Exhibit I

MICROTEL®
BY WYNDHAM

Wyndham Microtel

750 Quince Street

Florence, Oregon

STORMWATER PLAN

June 2022

Prepared by:

REGISTERED PROFESSIONAL ENGINEER
89522PE
Sean Lloyd
OREGON
SEP 11, 2018
SEAN DEAN LLOYD
RENEWS: 12/31/22

Civil West Engineering Services, Inc.

Designer's Certification and Statement: I hereby certify that this Stormwater Management Report for Wyndham Microtel has been prepared by me or under my supervision and meets minimum standards of the City of Florence and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by me.

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STORMWATER PLAN

WYNDHAM MICROTEL
FLORENCE, OREGON

1. Project Overview and Description

1.1 Size and Location of Project Site

The proposed development is a Microtel Hotel by Wyndham. The proposed hotel would be situated to the east of Quince Street in Florence, Oregon, across from the Florence Event Center, as shown in Figure 1, below. After proposed property line adjustments, the site would be approximately 3.05 acres.

Figure 1: Project Location

1.2 Property Zoning

The site is located in the Mixed use – Old Town Area C zone. There are areas of the existing site boundaries that are within the Natural Estuary zone, but this will be changed with the proposed lot line adjustments.

1.3 Type of Development/ Proposed Improvements

The proposal is to construct a commercial hotel on the site. This will consist of the hotel, asphalt parking lot, concrete sidewalks, and all necessary utilities, including an underground stormwater system. Please see attached Project Exhibits (Appendix A) for more details regarding the proposed improvements.

1.4 Watershed Description

The existing site and most of the surrounding area either sheet flows or is otherwise conveyed to either Munsel Creek to the northeast, or to the sloping hillside directly to the east. Both areas then flow into a low lying wetland before mixing with the Siuslaw River.

1.5 Permits Required

The project will require a DEQ 1200-C erosion control permit and any other construction permits that the City requires. Construction does not fall within a wetland, so no permitting with the Corps of Engineers or Department of State Lands will be required.

1.6 Existing vs. Post-Construction Conditions

The parcel in question at one point had a school on the site. Since then, it has been demolished and left undeveloped, occasionally being used as a material stockpiling area. Slopes range between 0-5% with the majority of the site sheet flowing to the east over the hillside. There is a mix of low lying vegetation and grass over predominantly soil sands, with some buried rubble from the previous school still remaining in some areas.

The proposed development will include an underground stormwater conveyance system and on site detention pond in order to infiltrate the stormwater, as well as provide treatment. This pond will entirely disperse the stormwater through infiltration.

2. Methodology

2.1 Drainage at Existing Site

2.1.1 Potential Impacts on the Proposed Site from Existing Conditions

Civil West Engineering does not foresee any measurable impacts to the existing site from the proposed development. The site is not currently being used and the proposed stormwater detention and treatment will discharge the drainage into the same aquifer that it is currently entering.

2.1.2 Potential Impacts from the Proposed Site on Existing Drainage

The existing site allows stormwater to either infiltrate or to sheet flow over the slope down into the wetland area to the east before ultimately entering the Siuslaw River. Because our proposed stormwater design relies on infiltration, we do not foresee any impacts to the drainage patterns.

2.1.3 Techniques for Mitigating Potential Conflicts or Problems

One concern that has been raised during planning discussions is that an outfall on the eastern slope could potentially cause erosion issues or unwanted concentrated flow onto an area that is planned to be developed into a trail along the estuary; however, by significantly oversizing our pond and utilizing the well drained soil in the area, emergency overflow will not occur even through the 100-year storm event. In the event that the pond was overtopped, the parking lot and system piping would provide extra storage.

2.2 Depth to Groundwater Testing Results

The Geotechnical Engineering Report attached (Appendix B) describes that the groundwater in the area is approximately 35-45’ below ground surface, corresponding to the elevation of the lower marsh area.

2.3 Stormwater Management Narrative

Currently, the undeveloped site handles runoff primarily through infiltration. Anything that does not infiltrate sheet flows to the east, over the bank and into the estuary below. Our proposal is to develop the site while eliminating the need for additional outfalls.

We will install an underground storm drainage system that will convey the water to a stormwater treatment pond. Double chambered catch basins will be utilized in order to ensure that hydrocarbons and other pollutants are adequately removed. The stormwater will then infiltrate while being stored in the treatment ponds. Modeling shows that even with the 100-year storm event, the system will not overflow.

2.4 Demonstration of Maximized Infiltration and Vegetative Treatment

By using a large storage pond and the well drained native soil, our proposal utilizes infiltration to the maximum extent possible. The treatment ponds will be planted with a native wetland mix in order to provide additional treatment to the water.

3. Analysis

3.1 Design Assumptions

3.1.1 Design Storm Used

The design storm is an SCS Type 1A storm using the values below, taken from the Florence Stormwater Design Manual.

Figure 2: Design Storm

Return Frequency	24-hr Rainfall Depth (inches)
Water Quality Design Storm	
	0.83
Flow Control (or Flood Control) Storms[1]	
2- year	3.46
10-year	4.48
25-year	5.06
100-year	5.95

3.1.2 Computation Methods

The Performance Approach was the chosen method provided by the Florence Stormwater Design Manual. Specifically, we used NRCS TR-55 methodology utilizing SCS hydrographs.

3.1.3 Software Used

The software used for stormwater modeling was Autodesk Hydraflow Hydrographs. Impervious and pervious area calculations were performed using Autodesk Civil3D.

3.1.4 Safety Factors, Curve Numbers, and Design Coefficients

To evaluate the pre-developed site, the following curve numbers were used:

- 98 for any impervious areas
- 76 for gravel with group A soils
- 72 for dirt with group A soils
- 49 for fair condition open space with group A soils
- 39 for good condition open space with group A soils

To evaluate the proposed site, the following curve numbers were used:

- 98 for any impervious areas
- 39 for good condition open space with group A soils (landscaping)

See Figure 3 below, displaying the areas for each basin along with the corresponding curve numbers.

Figure 3: Basins

Areas (Acres):

Curve Numbers:	Pre-Developed Site	Proposed West
98 (Impervious)	0.06	1.86
76 (Gravel - Group A)	0.49	
72 (Dirt - Group A)	1.02	
49 (Open Space - Group A)	1.02	

39 (Open Space - Group A)	0.62	1.35
Composite Curve Number:	59.4	73

The Geotechnical Engineering Report provided an average infiltration rate of 64.25 in./hr. Our calculations used a value of 25 in./hr, providing a factor of safety of approximately 2.57.

When calculating time of concentration during pipe flow segments, a velocity of 3.5 feet/second was used. The remaining time of concentration segments were calculated using the TR-55 method to compute overland sheet flow.

3.1.5 Clarify Variations from the Norm

We are using a higher infiltration rate than the assumed values allowed by the Florence Stormwater Design Manual. Per the manual, this is allowed with a supporting Geotechnical Engineering Report. Please see the attached report in Appendix B.

3.1.6 Flow Rate Comparisons

Please see Figure 4 below, comparing the pre-developed vs. proposed site flow rates for each basin.

Figure 4: Flow Rates

Flow Rates (cfs):	Pre-Developed Site	Proposed
2 - Year Storm	0.103	0
10 - Year Storm	0.368	0
25 - Year Storm	0.61	0
100 - Year Storm	1.033	0

3.1.7 Emergency Overflow

As previously discussed, the emergency overflow will be to utilize the parking lot and piping as additional storage, but this will not occur until an event larger than the 100-year storm.

4. Engineering Conclusions

4.1 Compliance with Stormwater Design Manual

This design and corresponding report have been specifically tailored to the Florence Stormwater Design Manual. We believe that the proposed design will be an effective solution to the treatment and detention of stormwater on the proposed site.

4.2 Satisfaction of Water Quality, Flow Control, and Discharge Requirements

4.2.1 Water Quality

The primary treatment of stormwater will be via the sand and vegetation in the stormwater detention pond. Sand is an extremely effective filtration tool, and the wetland vegetation mix will help to keep the stormwater cool and allow for pollutants to be removed. In order to reduce maintenance in the pond and preserve the life of the wetland vegetation, double chambered catch basins will be installed prior to the pond inlet in order to pre-emptively remove hydrocarbons and other pollutants.

4.2.2 Flow Control

The attached stormwater modeling shows that the sizing and infiltration rates of the proposed facilities allows us to actually reduce the amount of runoff that travels off-site onto the eastern slope.

4.2.3 Discharge Requirements

By actually reducing flow off site with the development, we are complying with discharge requirements.

5. Stormwater Facility Details/Exhibits

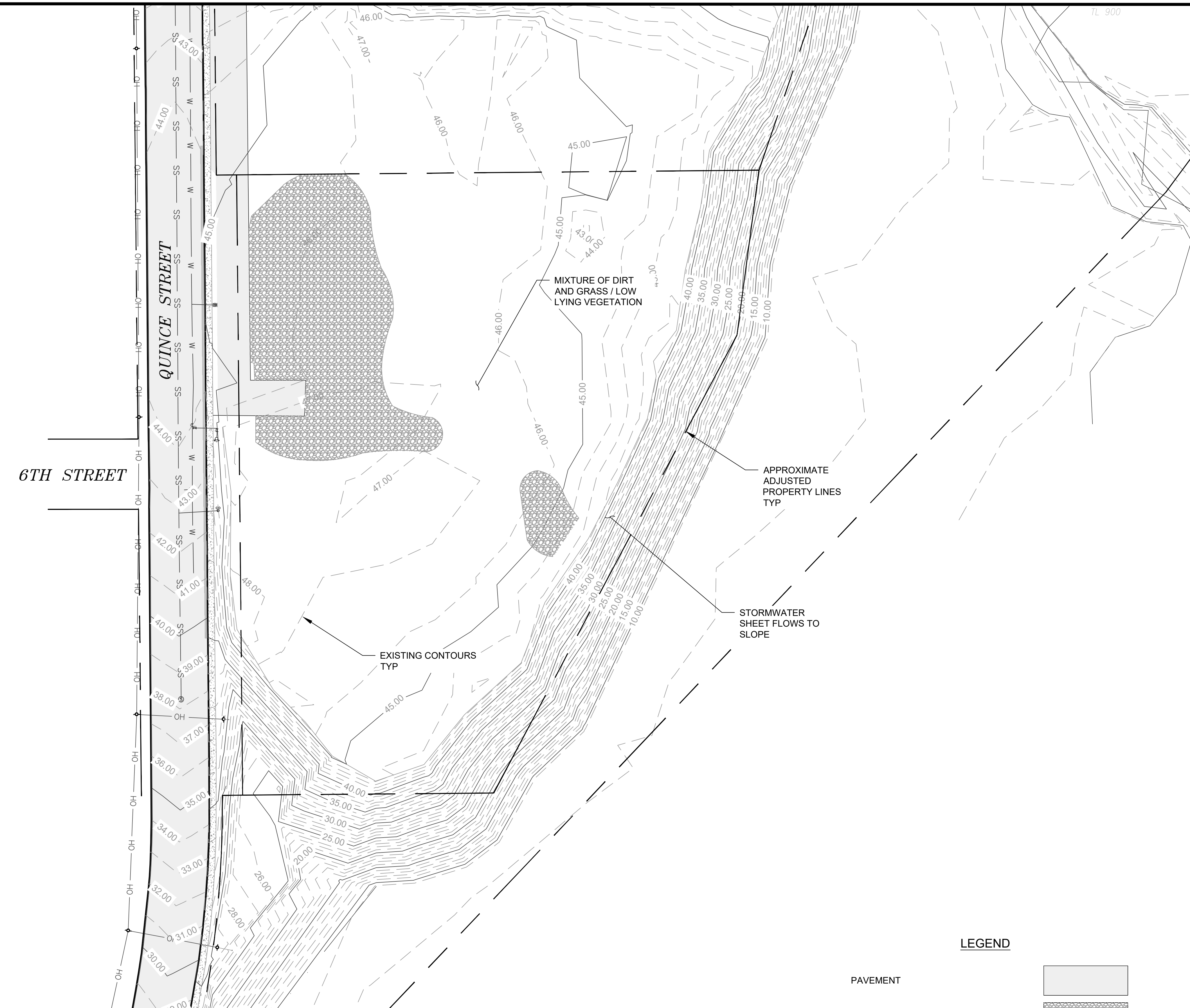
Please see the attached Project Exhibits in Appendix A for a display of contours, impervious areas, and basin delineation. Please see separate landscape plans within the Land Use Submittal Package for Project Landscape Plans.

6. Operations and Maintenance Plan and O&M Form.

Please see the required O&M Form attached in Appendix D. An Operations & Maintenance Plan adhering to the requirements of Chapter 3 of the Portland Stormwater Management Manual will be submitted once land use approval is granted.

APPENDIX A: Project Exhibits

DATE:5/23/22 FILE:O:\CW_Projects\2204 Misc Private Engineering Work\2204-165 Woodblock Architecture - Windham Microtel Florence Oregon\04 Final Design\Drawings\Dwg\Hydrology Pre-Dev.dwg



LEGEND

PAVEMENT

GRANULAR MATERIALS SUCH AS CRUSHED ROCK OR GRAVEL

PLAN SCALE

40 0 20 40 80

1"=80'

1 EX 1 HYDROLOGY - PRE-DEVELOPED

N

PRELIMINARY

Civil West Engineering Services, Inc.

609 SW Hurbert Street
Newport, Oregon 97365

541-266-8601
www.civilwest.com

REV.	DATE	DESCRIPTION	BY

Designed By: SDL
Drawn By: SDL
Checked By: SDL
Project No: 2204-165

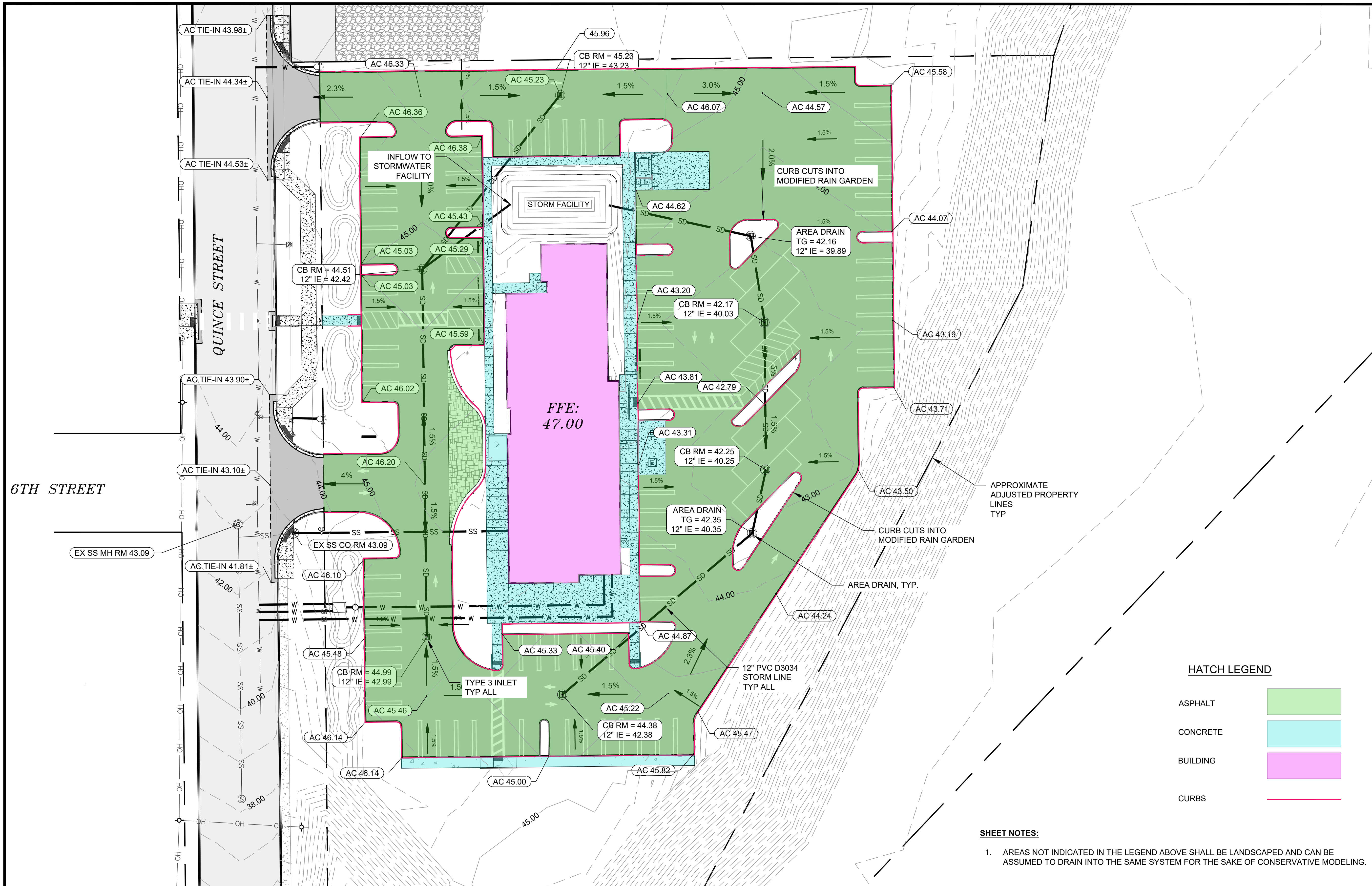
WYNDHAM MICROTEL
QUINCE ST., LANE COUNTY, FLORENCE, OR

PRELIMINARY SUBMITTAL

HYDROLOGY - PRE-DEVELOPED

Sheet No. EX 1

Date MAY 2022



HATCH LEGEND

ASPHALT	
CONCRETE	
BUILDING	
CURBS	

SHEET NOTES:

1. AREAS NOT INDICATED IN THE LEGEND ABOVE SHALL BE LANDSCAPED AND CAN BE ASSUMED TO DRAIN INTO THE SAME SYSTEM FOR THE SAKE OF CONSERVATIVE MODELING.

PLAN SCALE

25 0 12.5 25 50

1"=50'

1 EX 2 HYDROLOGY - DEVELOPED SITE

PRELIMINARY

Civil West Engineering Services, Inc.
609 SW Hurbert Street
Newport, Oregon 97365
541-266-8601
www.civilwest.com

REV.	DATE	DESCRIPTION	BY

Designed By: SDL
Drawn By: SDL & CSK
Checked By: SDL
Project No: 2204-165

WYNDHAM MICROTEL
QUINCE DR., FLORENCE, LANE COUNTY, OR

PRELIMINARY SUBMITTAL

HYDROLOGY - DEVELOPED SITE

Sheet No. EX 2

Date JUNE 2022

DATE:6/1/22 FILE:O:\CW_Projects\2204 Misc Private Engineering Work\2204-165 Woodblock Architecture - Windham Microtel Florence Oregon\04 Final Design\Drawings\Dwg\Hydrology Single Basin Revision 06012022.dwg

APPENDIX B: Geotechnical Engineering Report

PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

Proposed Microtel Inn and Suites
Tax Lots 18-12-26-33-00900 and 18-12-26-33-00901
Florence, Oregon 97439

Prepared for

Mr. Matt Braun
Braun Development Services
PO Box 13223
Portland, Oregon 97213

Prepared by

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February 1, 2022

PSI Project No. 07041434

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1 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

This report presents the results of PSI's geotechnical investigation performed for the proposed l Microtel Inn and Suites located on a 13.41 acre site consisting of two connecting tax lots, 18-12-26-33-00900 and 18-12-26-33-00901, east of the intersection between Quince Street and 6th Street in Florence, Oregon. A Vicinity Map of the site location is presented on Figure 1. This investigation was performed for Mr. Matt Braun of Braun Development Services in general accordance with PSI proposal number 0704-359739, dated November 23, 2021. The proposal was authorized by Mr. Braun on December 14, 2021.

1.2 PROJECT DESCRIPTION

Based on correspondence with Matt Braun of Bran Development Services, Logan Miller of SFA Design Group, and Michael Parshall of Woodblock Architecture, and the provided site information, PSI understands that an approximately 10,000 square foot four story hotel will be constructed. A storm facility to the north of the building a parking lot and associated drive lanes will be on all sides, and a pergola and an uncovered patio to the south of the building will be construed. Currently the site is undeveloped. Prior to 2009 the site was occupied with a local middle school. The site school and associated structures have been demolished but evidence of a concrete slab on grade and concrete foundations are currently visible at the ground surface. We anticipate that the majority of the structural material from the school demolition has been removed from the site.

PSI anticipates the project will consist of construction of a 3 or 4 story structure supported on shallow foundations and slab on grade floors. Structural loads were provided by Mr. Logan Miller of SFA Design Group with column loads not to exceed 50 kips,and wall loads not to exceed 3 kips per foot.. Cuts and fills at the site are expected to be less than 4 feet. Maximum depth of utilities will be less than 8 feet.

Traffic loading for associated parking and pavement areas was not provided. However, we anticipate the proposed parking and drive lanes will be paved with asphalt concrete. Should any of the above information or design basis made by PSI be inconsistent with the planned construction, it is requested that you contact us immediately to allow us to make any necessary modifications to this report. PSI will not be held responsible for changes to the project if not provided the opportunity to review the information and provide modifications to our recommendations.

2 SITE AND SUBSURFACE CONDITIONS

2.1 SITE DESCRIPTION

The property is located east of the intersection between Quince Street and 6th Street in Florence, Oregon. The site is covered mostly with grass and brush. Remnants of the concrete pad from the

school still exist along Quince Street and the asphalt parking lot is still used for parking. It is bound on the north, west, and south by commercial and residential developments. Trees and tidal flats are located to the east with Munsel Creek and the Siuslaw River approximately ¼ mile further.

2.2 TOPOGRAPHY

A review of available USGS topographic maps indicate that the site consists of an upper terrace above the Siuslaw River at an elevation of about 47 feet above mean sea level (AMSL) The ground surface slopes moderately to steeply down to a wooded area adjacent to the marsh about 45 feet below the upper terrace.

2.3 GEOLOGY

The project site is mapped as being underlain by a layer of fine sandy and silty loam over Stabilized Dunes consisting of unconsolidated fine to medium grained sand. The sand is underlain by the Tyee Formation, rhythmically bedded siltstone and sandstone layers. Alluvial deposits and Tidal flats are mapped to the east, bordering Munsel Creek. These consist of alluvial clay, silt, sand, and gravel.

2.4 SUBSURFACE CONDITIONS

PSI completed the initial field exploration for Sycan B Corp on February 22, 2021 through February 24, 2021. The supplemental explorations for Braun Development services were performed on January 4, 2022. Field activities consisted of drilling six cone penetration test (CPT) probes, two GeoProbe explorations, and three geophysical refraction-microtremor (ReMi) lines. Supplemental explorations consisted of excavating 7 test pits to depths of 5 to 8 feet.

Soils

The materials and conditions disclosed by the recent explorations are generally consistent with our previous experience and understanding of the subsurface conditions at the site. In the vicinity of the proposed building, the site is typically mantled with sandy silt topsoil and dune sand underlain by alluvial soils consisting of predominantly silt and sand to a depth of about 113 ft to 116 ft. The alluvial silt and sand are interbedded and the interbeds are often massive and indistinct. The alluvial silt and sand are underlain by medium-dense to dense sandy gravel.

For the purpose of discussion, the materials encountered in the explorations have been grouped into the following categories based on their physical characteristics and engineering properties. Listed as they were encountered from the ground surface downward, the categories are as follows:

1. **SAND**
2. **SILT**

The following paragraphs provide a detailed description of the materials encountered and a discussion of the groundwater conditions at the site.

1. **SAND.** Native sand layers were encountered at the ground surface in all 6 CPT probes and extend to depths ranging from about 33 feet to 50 ½ feet. CPT probe tip resistances indicate the relative density of the sand are generally medium dense in the upper 10 to 12 feet and dense to very dense below.
2. **SILT.** Layers of silt were encountered within the sand in both CPT- 2 and CPT- 6 at depths of 4 feet and 8 feet and extend to depths ranging from about 8 feet to 34 feet, respectively. CPT probe tip resistances indicate the relative consistency of the silt are generally very soft to stiff.

2.5 GROUNDWATER

Our review of available subsurface information from previous investigations indicates the groundwater level in the project area is about 45 feet below the ground surface, which corresponds closely to the elevation of the lower marsh area. At the time of our initial investigation, groundwater was observed at a depth of approximately 35 feet in GeoProbe explorations GP1 and GP2. at the estimated groundwater elevations at the site based on pore pressure dissipation testing in the CPT probes is provided below:

Table 1 - Summary of Pore Pressure Dissipation Test Results

CPT	Pore Dissipation calculated Groundwater Depth (feet bgs)
1	33.4
2	32.2
5	35.2
6	37.1

Fluctuations in the groundwater level should be anticipated. It is recommended that the contractor determine the groundwater levels at the time of the construction to evaluate groundwater impact on construction procedures. Discontinuous zones of perched water may also exist, or develop, within the silt layer encountered during our exploration. If groundwater conditions are found to be different from those determined in this report PSI should be notified to determine if changes to our recommendations are warranted.

2.6 LOCAL FAULTING AND SEISMIC DESIGN PARAMETERS

PSI has reviewed the USGS Quaternary Fault and Fold Database of the United States. Table 1 summarizes distance and names of the closest mapped faults within about 10 miles of the project site.

Table 2 - Summary of Published, Nearby Faults

Fault Name	Approximate Distance (miles) and Direction from the Site
Cascadia Fault and Fold Belt	6.2, southwest
Unnamed Siuslaw River Anticline	8.6, northeast

For preliminary seismic design considerations, we have assumed that a fundamental period of less than 0.5 seconds and a damping ratio of 5% are appropriate to characterize the planned structure. Based on the results of subsurface explorations, geophysical testing, and our review of geologic mapping, we recommend using soil Site Class D to evaluate the seismic design of the structure. Site coefficients and spectral acceleration parameters for structural design are provided in Table 2.

Table 3 - Seismic Design Parameters

(43.9727 °, -124.1003 °) – SITE CLASS "D"

ASCE 7-16 CODE BASED RESPONSE SPECTRUM MCER GROUND MOTION - 5% DAMPING 1% IN 50 YEARS PROBABILITY OF COLLAPSE	
S_S	1.402
S_1	0.737
MAPPED MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL RESPONSE ACCELERATION PARAMETER (SITE CLASS D)	
F_A	1.0
F_V	1.7 - SEE ASCE 7-16 SECTION 11.4.8*
S_{MS}	1.682
S_{M1}	1.253 - SEE ASCE 7-16 SECTION 11.4.8*
DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETER	
S_{DS}	0.935
S_{D1}	0.835 - SEE ASCE 7-16 SECTION 11.4.8*

*Factors dependent on structural design

Notes: SS = Short period (0.2 second) Mapped Spectral Acceleration
S1 = 1.0 second period Mapped Spectral Acceleration
SMS = Spectral Response adjusted for site class effects for short period = FA • SS
SM1 = Spectral Response adjusted for site class effects for 1-second period = Fv • S1
SDS = Design Spectral Response Acceleration for short period = 2/3 • SMS
SD1 = Design Spectral Response Acceleration for 1-second period =2/3 • SM1
FA = Short Period Site Coefficients
FV = Long Period Site Coefficients

2.7 LIQUEFACTION POTENTIAL

The potential for liquefaction and cyclic softening at the site was evaluated using the methods recommended by Idriss and Boulanger (I&B) 2008 and revised to Boulanger and Idriss (B&I) in 2014. For this procedure, the earthquake-induced cyclic shear stresses within the soil profile, designated by the term cyclic stress ratio (CSR), were estimated using the CPT data, earthquake magnitude distance pairs, estimated PGA values and the computer program CLIQ v3.0.3.4.

Based on our review of the 2014 USGS interactive deaggregation the Cascadia Subduction Zone (CSZ) represents the majority of the the seismic hazard at the site. For our liquefaction analysis, we considered MW 9.1 Cascadia earthquakes, and assumed a groundwater level of approximately 32 to 37 feet below the ground surface. The results of our evaluation indicate the poorly graded

sand that extend beyond a depth of about 32 feet in CPT2, 35 feet in CPT5, and 43 feet in CPT6 are susceptible to minor liquefaction during an MCE event. The silt soil encountered in CPT-6 will be subject to cyclic softening and could undergo some vertical or lateral deformation during a strong seismic event.

Our preliminary analysis indicates the potential for less than about 1 or 2 inches of seismically induced liquefaction settlement at the surface. Additional earthquake induced dry sand settlements is possible in the upper loose sands. Preliminary estimates of lateral spreading are on the order of about 6 inches based on evaluation of silt soil in CPT-6. However, we estimate that earthquake induced settlements experienced at the ground surface will be limited to dry sand settlement in the loose sands, due to the depth of the groundwater table and the unlikelihood that it would become perched in the well-drained sand at the ground surface.

2.8 TSUNAMI HAZARD

DOGAMI performed a government funded tsunami inundation assessment along the Oregon coast in 1995. In 2013, DOGAMI has performed a more thorough probabilistic assessment based on different magnitude CSZ events and prepared their findings in the "Local Source (Cascadia Subduction Zone) Tsunami Inundation Map" showing the current Tsunami Regions.

Based on the referenced map the site is located in a zone outside of Tsunami Hazard Areas based on "extra-large and large" CSZ earthquake events, correlating to magnitudes of approximately 9.0 and 9.1.

3 CONCLUSIONS AND RECOMMENDATIONS

The following preliminary geotechnical recommendations have been developed based on the subsurface conditions encountered at the site and PSI's preliminary understanding of the proposed project. In PSI's opinion, based on an evaluation of the data obtained, the proposed site is suitable for construction of the new additions, provided the geotechnical engineering recommendations in this report are followed.

The primary geotechnical related concerns at the site is the potential presence of concrete foundations and floor slab from the demolished buildings, the presence of the near surface loose sand, and the presence of over steepened sand slopes down to the lower elevation portion of the site. In this regard some over excavation and replacement of loose or disturbed sand should be anticipated, especially in the footprint of the proposed structures, in areas where the concrete foundations and floor slabs remain, or at the top of sand slope.

In addition, we recommend the geotechnical engineer to be involved in the layout of the proposed structures with respect to the slopes along the east and southern sides of the upper terrace. However, general recommendations for setbacks provided in the previous geotechnical report should be sufficient for preliminary layout planning purposes.

3.1 SITE PREPARATION

PSI recommends that construction debris, loose, soft, or otherwise unsuitable soils at the project site be stripped and removed from structural areas. Strippings will not be suitable for use as

structural fill and should be disposed of off-site or used only in landscape areas. Following stripping and prior to placement of structural fill, the exposed surface should be evaluated by a geotechnical engineer. Buried foundations, piping and utilities, if encountered, must be completely removed from below proposed building foundations and pavement areas. Should below-grade pipes remain, a risk of seepage or underground soil erosion may occur in the future.

PSI should observe the subgrade to identify any loose/soft or unsuitable areas. Any undocumented or uncontrolled fill should be completely removed, cleaned of any debris, and replaced as engineered fill. Where loose, soft or otherwise unsuitable soils are identified within structural areas of the project, these soils should be completely removed and replaced with structural fill. The Contractor should provide a contingency for the repair of loose, soft or otherwise unsuitable areas identified by the Geotechnical Engineer. Geotextile fabric or geotextile grid should be utilized to provide stabilization of the subgrade.

A proof roll using a fully loaded tandem-axle truck should be performed on finished subgrade elevations to identify any loose, soft or unsuitable areas of subgrade. Loose, soft or otherwise unsuitable soils in these areas should be over-excavated and replaced with properly placed and properly compacted structural fill.

3.2 EXCAVATION CONSIDERATIONS

Open excavations exceeding four feet are not anticipated; however, if they do occur, excavations should be performed in accordance with OSHA regulations as stated in 29 CFR Part 1926. The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor should evaluate the soil exposed in the excavations as part of the required safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified by local, state, and federal safety regulations. PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.

During wet weather, earthen berms or other methods should be used to prevent runoff water from entering the excavations. The bottom of the excavations should be sloped to a collection point. Collected water within the foundation and utility trench excavations should be discharged to a suitable location outside the construction limits.

3.3 STRUCTURAL FILL MATERIALS

PSI should observe the subgrade prior to placing structural fill or structures to document the subgrade condition and stability. In areas where unsuitable soils are encountered and over excavation occurs below footings, the over excavation and structural fill should extend laterally a minimum distance that is equal to the depth of the excavation below the footing. In general, we anticipate the near surface sand soil will be suitable as structural fill.

General. All fill within building, pavement, and sidewalk areas should be placed as compacted structural fill. In areas where unsuitable soils are encountered and over excavation occurs below

footings, the over excavation and structural fill should extend laterally a minimum distance that is equal to the depth of the excavation below the footing. All structural fill materials should be compacted to at least 95% of the maximum dry density, at a moisture content within about 3% of optimum, as determined by ASTM D 1557. Coarse granular fill should be compacted until well keyed. No brush, roots, construction debris, or other deleterious material should be placed within the structural fills. The earthwork contractor's compactive effort should be evaluated on the basis of field observations, and lift thicknesses should be adjusted accordingly to meet compaction requirements. Additional information regarding specific types of fill is provided below.

Granular Fill. Imported granular fill materials should consist of sand, gravel, or fragmental rock with a maximum size on the order of 4 inches and with not more than about 5% passing the No. 200 sieve (washed analysis). Material satisfying these requirements can usually be placed during periods of wet weather. The first lift of granular fill placed over a fine-grained subgrade should be about 18 in. thick and subsequent lifts about 12 inches thick when using medium- to heavy-weight vibratory rollers. Granular structural fill should be limited to a maximum size of about 1 ½ inches when compacted with hand-operated equipment. We also recommend that lift thicknesses be limited to less than 8 inches when using hand-operated vibratory plate compactors.

Utility Trench Backfill. Utility trench backfill should consist of granular fill limited to a maximum size of about 1 ½ inches. The granular trench backfill should be compacted to at least 95% of the maximum dry density as determined by ASTM D 1557 in the upper 4 feet of the trench and to at least 90% of this density below this depth. The use of hoe-mounted vibratory plate compactors is usually most efficient for compaction of trench backfill. Lift thicknesses should be evaluated on the basis of field density tests; however, particular care should be taken when operating hoe-mounted compactors to prevent damage to the newly placed conduits. Flooding or jetting to compact the trench backfill should not be permitted. Native materials can be used for trench backfill in unimproved areas where a soft trench and future settlement of the backfill can be tolerated.

Free-Draining Fill. Free-draining material should have less than 2% passing the No. 200 sieve (washed analysis). Examples of materials that would satisfy this requirement include pea gravel and ¾ - to ¼ - inch, 1 ½ - to 3/4-inch, or 3- to 1-inch crushed rock.

3.4 FOUNDATIONS

Based on the subsurface conditions encountered, PSI anticipates that a building with four or less stories can be supported on spread footing foundations bearing on 12-inch thick section of crushed rock placed as structural fill. Based primarily on settlement considerations and minimum column and strip footing width of 3 feet and 24 -inches, respectively and minimum embedment depth of 1½ feet (deeper footing embedment's may be required to achieve adequate setback from slopes), footings established in accordance with these criteria can be designed on the basis of an allowable soil bearing pressure of 3,000 psf. This value applies to the total of dead load plus frequently and/or permanently applied live loads and can be increased by one third for the total of all loads; dead, live, and wind or seismic. If fill and/or other unsuitable soils are encountered at footing depth, the unsuitable material should be over excavated to firm subgrade material and replaced with granular structural fill. The over excavated areas should be backfilled with clean crushed rock and compacted to at least 95% of the maximum dry density as determined by ASTM

D 698 (Modified Proctor).

The total static settlement of footings designed in accordance with the recommendations presented above is estimated to be less than one inch. Differential settlements between adjacent foundation units should be less than half the total settlement across a distance of 40 feet. If the structure is not designed to accommodate these differential settlements, the use of grade beams may be considered to limit differential settlement across individual foundation elements under seismic events.

Horizontal shear forces can be resisted partially or completely by frictional forces developed between the base of spread footings and the underlying soil. The total shearing resistance between the foundation footprint and the soil can be computed as the normal force, i.e., the sum of all vertical forces (dead load plus real live load), times the coefficient of friction equal to 0.40 (ultimate value). If additional lateral resistance is required, passive earth resistance against embedded footings or walls can be computed using a pressure based on an equivalent fluid with a unit weight of 300 pcf. This design passive earth pressure assumes granular structural fill is used to backfill the footing excavation or the footings will be neat formed in situ.

3.5 FLOOR SLAB SUPPORT

PSI recommends the slab-on-grade be underlain by at least 12-inches of native sand soil removed and replaced as structural fill and capped with a minimum of 6-inch thick section of crushed angular "drain rock." The drain rock should be compacted until it is well keyed. In addition, it will be appropriate to install a durable vapor-retarding membrane beneath the slab-on-grade to limit the risk of damp floors in areas that will have moisture-sensitive materials placed directly on the floor. The vapor-retarding membrane should be installed in accordance with the manufacturer's recommendations.

In our opinion, a coefficient of subgrade reaction, k, of 150 pci can be used to characterize the support with a minimum thickness of 12-inches of "structural fill" (based on a 1x1-foot plate load). Depending on how the slab load is applied, the value should be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesionless soil:

Modulus of Subgrade Reaction, for $k_s = k\left(\frac{B+1}{2B}\right)^2$ cohesionless soil,

where: k_s = coefficient of vertical subgrade reaction for loaded area;
k = coefficient of vertical subgrade reaction for 1x1 square foot area; and,
B = width of area loaded, in feet.

