GEOTECHNICAL REPORT

Scholls Ferry Apartments
18865 Southwest Scholls Ferry Road
Beaverton, Oregon

Project No. T-8600

Terra Associates, Inc.

Prepared for:

Holland Partner Group
Vancouver, Washington

November 9, 2021

TERRA ASSOCIATES, Inc.
Consultants in Geotechnical Engineering, Geology
and
Environmental Earth Sciences

November 9, 2021
Project No. T-8600

Mr. Jeff Hartman
Holland Partner Group
700 Washington Street, Suite 305
Vancouver, Washington 98660

Subject: Geotechnical Report
Scholls Ferry Apartments
18865 Southwest Scholls Ferry Road
Beaverton, Oregon

Dear Mr. Hartman:

As requested, we have conducted a geotechnical engineering study for the subject project. The attached report presents our findings and recommendations for the geotechnical aspects of project design and construction.

In general, the soil conditions at the site consisted of approximately two to three inches of organic topsoil overlying medium stiff to very stiff alluvial deposits composed of silt with sand, clayey silt, and silt to the termination depth of the test pits. Groundwater was observed in Test Pit TP-5 at a depth of approximately ten feet below existing site grades.

In our opinion, there are no geotechnical conditions that would preclude the planned development, provided the recommendations presented in this report are incorporated into project design and construction.

We trust the information presented is sufficient for your current needs. If you have any questions or require additional information, please call.

Sincerely yours,
TERRA ASSOCIATES, INC.

Zakeyo Ngoma, P.E.
Project Engineer

REGISTERED PROFESSIONAL ENGINEER
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OREGON
SEPTEMBER 13, 2016
CAROLYN S. DECKER
EXPIRES

11-9-2021

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TABLE OF CONTENTS

Page No.

1.0 Project Description ... 1
2.0 Scope of Work ... 1
3.0 Site Conditions ... 2
3.1 Surface ... 2
3.2 Soils ... 2
3.3 Groundwater ... 2
3.4 Seismic Design Parameters ... 2
4.0 Discussion and Recommendations ... 3
4.1 General ... 3
4.2 Site Preparation and Grading ... 3
4.3 Excavations ... 4
4.4 Foundations ... 5
4.5 Slab-on-Grade Floors ... 5
4.6 Infiltration Feasibility ... 6
4.7 Drainage ... 6
4.8 Utilities ... 6
4.9 Pavements ... 6
5.0 Additional Services ... 7
6.0 Limitations ... 7

Figures

Vicinity Map ... Figure 1
Exploration Location Plan ... Figure 2

Appendix

Field Exploration and Laboratory Testing ... Appendix A

Geotechnical Report
Scholls Ferry Apartments
18865 Southwest Scholls Ferry Road
Beaverton, Oregon

1.0 PROJECT DESCRIPTION

The project consists of developing one parcel of land consisting of two tax lots totaling approximately 11.49 acres with an apartment complex that will include eight apartment buildings, one community building, and associated parking and infrastructure improvements. Building elevations, site grading, and stormwater facility plans are currently unavailable for our review. Based on the existing topography, we expect grading to achieve building lot and roadway elevations which will be minimal with cuts and fills from one to five feet.

We expect the buildings will be a maximum of three stories in height, wood-frame, and their main floors constructed at grade. For this type of construction, we anticipate structural loading for columns will be on the order of 150 to 250 kips, with continuous bearing walls carrying 3 to 4 kips per foot.

The recommendations contained in the following sections of this report are based on the above design features. We should review any changes in the geotechnical aspects of the design plans as they are developed to verify that our recommendations are valid for the proposed construction and to amend or modify our report, as necessary.

2.0 SCOPE OF WORK

Our scope of work was completed in accordance with our authorized proposal dated February 18, 2021. On August 18, 2021, we excavated 12 test pits to depths of 10 to 12 feet below existing site grades. Using the information obtained from our subsurface exploration, we performed analyses to develop geotechnical engineering recommendations for project design and construction. Specifically, our report addresses the following:

- Soil and groundwater conditions.
- Seismic design parameters per the current International Building Code (IBC).
- Site preparation and grading.
- Excavations.
- Foundations.
- Floor slabs on grade.
- Infiltration feasibility.
- Drainage.
- Utilities.
- Pavements.

It should be noted that the recommendations outlined in this report regarding drainage are associated with soil strength, erosion, and stability. Design and performance issues with respect to moisture as it relates to the structure environment are beyond Terra Associates, Inc's purview. A building envelope specialist or contractor should be consulted to address these issues, as needed.

