit, and MC= Moisture Content (ASTM D2216)
☐ FINES CONTENT (%)	Percentage passing the U.S. Standard No. 200 Sieve (ASTM D1140)

SAMPLING

GRAB	Grab sample
SPT	**Standard Penetration Test** (SPT) consists of driving a 2-inch, outside-diameter, split-spoon sampler into the undisturbed formation with repeated blows of a 140-pound, hammer falling a vertical distance of 30 inches (ASTM D1586). The number of blows (N-value) required to drive the sampler the last 12 inches of an 18-inch sample interval is used to characterize the soil consistency or relative density. The drill rig was equipped with an cat-head or automatic hammer to conduct the SPTs. The observed N-values, hammer efficiency, and N_{60} are noted on the boring logs.
MC	**Modified California** sampling consists of 3-inch, outside-diameter, split-spoon sampler (ASTM G3550) driven similarly to the SPT sampling method described above. A sampler diameter correction factor of 0.44 is applied to calculate the equivalent SPT N_{60} value per Lacroix and Horn, 1973.
CORE	**Rock Coring** interval
SH	**Shelby Tube** is a 3-inch, inner-diameter, thin-walled, steel tube push sampler (ASTM D1587) used to collect relatively undisturbed samples of fine-grained soils.
WDCP	**Wildcat Dynamic Cone Penetrometer** (WDCP) test consists of driving 1.1-inch diameter, steel rods with a 1.4-inch diameter, cone tip into the ground using a 35-pound drop hammer with a 15-inch free-fall height. The number of blows required to drive the steel rods is recorded for each 10 centimeters (3.94 inches) of penetration. The blow count for each interval is then converted to the corresponding SPT N_{60} values.
DCP	**Dynamic Cone Penetrometer** (DCP) test consists of driving a 20-millimeter diameter, hardened steel cone on 16-millimeter diameter steel rods into the ground using a 10-kilogram drop hammer with a 460-millimeter free-fall height. The depth of penetration in millimeters is recorded for each drop of the hammer.
POCKET PEN. (tsf)	**Pocket Penetrometer** test is a hand-held instrument that provides an approximation of the unconfined compressive strength in tons per square foot (tsf) of cohesive, fine-grained soils.

CONTACTS

	Observed (measured) contact between soil or rock units.
	Inferred (approximate) contact between soil or rock units.
	Transitional (gradational) contact between soil or rock units.

ADDITIONAL NOTATIONS

Italics	Notes drilling action or digging effort
{ Braces }	Interpretation of material origin/geologic formation (e.g. { Base Rock } or { Columbia River Basalt })

TSC SANDY - SANDY, OREGON Project Number G1804765	FIGURE A2 Soil Classification

Classification of Terms and Content

NAME: Group Name and Symbol
Relative Density or Consistency
Color
Moisture Content
Plasticity
Other Constituents
Other: Grain Shape, Approximate Gradation
Organics, Cement, Structure, Odor, etc.
Geologic Name or Formation

USCS Grain Size

Fines		<#200 (0.075 mm)
Sand	Fine Medium Coarse	#200 - #40 (0.425 mm) #40 - #10 (2 mm) #10 - #4 (4.75)
Gravel	Fine Coarse	#4 - 0.75 inch 0.75 inch - 3 inches
Cobbles		3 to 12 inches; scattered <15% estimated numerous >15% estimated
Boulders		> 12 inches

Relative Density or Consistency

Granular Material		Fine-Grained (cohesive) Materials				
SPT N-Value	Density	SPT N-Value	Torvane tsf Shear Strength	Pocket Pen tsf Unconfined	Consistency	Manual Penetration Test
		<2	<0.13	<0.25	Very Soft	Thumb penetrates more than 1 inch
0 - 4	Very Loose	2 - 4	0.13 - 0.25	0.25 - 0.50	Soft	Thumb penetrates about 1 inch
4 - 10	Loose	4 - 8	0.25 - 0.50	0.50 - 1.00	Medium Stiff	Thumb penetrates about ¼ inch
10 - 30	Medium Dense	8 - 15	0.50 - 1.00	1.00 - 2.00	Stiff	Thumb penetrates less than ¼ inch
30 - 50	Dense	15 - 30	1.00 - 2.00	2.00 - 4.00	Very Stiff	Readily indented by thumbnail
>50	Very Dense	>30	>2.00	>4.00	Hard	Difficult to indent by thumbnail

Moisture Content

Dry: Absence of moisture, dusty, dry to the touch
Damp: Some moisture but leaves no moisture on hand
Moist: Leaves moisture on hand
Wet: Visible free water, likely from below water table

	Plasticity	Dry Strength	Dilatancy	Toughness
ML	Non to Low	Non to Low	Slow to Rapid	Low, can't roll
CL	Low to Medium	Medium to High	None to Slow	Medium
MH	Medium to High	Low to Medium	None to Slow	Low to Medium
CH	Medium to High	High to Very High	None	High

Structure

Stratified: Alternating layers of material or color >6 mm thick
Laminated: Alternating layers < 6 mm thick
Fissured: Breaks along definite fracture planes
Slickensided: Striated, polished, or glossy fracture planes
Blocky: Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lenses: Has small pockets of different soils, note thickness
Homogeneous: Same color and appearance throughout

Visual-Manual Classification

Major Divisions			Group Symbols	Typical Names
Coarse Grained Soils: More than 50% retained on No. 200 sieve	Gravels: 50% or more *retained* on the No. 4 sieve	Clean Gravels	GW	Well-graded gravels and gravel/sand mixtures, little or no fines
			GP	Poorly-graded gravels and gravel/sand mixtures, little or no fines
		Gravels with Fines	GM	Silty gravels, gravel/sand/silt mixtures
			GC	Clayey gravels, gravel/sand/clay mixtures
	Sands: More than 50% *passing* the No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines
			SP	Poorly-graded sands and gravelly sands, little or no fines
		Sands with Fines	SM	Silty sands, sand/silt mixtures
			SC	Clayey sands, sand/clay mixtures
Fine-Grained Soils: 50% or more Passes No. 200 Sieve	Silt and Clays Low Plasticity Fines		ML	Inorganic silts, rock flour, clayey silts
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
			OL	Organic silt and organic silty clays of low plasticity
	Silt and Clays High Plasticity Fines		MH	Inorganic silts, clayey silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat, muck, and other highly organic soils

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ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

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FIGURE A3

Test Pit TP-1

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18 **GROUND ELEVATION** 741 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F **SURFACE** grass
LOGGED BY DJD **REVIEWED BY** KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ PL LL MC; ☐ FINES CONTENT (%) ☐ 0 20 40 60 80 100
740		OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.		0				0.5		
		CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist to wet, medium to high plasticity, trace fine organics.			GRAB TP1-1			1		30
									1.5		
						GRAB TP1-2			1.5		23 30 57
									1.25		
			FAT CLAY: Stiff to hard, light to red-brown, moist, medium to high plasticity. Blocky structure below 4 feet bgs.						3.75		
					5	GRAB TP1-3			4.5+		
735											
			With fine-grained sand below about 7 feet bgs.			GRAB TP1-4					57 83 ☐
			Infiltration test performed at 8 feet bgs. See Appendix B for details.								
		CH			10						
730											
					15	GRAB TP1-5					65
725			•Test pit terminated at 15 feet bgs. •No groundwater or caving observed. •Test pit backfilled loosely upon completion.								

CGT EXPLORATION WITH WDCP G1804765.GPJ 2/15/18 DRAFTED BY:

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FIGURE A4

Test Pit TP-2

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18 **GROUND ELEVATION** 737 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F **SURFACE** grass
LOGGED BY DJD **REVIEWED BY** KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐ 0 20 40 60 80 100
		OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.		0				4.5+		
		CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist to wet, medium to high plasticity.						1.75		
735									1.75		
						GRAB TP2-1			2.5		30
									2.5		
									4		
		CH	**FAT CLAY:** Hard, light to red-brown, moist, medium to high plasticity.						4.5+		
						ST TP2-2			4.5+	89	34
					5						
730			•Test pit terminated at 5 feet bgs. •No groundwater or caving observed. •Test pit backfilled loosely upon completion.								
725											

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FIGURE A5

Test Pit TP-3

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18
GROUND ELEVATION 750 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F
SURFACE grass
LOGGED BY DJD
REVIEWED BY KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐ 0 20 40 60 80 100
		OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.		0				0.5		
		ML FILL	**UNDOCUMENTED SILT FILL:** Brown, moist, low plasticity.			GRAB TP3-1			0.5		
		CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, moist to wet, medium to high plasticity.						0.5		
									4.5+		
						GRAB TP3-2			4.5+		
									3.75		
									3		
745		CH	**FAT CLAY:** Very stiff to hard, red-brown, moist, medium to high plasticity.			GRAB TP3-3			3.25		● 55
					5						

•Test pit terminated at 5 feet bgs.
•No groundwater or caving observed.
•Test pit backfilled loosely upon completion.

740
735

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FIGURE A6
Test Pit TP-4

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18 **GROUND ELEVATION** 759 ft **ELEVATION DATUM** See Figure 2
WEATHER Rain, 40°F **SURFACE** grass **LOGGED BY** DJD **REVIEWED BY** KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation **SEEPAGE** ---
EQUIPMENT Cat C/2C tracked excavator **GROUNDWATER AT END** ---
EXCAVATION METHOD 24-inch wide toothed bucket **GROUNDWATER AFTER EXCAVATION** ---

ELEVATION (ft)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐
					0						0 20 40 60 80 100
		OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.			GRAB TP4-1			0.5		28
		CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist to wet, medium to high plasticity.						2.5 2 1.5 2.5 2.75		
755		CH	**FAT CLAY:** Very stiff, red-brown, moist, medium to high plasticity. Blocky structure below 4 feet bgs.			GRAB TP4-2			3.5 4		PL 30, LL 65, MC 32
					5	GRAB TP4-3					33

- Test pit terminated at 5 feet bgs.
- No groundwater or caving observed.
- Test pit backfilled loosely upon completion.

750

745

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FIGURE A7

Test Pit TP-5

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18
GROUND ELEVATION 748 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F
SURFACE grass
LOGGED BY DJD
REVIEWED BY KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐ 0 20 40 60 80 100
		OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.		0				0.5		
		CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist to wet, medium to high plasticity.			GRAB TP5-1			1		
745						GRAB TP5-2			2.75		
						GRAB TP5-3			2.25		
									2.5		
									3.75		
									3.75		33
			FAT CLAY: Very stiff, red-brown, moist, medium to high plasticity. Blocky structure below 4 feet bgs.		5				4		
		CH									
740						GRAB TP5-4					33
					10	GRAB TP5-5					
735											

- Test pit terminated at 10 feet bgs.
- No groundwater or caving observed.
- Test pit backfilled loosely upon completion.

CGT EXPLORATION WITH WDCP G1804765.GPJ 2/15/18 DRAFTED BY:

Carlson Geotechnical
7185 SW Sandburg Street, Suite 200
Tigard, Oregon 97281
(503) 601-8250
www.carlsontesting.com

FIGURE A8

Test Pit TP-6

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18
GROUND ELEVATION 755 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F
SURFACE grass
LOGGED BY DJD
REVIEWED BY KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐ 0 20 40 60 80 100
		OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.		0				0.5		
		CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist to wet, medium to high plasticity.			GRAB TP6-1			2		
									2		
						GRAB TP6-2			1.5		
									1.5		
									2.75		31
									3.75		
750			**FAT CLAY:** Very stiff, red-brown, very moist to wet, medium to high plasticity.						4		
					5						
		CH	Blocky structure below 5 feet bgs.			GRAB TP6-3					32
						GRAB TP6-4					
745					10						

- Test pit terminated at 10 feet bgs.
- No groundwater or caving observed.
- Test pit backfilled loosely upon completion.

740

CGT EXPLORATION WITH WDCP G1804765.GPJ 2/15/18 DRAFTED BY:

Carlson Geotechnical
7185 SW Sandburg Street, Suite 200
Tigard, Oregon 97281
(503) 601-8250
www.carlsontesting.com

FIGURE A9

Test Pit TP-7

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18 **GROUND ELEVATION** 740 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F **SURFACE** grass
LOGGED BY DJD **REVIEWED BY** KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ■
		OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.		0				2		
		CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist, medium to high plasticity.			GRAB TP7-1			2		
						GRAB TP7-2			1.5		
									2.75		
			FAT CLAY: Very stiff to hard, light to red-brown, moist, medium to high plasticity.						4.5+		
			Blocky structure below 3½ feet bgs.						4.5+		
			ST TP7-3: Results of consolidation test (ASTM D2435) shown on Figure A10.			ST TP7-3			4.5+	78	
735		CH			5				4.5+		
						GRAB TP7-4					
730					10						
						GRAB TP7-5					
725											

- Test pit terminated at 10½ feet bgs.
- No groundwater or caving observed.
- Test pit backfilled loosely upon completion.

CGT EXPLORATION WITH WDCP G1804765.GPJ 2/15/18 DRAFTED BY:

FIGURE A10
Consolidation Test Results

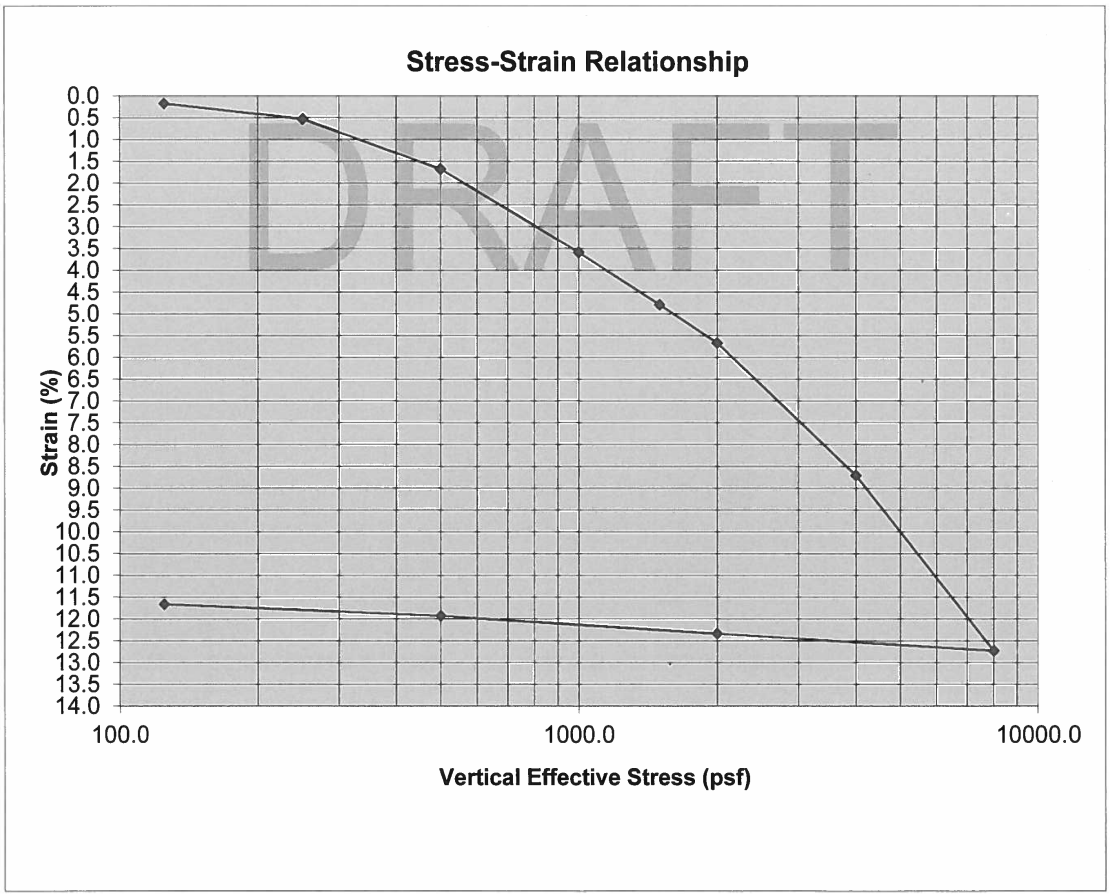
Bend (541) 330-9155
Eugene (541) 345-0289
Geotechnical (503) 601-8250
Salem (503) 589-1252
Tigard (503) 684-3460

Carlson Testing, Inc.

Load Increment	Total Stress (psf)	Strain ϵ (%)	Total ΔH (in.)	24 hr. ΔH Value (in.)
1	125	0.1700	0.0017	0.0017
2	250	0.5300	0.0053	0.0053
5	500	1.6800	0.0168	0.0168
6	1000	3.5900	0.0359	0.0359
7	1500	4.7900	0.0479	0.0479
8	2000	5.6700	0.0567	0.0567
9	4000	8.7100	0.0871	0.0871
10	8000	12.7300	0.1273	0.1273
11	2000	12.3400	0.1234	0.1234
12	500	11.9300	0.1193	0.1193
13	125	11.6600	0.1166	0.1166

CTI Project #:	G1804765
Lab Log #:	18-0083
Sample ID:	ST TP7-3
Sample depth:	3'-5'

Initial Dial Reading, do	0.0000	in.
Initial Specimen Height, Ho:	1.0000	in.
Initial Moisture Content:	52.4	%
Final Moisture Content:	56.7	%



Carlson Geotechnical

A Division of Carlson Testing, Inc.
Phone: (503) 601-8250
Fax: (503) 601-8254

Bend Office	(541) 330-9155
Eugene Office	(541) 345-0289
Salem Office	(503) 589-1252
Tigard Office	(503) 684-3460

Appendix B: Results of Infiltration Testing

TSC Sandy
Mt. Hood Highway & Champion Way
Sandy, Oregon

CGT Project Number G1804765

February 16, 2018

Prepared For:

Hix Snedeker Companies
Lindsay Gadd
805 Trione Street
Daphne, Alabama 36526

Prepared by
Carlson Geotechnical

Appendix B: Results of Infiltration Testing
TSC Sandy
Sandy, Oregon
CGT Project Number G1804765
February 16, 2018

B.1.0 INTRODUCTION

The project civil engineer, Mr. Trey Jinright, P.E., of Jade Consulting, LLC, requested one infiltration test be conducted within the southwest portion of the site. Mr. Jinright requested the test be conducted at a depth of about 8 feet below ground surface (bgs). The test was performed in test pit TP-1 as shown on the Site Plan, which is attached to the main report as Figure 2.

B.2.0 TEST PROCEDURE

Infiltration testing was performed within the prepared test pit on January 23, 2018, in general accordance with the 1980 EPA Falling Head Test Method. The test pit was excavated to the infiltration test depth, as described in the main report. A 6-inch-inner-diameter PVC pipe was pushed about 12 inches into the subgrade soils at the bottom of the test pit. The subsurface soils were pre-soaked at the infiltration test location by pouring sufficient water to achieve a minimum 12-inch vertical column of water in the pipe. The 12-inch column of water was maintained for the minimum, 4-hour soaking time per the referenced test method Less than ¼ inch of drop in the water level was noted during the soaking period.

After the soaking period, about 12 inches of water remained in the pipe, and the drop in water level was recorded at 20-minute intervals for 1 hour. Measurements were taken with a tape measure and recorded to the nearest one-sixteenth of an inch.

B.3.0 INFILTRATION TEST RESULTS

The following table presents the details, raw data, and calculated infiltration rate observed during testing.

Table B1 Results of Infiltration Test TP-1

Test Depth: 8 feet bgs	**Soil Type:** Fat Clay (CH)	
Time Interval (minutes)	**Drop in Water Level (inches)***	**Raw Infiltration Rate (inches per hour)****
20	0	0
20	0	0
20	0	0

* Water level measurements taken in inches, measured to the nearest one-sixteenth inch

B.4.0 DISCUSSION

As detailed in Section B.3.0, no discernible infiltration was observed during our infiltration test. Further excavation to about 15 feet bgs at the infiltration test pit did not reveal a significant change in soil characteristics that would suggest infiltration rates would improve with depth.

If alternative infiltration location(s) are considered at the site, we recommend supplemental field investigation and testing be performed. CGT would be pleased to perform supplemental field investigation and testing for an additional fee, upon request.

APPENDIX G – Water Quality Treatment Device

Summary for Subcatchment 1S: CDS

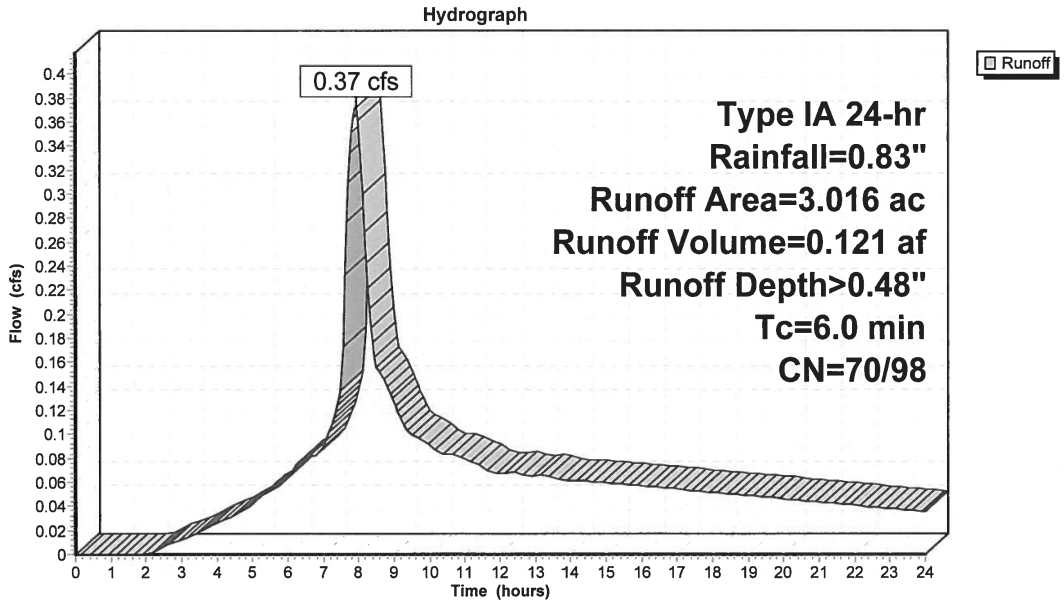
Runoff = 0.37 cfs @ 7.95 hrs, Volume= 0.121 af, Depth> 0.48"

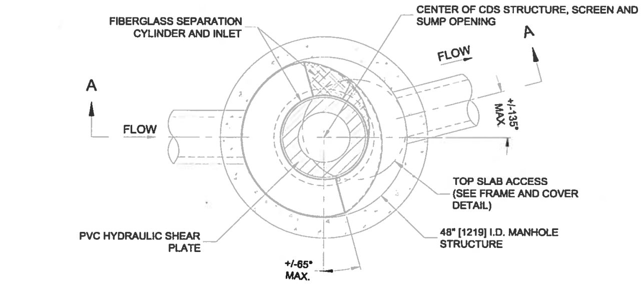
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr Rainfall=0.83"

	Area (ac)	CN	Description
*	2.322	98	
*	0.694	70	
	3.016	92	Weighted Average
	0.694	70	23.01% Pervious Area
	2.322	98	76.99% Impervious Area

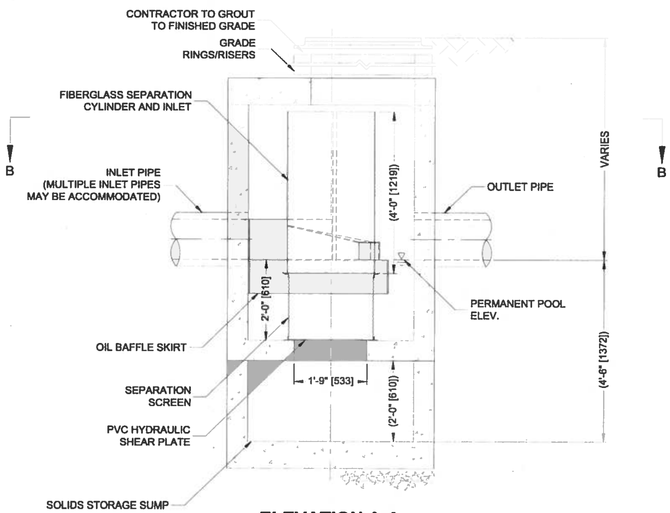
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1S: CDS





PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.

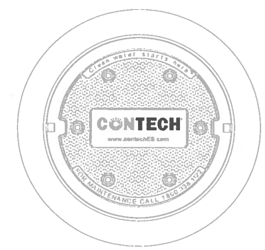
\\AD.CONTECH-CPI.COM\ROOT\COMMON\CAD\TREATMENT\22 CDS\40 STANDARD DRAWINGS\ONLINE (CDS-C)\DWG\CDS2015-4-C-DTL.DWG 9/25/2015 8:05 AM

CDS2015-4-C DESIGN NOTES

CDS2015-4-C RATED TREATMENT CAPACITY IS 0.7 CFS [19.8 L/s], OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 10.0 CFS [283 L/s]. IF THE SITE CONDITIONS EXCEED 10.0 [283 L/s] CFS, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			

* PER ENGINEER OF RECORD

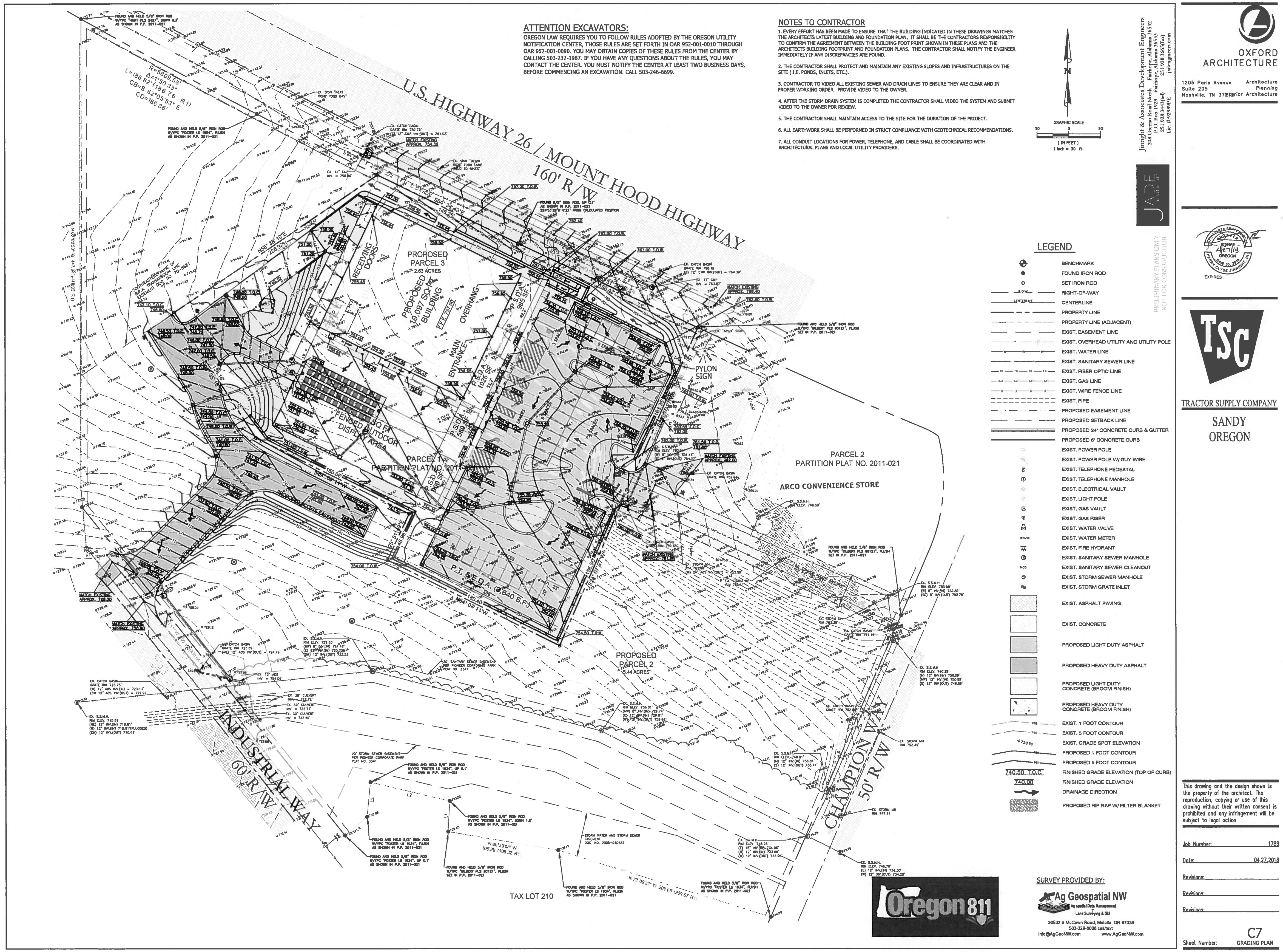
GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO..
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS2015-4-C
ONLINE CDS
STANDARD DETAIL

APPENDIX H – Overall Grading and Drainage Plan


U.S. HIGHWAY 26 / MOUNT HOOD HIGHWAY
160' R/W
INDUSTRIAL WAY
60' R/W
CHAMPION WAY
50' R/W
PROPOSED
PARCEL 3
2.63 ACRES
PROPOSED
19,097 SQ.FT.
BUILDING
RECEIVING
DOORS
MAIN
ENTRANCE
OVERHANG
FENCED OUTDOOR
DISPLAY AREA
PYLON
SIGN
PARCEL 2
PARTITION PLAT NO. 2011-021
ARCO CONVENIENCE STORE
PROPOSED
PARCEL 2
TAX LOT 210
LEGEND
BENCHMARK
FOUND IRON ROD
SET IRON ROD
RIGHT-OF-WAY
CENTERLINE
PROPERTY LINE
PROPERTY LINE (ADJACENT)
EXIST. EASEMENT LINE
EXIST. OVERHEAD UTILITY AND UTILITY POLE
EXIST. WATER LINE
EXIST. SANITARY SEWER LINE
EXIST. FIBER OPTIC LINE
EXIST. GAS LINE
EXIST. WIRE FENCE LINE
EXIST. PIPE
PROPOSED EASEMENT LINE
PROPOSED SETBACK LINE
PROPOSED 24" CONCRETE CURB & GUTTER
PROPOSED 6" CONCRETE CURB
EXIST. POWER POLE
EXIST. POWER POLE W/ GUY WIRE
EXIST. TELEPHONE PEDESTAL
EXIST. TELEPHONE MANHOLE
EXIST. ELECTRICAL VAULT
EXIST. LIGHT POLE
EXIST. GAS VAULT
EXIST. GAS RISER
EXIST. WATER VALVE
EXIST. WATER METER
EXIST. FIRE HYDRANT
EXIST. SANITARY SEWER MANHOLE
EXIST. SANITARY SEWER CLEANOUT
EXIST. STORM SEWER MANHOLE
EXIST. STORM GRATE INLET
EXIST. ASPHALT PAVING
EXIST. CONCRETE
PROPOSED LIGHT DUTY ASPHALT
PROPOSED HEAVY DUTY ASPHALT
PROPOSED LIGHT DUTY CONCRETE (BROOM FINISH)
PROPOSED HEAVY DUTY CONCRETE (BROOM FINISH)
EXIST. 1 FOOT CONTOUR
EXIST. 5 FOOT CONTOUR
EXIST. GRADE SPOT ELEVATION
PROPOSED 1 FOOT CONTOUR
PROPOSED 5 FOOT CONTOUR
740.50 T.O.C.
FINISHED GRADE ELEVATION (TOP OF CURB)
740.00
FINISHED GRADE ELEVATION
DRAINAGE DIRECTION
PROPOSED RIP RAP W/ FILTER BLANKET
GRAPHIC SCALE
(IN FEET)
1 inch = 30 ft.
Oregon 811
SURVEY PROVIDED BY:
Ag Geospatial NW
30532 S McCown Road, Molalla, OR 97038
info@AgGeoNW.com
www.AgGeoNW.com
Jinright & Associates Development Engineers
208 Greeno Road North Fairhope, Alabama 36532
P.O. Box 1929 Fairhope, Alabama 36533
jadengineers.com
JADE
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NOT FOR CONSTRUCTION
OXFORD
ARCHITECTURE
1205 Paris Avenue
Suite 205
Nashville, TN 37
Architecture
Planning
Interior Architecture
EXPIRES
TSC
TRACTOR SUPPLY COMPANY
SANDY
OREGON
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Job Number: 1789
Date: 04.27.2018
Revision:
Revision:
Revision:
Sheet Number: C7
GRADING PLAN

ATTENTION EXCAVATORS:

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NOTES TO CONTRACTOR

1. EVERY EFFORT HAS BEEN MADE TO ENSURE THAT THE BUILDING INDICATED IN THESE DRAWINGS MATCHES THE ARCHITECTS LATEST BUILDING AND FOUNDATION PLAN. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO CONFIRM THE AGREEMENT BETWEEN THE BUILDING FOOT PRINT SHOWN IN THESE PLANS AND THE ARCHITECTS BUILDING FOOTPRINT AND FOUNDATION PLANS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF ANY DISCREPANCIES ARE FOUND.

2. THE CONTRACTOR SHALL PROTECT AND MAINTAIN ANY EXISTING SLOPES AND INFRASTRUCTURES ON THE SITE (I.E. PONDS, INLETS, ETC.).

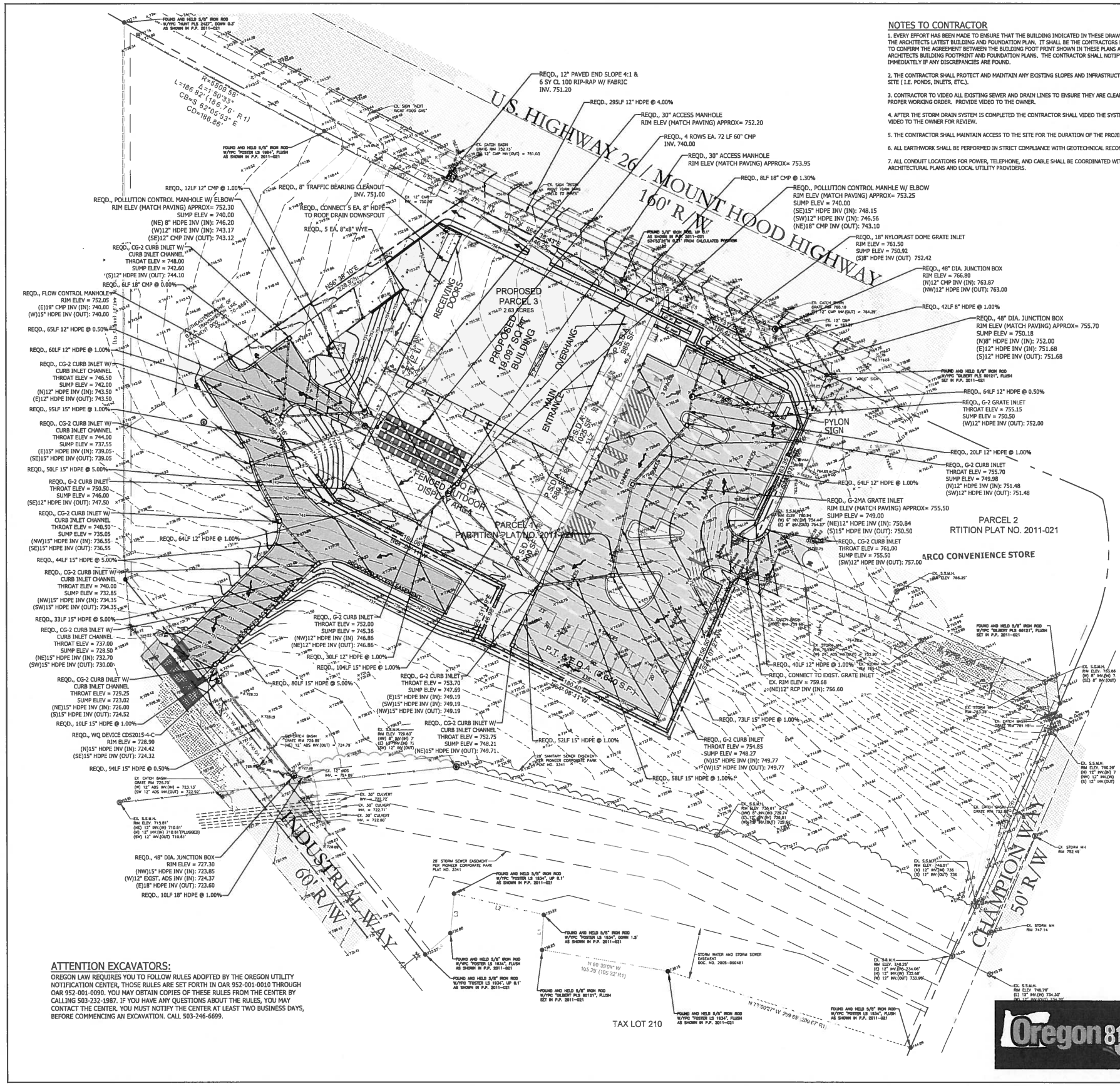
3. CONTRACTOR TO VIDEO ALL EXISTING SEWER AND DRAIN LINES TO ENSURE THEY ARE CLEAR AND IN PROPER WORKING ORDER. PROVIDE VIDEO TO THE OWNER.

4. AFTER THE STORM DRAIN SYSTEM IS COMPLETED THE CONTRACTOR SHALL VIDEO THE SYSTEM AND SUBMIT VIDEO TO THE OWNER FOR REVIEW.

5. THE CONTRACTOR SHALL MAINTAIN ACCESS TO THE SITE FOR THE DURATION OF THE PROJECT.

6. ALL EARTHWORK SHALL BE PERFORMED IN STRICT COMPLIANCE WITH GEOTECHNICAL RECOMMENDATIONS.

7. ALL CONDUIT LOCATIONS FOR POWER, TELEPHONE, AND CABLE SHALL BE COORDINATED WITH ARCHITECTURAL PLANS AND LOCAL UTILITY PROVIDERS.



NOTES TO CONTRACTOR

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7. ALL CONDUIT LOCATIONS FOR POWER, TELEPHONE, AND CABLE SHALL BE COORDINATED WITH ARCHITECTURAL PLANS AND LOCAL UTILITY PROVIDERS.

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Oregon 811

SURVEY PROVIDED BY:

Ag Geospatial NW
Ag spatial Data Management
+
Land Surveying & GIS
30532 S McCown Road, Molalla, OR 97038
503-329-8008 cell/text
info@AgGeoNW.com www.AgGeoNW.com

LEGEND

⌖	BENCHMARK
●	FOUND IRON ROD
○	SET IRON ROD
ROW	RIGHT-OF-WAY
CENTERLINE	CENTERLINE
	PROPERTY LINE
	PROPERTY LINE (ADJACENT)
	EXIST. EASEMENT LINE
	EXIST. OVERHEAD UTILITY AND UTILITY POLE
—W—W—W—	EXIST. WATER LINE
	EXIST. SANITARY SEWER LINE
—FO—FO—FO—FO—	EXIST. FIBER OPTIC LINE
—GAS—GAS—GAS—GAS—	EXIST. GAS LINE
—x—x—x—x—	EXIST. WIRE FENCE LINE
	EXIST. PIPE
	PROPOSED EASEMENT LINE
	PROPOSED SETBACK LINE
	PROPOSED 24" CONCRETE CURB & GUTTER
	PROPOSED 6" CONCRETE CURB
	EXIST. POWER POLE
	EXIST. POWER POLE W/ GUY WIRE
	EXIST. TELEPHONE PEDESTAL
Ⓣ	EXIST. TELEPHONE MANHOLE
	EXIST. ELECTRICAL VAULT
	EXIST. LIGHT POLE
	EXIST. GAS VAULT
	EXIST. GAS RISER
	EXIST. WATER VALVE
WM	EXIST. WATER METER
	EXIST. FIRE HYDRANT
Ⓢ	EXIST. SANITARY SEWER MANHOLE
CO	EXIST. SANITARY SEWER CLEANOUT
Ⓓ	EXIST. STORM SEWER MANHOLE
	EXIST. STORM GRATE INLET
▨	EXIST. ASPHALT PAVING
☐	EXIST. CONCRETE
▨	PROPOSED LIGHT DUTY ASPHALT
■	PROPOSED HEAVY DUTY ASPHALT
☐	PROPOSED LIGHT DUTY CONCRETE (BROOM FINISH)
▨	PROPOSED HEAVY DUTY CONCRETE (BROOM FINISH)
739	EXIST. 1 FOOT CONTOUR
740	EXIST. 5 FOOT CONTOUR
×738.90	EXIST. GRADE SPOT ELEVATION
739	PROPOSED 1 FOOT CONTOUR
740	PROPOSED 5 FOOT CONTOUR
740.50 T.O.C.	FINISHED GRADE ELEVATION (TOP OF CURB)
740.00	FINISHED GRADE ELEVATION
→	DRAINAGE DIRECTION
▨	PROPOSED RIP RAP W/ FILTER BLANKET

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Job Number: 1789
Date: 04.27.2018
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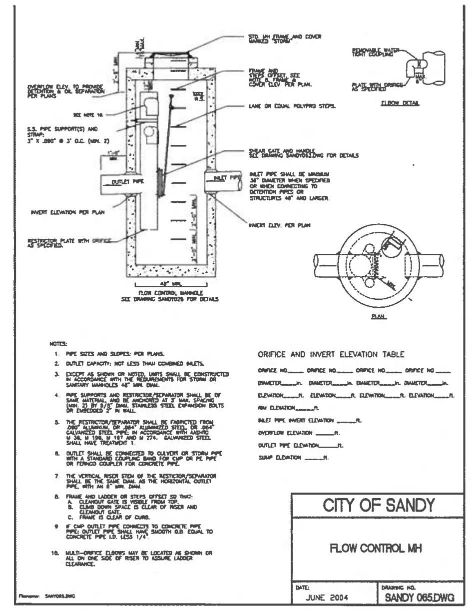
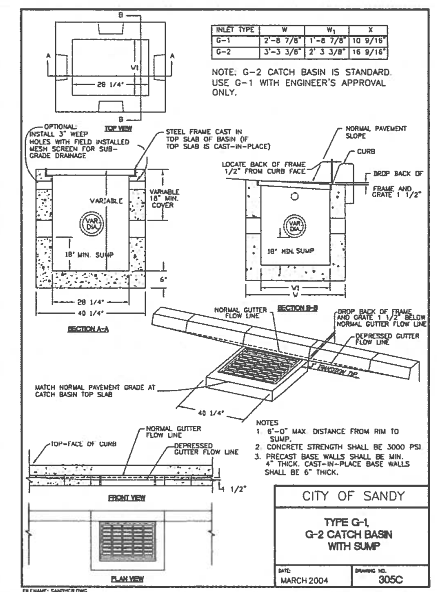
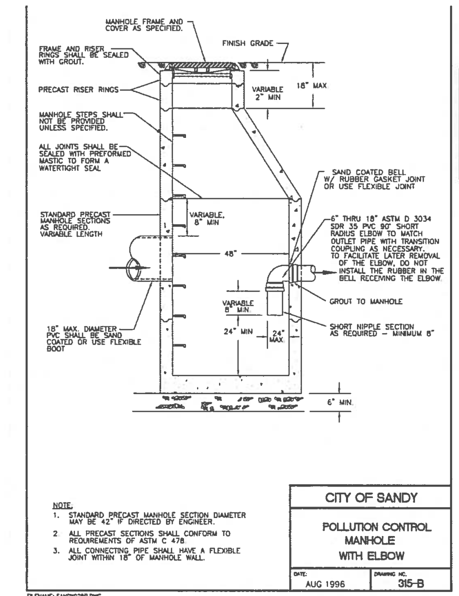
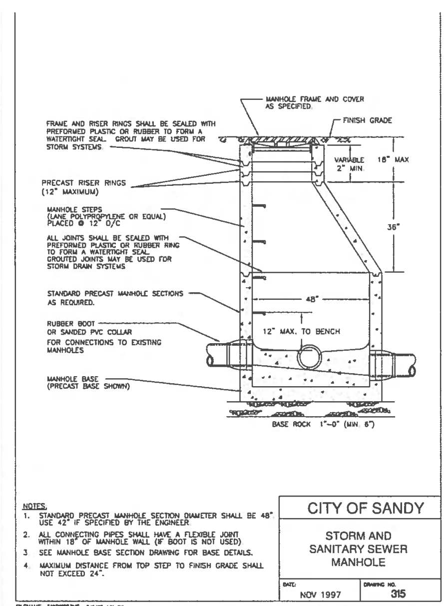
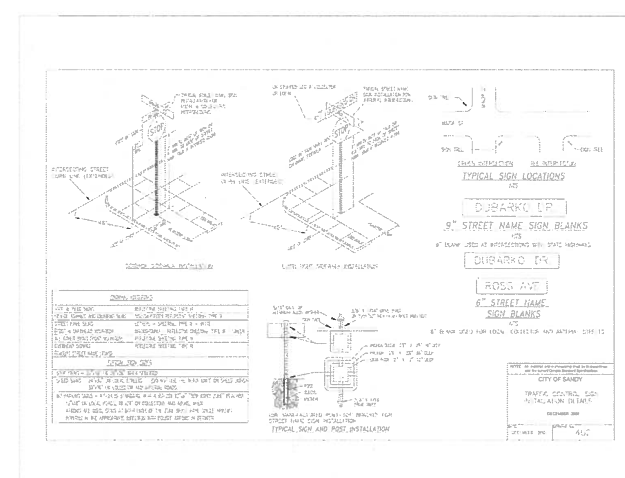
Sheet Number: C8
DRAINAGE PLAN











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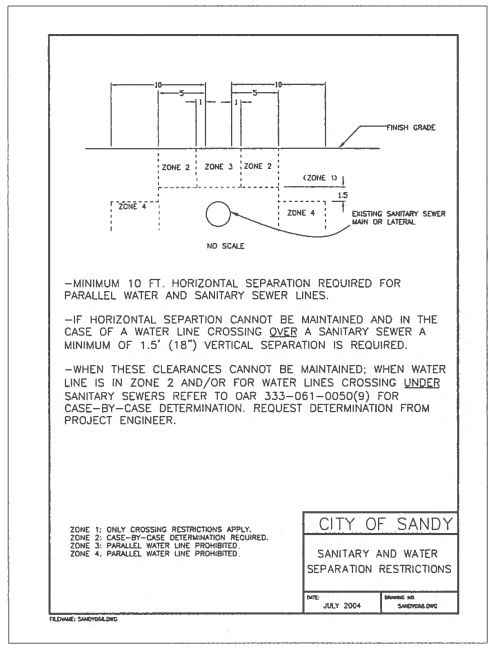
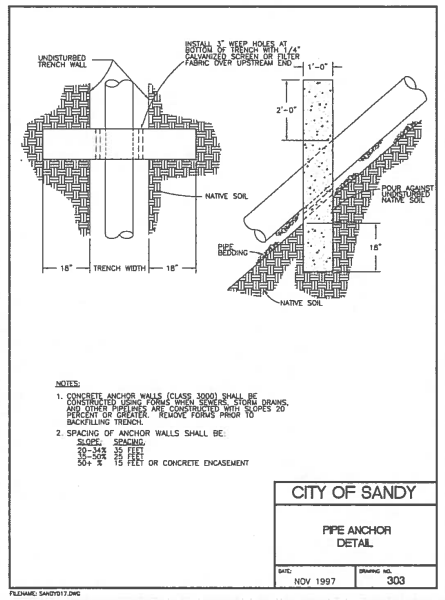
C12
Sheet Number: CIVIL CONSTRUCTION DETAILS





–MINIMUM 10 FT. HORIZONTAL SEPARATION REQUIRED FOR PARALLEL WATER AND SANITARY SEWER LINES.

–IF HORIZONTAL SEPARTION CANNOT BE MAINTAINED AND IN THE CASE OF A WATER LINE CROSSING OVER A SANITARY SEWER A MINIMUM OF 1.5' (18") VERTICAL SEPARATION IS REQUIRED.

–WHEN THESE CLEARANCES CANNOT BE MAINTAINED; WHEN WATER LINE IS IN ZONE 2 AND/OR FOR WATER LINES CROSSING UNDER SANITARY SEWERS REFER TO OAR 333–061–0050(9) FOR CASE–BY–CASE DETERMINATION. REQUEST DETERMINATION FROM PROJECT ENGINEER.

ZONE 1: ONLY CROSSING RESTRICTIONS APPLY.
ZONE 2: CASE–BY–CASE DETERMINATION REQUIRED.
ZONE 3: PARALLEL WATER LINE PROHIBITED.
ZONE 4: PARALLEL WATER LINE PROHIBITED.

CITY OF SANDY
SANITARY AND WATER SEPARATION RESTRICTIONS
DATE: JULY 2004
DRAWING NO. SANDY068.DWG
FILENAME: SANDY068.DWG

NOTES:

1. CONCRETE ANCHOR WALLS (CLASS 3000) SHALL BE CONSTRUCTED USING FORMS WHEN SEWERS, STORM DRAINS, AND OTHER PIPELINES ARE CONSTRUCTED WITH SLOPES 20 PERCENT OR GREATER. REMOVE FORMS PRIOR TO BACKFILLING TRENCH.
2. SPACING OF ANCHOR WALLS SHALL BE:

SLOPE	SPACING
20–34%	35 FEET
35–50%	25 FEET
50+ %	15 FEET OR CONCRETE ENCASEMENT

CITY OF SANDY
PIPE ANCHOR DETAIL
DATE: NOV 1997
DRAWING NO. 303
FILENAME: SANDY017.DWG

NOTE:
PLUG ENDS OF CASING WITH CONCRETE

CITY OF SANDY
BORE CASING DETAIL
DATE: NOV 1997
DRAWING NO. 307
FILENAME: SANDY022.DWG

NOTES:

1. SANITARY MAIN, LATERAL AND FITTINGS SHALL BE LIKE MATERIALS. ONLY MANUFACTURED FITTINGS SHALL BE USED.
2. MINIMUM DEPTH AT RIGHT OF WAY OR EASEMENT LINE SHALL BE 4 FEET.
3. MARKER POSTS AND BLOCKING SHALL BE TREATED WOOD. POST SHALL BE 2" x 4" FIR. POST TO EXTEND 12" MINIMUM ABOVE FINISH GRADE AND EXPOSED AREA SHALL BE PAINTED FLOURESCENT GREEN.
4. INSTALL CLEANOUT WHEN SPECIFIED IN PERMIT OR PLAN REVIEW. REFER TO SANDY052.DWG (DRAWING 310) FOR CLEANOUT DETAIL.
5. LAY BUILDING SEWER AT MAX. 45° FROM HORIZONTAL TO ACHIEVE REQUIRED DEPTH AT PROPERTLY LINE WHEN MINIMUM SLOPE RESULTS IN EXCESSIVE DEPTH.

CITY OF SANDY
SHALLOW TRENCH SERVICE CONNECTION, BLOCKING, AND MARKERS
DATE: DEC 2003
DRAWING NO. 308
FILENAME: SANDY023.DWG

NOTES:

1. PIPE AND FITTINGS SHALL BE COMPATIBLE. ONLY MANUFACTURED FITTINGS SHALL BE USED. LATERALS SHALL BE 6" DIAMETER.
2. MINIMUM DEPTH AT RIGHT OF WAY OR EASEMENT LINE SHALL BE 4 FEET.
3. PLUGGING, BLOCKING, AND MARKING OF UNCONNECTED SERVICES SHALL CONFORM TO SANDY023.DWG (DRAWING 308).
4. VERTICAL TRENCH WALLS ARE REQUIRED. IF IT IS NOT POSSIBLE TO MAINTAIN VERTICAL TRENCH WALLS, USE ALTERNATE CONNECTION METHOD TO MAINTAIN 6" MAXIMUM DISTANCE BETWEEN RISER PIPE AND TRENCH WALLS. REPLACE ALL EXCAVATED OR DISTURBED MATERIAL WITH FULL DEPTH GRANULAR BACKFILL COMPACTED TO 95% RELATIVE DENSITY.
5. WHERE DEEP CONNECTION IS AT AN ANGLE LESS THAN 45° FROM VERTICAL, C–900 PVC PIPE AND OR D.I. FITTINGS SHALL BE USED.
6. WHEN SPECIFIED IN PERMIT OR PLAN REVIEW INSTALL CLEANOUT. REFER TO SANDY023.DWG (DRAWING 308) FOR DETAILS.

CITY OF SANDY
TYPICAL DEEP TRENCH SERVICE CONNECTION
DATE: JUNE 2004
DRAWING NO. 309
FILENAME: SANDY024.DWG

NOTES:

1. CLEANOUT WYE AND RISER SHALL BE SAME MATERIAL AS MAINLINE PIPE
2. USE INLAND FOUNDRY CO. # 240 FRAME AND COVER FOR TRAFFIC AREAS

USE INLAND FOUNDRY CO. # 249 LOCKING FRAME AND COVER OUTSIDE PAVED AREAS.

CITY OF SANDY
CLEANOUT
DATE: MAY 1992
DRAWING NO. 310
FILENAME: SANDY052.DWG

CITY OF SANDY
MANHOLE ADJUSTMENT DETAILS
DATE: NOV 1997
DRAWING NO. 312
FILENAME: SANDY026.DWG

NOTE:

1. SEE MANHOLE BASE SECTION DRAWING FOR BASE DETAILS
2. MANHOLE MAY BE 42" DIAMETER IF DIRECTED BY ENGINEER.
3. MAXIMUM DISTANCE FROM TOP STEP TO FINISH GRADE SHALL NOT EXCEED 24".

CITY OF SANDY
FLAT–TOP MANHOLE
DATE: JULY 1997
DRAWING NO. 315–A
FILENAME: SANDY28FT.DWG

CITY OF SANDY STANDARD DETAILS

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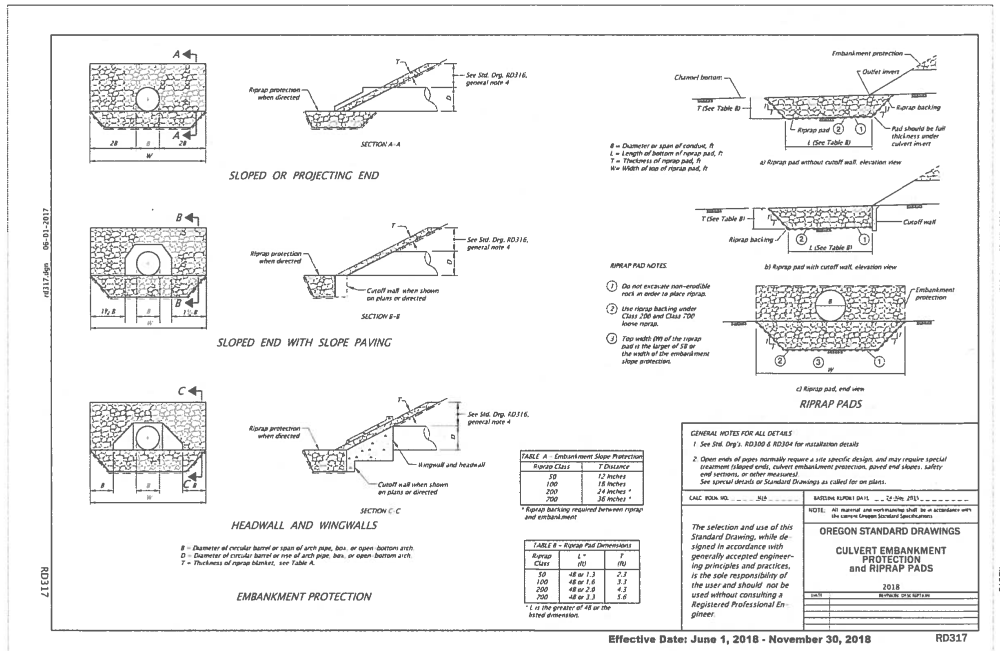
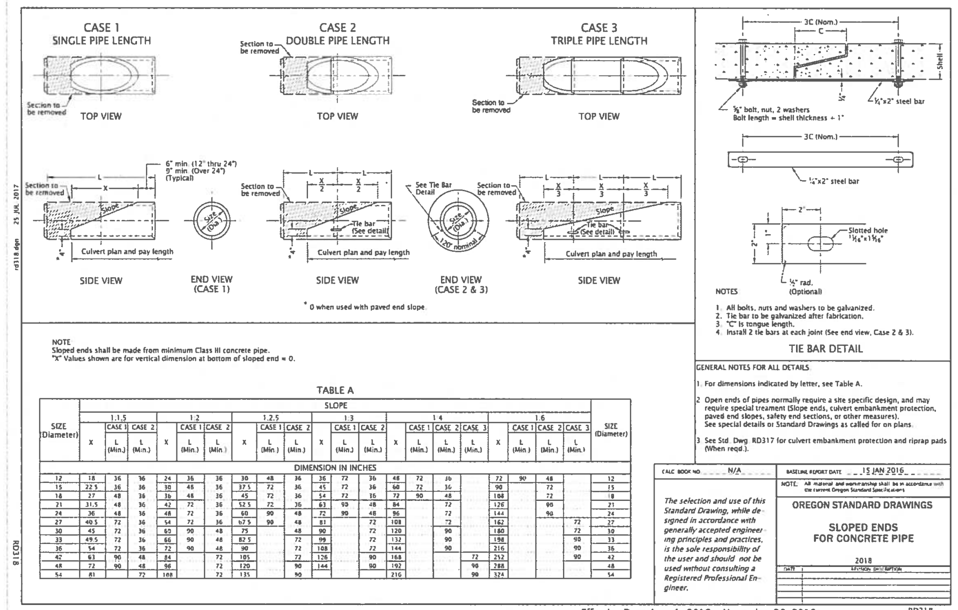
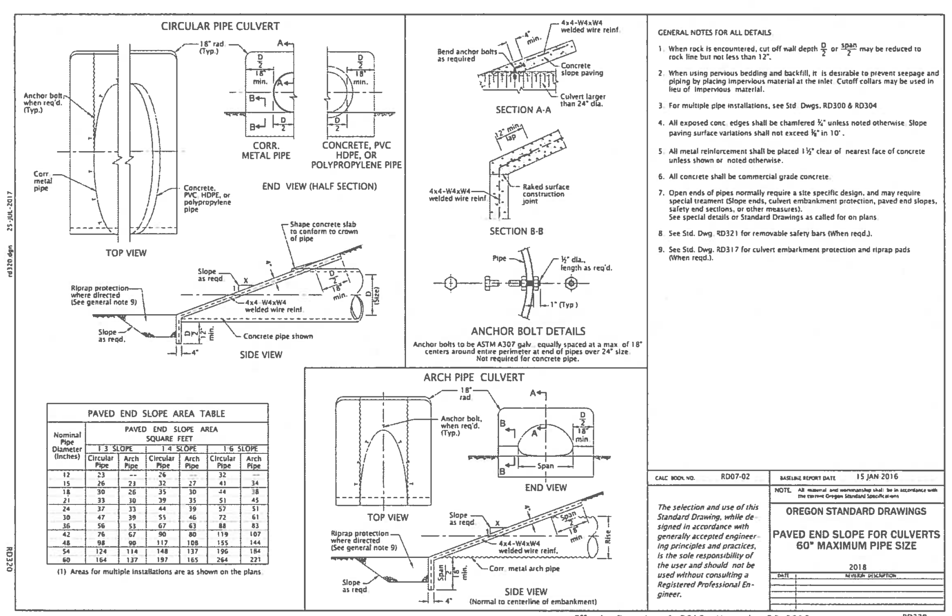
Sheet Number: CIVIL CONSTRUCTION DETAILS







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Date: 04.27.2018

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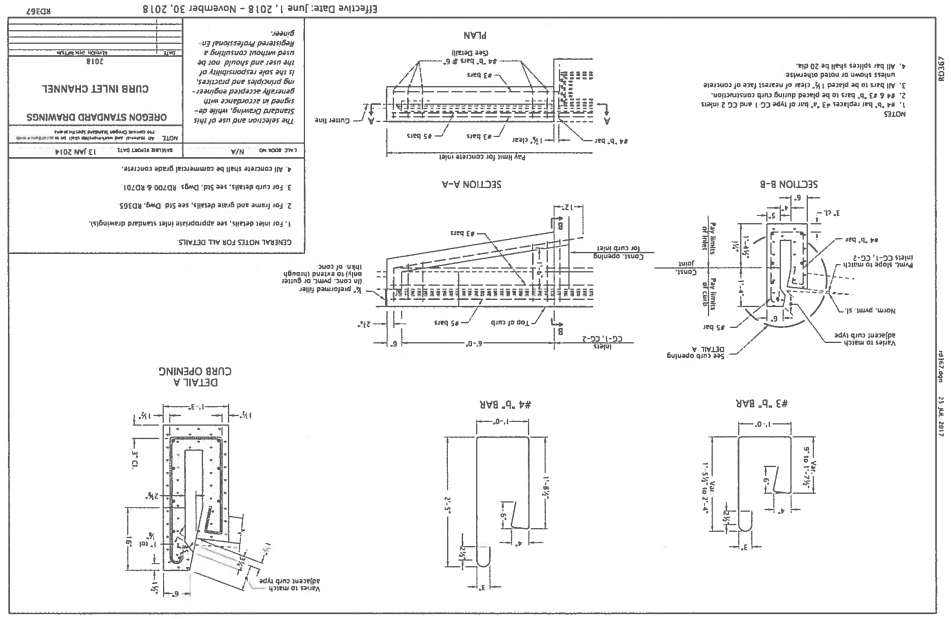

NOTES.
1. Provide 1½" local depression at points A & B.
2. Match normal pvmt. grade at points C, D, E & F.
3. Vary transition section slopes to match above points.

* Varies, see general note 3

GENERAL NOTES FOR ALL DETAILS

1. For inlet details, see appropriate inlet standard drawing(s).
2. For frame and grate details, see Std. Dwg. RD365
3. For curb details, see Std. Dwgs. RD700 & RD701.
4. All concrete shall be commercial grade concrete.
5. Pay limit for inlet is expanded when curb and gutter are monolithic

CALC. BOOK NO. N/A

BASELINE REPORT DATE 21-JUL-2015

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

GUTTER TRANSITION AT INLET

2018

Effective Date: June 1, 2018 – November 30, 2018

RD363

NOTE:
All reinforcement to be placed 2" clear of nearest face of concrete unless shown or noted otherwise

TABLE A		
INLET TYPE	W	W_1
G-1	2'-8⅞"	1'-8⅞"
G-2, G-2M, G-2MA	3'-3⅜"	2'-3⅜"

GENERAL NOTES FOR ALL DETAILS
1. Where precast inlets are used as an alternate to cast-in-place inlets, a 4" compacted leveling bed of sand or ¼"-0 crushed aggregate shall be provided. All precast inlets shall conform to requirements of ASTM C913
2. Graphics show G-1 inlet with Type 2 grate. See Table A for inlet dimensions
   Type 1 grate allowed only in locations not subject to bicycle or pedestrian use
   For frame and grate details, see Std. Dwg. RD365.
3. Provide sump only where shown on plans, and allowed by jurisdiction. See Detail A for inlet without sump.
4. For curb details, see Std. Dwgs. RD700 & RD701.
5. See Std. Dwg. RD336 for tracer wire details, or approved alternate.
6. Max. pipe diameter varies with pipe material.
7. Location, elevation, diameter, slope, and number of pipe(s) varies, see project plans.
8. All concrete shall be commercial grade concrete.
9. ¾" preformed filler (in concrete pavement or gutter only) to extend through thickness of concrete
10. See Std. Dwg. RD363 for gutter transition section, when curb and gutter are required.
11. See Std. Dwg. RD339 for pipe to structure connections.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 21-JUL-2015

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

CONCRETE INLETS TYPE G-1, G-2, G-2M, & G-2MA

2018

Effective Date: June 1, 2018 – November 30, 2018

RD364

GENERAL NOTES FOR ALL DETAILS:
1. Where precast inlets are used as an alternate to cast-in-place inlets, a 4" compacted leveling bed of sand or ¼"-0 crushed aggregate shall be provided. All precast inlets shall conform to requirements of ASTM C913
2. Graphics show CG-1 inlet with Type 2 grate. See Table A for inlet dimensions
   Type 1 grate allowed only in locations not subject to bicycle or pedestrian use
   For frame and grate details, see Std. Dwg. RD365
3. Provide sump only where shown on plans, and allowed by jurisdiction. See Detail B for inlet without sump
4. For curb details, see Std. Dwgs. RD700 & RD701
5. See Std. Dwg. RD336 for tracer wire details, or approved alternate
6. Max. pipe diameter varies with pipe material.
7. Location, elevation, diameter, slope, and number of pipe(s) varies, see project plans
8. All concrete shall be commercial grade concrete
9. ¾" preformed filler (in concrete pavement or gutter only) to extend through thickness of concrete.
10. See Std. Dwg. RD363 for gutter transition section, when curb and gutter are required. (Pay limit for inlet is expanded when curb and gutter are monolithic)
11. See Std. Dwg. RD339 for pipe to structure connections.

TABLE A		
INLET TYPE	W	W_1
CG-1	2'-8⅞"	1'-8⅞"
CG-2	3'-3⅜"	2'-3⅜"

NOTES
1. #3 "a" bars to be placed during curb construction.
2. All bars to be placed 1½" clear of nearest face of concrete unless shown or noted otherwise
3. All bars shall be full length.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 21-JUL-2015

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

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OREGON STANDARD DRAWINGS

CONCRETE INLETS TYPE CG-1, CG-2

2018

Effective Date: June 1, 2018 – November 30, 2018

RD366

NOTES
1. #4 "b" bar replaces #3 "a" bar of type CG-1 and CG-2 inlets
2. #4 & #3 "b" bars to be placed during curb construction.
3. All bars to be placed 1½" clear of nearest face of concrete unless shown or noted otherwise
4. All bar splices shall be 20 dia.

GENERAL NOTES FOR ALL DETAILS.
1. For inlet details, see appropriate inlet standard drawing(s).
2. For frame and grate details, see Std. Dwg. RD365
3. For curb details, see Std. Dwgs. RD700 & RD701
4. All concrete shall be commercial grade concrete.

CALC. BOOK NO. N/A

BASELINE REPORT DATE 13 JAN 2014

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OREGON STANDARD DRAWINGS

CURB INLET CHANNEL

2018

Effective Date: June 1, 2018 – November 30, 2018

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ODOT STANDARD DETAILS

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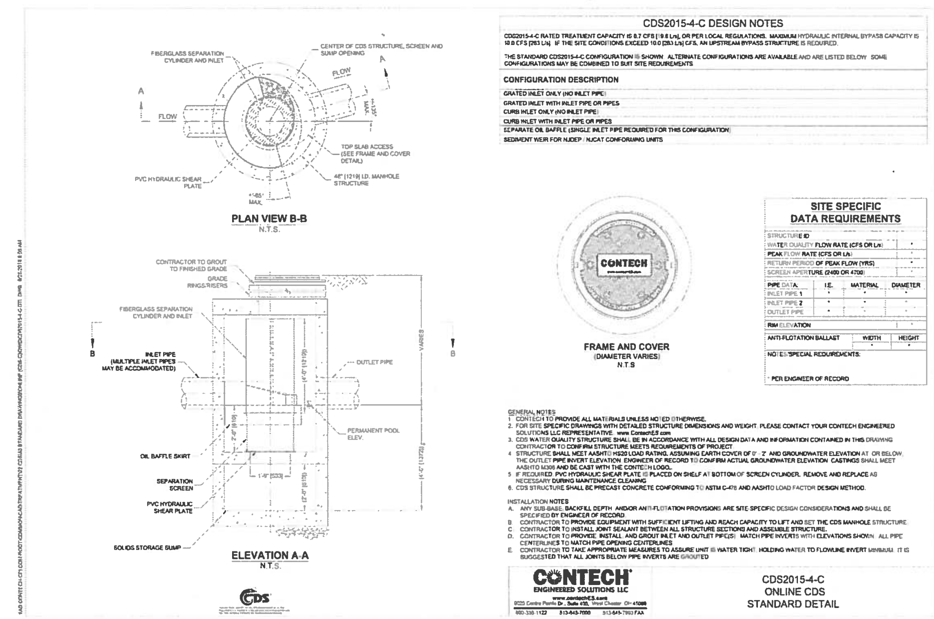

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Date: 04.27.2018
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C18
Sheet Number: CIVIL CONSTRUCTION DETAILS

APPENDIX I - Design Storm Rainfall Charts and Runoff Coefficients

Stormwater

The City of Sandy manages stormwater in order to reduce runoff and therby reduce capital and maintenance costs to the City and improve the water quality of streams in and around Sandy.

The City requires all new developments to treat and detain stormwater from the 2, 5, 10 and 25 year storm events to pre-development conditions, as defined in the City of Portland Stormwater Management Manual (https://www.portlandoregon.gov/bes/64040) . and in the City Municipal Code (/city-of-sandy-municipal-code/) .

24-hour rainfall amounts to be used in the calculations are:

Storm Recurrence Interval	Rainfall (inches)
2 year	3.50
5 year	4.50
10 year	4.80
25 year	5.50
100 year	6.50

In 2001, the City developed a stormwater management plan to help staff review future and present developments to ensure that stormwater quality and quantity does not negatively impact our local streams. A map of infiltration opportunities and constraints in the Sandy area was produced as part of the study, and is available below.

The City administers an incentive plan to encourage property owners to reduce or mitigate for impervious pavement on commercial, industrial and multi-family residential properties. Click here (/Stormwater-Management-Incentive-Program/) for more information.

Infiltration opportunities and constrains Requires Adobe Acrobat Reader

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Table 6.11 Tabulated Rainfall Intensity Duration Frequency Rainfall Data Compiled at Portland International Airport

Time, minutes	Rainfall Intensity, inches per hour					
	Return Period, years					
	2	5	10	25	50	100
5	1.92	2.47	2.86	3.32	3.75	4.14
6	1.75	2.25	2.60	3.02	3.43	3.78
7	1.62	2.08	2.40	2.80	3.18	3.50
8	1.52	1.95	2.24	2.61	2.96	3.28
9	1.43	1.84	2.11	2.46	2.79	3.08
10	1.35	1.74	2.00	2.32	2.65	2.91
11	1.28	1.66	1.90	2.22	2.52	2.77
12	1.22	1.59	1.82	2.12	2.41	2.66
13	1.17	1.53	1.75	2.04	2.32	2.55
14	1.13	1.48	1.69	1.96	2.24	2.46
15	1.09	1.43	1.63	1.90	2.16	2.37
16	1.06	1.38	1.57	1.83	2.08	2.29
17	1.02	1.33	1.52	1.77	2.01	2.21
18	0.99	1.28	1.47	1.72	1.94	2.14
19	0.96	1.24	1.42	1.66	1.88	2.07
20	0.93	1.20	1.38	1.60	1.82	2.01
21	0.90	1.16	1.34	1.56	1.77	1.95
22	0.87	1.13	1.30	1.52	1.72	1.89
23	0.85	1.10	1.27	1.48	1.67	1.84
24	0.83	1.07	1.23	1.44	1.62	1.79
25	0.81	1.04	1.19	1.40	1.58	1.74
26	0.79	1.01	1.16	1.36	1.54	1.69
27	0.77	0.98	1.13	1.32	1.50	1.64
28	0.75	0.96	1.10	1.29	1.46	1.60
29	0.73	0.94	1.07	1.26	1.42	1.56
30	0.71	0.92	1.05	1.22	1.39	1.53
35	0.64	0.82	0.95	1.11	1.26	1.38
40	0.59	0.76	0.87	1.02	1.16	1.27
45	0.55	0.70	0.81	0.95	1.08	1.18
50	0.51	0.66	0.76	0.89	1.01	1.10
60	0.46	0.59	0.68	0.79	0.90	0.99
90	0.37	0.47	0.54	0.62	0.70	0.77
120	0.32	0.40	0.46	0.53	0.59	0.65
180	0.25	0.38	0.43	0.50	0.55	0.61
240	0.22	0.35	0.40	0.46	0.51	0.56
300	0.20	0.32	0.37	0.43	0.48	0.52
360	0.19	0.30	0.34	0.40	0.44	0.48
420	0.18	0.27	0.31	0.36	0.40	0.44
480	0.17	0.25	0.29	0.33	0.36	0.39
540	0.17	0.22	0.26	0.30	0.32	0.35
600	0.16	0.16	0.20	0.22	0.25	0.28
720	0.15	0.15	0.18	0.21	0.23	0.26
1080	0.12	0.12	0.15	0.17	0.19	0.21
1440	0.10	0.10	0.12	0.14	0.16	0.18

Table 6.4 Rational Formula Method – Runoff Coefficients for Developed Areas. Average Impervious Area Percent for Typical Land Uses, Ground Slopes and Hydrologic Soils Groups

Percent Impervious	Hydrologic Soil Group	Drainage Area Slope			Typical Area Zoning, Service Road and Land Use
		Under <5%	5% to 10%	Over 10%	
0-10	A	0.19	0.24	0.29	**Zones**: OS, RF **Street Type:** Local Queuing **Other:** Parks, Cemeteries and Playgrounds
	B	0.24	0.30	0.36	
	C	0.29	0.36	0.44	
	D	0.33	0.43	0.52	
11-20	A	0.26	0.31	0.36	**Zones:** R20 **Street Types:** Local Queuing **Other:**
	B	0.30	0.37	0.43	
	C	0.35	0.42	0.50	
	D	0.39	0.48	0.57	
21-30	A	0.34	0.39	0.44	**Zones:** R10 **Street Types:** Local Queuing **Other:**
	B	0.37	0.44	0.50	
	C	0.41	0.49	0.56	
	D	0.45	0.54	0.62	
31-40	A	0.41	0.46	0.51	**Zones:** R7, R5 **Street Types:** Local Queuing **Other:**
	B	0.44	0.50	0.56	
	C	0.47	0.55	0.61	
	D	0.51	0.59	0.67	
41-50	A	0.49	0.54	0.59	**Zones:** R2.5, R3 **Street Types:** Local Traffic & Neighborhood Collector **Other:**
	B	0.52	0.57	0.63	
	C	0.55	0.61	0.67	
	D	0.57	0.65	0.72	
51-60	A	0.56	0.61	0.66	**Zones:** R2, C01 **Street Types:** Local Traffic & Neighborhood Collector **Other:**
	B	0.58	0.64	0.70	
	C	0.61	0.67	0.74	
	D	0.63	0.70	0.77	
61-70	A	0.64	0.69	0.74	**Zones:** RN1, CN2, CO2 **Street Types:** Local Traffic & Neighborhood Collector **Other:**
	B	0.66	0.72	0.77	
	C	0.67	0.74	0.80	
	D	0.69	0.76	0.82	
71-80	A	0.71	0.76	0.81	**Zones:** **Street Types:** Local Traffic & Neighborhood Collector **Other:**
	B	0.72	0.78	0.83	
	C	0.73	0.80	0.85	
	D	0.75	0.81	0.87	
81-90	A	0.79	0.84	0.89	**Zones:** RH, CN1, CM, CS, CG, EG1, EG2, IG1, IG2 **Street Types:** **Other:**
	B	0.80	0.85	0.90	
	C	0.81	0.86	0.91	
	D	0.81	0.87	0.92	
91-100	A	0.86	0.91	0.96	**Zones:** RX, CX, EX, IH, IR **Street Types:** Arterial, Commercial **Other:** Any portion of a paved street
	B	0.87	0.92	0.97	
	C	0.87	0.92	0.97	
	D	0.88	.0.92	0.97	

Notes: Any of the runoff coefficients may be adjusted to the nearest 0.05 to reflect any departure from these typical values. Any adjustment must be applied uniformly throughout a drainage area.

All Zoning designations reference the current City Comprehensive Plan. Designated Street Classifications reference the current Transportation Element of the City's Comprehensive Plan and any applicable Standards.

Table 6.5 Rational Formula Method – Runoff Coefficients for Undeveloped Areas. General Surface Characteristics, Ground Slope and Hydrologic Soil Groups

Surface Characteristics	Hydrologic Soil Group	Ground Slope		
		Under 5%	5% to 10 %	Over 10%
Woodland	A	0.10	0.15	0.20
	B	0.15	0.20	0.25
	C	0.25	0.30	0.35
	D	0.30	0.35	0.40
Lawn, Pasture and Meadow	A	0.15	0.20	0.25
	B	0.20	0.25	0.30
	C	0.25	0.35	0.45
	D	0.30	0.40	0.50
Cultivated Land	A	0.25	0.35	0.50
	B	0.30	0.45	0.60
	C	0.40	0.55	0.70
	D	0.50	0.65	0.80
Railroad Yard	-	0.25	0.30	0.40
Gravel Areas and Walks				
a. Loose	-	0.30	0.40	0.50
b. Packed		0.70	0.75	0.80
Pavement and Roof	-	0.90	0.95	1.00

6.5.4 Soil Conservation Service (SCS) Hydrograph Method

The SCS hydrologic method requires basic data similar to what is required for the Rational Method. However, it is more comprehensive in that it also considers a rainfall-time distribution (i.e. hyetograph), as well as rainfall losses to interception/depression storage and an infiltration rate that decreases during the storm duration.

A. Application

Use the SCS method to estimate a peak runoff rate and generate a hydrograph for routing flow. The method described is applicable for areas draining up to 1,000 acres. Thus, the SCS method can be used for most design applications including storage and outlet structures, drainage facilities, culverts, small drainage ditches, and open channels and energy dissipation facilities.

B. Equations

The SCS Method estimates an outflow hydrograph that represents the sum of all of the individual subarea hydrographs within a drainage area modified by the effects of travel time and channel storage. Because this method assumes the physical characteristics of a drainage area including area, slope, soils, etc. are constant the approach assumes similarity in the hydrograph shape from storms of similar rainfall characteristics. The following discussion outlines the equations and basic concepts used in the SCS method.

The SCS derived a relationship between accumulated rainfall and accumulated runoff from experimental plots for numerous soils and cover conditions. The method relies on the following equation to estimate direct runoff from a 24-hour storm rainfall.

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S}$$

Table A-2. Curve Numbers for Urban Areas

Cover type and hydrological condition	Average percent impervious area	Curve Numbers by Hydrologic Soil Group			
		A	B	C	D
Open Space (lawns, parks, golf courses, cemeteries, etc.):					
Poor condition (grass cover <50%)		68	79	86	89
Fair condition (grass cover 50-75%)		49	69	79	84
Good condition (grass cover >75%)		39	61	74	80
Impervious Area:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	93
Urban Districts:					
Commercial and business	85	85	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	82
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82

Soil Conservation Service, Urban Hydrology for Small Watersheds, Technical Release 55, pp. 2.5-2.8, June 1986.

Table A-4. Runoff Curve Numbers for Stormwater Facilities Designed Under the Simplified Approach

Stormwater Facility Type	Hydrologic Condition	Curve Numbers by Hydrologic Soil Group			
		A	B	C	D
Ecoroof	Good	n/a	61	n/a	n/a
Planter	Good	n/a	48	n/a	n/a
Pervious Pavement	n/a	76	85	89	n/a
Trees (new or existing)	n/a	36	60	73	79

n/a - Does not apply, as design criteria for the relevant mitigation measures do not include the use of this soil type.

**CNs of various cover types were assigned to the Simplified Approaches with similar cover types as follows:

Eco-roof – assumed grass in good condition with soil type B.

Planter – assumed brush-weed-grass mixture with >75% ground cover and soil type B.

Pervious Pavement – assumed gravel.

Trees – assumed woods with fair hydrologic conditions.

Table A-5. NRCS Hydrologic Soil Group Descriptions

NRCS Hydrologic Soil Group	Description
Group A	Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.
Group B	Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
Group C	Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.
Group D	Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a fragipan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

To determine hydrologic soil type, consult local USDA Soil Conservation Service Soil Survey.

Table A-3. Runoff Curve Numbers for Other Agricultural Lands

Cover type and hydrological condition	Hydrologic Condition	Curve Numbers by Hydrologic Soil Group			
		A	B	C	D
Pasture, grassland, or range-continuous forage for grazing:					
<50% ground cover or heavily grazed with no mulch	Poor	68	79	86	89
50 to 75% ground cover and not heavily grazed	Fair	49	69	79	84
>75% ground cover and lightly or only occasionally grazed	Good	39	61	74	80
Meadow-continuous grass, protected from grazing and generally mowed for hay		30	58	71	78
Brush-weed-grass mixture with brush as the major element:					
<50% ground cover	Poor	48	67	77	83
50-75% ground cover	Fair	35	56	70	77
>75% ground cover	Good	30	48	65	73
Woods-grass combination (orchard or tree farm)	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods					
Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning	Poor	45	66	77	83
Woods are grazed by not burned, and some forest litter covers the soil	Fair	36	60	73	79
Woods are protected from grazing and litter and brush adequately cover the soil	Good	30	55	70	77

Soil Conservation Service, Urban Hydrology for Small Watersheds, Technical Release 55, pp. 2.5-2.8, June 1986.