3.6 EMBEDDED WALL DESIGN

We anticipate embedded walls for the project will be limited to elevator pits or loadings docks with a height of less than five feet. Design lateral earth pressures against a retaining wall or other embedded structure depend on the drainage condition provided behind the wall, the geometry of the backfill slope, and the type of construction, i.e., the ability of the wall to yield. The two possible conditions regarding the ability of the wall to yield include the active and at-rest earth pressure cases. The active earth pressure case is applicable to a wall that is capable of yielding slightly away from the backfill by either sliding or rotating about its base. A conventional cantilever retaining wall is an example of a wall that can develop the active earth pressure case

by yielding. The at-rest earth pressure case is applicable to a wall that is considered to be relatively rigid and laterally supported at the top and bottom and therefore is unable to yield. The following general recommendations for embedded wall design assume the wall backfill is compacted to 90% of ASTM D 1557, and the embedded wall is fully drained, i.e., hydrostatic pressure cannot act on the wall.

Walls that are allowed to yield by tilting about their base should be designed using a lateral earth pressure based on an equivalent fluid having a unit weight of 25 pcf for horizontal backfill. Non-yielding walls should be designed using a lateral earth pressure based on an equivalent fluid having a unit weight of 45 pcf for horizontal backfill. Surcharge loads on walls should be accounted for in the structural design of the walls.

Over compaction of the backfill behind walls should be avoided. In this regard, we recommend compacting the backfill to about 90% of the maximum dry density (ASTM D 1557). Heavy compactors and large pieces of construction equipment should not operate within 5 ft of any embedded wall to avoid the buildup of excessive lateral pressures. Compaction close to the walls should be accomplished using hand-operated vibratory plate compactors.

3.7 PAVEMENT

In lieu of project-specific traffic estimates, the following pavement design recommendations are based on our past experience with similar facilities and subgrade conditions.

For automobile parking areas, we recommend a pavement section consisting of 3 in. of asphaltic concrete (AC) over 8 in. of crushed rock base (CRB). For heavy truck traffic areas, the pavement section should consist of 4 in. of AC over 12 in. of CRB. These recommended pavement sections are based on the assumption that the subgrade consists of firm, undisturbed soil or sand structural fill and that the pavements will be constructed during the dry summer months. Proof rolling should be used to evaluate pavement subgrades. Any soft areas disclosed by the proof rolling will likely require over excavation and replacement with structural fill. Some contingency should be provided for the repair of any soft areas. If pavement construction is scheduled for the wet season, it will be necessary to increase the above-recommended base course sections.

Permanent, properly installed drainage is also an essential aspect of pavement design and construction. All paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as in sunken loading dock areas or around stormwater catch basins. Effective means to prevent saturation of the base course include installing subdrain systems below sunken loading docks and weep holes in the sidewalls of catch basins.

To provide quality materials and construction practices, we recommend that the pavement work conform to the "Standard Specifications for Highway Construction" used by the Oregon Department of Transportation.

3.8 DESIGN REVIEW AND CONSTRUCTION MONITORING

After plans and specifications are complete, PSI should review the final design and specifications so that the earthwork and foundation recommendations are properly interpreted and implemented. It is considered imperative that the Geotechnical Engineer and/or their representative be present during earthwork operations and foundation installations to observe the field conditions with respect to the design assumptions and specifications. PSI will not be responsible for changes in the project design or project information it was not provided, or interpretations and field quality control observations made by others. PSI would be pleased to provide these services for this project.

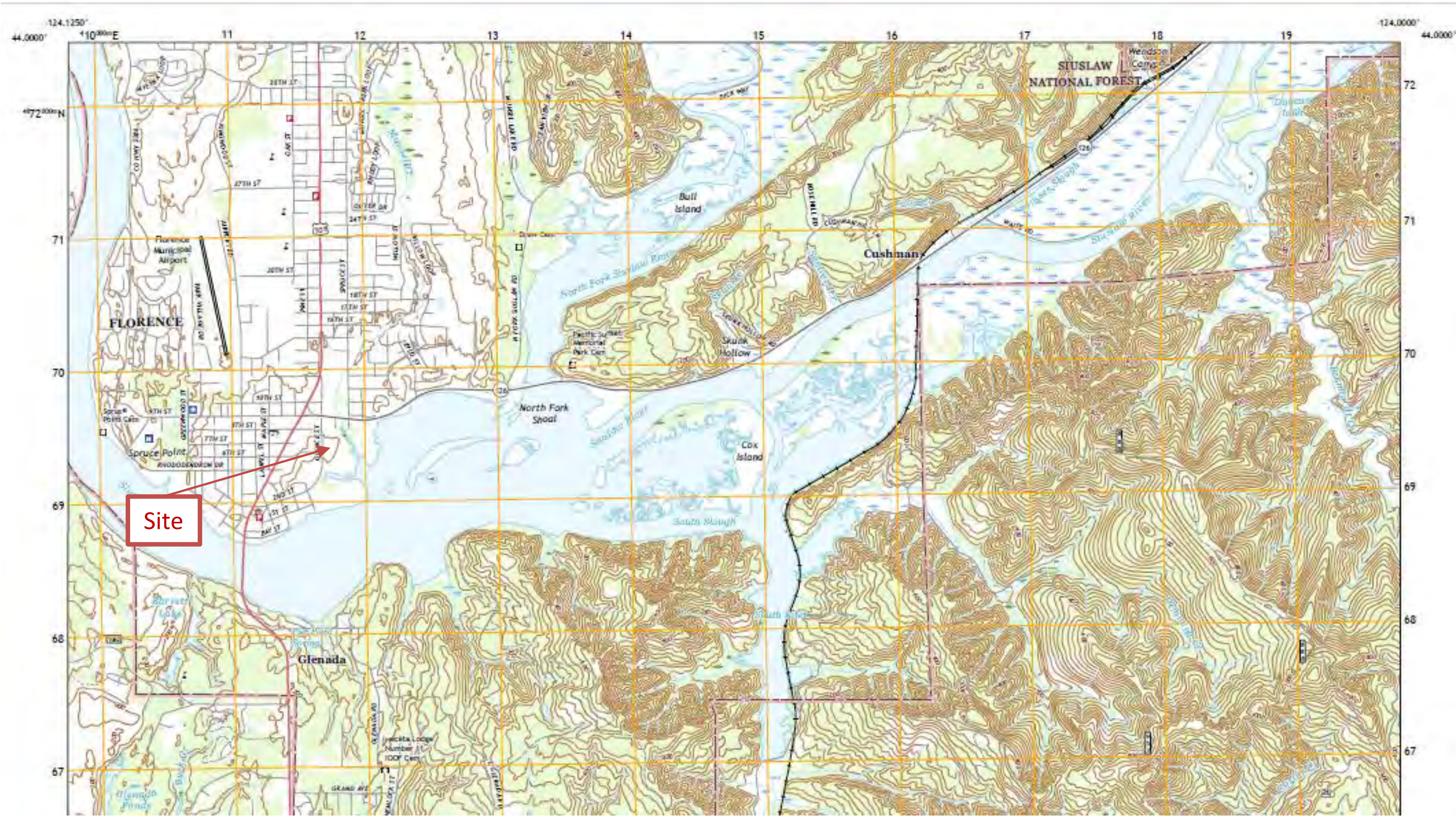
4 GEOTECHNICAL RISK AND REPORT LIMITATIONS

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the building and proposed pavement section will perform as planned. The engineering recommendations presented in the preceding sections constitute PSI's professional estimate of those measures that are necessary for the proposed building addition to perform according to the proposed design based on the information generated and referenced during this evaluation, and PSI's experience in working with these conditions.

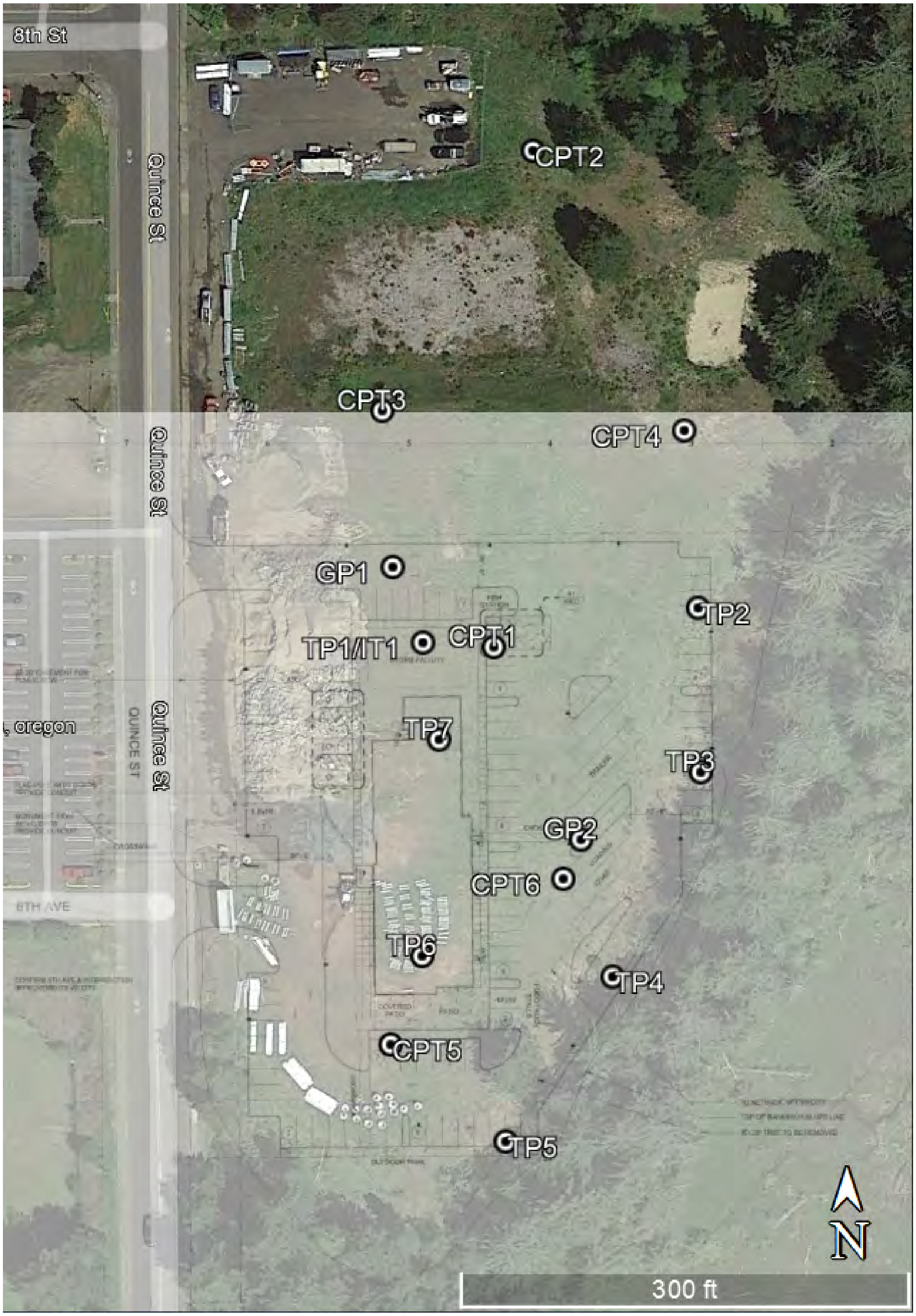
The recommendations submitted are based on the available subsurface information obtained by PSI, and information provided by Mr.Matt Braun. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the recommendations are required. If PSI is not retained to perform these functions, PSI cannot be responsible for the impact of those conditions on the performance of the project.

The Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of Mr. J. B. Jaramillo and his design consultants for the specific application to the proposed Microtel Inn and Suites located east of the intersection between Quince Street and 6th Street in Florence, Oregon.

FIGURES



USGS Florence Quadrangle Oregon - Lane County 7.5 Minute Series	intertek psi	Microtel Inn and Suites- Florence, OR	JOB NO.	7041434
		Site Vicinity Map	FIGURE NO.	1



intertek psi	DATE January 31 2022	Microtel Inn and Suites Florence, OR	PSI PROJECT #: 07041434
Obtained from Google Earth	DRAWN BY: SRS	**INVESTIGATION LOCATION PLAN**	**FIGURE 2**

APPENDIX A

FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATION PROGRAM

PSI completed the original field exploration of the project site on February 22, 2021, through February 24, 2021, using a track-mounted rig owned and operated by Oregon Geotechnical Exploration, Inc. of Kaiser, Oregon. The scope of the exploration included completion of six CPT probes and two direct push probes at the site. The CPT probes were designated CPT1 through CPT6 and the direct push probes were designated GP1 and GP2.

The supplemental explorations were conducted on January 4, 2022, using a tracked excavator provided by Dan J. Fisher Excavating, Inc. of Forest Grove, Oregon. The scope included the completion of seven test pits designated TP1 through TP7. The exploration locations were located in the field by PSI using handheld GPS. These exploration locations are presented on Figure 2. PSI notified Oregon's Utility Notification to locate public underground utilities and a Private Utility Locator to locate any potential private utilities in the vicinity of the proposed exploration locations prior to commencing the field activities.

Table 1 – Investigation Depths

Boring	Proposed Depth (feet)	Completion/Refusal Depth (feet)
CPT1	100	36.4*
CPT2	100	37.1*
CPT3	50	32.9*
CPT4	50	33.5*
CPT5	100	49.2*
CPT6	50	50.5*
GP1	20	38.5*
GP2	20	38.5*
TP1	10	5½**
TP2	10	8**
TP3	10	8**
TP4	10	8**
TP5	10	8**
TP6	10	7**
TP7	10	8**

* Refusal
**Caving

A representative from PSI's office observed the explorations and prepared borings logs of the conditions encountered. It should be noted that the subsurface conditions presented on the boring logs are representative of the conditions at the specific locations drilled. Variations may occur and should be expected across the site. The soil morphology represents the approximate boundary between subsurface materials and the transitions may be gradual and indistinct. Elevations referenced were obtained from the National Map developed by the United States Geological Survey (USGS) and should be considered approximations.

Infiltration Testing Procedure and Results

Based on the provided site plan, we understand that an infiltration facility is proposed in the northern portion of the site.

PSI performed a falling-head infiltration tests in general accordance with the EPA Design Manual, Onsite Wastewater Treatment and Disposal Systems, Table 3-8 Falling Head Percolation Test Procedure. Test pit TP-1 was excavated to a depth of 5 feet bgs and a 6-inch outside diameter pipe was set in the pit. The pipe was pushed down by the excavator bucket approximately 8 inches. At each infiltration location, the pipe was filled with between one to two feet of water a total of four times and the falling water level was recorded a various time interval during the test. Results of the infiltration testing are summarized below:

Table 1 – Field Infiltration Test Results

Infiltration Test	Duration (minutes)	Head (inches)	Average Infiltration Rate (inches/hour)
1	13	12.5	57
2	10	12	72
3	13	13	60
4	11	12.5	68

Please note that the infiltration rates shown above are measured rates and do not include a factor of safety. PSI recommends that a factor of safety of at least 2 be applied to this rate for design of infiltration systems.

Seismic Cone Penetration Test with Pore-Pressure Readings (SCPTu)

SCPTu is an in-situ testing method used to determine the geotechnical engineering properties of soils and to delineate soil lithology. SCPTu data is used in the analysis and design of foundations. SCPTu probing is a fast and cost-effective method for identifying subsurface soil types and evaluating the engineering properties of soils. The SCPTu records are presented in Appendix A.

During an SCPTu sounding, the electric cone (tip angle 60°, section area 10 cm^2) and the sounding rods are pushed continuously into the ground. Intermittent measurements of the cone resistance (q_t) and sleeve friction (f_s) are measured and recorded by the electric cone while it is being pushed into the ground.

The measurements from a SCPTu can be used to correlate a multitude of geotechnical parameters, including:

- Undrained shear strength (su)
- Effective friction angle (ϕ', degree)
- Coefficient of consolidation (Cv, cm^2/sec)
- Overconsolidation Ratio (OCR)

The results of the measured and correlated data are used in various geotechnical analyses, including soil behavior type, soil bearing capacity, estimated settlement, liquefaction settlement, lateral spread, foundation-design criteria, slope stability, and seismic site class.

Pore Pressure Dissipation Tests

Pore Pressure Dissipation Tests (PPDTs) were conducted at various intervals to measure equilibrium water pressure at the time of the SCPTu sounding. As the conditions are assumed to be hydrostatic, the equilibrium water pressure can be used to determine the approximate depth of the groundwater table. A PPDT is conducted when penetration is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (u) with time is measured using a piezometer fitted between the cone and the sleeve and recorded. Pore Pressure Dissipation Tests are provided below.

Downhole Shear Wave Velocity Measurements

Down hole shear wave velocity measurements were made while advancing each of the probes. This test consists of generating a shear wave by striking a hammer equipped with a trigger on a source beam located on the ground surface under the outrigger of the cone rig. The seismic cone consists of a piezocone unit with a receiver above it. The seismic cone penetrometer is pushed into the ground and penetration is stopped at 1-meter intervals. During the pause in penetration, a shear wave is generated at the ground surface and the time required for the shear wave to reach the seismometer in the cone penetrometer is recorded. The shear wave velocity measurements are used with elastic theory to estimate the mass density of the soil layers. Shear wave velocity measurements are provided below.

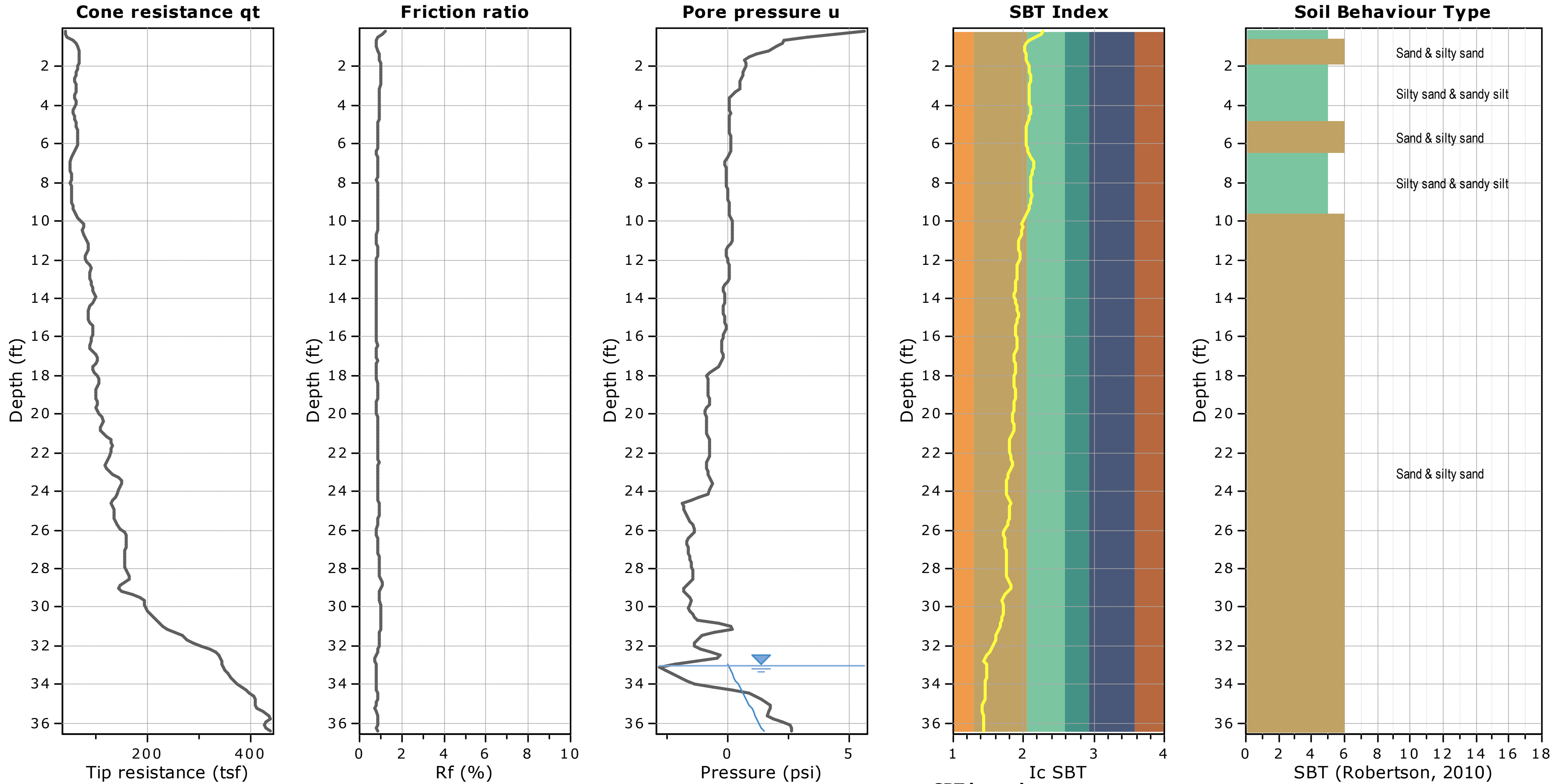
Field Classification

Soil samples were initially classified visually in the field. Consistency, color, relative moisture, degree of plasticity, and other distinguishing characteristics of the soil samples were noted. The terminology used in the soil classifications and other modifiers are depicted in the General Notes and Soil Classification Chart.

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

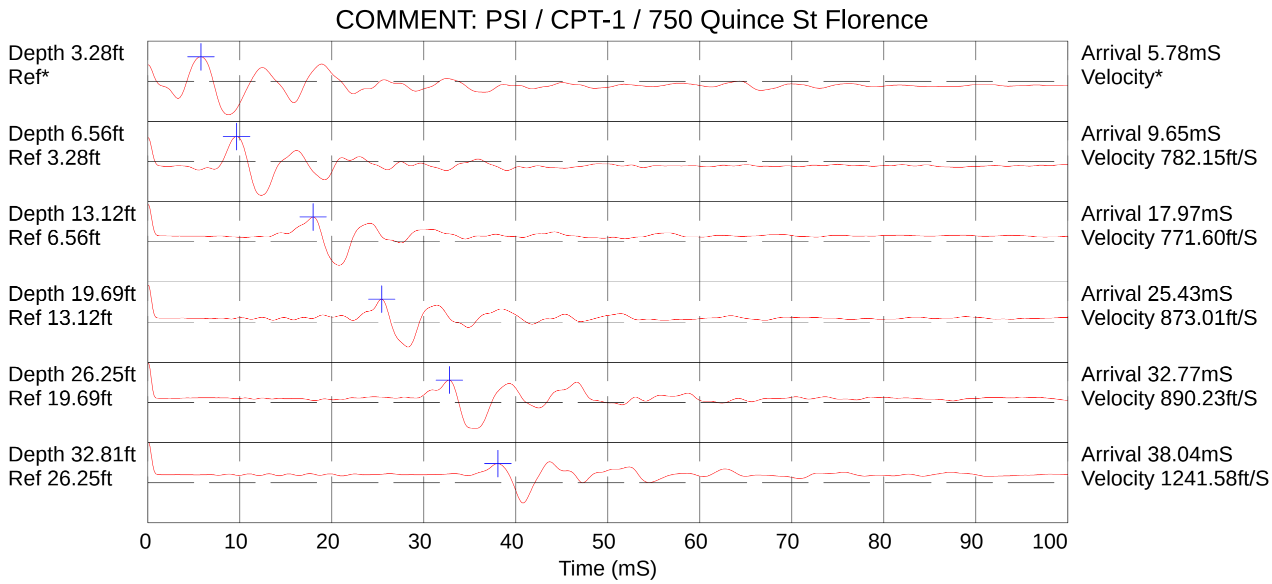
CPT: 21020 CPT-1 Text File
Total depth: 36.42 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

Project: **Microtel Inn and Suites - 07041434**
Location: **43.9727, -124.1003**



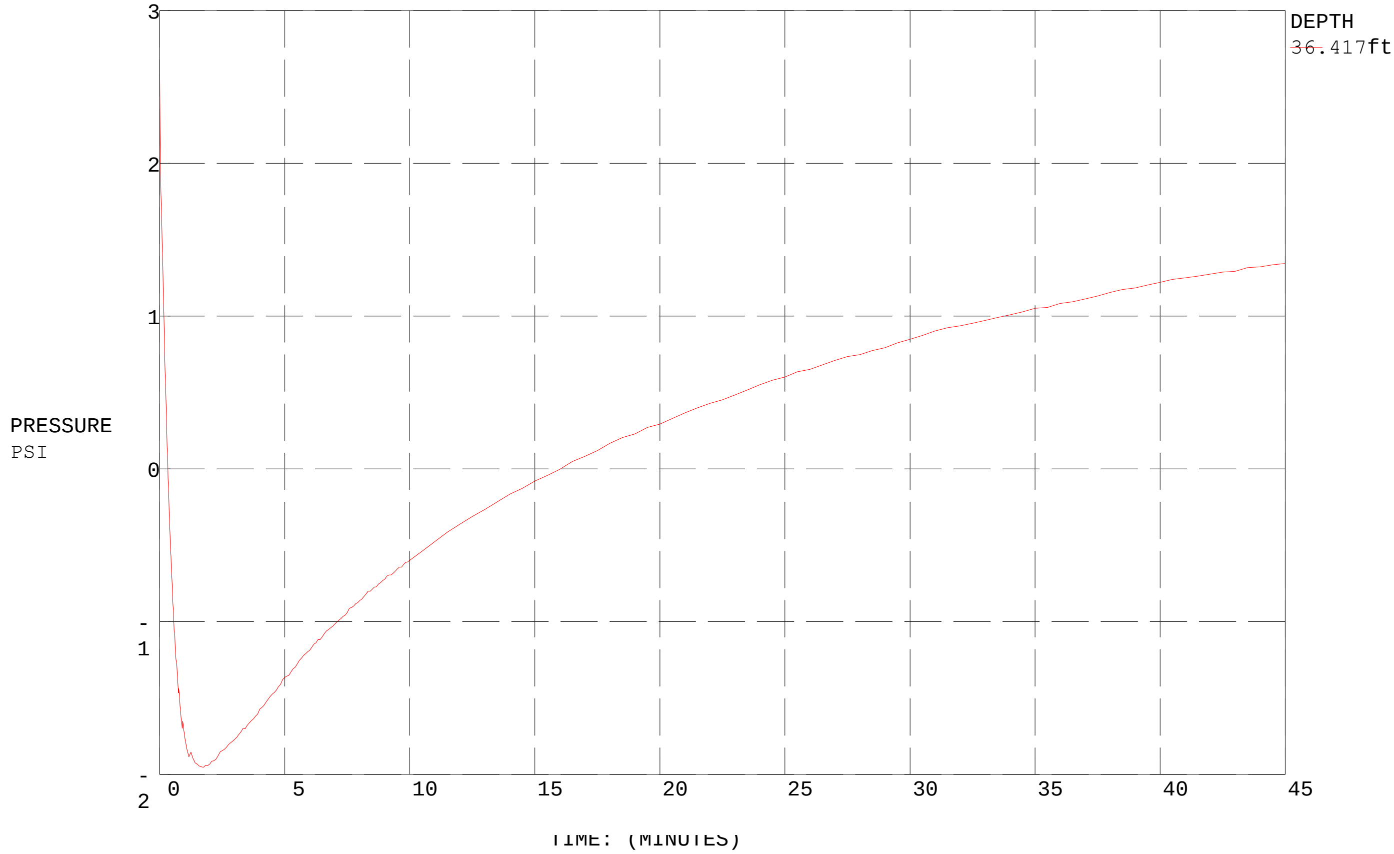
SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-1 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A2**



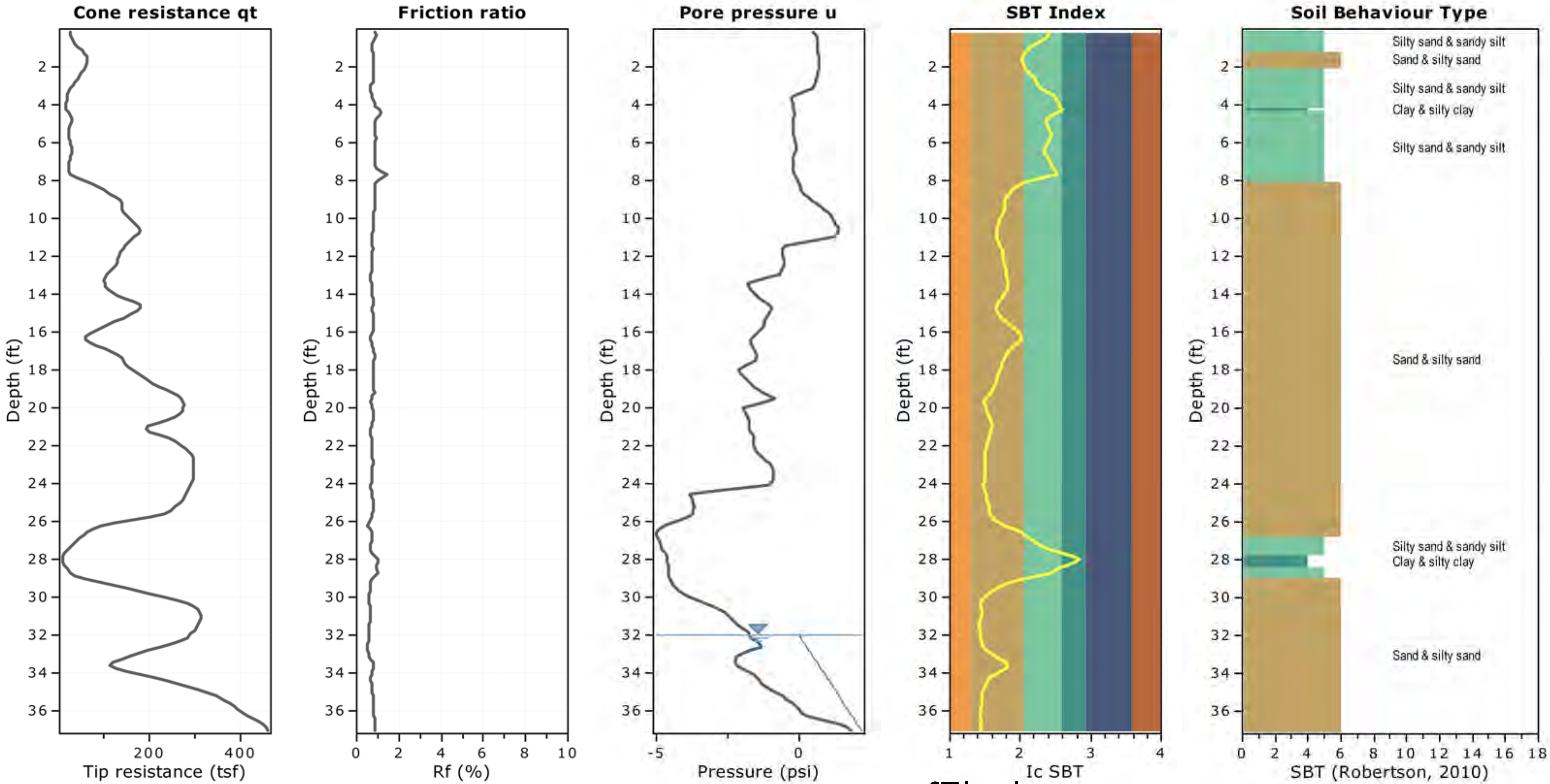
MAXIMUM PRESSURE = 2.582 (PSI)
HYDROSTATIC PRESSURE = 1.499 (PSI), WATER TABLE: 32.96 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites** **Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-1 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A3**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-2 Text File
Total depth: 37.07 ft, Date: 2/23/2021
Surface Elevation: 44.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

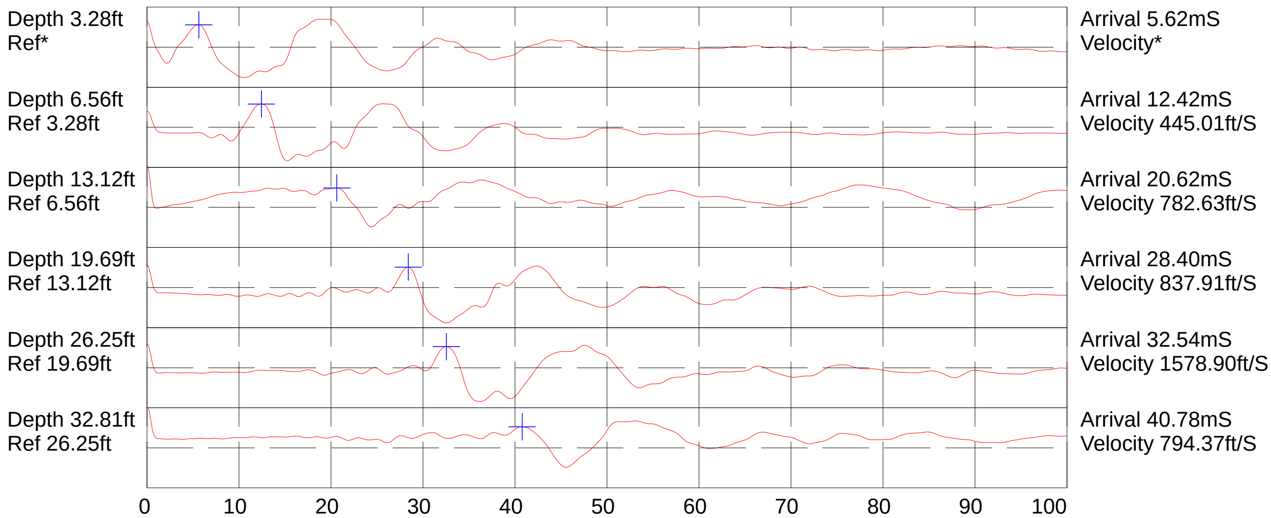
Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

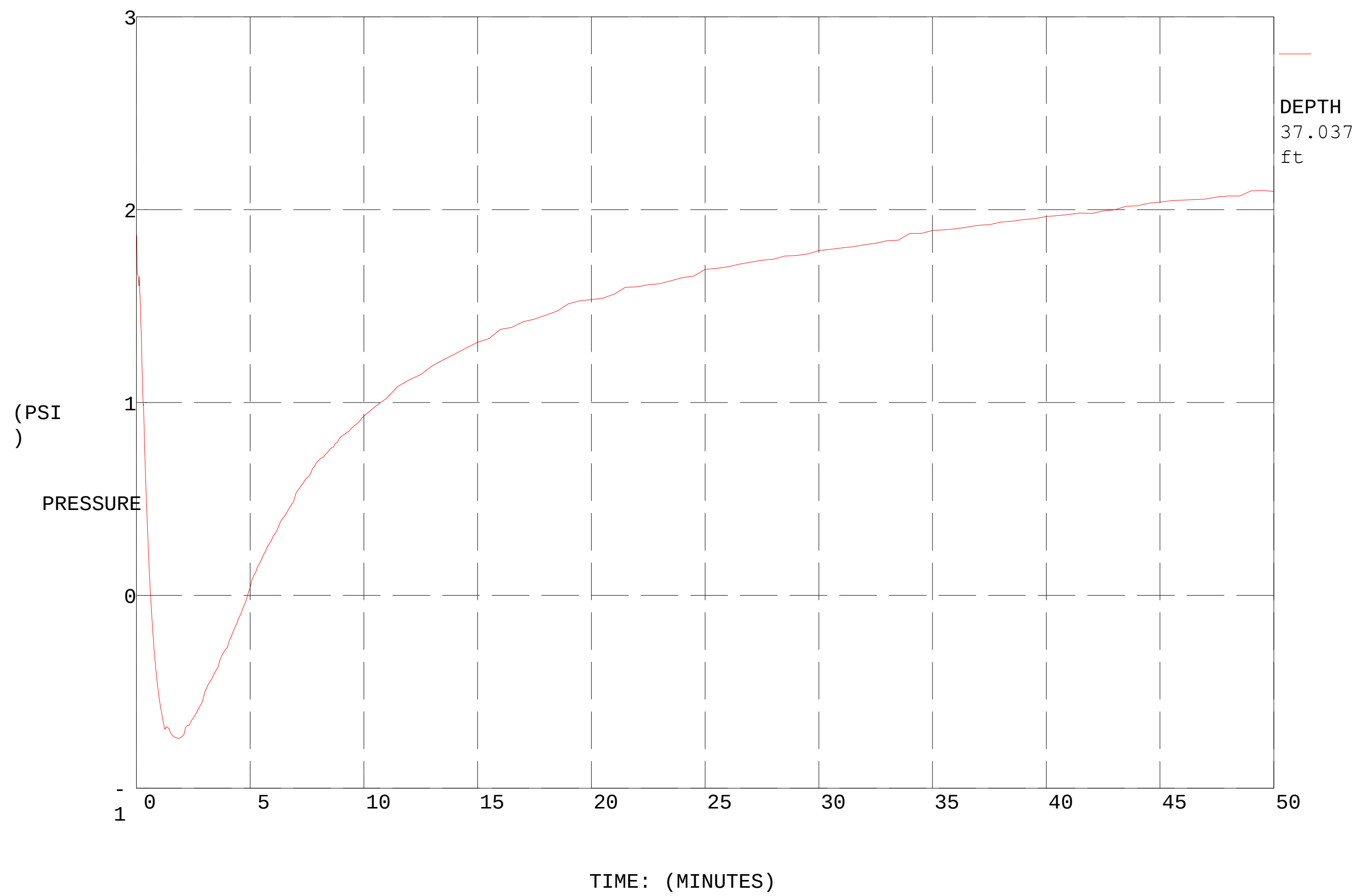
COMMENT: PSI / CPT-2 / 750 Quince St Florence