3.0 SITE CONDITIONS

3.1 Surface

The site is an approximately 11.49-acre parcel of land consisting of two tax lots located at 18865 Southwest Scholls Ferry Road in Hillsboro, Oregon. The approximate location of the site is shown on Figure 1.

The southwestern portion of the site is currently developed with older, abandoned farm buildings. The remainder of the site is undeveloped and covered with surface vegetation consisting of scattered trees and brush. Site topography consists of a slight slope descending from west to east.

3.2 Soils

In general, the soil conditions at the site consisted of approximately two to three inches of organic topsoil overlying medium stiff to very stiff alluvial deposits composed of silt with sand, clayey silt, and silt to the termination depth of the test pits.

A map titled *Geologic Framework of the Willamette Lowland Aquifer System, Oregon, and Washington,* by M.W. Gannett and R.R. Caldwell, dated 1998, shows the site soils mapped as Qs, Alluvium, and glacial-outburst flood sediment. The soils observed in the test pits are generally consistent with the alluvium mapping.

The preceding discussion is intended to be a general review of the soil conditions observed at the site. For more detailed descriptions, please refer to the Test Pit Logs in Appendix A. The approximate locations of the test pits are shown on Figure 2.

3.3 Groundwater

Minor groundwater seepage was observed in Test Pit TP-5 at a depth of approximately ten feet below existing grade. The groundwater appeared to be trapped in a pocket of sandier material within the lower stiff to very stiff silt deposit. Groundwater seepage was not observed in any other subsurface exploration.

3.4 Seismic Design Parameters

Based on soil conditions noted in the test pits and our knowledge of the area geology, per Chapter 16 of the 2018 International Building Code (IBC), site class "D" should be used in structural design.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 General

Based on our study, there are no geotechnical considerations that would preclude development of the site, as currently planned. The buildings can be supported on conventional spread footings bearing on competent native soils below the organic surficial soils or on structural fill placed and compacted above these competent native soils. Floor slabs and pavements can be similarly supported.

The soils encountered at the site predominantly consist of fines which will make the soils very difficult to compact as structural fill when too wet. The ability to use soils from site excavations as structural fill will depend on the soil moisture content and the prevailing weather conditions at the time of construction. The contractor should be prepared to dry the soils by aeration during the normally dry summer season to facilitate compaction as structural fill. Alternatively, stabilizing the moisture in the native soil with cement or lime can be considered. If grading activities will take place during the winter season, the contractor should be prepared to import clean granular material for use as structural fill and backfill.

Detailed recommendations regarding these issues and other geotechnical design considerations are provided in the following sections. These recommendations should be incorporated into the final design drawings and construction specifications.

4.2 Site Preparation and Grading

To prepare the site for construction, all vegetation and organic surface soils should be stripped and removed from below the building lots and roadway areas. Surface stripping depths of approximately two to three inches should be expected to remove the organic surficial soils. Soil containing organic material will not be suitable for use as structural fill but may be used for limited depths in nonstructural areas. In the developed portion of the site, demolition of existing structures should include removal of existing foundations and abandonment of underground septic systems and other buried utilities. Abandoned utility pipes that fall outside of the new building area can be left in place, provided they are sealed to prevent intrusion of groundwater seepage and soil.

Once clearing and stripping operations are complete, cut and fill operations can be initiated to establish desired grades. Prior to placing fill, all exposed bearing surfaces should be observed by a representative of Terra Associates, Inc. to verify soil conditions are as expected and suitable for support of building foundations and pavement elements or placement of structural fill. Our representative may request proofrolling the exposed surface with a heavy rubber-tired vehicle to determine if any isolated soft and yielding areas are present. If unsuitable yielding areas are observed, they should be cut to firm bearing soil and filled to grade with structural fill. If depth of excavation to remove unstable soils is excessive, use of geotextile fabric, such as Mirafi 500X or equivalent in conjunction with structural fill can be considered in order to limit the depth of removal. Our experience has shown, in general, a minimum of 18 inches of a clean, granular structural fill placed and compacted over the geotextile fabric should establish a stable bearing surface.

The soils encountered at the site predominantly consist of fines which will quickly degrade under construction traffic if shallow groundwater is encountered or rainy weather occurs during site clearing and subgrade preparation activities. These soils exhibit a narrow range of moisture contents where adequate compaction can be achieved during construction. Accordingly, these soils will be difficult to compact as structural fill if they are too wet or too dry. The ability to use the soils from site excavations as structural fill will depend on their moisture content and the prevailing weather conditions when site grading activities take place. Soils that are too wet to properly compact could be dried by aeration during dry weather conditions or mixed with an additive, such as cement or lime to stabilize the soil and facilitate compaction. If cement is used, based on the soil type and moisture content at the time of our exploration, we expect that three to six percent of the soil's dry unit weight will be required for structural fill. For pavement subgrade we expect that four to seven percent of the soil's dry unit weight will be required. If an additive is used, additional Best Management Practices (BMPs) for its use will need to be incorporated into the Temporary Erosion and Sedimentation Control plan (TESC) for the project.

