Earth Solutions NW LLC
Geotechnical Engineering, Construction
Observation/Testing and Environmental Services

October 23, 2020
ES-5559.03

Mr. Peter Chen
4709 Memory Lane West
University Place, Washington 98488

Subject: **Geotechnical Addendum – Response to Comments**
Proposed Sunset Pointe Residential Development
2301 – 23rd Street Southeast
Puyallup, Washington

Reference: Earth Solutions NW, LLC
Geotechnical Engineering Study
ES-5559, updated June 24, 2019

Earth Solutions NW, LLC
Response to Development Review Team Letter
ES-5559.01, dated October 31, 2018

CES NW, Inc.
Slope Exhibit

City of Puyallup Development Review Team (DRT) Letter
Dated November 21, 2019

Greetings, Mr. Chen:

At the request of CES NW, Inc., Earth Solutions NW, LLC (ESNW), has prepared this geotechnical addendum for the subject project. Our scope of services included project team discussions, subsurface exploration, infiltration testing, document review, and geotechnical engineering, of which were completed to address jurisdictional comments provided in the referenced DRT letter. This addendum letter has been structured to provide updated information with respect to project intentions and subsurface soil and groundwater conditions. Following this introductory narrative are ESNW response to the DRT letter comments.

Project Description

The site consists of one tax parcel (Pierce County Parcel No. 0420353027) totaling about 9.09 acres. The approximate site location is depicted on Plate 1 (Vicinity Map). Overall site topography consists of a central low area that trends roughly north to south, which likely represents a former, post-glacial drainage channel or similar geomorphological feature. We understand the project is pursing construction of a residential plat that will consist of 18 home building sites and infrastructure improvements. The lots will be located within the topographically higher areas, where gradients are gentler. Infiltration is considered infeasible from a geotechnical standpoint based on the conditions encountered during our various subsurface explorations and recent in-situ infiltration testing, and therefore, will not be pursued. As such, detention and targeted dispersion will likely be pursued for stormwater management.

Surface

The subject site was previously developed to some degree; as evidenced by remnant foundation elements and rubble fill present within the southern site area. The fill encountered across the site also suggests historic grade modifications which altered the natural topography. Current topographic conditions vary across the site, with some areas being relatively level (Lots 1 – 7 and 15 – 18). The remaining lots either partially or fully contain some slope features. Three pond areas which have been designated as wetlands (A-C) are present within the central low area of the site, effectively separating Lots 1 through 8 from the rest of the development. In total, about 30 feet of elevation change occurs within the confines of the property. However, no proposed lot area contains more than 22 feet of elevation change. The site is heavily vegetated with grass, brush, brambles, and tree growth.

Subsurface

ESNW previously performed three separate subsurface investigations at the site. The site investigations were performed on October 24, 2017, May 15, 2019, and January 22, 2020. Each exploration was conducted using equipment and an operator retained by our firm and completed to both classify soil and groundwater conditions as well as perform in-situ infiltration testing. Please refer to the test pit logs provided in Appendix A for a more detailed description of subsurface conditions. Representative soil samples collected at the test pit locations were analyzed in general accordance with both Unified Soil Classification System (USCS) and USDA methods and procedures.

It should be noted that TP-14 through TP-18 were performed in an area that is no longer included in the proposed development. As such, subsurface soil and groundwater conditions encountered at these locations are not directly relevant to the proposed development area.

Topsoil and Fill

Topsoil was encountered in the upper approximately 1 to 18 inches of existing grades. The topsoil was characterized by a dark brown color, the presence of fine organic material, and small root intrusions. Fill was observed at nine test pit locations and generally consisted of silty sand (with or without gravel), silt, and silt with sand. Near surface fill consisting of crushed to clean rock was encountered at TP-1, -2, and -202. Encountered fill was characterized as loose to medium dense and moist to wet condition extending in exposure depths from about 0.5 to 13 feet below the existing ground surface (bgs). We did not fully penetrate the fill at test pit locations TP-3 and TP-103.

Native Soil

Underlying topsoil and fill, the encountered native soils were generally considered representative of glacial drift deposits. In our opinion, the predominate native soil type should be considered silty sand with or without gravel and silt with varying fines percentages (USCS: SM and ML, respectively). However, areas and depositional lenses of poorly graded sand (USCS: SP) should be anticipated across the site. The native soils were typically encountered in a medium dense to dense and moist to wet condition extending to a maximum exploration depth of about 16 feet bgs.

Groundwater

Perched groundwater seepage was encountered at TP-4 during our fieldwork completed on October 24, 2017, and was exposed at a depth of about four feet bgs. The seepage flow was characterized as heavy at that time. Groundwater seepage was not encountered during our May 2019 or January 2020 exploration. Groundwater seepage zones are common within glacial deposits and may develop within permeable lens or atop denser deposits. Seepage rates and elevations can be influenced by precipitation duration/amounts, the time of year, and soil conditions.

Geologically Hazardous Areas

In preparation of this report, we reviewed applicable city of Puyallup mapping and geologically hazardous area code section 21.06. Our evaluation is as follows.

Landslide Hazard

As defined in Puyallup Municipal Code (PMC) 21.06.1210, landslide and erosion hazard areas include those identified by the U.S. Department of Agriculture Natural Resources Conservation Service as having a moderate to severe, severe, or very severe erosion hazard because of natural characteristics, including vegetative cover, soil texture, slope, gradient, and rainfall patterns, or human-induced changes to natural characteristics. Landslide and erosion hazard areas include areas with the following characteristics:

- Areas that have shown mass movement during the Holocene epoch (from 10,000 years ago to the present) or that are underlain or covered by mass wastage debris of that epoch;

- Slopes that are parallel or subparallel to planes of weakness (such as bedding planes, joint systems, and fault planes) in subsurface materials;

- Slopes having gradients steeper than 80 percent subject to rock fall during seismic shaking;

- Areas potentially unstable because of stream incision or stream bank erosion;

- Areas located in a canyon, ravine, or on an active alluvial fan, presently or potentially subject to inundation by debris flows or flooding;

- Any area with a slope of 40 percent or steeper and a vertical relief of 10 or more feet, except areas composed of consolidated rock and properly engineered manmade slopes/retained fill. A slope is delineated by establishing its toe and top and measured by averaging the inclination over at least 10 feet of vertical relief;

- Areas with a severe limitation for building development because of slope conditions, according to the Natural Resource Conservations Service, and;

- Areas meeting all three of the following criteria: (A) slopes steeper than 15 percent, except that slopes of less than 15 percent may be considered erosion hazard areas if they have certain unstable soil and drainage characteristics; (B) hillsides intersecting geologic contacts with a relatively permeable sediment overlying a relatively impermeable sediment or bedrock; and (C) wet season springs or ground water seepage.

Based on the conditions encountered during our subsurface explorations, review of available topographic information, and review of the referenced slope schematic, it appears that the majority of the proposed home building sites do not contain a landslide hazard, as defined by the PMC. Although there are areas onsite which do contain slope gradients of 40 percent or more, these are generally less than 10 feet in height and therefore do not meet the definition of a landslide hazard per PMC code. Slopes which do extend above 10 feet in elevation change appear to primarily be within tract areas. However, it does appear that Lots 10 and 15 either partially contain, or are directly adjacent to, a slope which may be characterized as a landslide hazard.