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**

6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-2 SHEAR WAVE VELOCITY MEASUREMENTS**	**FIGURE A5**



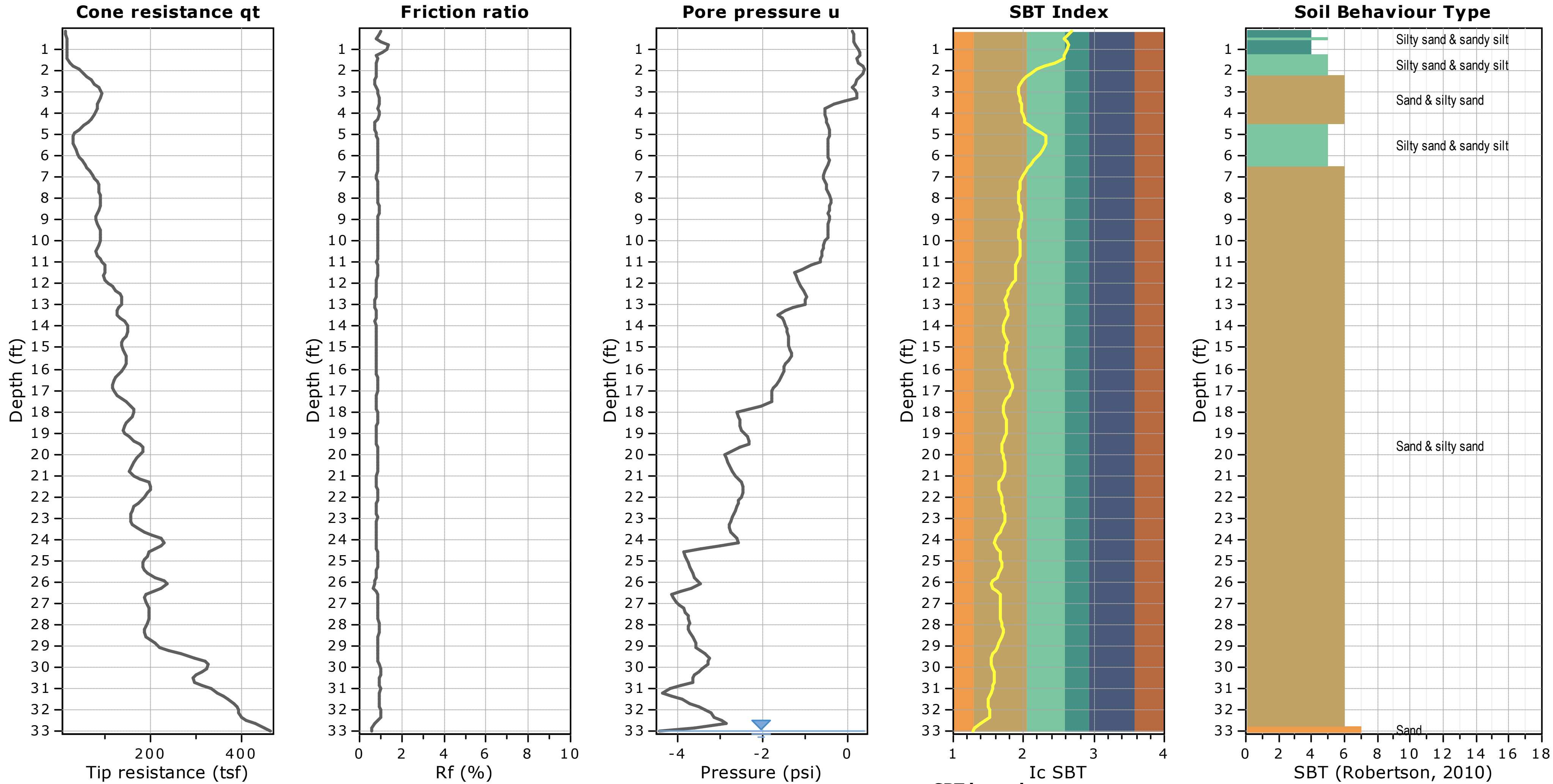
MAXIMUM PRESSURE = 2.1 (PSI)
HYDROSTATIC PRESSURE = 2.15 (PSI), WATER TABLE: 32.11 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-2 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A6**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-3 Text File
Total depth: 32.97 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

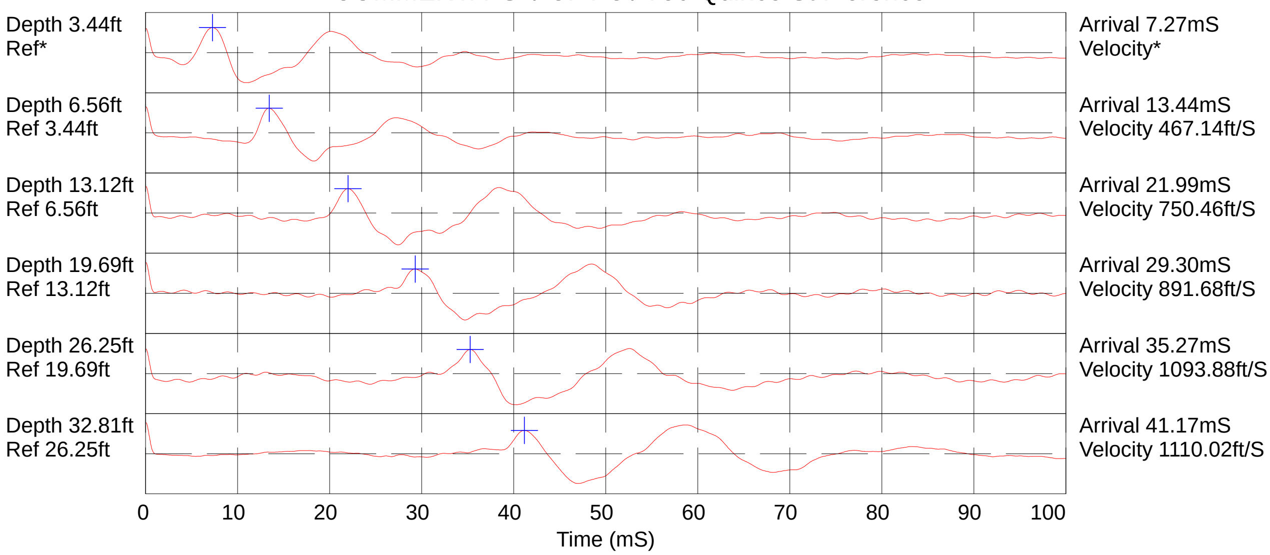
Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

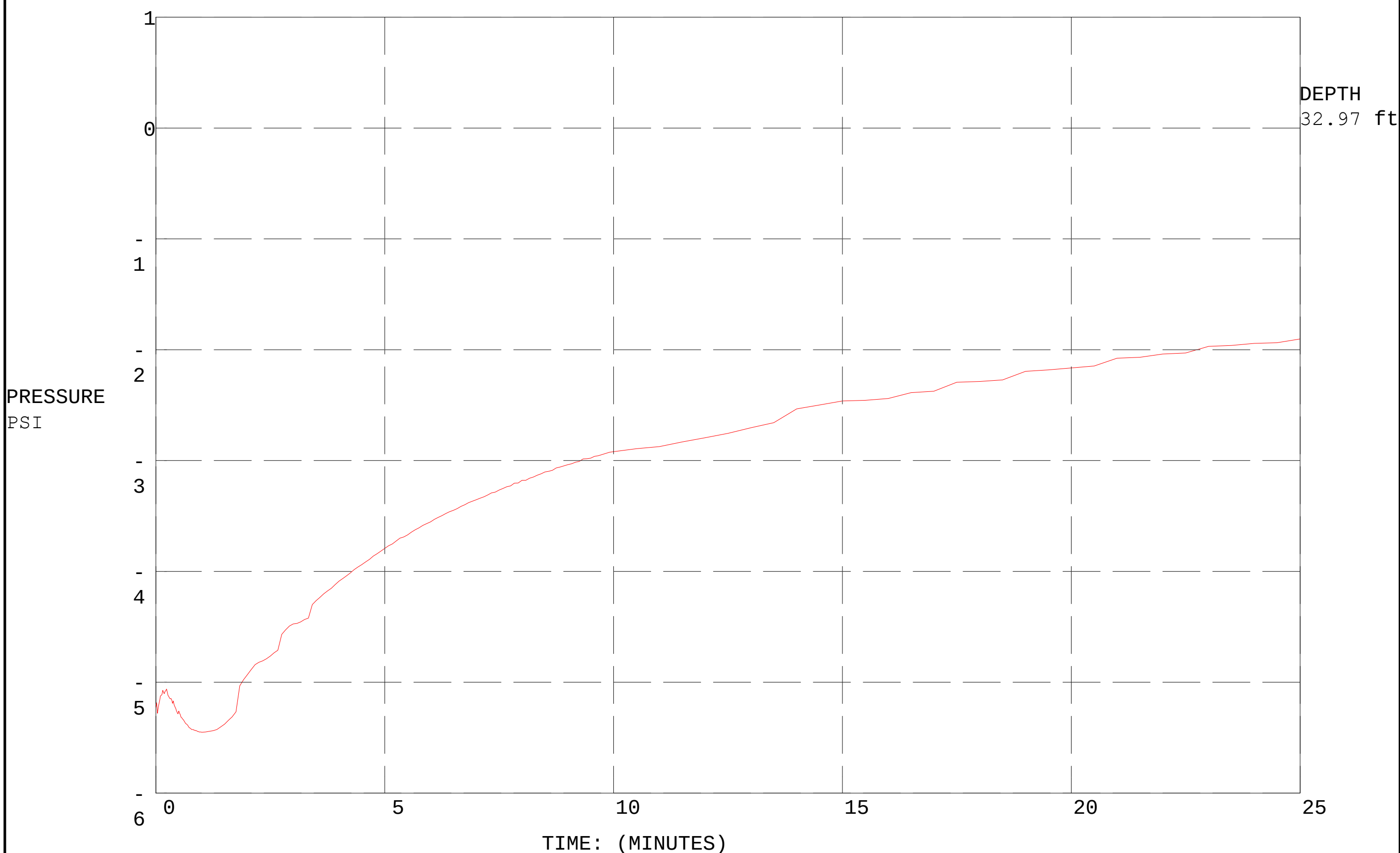
COMMENT: PSI / CPT-3 / 750 Quince St Florence



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-3 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A8**

COMMENT: PSI / CPT-3 / 750 Quince St Florence



MAXIMUM PRESSURE = -1.903 (PSI)

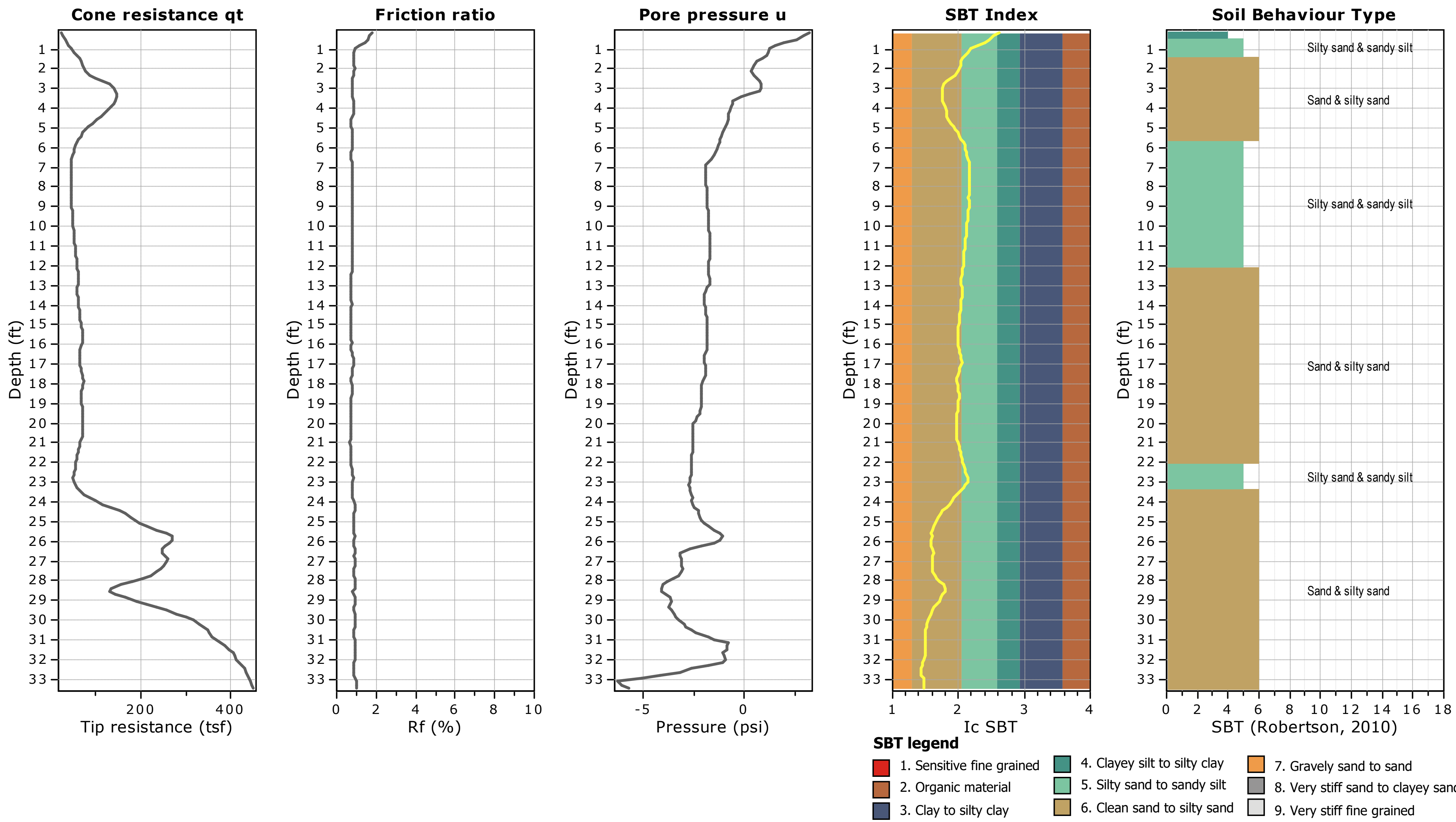
HYDROSTATIC PRESSURE = 0.0 (PSI), WATER TABLE: 33.14 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-3 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A9**

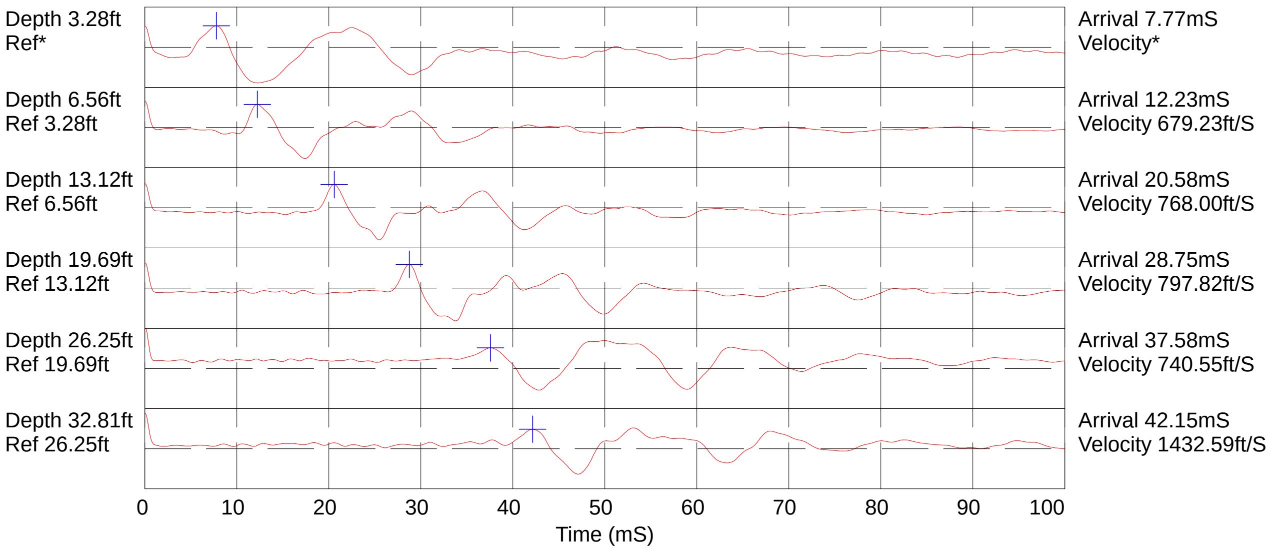
Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-4 Text File
Total depth: 33.47 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



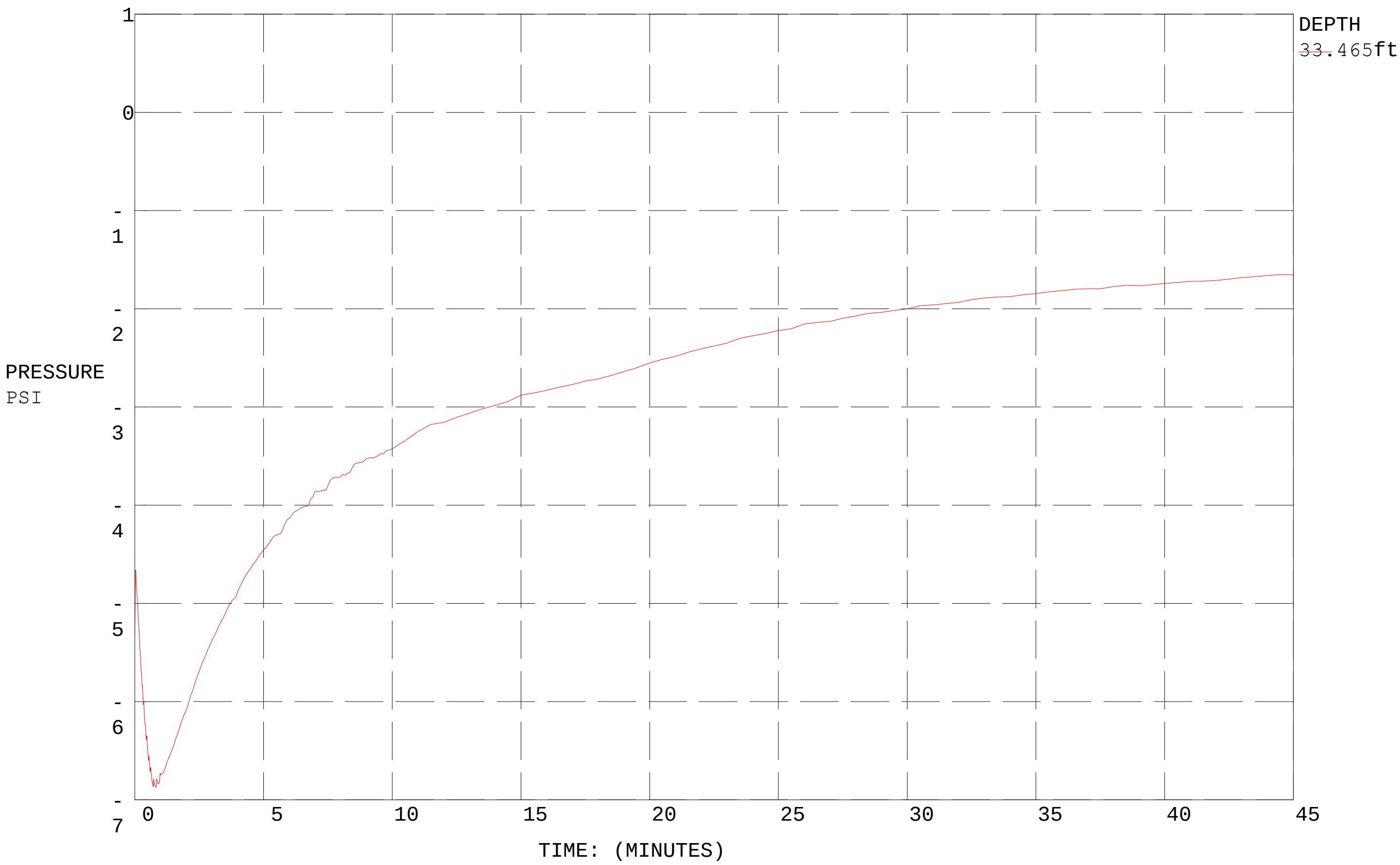
COMMENT: PSI / CPT-4 / 750 Quince St Florence



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-4 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A11**

COMMENT: PSI / CPT-4 / 750 Quince St Florence



MAXIMUM PRESSURE = -1.653 (PSI)

HYDROSTATIC PRESSURE = 0.0 (PSI), WATER TABLE: 35.01 ft

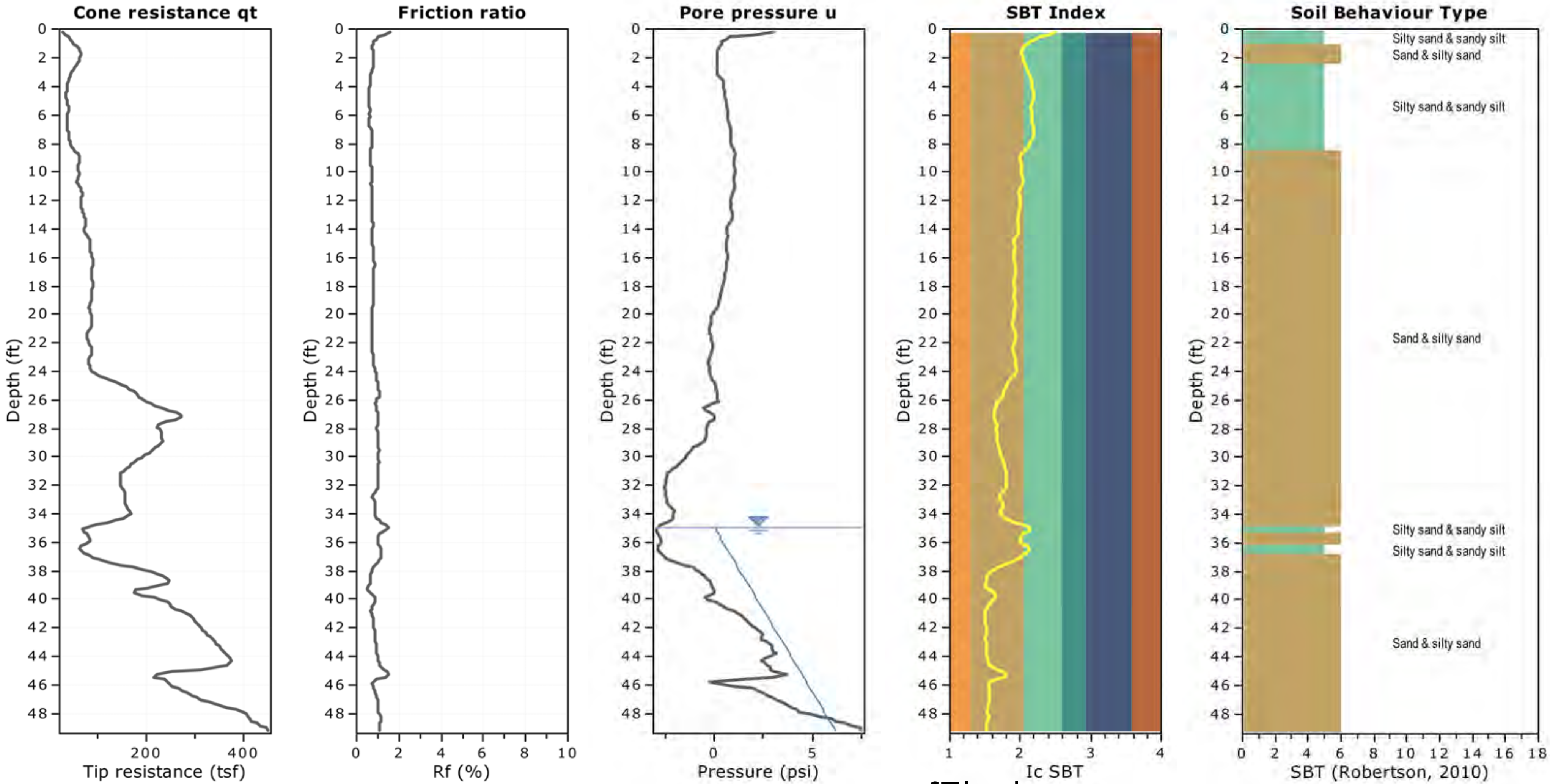
intertek psi	Project No. 07041434	Microtel Inn and Suites Florence, Oregon

6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	CPT-4 PORE PRESSURE DISSAPATION MEASUREMENTS	FIGURE A12

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003

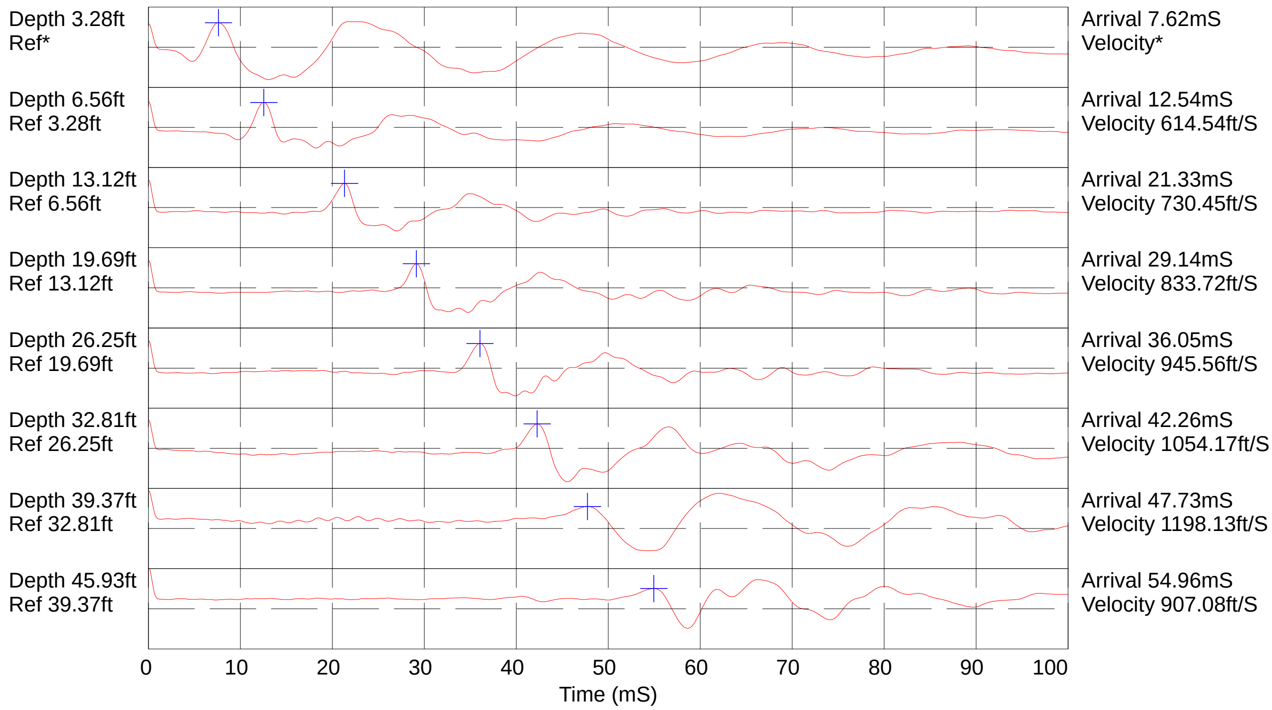
CPT: 21020 CPT-5 Text File
Total depth: 49.21 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

COMMENT: PSI / CPT-5 / 750 Quince St Florence

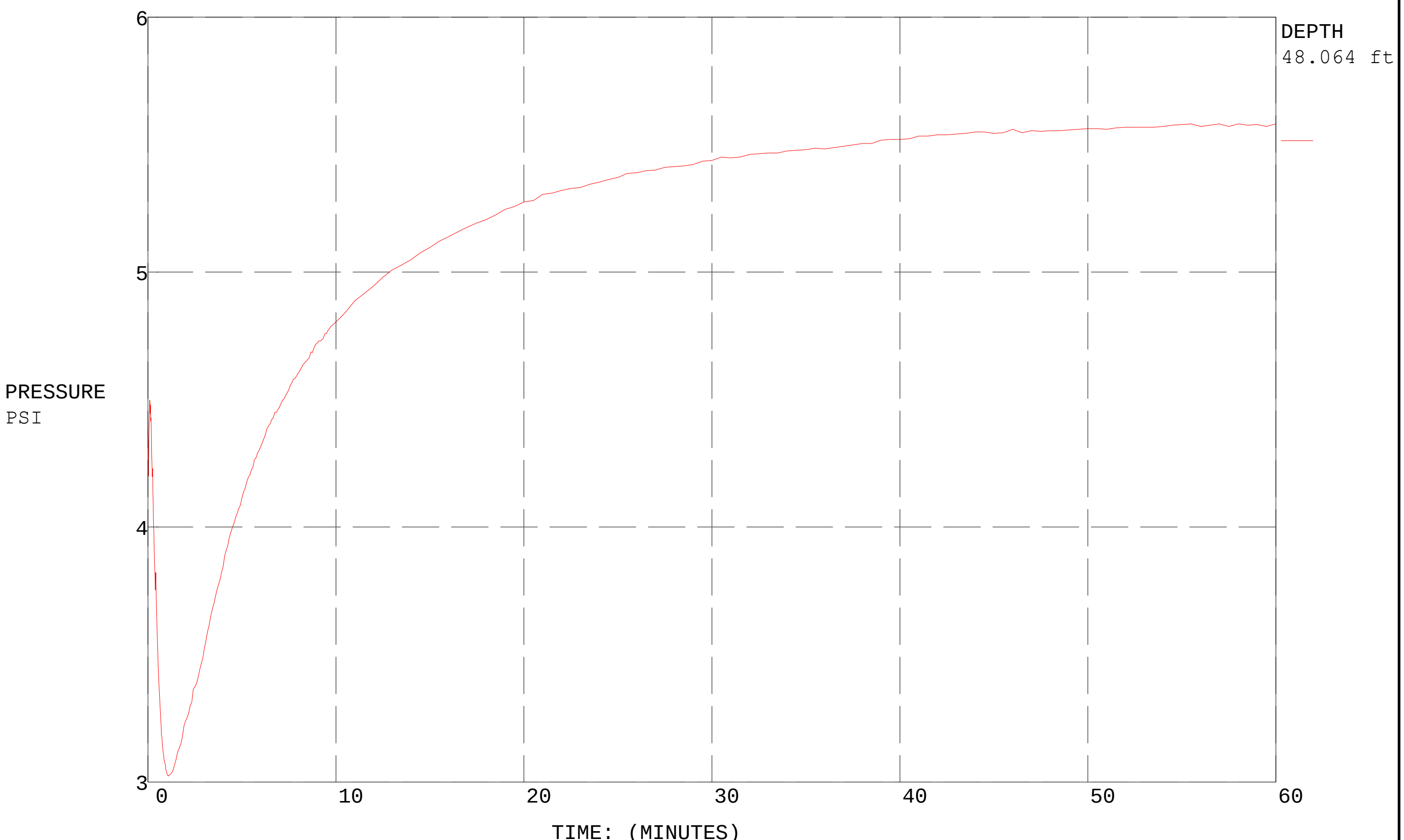


Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**

6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-5SHEAR WAVE VELOCITY MEASUREMENTS**	**FIGURE A14**

COMMENT: PSI / CPT-5 / 750 Quince St Florence



MAXIMUM PRESSURE = 5.581 (PSI)

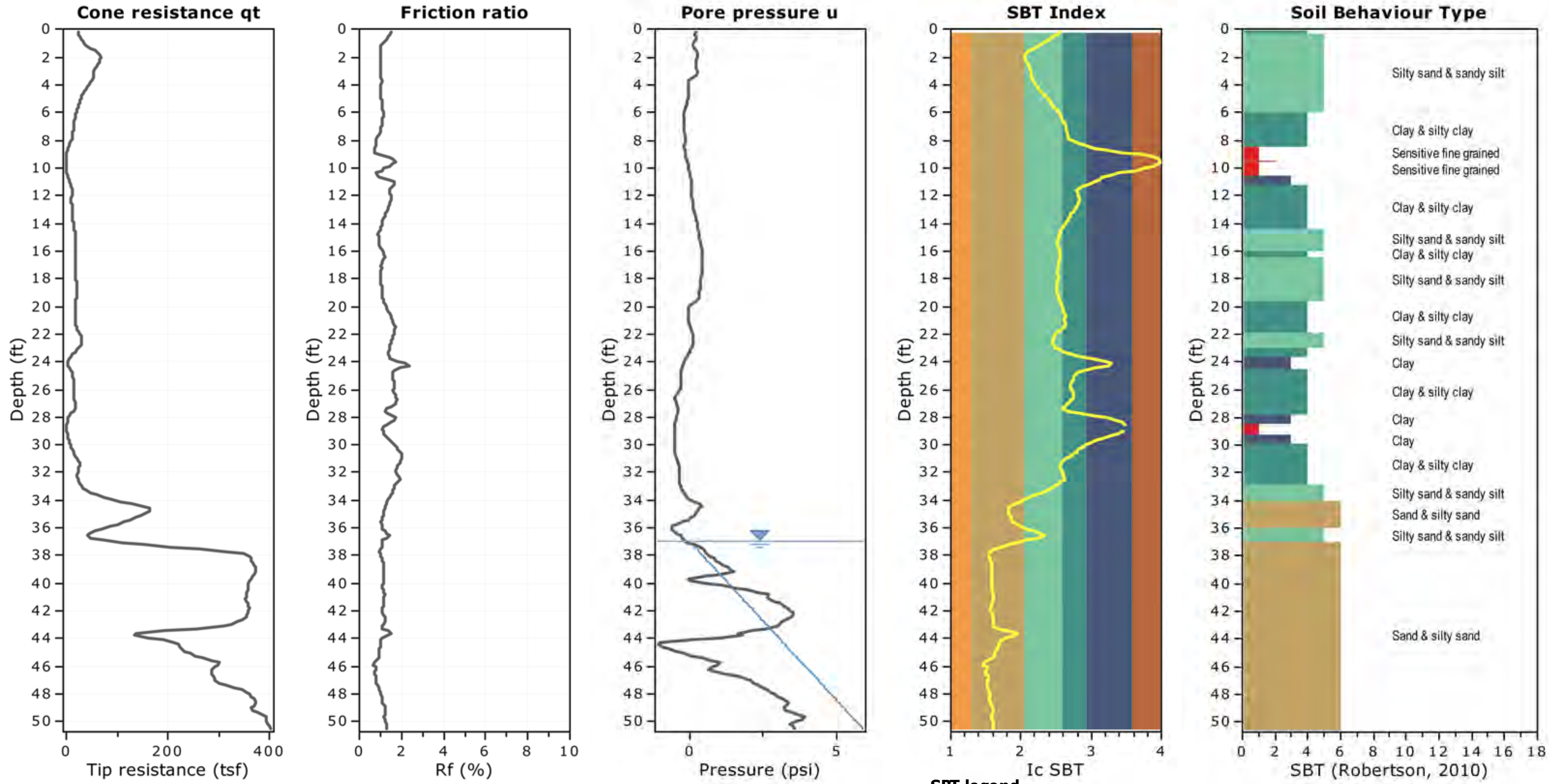
HYDROSTATIC PRESSURE = 5.584 (PSI), WATER TABLE: 35.18 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**	
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-5 PORE PRESSURE DISSAPATION MEASUREMENTS**	**FIGURE A15**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