If grading activities are planned during the wet winter months, or if they are initiated during the summer and extend into fall and winter, the contractor should be prepared to import wet-weather structural fill. For this purpose, we recommend importing a granular soil that meets the following grading requirements:

U.S. Sieve Size	Percent Passing
6 inches	100
No. 4	75 maximum
No. 200	5 maximum*

*Based on the 3/4-inch fraction.

Prior to use, Terra Associates, Inc. should examine and test all materials imported to the site for use as structural fill.

Structural fill should be placed in uniform loose layers not exceeding six inches and compacted to a minimum of 95 percent of the soil's maximum dry density, as determined by American Society for Testing and Materials (ASTM) Test Designation D-698 (Standard Proctor). The moisture content of the soil at the time of compaction should be within two percent of its optimum, as determined by this ASTM standard. In nonstructural areas, the degree of compaction can be reduced to 90 percent.

4.3 Excavations

All excavations at the site associated with confined spaces, such as utility trenches, must be completed in accordance with local, state, or federal requirements. Based on current rules outlined in Oregon OSHA, Division 3, Subdivision P – Excavations, the medium stiff to very stiff silts and any soils containing groundwater at the project site would be classified as Type C soils.

Accordingly, temporary excavations in Type C soils should be laid back from the toe to the crest of the slope at an inclination of 1.5:1 (Horizontal:Vertical) or flatter. If there is insufficient lateral space to complete the excavations in this manner, or if excavations greater than 20 feet in depth are planned, temporary shoring to support the excavations may be required. Properly designed and installed shoring trench boxes can be used to support utility trench excavations where required.

All temporary exposed slopes on excavations that will remain open for an extended time period should be covered with a durable reinforced plastic membrane during construction to prevent slope raveling and rutting during periods of precipitation.

This information is provided solely for the benefit of the owner and other design consultants, and should not be construed to imply that Terra Associates, Inc. assumes responsibility for job site safety. It is understood that job site safety is the sole responsibility of the project contractor.

4.4 Foundations

The building may be supported on conventional spread footing foundations bearing on foundation subgrades prepared as recommended in Section 4.2 of this report. Perimeter foundations exposed to the weather should bear at a minimum depth of 1.5 feet below final exterior grades for frost protection. Interior foundations can be constructed at any convenient depth below the floor slab.

We recommend designing foundations bearing on suitable soils for a net allowable bearing capacity of 2,000 pounds per square foot (psf). For short-term loads, such as wind and seismic, a one-third increase in this allowable capacity can be used in design. With the anticipated loads and this bearing stress applied, building settlements should be less than one inch total and one-half inch differential.

A base friction coefficient of 0.30 can be used for designing foundations to resist lateral loads. Passive earth pressures acting on the sides of the footings can also be considered. We recommend calculating this lateral resistance using an equivalent fluid weight of 300 pounds per cubic foot (pcf). We recommend not including the upper 12 inches of soil in this computation because it can be affected by weather or disturbed by future grading activity. This value assumes the foundations will be backfilled with structural fill, as described in Section 4.2 of this report. The recommended values include a safety factor of 1.5.

4.5 Slab-on-Grade Floors

Slabs on grade floors may be supported on subgrade prepared as recommended in Section 4.2 of this report. Immediately below the floor slabs, we recommend placing a four-inch thick capillary break layer of clean, free-draining, coarse sand or fine gravel that has less than five percent passing the No. 200 sieve. This material will reduce the potential for upward capillary movement of water through the underlying soil and subsequent wetting of the floor slabs.

The capillary break layer will not prevent moisture intrusion through the slab caused by water vapor transmission. Where moisture by vapor transmission is undesirable, such as covered floor areas, a common practice is to place a durable plastic membrane on the capillary break layer and then cover the membrane with a layer of clean sand or fine gravel to protect it from damage during construction, and aid in uniform curing of the concrete slab. It should be noted that if the sand or gravel layer overlying the membrane is saturated prior to pouring the slab, it will be ineffective in assisting in uniform curing of the slab, and can actually serve as a water supply for moisture transmission through the slab and affecting floor coverings. Therefore, in our opinion, covering the membrane with a layer of sand or gravel should be avoided if floor slab construction occurs during the wet winter months and the layer cannot be effectively drained. We recommend floor designers and contractors refer to the current American Concrete Institute (ACI) Manual of Concrete Practice, for further information regarding vapor barrier installation below slab-on-grade floors.