PMC 21.06.1240.1a.iii, suggests that a buffer equal to the height of the slope (H) divided by 2 be applied for slopes with a vertical elevation of more than 10 feet but less than 25 feet, regardless of slope percent provided that no other factors are present that pose a slope stability risk. Based on our review of the referenced scope schematic, this code consideration would be applicable to Lots 10 and 15. However, this code section does acknowledge the buffer may be waived for isolated slopes that are limited in extent and predominately less than 10 feet in height. Given the limited and isolated occurrences of the sloping areas that meet the PMC definition of a landslide hazard area (40 percent gradient), it is our opinion these slopes not be considered a regulated hazard and meet the criteria for an exemption, as allowed within PMC 21.06.1240.1a.iii. Although lot grading plans have yet to be developed, it is our opinion that general mass grading will allow for the removal of unsuitable soil (native or fill) and restoration with suitable structural fill, where necessary. In our opinion, the proposed development provides an opportunity for general improvements to soil stability and the site hydrologic regime. Although the PMC suggests that minimizing alterations to existing slope features is preferred over mass grading, it may be considered advantageous for both structural support and soil stability characteristics to alter areas/slopes that contain unsuitable soils and install improved drainage measures. Slope fills (placed in accordance with this report) as well as the use of retaining walls to achieve design grades may also be considered feasible from a geotechnical standpoint.

The PMC also characterizes landslide hazards as areas that have a combination of slopes more than 15 percent, that have permeable soils overlying impermeable soils, and wet season springs and groundwater seepage. The majority of the proposed development area is relatively level to gently sloping. There are areas of the site that do exceed 15 percent, however, based on our exploration, the majority of these areas do not meet the additional soil and groundwater requisite conditions to be considered a landslide hazard.

One area of seepage was identified during our subsurface explorations (TP-4, October 24, 2017). In this respect, the seepage zone is considered isolated, rather than a pervasive or chronic site condition. It is possible for groundwater seepage zones to develop elsewhere on site but will likely be seasonal and a result of yearly rainfall totals. From a stability standpoint, the development of a seepage zone is not considered a direct indication of instability, but rather the natural lateral migration of subsurface water. We understand stormwater flows will be managed with a detention vault in conjunction with individual lot dispersion devices, where feasible. In this regard, surface water and erosion that may impact adjacent properties either during or post construction will be adequately mitigated. Where encountered during construction, seepage zones can adequately be mitigated via passive drainage elements and Best Management Practice (BMPs) measures.

In general, the development areas of the site do not contain a landslide hazard. Although some sites area may meet the PMC criteria for landslide hazard, they are isolated and limited occurrence, which meets the requirements for an exemption per PMC 21.06.1240.1a.iii. In our opinion, the site does not contain a hazard that would preclude successful development. However, remediation of unsuitable existing soils and groundwater drainage improvements will likely be necessary to assist in maintaining or improving post-construction soil stability. As such, ESNW should be present during construction activities to help identify areas of unsuitable soil and groundwater seepage and provide such mitigation recommendations. From a geotechnical standpoint, provided the recommendations of the referenced report and those contained within this letter are incorporated into the project designs, it is our opinion, based on our understanding of the current scope, the project can be developed as is currently proposed.

Erosion Hazard

As delineated in Puyallup Municipal Code (PMC) 21.06.1210, erosion hazard areas include those identified by the U.S. Department of Agriculture Natural Resources Conservation Service as having a moderate to severe, severe, or very severe erosion hazard because of natural characteristics, including vegetative cover, soil texture, slope, gradient, and rainfall patterns, or human-induced changes to natural characteristics.

Site soils are considered to have moderate to severe erosion potential when exposed to precipitation. In our opinion, provided appropriate temporary and permanent erosion and sediment control (ESC) measures are incorporated into final designs, the potential for erosion will remain low both during and after construction. Site BMPs and other means of sediment and surface flow control measures should be actively maintained during construction to ensure proper performance and functions.

Provided the above recommendations and considerations are include with the construction plan and sequence, it is our opinion that the proposed development will not adversely affect soil stability on adjacent properties.

Please note that our evaluation and corresponding lot recommendations are based on plans and site layouts made available to ESNW during report preparation. If site layout plans change, ESNW should be notified to provide updated recommendations.

Response to Comments

As requested, ESNW has prepared the following sections in response to the referenced DRT letter issued by the City of Puyallup.

Planning Review – Page 2 of 11

City Comment 5 – In a separate memo from your Geotech, please address the site development and the standards of PMC 21.06.1230.2(A-F).

PMC 21.06.1230.2.a. The proposed development shall not decrease the factor of safety for landslide occurrences below the limits of 1.5 for static conditions and 1.2 for dynamic conditions. Analysis of dynamic conditions shall be based on a minimum horizontal acceleration as established by the current version of the International Building Code.

ESNW Response – We understand that grading plans for the proposed roadway have been developed; however, mass/lot grading plans will not be completed until the time of construction. ESNW can provide stability analyses once plans have been developed. However, as stated above in our landslide hazard evaluation, the proposed development provides an opportunity for general improvements to soil stability and the site hydrologic regime through removal or unsuitable soils, engineered fills, and drainage improvements. In general, these are considered advantageous for soil stability.

PMC 21.06.1230.2.b. The alteration will not increase the threat of the geological hazard to the project site or adjacent properties beyond predevelopment conditions, nor shall it result in the need for increased buffers on neighboring properties.

ESNW Response – As with similar residential developments, the proposed construction will include drainage improvements, stormwater management systems, and earthwork activities, will likely include engineered slope and structural fill placement and compaction. As such, it is our opinion that site stability characteristics will not be adversely affected by the proposed project. Additionally, it is our opinion the proposed project will not result in the need for increased buffers on adjacent properties.

PMC 21.06.1230.2.c. The development will not increase or concentrate surface water discharge or sedimentation to adjacent sites beyond predevelopment conditions.

ESNW Response – Temporary erosion control measures and best management practices (BMPs) will be used during construction. Provided they are adequately maintained, they should provide sufficient mitigation for control of surface water flows and potential sediment migration. Post construction, the stormwater management system will provide surface water flow control while permanent landscaping will help prevent sediment migration.

PMC 21.06.1230.2.d. Structures and improvements shall be located to minimize alterations to the natural contour of the slope and foundations shall be tiered where possible to conform to existing topography.

ESNW Response – Where feasible, foundations should be stepped to follow existing contours to minimize alteration to the existing topography. It is also our opinion that the use of engineered retaining walls and fill slopes (constructed in accordance with our referenced report) are also a feasible means of establishing design grades.

PMC 21.06.1230.2.e. The use of engineered retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes. Engineered retaining walls shall not exceed 15 feet in height and preferably should be less than eight feet in height. Riprap retaining walls should not exceed eight feet in height. Wherever possible, retaining walls should be designed as structural elements of the building foundation.

ESNW Response – The use of mechanically stabilized earth (MSE) walls are considered feasible for the project. ESNW can provide MSE wall designs and supporting calculations, upon request.

PMC 21.06.1230.2.f. Development shall be designed to minimize impervious lot coverage. Use of common access drives and utility corridors is encouraged.

ESNW Response – Geotechnical response not applicable.

Engineering Review – Page 4 of 11

City Comment 2 – The city will require the applicant to depict the toe of the slope on the Kodiac estates. If site access cannot be grained, Lidar contours may be used to supplement survey information. The critical area report must individually address performance standards from PMC 21.06.1230. As part of this, the geotechnical engineer must specifically address impacts to adjacent properties.

ESNW Response – We have provided a response to the comment (PMC 21.06.1230.2) in the above section. The response was prepared using information and site design available to us.

City Comment 5 – Small-scale PIT tests and continuous seasonal high groundwater monitoring in accordance with the 2014 DOE manual will be required prior to approval of the preliminary plat.