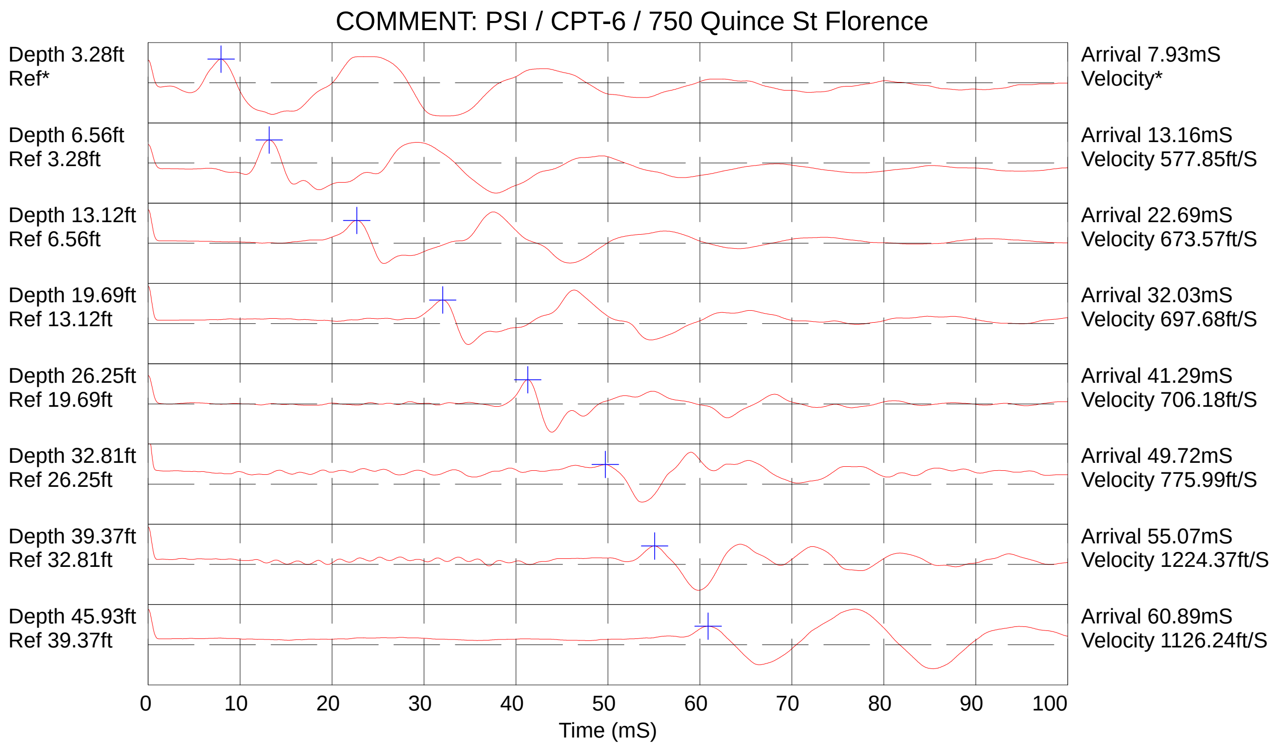
CPT: 21020 CPT-6 Text File
Total depth: 50.53 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:121.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

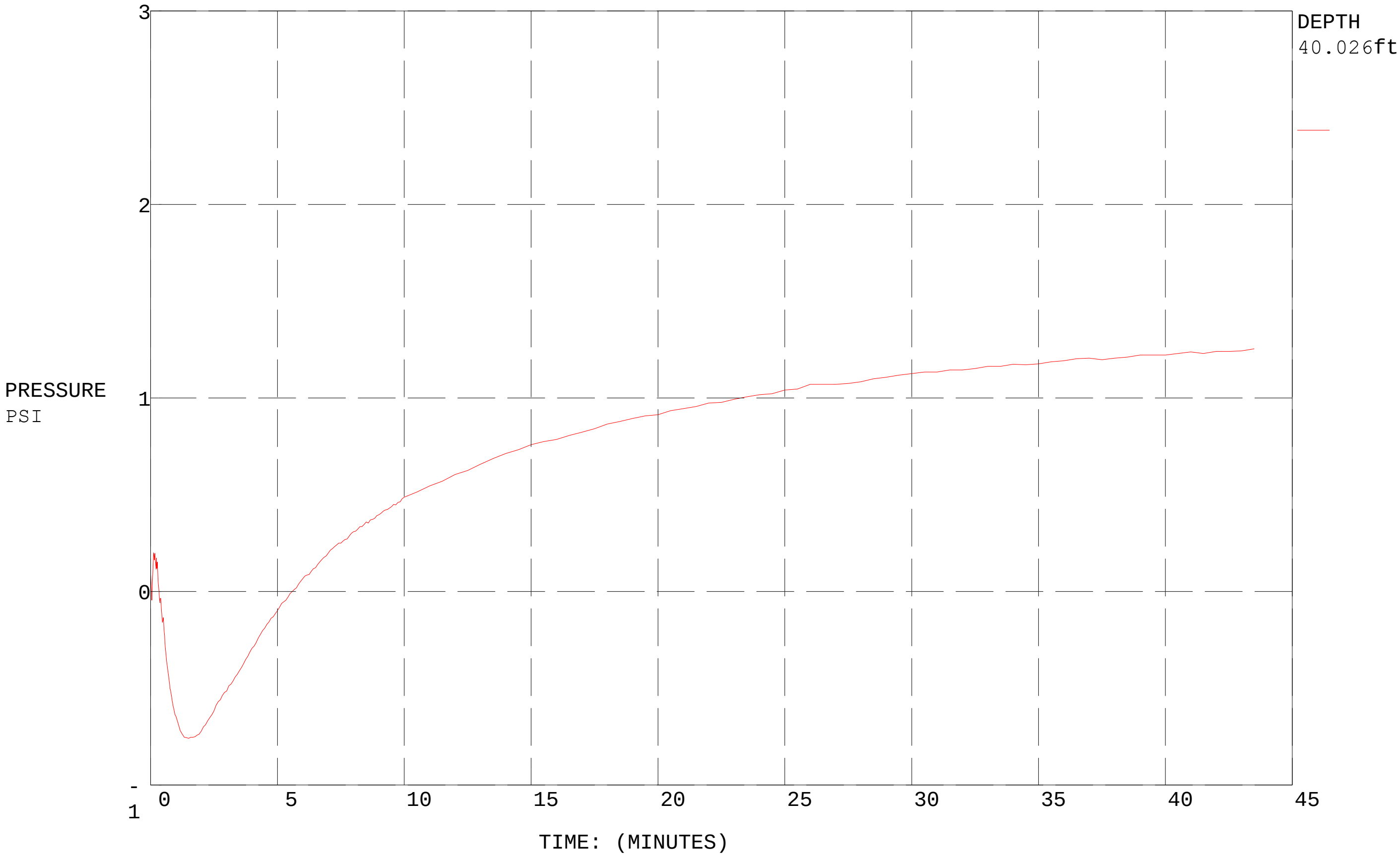


Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**

6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-6 SHEAR WAVE VELOCITY MEASUREMENTS**	**FIGURE A17**

COMMENT: PSI / CPT-6 / 750 Quince St Florence



MAXIMUM PRESSURE = 1.254 (PSI)

HYDROSTATIC PRESSURE = 1.297 (PSI), WATER TABLE: 37.03 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-6 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A18**

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.: Diamond Bit Core Sampler
H.A.: Hand Auger
P.A.: Power Auger - Handheld motorized auger

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
RC: Rock Core
TC: Texas Cone
BS: Bulk Sample
PM: Pressuremeter
CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N_{60}: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q_u: Unconfined compressive strength, TSF
Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼,▽,▼: Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

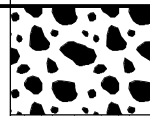
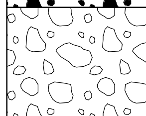
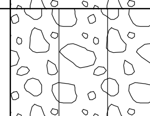
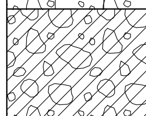
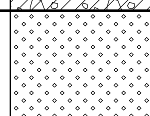
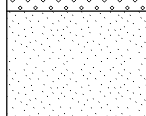
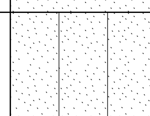
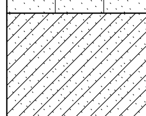
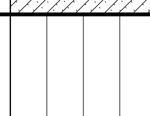
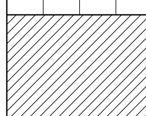
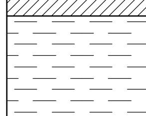
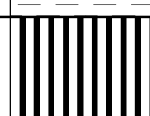
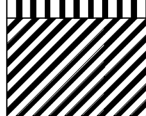
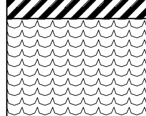
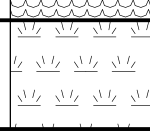
Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS	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
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS	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
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS 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

DATE STARTED: 2/23/20	**DRILL COMPANY:** Oregon Geotechnical Exploration, Inc		**BORING GP-1**
DATE COMPLETED: 2/23/20	**DRILLER:** Dom	**LOGGED BY:** Staci Shub	
COMPLETION DEPTH 45.0 ft	**DRILL RIG:** GeoProbe Rig		
BENCHMARK: N/A	**DRILLING METHOD:** GeoProbe		
ELEVATION: 47 ft	**SAMPLING METHOD:** GP		
LATITUDE: 43.972804°	**HAMMER TYPE:** Automatic		**BORING LOCATION:**
LONGITUDE: -124.100541°	**EFFICIENCY** N/A		
STATION: N/A **OFFSET:** N/A	**REVIEWED BY:** SRS		
REMARKS:			

Water		
While Drilling		35 feet
Upon Completion		35 feet
Delay		N/A

STANDARD PENETRATION TEST DATA: N in blows/ft ◎; × Moisture; PL; LL (scale 0, 25, 50)
STRENGTH, tsf: ▲ Qu; ✳ Qp (scale 0, 2.0, 4.0)

Elevation (feet)	Depth, (feet)	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	N (blows/ft)	Additional Remarks
47	0	1	**Approximately 4 inches of grassy Topsoil**	Topsoil	46	>>	Gradation: Fines = 25%
			Light brown to brown, moist, **Well graded silty SAND**, fine to coarse grained, trace black staining	SM			
		2			4	>>	
42	5		Gray to light brown, moist, **Poorly graded SAND**, fine to medium grained, trace intermitten silt lenses	SP			
		3			7	>>	Gradation: Fines = 5%
		4			8	>>	
		5			6	>>	
		6			6	>>	Gradation: Fines = 1%
		7			7	>>	Gradation: Fines = 0%
		8	Black staining and trace orange and gray mottling below 18 feet bgs		6	>>	
		9			6	>>	
		10			5	>>	
		11			6	>>	Gradation: Fines = 0%
	35	12	Wet below 35 feet bgs		18	>>	Gradation: Fines = 3%
	38.5		Geoprobe terminated at 38.5 due to refusal on very dense sand				

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778

PROJECT NO.: 07041434
PROJECT: Microtell Inn and Suites
LOCATION: 750 Quince Street
Florence, Oregon

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING GP-2

DATE STARTED:	2/23/20	**DRILL COMPANY:**	Oregon Geotechnical Exploration, Inc
DATE COMPLETED:	2/23/20	**DRILLER:** Dom	**LOGGED BY:** Staci Shub
COMPLETION DEPTH	45.0 ft	**DRILL RIG:**	GeoProbe Rig
BENCHMARK:	N/A	**DRILLING METHOD:**	GeoProbe
ELEVATION:	47 ft	**SAMPLING METHOD:**	GP
LATITUDE:	43.972073°	**HAMMER TYPE:**	Automatic
LONGITUDE:	-124.100257°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	SRS

REMARKS:

Water

While Drilling	35 feet
Upon Completion	35 feet
Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	Additional Remarks
	0	1	**Approximately 4 inches of grassy Topsoil**	Topsoil	45	Gradation: Fines =28%
45		2	Light brown to brown, moist, **Poorly graded silty SAND** , fine to medium grained, trace black staining and organge mottling	SM	5	Fines = 0% Gradation:
40	5		Gray to light brown, moist, **Poorly graded SAND**, fine to medium grained, trace intermitten silt lenses	SP		
		3			9	
	10	4			6	
35						
	15	5			5	
30			Black staining and trace orange and gray mottling below 18 feet bgs			
	20	6			5	Gradation: Fines = 1%
25		7			5	
	25	8			5	Gradation: Fines = 1%
20						
	30	9			7	Gradation: Fines = 1%
15			Light gray to gray below 32 feet bgs			
	35	10	Wet below 35 feet bgs		17	Gradation: Fines = 0%
10						
			Geoprobe terminated at 38.5 due to refusal on very dense sand			
	40					
5						
	45					

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture ◩ PL ✚ LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0

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LOG OF TP1

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ (0 15 30); × Moisture, PL, LL (0 25 50); STRENGTH, tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
						Surface Elev.: 47 ft					
	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining					
	2								19	×	Fines=7%
			Grab Sample	1						>>◎	
44	3						SP				
	4										
42	5		Grab Sample	2						>>◎	
						Test pit terminated at approximately 5 feet bgs					

Completion Depth: 5.5 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9727°
Longitude: -124.1005°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP2

Sheet 1 of 1

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ (0–15–30); Moisture × / PL / LL (0–25–50); STRENGTH, tsf ▲ Qu ✳ Qp (0–2.0–4.0)	Additional Remarks
	0					Surface Elev.: 47 ft					
	0–0.33					**Approximately 4 inches of grassy Topsoil**	Topsoil				
	0.33–8					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP				
46	1										
	2										
44	3										
	3.5		Grab	1						>>◎	
	4										
42	5										
	6										
	6.5		Grab	2						>>◎	
40	7										
	8					Test pit terminated at approximately 8 feet bgs due to caving					

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9727°
Longitude: -124.0998°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP3

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Surface Elev.: 47 ft

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ (0, 15, 30); × Moisture, PL, LL (0, 25, 50); STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
47	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP				
	2.5		Grab	1						>>◎	
44	3										
42	5										
	6.5		Grab	2						>>◎	
40	7										
	8		Grab	3		Test pit terminated at approximately 7 feet bgs due to caving				>>◎	

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9724°
Longitude: -124.0998°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP4

Sheet 1 of 1

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Surface Elev.: 47 ft

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	Additional Remarks
47	0				**Approximately 4 inches of grassy Topsoil**	Topsoil			
					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining	SP			
46	1								
	2								
44	3	Grab	1				>>	26	Fines=0.2%
	4								
42	5	Grab	2				>>	20	Fines=0.2%
	6								
40	7	Grab	3				>>		
	8				Test pit terminated at approximately 8 feet bgs due to caving				

DYNAMIC CONE PENETRATION TEST DATA: Blows per 1¾-inch ◎ (0, 15, 30); × Moisture, PL, LL (0, 25, 50); STRENGTH, tsf: ▲ Qu, ✳ Qp (0, 2.0, 4.0)

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9721°
Longitude: -124.1°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

LOG OF TP5

PSI Job No.:	07041434	Excavation Method:	Excavation
Project:	Microtel Inn and Suites	Sampling Method:	
Location:	750 Quince Street	DCP Type:	N/A
	Florence, Oregon	Boring Location:	

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ (0 15 30); × Moisture ◪ PL ✚ LL (0 25 50); STRENGTH, tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
						Surface Elev.: 47 ft					
	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining					
	2										
44	3										
	4						SP				
42	5										
	6		Grab Sample	1					8	×	>>◎Fines=0.3%
						Test pit terminated at approximately 6 feet bgs due to caving					

Completion Depth:	6.0 ft	Sample Types:	Latitude: 43.9718°
Date Boring Started:	1/4/21	Shelby Tube	Longitude: -124.1003°
Date Boring Completed:	1/4/21	Dynamic Cone (DCP)	Excavation Equipment: Excavator
Logged By:	S. Shub	Grab Sample	Remarks:
Excavation Contractor:	Dan Fisher Excavating, Inc		

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP6

Sheet 1 of 1

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Surface Elev.: 47 ft

Elevation (feet)	Depth, (feet)	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	Additional Remarks
47	0		**Approximately 4 inches of grassy Topsoil**	Topsoil		
46	1		Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt and gravel, trace black staining	SP		
	1.5		No gravel observed below 1.5 feet			
42	5	1			12	>> DCP; Fines=0.2%
	7	2				>> DCP
40	7		Test pit terminated at approximately 7 feet bgs due to caving			

DYNAMIC CONE PENETRATION TEST DATA: Blows per 1¾-inch (scale 0, 15, 30); Moisture, PL, LL (scale 0, 25, 50); STRENGTH, tsf: Qu, Qp (scale 0, 2.0, 4.0)

Completion Depth: 7.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9721°
Longitude: -124.1005°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP7

Sheet 1 of 1

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ (0, 15, 30); × Moisture, PL, LL (0, 25, 50); STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
						Surface Elev.: 47 ft					
	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP				
	2										
44	3										
	4										
42	5										
	6										
40	7										
	8		Grab Sample	1						>>◎	
						Test pit terminated at approximately 8 feet bgs due to caving					

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9725°
Longitude: -124.1004°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

Geophysical Testing

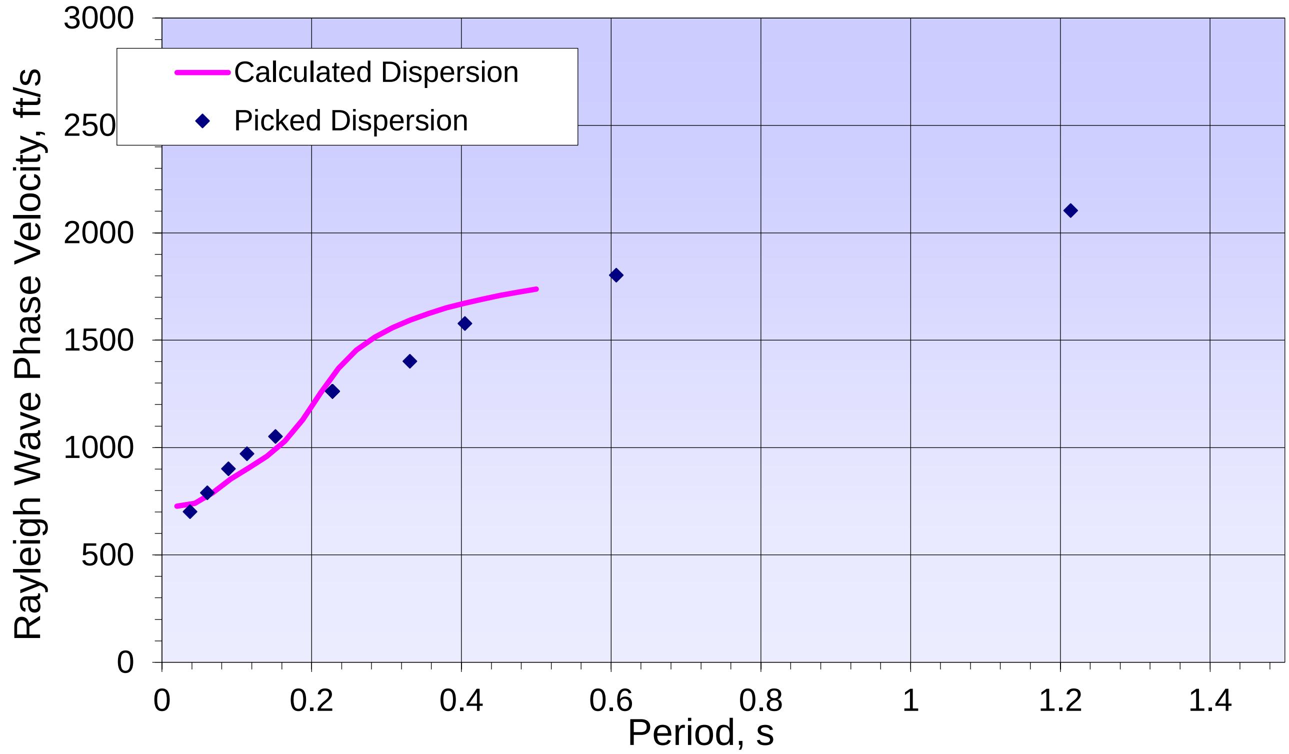
Three Refraction Microtremor (ReMi) arrays were performed at the project site (see Figure 2). The ReMi method uses standard P-wave recording equipment and ambient noise to determine shear-wave velocities. The equipment used for our ReMi evaluation included a Seismic Source DAQLink III 24-Bit ADC acquisition system and STC-85-SM-4 10-hertz geophones developed by Seismic Source Technology. Field acquisition of the data incorporated 24 geophone locations with equal spacing of 15 feet. SeisOpt ReMi Version 4.0 (Vspect and Disper modules) software developed by Optim LLC was used to process the collected data, and to create the shear wave velocity profile. To provide a robust data profile, both individual recordings and multiple summed (stacked) recordings were evaluated.

Each individual record of the traces is pre-processed to reduce or eliminate anomalies in the raw data. The data is then processed to produce a velocity spectrum. This process involves computing a surface wave, phase velocity dispersion spectral ratio image by p-tau and Fourier transforms across the array. This process is described in the document titled, "Faster, Better: Shear-wave Velocity to 100 Meters Depth from Refraction Microtremor Arrays", Bulletin of the Seismological Society of America by Louie, J, N. (2001). The resulting spectrum is in the slowness-frequency (p-f) domain. The p-f transformation helps segregate the Rayleigh Wave arrivals from other surface waves, body waves, sound waves, etc. The p-f image is generated for each record, and a final p-f image for each test is generated by combining some, or all, of the individual images.

The fundamental mode dispersion curve on the final p-f image can be seen as a distinct trend from the aliasing and wave-field transformation truncation artifact trends in the spectra. Once the fundamental mode dispersion curve is visually interpreted, data points along this curve are picked. Using the picked data points, an interactive forward-modeling process is used to model a shear wave velocity profile, with a resulting dispersion curve that approximately matches the picked data points. The process and resulting velocity profiles are able to identify the various velocity layers in the subsurface, including velocity inversions within the profile.

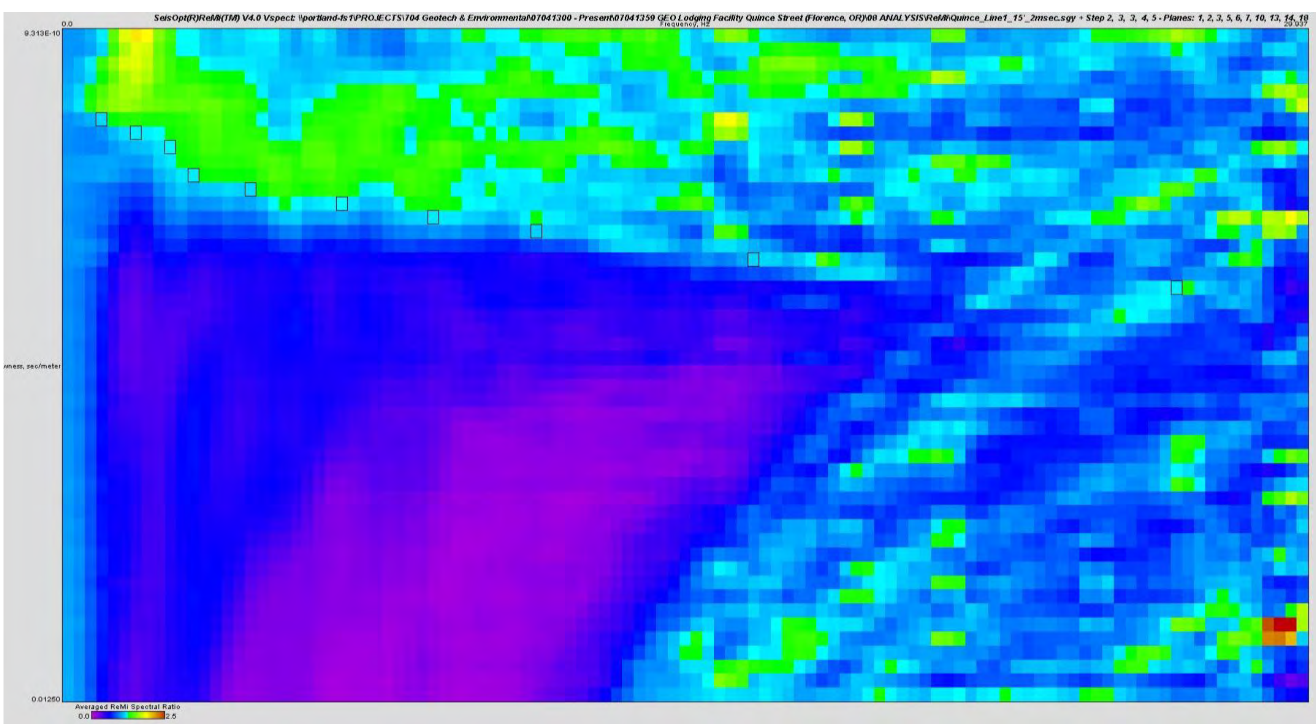
The results of the ReMi testing indicates that the weighted-average shear wave velocity in the upper 100 feet of the project site (VS) is approximately 1,000 feet per second. This indicates that the project site is classified as a Site Class D, in accordance with ASCE 7-16.

Dispersion Curve Showing Picks and Fit



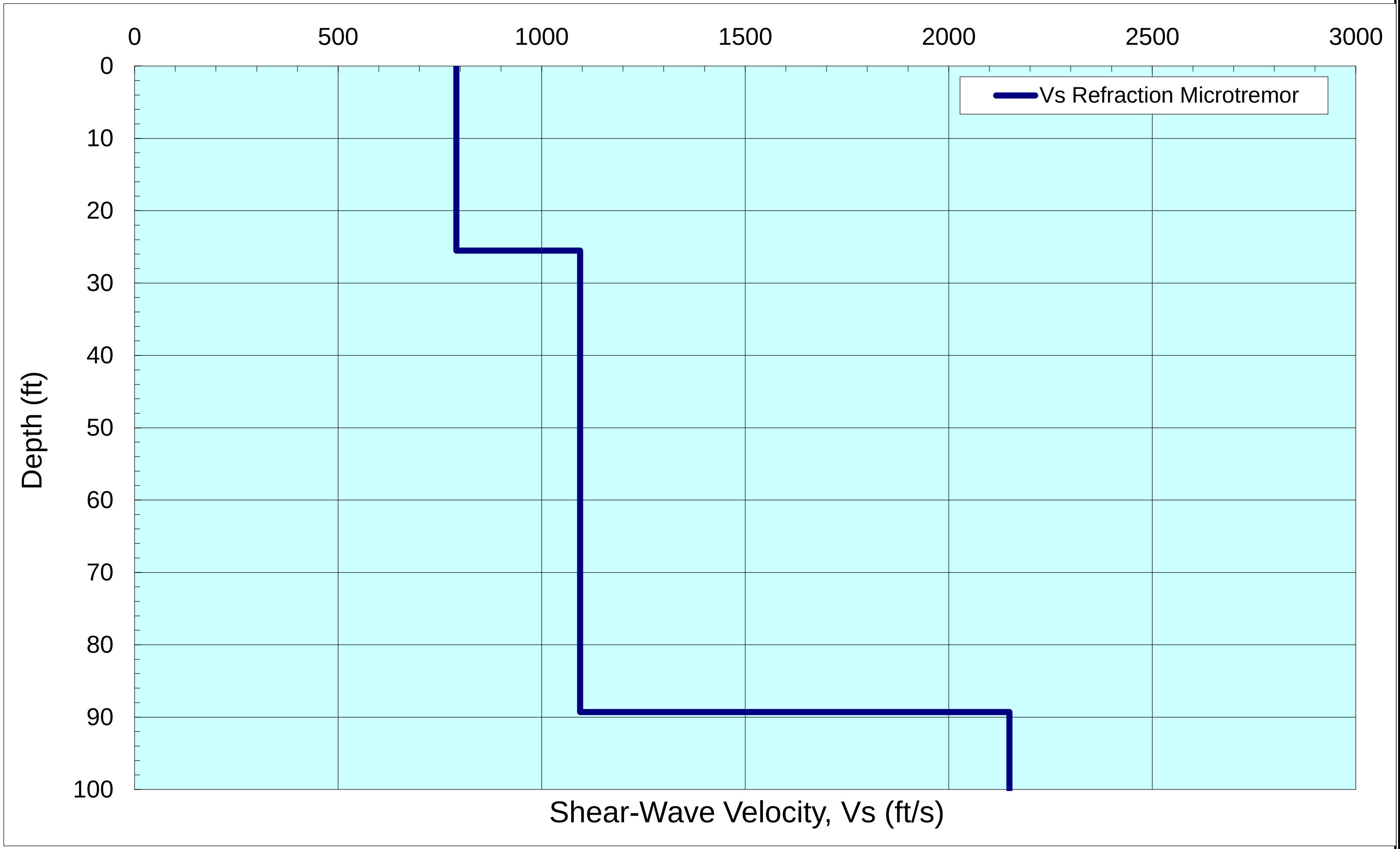
Geophone Spacing (ft) 15 Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



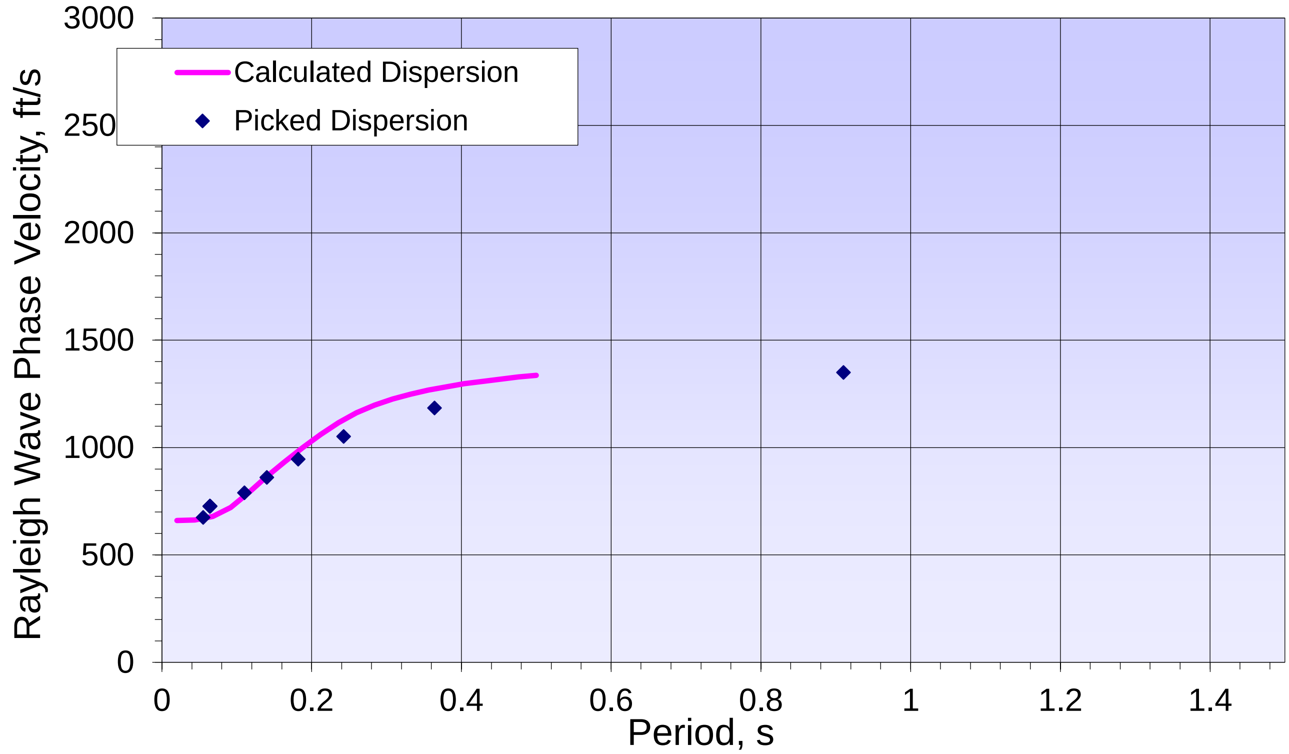
Line Number	**Array 1 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

Shear Wave Velocity Profile Vs. Depth



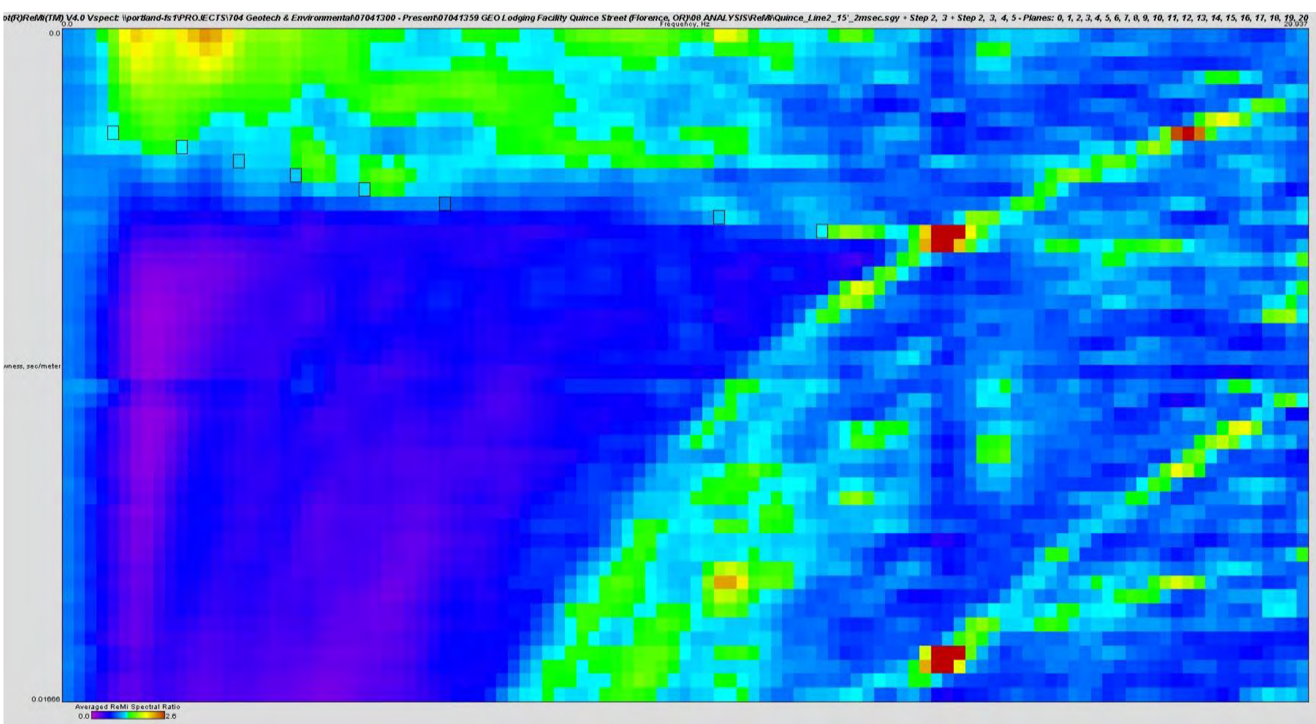
intertek psi	**IBC Site Class**	**D**	**Line Number** **Array 1 (Geophones 1-24)**
			Project Number 07041434
			Project Name Microtell Inn and Suites
	Average Shearwave Velocity within 100 feet, V_s (ft/s)	**1,047**	Location 43.972804, -124.100541 Florence, Oregon — Figure: A10

Dispersion Curve Showing Picks and Fit



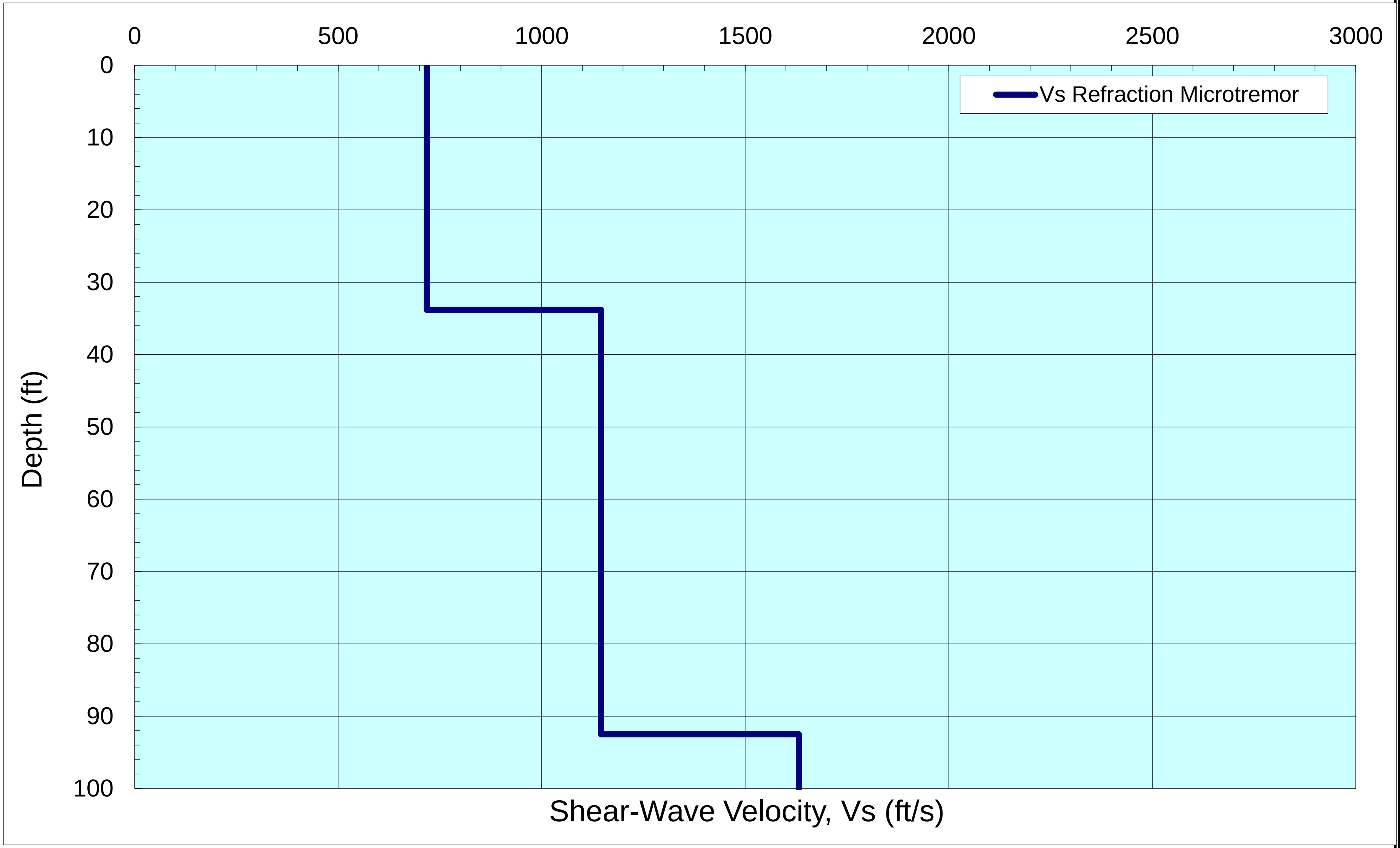
Geophone Spacing (ft) 15 Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