4.6 Infiltration Feasibility

Based on our study, it is our opinion that subsurface conditions observed in the test pits are not favorable for stormwater infiltration. This is due primarily to the predominant fines content of the site's silt soils which would impede the downward migration of stormwater. We recommend using conventional stormwater management for the site.

4.7 Drainage

Surface

Final exterior grades should promote free and positive drainage away from the building areas. We recommend providing a positive drainage gradient away from the building perimeter. If this gradient cannot be provided, surface water should be collected adjacent to the structures and disposed to appropriate storm facilities.

Subsurface

In our opinion, with the area immediately adjacent to the structure paved, and positive surface drainage maintained, perimeter foundation drains would not be necessary. If the grade is not positively drained away from the structure or is landscaped, perimeter foundation drains should be installed.

Where foundation drains are installed, the drains should be laid to grade at an invert elevation equivalent to the bottom of footing grade. The drains can consist of four-inch diameter perforated PVC pipe that is enveloped in washed pea gravel-sized drainage aggregate. The aggregate should extend six inches above and to the sides of the pipe. Roof and foundation drains should be tightlined separately to the storm drains. All drains should be provided with cleanouts at easily accessible locations.

4.8 Utilities

Utility pipes should be bedded and backfilled in accordance with American Public Works Association (APWA), or applicable jurisdiction's specifications. As a minimum, trench backfill should be placed and compacted as structural fill, as described in Section 4.2 of this report.

As discussed above, the site soils are predominantly fine grained and will have narrow ranges of moisture content for suitable compaction. These soils will need to be dried or amended as discussed above prior to use as backfill material. If the soils cannot be dried, or if utility construction takes place during the wet winter months, it may be necessary to import suitable wet-weather fill for utility trench backfilling. Recommendations for wet-weather fill are provided in Section 4.2.

4.9 Pavements

Pavement subgrades should be prepared as described in Section 4.2 of this report. Regardless of the degree of relative compaction achieved, the subgrade must be firm and relatively unyielding before paving. The subgrade should be proofrolled with heavy rubber-tired construction equipment such as a loaded 10-yard dump truck to verify this condition.

The pavement design section is dependent upon the supporting capability of the subgrade soils and the traffic conditions to which it will be subjected. We expect traffic at the development will consist of cars and light trucks. For design considerations, we have assumed traffic in parking and in car/light truck access pavement areas can be represented by an 18-kip Equivalent Single Axle Loading (ESAL) of 50,000 over a 20-year design life.

With a stable subgrade prepared as recommended, we recommend the following pavement sections:

Light Traffic and Parking:

- Two inches of hot mix asphalt concrete pavement (HMAC) over six inches of aggregate base.
- Full depth HMAC – four inches.

The paving materials used should conform to the Oregon Department of Transportation (ODOT) specifications for HMAC and aggregate base.

Long-term pavement performance will depend on surface drainage. A poorly drained pavement section will be subject to premature failure as a result of surface water infiltrating the subgrade soils and reducing their supporting capability. For optimum performance, we recommend surface drainage gradients of at least two percent. Some degree of longitudinal and transverse cracking of the pavement surface should be expected over time. Regular maintenance should be planned to seal cracks as they occur.

5.0 ADDITIONAL SERVICES

Terra Associates, Inc. should review project designs and specifications to verify that earthwork and foundation recommendations have been properly interpreted and incorporated into project design. We should also provide geotechnical services during construction to observe compliance with our design concepts, specifications, and recommendations. This will allow for expedient design changes if subsurface conditions differ from those anticipated prior to the start of construction.

6.0 LIMITATIONS

We prepared this report in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made. This report is the copyrighted property of Terra Associates, Inc. and is intended for specific application to the Scholls Ferry Apartments project in Hillsboro, Oregon. This report is for the exclusive use of Holland Partner Group and their authorized representatives.

The analyses and recommendations presented in this report are based on data obtained from the subsurface explorations completed onsite. Variations in soil conditions can occur, the nature and extent of which may not become evident until construction. If variations appear evident, Terra Associates, Inc. should be requested to re-evaluate the recommendations in this report prior to proceeding with construction.

REFERENCE: https://www.bing.com/maps

ACCESSED 9/3/2021

Terra Associates, Inc.
Consultants in Geotechnical Engineering
Geology and
Environmental Earth Sciences

VICINITY MAP
SCHOLLS FERRY APARTMENTS
BEAVERTON, OREGON

Proj.No. T-8600	Date: NOV 2021	Figure 1

NOTE:

THIS SITE PLAN IS SCHEMATIC. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. IT IS INTENDED FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION PURPOSES.