ESNW Response – ESNW performed two small-scale PIT tests on January 22, 2020. The locations of the PITs are depicted on the attached Plate 2 and are denoted as TP-201 and TP-202. The testing was intended to provide a general determination of site infiltration feasibility given that our previous recommendation that the site not pursue infiltration. The PITs were performed at a depth of about four feet bgs within undisturbed native soils. At this depth silt (USCS: ML) was encountered at each testing location. At the time of our testing, a measured rate of zero (0) inches per hour (iph) was recorded during the soak.

In accordance with our previous evaluations, infiltration is not considered feasible for the proposed project. Although areas of sand were locally encountered, they are not prevalent enough to be considered a feasible targeted media that would facilitate infiltration. In addition, the measured rate of 0 iph from our January 2020 testing further suggests the infeasibly of site soils to be used for infiltration purposes. As such, infiltration is not considered feasible from a geotechnical standpoint.

Geotechnical/Critical Areas Assessment/Stormwater Report Review – Page 5 of 11

City Comment 1 – The 06/2019 geotechnical report appears to have a different lot numbering than the civil plans. Please update so that both the plans and report have the same lot numbering. Further, the body of the geotechnical report appears to be referencing a different lot numbering than the report exhibit. Specifically, the updated geotechnical report states that lots 9, 10, and 15 meet the landslide hazard criteria of having slopes greater than 40 percent with at least 10 feet of vertical elevation relief, yet these lots do not appear to meet that criteria. Please verify.

ESNW Response – The attached Plate 2 reflects the current site layout designs and lot numbering. The reference slope schematic provided to us had been generated to display slopes of 40 percent or greater located on site. In general, slopes of 40 percent or greater are confined within wetland or tract areas and will largely not be disturbed as part of site development activities. However, minor areas of 40 percent or greater slopes that extend 10 or more vertical feet have been shown to be partially within or extend onto Lots 10 and 15. However, given the limited extent and isolated occurrence, it is our opinion these areas may pursue an exemption in accordance with PMC 21.06.1240.1a.iii.

City Comment 2 – The geotechnical study does not include any infiltration testing to support its claim that infiltration is infeasible. In addition, other than the heavy perched groundwater seepage observed in TP-4, the report offers little discussion on the expected groundwater conditions. Evidence of iron oxide staining in many test pits along with Habitat Technologies observation of "numerous groundwater seeps" and fully "fully saturated conditions" in their site reconnaissance suggests that there is more to elaborate on with regards to groundwater. Prior to preliminary plat approval, we weather infiltration and groundwater testing in accordance with the 2012 SWMMWW will be require to support stormwater feasibility/infeasibility.

ESNW Response – ESNW performed two small PIT tests on January 22, 2020. The locations of the PITs are depicted on the attached Plate 2 and are denoted as TP-201 and TP-202. Because infiltration has not been proposed and no designs were produced, the testing was intended to provide a general determination of site infiltration feasibility. The PITs were performed at a depth of about four feet bgs within undisturbed native soil. Silt (USCS: ML) was encountered at the testing depth at each location. At the time of our testing, a measured rate of zero (0) inches per hour (iph) was recorded during the soak. At that time the testing was terminated, given the measured rate of 0 iph.

In accordance with our previous evaluations, infiltration is not considered feasible for the proposed project. Although areas of sand were locally encountered, they are not prevalent enough to be considered representative of the overall site conditions or a feasible targeted media that would facilitate infiltration. In addition, the measured rate of 0 iph from our January 2020 testing further indicates the infeasibly of site soils to be used for infiltration purposes. As such, infiltration is not considered feasible from a geotechnical standpoint.

Groundwater seepage was only encountered at TP-4 during our October 2017 exploration. Perched groundwater seepage is common within glacially deposited sediments. The presence and flow rate of a perched seepage zone can depend precipitation duration and amounts, the time of year, and soil types present within the substratum. In this respect, it can be difficult to determine when and where a perched seepage may develop. Although iron oxide staining was encountered at various test pit locations, the presence is not a clear and accurate indication of current site groundwater conditions.

City Comment 3 – The geotechnical study does not address the presence of wetland and perennial streams on-site. Please include a brief description of these features and their impacts on the site soils, if applicable.

ESNW Response – Three wetland areas have been identified on site (by others) and largely occupy the entire central site area within a local depression. Because these areas are largely outside the proposed development envelope, we do not anticipate they will have an impact on site soils within the proposed development envelope.

City Comment 5 – The landslide hazard discussion for lots 12 and 13 appear to be commenting on the existing slope and not the proposed 2:1, 20 foot plus slope at the southern sides of lots 13 through 17, 7, and 8. Further, the discussion does not address the heavy perched groundwater found near TP-4 near proposed lot 14 or the presence of loose to medium dense soils atop dense silts and the impact of development on these soils. Applicant will not be permitted to increase the height and slopes of the landslide hazard area as currently depicted.

ESNW Response – The above comment appears to be in reference to a different site layout than what has been currently provided to ESNW. In any respect, 2H:1V engineered slopes are considered feasible if constructed in accordance with the recommendations provided in the referenced report and as recommended by ESNW at the time of construction. Where significant groundwater seepage is encountered during slopes construction, additional drainage measures may be recommended at that time. Areas of existing fill may require reworking (e.g. removal and replacement) to establish competent conditions for foundation or fill slope construction.

ESNW should have an opportunity to review final project plans with respect to the geotechnical recommendations provided in this letter. ESNW should also be retained to provide testing, observation, and other consultation services during construction.

We trust this addendum meets your current needs. If you have any questions regarding the content of this letter, or require additional information, please call.

Sincerely,

EARTH SOLUTIONS NW, LLC

10/23/2020

Chase G. Halsen

Chase G. Halsen, L.G.
Project Geologist

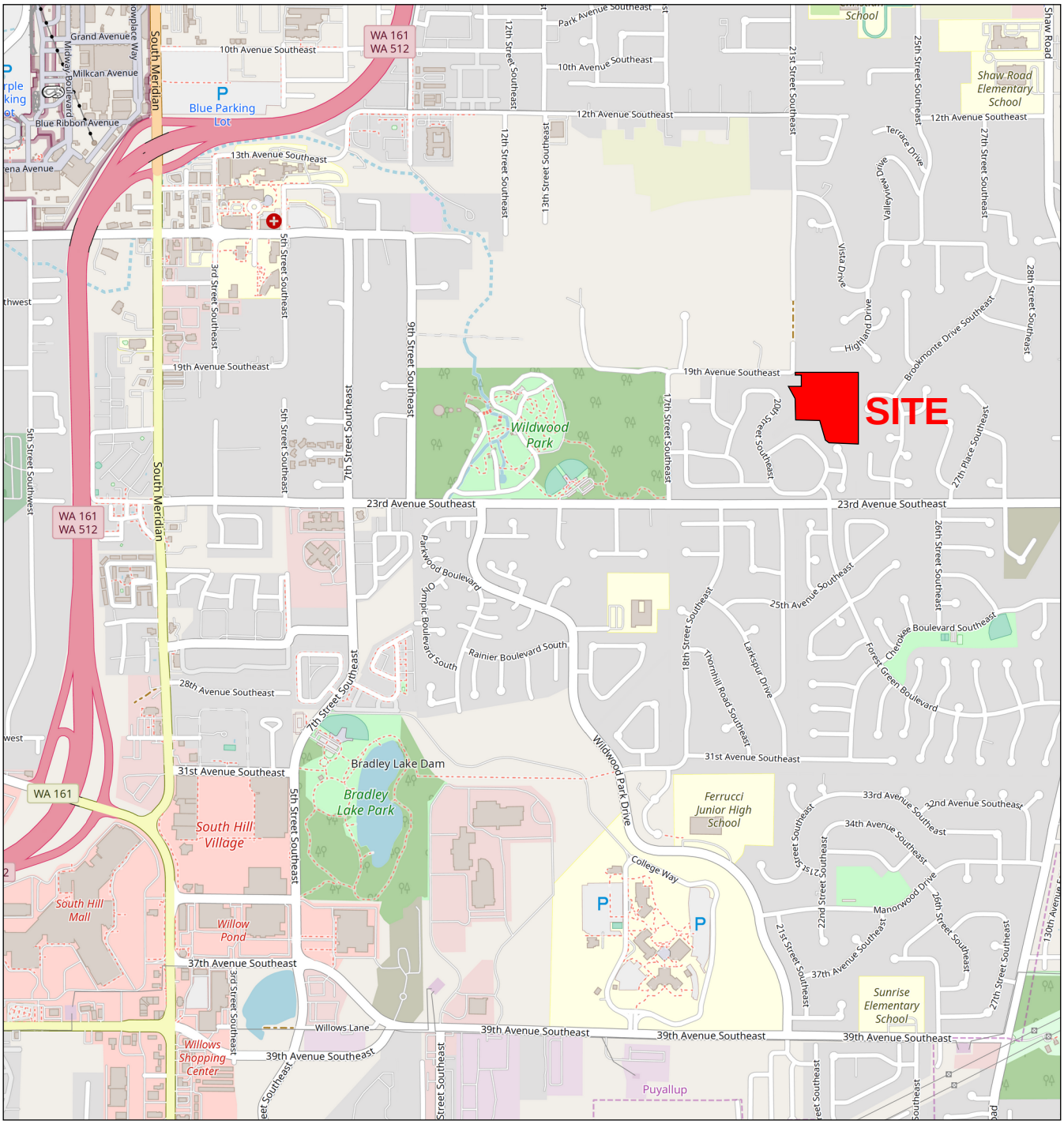
Scott S. Riegel, L.G., L.E.G.
Senior Project Manager