Line Number	Array 2 (Geophones 1-24)	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

Shear Wave Velocity Profile Vs. Depth



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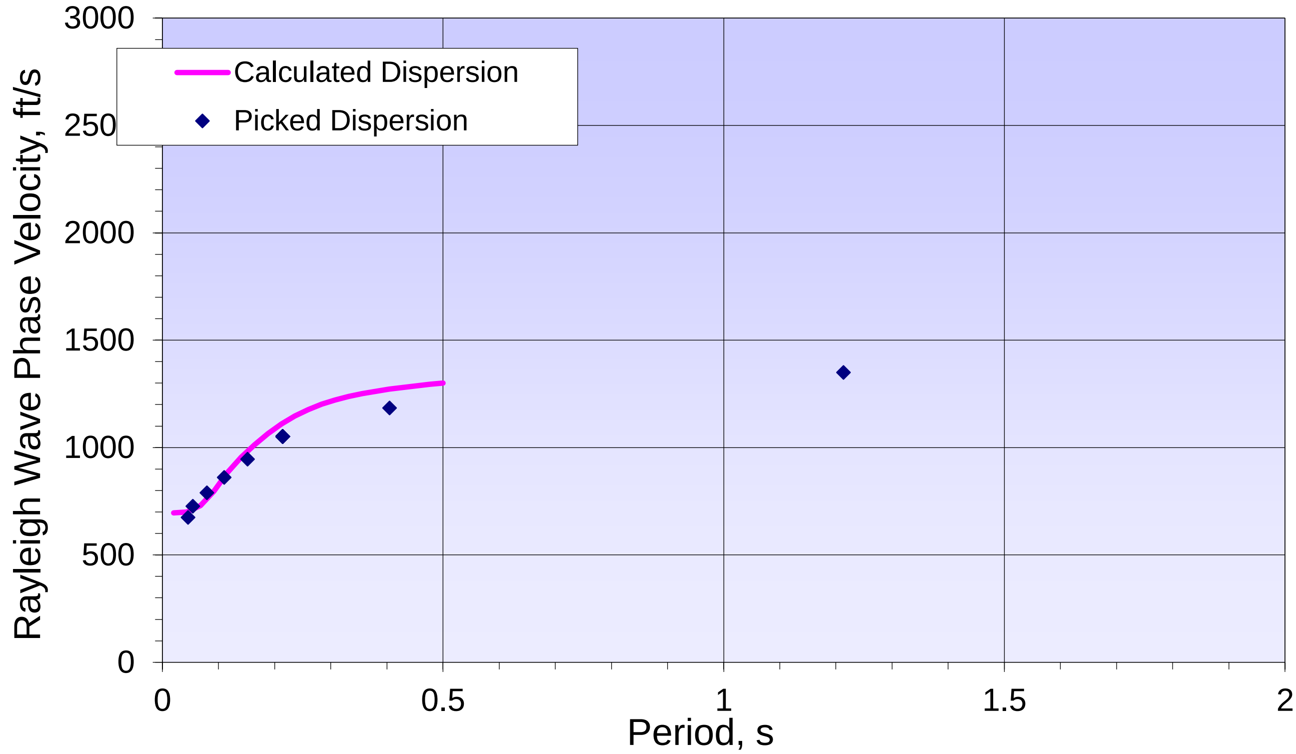
IBC Site Class	**D**
Average Shearwave Velocity within 100 feet, V_s (ft/s)	**972**

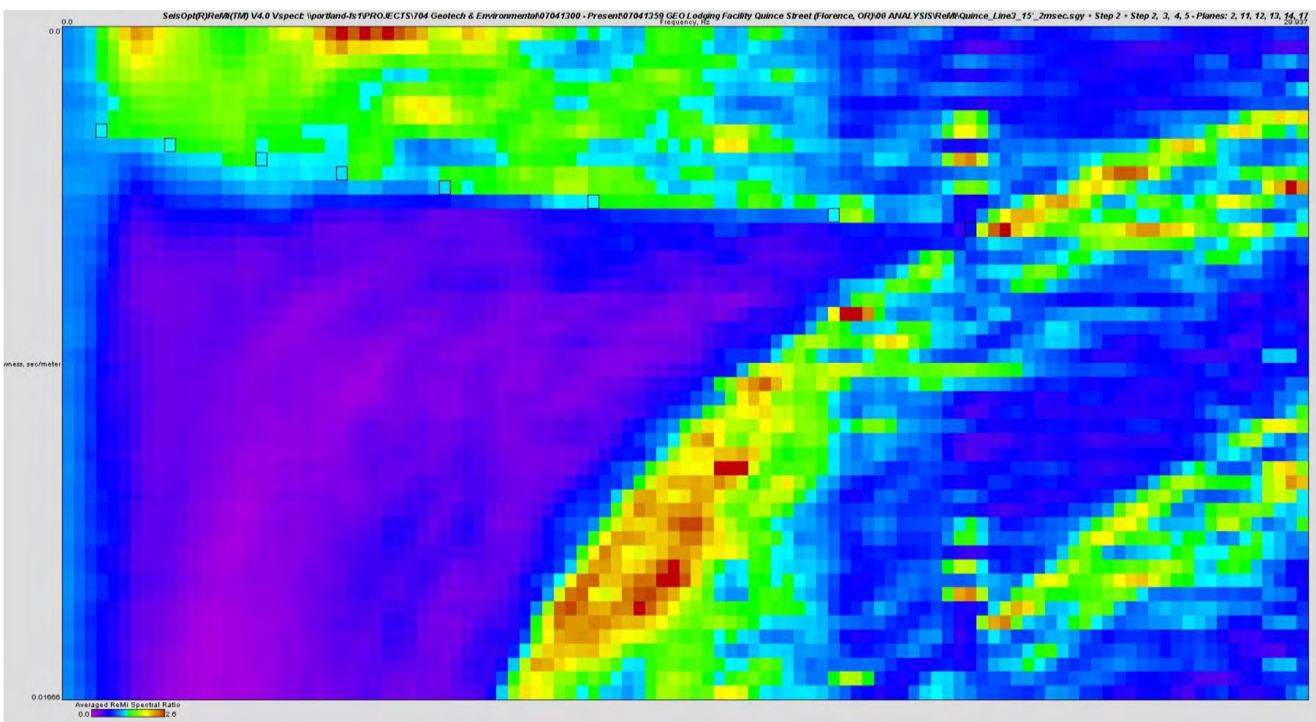
Line Number	**Array 2 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A10

Dispersion Curve Showing Picks and Fit



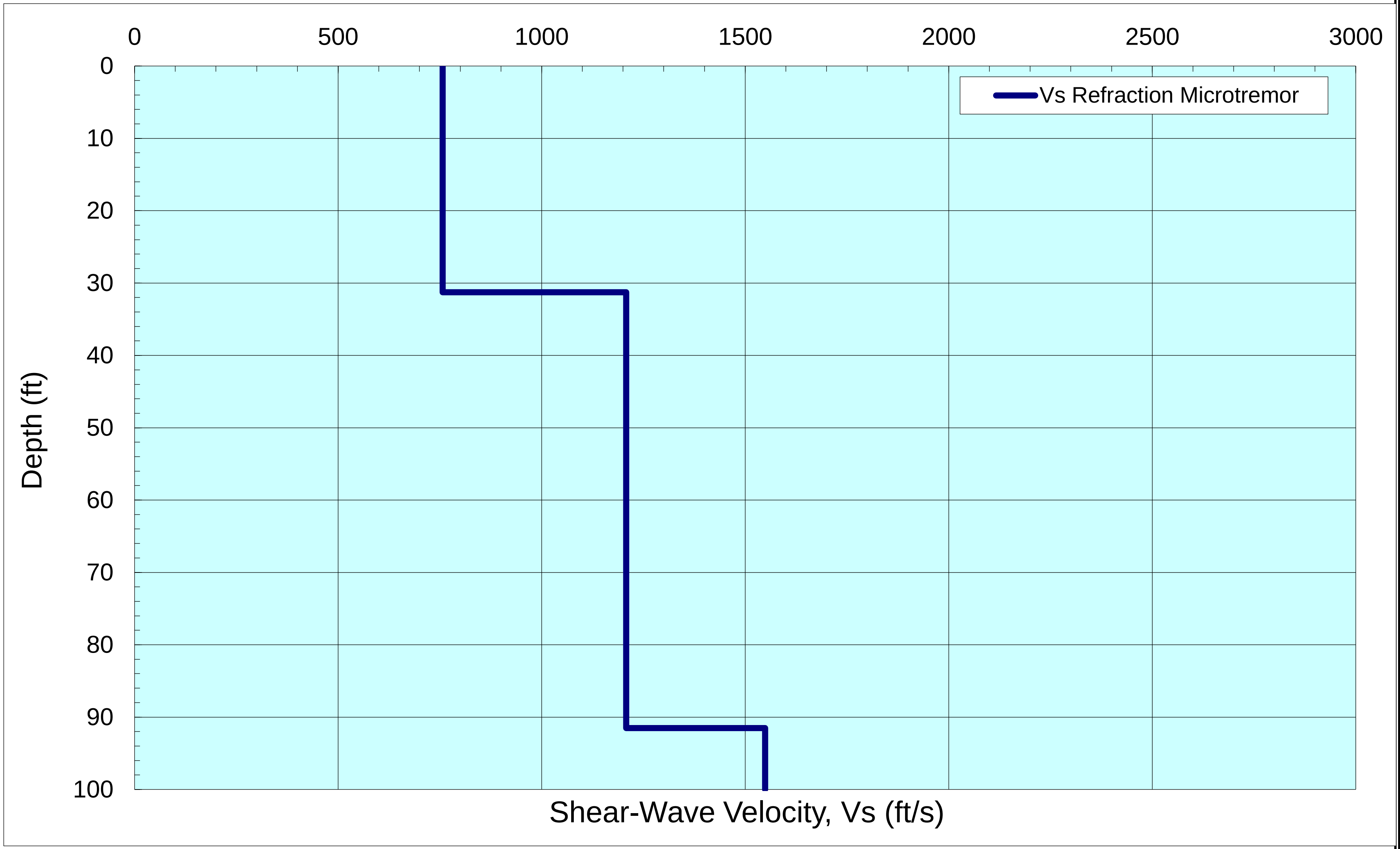
Geophone Spacing (ft) 15 Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



Line Number	**Array 2 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

Shear Wave Velocity Profile Vs. Depth



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IBC Site Class	**D**
Average Shearwave Velocity within 100 feet, V_s (ft/s)	**1,034**

Line Number	**Array 2 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A10

LABORATORY TESTING PROGRAM AND PROCEDURES

Soil samples obtained during the field explorations were examined in our laboratory. The physical characteristics of the samples were noted, and the field classifications were modified, where necessary. Representative samples were selected during the course of the examination for further testing.

Moisture Content

Natural moisture content determinations were made on selected soil samples in general accordance with ASTM D2216. The natural moisture content is defined as the ratio of the weight of water to the dry weight of soil, expressed as a percentage.

Visual-Manual Classification

The soil samples were classified in general accordance with guidelines presented in ASTM D2487. Certain terminology incorporating current local engineering practice, as provided in the Soil Classification Chart, included with, or in lieu of, ASTM terminology. The term which best described the major portion of the sample was used in determining the soil type (i.e., gravel, sand, silt or clay).

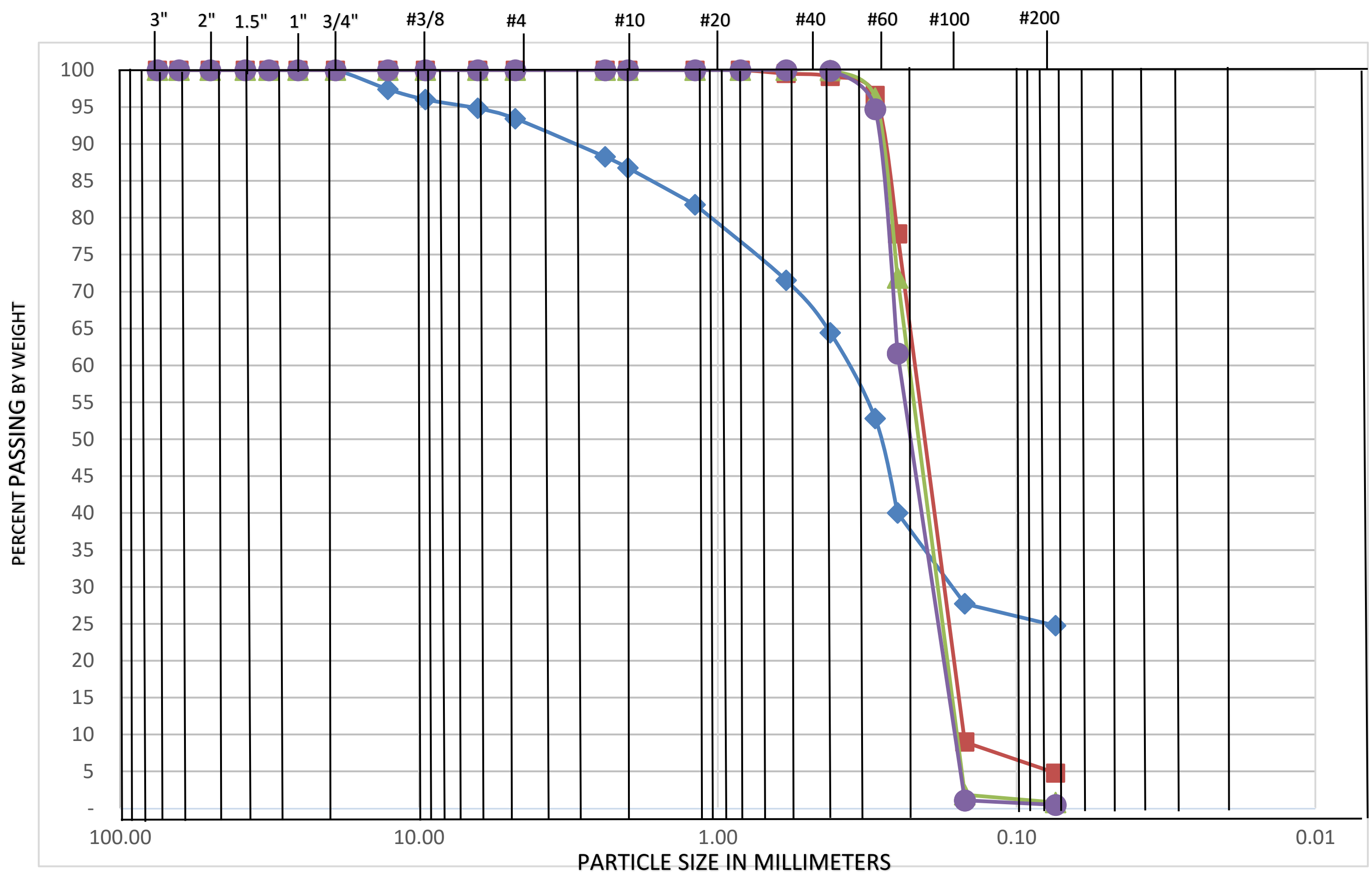
Sieve Analysis

The determination of the amount of material finer than the U.S. Standard No. 200 (75-µm) sieve was made on selected soil sample in general accordance with ASTM D1140. In general, the sample was dried in an oven and then washed with water over the No. 200 sieve. The mass retained on the No. 200 sieve was dried in an oven, and the dry weight recorded. Results from this test procedure assist in determining the fraction, by weight, of coarse-grained and fine-grained soils in the sample.

The determination of the gradation curve of the coarse-grained material was made on selected soil samples in general accordance with ASTM D6913. In general, the oven dried mass retained on the No. 200 sieve is passed over progressively smaller sieve openings, by agitating the sieves by hand or by a mechanical apparatus. The mass retained on each sieve is recorded as a fraction of the total sample, including the percent passing the No. 200 sieve.

PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



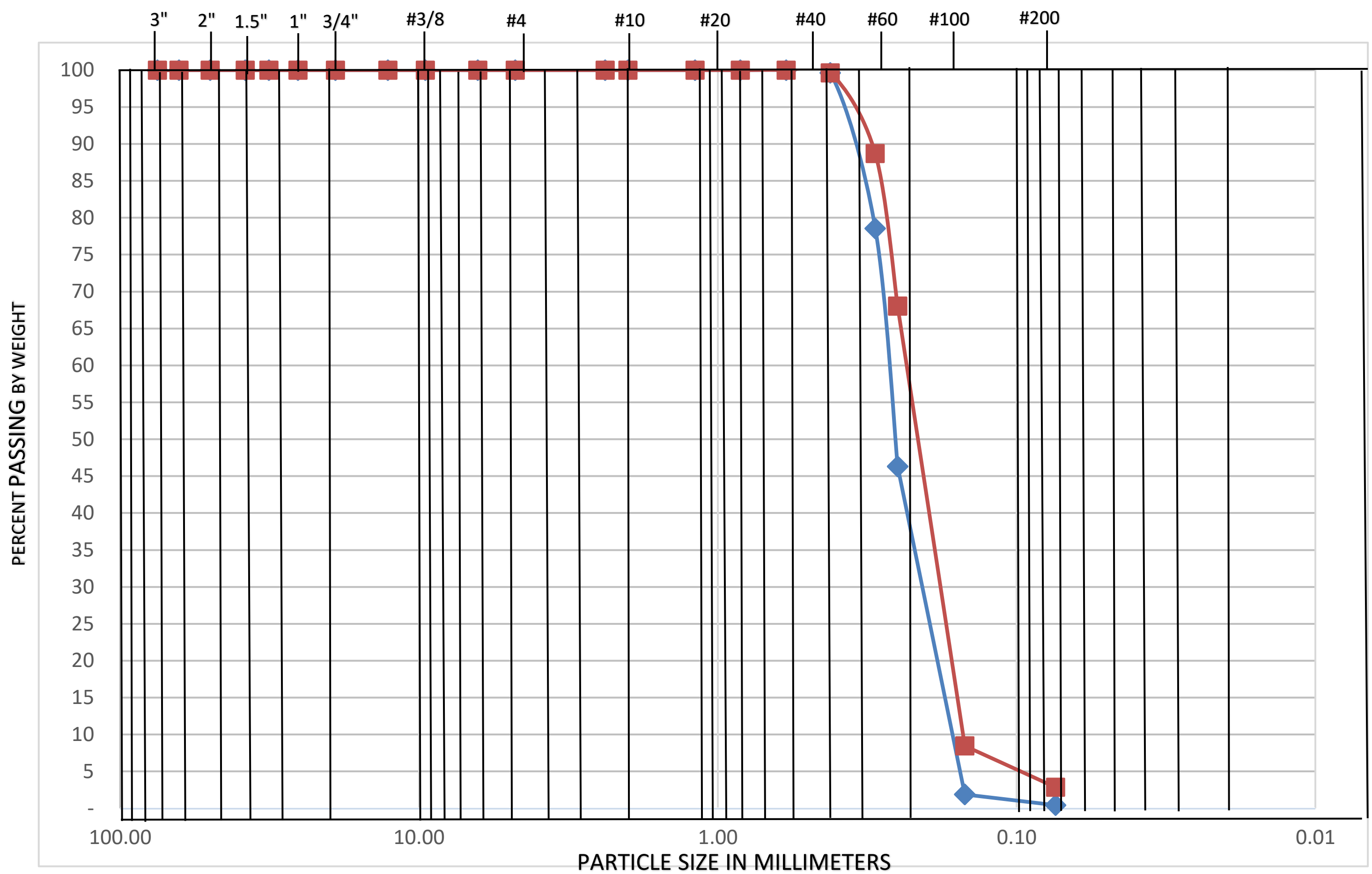
Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP1	0	7	69	25				46
GP1	6	0	95	5				7
GP1	13	0	99	1				6
GP1	16	0	100	0				7

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	0	SM	Well Graded Silty SAND	
GP1	6	SP	Poorly Graded SAND	
GP1	13	SP	Poorly Graded SAND	
GP1	16	SP	Poorly Graded SAND	

PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



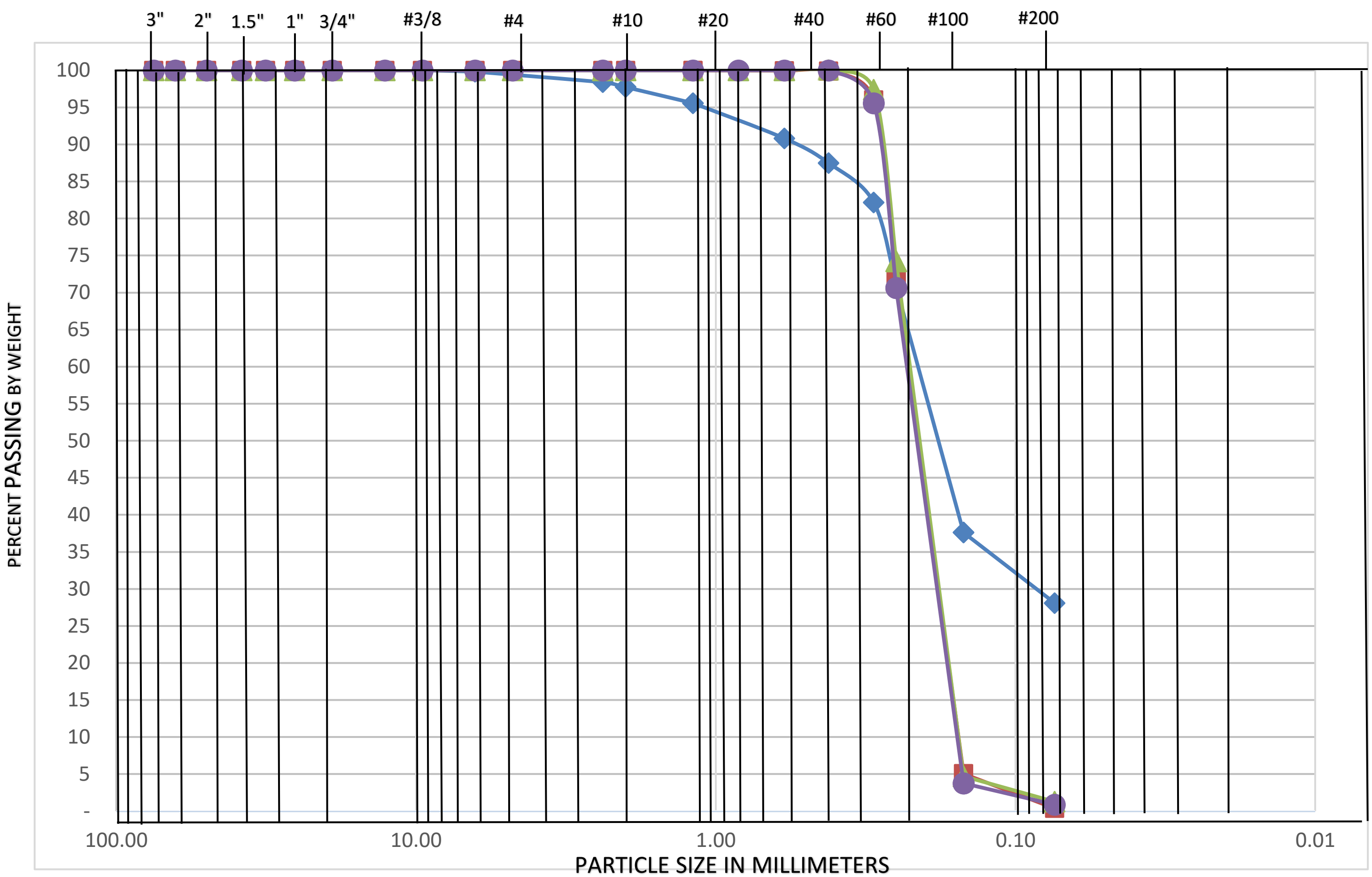
Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP1	34	0	100	0				6
GP1	36	0	97	3				18

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	34	SP	Poorly Graded SAND	
GP1	36	SP	Poorly Graded SAND	

PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing 2/28/2021	Reviewed By SRS



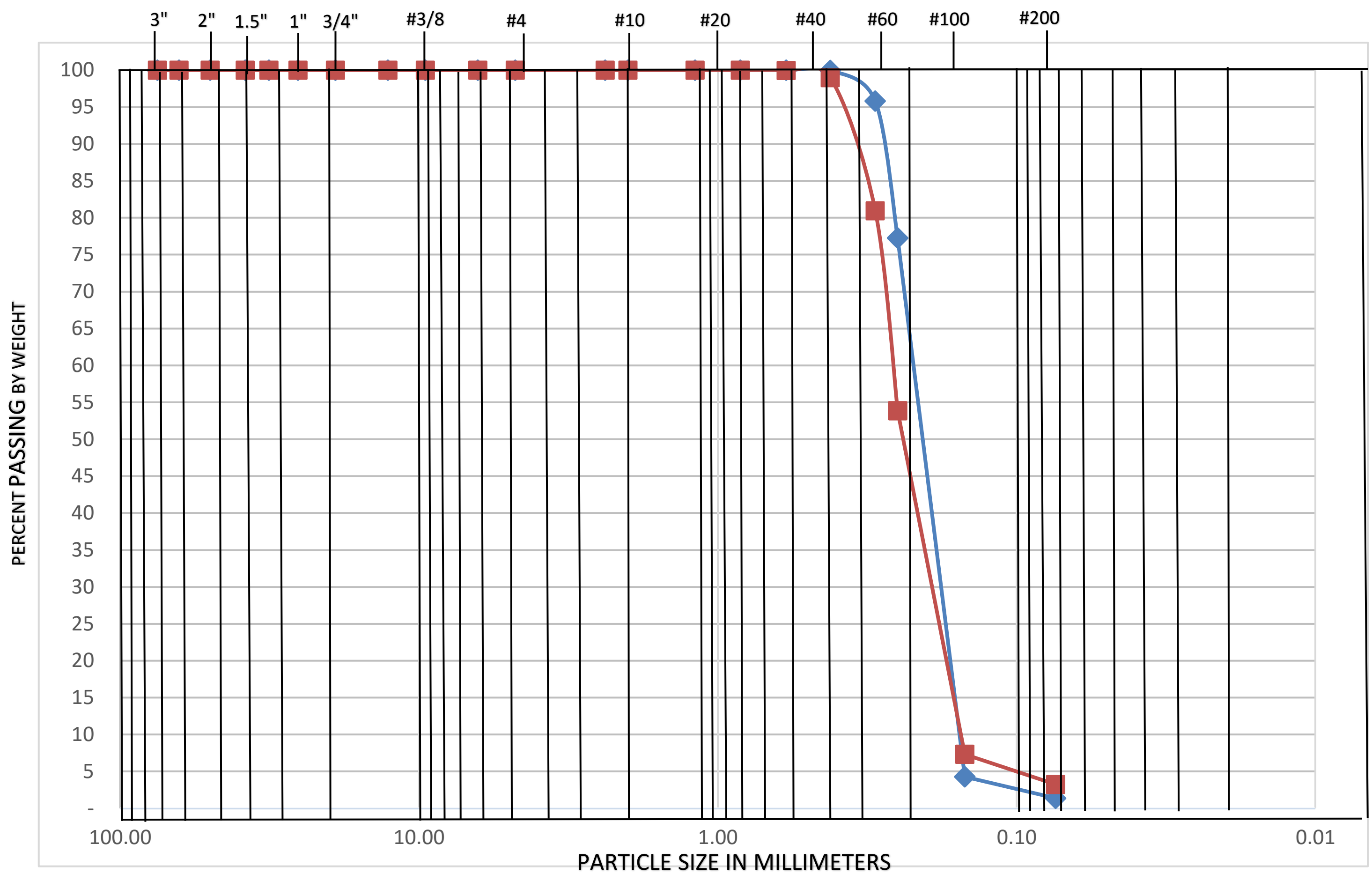
Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP2	0	0	72	28				45
GP2	2	0	100	0				5
GP2	21	0	99	1				5
GP2	26	0	99	1				5

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP2	0	SM	Poorly Graded Silty SAND	
GP2	2	SP	Poorly Graded SAND	
GP2	21	SP	Poorly Graded SAND	
GP2	26	SP	Poorly Graded SAND	

PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



Gravel		Sand			Fine Grained
Coarse	Fine	Coarse	Medium	Fine	Silt/Clay

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture
GP1	31	0	99	1				7
GP1	35	0	97	3				17

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	31	SP	Poorly Graded SAND	
GP1	35	SP	Poorly Graded SAND	

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Professional Service Industries, Inc.
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Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: MAT:07041434-1-S1
Issue No: 1

Material Test Report

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID:	07041434-1-S1
Client Sample ID:	
Date Sampled:	12/30/21
Sampled By:	Staci Shub
Specification:	Proctor / Grad
Supplier:	
Source:	Native
Material:	Sand
Sampling Method:	Sub-Surface Grab Sample
General Location:	TP 4
Location:	
Lift:	
Feature:	
Contractor:	

Other Test Results

Description	Method	Result	Limits
Maximum Dry Unit Weight (lbf/ft³)	ASTM D 1557	102.8	
Corrected Maximum Dry Unit Weight (lbf/ft³)		102.8	
Optimum Water Content (%)		8.2	
Corrected Optimum Water Content (%)		8.2	
Method		A	
Preparation Method		Moist	
Rammer Type		Mechanical	

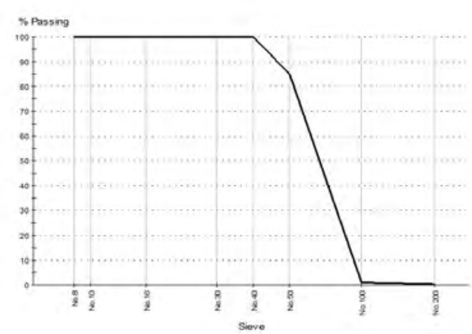
Particle Size Distribution

Method: ASTM C 136, ASTM C 117

Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.8 (2.36mm)	100	
No.10 (2.0mm)	100	
No.16 (1.18mm)	100	
No.30 (600µm)	100	
No.40 (425µm)	100	
No.50 (300µm)	85	
No.100 (150µm)	1	
No.200 (75µm)	0.20	

Chart



Comments

N/A

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: PTR:07041434-1-S1
Issue No: 1

Proctor Report

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

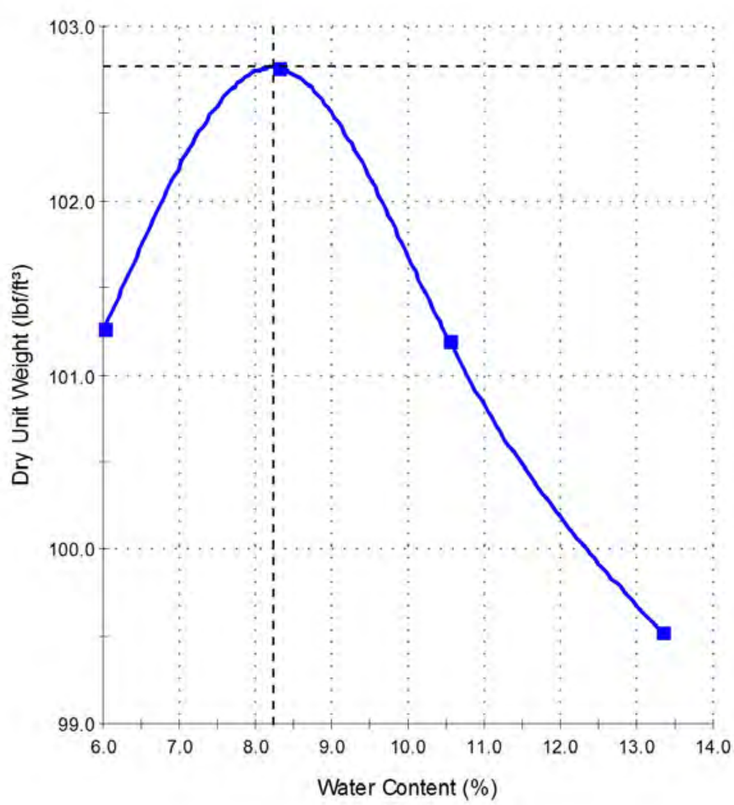
Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID:	07041434-1-S1	**Date Sampled:**	12/30/2021
Sampled By:	Staci Shub	**Specification:**	Proctor / Grad
Source:	Native	**Material:**	Sand
Sampling Method:	Sub-Surface Grab Sample	**General Location:**	TP 4
Location:			

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 1557

Maximum Dry Unit Weight (lbf/ft³):	**102.8**
Optimum Water Content (%):	**8.2**
Method:	A
Preparation Method:	Moist
Rammer Type:	Mechanical
Tested By:	
Date Tested:	

Comments

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: MAT:07041434-1-S2
Issue No: 1

Material Test Report

These test results apply only to the specific locations and materials noted and may not represent any other locations or elevations. This report may not be reproduced, except in full, without written permission by Professional Service Industries, Inc. If a non-compliance appears on this report, to the extent that the reported non-compliance impacts the project, the resolution is outside the PSI scope of engagement. Tests and inspections are considered to be simple acceptance criteria

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID: 07041434-1-S2
Feature:
Client Sample ID:
Contractor:
Date Sampled:
Sampled By: Staci Shub
Specification: Proctor / Grad
Supplier:
Source: Native
Material: Sand
Sampling Method: Sub-Surface Grab Sample
General Location: TP 6
Location:
Lift:

Other Test Results

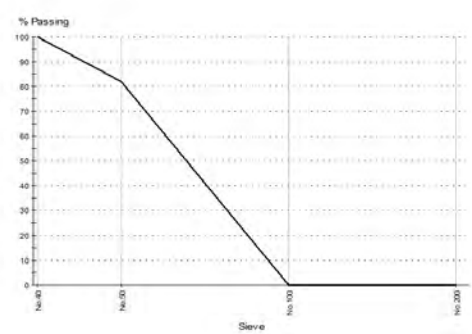
Description	Method	Result	Limits
Maximum Dry Unit Weight (lbf/ft³)	ASTM D 1557	102.2	
Corrected Maximum Dry Unit Weight (lbf/ft³)		102.2	
Optimum Water Content (%)		9.5	
Corrected Optimum Water Content (%)		9.5	
Method		A	
Preparation Method		Moist	
Rammer Type		Mechanical	

Particle Size Distribution

Method: ASTM C 136, ASTM C 117
Drying By: Oven
Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.40 (425µm)	100	
No.50 (300µm)	82	
No.100 (150µm)	0	
No.200 (75µm)	0.10	

Chart



Comments

N/A

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
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CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: PTR:07041434-1-S2
Issue No: 1

Proctor Report

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

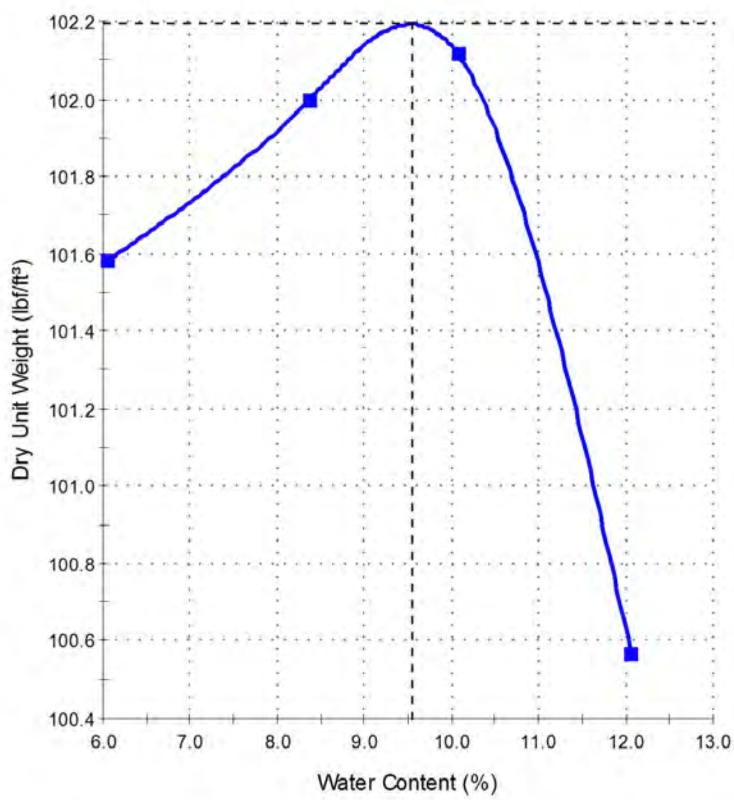
Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID:	07041434-1-S2	**Date Sampled:**	
Sampled By:	Staci Shub	**Specification:**	Proctor / Grad
Source:	Native	**Material:**	Sand
Sampling Method:	Sub-Surface Grab Sample	**General Location:**	TP 6
Location:			

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 1557

Maximum Dry Unit Weight (lbf/ft³):	**102.2**
Optimum Water Content (%):	**9.5**
Method:	A
Preparation Method:	Moist
Rammer Type:	Mechanical
Tested By:	
Date Tested:	

