Oregon
Kate Brown, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

April 20, 2020

Gil Gramson
15 NW 17th Place
Warrenton, OR 97146

Re: WD # 2020-0039 **Approved**
Delineation Report for SW Juniper Ave Residential Development
Clatsop County; T8N R10W S21CB TL1500 (Portion)
Warrenton Local Wetlands Inventory, Wetland T-22

Dear Mr. Gramson:

The Department of State Lands has reviewed the wetland delineation report prepared by Pacific Habitat Services for the site referenced above. Please note that the study area includes only a portion of the tax lot described above (see the attached map). Based upon the information presented in the report, and additional information submitted upon request, we concur with the wetland boundaries as mapped in Figure 6 of the report. Please replace all copies of the preliminary wetland map with this final Department-approved map.

Within the study area, one wetland (Wetland A, totaling approximately 0.56 acres) is identified. It is subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in wetlands or below the ordinary high-water line (OHWL) of the waterway (or the 2-year recurrence interval flood elevation if OHWL cannot be determined).

This concurrence is for purposes of the state Removal-Fill Law only. We recommend that you attach a copy of this concurrence letter to any subsequent state permit application to speed application review. Federal or local permit requirements may apply as well. The U.S. Army Corps of Engineers will determine jurisdiction under the Clean Water Act, which may require submittal of a complete Wetland Delineation Report.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. If you have any questions, please contact the Jurisdiction Coordinator for Clatsop County, Daniel Evans, PWS, at (503) 986-5271.

Sincerely,

Peter Ryan, PWS
Aquatic Resource Specialist

Enclosures

ec: Joe Thompson, PWS, Pacific Habitat Services
Warrenton Planning Department (Maps enclosed for updating LWI)
Brad Johnson, Corps of Engineers
Dan Cary, SPWS, DSL
Oregon Coastal Management Program (Coastal Zone, coastpermits@state.or.us)

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

This form must be included with any wetland delineation report submitted to the Department of State Lands for review and approval. A wetland delineation report submittal is not "complete" unless the fully completed and signed report cover form and the required fee are submitted. Attach this form to the front of an unbound report or include a hard copy of the completed form with a CD/DVD that includes a single PDF file of the report cover form and report (minimum 300 dpi resolution) and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279.** A single PDF attachment of the completed cover from and report may be e-mailed to **Wetland_Delineation@dsl.state.or.us**. For submittal of PDF files larger than 10 MB, e-mail instructions on how to access the file from your ftp or other file sharing website. Fees can be paid by check or credit card. Make the check payable to the Oregon Department of State Lands. To pay the fee by credit card, call 503-986-5200.

☐ Applicant ☒ Owner Name, Firm and Address: Gil Gramson 15 NW 17th Place Warrenton, OR 97146	Business phone # 503-861-1133 Mobile phone # (optional) 503-440-6818 E-mail: gilandanngramson@charter.net
☐ Authorized Legal Agent, Name and Address:	Business phone # Mobile phone # E-mail:

RECEIVED
JAN 17 2020
RECEIVED $ M2
DEPARTMENT OF STATE LANDS

M1-$112.00 #3672
M2-$454.00 #10131

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: **Gil Gramson** Signature: Gil Gramson

Date: Special instructions regarding site access: **None**

Project and Site Information (using decimal degree format for lat/long.,enter centroid of site or start & end points of linear project)

Project Name: SW Juniper Ave Residential Development	Latitude: 46.1605, - Longitude: 123.9390
Proposed Use: Residential Development	Tax Map #8.10.21CB
Project Street Address (or other descriptive location): SW Juniper Ave	Township 8N Range 10W Section 21CB QQ Tax Lot(s) **1500 (portion)**
City: Warrenton County: Clatsop	Waterway: None River Mile: N/A NWI Quad(s): Warrenton

Wetland Delineation Information

Wetland Consultant Name, Firm and Address: **Pacific Habitat Services, Inc.** **Attn: Joe Thompson, PWS** **9450 Commerce Circle, Suite 180, Wilsonville, OR 97070**	Phone # **503-570-0800** Mobile phone # E-mail: jt@pacifichabitat.com

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: Joe Thompson Date: 12/17/2019

Primary Contact for report review and site access is ☒ Consultant ☐ Applicant/Owner ☐ Authorized Agent

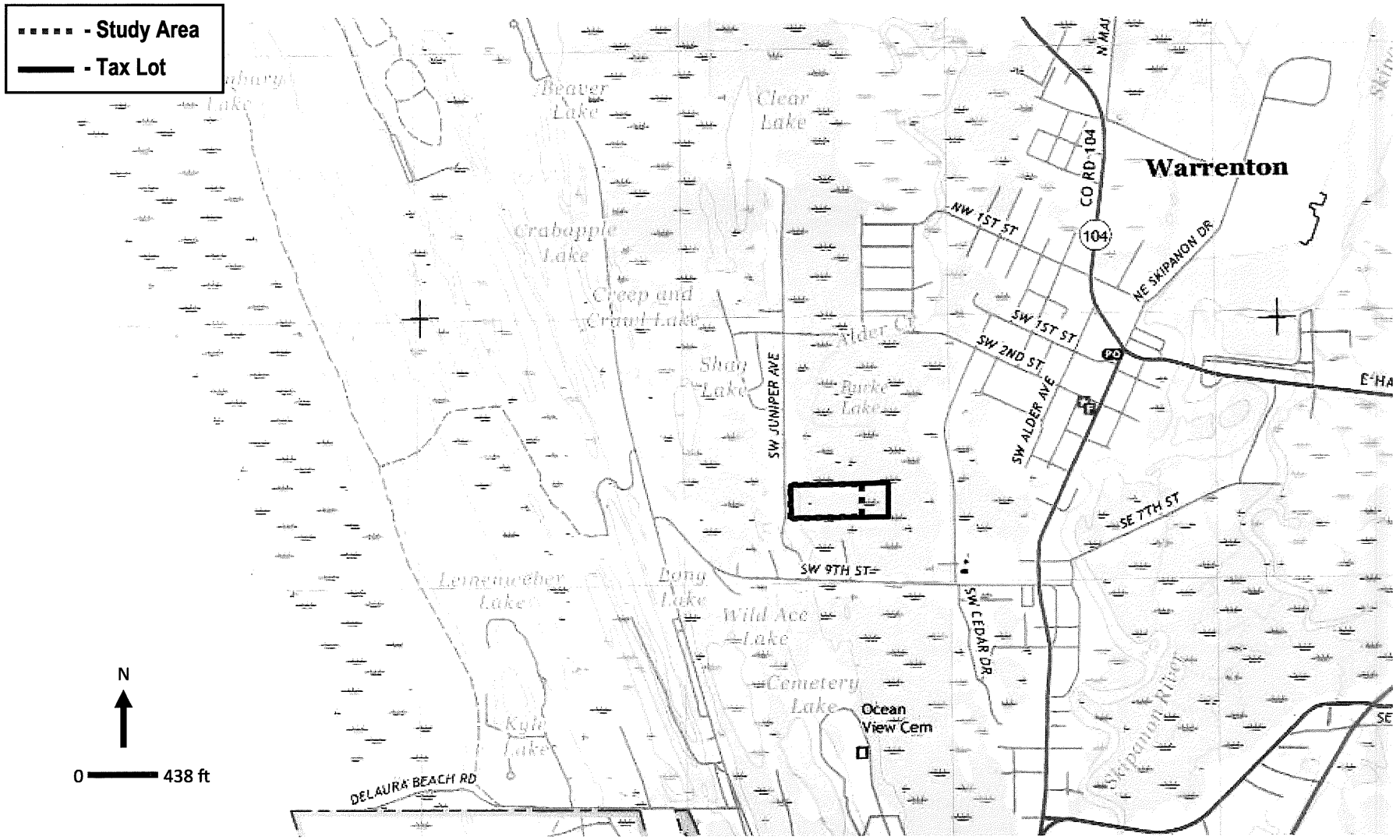
Wetland/Waters Present? ☒ Yes ☐ No Study Area size: 1.87 Acres Total Wetland Acreage: 0.56 Acres

Check Box Below if Applicable:	**Fees:**
☐ R-F permit application submitted	☒ Fee payment submitted **$ 454**
☐ Mitigation bank site	☐ Fee ($100) for resubmittal of rejected report
☐ Wetland restoration/enhancement project (not mitigation)	☐ No fee for request for reissuance of an expired report
☐ Industrial Land Certification Program Site	
☐ Reissuance of a recently expired delineation	
Previous DSL # Expiration date ____	

Other Information:	Y	N	
Has previous delineation/application been made on parcel?	☐	☐	If known, previous DSL #
Does LWI, if any, show wetland or waters on parcel?	☒	☐	T-22

For Office Use Only

DSL Reviewer: DE	Fee Paid Date: 1/17/20	DSL WD # 2020-0039
Date Delineation Received: 12/30/19	DSL Project # 79331	DSL Site #
Scanned: ☐ Final Scan: ☐	DSL WN #	DSL App. #



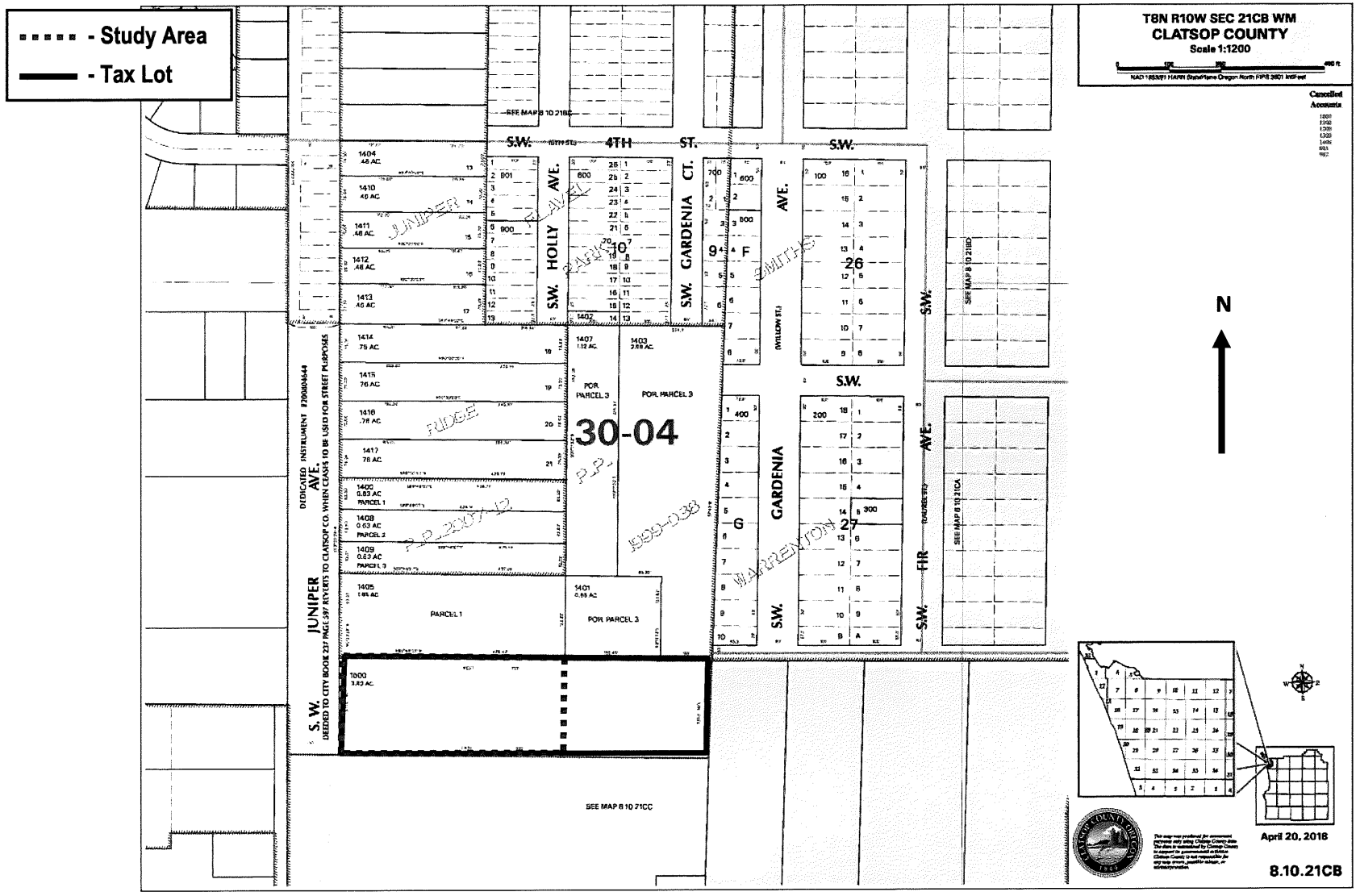
#6778
12/2/19

PHS

Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180
Wilsonville, OR 97070

General Location and Topography
SW Juniper Avenue - Warrenton, Oregon
United States Geological Survey (USGS) Warrenton, Oregon 7.5 quadrangle, 2017
(viewer.nationalmap.gov/basic)