10/23/2020

Raymond A. Coglas, P.E.
Principal Engineer

Attachments: Plate 1 – Vicinity Map
Plate 2 – Test Pit Location Plan
Test Pit Logs
Grain Size Distribution

cc: CES NW, Inc.
Attention: Mr. Fred Brown, P.E. (Email only)



Reference:
Pierce County, Washington
OpenStreetMap.org

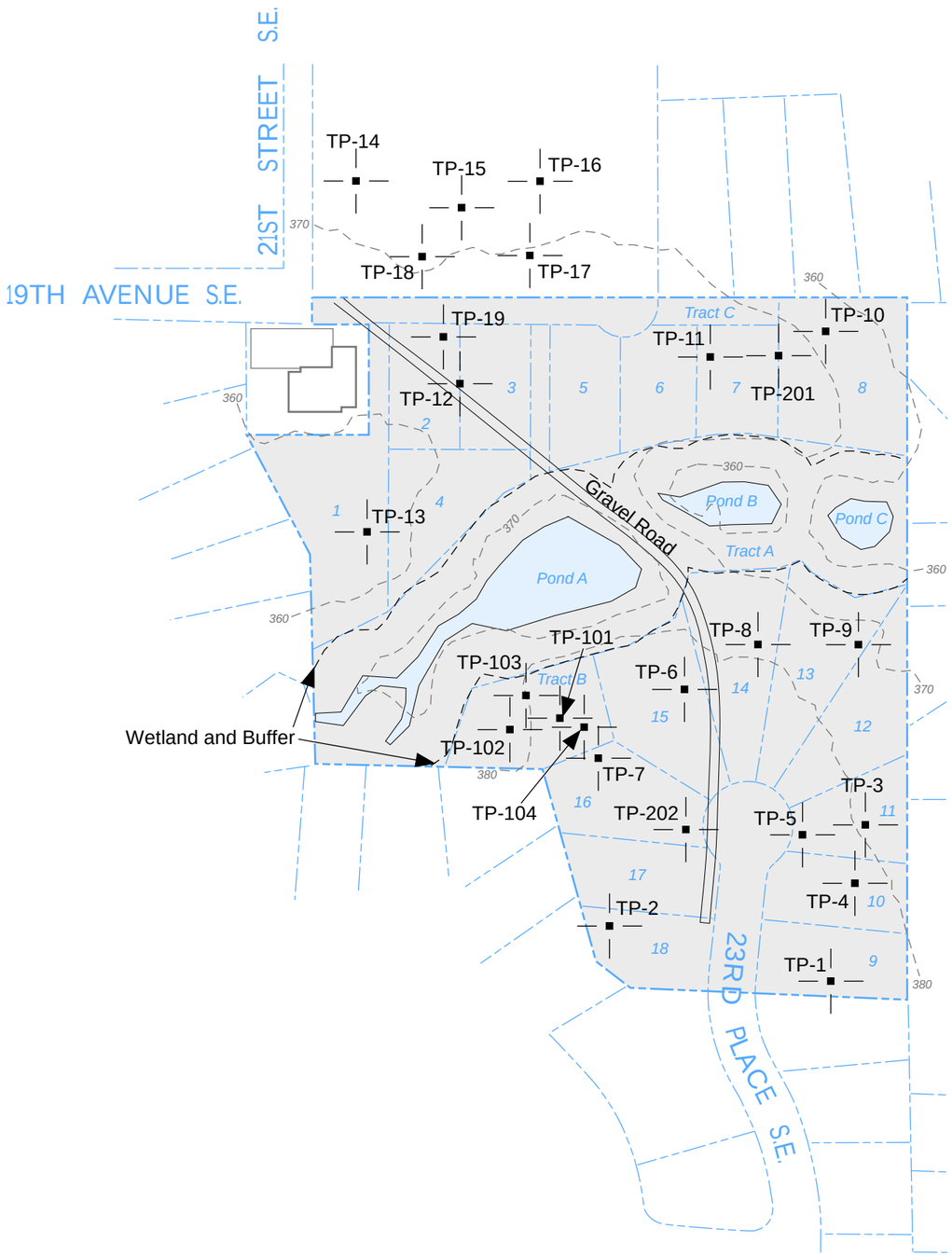
NOTE: This plate may contain areas of color. ESNW cannot be responsible for any subsequent misinterpretation of the information resulting from black & white reproductions of this plate.

Earth Solutions NW LLC

Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Vicinity Map
Sunset Pointe
Puyallup, Washington

Drwn. CAM	Date 02/21/2020	Proj. No. 5559.03
Checked CGH	Date Feb. 2020	Plate 1



LEGEND

TP-201 — Approximate Location of ESNW Test Pit, Proj. No. ES-5559.03, Jan. 2020

TP-101 — Approximate Location of ESNW Test Pit, Proj. No. ES-5559, May 2019

TP-1 — Approximate Location of ESNW Test Pit, Proj No. ES-5559, Oct. 2017

Subject Site

Existing Building

10 — Proposed Lot Number

NORTH

1"=150'

0 75 150

Scale in Feet

NOTE: The graphics shown on this plate are not intended for design purposes or precise scale measurements, but only to illustrate the approximate test locations relative to the approximate locations of existing and / or proposed site features. The information illustrated is largely based on data provided by the client at the time of our study. ESNW cannot be responsible for subsequent design changes or interpretation of the data by others.

NOTE: This plate may contain areas of color. ESNW cannot be responsible for any subsequent misinterpretation of the information resulting from black & white reproductions of this plate.