REFERENCE: SITE PLAN PROVIDED BY LRS ARCHITECHS.

LEGEND:

APPROXIMATE TEST PIT LOCATION

0 100 200

APPROXIMATE SCALE IN FEET

N

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EXPLORATION LOCATION PLAN
SCHOLLS FERRY APARTMENTS
BEAVERTON, OREGON

Proj.No. T-8600	Date: NOV 2021	Figure 2

APPENDIX A
FIELD EXPLORATION AND LABORATORY TESTING

Scholls Ferry Apartments
Beaverton, Oregon

On August 18, 2021, we explored subsurface conditions at the site by excavating 12 test pits to maximum depths of 10 to 12 feet below existing surface grades using a track-mounted excavator. The test pit locations were approximately determined in the field by sighting and pacing from existing site features. The approximate test pit locations are shown on Figure 2. The Test Pit Logs are presented as Figures A-2 through A-13.

A geotechnical engineer from our office conducted the field exploration. Our representative classified the soil conditions encountered, maintained a log of each test pit, obtained representative soil samples, and recorded water levels observed during excavation. All soil samples were visually classified in accordance with the Unified Soil Classification System (USCS) described on Figure A-1.

Representative soil samples obtained from the test pits were placed in closed containers and taken to our laboratory for further examination and testing. The moisture content of each sample was measured and is reported on the individual Test Pit Logs. Grain size analyses were performed on selected samples. The results of the analysis are shown on Figures A-14 and A-15.

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS More than 50% material larger than No. 200 sieve size	**GRAVELS** More than 50% of coarse fraction is larger than No. 4 sieve	Clean Gravels (less than 5% 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	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS More than 50% of coarse fraction is smaller than No. 4 sieve	Clean Sands (less than 5% fines)	SW	Well-graded sands, sands with gravel, little or no fines.
			SP	Poorly-graded sands, sands with gravel, little or no fines.
		Sands with fines	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS More than 50% material smaller than No. 200 sieve size	**SILTS AND CLAYS** Liquid Limit is less than 50%		ML	Inorganic silts, rock flour, clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity. (Lean clay)
			OL	Organic silts and organic clays of low plasticity.
	SILTS AND CLAYS Liquid Limit is greater than 50%		MH	Inorganic silts, elastic.
			CH	Inorganic clays of high plasticity. (Fat clay)
			OH	Organic clays of high plasticity.
HIGHLY ORGANIC SOILS			PT	Peat.

DEFINITION OF TERMS AND SYMBOLS

COHESIONLESS

<u>Density</u>	<u>Standard Penetration Resistance in Blows/Foot</u>
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	>50

COHESIVE

<u>Consistancy</u>	<u>Standard Penetration Resistance in Blows/Foot</u>
Very Soft	0-2
Soft	2-4
Medium Stiff	4-8
Stiff	8-16
Very Stiff	16-32
Hard	>32

Symbol	Definition
I	2" OUTSIDE DIAMETER SPILT SPOON SAMPLER
II	2.4" INSIDE DIAMETER RING SAMPLER OR SHELBY TUBE SAMPLER
▼	WATER LEVEL (Date)
Tr	TORVANE READINGS, tsf
Pp	PENETROMETER READING, tsf
DD	DRY DENSITY, pounds per cubic foot
LL	LIQUID LIMIT, percent
PI	PLASTIC INDEX
N	STANDARD PENETRATION, blows per foot

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UNIFIED SOIL CLASSIFICATION SYSTEM
SCHOLLS FERRY APARTMENTS
BEAVERTON, OREGON

Proj.No. T-8600	Date: NOV 2021	Figure A-1

LOG OF TEST PIT NO. TP-1

FIGURE A-2

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(3 inches TOPSOIL)		
1		Olive-gray to yellow-brown SILT with fine sand, moist, non-plastic. (ML)		
2				
3	1		Medium Stiff to Stiff	15.6
4				
5		*Becomes mottled.		
6				
7				
8			Stiff to Very Stiff	
9	2			28.5
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-2

FIGURE A-3

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Grass and shrubs **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(3 inches TOPSOIL)		
1		Yellow-brown SILT with fine sand, moist, mottled, non-plastic. (ML)		
2	1			11.8
3			Medium Stiff to Stiff	
4		*Becomes olive-brown.		
5				
6				
7				
8			Stiff to Very Stiff	
9	2			29.5
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-3