FIGURE
1

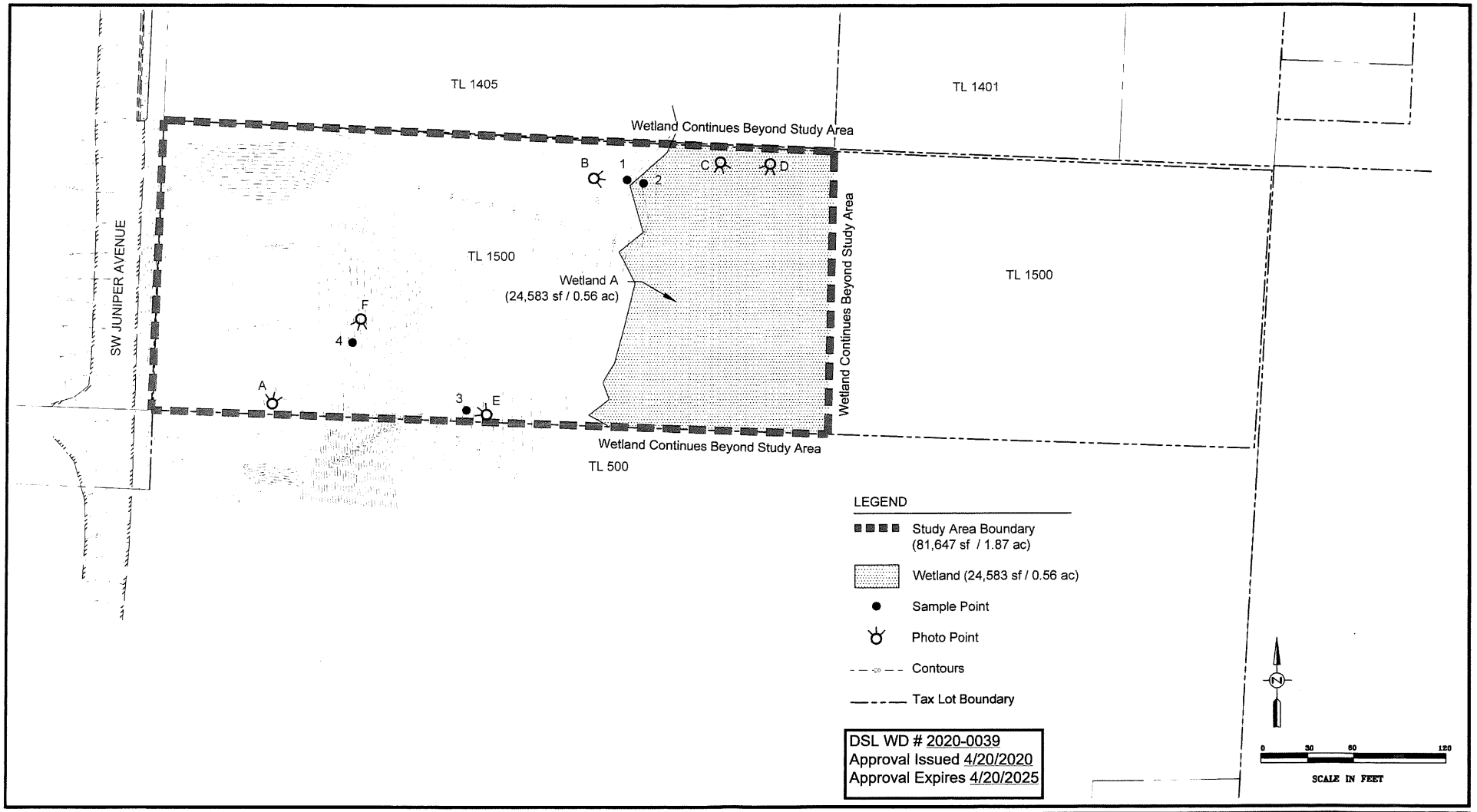


#6778
12/2/19

Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180
Wilsonville, OR 97070

Tax Lot Map
SW Juniper Avenue - Warrenton, Oregon
The Oregon Map (ormap.net)

FIGURE
2



PHS
Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180 Wilsonville, Oregon 97070
Phone (503) 570-0800 Fax (503) 570-0855

Survey provided by
CKI Land Surveying
Survey and Sample point accuracy is sub-centimeter. Study area boundary eastern edge was digitized by PHS using survey results and is precise to +/- 5 feet.

Wetland Delineation
SW Juniper Avenue - Warrenton, Oregon

FIGURE
6

12-17-2019

C:\Users\Lisa\Desktop\WorkFromHome\6778\AutoCAD\Plot Dwg\Fig6 WetDel.dwg, 12/27/2019 10:26:13 AM, AutoCAD PDF (High Quality Print).pc3

STORMWATER REPORT

Juniper Avenue – Taxlot 81021CB01500
Preliminary Subdivision Plan
Warrenton, OR 97146

Prepared July 29, 2020

Prepared By:

FDG
Firwood Design Group, LLC
SURVEYING • ENGINEERING • PLANNING

359 E. Historic Columbia River Highway
Troutdale, OR 97060
503.668.3737- fax 503.668.3788

TABLE OF CONTENTS

I. OBJECTIVE

The objective is to address stormwater system capacity for the Juniper Avenue Subdivision, as well as addressing how fill will impact the existing storm sewer outfall and stormwater storage in the existing wetlands.

II. STORMWATER STORAGE IN EXISTING WETLANDS & FLOODPLAIN

The proposed fill slope will not encroach on the existing wetlands and so will not impact stormwater storage within the wetlands. There are no mapped FEMA floodplains in the project vicinity (FIRMette included in the appendix for reference). The entire project site is mapped as Zone X, area of minimal flood hazard. The mapped 100-year floodplain nearest to the site is roughly 1/3 of a mile to the northeast, mapped at an elevation of 8 feet (FIRMette included in the appendix for reference). Fill is planned to be placed down to an elevation of approximately 17 feet, well above the nearest 100-year floodplain elevation. Therefore, stormwater storage within wetland and floodplain limits will not be negatively impacted.

III. EXISTING STORMWATER OUTFALL & CONNECTION

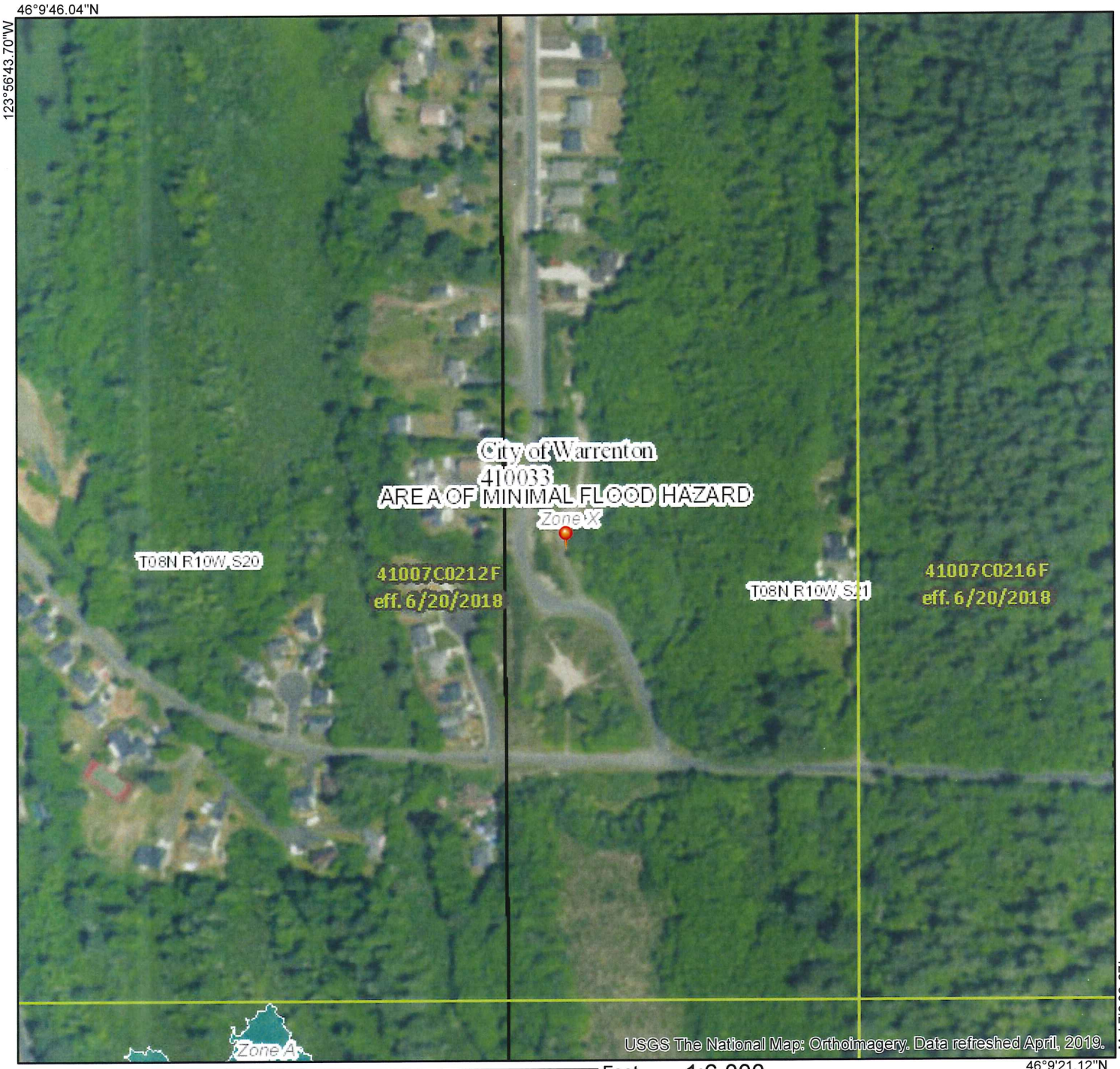
The existing stormwater outfall line will be protected by a 10' stormwater easement along the north property line dedicated to the City of Warrenton. No grading within the easement is proposed, so heavy equipment will not damage the pipe. The toe of the fill slope will be protected from erosion by the installation of riprap along the toe of the fill slope. The outfall itself will be protected by a rock energy dissipator. The riprap and the dissipator will be installed with the previously approved grading plan for this property, prepared by Firwood Design Group dated June 30, 2020, and in place before construction of final improvements for the proposed subdivision.

The existing storm sewer outfall line is 12" corrugated plastic pipe, assumed to be ADS N-12, constructed at a slope of approximately 4.6%. Maximum capacity of the line is calculated at 8.9 cfs using Manning's equation with the HydraFlow Express tool. To demonstrate that the storm line is capable of conveying runoff from all existing, proposed, and possible future tributary impervious areas, a maximum tributary impervious area was calculated using HydroCAD. As shown in the HydroCAD model, it takes approximately 6.3 acres of impervious surface (with a minimum time of concentration) to generate a peak runoff of 8.9 cfs in a 100-year storm event. The 100-year storm event of of 6.0" over 24 hours was modeled using the Santa Barbara Urban Hydrograph (SBUH) with a Type 1A rainfall distribution. HydraFlow Express and HydroCAD outputs are included in the appendix for reference.

The high point of Juniper Avenue is approximately 750' upstream of the existing Juniper Avenue catch basins; assuming a paved width of 60' at full build-out, there could be up to 1.0 acres of tributary impervious roadway. Coupled with a proposed project site of 1.1 acres (much of which is not impervious), approximately 2/3 of total existing outfall pipe capacity is still available. Therefore, the existing outfall has sufficient capacity.

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone I*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represen an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/9/2020 at 11:31:22 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

Legend

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Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Jul 28 2020

12in Outfall Capacity

Circular

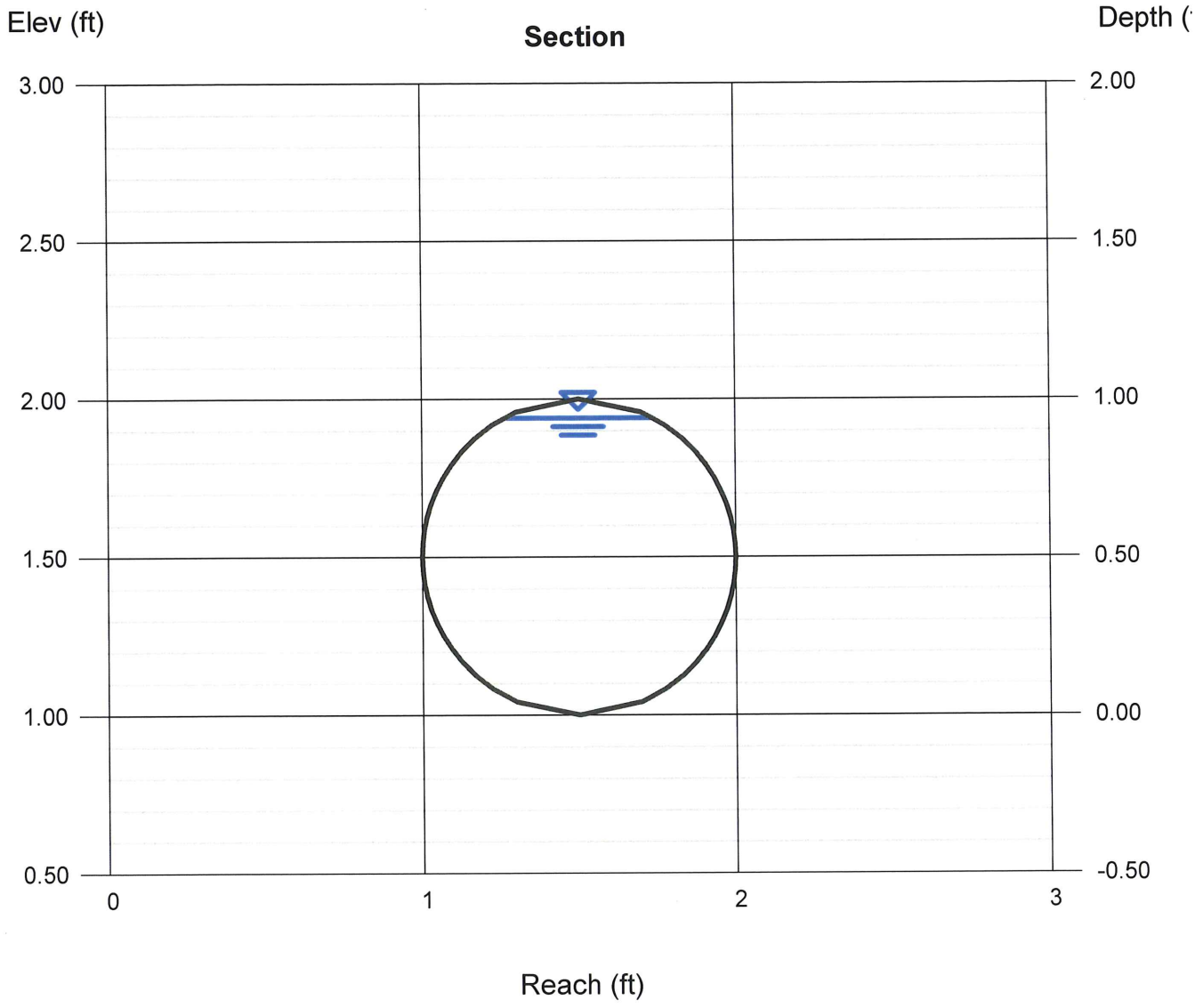
Diameter (ft)	= 1.00
Invert Elev (ft)	= 1.00
Slope (%)	= 4.60
N-Value	= 0.012

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 0.94

Highlighted

Depth (ft)	= 0.94
Q (cfs)	= 8.901
Area (sqft)	= 0.77
Velocity (ft/s)	= 11.61
Wetted Perim (ft)	= 2.65
Crit Depth, Yc (ft)	= 0.99
Top Width (ft)	= 0.47
EGL (ft)	= 3.04



Tributary Impervious

Subcat Reach Pond Link

Routing Diagram for Juniper Ave - Land Use
Prepared by Blake Davis @ FDG, Printed 7/28/2020

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary Impervious Runoff Area=6.300 ac 100.00% Impervious Runoff Depth>5.75"
Tc=6.0 min CN=0/98 Runoff=8.88 cfs 3.019 af

Total Runoff Area = 6.300 ac Runoff Volume = 3.019 af Average Runoff Depth = 5.75"
0.00% Pervious = 0.000 ac 100.00% Impervious = 6.300 ac