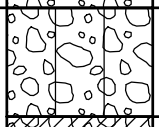
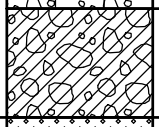
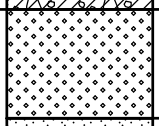
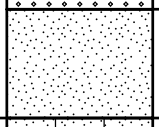
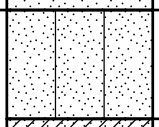
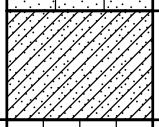
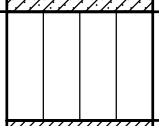
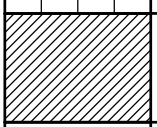
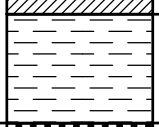
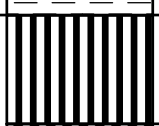
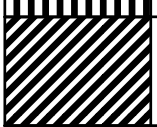
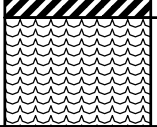
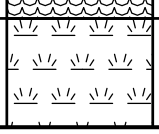
Test Pit Location Plan
Sunset Pointe
Puyallup, Washington

Earth Solutions NW LLC
Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Drwn. By	CAM
Checked By	CGH
Date	02/21/2020
Proj. No.	5559.03
Plate	2

Earth Solutions NW LLC

SOIL CLASSIFICATION CHART

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

DUAL SYMBOLS are used to indicate borderline soil classifications.

The discussion in the text of this report is necessary for a proper understanding of the nature of the material presented in the attached logs.

Earth Solutions NW, LLC
15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-201

PROJECT NUMBER ES-5559.03 **PROJECT NAME** Sunset Pointe

DATE STARTED 1/22/20 **COMPLETED** 1/22/20 **GROUND ELEVATION** 374 ft **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** SSR **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 6": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION	
0			TPSL		0.5	Dark brown TOPSOIL, root intrusions to 1'	373.5
		MC = 20.7%	ML			Tan SILT, medium dense, moist to wet -mottled texture	
		MC = 32.6% Fines = 88.9%			4.5	[USDA Classification: LOAM]	369.5
5		MC = 15.1%	SP		6.0	Gray poorly graded SAND, dense, moist to wet -heavy iron oxide staining at contact, light groundwater seepage at 6'	368.0
		MC = 30.7%	ML			Gray SILT with sand, dense, moist to wet -minor iron oxide staining throughout	
		MC = 30.5% Fines = 78.7%			8.0	[USDA Classification: slightly gravelly LOAM]	366.0
						Test pit terminated at 8.0 feet below existing grade. Groundwater seepage encountered at 6.0 feet during excavation. No caving observed.	

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Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-202

PROJECT NUMBER ES-5559.03 **PROJECT NAME** Sunset Pointe

DATE STARTED 1/22/20 **COMPLETED** 1/22/20 **GROUND ELEVATION** 388 ft **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** SSR **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 6": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION	
0			TPSL		0.5	Dark brown TOPSOIL, root intrusions to 6"	387.5
			FILL		1.5	Crushed rock (Fill) -light perched groundwater seepage	386.5
		MC = 31.9%	SM		2.7	Tan silty SAND, medium dense, moist ~<8" sand lens	385.3
		MC = 19.4% Fines = 58.7% MC = 31.8%	ML		4.5	Tan sandy SILT, dense, moist -becomes gray [USDA Classification: slightly gravelly LOAM]	383.5
5			SM			Gray silty SAND, dense, moist -light iron oxide staining -increased sand content	
		MC = 13.3% Fines = 39.9%			8.0	[USDA Classification: slightly gravelly fine sandy LOAM]	380.0

Test pit terminated at 8.0 feet below existing grade. Groundwater seepage encountered at 1.0 foot during excavation. No caving observed.

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15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-101

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 5/15/19 **COMPLETED** 5/19/19 **GROUND ELEVATION** 383 ft **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** SSR **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 12": heavy bramble **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0			TPSL		Dark brown TOPSOIL, root intrusions to 12"	
					1.0	382.0
		MC = 13.8%	SM		Gray silty SAND with gravel, dense, moist (Fill)	
5					-sand lens ~12" thick	
		MC = 20.0%			5.5	377.5
			ML		Gray SILT, medium dense, moist (Fill)	
10		MC = 27.3% Fines = 90.0%			-becomes brown, increased fines [USDA Classification: slightly gravelly LOAM]	
					13.0	370.0
		MC = 31.9% Fines = 95.8%	ML		Tan SILT, medium dense, wet [USDA Classification: LOAM]	
15					15.0	368.0
		MC = 35.3%	SM		Tan silty SAND, medium dense, wet to saturated -minor iron oxide staining -sand lens 6"- 12" thick	
		MC = 28.5%			18.0	365.0
					Test pit terminated at 18.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.	

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15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-102

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 5/15/19 **COMPLETED** 5/15/19 **GROUND ELEVATION** 376 ft **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** SSR **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 12": heavy bramble **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0			TPSL		Dark brown TOPSOIL, root intrusions to 2.25'	
				1.0		375.0
			SM		Brown silty SAND, loose, moist	
				2.5		373.5
		MC = 25.4% Fines = 98.3%			Gray SILT, dense, moist [USDA Classification: LOAM] -heavy iron oxide staining	
5						
		MC = 32.0% Fines = 92.5%	ML		-becomes brown, wet [USDA Classification: LOAM]	
					-becomes wet to saturated	
		MC = 35.2%		9.5		366.5
					Test pit terminated at 9.5 feet below existing grade. No groundwater encountered during excavation. No caving observed.	

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15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-103

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 5/15/19 **COMPLETED** 5/15/19 **GROUND ELEVATION** 384 ft **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** SSR **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 8": heavy bush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0			TPSL		Dark brown TOPSOIL, root intrusions to 6.25' (Fill)	
				0.6		383.4
					Gray silty SAND with gravel, medium dense to dense, moist (Fill)	
					-asphalt debris	
		MC = 11.3%				
5			SM			
		MC = 10.4%				
					-increased sand content	
					-erratic silt interbeds	
		MC = 11.7%				
10						
		MC = 20.2%		11.0		373.0

Test pit terminated at 11.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

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Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-104

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 5/15/19 **COMPLETED** 5/15/19 **GROUND ELEVATION** 383 ft **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** SSR **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 8": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0			TPSL		Dark brown TOPSOIL, root intrusions to 12"	
				0.6		382.4
					Gray silty SAND with gravel, medium dense to dense, moist	
		MC = 19.9%	SM		-becomes brown -becomes gray	
5		MC = 23.5%		5.0	-heavy iron oxide staining	378.0
					Gray SILT, loose, moist to wet	
			ML		-becomes brown, wet	
10						
		MC = 29.8% Fines = 93.5%		11.0	[USDA Classification: LOAM]	372.0
					Test pit terminated at 11.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.	

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15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-1

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil &Sod 1"- 3": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION
0			Rock		0.5	Crushed Rock (Fill)
			ML		1.0	Brown SILT, loose, moist
						Brown poorly graded SAND with silt, medium dense, moist
		MC = 7.4% Fines = 6.2%				[USDA Classification: slightly gravelly SAND]
						-increased gravel content
5			SP-SM			-becomes medium dense to dense
		MC = 4.4%				
						-increased cobbles
		MC = 7.4%			9.0	

Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

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Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-2

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 4": brush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL		0.3 Dark brown TOPSOIL (Fill), root intrusions to 7'
			Fill		1.0 Clean washed ROCK (Fill)
					Brown/tan sandy SILT, medium dense, moist
					-light iron oxide staining 2'- 4'
		MC = 21.6%	ML		
5					5.0
			SP		Gray poorly graded SAND, medium dense to dense, moist
		MC = 9.5%			6.5
			ML		Tan sandy SILT, dense, moist
					8.0
			SP		Gray poorly graded SAND with gravel, dense, moist
		MC = 4.8%			9.0 -caving caused by excavation activities

Test pit terminated at 9.0 feet below existing grade. No groundwater seepage encountered during excavation. Caving observed from 6.0 to 6.5 feet and 8.0 feet to BOH.