Exhibit J

Phase I Environmental Site Assessment Report

HSC Sandy Lot
16455 Champion Way
Sandy, OR 97055

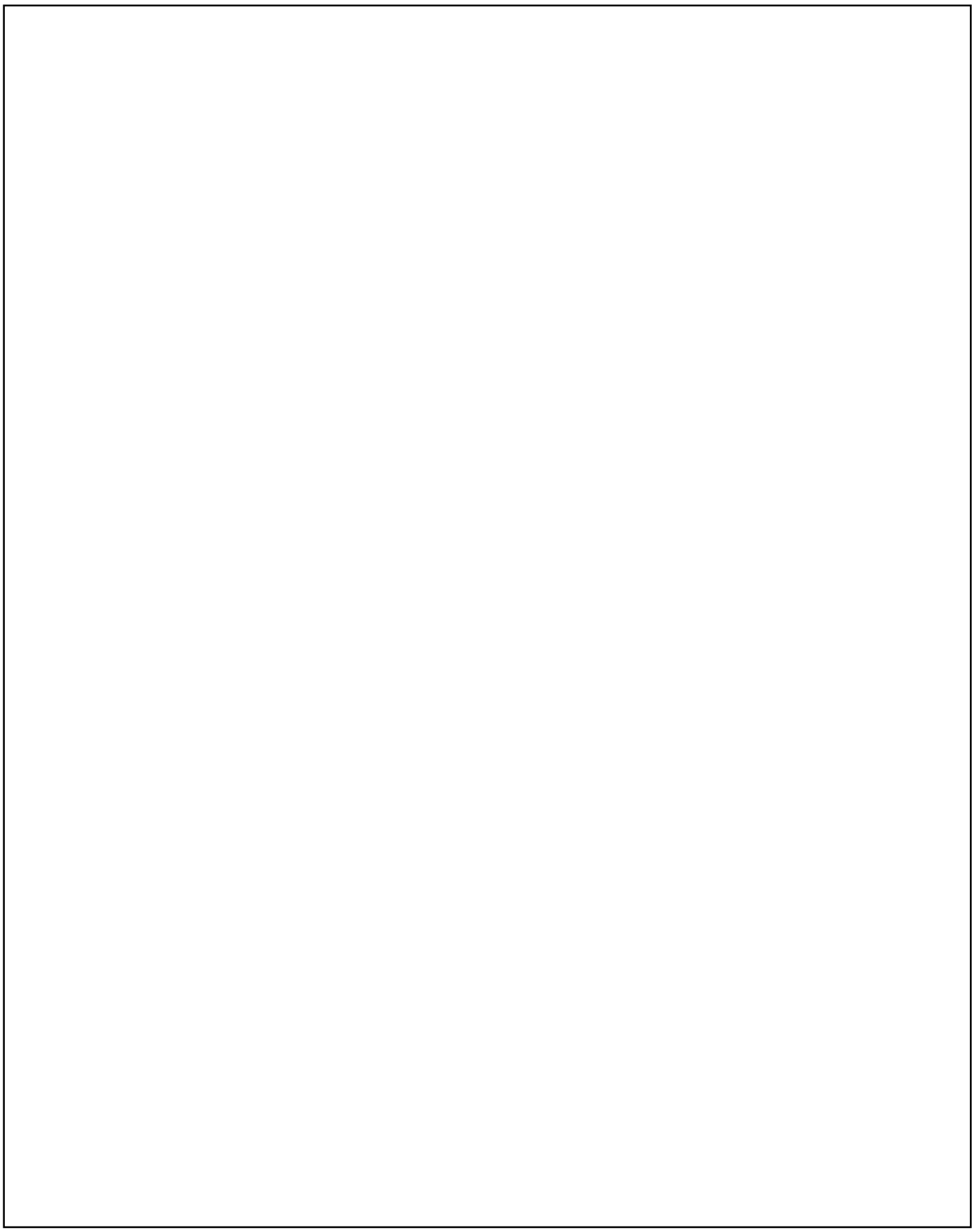
Prepared for

HSC Sandy, LLC
805 Trione St.
Daphne, AL 36526

Prepared by

BMEC
PO Box 545
Waitsburg, WA 99361
Phone: 509-520-4416

Job Number: P2018-0101
2/28/2018



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1.0 GENERAL INFORMATION

Project Information:
HSC Sandy Lot
Project Number:
P2018-0101

Consultant Information:
BMEC
PO Box 545
Waitsburg, WA 99361
Phone: 509-520-4416
Fax:
E-mail Address: ymeyer@bmecww.com
Inspection Date: 1/22/2018
Report Date: 2/28/2018

Site Information:
HSC Sandy Lot
16455 Champion Way
Sandy, OR 97055
County: Clackamas
Latitude, Longitude: 45.405593, -122.296502
Site Access Contact: N/A

Client Information:
HSC Sandy, LLC
Jennifer Nylander
805 Trione St.
Daphne, AL 36526

Site Assessor:
Chad Kauppi
Environmental Professional

Senior Reviewer:
Peter H. Trabusiner
Engineer

EP Certification:

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in 312.10 of this part.

Chad Kauppi - Environmental Professional

AAI Certification:

I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Chad Kauppi - Environmental Professional

2.0 EXECUTIVE SUMMARY

2.1 Subject Property Description

The subject property is an undeveloped lot located off of Champion Way in Sandy, Oregon, on the south side of Mt. Hood Highway, a major arterial (U.S. Highway 26) that trends southeast/northwest. The subject property does not contain a physical address but was plotted at 16455 Champion Way.

2.2 Data Gaps

No prior owner interviews were obtained. This gap is significant; however, given the known history of the site, it is reasonable and prudent to believe that this information would not alter the opinion in Section 2.4.

2.3 Environmental Report Summary

BMEC, Co. Inc. has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-13 of the undeveloped property located off of Champion Way, in Sandy, Oregon, identified as Parcel 01786197. Any exceptions to, or deletions from, this practice are described in Section 3.4 of this report. This assessment has revealed no evidence of Recognized Environmental Conditions in connection with the property:

Given the lack of structures at the site, there are no concerns with asbestos or lead-based paint according to 29 CFR 1926.1101 or 29 CFR 1926.62.

Report Section		No Further Action	REC	HREC	CREC	Issue/Further Investigation	Comments
4.4	**Current Use of Property**	X					
4.6	**Adjoining Property Information**	X					
6.1	**Standard Environmental Records Sources**	X					
6.4.1	**Historical Summary**	X					
6.4.6	**Other Environmental Reports**	X					
7.3.1	**Hazardous Substances**	X					
7.3.3	**USTs**	X					
7.3.4	**ASTs**	X					
7.3.5	**Other Suspect Containers**	X					
7.3.6	**Equipment Likely to Contain PCBs**	X					
7.3.11	**Stained Soil/Stressed Vegetation**	X					
9.1	**Asbestos-Containing Materials**	X					
9.2	**Lead-Based Paint**	X					
9.3	**Radon**	X					

2.4 Recommendations

During the course of the on-site visual inspection, a review of the available information at the Clackamas County Courthouse, the Oregon Department of Environmental Quality, and a review of the Environmental Database for the site, no potential environmental risks, recognized environmental conditions or hazards were discovered.

It is the opinion of BMEC, Inc. that it is reasonable and prudent to believe that the risk of contamination at the site is so minimal that no further investigation is warranted.

3.0 INTRODUCTION

3.1 Purpose

The purpose of the Phase I Environmental Site Assessment (ESA) was to evaluate the current and historical conditions of the Subject Property in an effort to identify recognized environmental conditions in connection with the Subject Property.

A recognized environmental condition is defined by ASTM E1527-13 as:

Recognized Environmental Condition - the presence or likely presence of any hazardous substances or petroleum products in, on or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not recognized environmental conditions.

De minimis conditions are those that generally do not present a material risk to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate government agencies.

The identification of recognized environmental conditions in connection with the subject property may impose an environmental liability on owners or operators of the site, reduce the value of the site, or restrict the use or marketability of the site, and therefore, further investigation may be warranted to evaluate the scope and extent of potential environmental liabilities.

Unless specifically noted within the text of this Report, this Phase I Environmental Site Assessment (ESA) does not include or address groundwater, soil, or extraneous materials contamination upon or under the surface soils, with respect to testing, coring, or sampling analysis.

3.2 Scope of Work

The Phase I ESA conducted at the Subject Property was in general accordance with ASTM Standard E 1527-13 and included the following:

- Review of previous environmental site assessments;
- Records review;
- Interviews with regulatory officials and personnel associated with the subject and adjoining properties;
- A site visit; and
- Evaluation of information and preparation of the report provided herein.

Typically, a Phase I ESA does not include sampling or testing of air, soil, groundwater, surface water, or building materials. These activities would be carried out in a Phase II ESA, if required. For this Phase I ESA, no additions to the ASTM E 1527-13 standard were made.

3.3 Significant Assumptions

It is assumed that this investigation is being conducted to identify recognized environmental conditions concerning the subject property, and to permit the user to satisfy one of the requirements to qualify for the innocent landowner defense to CERCLA liability. This investigation may mention but does not fully address non-scope considerations such as, but not limited to, asbestos containing materials (ACM), radon, lead-based paint (LBP), lead in drinking water, mold, wetlands, regulatory compliance, cultural and historical resources, industrial hygiene, health and safety, ecological resources, endangered species, indoor air quality, and/or high voltage power lines, although, one or more may be mentioned in the report as a business environmental risk concern.

It is also assumed that the information provided by the client is accurate and that the client is not withholding any information that would alter the conclusions of this report.

3.4 Limitations and Exceptions

Along with all of the limitations set forth in various sections of the ASTM E 1527-13 protocol, the accuracy and completeness of this report may be limited by the following:

Access Limitations - None

3.4 Limitations and Exceptions (continued)

Physical Obstructions to Observations - None
Outstanding Information Requests - None
Historical Data Source Failure - No prior owner interviews were obtained; this factor is not expected to alter the opinion in Section 2.4.
Other - None

It should be noted that this assessment did not include a review or audit of operational environmental compliance issues, or of any environmental management systems (EMS) that may exist on the property. Where required, the documents listed in Appendices A and F were used as reference material for the completion of the Phase I ESA. Some of the information presented in this report was provided through existing documents and interviews. Although attempts were made, whenever possible, to obtain a minimum of two confirmatory sources of information, BMEC, Co. Inc. in certain instances has been required to assume that the information provided is accurate.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgment of BMEC, Co. Inc. based on the data obtained from the work. Due to the nature of investigation and the limited data available, BMEC, Co. Inc. cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be construed as legal advice.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, we request that this information be brought to our attention so that we may reassess the conclusions provided herein.

3.5 Deviations

No deviations from the recommended scope of ASTM Standard E 1527-13 were performed as part of this Phase I ESA with the exception of any additions noted in Detailed Scope of Services.

3.6 Special Terms and Conditions

Authorization to perform this assessment was given by the client on January 12, 2018. Instructions as to the location of the property, access, and an explanation of the property and facilities to be assessed were provided by Jennifer Nylander with HSC Sandy, LLC.

3.7 Reliance

This report has been prepared for the sole benefit of the client. The report may not be relied upon by any other person or entity without the express written consent of BMEC, Co. Inc. and the client. We acknowledge a third party's reliance on this report as part of the process of evaluating the risks associated with this transaction.

4.0 SITE DESCRIPTION

4.1 Location and Legal Description

The subject property is the site of an undeveloped, approximately 8.13-acre parcel located off of Champion Way in Sandy, Oregon, on the south side of Mt. Hood Highway, a major arterial (U.S. Highway 26) that trends southeast/northwest. There is no physical address for the subject property; however, the property was plotted at 16455 Champion Way. The Clackamas County Assessor's Office indicated that the subject property consists of one parcel with a property number of 01786197 (see Appendix F for legal description).

4.2 Activity/Use Limitations

No specific Activity/Use limitations were specified for the subject property.

4.3 Site and Vicinity Description

The subject property is currently undeveloped land and has an area of approximately 8.13 acres. The site is mostly undulating land that slopes towards the south with minimal tree cover in the southern portion of the site. A seasonal stream is located near the southern boundary of the subject property.

The area surrounding the site consist of commercial activity to the south and north.

4.4 Current Use of Property

The subject property is currently undeveloped land.

4.5 Description of Structures and Other Improvements

No structures were observed at the site.

4.6 Adjoining Property Information

For the Scope of this Assessment, properties are defined and categorized based upon their physical proximity to the subject property. An adjacent property is any real property located within 0.25 miles of the subject property's border. An adjoining property is any real property whose border is contiguous or partially contiguous with the subject property, or that would be if the properties were not separated by a roadway, street, public thoroughfare, river, or stream.

Direction From Site	Occupant	Use	Comments
North	Arco AM/PM	Commercial	The north adjoining property located at 16355 Champion Way was listed in the EDR research under NPDES and the UST database. This property contains three underground storage tanks (USTs) with no violations noted and a NPDES permit.
North	Pioneer Coffee	Commercial	
East	USDA Mt. Hood Forest Service office		East of Champion Way
South		Undeveloped	
West	Sobella Farms	Agricultural	

5.0 USER PROVIDED INFORMATION

5.1 Specialized Knowledge

No specialized knowledge in connection with the subject property or facility operations was identified by the user/client.

5.2 Valuation Reduction for Environmental Issues

No environmental issues were identified by the user/client that could result in property value reduction.

5.3 Owner, Property Manager, and Occupant Information

No other pertinent information in connection with the subject property was provided by the owner, the property manager, or the occupant.

5.4 Reason For Performing Phase I

The Phase I ESA is being conducted as part of environmental due diligence prior to property transfer or refinancing.

6.0 RECORDS REVIEW

6.1 Standard Environmental Records Sources

BMEC, Co. Inc. contracted Environmental Data Resources, Inc. (EDR) to conduct a search of Federal and State databases containing known and suspected sites of environmental contamination. The number of listed sites identified within the approximate minimum search distance (AMSD) from the Federal and State environmental records database listings specified in ASTM Standard E 1527-13 are summarized in the following table. Detailed information for sites identified within the AMSDs is provided below, along with an opinion about the significance of the listing to the analysis of recognized environmental conditions in connection with the subject property. Copies of the EDR research data and a description of the databases are included in Appendix D of this report.

The subject property was not listed in the EDR database.

The north adjoining property located at 16355 Champion Way was listed in the EDR research under NPDES and the UST database. This property contains three underground storage tanks (USTs) with no violations noted and a NPDES permit.

Other sites within 0.25 miles of the subject property appear unlikely to have an adverse environmental effect on the subject property due to distance, groundwater gradient, the nature of the particular listing, and/or cleanup status.

Map Findings Summary

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
NPL		1	0	0	0	0	NR	0
Proposed NPL		1	0	0	0	0	NR	0
NPL LIENS		0.001	NR	NR	NR	NR	NR	0
Delisted NPL		1	0	0	0	0	NR	0
CORRACTS		1	0	0	0	0	NR	0
RCRA-TSDF		0.5	0	0	0	NR	NR	0
RCRA-LQG		0.25	0	0	NR	NR	NR	0
RCRA-SQG		0.25	0	0	NR	NR	NR	0
RCRA-CESQG		0.25	1	0	NR	NR	NR	1
US ENG CONTROLS		0.5	0	0	0	NR	NR	0
US INST CONTROL		0.5	0	0	0	NR	NR	0
ERNS		0.001	NR	NR	NR	NR	NR	0
HMIRS		0.001	NR	NR	NR	NR	NR	0
DOD		1	0	0	0	0	NR	0
FUDS		1	0	0	0	0	NR	0
US BROWNFIELDS		0.5	0	0	0	NR	NR	0
CONSENT		1	0	0	0	0	NR	0
UMTRA		0.5	0	0	0	NR	NR	0
ODI		0.5	0	0	0	NR	NR	0
TRIS		0.001	NR	NR	NR	NR	NR	0
TSCA		0.001	NR	NR	NR	NR	NR	0
FTTS		0.001	NR	NR	NR	NR	NR	0
SSTS		0.001	NR	NR	NR	NR	NR	0
LUCIS		0.5	0	0	0	NR	NR	0
DOT OPS		0.001	NR	NR	NR	NR	NR	0
ICIS		0.001	NR	NR	NR	NR	NR	0
HIST FTTS		0.001	NR	NR	NR	NR	NR	0
RADINFO		0.001	NR	NR	NR	NR	NR	0
LIENS 2		0.001	NR	NR	NR	NR	NR	0
PADS		0.001	NR	NR	NR	NR	NR	0
MLTS		0.001	NR	NR	NR	NR	NR	0
FINDS		0.001	NR	NR	NR	NR	NR	0
RAATS		0.001	NR	NR	NR	NR	NR	0
US CDL		0.001	NR	NR	NR	NR	NR	0
US FIN ASSUR		0.001	NR	NR	NR	NR	NR	0
UXO		1	0	0	0	0	NR	0
FUSRAP		1	0	0	0	0	NR	0
SCRD DRYCLEANERS		0.5	0	0	0	NR	NR	0

6.1 Standard Environmental Records Sources (continued)

EDR Hist Auto		0.125	1	NR	NR	NR	NR	1
COAL ASH EPA		0.5	0	0	0	NR	NR	0
COAL ASH DOE		0.001	NR	NR	NR	NR	NR	0
SEMS		0.5	0	0	0	NR	NR	0
US MINES		0.25	0	0	NR	NR	NR	0
EDR Hist Cleaner		0.125	0	NR	NR	NR	NR	0
HIST FTTS INSP		0.001	NR	NR	NR	NR	NR	0
DEBRIS REGION 9		0.5	0	0	0	NR	NR	0
USGS WATER WELLS		1	0	0	0	0	NR	0
US AIRS (AFS)		0.001	NR	NR	NR	NR	NR	0
EPA WATCH LIST		0.001	NR	NR	NR	NR	NR	0
2020 COR ACTION		0.25	0	0	NR	NR	NR	0
SEMS-ARCHIVE		0.5	0	0	0	NR	NR	0
ABANDONED MINES		0.001	NR	NR	NR	NR	NR	0
FEDERAL FACILITY		0.5	0	0	0	NR	NR	0
PRP		0.001	NR	NR	NR	NR	NR	0
RMP		0.001	NR	NR	NR	NR	NR	0
ROD		1	0	0	0	0	NR	0
PCB TRANSFORMER		0.001	NR	NR	NR	NR	NR	0
ECHO		0.001	NR	NR	NR	NR	NR	0
RCRA NonGen / NLR		0.25	0	1	NR	NR	NR	1
US MINES 2		0.25	0	0	NR	NR	NR	0
EDR Hist Cleaner		0.125	0	NR	NR	NR	NR	0
EDR Hist Auto		0.125	0	NR	NR	NR	NR	0
US AIRS MINOR		0.001	NR	NR	NR	NR	NR	0
LEAD SMELTER 2		0.001	NR	NR	NR	NR	NR	0
PWS		0.001	NR	NR	NR	NR	NR	0
US MINES 3		0.25	0	0	NR	NR	NR	0
FTTS INSP		0.001	NR	NR	NR	NR	NR	0
US HIST CDL		0.001	NR	NR	NR	NR	NR	0
DOCKET HWC		0.001	NR	NR	NR	NR	NR	0
FUELS PROGRAM		0.25	0	0	NR	NR	NR	0
FEMA UST		0.25	0	0	NR	NR	NR	0
LEAD SMELTER 1		0.001	NR	NR	NR	NR	NR	0
SWF/LF		0.5	0	0	0	NR	NR	0
HIST LF		0.5	0	0	0	NR	NR	0
UIC		0.001	NR	NR	NR	NR	NR	0
LUST		0.5	0	0	2	NR	NR	2
UST		0.25	1	1	NR	NR	NR	2
AST		0.25	0	2	NR	NR	NR	2
OR MANIFEST		0.25	0	0	NR	NR	NR	0
SPILLS		0.001	NR	NR	NR	NR	NR	0
ENG CONTROLS		0.5	0	0	0	NR	NR	0
INST CONTROL		0.5	0	0	0	NR	NR	0
DRYCLEANERS		0.25	0	0	NR	NR	NR	0
BROWNFIELDS		0.5	0	0	0	NR	NR	0
CDL		0.001	NR	NR	NR	NR	NR	0
AIRS		0.001	NR	NR	NR	NR	NR	0
COAL ASH		0.5	0	0	0	NR	NR	0
Financial Assurance 1		0.001	NR	NR	NR	NR	NR	0
CRL		1	0	0	0	0	NR	0
RGA LUST		0.001	NR	NR	NR	NR	NR	0
WELLS		1	0	0	0	0	NR	0
NPDES		0.001	NR	NR	NR	NR	NR	0
CDL 2		0.001	NR	NR	NR	NR	NR	0
RGA HWS		0.001	NR	NR	NR	NR	NR	0
SPILLS 90		0.001	NR	NR	NR	NR	NR	0
HAZMAT		0.001	NR	NR	NR	NR	NR	0
RGA LF		0.001	NR	NR	NR	NR	NR	0
AOC COL		1	0	0	0	0	NR	0
DAY CARE		0.001	NR	NR	NR	NR	NR	0

6.1 Standard Environmental Records Sources (continued)

VCS		0.5	0	0	0	NR	NR	0
ECSI		1	0	0	0	1	NR	1
SWRCY		0.5	0	0	0	NR	NR	0
AOC MU		1	0	0	0	0	NR	0
HSIS		0.001	NR	NR	NR	NR	NR	0
Financial Assurance 2		0.001	NR	NR	NR	NR	NR	0
INDIAN LUST		0.5	0	0	0	NR	NR	0
INDIAN UST		0.25	0	0	NR	NR	NR	0
INDIAN VCP		0.5	0	0	0	NR	NR	0
INDIAN ODI		0.5	0	0	0	NR	NR	0
INDIAN RESERV		0.001	NR	NR	NR	NR	NR	0
EDR MGP		1	0	0	0	0	NR	0

Detail Summary

Site Name: SANDY AMPM
Databases: UST
Address: 16355 CHAMPION WAY
Distance: 87
Direction: East
Elevation: Higher
Comments:

Site Name: USDA FS MT HOOD NF HEADQUARTERS
Databases: FINDS, ECHO, RCRA-CESQG
Address: 16400 CHAMPION WAY
Distance: 413
Direction: ESE
Elevation: Higher
Comments:

Site Name: OUR DDDYS CSTOMS TRANSMISSIONS
Databases: EDR Hist Auto
Address: 35900 INDUSTRIAL WAY
Distance: 566
Direction: SSE
Elevation: Higher
Comments:

Site Name: FRED MEYER STORES INC
Databases: AST, HAZMAT, NPDES, HSIS
Address: 16625 362ND AVE
Distance: 663
Direction: SSE
Elevation: Higher
Comments:

Site Name: FM FUEL STOP #663 SANDY
Databases: UST
Address: 16625 SE 362ND DR
Distance: 663
Direction: SSE
Elevation: Higher
Comments:

6.1 Standard Environmental Records Sources (continued)

Site Name:	COLUMBIA SCREW MACHINE INC
Databases:	FINDS, ECHO, RCRA NonGen / NLR
Address:	16542 SE 362ND AVE
Distance:	1025
Direction:	ESE
Elevation:	Higher
Comments:	

Site Name:	MAIDEN STUDIOS
Databases:	AST, HSIS
Address:	16600 SE 362ND DR
Distance:	1145
Direction:	ESE
Elevation:	Higher
Comments:	

6.2 Additional Environmental Record Sources

No information regarding additional environmental record sources was uncovered.

6.3 Physical Setting Sources

Source of reference is a United States Geological Survey (USGS) 7.5 Minute Topographic Quadrangle (quad) Map containing the subject property. The USGS 7.5 minute quad map has an approximate scale of 1" to 24,000 feet, shows physical features such as water bodies, and roadways. The USGS 7.5 quad map is considered to be the only Standard Physical Setting Source, and is sufficient as a single reference.

6.3.1 Topography

The property consists of one parcel of land located off of Champion Way near the 16455 Champion Way. The site is accessible from Champion Way to the east. Mt. Hood Highway (U.S. Highway 26) is the nearest major roadway located to the north of the site. The elevation is approximately 755 feet above mean sea level.

6.3.2 Surface Water Bodies

The nearest major body of water is the Tickle Creek, approximately 0.30 miles southwest of the site. A seasonal stream appears to be located along the southern boundary of the site.

6.3.3 Geology and Hydrology

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. The groundwater gradient inferred from topography is to the south-southwest.

6.4 Historical Use

6.4.1 Historical Summary

Historical information identifying the past site use was obtained from a variety of sources as detailed in Appendix C of this report and included Aerial Photographs, Historical Topographic Maps, Clackamas County Assessor's Office records, and interviews.

The subject property originally contained a rural roadway that bisected the site to access rural farm properties. The subject property has never been developed and is currently undeveloped land.

6.4.2 Title Records

No title records were provided by the user/client. Please refer to the Records Review section for current and historical ownership/use of the subject property.

6.4.3 City Directories

City directories for the subject property and surrounding area were not readily available or practically reviewable.

6.4.4 Aerial Photos

Aerial photographs were available from 1948, 1952, 1955, 1960, 1970, 1975, 1980, 1982, 1991, 1995, 2005, 2006, 2009, and 2012. The aerial photographs from 1948, 1952, 1955, 1960, 1970, 1975, 1980, 1982, 1991, and 1995 depict the subject property as undeveloped land with a rural roadway accessing farm properties. The site is located south of either Mt. Hood Loop Highway or State Highway 26, depending on the year. The aerial photographs from 2005, 2006, and 2009 shows the undeveloped site located off of the newly constructed Champion Way. Commercial properties are located to the south of the site. The aerial photograph from 2012 depicts the subject property in its current configuration. The site is located off of Champion Way and to the south of State Highway 26 and the Arco AM/PM Station.

Copies of the aerial photographs are located in Appendix C.

6.4.5 Sanborn/Historical Maps

Sanborn fire insurance maps for the subject property and surrounding area were not readily available or practically reviewable.

Historical Topographic maps for the subject property were available for the years of 1911, 1914, 1916, 1939, 1940, 1954, 1961, 1970, 1975, 1985, and 2014. In all of the maps, the subject property is located in the southeast quarter of Section 10, Township 2 South, and Range 4 East of the Willamette Meridian. The maps from 1911 through 1961 depict the subject property located south of the Mt. Hood Loop Highway and with a rural roadway that bisects the property to access rural farm properties. From 1970 through 1985, the subject property is shown in similar configuration with a rural roadway bisecting the site; however, now the subject property is located off of State Highway 26 instead of the Mt. Hood Loop Highway. The 2014 Historical Topographic maps depicts the vacant subject property located off of Champion Way, just south of State Highway 26.

Copies of the Historical Topographic maps are located in Appendix C.

6.4.6 Other Environmental Reports

No previous environmental reports were identified by BMEC, CO. Inc. or made available by the client/user during the Phase I ESA.

6.4.7 Building Department Records

No Building Department records were available for the subject property.

6.4.8 Other Land Use Records

No additional land use records were available during the course of the investigation.

6.5 Environmental Liens and Activity/Use Limitations

No environmental liens or activity/use restrictions in connection with the subject property were identified by the user/client.

7.0 SITE RECONNAISSANCE

7.1 Methodology and Limiting Conditions

The site reconnaissance was conducted on January 25, 2018 by Chad Kauppi, Environmental Professional with BMEC. Weather conditions at the time of the site reconnaissance was overcast and rainy with temperatures in the high 40s. The visual reconnaissance consisted of observing the boundaries of the property and systematically traversing the site to provide an overlapping field of view, wherever possible. Photographs of pertinent site features identified are included in Appendix B.

7.2 General Site Setting

The subject property is currently undeveloped land and has an area of approximately 8.13 acres. The site is undulating land that slopes towards the south with minimal tree cover in the southern portion of the site. A seasonal stream is located near the southern boundary of the subject property. The subject property can be accessed from Champion Way to the east.

7.3 Site Visit Findings

7.3.1 Hazardous Substances

No hazardous substances were identified on the subject property.

No unusual or suspicious storage, handling, or disposal was observed.

7.3.2 Petroleum Products

No petroleum products were identified on the subject property.

7.3.3 USTs

No readily apparent evidence of underground storage tanks (USTs) was identified on the subject property.

7.3.4 ASTs

No readily apparent evidence of aboveground storage tanks (ASTs) was identified on the subject property.

7.3.5 Other Suspect Containers

No suspect containers were identified on the subject property.

7.3.6 Equipment Likely to Contain PCBs

No equipment likely to contain PCBs was observed on the subject property.

7.3.7 Interior Staining/Corrosion

No buildings or structures are located on the subject property; therefore, no interior staining or corrosion was observed.

7.3.8 Discharge Features

No discharge features (floor drains, catch basins, oil/water separators, etc.) were observed on the subject property.

7.3.9 Pits, Ponds, And Lagoons

No pits, ponds or lagoons were observed on the subject property. A seasonal stream was observed located on the southern boundary of the subject property.

7.3.10 Solid Waste Dumping/Landfills

No readily apparent evidence of solid waste dumping, suspect fill material, or landfills was identified on the subject property.

7.3.11 Stained Soil/Stressed Vegetation

No stained soil or stressed vegetation was observed on the subject property.

7.3.12 Wells

No evidence of water supply or groundwater monitoring wells was observed on the subject property.

8.0 INTERVIEWS

a) Interview with Owner

Mark Benson is listed as the current owner. Mr. Benson stated that he knew of no environmental concerns with the site.

b) Interview with Site Manager

Mr. Mark Benson was identified as the Key Site Manager for the property.

c) Interviews with Occupants

There are currently no occupants of the subject property.

d) Interviews with Local Government Officials

Clackamas County Assessor's Office information was obtained on-line. These records included no indications of recognized environmental conditions in connection with the subject property.

e) Interviews with Others

An employee of Pioneer Coffee was interviewed and said that the coffee stand has been operating north of the site since late 2012. The employee stated, to the best of their knowledge, that the south adjoining subject property has not been developed.

9.0 OTHER ENVIRONMENTAL CONSIDERATIONS

9.1 Asbestos-Containing Materials

The term "asbestos" is applied to a group of naturally occurring fibrous, inorganic hydrated mineral silicates. Asbestos-containing building materials (ACBM) were widely used in building applications as fireproofing, insulation, and soundproofing from about 1946 until the EPA banned its use. Any material containing more than one percent asbestos is considered an ACM by the Environmental Protection Agency (EPA). Asbestos has been designated as a hazardous air pollutant under the National Emission Standard for Hazardous Air Pollutants (NESHAP). The NESHAP regulations prohibit visible asbestos emissions from mills and manufacturing plants, establish notification requirements and procedures for the demolition and renovation of all buildings containing friable asbestos, and delineate procedures to be followed in the disposal of asbestos-containing waste material. "Friable asbestos material" is any material that contains greater than one percent asbestos by weight, and can be pulverized, crumbled, or reduced to powder by hand pressure. To date, there are no federal regulations requiring the removal of asbestos from industrial or commercial buildings, even if friable.

Given the lack of development of the subject property, there are no concerns with asbestos according to 29 CFR 1926.1101.

9.2 Lead-Based Paint

In 1978, the Federal Government banned the use of lead-based paint in residential applications; however, use in general industry continued at a decreased rate to the present. Lead-based paint presents a hazard through inhalation or ingestion of paint chips or vapor fumes. The greatest cumulative health threat is to young children, and for this reason the Department of Housing and Urban Development (HUD) has promulgated lead standards and survey requirements for buildings affected by HUD funding. This HUD regulation represents the only Federal requirement for lead-based paint hazard management applicable to privately owned structures.

Given the lack of development of the site, there are no concerns with lead-based paint according to 29 CFR 1926.62.

9.3 Radon

Radon is emitted by the natural breakdown and radioactive decay of uranium in rocks and soils, which then enters buildings through cracks in the foundation, sump pumps, areas around drainage pipes and other openings. In addition, radon may enter a structure as a water contaminant, natural-gas contaminant, or off-gas by product of building materials. Once inside an enclosed space, radon can accumulate.
Radon has been declared by the EPA as the second leading contributor to lung cancer, after smoking. EPA guidelines for the highest acceptable level of radon are 4 picoCuries per liter (pCi/l). At this level, the estimated number of lung-cancer deaths due to radon exposure is 13-50 out of 1,000. An EPA survey of indoor radon concentrations in 11,000 homes from Arizona to Massachusetts revealed that radon levels exceeded the EPA's action level of 4 pCi/l in one out of three homes. Yet another study in 10 other states found that one in five homes exceeded the 4 pCi/l level. No visual estimation technique exists that accurately predicts the potential radon risk within a building. The radon risk is a function of site location, soils composition, building construction, foundation integrity, and previous landfill practices. Actual physical testing of a building is the only way to accurately determine the radon levels. Radon health risks can be controlled by recognizing the potential for a problem, by testing and by reduction of radon levels in the building. The property exhibits low potential for radon contamination, based upon the visual indicators observed during the site observation.

The EPA has assigned each of the 3141 counties in the United States to one of the three Radon Zones:

Zone 1	Predicted average indoor screening level	>than 4pCi/L
Zone 2	Predicted average indoor screening level	>=2 pCi/L and<= 4pCi/L
Zone 3	Predicted average indoor screening level	< 2 pCi/L

Clackamas County Radon Zone Level: 3

9.4 Wetlands

This site was not listed in the environmental database as containing wetlands, and the soil did not qualify as a hydric soil. Visual on site inspection revealed no evidence of areas of standing water or wetland plant indicators; however, a seasonal stream was observed near the southern boundary of the subject property.

9.4 Wetlands (continued)

It should be noted that these wetland observations are based on secondary information and conditions at the time of the site visit, and do not take into account weather variations such as season, drought, snow cover, etc. If further wetlands review is required, a wetlands delineation should be performed by a qualified hydro-geologist.

9.5 Microbial Contamination (Mold)

Since no EPA, State or Federal, threshold limits have been set for mold spores, no sampling for mold will be done to check a building's compliance with Federal or other mold standards.
The results of sampling may have limited use or application. Sampling may only help locate the source of mold contamination, identify some of the mold species present, and differentiate between mold, soot or dirt.
Air sampling for mold provides information only for the moment in which the sampling occurred, much like a snapshot. Air sampling will reveal, when properly done, what was in the air at the moment the sample was taken. Without set mold standards, sampling results are difficult to interpret, especially if there is no visible mold growth present. On the other hand, if there is visible mold growth present, sampling is unnecessary.
Since the subject property does not contain any buildings or structures, no visual evidence of mold or mildew was found during the inspection.

9.6 Vapor Encroachment

BMEC, Co. Inc. performed a Tier 1 Initial Screening for Vapor Encroachment Conditions (VECs) at the subject property. Historical and government databases were reviewed at specific search distances to identify properties contaminated by Chemicals of Concern (COCs) within the following Areas of Concern (AOC) where groundwater flow direction cannot be determined:

- One third of one mile for known or suspect contaminated sites with non-petroleum COCs
- One tenth of one mile for known or suspect contaminated sites with petroleum COCs

The following AOCs can be applied where groundwater flow direction can be determined:

- Up-gradient
    - One third of one mile for known or suspect contaminated sites with non-petroleum COCs
    - One tenth of one mile for known or suspect contaminated sites with petroleum COCs
- Down-gradient
    - One hundred feet for known or suspect contaminated sites with non-petroleum COCs
    - Thirty feet for known or suspect contaminated sites with petroleum COCs
- Cross-gradient
    - One hundred feet for known or suspect contaminated sites with non-petroleum COCs + plume width
    - Thirty feet for known or suspect contaminated sites with petroleum COCs + plume width

After conducting the VEC screen at the subject property, it is the opinion of BMEC, Co. Inc. that:

- A VEC can be ruled out because it does not exist or is not likely to exist

9.7 Client-Specific Items

There are no client-specific items entered for the Site.

Appendix A:

Figures

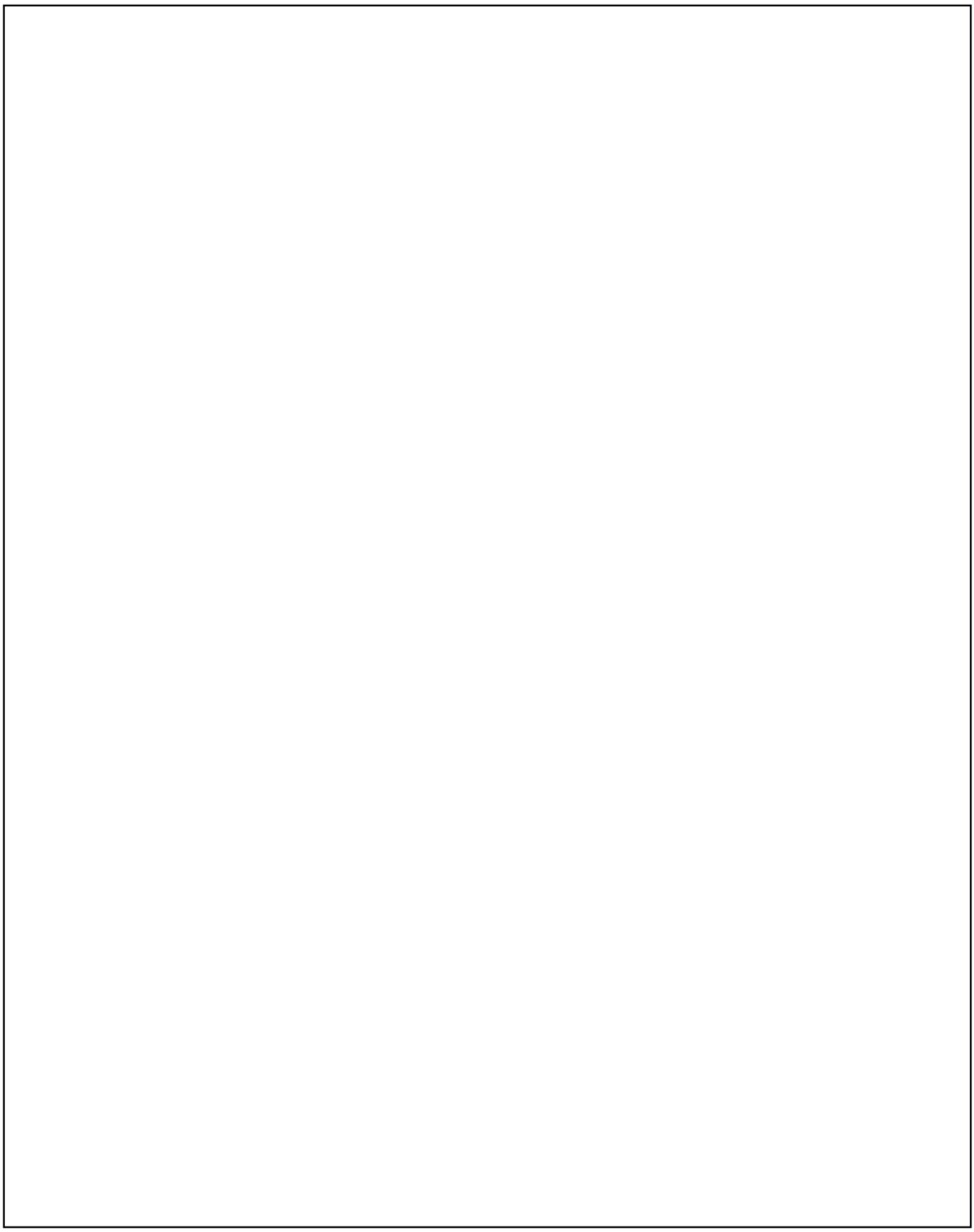
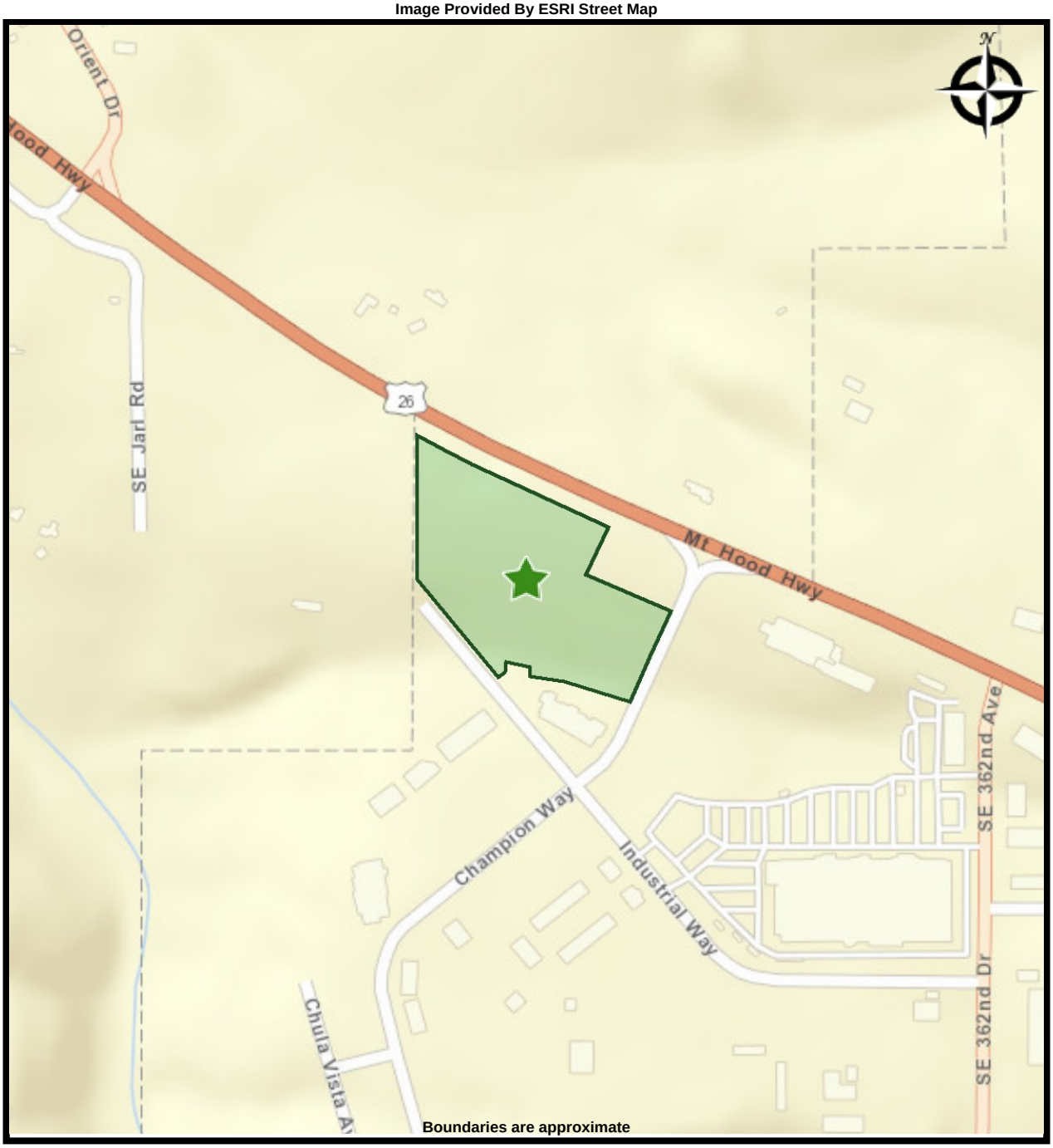


Image Provided By ESRI Street Map

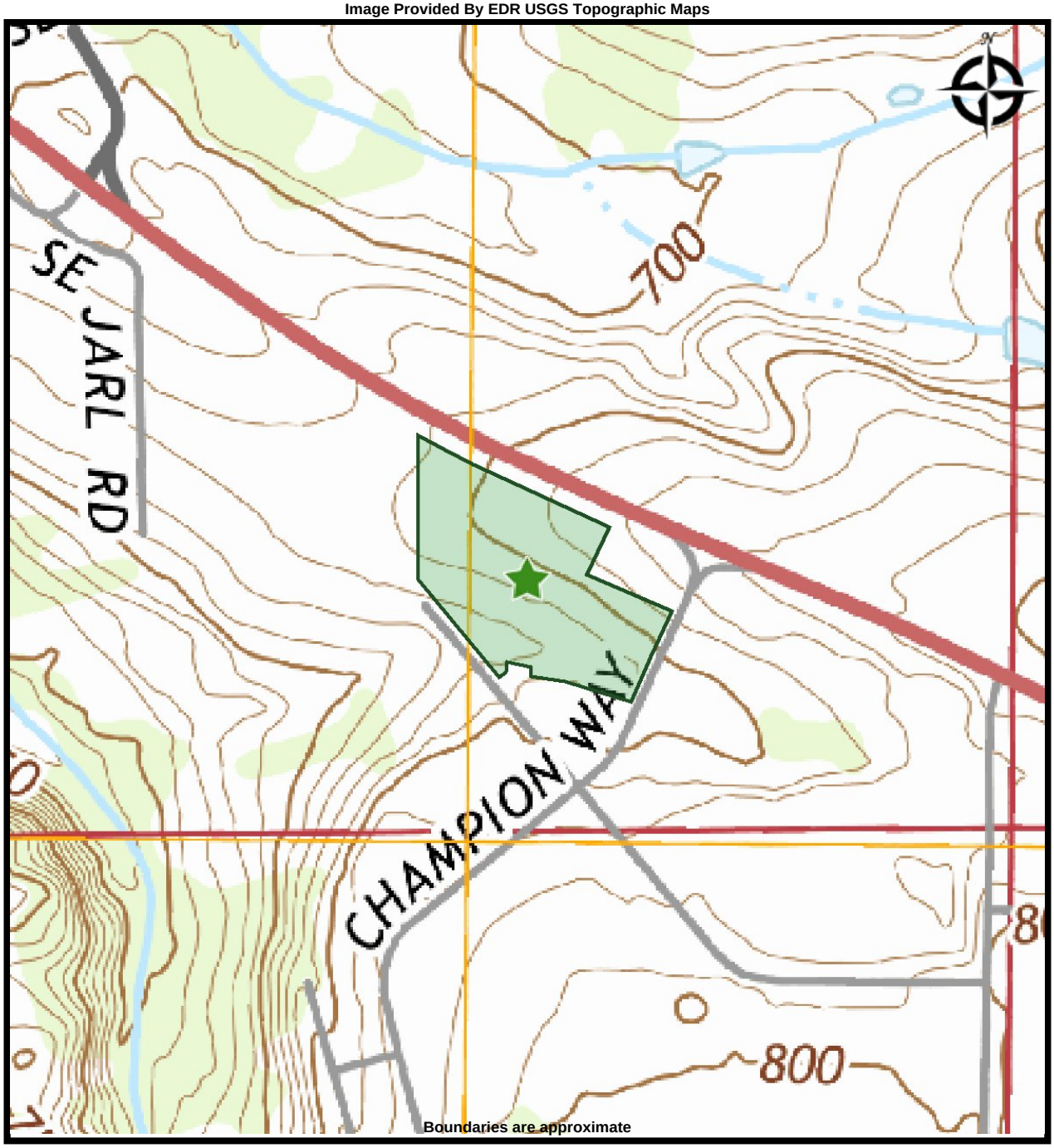


DR PARCEL Platform

STREET MAP
HSC SANDY LOT
16455 Champion Way
Sandy, Oregon 97055

PREPARED FOR: HSC Sandy, LLC
PROJ. MGR: **DATE: 1/30/2018**
DRAWN BY: Chad Kauppi **PROJ. #: P2018-0101**

Image Provided By EDR USGS Topographic Maps



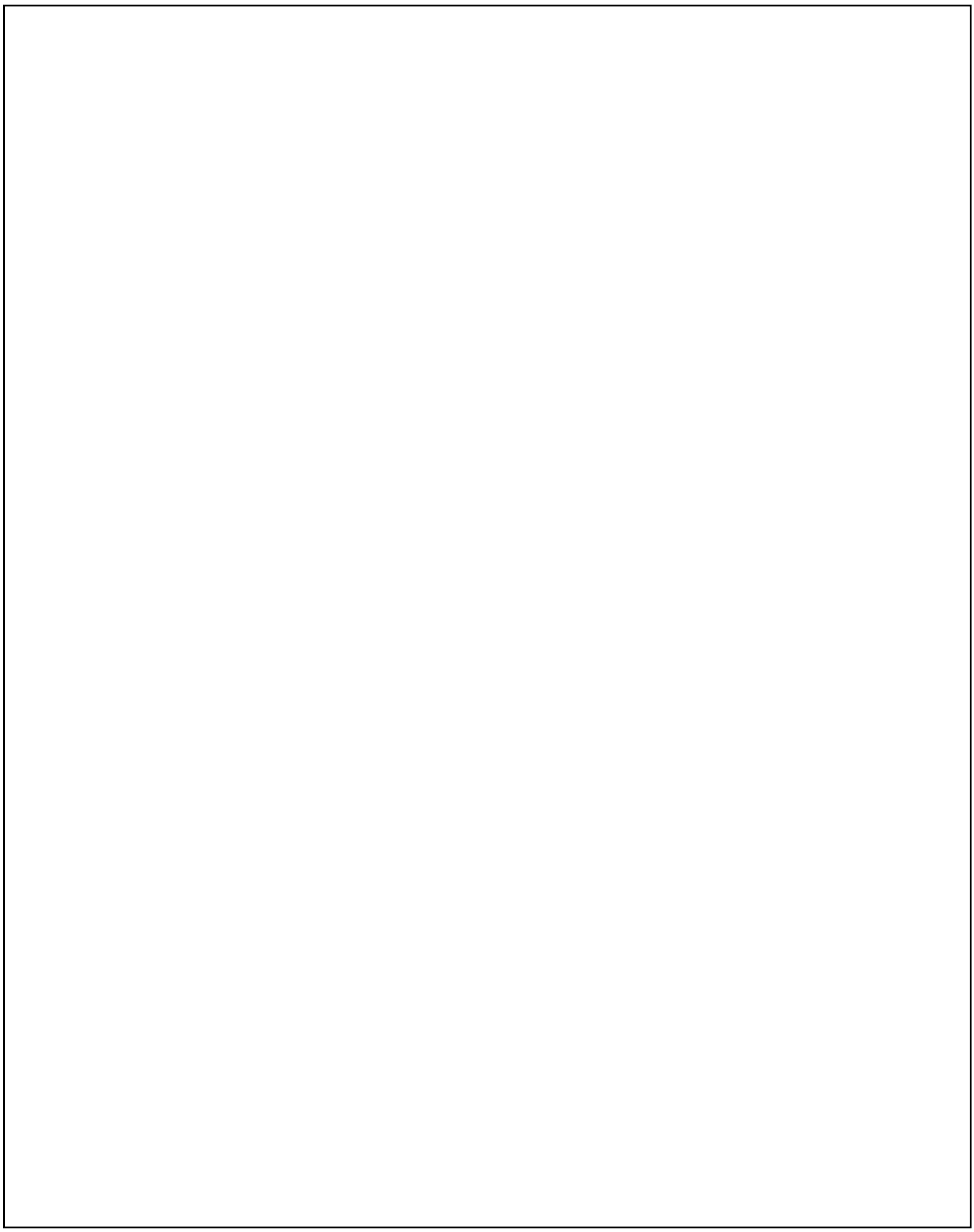
DR PARCEL Plat01

TOPO MAP - 2014
HSC SANDY LOT
16455 Champion Way
Sandy, Oregon 97055

PREPARED FOR: HSC Sandy, LLC
PROJ. MGR: **DATE: 1/30/2018**
DRAWN BY: Chad Kauppi **PROJ. #: P2018-0101**

Appendix B:

Photographs



Looking towards the eastern portion of the subject property off of Champion Way.

View looking west across the subject property from the north adjoin site.

Southern boundary of the subject property

View looking north from the southern boundary of the subject property.

View looking east from the western portion of the subject property.

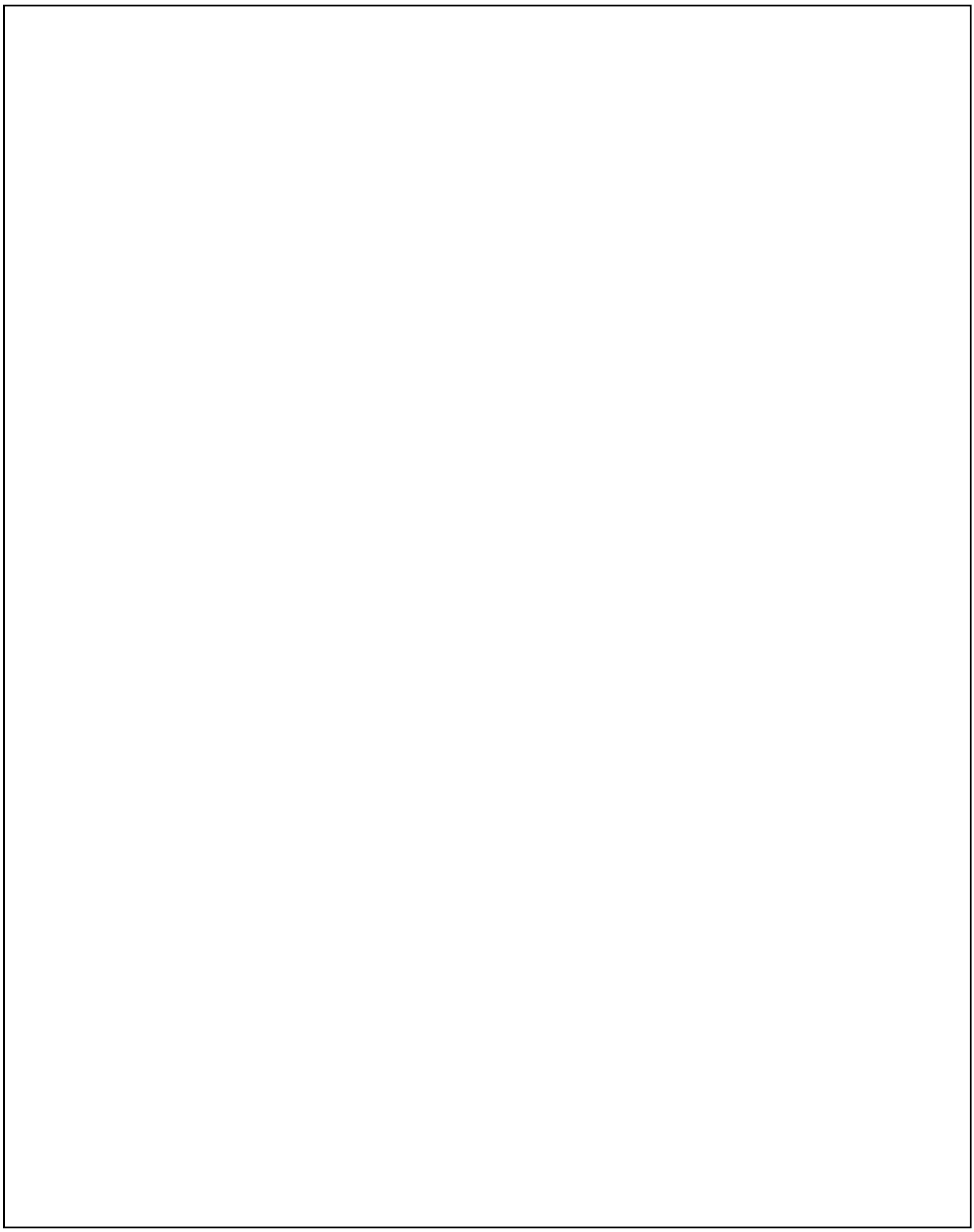
View looking southwest towards Industrial Way from the western portion of the subject property.

View looking west from the northwest corner of the site towards Sobella Farms and US Highway 26.

View looking east from the western portion of the site towards the Arco AM/PM and Pioneer Coffee Shop.

Appendix C:

Historical Research

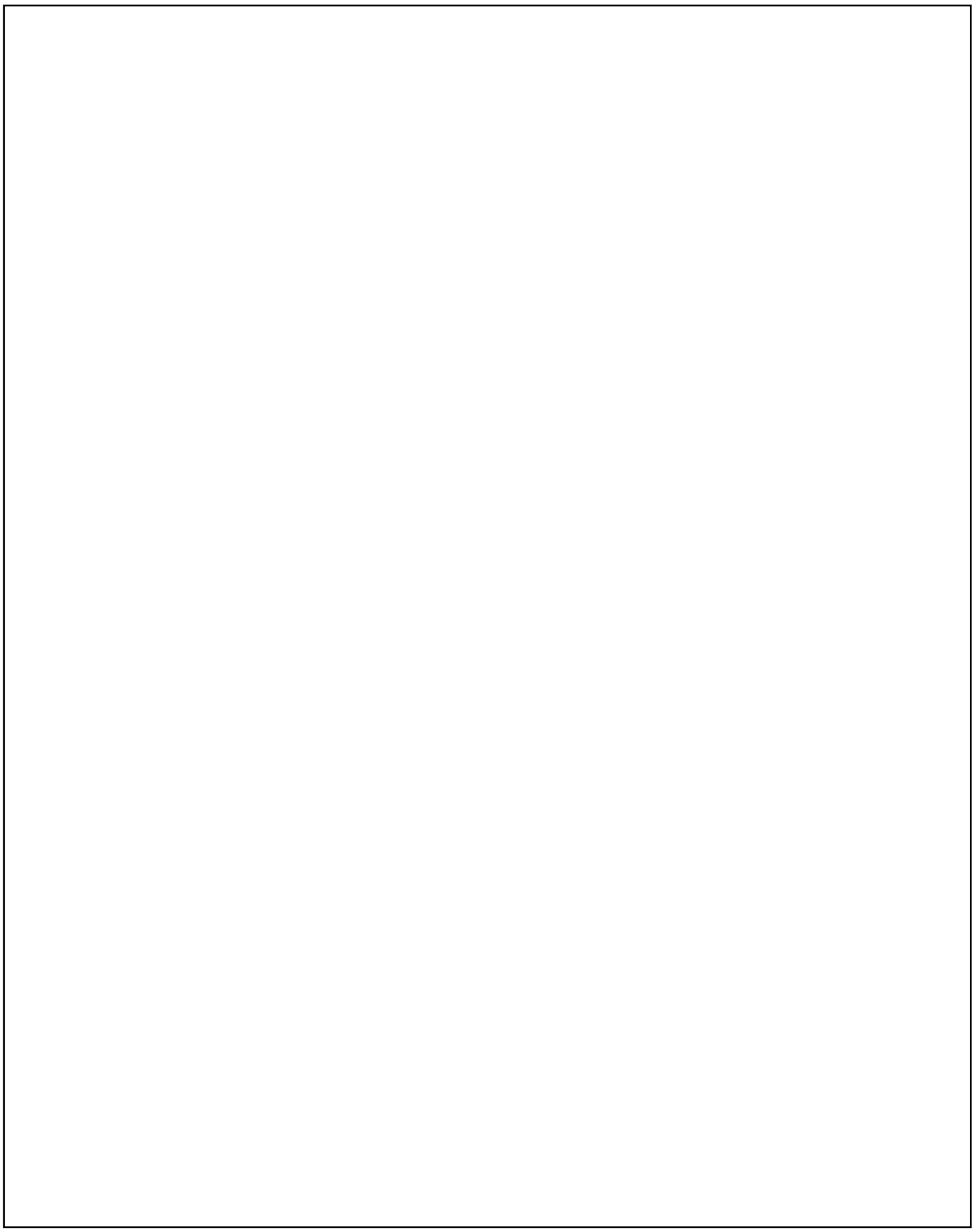


HSC Sandy Lot
16455 Champion Way
Sandy, OR 97055

Inquiry Number: 5168641.3
January 26, 2018

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com



Certified Sanborn® Map Report

01/26/18

Site Name:

HSC Sandy Lot
16455 Champion Way
Sandy, OR 97055
EDR Inquiry # 5168641.3

Client Name:

Blue Mountain Env. Cons. Inc.
125 Main St
Waitsburg, WA 99361-0000
Contact: Chad Kauppi

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Blue Mountain Env. Cons. Inc. were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # DC43-4E79-AC2F

PO # NA

Project P2018-0101

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: DC43-4E79-AC2F

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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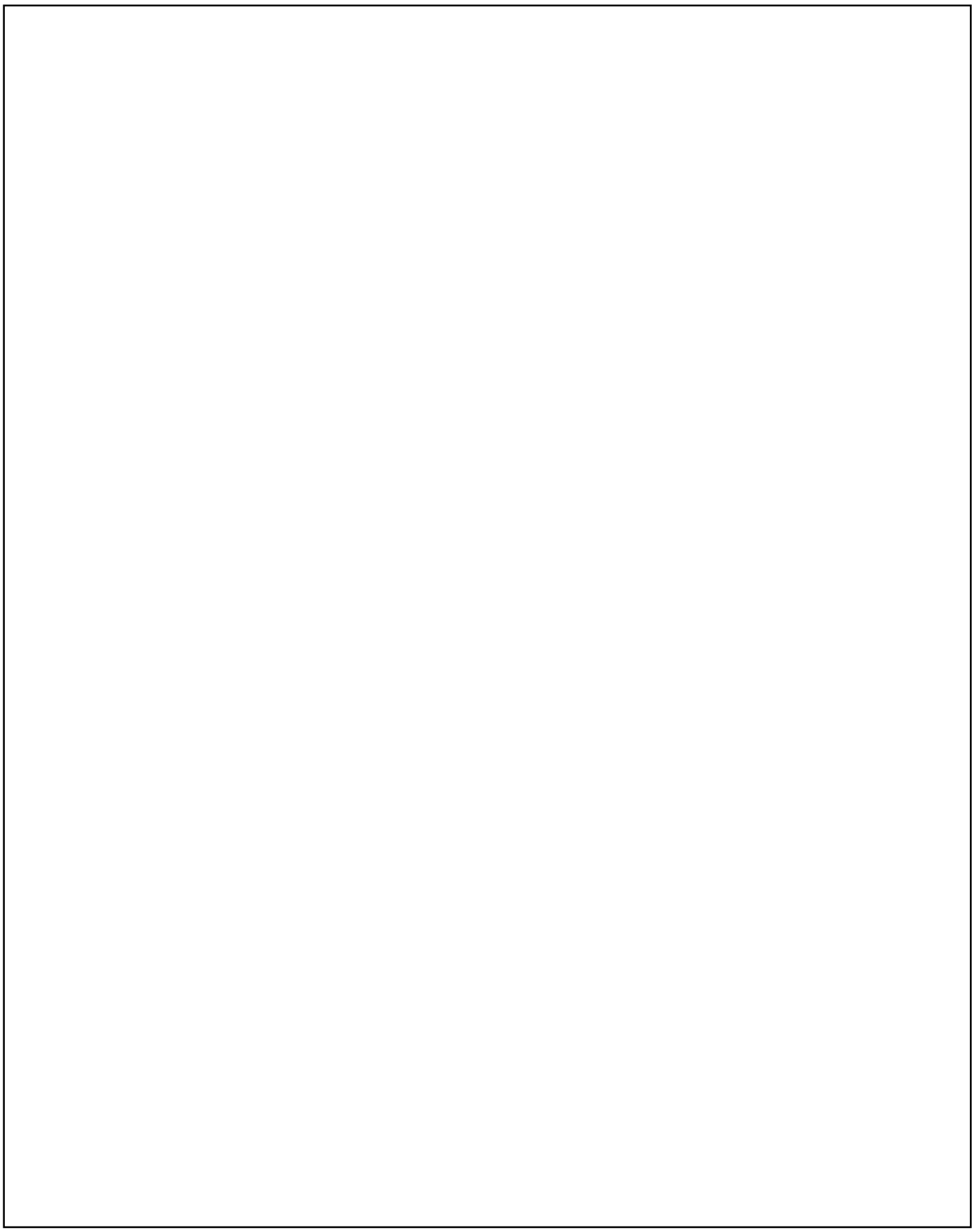
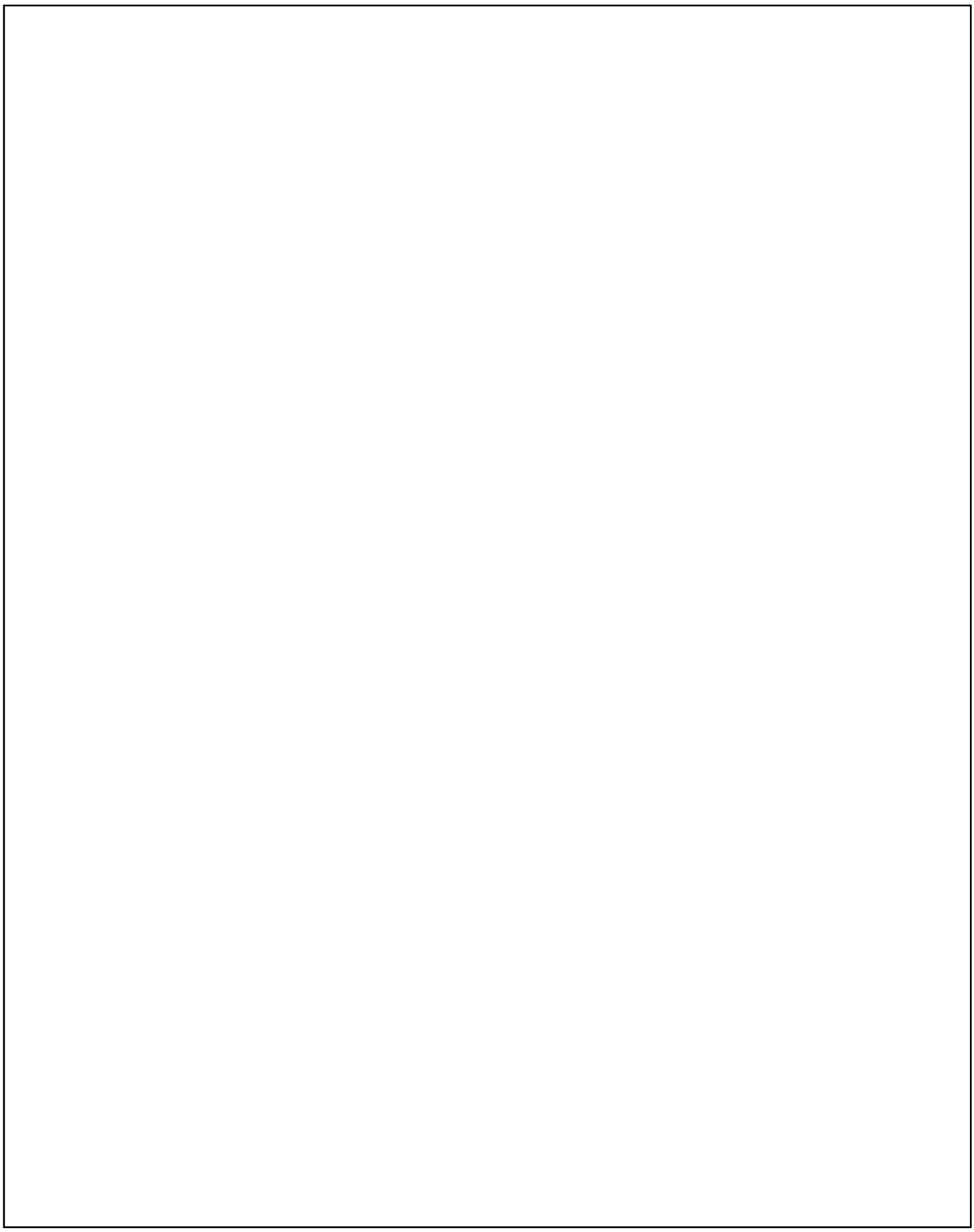


Arco AM/PM
16400 Champion Way
Sandy, OR 97055

Inquiry Number: 4548497.5
February 26, 2016

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com



EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Date EDR Searched Historical Sources:
Aerial Photography February 26, 2016

Target Property:
16400 Champion Way
Sandy, OR 97055

Year	*Scale*	*Details*	*Source*
1948	Aerial Photograph. Scale: 1"=500'	Flight Date: July 14, 1948	USGS
1952	Aerial Photograph. Scale: 1"=500'	Flight Date: July 03, 1952	USGS
1955	Aerial Photograph. Scale: 1"=500'	Flight Date: August 17, 1955	USGS
1960	Aerial Photograph. Scale: 1"=500'	Flight Date: July 18, 1960	USGS
1970	Aerial Photograph. Scale: 1"=500'	Flight Date: July 08, 1970	USGS
1975	Aerial Photograph. Scale: 1"=500'	Flight Date: September 13, 1975	USGS
1980	Aerial Photograph. Scale: 1"=1000'	Flight Date: June 30, 1980	EDR
1982	Aerial Photograph. Scale: 1"=500'	Flight Date: August 06, 1982	USGS
1991	Aerial Photograph. Scale: 1"=1000'	Flight Date: February 28, 1991	EDR
1995	Aerial Photograph. Scale: 1"=750'	Flight Date: June 29, 1995	EDR
1995	Aerial Photograph. Scale: 1"=500'	DOQQ - acquisition dates: June 29, 1995	USGS/DOQQ
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	USDA/NAIP
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	USDA/NAIP
2009	Aerial Photograph. Scale: 1"=500'	Flight Year: 2009	USDA/NAIP
2012	Aerial Photograph. Scale: 1"=500'	Flight Year: 2012	USDA/NAIP


INQUIRY #: 4548497.5
YEAR: 1948
= 500'
N
EDR


INQUIRY #: 4548497.5
YEAR: 1952
= 500'
N
EDR


INQUIRY #: 4548497.5
YEAR: 1955
= 500'
N
EDR


INQUIRY #: 4548497.5
YEAR: 1960
= 500'
N
EDR


INQUIRY #: 4548497.5
YEAR: 1970
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EDR


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YEAR: 1975
= 500'
N
EDR


INQUIRY #: 4548497.5
YEAR: 1980
= 1000'
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EDR


INQUIRY #: 4548497.5
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EDR


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YEAR: 1991
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EDR


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INQUIRY #: 4548497.5
YEAR: 2006
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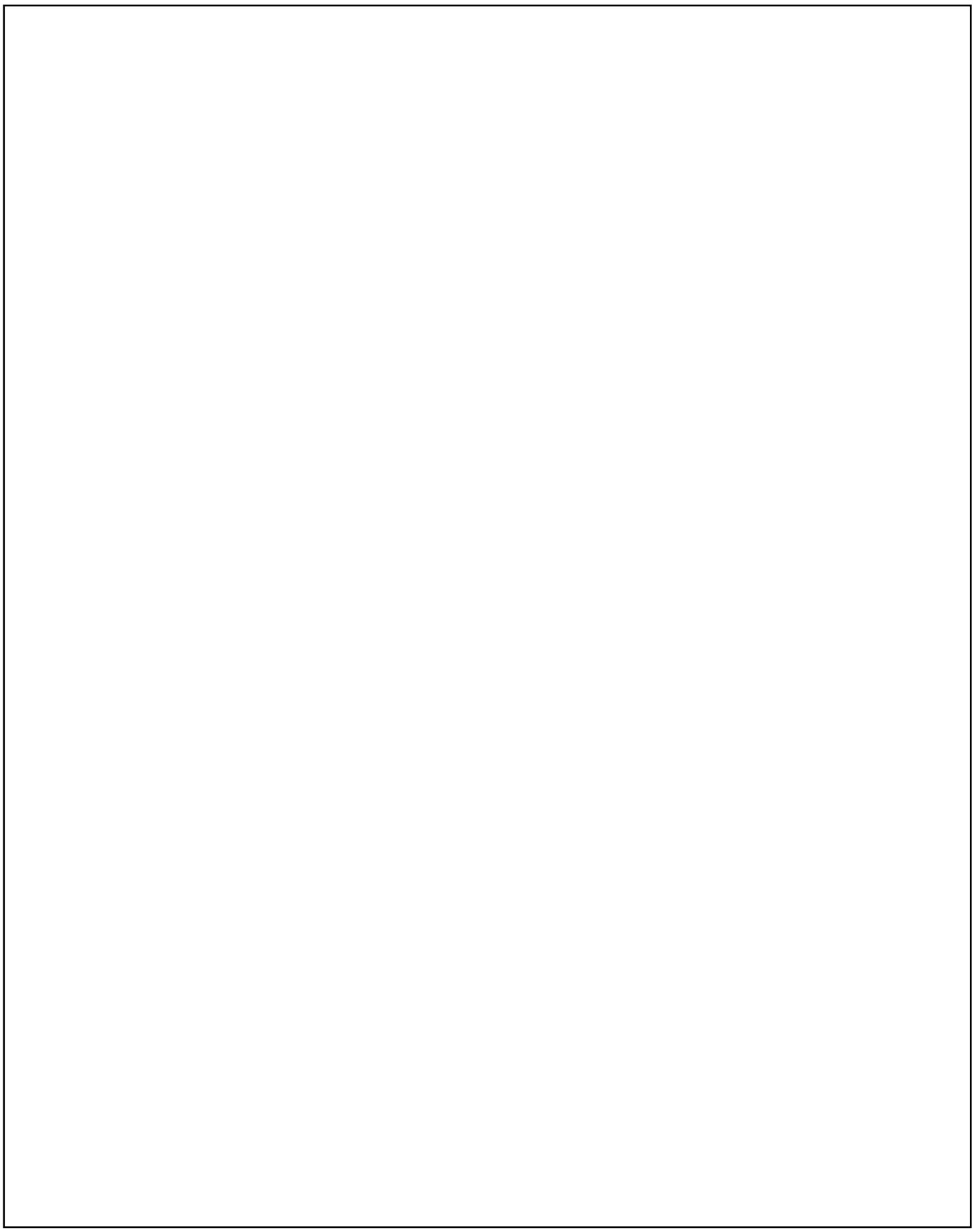
N
EDR


INQUIRY #: 4548497.5
YEAR: 2009
= 500'
N
EDR


INQUIRY #: 4548497.5
YEAR: 2012
= 500'
N
EDR



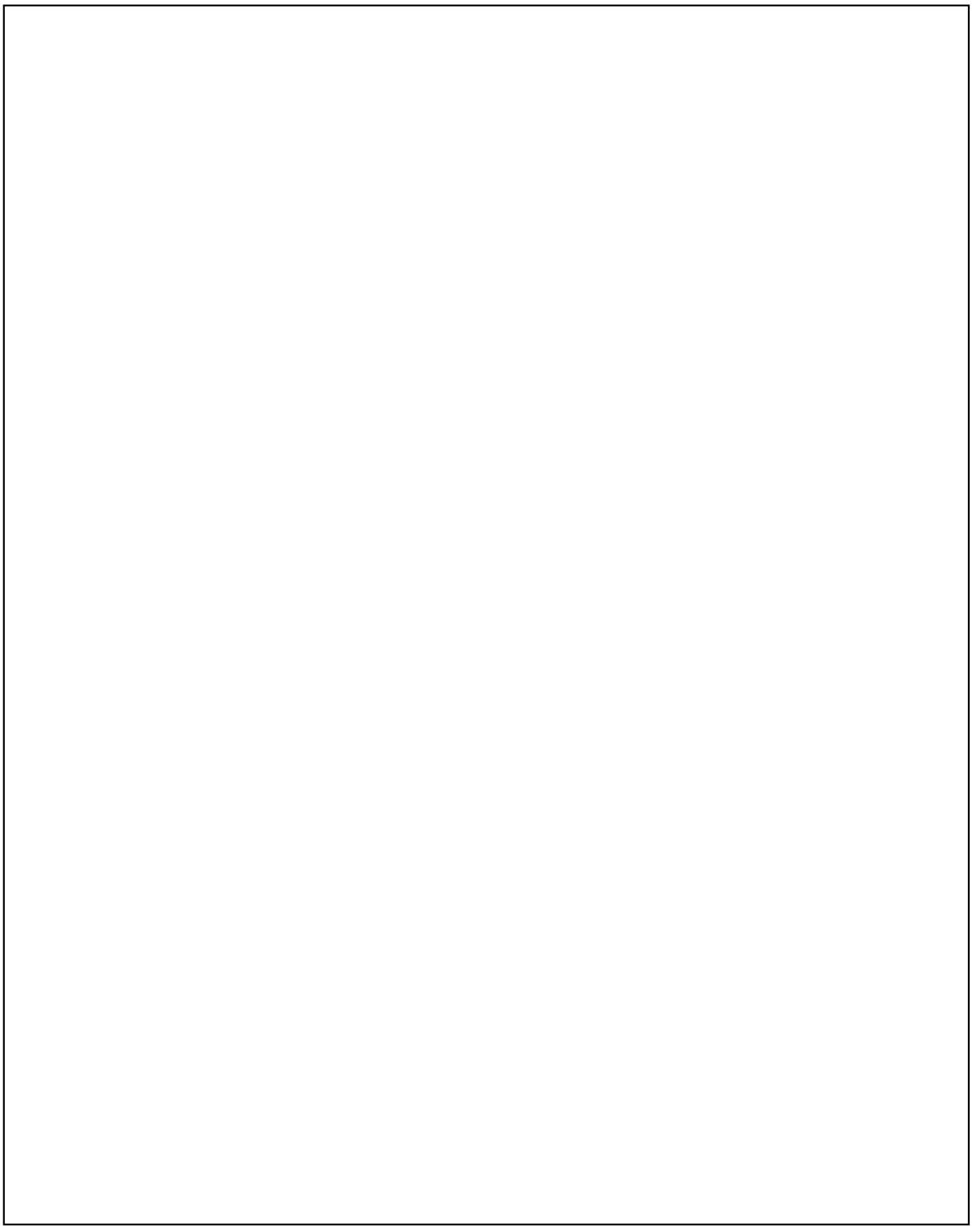
HSC Sandy Lot
16455 Champion Way
Sandy, OR 97055

Inquiry Number: 5168641.4
January 26, 2018

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com



EDR Historical Topo Map Report

01/26/18

Site Name:

HSC Sandy Lot
16455 Champion Way
Sandy, OR 97055
EDR Inquiry # 5168641.4

Client Name:

Blue Mountain Env. Cons. Inc.
125 Main St
Waitsburg, WA 99361-0000
Contact: Chad Kauppi

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Blue Mountain Env. Cons. Inc. were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:

P.O.# NA
Project: P2018-0101

Coordinates:

Latitude:	45.405593 45° 24' 20" North
Longitude:	-122.296502 -122° 17' 47" West
UTM Zone:	Zone 10 North
UTM X Meters:	555053.81
UTM Y Meters:	5028248.93
Elevation:	755.57' above sea level

Maps Provided:

2014	1916
1985	1914
1975	1911
1970	
1961	
1954	
1940	
1939	

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

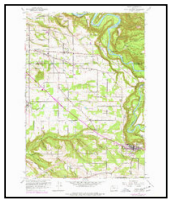
2014 Source Sheets

Sandy
2014
7.5-minute, 24000

1985 Source Sheets

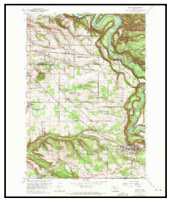
Sandy
1985
7.5-minute, 24000
Aerial Photo Revised 1981

1975 Source Sheets



Sandy
1975
7.5-minute, 24000
Aerial Photo Revised 1975

1970 Source Sheets



Sandy
1970
7.5-minute, 24000
Aerial Photo Revised 1970

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

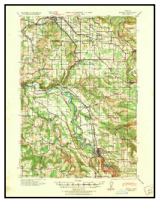
1961 Source Sheets

Sandy
1961
7.5-minute, 24000
Aerial Photo Revised 1960

1954 Source Sheets

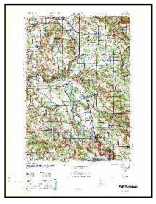
Sandy
1954
7.5-minute, 24000
Aerial Photo Revised 1952

1940 Source Sheets



Boring
1940
15-minute, 62500

1939 Source Sheets



BORING
1939
15-minute, 50000

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1916 Source Sheets

Estacada
1916
30-minute, 125000

1914 Source Sheets

Boring
1914
15-minute, 62500

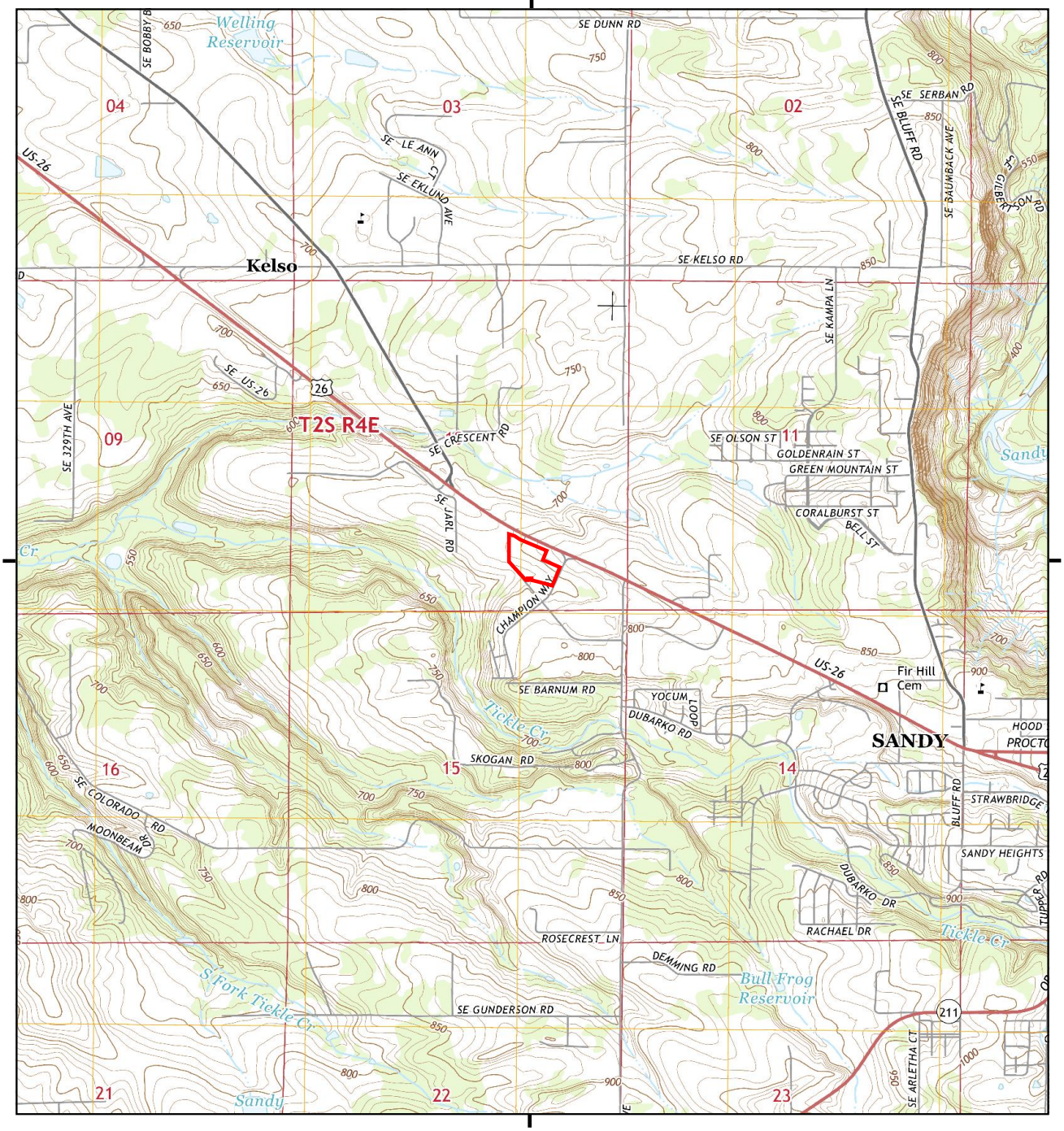
1911 Source Sheets

Boring
1911
15-minute, 48000

EDR

Historical Topo Map

2014



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Sandy, 2014, 7.5-minute

SITE NAME: HSC Sandy Lot
ADDRESS: 16455 Champion Way
Sandy, OR 97055
CLIENT: Blue Mountain Env. Cons. Inc.