Summary for Subcatchment 1S: Tributary Impervious

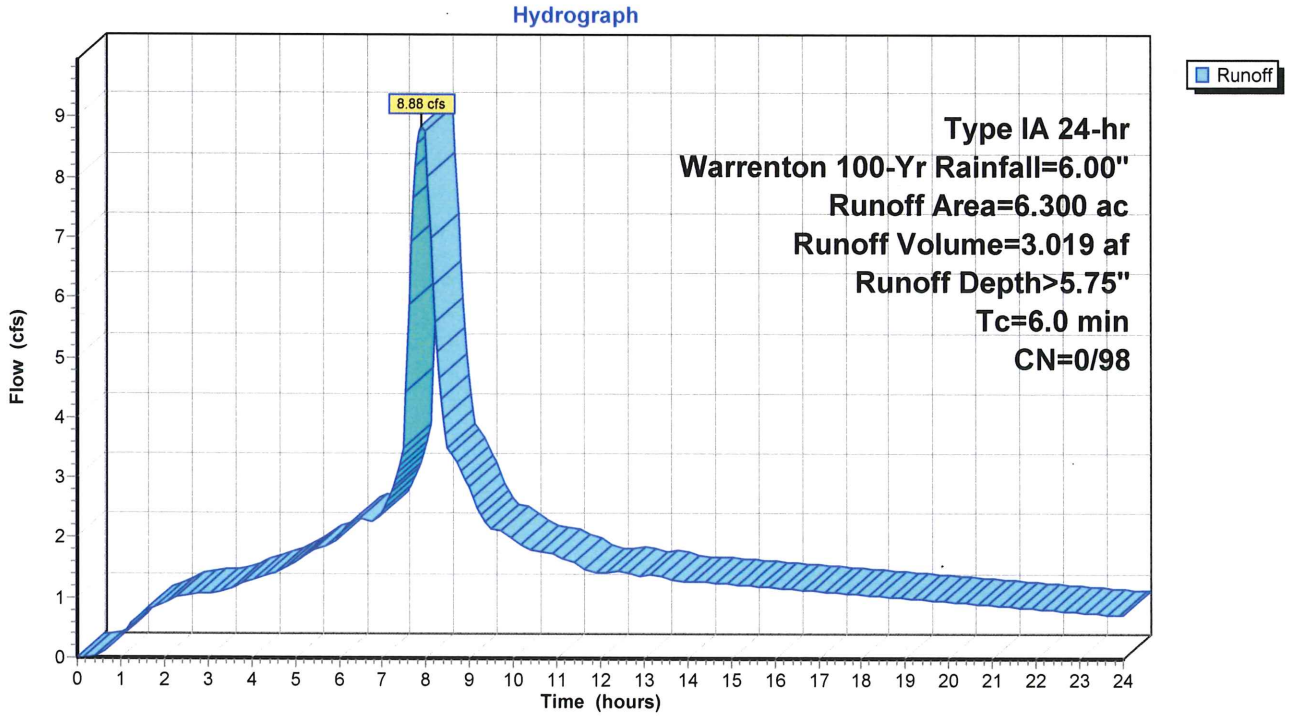
Runoff = 8.88 cfs @ 7.91 hrs, Volume= 3.019 af, Depth> 5.75"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr Warrenton 100-Yr Rainfall=6.00"

Area (ac)	CN	Description
6.300	98	Paved parking, HSG B
6.300	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Standard Min Tc**
5.0	0	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1S: Tributary Impervious



Geotechnical Engineering Report

Juniper Development
Warrenton, Oregon

for
Sandworks, Inc.

March 27, 2020

GeoEngineers
Earth Science + Technology

Geotechnical Engineering Report

Juniper Development
Warrenton, Oregon

for
Sandworks, Inc.

March 27, 2020

GeoEngineers

4000 Kruse Way Place
Building 3, Suite 200
Lake Oswego, Oregon 97035
503.624.9274

Geotechnical Engineering Report

Juniper Development
Warrenton, Oregon

File No. 23773-003-00

March 27, 2020

Prepared for:

Sandworks, Inc.
15 NW 17th Place
Warrenton, Oregon 97146

Attention: Gil Gramson

Prepared by:

GeoEngineers, Inc.
4000 Kruse Way Place
Building 3, Suite 200
Lake Oswego, Oregon 97035
503.624.9274

Tygh N. Gianella, PE
Geotechnical Engineer

Greg A. Landau, PE, GE
Digitally signed by Greg A. Landau, PE, GE
Date: 2020.03.27 17:38:54 -07'00'

REGISTERED PROFESSIONAL ENGINEER
77420PE
OREGON
NOVEMBER 08, 2019
GREG ALAN LANDAU

Greg A. Landau, PE, GE
Associate Geotechnical Engineer

EXPIRES: 12/31/2020

TNG:GAL:tt

GeoEngineers

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APPENDICES

1.0 INTRODUCTION

This geotechnical report summarizes our geotechnical engineering services for the proposed Juniper development located east of SW Juniper Avenue in Warrenton, Oregon. A concept layout and preliminary grading plan for the development, titled Juniper Avenue Subdivision, dated December 3, 2019, was prepared and provided to us by the project civil engineer, Firwood Design Group, LLC (Firwood). The preliminary concept plan indicates the project will consist of single-family residential buildings, associated stormwater facilities and associated roadway and parking areas. Based on the team meeting held at GeoEngineers' office with Firwood and Sandworks, Inc., the concept layout will be changed based on zoning requirements, final lot width and recommendations included in this geotechnical report. It is our understanding that the lot width may be reduced from 231 feet as shown on the preliminary plans to approximately 187 feet. The general location of the site is shown in Figure 1, Vicinity Map.

Our recommendations are based on site development that includes typical light wood-frame structural loads. We have assumed that maximum column and wall loads will be on the order of 10 kips and up to 2 kips per lineal foot (klf) respectively, and that floor loads for slabs on grade will be 75 pounds per square foot (psf) or less. Our recommendations for retaining structures assume that on-site retaining walls will be less than 8 feet in height. On-site cuts will be up to 10 feet along the western portions of the site and fills will be up to 20 feet in the eastern portions. This geotechnical report presents on-site explorations and geotechnical design recommendations for general site development of the overall project, and not for specific, individual residential lots or layouts.

2.0 SCOPE OF SERVICES

The purpose of our services was to evaluate soil and groundwater conditions as a basis for developing geotechnical engineering design and construction recommendations for general site development. Our report should not be used for individual residential lot development. Our specific scope of services is summarized in our proposal dated December 4, 2019 and authorized on January 5, 2020, and included the following:

1. Reviewed selected information regarding subsurface soil and groundwater at the site.
2. Coordinated and managed the field explorations, including public utility notification and scheduling of subcontractors and GeoEngineers' field staff.
3. Explored subsurface soil and groundwater conditions at the site by conducting 10 test pit explorations, extended to approximate depths between 10 to 12½ feet below ground surface (bgs).
4. Obtained samples at representative intervals from the explorations, observed groundwater conditions and maintained detailed logs in general accordance with ASTM International (ASTM) Standard Practices Test Method D 2488.
5. Performed laboratory tests on selected soil samples obtained from the explorations to evaluate pertinent engineering characteristics.
6. Provided a geotechnical evaluation of the site and design recommendations in this geotechnical report.

3.0 SITE CONDITIONS

3.1. Site Geology

The geologic mapping of Schlicker et al. (1972) shows the site located near the contact between two topographic and geologic regions. The higher, western portions of the site are shown within Quaternary stabilized dune sand deposits. This material (lumped in with beach deposits as "sand") is described as "Unconsolidated sand...form(ing) a smooth arcuate coastline and inland series of ridges parallel to the beach...consist(ing) of medium- to fine-grained quartzo-feldspathic sand." (Schlicker et al. 1972)

The lower-lying, eastern portions of the site are located within the western margins of a feature identified by Schlicker et al. (1972) as "Burke Lake" but which is shown on the geologic map not as open water but as a swamp or bog in the trough between the western dune ridge supporting SW Juniper Avenue and the high ground around the Warrenton town center to the east. This area fits the description of the source of material identified as "peat" in Schlicker et al. (1972) and described therein as "Peat and organic soil (which) form thick deposits...inland of the dunes north of Neskowin...in swamps (and) lowlands...where the water table remains at or near the ground surface for large parts of the year."

Although not shown on the published mapping, our observations and field investigation suggests that the contact between these materials is located near the east-center of the site and is complex both horizontally and vertically. Our explorations also found that the bulk of the site is mantled with an unmapped but highly variable veneer of artificial fill soils.

3.2. Surface Conditions

The proposed development area (hereafter "the site") consists of an approximately 1.5-acre portion at the west end of a 4.6-acre parcel that extends east from SW Juniper Avenue. The site is bordered by SW Juniper Avenue to the west, private parcels to the north and east, and a City of Warrenton property to the south. The eastern 3 acres of the parcel are within a delineated wetland.

The site is undeveloped but has largely been cleared of tree cover along the higher, western portion that extends roughly 100 to 150 feet east from Juniper Avenue. In this area stockpiles of sand, approximately 3 to 5 feet high, cover the surface of the northwestern portions of the site, and a large debris-fill pile is located immediately south of the southwestern property line. A gravel construction entrance has been built into the southwest corner of the site to allow access from Juniper Avenue. Besides the stockpile areas and the crushed aggregate entrance, the ground is level to gently sloping and covered with a mixture of rough field grass and scotch broom. Elevations across this portion of the site range from approximately 53 to 57 feet above Mean Sea Level (MSL).

Near the center of the site an approximately 20- to 30-foot-high slope grades down from the high, western plateau to the lower-lying eastern portions of the site. Typical gradients across the bulk of the slope range from as gentle as 3H:1V (horizontal to vertical) to 2H:1V, and the slope face ranges from planar to gently convex. A small portion near the north end of the slope is steeper (roughly 1½H:1V) and is slightly concave. The slope itself is thickly wooded over a dense understory of swordfern and salal.

From the base of the high slope to the wetland boundary that marks the eastern limit of development the remainder of the site slopes relatively gently down to the east. This area is wooded, with an open canopy of large conifers over a thick northwest understory including devil's club, swordfern, and salal.

3.3. Subsurface Conditions - General

We completed field explorations at the site on February 18, 2020. Our explorations included 10 test pit excavations (TP-1 through TP-10) to depths between 10 to 12½ feet bgs at the approximate locations shown in Figure 2. Appendix A summarizes our exploration methods and presents our exploration logs. Laboratory test results are provided in the exploration logs and described in Appendix A.

The subsurface conditions vary laterally between the western and eastern areas of the site but are also highly variable both laterally and vertically within those areas. Test pits TP-1 to TP-5 were performed within the eastern site area and TP-6 to TP-10 were performed within the western site area. Subsurface conditions encountered within the two areas are described in detail in the sections below.

3.4. Subsurface Conditions - Western Site Area

The western portions of the site are mantled by a highly variable thickness of fill and underlain by dune sand. Our investigation suggests that the conditions underlying the central slope are likely similar to the western portion of the site.

3.4.1. Artificial Fill

Within the western portion of the site much of the ground surface is mantled with very loose to loose, poorly graded, fine- to medium-grained sand and silty sand fill; only the northernmost strip of the western highland appears to be free of this fill material. As encountered in TP-7 though TP-10, the fill includes a scattering of debris ranging from organics and wood fragments to large concrete blocks up to 3 to 4 feet in dimension. The thickness of the fill is highly variable, ranging from 4 feet of sand encountered in TP-7 and TP-9 to as much as 9 feet in TP-8. Eleven feet of fill was encountered in TP-10, but the uppermost approximately 6 feet of fill was contained in an above-ground stockpile located near the south edge of the site. The approximate fill thickness at each test pit location is included on the Site Plan, Figure 2.

3.4.2. Dune Sand

At the ground surface at TP-6, and below the fills in TP-7 though TP-10, we encountered a very loose to loose, fine- to medium-grained poorly graded sand we interpret as the native stabilized dune sand deposits. This material was typically free of debris and extended to the maximum depths explored along the western portions of the site.

3.5. Subsurface Conditions – Eastern Site Area

The low-lying area east of the base of the central slope is also mantled by man-made fills, but below the fills the native soils are a complex of materials that include native organic peat, buried organic topsoil, and dune sand.

3.5.1. Artificial Fill

Fill was encountered at the ground surface in all five test pits excavated in the eastern site area. Fill thickness ranged from as little as 1½ feet of organic-rich fill in TP-2 to 5½ feet of mixed silt, sand, clay, and organics encountered in TP-3. This material was typically more organic-rich than the fill soils encountered in the western site area, ranging from very loose to loose clayey sand and very soft to soft sandy clay with organic matter to very soft organic clay with sand that included woody debris and peat. We encountered little man-made debris in the eastern site area fill; the exception was a fragment of clay pipe found in TP-3.

3.5.2. Dune Sand

Underlying the fills in TP-1 through TP-4, we encountered the very loose to loose, fine- to medium-grained sand discussed above as the native dune sand deposit. In the eastern area, this material contained more fine particles than those encountered in the western site area, and in TP-1 and TP-2 included a layer of very soft to soft and very loose organic-rich soils we interpret as a buried soil formed in the dune sands. In TP-1, TP-2, and TP-3, the dune sands were encountered below the fills to the maximum depth explored. There was no sand observed in TP-5.

In TP-4, sand was encountered below the fill at 3 feet bgs, but we penetrated the full 5½-foot thickness of the deposit and encountered peat at 8½ feet bgs. Based on our experience at other Oregon coastal sites we believe this to be a portion of the eastern slope of the dune that was blown over old to ancient native peat swamp deposits prior to modern stabilization of the dune. Other areas of buried peat deposits may also be present along other parts of the base of the central slope.

3.5.3. Peat

As noted above, much of the fill soils encountered on the east site area contained organic matter. Highly organic soils – ranging from very soft to soft organic clay and silt to very loose to loose clayey organic sand – that appeared to be native peats of Burke Lake were also encountered in several locations, including (as discussed above) below the dune sand at 8½ feet bgs in TP-4, and below sandy clay organic fill at 3½ feet bgs in TP-5. These deposits extended to the maximum depths explored (10 to 12 feet bgs) in both test pits. A large (1-foot diameter or larger) buried log was encountered at 9 feet bgs in TP-5 and the excavator was unable to dig below 10 feet bgs. The approximate combined fill and organic thickness at each test pit location is included on the Site Plan, Figure 2. See exploration logs in Appendix A for more detailed information about the soils encountered in the test pit explorations.

3.6. Groundwater

Groundwater was encountered in the three easternmost test pits; at approximately 6 feet bgs in TP-2, 7 feet bgs in TP-1, and 12 feet bgs in TP-3. Soil color suggests that permanent groundwater is below the base of excavation of the remaining test pits, but groundwater conditions at the site are expected to vary seasonally due to rainfall events and other factors not observed in our explorations.