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Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-3

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 18": brush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL		Dark brown TOPSOIL (Fill), intrusions to 7'
				1.5	Gray silty SAND with gravel, medium dense, moist (Fill)
		MC = 8.9%			-clean washed rock ~4" thick
					-becomes brown dense
			SM		
5		MC = 8.1% Fines = 15.9%			[USDA Classification: very gravelly loamy SAND]
				7.0	
			ML		Gray SILT with sand, medium dense, moist (Fill)
		MC = 19.2%		9.0	
					Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

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15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-4

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe
DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____
EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**
EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---
LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---
NOTES Depth of Topsoil & Sod 2": brush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Brown silty SAND, loose to medium dense, moist (Fill)
					-root intrusions to 9'
			SM		-heavy perched groundwater seepage
5					
		MC = 12.3%			7.0
					Gray SILT with sand, loose to medium dense, wet (Fill)
					-trace organics
					-light iron oxide staining
			ML		
10		MC = 19.3%			
		MC = 22.1%			12.0
					Brown sandy SILT, dense, moist
					-light iron oxide staining
			ML		
15		MC = 27.4%			15.0
					Test pit terminated at 15.0 feet below existing grade. Groundwater encountered seepage encountered at 4.0 feet during excavation. Caving observed from 0.0 to 9.0 feet.

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Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-5

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 12": brush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL		Dark brown TOPSOIL, root intrusions to 3'
				1.0	
					Brown silty SAND, medium dense, moist
		MC = 7.2%			-becomes tan, damp to moist
5			SM		
					-becomes dense
		MC = 20.9%			-light iron oxide staining
					-becomes gray, very dense
					-moderate cementation, light iron oxide staining
		MC = 12.4%		9.5	
					Test pit terminated at 9.5 feet below existing grade. No groundwater encountered during excavation. No caving observed.

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Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-6

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 2"- 4": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					
			SM		Brown silty SAND, medium dense, moist (Fill)
					-root intrusions to 7'
				2.0	
					Relic TOPSOIL Horizon
				2.5	
					Brown sandy SILT, medium dense, moist (Fill)
					-minor brick debris
		MC = 20.5%			-becomes gray
5			ML		
				8.0	
					Brown poorly graded SAND, dense, moist
		MC = 10.0%			-light iron oxide staining
10			SP		
				12.0	-becomes wet to saturated
		MC = 31.7%			
					Test pit terminated at 12.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

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Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-7

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 6"- 8": brush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL	0.5	Dark brown TOPSOIL, root intrusions to 7'
					Brown silty SAND, loose to medium dense, moist
		MC = 9.5%			-light to moderate iron staining
					-becomes gray, very dense
5			SM		
				9.0	-becomes wet
		MC = 18.0%			Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

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Fax: 425-449-4711

TEST PIT NUMBER TP-8

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 4": brush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL	0.5	Dark brown TOPSOIL, root intrusions to 5'
					Brown silty SAND, medium dense, moist
		MC = 16.3%	SM		-becomes gray, dense
5					
		MC = 17.8%		8.0	
			SP	9.0	Gray poorly graded SAND, dense, moist
		MC = 3.2%			Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

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Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-9

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 4": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL		Dark brown TOPSOIL, root intrusions to 3'
				0.5	Brown SILT with sand, medium dense to dense, moist
		MC = 21.7% Fines = 81.2%	ML		[USDA Classification: LOAM] -becomes gray -light iron oxide staining
5				6.0	
			SP	6.5	Gray poorly graded SAND, dense, moist
		MC = 3.9%			Test pit terminated at 6.5 feet below existing grade. No groundwater encountered during excavation. No caving observed.

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Redmond, Washington 98052
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Fax: 425-449-4711

TEST PIT NUMBER TP-10

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 2": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			SM		Gray silty SAND, medium dense, moist (Fill)
					-root intrusions to 3.5'
				2.0	
			TPSL	2.5	Relic TOPSOIL Horizon
		MC = 12.4%			Brown silty SAND, medium dense, moist
					-becomes gray, dense
5					
		MC = 18.7%	SM		
		MC = 8.9%		9.0	

Test pit terminated at 9.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

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15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-11

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 6": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL		Dark brown TOPSOIL, root intrusions to 4'
0.5					Tan silty SAND, medium dense, moist
					-moderate iron oxide staining to 4'
		MC = 21.1%			
5		MC = 20.1%	SM		-intermittent light iron oxide staining
					-becomes dense
10		MC = 16.0%			
10.0					Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

Earth Solutions NW, LLC
15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
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TEST PIT NUMBER TP-12

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 2": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Brown sandy SILT, medium dense, moist
					-root intrusions to 3'
			ML		-becomes gray
		MC = 15.2% Fines = 60.2%			[USDA Classification: LOAM]
5					
		MC = 17.3%			6.0

Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

Earth Solutions NW, LLC
15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-13

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 4": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Brown sandy SILT, loose to medium dense, moist
		MC = 27.3%			
5			ML		-becomes gray
		MC = 23.9%			
					9.5
10		MC = 16.0%	SP		10.0 Gray poorly graded SAND with gravel, dense, wet

Test pit terminated at 10.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

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Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-14

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 6"- 8": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL	0.5	Dark brown TOPSOIL, root intrusions to 3'
					Brown silty SAND, loose to medium dense, moist
		MC = 15.2%			
			SM		-becomes gray, medium dense
					-light iron oxide staining
5					
		MC = 7.1%		7.0	
					Gray poorly graded SAND, dense, moist
			SP		
10		MC = 12.5%		10.0	
					Brown silty SAND, dense, moist
			SM		
		MC = 9.0%		12.0	
					Test pit terminated at 12.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

Earth Solutions NW, LLC
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Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-15

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Surface Conditions: brush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Brown silty SAND, loose, moist (Fill) -trace to moderate organics throughout -root intrusions to 12'
		MC = 18.9%			
5			SM		
10		MC = 91.3% Fines = 79.0%			[USDA Classification: gravelly loamy coarse SAND] -becomes wet
15				15.5	
		MC = 28.6%	ML	16.0	Gray sandy SILT, medium dense, moist
					Test pit terminated at 16.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

Earth Solutions NW, LLC
15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-16

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Surface Conditions: brush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Dark brown silty SAND, loose, wet
					-root intrusions to 3'
		MC = 30.8%	SM		
5		MC = 16.5%			-becomes brown, medium dense, moist
		MC = 7.9%		6.0	-becomes gray
					Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

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15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-17

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 4": brush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Brown silty SAND, loose, wet (Fill)
					-root intrusions to 7'
		MC = 24.1%	SM		
5					
					7.0
			SM		Tan silty SAND, medium dense, moist
		MC = 6.3%			7.5

Test pit terminated at 7.5 feet below existing grade. No groundwater encountered during excavation. No caving observed.