Comments

APPENDIX B

LIQUEFACTION RESULTS

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

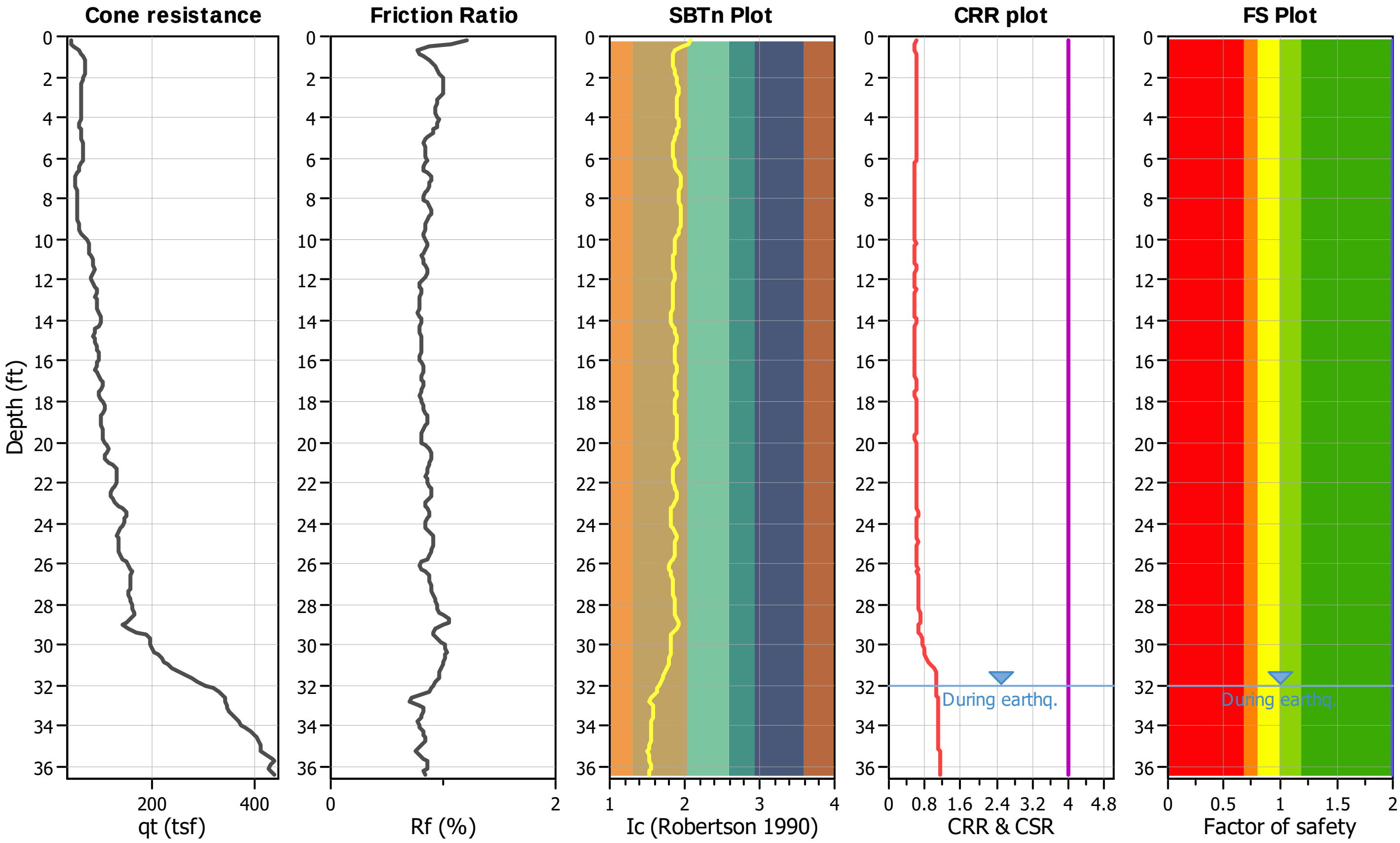
LIQUEFACTION ANALYSIS REPORT

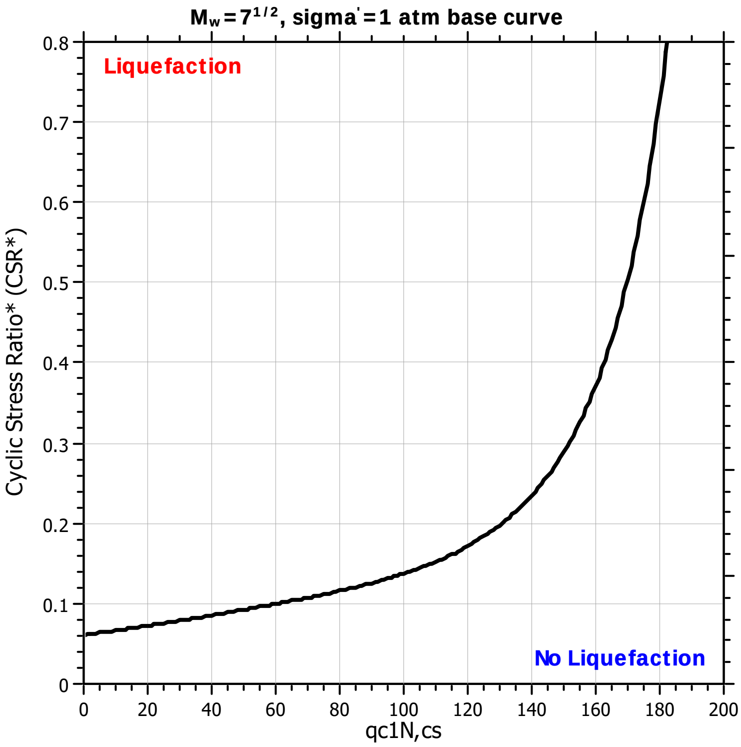
Project title : Microtel Inn and Suites **Location : Florence, OR**

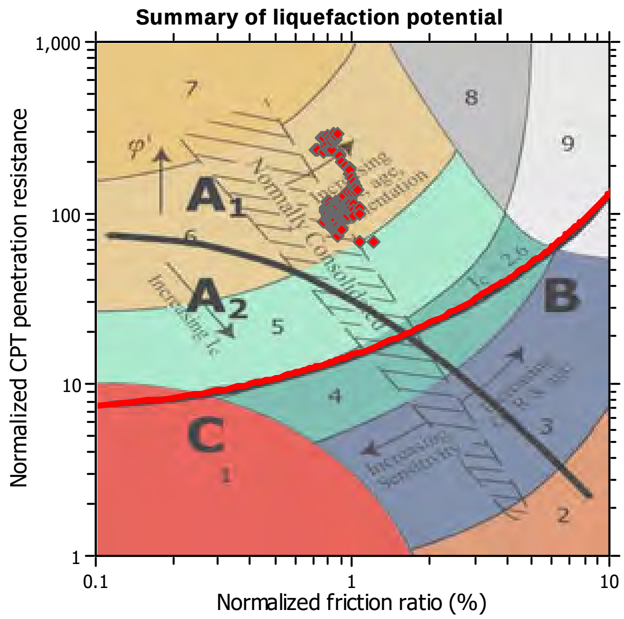
CPT file : 21020 CPT-1 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

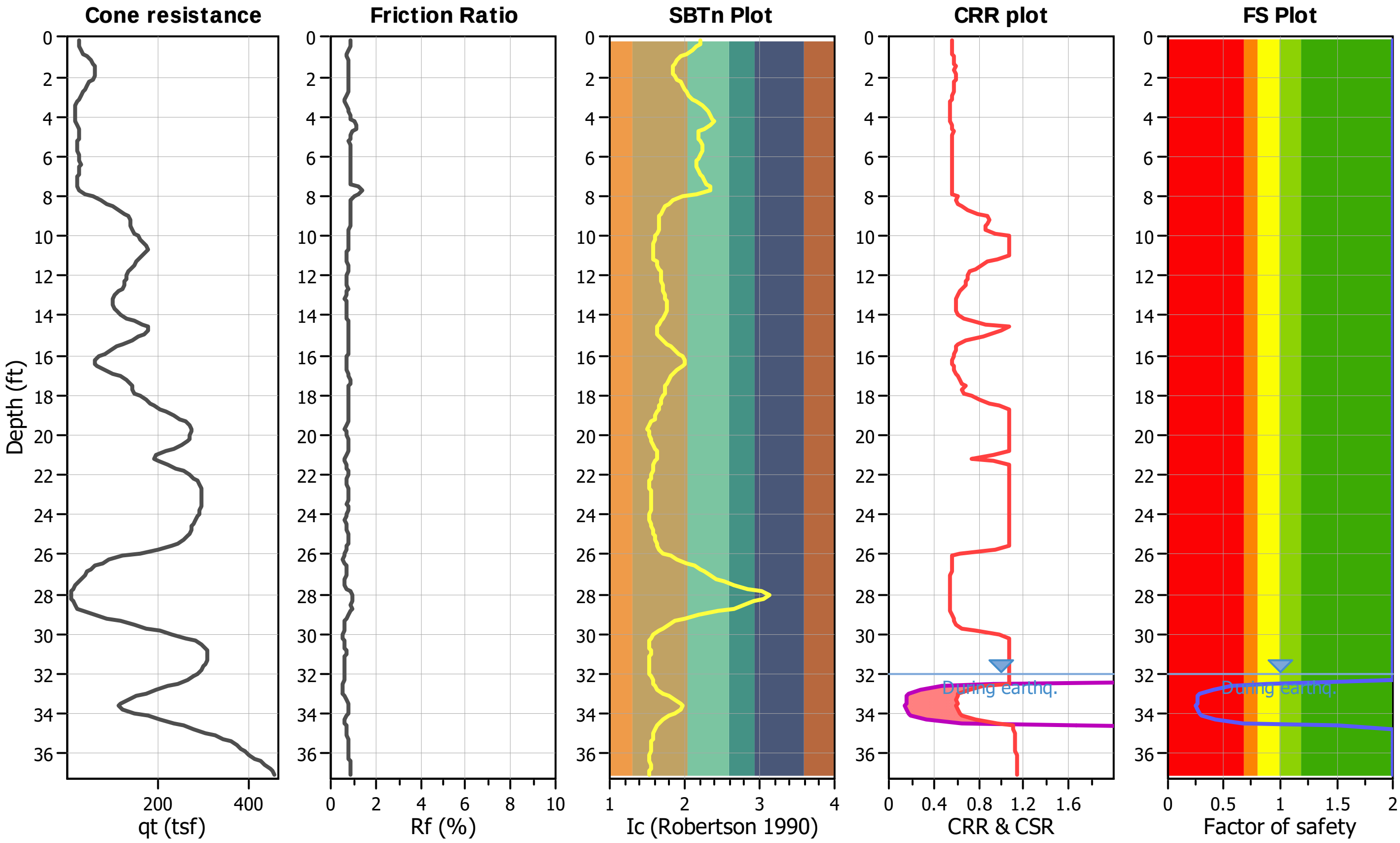
LIQUEFACTION ANALYSIS REPORT

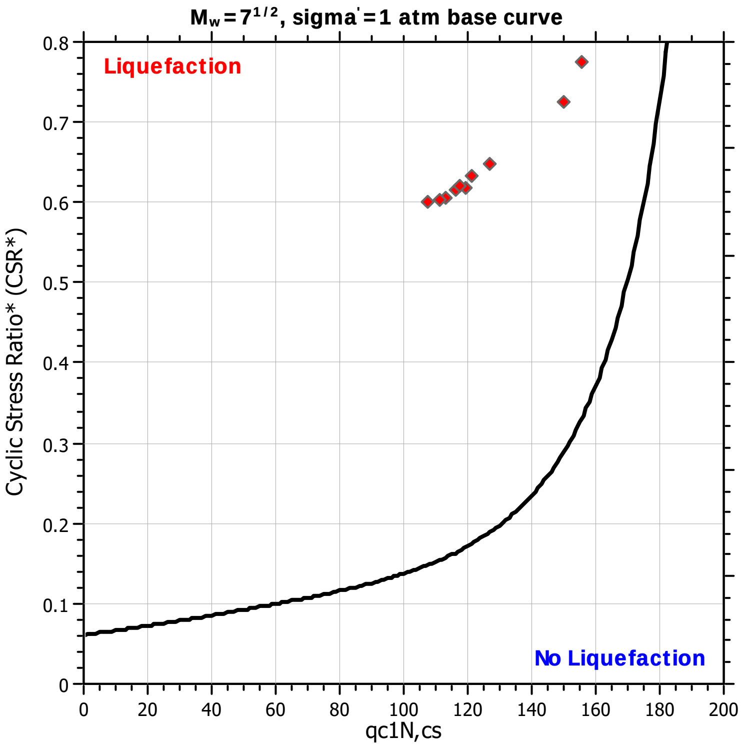
Project title : Microtel Inn and Suites **Location : Florence, OR**

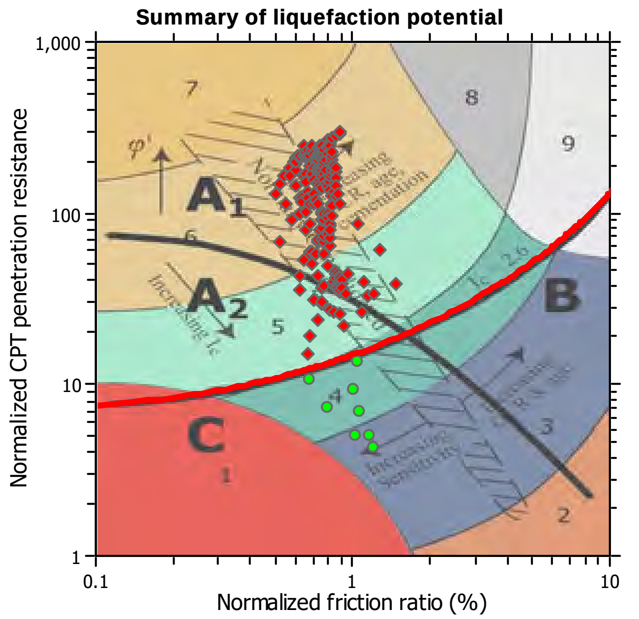
CPT file : 21020 CPT-2 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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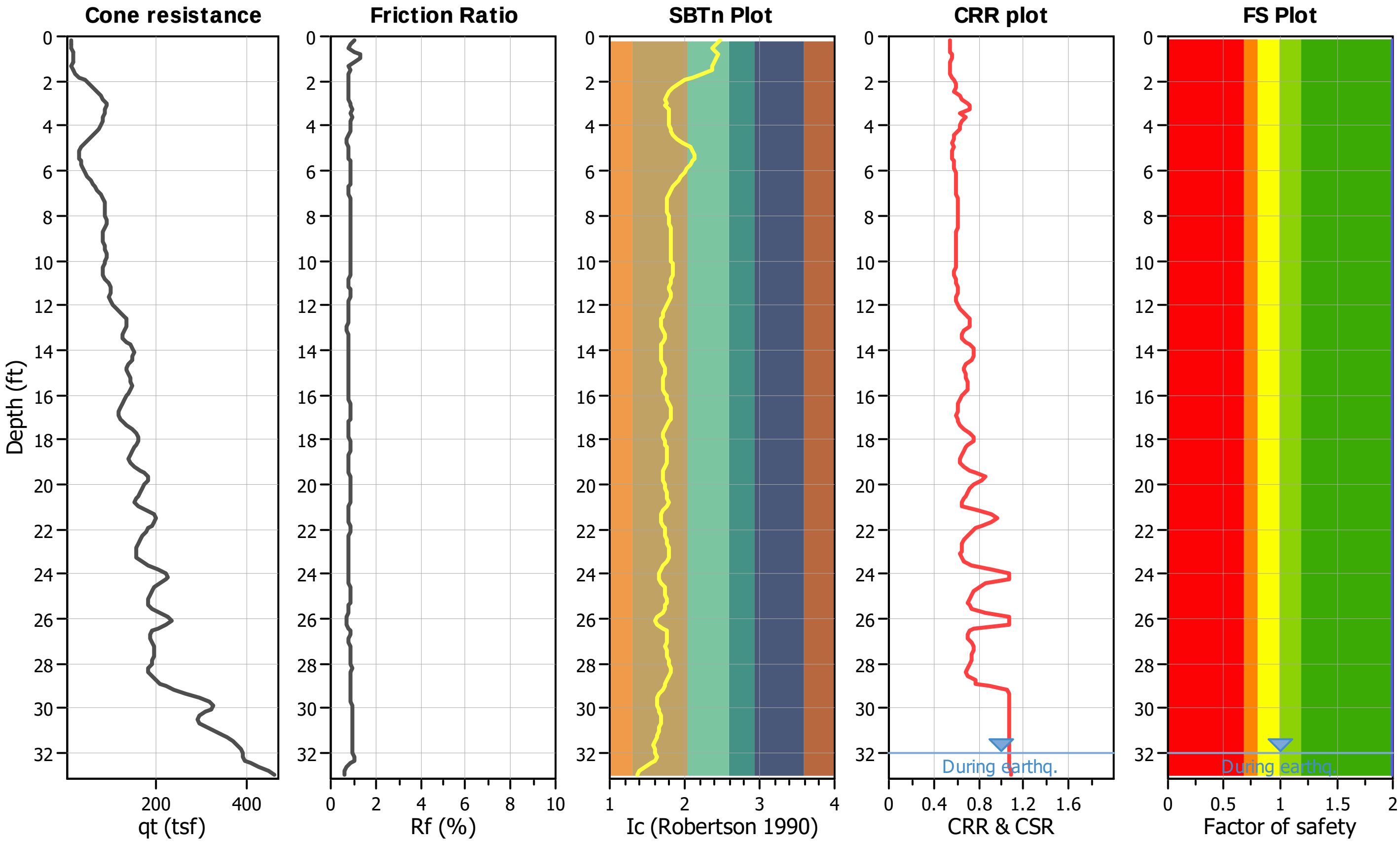
LIQUEFACTION ANALYSIS REPORT

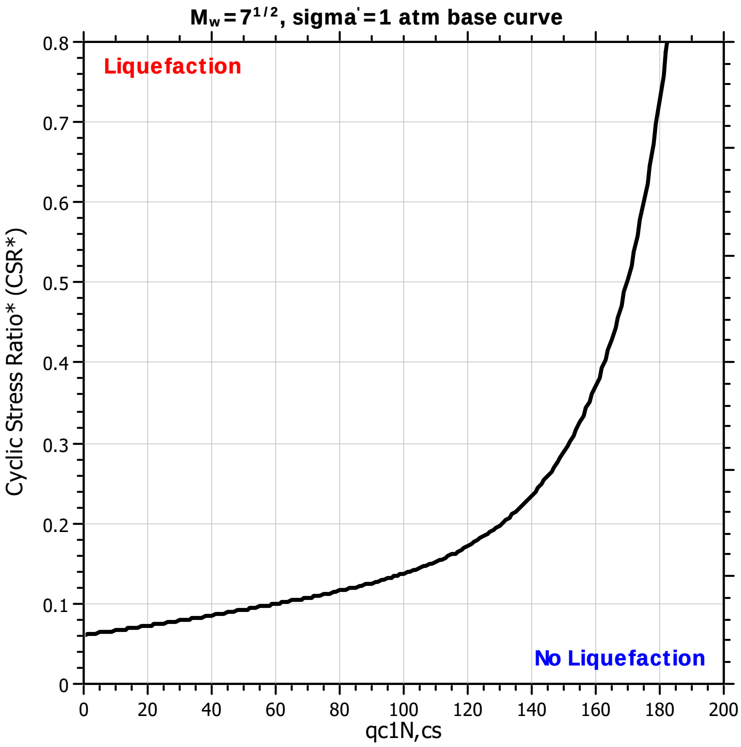
Project title : Microtel Inn and Suites **Location : Florence, OR**

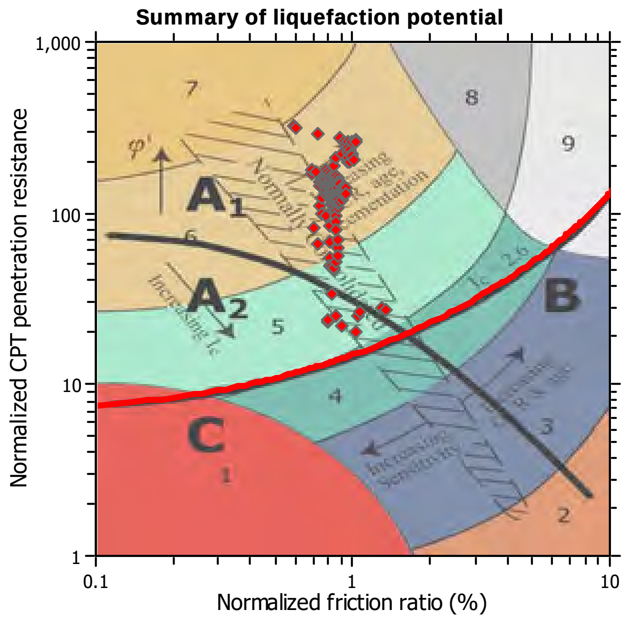
CPT file : 21020 CPT-3 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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Portland, OR 97217
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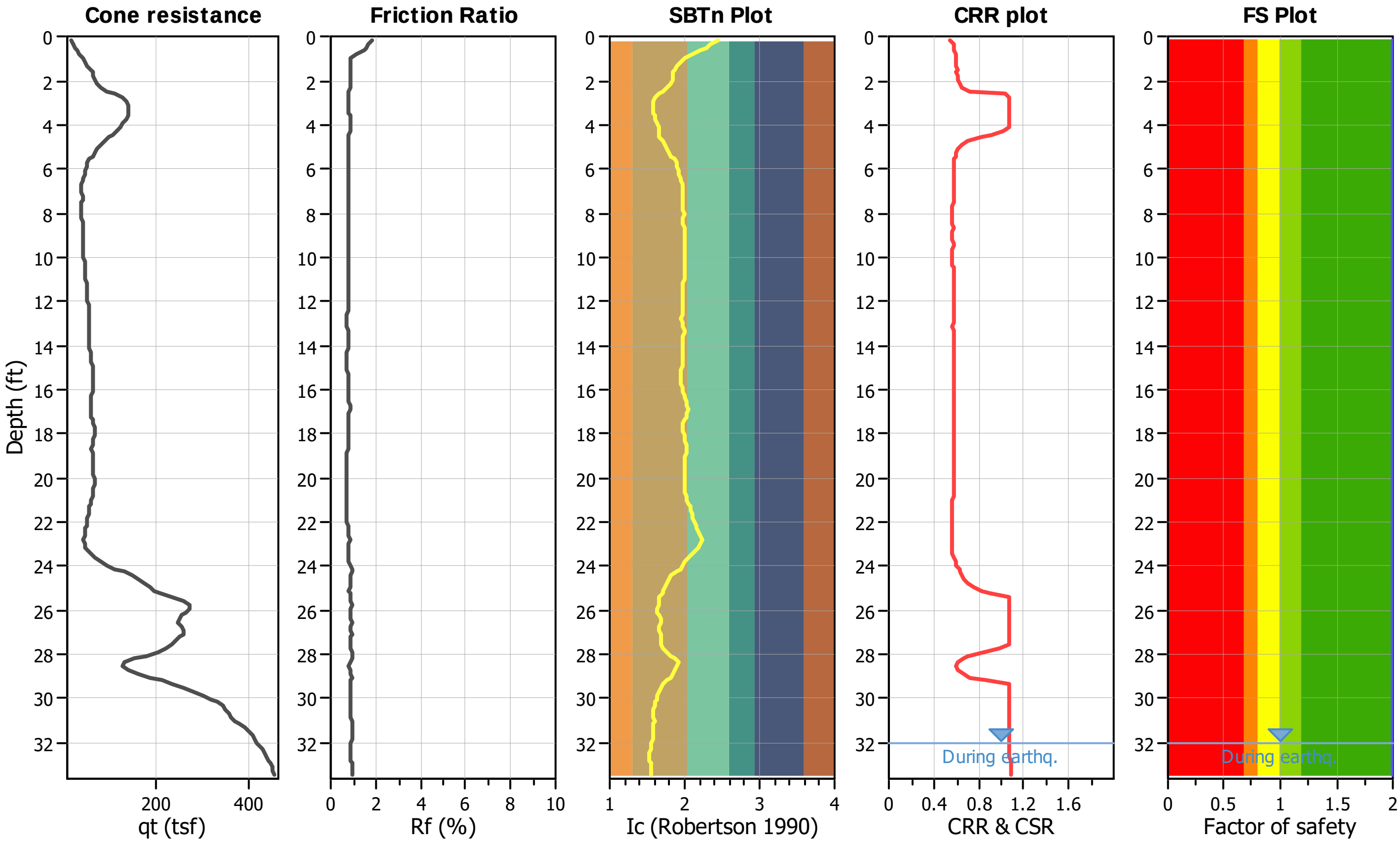
LIQUEFACTION ANALYSIS REPORT

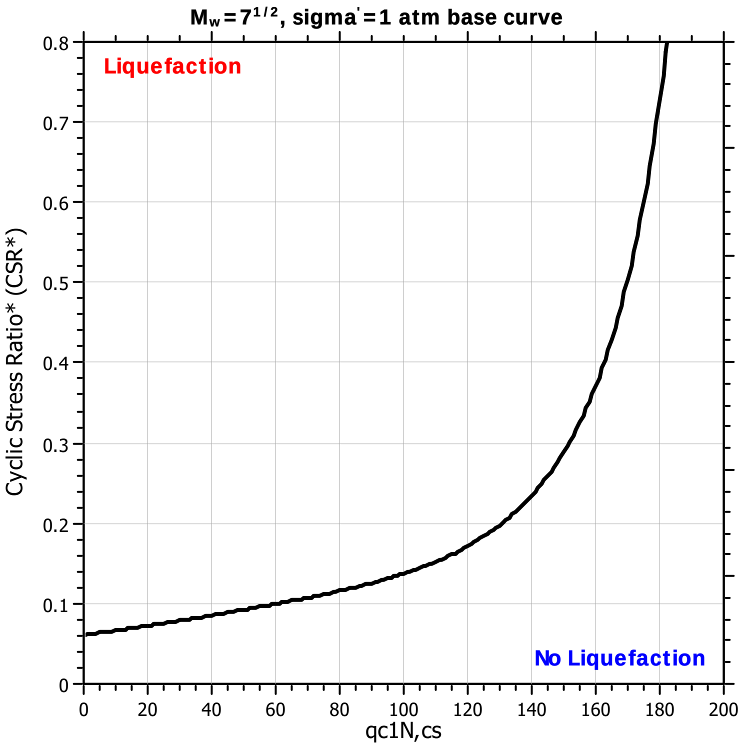
Project title : Microtel Inn and Suites **Location : Florence, OR**

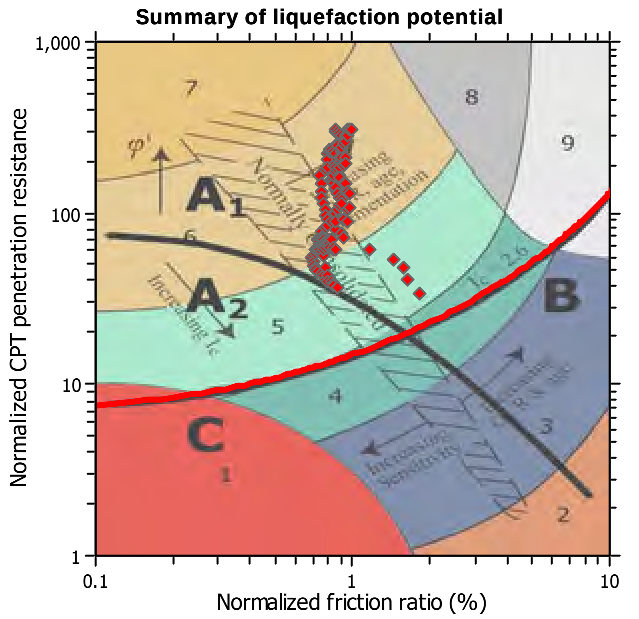
CPT file : 21020 CPT-4 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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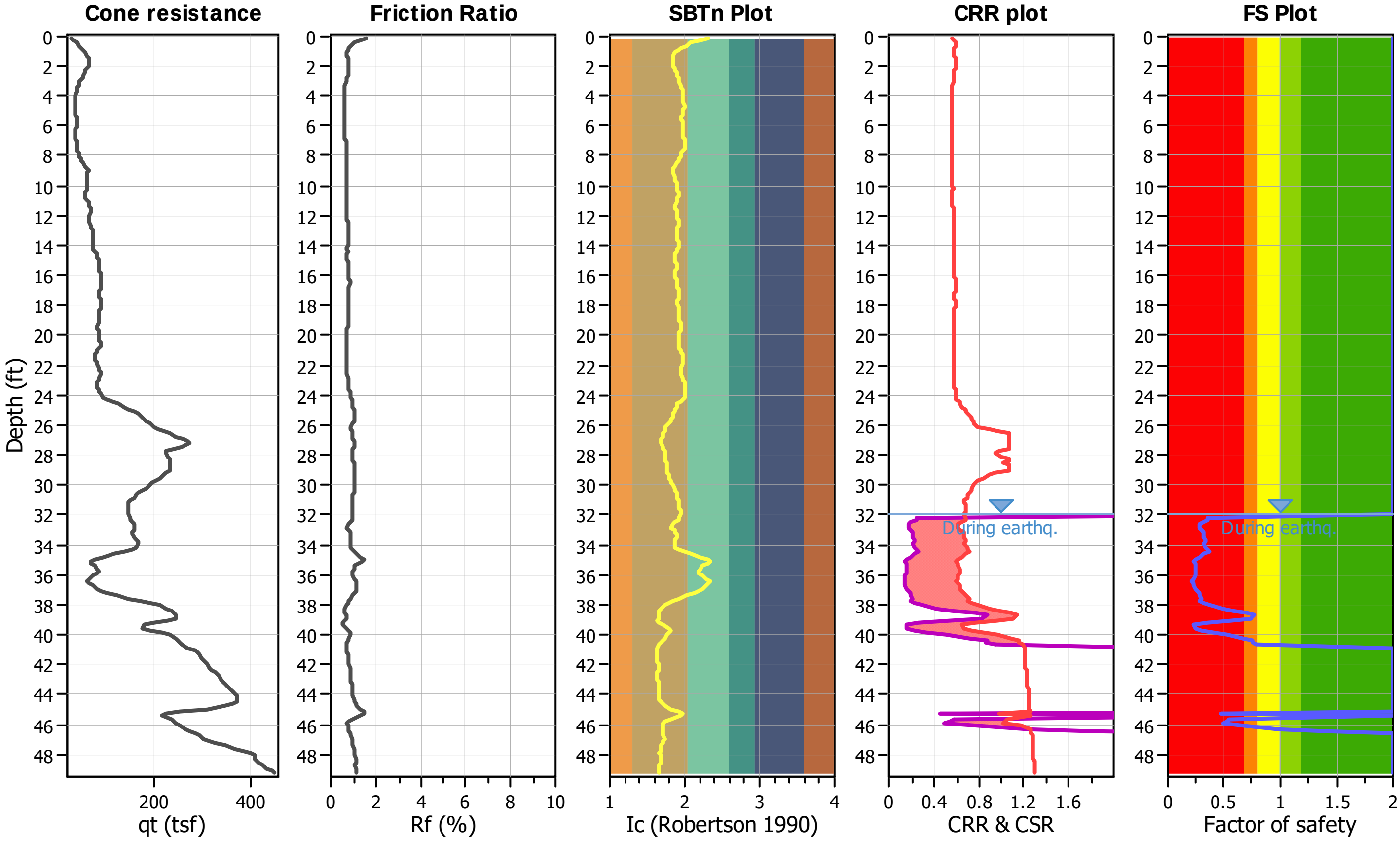
LIQUEFACTION ANALYSIS REPORT

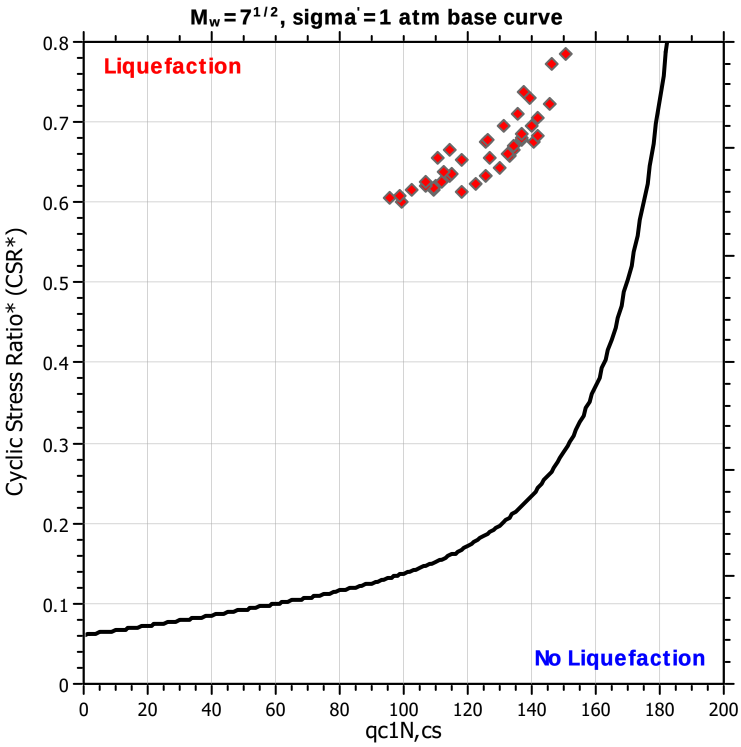
Project title : Microtel Inn and Suites **Location : Florence, OR**

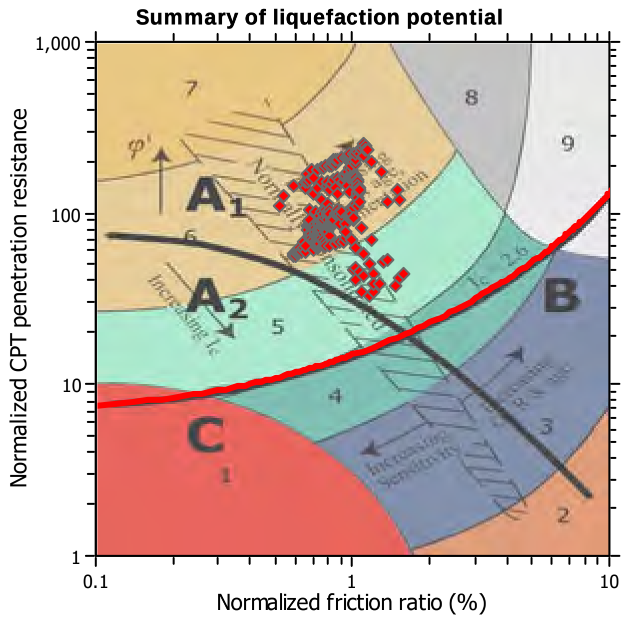
CPT file : 21020 CPT-5 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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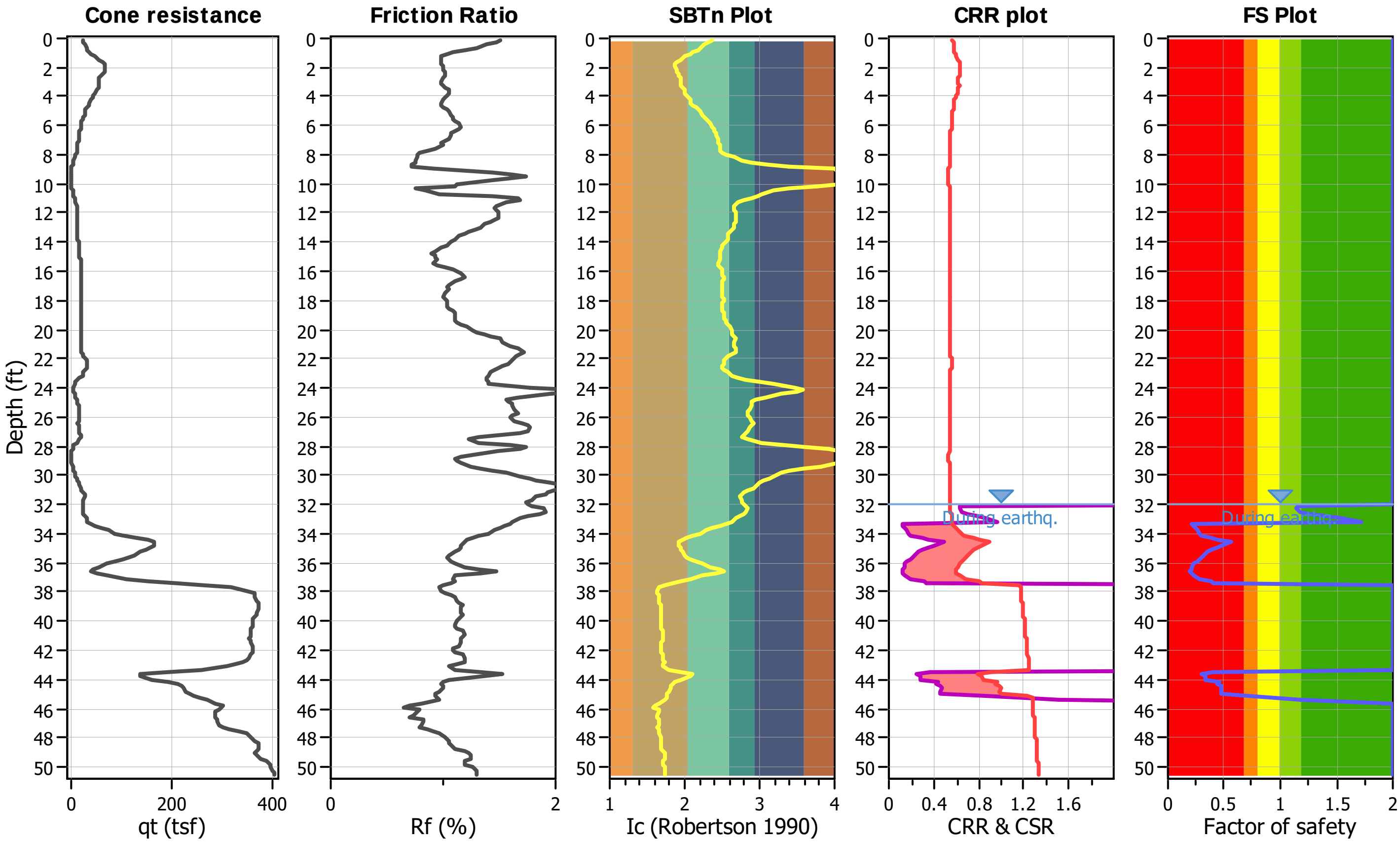
LIQUEFACTION ANALYSIS REPORT