N

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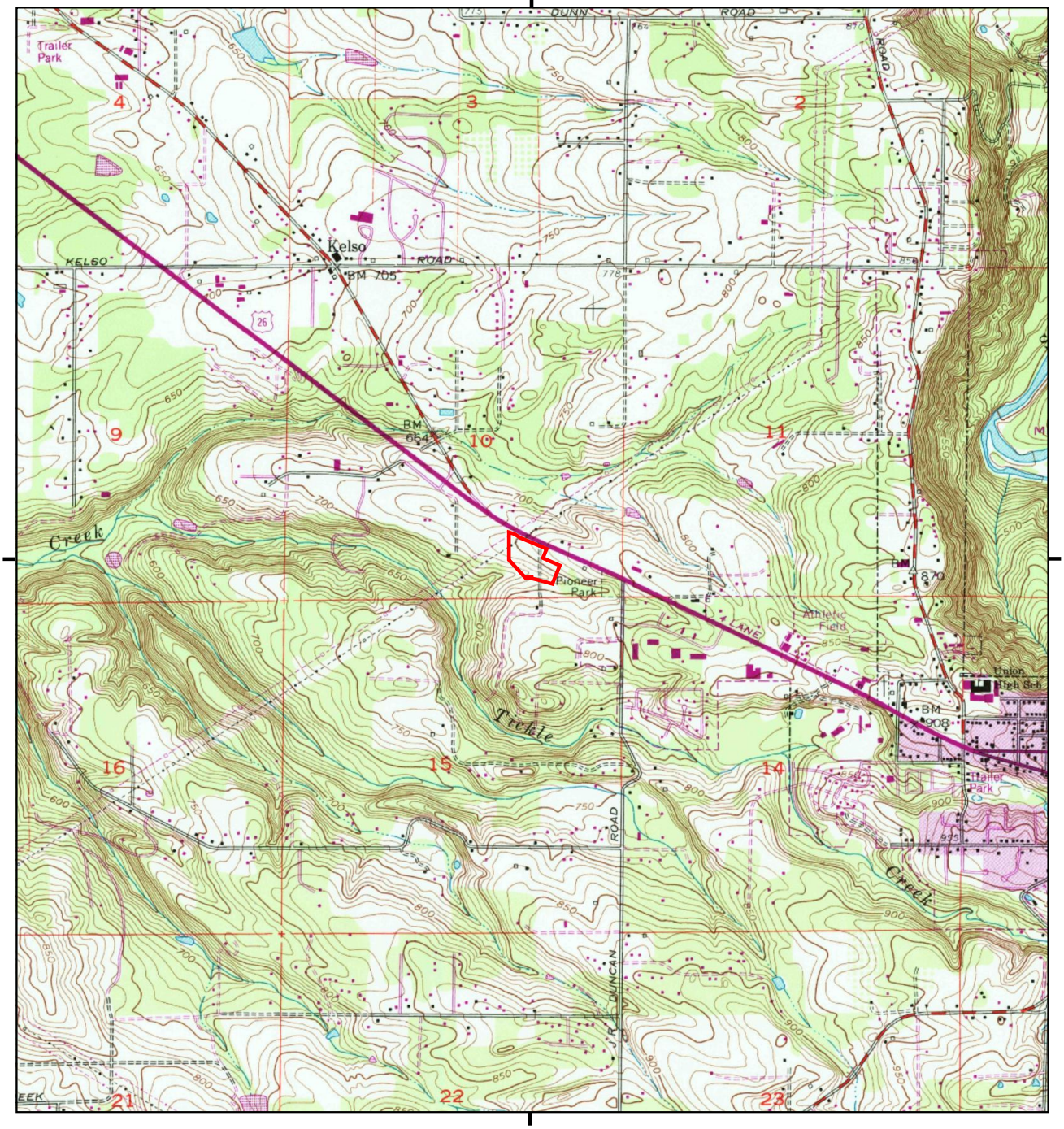
Historical Topo Map

1985



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Sandy, 1985, 7.5-minute

SITE NAME: HSC Sandy Lot
ADDRESS: 16455 Champion Way
Sandy, OR 97055
CLIENT: Blue Mountain Env. Cons. Inc.

N

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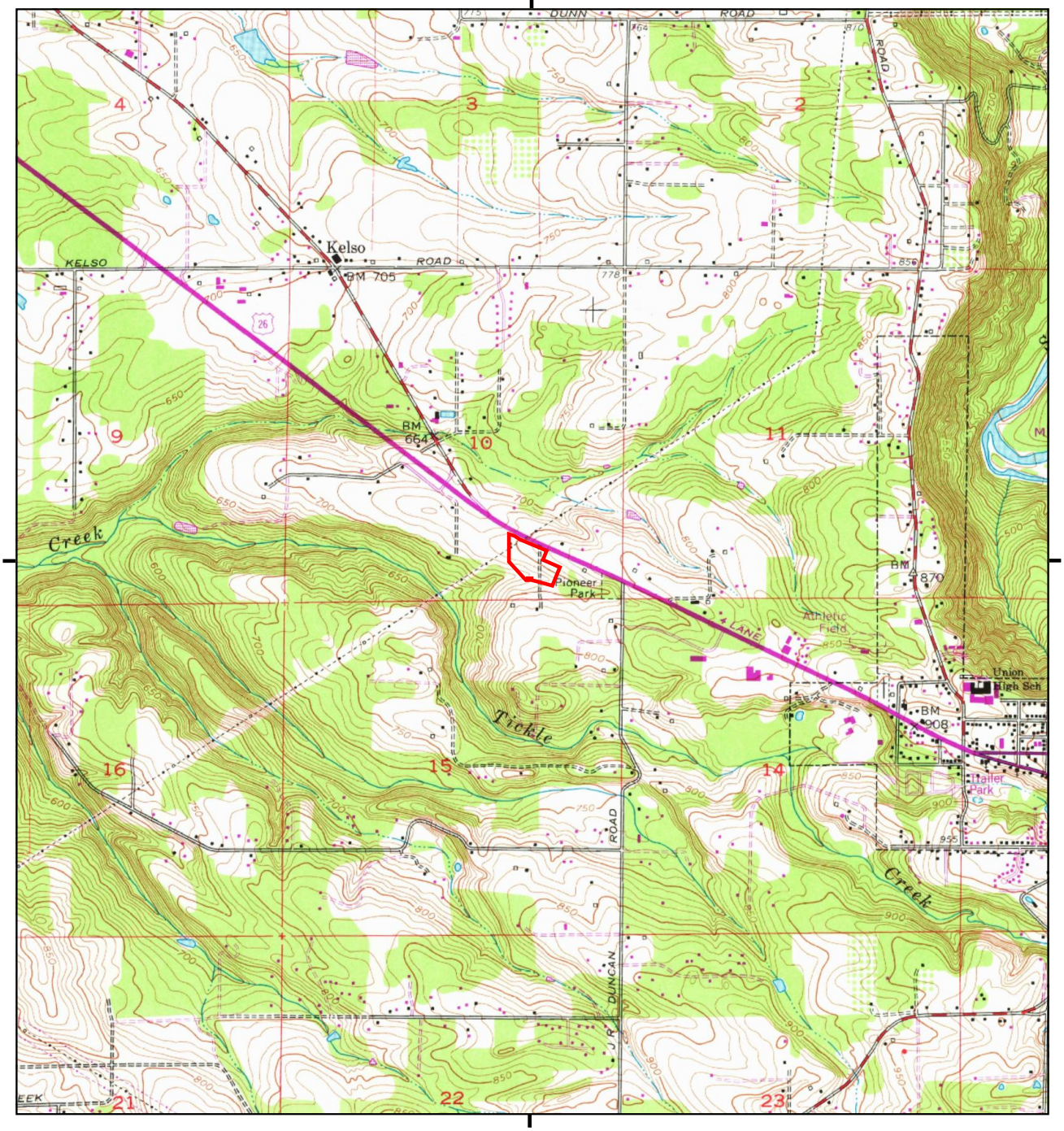
Historical Topo Map

1975



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Sandy, 1975, 7.5-minute

SITE NAME: HSC Sandy Lot
ADDRESS: 16455 Champion Way
Sandy, OR 97055
CLIENT: Blue Mountain Env. Cons. Inc.

N

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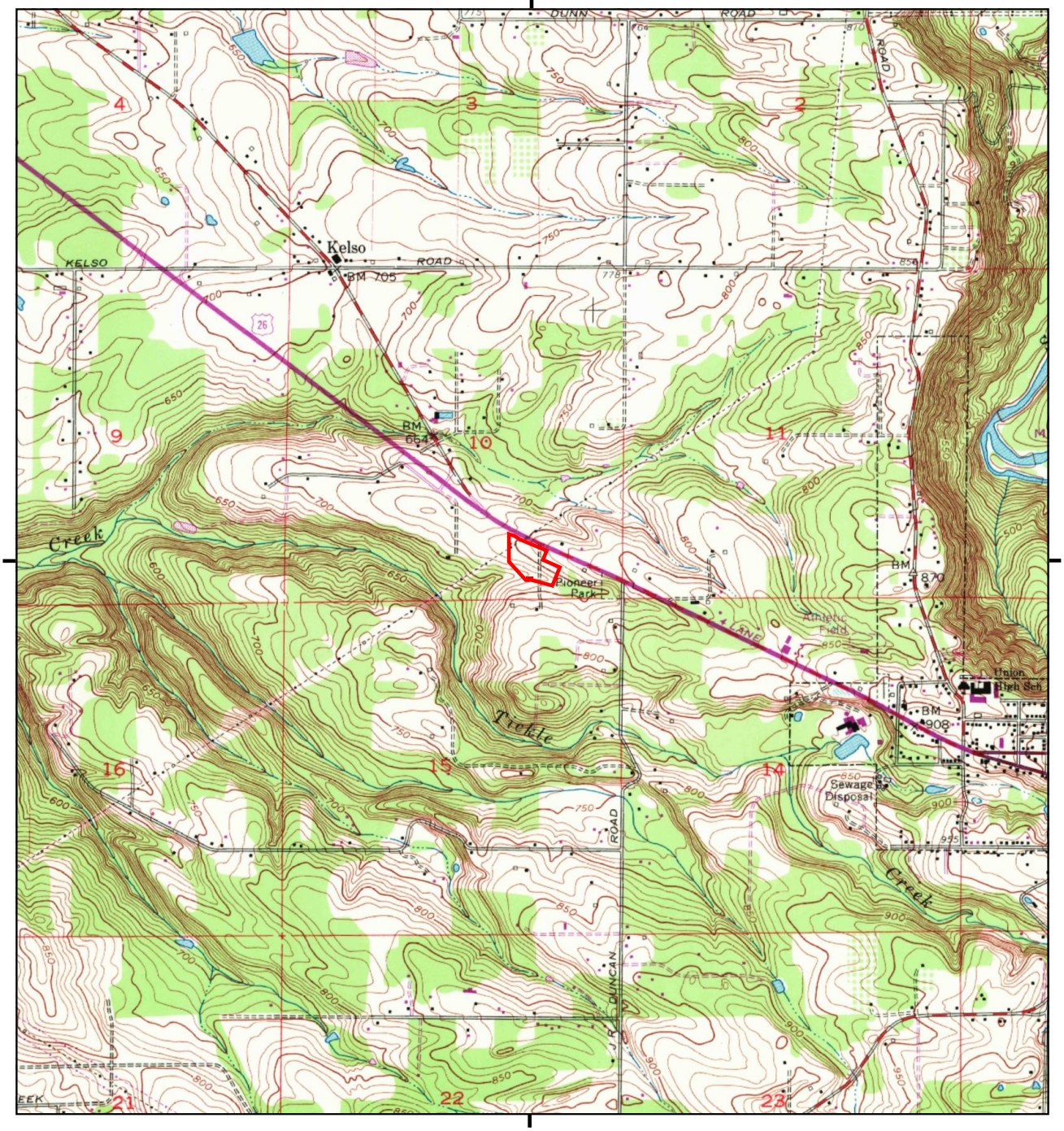
Historical Topo Map

1970



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Sandy, 1970, 7.5-minute

SITE NAME: HSC Sandy Lot
ADDRESS: 16455 Champion Way
Sandy, OR 97055
CLIENT: Blue Mountain Env. Cons. Inc.

N

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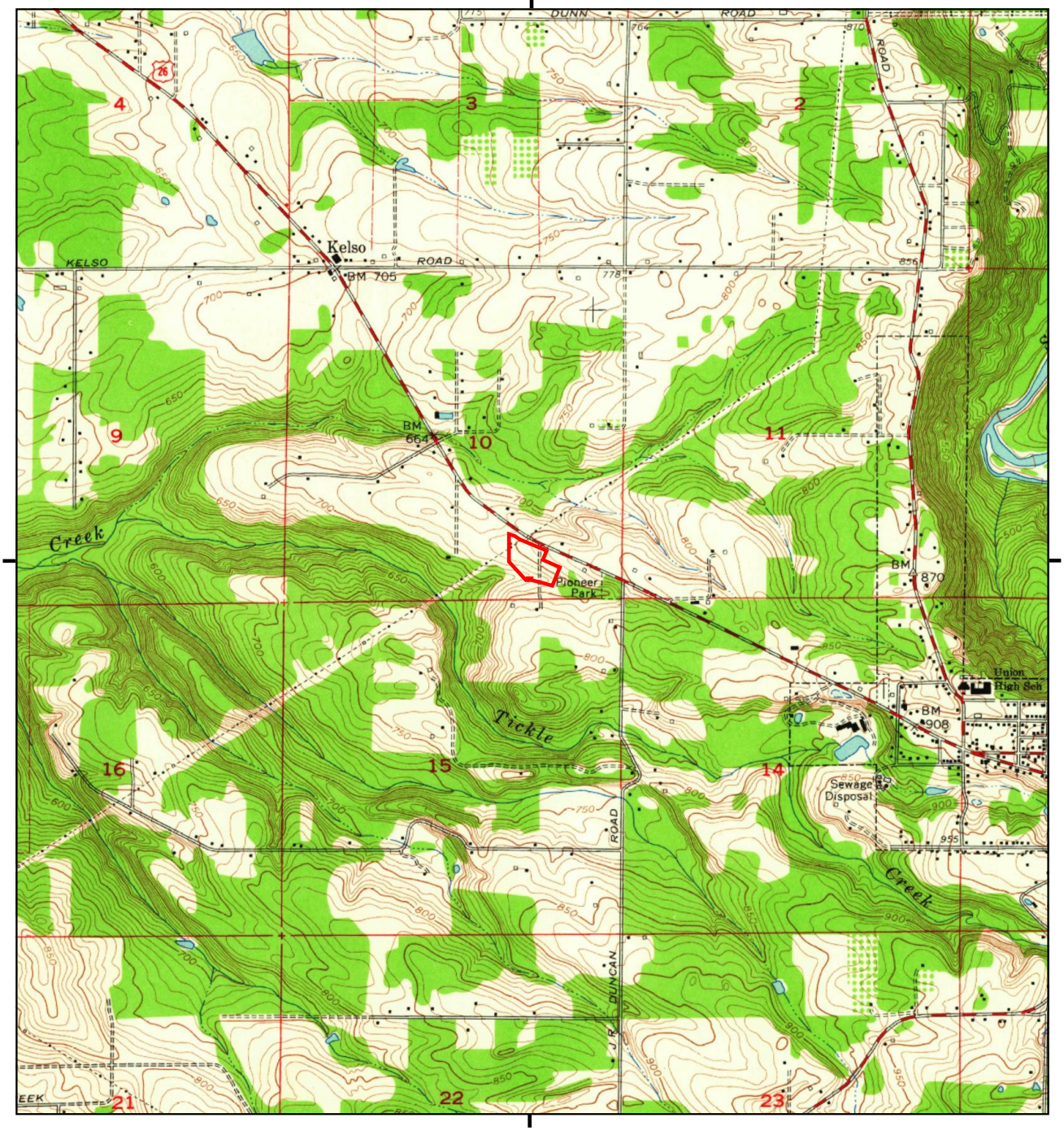
Historical Topo Map

1961



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Sandy, 1961, 7.5-minute

SITE NAME: HSC Sandy Lot
ADDRESS: 16455 Champion Way
Sandy, OR 97055
CLIENT: Blue Mountain Env. Cons. Inc.

N

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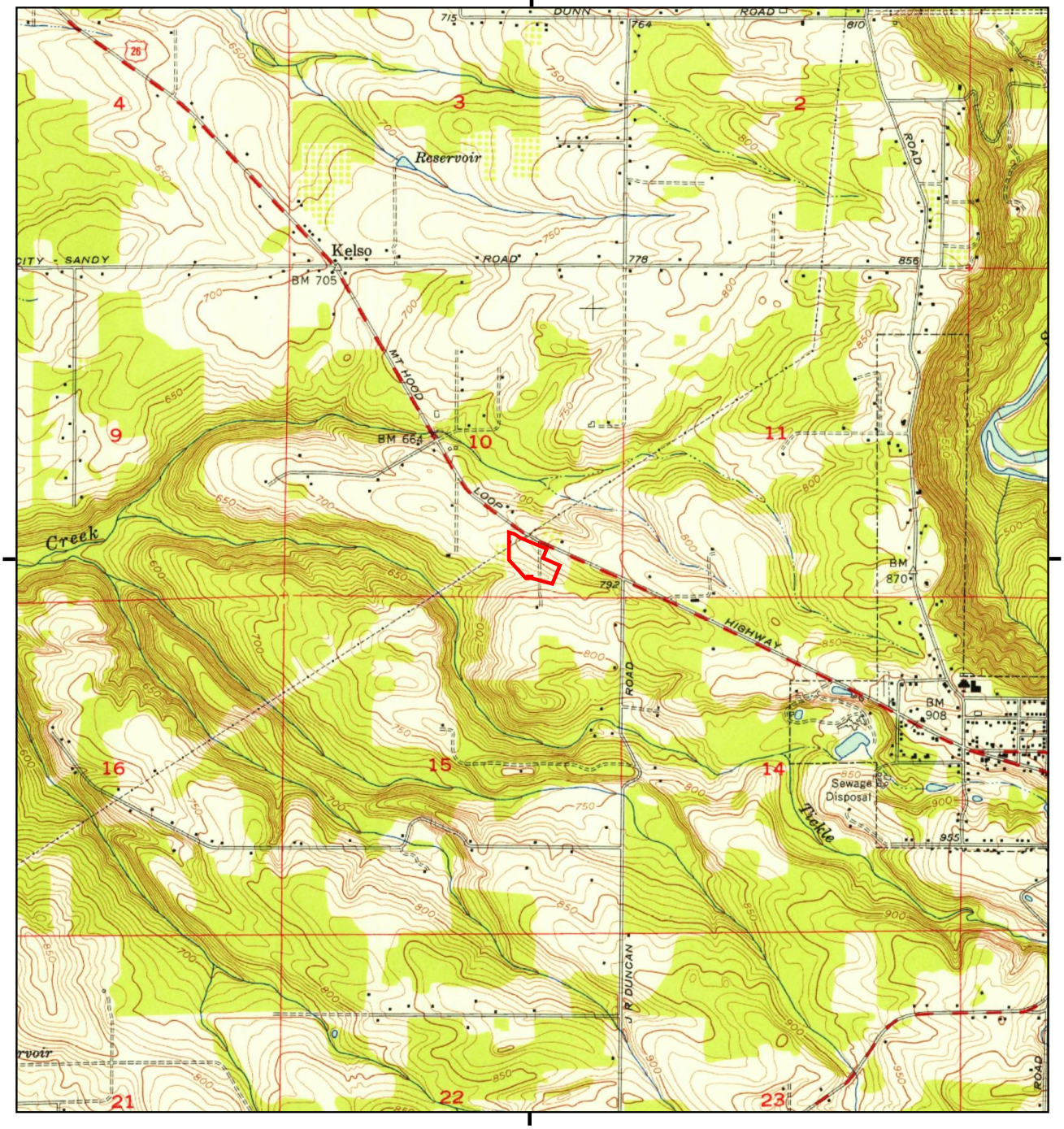
Historical Topo Map

1954



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

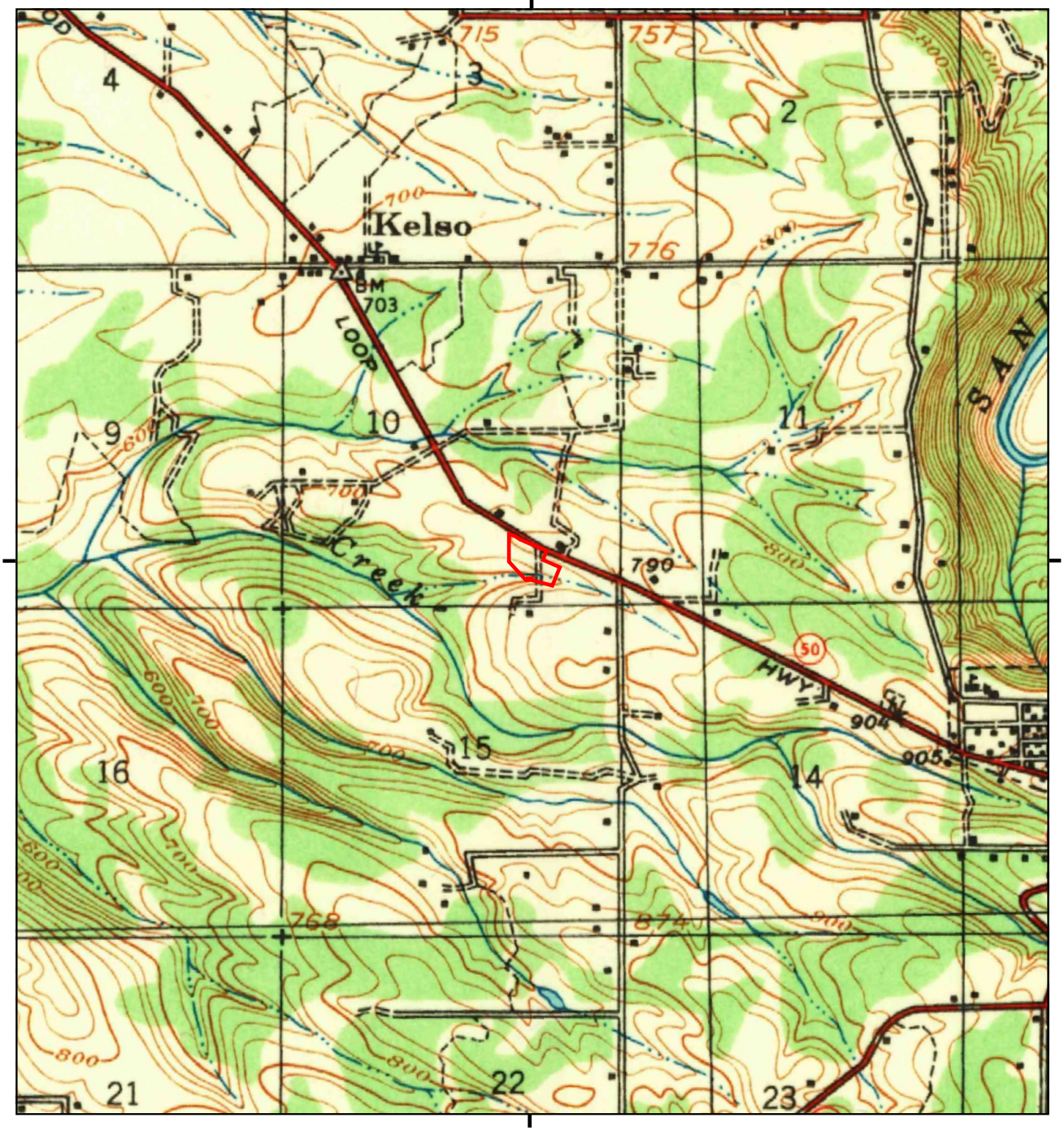
TP, Sandy, 1954, 7.5-minute

SITE NAME: HSC Sandy Lot
ADDRESS: 16455 Champion Way
Sandy, OR 97055
CLIENT: Blue Mountain Env. Cons. Inc.

N

Historical Topo Map

1940



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Boring, 1940, 15-minute

SITE NAME: HSC Sandy Lot
ADDRESS: 16455 Champion Way
Sandy, OR 97055
CLIENT: Blue Mountain Env. Cons. Inc.

N

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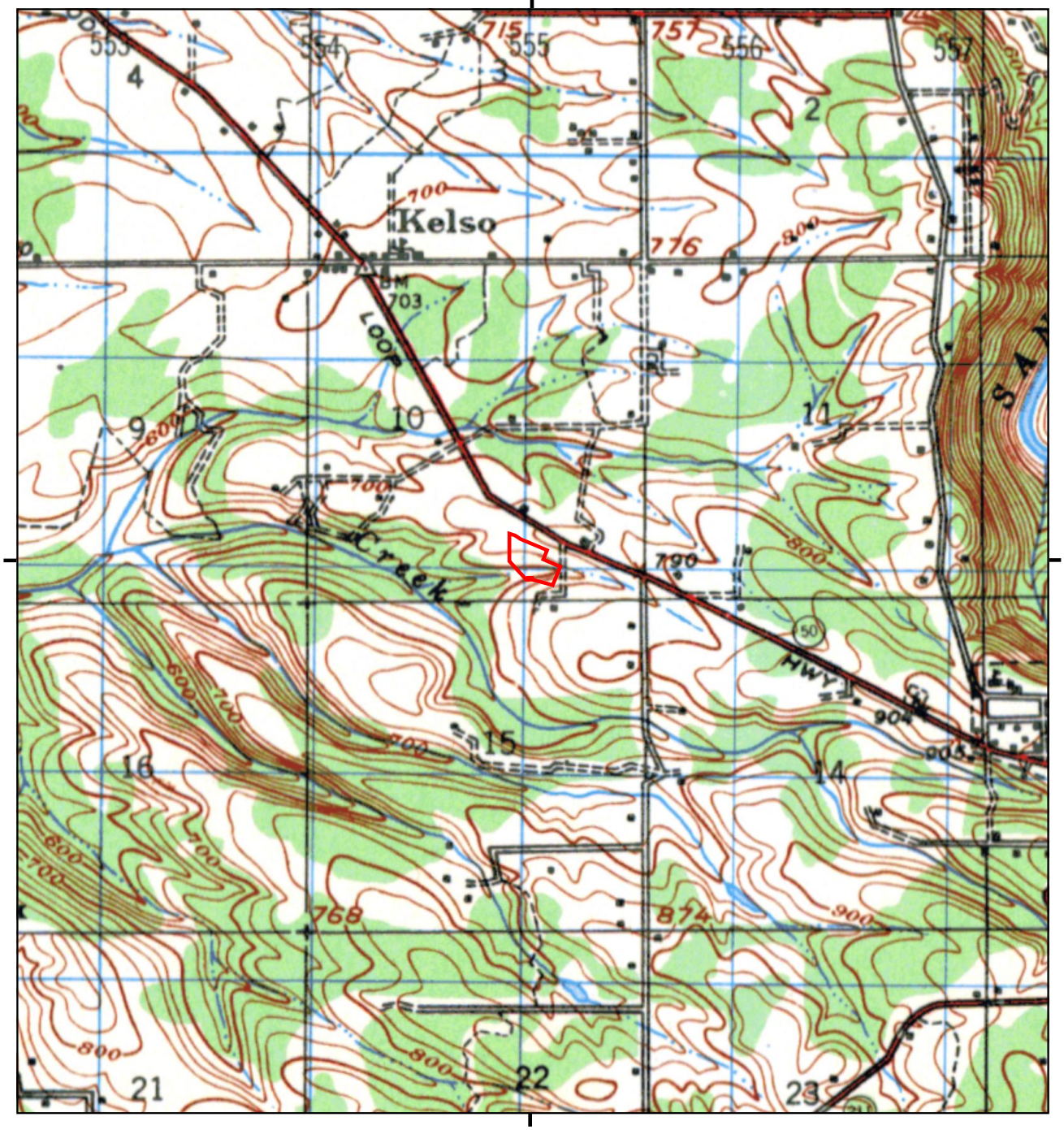
Historical Topo Map

1939



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, BORING, 1939, 15-minute

SITE NAME: HSC Sandy Lot
ADDRESS: 16455 Champion Way
Sandy, OR 97055
CLIENT: Blue Mountain Env. Cons. Inc.

N

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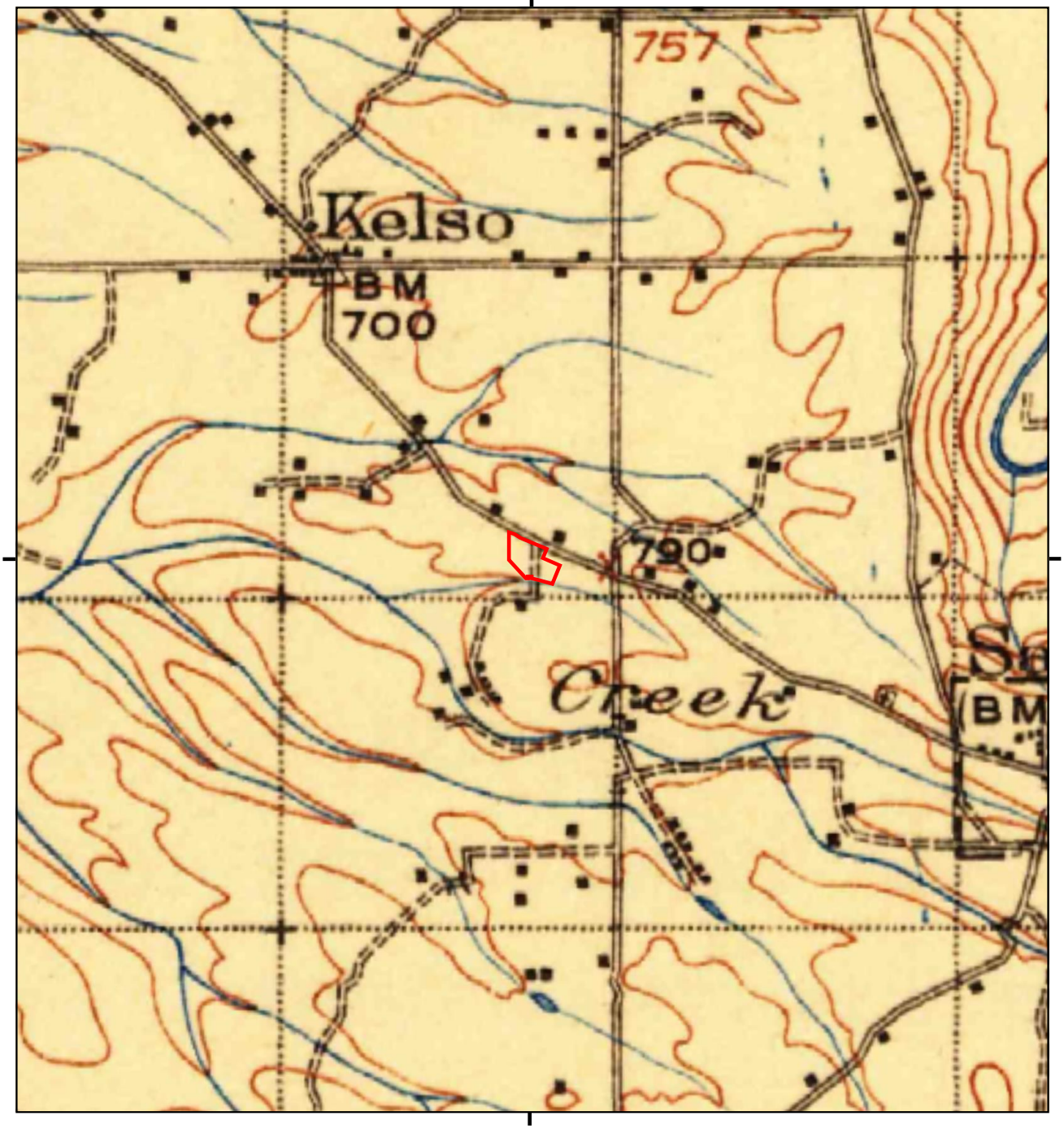
Historical Topo Map

1916



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Estacada, 1916, 30-minute

SITE NAME: HSC Sandy Lot
ADDRESS: 16455 Champion Way
Sandy, OR 97055
CLIENT: Blue Mountain Env. Cons. Inc.

N

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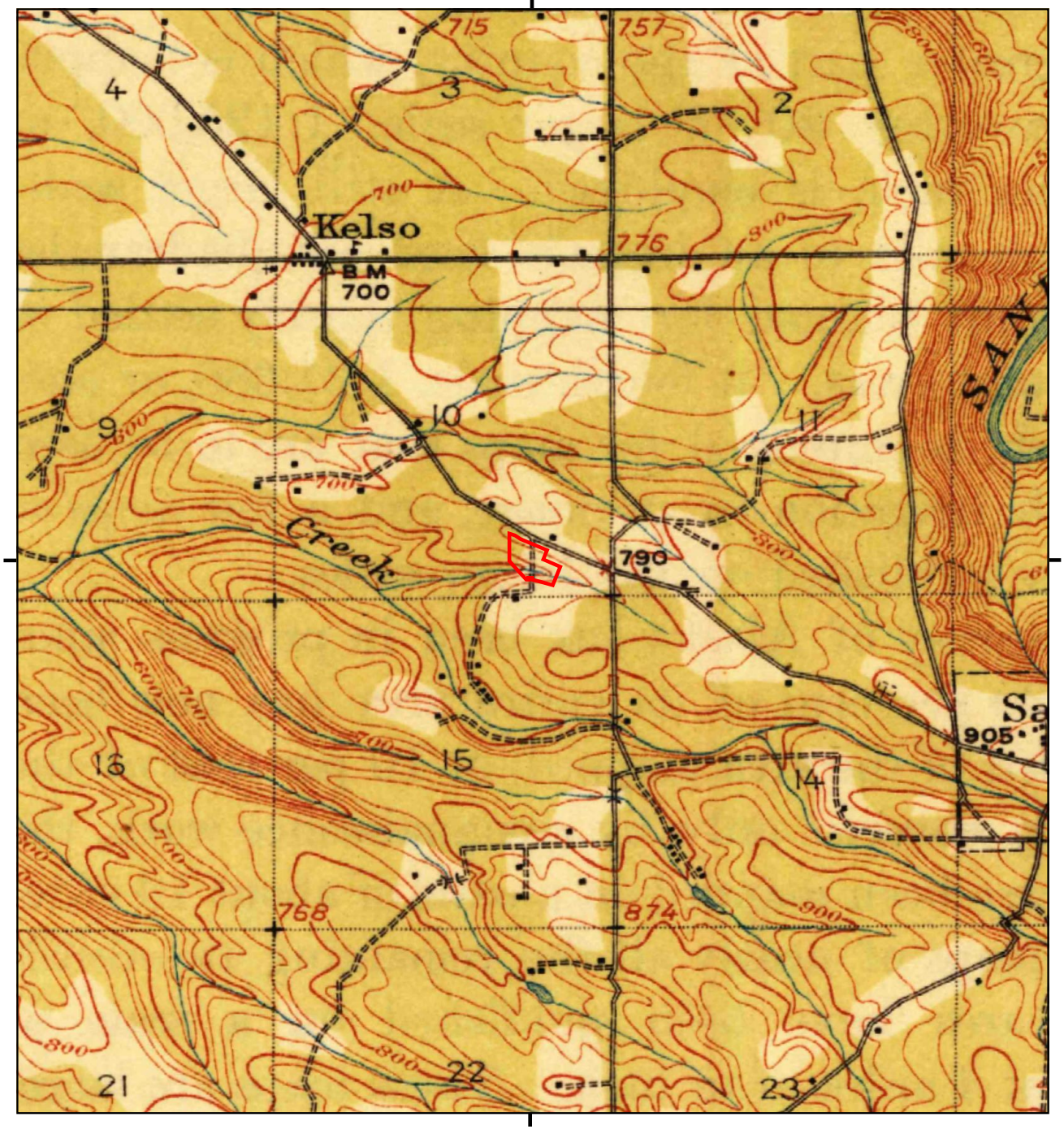
Historical Topo Map

1914



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Boring, 1914, 15-minute

SITE NAME: HSC Sandy Lot
ADDRESS: 16455 Champion Way
Sandy, OR 97055
CLIENT: Blue Mountain Env. Cons. Inc.

N

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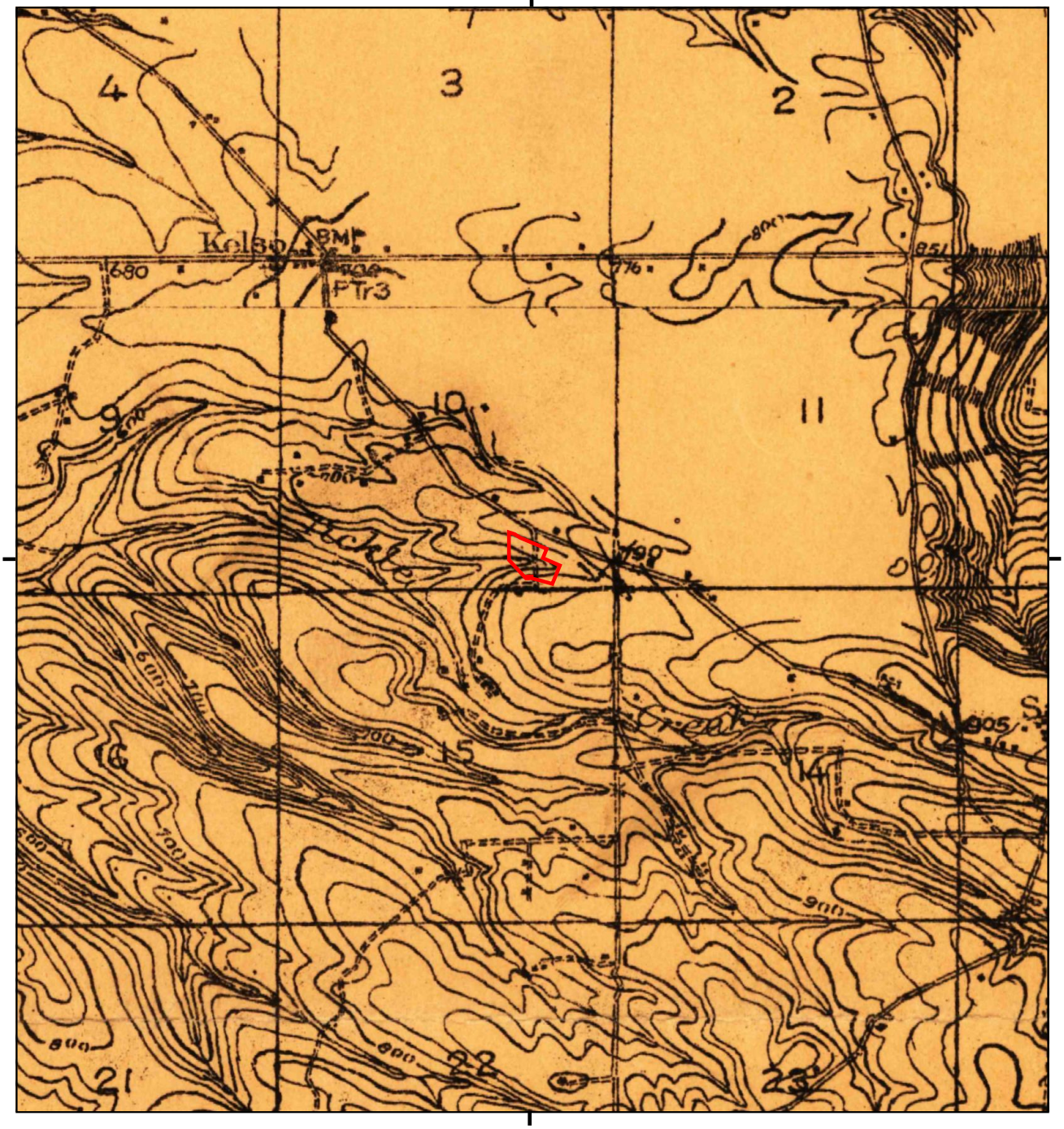
Historical Topo Map

1911



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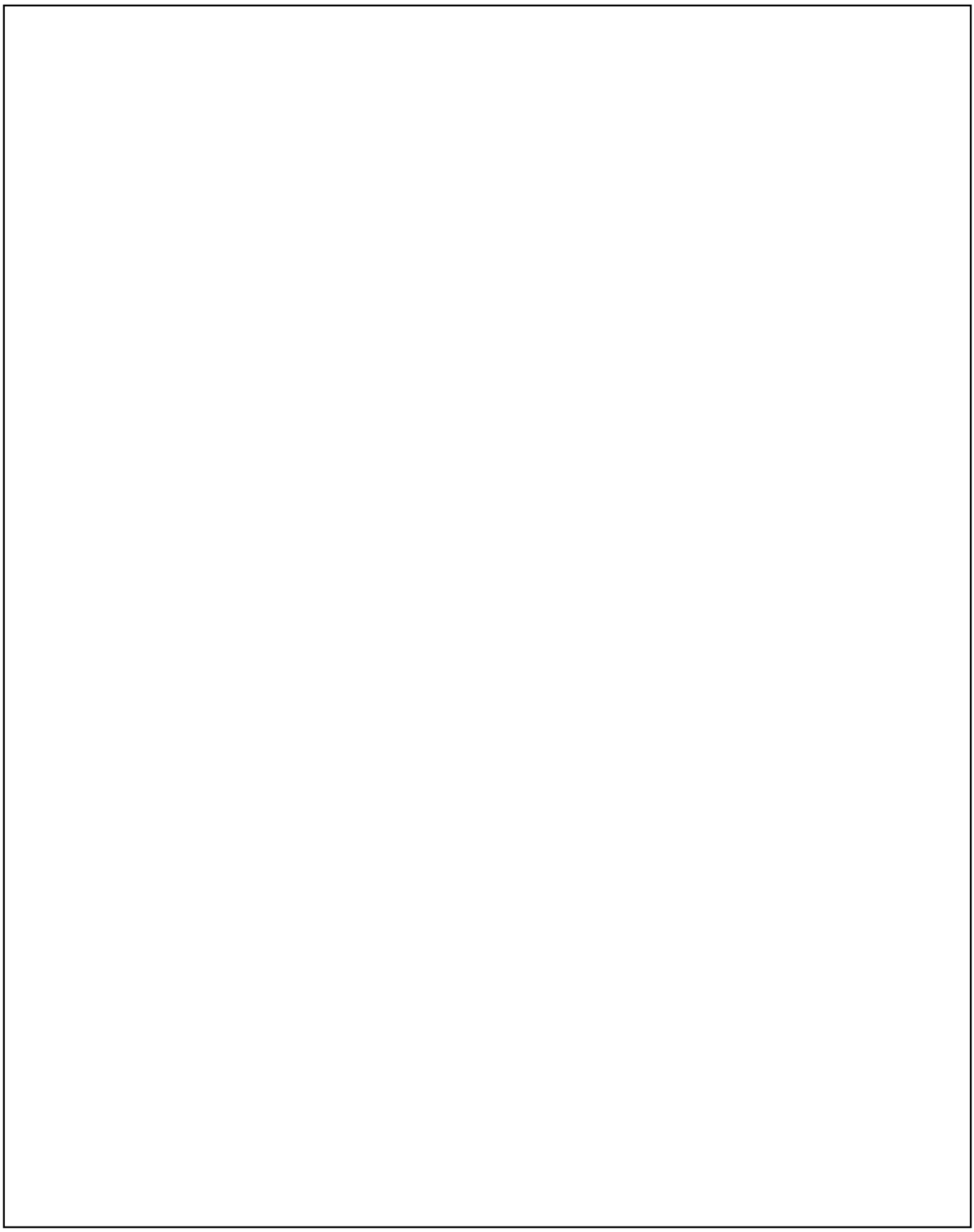
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Boring, 1911, 15-minute

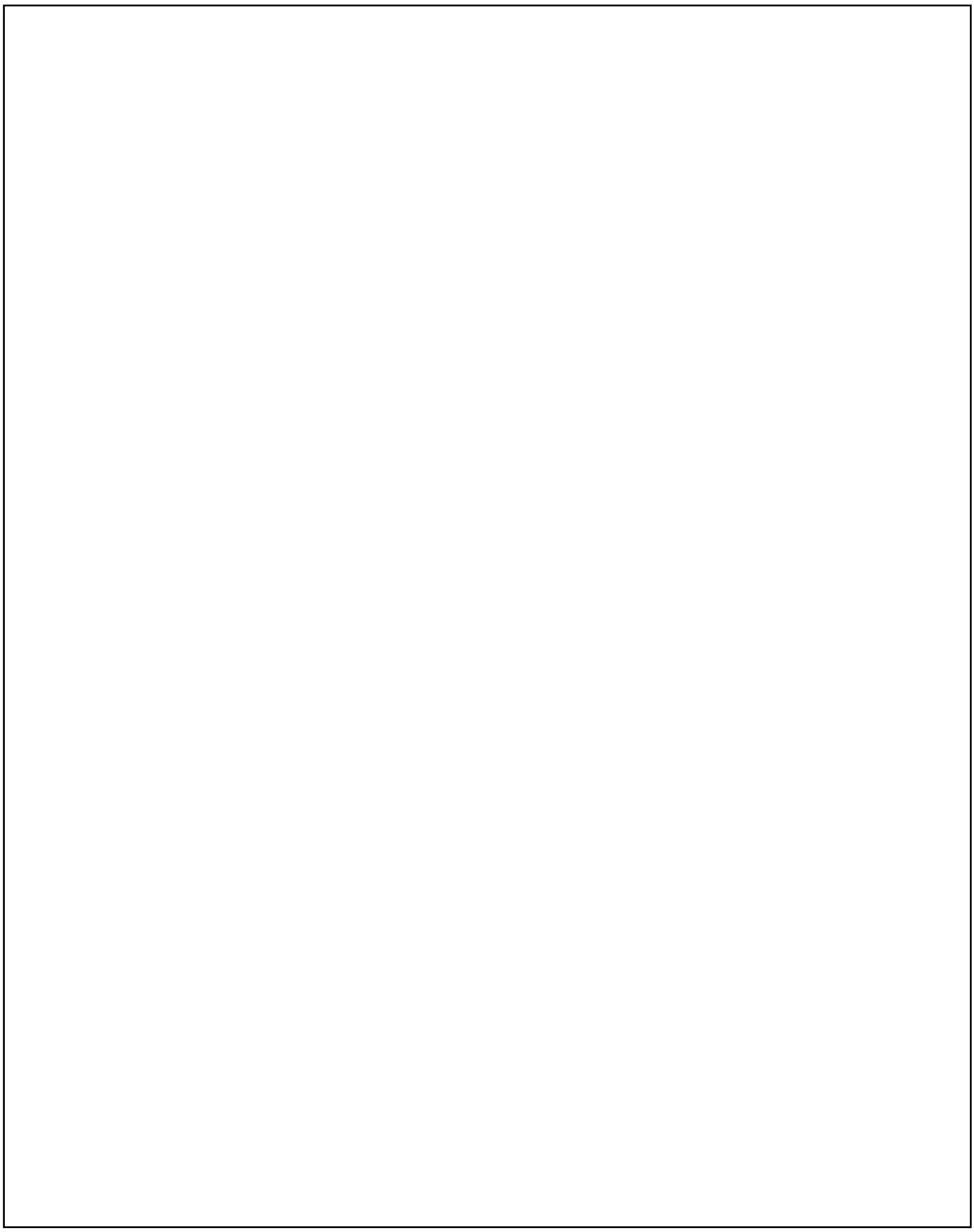
SITE NAME: HSC Sandy Lot
ADDRESS: 16455 Champion Way
Sandy, OR 97055
CLIENT: Blue Mountain Env. Cons. Inc.

N



Appendix D:

Regulatory Records



HSC Sandy Lot
16455 Champion Way
Sandy, OR 97055

Inquiry Number: 5168641.2s
January 26, 2018

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

FORM-LBD-CHM

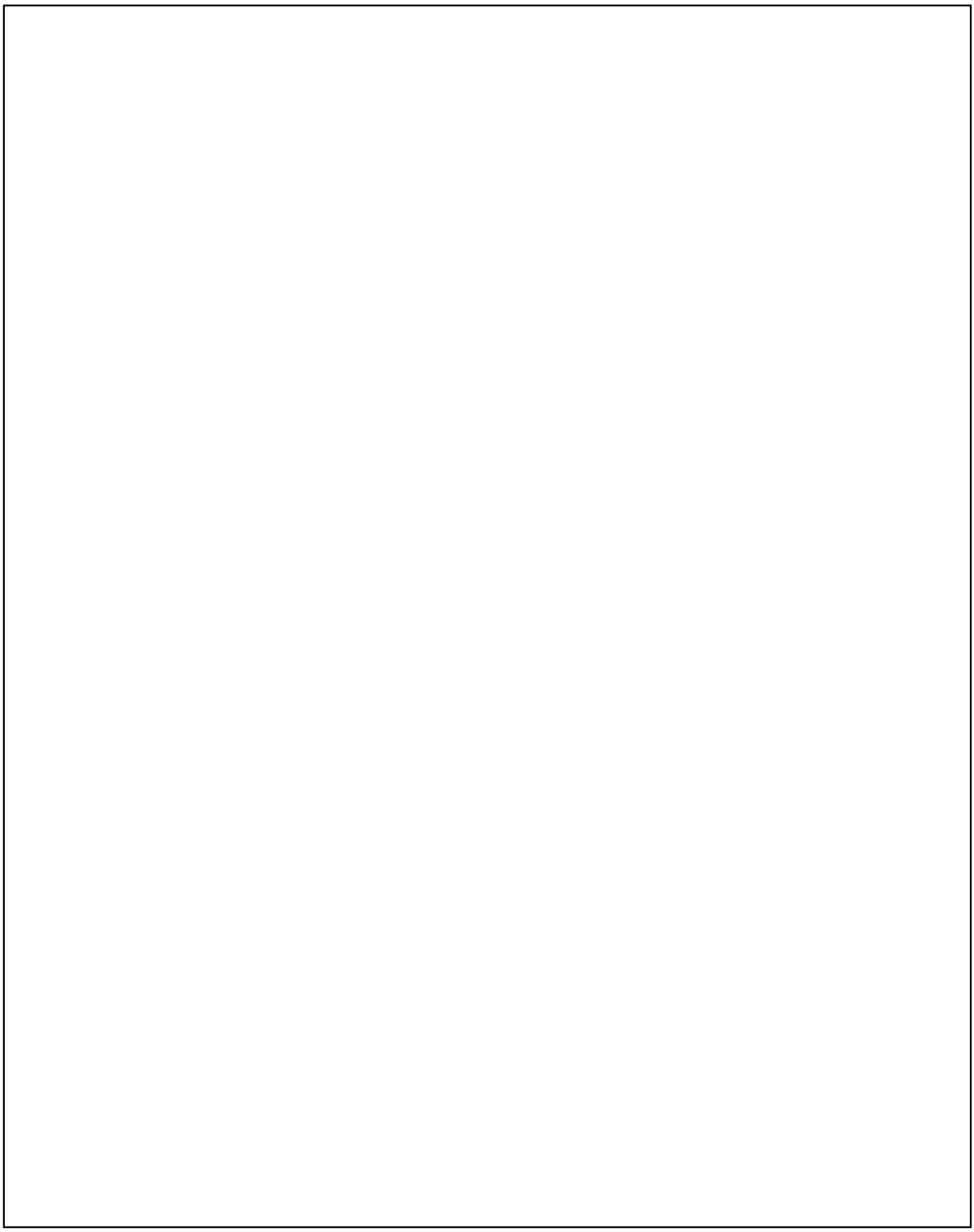


TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

16455 CHAMPION WAY
SANDY, OR 97055

COORDINATES

Latitude (North):	45.4055930 - 45° 24' 20.13''
Longitude (West):	122.2965020 - 122° 17' 47.40''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	555055.4
UTM Y (Meters):	5028031.5
Elevation:	756 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	6066512 SANDY, OR
Version Date:	2014

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140630
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
16455 CHAMPION WAY
SANDY, OR 97055

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	SANDY AMPM	16355 CHAMPION WAY	UST	Higher	87, 0.016, East
2	USDA FS MT HOOD NF H	16400 CHAMPION WAY	RCRA-CESQG, FINDS, ECHO	Higher	413, 0.078, ESE
A3	OUR DDDYS CSTOMS TRA	35900 INDUSTRIAL WAY	EDR Hist Auto	Higher	566, 0.107, SSE
A4	FRED MEYER STORES IN	16625 362ND AVE	AST, OR HAZMAT, HSIS, NPDES	Higher	663, 0.126, SSE
A5	FM FUEL STOP #663 SA	16625 SE 362ND DR	UST	Higher	663, 0.126, SSE
6	COLUMBIA SCREW MACHI	16542 SE 362ND AVE	RCRA NonGen / NLR, FINDS, ECHO	Higher	1025, 0.194, ESE
7	MAIDEN STUDIOS	16600 SE 362ND DR	AST, HSIS	Higher	1145, 0.217, ESE
8	HEATING OIL TANK	35447 SE CRESCENT RD	LUST	Lower	1567, 0.297, NNW
9	JIM TURIN & SONS INC	36775 INDUSTRIAL WAY	LUST, UST, AST, HSIS	Higher	2349, 0.445, ESE
10	CASCADE CLEANERS	36653 HWY 26	ECSI, VCP, DRYCLEANERS	Higher	2737, 0.518, ESE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent CERCLIS

CRL ---------- Confirmed Release List and Inventory

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Solid Waste Facilities List

State and tribal leaking storage tank lists

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST ---------- Underground Storage Tank Listing
INDIAN UST ---------- Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

ENG CONTROLS ---------- Engineering Controls Recorded at ESCI Sites
INST CONTROL ---------- Institutional Controls Recorded at ESCI Sites

State and tribal voluntary cleanup sites

VCP ---------- Voluntary Cleanup Program Sites
INDIAN VCP ---------- Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS ---------- Brownfields Projects

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY ---------- Recycling Facility Location Listing
HIST LF ---------- Old Closed SW Disposal Sites
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI ---------- Open Dump Inventory
IHS OPEN DUMPS ---------- Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---------- Delisted National Clandestine Laboratory Register

AOCONCERN	Columbia Slough
CDL	Uninhabitable Drug Lab Properties
US CDL	National Clandestine Laboratory Register

Local Land Records

LIENS 2	CERCLA Lien Information

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
SPILLS	Spill Database
OR HAZMAT	Hazmat/Incidents
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
US MINES	Mines Master Index File
ABANDONED MINES	Abandoned Mines
FINDS	Facility Index System/Facility Registry System
ECHO	Enforcement & Compliance History Information
DOCKET HWC	Hazardous Waste Compliance Docket Listing
UXO	Unexploded Ordnance Sites
FUELS PROGRAM	EPA Fuels Program Registered Listing
AIRS	Oregon Title V Facility Listing

EXECUTIVE SUMMARY

COAL ASH ..... Coal Ash Disposal Sites Listing
DRYCLEANERS ..... Drycleaning Facilities
Financial Assurance ..... Financial Assurance Information Listing
HSIS ..... Hazardous Substance Information Survey
MANIFEST ..... Manifest Information
NPDES ..... Wastewater Permits Database
UIC ..... Underground Injection Control Program Database

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ..... EDR Proprietary Manufactured Gas Plants
EDR Hist Cleaner ..... EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS ..... Recovered Government Archive State Hazardous Waste Facilities List
RGA LF ..... Recovered Government Archive Solid Waste Facilities List
RGA LUST ..... Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal RCRA generators list

RCRA-CESQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-CESQG list, as provided by EDR, and dated 09/13/2017 has revealed that there is 1 RCRA-CESQG site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
USDA FS MT HOOD NF H	***16400 CHAMPION WAY***	***ESE 0 - 1/8 (0.078 mi.)***	***2***	***8***

State- and tribal - equivalent CERCLIS

ECSI: The Environmental Cleanup Site Information System records information about sites in Oregon that may be of environmental interest. The data come from the Department of Environmental Quality.

A review of the ECSI list, as provided by EDR, and dated 10/01/2017 has revealed that there is 1 ECSI site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CASCADE CLEANERS	***36653 HWY 26***	***ESE 1/2 - 1 (0.518 mi.)***	***10***	***23***
Investigation: No Further Action				
State ID Number: 2756				

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Environmental Quality's LUST Database List.

A review of the LUST list, as provided by EDR, and dated 10/03/2017 has revealed that there are 2 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JIM TURIN & SONS INC	***36775 INDUSTRIAL WAY***	***ESE 1/4 - 1/2 (0.445 mi.)***	***9***	***20***
Facility ID: 03-94-0124				
Cleanup Complete: 10/18/2001				

Lower Elevation	Address	Direction / Distance	Map ID	Page
HEATING OIL TANK	35447 SE CRESCENT RD	NNW 1/4 - 1/2 (0.297 mi.)	8	20
Facility ID: 03-00-0014				
Cleanup Complete: 07/31/2000				

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Quality's UST List on Disk.

A review of the UST list, as provided by EDR, and dated 10/03/2017 has revealed that there are 2 UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SANDY AMPM	16355 CHAMPION WAY	E 0 - 1/8 (0.016 mi.)	1	8
Facility ID: 12424				
FM FUEL STOP #663 SA	16625 SE 362ND DR	SSE 1/8 - 1/4 (0.126 mi.)	A5	16
Facility ID: 12389				

AST: The Aboveground Storage Tank database contains registered ASTs. The data comes from the list of ASTs reported to the Office of State Fire Marshal.

A review of the AST list, as provided by EDR, and dated 09/05/2017 has revealed that there are 2 AST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FRED MEYER STORES IN Facility Id: 094538	***16625 362ND AVE***	***SSE 1/8 - 1/4 (0.126 mi.)***	***A4***	***11***
MAIDEN STUDIOS Facility Id: 000811	***16600 SE 362ND DR***	***ESE 1/8 - 1/4 (0.217 mi.)***	***7***	***18***

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 09/13/2017 has revealed that there is 1 RCRA NonGen / NLR site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
COLUMBIA SCREW MACHI	***16542 SE 362ND AVE***	***ESE 1/8 - 1/4 (0.194 mi.)***	***6***	***16***

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

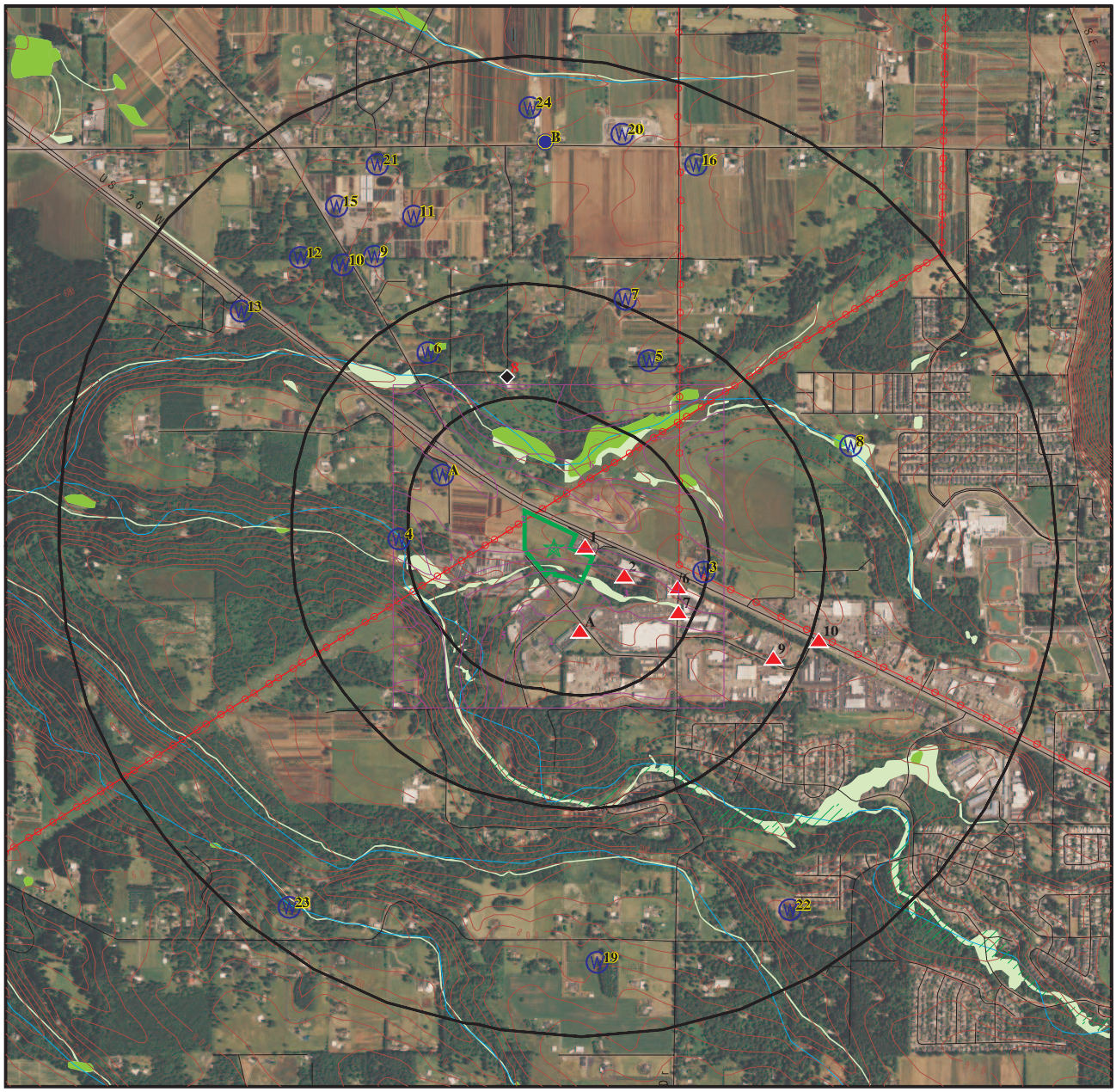
A review of the EDR Hist Auto list, as provided by EDR, has revealed that there is 1 EDR Hist Auto site within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
OUR DDDYS CSTOMS TRA	35900 INDUSTRIAL WAY	SSE 0 - 1/8 (0.107 mi.)	A3	10

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 5168641.2S

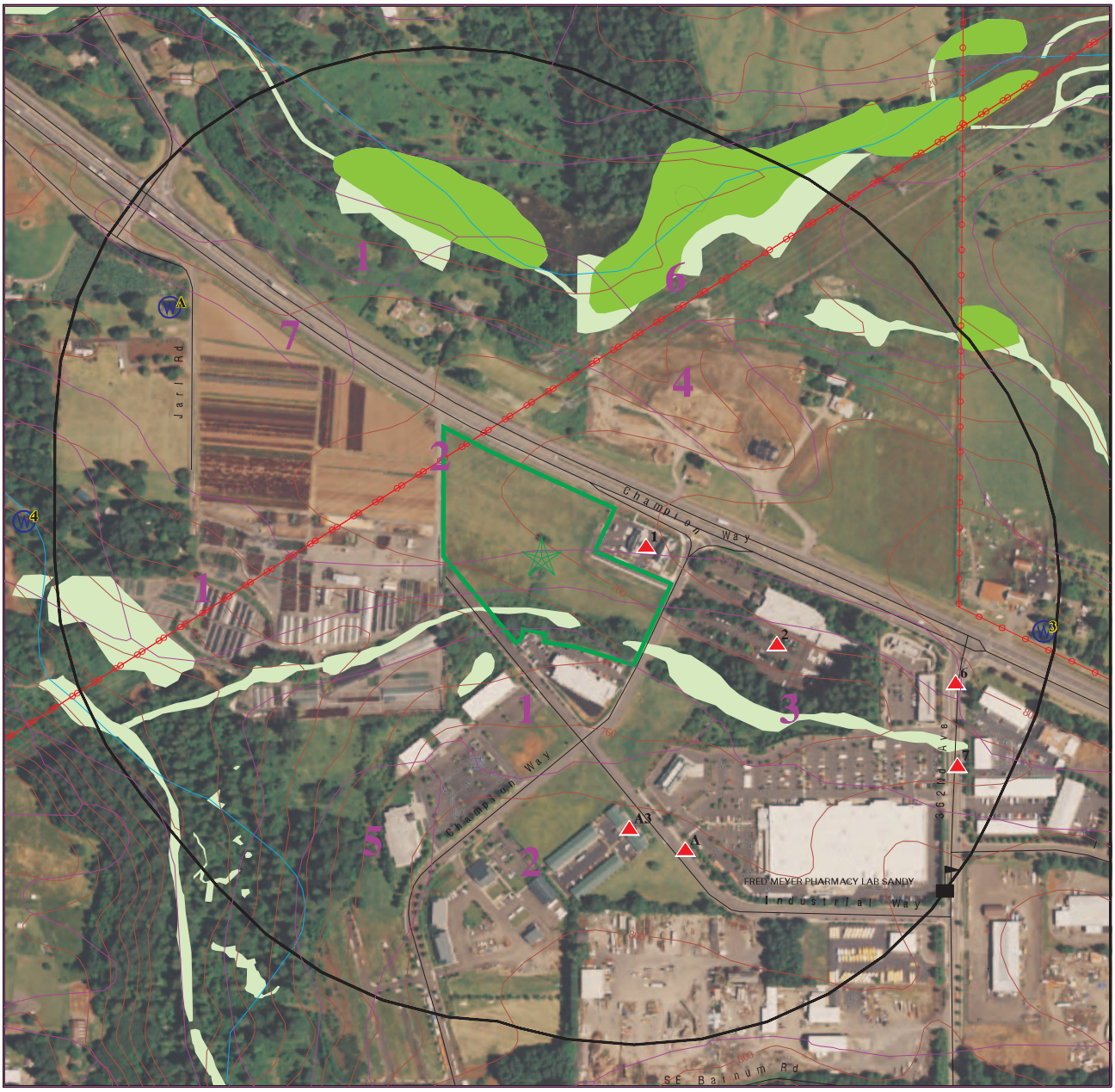


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Upgradient Area
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: HSC Sandy Lot ADDRESS: 16455 Champion Way Sandy OR 97055 LAT/LONG: 45.405593 / 122.296502	CLIENT: Blue Mountain Env. Cons. Inc. CONTACT: Chad Kauppi INQUIRY #: 5168641.2s DATE: January 26, 2018 6:48 am

DETAIL MAP - 5168641.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

0 1/16 1/8 1/4 Miles

- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: HSC Sandy Lot ADDRESS: 16455 Champion Way Sandy OR 97055 LAT/LONG: 45.405593 / 122.296502	CLIENT: Blue Mountain Env. Cons. Inc. CONTACT: Chad Kauppi INQUIRY #: 5168641.2s DATE: January 26, 2018 6:49 am

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	0.001		0	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		1	0	NR	NR	NR	1
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
CRL	1.000		0	0	0	0	NR	0
ECSI	1.000		0	0	0	1	NR	1
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	2	NR	NR	2
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
UST	0.250		1	1	NR	NR	NR	2
AST	0.250		0	2	NR	NR	NR	2
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS	0.500		0	0	0	NR	NR	0
INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
SWRCY	0.500		0	0	0	NR	NR	0
HIST LF	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
AOCONCERN	1.000		0	0	0	0	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	0.001		0	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
SPILLS	0.001		0	NR	NR	NR	NR	0
OR HAZMAT	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	1	NR	NR	NR	1
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	0.001		0	NR	NR	NR	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.001		0	NR	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
AIRS	0.001		0	NR	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HSIS	0.001		0	NR	NR	NR	NR	0
MANIFEST	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		1	NR	NR	NR	NR	1
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA HWS	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	3	4	2	1	0	10

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

MAP FINDINGS

1
East
< 1/8
0.016 mi.
87 ft.

SANDY AMPM
16355 CHAMPION WAY
SANDY, OR 97055

UST **U004190922**
N/A

Relative:
Higher

Actual:
777 ft.

UST:

Facility ID:	12424
Facility Telephone:	(360) 907-9504
Permittee Name:	Debbie (Store Manager)
Number of Permitted Tanks:	3
Active Tanks:	3
Decommissioned Tanks:	Not reported
Number of Tanks:	3

2
ESE
< 1/8
0.078 mi.
413 ft.

USDA FS MT HOOD NF HEADQUARTERS
16400 CHAMPION WAY
SANDY, OR 97055

RCRA-CESQG **1004771393**
FINDS **ORQ000007476**
ECHO

Relative:
Higher

Actual:
775 ft.

RCRA-CESQG:

Date form received by agency:	12/31/2003
Facility name:	USDA FS MT HOOD NF HEADQUARTERS
Facility address:	16400 CHAMPION WAY SANDY, OR 97055
EPA ID:	ORQ000007476
Contact:	MICHAEL HUMPHREY
Contact address:	16400 CHAMPION WAY SANDY, OR 97055
Contact country:	US
Contact telephone:	503-662-3191
Contact email:	Not reported
EPA Region:	10
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	USDA FS MT HOOD NF HEADQUARTERS
Owner/operator address:	16400 CHAMPION WAY SANDY, OR 97055
Owner/operator country:	US
Owner/operator telephone:	503-668-1700
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported

USDA FS MT HOOD NF HEADQUARTERS (Continued) **1004771393**

Legal status: Federal
Owner/Operator Type: Owner
Owner/Op start date: 10/23/1997
Owner/Op end date: Not reported

Owner/operator name: USDA FS MT HOOD NF HEADQUARTERS
Owner/operator address: 16400 CHAMPION WAY
SANDY, OR 97055
Owner/operator country: US
Owner/operator telephone: 503-668-1700
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Federal
Owner/Operator Type: Operator
Owner/Op start date: 12/31/2003
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: NA
. Waste name: NA

Historical Generators:
Date form received by agency: 01/13/2003
Site name: USDA FS MT HOOD NF HEADQUARTERS
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 01/28/2002
Site name: USDA FS MT HOOD NF HEADQUARTERS
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 01/26/2001
Site name: USDA FS MT HOOD NF HEADQUARTERS
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 03/06/2000
Site name: USDA FS MT HOOD NF HEADQUARTERS
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 03/02/1999

USDA FS MT HOOD NF HEADQUARTERS (Continued) **1004771393**

Site name: USDA FS MT HOOD NF HEADQUARTERS
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 02/06/1998
Site name: USDA FS MT HOOD NF HEADQUARTERS
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 10/23/1997
Site name: USDA FS MT HOOD NF HEADQUARTERS
Classification: Conditionally Exempt Small Quantity Generator

. Waste code: NONE
. Waste name: None

Violation Status: No violations found

FINDS:

Registry ID: 110004814345

Environmental Interest/Information System

OR-DEQ (Oregon - Department Of Environmental Quality) is a regulatory agency whose job is to protect the quality of Oregon's Environment. DEQ uses a combination of technical assistance, inspections and permitting to help public and private facilities and citizens understand and comply with state and federal environmental regulations.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1004771393
Registry ID: 110004814345
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110004814345

A3 **OUR DDDYS CSTOMS TRANSMISSIONS** **EDR Hist Auto** **1020803780**
SSE **35900 INDUSTRIAL WAY** **N/A**
< 1/8 **SANDY, OR 97055**
0.107 mi.
566 ft. **Site 1 of 3 in cluster A**

Relative:
Higher

EDR Hist Auto

Actual:
785 ft.

Year:	Name:	Type:
2009	D AND D AUTOMOTIVE & ELEC	Automotive Repair Shops, NEC
2010	MOUNT HOOD TRANSMISSIONS	Automotive Transmission Repair Shops
2011	MOUNT HOOD TRANSMISSIONS	Automotive Transmission Repair Shops
2011	OUR DDDYS CSTOMS TRANSMISSIONS	Automotive Transmission Repair Shops
2012	OUR DDDYS CSTOMS TRANSMISSIONS	Automotive Transmission Repair Shops

OUR DDDYS CSTOMS TRANSMISSIONS (Continued) **1020803780**

2012	MOUNT HOOD TRANSMISSIONS	Automotive Transmission Repair Shops
2013	OUR DDDYS CSTOMS TRANSMISSIONS	Automotive Transmission Repair Shops

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A4 **FRED MEYER STORES INC** **AST** **S110284698**
SSE **16625 362ND AVE** **OR HAZMAT** **N/A**
1/8-1/4 **SANDY, OR 97055** **HSIS**
0.126 mi. **NPDES**
663 ft. **Site 2 of 3 in cluster A**

Relative:
Higher

Actual:
786 ft.

AST:

Facility Id:	094538
Hazardous Substance:	PROPANE
Reporting Quantities:	1,000-4,999
Quantity Units:	GALLONS
Physical State:	GAS
Storage 1:	ABOVEGROUND TANK
Storage 2:	CYLINDER

HAZMAT:

Responsble Party:	Not reported
RP Company:	Not reported
RP Address:	Not reported
RP City,St,Zip:	Not reported
Facility ID:	1421343
OERS Number:	Not reported
Dept Rsp:	Not reported
Narrative:	Not reported
Property Loss:	Not reported
Amount Released:	Not reported
Service County:	Not reported
Service Name:	BORING FIRE DIST
Incident Type:	Not reported
Civilian Casualty Activity:	Not reported
Chemical Name:	Not reported
Hazmat Area Affected:	Not reported
Hazmat Area Evacuated:	Not reported
Hazmat Container Type:	Not reported
Hazmat Physical State Released:	Not reported
Hazmat Released Into:	Not reported
Hazmat Released Volume Units:	Not reported
Hazmat Released Weight Units:	Not reported
Hazmat Released From:	Not reported
Hazmat Area Affected Measurement:	Not reported
Hazmat No. of People Evacuated:	Not reported
Hazmat No of Buildings Evacuated:	Not reported
Incident Content Loss:	Not reported
Civilian Casualty Patient Disposition:	Not reported
Incident Mixed Use Property:	Not reported
Location Type:	Street address
Incident Aid Given Or Received:	Mutual aid given
Incident AID Received from FDID:	Not reported
Incident Aided Department FDID:	323
Person Involved Business Name:	Not reported
Person Involved First Name:	Not reported
Person Involved Last Name:	Not reported
Person Involved Type:	Not reported
Person Involved Phone Number:	Not reported

FRED MEYER STORES INC (Continued) **S110284698**

Person Involved Primary Language:	Not reported
Hazmat Evacuated Measurement:	Not reported
Hazmat Story of Release:	Not reported
Remark:	TITLE:New Narrative [CRLF]E14 responded with Sandy Fire to Sandy Fred Meyer store for a natural gas odor.[CRLF][CRLF]E14 used gas monitor to check for gas, None found[CRLF][CRLF]E14 clear
Incident District:	Not reported
Date Added:	Not reported
Unit:	Not reported
Agency Phone:	Not reported
Osfm Incident Report Number:	1421343
Dept. Responding:	Not reported
Person Making Report:	Not reported
Title:	Not reported
Agency:	Not reported
Phone:	Not reported
Date Of Incident:	12/28/2014
Call Time:	18:01
In Route:	Not reported
Arrival:	Not reported
Depart Scene:	Not reported
Back In Quarters:	Not reported
In Service:	Not reported
Dist Of Incident:	Not reported
Were State Resources Used?:	Not reported
Was Oers Notified?:	Not reported
Oers Number:	Not reported
Team Number:	Not reported
Agency Report Number:	Not reported
Unit:	Not reported
Highway:	Not reported
Mile Post:	Not reported
Scene Type:	Not reported
Area Type:	Not reported
Responsible Party(Ies):	Not reported
Company:	Not reported
Respcontact:	Not reported
Address:	Not reported
Resp City:	Not reported
Resp State:	Not reported
Resp ZipCode:	Not reported
Phone:	Not reported
Resp Phone2:	Not reported
Weather:	Not reported
Temperature:	Not reported
Wind Speed:	Not reported
Wind Direction:	Not reported
Were Haz Materials Released?:	Not reported
Operation Performed:	Not reported
Cause:	Not reported
Vehicle And Cargo:	Not reported
Fixed Property:	Not reported
Total Loss:	Not reported
Hazmat Population Density:	Not reported
HazMat Actions Taken - Description:	Not reported
Hazmat Factors Contributing To Release:	Not reported
Hazmat DOT Hazard Classification:	Not reported

FRED MEYER STORES INC (Continued) **S110284698**

Hazmat CAS Number: Not reported
Hazardous Materials Release: Not reported
Fire Incident Type: Gas leak (natural gas or LPG)
Property Use: General retail, other
Latitude: Not reported
Longitude: Not reported
Hazmat Disposition: Not reported

HSIS:
Facility Id: 094538
Chemical Is Extremely Hazardous Substance (EHS): No
Department Or Division Of Company: SANDY - 663
Facility Has Written Emergency Plan: Yes
Contains 112R: No
NAICS Code 1: 445110
NAICS Desc 1: SUPERMARKETS & OTHER GROCERY (EXC CONVENIE
NAICS Code 2: 447190
NAICS Desc 2: OTHER GASOLINE STATIONS
Manager Name: JOE GRIESHABER
Business Phone: 5036682300
Mailing Address: PO BOX 42121
Mailing City,St,Zip: PORTLAND, OR 97242
No. of Employees: 299
Day Phone: 5036682300
Placard: Not reported
Fire Dept Code: 0323
Sprinkler System: Not reported
Emergency Contact: GARY RUTZ
Emergency Procedure: CUSTOMER SERVICE DESK - INTRANET
Business Type: GROCERY & DEPT STORE

Facility:
Facility Id: 094538
Physical State Of The Substance: 3
Physical State: GAS
Average Amount Possessed During The Year Code: 11
Maximum Amount Possessed During The Year Code: 20
Applicable Unit Of Measure Code: 3
Description Of The Unit Of Measure: CUBIC FEET
Type Code: L
Description: CYLINDER
Type Code: Not reported
Temperature Description: Not reported
Pressure of Code: 2
Pressure Description: GREATER THAN NORMAL PRESSURE
Pressure of Code: Not reported
Pressure Description: Not reported
Temperature Description: NORMAL TEMPERATURE
Temperature of The Hazardous Substance Code: 4
Temperature Description: Not reported
Temperature of The Hazardous Substance Code: Not reported
Days Hazardous Substance On Site During Year: 365
Is The Substance Protected A Trade Secret: False
Description Of The Max Qnty Code: 1,000-4,999
Description Of The Avg Qnty Code: 500-999
Most Hazardous Ingridient: HELIUM
United Nations/north America 4 Digit Class Number: 1046

FRED MEYER STORES INC (Continued) **S110284698**

Hazard Rank:	2
EHS Ingredient:	NONE LISTED ON MSDS
Substance Pure:	True
Substance Mix:	False
First Hazardous Class Code For Chemical:	Non-flammable Gas
Second Hazardous Class Code For Chemical:	Not reported
Third Hazardous Class Code For Chemical:	Not reported
Hazard Class 1 Of The Chemical:	2.2
Hazard Class 2 Of The Chemical:	Not reported
Hazard Class 3 Of The Chemical:	Not reported

Chemical:

United Nations/north America 4 Digit Class Number:	1046
Chemical Abstract Service Identifier Number:	7440597
Chemical Is Extremely Hazardous Substance (EHS):	No
First Hazardous Class Code For Chemical:	Non-flammable Gas
Second Hazardous Class Code For Chemical:	Not reported
Third Hazardous Class Code For Chemical:	Not reported
Hazard Class 1 Of The Chemical:	2.2
Hazard Class 2 Of The Chemical:	Not reported
Hazard Class 3 Of The Chemical:	Not reported
Chemical Is A Toxic 313 Chemical:	No
EPA Pesticide Registration Number:	Not reported
Contains 112R:	No
Contains EHS:	No
Fertilizer:	No
Pesticide:	No
Contains 313:	No

Facility Id:	094538
Physical State Of The Substance:	3
Physical State:	GAS
Average Amount Possessed During The Year Code:	20
Maximum Amount Possessed During The Year Code:	20
Applicable Unit Of Measure Code:	2
Description Of The Unit Of Measure:	GALLONS
Type Code:	A
Description:	ABOVEGROUND TANK
Type Code:	L
Temperature Description:	CYLINDER
Pressure of Code:	2
Pressure Description:	GREATER THAN NORMAL PRESSURE
Pressure of Code:	2
Pressure Description:	GREATER THAN NORMAL PRESSURE
Temperature Description:	NORMAL TEMPERATURE
Temperature of The Hazardous Substance Code:	4
Temperature Description:	NORMAL TEMPERATURE
Temperature of The Hazardous Substance Code:	4
Days Hazardous Substance On Site During Year:	365
Is The Substance Protected A Trade Secret:	False
Description Of The Max Qnty Code:	1,000-4,999
Description Of The Avg Qnty Code:	1,000-4,999
Most Hazardous Ingridient:	PROPANE
United Nations/north America 4 Digit Class Number:	1075
Hazard Rank:	2
EHS Ingredient:	NONE LISTED ON SDS
Substance Pure:	True

FRED MEYER STORES INC (Continued) **S110284698**

Substance Mix:	False
First Hazardous Class Code For Chemical:	Flammable Gas
Second Hazardous Class Code For Chemical:	Acute Health Hazard
Third Hazardous Class Code For Chemical:	Not reported
Hazard Class 1 Of The Chemical:	2.1
Hazard Class 2 Of The Chemical:	6.3
Hazard Class 3 Of The Chemical:	Not reported

Chemical:

United Nations/north America 4 Digit Class Number:	1075
Chemical Abstract Service Identifier Number:	74986
Chemical Is Extremely Hazardous Substance (EHS):	No
First Hazardous Class Code For Chemical:	Flammable Gas
Second Hazardous Class Code For Chemical:	Acute Health Hazard
Third Hazardous Class Code For Chemical:	Not reported
Hazard Class 1 Of The Chemical:	2.1
Hazard Class 2 Of The Chemical:	6.3
Hazard Class 3 Of The Chemical:	Not reported
Chemical Is A Toxic 313 Chemical:	No
EPA Pesticide Registration Number:	Not reported
Contains 112R:	No
Contains EHS:	No
Fertilizer:	No
Pesticide:	No
Contains 313:	No

NPDES:

WQ File Nbr:	120086
Legal Name:	THE KROGER COMPANY
Region:	Not reported
Pri SIC:	1623
Facility Type:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Category:	Not reported
Permit Type:	GEN12C
Permit Active:	Not reported
Is Active?:	FALSE
Permit Description:	Not reported
Expiration Date:	Not reported
EPA Number:	Not reported
UIC Facility:	Not reported
Admin Agent:	Not reported
Last Action Date:	Not reported
Permit Writer:	Not reported
Compliance Inspector:	Not reported
DMR Reviewer:	Not reported
Application Number:	Not reported
Class:	Not reported
Start Date:	Not reported
Region Decode:	Not reported

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
A5 SSE 1/8-1/4 0.126 mi. 663 ft.	**FM FUEL STOP #663 SANDY 16625 SE 362ND DR SANDY, OR 97055**	**UST**	**U004155783 N/A**

Site 3 of 3 in cluster A

Relative:
Higher

Actual:
786 ft.

UST:

Facility ID:	12389
Facility Telephone:	(503) 797-3512
Permittee Name:	DANIEL HERMANN
Number of Permitted Tanks:	3
Active Tanks:	3
Decommissioned Tanks:	Not reported
Number of Tanks:	3

---

6 ESE 1/8-1/4 0.194 mi. 1025 ft.	**COLUMBIA SCREW MACHINE INC 16542 SE 362ND AVE SANDY, OR 97055**	**RCRA NonGen / NLR FINDS ECHO**	**1004771702 ORQ000013060**

Relative:
Higher

Actual:
793 ft.