Earth Solutions NW, LLC
15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-18

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 2"- 3": brush **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Brown silty SAND, loose, moist (Fill)
					-root intrusions to 3'
		MC = 14.9%	SM		
					-wire debris
5				5.0	
			SM		Tan silty SAND, medium dense, moist
		MC = 6.3%		6.0	

Test pit terminated at 6.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

Earth Solutions NW, LLC
15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-19

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe

DATE STARTED 10/24/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** _____ **TEST PIT SIZE** _____

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD _____ **AT TIME OF EXCAVATION** ---

LOGGED BY CGH **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 10": brush **AFTER EXCAVATION** ---

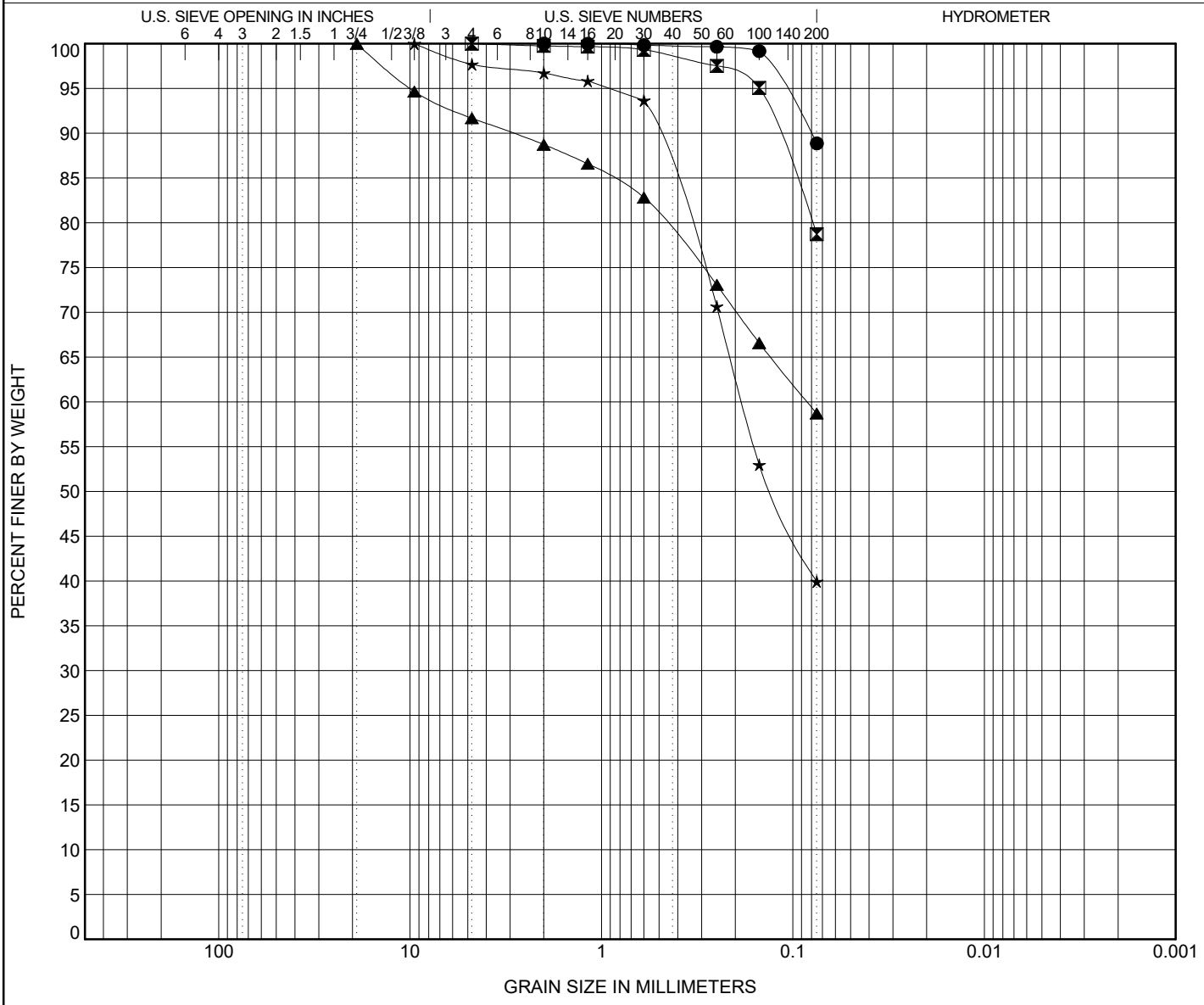
DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL		Dark brown TOPSOIL, root intrusions to 2'
				1.0	
			SM		Gray silty SAND, medium dense, moist
		MC = 13.0%			
					-becomes dense
5		MC = 15.4%		5.0	

Test pit terminated at 5.0 feet below existing grade. No groundwater encountered during excavation. No caving observed.

Earth Solutions NW, LLC
15365 N.E. 90th Street, Suite 100
Redmond, Washington 98052
Telephone: 425-449-4704
Fax: 425-449-4711

GRAIN SIZE DISTRIBUTION

PROJECT NUMBER ES-5559.03 **PROJECT NAME** Sunset Pointe



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

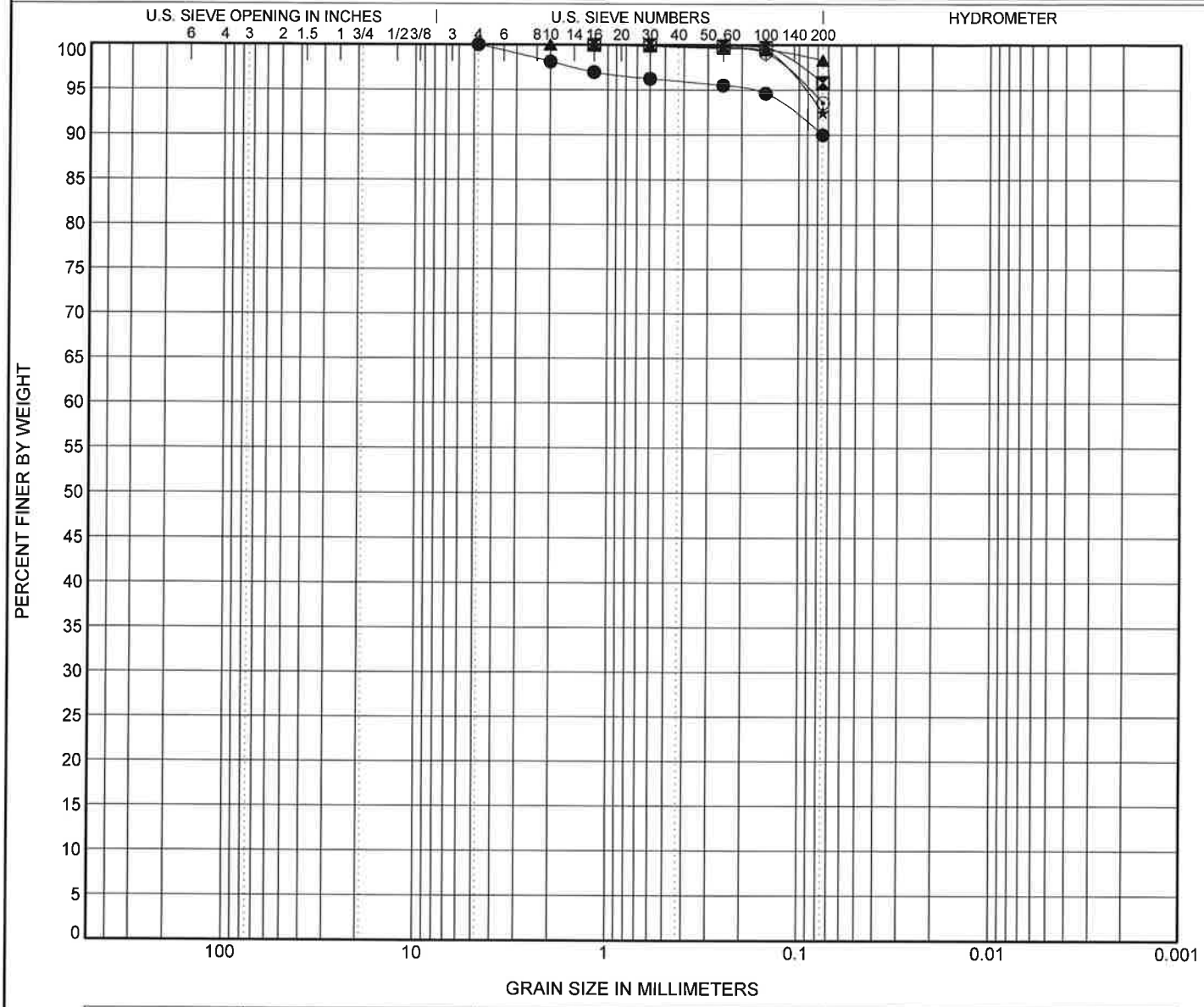
Specimen Identification			Classification	Cc	Cu
●	**TP-201**	**4.00ft.**	**USDA: Tan Loam. USCS: ML.**		
⧓	**TP-201**	**8.00ft.**	**USDA: Gray Slightly Gravelly Loam. USCS: ML with Sand.**		
▲	**TP-202**	**4.00ft.**	**USDA: Tan Slightly Gravelly Loam. USCS: Sandy ML.**		
★	**TP-202**	**8.00ft.**	**USDA: Gray Slightly Gravelly Fine Sandy Loam. USCS: SM.**		