4.0 CONCLUSIONS

Based on our explorations, testing and analyses, it is our opinion that the site is suitable for development from a geotechnical engineering standpoint provided the recommendations in this report are included in design and construction. We offer the following conclusions regarding geotechnical design at the site.

- Subsurface conditions are highly variable and can generally be divided between the western and eastern halves of the site. The western half of the site is primarily very loose to loose sand consisting of both fill sand with some debris up to 9 feet thick and native dune sand. The eastern half of the site includes very loose to loose fill sand similar to that encountered on the western half of the site but with more silt, clay, and organics and a significant thickness of highly organic material, including a buried log.

- Groundwater was encountered in the three easternmost test pits (TP-1 to TP-3); at approximately 6 to 12 feet bgs.
- On-site dune sands are suitable for use as structural fill. On-site soil with organic matter is not suitable for use as structural fill.
- Organic soil beneath proposed structural elements should be removed as follows:
    - Within the footprints of proposed buildings all organic material should be removed to medium dense or denser native soils and replaced with structural fill. The width of excavation should extend outside the building footprint with a projection of ½H:1V from each side of the building footprint down to native soils.
    - Within paved areas, organics may be removed full depth, as for buildings, to minimize long-term settlement. Alternately, a reinforced fill may be constructed as described in this report, with the expectation that some long-term maintenance and repaving will be required.
- Very loose to loose fill material and native dune sands encountered beneath structural elements should be scarified to a depth of at least 18 inches, moisture conditioned, and recompacted. Areas not responding to compaction should be overexcavated as directed by the geotechnical engineer and backfilled with structural fill over approved subgrade.
- Permanent cut and fill slopes can be constructed at a slope of 1½H:1V. Slopes will be stable under static conditions but will likely slough during a design level earthquake and require repair.
- Structures, access roads, and pavements should be set back either 10 feet from the top of the slope or behind a 2H:1V projection from the base of the slope, whichever is greater.
- Proposed residential structures can be satisfactorily supported on continuous and isolated shallow foundations supported on the firm native soils, or on structural fill that extends to the firm native soils.
- Slabs-on-grade can be satisfactorily supported on aggregate base that is founded on the firm fill soils, firm native soils or on structural fill that extends to the firm native soils. We recommend that slabs-on-grade be provided with proper moisture control by constructing a sub-slab aggregate base section as a capillary break and providing a vapor barrier for moisture-sensitive applications.
- As stated above, our report should not be used for individual residential lot development. Specialized studies and additional geotechnical investigations may be required for future development of individual residential lots, depending on the structural requirements and final grading configurations. The recommendations provided in this report are intended for overall site development and infrastructure improvements.
- The potential of irregular areal settlement as a result of the underlying organic soil will likely result in differential settlement of underlying utilities if organics are not removed. Utilities that require consistent slope for proper function may require supplemental maintenance or repair, including at hard connection points over the life of the project.
- Standard pavement sections prepared as described in this report will suitably support the estimated traffic loads. Unless all the organics are removed, site maintenance should be planned due to long-term, secondary settlement that will likely occur over the life of the project

5.0 EARTHWORK RECOMMENDATIONS

5.1. Site Preparation

In general, site preparation and earthwork for site development will include demolition and removal or relocation of existing site utilities if present, stripping and grubbing, removing organic soil beneath building foundations and slabs, grading the site and excavating for utilities and foundations.

5.1.1. Demolition

If present, existing utilities that will be abandoned should be identified prior to project construction. Abandoned utility lines beneath proposed structural areas should be completely removed or filled with grout if abandoned and left in place in order to reduce potential settlement or caving in the future. Materials generated during demolition of existing utilities should be transported off site for disposal.

Existing voids and new depressions created during removal of existing utilities, or other subsurface elements, should be cleaned of loose soil or debris down to firm soil and backfilled with compacted structural fill. Disturbance to a greater depth should be expected if site preparation and earthwork are conducted during periods of wet weather.

5.1.2. Stripping/Organic Soil Removal

Based on our observations, we estimate that the depth of stripping will generally be on the order of about 2 to 3 inches within the western site area (approximate Station 0+50 to 2+00) prior to cutting to lower site grades. Based on our explorations performed within the low-lying area east of the base of the central slope (approximate Station 2+00 to 3+50), the area consists of man-made fills, native organic peat, and buried organic topsoil, as described in the "Subsurface Conditions" section above. We estimate the thickness of organic material east of approximate Station 2+00 ranges from approximately 4½ feet to greater than 12 feet below existing grades. All organic soil should be removed underneath proposed building footprints and extend outward from each building footprint with a projection of ½H:1V to native soils prior to placing fill to raise site grades.

The actual organic soil removal depth should be based on field observations at the time of construction. Stripped material and organic material generated during the process should be transported off site for disposal unless otherwise allowed by project specifications for other uses such as landscaping. Clearing and grubbing recommendations provided below should be used in areas where moderate to heavy vegetation are present, or where surface disturbance from prior use has occurred.

5.1.3. Clearing and Grubbing

Existing vegetation or trees should be removed from the site in all proposed building pad and pavement areas and for a 5-foot margin around such areas. Following clearing and grubbing, excavations up to several feet will be required to remove the root zones of thick shrubs and trees. Deeper excavations may be required to remove the root zones of larger trees.

In general, roots larger than ½ inch in diameter should be removed. Excavations to remove root zones should be done with a smooth bucket to minimize subgrade disturbance. Portions of the site are heavily vegetated and previously buried roots may be present, even in the current grassy areas of the site. Grubbed

materials should be hauled off site and properly disposed unless otherwise allowed by the project specifications for other uses such as landscaping, stockpiling or on-site burning.

Existing voids and new depressions created during demolition, clearing, grubbing or other site preparation activities, should be scarified and recompacted, if possible, or excavated to firm soil and backfilled with structural fill. Greater depths of disturbance should be expected if site preparation and earthwork are conducted during periods of wet weather.

5.1.4. Fill Stockpile Removal

We recommend that the soil fill stockpiles located in the western portion of the site be evaluated for suitability for reuse as structural fill and either be reused or removed, as appropriate. Explorations were not performed within these soil stockpiles; therefore, the soil conditions are unknown. Based on the surface of the stockpiles, the material appears to consist of dune sand and may be suitable as structural fill on site provided it meets the requirements of the "Structural Fill and Backfill" section of this report. We can further evaluate the suitability of these stockpiles with additional explorations or during site construction.

5.2. Subgrade Improvement

Following stripping of the root zone and organic soils, and in areas where fill will be placed to reach proposed finished grade, we recommend that the upper soils be improved by compaction prior to placement of additional fill to raise grades. Subgrade improvement can be accomplished by removing and replacing or scarifying and recompacting the disturbed soil prior to placing site grading fill or base rock materials. Scarification is typically performed by ripping with agricultural discs or dozer shanks. Soil processing, including moisture conditioning (drying back or adding water depending on the time of year and surface conditions at time of grading), may be required to adequately compact the upper soils. If the soil cannot be properly moisture conditioned, it should be removed and replaced with structural fill.

5.3. Subgrade Preparation and Evaluation

Where fill and organic soils are encountered, we recommend that subgrade preparation and evaluation be completed as follows:

- Proposed Building Footprints (eastern site area east of approximate Station 2+00) - remove uncontrolled fill and organic soil to full depth underneath building footprint and a width outside the building footprint extending with a projection of ½H:1V from each side of a proposed building to native soils. Replace with structural fill over approved subgrade.
- Proposed Building Footprint (western site area, approximate Station 0+50 to 2+00) - scarify and recompact existing fill material or native dune sands exposed at the proposed subgrade elevation. Areas not responding to compaction should be overexcavated and backfilled to subgrade elevation with structural fill over approved subgrade. If present, remove organic soil to full depth underneath building footprint as described above. Replace with structural fill over approved subgrade.
- Parking and Drive Aisles – scarify and recompact existing fill or native material exposed at the subgrade elevation prior to placing additional fill to raise site grades. Geogrid reinforcement may be placed beneath the pavement sections on the eastern portion of the site in order to reduce differential settlement from long-term consolidation and decay of the underlying organic soil. Geogrid reinforcement should consist of two layers of geogrid, similar to Tensar TX7, separated by 12 inches of

¾-inch minus crushed aggregate base beneath the pavement section (asphalt and base rock). If the long-term differential settlement and maintenance of proposed pavements is not acceptable to the project team, we recommend removing and replacing all of the organic soil underlying all parking and drive aisles.

Upon completion of site preparation activities, the exposed subgrade should be proof-rolled with a fully loaded dump truck or similar heavy rubber-tired construction equipment to identify soft, loose or unsuitable areas. Proof-rolling should be conducted prior to placing fill, and should be observed by a representative of GeoEngineers who will evaluate the suitability of the subgrade and identify areas of yielding that are indicative of soft or loose soil. If soft or loose zones are identified during proof-rolling, these areas should be excavated to the extent indicated by our representative and replaced with imported select structural fill as defined in this report.

During wet weather, or when the exposed subgrade is wet or unsuitable for proof-rolling, the prepared subgrade should be evaluated by observing excavation activity and probing with a steel foundation probe. Observations, probing and compaction testing should be performed by a member of our staff. Wet soil that has been disturbed due to site preparation activities or soft or loose zones identified during probing, should be removed and replaced with imported select structural fill as directed by the on-site geotechnical engineer.

5.4. Subgrade Protection and Wet Weather Considerations

Upper fine-grained soils (soils that are less sandy) at the site are susceptible to moisture. Wet weather construction practices will be necessary if work is performed during periods of wet weather. If site grading will occur during wet weather conditions, it will be necessary to use track-mounted equipment, load material into trucks supported on gravel work pads and employ other methods to reduce ground disturbance. The contractor should be responsible to protect the subgrade during construction reflective of their proposed means and methods and time of year.

During wet weather, or when the exposed subgrade is wet or unsuitable for proof-rolling, the prepared subgrade should be evaluated by observing excavation activity and probing with a steel foundation probe. Observations and probing should be performed by a member of our staff. Wet soil that has been disturbed due to site preparation activities, or soft or loose zones identified during probing, should be scarified and recompacted, if possible, or removed and replaced with imported select structural fill.

5.5. Erosion Control

Erosion control measures should be implemented in accordance with the Erosion Control Notes provided in the "City of Warrenton Public Works Department Engineering Specifications & Design Criteria" and the Juniper Avenue Subdivision plans, dated December 3, 2019, prepared by Firwood Design Group, LLC.

5.6. Excavation

Based on the materials encountered in our subsurface explorations, it is our opinion that conventional earthmoving equipment in proper working condition should be capable of making necessary general excavations.

The earthwork contractor should be responsible for reviewing this report, including the exploration logs, providing their own assessments, and providing equipment and methods needed to excavate the site soils while protecting subgrades.

5.7. Dewatering

As discussed in the "Groundwater" section of this report, groundwater was encountered at a depth of 6 to 12 feet bgs in the easternmost explorations (TP-1 to TP-3), and is expected to be below the anticipated excavation depth to remove organic soils in the eastern half of the site. Excavations that extend into saturated/wet soils, or excavations that extend into perched groundwater, should be dewatered. Sump pumps are expected to adequately address perched water encountered in shallow excavations. In addition to groundwater seepage, surface water inflow to the excavations during the wet season can be problematic. Provisions for surface water control during earthwork and excavations should be included in the project plans and should be installed prior to commencing earthwork.

5.8. Trench Cuts and Trench Shoring

All trench excavations should be made in accordance with applicable Occupational Safety and Health Administration (OSHA) and state regulations. In our opinion, native soils are generally OSHA Type C. Temporary excavations should be shored or laid back at an inclination of 1½H:1V or flatter if workers are required to enter. Excavations made to construct footings or other structural elements should be laid back or shored at the surface as necessary to prevent soil from falling into excavations.

It should be expected that unsupported cut slopes will experience some sloughing and raveling if exposed to water. Plastic sheeting, placed over the exposed slope and directing water away from the slope, will reduce the potential for sloughing and erosion of cut slopes during wet weather.

The contractor is responsible for shoring methods and shoring system design. Shoring systems should be designed by a professional engineer before installation.

In our opinion, the contractor will be in the best position to observe subsurface conditions continuously throughout the construction process and to respond to the soil and groundwater conditions. Construction site safety is generally the sole responsibility of the contractor, who also is solely responsible for the means, methods, and sequencing of the construction operations and choices regarding excavations and shoring.

Under no circumstances should the information provided by GeoEngineers be interpreted to mean that GeoEngineers is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

5.9. Slopes

5.9.1. Permanent Slopes

Permanent cut and fill slopes should not exceed 1.5H:1V. Where access for landscape maintenance is desired, we recommend a maximum gradient of 3H:1V. Fill slopes should be overbuilt by at least 12 inches and trimmed back to the required slope to maintain a firm face.

Slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. Surface water runoff should be collected and directed away from slopes to prevent

water from running down the face of the slope. New structures, pavements and access roads should be located 10 feet from the edge of the top of the slopes or behind a 2H:1V projection from the base of the slope, whichever is greater.

We did not perform site-specific slope stability analysis under this scope of services. Although, based on our experience with similar soils, it should be expected that after a seismic event, the slopes will require repair as they are likely to experience shallow landslides and sloughing. If slope failure during a seismic event is un-acceptable, the steepness of the slope should be reduced or a riprap buttress may be added at the toe of the slopes to increase the factor of safety of the slope.

5.9.2. Temporary Slopes

All temporary soil cuts associated with site excavations (greater than 4 feet in depth) should be adequately sloped back to prevent sloughing and collapse, in accordance with applicable OSHA and state guidelines.

Temporary cut slopes should not exceed a gradient appropriate for the soil type being excavated. In our opinion, the on-site native sand is generally OSHA Type C. However, because of the variables involved, actual slope angles required for stability in temporary cut areas can only be estimated before construction.

The stability and safety of cut slopes depend on a number of factors, including:

- The type and density of the soil
- The presence and amount of any seepage
- Depth of cut
- Proximity and magnitude of the cut to any surcharge loads, such as stockpiled material, traffic loads, or structures
- Duration of the open excavation
- Care and methods used by the contractor

We recommend that stability of the temporary slopes used for construction be the responsibility of the contractor, since the contractor is in control of the construction operation and is continuously at the site to observe the nature and condition of the subsurface. If groundwater seepage is encountered within the excavation slopes, the cut slope inclination may have to be flatter than 1.5H:1V. However, appropriate inclinations will ultimately depend on the actual soil and groundwater seepage conditions exposed in the cuts at the time of construction. It is the responsibility of the contractor to ensure that the excavation is properly sloped or braced for worker protection, in accordance with applicable guidelines. To assist with this effort, we make the following recommendations regarding temporary excavation slopes:

- Protect the slope from erosion with plastic sheeting for the duration of the excavation to minimize surface erosion and raveling.
- Limit the maximum duration of the open excavation to the shortest time period possible.
- Place no surcharge loads (equipment, materials, etc.) within a distance equal to the height of the cut from the top of the slope.