RCRA NonGen / NLR:

Date form received by agency:	04/16/2001
Facility name:	COLUMBIA SCREW MACHINE INC
Facility address:	16542 SE 362ND AVE SANDY, OR 97055
EPA ID:	ORQ000013060
Mailing address:	37470 RUBEN LANE SANDY, OR 97055
Contact:	PAMELA M TRAFTON
Contact address:	16542 SE 362ND AVE SANDY, OR 97055
Contact country:	US
Contact telephone:	503-668-7216
Contact email:	SETUPMAN@WORLDNET.ATT.NET
EPA Region:	10
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	DANIEL S TRAFTON
Owner/operator address:	1241 SW 4TH ST GRESHAM, OR 97080
Owner/operator country:	US
Owner/operator telephone:	503-669-1971
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	04/16/2001
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No

COLUMBIA SCREW MACHINE INC (Continued) **1004771702**

Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency: 05/15/2000
Site name: COLUMBIA SCREW MACHINE INC
Classification: Not a generator, verified

Date form received by agency: 10/06/1999
Site name: COLUMBIA SCREW MACHINE INC
Classification: Not a generator, verified

. Waste code: NONE
. Waste name: None

Violation Status: No violations found

FINDS:

Registry ID: 110004818840

Environmental Interest/Information System

OR-DEQ (Oregon - Department Of Environmental Quality) is a regulatory agency whose job is to protect the quality of Oregon's Environment. DEQ uses a combination of technical assistance, inspections and permitting to help public and private facilities and citizens understand and comply with state and federal environmental regulations.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid: 1004771702
Registry ID: 110004818840
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110004818840

7
ESE
1/8-1/4
0.217 mi.
1145 ft.

MAIDEN STUDIOS
16600 SE 362ND DR
SANDY, OR 97055

AST **S111251857**
HSIS **N/A**

Relative:
Higher

Actual:
773 ft.

AST:

Facility Id:	000811
Hazardous Substance:	PROPANE
Reporting Quantities:	500-999
Quantity Units:	GALLONS
Physical State:	GAS
Storage 1:	ABOVEGROUND TANK

HSIS:

Facility Id:	000811
Chemical Is Extremely Hazardous Substance (EHS):	No
Department Or Division Of Company:	DBA MAIDEN BRONZE
Facility Has Written Emergency Plan:	Yes
Contains 112R:	No
NAICS Code 1:	423220
NAICS Desc 1:	HOME FURNISHING WHSLE
NAICS Code 2:	000000
NAICS Desc 2:	Not reported
Manager Name:	MICHAEL MAIDEN
Business Phone:	5036688097
Mailing Address:	16600 SE 362ND DR
Mailing City,St,Zip:	SANDY, OR 97055
No. of Employees:	21
Day Phone:	5036688097
Placard:	Yes
Fire Dept Code:	0323
Sprinkler System:	No
Emergency Contact:	MIKE MAIDEN
Emergency Procedure:	LUNCHROOM
Business Type:	FINE ART FOUNDRY

Facility:

Facility Id:	000811
Physical State Of The Substance:	3
Physical State:	GAS
Average Amount Possessed During The Year Code:	10
Maximum Amount Possessed During The Year Code:	11
Applicable Unit Of Measure Code:	2
Description Of The Unit Of Measure:	GALLONS
Type Code:	A
Description:	ABOVEGROUND TANK
Type Code:	Not reported
Temperature Description:	Not reported
Pressure of Code:	1
Pressure Description:	NORMAL PRESSURE
Pressure of Code:	Not reported
Pressure Description:	Not reported
Temperature Description:	NORMAL TEMPERATURE
Temperature of The Hazardous Substance Code:	4
Temperature Description:	Not reported
Temperature of The Hazardous Substance Code:	Not reported
Days Hazardous Substance On Site During Year:	365
Is The Substance Protected A Trade Secret:	False

MAIDEN STUDIOS (Continued) **S111251857**

Description Of The Max Qnty Code:	500-999
Description Of The Avg Qnty Code:	200-499
Most Hazardous Ingridient:	PROPANE
United Nations/north America 4 Digit Class Number:	1075
Hazard Rank:	2
EHS Ingredient:	NONE LISTED ON SDS
Substance Pure:	True
Substance Mix:	False
First Hazardous Class Code For Chemical:	Flammable Gas
Second Hazardous Class Code For Chemical:	Acute Health Hazard
Third Hazardous Class Code For Chemical:	Not reported
Hazard Class 1 Of The Chemical:	2.1
Hazard Class 2 Of The Chemical:	6.3
Hazard Class 3 Of The Chemical:	Not reported

Chemical:

United Nations/north America 4 Digit Class Number:	1075
Chemical Abstract Service Identifier Number:	74986
Chemical Is Extremely Hazardous Substance (EHS):	No
First Hazardous Class Code For Chemical:	Flammable Gas
Second Hazardous Class Code For Chemical:	Acute Health Hazard
Third Hazardous Class Code For Chemical:	Not reported
Hazard Class 1 Of The Chemical:	2.1
Hazard Class 2 Of The Chemical:	6.3
Hazard Class 3 Of The Chemical:	Not reported
Chemical Is A Toxic 313 Chemical:	No
EPA Pesticide Registration Number:	Not reported
Contains 112R:	No
Contains EHS:	No
Fertilizer:	No
Pesticide:	No
Contains 313:	No

Facility Id:	000811
Physical State Of The Substance:	1
Physical State:	SOLID
Average Amount Possessed During The Year Code:	10
Maximum Amount Possessed During The Year Code:	20
Applicable Unit Of Measure Code:	1
Description Of The Unit Of Measure:	POUNDS
Type Code:	K
Description:	BOX
Type Code:	Not reported
Temperature Description:	Not reported
Pressure of Code:	1
Pressure Description:	NORMAL PRESSURE
Pressure of Code:	Not reported
Pressure Description:	Not reported
Temperature Description:	NORMAL TEMPERATURE
Temperature of The Hazardous Substance Code:	4
Temperature Description:	Not reported
Temperature of The Hazardous Substance Code:	Not reported
Days Hazardous Substance On Site During Year:	365
Is The Substance Protected A Trade Secret:	False
Description Of The Max Qnty Code:	1,000-4,999
Description Of The Avg Qnty Code:	200-499
Most Hazardous Ingridient:	COPPER

MAIDEN STUDIOS (Continued) **S111251857**

United Nations/north America 4 Digit Class Number: Not reported
Hazard Rank: 2
EHS Ingredient: Not reported
Substance Pure: False
Substance Mix: True
First Hazardous Class Code For Chemical: Miscellaneous Hazardous Material
Second Hazardous Class Code For Chemical: Not reported
Third Hazardous Class Code For Chemical: Not reported
Hazard Class 1 Of The Chemical: 9.0
Hazard Class 2 Of The Chemical: Not reported
Hazard Class 3 Of The Chemical: Not reported

Chemical:
United Nations/north America 4 Digit Class Number: Not reported
Chemical Abstract Service Identifier Number: 7440508
Chemical Is Extremely Hazardous Substance (EHS): Not reported
First Hazardous Class Code For Chemical: Miscellaneous Hazardous Material
Second Hazardous Class Code For Chemical: Not reported
Third Hazardous Class Code For Chemical: Not reported
Hazard Class 1 Of The Chemical: 9.0
Hazard Class 2 Of The Chemical: Not reported
Hazard Class 3 Of The Chemical: Not reported
Chemical Is A Toxic 313 Chemical: No
EPA Pesticide Registration Number: Not reported
Contains 112R: Not reported
Contains EHS: Not reported
Fertilizer: Not reported
Pesticide: Not reported
Contains 313: Yes

8
NNW
1/4-1/2
0.297 mi.
1567 ft.

HEATING OIL TANK **LUST** **S104304187**
35447 SE CRESCENT RD **N/A**
BORING, OR 97009

Relative:
Lower

Actual:
707 ft.

LUST:
Region: North Western Region
Facility ID: 03-00-0014
Cleanup Received Date: 01/06/2000
Cleanup Start Date: 12/02/1999
Cleanup Complete Date: 07/31/2000
Decode for Region: North West Region

9
ESE
1/4-1/2
0.445 mi.
2349 ft.

JIM TURIN & SONS INC **LUST** **U000430902**
36775 INDUSTRIAL WAY **UST** **N/A**
SANDY, OR 97055 **AST**
HSIS

Relative:
Higher

Actual:
822 ft.

LUST:
Region: North Western Region
Facility ID: 03-94-0124
Cleanup Received Date: 02/17/1994
Cleanup Start Date: 08/25/1994

JIM TURIN & SONS INC (Continued) **U000430902**

Cleanup Complete Date: 10/18/2001
Decode for Region: North West Region

UST:
Facility ID: 3664
Facility Telephone: (503)668-5237
Permittee Name: JAMES C TURIN, PRESIDENT
Number of Permitted Tanks: Not reported
Active Tanks: Not reported
Decommissioned Tanks: 4
Number of Tanks: 4

AST:
Facility Id: 011420
Hazardous Substance: GASOLINE
Reporting Quantities: 1,000-4,999
Quantity Units: GALLONS
Physical State: LIQUID
Storage 1: ABOVEGROUND TANK

Facility Id: 011420
Hazardous Substance: DIESEL OIL
Reporting Quantities: 5,000-9,999
Quantity Units: GALLONS
Physical State: LIQUID
Storage 1: ABOVEGROUND TANK

HSIS:
Facility Id: 011420
Chemical Is Extremely Hazardous Substance (EHS): No
Department Or Division Of Company: Not reported
Facility Has Written Emergency Plan: No
Contains 112R: No
NAICS Code 1: 237310
NAICS Desc 1: HIGHWAY, STREET, & BRIDGE CONST
NAICS Code 2: 000000
NAICS Desc 2: Not reported
Manager Name: JAMES TURIN
Business Phone: 5036685237
Mailing Address: PO BOX 175
Mailing City,St,Zip: WELCHES, OR 97067
No. of Employees: 9
Day Phone: 5036685237
Placard: Yes
Fire Dept Code: 0323
Sprinkler System: No
Emergency Contact: DOUG TURIN
Emergency Procedure: Not reported
Business Type: ASPHALTIC PAVING COMPANY

Facility:
Facility Id: 011420
Physical State Of The Substance: 2
Physical State: LIQUID
Average Amount Possessed During The Year Code: 21
Maximum Amount Possessed During The Year Code: 21

JIM TURIN & SONS INC (Continued) **U000430902**

Applicable Unit Of Measure Code:	2
Description Of The Unit Of Measure:	GALLONS
Type Code:	A
Description:	ABOVEGROUND TANK
Type Code:	Not reported
Temperature Description:	Not reported
Pressure of Code:	1
Pressure Description:	NORMAL PRESSURE
Pressure of Code:	Not reported
Pressure Description:	Not reported
Temperature Description:	NORMAL TEMPERATURE
Temperature of The Hazardous Substance Code:	4
Temperature Description:	Not reported
Temperature of The Hazardous Substance Code:	Not reported
Days Hazardous Substance On Site During Year:	365
Is The Substance Protected A Trade Secret:	False
Description Of The Max Qnty Code:	5,000-9,999
Description Of The Avg Qnty Code:	5,000-9,999
Most Hazardous Ingridient:	PETROLEUM HYDROCARBONS
United Nations/north America 4 Digit Class Number:	1993
Hazard Rank:	2
EHS Ingredient:	NONE LISTED ON MSDS
Substance Pure:	False
Substance Mix:	True
First Hazardous Class Code For Chemical:	Flammable and Combustible Liquid
Second Hazardous Class Code For Chemical:	Not reported
Third Hazardous Class Code For Chemical:	Not reported
Hazard Class 1 Of The Chemical:	3.0
Hazard Class 2 Of The Chemical:	Not reported
Hazard Class 3 Of The Chemical:	Not reported

Chemical:

United Nations/north America 4 Digit Class Number:	1993
Chemical Abstract Service Identifier Number:	68334305
Chemical Is Extremely Hazardous Substance (EHS):	No
First Hazardous Class Code For Chemical:	Flammable and Combustible Liquid
Second Hazardous Class Code For Chemical:	Not reported
Third Hazardous Class Code For Chemical:	Not reported
Hazard Class 1 Of The Chemical:	3.0
Hazard Class 2 Of The Chemical:	Not reported
Hazard Class 3 Of The Chemical:	Not reported
Chemical Is A Toxic 313 Chemical:	Not reported
EPA Pesticide Registration Number:	Not reported
Contains 112R:	Not reported
Contains EHS:	No
Fertilizer:	Not reported
Pesticide:	Not reported
Contains 313:	Not reported

Facility Id:	011420
Physical State Of The Substance:	2
Physical State:	LIQUID
Average Amount Possessed During The Year Code:	20
Maximum Amount Possessed During The Year Code:	20
Applicable Unit Of Measure Code:	2
Description Of The Unit Of Measure:	GALLONS
Type Code:	A

JIM TURIN & SONS INC (Continued) **U000430902**

Description:	ABOVEGROUND TANK
Type Code:	Not reported
Temperature Description:	Not reported
Pressure of Code:	1
Pressure Description:	NORMAL PRESSURE
Pressure of Code:	Not reported
Pressure Description:	Not reported
Temperature Description:	NORMAL TEMPERATURE
Temperature of The Hazardous Substance Code:	4
Temperature Description:	Not reported
Temperature of The Hazardous Substance Code:	Not reported
Days Hazardous Substance On Site During Year:	365
Is The Substance Protected A Trade Secret:	False
Description Of The Max Qnty Code:	1,000-4,999
Description Of The Avg Qnty Code:	1,000-4,999
Most Hazardous Ingridient:	PETROLEUM DISTILLATES
United Nations/north America 4 Digit Class Number:	1203
Hazard Rank:	2
EHS Ingredient:	NONE LISTED ON MSDS
Substance Pure:	False
Substance Mix:	True
First Hazardous Class Code For Chemical:	Flammable and Combustible Liquid
Second Hazardous Class Code For Chemical:	Acute Health Hazard
Third Hazardous Class Code For Chemical:	Chronic Health Hazard
Hazard Class 1 Of The Chemical:	3.0
Hazard Class 2 Of The Chemical:	6.3
Hazard Class 3 Of The Chemical:	6.4

Chemical:

United Nations/north America 4 Digit Class Number:	1203
Chemical Abstract Service Identifier Number:	8006619
Chemical Is Extremely Hazardous Substance (EHS):	No
First Hazardous Class Code For Chemical:	Flammable and Combustible Liquid
Second Hazardous Class Code For Chemical:	Acute Health Hazard
Third Hazardous Class Code For Chemical:	Chronic Health Hazard
Hazard Class 1 Of The Chemical:	3.0
Hazard Class 2 Of The Chemical:	6.3
Hazard Class 3 Of The Chemical:	6.4
Chemical Is A Toxic 313 Chemical:	No
EPA Pesticide Registration Number:	Not reported
Contains 112R:	Yes
Contains EHS:	No
Fertilizer:	No
Pesticide:	No
Contains 313:	Yes

10
ESE
1/2-1
0.518 mi.
2737 ft.

CASCADE CLEANERS **ECSI** **S105614408**
36653 HWY 26 **VCP** **N/A**
SANDY, OR 97055 **DRYCLEANERS**

Relative:
Higher

Actual:
827 ft.

ECSI:

State ID Number:	2756
Brown ID:	0
Study Area:	False

CASCADE CLEANERS (Continued) **S105614408**

Region ID:	2
Legislatve ID:	831
Investigation:	No Further Action
FACA ID:	3319
Further Action:	0
Lat/Long (dms):	45 24 9.72 / -122 17 .24
County Code:	3.00
Score Value:	Not reported
Cerclis ID:	Not reported
Township Coord.:	2.00
Township Zone:	S
Range Coord:	4.00
Range Zone:	E
Section Coord:	14
Qtr Section:	Not reported
Tax Lots:	Not reported
Size:	Not reported
NPL:	False
Orphan:	False
Updated By:	GWISTAR
Update Date:	10/19/2006
Created Date:	11/17/2000
Decode For RegionID:	Northwest Region
Decode For BrownID:	Not reported
Decode For Furtheract:	Not reported
Decode For Investstat:	No Further Action
Decode For Legislative:	Owner, operator or other party under agreement, order or consent decree under ORS 465.200 or 465.420

Alias Name: Sandy Marketplace

Hazardous Release:

Substance ID.:	121011
Haz Release ID:	378876
Qty Released:	Not reported
Date Released:	Not reported
Update Date:	11/17/2000
Update By:	Not reported
Substance Code:	127-18-4
Substance Name:	TETRACHLOROETHYLENE
Substance Abbrev.:	Not reported
Substance Category ID:	8519
Substance Category:	Volatiles
Category Level:	Not reported
Created By:	Not reported
Created Date:	12/17/2002
Substance Category ID:	8551
Substance Category:	Solvents of interest to Milwaukie Area GW study
Category Level:	Not reported
Created By:	Not reported
Created Date:	12/17/2002
Substance Category ID:	8519
Substance Category:	Volatiles
Category Level:	Not reported
Created By:	Not reported
Created Date:	12/17/2002
Substance Category ID:	8551
Substance Category:	Solvents of interest to Milwaukie Area GW study
Category Level:	Not reported

CASCADE CLEANERS (Continued) **S105614408**

Created By: Not reported
Created Date: 12/17/2002
Substance Alias ID: 316912
Sub Alias Name: ETHENE,TETRACHLORO-
Substance Alias ID: 316913
Sub Alias Name: ETHYLENE TETRACHLORIDE
Substance Alias ID: 316914
Sub Alias Name: PERCHLOROETHYLENE
Substance Alias ID: 316915
Sub Alias Name: PERCLENE
Substance Alias ID: 316916
Sub Alias Name: TETRACHLOROETHENE
Substance Alias ID: 316917
Sub Alias Name: TETRACHLOROETHENE,1,1,2,2-
Substance Alias ID: 316918
Sub Alias Name: TETRACHLOROETHYLENE,1,1,2,2-
Sampling Result ID: 338162
Feature Id: Not reported
Hazard Release Id: 378876
Medium: 703
Substance Abbrev.: Not reported
Unit Code: Not reported
Observation: False
Owner Operator: False
Lab Data: True
Sample Depth: Not reported
Start Date: 04/23/1998
End Date: Not reported
Min Concentration: Not reported
Max Concentration: Not reported
Sample Comment: 0.128 mg/kg
Last Update By: jmw
Update Date: 11/17/2000
Decode for MediumID: Soil
Sampling Result ID: 338163
Feature Id: Not reported
Hazard Release Id: 378876
Medium: 698
Substance Abbrev.: Not reported
Unit Code: Not reported
Observation: False
Owner Operator: False
Lab Data: True
Sample Depth: Not reported
Start Date: 10/05/1998
End Date: Not reported
Min Concentration: Not reported
Max Concentration: Not reported
Sample Comment: 3.1 ug/L
Last Update By: jmw
Update Date: 11/17/2000
Decode for MediumID: Groundwater

Substance ID.: 121124
Haz Release ID: 378877
Qty Released: Not reported
Date Released: Not reported

CASCADE CLEANERS (Continued) **S105614408**

Update Date: 11/17/2000
Update By: Not reported
Substance Code: 156-59-2
Substance Name: DICHLOROETHYLENE,1,2-CIS-
Substance Abbrev.: Not reported
Substance Category ID: 8513
Substance Category: Volatiles
Category Level: Not reported
Created By: Not reported
Created Date: 12/17/2002
Substance Category ID: 8513
Substance Category: Volatiles
Category Level: Not reported
Created By: Not reported
Created Date: 12/17/2002
Substance Alias ID: 317200
Sub Alias Name: ACETYLENE DICHLORIDE,CIS-
Substance Alias ID: 317201
Sub Alias Name: DICHLOROETHENE,CIS-
Substance Alias ID: 317202
Sub Alias Name: DICHLOROETHYLENE,CIS-
Substance Alias ID: 317203
Sub Alias Name: DICHLOROETHENE,1,2-CIS-
Sampling Result ID: 338164
Feature Id: Not reported
Hazard Release Id: 378877
Medium: 703
Substance Abbrev.: Not reported
Unit Code: Not reported
Observation: False
Owner Operator: False
Lab Data: True
Sample Depth: Not reported
Start Date: 04/23/1998
End Date: Not reported
Min Concentration: Not reported
Max Concentration: Not reported
Sample Comment: 0.29 mg/kg
Last Update By: jmw
Update Date: 11/17/2000
Decode for MediumID: Soil

Narrative:
NARR ID: 5740383
NARR Code: Contamination
Created By: Not reported
Created Date: 12/17/2002
Updated By: Not reported
Updated Date: 12/17/2002
Decode for NarcdID: Contamination
NARR Comments: (11/15/00 TER/VCP) Contamination from dry-cleaning operations.

NARR ID: 5740384
NARR Code: Hazardous Substance/Waste Types
Created By: Not reported
Created Date: 12/17/2002
Updated By: GWISTAR
Updated Date: 09/21/2005

CASCADE CLEANERS (Continued) **S105614408**

Decode for NarcdID: Hazardous Substance/Waste Types
NARR Comments: Perchloroethylene (PCE) - dry cleaning solvent.

NARR ID: 5740385
NARR Code: Manner of Release
Created By: Not reported
Created Date: 12/17/2002
Updated By: Not reported
Updated Date: 12/17/2002
Decode for NarcdID: Manner of Release
NARR Comments: Discharge of wastewater containing PCE to the floor drain after the facility began operations in 1986.

NARR ID: 5747242
NARR Code: Project Activity Status
Created By: GWISTAR
Created Date: 09/21/2005
Updated By: GWISTAR
Updated Date: 09/21/2005
Decode for NarcdID: Project Activity Status
NARR Comments: PROJECT FILE ARCHIVED, BOX #272839196

NARR ID: 5740386
NARR Code: Pathways Other Hazards
Created By: Not reported
Created Date: 12/17/2002
Updated By: Not reported
Updated Date: 12/17/2002
Decode for NarcdID: Pathways & Other Hazards
NARR Comments: Migration through soil or groundwater to indoor or outdoor air. Potential groundwater migration.

NARR ID: 5740387
NARR Code: Remedial Action
Created By: Not reported
Created Date: 12/17/2002
Updated By: Not reported
Updated Date: 12/17/2002
Decode for NarcdID: Remedial Action
NARR Comments: (11/20/00 TER/VCP) Phase I and Phase II site investigations were conducted in 1998. Additional groundwater grab sampling was conducted in March and April 2000. PCE was detected in some soil and groundwater samples, but below risk-based levels or MCLs, and the extent of contamination was very limited. Gasoline constituents such as toluene and naphthalene were also detected in groundwater, but were below risk-based concentrations and not likely related to the dry-cleaning facility. No further action is needed at this site.

Administrative Action:
Action ID: 9511
Region: Northwestern Region
Complete Date: 11/15/2000
Rank Value: 0
Cleanup Flag: False
Created Date: 12/17/2002
Decode for AgencyID: Department of Environmental Quality
Decode for RegionID: Northwest Region
Category: Remedial Action

CASCADE CLEANERS (Continued) **S105614408**

Action Code Flag: False
Action: SITE INVESTIGATION
Further Action: Not reported
Comments: Not reported

Action ID: 9424
Region: Northwestern Region
Complete Date: 11/16/2000
Rank Value: 0
Cleanup Flag: False
Created Date: 12/17/2002
Decode for AgencyID: Department of Environmental Quality
Decode for RegionID: Northwest Region
Category: Administrative Action
Action Code Flag: False
Action: Site added to database
Further Action: Not reported
Comments: Not reported

Action ID: 9435
Region: Northwestern Region
Complete Date: 11/20/2000
Rank Value: 0
Cleanup Flag: False
Created Date: 12/17/2002
Decode for AgencyID: Department of Environmental Quality
Decode for RegionID: Northwest Region
Category: Remedial Action
Action Code Flag: False
Action: Independent Cleanup Program
Further Action: Not reported
Comments: Not reported

Action ID: 9443
Region: Northwestern Region
Complete Date: 11/20/2000
Rank Value: 0
Cleanup Flag: False
Created Date: 12/17/2002
Decode for AgencyID: Department of Environmental Quality
Decode for RegionID: Northwest Region
Category: Remedial Action
Action Code Flag: False
Action: NO FURTHER STATE ACTION REQUIRED
Further Action: 0
Comments: Not reported

Operations:
Operation Id: 133949
Operation Status: Active
Common Name: Cascade Dry Cleaner Facility
Yrs of Operation: 1986 - present
Comments: Dry cleaning facility located in a retail shopping plaza.
Updated Date: 11/17/2000
Updated By: jmw
Decode for OpstatID: Active
Operations SIC Id: 197245
SIC Code: 7210

CASCADE CLEANERS (Continued) **S105614408**

Created By: Not reported
Created Date: 12/17/2002

VCS:
ECS Site ID: 2756
Facility Size: Not reported
Action: No Further State Action Required
Start Date: 11/20/2000
End Date: 11/20/2000
Facility Status: Completed
Program: ICP
Latitude: 45.4027
Longitude: -122.2834

DRYCLEANERS:
Dry Cleaner ID: 138
Current Status: Closed
Last Update: Not reported
DEQID: ORD987199908
Latitude: 45.403623607
Longitude: -122.28534291
Decode for Fstatus: Closed
Mail Name: Cascade Cleaners
Mail Address: 4450 NE 131st PL
Mail City: Portland
Mail State: OR
Mail ZIP: 97230-1425
Mail Email Address: Not reported
Mail Effective Date: 03/21/2005
Mail Last Updated: 03/21/2005
Owner ID: 7821
Own Name: Ken & Donna Giusto
Own Organization: Cascade Cleaners
Own Address: 11555 SE Orient Dr
Own City: Boring
Own State: OR
Own ZIP: 97009
Own Phone: Not reported
Own Email Address: Not reported
Owner Effective Date: 01/01/2000
Owner Last Updated: 04/18/2001
Property Owner ID: 3205
Property Owner Name: Not reported
Property Owner Organization: Pan Pacific Properties, Inc
Property Owner Address: 13635 NW Cornell Rd Ste 160
Property Owner City: Portland
Property Owner State: OR
Property Owner ZIP: 97229
Property Owner Phone: Not reported
Property Owner Email Address: Not reported
Property Owner Effective Date: 04/18/2001
Property Owner Last Updated: 04/18/2001

Count: 0 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/07/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 92

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/05/2018
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 21

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 01/17/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 21

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 01/17/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (206) 553-1200
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (206) 553-1200
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (206) 553-1200
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (206) 553-1200
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/22/2017
Date Data Arrived at EDR: 06/13/2017
Date Made Active in Reports: 09/15/2017
Number of Days to Update: 94

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/08/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/10/2017
Date Data Arrived at EDR: 08/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 08/10/2017
Date Data Arrived at EDR: 08/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal ERNS list

ERNS: Emergency Response Notification System
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/18/2017
Date Data Arrived at EDR: 09/21/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 22

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

CRL: Confirmed Release List and Inventory
All facilities with a confirmed release.

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/16/2017
Date Made Active in Reports: 01/09/2018
Number of Days to Update: 54

Source: Department of Environmental Quality
Telephone: 503-229-6170
Last EDR Contact: 11/16/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Quarterly

ECSI: Environmental Cleanup Site Information System
Sites that are or may be contaminated and may require cleanup.

Date of Government Version: 10/01/2017
Date Data Arrived at EDR: 10/06/2017
Date Made Active in Reports: 12/04/2017
Number of Days to Update: 59

Source: Department of Environmental Quality
Telephone: 503-229-6629
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Facilities List
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 10/18/2017
Date Data Arrived at EDR: 10/19/2017
Date Made Active in Reports: 12/11/2017
Number of Days to Update: 53

Source: Department of Environmental Quality
Telephone: 503-229-6299
Last EDR Contact: 01/16/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Semi-Annually

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 10/03/2017
Date Data Arrived at EDR: 11/16/2017
Date Made Active in Reports: 01/10/2018
Number of Days to Update: 55

Source: Department of Environmental Quality
Telephone: 503-229-5790
Last EDR Contact: 11/16/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 05/01/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/13/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/24/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/25/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 31

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/14/2016
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 98

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/26/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/09/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Varies

UST: Underground Storage Tank Database
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 10/03/2017
Date Data Arrived at EDR: 11/16/2017
Date Made Active in Reports: 01/10/2018
Number of Days to Update: 55
Source: Department of Environmental Quality
Telephone: 503-229-5815
Last EDR Contact: 11/16/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Quarterly

AST: Aboveground Storage Tanks
Aboveground storage tank locations reported to the Office of State Fire Marshal.

Date of Government Version: 09/05/2017
Date Data Arrived at EDR: 11/16/2017
Date Made Active in Reports: 01/09/2018
Number of Days to Update: 54
Source: Office of State Fire Marshal
Telephone: 503-378-3473
Last EDR Contact: 11/13/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Semi-Annually

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/25/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/26/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71
Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/24/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 134

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 05/02/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/14/2016
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 98

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Semi-Annually

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 05/01/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/13/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

State and tribal institutional control / engineering control registries

ENG CONTROLS: Engineering Controls Recorded at ESCI Sites
Engineering controls are physical measures selected or approved by the Director for the purpose of preventing or minimizing exposure to hazardous substances. Engineering controls may include, but are not limited to, fencing, capping, horizontal or vertical barriers, hydraulic controls, and alternative water supplies.

Date of Government Version: 10/01/2017
Date Data Arrived at EDR: 10/06/2017
Date Made Active in Reports: 12/04/2017
Number of Days to Update: 59

Source: Department of Environmental Quality
Telephone: 503-229-5193
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

INST CONTROL: Institutional Controls Recorded at ESCI Sites
An institutional control is a legal or administrative tool or action taken to reduce the potential for exposure to hazardous substances. Institutional controls may include, but are not limited to, use restrictions, environmental monitoring requirements, and site access and security measures.

Date of Government Version: 10/01/2017
Date Data Arrived at EDR: 10/06/2017
Date Made Active in Reports: 12/04/2017
Number of Days to Update: 59

Source: Department of Environmental Quality
Telephone: 503-229-5193
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

VCS: Voluntary Cleanup Program Sites
Responsible parties have entered into an agreement with DEQ to voluntarily address contamination associated with their property.

Date of Government Version: 10/02/2017
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 12/04/2017
Number of Days to Update: 34

Source: DEQ
Telephone: 503-229-5256
Last EDR Contact: 12/28/2017
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/20/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Projects
Brownfields investigations and/or cleanups that have been conducted in Oregon.

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/16/2017
Date Made Active in Reports: 01/09/2018
Number of Days to Update: 54

Source: Department of Environmental Quality
Telephone: 503-229-6801
Last EDR Contact: 11/16/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Annually

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 08/21/2017
Date Data Arrived at EDR: 09/20/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

HIST LF: Old Closed SW Disposal Sites

A list of solid waste disposal sites that have been closed for a long while.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 07/08/2003
Date Made Active in Reports: 07/18/2003
Number of Days to Update: 10

Source: Department of Environmental Quality
Telephone: 503-229-5409
Last EDR Contact: 07/08/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWRCY: Recycling Facility Location Listing

A listing of recycling facility locations.

Date of Government Version: 11/28/2017
Date Data Arrived at EDR: 11/29/2017
Date Made Active in Reports: 01/10/2018
Number of Days to Update: 42

Source: Department of Environmental Quality
Telephone: 503-229-5353
Last EDR Contact: 11/29/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Quarterly

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 10/30/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176
Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 11/03/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

AOC COL: Columbia Slough
Columbia Slough waterway boundaries.

Date of Government Version: 08/10/2005
Date Data Arrived at EDR: 05/17/2006
Date Made Active in Reports: 06/16/2006
Number of Days to Update: 30
Source: City of Portland Environmental Services
Telephone: 503-823-5310
Last EDR Contact: 03/13/2007
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

AOC MU: East Multnomah County Area
Approximate extent of TSA VOC plume February , 2002

Date of Government Version: N/A
Date Data Arrived at EDR: 10/07/2002
Date Made Active in Reports: 10/22/2002
Number of Days to Update: 15
Source: City of Portland Environmental Services
Telephone: 503-823-5310
Last EDR Contact: 03/13/2007
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 07/13/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 30
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/28/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: No Update Planned

CDL: Uninhabitable Drug Lab Properties
The properties listed on these county pages have been declared by a law enforcement agency to be unfit for use due to meth lab and/or storage activities. The properties are considered uninhabitable until cleaned up by a state certified decontamination contractor and a certificate of fitness is issued by the Oregon Health Division.

Date of Government Version: 11/08/2017
Date Data Arrived at EDR: 11/10/2017
Date Made Active in Reports: 01/09/2018
Number of Days to Update: 60
Source: Department of Consumer & Business Services
Telephone: 503-378-4133
Last EDR Contact: 11/07/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

CDL 2: Clandestine Drug Lab Site Listing
A listing of clandestine drug lab site locations included in the Incident database.

Date of Government Version: 10/02/2017
Date Data Arrived at EDR: 11/01/2017
Date Made Active in Reports: 12/01/2017
Number of Days to Update: 30
Source: Oregon State Police
Telephone: 503-373-1540
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 07/13/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 30
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 21
Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 09/21/2017
Date Data Arrived at EDR: 09/21/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 22
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

SPILLS: Spill Data
Oil and hazardous material spills reported to the Environmental Response Program.

Date of Government Version: 09/28/2017
Date Data Arrived at EDR: 10/02/2017
Date Made Active in Reports: 12/04/2017
Number of Days to Update: 63
Source: Department of Environmental Quality
Telephone: 503-229-5815
Last EDR Contact: 01/02/2018
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Semi-Annually

HAZMAT: Hazmat/Incidents
Hazardous material incidents reported to the State Fire Marshal by emergency responders. The hazardous material may or may not have been released.

Date of Government Version: 07/03/2017
Date Data Arrived at EDR: 08/03/2017
Date Made Active in Reports: 09/26/2017
Number of Days to Update: 54

Source: State Fire Marshal's Office
Telephone: 503-373-1540
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Semi-Annually

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 05/01/2006
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (206) 553-1200
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 11/22/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/13/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/11/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: N/A

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 11/17/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 10/17/2017
Date Data Arrived at EDR: 11/01/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 11/09/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Every 4 Years

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 01/10/2018
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/25/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 21

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2017
Date Data Arrived at EDR: 06/09/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 126

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/12/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 01/09/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 11/20/2017
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/08/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 10/26/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 10/02/2017
Date Data Arrived at EDR: 10/05/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 11/10/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 63

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/09/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 12/23/2016
Date Data Arrived at EDR: 12/27/2016
Date Made Active in Reports: 02/17/2017
Number of Days to Update: 52

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 11/22/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 10/10/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites
A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 10/29/2017
Date Data Arrived at EDR: 11/28/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 45

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 11/28/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 12/01/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 12/01/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 09/25/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/20/2017
Number of Days to Update: 24

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 12/19/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/23/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 09/15/2017
Number of Days to Update: 9

Source: EPA
Telephone: (206) 553-1200
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 09/30/2016
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 73

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 01/02/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 06/27/2017
Date Data Arrived at EDR: 11/21/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/02/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 10/20/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 11/20/2017
Date Data Arrived at EDR: 11/20/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 53

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Quarterly

AIRS: Oregon Title V Facility Listing
A listing of Title V facility source and emissions information.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 10/18/2017
Date Made Active in Reports: 10/23/2017
Number of Days to Update: 5

Source: Department of Environmental Quality
Telephone: 503-229-6459
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/17/2047
Data Release Frequency: Annually

COAL ASH: Coal Ash Disposal Sites Listing
A listing of coal ash disposal sites.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 03/03/2017
Date Made Active in Reports: 10/11/2017
Number of Days to Update: 222

Source: Department of Environmental Quality
Telephone: 541-298-7255
Last EDR Contact: 12/04/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

DRYCLEANERS: Drycleaning Facilities
A listing of registered drycleaning facilities in Oregon.

Date of Government Version: 11/03/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/01/2017
Number of Days to Update: 24

Source: Department of Environmental Quality
Telephone: 503-229-6783
Last EDR Contact: 10/30/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Annually

Financial Assurance 1: Financial Assurance Information Listing
Financial assurance information for hazardous waste facilities.

Date of Government Version: 09/08/2017
Date Data Arrived at EDR: 09/11/2017
Date Made Active in Reports: 10/23/2017
Number of Days to Update: 42

Source: Department of Environmental Quality
Telephone: 541-633-2011
Last EDR Contact: 12/04/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Semi-Annually

Financial Assurance 2: Financial Assurance Information Listing
Financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/20/2017
Date Data Arrived at EDR: 11/20/2017
Date Made Active in Reports: 01/10/2018
Number of Days to Update: 51

Source: Department of Environmental Quality
Telephone: 503-229-5521
Last EDR Contact: 11/15/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Semi-Annually

HSIS: Hazardous Substance Information Survey

Companies in Oregon submitting the Hazardous Substance Information Survey and either reporting or not reporting hazardous substances.

Date of Government Version: 09/05/2017
Date Data Arrived at EDR: 11/16/2017
Date Made Active in Reports: 01/09/2018
Number of Days to Update: 54

Source: State Fire Marshal's Office
Telephone: 503-373-1540
Last EDR Contact: 11/13/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Semi-Annually

OR MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/02/2017
Date Made Active in Reports: 10/11/2017
Number of Days to Update: 131

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Annually

NPDES: Wastewater Permits Database

A listing of permitted wastewater facilities.

Date of Government Version: 11/06/2017
Date Data Arrived at EDR: 11/09/2017
Date Made Active in Reports: 01/10/2018
Number of Days to Update: 62

Source: Department of Environmental Quality
Telephone: 503-229-5657
Last EDR Contact: 11/09/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

UIC: Underground Injection Control Program Database

DEQ's Underground Injection Control Program is authorized by the Environmental Protection Agency (EPA) to regulate all underground injection in Oregon to protect groundwater resources.

Date of Government Version: 09/21/2017
Date Data Arrived at EDR: 09/22/2017
Date Made Active in Reports: 10/11/2017
Number of Days to Update: 19

Source: Department of Environmental Quality
Telephone: 503-229-5945
Last EDR Contact: 12/21/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List

The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Oregon.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/03/2014
Number of Days to Update: 186

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Oregon.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Oregon.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/27/2013
Number of Days to Update: 179

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 10/01/2017
Date Data Arrived at EDR: 11/01/2017
Date Made Active in Reports: 11/13/2017
Number of Days to Update: 12

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Quarterly

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/13/2017
Date Made Active in Reports: 07/14/2017
Number of Days to Update: 92

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/11/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.
Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.
Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.
Daycare Centers: Child Care Listings
Source: Employment Department
Telephone: 503-947-1420

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory Data
Source: Oregon Geospatial Enterprise Office
Telephone: 503-378-2166

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

HSC SANDY LOT
16455 CHAMPION WAY
SANDY, OR 97055

TARGET PROPERTY COORDINATES

Latitude (North):	45.405593 - 45° 24' 20.13''
Longitude (West):	122.296502 - 122° 17' 47.41''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	555055.4
UTM Y (Meters):	5028031.5
Elevation:	756 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	6066512 SANDY, OR
Version Date:	2014

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

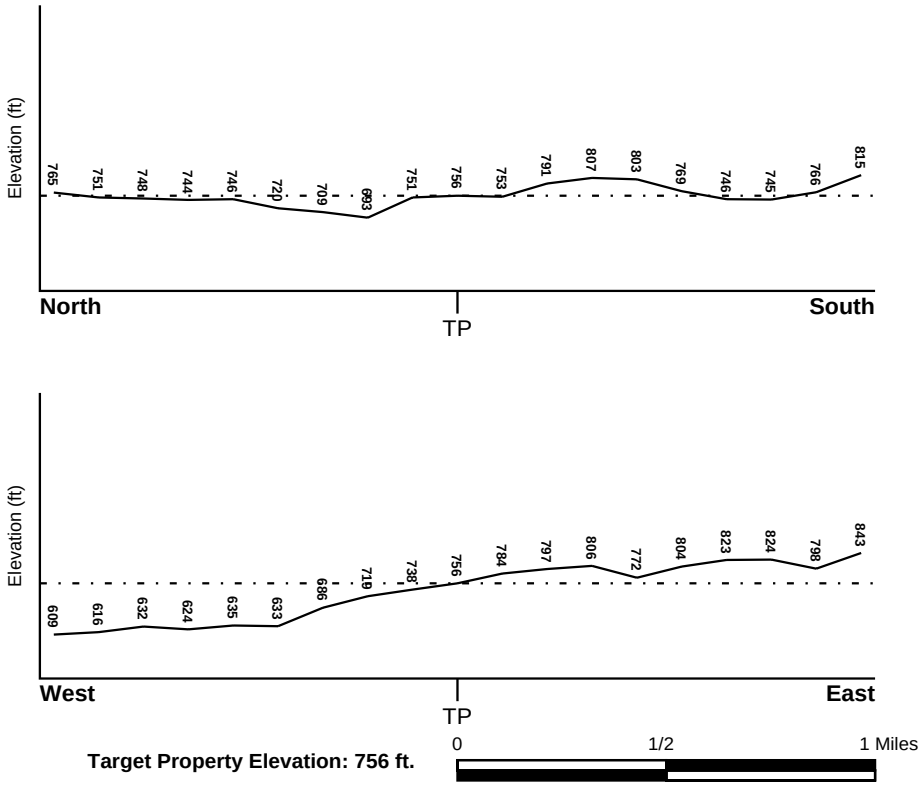
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
41005C0093D	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
4155880065A	FEMA Q3 Flood data
41005C0092D	FEMA FIRM Flood data
41005C0094D	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
SANDY	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

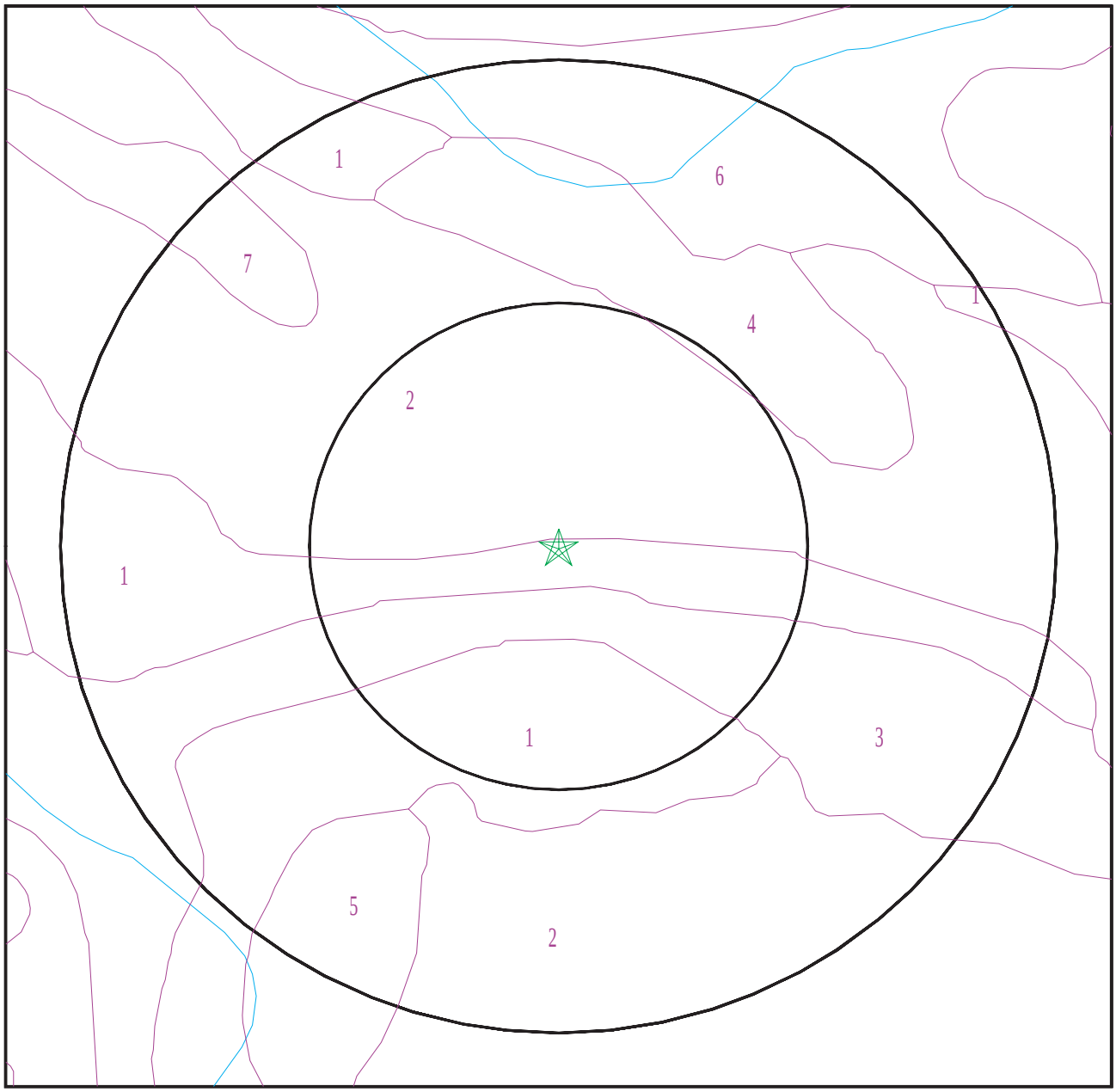
Era:	Cenozoic
System:	Tertiary
Series:	Upper Tertiary andesite
Code:	uTa *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Volcanic Rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 5168641.2s



SITE NAME: HSC Sandy Lot ADDRESS: 16455 Champion Way Sandy OR 97055 LAT/LONG: 45.405593 / 122.296502	CLIENT: Blue Mountain Env. Cons. Inc. CONTACT: Chad Kauppi INQUIRY #: 5168641.2s DATE: January 26, 2018 6:49 am

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Cazadero

Soil Surface Texture: silty clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	20 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 6 Min: 5.1
2	20 inches	75 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 4 Min: 1.4	Max: 6 Min: 5.1

Soil Map ID: 2

Soil Component Name: Cazadero

Soil Surface Texture: silty clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	20 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 6 Min: 5.1
2	20 inches	75 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 4 Min: 1.4	Max: 6 Min: 5.1

Soil Map ID: 3

Soil Component Name: Cottrell

Soil Surface Texture: silty clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 75 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	24 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 6 Min: 5.1
2	24 inches	55 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 4 Min: 1.4	Max: 5.5 Min: 5.1
3	55 inches	85 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 5.5 Min: 5.1

Soil Map ID: 4

Soil Component Name: Klickitat

Soil Surface Texture: stony loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 122 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	stony loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 6 Min: 4.5
2	14 inches	35 inches	very gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 5.5 Min: 4.5
3	35 inches	48 inches	extremely cobbly loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 5.5 Min: 4.5
4	48 inches	51 inches	unweathered bedrock	Not reported	Not reported	Max: Min:	Max: Min:

Soil Map ID: 5

Soil Component Name: Cazadero

Soil Surface Texture: silty clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	20 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 6 Min: 5.1
2	20 inches	75 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 4 Min: 1.4	Max: 6 Min: 5.1

Soil Map ID: 6

Soil Component Name: Wapato

Soil Surface Texture: silty clay loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 8 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 1.4	Max: 7.3 Min: 5.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	44 inches	59 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.	Max: 4 Min: 1.4	Max: 6.5 Min: 5.6
3	16 inches	40 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 4 Min: 1.4	Max: 6.5 Min: 5.1

Soil Map ID: 7

Soil Component Name: Cottrell

Soil Surface Texture: silty clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 75 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	24 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 6 Min: 5.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	24 inches	55 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 4 Min: 1.4	Max: 5.5 Min: 5.1
3	55 inches	85 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 5.5 Min: 5.1

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 0.001 miles
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
4	USGS40000993018	1/4 - 1/2 Mile West
B18	USGS40000993086	1/2 - 1 Mile North

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

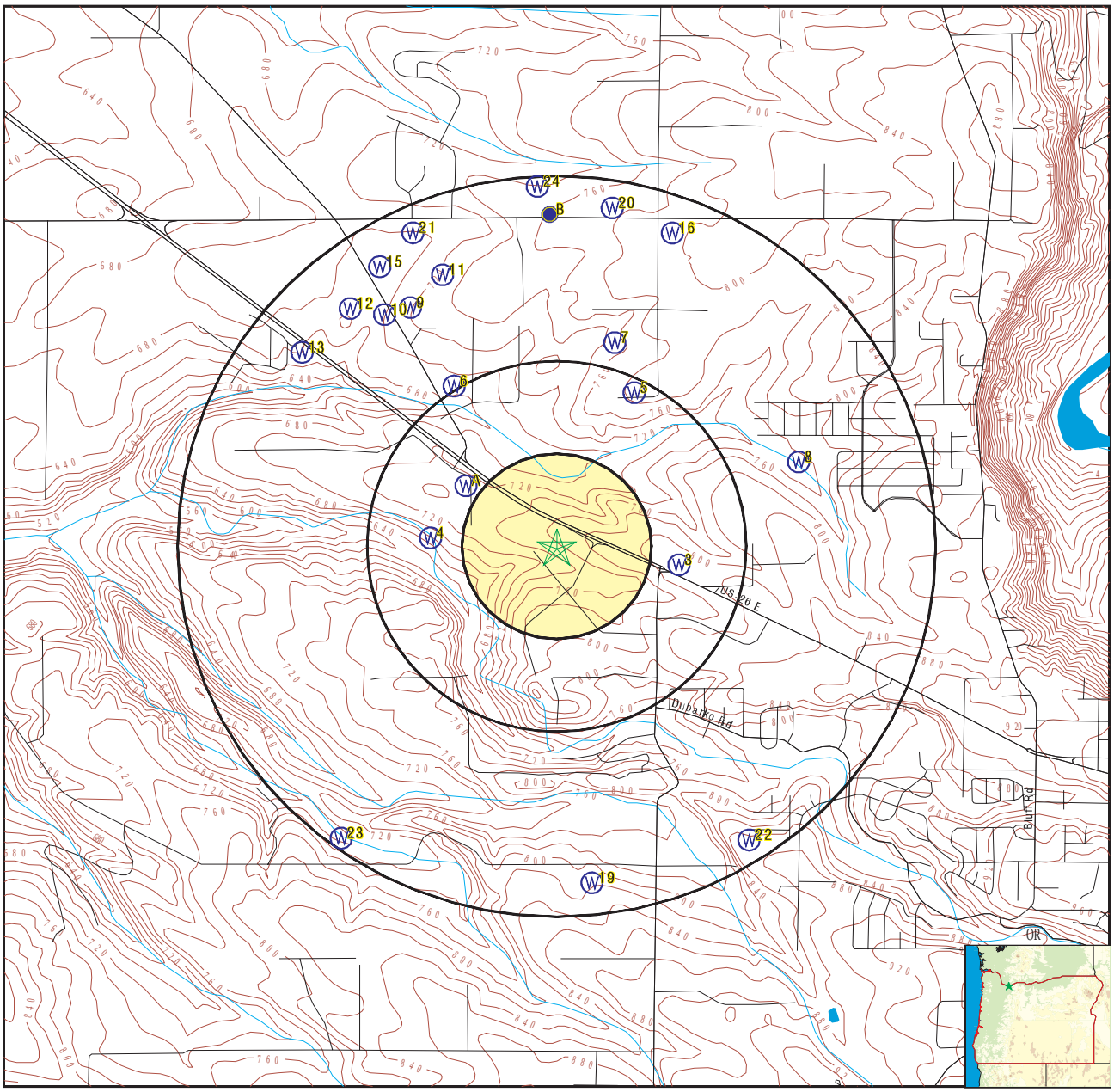
Note: PWS System location is not always the same as well location.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A1	ORW500000011189	1/4 - 1/2 Mile NW
A2	ORI500000054933	1/4 - 1/2 Mile WNW
3	ORW500000004621	1/4 - 1/2 Mile East
5	ORW500000004616	1/4 - 1/2 Mile NNE
6	ORI500000053696	1/2 - 1 Mile NNW
7	ORW500000011191	1/2 - 1 Mile NNE
8	ORW500000004698	1/2 - 1 Mile ENE
9	ORW500000011190	1/2 - 1 Mile NNW
10	ORW500000004618	1/2 - 1 Mile NW
11	ORW500000011991	1/2 - 1 Mile NNW
12	ORW500000004617	1/2 - 1 Mile NW
13	ORW500000004635	1/2 - 1 Mile NW
B14	ORW500000007768	1/2 - 1 Mile North
15	ORW500000007769	1/2 - 1 Mile NNW
16	ORW500000004619	1/2 - 1 Mile NNE
B17	ORW500000003784	1/2 - 1 Mile North
19	ORW500000001839	1/2 - 1 Mile South
20	ORW500000007766	1/2 - 1 Mile North
21	ORW500000011155	1/2 - 1 Mile NNW
22	ORW500000001838	1/2 - 1 Mile SSE
23	ORW500000004622	1/2 - 1 Mile SW
24	ORW500000007767	1/2 - 1 Mile North

PHYSICAL SETTING SOURCE MAP - 5168641.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Oil, gas or related wells

SITE NAME: HSC Sandy Lot ADDRESS: 16455 Champion Way Sandy OR 97055 LAT/LONG: 45.405593 / 122.296502	CLIENT: Blue Mountain Env. Cons. Inc. CONTACT: Chad Kauppi INQUIRY #: 5168641.2s DATE: January 26, 2018 6:49 am

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
A1 **NW** **1/4 - 1/2 Mile** **Lower**	**OR WELLS**	**ORW500000011189**

Fid:	11188	Objectid:	11313
Logid:	CLAC 5689	Lstupdate:	05/23/2008
Establby:	KARL WOZNIAK	Xysource:	FINAL PROOF MAP & DOQ
Horizerr:	50	Sourceorg:	OWRD
Sourceowrd:	GWATER	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	9
Recwell:	9	Obsflagall:	Not Reported
Lsdelev:	717		
Latitude:	45.4081821979		
Longitude:	-122.300935148		
Site id:	ORW500000011189		

A2 **WNW** **1/4 - 1/2 Mile** **Lower**		**OR WELLS**	**ORI500000054933**
Fid:	54932	Well inspe:	0
Physical l:	Not Reported	Inspection:	2014-08-25 00:00:00.000
Startcard :	1024138	Wl county :	Not Reported
Wl nbr:	Not Reported	Startcar00:	Not Reported
Well tag n:	Not Reported	No log:	0
Property o:	Not Reported	Inspecti00:	CMP
Special st:	0	Title:	WIN
Inspecti01:	NEW	Witnesses:	ADAM
Name owner:	TRIMBLE, BILL		
Street:	35050	City:	BORIN
State:	OR	Zip:	97003
Phone home:	Not Reported	Phone comp:	Not Reported
Gps on wel:	1	Distance t:	Not Reported
Bearing to:	Not Reported	Drilling m:	Not Reported
Use of wel:	Not Reported	Drilling00:	1
Rough log :	1	Well tag r:	DRILL
Monitoring:	Not Reported	Monitori00:	0
Protective:	0	Well locke:	0
Consultant:	0	Water in v:	0
Seal test :	Not Reported	Samples ta:	0
Casing dia:	6.00	Csg above :	Not Reported
Csg gauge:	Not Reported	Borehole d:	10.00
Dedicated :	0	Access por:	0
Access p00:	Not Reported	Measuring :	Not Reported
Measurin00:	Not Reported	Depth belo:	Not Reported
Depth be00:	Not Reported	Tape hold:	0.00
Tape missi:	0.00	Tape cut:	Not Reported
Water leve:	Not Reported	Water le00:	Not Reported
Cascading :	0	Pump type:	NON
Pump make:	Not Reported	Pump hp:	Not Reported

Flowmeter :	Not Reported	Flowmete00:	Not Reported
Flowmete01:	Not Reported	Flowmete02:	Not Reported
Associated:	Not Reported	Nbr of hou:	1
Deficiency:	Not Reported		
Inspecti02:	Not Reported		
Work new:	1	Work deepe:	0
Work conve:	0	Work alter:	0
Work aband:	0	Work exist:	0
Work other:	Not Reported	Drill rota:	1
Drill ro00:	0	Drill cabl:	0
Drill ca00:	0	Drill reve:	0
Drill re00:	0	Drill auge:	0
Drill push:	0	Drill hand:	0
Drill holl:	0	Drill soni:	0
Drill othe:	Not Reported	Use domest:	1
Use irriga:	0	Use commun:	0
Use indust:	0	Use livest:	0
Use dewate:	0	Use monito:	0
Use therma:	0	Use inject:	0
Use piezom:	0	Use observ:	0
Use recove:	0	Use other:	Not Reported
Bentonite :	0	Conductivi:	Not Reported
Conducti00:	Not Reported	Measuremen:	Not Reported
Well tag00:	Not Reported	Bonded lic:	1738
Unbonded l:	Not Reported	Bonded dri:	VANCE
Unbonded d:	Not Reported	County cod:	CLAC
Tax lot:	4700	Township:	2
Township c:	S	Range:	4
Range char:	E	Sctn:	10
Qtr40:	NE	Qtr160:	SW
Latitude d:	45.40774000	Longitude :	-122.30190000
Gps horizo:	4.00000000	Year const:	Not Reported
Date const:	2014-	Date con00:	Not Reported
Deficienci:	U	Previous i:	0
Inspected :	Not Reported	Inspecte00:	129890
Wm region:	NW		
Well tag a:	Not Reported		
Well tag01:	Not Reported	Depth:	Not Reported
Static wat:	Not Reported	Status of :	DIP
Location r:	LOCAT	Site visit:	Not Reported
Type of lo:	W	Casing cap:	Not Reported
Pictures t:	1	Street of :	Not Reported
Street o00:	35050 SE JARL ROAD, BORING OR 97009		
Last updt :	2014-08-27 10:28:11.173		
Last upd00:	sanforba	Rec creati:	2014-08-27 10:10:51.090
Rec crea00:	sanforba		
Latitude:	45.40774		
Loongitude:	-122.3019		
Site id:	ORI500000054933		

3
East
1/4 - 1/2 Mile
Higher

OR WELLS **ORW500000004621**

Fid:	4620	Objectid:	4642
Logid:	CLAC 5740	Lstupdate:	01/01/1990
Establby:	KARL WOZNIAK	Xysource:	UNKNOWN
Horizerr:	1000	Sourceorg:	OWRD
Sourceowrd:	USGS WILLGW	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	N
Recwell:	9	Obsflagall:	ON
Lsdelev:	810		
Latitude:	45.4048706698		
Longitude:	-122.289861419		
Site id:	ORW500000004621		

4
West
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000993018**

Org. Identifier:	USGS-OR		
Formal name:	USGS Oregon Water Science Center		
Monloc Identifier:	USGS-452422122180801		
Monloc name:	02S/04E-10CDA		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	17090011	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	45.4059207
Longitude:	-122.3033434	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	665
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Valley Fill		
Aquifer type:	Not Reported		
Construction date:	19940113	Welldepth:	1493
Welldepth units:	ft	Wellholedepth:	1493
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 0

5
NNE
1/4 - 1/2 Mile
Higher

OR WELLS **ORW500000004616**

Fid:	4615	Objectid:	4637
Logid:	CLAC 5730	Lstupdate:	01/01/1990
Establby:	KARL WOZNIAK	Xysource:	UNKNOWN
Horizerr:	1000	Sourceorg:	OWRD
Sourceowrd:	USGS WILLGW	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	N
Recwell:	9	Obsflagall:	ON
Lsdelev:	778		
Latitude:	45.411600782		

Longitude: -122.292289893
Site id: ORW500000004616

6
NNW
1/2 - 1 Mile
Lower

OR WELLS **ORI500000053696**

Fid:	53695	Well inspe:	0
Physical l:	Not Reported	Inspection:	2013-09-03 00:00:00.000
Startcard :	1020142	Wl county :	CLAC
Wl nbr:	69805	Startcar00:	Not Reported
Well tag n:	Not Reported	No log:	0
Property o:	Not Reported	Inspecti00:	CMP
Special st:	0	Title:	WMR
Inspecti01:	NEW	Witnesses:	Not Reported
Name owner:	DOUG, DAVIDSON		
Street:	PO BO	City:	SANDY
State:	OR	Zip:	97055
Phone home:	Not Reported	Phone comp:	Not Reported
Gps on wel:	1	Distance t:	Not Reported
Bearing to:	Not Reported	Drilling m:	Not Reported
Use of wel:	Not Reported	Drilling00:	0
Rough log :	0	Well tag r:	Not Reported
Monitoring:	Not Reported	Monitori00:	0
Protective:	0	Well locke:	0
Consultant:	0	Water in v:	0
Seal test :	PP	Samples ta:	0
Casing dia:	6.00	Csg above :	2.10
Csg gauge:	0.250	Borehole d:	10.00
Dedicated :	0	Access por:	0
Access p00:	Not Reported	Measuring :	2.10
Measurin00:	0	Depth belo:	Not Reported
Depth be00:	Not Reported	Tape hold:	0.00
Tape missi:	0.00	Tape cut:	Not Reported
Water leve:	Not Reported	Water le00:	Not Reported
Cascading :	0	Pump type:	Not Reported
Pump make:	Not Reported	Pump hp:	Not Reported
Flowmeter :	Not Reported	Flowmete00:	Not Reported
Flowmete01:	Not Reported	Flowmete02:	Not Reported
Associated:	Not Reported	Nbr of hou:	Not Reported
Deficiency:	Not Reported		
Inspecti02:	Not Reported		
Work new:	1	Work deepe:	0
Work conve:	0	Work alter:	0
Work aband:	0	Work exist:	0
Work other:	Not Reported	Drill rota:	1
Drill ro00:	0	Drill cabl:	0
Drill ca00:	0	Drill reve:	0
Drill re00:	0	Drill auge:	0
Drill push:	0	Drill hand:	0
Drill holl:	0	Drill soni:	0
Drill othe:	Not Reported	Use domest:	1
Use irriga:	0	Use commun:	0
Use indust:	0	Use livest:	0
Use dewate:	0	Use monito:	0
Use therma:	0	Use inject:	0
Use piezom:	0	Use observ:	0

Use recove:	0	Use other:	Not Reported
Bentonite :	0	Conductivi:	Not Reported
Conducti00:	Not Reported	Measuremen:	Not Reported
Well tag00:	111491	Bonded lic:	1771
Unbonded l:	Not Reported	Bonded dri:	GEORG
Unbonded d:	Not Reported	County cod:	CLAC
Tax lot:	Not Reported	Township:	2
Township c:	S	Range:	4
Range char:	E	Sctn:	10
Qtr40:	SE	Qtr160:	NW
Latitude d:	45.41186000	Longitude :	-122.30206000
Gps horizo:	13.00000000	Year const:	Not Reported
Date const:	2013-	Date con00:	2013-
Deficienci:	U	Previous i:	0
Inspected :	Not Reported	Inspecte00:	122818
Wm region:	NW		
Well tag a:	Band		
Well tag01:	DRL	Depth:	Not Reported
Static wat:	Not Reported	Status of :	Not Reported
Location r:	Not Reported	Site visit:	Not Reported
Type of lo:	W	Casing cap:	PTL
Pictures t:	0	Street of :	15300 SE ORIENT
Street o00:	Not Reported		
Last updt :	2013-09-06 13:27:17.053		
Last upd00:	constajw	Rec creati:	2013-09-06 13:25:12.323
Rec crea00:	constajw		
Latitude:	45.41186		
Loongitude:	-122.30206		
Site id:	ORI500000053696		

7
NNE
1/2 - 1 Mile
Lower

OR WELLS **ORW500000011191**

Fid:	11190	Objectid:	11315
Logid:	CLAC 5712	Lstupdate:	05/23/2008
Establby:	KARL WOZNIAK	Xysource:	FINAL PROOF MAP & DOQ
Horizerr:	100	Sourceorg:	OWRD
Sourceowrd:	GWATER	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	9
Recwell:	9	Obsflagall:	Not Reported
Lsdelev:	740		
Latitude:	45.4135568422		
Longitude:	-122.293347643		
Site id:	ORW500000011191		

8
ENE
1/2 - 1 Mile
Higher

OR WELLS **ORW500000004698**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Fid:	4697	Objectid:	4719
Logid:	CLAC 5760	Lstupdate:	01/01/1990
Establby:	KARL WOZNIAK	Xysource:	UNKNOWN
Horizerr:	1000	Sourceorg:	OWRD
Sourceowrd:	USGS WILLGW	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	9
Recwell:	9	Obsflagall:	Not Reported
Lsdelev:	750		
Latitude:	45.4088896824		
Longitude:	-122.283375316		
Site id:	ORW500000004698		

9
NNW
1/2 - 1 Mile
Lower

OR WELLS **ORW500000011190**

Fid:	11189	Objectid:	11314
Logid:	CLAC 5735	Lstupdate:	05/23/2008
Establby:	KARL WOZNIAK	Xysource:	FINAL PROOF MAP & DOQ
Horizerr:	100	Sourceorg:	OWRD
Sourceowrd:	GWATER	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	9
Recwell:	9	Obsflagall:	Not Reported
Lsdelev:	712		
Latitude:	45.4149280931		
Longitude:	-122.304429952		
Site id:	ORW500000011190		

10
NW
1/2 - 1 Mile
Lower

OR WELLS **ORW500000004618**

Fid:	4617	Objectid:	4639
Logid:	CLAC 5700	Lstupdate:	01/01/1990
Establby:	KARL WOZNIAK	Xysource:	UNKNOWN
Horizerr:	1000	Sourceorg:	OWRD
Sourceowrd:	USGS WILLGW	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	N
Recwell:	9	Obsflagall:	ON
Lsdelev:	693		
Latitude:	45.4146545274		
Longitude:	-122.305835509		
Site id:	ORW500000004618		

11
NNW
1/2 - 1 Mile
Lower

OR WELLS **ORW500000011991**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Fid:	11990	Objectid:	12128
Logid:	CLAC 52937	Lstupdate:	08/04/2009
Establby:	KARL WOZNIAK	Xysource:	TRANSFER MAP
Horizerr:	50	Sourceorg:	OWRD
Sourceowrd:	GWATER	Waypoint:	Not Reported
Welltag:	15858		
Sownum:	0	Obswell:	9
Recwell:	9	Obsflagall:	Not Reported
Lsdelev:	0		
Latitude:	45.4162051693		
Longitude:	-122.302694		
Site id:	ORW500000011991		

12
NW
1/2 - 1 Mile
Lower

OR WELLS **ORW500000004617**

Fid:	4616	Objectid:	4638
Logid:	CLAC 5718	Lstupdate:	01/01/1990
Establby:	KARL WOZNIAK	Xysource:	UNKNOWN
Horizerr:	1000	Sourceorg:	OWRD
Sourceowrd:	USGS WILLGW	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	N
Recwell:	9	Obsflagall:	ON
Lsdelev:	692		
Latitude:	45.4148908816		
Longitude:	-122.307696931		
Site id:	ORW500000004617		

13
NW
1/2 - 1 Mile
Lower

OR WELLS **ORW500000004635**

Fid:	4634	Objectid:	4656
Logid:	CLAC 5658	Lstupdate:	01/01/1990
Establby:	KARL WOZNIAK	Xysource:	UNKNOWN
Horizerr:	1000	Sourceorg:	OWRD
Sourceowrd:	USGS WILLGW	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	N
Recwell:	9	Obsflagall:	ON
Lsdelev:	676		
Latitude:	45.4131784727		
Longitude:	-122.310310556		
Site id:	ORW500000004635		

B14
North
1/2 - 1 Mile
Higher

OR WELLS **ORW500000007768**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Fid:	7767	Objectid:	7874
Logid:	CLAC 51552	Lstupdate:	05/23/2008
Establby:	KARL WOZNIAK	Xysource:	FINAL PROOF MAP & DOQ
Horizerr:	50	Sourceorg:	OWRD
Sourceowrd:	GWATER	Waypoint:	Not Reported
Welltag:	7380		
Sownum:	0	Obswell:	C
Recwell:	9	Obsflagall:	OC
Lsdelev:	763		
Latitude:	45.4183370084		
Longitude:	-122.29614257		
Site id:	ORW500000007768		

15
NNW
1/2 - 1 Mile
Lower

OR WELLS **ORW500000007769**

Fid:	7768	Objectid:	7875
Logid:	CLAC 19304	Lstupdate:	05/23/2008
Establby:	KARL WOZNIAK	Xysource:	FINAL PROOF MAP & DOQ
Horizerr:	50	Sourceorg:	OWRD
Sourceowrd:	GWATER	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	C
Recwell:	9	Obsflagall:	OC
Lsdelev:	684		
Latitude:	45.4165249632		
Longitude:	-122.30609662		
Site id:	ORW500000007769		

16
NNE
1/2 - 1 Mile
Higher

OR WELLS **ORW500000004619**

Fid:	4618	Objectid:	4640
Logid:	CLAC 5748	Lstupdate:	01/01/1990
Establby:	KARL WOZNIAK	Xysource:	UNKNOWN
Horizerr:	1000	Sourceorg:	OWRD
Sourceowrd:	USGS WILLGW	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	N
Recwell:	9	Obsflagall:	ON
Lsdelev:	791		
Latitude:	45.4178438405		
Longitude:	-122.290219726		
Site id:	ORW500000004619		

B17
North
1/2 - 1 Mile
Higher

OR WELLS **ORW500000003784**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Fid:	3783	Objectid:	3799
Logid:	CLAC 5434	Lstupdate:	05/23/2008
Establby:	KARL WOZNIAK	Xysource:	FINAL PROOF MAP & DOQ
Horizerr:	50	Sourceorg:	OWRD
Sourceowrd:	GWATER	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	C
Recwell:	9	Obsflagall:	OC
Lsdelev:	755		
Latitude:	45.4186548484		
Longitude:	-122.297185897		
Site id:	ORW500000003784		

B18
North
1/2 - 1 Mile
Higher

FED USGS **USGS40000993086**

Org. Identifier:	USGS-OR		
Formal name:	USGS Oregon Water Science Center		
Monloc Identifier:	USGS-452508122174601		
Monloc name:	02S/04E-03DCD		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	17090011	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	45.4187317
Longitude:	-122.2973104	Sourcemap scale:	Not Reported
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	755
Vert measure units:	feet	Vertacc measure val:	20
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19691012	Welldepth:	250
Welldepth units:	ft	Wellholedepth:	250
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 9

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1988-09-07	187.2		1988-04-04	184.8	
1987-09-21	187.5		1987-04-06	184.3	
1986-09-09	185.0		1986-06-12	186.9	
1986-01-28	181.6		1984-05-24	181.7	
1969-10-12	180				

19
South
1/2 - 1 Mile
Higher

OR WELLS **ORW500000001839**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Fid:	1838	Objectid:	1842
Logid:	CLAC 5850	Lstupdate:	01/01/1990
Establby:	KARL WOZNIAK	Xysource:	UNKNOWN
Horizerr:	1000	Sourceorg:	OWRD
Sourceowrd:	USGS WILLGW	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	9
Recwell:	9	Obsflagall:	Not Reported
Lsdelev:	765		
Latitude:	45.3924331173		
Longitude:	-122.294585047		
Site id:	ORW500000001839		

20
North
1/2 - 1 Mile
Higher

OR WELLS **ORW500000007766**

Fid:	7765	Objectid:	7872
Logid:	CLAC 5360	Lstupdate:	05/27/2008
Establby:	KARL WOZNIAK	Xysource:	FINAL PROOF MAP & DOQ
Horizerr:	100	Sourceorg:	OWRD
Sourceowrd:	GWATER	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	C
Recwell:	9	Obsflagall:	OC
Lsdelev:	771		
Latitude:	45.4188191986		
Longitude:	-122.293482646		
Site id:	ORW500000007766		

21
NNW
1/2 - 1 Mile
Lower

OR WELLS **ORW500000011155**

Fid:	11154	Objectid:	11279
Logid:	CLAC 57278	Lstupdate:	08/03/2009
Establby:	KARL WOZNIAK	Xysource:	TRANSFER MAP & DOQ
Horizerr:	50	Sourceorg:	OWRD
Sourceowrd:	GWATER	Waypoint:	Not Reported
Welltag:	48496		
Sownum:	0	Obswell:	C
Recwell:	9	Obsflagall:	OC
Lsdelev:	694		
Latitude:	45.4178496663		
Longitude:	-122.304298283		
Site id:	ORW500000011155		

22
SSE
1/2 - 1 Mile
Higher

OR WELLS **ORW500000001838**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Fid:	1837	Objectid:	1841
Logid:	CLAC 5797	Lstupdate:	01/01/1990
Establby:	KARL WOZNIAK	Xysource:	UNKNOWN
Horizerr:	1000	Sourceorg:	OWRD
Sourceowrd:	USGS WILLGW	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	9
Recwell:	9	Obsflagall:	Not Reported
Lsdelev:	875		
Latitude:	45.3941083084		
Longitude:	-122.286062876		
Site id:	ORW500000001838		

23
SW
1/2 - 1 Mile
Lower

OR WELLS **ORW500000004622**

Fid:	4621	Objectid:	4643
Logid:	CLAC 5828	Lstupdate:	01/01/1990
Establby:	KARL WOZNIAK	Xysource:	UNKNOWN
Horizerr:	1000	Sourceorg:	OWRD
Sourceowrd:	USGS WILLGW	Waypoint:	Not Reported
Welltag:	0		
Sownum:	0	Obswell:	N
Recwell:	9	Obsflagall:	ON
Lsdelev:	696		
Latitude:	45.3941817654		
Longitude:	-122.308187666		
Site id:	ORW500000004622		

24
North
1/2 - 1 Mile
Lower

OR WELLS **ORW500000007767**

Fid:	7766	Objectid:	7873
Logid:	CLAC 55291	Lstupdate:	05/23/2008
Establby:	KARL WOZNIAK	Xysource:	FINAL PROOF MAP & DOQ
Horizerr:	100	Sourceorg:	OWRD
Sourceowrd:	GWATER	Waypoint:	Not Reported
Welltag:	37051		
Sownum:	0	Obswell:	N
Recwell:	9	Obsflagall:	ON
Lsdelev:	740		
Latitude:	45.4196639624		
Longitude:	-122.297548613		
Site id:	ORW500000007767		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: OR Radon

Radon Test Results

Zipcode	Num Tests	Maximum	Minimum	Average	# > 4 pCi/L
97055	5	7.8	0.2	2.9	1

Federal EPA Radon Zone for CLACKAMAS County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory Data
Source: Oregon Geospatial Enterprise Office
Telephone: 503-378-2166

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Data
Source: Department of Water Resources
Telephone: 503-986-0843

OTHER STATE DATABASE INFORMATION

Oil and Gas Well Locations
Source: Department of Geology and Mineral Industries
Telephone: 971-673-1540
A listing of oil and gas well locations in the state.

RADON

State Database: OR Radon
Source: Oregon Health Services
Telephone: 503-731-4272
Radon Levels in Orgeon

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

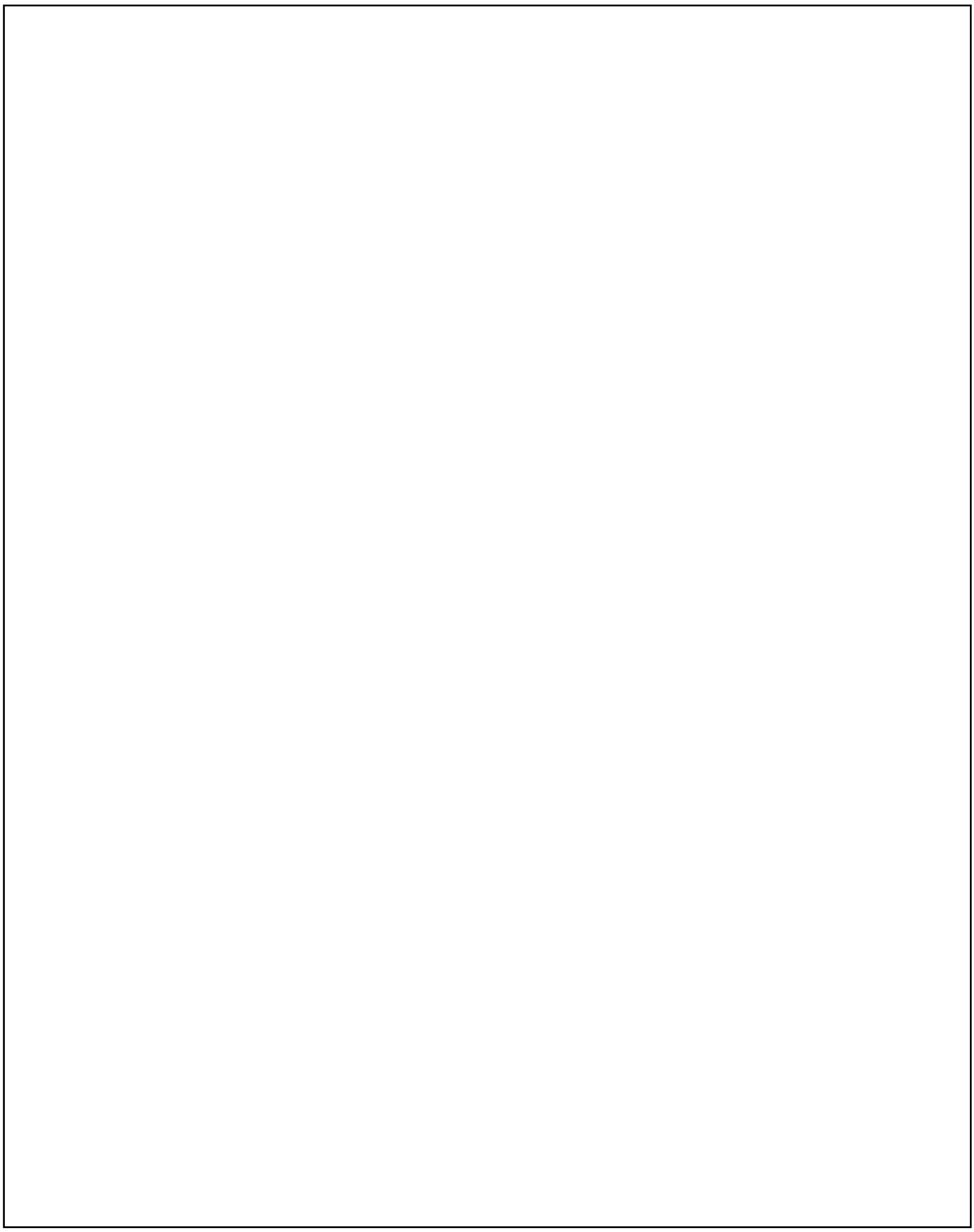
Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

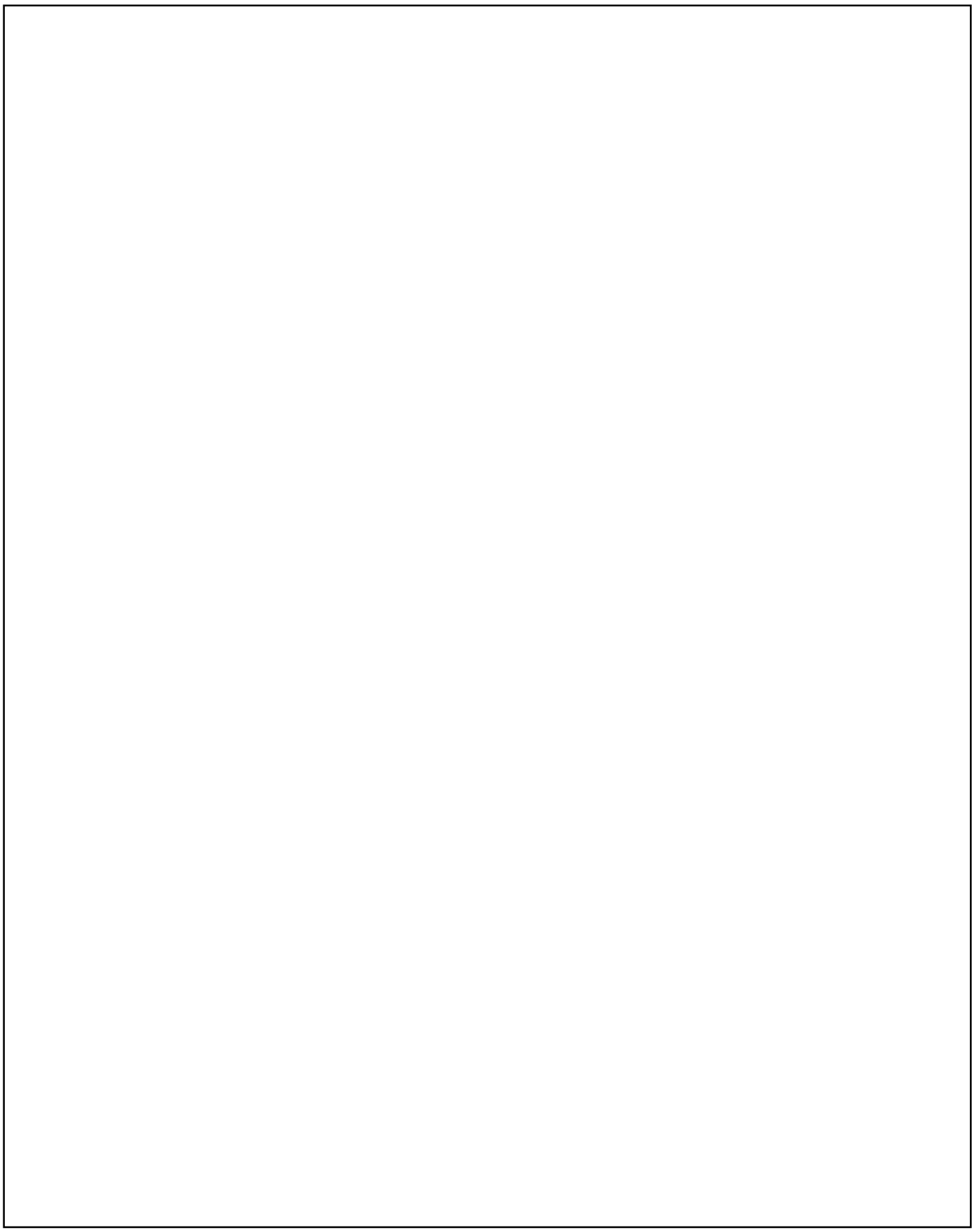
PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION



Appendix E:

Qualifications



Mr. Kauppi has a BA in Environmental Policy & Planning from Huxley College of the Environment at Western Washington University in 2002. He has been an accredited Asbestos Hazardous Emergency Response Act (AHERA) Building Inspection since 2003 (#BIR-13-043), 40-hour HAZWOPER Trained since 2003, and a Certified USTs Site Assessor (#821884) since 2007.