Specimen Identification			D100	D60	D30	D10	LL	PL	PI	%Silt	%Clay
●	**TP-201**	**4.0ft.**	**2**							**88.9**	
⧓	**TP-201**	**8.0ft.**	**4.75**							**78.7**	
▲	**TP-202**	**4.0ft.**	**19**	**0.084**						**58.7**	
★	**TP-202**	**8.0ft.**	**9.5**	**0.184**						**39.9**	

Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

GRAIN SIZE DISTRIBUTION

PROJECT NUMBER ES-5559 **PROJECT NAME** Sunset Pointe



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	Cc	Cu
● TP-101	10.00ft.	USDA: Gray Slightly Gravelly Loam. USCS: ML.		
⊠ TP-101	14.00ft.	USDA: Tan Loam. USCS: ML.		
▲ TP-102	3.00ft.	USDA: Gray Loam. USCS: ML.		
★ TP-102	6.00ft.	USDA Brown Loam. USCS: ML.		
⊙ TP-104	11.00ft.	USDA: Brown Loam. USCS: ML.		

Specimen Identification		D100	D60	D30	D10	LL	PL	PI	%Silt	%Clay
● TP-101	10.0ft.	4.75							90.0	
⊠ TP-101	14.0ft.	1.18							95.8	
▲ TP-102	3.0ft.	2							98.3	
★ TP-102	6.0ft.	1.18							92.5	
⊙ TP-104	11.0ft.	1.18							93.5	

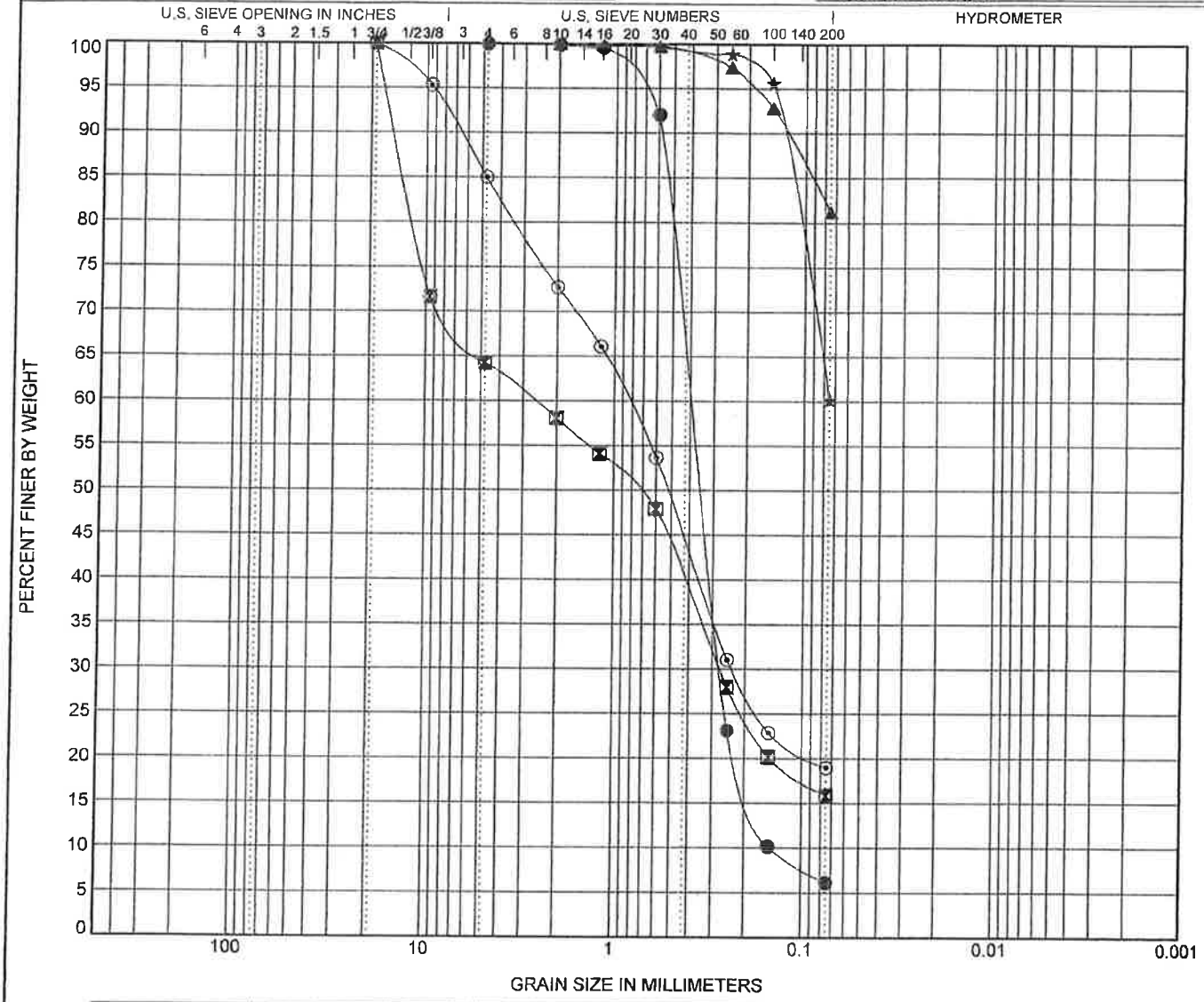
GRAIN SIZE USDA ES-5559 SUNSET POINTE.GPJ GINT US LAB.GDT 6/24/19

Earth Solutions NW, LLC
1805 - 136th PL N.E., Suite 201
Bellevue, WA 98005
Telephone: 425-449-4704
Fax: 425-449-4711

GRAIN SIZE DISTRIBUTION

CLIENT Peter Chen **PROJECT NAME** Sunset Pointe

PROJECT NUMBER ES-5559 **PROJECT LOCATION** Puyallup, Washington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	Cc	Cu
TP-01	3.00ft.	USDA: Brown Slightly Gravelly Sand. USCS: SP-SM.	1.28	2.74
TP-03	5.00ft.	USDA: Brown Very Gravelly Loamy Sand. USCS: SM with Gravel.		
TP-09	2.50ft.	USDA: Gray Loam. USCS: ML with Sand.		
TP-12	4.00ft.	USDA: Brown Loam. USCS: Sandy ML.		
TP-15	10.50ft.	USDA: Brown Gravelly Loamy Coarse Sand. USCS: SM with Gravel.		

Specimen Identification		D100	D60	D30	D10	LL	PL	PI	%Silt	%Clay
TP-01	3.0ft.	4.75	0.399	0.273	0.146				6.2	
TP-03	5.0ft.	19	2.638	0.273					15.9	
TP-09	2.5ft.	2							81.2	
TP-12	4.0ft.	2							60.2	
TP-15	10.5ft.	19	0.847	0.234					19.0	