More restrictive requirements may apply depending on specific site conditions, which should be continuously assessed by the contractor.

If temporary sloping is not feasible based on site spatial constraints, excavations could be supported by internally braced shoring systems, such as a trench box or other temporary shoring. There are a variety of options available. We recommend that the contractor be responsible for selecting the type of shoring system to apply.

5.9.3. Slope Drainage

If seepage is encountered at the face of permanent or temporary slopes, it will be necessary to flatten the slopes or install a subdrain to collect the water. We should be contacted to evaluate such conditions on a case-by-case basis.

5.10. Fill Materials

5.10.1. General

Structural areas include areas beneath foundations, floor slabs, pavements, and any other areas intended to support structures or within the influence zone of structures. Fill intended for use in structural areas should meet the criteria for structural fill presented below. All structural fill soils should be free of debris, clay balls, roots, organic matter, frozen soil, man-made contaminants, particles with greatest dimension exceeding 4 inches (3-inch maximum particle size in building footprints) and other deleterious materials.

The suitability of soil for use as structural fill will depend on the gradation and moisture content of the soil. As the amount of fines (silt and clay) in the soil matrix increases, the soil becomes increasingly more sensitive to small changes in moisture content and achieving the required degree of compaction becomes more difficult or impossible. Recommendations for suitable fill material are provided in the following sections.

5.10.2. On-Site Soils

As described in the "Subsurface Conditions" section, the western portion of the site is mantled with poorly graded, fine- to medium-grained sand and silty sand with occasional organic and concrete debris (fill) underlain by a fine to medium native dune sand. This material is generally suitable for use as general structural fill provided it meets the recommendations above. The soils within the eastern portion of the site consisted of more organics, ranging from very loose to loose clayey sand and very soft to soft sandy clay with organic matter to very soft organic clay with sand that included woody debris and peat. The soils within the eastern portion of the site are unsuitable for use as structural fill, with the exception of the native sand soils observed at TP-4.

5.10.3. Imported Select Structural Fill

Select imported granular material may be used as structural fill. The imported material should consist of pit or quarry run rock, crushed rock, or crushed gravel and sand that is fairly well-graded between coarse and fine sizes (approximately 25 to 65 percent passing the U.S. No. 4 sieve). It should have less than 5 percent passing the U.S. No. 200 sieve. During dry weather, the fines content can be increased to a maximum of 12 percent.

5.10.4. Aggregate Base

Aggregate base material located under floor slabs and pavements, and crushed rock used in footing overexcavations should consist of imported clean, durable, crushed angular rock. Such rock should be well-graded, have a maximum particle size of 1 inch and have less than 5 percent passing the U.S. No. 200 sieve. In addition, aggregate base shall have a minimum of 75 percent fractured particles according to American Association of State Highway and Transportation Officials (AASHTO) TP-61 and a sand equivalent of not less than 30 percent based on AASHTO T-176.

5.10.5. Retaining Wall Backfill

Fill placed to provide a drainage zone behind retaining walls should meet the general requirements above and consist of free-draining sand and gravel or crushed rock with a maximum particle size of ¾ inch and less than 3 percent passing the U.S. No. 200 sieve.

5.10.6. Trench Backfill

Backfill for pipe bedding and in the pipe zone should consist of well-graded granular material with a maximum particle size of ¾ inch and less than 5 percent passing the U.S. No. 200 sieve. The material should be free of organic matter and other deleterious materials. Further, the backfill should meet the pipe manufacturer's recommendations. Above the pipe zone, imported select structural fill may be used as described above.

5.11. Fill Placement and Compaction

Structural fill should be compacted at moisture contents that are within 3 percent of the optimum moisture content as determined by ASTM Test Method D 1557 (Modified Proctor). The optimum moisture content varies with gradation and should be evaluated during construction. Fill material that is not near the optimum moisture content should be moisture conditioned prior to compaction.

Fill and backfill material should be placed in uniform, horizontal lifts and compacted with appropriate equipment. The appropriate lift thickness will vary depending on the material and compaction equipment used. Fill material should be compacted in accordance with Table 1. It is the contractor's responsibility to select appropriate compaction equipment and place the material in lifts that are thin enough to meet these criteria. However, in no case should the loose lift thickness exceed 18 inches.

TABLE 1. COMPACTION CRITERIA

	Compaction Requirements		
	Percent Maximum Dry Density Determined by ASTM Test Method D 1557 at ± 3% of Optimum Moisture		
Fill Type	**0 to 2 Feet Below Subgrade**	**> 2 Feet Below Subgrade**	**Pipe Zone**
On-site granular soils	95	95	-----
Imported Granular, maximum particle size < 1¼ inch	95	95	-----
Imported Granular, maximum particle size 1¼ inch to 6 inches (3-inch maximum under building footprints)	n/a (proof-roll)	n/a (proof-roll)	-----
Retaining Wall Backfill*	92	92	-----

Fill Type	Compaction Requirements		
	Percent Maximum Dry Density Determined by ASTM Test Method D 1557 at ± 3% of Optimum Moisture		
	0 to 2 Feet Below Subgrade	> 2 Feet Below Subgrade	Pipe Zone
Nonstructural Zones	90	90	90
Trench Backfill	95	92	90

Note:

* Measures should be taken to prevent overcompaction of the backfill behind retaining walls. We recommend placing the zone of backfill located within 5 feet of the wall in lifts not exceeding about 6 inches in loose thickness and compacting this zone with hand-operated equipment such as a vibrating plate compactor or a jumping jack.

A representative from GeoEngineers should evaluate compaction of each lift of fill. Compaction should be evaluated by in-place compaction testing with a nuclear density gage, unless other methods are proposed for oversized materials and are approved by GeoEngineers during construction. These other methods typically involve procedural placement and compaction specifications together with verification requirements such as proof-rolling.

6.0 STRUCTURAL DESIGN RECOMMENDATIONS

6.1. Construction Considerations

As discussed in the "Subsurface Conditions" section we encountered native organic peat and buried organic topsoil east of approximate Station 2+00 ranging from approximately 4½ feet to greater than 12 feet below existing grades. Because of the variable quality and the type and amount of organics present across the site, the potential of irregular areal settlement will likely result in differential settlement of site utilities. Differential settlement along utility alignments may be several inches and may significantly impact hard connection points such as intersections with other lines, at manholes, or at connections to structures where organic material has been removed beneath the building footprints. Utilities that require consistent slope for proper function may require supplemental maintenance or repair over the life of the project, and/or the use of flexible connections at hard connection points.

6.2. General Foundation Support

Proposed residential wood-framed structures at the site can be satisfactorily founded on continuous wall or isolated column footings supported on medium dense or denser native soils, or on structural fill placed and compacted as recommended over native soils. It may be necessary to evaluate individual building locations to assess the need for overexcavation of organic soils. Our recommendations are not intended for individual residential lots, which should be required to have their own geotechnical explorations and recommendations appropriate to the specific structures based on City requirements and the requirements of the International Building Code (IBC).

We recommend footings have a minimum width of 24 inches and the bottom of the exterior footings be founded at least 18 inches below the lowest adjacent grade, or as needed to meet the design loads. The recommended minimum footing depth is greater than the anticipated frost depth.

6.2.1. Foundation Subgrade Preparation

Fill material and organic soil beneath proposed structural elements should be removed as described in the "Subgrade Preparation and Evaluation" section. We recommend a contingency be established in the earthwork budget, and a predetermined unit price and method of measurement be included in the earthwork contract.

We recommend soft/loose or disturbed soils be removed before placing reinforcing steel and concrete. Foundation bearing surfaces should not be exposed to standing water. If water infiltrates and pools in the excavation, the water, along with any disturbed soil, should be removed before placing reinforcing steel. A thin layer of crushed rock can be used to provide protection to the subgrade from weather and light foot traffic. Compaction should be performed as described in the "Fill Placement and Compaction" section.

6.2.2. Bearing Capacity – Spread Footings

We recommend conventional footings be proportioned using a maximum allowable bearing pressure of 2,500 psf if supported on firm native soils, or on structural fill placed over firm native soils. This bearing pressure applies to the total of dead and long-term live loads and may be increased by one-third when considering earthquake or wind loads. This is a net bearing pressure. The weight of the footing and overlying backfill can be ignored in calculating footing sizes.

6.2.3. Foundation Settlement

Foundations designed and constructed as recommended are expected to experience settlements of less than 1 inch. Differential settlements of up to one-half of the total settlement magnitude can be expected between adjacent footings supporting comparable loads.

6.2.4. Lateral Resistance

Lateral loads on footings can be resisted by passive earth pressures on the sides of footings and by friction on the bearing surface. We recommend that passive earth pressures be calculated using an equivalent fluid unit weight of 260 pounds per cubic foot (pcf) for foundations confined by native medium dense or denser sand and 350 pcf if confined by a minimum of 2 feet of imported granular fill.

We recommend using a friction coefficient of 0.35 for foundations placed on the native medium dense or denser sand, or 0.50 for foundations placed on the very dense gravel or a minimum 2-foot-thickness of compacted crushed rock. The passive earth pressure and friction components may be combined provided the passive component does not exceed two-thirds of the total.

The passive earth pressure value is based on the assumptions that the adjacent grade is level and static groundwater remains below the base of the footing throughout the year. The top 1 foot of soil should be neglected when calculating passive lateral earth pressures unless the adjacent area is covered with pavement. The lateral resistance values do not include safety factors.

6.3. Drainage Considerations

We recommend the ground surface be sloped away from the buildings at least 2 percent. All downspouts should be tightlined away from the building foundation areas and should also be discharged into a stormwater disposal system. Downspouts should not be connected to footing drains.

Depending on grading configuration of individual lots, perimeter footing drains may be required to route near-surface water away from structures. The engineer for the individual lot should make the determination if perimeter drains are required. If perimeter footing drains are used for below-grade structural elements or crawl spaces, they should be installed at the base of the exterior footings. The perimeter footing drains should be provided with cleanouts and should consist of at least 4-inch-diameter perforated pipe placed on a 3-inch bed of, and surrounded by, 6 inches of drainage material enclosed in a non-woven geotextile such as Mirafi 140N (or approved equivalent) to prevent fine soil from migrating into the drain material. We recommend against using flexible tubing for footing drainpipes. The perimeter drains should be sloped to drain by gravity to a suitable discharge point, preferably a storm drain. We recommend that the cleanouts be covered and placed in flush-mounted utility boxes. Water collected in roof downspout lines must not be routed to the footing drain lines.

6.4. Floor Slabs

Satisfactory subgrade support for floor slabs-on-grade supporting the planned 75 psf floor loads can be obtained provided the floor slab subgrade is prepared as described in the "Earthwork Recommendations" section of this report. Slabs should be reinforced according to their proposed use and per the structural engineer's recommendations. Subgrade support for concrete slabs can be obtained from the firm native soils or on structural fill placed over firm native soils.

A minimum 6-inch-thick layer of crushed rock aggregate base material should be placed over the prepared subgrade as a capillary break. Aggregate base material placed directly below the slab should be ¾-inch maximum particle size or less. We recommend using a subgrade modulus value of 125 pounds per cubic inch (pci) to design slabs on grade, provided the site is prepared as recommended. Concrete slabs constructed as recommended will likely settle less than 1 inch. We recommend that concrete slabs be jointed around columns to allow the individual structural elements to settle differentially.

If dry on-grade slabs are required, for example at interior spaces where adhesives are used to anchor carpet or tile to the slab, a waterproof liner may be placed as a vapor barrier below the slab. The vapor barrier should be selected by the structural engineer and should be accounted for in the design floor section and mix design selection for the concrete, to accommodate the effect of the vapor barrier on concrete slab curing.

6.5. Conventional Retaining Walls

6.5.1. Drainage

Positive drainage is imperative behind retaining structures. This can be accomplished by providing a drainage zone behind the wall consisting of free-draining material and perforated pipes to collect and dispose the water. The drainage material should consist of aggregate base having less than 3 percent passing the U.S. No. 200 sieve. The wall drainage zone should extend horizontally at least 2 feet from the back of the wall.

A perforated smooth-walled rigid drainpipe, having a minimum diameter of 4 inches, should be placed at the bottom of the drainage zone along the entire length of the wall, with the pipe invert at or below the base of the wall footing. The drainpipes should discharge to a tightline leading to an appropriate collection and disposal system. An adequate number of cleanouts should be incorporated into the design of the drains to

provide access for regular maintenance. Roof downspouts, perimeter drains, or other types of drainage systems should not be connected to retaining wall drain systems.

6.5.2. Design Parameters

Retaining structures free to rotate slightly around the base should be designed for active earth pressures using an equivalent fluid unit weight of 37 pcf when the ground surface extends level behind the wall equal to the wall height and 59 pcf for a 2H:1V slope above the wall. For lesser slopes between flat and 2H:1V, the equivalent fluid pressure can be linearly interpolated between the recommended values. The equivalent fluid pressure value is based on the following assumptions.

- The walls will not be restrained against rotation when the backfill is placed.
- Walls are 8 feet or less in total wall support height.
- The backfill within 2 feet of the wall consists of free-draining granular materials.
- Grades above the top of the walls are no steeper than a 2H:1V slope.
- A level front slope is present at the base of the wall.
- Hydrostatic pressures do not develop and drainage will be provided behind the wall.

Seismically induced lateral forces on retaining walls can be calculated using a dynamic force equal to 12H psf, where H is the wall height. This seismic force should be applied with the centroid located at 0.6H from the wall base. These values assume that the wall is vertical and unrestrained and the backfill behind the wall is horizontal. Seismic lateral earth pressures were computed using the Mononobe-Okabe equation.

Retaining walls, including foundation walls that are restrained against rotation during backfilling, should be designed for an at-rest equivalent fluid unit weight of 55 pcf when the ground surface extends level behind the wall equal to a distance of at least twice the height of the wall, and 87 pcf for an inclined slope of 2H:1V above the wall. For lesser slopes between flat and 2H:1V, the equivalent fluid pressure can be linearly interpolated between the recommended values.

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

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

Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project vary from these assumptions. We recommend that GeoEngineers be retained to review the retaining wall design to confirm that it meets the requirements in our report.

6.6. Seismic Design

Parameters provided in Table 2 are based on the conditions encountered during our subsurface exploration program and the procedure outlined in the 2015 IBC. Some jurisdictions are beginning to adopt the 2018 IBC, which references the 2016 Minimum Design Loads for Buildings and Other Structures (American Society of Civil Engineers [ASCE] 7-16). Per ASCE 7-16 Section 11.4.8, a ground motion hazard analysis or site-specific response analysis is required to determine the design ground motions for structures on Site Class D sites with S1 greater than or equal to 0.2g.