EP Certification: I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in 312.10 of this part.

AAI Certification: I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed all the appropriate inquiries in conformance with the standards and practices set in forth in 40 CFR Part 312.

Chad M. Kauppi, Environmental Professional

Mr. Trabusiner holds a BS in Environmental Engineering from Nova University in Florida, and he has been an accredited Asbestos Hazard Emergency Response Act (AHERA) Building Inspector since 1993 (#3509-06-17-02), Washington and Oregon USTs Site Assessor (#14359) and certified as an Oregon Soil Matrix cleanup specialist (#14360) since 1993. Mr. Trabusiner also has been a Certified Environmental Specialist with the National Environmental Assessment Association since 1995 (#1418), and has been working in his field since 1987.

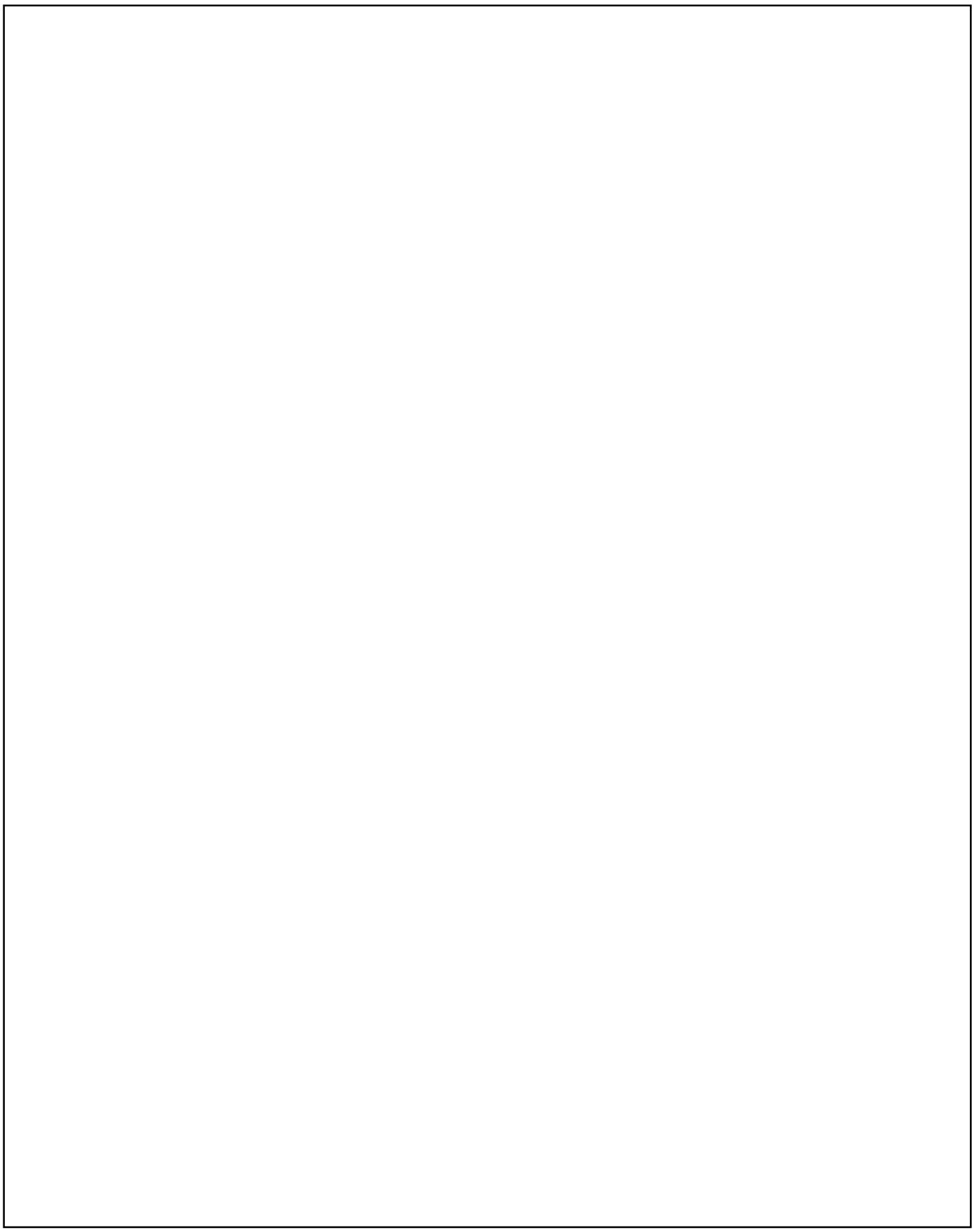
EP Certification: I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in 312.10 of this part.

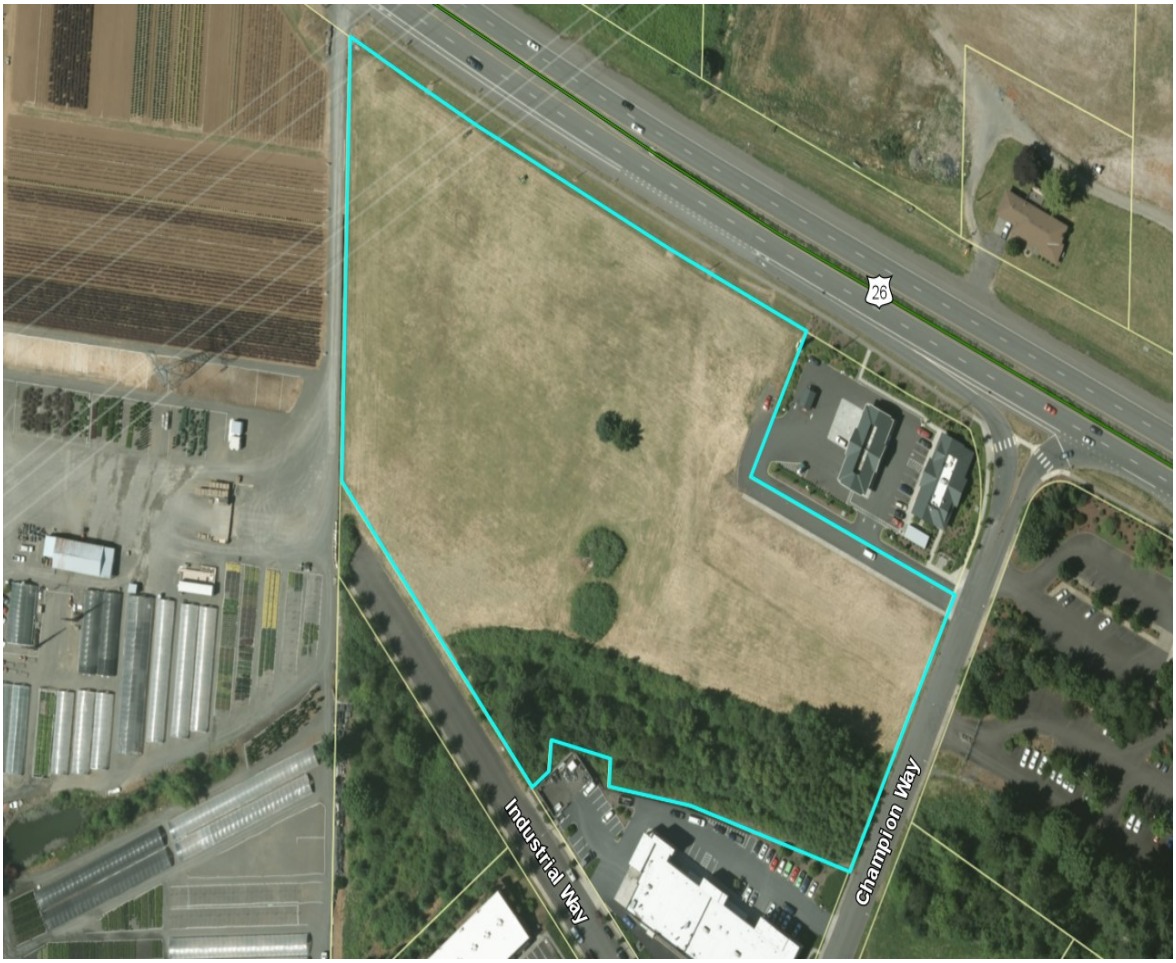
AAI Certification: I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Peter Trabusiner, Environmental Professional

Appendix F:

Additional Documentation





Primary Address: No Situs
Jurisdiction: Sandy (http://www.ci.sandy.or.us/)
Map Number: 24E15A
Taxlot Number: 24E15A 00209
Parcel Number: 01786197
Document Number: 2007-058373
Census Tract: 023401

Assessment

Estimated Acres: 8.13
Current Year Assessed Value: $1,150,008.00
Market Building Value: $0.00
Market Land Value: $1,884,636.00
Market Total Value: $1,884,636.00

Sale Price: $310,000.00
Doc Date: 07/02/2007
Doc Type: S
Taxcode: 046017

Schools

Public Safety

Nearest Fire Station

Sandy Station #72
17460 Bruns Ave, Sandy 97055
Sandy Fire Dist #72

Nearest Police Station

Sandy Police
38970 SE Proctor Blvd, Sandy 97055

Zoning & Development

Designation: Contact City
Urban Growth Boundary: SANDY UGB

Voting

Voting Precinct: 108
State House District: 52
State Senate District: 26
Congressional District: 3

Utilities & Districts

Environmental & Hazards

Flood

Likely not in a flood zone.
Likely not in a flood zone.

Wildfire

You may be at low to moderate risk.

Earthquake Hazard

You may be at a lower risk.

Soils

15C - Cazadero Silty Clay Loam, 7 To 12 Percent Slopes
15B - Cazadero Silty Clay Loam, 0 To 7 Percent Slopes
15C - Cazadero Silty Clay Loam, 7 To 12 Percent Slopes
24C - Cottrell Silty Clay Loam, 8 To 15 Percent Slopes

Approximate Elevation

746.00 ft

North Folk Dam Failure

Most likely not at risk of flooding due to dam failure

River Mill Dam Failure

Most likely not at risk of flooding due to dam failure

Timothy Dam Failure

Most likely not at risk of flooding due to dam failure

Parks

Nearby

Bell Street Fields (https://www.ci.sandy.or.us/maps/location/BellStreetFields)
37680 Bell St, Sandy
1.12 miles
Jonsrud Viewpoint Park (https://www.ci.sandy.or.us/junsrud-viewpoint-park)
15652 Bluff Rd, Sandy
1.17 miles
Salmon Creek Park (https://www.ci.sandy.or.us/maps/location/SalmonCreekPark)
35899 Chinook St, Sandy
0.55 miles
Sandy Bluff Park (https://www.ci.sandy.or.us/sandy-bluff-park-dog-park)
36801 Goldenrain St, Sandy
0.67 miles
Tickle Creek Park (https://www.ci.sandy.or.us/tickle-creek-park-trail)
Dubarko Rd, Sandy
0.60 miles

Documents

District Maps

Voting Precinct (http://clackamas.us/elections/documents/districts/pct108.pdf)
State House District (http://clackamas.us/elections/documents/districts/rep52.pdf)

Surveyor Documents

Survey - SN26759 (http://cmap.clackamas.us/survey/PSImages/2S4E/10/PS26759.TIF)
Survey - SN29073 (http://cmap.clackamas.us/survey/PSImages/2S4E/10/PS29073.tif)
Plat - 3341 (http://cmap.clackamas.us/survey/SDImages/2S4E/10/3341-P1.TIF)
Plat - 3341 (http://cmap.clackamas.us/survey/SDImages/2S4E/10/3341-P2.TIF)
Plat - 3341 (http://cmap.clackamas.us/survey/SDImages/2S4E/10/3341-P3.TIF)
Plat - 3341 (http://cmap.clackamas.us/survey/SDImages/2S4E/10/3341-P4.TIF)
Plat - 3341 (http://cmap.clackamas.us/survey/SDImages/2S4E/10/3341-P5.TIF)
Plat - PP2011-021 (http://cmap.clackamas.us/survey/SDImages/2S4E/10/PP2011-021-P1.TIF)
Plat - PP2011-021 (http://cmap.clackamas.us/survey/SDImages/2S4E/10/PP2011-021-P2.TIF)

Assessor Documents

Taxmap - 2S4E15A (http://cmap.clackamas.us/taxmap/03_2s4e15a.pdf)

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Carlson Geotechnical

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Eugene Office	(541) 345-0289
Salem Office	(503) 589-1252
Tigard Office	(503) 684-3460

EXHIBIT K

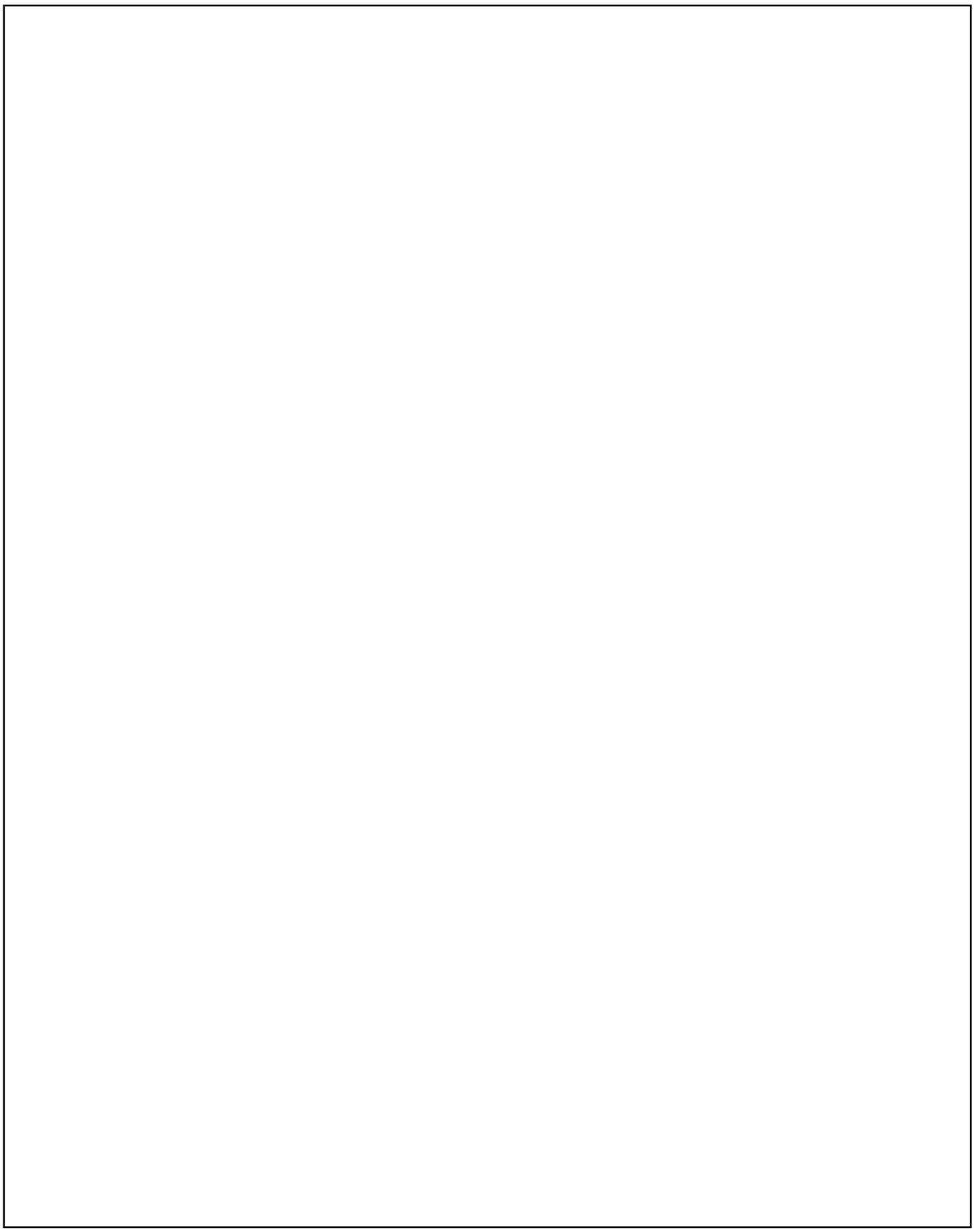
Report of
Geotechnical Investigation &
Infiltration Testing Services
TSC Sandy
Mt. Hood Highway & Champion Way
Sandy, Oregon

CGT Project Number G1804765

Prepared for

Hix Snedeker Companies
Attn: Ms. Lindsay Gadd
805 Trione Street
Daphne, Alabama 36526

February 16, 2018



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Hix Snedeker Companies
Attn: Ms. Lindsay Gadd
805 Trione Street
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Report of
Geotechnical Investigation &
Infiltration Testing Services
TSC Sandy
Mt. Hood Highway & Champion Way
Sandy, Oregon

CGT Project Number G1804765

Dear Ms. Gadd:

Carlson Geotechnical (CGT), a division of Carlson Testing, Inc. (CTI), is pleased to submit this report summarizing the results of our geotechnical investigation and infiltration testing services for the TSC Sandy project. The site consists of Tax Parcel 01786197, located southwest of the intersection of Mt. Hood Highway and Champion Way in Sandy, Oregon. We performed our work in general accordance with CGT Proposal GP7823, dated December 1, 2017. Written authorization for our services was provided on January 12, 2018.

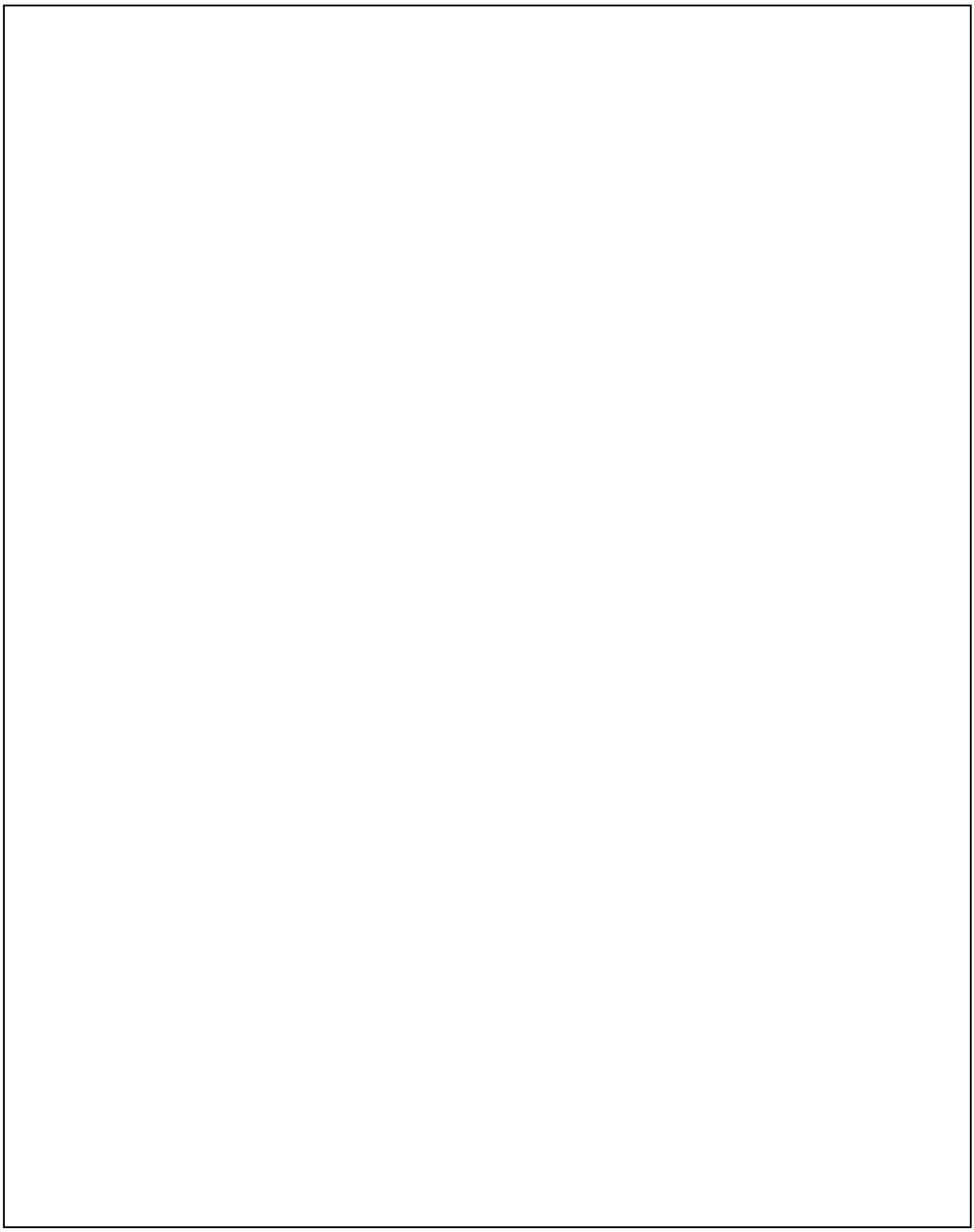
We appreciate the opportunity to work with you on this project. Please contact us at 503.601.8250 if you have any questions regarding this report.

Respectfully Submitted,
CARLSON GEOTECHNICAL

Kyle J. Smetana, E.I.T.
Geotechnical Project Manager
ksmetana@carlsontesting.com

Brad M. Wilcox, P.E., G.E.
Principal Geotechnical Engineer
bwilcox@carlsontesting.com

Doc ID: G:\GEOTECH\PROJECTS\2018 Projects\G1804765 - TSC Sandy\GEO - G1804765\008 - Deliverables\Report G1804765 - bmw review 02-14-18.doc



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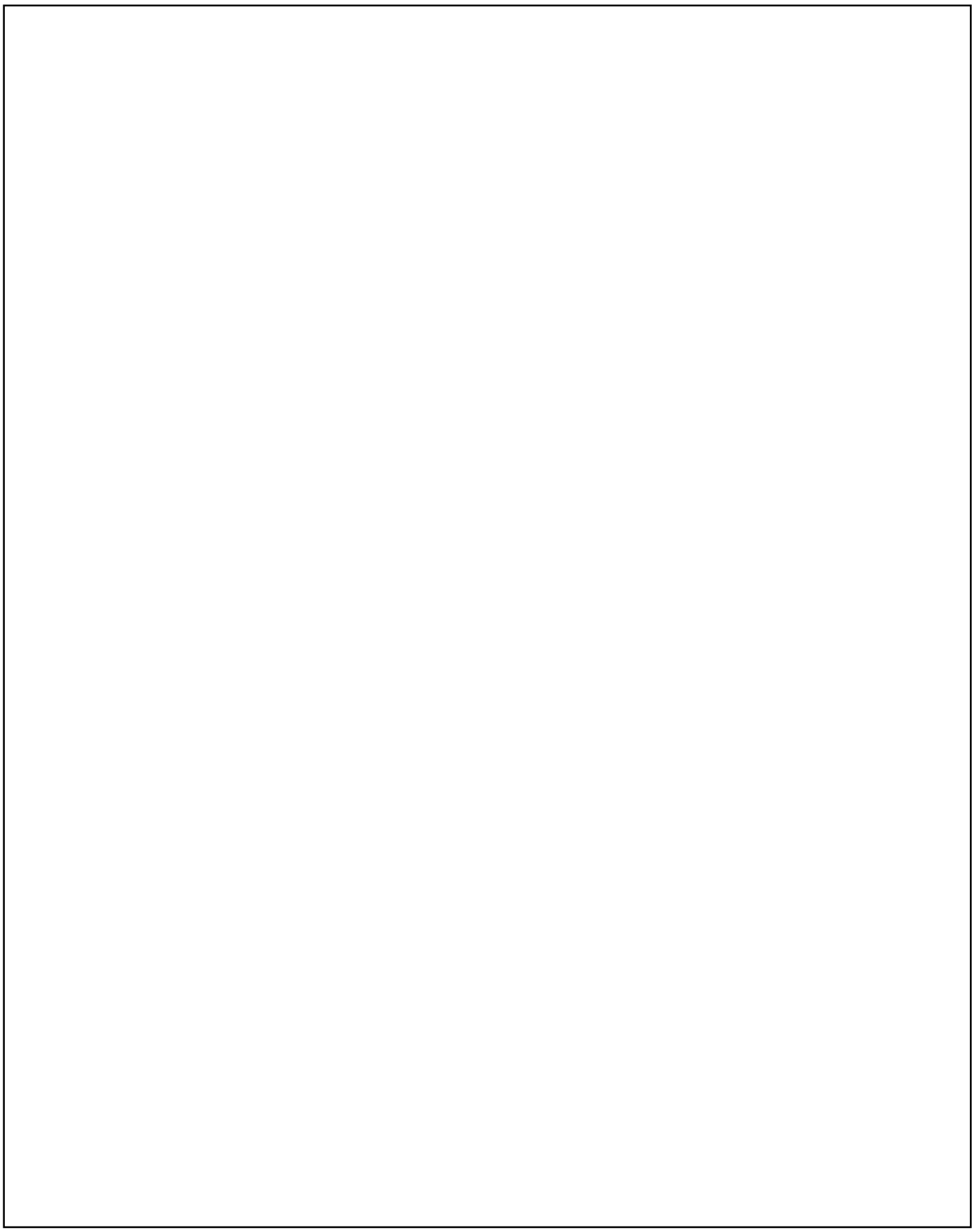
ATTACHMENTS



1.0 INTRODUCTION

Carlson Geotechnical (CGT), a division of Carlson Testing, Inc. (CTI), is pleased to submit this report summarizing the results of our geotechnical investigation and infiltration testing services for the TSC Sandy project. The site consists of Tax Parcel 01786197, located southwest of the intersection of Mt. Hood Highway and Champion Way in Sandy, Oregon, as shown on the attached Figure 1.

1.1 Project Information

Based on our correspondence and review of the provided conceptual grading plan dated December 14, 2017, we understand the project will include:

- Construction of an approximate 19,000-square-foot, one-story, commercial building at the northwest portion of the site. The building will be supported on conventional shallow foundations, masonry- and steel-framed, and incorporate concrete slab-on-grade floors. No below-grade levels (basements) are anticipated. Although no structural information has been provided, we have assumed maximum column, continuous wall, and uniform floor slab loads will be on the order of 50 kips, 3 kips per lineal foot (klf), and 200 pounds per square foot (psf).
- Construction of an approximate 15,000-square-foot, concrete slab-on-grade, outdoor display area. We understand a dry-storage building/shed will be located in the display area. The building/shed will be supported on conventional shallow foundations, masonry- and steel-framed, and incorporate concrete slab-on-grade floors. We have assumed maximum column, continuous wall, and uniform floor slab loads associated with this building will be on the order of 30 kips, 2 klf, and 200 psf.
- We understand permanent grade changes will include cuts of up to about 11 feet and fills up to about 20 feet in depth in order to achieve design grades. The majority of site cuts will occur within the north portion of the site, while the majority of structural fills will be placed within the southeast portion of the site. Retaining walls will be incorporated to achieve the desired grades. Based on preliminary discussions, we understand retaining walls will likely consist of concrete, cast-in-place, cantilevered walls. Design of the retaining walls will rest with others.
- Stormwater runoff from the new development may, in part, be managed on site. Details of the type of system and design, provided by others, are not known at this time. One infiltration test was performed at a depth of about 8 feet below ground surface (bgs) at the location requested by the project civil engineer.

1.2 Scope of Services

The purpose of our work was to explore subsurface conditions at the site in order to provide geotechnical engineering recommendations for design and construction of the proposed project. Our specific scope of services will include the following:

- Contact the Oregon Utilities Notification Center to mark the locations of public utilities within a 30-foot radius of our explorations at the site. CGT also subcontracted a private utility locator service to mark the locations of detectable private utilities within the same radius.
- Explore subsurface conditions at the site by observing the excavation of seven test pits to depths up to about 15 feet bgs. Details of the subsurface investigation are presented in Appendix A.
- Conduct one infiltration test at the site as requested by the project civil engineer. Infiltration test results are presented in Appendix B.
- Classify the materials encountered in the test pits in general accordance with American Society for Testing and Materials (ASTM) D2488 (Visual-Manual Procedure).

- Provide a technical narrative describing surface and subsurface deposits, and local geology of the site, based on the results of our explorations and published geologic mapping.
- Provide geotechnical recommendations for site preparation and earthwork.
- Provide geotechnical engineering recommendations for use in design and construction of shallow foundations, floor slabs, retaining walls, and pavements.
- Provide recommendations for the Seismic Site Class, mapped maximum considered earthquake spectral response accelerations, and site seismic coefficients.
- Provide a qualitative evaluation of seismic hazards at the site, including earthquake-induced liquefaction, landsliding, and surface rupture due to faulting or lateral spread.
- Provide this written report summarizing the results of our geotechnical investigation and recommendations for the project.

2.0 SITE DESCRIPTION

2.1 Site Geology

Available geologic mapping[1] indicates the site is underlain by Pliocene-Pleistocene Gravels. These include weakly indurated, cobbly and bouldery gravel and associated pyroclastic mudflows. Extensive weathering has produced a reddish-brown clayey soil. This soil is up to 400 feet thick and is exposed throughout Sandy, Estacada, and Damascus.

2.2 Site Surface Conditions

The approximate 3.6-acre site is bordered by Mt. Hood Highway to the north, Industrial Way and a vegetated area to the south, a grass-covered area to the west, and a grass-covered area, fuel station, and convenience mart to the east. At the time of our field investigation, the site was primarily grass-covered with a few small trees and shrubs, and descended gently to the south-southwest at gradients up to about 5H:1V (vertical:horizontal). The existing and proposed topography, as well as the planned development, are shown on the attached Site Plan, Figure 2. Photographs taken at the time of our investigation are shown on the attached Site Photographs, Figure 3.

2.3 Subsurface Conditions

2.3.1 Subsurface Investigation & Laboratory Testing

Our field investigation consisted of the excavation of seven test pits on January 23, 2018. The approximate exploration locations are shown on the Site Plan, Figure 2. Additional details of the explorations and laboratory testing performed on selected samples are presented in the attached Appendix A. Logs of the test pits are presented therein as Figures A3 through A9. Section 2.3.2 describes each of the subsurface materials encountered at the site.

2.3.2 Subsurface Materials

2.3.2.1 *Silt Topsoil Fill (OL FILL)*

Silt topsoil fill was encountered at the surface of the test pits and was about 8 inches thick. The silt topsoil fill was generally dark brown, moist, and contained organics.

[1] Schlicker, H.G. and Finlayson, C.T., 1979, Geology and geologic hazards of northwest Clackamas County: Oregon Department of Geology and Mineral Industries, Bulletin 99, scale 1:24,000.

2.3.2.2 *Undocumented Silt Fill (ML FILL)*

Undocumented silt fill was encountered beneath the topsoil within TP-3 and extended to about 1½ feet bgs. Undocumented fill refers to materials placed without (available) records of subgrade conditions or evaluation of compaction. The silt fill was generally dark brown, moist, and exhibited low plasticity.

2.3.2.3 *Undocumented Fat Clay Fill (CH FILL)*

Undocumented fat clay fill was encountered beneath the silt fill within TP-3 and beneath the silt topsoil within the remaining test pits. The fat clay fill extended to depths ranging from about 2½ to 3½ feet bgs. The fat clay fill was generally red-brown, moist to wet, exhibited medium to high plasticity, and in some instances contained trace fine organics.

2.3.2.4 Fat Clay (CH)

Native fat clay (CH) was encountered beneath the undocumented fill within the test pits and extended to the full depths explored, up to about 15 feet bgs. This soil was typically medium stiff to hard, light to red-brown, moist to wet, and exhibited medium to high plasticity. This material was blocky in structure (resembling residual soils) below depths ranging from about 3 to 5 feet bgs in some of the test pits.

2.4 Groundwater

Groundwater was not encountered within the depths explored on January 23, 2018. To help assess local groundwater levels, we researched available well logs located within Section 10, Township 2 South, Range 4 East, Willamette Meridian on the Oregon Water Resources Department (OWRD)[2] website. Our review indicated that groundwater levels in the area varied with surface elevations and generally ranged from about 107 to 200 feet bgs. It should be noted that groundwater levels vary with local topography. In addition, the groundwater levels reported on the OWRD logs often reflect the purpose of the well, so water well logs may only report deeper, confined groundwater, while geotechnical or environmental borings will often report any groundwater encountered, including shallow, unconfined groundwater. Therefore, the levels reported on the OWRD well logs referenced above are considered generally indicative of local water levels and may not reflect actual groundwater levels at the project site. The depth to groundwater map for the Portland area[3] indicates groundwater is present at about 65 to 85 feet bgs in the vicinity of the site. It should be noted that the levels reported by the referenced map are average values for a given location and incorporate a degree of uncertainty, in this case described as “Low”.

3.0 SEISMIC CONSIDERATIONS

3.1 Seismic Design

Section 1613.3.2 of the 2014 Oregon Structural Specialty Code (2014 OSSC) requires that the determination of the seismic site class be based on subsurface data in accordance with Chapter 20 of the American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures (ASCE 7). Based on the results of the explorations and review of geologic mapping, we have assigned the site as Site Class D for the subsurface conditions encountered. Earthquake ground motion parameters for the site were obtained based on the United States Geological Survey (USGS) Seismic Design Values for Buildings - Ground Motion

[2] Oregon Water Resources Department, 2018. Well Log Records, *accessed February 2018*, from OWRD web site: http://apps.wrd.state.or.us/apps/gw/well_log/.

[3] Snyder, D.T., 2008. Estimated depth to ground water and configuration of the water table in the Portland, Oregon area: U.S. Geological Survey, Scientific Investigations Report SIR-2008-5059, scale 1:60,000. A*ccessed February 2018* from USGS web site: https://or.water.usgs.gov/projs_dir/puz/.

Parameter Web Application[4]. The site Latitude 45.405976° North and Longitude 122.296282° West were input as the site location. The following table shows the recommended seismic design parameters for the site.

Table 1 Seismic Ground Motion Values (2014 OSSC)

Parameter		Value
Mapped Acceleration Parameters	Spectral Acceleration, 0.2 second (S_s)	0.784g
	Spectral Acceleration, 1.0 second (S_1)	0.341g
Coefficients (Site Class D)	Site Coefficient, 0.2 sec. (F_A)	1.186
	Site Coefficient, 1.0 sec. (F_V)	1.719
Adjusted MCE Spectral Response Parameters	MCE Spectral Acceleration, 0.2 sec. (S_{MS})	0.931g
	MCE Spectral Acceleration, 1.0 sec. (S_{M1})	0.586g
Design Spectral Response Accelerations	Design Spectral Acceleration, 0.2 seconds (S_{DS})	0.620g
	Design Spectral Acceleration, 1.0 second (S_{D1})	0.390g
Seismic Design Category		D

3.2 Seismic Hazards

3.2.1 Liquefaction

In general, liquefaction occurs when deposits of loose/soft, saturated, cohesionless soils, generally sands and silts, are subjected to strong earthquake shaking. If these deposits cannot drain quickly enough, pore water pressures can increase, approaching the value of the overburden pressure. The shear strength of a cohesionless soil is directly proportional to the effective stress, which is equal to the difference between the overburden pressure and the pore water pressure. When the pore water pressure increases to the value of the overburden pressure, the shear strength of the soil approaches zero, and the soil can liquefy. The liquefied soils can undergo rapid consolidation or, if unconfined, can flow as a liquid. Structures supported by the liquefied soils can experience rapid, excessive settlement, shearing, or even catastrophic failure.

For fine-grained soils, susceptibility to liquefaction is evaluated based on penetration resistance and plasticity, among other characteristics. Criteria for identifying non-liquefiable, fine-grained soils are constantly evolving. Current practice[5] to identify non-liquefiable, fine-grained soils is based on plasticity characteristics of the soils, as follows: (1) liquid limit greater than 47 percent, (2) plasticity index greater than 20 percent, and (3) moisture content less than 85 percent of the liquid limit. Soils identified as susceptible to liquefaction are analyzed using the industry standard "simplified procedure", originally published by Seed and Idriss[6] in 1971 and updated continually since that time. The susceptibility of sands, gravels, and sand-gravel mixtures to liquefaction is typically assessed based on penetration resistance, as measured using SPTs, CPTs, or Becker Hammer Penetration tests (BPTs).

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[4] United States Geological Survey, 2018. Seismic Design Parameters determined using:, "U.S. Seismic Design Maps Web Application," *accessed February 2018*, from the USGS website http://earthquake.usgs.gov.

[5] Seed, R.B. et al., 2003. Recent Advances in Soil Liquefaction Engineering: A Unified and Consistent Framework. Earthquake Engineering Research Center Report No. EERC 2003-06.

[6] Seed, H.B., and Idriss, I.M., 1971, Simplified Procedure for Evaluating Soil Liquefaction Potential, Journal of Geotechnical Engineering Division, ASCE, 97(9), 1249-1273.

Based on the lack of saturated conditions and their medium to high plasticity, the fat clay soils encountered at the site are considered non-liquefiable within the depths explored. Earthquake mapping[7] indicates the site does not have a potential for liquefaction. Therefore, the risk of liquefaction at the site is considered very low to negligible.

3.2.2 Slope Instability

HazVu[7] indicates a low to moderate hazard due to landsliding for the site. No obvious signs of recent slope instability were noted during our field investigation. Provided the recommendations presented later in this report for grading and stormwater management are incorporated into construction, we conclude the risk of seismically-induced slope instability at the site is low.

3.2.3 Surface Rupture

3.2.3.1 Faulting

Although the site is situated in a region of the country with known active faults and historic seismic activity, no known faults exist on or immediately adjacent to the site. Therefore, the risk of surface rupture at the site due to faulting is considered low.

3.2.3.2 Lateral Spread

Surface rupture due to lateral spread can occur on sites underlain by liquefiable soils that are located on or immediately adjacent to slopes steeper than about 3 degrees (20H:1V), and/or adjacent to a free face, such as a stream bank or the shore of an open body of water. During lateral spread, the materials overlying the liquefied soils are subject to lateral movement downslope or toward the free face. Given the lack of liquefiable soils at the site, the risk of lateral spread is considered negligible.

4.0 CONCLUSIONS

4.1 Overview

Based on the results of our field explorations and analyses, the site may be developed as described in Section 1.1 of this report, provided the recommendations presented in this report are incorporated into the design and development. We conclude the primary geotechnical considerations at this site include:

- The presence of moderately compressible native soils and proposed grade changes, most notably the relatively deep fills proposed within the south portion of the site.
- The presence of approximately 2½ to 3½ feet of undocumented fill materials at the site.
- The presence of potentially expansive soils (high plasticity fine-grained soils) and requirement for mitigation (where encountered at design subgrade elevations) for building foundations, floor slabs, and pavements.
- The moisture sensitivity of the on-site soils and their susceptibility to disturbance during wet weather.

These considerations are described in more detail in the following sections.

[7] Oregon Department of Geology and Mineral Industries, 2017. Oregon Statewide Geohazards Viewer, accessed February 2018, from DOGAMI web site: http://www.oregongeology.org/sub/hazvu/index.htm.

4.2 Proposed Grading Plans

Laboratory testing of the native, near-surface, fat clay (CH) indicated the material is moderately compressible. Based on review of the updated drawings, permanent grade changes in the area of the proposed building will be relatively minor, with cuts and fills up to about 5 feet and 3 feet in depth, respectively. Geotechnical recommendations for building pad preparation are presented in Section 5.1 of this report. Geotechnical recommendations for use in design and construction of shallow foundations associated with the proposed building are presented in Section 5.6 of this report. In the event that structural (column and continuous wall) loads for the building will be above those described in Section 1.1 of this report, the geotechnical engineer should be consulted to review the proposed construction.

Cuts up to about 8 feet in depth are planned within the northeast parking lot area and a retaining wall will be constructed to retain site cuts. Geotechnical recommendations for use in planning of temporary excavations at the site are presented in Section 5.2 of this report. Geotechnical recommendations for use in design and construction of the north site retaining wall are presented in Section 5.7 of this report.

The updated drawings indicate the south portion of the site will receive up to about 20 feet of structural fill in order to achieve design site grades, and a retaining wall of similar height will be constructed to retain site fills. Recognizing the presence of the moderately compressive fat clay and significant changes in site grades, supplemental (deeper) geotechnical investigation of the south portion of the site is recommended in order to develop finalized recommendations for site grading, as well as design and construction of the south site retaining wall. Supplemental geotechnical explorations are outside the scope of this current assignment, but can be provided, upon request, for an additional fee.

4.3 Undocumented Fill Materials

As indicated above, undocumented fill soils were encountered at the surface of each test pit and extended to depths of about 2½ to 3½ feet bgs. The undocumented fill consisted primarily of fat clay soils (CH FILL) and ranged from medium stiff to very stiff, based on pocket penetrometer readings taken within the test pit. Observation of digging effort during test pit excavation indicated variability in relatively compaction of the undocumented fill soils. To the best of our knowledge, there is no documentation available related to the placement and compaction of the existing fill materials at the site. Anecdotally, we anticipate the fill materials were placed as part of previous earthwork within the nearby commercial developments. Earthwork records could be sought to confirm these assumptions and provide more information. Due to its variable consistency, we conclude the existing fill materials were <u>not</u> compacted in accordance with typical code requirements for structural fill. Where encountered at design subgrade elevations for shallow foundations, floor slabs, pavements, or structural fills, we recommend existing fill materials be completely over-excavated and replaced with structural fill. Over-excavated, inorganic, fill materials may be re-used as structural fill at the site, provided they are prepared in conformance with Section 5.4.1 of this report.

4.4 Potentially Expansive Soils

Laboratory testing of the native fat clay (CH) showed plasticity indices ranging from 34 to 35, indicating the soil exhibits high plasticity and a high expansion potential[8]. This refers to the potential for changes in soil volume (shrinking or swelling) in response to changes in moisture content. Footings, floor slabs, and pavements directly supported on expansive soils are susceptible to differential movements, possibly resulting

[8] Drawn from Table 9.1 of Foundation Engineering Handbook,

in stress cracking, caused by the shrink/swell movements of this soil. Where encountered at design subgrade elevations, provisions to mitigate the effects of shrink/swell movements of this soil will need to be undertaken. Geotechnical recommendations for treatment of this potentially expansive soil are presented later in this report.

4.5 Moisture Sensitive Soils

Due to their fine-grained nature, the near surface clayey soils are susceptible to disturbance during wet weather. Trafficability of these soils may be difficult, and significant damage to the subgrade could occur, if earthwork is undertaken without proper precautions at times when the exposed soils are more than a few percentage points above optimum moisture content. In the event that construction occurs during wet weather, we recommend measures be implemented to protect the fine-grained subgrade in areas of repeated construction traffic and in foundation bearing areas. Geotechnical recommendations for wet weather construction are presented in Section 5.3 of this report. Re-use of these soils as structural fill during wet times of the year will require special consideration as discussed in Section 5.4.1.1 of this report.

5.0 RECOMMENDATIONS

The recommendations presented in this report are based on the information provided to us, results of our field investigation and analyses, laboratory data, and professional judgment. CGT has observed only a small portion of the pertinent subsurface conditions. The recommendations are based on the assumptions that the subsurface conditions do not deviate appreciably from those found during the field investigation. CGT should be consulted for further recommendations if the design of the proposed development changes and/or variations or undesirable geotechnical conditions are encountered during site development.

5.1 Site Preparation

5.1.1 Stripping & Fill Over-Excavation

Existing vegetation, rooted soils, and undocumented fill soils (OL FILL, ML FILL, CH FILL) should be removed from within, and for a minimum 5-foot margin around, proposed structural fill, building pad, and pavement areas. Based on the results of our field explorations, undocumented fill soils encountered at the site extended to depths of about 2½ to 3½ feet bgs. These materials may be deeper or shallower at locations away from the completed explorations. The geotechnical engineer or his representative should provide recommendations for actual stripping depths based on observations during site stripping. Stripped surface vegetation and rooted soils should be transported off-site for disposal, or stockpiled for later use in landscaped areas. Stripped, inorganic fill materials should be transported off-site for disposal, or may be stockpiled for later use as structural fill as described in Section 5.4.1 of this report.

5.1.2 Grubbing

Grubbing of trees and shrubs should include the removal of the root mass and roots greater than ½-inch in diameter. Grubbed materials should be transported off-site for disposal. Root masses from larger trees may extend greater than 3 feet bgs. Where root masses are removed, the resulting excavation should be properly backfilled with structural fill in conformance with Section 5.4 of this report.

5.1.3 Test Pit Backfills

The test pits conducted at the site were loosely backfilled during our field investigation. Where test pits are located within finalized building, structural fill, or pavement areas, the loose backfill materials should be re-

excavated. The resulting excavations should be backfilled with structural fill in conformance with Section 5.4 of this report.

5.1.4 Existing Utilities & Below-Grade Structures

All existing utilities at the site should be identified prior to excavation. Abandoned utility lines beneath the new building, pavements, and hardscaping features should be completely removed or grouted full. Soft, loose, or otherwise unsuitable soils encountered in utility trench excavations should be removed and replaced with structural fill in conformance with Section 5.4 this report. Buried structures (i.e. footings, foundation walls, retaining walls, slabs-on-grade, tanks, etc.), if encountered during site development, should be completely removed and replaced with structural fill in conformance with Section 5.4 of this report.

5.1.5 Subgrade Preparation – Building Pads, Pavement Areas & Areas to Receive Structural Fill

5.1.5.1 Dry Weather Construction

After site preparation as recommended above, but prior to placement of structural fill and/or aggregate base, the geotechnical engineer or his representative should observe a proof roll test of the exposed subgrade soils in order to identify areas of excessive yielding. Proof rolling of subgrade soils is typically conducted during dry weather conditions using a fully-loaded, 10- to 12-cubic-yard, tandem-axle, tire-mounted, dump truck or equivalent weighted water truck. Areas that appear too soft and wet to support proof rolling equipment should be prepared in general accordance with the recommendations for wet weather construction presented in Section 5.3 of this report. If areas of soft soil or excessive yielding are identified, the affected material should be over-excavated to firm, stable subgrade, and replaced with imported granular structural fill in conformance with Section 5.4.2.2 of this report.

5.1.5.2 Wet Weather Construction

Preparation of subgrade soils during wet weather should be in conformance with Section 5.3 of this report. As indicated therein, increased granular fill (working surfaces) and a geotextile separation fabric may be required in wet conditions in order to support construction traffic and protect the subgrade.

5.1.5.3 Treatment of High Plasticity Fat Clay

Where high plasticity (potentially expansive) fat clay (CH) is encountered at design subgrade elevations for building pads and pavements, the subgrade soils should be kept moist, near optimum moisture content, and not allowed to dry out. If allowed to dry below optimum moisture content, to a point where surface cracking appears in the subgrade, the affected material should be over-excavated and replaced with structural fill in conformance with Section 5.4 of this report.

5.1.6 Erosion Control

Erosion and sedimentation control measures should be employed in accordance with applicable City, County, and State regulations.

5.2 Temporary Excavations

5.2.1 Overview

Conventional earthmoving equipment in proper working condition should be capable of making necessary excavations for the anticipated site cuts as described earlier in this report. All excavations should be in accordance with applicable OSHA and state regulations. It is the contractor's responsibility to select the excavation methods, to monitor site excavations for safety, and to provide any shoring required to protect

personnel and adjacent improvements. A "competent person", as defined by OR-OSHA, should be on-site during construction in accordance with regulations presented by OR-OSHA. CGT's current role on the project does not include review or oversight of excavation safety.

5.2.2 OSHA Soil Type

For use in the planning and construction of temporary excavations up to 10 feet in depth, an OSHA soil type of "A" can be used for the fine-grained fat clay (CH) encountered near the surface of the site.

5.2.3 Utility Trenches

Temporary trench cuts should stand near vertical to depths of approximately 4 feet in the native, fat clay (CH) encountered near the surface of the site. If groundwater seepage undermines the stability of the trench, or if sidewall caving is observed during excavation, the sidewalls should be flattened or shored. Depending on the time of year trench excavations occur, trench dewatering may be required in order to maintain dry working conditions. Pumping from sumps located within the trench will likely be effective in removing water resulting from seepage. If groundwater is encountered, we recommend placing trench stabilization material at the base of the excavations. Trench stabilization material should be in conformance with Section 5.4.2.4.

5.2.4 Excavations Near Foundations

Excavations near footings should not extend within a 1½H:1V (horizontal:vertical) plane projected out and down from the outside, bottom edge of the footings. In the event excavation needs to extend below the referenced plane, temporary shoring of the excavation and/or underpinning of the subject footing may be required. The geotechnical engineer should be consulted to review proposed excavation plans for this design case to provide specific recommendations.

5.2.5 Draping of Cut Slopes

In wet weather conditions, we recommend temporary cut slopes in excess of 4 feet in height (created during construction) be draped with minimum 10-mil plastic sheeting (e.g. polyethylene). Draping of cut slopes less than 4 feet in height may also be performed. The draping should extend from the base of the cut slope and back from the top of the cut slope sufficient to limit runoff from flowing under the covering. The plastic sheets should be lapped sufficiently to prevent water from flowing directly onto the slope and should extend at least several feet beyond each side of the cut area. The plastic should be weighted or otherwise anchored so that it remains on the slope during construction. Runoff from the sheeting should not be allowed to pond or infiltrate into the subsurface at the toe of the slope, but should be collected and diverted away from the cut slope to a suitable discharge point.

5.3 Wet Weather Considerations

For planning purposes, the wet season should be considered to extend from late September to late June. It is our experience that dry weather working conditions should prevail between early July and mid-September. Notwithstanding the above, soil conditions should be evaluated in the field by the geotechnical engineer or their representative at the initial stage of site preparation to determine whether the recommendations within this section should be incorporated into construction.

5.3.1 Overview

Due to the fines content, the on-site fat clay (CH) soils are susceptible to disturbance during wet weather. Trafficability of these soils may be difficult, and significant damage to subgrade soils could occur, if earthwork is undertaken without proper precautions at times when the exposed soils are more than a few percentage points above optimum moisture content. For wet weather construction, site preparation activities may need to be accomplished using track-mounted equipment, loading removed material onto trucks supported on granular haul roads, or other methods to limit soil disturbance. The geotechnical engineer or their representative should evaluate the subgrade during excavation by probing rather than proof rolling. Soils that have been disturbed during site preparation activities, or soft or loose areas identified during probing, should be over-excavated to firm, stable subgrade, and replaced with imported granular structural fill in conformance with Section 5.4.2.2.

5.3.2 Geotextile Separation Fabric

We recommend a geotextile separation fabric be placed to serve as a barrier between the prepared subgrade and granular fill/base rock in areas of repeated or heavy construction traffic. The geotextile fabric should meet the requirements presented in the current Oregon Department of Transportation (ODOT) Standard Specification for Construction, Section 02320.

5.3.3 Granular Working Surfaces (Haul Roads & Staging Areas)

Haul roads subjected to repeated heavy, tire-mounted, construction traffic (e.g. dump trucks, concrete trucks, etc.) will require a minimum of 18 inches of imported granular material. For light staging areas, 12 inches of imported granular material is typically sufficient. Additional granular material, geo-grid reinforcement or cement amendment may be recommended based on site conditions and/or loading at the time of construction. The imported granular material should be in conformance with Section 5.4.2.2 and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. The prepared subgrade should be covered with geotextile fabric (Section 5.3.2) prior to placement of the imported granular material. The imported granular material should be placed in a single lift (up to 24 inches deep) and compacted using a smooth-drum, non-vibratory roller until well-keyed.

5.3.4 Footing Subgrade Protection

A minimum of 3 inches of imported granular material is recommended to protect fine-grained, footing subgrades from foot traffic during inclement weather. The imported granular material should be in conformance with Section 5.4.2.2. The maximum particle size should be limited to 1 inch. The imported granular material should be placed in one lift over the prepared, undisturbed subgrade, and compacted using non-vibratory equipment until well keyed.

5.4 Structural Fill

The geotechnical engineer should be provided the opportunity to review all materials considered for use as structural fill (prior to placement). Samples of the proposed fill materials should be submitted to the geotechnical engineer a minimum of 5 business days prior their use on site[9]. The geotechnical engineer or their representative should be contacted to evaluate compaction of structural fill as the material is being placed. Evaluation of compaction may take the form of in-place density tests and/or proof roll tests with

[9] Laboratory testing for moisture density relationship (Proctor) is required. Tests for gradation may be required.

suitable equipment. Structural fill should be evaluated at intervals not exceeding every 2 vertical feet as the fill is being placed.

5.4.1 On-Site Soils – General Use

5.4.1.1 Silt Fill (ML Fill)

Re-use of this soil as structural fill may be difficult because it is sensitive to small changes in moisture content and are difficult, if not impossible, to adequately compact during wet weather. We anticipate the moisture content of this soil will be higher than the optimum moisture content for satisfactory compaction. Therefore, moisture conditioning (drying) should be expected in order to achieve adequate compaction. If used as structural fill, this soil should be free of organic matter, debris, and particles larger than 4 inches. When used as structural fill, this soil should be placed in lifts with a maximum pre-compaction thickness of about 8 inches at moisture contents within -1 and +3 percent of optimum, and compacted to not less than 92 percent of the material's maximum dry density, as determined in general accordance with ASTM D1557 (Modified Proctor).

5.4.1.2 High Plasticity Fat Clay Soils (CH FILL, CH)

The recommendations presented in Section 5.4.1.1 of this report are applicable for re-using this on-site soil as structural fill, with the following considerations:

- The material should be capped with a minimum of 18 inches of granular fill where intended to support a structural feature (e.g. floor slabs, hardscaping feature, pavements).
- Treating this soil with Portland cement (if considered) may be difficult due to its high plasticity. If considered, we recommend supplemental testing of the fat clay blended with Portland cement be performed to evaluate the response of the soil to cement. Alternative treatment agent(s), such as lime, may be considered subject to review of the geotechnical engineer.

If the on-site materials cannot be properly moisture-conditioned and/or processed, we recommend using imported granular material for structural fill.

5.4.2 Imported Fill (General Use)

5.4.2.1 Imported Material(s) with Appreciable Fines Content

Imported fill materials with a relatively high concentration of fines (e.g. clay- to silt-sized particles) may be considered for use as structural fill during mass grading. For the purposes of discussion, a fill material containing more than 12 percent passing the U.S. Standard No. 200 Sieve constitutes a material with relatively high concentration of fines. Subject to the review of the geotechnical engineer, fill material(s) meeting this designation may be used as structural fill (general use) at the site, provided they can be moisture-conditioned and compacted in conformance with the recommendations presented in Section 5.4.1 of this report, and are free of organic matter, debris, and particles larger than 4 inches. Fill materials with a high concentration of fines are best suited for use during dry weather conditions, as they inherently are sensitive to changes in moisture content and are difficult, if not impossible, to adequately compact during wet weather. Specific recommendations for placement and compaction of imported fill materials with appreciable fines content can be provided by the geotechnical engineer on a case-by-case basis.

5.4.2.2 Imported Granular Fill with Low Fines Content

Imported granular fill should consist of angular pit or quarry run rock, crushed rock, or crushed gravel that is fairly well graded between coarse and fine particle sizes. The granular fill should contain no organic matter,

debris, or particles larger than 4 inches, and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. The percentage of fines can be increased to 12 percent of the material passing the U.S. Standard No. 200 Sieve if placed during dry weather, and provided the fill material is moisture-conditioned, as necessary, for proper compaction. As a guideline, grading of this material with particles up to about 4 inches in diameter may follow that presented in the following table.

Table 2 Guideline Gradation of Coarse-Grained Imported Granular Fill w/ Low Fines Content

Sieve Size	% Passing
4 inches	100
3 inches	88 – 100
¾-inch	70 – 90
U.S. Standard No. 4	40 – 60
U.S. Standard No. 40	20 – 40
U.S. Standard No. 200	Dry Weather: Less than 12
	Wet Weather: Less than 5

Imported granular fill material should be compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor). Granular fill materials with high percentages of particle sizes in excess of 1½ inches are considered non-moisture-density testable materials. As an alternative to conventional density testing, compaction of these materials should be evaluated by periodic deflection (proof roll) testing in accordance with ODOT Test Method 158. Proof roll tests should be performed at maximum intervals of every 1 vertical foot as the fill is being placed.

5.4.2.3 Floor Slab Base Rock

Floor slab base rock should consist of well-graded granular material (crushed rock) containing no organic matter or debris, have a maximum particle size of ¾ inch, and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. Floor slab base rock should be placed in one lift and compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor). We recommend "choking" the surface of the base rock with sand just prior to concrete placement. Choking means the voids between the largest aggregate particles are filled with sand, but does not provide a layer of sand above the base rock. Choking the base rock surface reduces the lateral restraint on the bottom of the concrete during curing.

5.4.2.4 Trench Base Stabilization Material

If groundwater is present at the base of utility excavations, trench base stabilization material should be placed. Trench base stabilization material should consist of a minimum of 1 foot of well-graded granular material with a maximum particle size of 4 inches and less than 5 percent material passing the U.S. Standard No. 4 Sieve. The material should be free of organic matter and other deleterious material, placed in one lift (up to 24 inches thick), and compacted until well-keyed.

5.4.2.5 Trench Backfill Material

Trench backfill for the utility pipe base and pipe zone should consist of granular material as recommended by the utility pipe manufacturer. Trench backfill above the pipe zone should consist of well-graded granular material containing no organic matter or debris, have a maximum particle size of ¾ inch, and have less than 8 percent material passing the U.S. Standard No. 200 Sieve. As a guideline, trench backfill should be placed in maximum 12-inch-thick lifts. The earthwork contractor may elect to use alternative lift thicknesses based on their experience with specific equipment and fill material conditions during construction in order to achieve

the required compaction. The following table presents recommended relative compaction percentages for utility trench backfill.

Table 3 Utility Trench Backfill Compaction Recommendations

Backfill Zone	Recommended Minimum Relative Compaction	
	Structural Areas[1]	Landscaping Areas
Pipe Base and Within Pipe Zone	90% ASTM D1557 or pipe manufacturer's recommendation	88% ASTM D1557 or pipe manufacturer's recommendation
Above Pipe Zone	92% ASTM D1557	90% ASTM D1557
Within 3 Feet of Design Subgrade	95% ASTM D1557	90% ASTM D1557

[1]Includes proposed building, pavement areas, structural fill areas, exterior hardscaping, etc.

5.4.3 Controlled Low-Strength Material (CLSM)

CLSM is a self-compacting, cementitious material that is typically considered when backfilling localized areas. CLSM is sometimes referred to as "controlled density fill" or CDF. Due to its flowable characteristics, CLSM typically can be placed in restricted-access excavations where placing and compacting fill is difficult. If chosen for use at this site, we recommend the CLSM be in conformance with Section 00442 of the most recent, State of Oregon, Standard Specifications for Highway Construction. The geotechnical engineer's representative should observe placement of the CLSM and obtain samples for compression testing in accordance with ASTM D4832. As a guideline, for each day's placement, two compressive strength specimens from the same CLSM sample should be tested. The results of the two individual compressive strength tests should be averaged to obtain the reported 28-day compressive strength. If CLSM is considered for use on this site, please contact the geotechnical engineer for site-specific and application-specific recommendations.

5.5 Permanent Slopes

5.5.1 Overview

Permanent cut or fill slopes constructed at the site, if any, should be graded at 2H:1V or flatter. Constructed slopes should be overbuilt by a few feet depending on their size and gradient so that they can be properly compacted prior to being cut to final grade. The surface of all slopes should be protected from erosion by seeding, sodding, or other acceptable means. Adjacent on-site and off-site structures should be located at least 5 feet from the top of slopes.

5.5.2 Placement of Fill on Slopes

New fill should be placed and compacted against horizontal surfaces. Where slopes exceed 5H:1V (horizontal to vertical), the slopes should be keyed and benched prior to structural fill placement in general accordance with the attached Fill Slope Detail, Figure 4. If subdrains are needed on benches, subject to the review of the geotechnical representative, they should be placed as shown on the attached Fill Slope Detail. In order to achieve well-compacted slope faces, slopes should be overbuilt by a few feet and then trimmed back to proposed final grades. The geotechnical engineer or his representative should observe the benches, keyways, and associated subdrains, if needed, prior to placement of structural fill.

The fat clay (CH) soils exposed on benches should be kept moist, near optimum moisture content, and not allowed to dry out. If allowed to dry below optimum moisture content, to a point where surface cracking appears in the subgrade, the affected material should be over-excavated and replaced with imported granular structural fill.

5.6 Shallow Foundations

The recommendations that follow are based, in part, on the maximum structural (column and continuous wall) loads described in Section 1.1 of this report. In the event that loads for the building will be above those listed therein, the geotechnical engineer should be consulted to review the proposed construction.

5.6.1 Subgrade Preparation

Satisfactory subgrade support for shallow foundations can be obtained from a minimum of 12 inches of imported granular structural fill that is properly placed and compacted on the native, medium stiff to better, fat clay (CH) during construction. The imported granular fill should be in conformance with Section 5.4.2.2 of this report, with maximum particle size limited to 1½ inches. During excavation, the fat clay (CH) soils should be kept moist, near optimum moisture content, and not allowed to dry out. If allowed to dry below optimum moisture content, to a point where surface cracking appears in the subgrade, the affected material should be over-excavated and replaced with imported granular structural fill.

The geotechnical engineer or their representative should be contacted to observe subgrade conditions prior to placement of the granular pad. If soft, loose, or otherwise unsuitable soils are encountered, they should be over-excavated as recommended by the geotechnical representative at the time of construction. The resulting over-excavation should be brought back to grade with imported granular structural fill in conformance with Section 5.4.2.2. The maximum particle size of over-excavation backfill should be limited to 1½ inches. All granular pads for footings should be constructed a minimum of 6 inches wider on each side of the footing for every vertical foot of over-excavation.

5.6.2 Minimum Footing Width & Embedment

Minimum footing widths should be in conformance with the current Oregon Structural Specialty Code (OSSC). As a guideline, we recommend individual spread footings have a minimum width of 24 inches. We recommend continuous wall footings have a minimum width of 18 inches. All footings should be founded at least 18 inches below the lowest, permanent adjacent grade to develop lateral capacity and for frost protection.

5.6.3 Bearing Pressure & Settlement

Footings founded as recommended above should be proportioned for a maximum allowable soil bearing pressure of 1,500 pounds per square foot (psf). This bearing pressure is a net bearing pressure, applies to the total of dead and long-term live loads, and may be increased by one-third when considering seismic or wind loads. For foundations founded as recommended above, total settlement of foundations is anticipated to be less than 1 inch. Differential settlements between adjacent columns and/or bearing walls should not exceed ½-inch. If an increased allowable soil bearing pressure is desired, the geotechnical engineer should be consulted.

5.6.4 Lateral Capacity

A maximum passive (equivalent fluid) earth pressure of 150 pounds per cubic foot (pcf) is recommended for design of footings cast neat into excavations in suitable native soil or confined by the structural fill that is properly placed and compacted during construction. The recommended earth pressure was computed using a factor of safety of 1½, which is appropriate due to the amount of movement required to develop full passive resistance. In order to develop the above capacity, the following should be understood:

- Concrete must be poured neat in excavations or the foundations must be backfilled with imported granular structural fill,
- The adjacent grade must be level,
- The static ground water level must remain below the base of the footings throughout the year.
- Adjacent floor slabs, pavements, or the upper 12-inch-depth of adjacent, unpaved areas should not be considered when calculating passive resistance.

An ultimate coefficient of friction equal to 0.45 may be used when calculating resistance to sliding for footings founded as recommended above.

5.6.5 Subsurface Drainage

Recognizing the fine-grained soils encountered at this site, placement of foundation drains is recommended at the outside base elevations of perimeter continuous wall footings. Foundation drains should consist of a minimum 4-inch diameter, perforated, PVC drainpipe wrapped with a non-woven geotextile filter fabric. The drains should be backfilled with a minimum of 2 cubic feet of open graded drain rock per lineal foot of pipe. The drain rock should also be encased in a geotextile fabric in order to provide separation from the surrounding fine-grained soils. Foundation drains should be positively sloped and should outlet to a suitable discharge point. The geotechnical engineer or their representative should observe the drains prior to backfilling. Roof drains should not be tied into foundation drains.

5.7 North Site Retaining Wall

The recommendations that follow are presented for the retaining wall proposed at the north portion of the site as shown on the attached Site Plan, Figure 2.

5.7.1 Footings

Retaining wall footings should be designed and constructed in conformance with the recommendations presented in Section 5.6, as applicable.

5.7.2 Wall Drains

We recommend placing a retaining wall drain at the base elevation of the heel of the retaining wall footing. Retaining wall drains should consist of a minimum 4-inch-diameter, perforated, HDPE (High Density Polyethylene) drainpipe wrapped with a non-woven geotextile filter fabric. The drains should be backfilled with a minimum of 2 cubic feet of open graded drain rock per lineal foot of pipe. The drain rock should be encased in a geotextile fabric in order to provide separation from the surrounding soils. Retaining wall drains should be positively sloped and should outlet to a suitable discharge point. The geotechnical engineer or their representative should be contacted to observe the drains prior to backfilling. Roof or area drains should not be tied into retaining wall drains.

5.7.3 Wall Backfill

Retaining walls should be backfilled with imported granular structural fill in conformance with Section 5.4.2.2 and contain less than 5 percent passing the U.S. Standard No. 200 Sieve. The backfill should be compacted to a minimum of 90 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor). When placing fill behind walls, care must be taken to minimize undue lateral loads on the walls. Heavy compaction equipment should be kept at least "H" feet from the back of the walls, where "H" is the height of the wall. Light mechanical or hand tamping equipment should be used for compaction of backfill materials within "H" feet of the back of the walls.

5.7.4 Design Parameters & Limitations

For rigid retaining walls founded, backfilled, and drained as recommended above, the following table presents parameters recommended for design.

Table 4 Design Parameters for Rigid Retaining Walls

Retaining Wall Condition	Modeled Backfill Condition	Static Equivalent Fluid Pressure (S_A)	Seismic Equivalent Fluid Pressure (S_{AE})
Not Restrained from Rotation	Level (i = 0)	29 pcf	39 pcf
Restrained from Rotation	Level (i = 0)	52 pcf	54 pcf

Note 1: Refer to the attached Figure 5 for a graphical representation of static and seismic loading conditions. Seismic component of active thrust acts at 0.6H above the base of the wall.

Note 2: Seismic (dynamic) lateral loads were computed using the Mononobe-Okabe Equation as presented in the 1997 Federal Highway Administration (FHWA) design manual.

The above design recommendations are based on the assumptions that:

- The wall consists of a concrete cantilevered retaining wall (β = 0 and δ = 24 degrees, see Figure 5).
- The wall is 10 feet or less in height.
- The backfill is drained and consists of imported granular structural fill (ϕ = 38 degrees).
- No area load, line load or point load surcharges are imposed behind the wall.
- The grade behind the wall is level, or sloping down and away from the wall, for a distance of 10 feet or more from the wall.
- The grade in front of the wall is level or sloping up for a distance of at least 5 feet from the wall.

Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project vary from these assumptions.

5.8 Floor Slabs

5.8.1 Subgrade Preparation

Satisfactory subgrade support for slabs constructed on grade, supporting up to 150 psf area loading, can be obtained from a minimum of 12 inches of imported granular structural fill that is properly placed and compacted on the native, medium stiff to better, fat clay (CH) during construction. The minimum 18-inch thick granular layer may be considered a "sub-base" in these areas. Floor slab subgrade preparation should

be in conformance with Section 5.1.5 of this report. During excavation, the fat clay subgrade soils should be kept moist, near optimum moisture content, and not allowed to dry out. If allowed to dry below optimum moisture content, to a point where surface cracking appears in the subgrade, the affected material should be over-excavated and replaced with imported granular structural fill.

5.8.2 Crushed Rock Base

Concrete floor slabs should be supported on a minimum 6-inch-thick layer of crushed rock (base rock) in conformance with Section 5.4.2.2. For design cases where a vapor barrier or retarder is not placed below the slab, the surface of the base rock should be choked with sand just prior to concrete placement. Choking means the voids between the largest aggregate particles are filled with sand, but does not provide a layer of sand above the base rock. Choking the base rock surface reduces the lateral restraint on the bottom of the concrete during curing.

5.8.3 Design Considerations

For floor slabs constructed as recommended, a modulus of subgrade reaction of 150 pounds per cubic inch (pci) is recommended for the design of the floor slab. Floor slabs constructed as recommended will likely settle less than ½-inch. For general floor slab construction, slabs should be jointed around columns and walls to permit slabs and foundations to settle differentially.

5.8.4 Subgrade Moisture Considerations

Liquid moisture and moisture vapor should be expected at the subgrade surface. The recommended crushed rock base is anticipated to provide protection against liquid moisture. Where moisture vapor emission through the slab must be minimized, e.g. impervious floor coverings, storage of moisture sensitive materials directly on the slab surface, etc., a vapor retarding membrane or vapor barrier below the slab should be considered. Factors such as cost, special considerations for construction, floor coverings, and end use suggest that the decision regarding a vapor retarding membrane or vapor barrier be made by the architect and owner.

If a vapor retarder or vapor barrier is placed below the slab, its location should be based on current American Concrete Institute (ACI) guidelines, ACI 302 Guide for Concrete Floor and Slab Construction. In some cases, this indicates placement of concrete directly on the vapor retarder or barrier. Please note that the placement of concrete directly on impervious membranes increases the risk of plastic shrinkage cracking and slab curling in the concrete. Construction practices to reduce or eliminate such risk, as described in ACI 302, should be employed during concrete placement.

5.9 Pavements

5.9.1 Subgrade Preparation

Satisfactory subgrade support for pavements constructed on grade can be obtained from a minimum of 12 inches of imported granular structural fill that is properly placed and compacted on the native, medium stiff to better, fat clay (CH) or structural fill placed during construction. The minimum 12-inch thick granular layer may be considered a “sub-base” in these areas. Pavement subgrade preparation should be in conformance with Section 5.1.5 of this report. Pavement subgrade surfaces should be crowned (or sloped) for proper drainage in accordance with specifications provided by the project civil engineer.

5.9.2 Traffic Classifications

Recognizing that traffic data has not been provided, we have considered two levels of traffic demand for review and design of pavement sections. We modeled the following design cases (traffic levels) developed from the Asphalt Pavement Association of Oregon (APAO):

- *APAO Level I (Very Light):* This design case considers typical average daily truck traffic (ADTT) of 1 per day over 20 years. Among others, examples under this loading consist of passenger car parking stalls, residential driveways, and seasonal recreational roads.
- *APAO Level II (Light):* This design case considers typical ADTT of 2 to 7 per day over 20 years. Examples under this loading consist of residential streets and parking lots of less than 500 stalls.

5.9.3 Input Parameters

Designs of the hot mixed asphalt concrete (HMAC) flexible pavement sections and the rigid Portland cement concrete (PCC) rigid slab section presented below were based on the parameters presented in the following table and design approaches from:

- The American Association of State Highway and Transportation Officials (AASHTO) 1993 "Design of Pavement Structures" manual,
- The Asphalt Pavement Association of Oregon (APAO) 2003 "Asphalt Pavement Design Guide", and
- The Oregon Department of Transportation (ODOT) 2011 "Pavement Design Guide".

If any of the items listed in Table 5 or Table 6 need to be revised, please contact us and we will reassess the pavement design sections presented below.

Table 5 Input Parameters Used in HMAC Pavement Design

Input Parameter	Design Value[1]	Input Parameter		Design Value[1]
Pavement Design Life	20 years	Resilient Modulus	Native Fat Clay (CH)[4]	4,000 psi
Annual Percent Growth	0 percent		Crushed Aggregate Base[2]	20,000 psi
Serviceability	4.2 initial, 2.5 terminal	Structural Coefficient[2]	Crushed Aggregate Base	0.10
Reliability[2]	75 percent		Asphalt	0.42
Standard Deviation[2]	0.49	Vehicle Traffic[5] (range in ESALs)	APAO Level I (Very Light)	Up to 10,000
Drainage Factor[3]	1.0		APAO Level II (Light)	Up to 50,000

[1] If any of the above parameters are incorrect, please contact us so that we may revise our recommendations, if warranted.
[2] Value based on guidelines presented in Section 5.3 of the 2011 ODOT Pavement Design Guide and APAO manual.
[3] Assumes good drainage away from pavement, base, and subgrade is achieved by proper crowning of subgrades.
[4] Values based on experience with similar soils prepared as recommended in this report.
[5] ESAL = Total 18-Kip equivalent single axle load. Traffic levels taken from Table 3.1 of APAO manual. If an increased traffic load is estimated, please contact us so that we may refine the traffic loading and revise our recommendations, if warranted.

Table 6 Input Parameters Used in PCC Pavement Design

Input Parameter	Design Value[1]	Input Parameter		Design Value[1]
Pavement Design Life	20 years	Modulus of Subgrade Reaction[4] (Min. 18 inches of Granular Fill Over CH soil)		100 pci
Annual Percent Growth	0 percent			
Serviceability	4.2 initial, 2.5 terminal	PCC Parameters[2]	Elastic Modulus	5,000 ksi
Reliability	75 percent		Modulus of Rupture	0.7 ksi
Standard Deviation[2]	0.39	Vehicle Traffic[5] (range in ESALs)	APAO Level II (Light)	Up to 50,000
Drainage Factor[3]	1.0			
Load Transfer Coefficient	3.2			

[1] If any of the above parameters are incorrect, please contact us so that we may revise our recommendations, if warranted.
[2] Value based on guidelines presented in the ODOT Pavement Design Guide for rigid pavements.
[3] Assumes good drainage away from pavement, base, and subgrade is achieved by proper crowning of subgrades.
[4] Values based on experience and published literature.
[5] ESAL = Total 18-Kip equivalent single axle load. Traffic levels taken from Table 3.1 of APAO manual. If an increased traffic load is estimated, please contact us so that we may refine the traffic loading and revise our recommendations, if warranted.

5.9.4 Recommended Minimum Pavement Sections

The following table presents the minimum HMAC pavement sections for the traffic levels indicated in the preceding table, based on the referenced design procedures.

Table 7 Recommended Minimum Flexible (HMAC) Pavement Sections

Material	APAO Traffic Loading	
	Level I (Passenger Car Traffic Only	Level II (Entrance/Service Drive Lanes)
Asphalt Pavement (inches)	3	3½
Crushed Aggregate Base (inches)	4	4
Granular Sub-Base (inches)	12	12
Geotextile Separation Fabric	Placed in conformance with Section 5.3.2 of this report	
Subgrade Soils	Prepared in conformance with Section 5.9.1 of this report	

The following table presents the recommended minimum concrete pavement sections based on the referenced AASHTO procedures. Jointing, reinforcement, and surface finish should be performed in accordance with the project civil engineer, architect, and owner requirements.

Table 8 Recommended Minimum Rigid (PCC) Pavement Sections

Material	APAO Traffic Loading
	Level II (Entrance/Service Drive Lanes)
PCC Slab (inches)	6
All Weather Base (inches)	2
Granular Sub-Base (inches)[1]	12
Geotextile Separation Fabric	Placed in conformance with Section 5.3.2 of this report.
Subgrade Soils	Prepared in accordance with Section 5.9.1 of this report.

5.9.5 Pavement Materials

5.9.5.1 HMAC Pavements

We recommend pavement aggregate sub-base consist of durable, relatively well-graded, granular fill in conformance with Section 00641.10.b of the most recent State of Oregon, Standard Specifications for Highway Construction (ODOT SSC), with the following considerations. We recommend the material have a maximum particle size of 4 inches and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. Aggregate sub-base should be compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor), or visual equivalent as identified by deflection (proof roll) testing.

We recommend pavement aggregate base consist of dense-graded aggregate in conformance with Section 02630.10 of the most recent ODOT SSC, with the following additional considerations. We recommend the material consist of crushed rock or gravel, have a maximum particle size of 1½ inches, and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. Aggregate base should be compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor).

We recommend asphalt pavement consist of Level 2, ½-inch, dense-graded HMAC in conformance with the most recent ODOT SSC. Asphalt pavement should be compacted to at least 91 percent of the material's theoretical maximum density as determined in general accordance with ASTM D2041 (Rice Specific Gravity).

5.9.5.2 PCC Pavements

We recommend pavement aggregate sub-base consist of durable, relatively well-graded, granular fill in conformance with Section 00641.10.b of the most recent ODOT SSC, with the following considerations. We recommend the material have a maximum particle size of 4 inches and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. Aggregate sub-base should be compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor), or visual equivalent as identified by deflection (proof roll) testing.

All-weather base should consist of dense-graded aggregate in conformance with Section 02630.10 of the most recent ODOT SSC, with the following additional considerations. We recommend the material consist have a maximum particle size of ¾-inch and have less than 5 percent material passing the U.S. Standard No. 200 Sieve. Aggregate base should be compacted to not less than 95 percent of the material's maximum dry density as determined in general accordance with ASTM D1557 (Modified Proctor).

Portland cement concrete (PCC) pavement should be in conformance with Section 02001 of the most recent ODOT SSC and meet the properties detailed in Table 6 above.

5.10 Additional Considerations

5.10.1 Drainage

Subsurface drains should be connected to the nearest storm drain, on-site infiltration system (to be designed by others) or other suitable discharge point. Paved surfaces and grading near or adjacent to the building should be sloped to drain away from the building. Surface water from paved surfaces and open spaces

should be collected and routed to a suitable discharge point. Surface water should not be directed into foundation drains or onto site slopes.

5.10.2 Freezing Weather Considerations

For construction that occurs during extended periods of sub-freezing temperatures, the following special provisions are recommended:

- Structural fill should not be placed over frozen ground.
- Frozen soil should not be placed as structural fill.
- Fine-grained soils should not be placed as structural fill during sub-freezing temperatures.

Identification of frozen soils at the site should be in accordance with ASTM D4083-01 "Standard Practice for Description of Frozen Soils (Visual-Manual Procedure)" or other approved method. The geotechnical engineer can aid the contractor with supplemental recommendations for earthwork that will take place during extended periods of sub-freezing weather, as required.

6.0 RECOMMENDED ADDITIONAL SERVICES

6.1 Supplemental Geotechnical Investigation

As indicated in Section 4.2 of this report, supplemental geotechnical investigation of the south portion of the site (i.e. area of proposed deep fills and retaining wall) is recommended in order to develop final geotechnical recommendations for use in design and construction of those features. We recommend the geotechnical engineer be retained to perform the investigation and collaborate with the project design team on finalizing design concepts for that portion of the site.

6.2 Design Review

Geotechnical design review is of paramount importance. We recommend the geotechnical design review take place prior to releasing bid packets to contractors.

6.3 Observation of Construction

Satisfactory earthwork, foundation, floor slab, and pavement performance depends to a large degree on the quality of construction. Sufficient observation 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 subsurface explorations, and recognition of changed conditions often requires experience. We recommend that qualified personnel visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those observed to date and anticipated in this report. We recommend the geotechnical engineer or their representative attend a pre-construction meeting coordinated by the contractor and/or developer. The project geotechnical engineer or their representative should provide observations and/or testing of at least the following earthwork elements during construction:

- Site Stripping
- Subgrade Preparation for Shallow Foundations, Retaining Walls, Structural Fills, Floor Slabs, and Pavements
- Compaction of Structural Fill, Utility Trench Backfill, and Retaining Wall Backfill

- Placement of Foundation Drains, Retaining Wall Drains, and Other Site Drains, as appropriate
- Compaction of Base Rock for Floor Slabs & Pavements
- Compaction of HMAC for Pavements

It is imperative that the owner and/or contractor request earthwork observations and testing at a frequency sufficient to allow the geotechnical engineer to provide a final letter of compliance for the earthwork activities.

7.0 LIMITATIONS

We have prepared this report for use by the owner/developer and other members of the design and construction team for the proposed development. The opinions and recommendations contained within this report are not intended to be, nor should they be construed as a warranty of subsurface conditions, but are forwarded to assist in the planning and design process.

We have made observations based on our explorations that indicate the soil conditions at only those specific locations and only to the depths penetrated. These observations do not necessarily reflect soil types, strata thickness, or water level variations that may exist between or away from our explorations. If subsurface conditions vary from those encountered in our site explorations, CGT should be alerted to the change in conditions so that we may provide additional geotechnical recommendations, if necessary. Observation by experienced geotechnical personnel should be considered an integral part of the construction process.

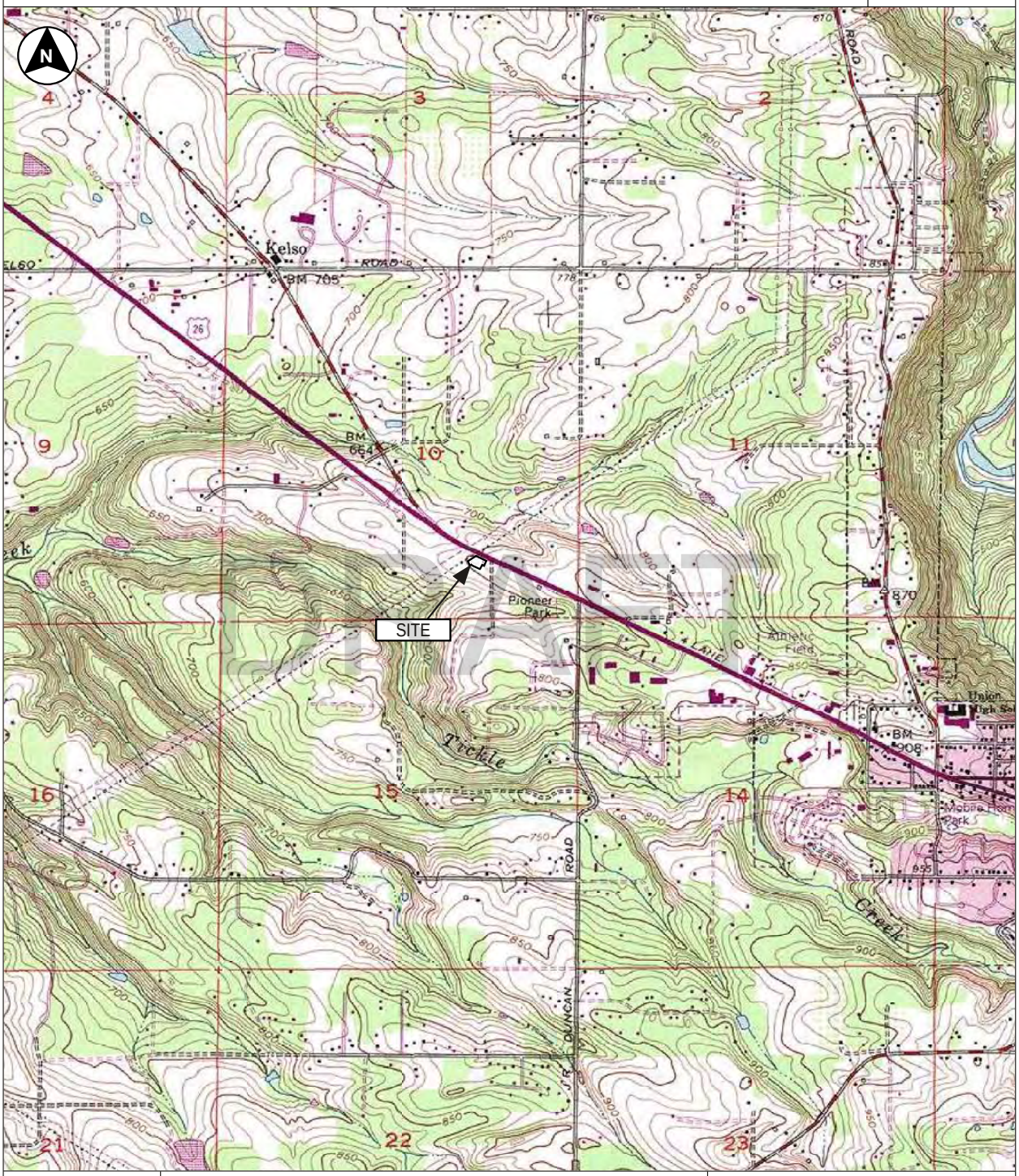
The owner/developer is responsible for ensuring that the project designers and contractors implement our recommendations. When the design has been finalized, prior to releasing bid packets to contractors, we recommend that the design drawings and specifications be reviewed by our firm to see that our recommendations have been interpreted and implemented as intended. If design changes are made, we request that we be retained to review our conclusions and recommendations and to provide a written modification or verification. Design review and construction phase testing and observation services are beyond the scope of our current assignment, but will be provided for an additional fee.