FIGURE A-4

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(2 inches TOPSOIL)		
1		Olive-gray to olive-brown SILT with fine sand, moist, non-plastic. (ML)	Medium Stiff to Stiff	
2	1			11.0
3				
4				
5	2	*Becomes mottled.		25.6
6				
7			Stiff to Very Stiff	
8				
9	3			22.2
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-4

FIGURE A-5

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Shrubs **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0				
		(3 inches TOPSOIL)		
1		Olive-brown SILT with fine sand, moist, non-plastic. (ML)		
2	1			14.8
3				
4			Medium Stiff to Stiff	
5				
6		*Becomes mottled.		
7	2			27.4
8			Stiff to Very Stiff	
9	3			28.5
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-5

FIGURE A-6

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** 10 feet **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(2 inches TOPSOIL)		
1		Olive-brown SILT with fine sand, moist, non-plastic. (ML)		
2	1		Medium Stiff to Stiff	13.2
3				
4				
5	2	*Becomes mottled.		28.0
6				
7			Stiff to Very Stiff	
8				
9				
10	3			29.5
11		Test Pit terminated at approximately 11 feet. Minor groundwater seepage observed at approximately 10 feet.		
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-6

FIGURE A-7

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(2 inches TOPSOIL)		
1		Olive-gray to olive-brown SILT, moist, non-plastic. (ML)		
2	1			10.0
3				
4			Medium Stiff to Stiff	
5				
6		*Becomes mottled.		
7	2			23.9
8		Red-brown clayey SILT, moist, low plasticity. (CL-ML)		
9	3		Stiff to Very Stiff	27.8
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-7

FIGURE A-8

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Shrubs **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0–7	1	(3 inches TOPSOIL) Red-brown SILT with fine sand, moist, non-plastic. (ML)	Medium Stiff to Stiff	16.3
7–10	2	Olive-gray to olive-brown clayey SILT, moist, low plasticity. (CL-ML)	Stiff to Very Stiff	27.1
10–12		Test Pit terminated at approximately 10 feet. No groundwater seepage observed.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-8

FIGURE A-9

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0–5	1	(2 inches TOPSOIL) Olive-brown SILT with fine sand, moist, mottled, non-plastic. (ML)	Medium Stiff to Stiff	19.6
5–10.5	2	Olive-brown SILT, moist, non-plastic. (ML)	Stiff to Very Stiff	26.9
10.5		Test Pit terminated at approximately 10.5 feet. No groundwater seepage observed.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-9

FIGURE A-10

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(3 inches TOPSOIL)		
1		Olive-brown SILT with fine sand, moist, non-plastic. (ML)		
	1			10.8
2				
3			Medium Stiff to Stiff	
4				
5	2			27.5
6				
7				
8			Stiff to Very Stiff	
9	3			29.9
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-10

FIGURE A-11

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(2 inches TOPSOIL)		
1		Olive-brown SILT with fine to medium sand, moist, mottled, non-plastic. (ML)		
	1			11.7
2				
3			Medium Stiff to Stiff	
4				
5				
6				
7				
8			Stiff to Very Stiff	
9	2			28.3
10				
11		Test Pit terminated at approximately 11 feet. No groundwater seepage observed.		
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-11

FIGURE A-12

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(2 inches TOPSOIL)		
1		Olive-brown SILT with fine sand, moist, mottled, non-plastic. (ML)		
2	1			12.4
3				
4			Medium Stiff to Stiff	
5	2			28.6
6				
7				
8				
9			Stiff to Very Stiff	
10	3			26.8
11		Test Pit terminated at approximately 11 feet. No groundwater seepage observed.		
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-12