For this project, the site is classified as Site Class D with an S1 value of 1.339g; therefore, the provision of 11.4.8 applies. Alternatively, the parameters listed in Table 2 below may be used to determine the design ground motions if Exception 2 of Section 11.4.8 of ASCE 7-16 is used. Using this exception, the seismic response coefficient (C_s) is determined by Equation (Eq.) (12.8-2) for values of $T \leq 1.5T_S$, and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for $T_L \geq T > 1.5T_s$ or Eq. (12.8-4) for $T > T_L$, where T represents the fundamental period of the structure and T_S=0.893 sec. Based on the proposed structures (i.e., proposed building period<$1.5T_S$), scaling of C_s will not be required.

We recommend seismic design be performed using the values noted in Table 2 or Table 3 below depending on the version of the IBC used for design.

TABLE 2. MAPPED 2015 IBC SEISMIC DESIGN PARAMETERS

Parameter	Recommended Value[1]
Site Class	D
Mapped Spectral Response Acceleration at Short Period (S_S)	1.337 g
Mapped Spectral Response Acceleration at 1 Second Period (S_1)	0.685 g
Site Modified Peak Ground Acceleration (PGA_M)	0.590 g
Site Amplification Factor at 0.2 second period (F_a)	1.000
Site Amplification Factor at 1.0 second period (F_v)	1.500
Design Spectral Acceleration at 0.2 second period (S_{DS})	0.892 g
Design Spectral Acceleration at 1.0 second period (S_{D1})	0.685 g

Note:

[1] Parameters developed based on Latitude 46.160597° and Longitude -123.940164° using the ATC Hazards online tool.

TABLE 3. MAPPED 2018 IBC SEISMIC DESIGN PARAMETERS

Parameter	Recommended Value[1,2]
Site Class	D
Mapped Spectral Response Acceleration at Short Period (S_S)	1.339 g
Mapped Spectral Response Acceleration at 1 Second Period (S_1)	0.698 g
Site Modified Peak Ground Acceleration (PGA_M)	0.743 g
Site Amplification Factor at 0.2 second period (F_a)	1.000
Site Amplification Factor at 1.0 second period (F_v)	1.700
Design Spectral Acceleration at 0.2 second period (S_{DS})	0.893 g

Parameter	Recommended Value[1,2]
Design Spectral Acceleration at 1.0 second period (S_{D1})	0.791 g

Notes:

[1] Parameters developed based on Latitude 46.160597° and Longitude -123.940164° using the ATC Hazards online tool.

[2] These values are only valid if the structural engineer utilizes Exception 2 of Section 11.4.8 (ASCE 7-16).

7.0 PAVEMENT RECOMMENDATIONS

7.1. General

Our pavement recommendations are based on the results of our field observations and analysis. Pavement analyses and recommendations for on-site roadways were developed in general accordance with the Oregon Department of Transportation (ODOT) Pavement Design Guide. Pavement subgrades should be prepared in accordance with the "Earthwork Recommendations" section of this report. The design of the recommended pavement sections is based on an assumed California Bearing Ratio of 3. We do not have specific information on the frequency and type of vehicles that will use the area; however, we have based our design analysis on traffic consisting of 100 cars and up to two, three-axle trucks per day to account for trash and delivery vehicles. Light-duty pavement areas are considered those accessed only by auto traffic (i.e., parking areas). Heavy-duty pavement areas include those within the drive path of heavy trucks.

Heavy construction traffic has not been considered in our pavement design; therefore, we assume that the pavements will be constructed at the end of the project after heavy construction vehicles, such as concrete trucks and construction material delivery trucks, will no longer access the site. Construction traffic should not be allowed on new pavements. If this is not the case, we will have to re-design the pavements for those heavier loading conditions.

Our pavement recommendations are based on the following parameters:

- The pavement subgrades, fill subgrades and site earthwork used to establish road grades below the Aggregate Subbase and Aggregate Base materials have been prepared as described in the "Earthwork Recommendations" section of this report.
- A resilient modulus of 20,000 psi has been estimated for compacted aggregate subbase and aggregate base materials.
- A resilient modulus of 4,500 psi based on on-site observations and experience in similar sites.
- Initial and terminal serviceability indices of 4.2 and 2.0, respectively.
- Reliability and standard deviations of 75 percent and 0.45, respectively.
- Structural coefficients of 0.42 and 0.10 for the asphalt and base rock, respectively.
- A 20-year design life with a 2 percent growth rate.
- Estimated traffic of 100 cars per day and 2 three-axle trucks.

If any of the noted assumptions vary from project design use, our office should be contacted with the appropriate information so that the pavement designs can be revised or confirmed adequate.

7.2. Drainage

Long-term performance of pavements is influenced significantly by drainage conditions beneath the pavement section. Positive drainage can be accomplished by crowning the subgrade with a minimum 2 percent cross slope and establishing grades to promote drainage. The recommended pavement sections assume that final improvements surrounding the pavement will be designed and constructed such that stormwater or excess irrigation water from landscape areas does not infiltrate below the pavement section into the base rock materials.

7.3. Pavement Sections

Based on the estimated traffic data and our analyses, our recommended pavement sections are presented in Table 4. Based on the Paving & Street Design Criteria provided in the "City of Warrenton Public Works Department Engineering Specifications & Design Criteria", the minimum pavement section allowed by the design criteria is 12 inches of compacted base rock and 2 inches of asphalt (2 inches AC over 12 inches aggregate base). Unless the City permits a site- and traffic-specific pavement design as provided in Table 4 below (section thinner than the prescribed standard), the pavement section outlined by the City should be implemented by the project. We recommend a minimum asphalt concrete (AC) thickness of 2.5 inches for all pavement sections.

TABLE 4. RECOMMENDED AC PAVEMENT SECTIONS

Section	Minimum Asphalt Thickness (inches)	Minimum Aggregate Base Thickness (inches)
Light Duty (general automobile parking areas)	2.5	6
Heavy Duty (drive aisles and heavy delivery areas)	3.0	8

The aggregate base course should conform to the "Aggregate Base" section of this report and be compacted to at least 95 percent of the maximum dry density (MDD) determined in accordance with AASHTO T-180/ASTM Test Method D 1557.

The AC pavement should conform to Section 00745 of the most current edition of the ODOT Standard Specifications for Highway Construction. The Job Mix Formula should meet the requirements for a ½-inch Dense Graded Level 2 Mix. The AC should be PG 64-22 grade meeting the ODOT Standard Specifications for Asphalt Materials. AC pavement should be compacted to 92.0 percent at Maximum Theoretical Unit Weight (Rice Gravity) of AASHTO T-209.

7.3.1. Pavement Considerations

The pavement sections provided above are adequate for the assumed standard traffic loads. Although, as discussed in the "Subsurface Conditions" section of the report, the site is underlain by uncontrolled fill and organic soil with potential voids, organic matter and construction debris. There may be up to 4 inches of long-term differential settlement as a result of decomposition of organic matter slowly over decades of time. All organic soil beneath the proposed parking lot could be removed to mitigate settlements but would likely be more expensive than occasional maintenance or leveling of the pavement. Long-term differential settlement can be reduced if geogrid is placed between lifts of fill to raise site grades as recommended in the "Earthwork Recommendations" Section.

8.0 DESIGN REVIEW AND CONSTRUCTION SERVICES

Recommendations provided in this report are based on the assumptions and preliminary design information stated herein. GeoEngineers should be retained to review the geotechnical-related portions of infrastructure development plans and specifications to evaluate whether they are in conformance with the recommendations provided in this report.

Satisfactory foundation and earthwork performance depend to a large degree on quality of construction. Sufficient monitoring of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated.

We recommend that GeoEngineers be retained to observe construction at the site to confirm that subsurface conditions are consistent with the site explorations, and to confirm that the intent of project plans and specifications relating to earthwork, pavement and earthwork construction for infrastructure development are being met. Individual lot developments may require project-specific evaluation for geotechnical considerations on a lot by lot basis. We anticipate that individual lots will be evaluated by others and are not included as part of infrastructure development.

9.0 LIMITATIONS

We have prepared this report for the exclusive use of Sandworks, Inc. and their authorized agents and/or regulatory agencies for the proposed Juniper Development in Warrenton, Oregon. This report is intended for general site evaluation and provides preliminary geotechnical recommendations. Recommendations provided herein are applicable in general for the project. Additional explorations, evaluations, and recommendations may be required at specific building locations. These data can be used for general design and project estimating purposes, but our report, general conclusions, and interpretations should not be construed as a warranty of the subsurface conditions.

This report is not intended for use by others, and the information contained herein is not applicable to other sites. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in the area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

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

10.0 REFERENCES

American Association of State Highway and Transportation Officials (AASHTO). 1993. Guide for Design of Pavement Structures.

International Code Council. 2015. International Building Code (IBC).

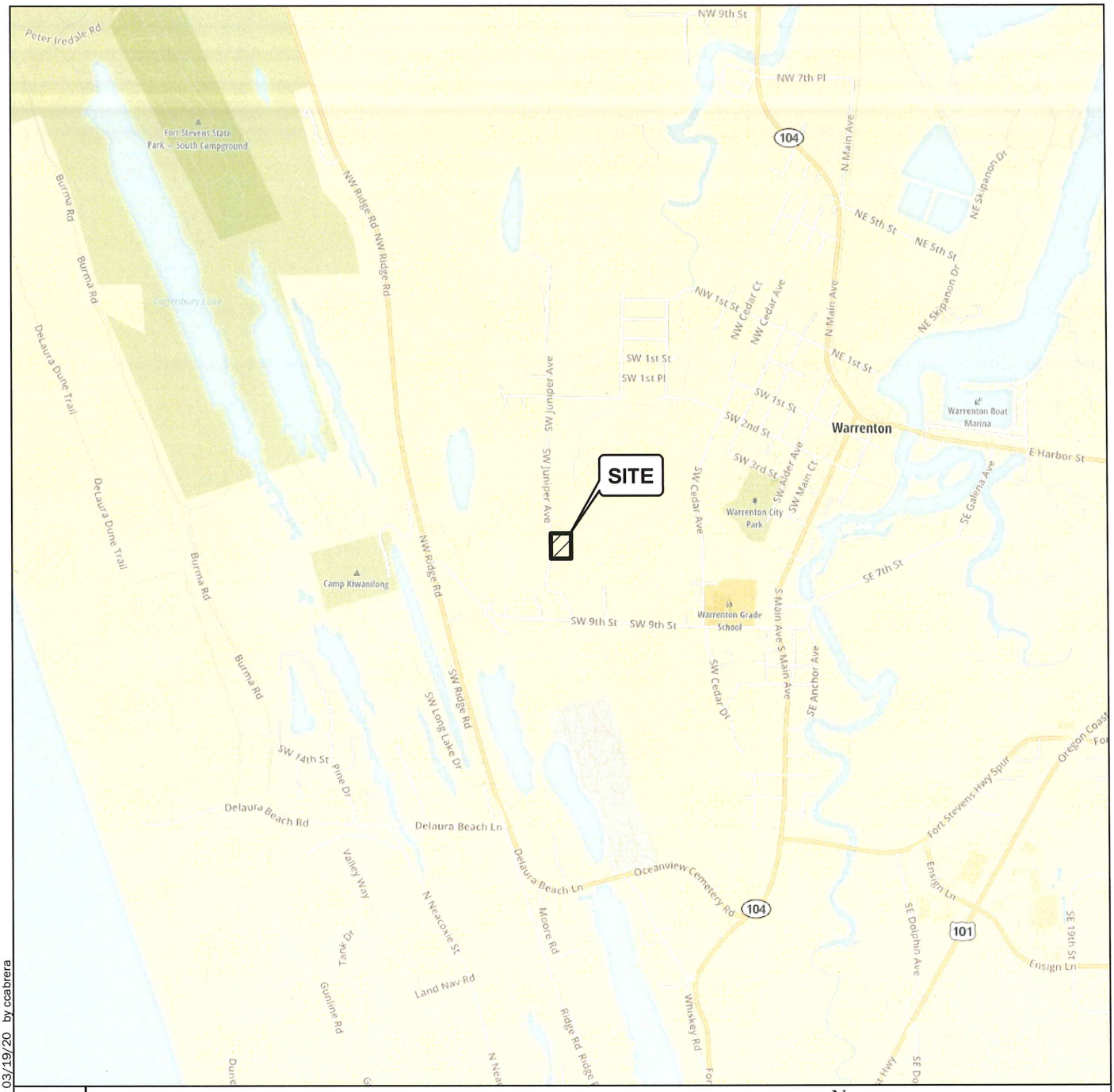
International Code Council. 2018. International Building Code (IBC).

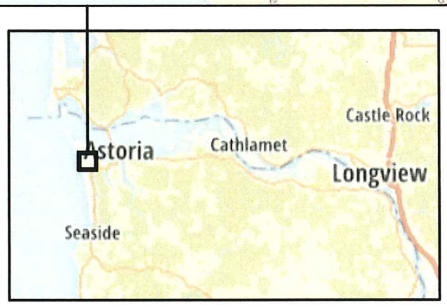
Occupational Safety and Health Administration (OSHA) Technical Manual Section V: Chapter 2, Excavations: Hazard Recognition in Trenching and Shoring: http://www.osha.gov/dts/osta/otm/otm_v/otm_v_2.html.

Oregon Department of Transportation (ODOT). 2019. ODOT Pavement Design Guide. Salem, Oregon.

Oregon Department of Transportation (ODOT). 2018. Standard Specifications for Highway Construction. Salem, Oregon.