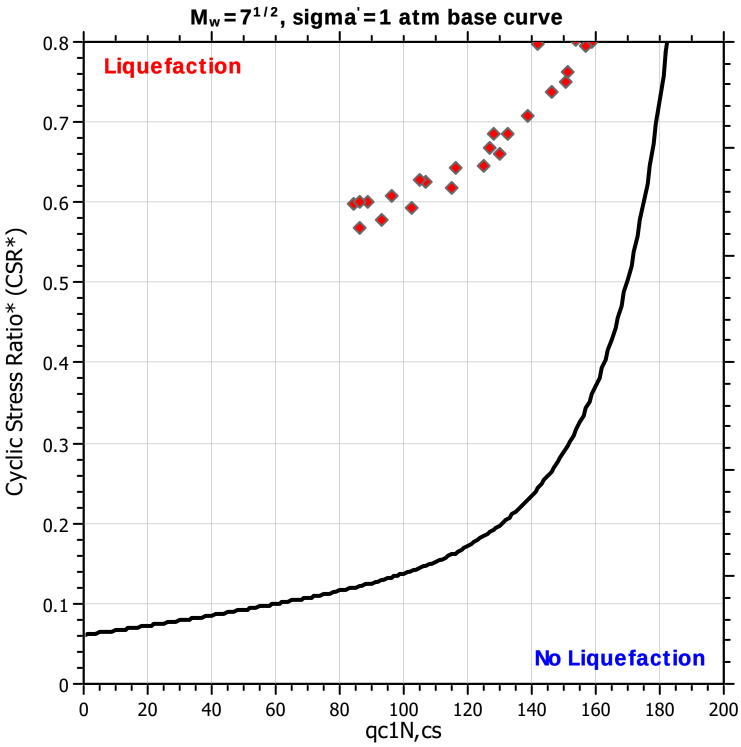
Project title : Microtel Inn and Suites **Location : Florence, OR**

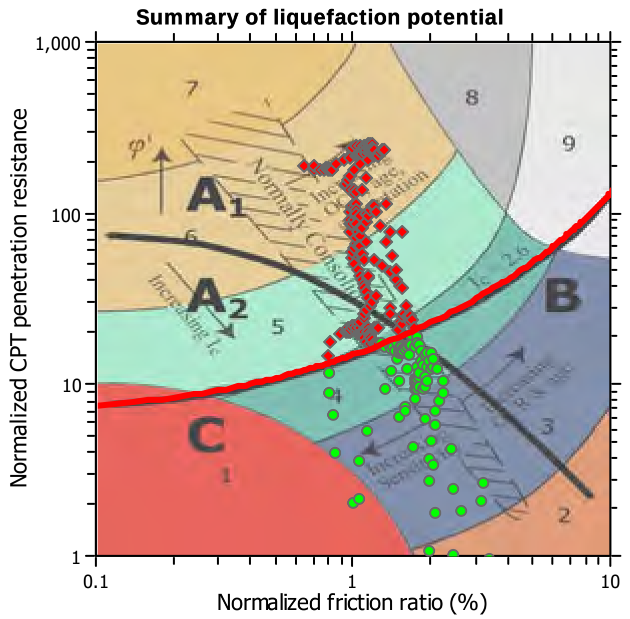
CPT file : 21020 CPT-6 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		



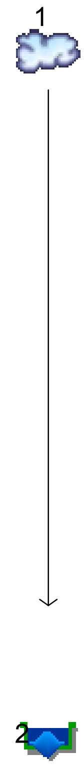




Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

APPENDIX C: Runoff Calculations

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Developed Site
2	Reservoir	Infiltration

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	0.730	-------	-------	1.338	1.721	-------	2.343	Developed Site
2	Reservoir	1	-------	0.000	-------	-------	0.000	0.000	-------	0.000	Infiltration

Proj. file: Hydro - Successful Single Pond.gpw

Wednesday, 06 / 1 / 2022

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.730	1	480	13,433	------	------	------	Developed Site
2	Reservoir	0.000	1	673	0	1	98.30	752	Infiltration

Hydrograph Report

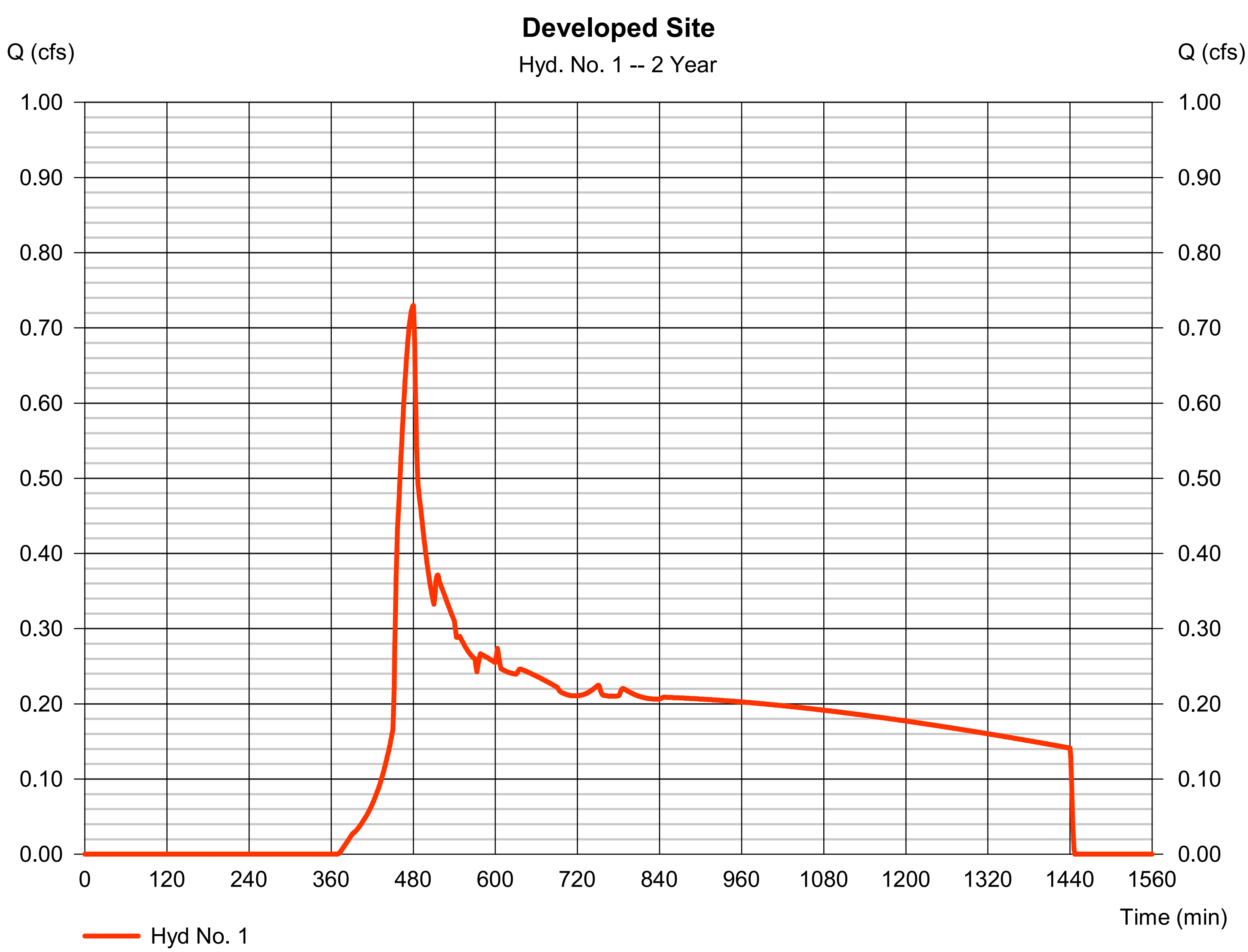
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 1

Developed Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.730 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 1 min	Hyd. volume	= 13,433 cuft
Drainage area	= 3.210 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 4.00 min
Total precip.	= 3.46 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.860 x 98) + (1.350 x 39)] / 3.210



Hydrograph Report

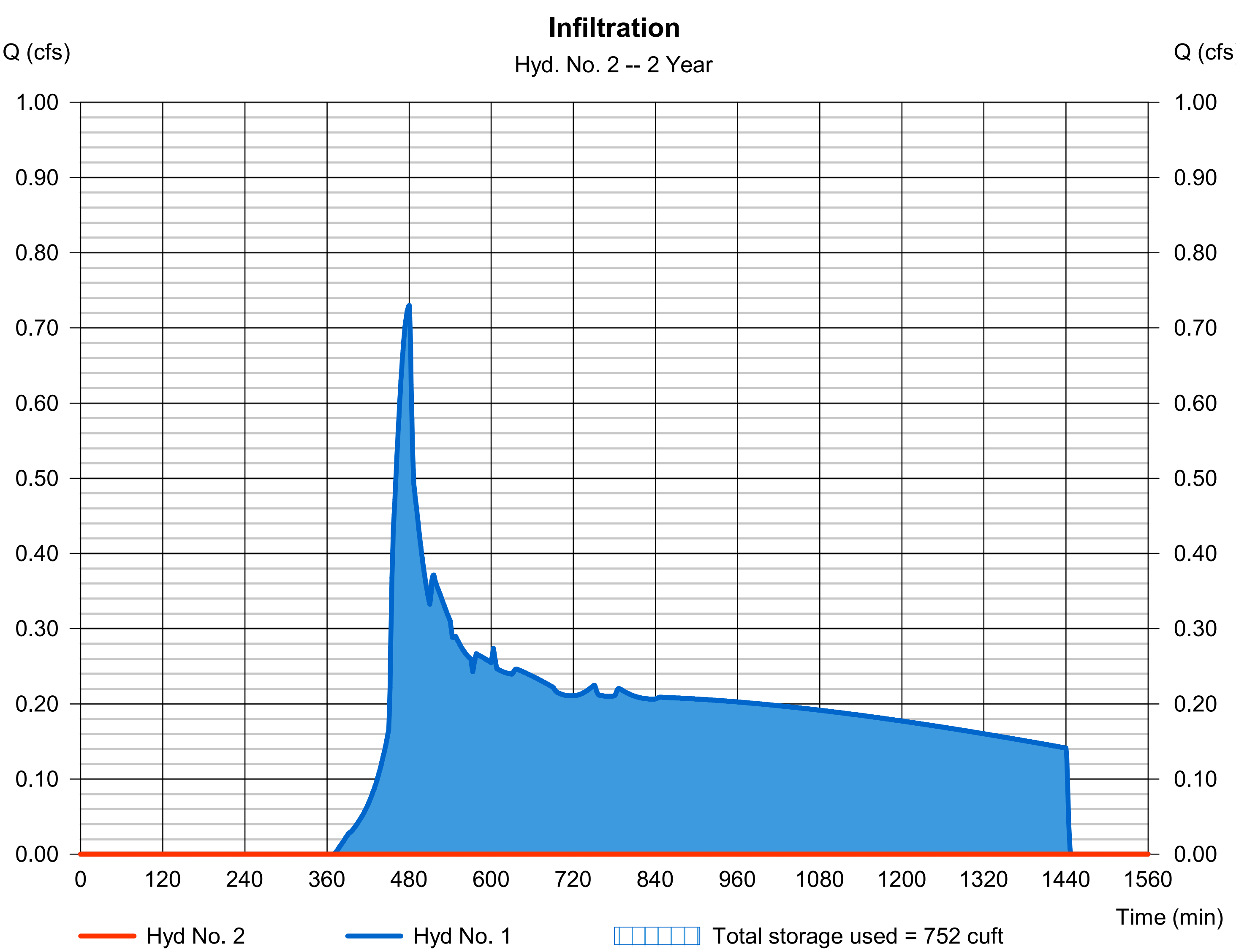
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 2

Infiltration

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 673 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 1 - Developed Site	Max. Elevation	= 98.30 ft
Reservoir name	= Detention Pond	Max. Storage	= 752 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - Detention Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 38.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	38.50	153	0	0
0.50	39.00	277	106	106
1.50	40.00	580	419	525
2.50	41.00	955	760	1,285
3.50	42.00	1,399	1,170	2,455
4.50	43.00	1,899	1,642	4,097

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	0.00	0.00
Span (in)	= 3.20	12.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 97.00	96.50	0.00	0.00
Length (ft)	= 1.00	50.00	0.00	0.00
Slope (%)	= 0.10	5.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 25.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	38.50	0.00	0.00	---	---	---	---	---	---	0.000	---	0.000
0.50	106	39.00	0.00	0.00	---	---	---	---	---	---	0.160	---	0.160
1.50	525	40.00	0.00	0.00	---	---	---	---	---	---	0.336	---	0.336
2.50	1,285	41.00	0.00	0.00	---	---	---	---	---	---	0.553	---	0.553
3.50	2,455	42.00	0.00	0.00	---	---	---	---	---	---	0.810	---	0.810
4.50	4,097	43.00	0.00	0.00	---	---	---	---	---	---	1.099	---	1.099

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.338	1	478	21,913	------	------	------	Developed Site
2	Reservoir	0.000	1	478	0	1	99.42	1,771	Infiltration

Hydrograph Report

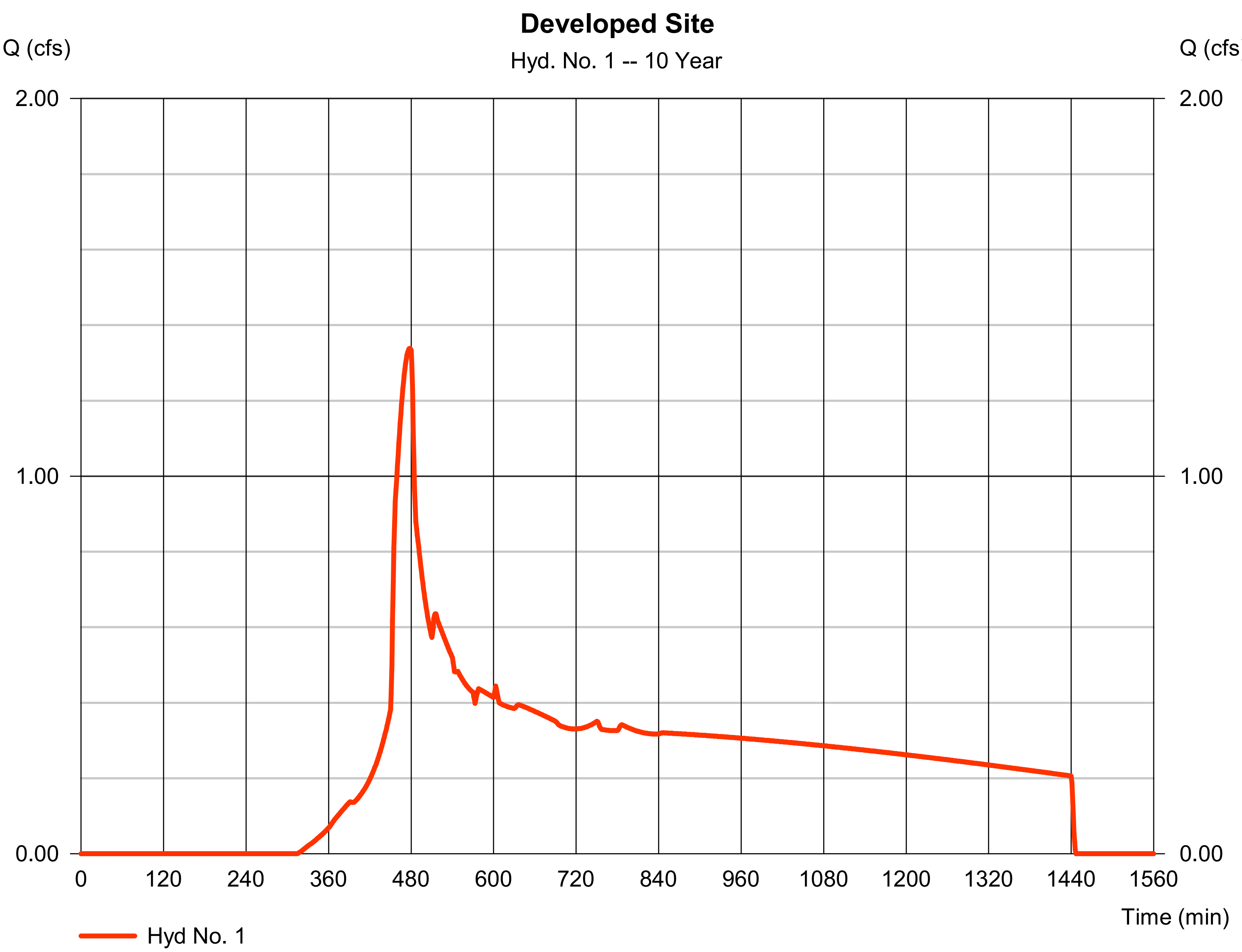
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 1

Developed Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.338 cfs
Storm frequency	= 10 yrs	Time to peak	= 478 min
Time interval	= 1 min	Hyd. volume	= 21,913 cuft
Drainage area	= 3.210 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 4.00 min
Total precip.	= 4.48 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.860 x 98) + (1.350 x 39)] / 3.210



Hydrograph Report

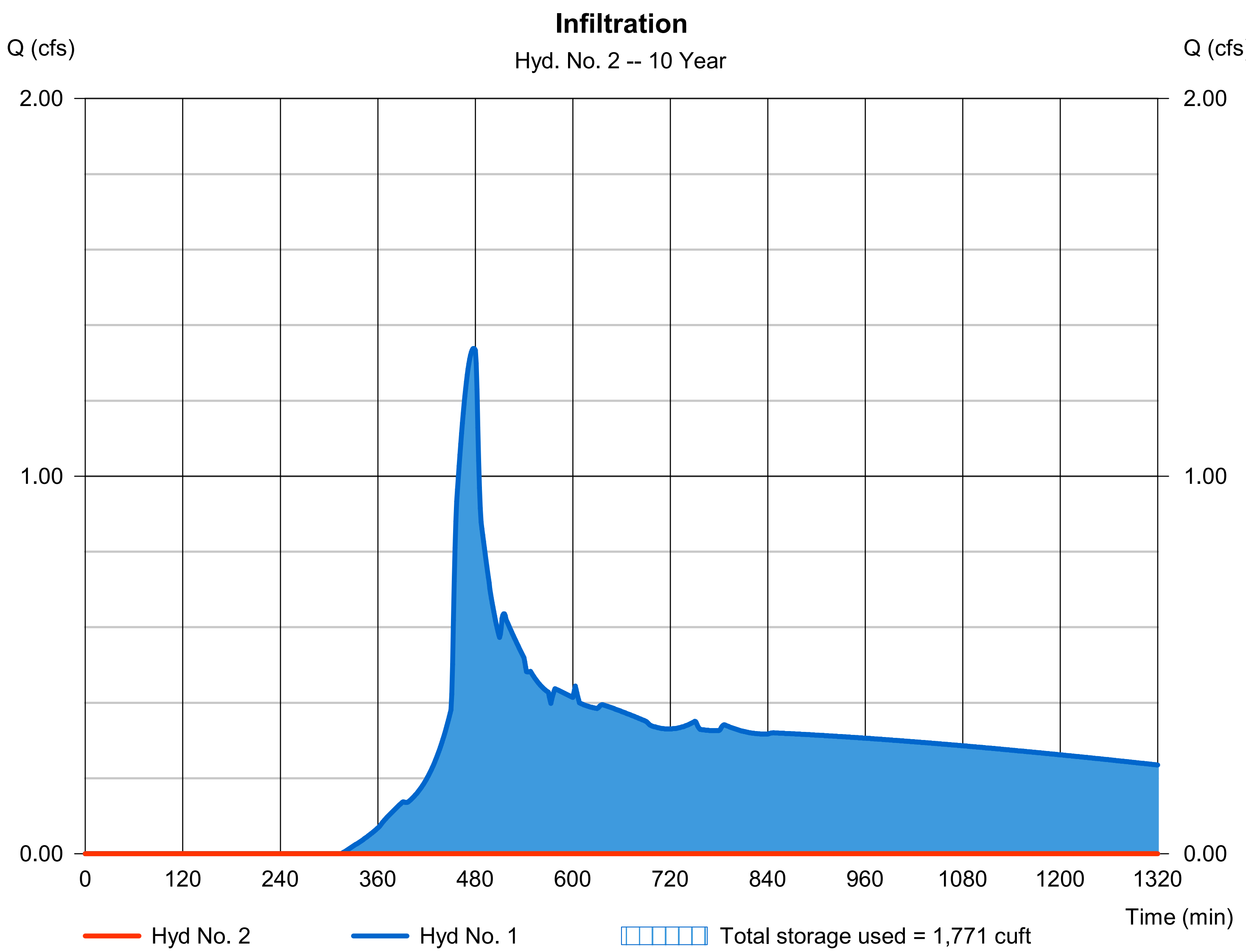
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 2

Infiltration

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 478 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 1 - Developed Site	Max. Elevation	= 99.42 ft
Reservoir name	= Detention Pond	Max. Storage	= 1,771 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.721	1	477	27,122	------	------	------	Developed Site
2	Reservoir	0.000	1	538	0	1	100.02	2,492	Infiltration

Hydrograph Report

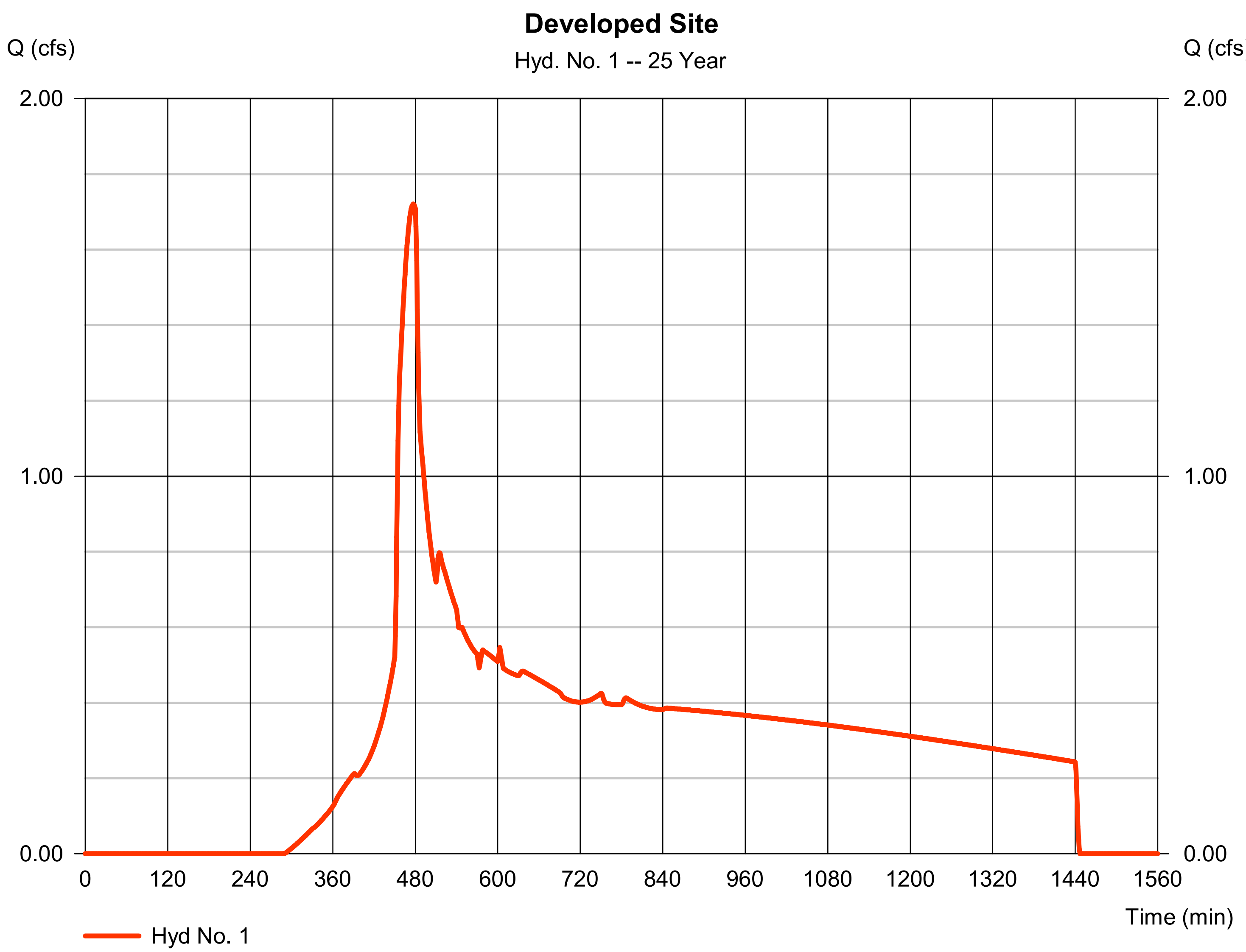
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 1

Developed Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.721 cfs
Storm frequency	= 25 yrs	Time to peak	= 477 min
Time interval	= 1 min	Hyd. volume	= 27,122 cuft
Drainage area	= 3.210 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 4.00 min
Total precip.	= 5.06 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.860 x 98) + (1.350 x 39)] / 3.210



Hydrograph Report

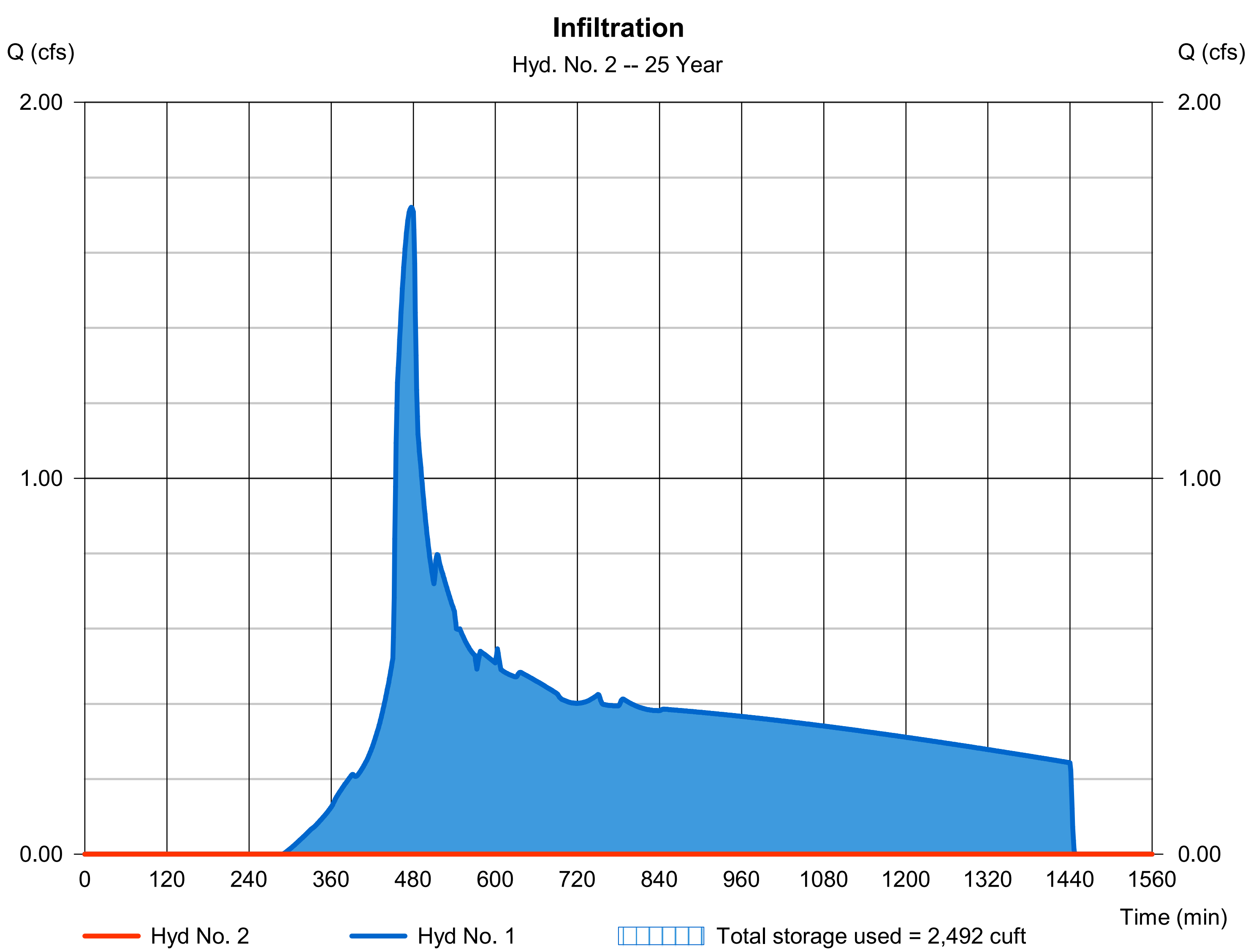
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 2

Infiltration

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= 538 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 1 - Developed Site	Max. Elevation	= 100.02 ft
Reservoir name	= Detention Pond	Max. Storage	= 2,492 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.343	1	476	35,507	------	------	------	Developed Site
2	Reservoir	0.000	1	504	0	1	100.81	3,783	Infiltration

Hydrograph Report

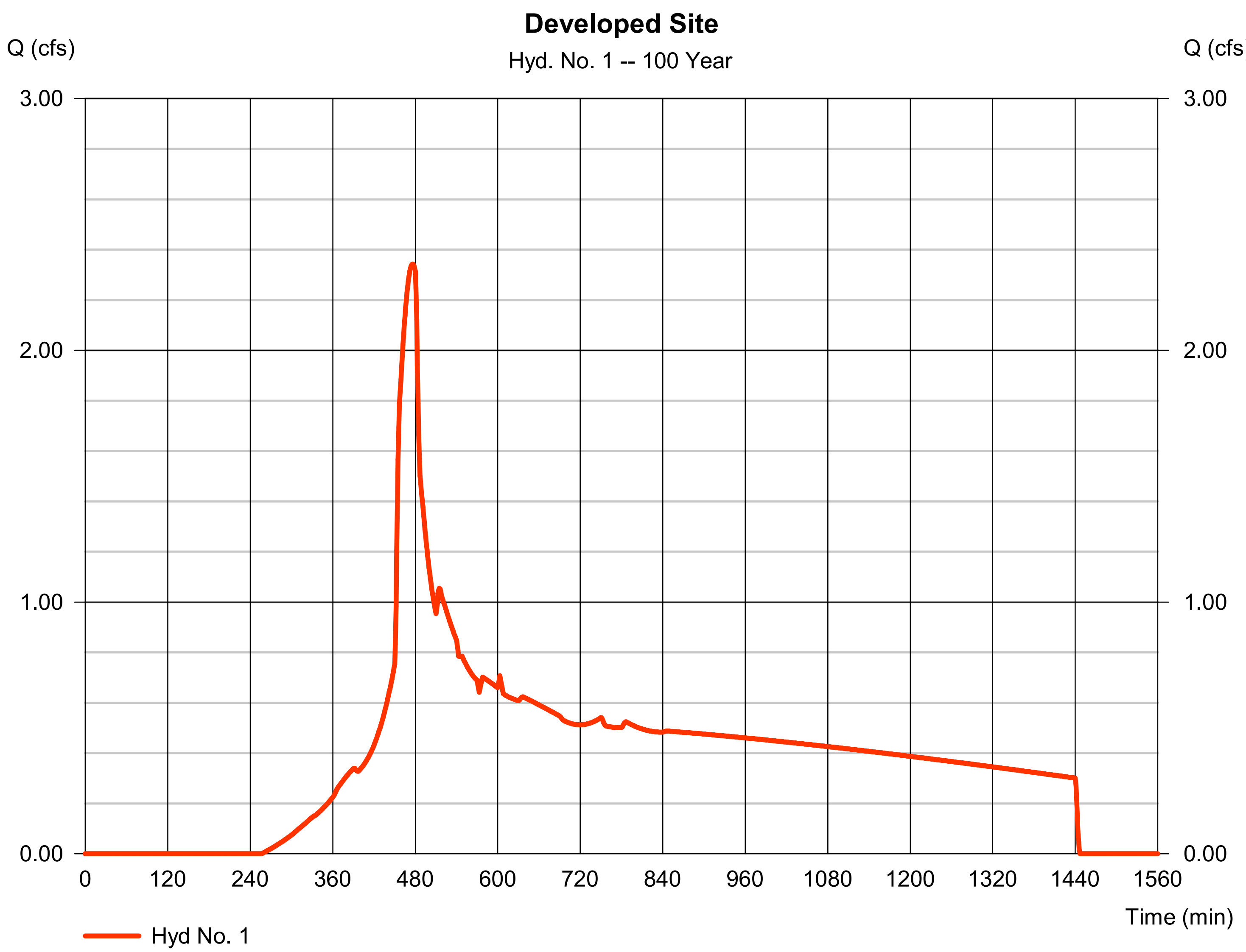
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 1

Developed Site

Hydrograph type	= SCS Runoff	Peak discharge	= 2.343 cfs
Storm frequency	= 100 yrs	Time to peak	= 476 min
Time interval	= 1 min	Hyd. volume	= 35,507 cuft
Drainage area	= 3.210 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 4.00 min
Total precip.	= 5.95 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.860 x 98) + (1.350 x 39)] / 3.210



Hydrograph Report

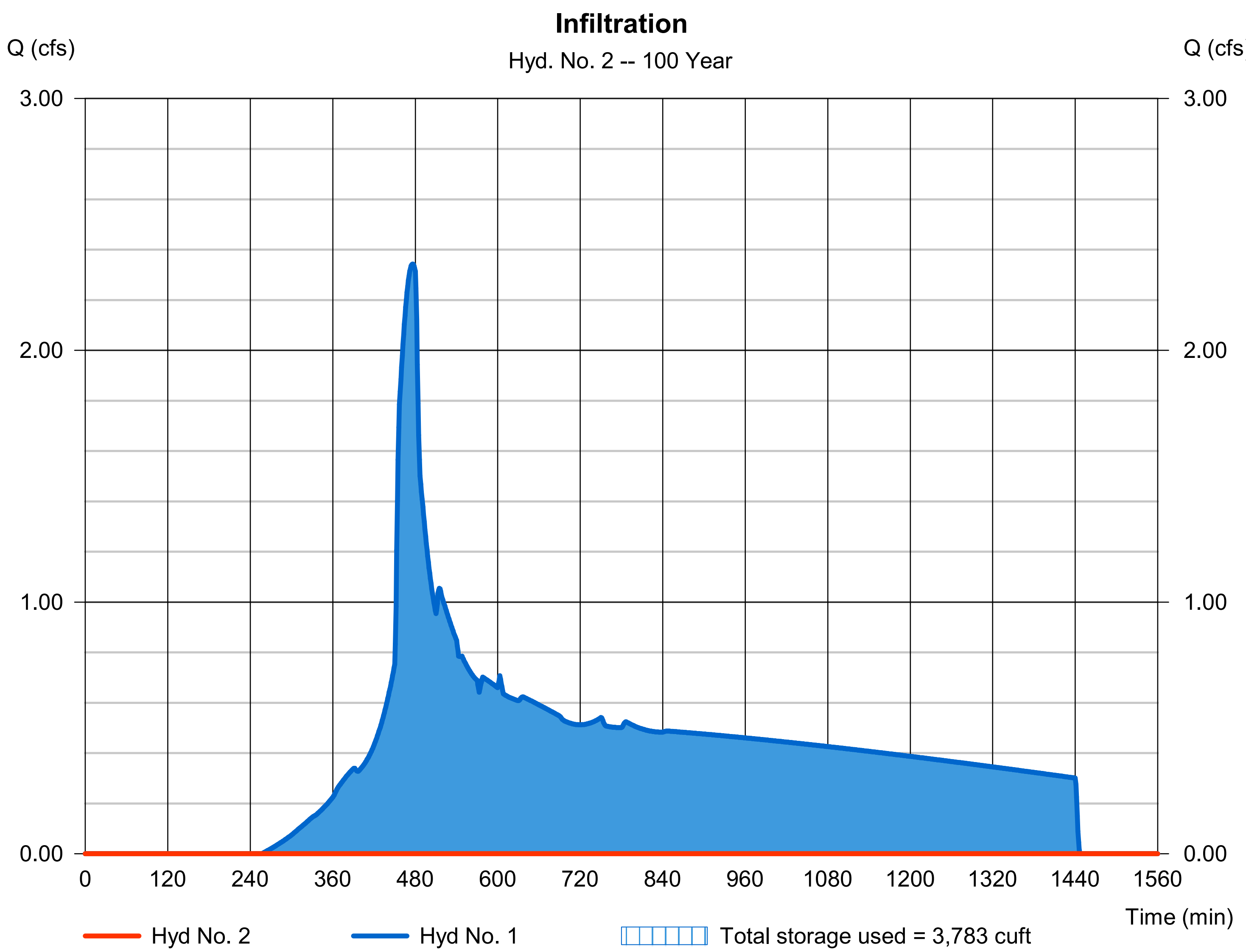
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 2

Infiltration

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 504 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 1 - Developed Site	Max. Elevation	= 100.81 ft
Reservoir name	= Detention Pond	Max. Storage	= 3,783 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



APPENDIX D: Operations & Maintenance

After Recording Return to:
Name:
Address:

Place Recording Label Here

APPENDIX A.4

Form O&M: Operations and Maintenance Plan

Permit Application No .____

Owner Name: ____

Phone: (*area code required)* ____

Mailing Address: *(return address for records)* ____

City/State/Zip:____

Site Address: ____

City/State/Zip:____

Site Legal Description:

____

____

____

1 Responsible Party for Maintenance (*check one)*

_ Homeowner association _ Property Owner _ Other *(describe)*

____

2 Contact Information for Responsible Party(ies) if Other than Owner

Daytime Phone: (*area code required)* ________- __________-_____________
Emergency/After Hours Phone: ________- __________-______________
Contact Name and Address:

____
_

Instructions

Simplified Sizing Approach: *Attach O&M Specifications from the Florence Stormwater Design Manual Appendix H.*

Presumptive and Performance Sizing Approach: *Attach the site-specific O&M Plan (See Stormwater Design Manual Section 6).*

3 Site Plan
Show all facility locations in relation to labeled streets, buildings, or other permanent features on the site. Also show the sources of runoff entering the facility, and the final onsite/offsite discharge point.
Please complete the table below

Maintaining the stormwater management facility on this site plan is a required condition of building permit approval for the identified property. The property owner is required to operate and maintain this facility in accordance with the O&M specifications or plan on file with the City of Florence. That requirement is binding on all current and future owners of the property. Failure to comply with the O&M specifications or plan may result in enforcement action, including penalties. The O&M specifications or plan may be modified by written consent of new owners and written approval by re-filing with the Community Development Department.