FIGURE A-13

PROJECT NAME: Scholls Ferry Apartments **PROJ. NO:** T-8600 **LOGGED BY:** ZN

LOCATION: Beaverton, Oregon **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: August 18, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(2 inches TOPSOIL)		
1		Olive-brown SILT with fine to medium sand, moist, non-plastic. (ML)	Medium Stiff to Stiff	
2	1			9.3
3				
4				
5		Olive-gray clayey SILT, moist, mottled, low plasticity. (CL-ML)		
6				
6.5	2			32.5
7				
8				
9				
10		Olive-brown SILT with fine to medium sand, moist to wet, non-plastic. (ML)		
11	3		Stiff to Very Stiff	29.9
12		Test Pit terminated at approximately 12 feet. No groundwater seepage observed.		
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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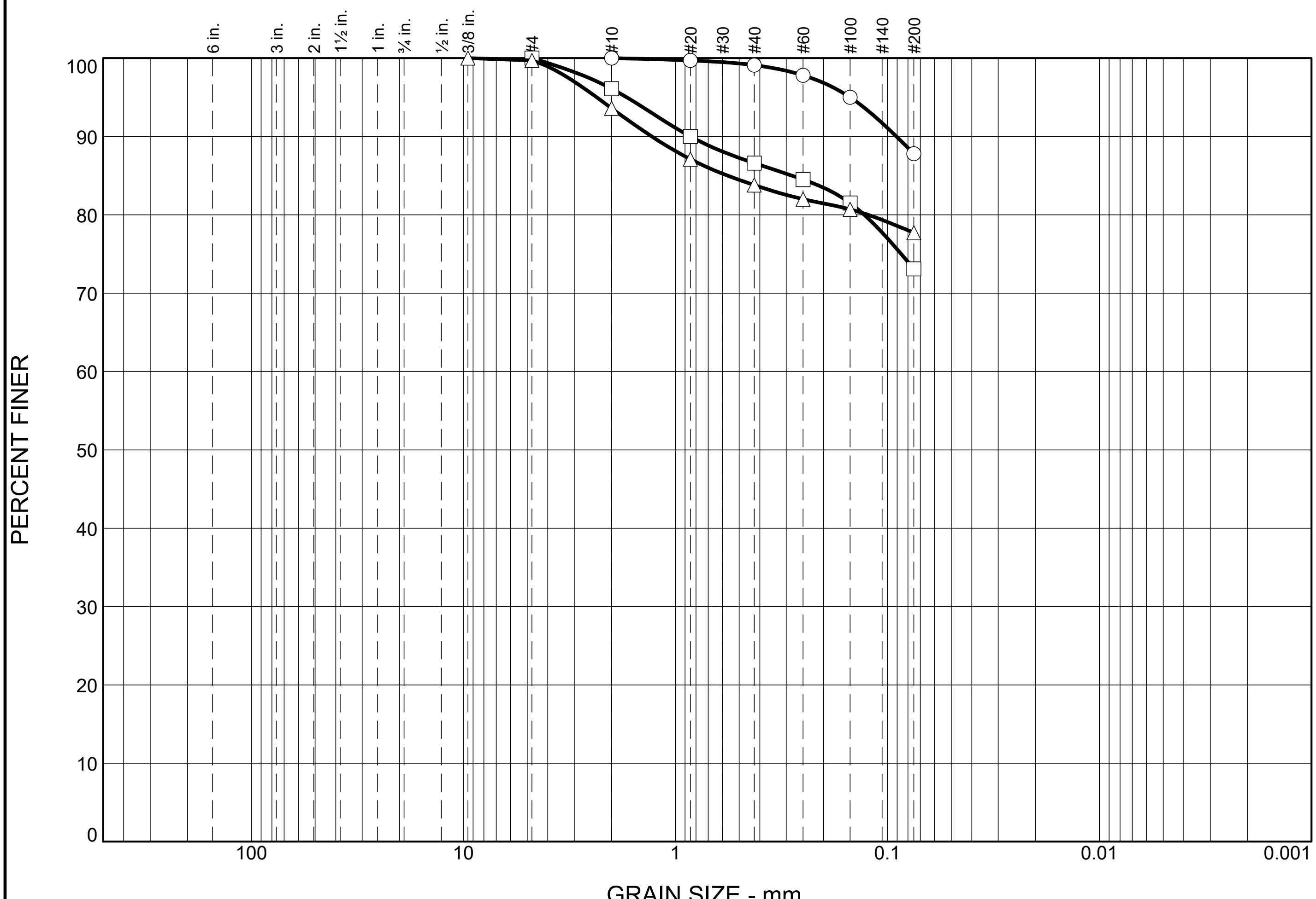
Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.9	11.3	87.8	
□	0.0	0.0	0.0	3.9	9.5	13.5	73.1	
△	0.0	0.0	0.3	6.1	9.8	6.1	77.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	38	27								
□	27	22	0.2823							
△			0.5671							

Material Description	USCS	AASHTO
○ SILT	ML	
□ SILT with sand	ML	
△ SILT with sand	ML	

Project No. T-8600 **Client:** Holland Partner Group

Project: Scholls Ferry Apartments

Beaverton, Oregon

○ **Location:** Test Pit TP-6 **Depth:** 7 feet **Sample Number:** 2

□ **Location:** Test Pit TP-8 **Depth:** 2.5 feet **Sample Number:** 1

△ **Location:** Test Pit TP-9 **Depth:** 9 feet **Sample Number:** 3

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Kirkland, WA

Remarks:

○ Tested on September 2, 2021

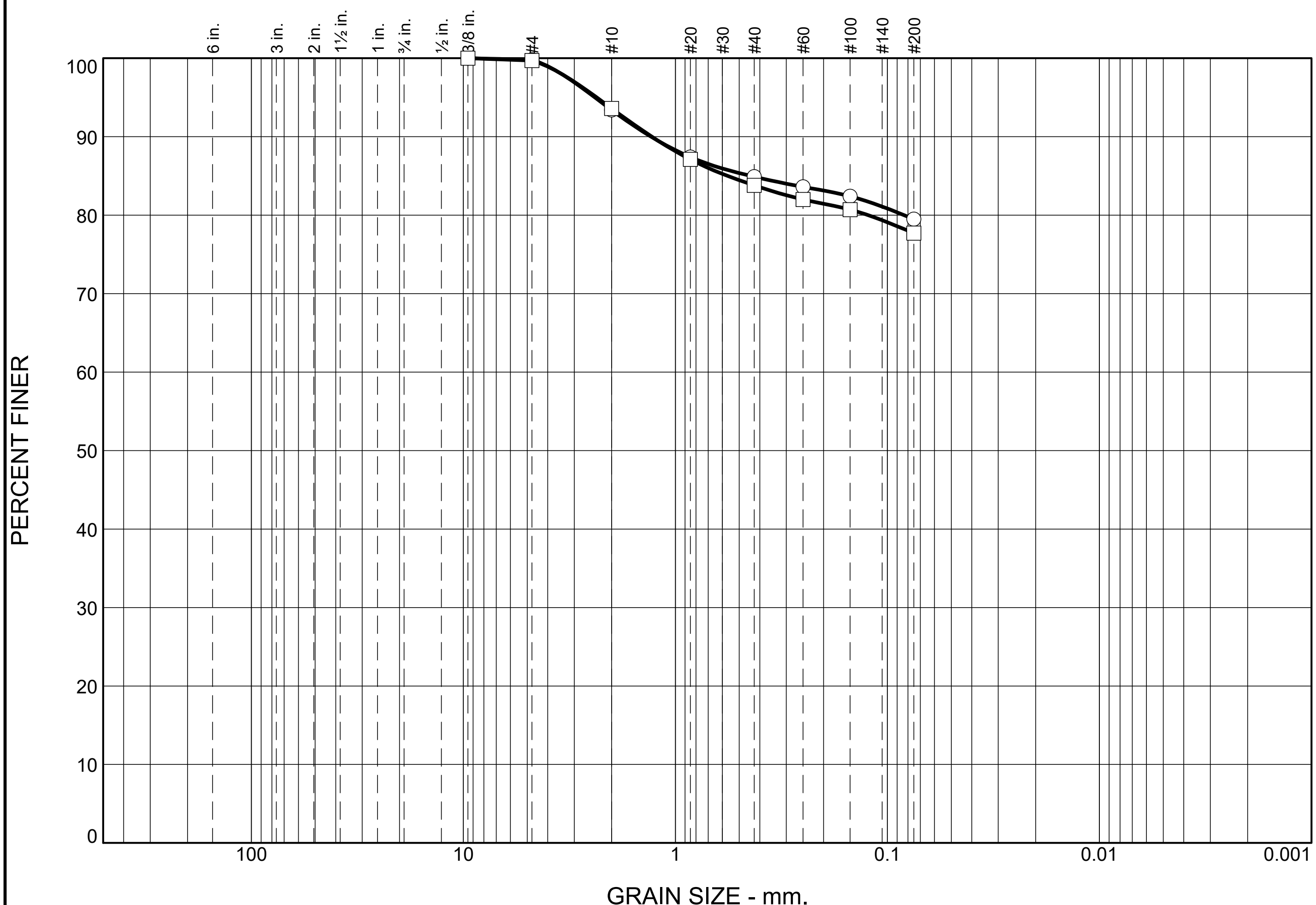
□ Tested on September 2, 2021

△ Tested on September 2, 2021

Figure A-14

Tested By: FQ **Checked By:** ZN

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.2	6.4	8.5	5.4	79.5	
□	0.0	0.0	0.3	6.1	9.8	6.1	77.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.4407							
□			0.5671							

Material Description	USCS	AASHTO
○ SILT with sand	ML	
□ SILT with sand	ML	

Project No. T-8600 **Client:** Holland Partner Group
Project: Scholls Ferry Apartments
Beaverton, Oregon
○ **Location:** Test Pit TP-10 **Depth:** 1.5 feet **Sample Number:** 1
□ **Location:** Test Pit TP-12 **Depth:** 2 feet **Sample Number:** 1

Remarks:
○ Tested on September 2, 2021
□ Tested on September 2, 2021

Terra Associates, Inc.

Kirkland, WA

Figure A-15

Tested By: FQ **Checked By:** ZN