Schlicker, H.G., Deacon, R.J., Beaulieu, J.D., and G. W. Olcott, 1972, Environmental geology of the coastal region of Tillamook and Clatsop counties, Oregon: Oregon Department of Geology and Mineral Industries, Bulletin B-74, 164 p. 18 pl. Scale: 1:62,500





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Feet

Notes:

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

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

Juniper Development
Warreton, Oregon

GeoEngineers

Figure 1

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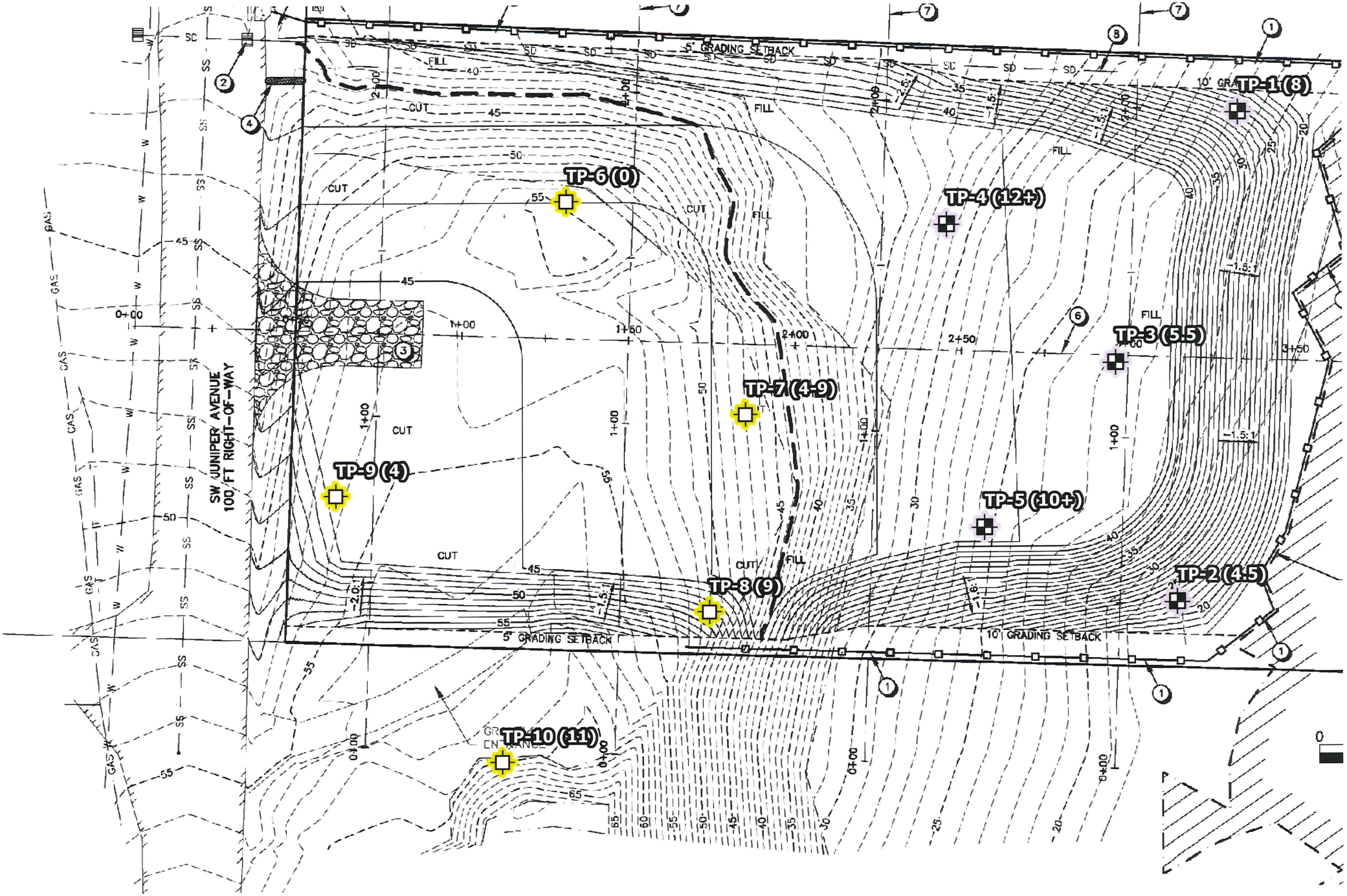

Legend

Test Pit Number and Approximate Location (Approximate Fill/Organic Thickness in Feet)

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APPENDIX A
Field Explorations and Laboratory Testing

APPENDIX A
FIELD EXPLORATIONS AND LABORATORY TESTING

Field Explorations

Soil and groundwater conditions at the proposed Juniper Development site were explored on February 18, 2020 by completing 10 test pits (TP-1 through TP-10). Test pits were extended to approximately 10 to 12½ feet below ground surface (bgs) at the approximate locations shown in Figure 2. Test pits were excavated using an excavator owned and operated by Sandridge Construction of Warrenton, Oregon.

The test pit excavations were continuously monitored by an engineering geologist from our office who maintained a detailed log of subsurface explorations, visually classified the soil encountered and obtained representative soil samples from the test pits, from the sidewalls above a depth of 4 feet bgs and from excavation spoil below that depth.

Recovered soil samples from exploratory borings were visually classified in the field in general accordance with ASTM International (ASTM) Standard Practices Test Method D 2488 and the classification chart listed in Figure A-1, Key to Exploration Logs. Logs of the test pits are presented in Figures A-2 through A-11. The logs are based on interpretation of the field and laboratory data and indicate the depth at which subsurface materials or their characteristics change, although these changes might actually be gradual.

Laboratory Testing

Soil samples obtained from the explorations were visually classified in the field and in our laboratory using the Unified Soil Classification System (USCS) and ASTM classification methods. ASTM Test Method D 2488 was used to visually classify the soil samples, while ASTM D 2487 was used to classify the soils based on laboratory tests results. Moisture content tests were performed in general accordance with ASTM D 2216-05 and percent fined tests in general accordance with ASTM D 1140. Results of the moisture and fine contents testing are presented in the appropriate exploration logs at the respective sample depths.

SOIL CLASSIFICATION CHART

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

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

Sampler Symbol Descriptions

- 2.4-inch I.D. split barrel
- Standard Penetration Test (SPT)
- Shelby tube
- Piston
- Direct-Push
- Bulk or grab
- Continuous Coring

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

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

"WOH" indicates sampler pushed using the weight of the hammer.

ADDITIONAL MATERIAL SYMBOLS

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

Groundwater Contact

- Measured groundwater level in exploration, well, or piezometer
- Measured free product in well or piezometer

Graphic Log Contact

- Distinct contact between soil strata
- Approximate contact between soil strata

Material Description Contact

- Contact between geologic units
- Contact between soil of the same geologic unit

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PL	Point lead test
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

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

Key to Exploration Logs

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Figure A-1

Date Excavated 2/18/2020	Total Depth (ft) 12	Logged By JLL Checked By TNG	Excavator Sandridge Construction, LLC Equipment Case 580K TLB	See "Remarks" section for groundwater observed See "Remarks" section for caving observed
Surface Elevation (ft) Undetermined Vertical Datum NAVD88		Easting (X) 427451.44 Northing (Y) 5112347.85		Coordinate System NAD83 (feet) Horizontal Datum

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				CL/OL	Black clay with occasional fine to medium sand to organic clay with sand, low plasticity to no plasticity, fragments of light gray claystone, occasional organic matter and wood debris (very soft/very loose, moist) (fill)	99	9	
	1		1 %F						
	2				OL	Black organic silt/clay, low to moderate plasticity (soft, moist to wet) (Stabilized Dune Sand; buried topsoil)	151		
	3		2 MC						
	4					Large roots 4 to 5 feet below ground surface			
	5				SC/OL	Gray with brown mottling clayey fine sand with organics to organic clayey sand, numerous organic matter and large roots (soft/ very loose, moist) (Stabilized Dune Sand)	374	42	
	6		3 %F						Root matter 6 to 7 feet below ground surface
	7								Rapid groundwater seepage observed at 7 feet below ground surface (along roots)
	8				SP	Light gray poorly graded fine sand, massive (loose, wet)	31	1	Slight caving observed at 8 to 12 feet below ground surface
	9		4 %F						
	10								
	11		5						
	12					Test pit completed at 12 feet below ground surface			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth. Vertical approximated based on Google Earth.

Log of Test Pit TP-1

GeoEngineers

Project: Juniper Development
Project Location: Warrenton, Oregon
Project Number: 23773-003-00

Figure A-2
Sheet 1 of 1

Date Excavated 2/18/2020	Total Depth (ft) 10.5	Logged By JLL Checked By TNG	Excavator Sandridge Construction, LLC Equipment Link-belt 210LE TE Excavator	See "Remarks" section for groundwater observed See "Remarks" section for caving observed
Surface Elevation (ft) Undetermined Vertical Datum NAVD88		Easting (X) 427450.6 Northing (Y) 5112300.88	Coordinate System NAD83 (feet) Horizontal Datum	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				CL/OL	Black sandy organic clay, much organic matter and roots to 10¼ inches, low plasticity (very soft, moist) (fill)			
	1		1 MC				262		
	2				SC/OL	Black organic clayey sand with organics to sandy organic clay, low plasticity to no plasticity, (very soft/very loose, moist) (Stabilized Dune Sand; buried topsoil)			
	3		2 MC				210		
	4					4-inch by 4-foot log at 4 feet below ground surface			Severe caving observed at 4 to 10½ feet below ground surface
	5		3 %F		SP-SC	Gray poorly graded fine to medium sand with clay, massive (very loose to loose, wet) (Stabilized Dune Sand)	38	11	
	6								Rapid groundwater seepage observed at 6 feet below ground surface
	7								
	8								
	9								
	10					Test pit completed at 10½ feet below ground surface			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth. Vertical approximated based on Google Earth.

Log of Test Pit TP-2

GeoEngineers

Project: Juniper Development
Project Location: Warrenton, Oregon
Project Number: 23773-003-00

Figure A-3
Sheet 1 of 1

Date Excavated 2/18/2020	Total Depth (ft) 12	Logged By JLL Checked By TNG	Excavator Sandridge Construction, LLC Equipment Link-belt 210LE TE Excavator	See "Remarks" section for groundwater observed See "Remarks" section for caving observed
Surface Elevation (ft) Undetermined Vertical Datum NAVD88		Easting (X) 427445.64 Northing (Y) 5112320.55	Coordinate System NAD83 (feet) Horizontal Datum	

Elevation (feet) / Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
0				SP-SC/OL	Mix of brown, tan, black, yellow poorly graded sand with clay and organics, clayey organic sand, organic clay with sand, chaotic appearance (very loose to very soft, moist) (fill)			
1								
2		1 %F				53	8	
3								Pottery shard at 3 feet below ground surface
4								
5								
6		2		SP-SC	Gray poorly graded fine to medium sand with clay, massive (loose, wet) (Stabilized Dune Sand)			Severe caving observed at 6 to 12 feet below ground surface
7								
8								
9								
10								
11								
12					Test pit completed at 12 feet below ground surface			Moderate groundwater seepage observed at 12 feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth. Vertical approximated based on Google Earth.

Log of Test Pit TP-3

GeoEngineers

Project: Juniper Development
Project Location: Warrenton, Oregon
Project Number: 23773-003-00

Figure A-4
Sheet 1 of 1

Date Excavated 2/18/2020	Total Depth (ft) 12	Logged By JLL Checked By TNG	Excavator Sandridge Construction, LLC Equipment Link-belt 210LE TE Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Undetermined Vertical Datum NAVD88		Easting (X) 427440.67 Northing (Y) 5112339.46	Coordinate System Horizontal Datum NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SC/CL	Mix of black, tan and brown clayey sand with organic sandy clay and organic clay and peat fragments, chaotic appearance (very soft/very loose, moist) (fill)			
	3				SP-SC	Tan poorly graded fine sand with clay, massive (loose, wet) (Stabilized Dune Sand)			
	4		1						Slight caving observed at 4 to 9 feet below ground surface
	5					Grades to gray			
	8				OL/SC	Brown sandy organic silt to clayey sand with organic matter (large roots), strong organic odor, much fibrous organic fragments (soft/loose, moist) (buried Peat Swamp Deposit)			
	10		2 MC				157		
	12					Test pit completed at 12 feet below ground surface			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth. Vertical approximated based on Google Earth.

Log of Test Pit TP-4

GeoEngineers

Project: Juniper Development
Project Location: Warrenton, Oregon
Project Number: 23773-003-00

Figure A-5
Sheet 1 of 1

Date Excavated 2/18/2020	Total Depth (ft) 10	Logged By JLL Checked By TNG	Excavator Sandridge Construction, LLC Equipment Link-belt 210LE TE Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Undetermined Vertical Datum NAVD88		Easting (X) 427439.07 Northing (Y) 5112305.09	Coordinate System Horizontal Datum NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SC/CL	Mix of black, brown, tan and yellow sand with clay, organic sand with clay and sandy clay with organic matter (roots and peat), chaotic appearance (very soft/very loose, moist) (fill)			
	1								
	2	1	%F				91	10	
	3								
	4	2	MC		OL	Black organic sandy clay, low plasticity (very soft, moist) (buried Peat Swamp Deposit)	193		
	5								
	6								Slight caving observed at 6 to 9 feet below ground surface
	7								
	8								
	9				WD	12-inch diameter log			
	10					Test pit completed at 10 feet on practical refusal on buried log			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth. Vertical approximated based on Google Earth.

Log of Test Pit TP-5

GeoEngineers

Project: Juniper Development
Project Location: Warrenton, Oregon
Project Number: 23773-003-00

Figure A-6
Sheet 1 of 1

Date Excavated 2/18/2020	Total Depth (ft) 10	Logged By JLL Checked By TNG	Excavator Sandridge Construction, LLC Equipment Link-belt 210LE TE Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Undetermined Vertical Datum NAVD88		Easting (X) 427444.89 Northing (Y) 5112345.95	Coordinate System NAD83 (feet) Horizontal Datum	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SP	Tan poorly graded fine to medium sand, massive (loose, moist) (Stabilized Dune Sand)			Severe caving observed at 0 feet
	1								
	2		1						
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10					Test pit completed at 10 feet below ground surface			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth. Vertical approximated based on Google Earth.

Log of Test Pit TP-6

GeoEngineers

Project: Juniper Development
Project Location: Warrenton, Oregon
Project Number: 23773-003-00

Figure A-7
Sheet 1 of 1

Date Excavated 2/18/2020	Total Depth (ft) 12	Logged By JLL Checked By TNG	Excavator Sandridge Construction, LLC Equipment Link-belt 210LE TE Excavator	Groundwater not observed See "Remarks" section for caving observed	
Surface Elevation (ft) Undetermined Vertical Datum NAVD88		Easting (X) 427423.01 Northing (Y) 5112318.82		Coordinate System NAD83 (feet) Horizontal Datum	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SP-SC	Brown and tan mix of clayey fine to medium sand with poorly graded sand, occasional wood fragments to 1 to 2 inches, concrete blocks to 3 feet (loose, moist) (fill)			Severe caving observed at 0 to 4 feet below ground surface
	1								
	2		1 %F				25	6	
	3								
	4								Contact depth varies. Approximately 4 feet below ground surface on the west side, and 9 feet below ground surface on the east side of the test pit. 4-inch-diameter, 4- to 5-foot long log
	5				SP	Tan poorly graded sand, massive (loose, moist) (Stabilized Dune Sand)			
	6								
	7								
	8								
	9								
	10		2						
	11								
	12								

Test pit completed at 12 feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth. Vertical approximated based on Google Earth.