The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design.

Geotechnical engineering and the geologic sciences are characterized by a degree of uncertainty. Professional judgments presented in this report are based on our understanding of the proposed construction, familiarity with similar projects in the area, and on general experience. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared; no warranty, expressed or implied, is made. This report is subject to review and should not be relied upon after a period of three years.

TSC SANDY - SANDY, OREGON
Project Number G1804765

FIGURE 1
Site Location



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503-601-8250
Drafted by:KJS

Map created with TOPO!™, © 2006 National Geographic Holdings
USGS 7.5 Minute Topographic Map Series, Sandy, Oregon Quadrangle, 1981

Township 2 South, Range 4 East, Section 10 Willamette Meridian

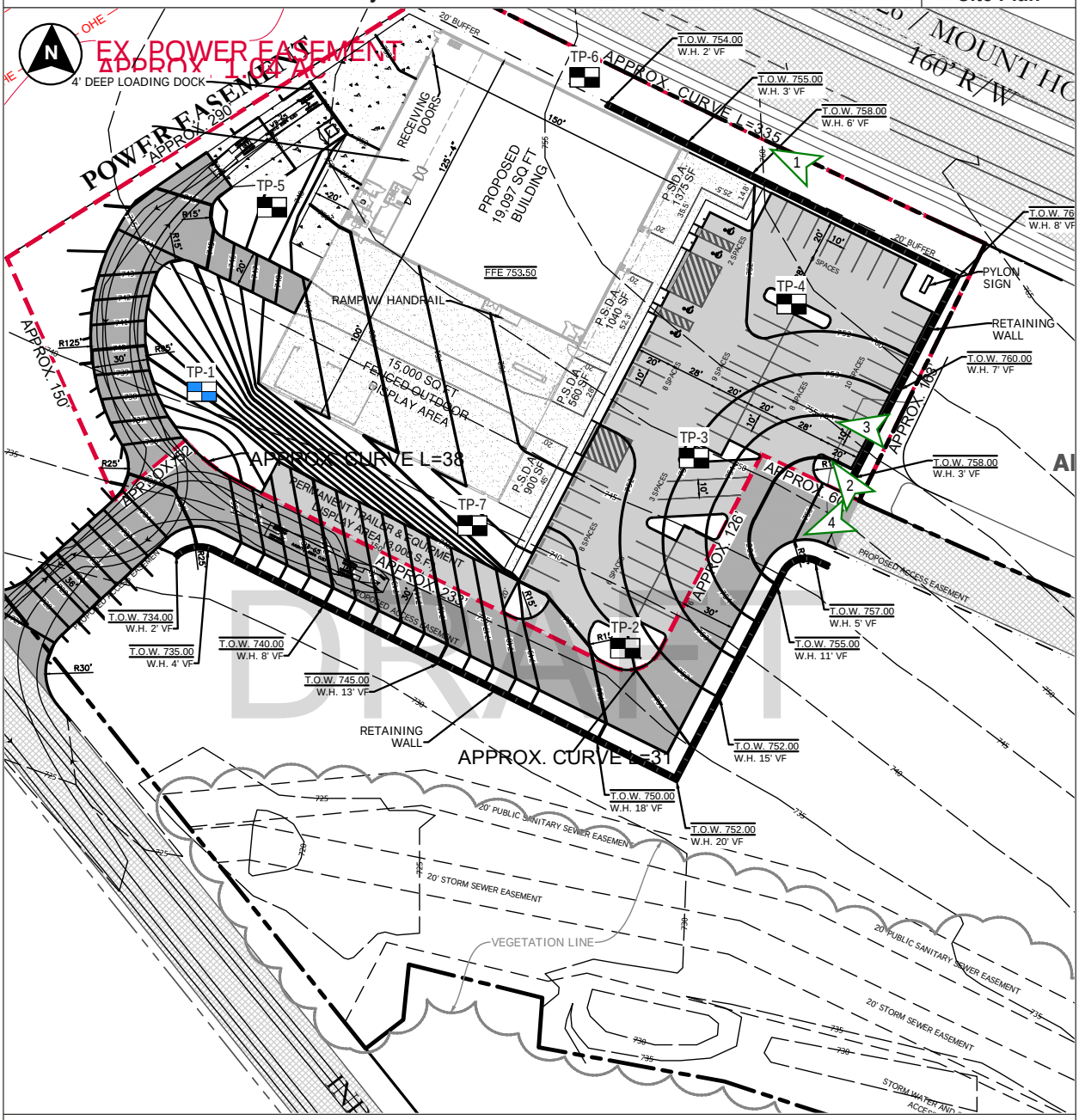
Latitude: 45.405976° North
Longitude: 122.296282° West

1 Inch = 2,000 feet

0 2000 4000

TSC SANDY - SANDY, OREGON
Project Number G1804765

FIGURE 2
Site Plan



LEGEND

TP-1 Infiltration test pit

TP-2 Test pit

1 Orientation of site photographs shown on Figure 3

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Drafted by: KJS

NOTES: Drawing based on observations made while on site and site plans provided by client. All exploration locations should be considered approximate.

1 Inch = 40 Feet

0 40 80

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Project Number G1804765

FIGURE 3
Site Photographs

Photograph 1

Photograph 2

Photograph 3

Photograph 4

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See Figure 2 for approximate photograph locations and directions. Photographs were taken at the time of our fieldwork.

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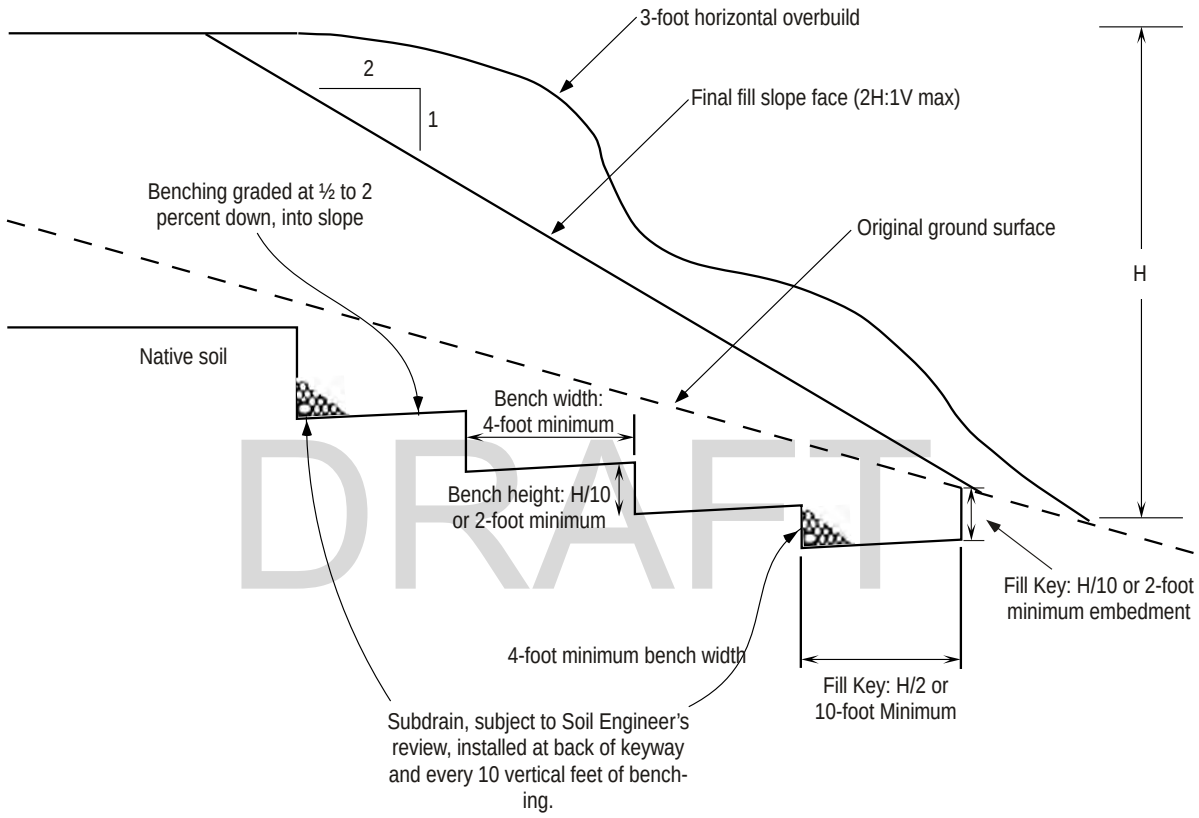
Project Number G1804765

FIGURE 4

Fill Slope Detail



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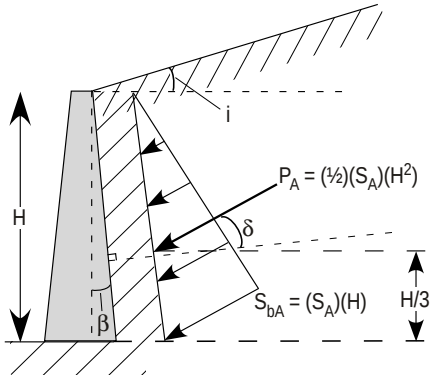
NOTE: Surfaces to receive fill with slopes steeper than 5H:1V (horizontal:vertical) should be benched and keyed as shown.

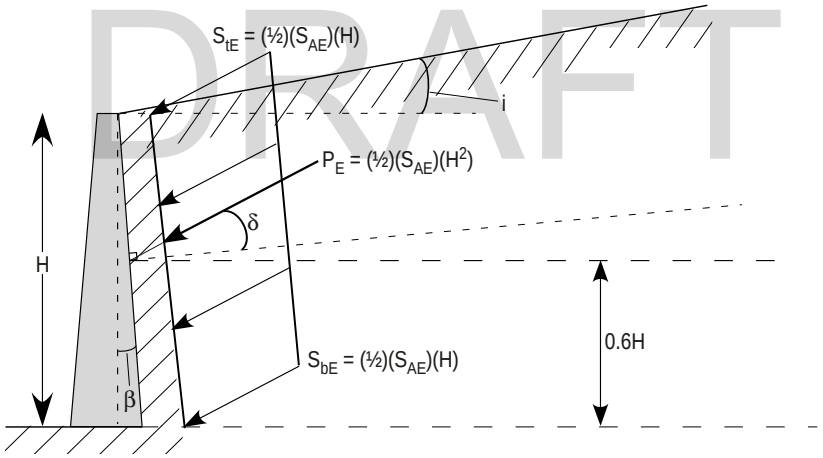
TSC SANDY - SANDY, OREGON Project Number G1804765	FIGURE 5 Retaining Walls

ACTIVE LATERAL PRESSURE DISTRIBUTION

STATIC LOADING CONDITIONS



SEISMIC LOADING CONDITIONS



LEGEND

P_A = Static active thrust force acting at a triangular distribution on wall (lb/ft^3)

P_E = Dynamic component of active thrust force acting at a uniform distribution on wall (lb/ft)

i = Slope of backfill (degrees)**

S_A = Active static equivalent fluid pressure (lb/ft^3)*

S_{tE} = Active earth pressure (dynamic) at the top of the wall (lb/ft^3)

S_{bA} = Active earth pressure (static) at the bottom of the wall (lb/ft^3)

ϕ = Internal angle of friction for backfill (degrees)**

δ = Angle from normal of back of wall (degrees). Based on friction developing between wall and backfill**

β = Slope of back of wall (degrees)**

S_{AE} = Seismic (static + dynamic) equivalent fluid pressure (lb/ft^3)*

$S_{bE} = S_{tE}$ = Active seismic (static + dynamic) pressure (lb/ft^3)

*Refer to report text for calculated values **Refer to report text for modeled/assumed values

Notes

1. Uniform pressure distribution of seismic loading is based on empirical evaluations [Sherif et al, 1982 and Whitman, 1990].
2. Placement of seismic resultant force at 0.6H is based on wall behavior and model test results [Whitman, 1990].

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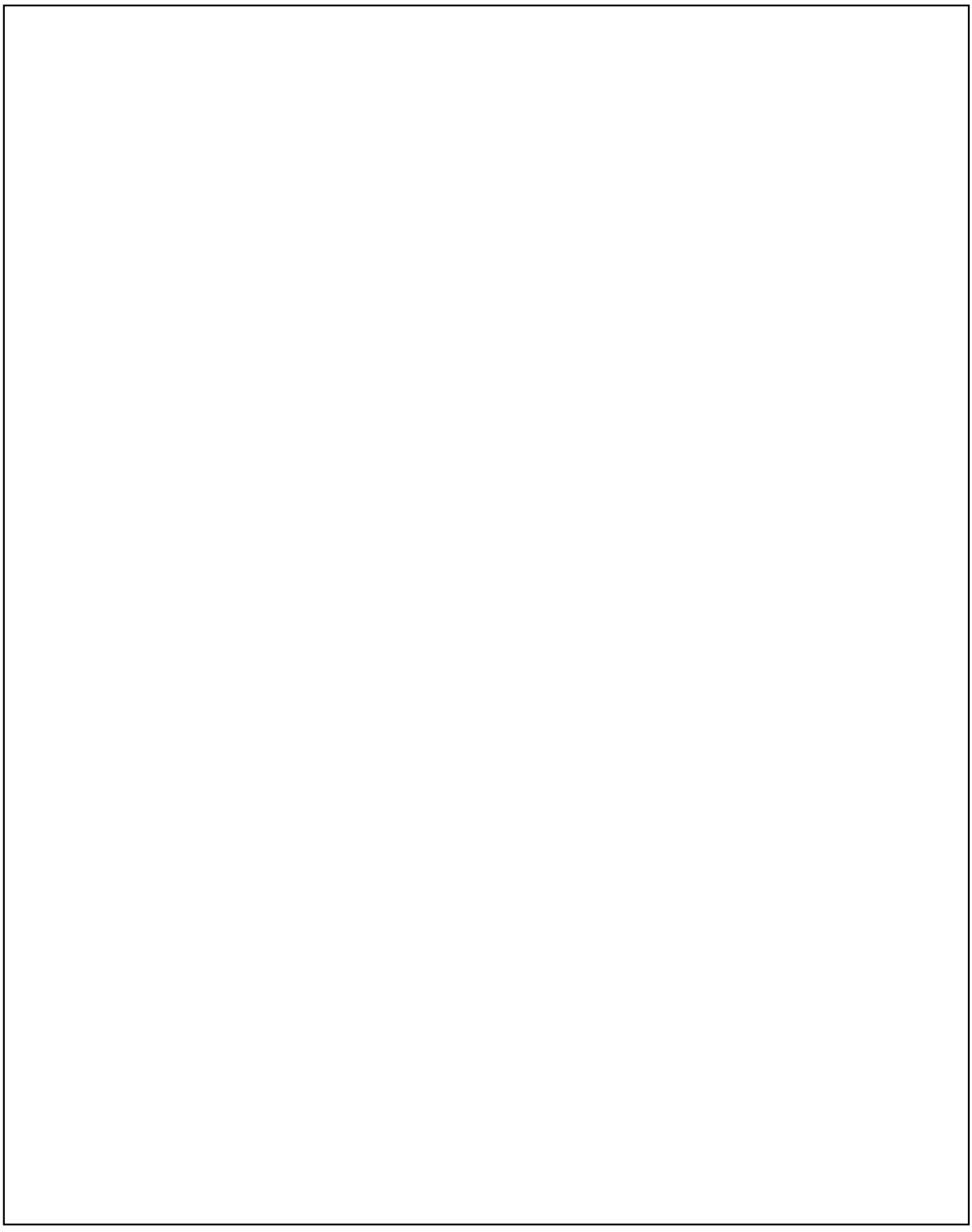

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Appendix A: Subsurface Investigation and Laboratory Testing

TSC Sandy
Mt. Hood Highway & Champion Way
Sandy, Oregon

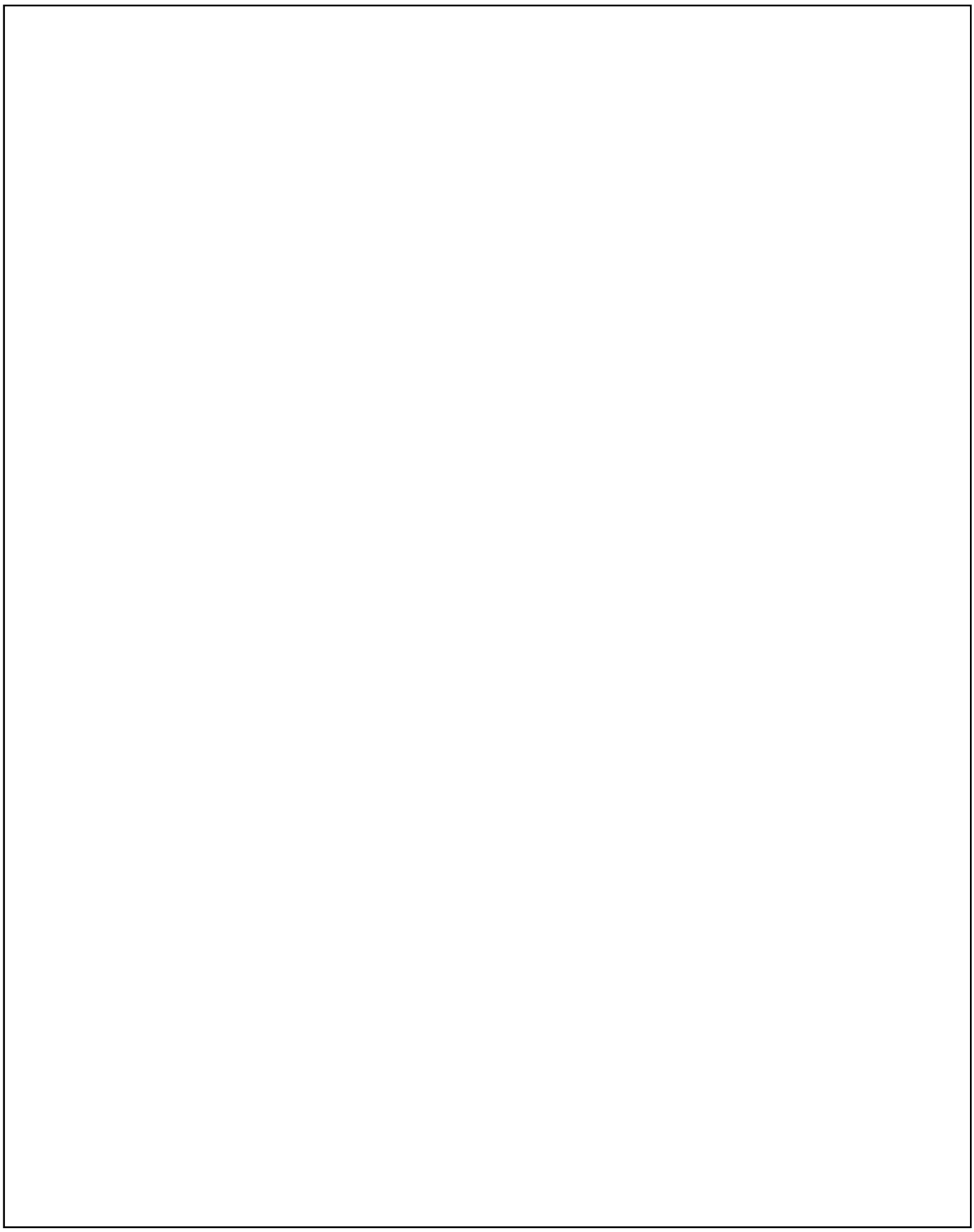
CGT Project Number G1804765

February 16, 2018

Prepared For:

Hix Snedeker Companies
Attn: Ms. Lindsay Gadd
805 Trione Street
Daphne, Alabama 36526

Prepared by
Carlson Geotechnical



A.1.0 SUBSURFACE INVESTIGATION

Our field investigation consisted of seven test pits completed in January 2018. The approximate exploration locations are shown on the Site Plan, attached to the geotechnical report as Figure 2. The locations were recorded in the office using desktop GIS software, located in the field using mobile GPS software[1], and are approximate (+/- 30 feet horizontally). Surface elevations indicated on the logs were estimated based on the topographic contours as shown on the referenced Site Plan and should be considered approximate.

A.1.1 Test Pits

CGT observed the excavation of seven test pits (TP-1 through TP-7) at the site on January 23, 2018, to depths of about 5 to 15 feet bgs. The test pits were excavated using a Cat C/2C track-mounted excavator provided and operated provided by our subcontractor, Tabert Trucking & Excavation of Sherwood, Oregon. The test pits were loosely backfilled with the excavated materials upon completion.

Pocket penetrometer readings were generally taken in the upper four feet of each test pit. The pocket penetrometer is a hand-held instrument that provides an approximation of the unconfined compressive strength of cohesive, fine-grained soils. The correlation between pocket penetrometer readings and the consistency of cohesive, fine-grained soils is provided on the attached Figure A2.

A.1.2 Material Classification & Sampling

Representative grab samples were obtained at select intervals within the test pits. In addition, thin-walled, steel (Shelby) tube samplers, detailed on Figure A1, were used to obtain relatively undisturbed samples of the site soils at selected depths within two of the test pits. A qualified member of CGT's staff collected the samples and logged the soils in general accordance with the Visual-Manual Procedure (ASTM D2488). An explanation of this classification system is attached as Figure A2. The grab samples were stored in sealable plastic bags and the Shelby tube samples were sealed with caps and tape and transported to our soils laboratory for further examination and testing. Our geotechnical staff visually examined all samples in order to refine the initial field classifications.

A.1.3 Subsurface Conditions

Subsurface conditions are summarized in Section 2.3 of the geotechnical report. Detailed logs of the explorations are presented on the attached Exploration Logs, Figures A3 through A9.

A.2.0 LABORATORY TESTING

Laboratory testing was performed on samples collected in the field to refine our initial field classifications and determine in-situ parameters. Results of the laboratory tests are shown on the exploration logs. Graphical results of the consolidation test are shown on the attached Figure A10.
Laboratory testing included the following:

- Seventeen moisture content determinations (ASTM D2216).
- Two Atterberg limits (plasticity) tests (ASTM D4318).
- Ones fines test to determine the percent passing the U.S. Standard No. 200 Sieve (ASTM D1140).
- Two shelby tube unit weight tests (weight-volume measurement)
- One consolidation test (ASTM D2435 / D2435M-11)

[1] Miocool Inc., 2016. Map Plus (GIS Editor + Offline Map + GPS Recorder) Mobile application software (Version 2.4.5). Retrieved from https://itunes.apple.com/ and installed on an Apple iPhone 5s.

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TSC SANDY - SANDY, OREGON
Project Number G1804765

FIGURE A1
Exploration Key

GEOTECHNICAL LABORATORY TESTING

PL — MC — LL	Atterberg limits (plasticity) test results (ASTM D4318): PL = Plastic Limit, LL = Liquid Limit, and MC= Moisture Content (ASTM D2216)
☐ FINES CONTENT (%)	Percentage passing the U.S. Standard No. 200 Sieve (ASTM D1140)

SAMPLING

GRAB	Grab sample
SPT	**Standard Penetration Test** (SPT) consists of driving a 2-inch, outside-diameter, split-spoon sampler into the undisturbed formation with repeated blows of a 140-pound, hammer falling a vertical distance of 30 inches (ASTM D1586). The number of blows (N-value) required to drive the sampler the last 12 inches of an 18-inch sample interval is used to characterize the soil consistency or relative density. The drill rig was equipped with an cat-head or automatic hammer to conduct the SPTs. The observed N-values, hammer efficiency, and N_{60} are noted on the boring logs.
MC	**Modified California** sampling consists of 3-inch, outside-diameter, split-spoon sampler (ASTM G3550) driven similarly to the SPT sampling method described above. A sampler diameter correction factor of 0.44 is applied to calculate the equivalent SPT N_{60} value per Lacroix and Horn, 1973.
CORE	**Rock Coring** interval
SH	**Shelby Tube** is a 3-inch, inner-diameter, thin-walled, steel tube push sampler (ASTM D1587) used to collect relatively undisturbed samples of fine-grained soils.
WDCP	**Wildcat Dynamic Cone Penetrometer** (WDCP) test consists of driving 1.1-inch diameter, steel rods with a 1.4-inch diameter, cone tip into the ground using a 35-pound drop hammer with a 15-inch free-fall height. The number of blows required to drive the steel rods is recorded for each 10 centimeters (3.94 inches) of penetration. The blow count for each interval is then converted to the corresponding SPT N_{60} values.
DCP	**Dynamic Cone Penetrometer** (DCP) test consists of driving a 20-millimeter diameter, hardened steel cone on 16-millimeter diameter steel rods into the ground using a 10-kilogram drop hammer with a 460-millimeter free-fall height. The depth of penetration in millimeters is recorded for each drop of the hammer.
POCKET PEN. (tsf)	**Pocket Penetrometer** test is a hand-held instrument that provides an approximation of the unconfined compressive strength in tons per square foot (tsf) of cohesive, fine-grained soils.

CONTACTS

	Observed (measured) contact between soil or rock units.
	Inferred (approximate) contact between soil or rock units.
	Transitional (gradational) contact between soil or rock units.

ADDITIONAL NOTATIONS

Italics	Notes drilling action or digging effort
{ Braces }	Interpretation of material origin/geologic formation (e.g. { Base Rock } or { Columbia River Basalt })

TSC SANDY - SANDY, OREGON Project Number G1804765	FIGURE A2 Soil Classification

Classification of Terms and Content

NAME: Group Name and Symbol
Relative Density or Consistency
Color
Moisture Content
Plasticity
Other Constituents
Other: Grain Shape, Approximate Gradation
Organics, Cement, Structure, Odor, etc.
Geologic Name or Formation

USCS Grain Size

Fines		<#200 (0.075 mm)
Sand	Fine Medium Coarse	#200 - #40 (0.425 mm) #40 - #10 (2 mm) #10 - #4 (4.75)
Gravel	Fine Coarse	#4 - 0.75 inch 0.75 inch - 3 inches
Cobbles		3 to 12 inches; scattered <15% estimated numerous >15% estimated
Boulders		> 12 inches

Relative Density or Consistency

Granular Material		Fine-Grained (cohesive) Materials				
SPT N-Value	Density	SPT N-Value	Torvane tsf Shear Strength	Pocket Pen tsf Unconfined	Consistency	Manual Penetration Test
		<2	<0.13	<0.25	Very Soft	Thumb penetrates more than 1 inch
0 - 4	Very Loose	2 - 4	0.13 - 0.25	0.25 - 0.50	Soft	Thumb penetrates about 1 inch
4 - 10	Loose	4 - 8	0.25 - 0.50	0.50 - 1.00	Medium Stiff	Thumb penetrates about ¼ inch
10 - 30	Medium Dense	8 - 15	0.50 - 1.00	1.00 - 2.00	Stiff	Thumb penetrates less than ¼ inch
30 - 50	Dense	15 - 30	1.00 - 2.00	2.00 - 4.00	Very Stiff	Readily indented by thumbnail
>50	Very Dense	>30	>2.00	>4.00	Hard	Difficult to indent by thumbnail

Moisture Content

Dry: Absence of moisture, dusty, dry to the touch
Damp: Some moisture but leaves no moisture on hand
Moist: Leaves moisture on hand
Wet: Visible free water, likely from below water table

	Plasticity	Dry Strength	Dilatancy	Toughness
ML	Non to Low	Non to Low	Slow to Rapid	Low, can't roll
CL	Low to Medium	Medium to High	None to Slow	Medium
MH	Medium to High	Low to Medium	None to Slow	Low to Medium
CH	Medium to High	High to Very High	None	High

Structure

Stratified: Alternating layers of material or color >6 mm thick
Laminated: Alternating layers < 6 mm thick
Fissured: Breaks along definite fracture planes
Slickensided: Striated, polished, or glossy fracture planes
Blocky: Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lenses: Has small pockets of different soils, note thickness
Homogeneous: Same color and appearance throughout

Visual-Manual Classification

Major Divisions			Group Symbols	Typical Names
Coarse Grained Soils: More than 50% retained on No. 200 sieve	Gravels: 50% or more *retained* on the No. 4 sieve	Clean Gravels	GW	Well-graded gravels and gravel/sand mixtures, little or no fines
			GP	Poorly-graded gravels and gravel/sand mixtures, little or no fines
		Gravels with Fines	GM	Silty gravels, gravel/sand/silt mixtures
			GC	Clayey gravels, gravel/sand/clay mixtures
	Sands: More than 50% *passing* the No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines
			SP	Poorly-graded sands and gravelly sands, little or no fines
		Sands with Fines	SM	Silty sands, sand/silt mixtures
			SC	Clayey sands, sand/clay mixtures
Fine-Grained Soils: 50% or more Passes No. 200 Sieve	Silt and Clays Low Plasticity Fines		ML	Inorganic silts, rock flour, clayey silts
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
			OL	Organic silt and organic silty clays of low plasticity
	Silt and Clays High Plasticity Fines		MH	Inorganic silts, clayey silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat, muck, and other highly organic soils

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ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

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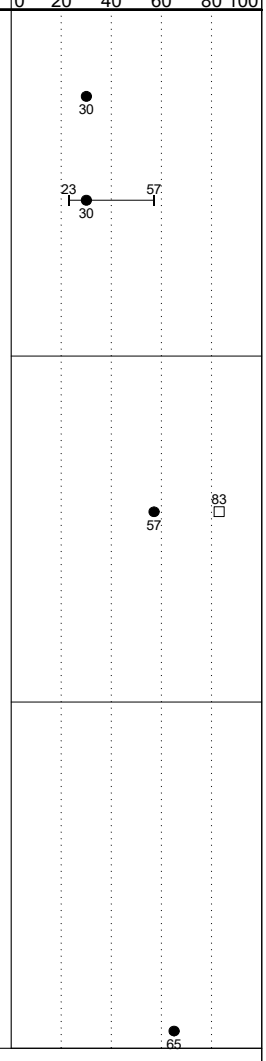
FIGURE A3

Test Pit TP-1

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18 **GROUND ELEVATION** 741 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F **SURFACE** grass
LOGGED BY DJD **REVIEWED BY** KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GROUP SYMBOL	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	POCKET PEN. (tsf)
740	OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.	0		0.5
	CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist to wet, medium to high plasticity, trace fine organics.		GRAB TP1-1	1
					1.5
					1.5
				GRAB TP1-2	1.5
					1.25
		FAT CLAY: Stiff to hard, light to red-brown, moist, medium to high plasticity. Blocky structure below 4 feet bgs.			3.75
			5	GRAB TP1-3	4.5+
735					
		With fine-grained sand below about 7 feet bgs.		GRAB TP1-4	
		Infiltration test performed at 8 feet bgs. See Appendix B for details.			
	CH		10		
730					
			15	GRAB TP1-5	
725		•Test pit terminated at 15 feet bgs. •No groundwater or caving observed. •Test pit backfilled loosely upon completion.			



CGT EXPLORATION WITH WDCP G1804765.GPJ 2/15/18 DRAFTED BY:

Carlson Geotechnical
7185 SW Sandburg Street, Suite 200
Tigard, Oregon 97281
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www.carlsontesting.com

FIGURE A4

Test Pit TP-2

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18 **GROUND ELEVATION** 737 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F **SURFACE** grass
LOGGED BY DJD **REVIEWED BY** KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐
		OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.		0				4.5+		
		CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist to wet, medium to high plasticity.						1.75		
735									1.75		
						GRAB TP2-1			2.5		30
									2.5		
		CH	**FAT CLAY:** Hard, light to red-brown, moist, medium to high plasticity.						4		
									4.5+		
						ST TP2-2			4.5+	89	34
					5						
730			•Test pit terminated at 5 feet bgs. •No groundwater or caving observed. •Test pit backfilled loosely upon completion.								
725											

CGT EXPLORATION WITH WDCP G1804765.GPJ 2/15/18 DRAFTED BY:

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FIGURE A5

Test Pit TP-3

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18 **GROUND ELEVATION** 750 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F **SURFACE** grass
LOGGED BY DJD **REVIEWED BY** KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐
		OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.		0				0.5		
		ML FILL	**UNDOCUMENTED SILT FILL:** Brown, moist, low plasticity.			GRAB TP3-1			0.5		
		CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, moist to wet, medium to high plasticity.						0.5		
									4.5+		
						GRAB TP3-2			4.5+		
									3.75		
		CH	**FAT CLAY:** Very stiff to hard, red-brown, moist, medium to high plasticity.						3		
						GRAB TP3-3			3.25		
745					5						55

•Test pit terminated at 5 feet bgs.
•No groundwater or caving observed.
•Test pit backfilled loosely upon completion.

740
735

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FIGURE A6
Test Pit TP-4

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18 **GROUND ELEVATION** 759 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F **SURFACE** grass
LOGGED BY DJD **REVIEWED BY** KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	GROUNDWATER	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	WDCP N_{60} VALUE	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ WDCP N_{60} VALUE ▲ / PL LL MC / ☐ FINES CONTENT (%) ☐
		OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.		0	GRAB TP4-1			0.5		28
		CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist to wet, medium to high plasticity.						2.5 2 1.5 2.5 2.75		
755		CH	**FAT CLAY:** Very stiff, red-brown, moist, medium to high plasticity. Blocky structure below 4 feet bgs.			GRAB TP4-2			3.5 4		30 32 65
					5	GRAB TP4-3					33

•Test pit terminated at 5 feet bgs.
•No groundwater or caving observed.
•Test pit backfilled loosely upon completion.

750

745

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FIGURE A7

Test Pit TP-5

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18 **GROUND ELEVATION** 748 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F **SURFACE** grass
LOGGED BY DJD **REVIEWED BY** KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GROUP SYMBOL	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	POCKET PEN. (tsf)
	OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.	0		0.5
	CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist to wet, medium to high plasticity.			1
					2.75
					2.25
745				GRAB TP5-1	2.5
				GRAB TP5-2	3.75
				GRAB TP5-3	3.75
	CH	**FAT CLAY:** Very stiff, red-brown, moist, medium to high plasticity. Blocky structure below 4 feet bgs.	5		4
740				GRAB TP5-4	
			10	GRAB TP5-5	
735		•Test pit terminated at 10 feet bgs. •No groundwater or caving observed. •Test pit backfilled loosely upon completion.			

GROUNDWATER

RECOVERY % (RQD)

WDCP N_{60} VALUE

DRY UNIT WT. (pcf)

▲ WDCP N_{60} VALUE ▲

PL LL MC

☐ FINES CONTENT (%) ☐

0 20 40 60 80 100

33

33

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FIGURE A8
Test Pit TP-6

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18 **GROUND ELEVATION** 755 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F **SURFACE** grass
LOGGED BY DJD **REVIEWED BY** KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GROUP SYMBOL	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	POCKET PEN. (tsf)
	OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.	0		0.5
	CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist to wet, medium to high plasticity.		GRAB TP6-1	2
					2
					1.5
				GRAB TP6-2	1.5
					2.75
					3.75
750		**FAT CLAY:** Very stiff, red-brown, very moist to wet, medium to high plasticity.	5		4
	CH	Blocky structure below 5 feet bgs.		GRAB TP6-3	
745			10	GRAB TP6-4	
740		•Test pit terminated at 10 feet bgs. •No groundwater or caving observed. •Test pit backfilled loosely upon completion.			

▲ WDCP N_{60} VALUE ▲
PL LL MC
☐ FINES CONTENT (%) ☐
0 20 40 60 80 100
31
32

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FIGURE A9

Test Pit TP-7

CLIENT Hix Snedeker Companies - Lindsay Gadd
PROJECT NAME TSC Sandy
PROJECT NUMBER G1804765
PROJECT LOCATION Champion Way & Mt. Hood Highway, Sandy, OR
DATE STARTED 1/23/18 **GROUND ELEVATION** 740 ft
ELEVATION DATUM See Figure 2
WEATHER Rain, 40°F **SURFACE** grass
LOGGED BY DJD **REVIEWED BY** KJS
EXCAVATION CONTRACTOR Tabert Trucking & Excavation
SEEPAGE ---
EQUIPMENT Cat C/2C tracked excavator
GROUNDWATER AT END ---
EXCAVATION METHOD 24-inch wide toothed bucket
GROUNDWATER AFTER EXCAVATION ---

ELEVATION (ft)	GROUP SYMBOL	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	WDCP N_{60} VALUE
	OL FILL	**SILT TOPSOIL FILL:** Dark brown, moist, with organics.	0	GRAB TP7-1	2		
	CH FILL	**UNDOCUMENTED FAT CLAY FILL:** Red-brown, very moist, medium to high plasticity.		GRAB TP7-2	2		
					1.5		
					2.75		
		FAT CLAY: Very stiff to hard, light to red-brown, moist, medium to high plasticity.			4.5+		42
		Blocky structure below 3½ feet bgs.			4.5+		
		ST TP7-3: Results of consolidation test (ASTM D2435) shown on Figure A10.		ST TP7-3	4.5+	78	
735			5		4.5+		
	CH						
				GRAB TP7-4			54
730			10				
				GRAB TP7-5			50
725							

•Test pit terminated at 10½ feet bgs.
•No groundwater or caving observed.
•Test pit backfilled loosely upon completion.

▲ WDCP N_{60} VALUE ▲
PL LL MC
☐ FINES CONTENT (%) ☐
0 20 40 60 80 100

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FIGURE A10
Consolidation Test Results

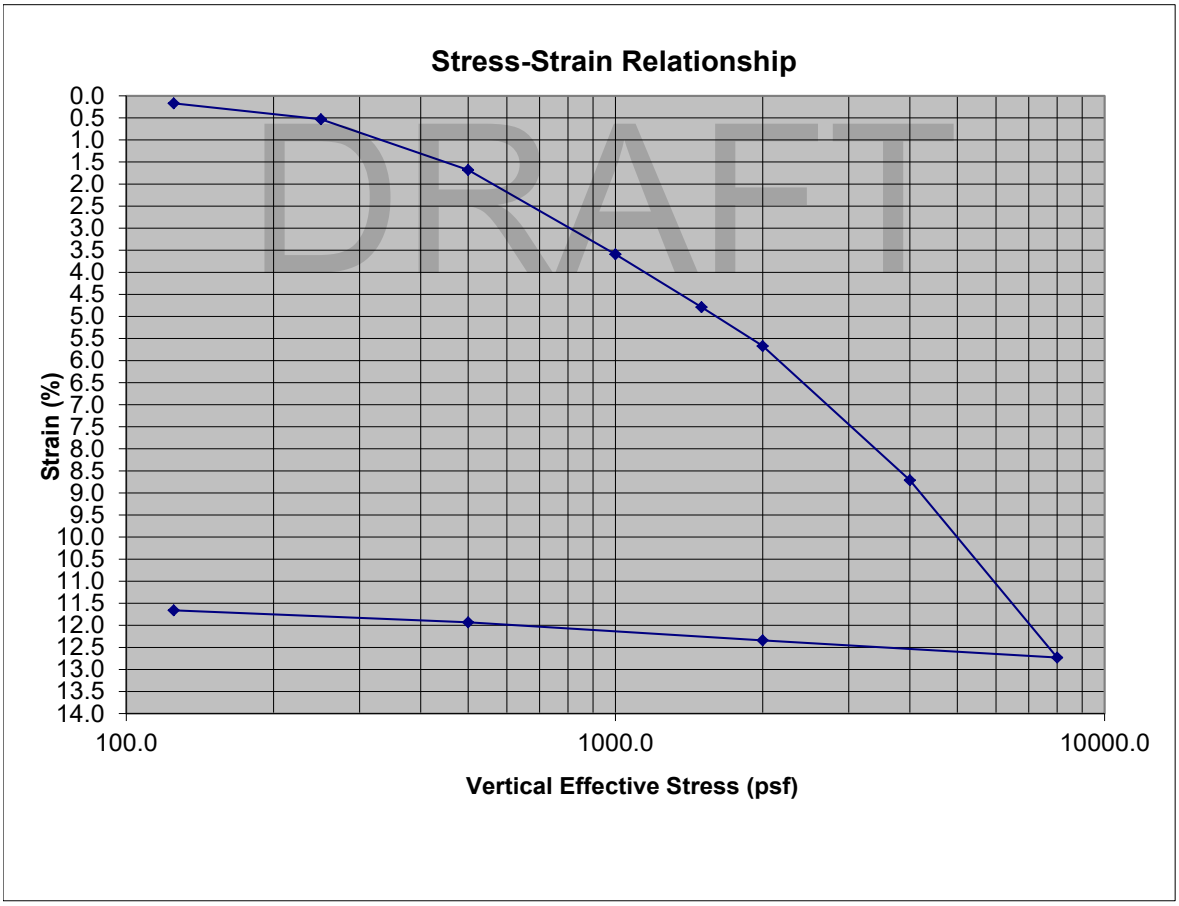
Bend (541) 330-9155
Eugene (541) 345-0289
Geotechnical (503) 601-8250
Salem (503) 589-1252
Tigard (503) 684-3460

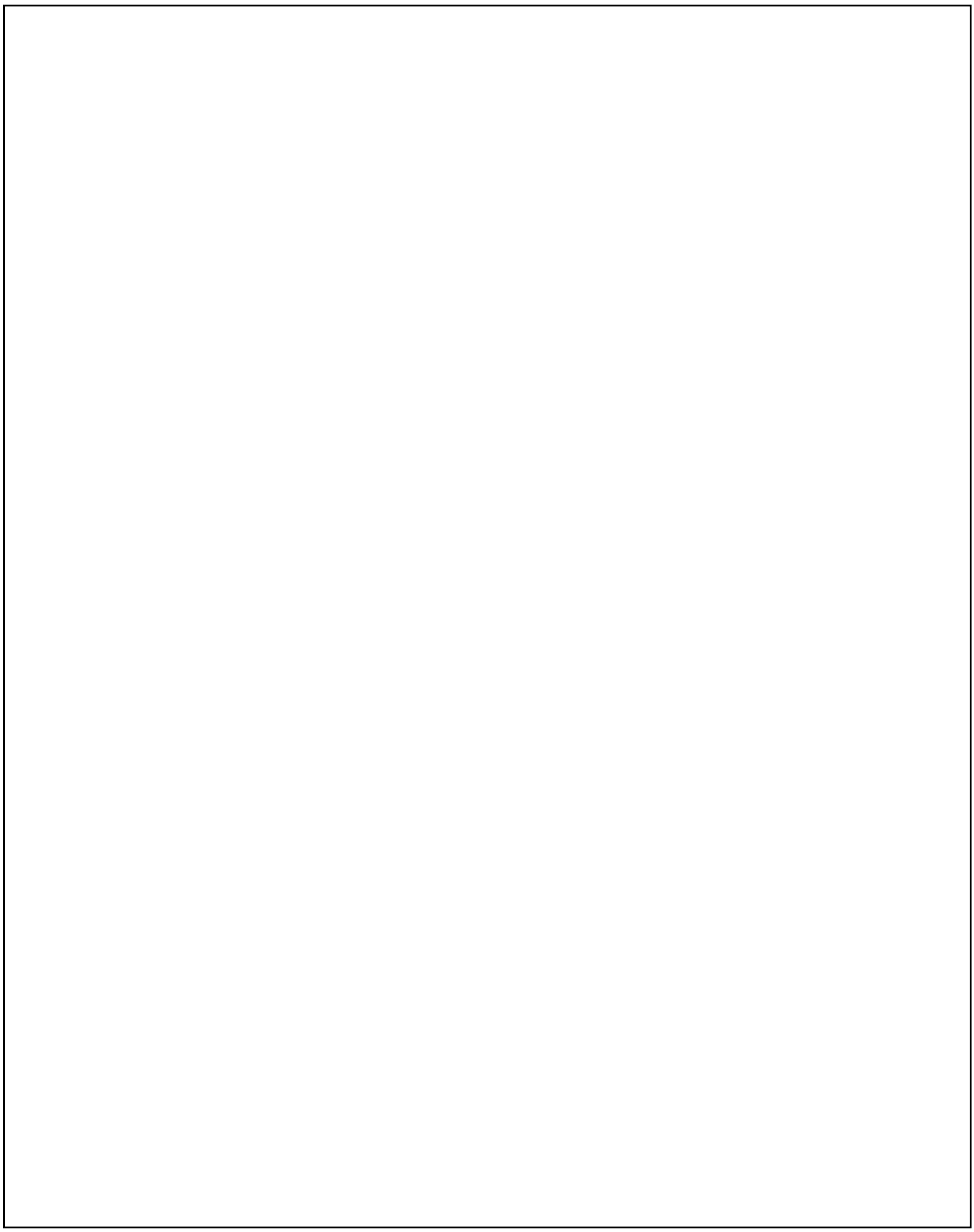
Carlson Testing, Inc.

Load Increment	Total Stress (psf)	Strain ϵ (%)	Total ΔH (in.)	24 hr. ΔH Value (in.)
1	125	0.1700	0.0017	0.0017
2	250	0.5300	0.0053	0.0053
5	500	1.6800	0.0168	0.0168
6	1000	3.5900	0.0359	0.0359
7	1500	4.7900	0.0479	0.0479
8	2000	5.6700	0.0567	0.0567
9	4000	8.7100	0.0871	0.0871
10	8000	12.7300	0.1273	0.1273
11	2000	12.3400	0.1234	0.1234
12	500	11.9300	0.1193	0.1193
13	125	11.6600	0.1166	0.1166

CTI Project #:	G1804765
Lab Log #:	18-0083
Sample ID:	ST TP7-3
Sample depth:	3'-5'

Initial Dial Reading, do	0.0000	in.
Initial Specimen Height, Ho:	1.0000	in.
Initial Moisture Content:	52.4	%
Final Moisture Content:	56.7	%





Carlson Geotechnical

A Division of Carlson Testing, Inc.
Phone: (503) 601-8250
Fax: (503) 601-8254

Bend Office	(541) 330-9155
Eugene Office	(541) 345-0289
Salem Office	(503) 589-1252
Tigard Office	(503) 684-3460

Appendix B: Results of Infiltration Testing

TSC Sandy
Mt. Hood Highway & Champion Way
Sandy, Oregon

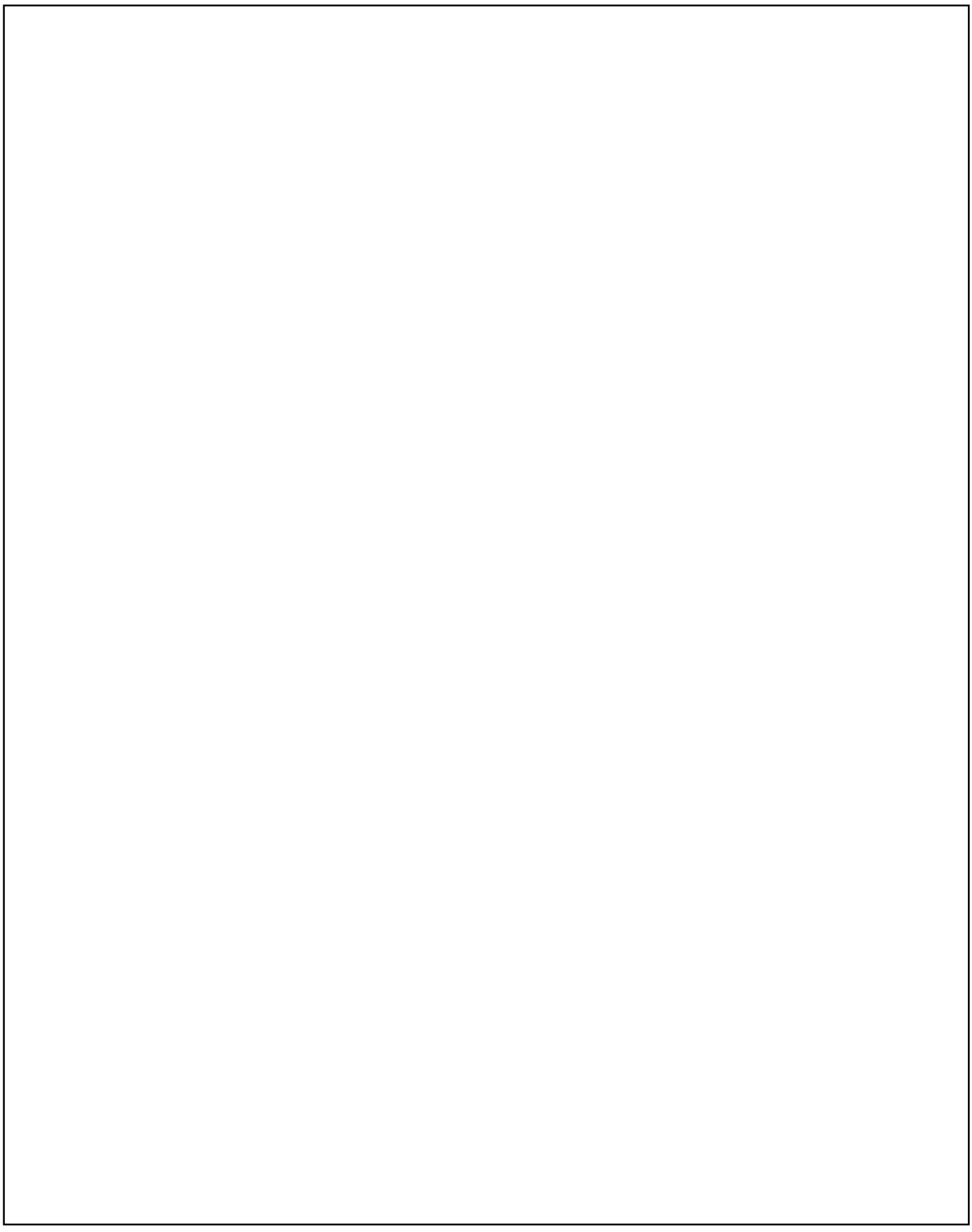
CGT Project Number G1804765

February 16, 2018

Prepared For:

Hix Snedeker Companies
Lindsay Gadd
805 Trione Street
Daphne, Alabama 36526

Prepared by
Carlson Geotechnical



B.1.0 INTRODUCTION

The project civil engineer, Mr. Trey Jinright, P.E., of Jade Consulting, LLC, requested one infiltration test be conducted within the southwest portion of the site. Mr. Jinright requested the test be conducted at a depth of about 8 feet below ground surface (bgs). The test was performed in test pit TP-1 as shown on the Site Plan, which is attached to the main report as Figure 2.

B.2.0 TEST PROCEDURE

Infiltration testing was performed within the prepared test pit on January 23, 2018, in general accordance with the 1980 EPA Falling Head Test Method. The test pit was excavated to the infiltration test depth, as described in the main report. A 6-inch-inner-diameter PVC pipe was pushed about 12 inches into the subgrade soils at the bottom of the test pit. The subsurface soils were pre-soaked at the infiltration test location by pouring sufficient water to achieve a minimum 12-inch vertical column of water in the pipe. The 12-inch column of water was maintained for the minimum, 4-hour soaking time per the referenced test method Less than ¼ inch of drop in the water level was noted during the soaking period.

After the soaking period, about 12 inches of water remained in the pipe, and the drop in water level was recorded at 20-minute intervals for 1 hour. Measurements were taken with a tape measure and recorded to the nearest one-sixteenth of an inch.

B.3.0 INFILTRATION TEST RESULTS

The following table presents the details, raw data, and calculated infiltration rate observed during testing.

Table B1 Results of Infiltration Test TP-1

Test Depth: 8 feet bgs	**Soil Type:** Fat Clay (CH)	
Time Interval (minutes)	**Drop in Water Level (inches)***	**Raw Infiltration Rate (inches per hour)****
20	0	0
20	0	0
20	0	0

* Water level measurements taken in inches, measured to the nearest one-sixteenth inch

B.4.0 DISCUSSION

As detailed in Section B.3.0, no discernible infiltration was observed during our infiltration test. Further excavation to about 15 feet bgs at the infiltration test pit did not reveal a significant change in soil characteristics that would suggest infiltration rates would improve with depth.

If alternative infiltration location(s) are considered at the site, we recommend supplemental field investigation and testing be performed. CGT would be pleased to perform supplemental field investigation and testing for an additional fee, upon request.

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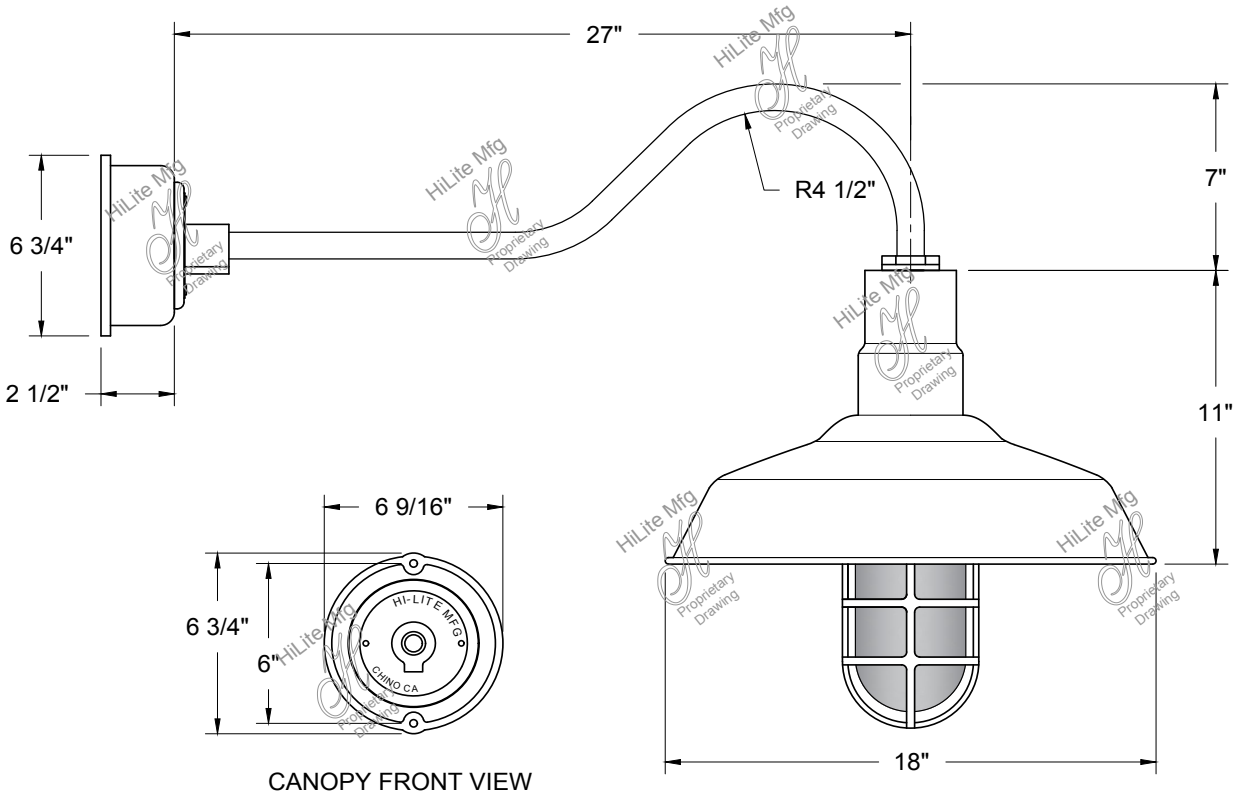
13450 Monte Vista Avenue
Chino, California 91710
Telephone: (909) 465-1999
Toll Free: (800) 465-0211
Fax: (909) 465-0907
www.hilitemfg.com

EXHIBIT L

JOB NAME:		
SCALE: N.T.S.	DATE: 03/07/2016	TYPE:
DRAWN BY: S.M.-D	QTY:	
SHEET:		REV:



CANOPY FRONT VIEW

Item Number	Wattage	Voltage
H-15118-97/HL-AHD-27”-97/LCGU-FR/18/LED3/40/BCM-M	18W	120/277V

Finish
97-Red (Fixture & Arm)
Frosted (Glass)

Mounting
Wall Mount

Lamp/Socket
18W LED3, 4000K

d"series

D-Series Size 1
LED Wall Luminaire

Catalog Number

Notes

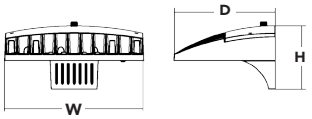
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

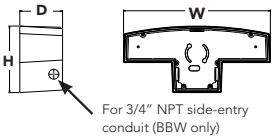
Luminaire

Width:	13-3/4" (34.9 cm)	**Weight:**	12 lbs (5.4 kg)
Depth:	10" (25.4 cm)		
Height:	6-3/8" (16.2 cm)		



Back Box (BBW, ELCW)

Width:	13-3/4" (34.9 cm)	**BBW Weight:**	5 lbs (2.3 kg)
Depth:	4" (10.2 cm)	**ELCW Weight:**	10 lbs (4.5 kg)
Height:	6-3/8" (16.2 cm)		



Introduction

The D-Series Wall luminaire is a stylish, fully integrated LED solution for building-mount applications. It features a sleek, modern design and is carefully engineered to provide long-lasting, energy-efficient lighting with a variety of optical and control options for customized performance.

With an expected service life of over 20 years of nighttime use and up to 74% in energy savings over comparable 250W metal halide luminaires, the D-Series Wall is a reliable, low-maintenance lighting solution that produces sites that are exceptionally illuminated.

Ordering Information

EXAMPLE: DSXW1 LED 20C 1000 40K T3M MVOLT DDBTXD

DSXW1 LED

Series	LEDs	Drive Current	Color temperature	Distribution	Voltage	Mounting	Control Options
DSXW1 LED	10C 10 LEDs (one engine) 20C 20 LEDs (two engines)	350 350 mA 530 530 mA 700 700 mA 1000 1000 mA (1 A)	30K 3000 K 40K 4000 K 50K 5000 K AMBPC Amber phosphor converted	T2S Type II Short T2M Type II Medium T3S Type III Short T3M Type III Medium T4M Type IV Medium TFTM Forward Throw Medium ASYDF Asymmetric diffuse	MVOLT [1] 120 [1] 208 [1] 240 [1] 277 [1] 347 [2] 480 [2]	**Shipped included** (blank) Surface mounting bracket BBW Surface-mounted back box (for conduit entry) [3]	**Shipped installed** PE Photoelectric cell, button type [4] DMG 0-10V dimming driver (no controls) PIR 180° motion/ambient light sensor, <15' mtg ht [5] PIRH 180° motion/ambient light sensor, 15-30' mtg ht [5] PIR1FC3V Motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc [5] PIRH1FC3V Motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc [5] ELCW Emergency battery backup (includes external component enclosure) [6]

Other Options			Finish *(required)*		
Shipped installed		**Shipped separately** [8]	DDBXD Dark bronze	DSSXD Sandstone	DWHGXD Textured white
SF Single fuse (120, 277 or 347V) [7]		BSW Bird-deterrent spikes	DBLXD Black	DDBTXD Textured dark bronze	DSSTXD Textured sandstone
DF Double fuse (208, 240 or 480V) [7]		WG Wire guard	DNAXD Natural aluminum	DBLBXD Textured black	
HS House-side shield [8]		VG Vandal guard	DWHXD White	DNATXD Textured natural aluminum	
SPD Separate surge protection [9]		DDL Diffused drop lens			

Accessories

Ordered and shipped separately.

DSXWHS U	House-side shield (one per light engine)
DSXWBSW U	Bird-deterrent spikes
DSXW1WG U	Wire guard accessory
DSXW1VG U	Vandal guard accessory

NOTES

1 MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options), or photocontrol (PE option).
2 Only available with 20C, 700mA or 1000mA. Not available with PIR or PIRH.
3 Back box ships installed on fixture. Cannot be field installed. Cannot be ordered as an accessory.
4 Photocontrol (PE) requires 120, 208, 240, 277 or 347 voltage option. Not available with motion/ambient light sensors (PIR or PIRH).
5 PIR and PIR1FC3V specifies the Sensor Switch SBGR-10-ODP control; PIRH specifies the Sensor Switch SBGR-6-ODP control; see Motion Sensor Guide for details. Includes ambient light sensor. Not available with "PE" option (button type photocell). Dimming driver standard. Not available with 20 LED/1000 mA configuration (DSXW1 LED 20C 1000).
6 Cold weather (-20C) rated. Not compatible with conduit entry applications. Not available with BBW mounting option. Not available with fusing. Not available with 347 or 480 voltage options. Emergency components located in back box housing. Emergency mode IES files located on product page at www.lithonia.com
7 Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option. Not available with ELCW.
8 Also available as a separate accessory; see Accessories information.
9 See the electrical section on page 3 for more details.

LITHONIA LIGHTING

One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • www.lithonia.com

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K					40K					50K					AMBER				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
10C (10 LEDs)	350mA	14W	T2S	1,415	0	0	1	101	1,520	0	0	1	109	1,529	0	0	1	109	894	0	0	1	64
			T2M	1,349	0	0	1	96	1,449	0	0	1	104	1,458	0	0	1	104	852	0	0	1	61
			T3S	1,400	0	0	1	100	1,503	0	0	1	107	1,512	0	0	1	108	884	0	0	1	63
			T3M	1,386	0	0	1	99	1,488	0	0	1	106	1,497	0	0	1	107	876	0	0	1	63
			T4M	1,358	0	0	1	97	1,458	0	0	1	104	1,467	0	0	1	105	858	0	0	1	61
			TFTM	1,411	0	0	1	101	1,515	0	0	1	108	1,525	0	0	1	109	892	0	0	1	64
			ASYDF	1,262	0	0	1	90	1,355	1	0	1	97	1,363	1	0	1	97	797	0	0	1	57
	530 mA	20W	T2S	2,054	1	0	1	103	2,205	1	0	1	110	2,219	1	0	1	111	1,264	0	0	1	63
			T2M	1,957	1	0	1	98	2,102	1	0	1	105	2,115	1	0	1	106	1,205	0	0	1	60
			T3S	2,031	0	0	1	102	2,181	0	0	1	109	2,195	0	0	1	110	1,250	0	0	1	63
			T3M	2,010	1	0	1	101	2,159	1	0	1	108	2,172	1	0	1	109	1,237	0	0	1	62
			T4M	1,970	1	0	1	99	2,115	1	0	1	106	2,128	0	0	1	106	1,212	0	0	1	61
			TFTM	2,047	0	0	1	102	2,198	0	0	1	110	2,212	0	0	1	111	1,260	0	0	1	63
			ASYDF	1,830	1	0	1	92	1,966	1	0	1	98	1,978	1	0	1	99	1,127	0	0	1	56
	700 mA	27W	T2S	2,623	1	0	1	97	2,816	1	0	1	104	2,834	1	0	1	105	1,544	0	0	1	57
			T2M	2,499	1	0	1	93	2,684	1	0	1	99	2,701	1	0	1	100	1,472	0	0	1	55
			T3S	2,593	1	0	1	96	2,785	1	0	1	103	2,802	1	0	1	104	1,527	0	0	1	57
			T3M	2,567	1	0	1	95	2,757	1	0	1	102	2,774	1	0	1	103	1,512	0	0	1	56
			T4M	2,515	1	0	1	93	2,701	1	0	1	100	2,718	1	0	1	101	1,481	0	0	1	55
			TFTM	2,614	1	0	1	97	2,807	1	0	1	104	2,825	1	0	1	105	1,539	0	0	1	57
			ASYDF	2,337	1	0	1	87	2,510	1	0	1	93	2,526	1	0	1	94	1,376	0	0	1	51
	1000 mA	40W	T2S	3,685	1	0	1	92	3,957	1	0	1	99	3,982	1	0	1	100	2,235	1	0	1	58
			T2M	3,512	1	0	1	88	3,771	1	0	1	94	3,795	1	0	1	95	2,130	1	0	2	55
			T3S	3,644	1	0	1	91	3,913	1	0	1	98	3,938	1	0	1	98	2,210	1	0	2	57
			T3M	3,607	1	0	1	90	3,874	1	0	1	97	3,898	1	0	1	97	2,187	1	0	2	56
			T4M	3,534	1	0	1	88	3,795	1	0	1	95	3,819	1	0	1	95	2,143	1	0	2	55
			TFTM	3,674	1	0	1	92	3,945	1	0	1	99	3,969	1	0	1	99	2,228	1	0	2	57
			ASYDF	3,284	1	0	1	82	3,527	1	0	1	88	3,549	1	0	1	89	1,991	1	0	2	51
20C (20 LEDs)	350mA	24W	T2S	2,820	1	0	1	118	3,028	1	0	1	126	3,047	1	0	1	127	1,777	1	0	1	74
			T2M	2,688	1	0	1	112	2,886	1	0	1	120	2,904	1	0	1	121	1,693	1	0	1	71
			T3S	2,789	1	0	1	116	2,995	1	0	2	125	3,013	1	0	2	126	1,757	0	0	1	73
			T3M	2,761	1	0	1	115	2,964	1	0	2	124	2,983	1	0	2	124	1,739	1	0	1	72
			T4M	2,705	1	0	1	113	2,904	1	0	2	121	2,922	1	0	2	122	1,704	1	0	1	71
			TFTM	2,811	1	0	1	117	3,019	1	0	2	126	3,038	1	0	2	127	1,771	0	0	1	74
			ASYDF	2,513	1	0	1	105	2,699	1	0	2	112	2,716	1	0	2	113	1,584	1	0	1	66
	530 mA	36W	T2S	4,079	1	0	1	113	4,380	1	0	1	122	4,408	1	0	1	122	2,504	1	0	1	70
			T2M	3,887	1	0	1	108	4,174	1	0	1	116	4,200	1	0	1	117	2,387	1	0	1	66
			T3S	4,034	1	0	1	112	4,332	1	0	1	120	4,359	1	0	1	121	2,477	1	0	1	69
			T3M	3,993	1	0	1	111	4,288	1	0	1	119	4,315	1	0	1	120	2,451	1	0	2	68
			T4M	3,912	1	0	2	109	4,201	1	0	2	117	4,227	1	0	1	117	2,402	1	0	1	67
			TFTM	4,066	1	0	1	113	4,367	1	0	1	121	4,394	1	0	1	122	2,496	1	0	1	69
			ASYDF	3,635	1	0	2	101	3,904	1	0	2	108	3,928	1	0	2	109	2,232	1	0	1	62
	700 mA	47W	T2S	5,188	1	0	1	110	5,571	1	0	1	119	5,606	1	0	1	119	3,065	1	0	1	65
			T2M	4,945	1	0	1	105	5,310	1	0	1	113	5,343	1	0	1	114	2,921	1	0	1	62
			T3S	5,131	1	0	1	109	5,510	1	0	2	117	5,544	1	0	2	118	3,031	1	0	1	64
			T3M	5,079	1	0	2	108	5,454	1	0	2	116	5,488	1	0	2	117	3,000	1	0	1	64
			T4M	4,976	1	0	2	106	5,343	1	0	2	114	5,377	1	0	2	114	2,939	1	0	1	63
			TFTM	5,172	1	0	2	110	5,554	1	0	2	118	5,589	1	0	2	119	3,055	1	0	1	65
			ASYDF	4,624	1	0	2	98	4,966	1	0	2	106	4,997	1	0	2	106	2,732	1	0	1	58
	1000 mA	74W	T2S	7,205	1	0	1	97	7,736	1	0	1	105	7,785	1	0	1	105	4,429	1	0	1	61
			T2M	6,866	1	0	2	93	7,373	1	0	2	100	7,419	1	0	2	100	4,221	1	0	2	58
			T3S	7,124	1	0	2	96	7,650	1	0	2	103	7,698	1	0	2	104	4,380	1	0	2	60
			T3M	7,052	1	0	2	95	7,736	1	0	2	105	7,620	1	0	2	103	4,335	1	0	2	59
			T4M	6,910	1	0	2	93	7,420	1	0	2	100	7,466	1	0	2	101	4,248	1	0	2	58
			TFTM	7,182	1	0	2	97	7,712	1	0	2	104	7,760	1	0	2	105	4,415	1	0	2	60
			ASYDF	6,421	1	0	2	87	6,895	2	0	2	93	6,938	2	0	2	94	3,947	1	0	2	54

Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	**77°F**	**1.00**
30°C	86°F	1.00
40°C	104°F	0.98

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the **DSXW1 LED 20C 1000** platform in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.95	0.93	0.88

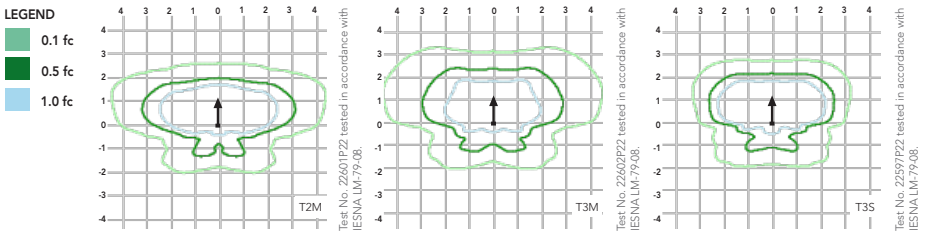
Electrical Load

LEDs	Drive Current (mA)	System Watts	Current (A) 120V	208V	240V	277V	347V	480V
10C	350	14 W	0.13	0.07	0.06	0.06	-	-
	530	20 W	0.19	0.11	0.09	0.08	-	-
	700	27 W	0.25	0.14	0.13	0.11	-	-
	1000	40 W	0.37	0.21	0.19	0.16	-	-
20C	350	24 W	0.23	0.13	0.12	0.10	-	-
	530	36 W	0.33	0.19	0.17	0.14	-	-
	700	47 W	0.44	0.25	0.22	0.19	0.15	0.11
	1000	74 W	0.69	0.40	0.35	0.30	0.23	0.17

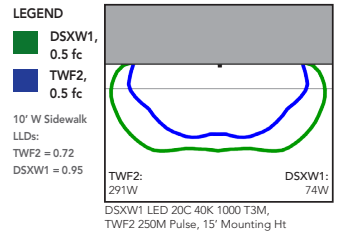
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Wall Size 1 homepage.

Isofootcandle plots for the DSXW1 LED 20C 1000 40K. Distances are in units of mounting height (15').



Distribution overlay comparison to 250W metal halide.



DSXW1 LED 20C 40K 1000 T3M, TWF2 250M Pulse, 15' Mounting Ht

Options and Accessories

T3M (left), ASYDF (right) lenses

HS - House-side shields

BSW - Bird-deterrent spikes

WG - Wire guard

VG - Vandal guard

DDL - Diffused drop lens

FEATURES & SPECIFICATIONS

INTENDED USE
The energy savings, long life and easy-to-install design of the D-Series Wall Size 1 make it the smart choice for building-mounted doorway and pathway illumination for nearly any facility.

CONSTRUCTION
Two-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance. The LED driver is mounted to the door to thermally isolate it from the light engines for low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65).

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in textured and non-textured finishes.

OPTICS
Precision-molded proprietary acrylic lenses provide multiple photometric distributions tailored specifically to building mounted applications. Light engines are available in 3000 K (70 min. CRI), 4000 K (70 min. CRI) or 5000 K (70 min. CRI) configurations.

ELECTRICAL
Light engine(s) consist of 10 high-efficacy LEDs mounted to a metal-core circuit board to maximize heat dissipation and promote long life (L88/100,000 hrs at 25°C). Class 1 electronic drivers have a power factor >90%, THD <20%, and a minimum 2.5KV surge rating. When ordering the SPD option, a separate surge protection device is installed within the luminaire which meets a minimum Category C Low (per ANSI/IEEE C62.41.2).

INSTALLATION
Included universal mounting bracket attaches securely to any 4" round or square outlet box for quick and easy installation. Luminaire has a slotted gasket wireway and attaches to the mounting bracket via corrosion-resistant screws.

LISTINGS
CSA certified to U.S. and Canadian standards. Rated for -40°C minimum ambient.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY
Five-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

D-Series Size 0
LED Area Luminaire

Catalog Number: DSX0-LED-40C-700-50K-T3M-MV

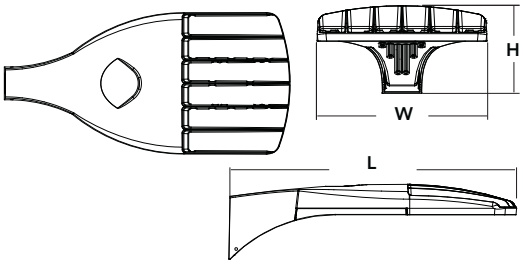
Notes:

Type: SITE

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

EPA:	0.95 ft² (.09 m²)
Length:	26" (66.0 cm)
Width:	13" (33.0 cm)
Height:	7" (17.8 cm)
Weight (max):	16 lbs (7.25 kg)



Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.

The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 400W metal halide with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information

EXAMPLE: DSX0 LED 40C 1000 40K T3M MVOLT SPA DDBXD

DSX0 LED

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting
DSX0 LED	**Forward optics** 20C 20 LEDs (one engine) 40C 40 LEDs (two engines) **Rotated optics**[1] 30C 30 LEDs (one engine)	530 530 mA 700 700 mA 1000 1000 mA (1 A) [2]	30K 3000 K 40K 4000 K 50K 5000 K AMBPC Amber phosphor converted [3]	T1S Type I short T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium T5VS Type V very short T5S Type V short T5M Type V medium T5W Type V wide BLC Backlight control[2,4] LCCO Left corner cutoff[2,4] RCCO Right corner cutoff[2,4]	MVOLT [5] 120 [5] 208 [5] 240 [5] 277 [5] 347 [6] 480 [6]	**Shipped included** SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor [7] RPUMBA Round pole universal mounting adaptor [7] **Shipped separately** KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish)[8]

Control options

Shipped installed

PER	NEMA twist-lock receptacle only (no controls) [9]
PER5	Five-wire receptacle only (no controls) [9,10]
PER7	Seven-wire receptacle only (no controls) [9,10]
DMG	0-10V dimming driver (no controls) [11]
DCR	Dimmable and controllable via ROAM® (no controls) [12]
PIR	Bi-level, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc [13]
PIRH	Bi-level, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 5fc [13]
PIR1FC3V	Bi-level, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc [13]
PIRH1FC3V	Bi-level, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc [13]
BL30	Bi-level switched dimming, 30% [14,15]
BL50	Bi-level switched dimming, 50% [14,15]
PNMTDD3	Part night, dim till dawn [16]
PNMT5D3	Part night, dim 5 hrs [16]
PNMT6D3	Part night, dim 6 hrs [16]
PNMT7D3	Part night, dim 7 hrs [16]
FAO	Field adjustable output [17]

Other options

Shipped installed

HS	House-side shield [18]
SF	Single fuse (120, 277, 347V) [19]
DF	Double fuse (208, 240, 480V) [19]
L90	Left rotated optics [1]
R90	Right rotated optics [1]
DDL	Diffused drop lens [18]
BS	Bird spikes

Finish *(required)*

DDBXD	Dark bronze
DBLXD	Black
DNAXD	Natural aluminum
DWHXD	White
DDBTXD	Textured dark bronze
DBLBXD	Textured black
DNATXD	Textured natural aluminum
DWHGXD	Textured white

Accessories

Ordered and shipped separately.

Controls & Shields

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) [20]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) [20]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) [20]
DSHORT SBK U	Shorting cap [20]
DSX0HS 20C U	House-side shield for 20 LED unit [18]
DSX0HS 30C U	House-side shield for 30 LED unit [18]
DSX0HS 40C U	House-side shield for 40 LED unit [18]
DSX0DDL U	Diffused drop lens (polycarbonate) [17]
PUMBA DDBXD U*	Square and round pole universal mounting bracket adaptor (specify finish)[21]
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish) [8]

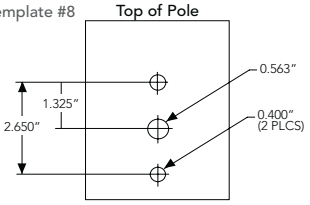
For more control options, visit DTL and ROAM online.

NOTES

1. 30 LEDs (30C option) and rotated options (L90 or R90) only available together.
2. Not available with AMBPC.
3. Only available with 530mA or 700mA.
4. Not available with HS or DDL.
5. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120V, 208V, 240V or 277V options only when ordering with fusing (SF, DF options).
6. Not available with single board, 530mA product (20C 530 or 30C 530). Not available with BL30, BL50 or PNMT options.
7. Existing drilled pole only. Available as a separate combination accessory; for retrofit use only: PUMBA (finish) U; 1.5 G vibration load rating per ANCI C136.31.
8. Must order fixture with SPA mounting. Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" mast arm (not included).
9. Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories.
10. If ROAM® node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Not available with DCR. Node with integral dimming.
11. DMG option for 347V or 480V requires 1000mA.
12. Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net. N/A with PIR options, PER5, PER7, BL30, BL50 or PNMT options. Node without integral dimming.
13. PIR and PIR1FC3V specify the SensorSwitch SBGR-10-ODP control; PIRH and PIRH1FC3V specify the SensorSwitch SBGR-6-ODP control; see Outdoor Control Technical Guide for details. Dimming driver standard. Not available with PER5 or PER7. Ambient sensor disabled when ordered with DCR. Separate on/off required. Not available with PNMT options.
14. Requires an additional switched circuit.
15. Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, PER5, PER7 or PNMT options. Not available with PIR1FC3V and PIRH1FC3V.
16. Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, PER5, PER7, BL30 or BL50. Not available with PIR1FC3V and PIRH1FC3V. Separate on/off required.
17. Dimming driver standard. Not available with PER5, PER7, DMG, DCR, BL30, BL50, PNMT, PIR, PIRH, PIR1FC3V and PIRH1FC3V.
18. Not available with BLC, LCCO and RCCO distribution. Also available as a separate accessory; see Accessories information.
19. Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
20. Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item from Acuity Brands Controls.
21. For retrofit use only.

Drilling

Template #8



DSX0 shares a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles, per the table below.

DM19AS	Single unit	**DM29AS**	2 at 90°*
DM28AS	2 at 180°	**DM39AS**	3 at 90°*
DM49AS	4 at 90°*	**DM32AS**	3 at 120°**

Example: SSA 20 4C **DM19AS** DDBXD

Visit Lithonia Lighting's POLES CENTRAL to see our wide selection of poles, accessories and educational tools.

*Round pole top must be 3.25″ O.D. minimum.

**For round pole mounting (RPA) only.

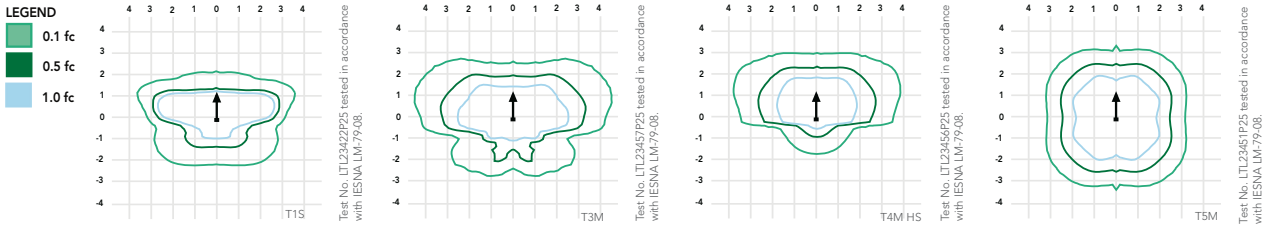
Tenon Mounting Slipfitter**

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8″	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8″	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4″	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Area Size 0 homepage.

Isofootcandle plots for the DSX0 LED 40C 1000 40K. Distances are in units of mounting height (20').



Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	**77°F**	**1.00**
30°C	86°F	1.00
40°C	104°F	0.99

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	DSX0 LED 20C 1000			
	1	0.98	0.96	0.93
	DSX0 LED 40C 1000			
	1	0.98	0.95	0.90
	DSX0 LED 40C 700			
	1	0.99	0.99	0.99

Electrical Load

Number of LEDs	Drive Current (mA)	System Watts	Current (A) 120	208	240	277	347	480
20C	530	35	0.34	0.22	0.21	0.20	--	--
	700	45	0.47	0.28	0.24	0.22	0.18	0.14
	1000	72	0.76	0.45	0.39	0.36	0.36	0.26
30C	530	52	0.51	0.31	0.28	0.25	--	--
	700	70	0.72	0.43	0.37	0.34	0.25	0.19
	1000	104	1.11	0.64	0.56	0.49	0.47	0.34
40C	530	68	0.71	0.41	0.36	0.33	0.25	0.19
	700	91	0.94	0.55	0.48	0.42	0.33	0.24
	1000	138	1.45	0.84	0.73	0.64	0.69	0.50

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
20C (20 LEDs)	530 mA	35 W	T1S	4,079	1	0	1	117	4,380	1	0	1	125	4,408	1	0	1	126	2,541	1	0	1	73
			T2S	4,206	1	0	1	120	4,516	1	0	1	129	4,544	1	0	1	130	2,589	1	0	1	74
			T2M	4,109	1	0	1	117	4,413	1	0	1	126	4,440	1	0	1	127	2,539	1	0	1	73
			T3S	4,104	1	0	1	117	4,407	1	0	1	126	4,435	1	0	1	127	2,558	1	0	1	73
			T3M	4,142	1	0	1	118	4,447	1	0	1	127	4,475	1	0	1	128	2,583	1	0	1	74
			T4M	4,198	1	0	1	120	4,508	1	0	1	129	4,536	1	0	1	130	2,570	1	0	1	73
			TFTM	4,135	1	0	1	118	4,440	1	0	2	127	4,468	1	0	2	128	2,540	1	0	1	73
			T5VS	4,368	2	0	0	125	4,691	2	0	0	134	4,720	2	0	0	135	2,650	1	0	0	76
			T5S	4,401	2	0	2	126	4,725	2	0	0	135	4,755	2	0	0	136	2,690	1	0	0	77
			T5M	4,408	2	0	1	126	4,734	3	0	1	135	4,763	3	0	1	136	2,658	2	0	0	76
			T5W	4,344	3	0	1	124	4,664	3	0	1	133	4,693	3	0	1	134	2,663	2	0	1	76
			BLC	3,071	1	0	1	88	3,297	1	0	1	94	3,318	1	0	1	95					
			LCCO	2,983	1	0	1	85	3,204	1	0	1	92	3,224	1	0	1	92					
			RCCO	2,983	1	0	1	85	3,204	1	0	1	92	3,224	1	0	1	92					
	700 mA	45 W	T1S	5,181	1	0	1	115	5,563	1	0	1	124	5,598	1	0	1	124	3,144	1	0	1	70
			T2S	5,342	1	0	1	119	5,736	1	0	1	127	5,772	1	0	1	128	3,203	1	0	1	71
			T2M	5,219	1	0	1	116	5,605	1	0	1	125	5,640	1	0	1	125	3,141	1	0	1	70
			T3S	5,213	1	0	1	116	5,598	1	0	1	124	5,633	1	0	1	125	3,165	1	0	1	70
			T3M	5,260	1	0	1	117	5,649	1	0	2	126	5,684	1	0	2	126	3,196	1	0	1	71
			T4M	5,332	1	0	1	118	5,725	1	0	2	127	5,761	1	0	2	128	3,179	1	0	1	71
			TFTM	5,252	1	0	2	117	5,640	1	0	2	125	5,675	1	0	2	126	3,143	1	0	1	70
			T5VS	5,548	2	0	0	123	5,958	2	0	0	132	5,995	2	0	0	133	3,278	2	0	0	73
			T5S	5,589	2	0	0	124	6,002	2	0	0	133	6,039	2	0	0	134	3,328	2	0	0	74
			T5M	5,599	3	0	1	124	6,012	3	0	1	134	6,050	3	0	1	134	3,288	2	0	1	73
			T5W	5,517	3	0	1	123	5,924	3	0	1	132	5,961	3	0	1	132	3,295	2	0	1	73
			BLC	3,909	1	0	1	87	4,198	1	0	1	93	4,224	1	0	1	94					
			LCCO	3,798	1	0	1	84	4,078	1	0	1	91	4,104	1	0	1	91					
			RCCO	3,798	1	0	1	84	4,078	1	0	1	91	4,104	1	0	1	91					
	1000 mA	72 W	T1S	7,085	1	0	1	98	7,608	2	0	2	106	7,656	2	0	2	106					
			T2S	7,305	1	0	1	101	7,845	2	0	2	109	7,894	2	0	2	110					
			T2M	7,138	1	0	2	99	7,665	2	0	2	106	7,713	2	0	2	107					
			T3S	7,129	1	0	1	99	7,656	2	0	2	106	7,704	2	0	2	107					
			T3M	7,194	1	0	2	100	7,725	2	0	2	107	7,773	2	0	2	108					
			T4M	7,292	1	0	2	101	7,830	2	0	2	109	7,879	2	0	2	109					
			TFTM	7,183	1	0	2	100	7,713	1	0	2	107	7,761	1	0	2	108					
			T5VS	7,588	2	0	0	105	8,148	3	0	0	113	8,199	3	0	0	114					
			T5S	7,644	2	0	0	106	8,208	2	0	0	114	8,259	2	0	0	115					
			T5M	7,657	3	0	1	106	8,222	3	0	1	114	8,274	3	0	1	115					
			T5W	7,545	3	0	1	105	8,102	3	0	2	113	8,153	3	0	2	113					
			BLC	5,162	1	0	1	72	5,543	1	0	2	77	5,578	1	0	1	77					
			LCCO	5,015	1	0	2	70	5,386	1	0	2	75	5,419	1	0	2	75					
			RCCO	5,015	1	0	2	70	5,386	1	0	2	75	5,419	1	0	2	75					

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
40C (40 LEDs)	530 mA	68 W	T1S	7,926	2	0	2	117	8,511	2	0	2	125	8,564	2	0	2	126	4,878	1	0	1	72
			T2S	8,172	2	0	2	120	8,775	2	0	2	129	8,830	2	0	2	130	4,969	1	0	1	73
			T2M	7,985	2	0	2	117	8,574	2	0	2	126	8,628	2	0	2	127	4,874	1	0	1	72
			T3S	7,975	1	0	2	117	8,564	2	0	2	126	8,617	2	0	2	127	4,910	1	0	1	72
			T3M	8,047	2	0	2	118	8,642	2	0	2	127	8,696	2	0	2	128	4,958	1	0	2	73
			T4M	8,157	1	0	2	120	8,759	2	0	2	129	8,813	2	0	2	130	4,932	1	0	2	73
			TFTM	8,035	1	0	2	118	8,628	2	0	2	127	8,682	2	0	2	128	4,876	1	0	2	72
			T5VS	8,488	2	0	0	125	9,115	3	0	0	134	9,172	3	0	0	135	5,086	2	0	0	75
			T5S	8,550	2	0	0	126	9,182	3	0	1	135	9,239	3	0	1	136	5,163	2	0	0	76
			T5M	8,565	3	0	1	126	9,198	3	0	2	135	9,255	3	0	2	136	5,102	3	0	1	75
			T5W	8,440	3	0	2	124	9,063	3	0	2	133	9,120	3	0	2	134	5,112	3	0	1	75
			BLC	6,142	1	0	2	90	6,595	1	0	2	97	6,636	1	0	2	98					
			LCCO	5,967	1	0	2	88	6,407	1	0	2	94	6,447	1	0	2	95					
			RCCO	5,967	1	0	2	88	6,407	1	0	2	94	6,447	1	0	2	95					
	700 mA	91 W	T1S	10,066	2	0	2	111	10,810	2	0	2	119	10,877	2	0	2	120	6,206	2	0	2	68
			T2S	10,379	2	0	2	114	11,145	2	0	2	122	11,215	2	0	2	123	6,322	2	0	2	69
			T2M	10,141	2	0	2	111	10,890	2	0	2	120	10,958	2	0	2	120	6,201	2	0	2	68
			T3S	10,129	2	0	2	111	10,877	2	0	2	120	10,945	2	0	2	120	6,247	1	0	2	69
			T3M	10,221	2	0	2	112	10,975	2	0	2	121	11,044	2	0	2	121	6,308	2	0	2	69
			T4M	10,359	2	0	2	114	11,124	2	0	2	122	11,194	2	0	2	123	6,275	1	0	2	69
			TFTM	10,205	2	0	2	112	10,958	2	0	3	120	11,027	2	0	3	121	6,203	1	0	2	68
			T5VS	10,781	3	0	0	118	11,576	3	0	1	127	11,649	3	0	1	128	6,569	2	0	0	72
			T5S	10,860	3	0	1	119	11,662	3	0	1	128	11,734	3	0	1	129	6,569	2	0	0	72
			T5M	10,879	3	0	2	120	11,682	3	0	2	128	11,755	3	0	2	129	6,491	3	0	1	71
			T5W	10,719	3	0	2	118	11,511	4	0	2	126	11,583	4	0	2	127	6,504	3	0	2	71
			BLC	7,819	1	0	2	86	8,396	1	0	2	92	8,448	1	0	2	93					
			LCCO	7,596	1	0	2	83	8,157	1	0	2	90	8,208	1	0	2	90					
			RCCCO	7,596	1	0	2	83	8,157	1	0	2	90	8,208	1	0	2	90					
	1000 mA	138 W	T1S	13,767	2	0	2	100	14,783	3	0	3	107	14,876	3	0	3	108					
			T2S	14,194	2	0	2	103	15,242	3	0	3	110	15,338	3	0	3	111					
			T2M	13,869	2	0	2	101	14,893	3	0	3	108	14,986	3	0	3	109					
			T3S	13,852	2	0	2	100	14,875	2	0	2	108	14,968	2	0	2	108					
			T3M	13,978	2	0	2	101	15,010	3	0	3	109	15,104	3	0	3	109					
			T4M	14,168	2	0	2	103	15,214	3	0	3	110	15,309	3	0	3	111					
			TFTM	13,956	2	0	3	101	14,987	2	0	3	109	15,080	2	0	3	109					
			T5VS	14,744	3	0	1	107	15,832	3	0	1	115	15,931	4	0	1	115					
			T5S	14,852	3	0	1	108	15,948	3	0	1	116	16,048	3	0	1	116					
			T5M	14,878	4	0	2	108	15,976	4	0	2	116	16,076	4	0	2	116					
			T5W	14,660	4	0	2	106	15,742	4	0	2	114	15,840	4	0	2	115					
			BLC	10,325	1	0	2	75	11,087	1	0	2	80	11,156	1	0	2	81					
			LCCO	10,031	2	0	2	73	10,771	2	0	3	78	10,839	2	0	3	79					
			RCCO	10,031	2	0	2	73	10,771	2	0	3	78	10,839	2	0	3	79					

TSC TRACTOR SUPPLY Co

EXHIBIT M

Approved By: _____

Signed: _____

Date: _____

Job Location: MOUNT HOOD HWY.,
SANDY, OR 97055

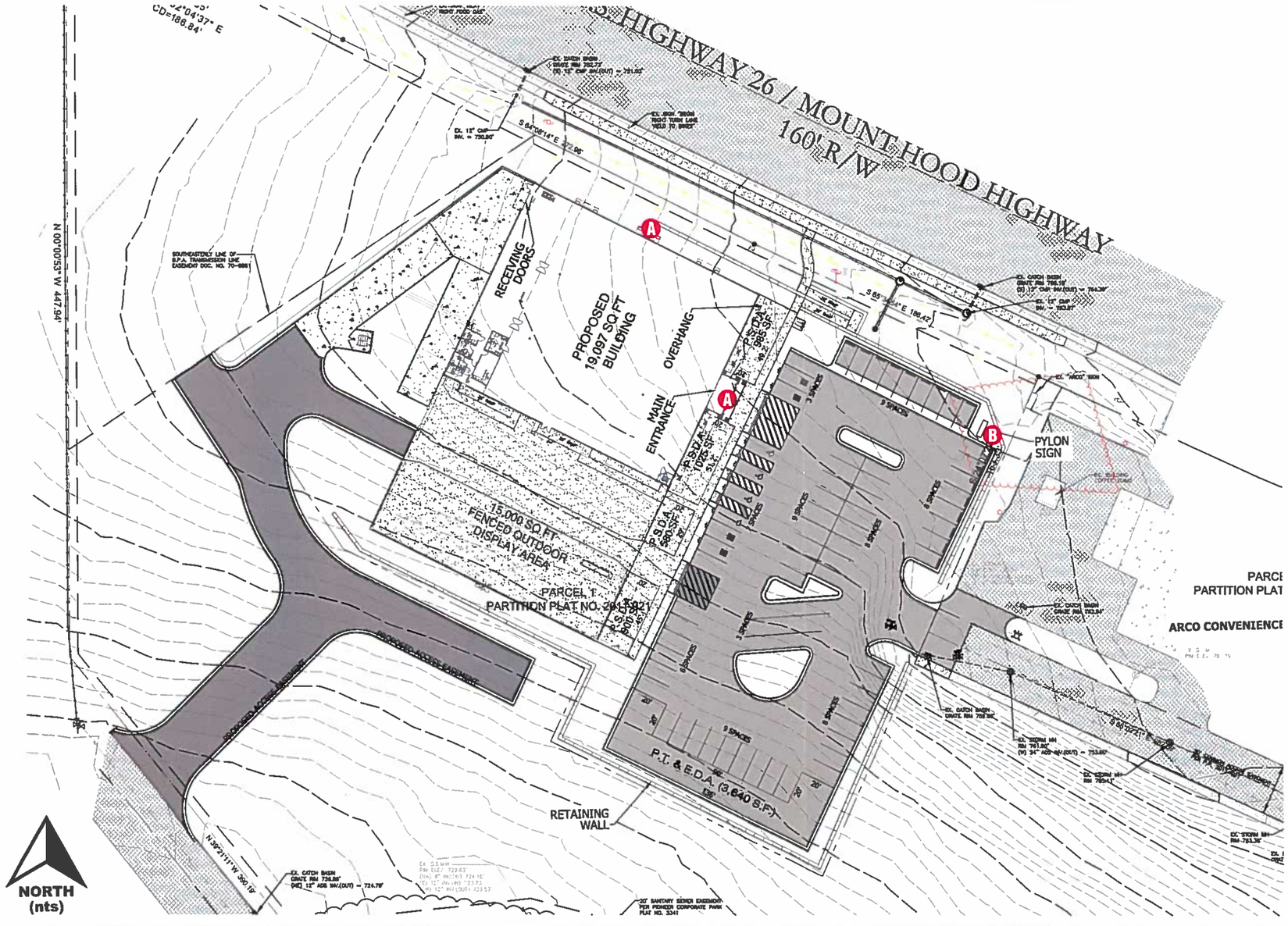
Date: April 20, 2018

CUMMINGS

D-ORDER# 93448.00 TDP
Project Mgr.: Liz Romo
liz.romo@cummingssigns.com
Page: 1 of 5

SITE PLAN

PRODUCT LIST		
SQ. FT.	QTY	ITEM
EXTERIOR BUILDING SIGNS		
A 69.7	2	CHANNEL LOGO & LETTER SETS
EXTERIOR GROUND SIGNS		
B 108	1	DF PYLON SIGN



Job Location: MOUNT HOOD HWY., SANDY, OR 97055

Date: April 20, 2018

CUMMINGS

D-ORDER# 93448.00 TDP

Project Mgr.: Liz Romo

liz.romo@cummingssigns.com

Page: 2 of 5

SCALE: 3/32" = 1'-0"

ELEVATION - WALL SIGNAGE

EAST - FRONT ENTRANCE

NORTH - RIGHT SIDE

Job Location: MOUNT HOOD HWY., SANDY, OR 97055

Date: April 20, 2018

CUMMINGS

D-ORDER# 93448.00 TDP

Project Mgr.: Liz Romo

liz.romo@cummingssigns.com

Page: 3 of 5

CHANNEL LETTERS

LED ILLUMINATED CHANNEL LETTER SET
ACRYLIC FACES DECORATED WITH 1ST SURFACE VINYL.
1"TRIMCAP - BLACK OR RED.
ALUMINUM RETURNS - BLACK OR RED

- 3M 3632-33 RED VINYL
- BLACK VINYL
- WHITE SUBSTRATE

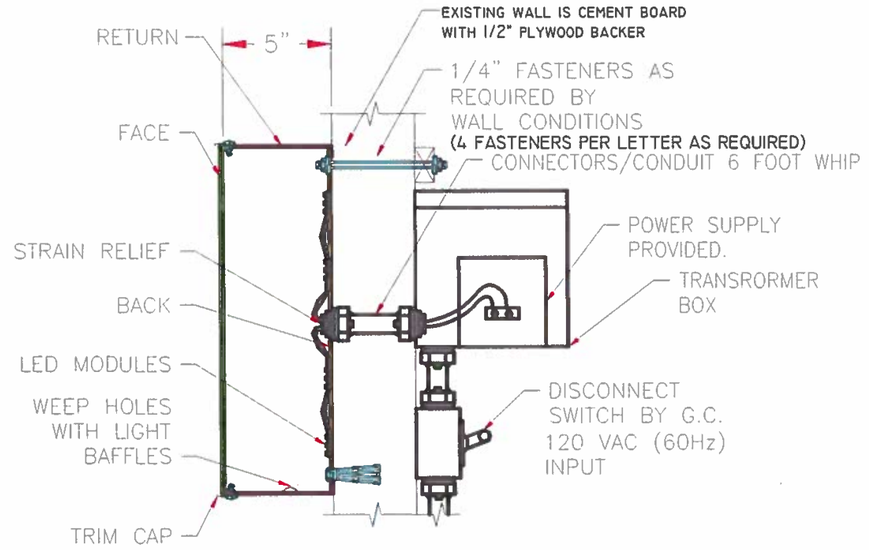
TOTAL SIGN AREA: 69.7 SQ. FT.

COLOR NOTES: LOGO
FACE: WHITE 7328 PA117080 WITH 3632-33 (PY711390) FIRST SURFACE
JEWELITE: XC200090 1" TRUE RED
RETURN: CY890050 PAINTED TRUE RED
ILLUMINATION: EN600104 PPO 160 65K

COLOR NOTES: LETTERS
FACE: CLEAR PA115000 WITH PY711065 SECOND SURFACE AND PY711408 DAY/NIGHT FIRST SURFACE
JEWELITE: XC200100 1" BLACK
RETURN: CY890050 PAINTED BLACK
ILLUMINATION: EN600020 TRUE RED

ELECTRICAL NOTES:
TOTAL AMPS – 4.5 A
TOTAL CIRCUITS – 1 20A REQUIRED
VOLTS – 120V-277V

THIS SIGN WILL BE UL OR cUL LISTED AND IS INTENDED TO BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 600 OF THE NATIONAL ELECTRICAL CODE AND/OR OTHER APPLICABLE LOCAL CODES. THIS INCLUDES PROPER GROUNDING AND BONDING OF THE SIGN. ##ø1/4" DRAINAGE/ WEEP HOLES @ 4' ON CENTERS OR AS REQUIRED BY UL. MIN 12 MTW/THHN 1011/ 1015/1230/1335 600V or 1032 1000V 105C WIRE. PER UL REQUIREMENT, ALL ELECTRICAL COMPONENTS AND WIRING MUST BE FIXED & SUPPORTED A MINIMUM OF 1/2" ABOVE THE BOTTOM OF SIGN



SECTION DETAIL
EQUIPMENT GROUNDED
NOT TO SCALE

Job Location: MOUNT HOOD HWY., SANDY, OR 97055

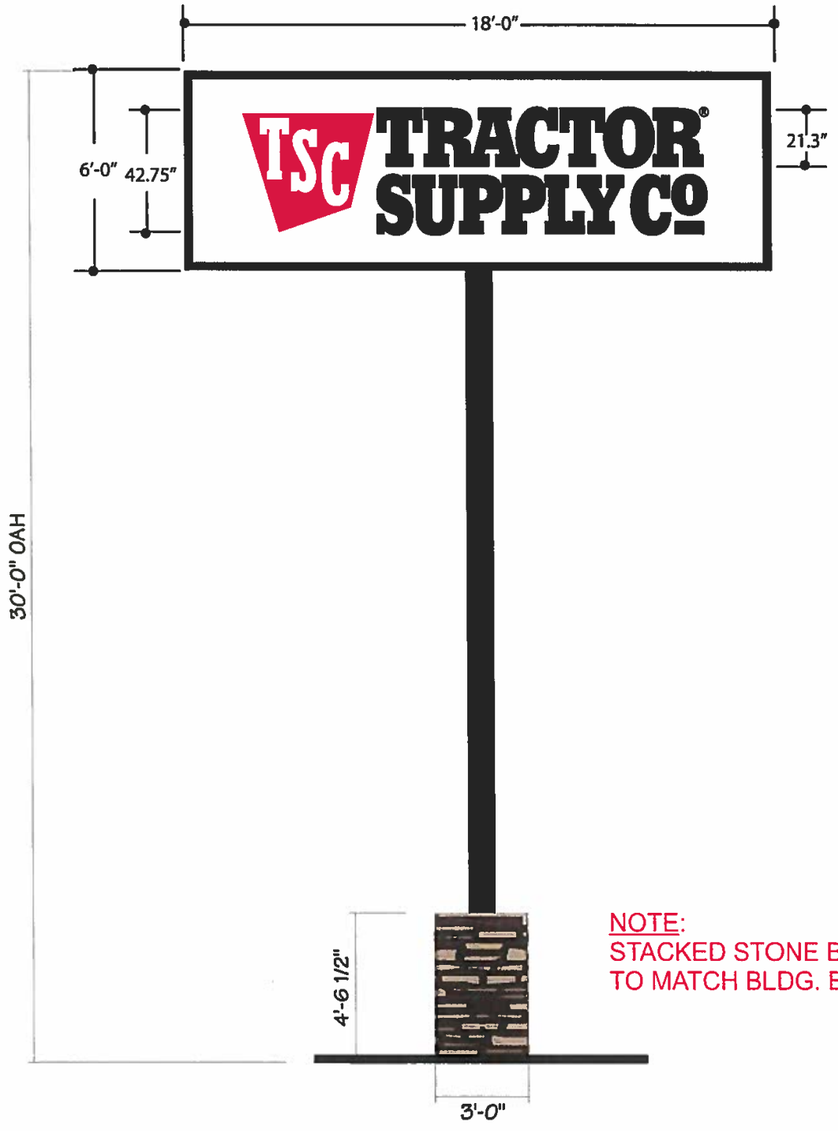
Date: April 20, 2018

CUMMINGS

D-ORDER# 93448.00 TDP
Project Mgr.: Liz Romo
liz.romo@cummingssigns.com
Page: 4 of 5

SCALE: 1/4" = 1'-0"

DF PYLON SIGN



NOTE:
STACKED STONE BASE
TO MATCH BLDG. BY OTHERS

DOUBLE FACE INTERNALLY ILLUMINATED
PYLON SIGN.

ALUMINUM CABINET & RETAINERS PAINTED
SATIN BLACK.
FLEXIBLE FABRIC FACES.
FLUORESCENT ILLUMINATION

- 3M 3632-33 RED VINYL
- BLACK VINYL
- WHITE SUBSTRATE

TOTAL SIGN AREA: 108 SQ. FT.

Job Location: MOUNT HOOD HWY.,
SANDY, OR 97055

Date: April 20, 2018

CUMMINGS

D-ORDER# 93448.00 TDP
Project Mgr.: Liz Romo
liz.romo@cummingssigns.com
Page: 5 of 5

SANDY OREGON

Emily Meharg <emeharg@ci.sandy.or.us>

Tractor Supply Company Store

1 message

EXHIBIT N

Hassan Ibrahim <hai@curran-mcleod.com>
To: Emily Meharg <emeharg@ci.sandy.or.us>

Thu, Jun 28, 2018 at 10:06 AM

Hi Emily,

Here are our comments on this application:

1. It appears that the curb exists along the most of the site frontage on Industrial Way, any missing curb needs to be extended to the westerly property line.
2. Sidewalks also needs to be constructed along the entire site frontage with Industrial Way, the width shall match the existing sidewalk to the east. Planter strip may need to be created as directed by the City.
3. A commercial driveway approach needs to be constructed at access point with Industrial Way. The width of the driveway shall accommodate the truck turning movement.
4. A drainage report needs to be submitted to the City for review and approval. The report must be in accordance with the most current City of Portland SWWM manual.

Should you have any questions, please let us know.

Hassan Ibrahim, P.E.
CURRAN-McLEOD, INC.
6655 SW Hampton St, Ste. 210
Portland, OR 97223
Tel: 503-684-3478
Fax: 503-624-8247
Cell: 503-807-2737
email: hai@curran-mcleod.com

REPLINGER & ASSOCIATES LLC
TRANSPORTATION ENGINEERING

EXHIBIT O

June 29, 2018

Ms. Emily Meharg
City of Sandy
39250 Pioneer Blvd.
Sandy, OR 97055

SUBJECT: REVIEW OF TRANSPORTATION IMPACT ANALYSIS – SANDY FARM STORE

Dear Emily:

In response to your request, I have reviewed materials submitted in support of the Sandy Farm Store. The materials consisted of the site plan and the Transportation Impact Study (TIS) for the Sandy Farm Store. The TIS prepared under the direction of William Farley, PE of Lancaster Engineering. The TIS is dated May 21, 2018.

The TIS describes a proposal to construct a retail store of approximately 19,000 square feet on a 2.65-acre parcel. The site is in the west part of Sandy, south of Highway 26 and west of Champion Way. The proposed store abuts US 26 and is immediately west of a gas station and convenience market in the southwest quadrant of US 26 and Champion Way. The site is currently vacant.

Overall

I find the TIS addresses the city's requirements and provides an adequate basis to evaluate impacts of the proposed development.

Comments

1. ***Study Area.*** The study addresses the appropriate intersections. It includes analyses of:
   - US 26 at Champion Way,
   - US 26 at SE 362nd Drive,
   - SE 362nd Drive at Industrial Way, and
   - Champion Way at site access.

2. ***Traffic Counts.*** The traffic counts were conducted on Tuesday, April 3 and Wednesday, April 4, 2018. The engineer used a seasonal adjustment factor for US 26 to account for seasonal variation. The counts and adjustments appear reasonable.

3. ***Trip Generation.*** The TIS uses trip generation for a tractor supply store (land use code 810) from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual.* The engineer calculates that the store will produce 27 AM peak hour trips and 27 PM peak hour trips. The calculation of trips generated by the proposed store appears reasonable.

4. ***Trip Distribution.*** The TIS provided information about trip distribution from the site. The engineer assumed 50 percent of the traffic would travel to and from the east on US 26; 30 percent would travel to and from the west on US 26; and 20 percent would travel to and from the south on 362nd Drive. The amount of traffic assumed for 362nd Drive seems slightly high, but overall, the trip distribution seems reasonable. Given the low traffic generation, a slight change in the trip distribution would not alter the conclusions of the TIS.

5. ***Traffic Growth.*** The TIS uses a 1.29 percent annual increase for US 26 based on ODOT's Future Volume Tables. For other facilities it uses a 2.0 percent annual growth rate for background traffic growth. Background traffic volumes were calculated for 2020, the year in which the development is expected to be completed. These assumptions account for future traffic and appear reasonable.

6. ***Analysis.*** Traffic volumes were calculated for the intersections cited in #1, above. Intersection level-of-service (LOS) and the volume-to-capacity (v/c) ratio were provided. ODOT uses the v/c ratio for its standard of intersection performance. Performance of the intersections was calculated for existing conditions; 2020 background conditions; and 2020 conditions with the proposed store.

   For the intersection of US 26/Champion Way, the engineer calculated that the intersection will operate at LOS B during the AM peak hour under all scenarios and will operate at LOS C during the PM peak hour under 2020 background conditions, but will fall to LOS D with the development. During the AM peak hour, the v/c ratio increases from 0.12 under existing conditions to 0.14 under background conditions to 0.15 with the development. During the PM peak hour, the v/c ratio increases from 0.28 under existing conditions to 0.39 under 2020 background conditions to 0.43 with the development. This intersection meets ODOT performance standards under all conditions.

   For the intersection of 362nd Drive/Industrial Way, the engineer calculated that the intersection will operate at LOS B during the AM peak hour under all scenarios. During the PM peak hour, it is calculated to operate at LOS C, but will fall to LOS D in 2020 with or without the development. During the AM peak hour, the v/c ratio increases from 0.40 under existing conditions to 0.42 under background conditions and to 0.43 with the development. During the PM peak hour, the v/c ratio increases from 0.74 under existing conditions to 0.78 under 2020 background conditions and to 0.80 with the development. This intersection meets city performance standards under all conditions.

   For the site access, the performance of the site access is calculated to be LOS B during both the AM and PM peak hours in 2020 with the development. This meets city performance standards.

   For the intersection of US 26/362nd Drive, the engineer calculated that the intersection will operate at LOS B during the AM peak hour under all scenarios and will operate at LOS C during the PM peak hour under all scenarios. During the AM peak hour, the v/c ratio increases from 0.56 under existing conditions to 0.67 under background conditions and to 0.67 with the development. During the PM peak hour, the v/c ratio increases from 0.76 under existing

conditions to 0.89 under 2020 background conditions. The PM peak hour v/c is also calculated to be 0.89 with the development.

The intersection of US 26/362nd Drive is expected to exceed ODOT's 0.80 v/c standard by 2020 with or without the development. The amount of traffic added to the intersection by this development is small and the v/c ratio is essentially unchanged for 2020 with the development. The City of Sandy and ODOT have identified the addition of a second westbound left-turn lane as well as a north leg for this intersection. The intersection improvement is identified in the adopted Sandy Transportation System Plan (TSP).

Due to the low volumes of traffic added by the proposed development at key intersections and the slight change in performance due to the additional traffic, the engineer recommends no mitigation for traffic from this proposal. I concur.

7. ***Crash Information.*** The TIS provides information on crashes for the most recent available five-year period (2011 through 2015). The engineer provides a detailed summary of the crashes at each location.

   For the five-year period, three crashes were reported at the US 26/Champion Way intersection. Injury or possible injury were cited in two crashes. The calculated crash rate was 0.05 crashes per million entering vehicles. Two crashes were reported at the intersection of 362nd Drive/Industrial Way. Both involved property damage only. The crash rate was calculated to be 0.10 crashes per million entering vehicles. No crashes were reported at the site access. All three locations experience a low crash rate.

   The intersection of US 26/362nd Drive had 38 reported crashes. Most were rear-end or turning movement crashes as is typical of major signalized urban intersections. The crash rate was calculated to be 0.59 crashes per million entering vehicles, which is above the state average for similar intersections. Intersection improvements with expansion of the intersection as identified in the TSP could involve elements to improve safety.

   The engineer detected no significant trends or crash patterns. The engineer did not recommend mitigation for any safety issues. I concur.

8. ***Site Plan and Access.*** The main access proposed for the site is an existing access shared by a gas station and convenience store that intersects Champion Way approximately 150 feet from US 26. A secondary access intended for trucks accesses the west part of the site from Industrial Way. As noted above, the main driveway is predicted to operate at LOS B or better with the development. No operational issues would be expected.

9. ***Left-Turn Lane and Signal Warrants.*** The engineer analyzed the site access at Champion Way for a northbound left-turn lane using standard methods based on traffic volumes, travel speeds, and lanes. He concluded left-turn lane warrants would not be met.

   He also analyzed traffic signal warrants for the intersection of 362nd Drive/Industrial Way by accounting for traffic volumes and concluded traffic signal warrants would be met under existing

conditions. The TSP identifies a project at this intersection that includes realignment of the east leg to form a standard four-way intersection. Since the number of trips added by the proposal to this intersection is small, the engineer recommends no mitigation. I concur.

10. ***Conclusions and Recommendations.*** The engineer concludes that the proposed development adds relatively little traffic to key intersections. He concludes traffic operations meet acceptable standards at all intersections except US 25/362nd Drive. At this intersection, the performance is expected to fall below ODOT standards by 2020 with the addition of background traffic. The calculated PM peak hour v/c does not change with the addition of the proposed development in 2020. The engineer concludes that the development does not warrant mitigation to account for added traffic and that crash data did not reveal need for mitigation for safety concerns. I concur with these conclusions.

Conclusion and Recommendations

I find the TIS meets City requirements. The TIS demonstrates that the development causes only slight degradation in performance of any intersection and that it does not warrant mitigation for traffic or safety issues. The TIS reinforces the need to continue to work toward implementing projects identified in the TSP including an additional westbound left-turn lane at US 26/362nd Drive and improvements and realignment of 362nd Drive/Industrial Way.

If you have any questions or need any further information concerning this review, please contact me at replinger-associates@comcast.net.

Sincerely,

John Replinger

John Replinger, PE
Principal

SandyFarmStoreTIA062918

SANDY OREGON

Emily Meharg <emeharg@ci.sandy.or.us>

PGE notification File# 18-018 DR/CUP/VAR

1 message

EXHIBIT P

Manuel Garcia <Manuel.Garcia@pgn.com> Mon, Jul 9, 2018 at 3:57 PM
To: "emeharg@ci.sandy.or.us" <emeharg@ci.sandy.or.us>
Cc: Kristine Hendrix <Kristine.Hendrix@pgn.com>

Dear Emily,

In regards of the notification received in our office for the Tractor Supply Company Store, located in 11872 SE 147th Ave, Happy Valley, OR 97086; we find no conflicts with any of our current projects as of today.

Find attached a map with colored polygons of the works we have in progress as of today.

Please, do not hesitate to contact me if you have any questions,

PGE

Manuel Garcia – Design Coordinator

1705 NE Burnside Rd, Gresham, OR 97030

✉: Manuel.Garcia@pgn.com

☎: 971.202.3894

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221K

Oregon
Kate Brown, Governor

Department of Transportation
Region 1 Headquarters
123 NW Flanders Street
Portland, Oregon 97209
(503) 731.8200
FAX (503) 731.8259

EXHIBIT Q

DATE: ODOT #7964

ODOT Response

Project Name: Champion Way Comm. - Tractor Supply (Benson Site)	**Applicant:** Hix Snedeker, LLC
Jurisdiction: City of Sandy	**Jurisdiction Case #:** 18-018 DR/CUP/VAR
Site Address: No Situs - Mt Hood Hwy (US 26) @ Champion Wy, Sandy, OR	**Legal Description:** 02S 04E 15A **Tax Lot(s):** 00209
State Highway: US 26	**Mileposts:** 22.2

The site of this proposed land use action is adjacent to US 26. ODOT has permitting authority for this facility and an interest in ensuring that this proposed land use is compatible with its safe and efficient operation. **Please direct the applicant to the District Contact indicated below to determine permit requirements and obtain application information.**

COMMENTS/FINDINGS

Proportional Share

ODOT recommends that the City collect a proportional share based on the developments impacts towards the following City of Sandy Transportation System Plan projects:

- Project ID#M4, US 26/Industrial Way: Change southbound approach to dual left turn lanes and a shared through/right lane and construct a northbound left turn lane (Project Cost $780,000, 2009 Dollars).
- Project ID#M12: Industrial Way extension to Jarl Road/US 26 (Project Cost $10,800,000, 2009 Dollars).
- Project ID#M15: Extend 362nd Drive to Kelso Road (Project Cost $26,620,000, 2009 Dollars).

Cross-Over Easements

ODOT recommends that the applicant provide necessary cross-over access easements from the Tractor Supply site through the recently partitioned property to the south, connecting to Industrial Way. Note, this was recommended as part of Local Case File #18-019 MP.

Sidewalk

As previously conveyed, , the sidewalk along the development's frontage does not meet ODOT standards, which requires a minimum of a 6' sidewalk with a 4'-8' buffer strip. As a note, ODOT has provided a cursory review of plans to be submitted for ODOT Permit plan review, the applicant's submittal includes bringing the sidewalk to current standard. ODOT Permits and plans for work within the right of way still need to be formally submitted. ODOT recommends that the City reinforces this improvements as a Condition of Approval to require the applicant to bring the sidewalk up to current ODOT and City standards. Please direct the applicant to the District Contact indicated below to determine permit requirements and obtain application information.

Preliminary ODOT Hydro Comments

As noted above, ODOT previously conveyed cursory comments for a future ODOT Permit submittal, those comments are reflected below and anticipated that the applicant will address/submit with a formal permit submission:

1. The storm water report, dated April 27, 2018, deals only with the on-site drainage for Tractor Supply which does not impact ODOT drainage.
2. The proposed sidewalk extension and pipe extension (plan sheet C-R6) requires the following:
    a. The engineer should document that this does not trigger FAHP concerns (gutter is already present so likely exempt)
    b. The proposed HDPE pipe added onto the existing CMP which ends just west of the ARCO development requires a complete drainage report/hydraulic study. The report must meet all the requirement of the ODOT hydraulics manual for stormwater conveyance. It must show that the size of pipe proposed will carry the stormwater meeting the conveyance guidelines, checking velocities and volumes in accordance with the hydraulics manual. HDPE is permitted but must be analyzed.
    c. The outfall to the existing ODOT ditch must be checked for ditch capacity and erosion, and if energy dissipation is needed.
    d. Better documentation of the existing CMP should be provided, and verification that all pipe requirements are met for the CMP and HDPE proposed (pipe cover, etc.). Contact ODOT maintenance for additional information (ARCO development).

General Comments

- All alterations within the State highway right of way are subject to the ODOT Highway Design Manual (HDM) standards. Alterations along the State highway but outside of ODOT right-of-way may also be subject to ODOT review pending its potential impact to safe operation of the highway. If proposed alterations deviate from ODOT standards a Design Exception Request must be prepared by a licensed engineer for review by ODOT Technical Services. Preparation of a Design Exception request does not guarantee its ultimate approval. Until more detailed plans have been reviewed, ODOT cannot make a determination whether design elements will require a Design Exception. *Note: Design Exception Requests may take up to 3 months to process.*
- All ODOT permits and approvals must reach 100% plans before the District Contact will sign-off on a local jurisdiction building permit, or other necessary requirement prior to construction.

ODOT RECOMMENDED LOCAL CONDITIONS OF APPROVAL

Proportional Share

☒ ODOT recommends that the City collect a proportional share based on the developments impacts towards the following City of Sandy Transportation System Plan projects:

Project ID#M4, US 26/Industrial Way; Project ID#M12: Industrial Way extension to Jarl Road/US 26; and Project ID#M15: Extend 362nd Drive to Kelso Road.

Frontage Improvements and Right of Way

☒ ODOT recommends that the sidewalk be improved to current ODOT, City and ADA standards. Curb, sidewalk, cross walk ramp(s) bikeways and road widening shall be constructed as necessary to be consistent with local, ODOT and ADA standards.

Permits and Agreements to Work in State Right of Way

☒ An ODOT Miscellaneous Permit must be obtained for all work in the highway right of way. When the total value of improvements within the ODOT right of way is estimated to be $100,000 or more, an agreement with ODOT is required to address the transfer of ownership of the improvement to ODOT. An Intergovernmental Agreement (IGA) is required for agreements involving local governments and a Cooperative Improvement Agreement (CIA) is required for private sector agreements. The agreement shall address the work standards that must be followed, maintenance responsibilities, and compliance with ORS 276.071, which includes State of Oregon prevailing wage requirements. *Note: If a CIA is required, it may take up to **6 months** to process.*

☒ An ODOT Miscellaneous Permit is required for connection to state highway drainage facilities. Connection will only be considered if the site's drainage naturally enters ODOT right of way. The applicant must provide ODOT District with a preliminary drainage plan showing impacts to the highway right of way.

A drainage study prepared by an Oregon Registered Professional Engineer is usually required by ODOT if:

1. Total peak runoff entering the highway right of way is greater than 1.77 cubic feet per second; or
2. The improvements create an increase of the impervious surface area greater than 10,758 square feet.

ADVISORY INFORMATION

Access Control

☒ The applicant is advised that the subject property's highway frontage is access controlled. ODOT has acquired and owns all access rights to the subject property and the proposed use does not have an access right to the highway.

Use of State Highway Right of Way:

☒ Stopping and/or parking vehicles upon State highway right of way for the maintenance of adjoining property or in furtherance of any business transaction or commercial establishment is strictly prohibited. The applicant must provide adequate on-site circulation for the parking and maneuvering of all vehicles anticipated to be displayed or parked on the lot (ORS 811.346, 811.550, and 811.580).

Signs:

☒ Off-premises signs require a permit through the ODOT Outdoor Advertising Sign program (ORS 377.725). To determine whether or not a sign will be on or off premises contact Jill Hendrickson (ODOT Right-of-Way 503.986.3635).

☒ Private signs are not permitted in the state highway right of way (ORS 377.700-377.840).

Please send a copy of the Staff Report and/or Notice of Decision including conditions of approval to:

ODOT Region 1 Planning
Development Review
123 NW Flanders St
Portland, OR 97209

Region1_DEVREV_Applications@odot.state.or.us

Development Review Planner: Joshua Brooking	503.731.3049, joshua.c.brooking@odot.state.or.us
Traffic Contact: Avi Tayar, P.E.	503.731.8221
District Contact: Loretta Kieffer	503.667.7441

MEMORANDUM

TO: EMILY MEHARG, ASSOCIATE PLANNER
FROM: MIKE WALKER, PUBLIC WORKS DIRECTOR
RE: FILE 18-018 DR/VAR
DATE: JULY 10, 2018

EXHIBIT R

The following are Public Works' comments on the above-referenced application:

Transportation

The Applicant shall install street improvements along the site (proposed parcel 3) frontage of Hwy 26, including but not limited to: curbs, sidewalks, storm drainage, street lighting and street trees per section 17.84.50(D)1 Sandy Municipal Code (SMC).

If a design exception is required for street trees the applicant shall adjust the location of the sidewalk (which the applicant proposes to demolish and replace) to allow street trees that meet ODOT's minimum shy distance criteria and/or apply for a design exception. There appears to be sufficient right-of-way to meet ODOT's shy distance criteria. Any costs for a design exception shall be borne by the applicant.

Utilities

With the exception of lateral connections for domestic water, fire protection, and sanitary sewer service limited public utility extensions are proposed or required for development of the site. The utility plans show private fire protection, sanitary sewer and stormwater connections located within and without the proposed access easement.

The proposed utility plan depicts a domestic water service branched off the proposed private fire service line on private property. Domestic water service laterals may not be branched off fire service lines and must be connected to public water mains. Domestic water service laterals and meters must be located within the public right-of-way. An additional easement for the domestic water service to the site will also be required once the water service is relocated to comply with these requirements.

The applicant shall secure and record utility easements for private utility lines located on proposed parcel 2. If the proposed access easement does not include provisions for private utility lines it shall be amended prior to filing the partition plat approved with File 2018-017 MP to include utility access or separate utility easements shall be secured and recorded.

Utility and frontage improvement plans are submitted solely to comply with the submission requirements of 17.90.100 SMC. Land use approval does not connote approval of utility or street frontage improvements plans which are subject to a separate submittal and review process.

Please let me know if you have any questions or need more information.

COMMENT SHEET for File No. 18-018 DR/CUP/VAR/TREE:

RECEIVED
JUL 06 2018
CITY OF SANDY

Again: We are extremely Concerned about the Height, Size & Spacing of the Proposed project Building Blocking the visibility of the Cinema + its Adjacent Buildings + Businesses from Hwy 26 —

EXHIBIT S

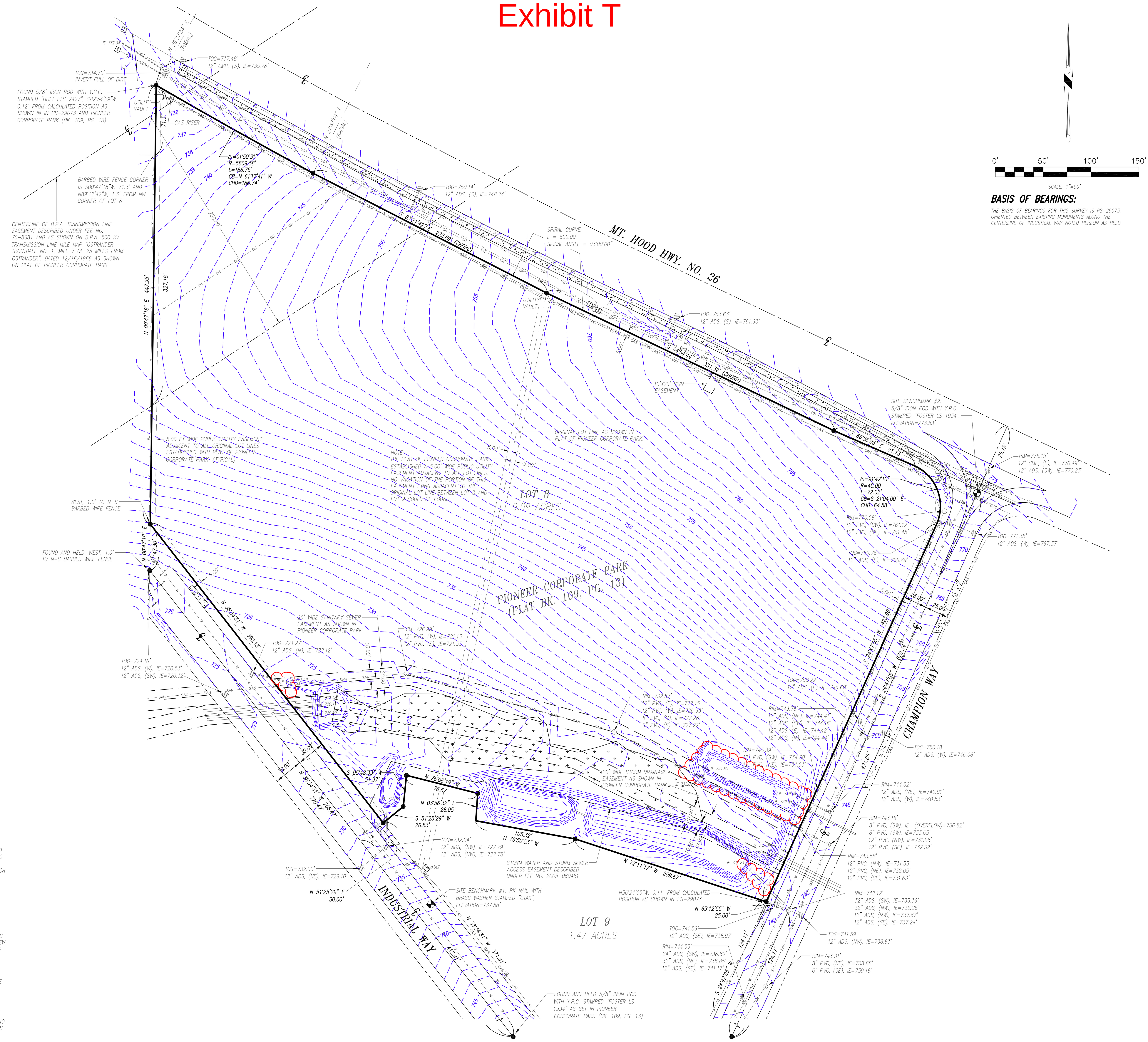
Elie Kassab, owner of Sandy Cinema 503-781-1699 cell
Your Name Phone Number 360-993-0010 office

16605 Champion Way, Sandy, OR 97055
Address

APPLICABLE CRITERIA: Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.22 Notices; 17.30 Zoning Districts; 17.48 Industrial Park (I-1); 17.66 Adjustments and Variances; 17.68 Conditional Uses; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.82 Special Setbacks on Transit Streets; 17.84 Improvements Required with Development; 17.90 Design Standards; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access; 17.102 Urban Forestry; and, 15.30 Dark Sky.

Exhibit T

VICINITY MAP
NO SCALE



SCALE: 1"=50'

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS PS-29073. ORIENTED BETWEEN EXISTING MONUMENTS ALONG THE CENTERLINE OF INDUSTRIAL WAY NOTED HEREON AS HELD

LEGEND:

- SIGN AS NOTED
- POWER POLE
- GUY ANCHOR
- WATER VALVE
- FIRE HYDRANT
- SANITARY MANHOLE
- STORM MH
- CATCH BASIN
- POWER J-BOX
- GAS VALVE
- TELEPHONE BOX
- SITE BENCHMARK AS NOTED
- FOUND 5/8" IRON ROD WITH Y.P.C STAMPED "FOSTER LS 1934" AS SHOWN IN PS-29073 UNLESS NOTED OTHERWISE.
- STM — STORM LINE
- GAS — BURIED GAS LINE
- W — WATER LINE
- UGE — BURIED POWER LINE
- FO — BURIED FIBER OPTIC LINE
- UGT — BURIED TELEPHONE / CABLE TV LINE
- OH — OVERHEAD POWER LINES
- Y.P.C. — YELLOW PLASTIC CAP
- TOG — TOP OF GRATE
- CONCRETE PAVING
- WETLANDS

VERTICAL DATUM:

ELEVATIONS SHOWN HEREON ARE NGVD29 A.K.A. CITY OF SANDY VERTICAL DATUM BASED ON TIES TO CITY OF SANDY BENCHMARK NO. 14, ELEVATION=820.61'.

BENCHMARK:

SITE BENCHMARK #1: IS A PK NAIL WITH BRASS WASHER STAMPED "OTAK" ON NORTH SIDE OF INDUSTRIAL WAY, SE, 320' TO INTERSECTION OF INDUSTRIAL WAY AND CHAMPION WAY. NE, 3' TO FACE OF CURB. ELEVATION=737.58'

SITE BENCHMARK #2: IS A 5/8" IRON ROD WITH Y.P.C. STAMPED "FOSTER LS 1934" IN CURB ISLAND ON CENTERLINE OF CHAMPION WAY S24°47'05"W, 75.18' FROM CENTERLINE OF HWY 26. ELEVATION=773.53'

NOTES:

THE LOCATION OF EXISTING UTILITY FACILITIES HAS NOT BEEN RESEARCHED. UNDERGROUND UTILITIES SHOWN HEREON ARE FROM TIES TO UTILITY PAINT MARKS MADE IN RESPONSE TO "ONE-CALL CONCEPTS" UTILITY NOTIFICATION TICKET NO. 8016970 AND 8016973. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES BY THE RESPECTIVE UTILITY OWNERS, NOR THE EXISTENCE OF BURIED OBJECTS WHICH ARE NOT SHOWN ON THIS PLAN.

THE FOLLOWING UTILITY COMPANIES WERE CONTACTED TO LOCATE THEIR UNDERGROUND SERVICES: CABLE TV, TELEPHONE, GAS, ELECTRIC, WATER AND SEWER. UTILITIES ARE SHOWN AS MARKED BY THE ABOVE UTILITY COMPANIES.

FIELD WORK FOR THIS SURVEY WAS PERFORMED FEBRUARY, 2008.

SURVEY MONUMENTS – ALL SURVEY MONUMENTS SHOWN HEREON, INCLUDING BENCHMARKS SHALL BE PROTECTED FROM DISTURBANCE OR DESTRUCTION. IF THE CONSTRUCTION OF NEW FACILITIES CAUSES THE NEED FOR ANY MONUMENT TO BE REMOVED. THE CONTRACTOR, IS ADVISED TO CONTACT THE APPROPRIATE LAND SURVEYOR PRIOR TO CONSTRUCTION FOR PERPETUATION OF THE ORIGINAL POSITION SUBJECT TO ORS 209-140.

THIS SURVEY REFLECTS THOSE EASEMENTS SHOWN ON COMMITMENT FOR TITLE INSURANCE POLICY NO. NCS-165342-OR1 PROVIDED BY FIRST AMERICAN TITLE INSURANCE COMPANY, EFFECTIVE 02/21/2006 AT 3:49 P.M.

THE RIGHT OF WAY OF HWY 26 IS BASED ON THE PLAT OF PIONEER CORPORATE PARK. OLSON ENGINEERING HAS NOT INDEPENDENTLY VERIFIED THE ACCURACY OF THE LOCATION.

THE RIGHT OF WAY OF THE B.P.A. TRANSMISSION LINE EASEMENT RECORDED UNDER FEE NO. 70-8681 IS BASED ON THE PLAT OF PIONEER CORPORATE PARK. OLSON ENGINEERING HAS NOT INDEPENDENTLY VERIFIED THE ACCURACY OF THE LOCATION.

WETLANDS SHOWN WERE OBTAINED FROM FOSTER MADDUX LAND SURVEYING IN JANUARY, 2008 AND ARE BASED ON MARCH, 2002 TIES MADE BY FOSTER MADDUX LAND SURVEYING.

J:\Data\8000\8300\8330\8336\survey\8336.S.EXCOND.dwg

CLIENT:
MARK BENSON
P.O. BOX 997
CAMAS, WASHINGTON, 98607

EXISTING CONDITIONS SURVEY FOR:
SANDY DEVELOPMENT
LOT 8 – PIONEER CORPORATE BUSINESS PARK
IN THE NE1/4 SECTION 15, T.2S., R.4.E, W.M., CITY OF SANDY, CLACKAMAS COUNTY, OREGON

OLSON LAND SURVEYORS
ENGINEERS
360-695-1385
503-289-9936
ENGINEERING INC. 1111 BROADWAY, VANCOUVER, WA 98660

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
FEBRUARY 3, 1983
BRUCE D. TOWLE
2030
RENEWAL DATE: 6/30/

CHANGES / REVISIONS

DESCRIPTION	DATE

DESIGNED:
DRAWN: J.M.B.
CHECKED: B.D.T.
DATE: MARCH, 2008
SCALE: 1" = 50'

PIONEER CORPORATE PARK
JOB NO. 8336.01.01

SHEET 1 of 1

PLANNING DIVISION
39250 PIONEER BOULEVARD ♦ SANDY, OR 97055
(503) 668-5533 ♦ www.ci.sandy.or.us

PLANNING COMMISSION STAFF REPORT
TYPE III LAND USE PROPOSAL

SUBJECT: File No. 18-027 INT – Highway 26 Storage Code Interpretation

STAFF REPORT DATE: July 24, 2018

Application Complete: June 25, 2018
120-Day Deadline: October 23, 2018

AGENDA DATE: July 30, 2018

DEPARTMENT: Planning Division

STAFF CONTACT: Kelly O'Neill Jr., Planning & Building Director

EXHIBITS:

Applicant's Submittals
A. Land Use Application
B. Narrative
C. Plan Set
- Sheet A1: Site Plan
- Sheet A2: Floor Plans
- Sheet A3: Elevations
- Sheet A4: Elevations
- Sheets 1-6: 3D Renderings

Staff Submittals
D. Pre-application notes from November 6, 2014
E. Pre-application notes from August 17, 2017
F. Pre-application notes from May 8, 2018

Public Comments
G. Elie Kassab, 16605 Champion Way (July 10, 2018)

I. BACKGROUND

A. APPLICABLE CRITERIA & REVIEW STANDARDS

Sandy Development Code: 17.12 Procedures for Decision Making; 17.14 Request for Interpretation; 17.18 Processing Applications; 17.22 Notices; 17.48 Industrial Park, I-1; 17.66 Adjustments and Variances; 17.90 Design Review.

B. FACTUAL INFORMATION

1. APPLICANT: Bill Whitney

2. PROPERTY OWNERS: Mark Benson

3. LEGAL DESCRIPTION: T2S R4E Section 15A, Tax Lot 209

4. PROPOSAL: Bill Whitney submitted an application on behalf of Mark Benson for a code interpretation and approval of a reduction in the window coverage requirements of the City of Sandy Development Code Section 17.90.120(E,2). The code interpretation and window reduction approval is being requested for five (5) proposed storage buildings located on a property owned by Mr. Benson south of Highway 26, west of Champion Way, and north of Industrial Way. Section 17.90.120(E.2) of the code requires 30 percent window coverage on the activated elevation(s) of buildings up to 10,000 square feet, 25 percent window coverage on the activated elevation(s) of buildings between 10,000 square feet and 30,000 square feet, and 20 percent window coverage on the activated elevation(s) of buildings greater than 30,000 square feet. The applicant's request states that storage buildings require many large overhead doors which limit wall area available for windows.

5. SITE LOCATION: South of Highway 26, north of Industrial Way, west of Champion Way

6. SITE SIZE: Site for mini-storage facility is 5.44 acres

7. SITE DESCRIPTION: The 5.44 acres is currently vacant land with a considerable slope running downhill to the southwest (towards Tickle Creek). The property is still legally tied to the 2.63 acre Hix Snedeker LLC (Tractor Supply) site, but received tentative partition approval on June 25, 2018 to divide the property into two parcels (File No. 18-019 MP).

8. COMPREHENSIVE PLAN DESIGNATION: Light Industrial

9. ZONING DISTRICT DESIGNATION: I-1, Industrial Park

10. RESPONSE FROM GOVERNMENTAL AGENCIES, UTILITY PROVIDERS, AND CITY DEPARTMENTS: No comments were sought, but the Director did consult with the City Attorney.

11. PUBLIC COMMENTS: Elie Kassab the owner of the Sandy Cinema at 16605 Champion Way (Exhibit G) submitted comments on July 10, 2018. Mr. Kassab has concerns with the height of the proposed mini-storage facility blocking the visibility of the cinema and other existing businesses from HWY 26.

C. PROCEEDING & BACKGROUND INFORMATION

In conformance with the standards of Chapter 17 of the Sandy Municipal Code (SMC) this application is processed as a Type III, Quasi-Judicial Land Use Decision. Per Chapter 17.14 the Director shall review a request for interpretation and within 30 calendar days after acceptance of a completed request for interpretation, the Director shall respond with a written interpretation. Over the course of three different pre-application meetings on November 6, 2014, August 17, 2017, and May 8, 2018 staff advised the property owner or his representative(s) that more windows were needed on the proposed buildings to meet the requirements of Section 17.90.120 (E.). The Director believes that staff's interpretation of the window coverage requirement has been adequately and repeatedly addressed through these multiple pre-application meetings. However, while the property owner has done a decent job at increasing the Sandy Style appearance of the mini-storage structures, the window coverage requirement is still not being met. Rather than have the applicant apply for a code interpretation by the Director/other city staff and receive the same interpretation as has been conveyed in multiple pre-application meetings, the Director is elevating the applicant's request for a code interpretation on window coverage to a Planning Commission decision.

On June 14, 2018 staff received an email from Bill Whitney on behalf of Mark Benson with a draft narrative and some 3D Renderings. Mr. Whitney asked the following: "*Please give me your candid thoughts on the narrative's content. Should it be far more extensive? I believe you said you're leaving it up to the Planning Commissions review, but your input would be helpful*." On June 15, 2018 the Director stated the following: "*The narrative is a little confusing though. The narrative makes it sound like you are asking for a variance. In the narrative you even state you are asking for a reduction to the required window area. My understanding from Mark was that you wanted to get an interpretation if the garage doors without windows meets the window coverage requirement found in Section 17.90.120 (E.2.) of the development code? Please clarify in the narrative what you are actually asking for. At the end of the narrative it also states, "Industrial Way is a dead end". There is no period or second page so I want to make sure you didn't have more information that you wanted to include but was somehow cropped from the narrative*." On June 21, 2018 staff received the narrative that is included with this staff report (Exhibit B.). Staff finds the narrative still does a lackluster job of supporting the code interpretation and instead asks for a reduction in required window coverage, which the city could only potentially approve through an adjustment or variance application pursuant to the development code. To be clear, the applicant has only applied for a minor code interpretation but has not applied for an adjustment or variance. Staff finds that we can review the development code and provide an interpretation for the subject mini-storages and other future development that is similar. The applicant has mentioned in several meetings that garage doors should count towards the percentage of window coverage as required in Section 17.90.120(E). Staff's interpretation of the applicant's request for a code interpretation is that the applicant is requesting that the doors be counted towards the window coverage requirement.

D. PREVIOUS LAND USE DECISIONS: The subject parcel was originally created as portions of Lot 8 (4.54 acres) and Lot 9 (6.07 acres) of the Pioneer Corporate Park subdivision platted in 1996 (Plat Book 109, Page 13) with the line dividing the lots oriented generally north-south. Since 2000 here are the primary land use approvals:

- In 2000, the owner of the property at the time was approved for a property line adjustment (File No. 2000-044, Survey No. PS-29073) shifting the common line between these parcels to an east-west orientation. This resulted in reconfigured parcels, Lot 8 (9.14 acres) and Lot 9 (1.47).
- In 2010 (File No. 10-035 MP), the current owner (Mark Benson) partitioned Lot 8 into two lots: Parcel 1 to contain 8.05 acres and Parcel 2 to contain 1.05 acres.
- In 2011 (File No. 11-008 CUP/DR/VAR), Champion 26 LLC received approval to construct the AmPm convenience store and fueling station.
- In 2018 (File No. 18-019 MP), Sandy Automotive LLC (Mark Benson) and Hix Snedeker LLC received approval to partition Parcel 1 from File No. 10-035 MP into two parcels at 5.44 and 2.63 acres.

II. ANALYSIS OF CONFORMANCE - DEVELOPMENT CODE

CHAPTER 17.90 – DESIGN STANDARDS
17.90.120 GENERAL COMMERCIAL AND INDUSTRIAL (C-2 and I-1) AND NON-RESIDENTIAL USES IN RESIDENTIAL ZONES DESIGN STANDARDS

Development in the C-2 and I-1 districts and non-residential uses in a residential zone shall conform to all of the standards in Chapter 17.90, as applicable. Where a conflict exists between the requirements of this Chapter and any other code provision, this Chapter shall prevail.

E. Windows

Intent: To promote business vitality, public safety and aesthetics through effective window placement and design, consistent with the Sandy Style. (Figures 17.90.120-A, 17.90.120-B, 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, and 17.90.120-H)

1. **Unified Design.** Building plans must provide for unity in window placement and design so that all sides of a building relate to one another and multiple buildings on a development site relate to one another.

2. **Ground Floor Windows.** The ground floor elevation of all new buildings shall contain ground floor display areas, windows, and doorways on the "activated" frontage as follows:

Building Size	Percentage Windows Required
0 - 10,000 sq. ft.	30 percent of elevation
10,000 sq. ft. - 30,000 sq. ft.	25 percent of elevation
Greater than 30,000 sq. ft.	20 percent of elevation

   a. Windows shall contain clear glass to allow views to interior activity or display areas. The bottom edge of windows shall be no less than three (3) feet above the adjacent finished grade. Where the internal functions of a building preclude windows at this height, the reviewing body may allow windows above or below this height. Display boxes affixed to a building's exterior are not counted in meeting the above standard.

   b. Windows shall be square or vertically oriented and may consist of vertically stacked or horizontally banked window units. Windows located over a door or transom windows may be horizontally oriented.

c. Windows with any dimension exceeding six (6) feet shall be divided to contain two or more smaller panes with real divided panes, vinyl inserts, or applied dividers.

d. Windows shall have trim or moldings at least three (3) inches in width around them, or have reveals of at least three (3) inches in depth. Casings shall consist of a drip cap, head casing, side casings, and/or sills.

CODE INTERPRETATION RESPONSE*: Section 17.90.120(E)(2) has requirements for window coverage on the ground floor of buildings. Depending on the size of the building the percentage of window coverage varies with larger buildings requiring less percentage of windows. The subject site has five proposed buildings with all of the buildings having some portion of their building visible from a public street (see Exhibit C: Sheets 1-6) meaning that all five buildings will need to define an activated frontage and adhere to the standards regarding window coverage and possibly providing a building entry.*

Chapter 17.10, Definitions, contains the following definition of "activate": Make the exterior of a building inviting to pedestrians through a combination of elements, such as an enhanced customer entrance, weather protecting features (such as canopies or awnings), pedestrian-scale signage, and transparent windows allowing for views into and from interior building spaces." In Section 17.90.120(D) the Development Code defines the 'activated frontage' as the following: "an elevation is activated when it meets the window transparency requirements in subsection 17.90.120(E), below, and contains a public entrance with a pedestrian shelter extending at least five (5) feet over an adjacent sidewalk, walkway or civic space". For example, the pedestrian shelter and door on Building 1 faces north to HWY 26 and the proposed civic space, which makes the north elevation of Building 1 the activated frontage. The figures in Chapter 17.90 also illustrate the importance of windows and building orientation. The figures in the development code consistently detail that a lack of ground floor windows is undesirable.

The Development Code does not exempt mini-storage facilities or any other buildings from adhering to the window requirements in Chapter 17.90.

Per Section 17.10.10 "All words and terms used in this Code have their commonly accepted, dictionary meaning unless they are specifically defined in this Code or the context in which they are used clearly indicated to the contrary".

Here are some dictionary terms for 'doorway':

- *Merriam-Webster: "the opening that a door closes; especially: an entrance into a building or room"*
- *Cambridge: " the space for a door through which you go into and out of a room or building"*

Here are some dictionary terms for 'window':

- *Merriam-Webster: "an opening especially in the wall of a building for admission of light and air that is usually closed by casements or sashes containing transparent material (such as glass) and capable of being opened and shut"*
- *Cambridge (window): " an opening in the wall of a building or vehicle, usually covered with glass, to let light and air in and to allow people inside to see out"*

Staff finds that garage doors and man-doors without windows/glass do not meet the definition of a window and do not meet the intent of providing 'effective window placement and design'.

Therefore, staff finds that garage doors and man-doors without glass do not achieve the requirements of 17.90.120(E) and do not qualify as windows.

OTHER DIRECTION NEEDED:
As part of this code interpretation staff would also like the Planning Commission to define which side(s) of the proposed buildings should be assigned as the activated frontage(s), if each building is required to include a main entryway, and if faux windows can count towards the window coverage requirement. Defining the activated frontage(s) on each proposed building will enable staff to evaluate for window coverage and determine if the applicant needs to provide more windows or submit for variance(s). Based on Exhibit C staff finds the activated frontage(s) are as follows:

- *Building 1 – north elevation facing HWY 26 (20 percent windows), east elevation facing Champion Way should remain as detailed on the elevations*
- *Building 2 – east elevation facing Champion Way (30 percent windows)*
- *Building 3 – south elevation facing Industrial Way (30 percent windows), west elevation facing Industrial Way will also be highly visible*
- *Building 4 – south elevation facing Industrial Way (30 percent windows), west elevation facing Industrial Way will also be highly visible*
- *Building 5 – south elevation facing Industrial Way (30 percent windows)*

The activated elevation on Building 1 facing HWY 26 is only proposed to contain six (6) windows and one clear glass door. The HWY 26 façade on Building 1 has 248 square feet of windows and 2,056 square feet of wall surface for a window coverage of 12 percent. The requirement for Building 1 is 20 percent window coverage so the proposed 12 percent does not meet the code requirement. ***Staff recommends the applicant shall provide at least 20 percent of window coverage on the north elevation of Building 1.*** *The applicant proposes 44 percent window coverage on the east elevation of Building 1 in conformance with the window coverage requirements of Section 17.90.120(E.2).*

Staff finds the activated frontage on Building 2 is the east elevation facing Champion Way, although Building 2 appears to lack a main entryway. The applicant proposes 23 percent window coverage on the east elevation. Since Building 2 is less than 10,000 square feet the east elevation is required to contain at least 30 percent coverage on the wall facing Champion Way. Section 17.90.120(E)(1) states that 'building plans must provide for unity in window placement and design so that all sides of a building relate to one another and multiple buildings on a development site relate to one another'. The applicant proposes the east elevation of Building 1 facing Champion Way to have a unified look with Building 2 by providing similar looking windows covering 44 percent of the east facing wall of Building 1. Staff finds that the east wall of Building 1 meets the unified design requirements in Section 17.90.120(E)(1); however, Building 2 needs 7 percent more window coverage on the east elevation.

In the applicant's narrative (Exhibit B) the applicant states that Buildings 3-5 have virtually no exposure from Champion Way or HWY 26, and that Industrial Way is a dead end. Staff agrees that Buildings 3-5 will have limited exposure to Champion Way or HWY 26 due to proposed retaining walls and other buildings (i.e. Buildings 1 and 2, and the Tractor Supply Building); however, according to the 3-D renderings for Buildings 3-5 they will be highly visible from Industrial Way. Buildings 3-5 are each less than 10,000 square feet and, therefore, require 30 percent window coverage on the activated frontage. ***Staff recommends the three buildings with their activated***

frontage on Industrial Way shall contain at least 30 percent window coverage on the walls facing Industrial Way. *Buildings 3-5 do not appear to contain main entryways either.*

The 3-D renderings show trees that appear to block the south elevation of Building 2, and a majority of the south elevations of Buildings 3 and 4. However, based on Google Earth imagery, it doesn't appear like the tree coverage is accurate, or at the very least there aren't existing trees that would provide such dense screening. Staff would like the applicant to explain if the proposal will includes trees/vegetation to screen the buildings as detailed on the 3-D renderings.

III. SUMMARY & RECOMMENDATION

It is hereby recommended that Planning Commission interpret that the property owner is not allowed to consider garage doors as qualifying for ground floor windows on the activated frontage of buildings. Staff would also like direction from Planning Commission on which sides of the proposed buildings should be assigned as the activated frontage. Staff recommends that if the applicant wants to propose less than the required window coverage on the activated frontage(s) of each building, that the applicant apply for an adjustment or variance to the window coverage requirements of Section 17.90.120(E) with any future land use submittal.

Staff would also like Planning Commission to define if each building is required to include a main entryway, and if faux windows can count towards the window coverage requirement. In addition, staff would like the applicant to explain if the proposal on the site will include trees/vegetation to the screen the buildings as detailed on the 3-D renderings.

LAND USE APPLICATION FORM

(Please print or type the information below)

CITY OF SANDY, OREGON

Planning Department
39250 Pioneer Blvd.
Sandy OR 97055
503-668-4886

EXHIBIT A

Name of Project Highway 26 Storage

Location or Address Champion Way

Map & Tax Lot Number T_____, R_____, Section_____; Tax Lot(s) 0209

Plan Designation _____ Zoning Designation I-1 Acres 5.44 ac

Request:

Code Interpretation for window coverage Dev. Code sec. 17.90.120 (E2)
Storage buildings require many large overhead doors which limit wall area available for windows. Many good sized windows proposed for "activated walls facing Champion Way

I am the (check one) ☑ owner ☐ lessee of the property listed above and the statements and information contained herein are in all respects true, complete and correct to the best of my knowledge and belief.

Applicant Bill Whitney	Owner Mark Benson
Address 52 NW 2nd Street	Address PO Box 241057
City/State/Zip Gresham, Or. 97030	City/State/Zip Honolulu, Hi 16824
Phone 971-533-8482	Phone 316-305-0892
Email BillW@axisdesigngroup.com	Email mlbenson911@aol.com
Signature	Signature

If signed by Agent, owner's written authorization must be attached.

File No. 18-037 ~~DR~~	Date 6/22/18	Rec. No.	Fee $ 6400
Type of Review (circle one): Type I	Type II	Type III	Type IV

24E15AA 7201

AXIS DESIGNGROUP ARCHITECTURE & ENGINEERING, INC.

EXHIBIT B

WHITNEY & ASSOCIATES ARCHITECTS PC

ARCHITECTURALDESIGN INTERIORDESIGN MASTERPLANNING LANDUSEPLANNING

NARRATIVE
REQUEST FOR CODE INTERPRETATION FOR WINDOW COVERAGE –I1 ZONE
PROPOSED SANDY STORAGE DEVELOPMENT
CHAMPION WAY SANDY OREGON
JUNE 21, 2018

We are requesting an interpretation (minor) for reducing the required window area on the storage buildings being proposed. The ruling would only apply to the storage buildings on this site and not generally to the I1 zone.

Per code section 17.90.120 E2 25% of the ground level wall area is required to be windows on street facing walls of buildings greater than 10,000 sf.
We are seeking an interpretation of the code and approval of a reduction in window area (see building descriptions below for %) for the following reasons:

1. Unlike most buildings, these storage buildings are typically rarely occupied, so there is little need for windows based on interior use. There is need for lots of large overhead doors to facilitate easy access to stored belongings from the exterior, loading and unloading, etc. The north elevation of Building One faces Hwy 26, but due to the steep site, it is the ideal location for a drive lane providing access to many units thru overhead doors. Available wall area for windows is thus limited there.

2. The proposed building design has pretty well maximized windows on the "activated" street facing facades, even when windows are located where there are storage units inside. "Sandy style" design details are employed including window trim, bracketed canopies over windows, split face concrete block wall base, and hardiboard lap siding. The color palette meets city standards as well.

3. Of the 5 buildings proposed only Building One has exposure to Hwy 26 and Champion Way
Most buildings facades are not visible from surrounding streets because they are hidden by the steep hillside (see renderings) and the Tractor Supply site parking lot "plateau" w/ surrounding tall retaining walls. Buildings 2-5 are screened by the hillside, tall retaining walls, the existing ARCO gas station, and the proposed Tractor Supply Building.

4. Storage Buildings are an allowed use in the I1 zone. Security is a primary concern to those considering renting spaces and by the property owner's liability. Display type decorative windows are used to at least partially meet development code standards, while addressing the need for exterior overhead doors and security.

The following is a cumulative ground floor window area breakdown for the various buildings:

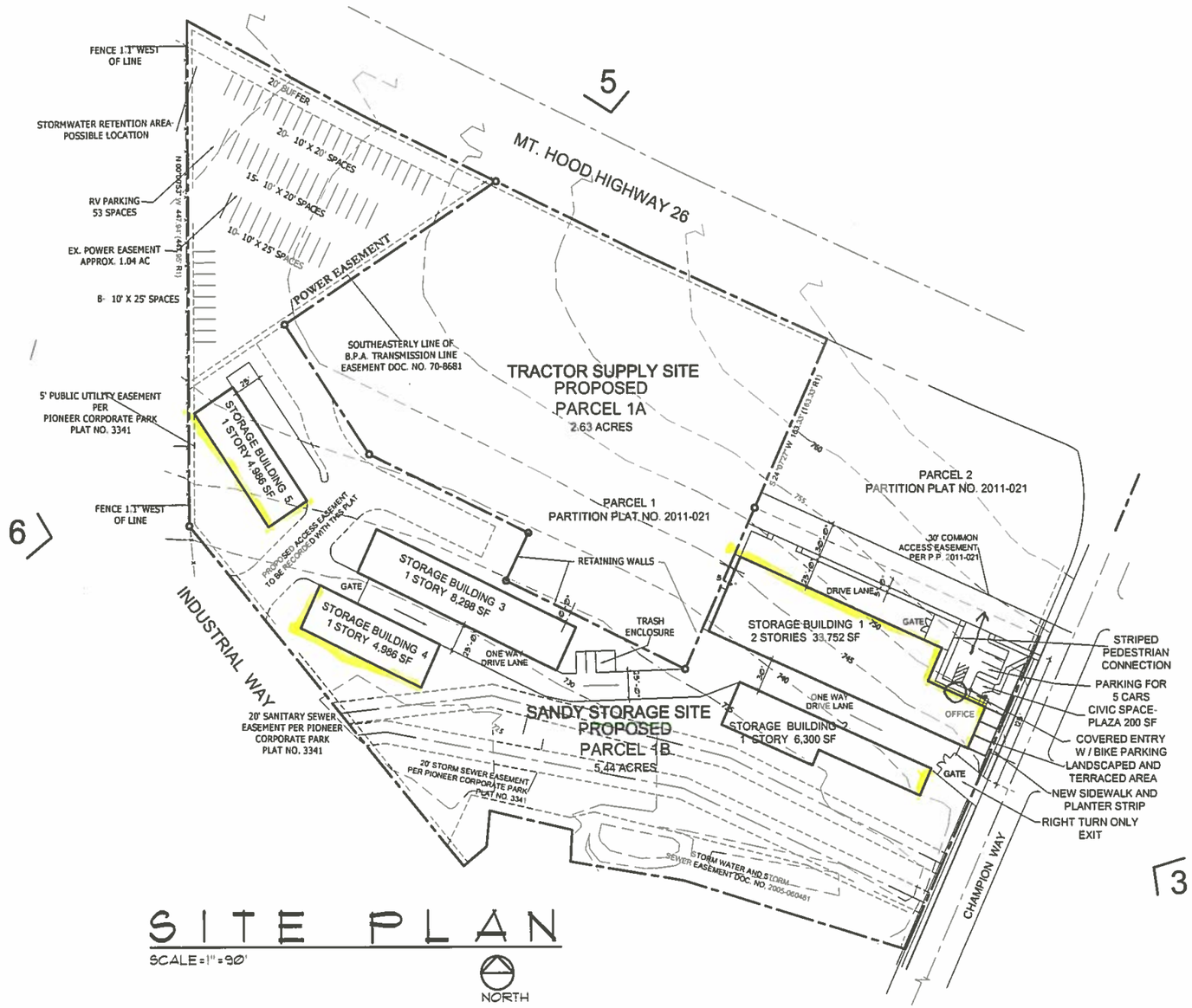
Building One
Window Area Required on street facing walls (North and East) Total Area = 340' L x 8' H = 2,720 sf x 25%= 680 sf
Window Area Provided on street facing walls (North and East) Total Area = 445/2,720 sf = 16%

Building Two
Window Area Required on street facing wall (East) Total Area = 40' L x 8' H = 320 sf x 25%= 80sf
Window Area Provided on street facing wall (East) Total Area = 320 sf x 25%= 72sf = 23%

Building Three thru Five
Virtually no exposure from Champion Way or Highway 26. Industrial Way is a dead end.