Log of Test Pit TP-7

GeoEngineers

Project: Juniper Development
Project Location: Warrenton, Oregon
Project Number: 23773-003-00

Figure A-8
Sheet 1 of 1

Date Excavated 2/18/2020	Total Depth (ft) 12	Logged By JLL Checked By TNG	Excavator Sandridge Construction, LLC Equipment Link-belt 210LE TE Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Undetermined Vertical Datum NAVD88		Easting (X) 427424.98 Northing (Y) 5112292.4	Coordinate System NAD83 (feet) Horizontal Datum	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SP-SM	Brown poorly graded fine to medium sand with silt, trace metal, wood, asphalt and concrete debris (loose, moist) (fill)			
	1		1						
	2								
	3								
	4								
	5								12-inch log
	6								
	7								
	8								
	9				SP	Tan poorly graded fine to medium sand, massive (loose, moist) (Stabilized Dune Sand)			Severe caving observed at 9 to 12 feet below ground surface
	10								
	11								
	12					Test pit completed at 12 feet below ground surface			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth. Vertical approximated based on Google Earth.

Log of Test Pit TP-8

GeoEngineers

Project: Juniper Development
Project Location: Warrenton, Oregon
Project Number: 23773-003-00

Figure A-9
Sheet 1 of 1

Date Excavated 2/18/2020	Total Depth (ft) 11	Logged By JLL Checked By TNG	Excavator Sandridge Construction, LLC Equipment Link-belt 210LE TE Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Undetermined Vertical Datum NAVD88		Easting (X) 427395.01 Northing (Y) 5112318.56	Coordinate System NAD83 (feet) Horizontal Datum	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SP-SC	Brown poorly graded sand with clay and angular gravel (medium dense, moist) (fill)			
	1								
	2		1 %F				15	6	
	3								
	4				SP-SC	Light brown poorly graded fine to medium sand with clay (loose, moist) (Stabilized Dune Sand)			Severe caving observed at 4 to 8 feet below ground surface
	5								
	6								
	7		2 %F		SP	Grades to tan poorly graded fine to medium sand, massive (loose, moist)	8	1	
	8								
	9								
	10								
	11					Test pit completed at 11 feet below ground surface			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth. Vertical approximated based on Google Earth.

Log of Test Pit TP-9

GeoEngineers

Project: Juniper Development
Project Location: Warrenton, Oregon
Project Number: 23773-003-00

Figure A-10
Sheet 1 of 1

Date Excavated 2/18/2020	Total Depth (ft) 12.5	Logged By JLL Checked By TNG	Excavator Sandridge Construction, LLC Equipment Link-belt 210LE TE Excavator	Groundwater not observed See "Remarks" section for caving observed
Surface Elevation (ft) Undetermined Vertical Datum NAVD88		Easting (X) 427406.86 Northing (Y) 5112288.54	Coordinate System Horizontal Datum NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				SM	Brown silty fine sand with gravel and debris including concrete and asphalt chunks to 3 to 4 feet (loose, moist) (fill)			Severe caving observed at 0 to 12 feet below ground surface
	4				SP-SM	Brown poorly graded fine to medium sand with silt, trace debris (loose, most)			
	6		1		SC/CL	Gray clayey fine sand to sandy clay, trace roots and organic matter (very loose and very soft, moist to wet)			
	11		2		SP	Tan poorly graded fine to medium sand, massive (loose, moist) (Stabilized Dune Sand)			
	12					Test pit completed at 12½ feet below ground surface			

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Google Earth. Vertical approximated based on Google Earth.

Log of Test Pit TP-10

GeoEngineers

Project: Juniper Development
Project Location: Warrenton, Oregon
Project Number: 23773-003-00

Figure A-11
Sheet 1 of 1

APPENDIX B
Report Limitations and Guidelines for Use

APPENDIX B
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

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

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its reports. Please confer with GeoEngineers if you need to know more how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the proposed Juniper Development specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with Sandworks, Inc. dated December 4, 2019 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

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

This report has been prepared for the proposed Juniper Development in Warrenton, Oregon. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

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

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

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

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

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns Are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings Are Professional Opinions

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

Geotechnical Engineering Report Recommendations Are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the

explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable, but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

Contractors Are Responsible for Site Safety on Their Own Construction Projects

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

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

Recording Instrument #: 201709647
Recorded By: Clatsop County Clerk
# of Pages: 3 Fee: 57.00
Transaction date: 11/27/2017 09:40:12
Deputy: nstethem

AFTER RECORDING RETURN TO GRANTOR:
Clatsop County Property Management
820 Exchange, Suite 230
Astoria, OR 97103

GRANTEE:
Sandridge Construction LLC
15 NW 17th Place
Warrenton, OR 97146

QUITCLAIM DEED

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009 AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17 CHAPTER 855, OREGON LAWS 2009 AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010.

CLATSOP COUNTY, a political subdivision of the State of Oregon, Grantor, releases and quitclaims to **Sandridge Construction LLC, an Oregon Limited Liability Company,** Grantee, all of its right, title and interest, including mineral rights, if any, in that parcel of real property situated in Clatsop County State of Oregon, described as follows:

LEGAL: See Exhibit "A" attached hereto and incorporated herein by reference.

ASSESSOR'S ACCT. NO. 81021BC01200, 81021CB00400, 500, 600, 1500 and 81021CC00401
ACCT. ID No's. 30493, 30587, 30588, 30589, 30602 and 30607
SITUS ADDRESS: Vacant land off of Juniper Avenue in Warrenton

THIS PROPERTY IS SOLD "AS IS." CLATSOP COUNTY DOES NOT WARRANT TITLE TO BE FREE OF DEFECTS OR ENCUMBRANCES OR THAT FORECLOSURE PROCEEDINGS OR ANY OTHER PROCEEDING AUTHORIZING THE ACQUISITION, SALE OR TRANSFER OF THIS PROPERTY TO BE FREE OF DEFECTS. CLATSOP COUNTY ONLY SELLS AND CONVEYS SUCH TITLE, IF ANY, AS IT HAS ACQUIRED.

The true and actual consideration paid for this transfer stated in terms of dollars is **TWO HUNDRED FIVE THOUSAND ($205,000) DOLLARS.**

In construing this deed, where the context so requires, the singular includes the plural and all grammatical changes shall be made so that this deed shall apply equally to corporation and to individuals.

IN WITNESS WHEREOF, the grantor has executed this instrument this 8th day of November, 2017.

Scott Lee, Chair

STATE OF OREGON)
) ss.
County of Clatsop)

This Quitclaim Deed was acknowledged before me on this 8th day of November, 2017 by, Scott Lee as Chairperson of the Board of Commissioners for Clatsop County, a political subdivision of the State of Oregon.

OFFICIAL STAMP
THERESA DURSSE
NOTARY PUBLIC-OREGON
COMMISSION NO. 939717
MY COMMISSION EXPIRES JUNE 10, 2019

Theresa Dursse
NOTARY PUBLIC FOR OREGON
My Commission Expires: 6/10/19

UNTIL A CHANGE IS REQUESTED, ALL TAX STATEMENTS SHALL BE SENT TO THE FOLLOWING ADDRESS:

Sandridge Construction LLC
15 NW 17th Place
Warrenton, OR 97146

APPROVED AS TO FORM:

COUNTY COUNSEL

NOTICE OF PUBLIC HEARING

The Warrenton Planning Commission will conduct a public hearing at 6:00 PM, September 10, 2020, at the Warrenton City Hall, Commission Chambers to consider:

CUP 20-2, SDR 20-4, & VAR 20-1 Conditional Use Permit, Site Design Review, & Variance by Ryan Osburn for a new contractors office and warehouse on property located at 2219 SE Dolphin Avenue. This request will be reviewed under Warrenton Municipal Code sections 16.40 General Commercial Zone, Division 3 Design Standards, 16.220 Conditional Use Permit, 16.212 Site Design Review, 16.272 Variances, & 16.208.050 Type III Procedure (Quasi-Judicial Hearing). This hearing is continued from the Planning Commission's July 9 meeting.

SDR 20-05 and V20-04, Site Design Review and Variance for NW Natural Gas for a new regional service center on SE Dolphin Avenue, and a variance to the 6-foot maximum fence height to allow a 7-foot perimeter fence. The property is located at map/taxlot 8103402300, on the east side of SE Dolphin Avenue, immediately south of the Warrenton School District access road and north of the Oregon State Police facility. This request will be reviewed under Warrenton Municipal Code sections 16.60.040, I-1 General Industrial zone development standards; 16.120, Design Standards: Access & Circulation; 16.124, Design Standards: Landscaping, Street Trees, Fences, and Walls; 16.128, Design Standards: Vehicle & Bicycle Parking; 16.132, Design Standards: Clear Vision Areas; 16.136, Public Facilities Standards; 16.140, Stormwater & Surface Water Management Standards; 16.192, Large Scale Development; 16.212, Site Design Review Application & Review Procedures; 16.272 Variances; and 16.208.050 Type III Procedure (Quasi-Judicial Hearing).

SDR20-07, V20-02, V20-03, and SUB20-01, Site Design Review, Subdivision Preliminary Plat Approval for a 12-lot residential subdivision, and a variance to the minimum cut-slope setback and to the minimum toe-of-fill slope setback; all submitted by Gilbert Gramson. The subject property, taxlot 81021CB01599, is a 3.8 acre (approximately) parcel located on the east side of SW Juniper Avenue, approximately 1,000 feet north of SW 9th Street, and about 1,000 feet south of SW Kalmia Avenue. This request will be reviewed under the procedures, applicable standards and criteria in Warrenton Municipal Code 16.28 R10 zone; 16.112, Growth Management (GM) zone; 16.120 Access and Circulation; 16.124 Landscaping, Street Trees, Fences and Walls; 16.132 Clear Vision Areas;16.136 Public Facilities Standards; 16.140 Stormwater and Surface Water Management; 16.152, Grading, Excavating and Erosion Control Plans; 16.156 Wetland Development Standards; 16.188 Multi-family Housing Design Standards; 16.192, Large Scale Developments; 16.208.050 Type III Procedure -- Quasi-Judicial; 16.212 Site Design Review; 16.216 Land Divisions; and 16.272 Variances.

Anyone wishing to testify on any of these proposals may attend the public hearing and speak to the Planning Commission, or submit written materials, which must be received by the Warrenton Community and Economic Development Department no later than 5:00 P.M. on the day of the hearing. Written comments may be mailed to Mark Barnes, Community & Economic Development Department, P.O. Box 250, Warrenton Oregon, 97146-0250; or via email to cityplanner@ci.warrenton.or.us.

Anyone wishing to review and/or purchase copies of the proposals and/or staff report may do so at Warrenton City Hall, 225 South Main, or may contact Mark Barnes at 503-861-0920 or via email at cityplanner@ci.warrenton.or.us. The staff report will be available for review at no cost at least seven days before the hearing.

Published: The Columbia Press
Date: August 28, 2020

P.O. BOX 250 ▪ WARRENTON, OR 97146-0250 ▪ OFFICE: 503.861.2233 ▪ FAX: 503.861.2351

NOTICE OF PUBLIC HEARING

To: Adjacent Property Owners & Interested Parties

The Warrenton Planning Commission will hold a public hearing at 6:00 pm on Thursday, September 10, 2020, in the City Commission Chambers, Warrenton City Hall, 225 S Main Ave regarding land use application for a twelve-lot residential subdivision, site design review, and a variance the minimum cut-slope setback and to the minimum toe-of-fill slope setback; all submitted by Gilbert Gramson. The subject property is a 3.8 acre (approximately) parcel located on the east side of SW Juniper Avenue, approximately 1,000 feet north of SW 9th Street, and about 1,000 feet south of SW Kalmia Avenue. The property is across the street from 703 SW Juniper, and immediately south of 702 SW Juniper. The subject property consists of taxlot 81021CB01500.

This application will be reviewed under the procedures, applicable standards and criteria in Warrenton Municipal Code Chapter 16.28 R10 zone; 16.112, Growth Management (GM) zone; Chapter 16.120 Access and Circulation; Chapter 16.124 Landscaping, Street Trees, Fences and Walls; Chapter 16.132 Clear Vision Areas; Chapter 16.136 Public Facilities Standards; Chapter 16.140 Stormwater and Surface Water Management; Chapter 16.152, Grading, Excavating and Erosion Control Plans; Chapter 16.156 Wetland Development Standards; Chapter 16.188 Multi-family Housing Design Standards; Chapter 16.192, Large Scale Developments; Section 16.208.050 Type III Procedure -- Quasi-Judicial; Chapter 16.212 Site Design Review; Chapter 16.216 Land Divisions; and Chapter 16.272 Variances.

Anyone wishing to participate in the above-noted public hearing may present testimony orally at the public hearing, or submit written testimony, which must be received by the Warrenton Planning and Building Department no later than 4:00 P.M. on the day of the hearing. Written comments may be mailed to the Warrenton Community Development Department, P.O. Box 250, Warrenton Oregon, 97146-0250; or by email to cityplanner@ci.warrenton.or.us. Failure to raise an issue on the record in person or by letter before the close of the record at the public hearing, or failure to provide statements or evidence sufficient to afford the decision-making body an opportunity to respond to the issue, will preclude appeal to the City Commission based on that issue.

A staff report will be available seven days before the public hearing. Anyone wishing to review and/or purchase copies of the application and/or staff report may make an appointment to do so by contacting Mark Barnes, Interim City Planner, at 503.861.0920 or cityplanner@ci.warrenton.or.us.

Notice to mortgagee, lienholder, vendor, or seller: the Warrenton Development Code requires that if you receive this notice it shall be promptly forwarded to the purchaser.

Mark Barnes, Interim City Planner

8/20/2020

Date

Bandeen Lois E		697 SW Juniper Ave	Warrenton, OR 97146-9736
Bandeen Lois E		697 SW Juniper Ave	Warrenton, OR 97146-9736
Bigelow Elise C	Bigleow Elise C	703 SW Juniper Ave	Warrenton, OR 97146-9775
Leavitt Russell Ray	Leavitt Sarah Adrianne	PO Box 411PO Box 411	Warrenton, OR 97146
Martin Michael P/ Cheryl J		707 SW Juniper Ave	Warrenton, OR 97146-9775
Alvarez Manuel	Alvarez Janet	735 SW Juniper Ave	Warrenton, OR 97146-9775
Sandridge Construction LLC		15 NW 17th Pl	Warrenton, OR 97146
Larson Dean P/Evelind		90198 Lewis & Clark Rd	Astoria, OR 97103-8324
Larson Dean P/Evelind		90198 Lewis & Clark Rd	Astoria, OR 97103-8324
Orrell Frank/ Jody		702 SW Juniper Ave	Warrenton, OR 97146-9775
Larson Dean P/Evelind		90198 Lewis & Clark Rd	Astoria, OR 97103-8324
Krevanko Fred L	Krevanko Tracie M	580 SW Juniper Ave	Warrenton, OR 97146
Sandridge Construction LLC		15 NW 17th Pl	Warrenton, OR 97146
Clatsop County			,
Sandridge Construction LLC		15 NW 17th Pl	Warrenton, OR 97146
Clatsop County			,
			,
			,
Warrenton City Of			,