SANDY STORAGE
CODE INTERPRETATION - WINDOW COVERAGE
CHAMPION WAY , SANDY, OREGON 97055

EXHIBIT C



SITE PLAN
SCALE = 1" = 90'

NORTH

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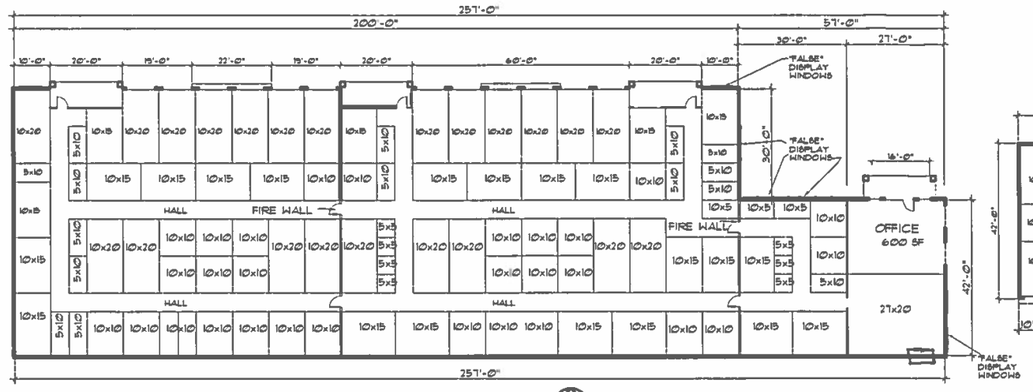
AXIS DESIGNGROUP
ARCHITECTURE & ENGINEERING, INC
WHITNEY & ASSOCIATES ARCHITECTS PC
52 NW 2ND STREET
GRESHAM, OR 97030
T 503 667 4252 | F 503 618 9842

SANDY STORAGE

REVISIONS

No	Description	Date

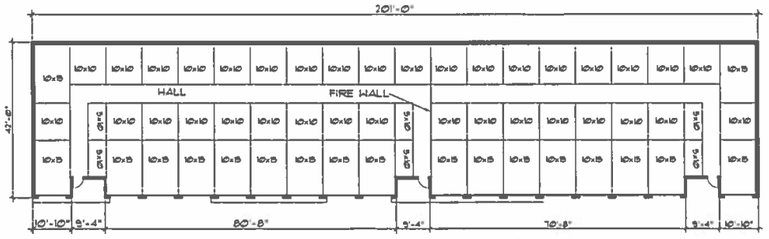
DRAWN BY BW
CHECKED BY
JOB NO 17-034
DATE 6/14/18
ISSUED FOR CODE INTERPRET
SHEET TITLE SITE PLAN
SHEET NO A1



UPPER FLOOR PLAN BUILDING ONE

SCALE: 1/16" = 1'-0" 16,806 SF

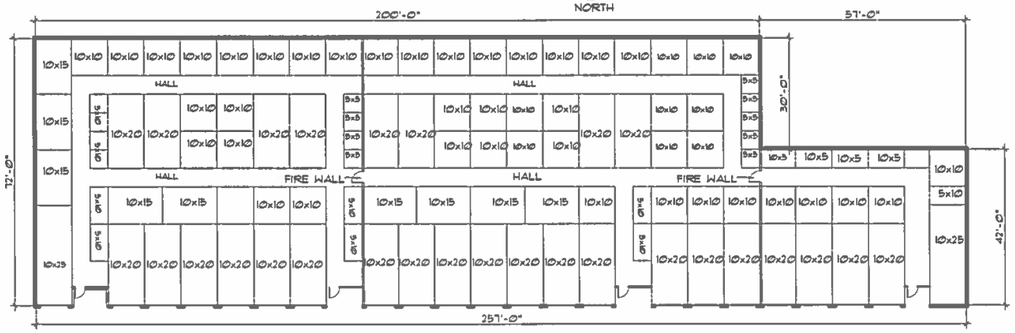
NORTH



FLOOR PLAN BUILDING THREE

SCALE: 1/16" = 1'-0" 8,738 SF

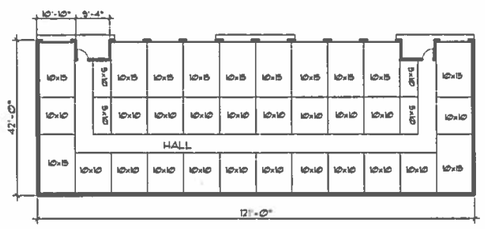
NORTH



LOWER FLOOR PLAN BUILDING ONE

SCALE: 1/16" = 1'-0" 16,344 SF

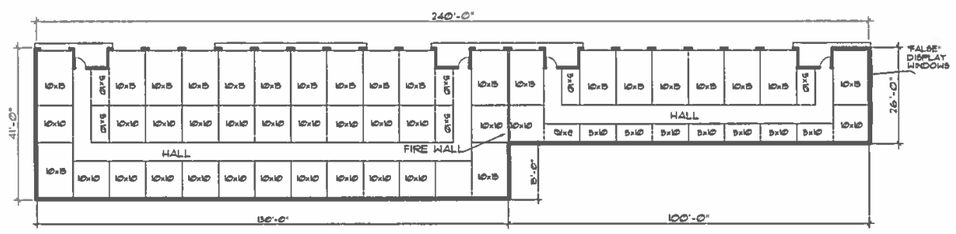
NORTH



FLOOR PLAN BUILDING FOUR & FIVE

SCALE: 1/16" = 1'-0" 4,986 SF

NORTH



FLOOR PLAN BUILDING TWO

SCALE: 1/16" = 1'-0" 7,180 SF

NORTH

AXIS DESIGNGROUP
ARCHITECTURE & ENGINEERING, INC

WHITNEY & ASSOCIATES ARCHITECTS PC

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SANDY STORAGE
FLOOR PLANS
BUILDINGS ONE THRU FIVE

REVISIONS

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DRAWN BY: BW
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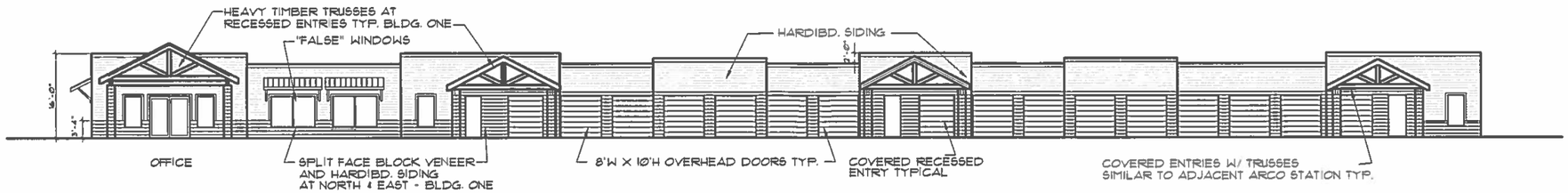
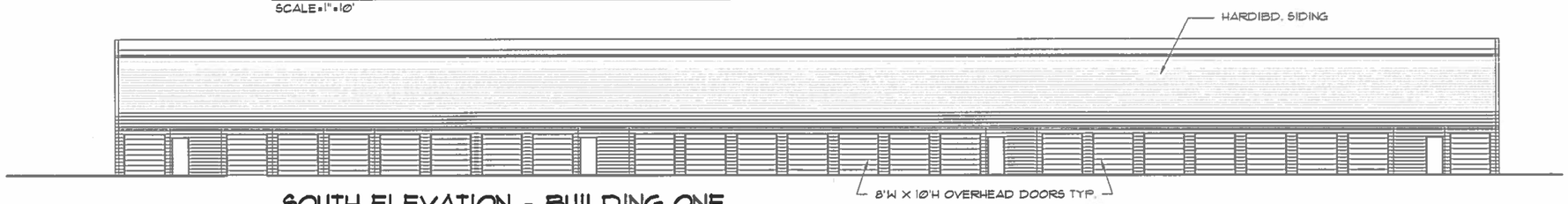
JOB NO.: 17-034
DATE: 6-14-18
ISSUED FOR: CODE INTERPRET.
SHEET TITLE: FLOOR PLANS
SHEET NO: A2



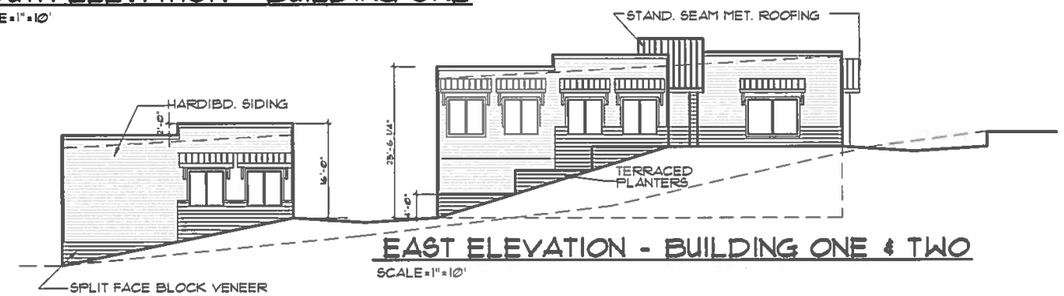
NORTH ELEVATION - BUILDING ONE

SCALE: 1" = 10'



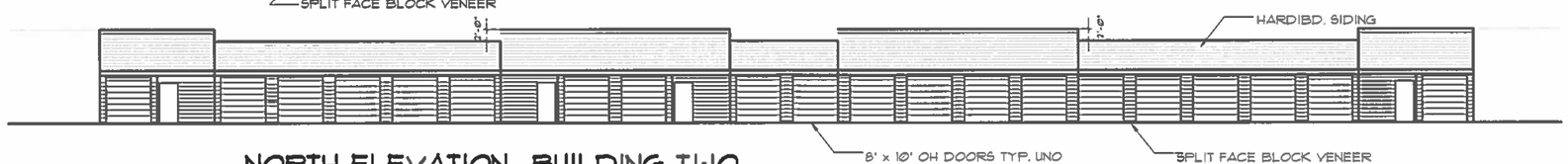
SOUTH ELEVATION - BUILDING ONE

SCALE: 1" = 10'



EAST ELEVATION - BUILDING ONE & TWO

SCALE: 1" = 10'



NORTH ELEVATION BUILDING TWO

SCALE: 1" = 10'

SOUTH ELEVATION BUILDING TWO

SCALE: 1" = 10'

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SANDY STORAGE

REVISIONS

No	Description	Date

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JOB NO 17-034
DATE 6-14-18
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SHEET TITLE
ELEVATIONS

SHEET NO
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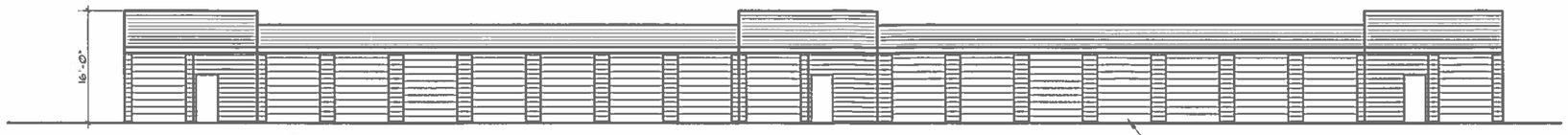

SOUTH ELEVATION BUILDING THREE

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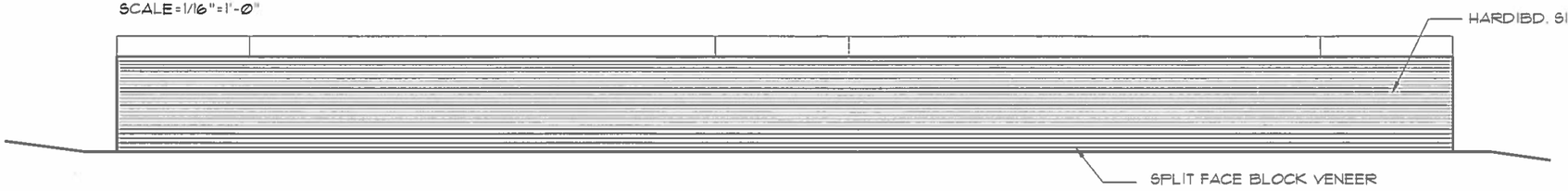
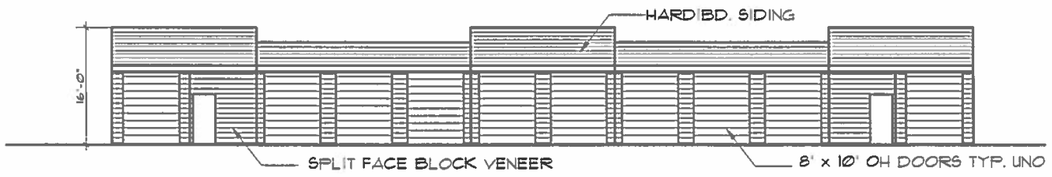


NORTH ELEVATION BUILDING THREE

SCALE=1/16"=1'-0"



NORTH ELEVATION BUILDING FOUR & FIVE

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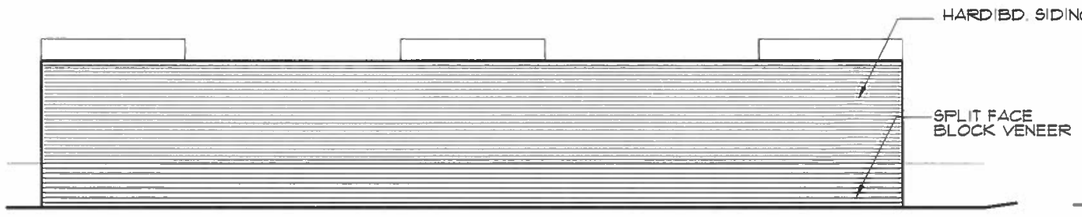

SOUTH ELEVATION BUILDING FOUR & FIVE

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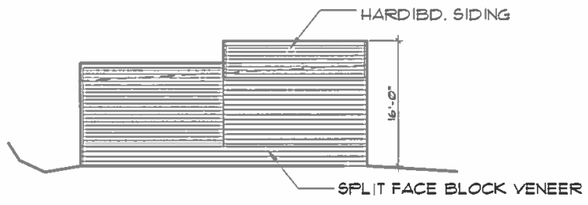

WEST ELEVATION - BLDG. 3

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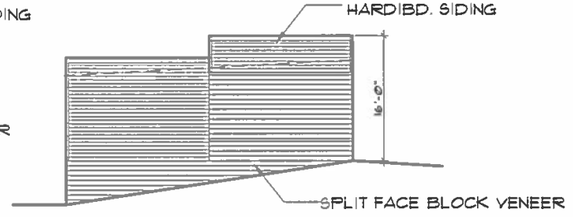

EAST ELEVATION - BLDG. 4 & 5

SCALE=1/16"=1'-0" (WEST ELEV. SIMILAR)

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WHITNEY & ASSOCIATES ARCHITECTS PC
52 NW 2ND STREET
GRESHAM, OR 97030
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SANDY STORAGE

REVISIONS

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(2)

3

4

Exhibit D

PRE-APPLICATION CONFERENCE NOTES

Project Name: Highway 26 Storage
Pre-Application Conference Date: November 6, 2014
Applicant Name: Firwood Design Group
Owner's Name: Mark Benson

FIRE DEPARTMENT COMMENTS – "Shall meet the requirements of Sandy Fire District for access and fire flow."

PLANNING DEPARTMENT REVIEW
Applicable Code Chapters: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.22 Notices; 17.48 I-1 Industrial Park Zoning District; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.84 Improvements with Development; 17.90 Design Standards; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access Requirements; 17.102 Urban Forestry; and Chapter 15.30 Dark Sky Ordinance.

Caveat: *This analysis includes a review of those code sections that may conflict with the proposed design as submitted. This review is not intended to be a comprehensive analysis of all applicable code sections.*

PRELIMINARY CODE EVALUATION – only code sections requiring modification have been included.

CHAPTER 17.48 – INDUSTRIAL PARK (I-1)
17.48.10 PERMITTED USES
A. Primary Uses Permitted Outright in buildings with less than 60,000 square ft. of gross floor area:
2. Service and professional businesses and organizations, including but not limited to:
i. Self-service storage;
*****The proposal contains two buildings totaling about 64,200 sq. ft. A conditional use permit process is required. Given the size of the office (1,200 sq. ft.) it is unclear if the proposal is intended to have a manager living onsite. Residential uses are not permitted in this zoning district, however an onsite manager would be considered an accessory use to the primary use and would be permitted.***
17.48.20
B. Conditional Uses
1. Building designed for one or more occupants with more than 60,000 square ft. of gross floor area.
***** A Conditional Use Permit is required.***
17.48.30 DEVELOPMENT REQUIREMENTS

Lot Area – Park	No minimum
Lot Area - Individual Lot	No minimum
Lot Dimension	No minimum
Setbacks Front …… Side …… Rear …….. Corner ……	 10 ft. minimum; 50 ft. maximum None - Unless abutting a more restrictive district; if abutting, the min. setback is 30 ft. None 15 ft.
Lot Coverage	80% maximum
Landscaping Requirement	20% minimum (includes required civic space per Section 17.90.120)
Structure Height	45 ft. maximum
Off-Street Parking	See Chapter 17.98
Design Review Standards	See Section 17.90.120

*****The Champion Way frontage is considered the front property line. The proposal meets required setbacks except that Section 17.80 requires a minimum 20 ft. setback on collector streets.***

CHAPTER 17.80 – ADDITIONAL SETBACKS ON COLLECTOR STREETS

*****Champion Way is classified as a collector street in the adopted Transportation System Plan requiring a 20 foot front setbac.***

CHAPTER 17.84 – IMPROVEMENTS REQUIRED WITH DEVELOPMENT

17.84.30 PEDESTRIAN AND BICYCLIST REQUIREMENTS

A. Sidewalks shall be required along both sides of all arterial, collector, and local streets, as follows:
   2. Sidewalks along arterial and collector streets shall be separated from curbs with a planting area, except as necessary to continue an existing curb-tight sidewalk. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of 6 ft. wide.

B. Safe and convenient pedestrian and bicyclist facilities that strive to minimize travel distance to the extent practicable shall be provided in conjunction with new development within and between new subdivisions, planned developments, commercial developments, industrial areas, residential areas, public transit stops, school transit stops, and neighborhood activity centers such as schools and parks, as follows:
   1. For the purposes of this section, "safe and convenient" means pedestrian and bicyclist facilities that: are reasonably free from hazards which would interfere with or discourage travel for short trips; provide a direct route of travel between destinations; and meet the travel needs of pedestrians and bicyclists considering destination and length of trip.
   3. Pathways and sidewalks shall be encouraged in new developments by clustering buildings or constructing convenient pedestrian ways. Pedestrian walkways shall be provided in accordance with the following standards:
      a) The pedestrian circulation system shall be at least five feet in width and shall connect the sidewalk on each abutting street to the main entrance of the primary structure on the site to minimize out of direction pedestrian travel.
      b)
      c) Walkways shall be as direct as possible and avoid unnecessary meandering.
      d) Walkway/driveway crossings shall be minimized. Internal parking lot design shall maintain ease of access for pedestrians from abutting streets, pedestrian facilities, and transit stops.
      e) With the exception of walkway/driveway crossings, walkways shall be separated from vehicle parking or vehicle maneuvering areas by grade, different paving material, painted crosshatching or landscaping. They shall be constructed in accordance with the sidewalk standards adopted by the City. (This provision does not require a separated walkway system to collect drivers and passengers from cars that have parked on site unless an unusual parking lot hazard exists).

   ***** The Champion Way frontage contains a curb but no sidewalk or planter strip. These improvements are required. The proposal does not appear to contain a direct pedestrian connection between the future sidewalk on Champion Way and the building entrance.***

17.84.50 STREET REQUIREMENTS

A. Traffic evaluations may be required of all development proposals in accordance with the following:
   1. A proposal establishing the scope of the traffic evaluation shall be submitted for review to the City Engineer. The evaluation requirements shall reflect the magnitude of the project in accordance with accepted traffic engineering practices. Large projects should assess all nearby key intersections. Once the scope of the traffic evaluation has been approved, the applicant shall present the results with and an overall site development proposal. If required by the City Engineer, such evaluations shall be signed by a Licensed Professional Civil Engineer or Licensed Professional Traffic Engineer licensed in the State of Oregon.
   2. If the traffic evaluation identifies level-of-service conditions less than the minimum standard established in the Transportation System Plan, improvements and funding strategies mitigating the problem shall be considered concurrent with a development proposal.

      *****Traffic Letter required***

CHAPTER 17.90.120 – GENERAL COMMERCIAL AND INDUSTRIAL (C-2 and I-1) AND NON-RESIDENTIAL USES IN RESIDENTIAL ZONES DESIGN STANDARDS

A. Site Layout and Access.

Intent: To provide for compact, walkable development, and to design and manage vehicle access and circulation in a manner that supports pedestrian safety, comfort and convenience. (Figures 17.90.120-A and 17.90.120-B)

1. All lots shall abut or have cross access to a dedicated public street.
2. All lots that have access to a public alley shall provide for an additional vehicle access from that alley.
3. Off-street parking shall be located to the rear or side of buildings with no portion of the parking lot located within required setbacks or within 10-feet of the public right-of-way, as shown in Figure 17.90.120-A. When access must be provided directly from a public right-of-way, driveways for ingress or egress shall be limited to one per 150 ft. For lots with frontage of less than 150 ft. or less, shared access may be required.
   As currently designed, Champion Way is considered the front of the building. Parking is located to the side of the building.
4. Adjacent parking lots shall be connected to one another when the City determines it is practicable to do so. Developments shall avoid creating barriers to inter-parcel circulation.
   A pedestrian connection between the upper and lower building would appear to be practicable and desirable.
5. Urban design details, such as raised or painted pedestrian crossings and similar devices incorporating changes in paving materials, textures or color, shall be used to calm traffic and protect pedestrians in parking areas.
6.
7. Walkways from the public street sidewalk to the building entrance(s) are required. Crosswalks through parking lots and drive aisles shall be constructed of a material contrasting with the road surface or painted (e.g., colored concrete inlay in asphalt).
8. Connection to Adjacent Properties:
9. Joint use of access points and interconnections and cross-over easements between parcels shall be required, where the City determines it is practicable and necessary. A development approval may be conditioned to require a joint use access easement and interconnecting driveways or alleys to comply with access spacing and other applicable code requirements.
10.
11. Free-standing buildings shall be connected to one another with a seamless pedestrian network that provides access to building entrances and adjacent civic spaces.
    The proposed pedestrian system does not facilitate connection between the sidewalk on Champion Way and the building entrance. The proposal includes use of the existing access serving the Champion Arco and a new access on Champion Way.

B. Building Facades, Materials, and Colors

1. Articulation. -*
   a. All elevations visible from an abutting public street or pedestrian way shall be divided into distinct planes of no more than 40 lineal feet long to include the following:
      1) Wall planes meeting this standard shall include a feature or variation in the wall plane that are those that are entirely separated from other wall planes by a recessed or projecting section of the structure that projects or recedes at least six (6) inches from the adjacent plane, for a length of at least four (4) feet. Changes in plane may include but are not limited to recessed entries, bays, secondary roof forms (e.g., gables, lower roof sheds, dormers and towers), building bases, canopies, awnings, projections, recesses, alcoves, pergolas, porticos, roof overhangs, or other features consistent with the Sandy Style.

   ***** This standard is applicable for all building elevations. Cannot determine compliance based on submittal.***

      2) Wall planes shall incorporate at least one visually contrasting and complementary change in

materials or changes in texture or patterns, including trim, moldings, or other ornamental devices.

3) The lower and upper floors of multi-storied buildings shall be delineated by using pedestrian shelters, changes in siding materials, heavy timbers, or natural wood accents (e.g. brackets, paneling, or other detailing).

***** The proposal may not comply with this standard.***

2. Pedestrian Shelters. Buildings must incorporate pedestrian shelters, as follows:
   a. Pedestrian shelters shall be provided over the building's primary entrance(s) and all pedestrian areas (i.e., sidewalks, and civic spaces) abutting the subject building, where pedestrians are likely to use these facilities.
   b. Features such as canopies, arcades, awnings, roofs overhangs, covered porches, alcoves, and/or porticoes are required to protect pedestrians from the rain and sun.
   c. Pedestrian shelters must extend at least five (5) feet over the pedestrian area.
   d. Shelters designed with gables (e.g., over building entrances) are preferred over flat shelters, and must comply with the roof pitch standards in Section 17.90.120(C). Dome or bubble shaped awnings are not permitted.

***** The primary pedestrian area is in the vicinity of the office from the proposed parking area. Compliance with this section cannot be determine based on submittal.***

3. Building Materials. Exterior building materials shall convey an impression of strength and durability consistent with the Sandy Style, as follows:
   a. Buildings on the same site shall be architecturally unified. This provision shall apply to new construction, additions, and remodeling such that buildings are related in architectural style and share some common elements, such as color scheme, materials, roof forms, and/or detailing. Unity does not mean repetition or mirroring of building elevations.

   ***** The design should contain elements of the Champion Arco project.***

   b. Strong base materials such as natural stone (e.g., basalt, granite, river stone), split-faced rusticated concrete block, brick, or concrete form liner replicating these materials are required. Cultured stone may be allowed if it has a stone texture and is similar in appearance and durability to natural stone. A building's base must extend at least 36 inches but not more than 60 inches above the adjacent finished grade and be included on those sides of the building visible from an abutting public street. If the site contains a grade differential making construction of a minimum 36-inch base impracticable, the reviewing body may allow portions of the base to be less than 36-inches.

   *****The proposal does not appear to comply with this section.***

   d. Siding shall consist of wood, composite-wood (e.g., concrete fiberboard, panels or shingles), stone, brick, split-faced or rusticated concrete block, concrete form liner or a combination of these materials. Stucco, synthetic stucco, or metal are only permitted as specified below. Vinyl, plastic or similar siding is not permitted.

      4) Where metal siding is used, it shall be used as an accent only, comprising not more than 20 percent of the surface area of the building elevation (e.g., wainscoting or other accent paneling). Metal must be architectural grade and have a non-reflective (burnished or painted) finish conforming to the approved Color Palette. Metal may also be used for flashing, gutters, downspouts, brackets, lighting, and signage and similar functional elements.

   ***** The proposal does not comply with this standard.***

   e. Building elevations facing a public street shall incorporate at least three (3) of the following features: Using these features may also address other code requirements, such as those related to building articulation, change in relief, pedestrian shelters, storefront elements.
      1) Exposed, heavy timbers;
      2) Exposed natural wood color beams, posts, brackets and/or trim (e.g., eaves or trim around windows);
      3) Natural wood color shingles (e.g., used as siding or to accent gable ends);
      4) Metal canopies;
      5) Heavy metal brackets (e.g., cast iron or similar appearance), which may be structural brackets or applied as cosmetic detailing, and/or;

6) Similar features, consistent with the Sandy Style.

***** Compliance with this standard is applicable to the Champion Way elevation. As submitted the proposal does not comply***

f. Materials required on elevations **visible** from an abutting public street must turn the building corner and incorporate appropriate transitions onto elevations not requiring these materials for a distance of not less than four (4) feet.

***** This standard applies to all building elevations.***

5) **Colors.** Building exteriors shall comply with the following standards:

a. Permitted colors include warm earth tones (tans, browns, reds, grays and greens) conforming to Color Palette in Appendix C.

***** Submit proposed colors with application.***

C. Roof Pitch, Materials, and Parapets

1. Except as provided in subsections 17.90.120(C)(8), below, pitched (gabled or hipped) roofs are required on all new buildings with a span of 50-feet or less. Gable and hipped roof forms must achieve a pitch not less than the following:

Zoning District	Primary Roof Forms (minimum)	Secondary Roof Forms (minimum)
C-2 and I-1	6:12	4:12

*****The proposed buildings contains a span greater than 50 feet (Building A – 70 ft. and Building B – 60 ft.) and does not require compliance with this standard. The proposed roof pitch is ½:12 for the Base Bid and 3:12 for the Alternate Bid. See Section C(8)(a) for additional requirements.***

2.

3. When practicable, buildings shall be oriented so the gable end of the roof faces the abutting street.

4. Pitched roofs **visible from an abutting public street shall provide a secondary roof form (e.g. dormer) in the quantity specified below.** Secondary roof forms may be located anywhere on the roof, although grouping these features is preferred.

Roof Length	Number of Secondary Roof Forms
30 – 40 feet	1
41 – 80 feet	2
81 feet and greater	4

***** The Base Bid does not contain any secondary roof forms. Compliance with this standard for the Alternate Bid cannot be determined. The length of the buildings require four secondary roof forms (210-250 ft.) on both the north and south roof areas.***

5. Visible roof materials must be wood shingle or architectural grade composition shingle, slate, or concrete tile. Metal with standing or batten seam may also be used conforming to the Color Palette in Appendix D.

*****Submit proposed colors with application.***

6. All roof and wall-mounted mechanical, electrical, communications, and service equipment, including satellite dishes and vent pipes, shall be screened from view from all adjacent public rights-of-way and civic spaces by parapets, walls or by other approved means. Roof plans and elevations must show proposed equipment locations, approximate dimensions, and line of sight from public rights-of-way and civic spaces. The reviewing body may require additional equipment setbacks, screen walls, or other mitigation to ensure compliance.

***** The land use application shall specify the location of exterior electrical panels and ground mounted equipment.***

8. Exception to Pitched Roof: When a building requires a roof span greater than 50-feet, or the internal function of the building or a portion of the building makes construction of a pitched roof impractical, the reviewing body may allow an alternative roof form. An alternative roof form includes an "applied

pitched roof" or flat roof constructed over the building or portion of the building as specified below. An example when a pitched roof is considered impractical would be the need to have large rooftop stove vents over the kitchen portion of a restaurant. Roof forms constructed under this exception shall comply with the standards below.

*****The roof span of the buildings are greater than 50 feet requiring compliance with this section.***

a. Applied Pitched Roof: An "applied pitched roof" is the preferred alternative roof form and shall be considered first. An "applied pitched roof" is a roof form with the general appearance of a pitched roof in terms of materials, pitch, and overhang, but does not extend all the way from the eave of the building to the ridge of the roof as a typical pitched roof. An "applied pitched roof" shall be constructed according to the following:

i. For buildings with a span of less than 50 feet, the "applied pitched roof" shall extend at least 50 percent of the distance from the eave to the ridge as if had been constructed as a pitched roof;

ii. For buildings with a span of 50 feet or greater, the applied pitched roof shall extend at least 12 feet from eave.

iii. The reviewing body may require buildings with a span of 50 feet or greater to include an "applied pitched roof" in lieu of a flat roof along street facing elevations.

b. Flat Roof: Flat roofs shall comply with the following standards:

1) Sandy Style stepped parapets and detailed coursing shall be provided on those elevations visible from an abutting public street. Parapets shall be varied so that the length of a parapet does not exceed 30 feet without a change in the parapet height of at least 2 feet or as necessary to hide rooftop equipment.

2) Average parapet height shall not exceed 15 percent of the supporting wall height, and the maximum parapet height shall not at any point exceed one-third (1/3) of the height of the supporting wall;

3) A cornice projecting at least six (6) inches from the building face shall be provided at the roofline of all elevations visible from abutting public rights-of-ways and pedestrian ways;

4) Parapet corners shall be stepped and the parapet be designed to emphasize the center or primary entrance(s), unless the primary entrance is at the corner of the building;

***** The applicant will need to submit revised plans in compliance with either the "applied pitch roof" or the "flat roof" options identified above.***

D. Building Orientation and Entrances

1. Buildings shall be oriented to a public street or civic space. This standard is met when at least 50 percent of the subject site's street frontage is comprised of building(s) placed within 20 feet of a sidewalk, walkway or civic space and not more than 20 percent of the off-street parking on a parcel as required by SDC 17.98, tract or area of land is located between a building's front façade and the adjacent street(s).

***** As designed this standard is not met. No civic space has been identified.***

2. Where parking is placed between a front façade and a street, a landscaped berm and/or architectural features, such as a knee wall, colonnade, arbor, trellis and/or similar device, shall be placed behind the sidewalk to partially screen the parking area from the sidewalk. The partial screen shall be designed to achieve at least 50 percent opacity at the time of installation, with openings for walkways connecting to the building's primary entrance.

*****No parking is proposed between the front façade and the street.***

3. Ground floor spaces shall face a public street or civic space and shall be connected to it by a direct pedestrian route (i.e., avoid out-of-direction travel).

***** Proposed upper level pedestrian route does not contain a direct pedestrian connection.***

4.

5.

6.

7. Buildings shall provide at least one (1) elevation where the pedestrian environment is **"activated"**. An elevation is "activated when it meets the window transparency requirements in subsection 17.90.120(E), below, and contains a public entrance with a pedestrian shelter extending at least five (5) feet over an adjacent sidewalk, walkway or civic space.

***** The office area is the likely "activated" elevation requiring compliance with these standards.***

8. Primary entrances must be architecturally emphasized and visible from the public right-of-way and shall be sheltered with a canopy, overhang, or portico with a depth of at least five (5) feet. Architectural emphasis should be provided by a gabled shelter where practical, consistent with the Sandy Style. Detailing around the base of the building, such as stonework, benches or art, should also be used to emphasize an entrance.

***** Additional architectural details are required to comply with this section.***

E. Windows

Intent: To promote business vitality, public safety and aesthetics through effective window placement and design, consistent with the Sandy Style. (Figures 17.90.120-A, 17.90.120-B, 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, and 17.90.120-H)

1. **Unified Design.** Building plans must provide for unity in window placement and design so that all sides of a building relate to one another and multiple buildings on a development site relate to one another.
2. **Ground Floor Windows.** The ground floor elevation of all new buildings shall contain ground floor display areas, windows, and doorways on the "activated" frontage. as follows:

Building Size	Percentage Windows Required
0 - 10,000 sq. ft.	30 percent of elevation
10,000 sq. ft. - 30,000 sq. ft.	25 percent of elevation
Greater than 30,000 sq. ft.	20 percent of elevation

   a. Windows shall contain clear glass to allow views to interior activity or display areas. The bottom edge of **windows shall be no less than three (3) feet above the adjacent finished grade.** Where the internal functions of a building preclude windows at this height, the reviewing body may allow windows above or below this height. Display boxes affixed to a building's exterior are not counted in meeting the above standard.
   b. Windows shall be square or vertically oriented and may consist of vertically stacked or horizontally banked window units. Windows located over a door or transom windows may be horizontally oriented.
   c. Windows with any dimension exceeding six (6) feet shall be divided to contain two or more smaller panes with real divided panes, vinyl inserts, or applied dividers.
   d. Windows shall have trim or moldings at least three (3) inches in width around them, or have reveals of at least three (3) inches in depth. Casings shall consist of a drip cap, head casing, side casings, and/or sills.

***** Windows are not identified on the submitted plans.***

3. **Upper Floor Window Standards.**
   a. The reviewing authority may require buildings exceeding 20 feet in height to provide upper-story windows along the "activated" frontage. Such windows may be required for attic space, or applied to roof forms where no second story exists, to meet the articulation requirements under Section 17.90.120(B)(1).
   b. Windows shall be square or vertically oriented. Individual window units shall not exceed five (5) feet by seven (7) feet. Any portion of a window unit with a dimension exceeding four (4) feet shall be divided into smaller panes.
   c. At least half of all the window area in upper floors shall be made up of glass panes with dimensions no greater than two (2) feet by three (3) feet, unless approved by variance or adjustment. Upper story windows that have one (1) foot by one (1) foot grid inside double pane glass are appropriate and are encouraged.

d. Window trim and moldings shall be compatible with those used on the ground floor.

***** Compliance with this standard cannot be determined.***

F. Landscaping and Streetscape Design

Intent: To promote business vitality, public safety and aesthetics through effective landscaping and streetscape design, consistent with the Sandy Style, and to provide for a continuous pedestrian network that promotes pedestrian safety, comfort and convenience, and provides materials and detailing consistent with the Sandy Style. (See Figures 17.90.120-J and 17.90.120-K and Appendix G)

***** The proposed development area is not adjacent to Highway 26, although the parcel the proposal is located on is adjacent. The applicant is advised to request a partition with this application to avoid the requirements of this section.***

4. All service and storage areas must be screened from view from all adjacent rights-of-way. (See Figure 17.90.120-K below.)

***** A service and storage area has not been identified.***

G. Civic Space

Intent: To connect buildings to the public realm and create comfortable and attractive gathering places and outdoor seating areas for customers and the public, consistent with Sandy's Downtown Streetscape Design. (See Figures 17.90.120-L and 17.90.120-M)

1. Not less than three (3) percent of the building area of every development shall be improved as civic space.

***** No civic space is identified. Building A contains 34,200 sq. ft. requiring 1,026 sq. ft. of civic space and Building B contains 30,000 requiring 900 sq. ft. for a total of 1,926 sq. ft. required. Staff believes a reasonable interpretation of this section would require the provision of civic space based on the size of the office rather than the entire building. The office size of 1,200 requires 36 sq. feet based on this section except as modified below.***

2. All civic spaces shall have dimensions of not less than eight (8) feet across and have a surface area of not less than 64 square feet. No civic space is required if the size of this space results in an area of less than 64 square feet.

***** This section requires civic space to contain not less than 64 sq. ft. The remainder of this section contains additional requirements.***

H. Lighting

1. Streetscape lighting shall conform to Chapter 15.30 Dark Sky Ordinance.
2. Exterior lighting must be an integral part of the architectural design and must complement any ornamental street lighting and remain in context with the overall architectural character of the district. On-site light fixtures conforming to the Sandy Style are encouraged.
3. Lighting must be adequate for safety purposes. Walkways and parking lots should be illuminated at 1.5 – 2.0 foot candles.

***** Submittal of a lighting plan, lighting cutsheets, and photometric analysis required is compliance with Chapter 15.30.***

J. External Storage

***** Need to identify the location of garbage/recycling and the location of mechanical equipment and electrical panels.***

CHAPTER 17.92 – LANDSCAPING AND SCREENING

17.92.20 MINIMUM IMPROVEMENTS - LANDSCAPING AND SCREENING

The minimum landscaping area of a site to be retained in landscaping shall be as follows:

ZONING DISTRICT OR USE	PERCENTAGE
I - 1 Industrial Park	20%

***** Submittal of a Landscape Plan is required.***

17.92.100 SCREENING OF SERVICE FACILITIES

Site-obscuring shrubbery or a berm, wall or fence shall be placed along a property line between residential and commercial and industrial zones and around unsightly areas such as trash and recycling areas, gas meters,

ground level air conditioning units, disc antennas exceeding 36 inches in diameter and equipment storage or an industrial or commercial use with outside storage of equipment or materials.

****Identify these areas and provide an enclosure and screening.**

17.92.110 OUTDOOR STORAGE

All outdoor storage areas for commercial, industrial, public and semi-public uses are to be entirely screened by a sight obscuring fence, vegetative materials, or other alternative deemed appropriate by the Director.

*****Is outside storage proposed?***

CHAPTER 17.98 – PARKING, LOADING, AND ACCESS REQUIREMENTS

17.98.20 OFF-STREET PARKING REQUIREMENTS

A. Off Street Parking Requirements. Off street parking shall conform to the following standards:

8.

Commercial Uses	**Number of Parking Spaces**	**Number of Bicycle Spaces**
General, professional or banking offices and services	1 per 300 sq. ft., plus 1 per 2 employees	5% or 2 whichever is greater

***** Parking other than loading and unloading is primarily necessary at the proposed office. The 1200 sq. ft. office requires 4 spaces plus 1 per 2 employees. One ADA space is required. The proposed ADA space does not appear to comply with standards (9 ft. space and 8 ft. accessible aisle). Bike parking is required. How many employees?***

17.98.50 SETBACKS

A.

B. Required parking shall not be located in a required front or side yard setback area abutting a public street except in industrial districts. For single family and two-family dwellings, required off-street parking may be located in a driveway.

C. Parking areas shall be setback from a lot line adjoining a street the same distance as the required building setbacks. Regardless of other provisions, a minimum setback of 5 feet shall be provided along the property fronting on a public street. The setback area shall be landscaped as provided in this code.

***** Parking is located to the side of the office building.***

17.98.60 DESIGN, SIZE AND ACCESS

All off-street parking facilities, vehicular maneuvering areas, driveways, loading facilities, accessways, and private streets shall conform to the standards set forth in this section.

***** Parking is required to contain minimum dimensions of 9ft.x18ft. and all parking appears to comply with standards except the proposed ADA space.***

17.98.70 ON-SITE CIRCULATION

A. Groups of more than three (3) parking spaces shall be permanently striped.

B. Backing and Maneuvering. Except for a single family dwelling or two family dwelling, groups of more than 3 parking spaces shall be provided with adequate aisles or turnaround areas so that all vehicles enter the right-of-way (except for alleys) in a forward manner. Parking spaces shall not have backing or maneuvering movements for any of the parking spaces occurring across public sidewalks or within any public street, except as approved by the City Engineer. Evaluations of requests for exceptions shall consider constraints due to lot patterns and impacts to the safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

***** Proposed parking appears to comply with this section.***

17.98.80 ACCESS TO ARTERIAL AND COLLECTOR STREETS

A. Location and design of all accesses to and/or from arterials and collectors (as designated in the Transportation System Plan) are subject to review and approval by the City Engineer. Where practical, access from a lower functional order street may be required. Accesses to arterials or collectors shall be located a minimum of 150 ft. from any other access or street intersection. Exceptions may be granted by the City Engineer. Evaluations of exceptions shall consider posted speed of the street on which access is

proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

***** Champion Way is classified as a collector street. The distance between the existing access at the Arco to the new access on Champion Way appears to be greater than 150 ft. but this new access may be less than 150 ft. from the access to Champion Collision. The City Engineer will need to review this design.***

B. No development site shall be allowed more than one access point to any arterial or collector street (as designated in the Transportation System Plan) except as approved by the City Engineer. Evaluations of exceptions shall consider posted speed of street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

***** The proposal includes use of the existing Champion Arco access and a new access on champion Way. The applicant is advised to determine if only the existing access is adequate to serve the site.***

17.98.120 LANDSCAPING AND SCREENING

A. Screening of all parking areas containing 4 or more spaces and all parking areas in conjunction with an off-street loading facility shall be required in accordance with zoning district requirements and Chapter 17.98. Where not otherwise specified by district requirement, screening along a public right-of-way shall include a minimum 5-ft. depth of buffer plantings adjacent to the right-of-way.

*****The area between Champion Way and the proposed parking area shall be screened.***

E. Parking area setbacks shall be landscaped with major trees, shrubs, and ground cover as specified in Chapter 17.92.

****Parking spaces adjacent to Champion Way shall be screened from view.**

F. Wheel stops, bumper guards, or other methods to protect landscaped areas shall be provided. No vehicle may project over a property line or a public right-of-way. Parking may project over an internal sidewalk, but a minimum clearance of 5 feet for safe pedestrian circulation is required.

*****Parking adjacent to five foot sidewalks shall be provided with bumper guards or widen sidewalk to seven feet.***

17.98.150 LIGHTING

Artificial lighting shall be provided in all required off-street parking areas. Lighting shall be directed into the site and shall be arranged to not produce direct glare on adjacent properties. Light elements shall be shielded and shall not be visible from abutting residential properties. Lighting shall be provided in all bicycle parking areas so that all facilities are thoroughly illuminated and visible from adjacent sidewalks or vehicle parking lots during all hours of use.

***** Submit a lighting plan, cutsheets, and photometric analysis for proposed lighting.***

17.68.20 REVIEW CRITERIA

The following criteria and compatibility factors shall be considered:

A. The use is listed as either a minor conditional use or conditional use in the underlying zoning district or has been interpreted to be similar in use to other listed conditional uses.
B. The characteristics of the site are suitable for the proposed use considering the size, shape, location, topography, and natural features.
C. The proposed use is timely considering the adequacy of the transportation systems, public facilities and services existing or planned for the area affected by the use
D. The proposed use will not alter the character of the surrounding area in a manner which substantially limits, precludes, or impairs the use of surrounding properties for the primary uses listed in the underlying zoning district.
E. The proposed use will not result in the use of land for any purpose which may create or cause to be created any public nuisance including, but not limited to, air, land, or water degradation, noise, glare, heat, vibration, or other considerations which may be injurious to the public health, safety, and welfare.
F. The proposed use will be reasonably compatible with existing or planned neighboring uses based on review of the following:
    1. Basic site design (organization of uses on the site)
    2. Visual elements (scale, structural design and form, materials, and so forth)

3. Noise
4. Noxious odors
5. Lighting
6. Signage
7. Landscaping for buffering and screening
8. Traffic
9. Effects on off-street parking
10. Effects on air quality and water quality

*****Submittal of a Conditional Use Permit and Design Review application is required.***

17.100.40 MINOR AND MAJOR PARTITIONS

Approval of a partition is required for a land division of 3 or fewer parcels in a calendar year. Partitions, which do not require creation or extension of a street for access, is classified as a Type I minor partition. Partitions, which require creation or extension of a street for access is classified as a Type II, major partition.

***** The applicant should complete a request for a minor partition to divide the development site from the rest of the property.***

REVIEW SUMMARY

Site

1. Frontage improvements
2. Building site should be partitioned from the rest of the site.
3. Pedestrian connection from street to building entrance.
4. Location of the following: civic space, garbage/recycling area, outside storage, bike parking, wheel chair ramps, striped accessible routes to building entrance.
5. Access spacing on Champion Way.
6. ADA parking design.

Building Design

1. Compliance with building articulation requirements (applies to side elevations).
2. Pedestrian shelters not provided over walkways abutting the building.
3. Materials – specify base height (min. 3 ft.), required features, specify colors.
4. Sandy Style features.
5. Required secondary roof forms (4 required on north and south elevations).
6. Identify location/screening for electrical panels and ground mounted equipment.
7. Identify "activated" elevation
8. Calculation of window glass percent on "activated" elevation (30% required). (Request Code Deviation)
9. Review window design standards for upper and lower windows.

Application Process: Type III Conditional Use Permit and Design Review application reviewed by the Planning Commission. The application may also require several code deviations and/or variances.

Projected Processing Steps:

- Submittal Requirements Conditional Use Permit and Design Review: signed land use application form, fee, narrative, property owner list, detailed site plan, landscape plan, utility plan, building elevations, photometric plan, stormwater analysis, traffic study, and driveway spacing analysis. (See Submittal Requirements Handout)
- Submittal Requirements Partition: signed land use application form, fee, narrative, proposed partition drawing.
- Staff review for completeness (30 days max.), if determined incomplete then the applicant submits additional information as required, staff then reviews for completeness again, if the application is deemed complete then the application processing begins.
- 45 – 60 day processing timeline projected.

Exhibit E

PRE-APPLICATION CONFERENCE NOTES

Project Name: Highway 26 Storage
Pre-Application Conference Date: August 17, 2017
Applicant Name: Whitney Axis Design Group (Bill Whitney)
Owner's Name: Tim Paul, Bill Whitney, Kelli Grover, Nick Morgan (SHS Student)
Staff: Mike Walker, Emily Meharg, Terre Gift, Thomas Fisher, David Snider, Kelly O'Neill Jr.

FIRE DEPARTMENT COMMENTS – "Shall meet the requirements of Sandy Fire District for access and fire flow."

TRANSIT COMMENTS – "The proposed development is not in a location that will require site preparation for transit amenities."

ODOT COMMENTS – "Seeing as Champion Way is a right-in/right-out, unless the City requires a TIA, ODOT has not comments at this time."

PLANNING DEPARTMENT REVIEW
Applicable Code Chapters: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.22 Notices; 17.48 I-1 Industrial Park Zoning District; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.84 Improvements with Development; 17.90 Design Standards; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access Requirements; 17.102 Urban Forestry; and Chapter 15.30 Dark Sky Ordinance.

Caveat: *This analysis includes a review of those code sections that may conflict with the proposed design as submitted. This review is not intended to be a comprehensive analysis of all applicable code sections.*

PRELIMINARY CODE EVALUATION – only code sections requiring modification have been included.

CHAPTER 17.48 – INDUSTRIAL PARK (I-1)
17.48.10 PERMITTED USES
A. Primary Uses Permitted Outright in buildings with less than 60,000 square ft. of gross floor area:
2. Service and professional businesses and organizations, including but not limited to:
i. Self-service storage;

** ***The proposal contains two buildings totaling about 40,900 sq. ft. Residential uses are not permitted in this zoning district; however, an onsite manager could potentially be considered an accessory use to the primary use and would be permitted.***

17.48.20
B. Conditional Uses
1. Building designed for one or more occupants with more than 60,000 square ft. of gross floor area.

** ***A Conditional Use Permit is not required, unless the building area exceeds 60,000 square feet.***

17.48.30 DEVELOPMENT REQUIREMENTS

Lot Area – Park	No minimum
Lot Area - Individual Lot	No minimum
Lot Dimension	No minimum
Setbacks Front …… Side …… Rear …….. Corner ……	 10 ft. minimum; 50 ft. maximum None - Unless abutting a more restrictive district; if abutting, the min. setback is 30 ft. None 15 ft.
Lot Coverage	80% maximum
Landscaping Requirement	20% minimum (includes required civic space per Section 17.90.120)

Structure Height	45 ft. maximum
Off-Street Parking	See Chapter 17.98
Design Review Standards	See Section 17.90.120

***** The Champion Way frontage is considered the front property line. The proposal meets required setbacks, including the Section 17.80 requirement of a minimum 20 ft. setback on collector streets.***

CHAPTER 17.80 – ADDITIONAL SETBACKS ON COLLECTOR STREETS

***** Champion Way is classified as a collector street in the adopted Transportation System Plan requiring a 20 foot front setback.***

CHAPTER 17.84 – IMPROVEMENTS REQUIRED WITH DEVELOPMENT

17.84.30 PEDESTRIAN AND BICYCLIST REQUIREMENTS

A. Sidewalks shall be required along both sides of all arterial, collector, and local streets, as follows:
   2. Sidewalks along arterial and collector streets shall be separated from curbs with a planting area, except as necessary to continue an existing curb-tight sidewalk. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of 6 ft. wide.

B. Safe and convenient pedestrian and bicyclist facilities that strive to minimize travel distance to the extent practicable shall be provided in conjunction with new development within and between new subdivisions, planned developments, commercial developments, industrial areas, residential areas, public transit stops, school transit stops, and neighborhood activity centers such as schools and parks, as follows:
   1. For the purposes of this section, "safe and convenient" means pedestrian and bicyclist facilities that: are reasonably free from hazards which would interfere with or discourage travel for short trips; provide a direct route of travel between destinations; and meet the travel needs of pedestrians and bicyclists considering destination and length of trip.
   3. Pathways and sidewalks shall be encouraged in new developments by clustering buildings or constructing convenient pedestrian ways. Pedestrian walkways shall be provided in accordance with the following standards:
      a) The pedestrian circulation system shall be at least five feet in width and shall connect the sidewalk on each abutting street to the main entrance of the primary structure on the site to minimize out of direction pedestrian travel.
      b)
      c) Walkways shall be as direct as possible and avoid unnecessary meandering.
      d) Walkway/driveway crossings shall be minimized. Internal parking lot design shall maintain ease of access for pedestrians from abutting streets, pedestrian facilities, and transit stops.
      e) With the exception of walkway/driveway crossings, walkways shall be separated from vehicle parking or vehicle maneuvering areas by grade, different paving material, painted crosshatching or landscaping. They shall be constructed in accordance with the sidewalk standards adopted by the City. (This provision does not require a separated walkway system to collect drivers and passengers from cars that have parked on site unless an unusual parking lot hazard exists).

   ***** The Champion Way frontage proposal contains a curb, but no sidewalk or planter strip. These improvements are required. The proposal does not appear to contain a direct pedestrian connection between the future sidewalk on Champion Way and the building entrance, though the narrative states one will be provided. The pedestrian connection needs to be shown on the site plan.***

17.84.50 STREET REQUIREMENTS

A. Traffic evaluations may be required of all development proposals in accordance with the following:
   1. A proposal establishing the scope of the traffic evaluation shall be submitted for review to the City Engineer. The evaluation requirements shall reflect the magnitude of the project in accordance with accepted traffic engineering practices. Large projects should assess all nearby key intersections. Once the scope of the traffic evaluation has been approved, the applicant shall present the results with and an overall site development proposal. If required by the City Engineer, such evaluations shall be signed by a Licensed Professional Civil Engineer or Licensed Professional Traffic Engineer licensed in the State of Oregon.

2. If the traffic evaluation identifies level-of-service conditions less than the minimum standard established in the Transportation System Plan, improvements and funding strategies mitigating the problem shall be considered concurrent with a development proposal.

***** Traffic Letter is required.***

CHAPTER 17.90.120 – GENERAL COMMERCIAL AND INDUSTRIAL (C-2 and I-1) AND NON-RESIDENTIAL USES IN RESIDENTIAL ZONES DESIGN STANDARDS

A. Site Layout and Access.

Intent: To provide for compact, walkable development, and to design and manage vehicle access and circulation in a manner that supports pedestrian safety, comfort and convenience. (Figures 17.90.120-A and 17.90.120-B)

1. All lots shall abut or have cross access to a dedicated public street.
2. All lots that have access to a public alley shall provide for an additional vehicle access from that alley.
3. Off-street parking shall be located to the rear or side of buildings with no portion of the parking lot located within required setbacks or within 10-feet of the public right-of-way, as shown in Figure 17.90.120-A. When access must be provided directly from a public right-of-way, driveways for ingress or egress shall be limited to one per 150 ft. For lots with frontage of less than 150 ft. or less, shared access may be required.

   ***** As currently designed, Champion Way is considered the front of the building. Parking is located to the side of the building.***
4. Adjacent parking lots shall be connected to one another when the City determines it is practicable to do so. Developments shall avoid creating barriers to inter-parcel circulation.

   ***** A pedestrian connection between the upper and lower building would appear to be practicable and desirable.***
5. Urban design details, such as raised or painted pedestrian crossings and similar devices incorporating changes in paving materials, textures or color, shall be used to calm traffic and protect pedestrians in parking areas.
6.
7. Walkways from the public street sidewalk to the building entrance(s) are required. Crosswalks through parking lots and drive aisles shall be constructed of a material contrasting with the road surface or painted (e.g., colored concrete inlay in asphalt).
8. Connection to Adjacent Properties:
9. Joint use of access points and interconnections and cross-over easements between parcels shall be required, where the City determines it is practicable and necessary. A development approval may be conditioned to require a joint use access easement and interconnecting driveways or alleys to comply with access spacing and other applicable code requirements.
10.
11. Free-standing buildings shall be connected to one another with a seamless pedestrian network that provides access to building entrances and adjacent civic spaces.

    ***** The proposed pedestrian system does not facilitate connection between the sidewalk on Champion Way and the building entrance. The proposal includes use of the existing access serving the Arco and a new access (lower exit with gate) on Champion Way.***

B. Building Facades, Materials, and Colors

1. Articulation. -*
   a. All elevations visible from an abutting public street or pedestrian way shall be divided into distinct planes of no more than 40 lineal feet long to include the following:
      1) Wall planes meeting this standard shall include a feature or variation in the wall plane that are those that are entirely separated from other wall planes by a recessed or projecting section of the structure that projects or recedes at least six (6) inches from the adjacent plane, for a length of at least four (4) feet. Changes in plane may include but are not limited to recessed entries, bays, secondary roof

forms (e.g., gables, lower roof sheds, dormers and towers), building bases, canopies, awnings, projections, recesses, alcoves, pergolas, porticos, roof overhangs, or other features consistent with the Sandy Style.

** ***This standard is applicable for all building elevations. The east elevations (facing Champion Way) of both buildings include recesses due to the footprint of the building such that no plane is greater than 40 feet; however, there's not much change in material so the east elevations may appear planar. The north elevation of Building One includes a 70 foot and an 80 foot stretch that do not appear to have any recesses. The elevations will need to be modified to address this code requirement.***

2) Wall planes shall incorporate at least one visually contrasting and complementary change in materials or changes in texture or patterns, including trim, moldings, or other ornamental devices.

3) The lower and upper floors of multi-storied buildings shall be delineated by using pedestrian shelters, changes in siding materials, heavy timbers, or natural wood accents (e.g. brackets, paneling, or other detailing).

** ***It appears the proposal complies with this standard.***

2. Pedestrian Shelters. Buildings must incorporate pedestrian shelters, as follows:
   a. Pedestrian shelters shall be provided over the building's primary entrance(s) and all pedestrian areas (i.e., sidewalks, and civic spaces) abutting the subject building, where pedestrians are likely to use these facilities.
   b. Features such as canopies, arcades, awnings, roofs overhangs, covered porches, alcoves, and/or porticoes are required to protect pedestrians from the rain and sun.
   c. Pedestrian shelters must extend at least five (5) feet over the pedestrian area.
   d. Shelters designed with gables (e.g., over building entrances) are preferred over flat shelters, and must comply with the roof pitch standards in Section 17.90.120(C). Dome or bubble shaped awnings are not permitted.

** ***The primary pedestrian area is not detailed on the submitted plan set. The narrative states that the north façade of Building One and the east facade of both buildings will include covered entries (pedestrian shelters). The floor plans for both buildings show five foot recessed entryways. This standard appears to be met.***

3. Building Materials. Exterior building materials shall convey an impression of strength and durability consistent with the Sandy Style, as follows:
   a. Buildings on the same site shall be architecturally unified. This provision shall apply to new construction, additions, and remodeling such that buildings are related in architectural style and share some common elements, such as color scheme, materials, roof forms, and/or detailing. Unity does not mean repetition or mirroring of building elevations.

   ** ***The design contains elements of the Arco project including heavy timber trusses with heavy metal brackets, split face concrete block, Hardie siding, and some wood or composite shingles and trim.***

   b. Strong base materials such as natural stone (e.g., basalt, granite, river stone), split-faced rusticated concrete block, brick, or concrete form liner replicating these materials are required. Cultured stone may be allowed if it has a stone texture and is similar in appearance and durability to natural stone. A building's base must extend at least 36 inches but not more than 60 inches above the adjacent finished grade and be included on those sides of the building visible from an abutting public street. If the site contains a grade differential making construction of a minimum 36-inch base impracticable, the reviewing body may allow portions of the base to be less than 36-inches.

   ** ***The proposal includes split face concrete block.***

   d. Siding shall consist of wood, composite-wood (e.g., concrete fiberboard, panels or shingles), stone, brick, split-faced or rusticated concrete block, concrete form liner or a combination of these materials. Stucco, synthetic stucco, or metal are only permitted as specified below. Vinyl, plastic or similar siding is not permitted.

      4) Where metal siding is used, it shall be used as an accent only, comprising not more than 20 percent of the surface area of the building elevation (e.g., wainscoting or other accent paneling). Metal must be architectural grade and have a non-reflective (burnished or painted) finish conforming to the approved Color Palette. Metal may also be used for flashing, gutters,

downspouts, brackets, lighting, and signage and similar functional elements.

***** The proposal does not comply with this standard. The south elevation of building one contains approximately 50 percent metal siding and the south elevation of building two contains even more.***

e. Building elevations facing a public street shall incorporate at least three (3) of the following features: Using these features may also address other code requirements, such as those related to building articulation, change in relief, pedestrian shelters, storefront elements.
   1) Exposed, heavy timbers;
   2) Exposed natural wood color beams, posts, brackets and/or trim (e.g., eaves or trim around windows);
   3) Natural wood color shingles (e.g., used as siding or to accent gable ends);
   4) Metal canopies;
   5) Heavy metal brackets (e.g., cast iron or similar appearance), which may be structural brackets or applied as cosmetic detailing, and/or;
   6) Similar features, consistent with the Sandy Style.

***** Compliance with this standard is applicable to the Champion Way elevation. As submitted the proposal does not comply.***

f. Materials required on elevations **visible** from an abutting public street must turn the building corner and incorporate appropriate transitions onto elevations not requiring these materials for a distance of not less than four (4) feet.

***** This standard applies to all building elevations.***

5) **Colors.** Building exteriors shall comply with the following standards:

a. Permitted colors include warm earth tones (tans, browns, reds, grays and greens) conforming to Color Palette in Appendix C.

***** Submit proposed colors with application.***

C. Roof Pitch, Materials, and Parapets

1. Except as provided in subsections 17.90.120(C)(8), below, pitched (gabled or hipped) roofs are required on all new buildings with a span of 50-feet or less. Gable and hipped roof forms must achieve a pitch not less than the following:

Zoning District	Primary Roof Forms (minimum)	Secondary Roof Forms (minimum)
C-2 and I-1	6:12	4:12

***** Building One contains a 70 foot span (span is greater than 50 feet) and does not require compliance with this standard. Building Two has a 40 foot span, which is less than the 50 foot minimum needed for the exception under 17.90.120(C)(8). The applicant is requesting a design deviation in order to make the two buildings consistent. A design deviation is reviewed by Planning Commission. See Section C(8)(a) for additional requirements.***

2.

3. When practicable, buildings shall be oriented so the gable end of the roof faces the abutting street.

4. Pitched roofs **visible from an abutting public street shall provide a secondary roof form (e.g. dormer) in the quantity specified below.** Secondary roof forms may be located anywhere on the roof, although grouping these features is preferred.

Roof Length	Number of Secondary Roof Forms
30 – 40 feet	1
41 – 80 feet	2
81 feet and greater	4

***** The proposal does not contain any secondary roof forms along the east elevations, with the exception of the side of the entryway on the north side of building one. The north side of Building One is visible from the Arco driveway. The length of the building requires four secondary roof forms (210-250 ft.),***

which it has.

5. Visible roof materials must be wood shingle or architectural grade composition shingle, slate, or concrete tile. Metal with standing or batten seam may also be used conforming to the Color Palette in Appendix D.

***** Submit proposed colors with application.***

6. All roof and wall-mounted mechanical, electrical, communications, and service equipment, including satellite dishes and vent pipes, shall be screened from view from all adjacent public rights-of-way and civic spaces by parapets, walls or by other approved means. Roof plans and elevations must show proposed equipment locations, approximate dimensions, and line of sight from public rights-of-way and civic spaces. The reviewing body may require additional equipment setbacks, screen walls, or other mitigation to ensure compliance.

***** The land use application shall specify the location of exterior electrical panels and ground mounted equipment.***

8. Exception to Pitched Roof: When a building requires a roof span greater than 50-feet, or the internal function of the building or a portion of the building makes construction of a pitched roof impractical, the reviewing body may allow an alternative roof form. An alternative roof form includes an "applied pitched roof" or flat roof constructed over the building or portion of the building as specified below. An example when a pitched roof is considered impractical would be the need to have large rooftop stove vents over the kitchen portion of a restaurant. Roof forms constructed under this exception shall comply with the standards below.

***** The roof span of Building One is greater than 50 feet requiring compliance with this section. The applicant is requesting a design deviation to allow Building Two to have a flat roof as well.***

a. Applied Pitched Roof: An "applied pitched roof" is the preferred alternative roof form and shall be considered first. An "applied pitched roof" is a roof form with the general appearance of a pitched roof in terms of materials, pitch, and overhang, but does not extend all the way from the eave of the building to the ridge of the roof as a typical pitched roof. An "applied pitched roof" shall be constructed according to the following:

   i. For buildings with a span of less than 50 feet, the "applied pitched roof" shall extend at least 50 percent of the distance from the eave to the ridge as if had been constructed as a pitched roof;

   ii. For buildings with a span of 50 feet or greater, the applied pitched roof shall extend at least 12 feet from eave.

   iii. The reviewing body may require buildings with a span of 50 feet or greater to include an "applied pitched roof" in lieu of a flat roof along street facing elevations.

b. Flat Roof: Flat roofs shall comply with the following standards:

   1) Sandy Style stepped parapets and detailed coursing shall be provided on those elevations visible from an abutting public street. Parapets shall be varied so that the length of a parapet does not exceed 30 feet without a change in the parapet height of at least 2 feet or as necessary to hide rooftop equipment.

   2) Average parapet height shall not exceed 15 percent of the supporting wall height, and the maximum parapet height shall not at any point exceed one-third (1/3) of the height of the supporting wall;

   3) A cornice projecting at least six (6) inches from the building face shall be provided at the roofline of all elevations visible from abutting public rights-of-ways and pedestrian ways;

   4) Parapet corners shall be stepped and the parapet be designed to emphasize the center or primary entrance(s), unless the primary entrance is at the corner of the building;

***** The proposal is for the "flat roof" options identified above.***

D. Building Orientation and Entrances

1. Buildings shall be oriented to a public street or civic space. This standard is met when at least 50 percent of

the subject site's street frontage is comprised of building(s) placed within 20 feet of a sidewalk, walkway or civic space and not more than 20 percent of the off-street parking on a parcel as required by SDC 17.98, tract or area of land is located between a building's front façade and the adjacent street(s).

** ***As designed this standard is not met. No civic space has been identified.***

2. Where parking is placed between a front façade and a street, a landscaped berm and/or architectural features, such as a knee wall, colonnade, arbor, trellis and/or similar device, shall be placed behind the sidewalk to partially screen the parking area from the sidewalk. The partial screen shall be designed to achieve at least 50 percent opacity at the time of installation, with openings for walkways connecting to the building's primary entrance.

** ***No parking is proposed between the front façade and the street.***

3. Ground floor spaces shall face a public street or civic space and shall be connected to it by a direct pedestrian route (i.e., avoid out-of-direction travel).

** ***Proposed upper level pedestrian route does not contain a direct pedestrian connection to the north.***

4.
5.
6.
7. Buildings shall provide at least one (1) elevation where the pedestrian environment is **"activated"**. An elevation is "activated when it meets the window transparency requirements in subsection 17.90.120(E), below, and contains a public entrance with a pedestrian shelter extending at least five (5) feet over an adjacent sidewalk, walkway or civic space.

** ***The office area is the likely "activated" elevation requiring compliance with these standards.***

8. Primary entrances must be architecturally emphasized and visible from the public right-of-way and shall be sheltered with a canopy, overhang, or portico with a depth of at least five (5) feet. Architectural emphasis should be provided by a gabled shelter where practical, consistent with the Sandy Style. Detailing around the base of the building, such as stonework, benches or art, should also be used to emphasize an entrance.

** ***All entrances appear to be covered and recessed five feet. The entrances along the north side of Building One, including the primary entrance by the office, contain a Sandy Style timber truss entryway.***

E. Windows

Intent: To promote business vitality, public safety and aesthetics through effective window placement and design, consistent with the Sandy Style. (Figures 17.90.120-A, 17.90.120-B, 17.90.120-D, 17.90.120-E, 17.90.120-F, 17.90.120-G, and 17.90.120-H)

1. **Unified Design.** Building plans must provide for unity in window placement and design so that all sides of a building relate to one another and multiple buildings on a development site relate to one another.
2. **Ground Floor Windows.** The ground floor elevation of all new buildings shall contain ground floor display areas, windows, and doorways on the "activated" frontage as follows:

Building Size	Percentage Windows Required
0 - 10,000 sq. ft.	30 percent of elevation
10,000 sq. ft. - 30,000 sq. ft.	25 percent of elevation
Greater than 30,000 sq. ft.	20 percent of elevation

a. Windows shall contain clear glass to allow views to interior activity or display areas. The bottom edge of **windows shall be no less than three (3) feet above the adjacent finished grade.** Where the internal functions of a building preclude windows at this height, the reviewing body may allow windows above or below this height. Display boxes affixed to a building's exterior are not counted in meeting the above standard.

b. Windows shall be square or vertically oriented and may consist of vertically stacked or horizontally banked window units. Windows located over a door or transom windows may be horizontally oriented.

c. Windows with any dimension exceeding six (6) feet shall be divided to contain two or more smaller panes with real divided panes, vinyl inserts, or applied dividers.
d. Windows shall have trim or moldings at least three (3) inches in width around them, or have reveals of at least three (3) inches in depth. Casings shall consist of a drip cap, head casing, side casings, and/or sills.

** ***The north elevation of Building One and east elevations of both buildings include minimal windows. The narrative states that windows will be limited due to the need for security. It appears the applicant will need to submit for a variance addressing the window coverage requirement.***

3. **Upper Floor Window Standards.**
   a. The reviewing authority may require buildings exceeding 20 feet in height to provide upper-story windows along the "activated" frontage. Such windows may be required for attic space, or applied to roof forms where no second story exists, to meet the articulation requirements under Section 17.90.120(B)(1).
   b. Windows shall be square or vertically oriented. Individual window units shall not exceed five (5) feet by seven (7) feet. Any portion of a window unit with a dimension exceeding four (4) feet shall be divided into smaller panes.
   c. At least half of all the window area in upper floors shall be made up of glass panes with dimensions no greater than two (2) feet by three (3) feet, unless approved by variance or adjustment. Upper story windows that have one (1) foot by one (1) foot grid inside double pane glass are appropriate and are encouraged.
   d. Window trim and moldings shall be compatible with those used on the ground floor.

** ***There are two proposed windows along the north elevation of Building One by the office; however, because the building is on a slope, the north side elevation is only 16 feet in height. On the east elevations, there are two proposed windows on the upper floor of Building One. Building Two is only one story but also has two proposed windows on the east elevation.***

F. Landscaping and Streetscape Design

Intent: To promote business vitality, public safety and aesthetics through effective landscaping and streetscape design, consistent with the Sandy Style, and to provide for a continuous pedestrian network that promotes pedestrian safety, comfort and convenience, and provides materials and detailing consistent with the Sandy Style. (See Figures 17.90.120-J and 17.90.120-K and Appendix G)

** ***The proposed development area is not adjacent to Highway 26, although the subject property is adjacent. The applicant is proposing a lot line adjustment to divide these two buildings from the rest of the lot to the west. The applicant is advised to request a partition with this application to avoid the requirements of this section and to sell the property west of this proposal as a separate lot.***

4. All service and storage areas must be screened from view from all adjacent rights-of-way. (See Figure 17.90.120-K below.)

** ***A service and storage area has not been identified.***

G. Civic Space

Intent: To connect buildings to the public realm and create comfortable and attractive gathering places and outdoor seating areas for customers and the public, consistent with Sandy's Downtown Streetscape Design. (See Figures 17.90.120-L and 17.90.120-M)

1. Not less than three (3) percent of the building area of every development shall be improved as civic space.

** ***No civic space is identified. Building One contains 32,600 sq. ft. requiring 978 sq. ft. of civic space and Building Two contains 8,300 requiring 249 sq. ft. for a total of 1,227 sq. ft. required. Staff believes a reasonable interpretation of this section would require the provision of civic space based on the size of the office rather than the entire building. The office size of 600 requires 18 square feet based on this section except as modified below.***

2. All civic spaces shall have dimensions of not less than eight (8) feet across and have a surface area of not less than 64 square feet. No civic space is required if the size of this space results in an area of less than 64 square feet.

*** This section requires civic space to contain not less than 64 sq. ft. The remainder of this section contains additional requirements.***

H. Lighting

1. Streetscape lighting shall conform to Chapter 15.30 Dark Sky Ordinance.
2. Exterior lighting must be an integral part of the architectural design and must complement any ornamental street lighting and remain in context with the overall architectural character of the district. On-site light fixtures conforming to the Sandy Style are encouraged.
3. Lighting must be adequate for safety purposes. Walkways and parking lots should be illuminated at 1.5 – 2.0 foot candles.

*** Submittal of a lighting plan, lighting cut-sheets, and photometric analysis is required in compliance with Chapter 15.30.***

J. External Storage

*** Need to identify the location of garbage/recycling and the location of mechanical equipment and electrical panels. Narrative states that mechanical equipment will either be on the ground and screened or inside the buildings.***

CHAPTER 17.92 – LANDSCAPING AND SCREENING

17.92.20 MINIMUM IMPROVEMENTS - LANDSCAPING AND SCREENING

The minimum landscaping area of a site to be retained in landscaping shall be as follows:

ZONING DISTRICT OR USE	PERCENTAGE
I - 1 Industrial Park	20%

*** Submittal of a Landscape Plan is required.***

17.92.100 SCREENING OF SERVICE FACILITIES

Site-obscuring shrubbery or a berm, wall or fence shall be placed along a property line between residential and commercial and industrial zones and around unsightly areas such as trash and recycling areas, gas meters, ground level air conditioning units, disc antennas exceeding 36 inches in diameter and equipment storage or an industrial or commercial use with outside storage of equipment or materials.

*** Identify all of the above areas and provide an enclosure and screening.***

17.92.110 OUTDOOR STORAGE

All outdoor storage areas for commercial, industrial, public and semi-public uses are to be entirely screened by a sight obscuring fence, vegetative materials, or other alternative deemed appropriate by the Director.

*** Need to identify if outside storage is proposed on the subject site.***

CHAPTER 17.98 – PARKING, LOADING, AND ACCESS REQUIREMENTS

17.98.20 OFF-STREET PARKING REQUIREMENTS

A. Off Street Parking Requirements. Off street parking shall conform to the following standards:

8.

Commercial Uses	Number of Parking Spaces	Number of Bicycle Spaces
General, professional or banking offices and services	1 per 300 sq. ft., plus 1 per 2 employees	5% or 2 whichever is greater

*** Parking other than loading and unloading is primarily necessary at the proposed office. The 600 sq. ft. office requires 2 spaces plus 1 per 2 employees for a total of 3 spaces (assuming one or two employees). One ADA space is required. The proposal includes 5 parking spaces. The parking space to the east of the ADA access aisle appears to be short of the required 18 feet in length. If a vehicle is parked in the short space the southern parking space in the parking area closer to Champion Way may not be accessible. Bike parking is required. How many employees will be on the site during the largest shift?***

17.98.50 SETBACKS

A. Parking areas, which abut a residential zoning district, shall meet the setback of the most restrictive adjoining residential zoning district.

B. Required parking shall not be located in a required front or side yard setback area abutting a public street except in industrial districts. For single family and two-family dwellings, required off-street parking may be located in a driveway.

C. Parking areas shall be setback from a lot line adjoining a street the same distance as the required building setbacks. Regardless of other provisions, a minimum setback of 5 feet shall be provided along the property fronting on a public street. The setback area shall be landscaped as provided in this code.

** ***Parking is located to the side of the office building.***

17.98.60 DESIGN, SIZE AND ACCESS

All off-street parking facilities, vehicular maneuvering areas, driveways, loading facilities, accessways, and private streets shall conform to the standards set forth in this section.

** ***Parking is required to contain minimum dimensions of 9 feet by 18 feet. Four of the proposed parking spaces do not appear to meet the parking space dimension standards. Compact parking spaces can comprise no more than 35 percent of the total parking spaces.***

17.98.70 ON-SITE CIRCULATION

A. Groups of more than three (3) parking spaces shall be permanently striped.

B. Backing and Maneuvering. Except for a single family dwelling or two family dwelling, groups of more than 3 parking spaces shall be provided with adequate aisles or turnaround areas so that all vehicles enter the right-of-way (except for alleys) in a forward manner. Parking spaces shall not have backing or maneuvering movements for any of the parking spaces occurring across public sidewalks or within any public street, except as approved by the City Engineer. Evaluations of requests for exceptions shall consider constraints due to lot patterns and impacts to the safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

** ***It is unclear whether the proposed parking complies with this section.***

17.98.80 ACCESS TO ARTERIAL AND COLLECTOR STREETS

A. Location and design of all accesses to and/or from arterials and collectors (as designated in the Transportation System Plan) are subject to review and approval by the City Engineer. Where practical, access from a lower functional order street may be required. Accesses to arterials or collectors shall be located a minimum of 150 ft. from any other access or street intersection. Exceptions may be granted by the City Engineer. Evaluations of exceptions shall consider posted speed of the street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

** ***Champion Way is classified as a collector street. The distance between the existing access at the Arco to the new access on Champion Way appears to be less than 150 feet. This new access may also be less than 150 ft. from the access to Champion Collision. The City Engineer will need to review this design for internal access and driveway access to Champion Way.***

B. No development site shall be allowed more than one access point to any arterial or collector street (as designated in the Transportation System Plan) except as approved by the City Engineer. Evaluations of exceptions shall consider posted speed of street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

** ***The proposal includes use of the existing Arco access and a new access to serve as an exit only on Champion Way. The applicant is advised to determine if the existing access is adequate to serve the site.***

17.98.120 LANDSCAPING AND SCREENING

A. Screening of all parking areas containing 4 or more spaces and all parking areas in conjunction with an off-street loading facility shall be required in accordance with zoning district requirements and Chapter 17.98. Where not otherwise specified by district requirement, screening along a public right-of-way shall include a minimum 5-ft. depth of buffer plantings adjacent to the right-of-way.

** ***The area between Champion Way and the proposed parking area shall be screened.***

E. Parking area setbacks shall be landscaped with major trees, shrubs, and ground cover as specified in Chapter 17.92.

** ***Parking spaces adjacent to Champion Way shall be screened from view.***

F. Wheel stops, bumper guards, or other methods to protect landscaped areas shall be provided. No vehicle may project over a property line or a public right-of-way. Parking may project over an internal sidewalk, but a minimum clearance of 5 feet for safe pedestrian circulation is required.

***** Parking adjacent to five-foot-wide walkways shall be provided with bumper guards or widen sidewalk to seven feet. Parked vehicles can not impede walkway clearance.***

17.98.150 LIGHTING

Artificial lighting shall be provided in all required off-street parking areas. Lighting shall be directed into the site and shall be arranged to not produce direct glare on adjacent properties. Light elements shall be shielded and shall not be visible from abutting residential properties. Lighting shall be provided in all bicycle parking areas so that all facilities are thoroughly illuminated and visible from adjacent sidewalks or vehicle parking lots during all hours of use.

***** Submit a lighting plan, cut-sheets, and photometric analysis for proposed lighting.***

17.100.40 MINOR AND MAJOR PARTITIONS

Approval of a partition is required for a land division of 3 or fewer parcels in a calendar year. Partitions, which do not require creation or extension of a street for access, is classified as a Type I minor partition. Partitions, which require creation or extension of a street for access is classified as a Type II, major partition.

***** The applicant shall complete a request for a minor partition to divide the development site from the remainder of the property to the west.***

17.102 URBAN FORESTRY

***** Applicable for tree removal. The Development Code requires retention of 3 trees per acre (11-inches and greater) for property greater than 1 acre. An arborist will need to conduct a tree evaluation and a tree retention plan shall be submitted with the application. The existing property (prior to partitioning) shall be evaluated for tree retention.***

15.30 DARK SKY ORDINANCE

***** All exterior lighting shall be full cut-off and no more than 3,000 Kelvins. The area 10 feet beyond the property line shall receive no more than one quarter (0.25) of a foot-candle of light.***

REVIEW SUMMARY

Site

1. The submitted Site Plan is inadequate and requires more details. The submitted site plan is trying to accomplish being a site plan, utility plan, existing conditions plan, and grading plan. All of these plans will need to be separated from one another with the land use submittal.
2. Frontage improvements along east property boundary (Champion Way).
3. Proposed storage area should be partitioned from the remainder of the site.
4. Pedestrian connection from street to building entrance.
5. Location of the following: civic space, garbage/recycling area, outside storage, bike parking, wheel chair ramps, striped accessible routes to building entrance.
6. Access spacing on Champion Way.
7. ADA parking design and parking spaces at required dimensions.
8. Tree retention plan for entire property prior to partition.

Building Design

1. Compliance with building articulation requirements.
2. Identify location/screening for electrical panels and ground mounted equipment.
3. Calculation of window glass percent on “activated” elevation (30% required).
4. Review window design standards for upper and lower windows.

5. What is the proposal for the area south of the office space?

Application Process: Type II Design Review application. The application may also require several code deviations and/or variances which would make this a Type III Design Review.

Projected Processing Steps:

- Submittal Requirements Design Review: signed land use application form, fee, narrative, property owner list, detailed site plan, landscape plan, tree retention plan (including arborist evaluation), utility plan, building elevations, detail of any retaining wall, cut-sheets for exterior lights, photometric plan, stormwater analysis, and traffic letter (trip generation & access spacing). (See Submittal Requirements Handout)
- Submittal Requirements Partition: signed land use application form, fee, narrative, proposed partition plat.
- Staff review for completeness (30 days max.), if determined incomplete then the applicant submits additional information as required, staff then reviews for completeness again, if the application is deemed complete then the application processing begins.
- 60 day processing timeline projected for each application (partition and design review).

Exhibit F

PRE-APPLICATION CONFERENCE NOTES

Project Name: Highway 26 Storage
Pre-Application Conference Date: May 8, 2018
Applicant Name: Whitney Axis Design Group (Bill Whitney)
Owner's Name: Mark Benson
Staff: Mike Walker, Emily Meharg, James Cramer, Thomas Fisher, Kelly O'Neill Jr.

TRANSIT COMMENTS – "The proposed development is not in a location that will require site preparation for transit amenities."

SANDYNET COMMENTS – "Please coordinate with SandyNet General Manager for infrastructure requirements."

SANDYNET COMMENTS – See separate letter dated May 7, 2018 from ODOT.

PLANNING DEPARTMENT REVIEW
Applicable Code Chapters: 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.22 Notices; 17.48 I-1 Industrial Park Zoning District; 17.60 Flood and Slope Hazard Overlay District; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.84 Improvements with Development; 17.90 Design Standards; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access Requirements; 17.102 Urban Forestry; and Chapter 15.30 Dark Sky Ordinance.

Caveat: *This analysis includes a review of those code sections that may conflict with the proposed design as submitted. This review is not intended to be a comprehensive analysis of all applicable code sections.*

CODE EVALUATION:

Zoning District and Setbacks (Chapters 17.48 and 17.80):

- The proposal contains five buildings totaling about 60,222 sq. ft. A Conditional Use Permit is required as the use exceeds 60,000 square feet of gross floor area.
- The RV storage area does not adhere to the requirements in Section D of 17.90.120 stating that the frontage on a site shall be at least 50 percent building(s) and also does not adhere to Section A of 17.90.120 stating that parking shall be located to the rear or side of buildings. The RV storage area most likely also exceeds 15 percent of the site therefore requiring a conditional use permit. How would you propose screening for the storage area under the BPA Easement where heights are limited and when the BPA can remove vegetation at any time they so choose? Due to the RV storage area not adhering to the design code, the large size of the storage area, screening not being a strong possibility and the location at the gateway to the community the Planning & Building Director will want the decision on this use to be a Planning Commission decision. The intent of the code is not to have storage of vehicles along right-of-way.
- Residential uses are not permitted in this zoning district; however, an onsite manager could potentially be considered an accessory use to the primary use and might be permitted.
- The Champion Way frontage is considered the front property line. Champion Way is classified as a collector street in the adopted Transportation System Plan requiring a 20-foot front setback.

Improvements with Development (Chapter 17.84):

- The Champion Way frontage proposal contains a curb, but no sidewalk or planter strip. These improvements are required. The proposal does not appear to contain a direct pedestrian connection between the future sidewalk on Champion Way and the building entrance. The pedestrian connection needs to be shown on the site plan.
- The Highway 26 frontage includes curb, sidewalk, and planter strip. Street trees would be required 30 feet on center. Would need to work with BPA to determine appropriate species.

- Industrial Way frontage requires full improvements (sidewalk, curb, planter strip, street trees).
- Traffic Letter is required. Additional analysis will be needed for access to the site and adhere to Section 17.84.50 of the Development Code.
- Stacking plan for driveways, this shall include stacking distance for large delivery vehicles and including gates/fence locations.
- Submittal of a utility plan will be necessary for sanitary sewer, water, SandyNet conduit, etc.
- As currently designed, Champion Way is considered the front of the site. Parking is located to the side of the building.
- A pedestrian connection between the upper and lower building levels of Building 1 would appear to be practicable and desirable.

Design Standards (Chapter 17.90):

- The buildings shall meet the articulation standards in Section B of 17.90.120 for all elevations visible from an abutting public street or pedestrian way.
- Strong base materials such as natural stone, split-faced rusticated concrete block, brick, or concrete form liner replicating these materials is required for the base at least 36 inches in height on building side visible from an abutting public street.
- Siding materials shall be wood, composite-wood, stone, brick, split-faced or rusticated block, concrete linear form, or a combination of these materials. Metal is only to be used as an accent.
- Roof pitch with secondary roof forms or in the alternative flat roofs will need to adhere to the standards in Section C of 17.90.120.
- Primary building entrances shall include covered entries at least 5 feet in depth.
- The design should contain elements similar to the Arco project including heavy timber trusses with heavy metal brackets, split face concrete block, Hardie siding, and some wood or composite shingles and trim.
- Submit proposed colors in compliance with the SandyStyle color palette with the application.
- The north elevation of Building One, the east elevations of Buildings One and Two, and the south elevations of the other three buildings include minimal windows. The narrative states that windows will be limited due to the need for security. The applicant will need to submit for a variance addressing the window coverage requirement. Window coverage on all building elevations facing adjacent public right-of-way shall adhere to Section E of Section 17.90.120.
- The site contains 60,222 square feet of gross floor area requiring a total of 1,807 square feet of civic space. The civic space is identified as 200 square feet, which seems reasonable for the use, but would require a variance.
- The location of the garbage/recycling seems to work, but will need to be verified with Hoodview Disposal.
- The land use application shall specify the location of exterior electrical panels and ground mounted equipment.

Landscaping and Parking/Access (Chapters 17.92 and 17.98):

- Submittal of a Landscape Plan is required.
- Parking other than loading and unloading is primarily necessary at the proposed office. The 600 sq. ft. office requires 2 spaces plus 1 per 2 employees for a total of 3 spaces (assuming one or two employees). One ADA space is required. The proposal includes 7 parking spaces. Bike parking is required. How many employees will be on the site during the largest shift?
- Parking spaces are required to contain minimum dimensions of 9 feet by 18 feet. Compact parking spaces can comprise no more than 35 percent of the total parking spaces.
- Champion Way is classified as a collector street. The distance between the existing access at the Arco to the new access on Champion Way appears to be less than 150 feet. The City Engineer will need to review this design for internal access and driveway access to Champion Way, and if the distance between driveways remains greater than 150 that will need to be evaluated by the City Engineer with robust analysis provided by the applicant. Driveway curb cuts shall not exceed 24 feet in width.
- Parking spaces adjacent to Champion Way shall be screened from view.
- Landscape planters (minimum 5 feet by 17 feet) required at each end of every parking bay. Planter shall contain one structural tree and groundcover.

- Parking adjacent to five-foot-wide walkways shall be provided with bumper guards or widened sidewalks at seven feet in width. Parked vehicles can not impede walkway clearance.

Tree Removal (Chapter 17.102):

- The Development Code requires retention of 3 trees per acre (11-inches DBH and greater) for property greater than 1 acre. An arborist will need to conduct a tree evaluation of all trees 8-inches DBH and greater and a tree retention plan shall be submitted with the application. The tree conditions shall be rated as good, fair, poor, and dead/dying.

Lighting Standards (Chapter 15.30):

- Submittal of a lighting plan, lighting cut-sheets, and photometric analysis is required in compliance with Chapter 15.30. All exterior lighting shall be full cut-off and no more than 3,000 Kelvins. The area 10 feet beyond the property line shall receive no more than one quarter (0.25) of a foot-candle of light.

Other

- Need to submit details on proposed retaining walls (material and height).
- What is the stormwater management plan?
- Possible wetland delineation study required.
- Boundary revision would need to be completed with Tractor Supply MP.

Primary Issues

1. The submitted Site Plan is inadequate and requires more details. The submitted site plan is trying to accomplish being a site plan, utility plan, existing conditions plan, and grading plan. All of these plans will need to be separated from one another with the land use submittal.
2. The elevations need more detail and shall comply with code requirements. In the alternative the applicant may ask for variances (quantitative provisions) or deviations (qualitative provisions) if the proposal includes requests to waive development standards.
3. Need to most likely submit 3-D modeling for buildings to determine the extent of the building facades that will be visible from a public street.
4. Need to finish the partition process with Hix Snedeker prior to moving forward with this application or this application can be conditioned that the partition needs to be complete prior to moving forward with the mini-storage development.

Application Process: Type III Conditional Use Permit, Design Review, FSH, and Tree applications.

Projected Processing Steps:

- Submittal Requirements CUP/Design Review: signed land use application form, supplemental CUP/DR application, fees (*just increased May 8, 2018*), narrative, property owner list and two sets of labels, detailed site plan, stacking distance plan for delivery vehicles, landscape plan, tree retention plan (including arborist evaluation), utility plan, building elevations, detail of any retaining wall, cut-sheets for exterior lights, photometric plan, stormwater analysis, and traffic letter (trip generation & access spacing). (See Submittal Requirements Handout)
- Staff review for completeness (30 days max.), if determined incomplete then the applicant submits additional information as required, staff then reviews for completeness again, if the application is deemed complete then the application processing begins.
- 60 to 90 day processing timeline projected for each application.

EXHIBIT G

File No. 18-027 INT:

JUL 10 2018

CITY OF SANDY

We are Extremely Concerned about the height and spacing of the proposed Buildings Blocking the visibility of the Cinema from Hwy 26.

So are the owners of the adjacent Buildings and Businesses in the adjacent area of the the Center

Elie Kassab, owner of Sandy Cinema (503) 781-1699 cell
Your Name Phone Number (360) 993-0010 office

16605 Champion Way, Sandy, OR 97055
Address

APPLICABLE CRITERIA: Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.14 Request for Interpretation; 17.18 Processing Applications; 17.22 Notices; 17.48 Industrial Park, I-1; 17.66 Adjustments and Variances; 17.90 Design Review.