Complete and recorded O&M Forms shall be submitted to:
Community Development Department, 250 Highway 101, Florence, OR, 97439
Office hours are 8 - 5, Monday through Friday. Call 541-997-3436 for assistance.

Required Site Plan (insert here or attach separate sheet)

☐ I Have Attached a Site Plan

Please complete this table

Facility Type	Size (sf)	Drainage is from:	Impervious Area Treated (sf)	Discharge Point

BY SIGNING BELOW *filer accepts and agrees to the terms and conditions contained in this O&M Form and in any document executed by filer and recorded with it. To be signed in the presence of a notary.*

____

Filer signature

____

INDIVIDUAL Acknowledgement
STATE of OREGON county of:

____

This instrument was acknowledged before me on:

____

By:

____

Notary Signature:

____

My Commission Expires: ______________________ *for notary seal*

CORPORATE Acknowledgement
STATE of OREGON county of:
____

This instrument was acknowledged before me on:
____

By:
____

As (title):
____

Of (corporation):
____

Notary Signature:
____

My Commission Expires: ________________________________

(SAMPLE)
STORMWATER MANAGEMENT FACILITY
CITY OF FLORENCE, OREGON
OPERATION & MAINTENANCE AGREEMENT

Sediment and other pollutants that degrade water quality will accumulate in urban stormwater facilities. The operation and maintenance of stormwater management facilities including the implementation of pollution reduction facilities is essential to the protection of the city's water quality. Removal of accumulated pollutants and sediment is important for proper operation. All property owners are expected to conduct business in a manner that promotes resource protection. This agreement contains specific provisions with respect to city maintenance of private stormwater management facilities and use of pollution reduction facilities.

Property Address:

Legal description:

Whereas, ____________________, herein referred to as Owner, has constructed improvements, including but not limited to buildings, pavement, and stormwater management facilities on the property described above. In order to further the goals of the City of Florence to ensure the protection and enhancement of water quality, the City of Florence and Owner hereby enter into this Agreement. The responsibilities of each party to this Agreement are identified below.

Recitals

1. Owner owns the above described property within the City of Florence, Lane County, Oregon.
2. Owner owns and operates stormwater management facilities approved and permitted as required by land use permit _________.
3. Owner has requested the city to provide the functional maintenance of the facility.
4. City approved construction plans dedicating the drainage system conveying the runoff from the residential properties to the stormwater facility as a public drainage system are on file.
5. Access routes for maintenance have been located within a dedicated public easement on private or commonly held property, within the public right-of-way or on city owned property.
6. Sufficient easement area, right-of-way width or property have been provided to accommodate the construction and maintenance of all existing and proposed utilities and public infrastructure.

Owner shall:

1. Implement the stormwater management plan included herein as Attachment "A". (Stormwater disposal and pollution reduction construction details, and source control protection, etc.)
2. Implement the stormwater maintenance plan included herein as Attachment "B". (Owner responsibilities such as vegetation control, debris pickup, etc.)
3. Inspect the facilities monthly and after significant storm events to determine if maintenance activity is warranted.
4. Maintain maintenance and inspection records (in the form of a log book) of steps taken to implement the programs referenced in (1) and (2) above. The log book shall be available for inspection by appointment at _________________________. The log book shall catalog any action taken, who took the action, when it was taken, how it was done, and any problems encountered or follow-on actions recommended. Maintenance items ("problems") listed in Attachment "A" shall be inspected as specified in the attached instructions or more often if necessary. The Owner and Users are encouraged to photocopy the individual checklists in Attachment "A" and use them to complete its inspections. These completed checklists would then, in combination, comprise the logbook.
5. Submit an annual report to the City of Florence regarding implementation programs referenced in (1) and (2) above. The report must be submitted on or before June 30 of each calendar year after execution of this agreement. At a minimum, the following items shall be included in the report:
    a. Name, address, and telephone number of the businesses, persons, or firms responsible for maintenance plan implementation, and the persons completing the report.

b. Time period covered by the report.
c. A chronological summary of activities conducted to implement the program and plan referenced in (1) and (2) above. A photocopy of the applicable sections of the logbook with any additional explanations needed shall suffice. For any activities conducted by paid parties, include a copy of the invoice for services.
d. Any outline planned activities for the upcoming year.

6. Allow the City of Florence staff to inspect stormwater management facilities at the above referenced site.

City of Florence shall:

1. Execute the following periodic major maintenance on the subdivision's pollution reduction facilities: sediment removal from facilities, resetting orifice sizes and elevations, and adding baffles.
2. Maintain all stormwater management facility elements within the public rights of way and dedicated easements, such as catch basins, weirs, oil-water separators, and pipes.
3. Provide technical assistance to the Owner in support of its operation and maintenance activities conducted pursuant to its maintenance and source control programs. Said assistance shall be provided upon request and as the City of Florence's time and resources permit.
4. Review the annual report and conduct a minimum of one (1) site visit per year to discuss performance and problems with the stormwater management facilities.
5. Review the agreement with the Owner and modify it as necessary at least once every three (3) years.

Remedies:

1. If the City of Florence determines that maintenance that maintenance or repair work is required to be done to the stormwater management facilities located in the subdivision, the City of Florence shall give the Owner notice of the specific maintenance and/or repair required. The City of Florence shall set a reasonable time in which such work is to be completed the persons who were given notice. If the above required maintenance and/or repair is not completed within the time set by the City of Florence, written notice will be sent to the Owner stating the City of Florence's intention to perform such maintenance and bill the Owner for all incurred expenses.
2. If, at any time, the City of Florence determines that the existing facility creates any imminent threat to public health, safety, or welfare, the City of Florence may take immediate measures to remedy said threat. No notice to the persons listed in Remedies (1), above shall be required under such circumstances. All other

Owner responsibilities shall remain in effect.

1. The Owner shall grant unrestricted authority to the City of Florence for access to any and all stormwater management facilities for the purpose of performing maintenance or repair as may become necessary under Remedies (1) and/or (2).
2. The Owner shall assume responsibility for the cost of maintenance and repairs to the stormwater management facilities, except for those maintenance actions explicitly assumed by the City of Florence in the preceding section. Such responsibility shall include reimbursement to the City of Florence within 90 days of the receipt of the invoice for any such work performed. Overdue payments will require payment of interest at the current legal rate for liquidated judgments. If legal action ensues, any costs or fees incurred by the City of Florence will be borne by the parties responsible for said reimbursements. This Agreement is intended to protect the value and desirability of the real property described above and to benefit all the citizens of the City of Florence. It shall run with the land and be binding on all parties having or acquiring any right, title, or interest or any part thereof, of real property in the subdivision. They shall inure to the benefit of each present or future successor in interest of said property or any part thereof or interest therein, and to the benefit of all citizens of the City of Florence.

This instrument is intended to be binding upon the parties hereto, their heirs, successors and assignees.

In Witness whereof, the undersigned has executed this instrument on this _________ day of __________________,20____.

OWNER(s):

Signature ____

____
(print name)

STATE OF OREGON,
County of Lane, ss:
This instrument was acknowledged before me this ________ day of _______________________________,
20__,by _______________________________________, owner(s) of the above described premises.

____
Notary Public for Oregon

____
My commission expires

MANAGER, CITY OF FLORENCE
In Witness whereof, the undersigned agent of the City of Florence has executed this instrument and acknowledged
the said instrument to be free and voluntary act and deed on this _______ day of _____________________,
20____ for the purposes herein mentioned and on oath states he is authorized to execute said instrument.

____
City Manager

STATE OF OREGON,
County of Lane, ss:
This instrument was acknowledged before me this ________ day of _______________________________,
20__, by _______________________________________, owner(s) of the above described premises.

____
Notary Public for Oregon

____
My commission expires

Exhibit I1

PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

Proposed Microtel Inn and Suites
Tax Lots 18-12-26-33-00900 and 18-12-26-33-00901
Florence, Oregon 97439

Prepared for

Mr. Matt Braun
Braun Development Services
PO Box 13223
Portland, Oregon 97213

Prepared by

Professional Service Industries, Inc.
6032 North Cutter Circle, Suite 480
Portland, Oregon 97217

February 1, 2022

PSI Project No. 07041434

Staci Shub
Staff Geologist
staci.shub@intertek.com

REGISTERED PROFESSIONAL ENGINEER 63231 OREGON JAN. 23, 2001 BRITTON W. GENTRY

RENEWS: 06/30/2023
Britton W. Gentry, PE GE
Chief Engineer
britton.gentry@intertek.com

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FIGURES

LIST OF APPENDICES

1 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

This report presents the results of PSI's geotechnical investigation performed for the proposed l Microtel Inn and Suites located on a 13.41 acre site consisting of two connecting tax lots, 18-12-26-33-00900 and 18-12-26-33-00901, east of the intersection between Quince Street and 6th Street in Florence, Oregon. A Vicinity Map of the site location is presented on Figure 1. This investigation was performed for Mr. Matt Braun of Braun Development Services in general accordance with PSI proposal number 0704-359739, dated November 23, 2021. The proposal was authorized by Mr. Braun on December 14, 2021.

1.2 PROJECT DESCRIPTION

Based on correspondence with Matt Braun of Bran Development Services, Logan Miller of SFA Design Group, and Michael Parshall of Woodblock Architecture, and the provided site information, PSI understands that an approximately 10,000 square foot four story hotel will be constructed. A storm facility to the north of the building a parking lot and associated drive lanes will be on all sides, and a pergola and an uncovered patio to the south of the building will be construed. Currently the site is undeveloped. Prior to 2009 the site was occupied with a local middle school. The site school and associated structures have been demolished but evidence of a concrete slab on grade and concrete foundations are currently visible at the ground surface. We anticipate that the majority of the structural material from the school demolition has been removed from the site.

PSI anticipates the project will consist of construction of a 3 or 4 story structure supported on shallow foundations and slab on grade floors. Structural loads were provided by Mr. Logan Miller of SFA Design Group with column loads not to exceed 50 kips,and wall loads not to exceed 3 kips per foot.. Cuts and fills at the site are expected to be less than 4 feet. Maximum depth of utilities will be less than 8 feet.

Traffic loading for associated parking and pavement areas was not provided. However, we anticipate the proposed parking and drive lanes will be paved with asphalt concrete. Should any of the above information or design basis made by PSI be inconsistent with the planned construction, it is requested that you contact us immediately to allow us to make any necessary modifications to this report. PSI will not be held responsible for changes to the project if not provided the opportunity to review the information and provide modifications to our recommendations.

2 SITE AND SUBSURFACE CONDITIONS

2.1 SITE DESCRIPTION

The property is located east of the intersection between Quince Street and 6th Street in Florence, Oregon. The site is covered mostly with grass and brush. Remnants of the concrete pad from the

school still exist along Quince Street and the asphalt parking lot is still used for parking. It is bound on the north, west, and south by commercial and residential developments. Trees and tidal flats are located to the east with Munsel Creek and the Siuslaw River approximately ¼ mile further.

2.2 TOPOGRAPHY

A review of available USGS topographic maps indicate that the site consists of an upper terrace above the Siuslaw River at an elevation of about 47 feet above mean sea level (AMSL) The ground surface slopes moderately to steeply down to a wooded area adjacent to the marsh about 45 feet below the upper terrace.

2.3 GEOLOGY

The project site is mapped as being underlain by a layer of fine sandy and silty loam over Stabilized Dunes consisting of unconsolidated fine to medium grained sand. The sand is underlain by the Tyee Formation, rhythmically bedded siltstone and sandstone layers. Alluvial deposits and Tidal flats are mapped to the east, bordering Munsel Creek. These consist of alluvial clay, silt, sand, and gravel.

2.4 SUBSURFACE CONDITIONS

PSI completed the initial field exploration for Sycan B Corp on February 22, 2021 through February 24, 2021. The supplemental explorations for Braun Development services were performed on January 4, 2022. Field activities consisted of drilling six cone penetration test (CPT) probes, two GeoProbe explorations, and three geophysical refraction-microtremor (ReMi) lines. Supplemental explorations consisted of excavating 7 test pits to depths of 5 to 8 feet.

Soils

The materials and conditions disclosed by the recent explorations are generally consistent with our previous experience and understanding of the subsurface conditions at the site. In the vicinity of the proposed building, the site is typically mantled with sandy silt topsoil and dune sand underlain by alluvial soils consisting of predominantly silt and sand to a depth of about 113 ft to 116 ft. The alluvial silt and sand are interbedded and the interbeds are often massive and indistinct. The alluvial silt and sand are underlain by medium-dense to dense sandy gravel.

For the purpose of discussion, the materials encountered in the explorations have been grouped into the following categories based on their physical characteristics and engineering properties. Listed as they were encountered from the ground surface downward, the categories are as follows:

1. **SAND**
2. **SILT**

The following paragraphs provide a detailed description of the materials encountered and a discussion of the groundwater conditions at the site.

1. **SAND.** Native sand layers were encountered at the ground surface in all 6 CPT probes and extend to depths ranging from about 33 feet to 50 ½ feet. CPT probe tip resistances indicate the relative density of the sand are generally medium dense in the upper 10 to 12 feet and dense to very dense below.
2. **SILT.** Layers of silt were encountered within the sand in both CPT- 2 and CPT- 6 at depths of 4 feet and 8 feet and extend to depths ranging from about 8 feet to 34 feet, respectively. CPT probe tip resistances indicate the relative consistency of the silt are generally very soft to stiff.

2.5 GROUNDWATER

Our review of available subsurface information from previous investigations indicates the groundwater level in the project area is about 45 feet below the ground surface, which corresponds closely to the elevation of the lower marsh area. At the time of our initial investigation, groundwater was observed at a depth of approximately 35 feet in GeoProbe explorations GP1 and GP2. at the estimated groundwater elevations at the site based on pore pressure dissipation testing in the CPT probes is provided below:

Table 1 - Summary of Pore Pressure Dissipation Test Results

CPT	Pore Dissipation calculated Groundwater Depth (feet bgs)
1	33.4
2	32.2
5	35.2
6	37.1

Fluctuations in the groundwater level should be anticipated. It is recommended that the contractor determine the groundwater levels at the time of the construction to evaluate groundwater impact on construction procedures. Discontinuous zones of perched water may also exist, or develop, within the silt layer encountered during our exploration. If groundwater conditions are found to be different from those determined in this report PSI should be notified to determine if changes to our recommendations are warranted.

2.6 LOCAL FAULTING AND SEISMIC DESIGN PARAMETERS

PSI has reviewed the USGS Quaternary Fault and Fold Database of the United States. Table 1 summarizes distance and names of the closest mapped faults within about 10 miles of the project site.

Table 2 - Summary of Published, Nearby Faults

Fault Name	Approximate Distance (miles) and Direction from the Site
Cascadia Fault and Fold Belt	6.2, southwest
Unnamed Siuslaw River Anticline	8.6, northeast

For preliminary seismic design considerations, we have assumed that a fundamental period of less than 0.5 seconds and a damping ratio of 5% are appropriate to characterize the planned structure. Based on the results of subsurface explorations, geophysical testing, and our review of geologic mapping, we recommend using soil Site Class D to evaluate the seismic design of the structure. Site coefficients and spectral acceleration parameters for structural design are provided in Table 2.

Table 3 - Seismic Design Parameters

(43.9727 °, -124.1003 °) – SITE CLASS "D"

ASCE 7-16 CODE BASED RESPONSE SPECTRUM MCER GROUND MOTION - 5% DAMPING 1% IN 50 YEARS PROBABILITY OF COLLAPSE	
S_S	1.402
S_1	0.737
MAPPED MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL RESPONSE ACCELERATION PARAMETER (SITE CLASS D)	
F_A	1.0
F_V	1.7 - SEE ASCE 7-16 SECTION 11.4.8*
S_{MS}	1.682
S_{M1}	1.253 - SEE ASCE 7-16 SECTION 11.4.8*
DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETER	
S_{DS}	0.935
S_{D1}	0.835 - SEE ASCE 7-16 SECTION 11.4.8*

*Factors dependent on structural design

Notes: SS = Short period (0.2 second) Mapped Spectral Acceleration
S1 = 1.0 second period Mapped Spectral Acceleration
SMS = Spectral Response adjusted for site class effects for short period = FA • SS
SM1 = Spectral Response adjusted for site class effects for 1-second period = Fv • S1
SDS = Design Spectral Response Acceleration for short period = 2/3 • SMS
SD1 = Design Spectral Response Acceleration for 1-second period =2/3 • SM1
FA = Short Period Site Coefficients
FV = Long Period Site Coefficients

2.7 LIQUEFACTION POTENTIAL

The potential for liquefaction and cyclic softening at the site was evaluated using the methods recommended by Idriss and Boulanger (I&B) 2008 and revised to Boulanger and Idriss (B&I) in 2014. For this procedure, the earthquake-induced cyclic shear stresses within the soil profile, designated by the term cyclic stress ratio (CSR), were estimated using the CPT data, earthquake magnitude distance pairs, estimated PGA values and the computer program CLIQ v3.0.3.4.

Based on our review of the 2014 USGS interactive deaggregation the Cascadia Subduction Zone (CSZ) represents the majority of the the seismic hazard at the site. For our liquefaction analysis, we considered MW 9.1 Cascadia earthquakes, and assumed a groundwater level of approximately 32 to 37 feet below the ground surface. The results of our evaluation indicate the poorly graded

sand that extend beyond a depth of about 32 feet in CPT2, 35 feet in CPT5, and 43 feet in CPT6 are susceptible to minor liquefaction during an MCE event. The silt soil encountered in CPT-6 will be subject to cyclic softening and could undergo some vertical or lateral deformation during a strong seismic event.

Our preliminary analysis indicates the potential for less than about 1 or 2 inches of seismically induced liquefaction settlement at the surface. Additional earthquake induced dry sand settlements is possible in the upper loose sands. Preliminary estimates of lateral spreading are on the order of about 6 inches based on evaluation of silt soil in CPT-6. However, we estimate that earthquake induced settlements experienced at the ground surface will be limited to dry sand settlement in the loose sands, due to the depth of the groundwater table and the unlikelihood that it would become perched in the well-drained sand at the ground surface.

2.8 TSUNAMI HAZARD

DOGAMI performed a government funded tsunami inundation assessment along the Oregon coast in 1995. In 2013, DOGAMI has performed a more thorough probabilistic assessment based on different magnitude CSZ events and prepared their findings in the "Local Source (Cascadia Subduction Zone) Tsunami Inundation Map" showing the current Tsunami Regions.

Based on the referenced map the site is located in a zone outside of Tsunami Hazard Areas based on "extra-large and large" CSZ earthquake events, correlating to magnitudes of approximately 9.0 and 9.1.

3 CONCLUSIONS AND RECOMMENDATIONS

The following preliminary geotechnical recommendations have been developed based on the subsurface conditions encountered at the site and PSI's preliminary understanding of the proposed project. In PSI's opinion, based on an evaluation of the data obtained, the proposed site is suitable for construction of the new additions, provided the geotechnical engineering recommendations in this report are followed.

The primary geotechnical related concerns at the site is the potential presence of concrete foundations and floor slab from the demolished buildings, the presence of the near surface loose sand, and the presence of over steepened sand slopes down to the lower elevation portion of the site. In this regard some over excavation and replacement of loose or disturbed sand should be anticipated, especially in the footprint of the proposed structures, in areas where the concrete foundations and floor slabs remain, or at the top of sand slope.

In addition, we recommend the geotechnical engineer to be involved in the layout of the proposed structures with respect to the slopes along the east and southern sides of the upper terrace. However, general recommendations for setbacks provided in the previous geotechnical report should be sufficient for preliminary layout planning purposes.

3.1 SITE PREPARATION

PSI recommends that construction debris, loose, soft, or otherwise unsuitable soils at the project site be stripped and removed from structural areas. Strippings will not be suitable for use as

structural fill and should be disposed of off-site or used only in landscape areas. Following stripping and prior to placement of structural fill, the exposed surface should be evaluated by a geotechnical engineer. Buried foundations, piping and utilities, if encountered, must be completely removed from below proposed building foundations and pavement areas. Should below-grade pipes remain, a risk of seepage or underground soil erosion may occur in the future.

PSI should observe the subgrade to identify any loose/soft or unsuitable areas. Any undocumented or uncontrolled fill should be completely removed, cleaned of any debris, and replaced as engineered fill. Where loose, soft or otherwise unsuitable soils are identified within structural areas of the project, these soils should be completely removed and replaced with structural fill. The Contractor should provide a contingency for the repair of loose, soft or otherwise unsuitable areas identified by the Geotechnical Engineer. Geotextile fabric or geotextile grid should be utilized to provide stabilization of the subgrade.

A proof roll using a fully loaded tandem-axle truck should be performed on finished subgrade elevations to identify any loose, soft or unsuitable areas of subgrade. Loose, soft or otherwise unsuitable soils in these areas should be over-excavated and replaced with properly placed and properly compacted structural fill.

3.2 EXCAVATION CONSIDERATIONS

Open excavations exceeding four feet are not anticipated; however, if they do occur, excavations should be performed in accordance with OSHA regulations as stated in 29 CFR Part 1926. The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor should evaluate the soil exposed in the excavations as part of the required safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified by local, state, and federal safety regulations. PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.

During wet weather, earthen berms or other methods should be used to prevent runoff water from entering the excavations. The bottom of the excavations should be sloped to a collection point. Collected water within the foundation and utility trench excavations should be discharged to a suitable location outside the construction limits.

3.3 STRUCTURAL FILL MATERIALS

PSI should observe the subgrade prior to placing structural fill or structures to document the subgrade condition and stability. In areas where unsuitable soils are encountered and over excavation occurs below footings, the over excavation and structural fill should extend laterally a minimum distance that is equal to the depth of the excavation below the footing. In general, we anticipate the near surface sand soil will be suitable as structural fill.

General. All fill within building, pavement, and sidewalk areas should be placed as compacted structural fill. In areas where unsuitable soils are encountered and over excavation occurs below

footings, the over excavation and structural fill should extend laterally a minimum distance that is equal to the depth of the excavation below the footing. All structural fill materials should be compacted to at least 95% of the maximum dry density, at a moisture content within about 3% of optimum, as determined by ASTM D 1557. Coarse granular fill should be compacted until well keyed. No brush, roots, construction debris, or other deleterious material should be placed within the structural fills. The earthwork contractor's compactive effort should be evaluated on the basis of field observations, and lift thicknesses should be adjusted accordingly to meet compaction requirements. Additional information regarding specific types of fill is provided below.

Granular Fill. Imported granular fill materials should consist of sand, gravel, or fragmental rock with a maximum size on the order of 4 inches and with not more than about 5% passing the No. 200 sieve (washed analysis). Material satisfying these requirements can usually be placed during periods of wet weather. The first lift of granular fill placed over a fine-grained subgrade should be about 18 in. thick and subsequent lifts about 12 inches thick when using medium- to heavy-weight vibratory rollers. Granular structural fill should be limited to a maximum size of about 1 ½ inches when compacted with hand-operated equipment. We also recommend that lift thicknesses be limited to less than 8 inches when using hand-operated vibratory plate compactors.

Utility Trench Backfill. Utility trench backfill should consist of granular fill limited to a maximum size of about 1 ½ inches. The granular trench backfill should be compacted to at least 95% of the maximum dry density as determined by ASTM D 1557 in the upper 4 feet of the trench and to at least 90% of this density below this depth. The use of hoe-mounted vibratory plate compactors is usually most efficient for compaction of trench backfill. Lift thicknesses should be evaluated on the basis of field density tests; however, particular care should be taken when operating hoe-mounted compactors to prevent damage to the newly placed conduits. Flooding or jetting to compact the trench backfill should not be permitted. Native materials can be used for trench backfill in unimproved areas where a soft trench and future settlement of the backfill can be tolerated.

Free-Draining Fill. Free-draining material should have less than 2% passing the No. 200 sieve (washed analysis). Examples of materials that would satisfy this requirement include pea gravel and ¾ - to ¼ - inch, 1 ½ - to 3/4-inch, or 3- to 1-inch crushed rock.

3.4 FOUNDATIONS

Based on the subsurface conditions encountered, PSI anticipates that a building with four or less stories can be supported on spread footing foundations bearing on 12-inch thick section of crushed rock placed as structural fill. Based primarily on settlement considerations and minimum column and strip footing width of 3 feet and 24 -inches, respectively and minimum embedment depth of 1½ feet (deeper footing embedment's may be required to achieve adequate setback from slopes), footings established in accordance with these criteria can be designed on the basis of an allowable soil bearing pressure of 3,000 psf. This value applies to the total of dead load plus frequently and/or permanently applied live loads and can be increased by one third for the total of all loads; dead, live, and wind or seismic. If fill and/or other unsuitable soils are encountered at footing depth, the unsuitable material should be over excavated to firm subgrade material and replaced with granular structural fill. The over excavated areas should be backfilled with clean crushed rock and compacted to at least 95% of the maximum dry density as determined by ASTM

D 698 (Modified Proctor).

The total static settlement of footings designed in accordance with the recommendations presented above is estimated to be less than one inch. Differential settlements between adjacent foundation units should be less than half the total settlement across a distance of 40 feet. If the structure is not designed to accommodate these differential settlements, the use of grade beams may be considered to limit differential settlement across individual foundation elements under seismic events.

Horizontal shear forces can be resisted partially or completely by frictional forces developed between the base of spread footings and the underlying soil. The total shearing resistance between the foundation footprint and the soil can be computed as the normal force, i.e., the sum of all vertical forces (dead load plus real live load), times the coefficient of friction equal to 0.40 (ultimate value). If additional lateral resistance is required, passive earth resistance against embedded footings or walls can be computed using a pressure based on an equivalent fluid with a unit weight of 300 pcf. This design passive earth pressure assumes granular structural fill is used to backfill the footing excavation or the footings will be neat formed in situ.

3.5 FLOOR SLAB SUPPORT

PSI recommends the slab-on-grade be underlain by at least 12-inches of native sand soil removed and replaced as structural fill and capped with a minimum of 6-inch thick section of crushed angular "drain rock." The drain rock should be compacted until it is well keyed. In addition, it will be appropriate to install a durable vapor-retarding membrane beneath the slab-on-grade to limit the risk of damp floors in areas that will have moisture-sensitive materials placed directly on the floor. The vapor-retarding membrane should be installed in accordance with the manufacturer's recommendations.

In our opinion, a coefficient of subgrade reaction, k, of 150 pci can be used to characterize the support with a minimum thickness of 12-inches of "structural fill" (based on a 1x1-foot plate load). Depending on how the slab load is applied, the value should be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesionless soil:

Modulus of Subgrade Reaction, for $k_s = k\left(\frac{B+1}{2B}\right)^2$ cohesionless soil,

where: k_s = coefficient of vertical subgrade reaction for loaded area;
k = coefficient of vertical subgrade reaction for 1x1 square foot area; and,
B = width of area loaded, in feet.

3.6 EMBEDDED WALL DESIGN

We anticipate embedded walls for the project will be limited to elevator pits or loadings docks with a height of less than five feet. Design lateral earth pressures against a retaining wall or other embedded structure depend on the drainage condition provided behind the wall, the geometry of the backfill slope, and the type of construction, i.e., the ability of the wall to yield. The two possible conditions regarding the ability of the wall to yield include the active and at-rest earth pressure cases. The active earth pressure case is applicable to a wall that is capable of yielding slightly away from the backfill by either sliding or rotating about its base. A conventional cantilever retaining wall is an example of a wall that can develop the active earth pressure case

by yielding. The at-rest earth pressure case is applicable to a wall that is considered to be relatively rigid and laterally supported at the top and bottom and therefore is unable to yield. The following general recommendations for embedded wall design assume the wall backfill is compacted to 90% of ASTM D 1557, and the embedded wall is fully drained, i.e., hydrostatic pressure cannot act on the wall.

Walls that are allowed to yield by tilting about their base should be designed using a lateral earth pressure based on an equivalent fluid having a unit weight of 25 pcf for horizontal backfill. Non-yielding walls should be designed using a lateral earth pressure based on an equivalent fluid having a unit weight of 45 pcf for horizontal backfill. Surcharge loads on walls should be accounted for in the structural design of the walls.

Over compaction of the backfill behind walls should be avoided. In this regard, we recommend compacting the backfill to about 90% of the maximum dry density (ASTM D 1557). Heavy compactors and large pieces of construction equipment should not operate within 5 ft of any embedded wall to avoid the buildup of excessive lateral pressures. Compaction close to the walls should be accomplished using hand-operated vibratory plate compactors.

3.7 PAVEMENT

In lieu of project-specific traffic estimates, the following pavement design recommendations are based on our past experience with similar facilities and subgrade conditions.

For automobile parking areas, we recommend a pavement section consisting of 3 in. of asphaltic concrete (AC) over 8 in. of crushed rock base (CRB). For heavy truck traffic areas, the pavement section should consist of 4 in. of AC over 12 in. of CRB. These recommended pavement sections are based on the assumption that the subgrade consists of firm, undisturbed soil or sand structural fill and that the pavements will be constructed during the dry summer months. Proof rolling should be used to evaluate pavement subgrades. Any soft areas disclosed by the proof rolling will likely require over excavation and replacement with structural fill. Some contingency should be provided for the repair of any soft areas. If pavement construction is scheduled for the wet season, it will be necessary to increase the above-recommended base course sections.

Permanent, properly installed drainage is also an essential aspect of pavement design and construction. All paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as in sunken loading dock areas or around stormwater catch basins. Effective means to prevent saturation of the base course include installing subdrain systems below sunken loading docks and weep holes in the sidewalls of catch basins.

To provide quality materials and construction practices, we recommend that the pavement work conform to the "Standard Specifications for Highway Construction" used by the Oregon Department of Transportation.

3.8 DESIGN REVIEW AND CONSTRUCTION MONITORING

After plans and specifications are complete, PSI should review the final design and specifications so that the earthwork and foundation recommendations are properly interpreted and implemented. It is considered imperative that the Geotechnical Engineer and/or their representative be present during earthwork operations and foundation installations to observe the field conditions with respect to the design assumptions and specifications. PSI will not be responsible for changes in the project design or project information it was not provided, or interpretations and field quality control observations made by others. PSI would be pleased to provide these services for this project.

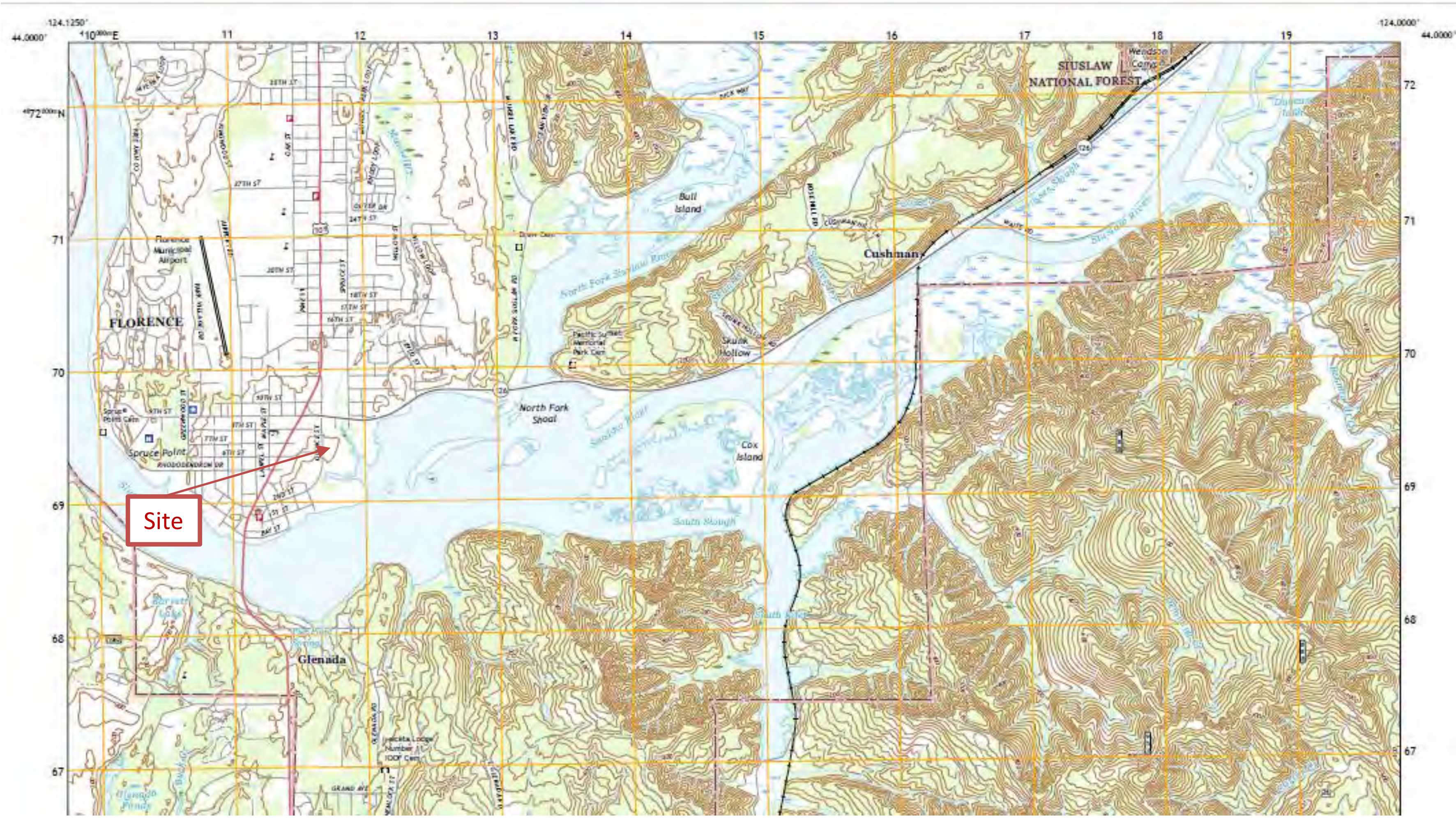
4 GEOTECHNICAL RISK AND REPORT LIMITATIONS

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the building and proposed pavement section will perform as planned. The engineering recommendations presented in the preceding sections constitute PSI's professional estimate of those measures that are necessary for the proposed building addition to perform according to the proposed design based on the information generated and referenced during this evaluation, and PSI's experience in working with these conditions.

The recommendations submitted are based on the available subsurface information obtained by PSI, and information provided by Mr.Matt Braun. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the recommendations are required. If PSI is not retained to perform these functions, PSI cannot be responsible for the impact of those conditions on the performance of the project.

The Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of Mr. J. B. Jaramillo and his design consultants for the specific application to the proposed Microtel Inn and Suites located east of the intersection between Quince Street and 6th Street in Florence, Oregon.

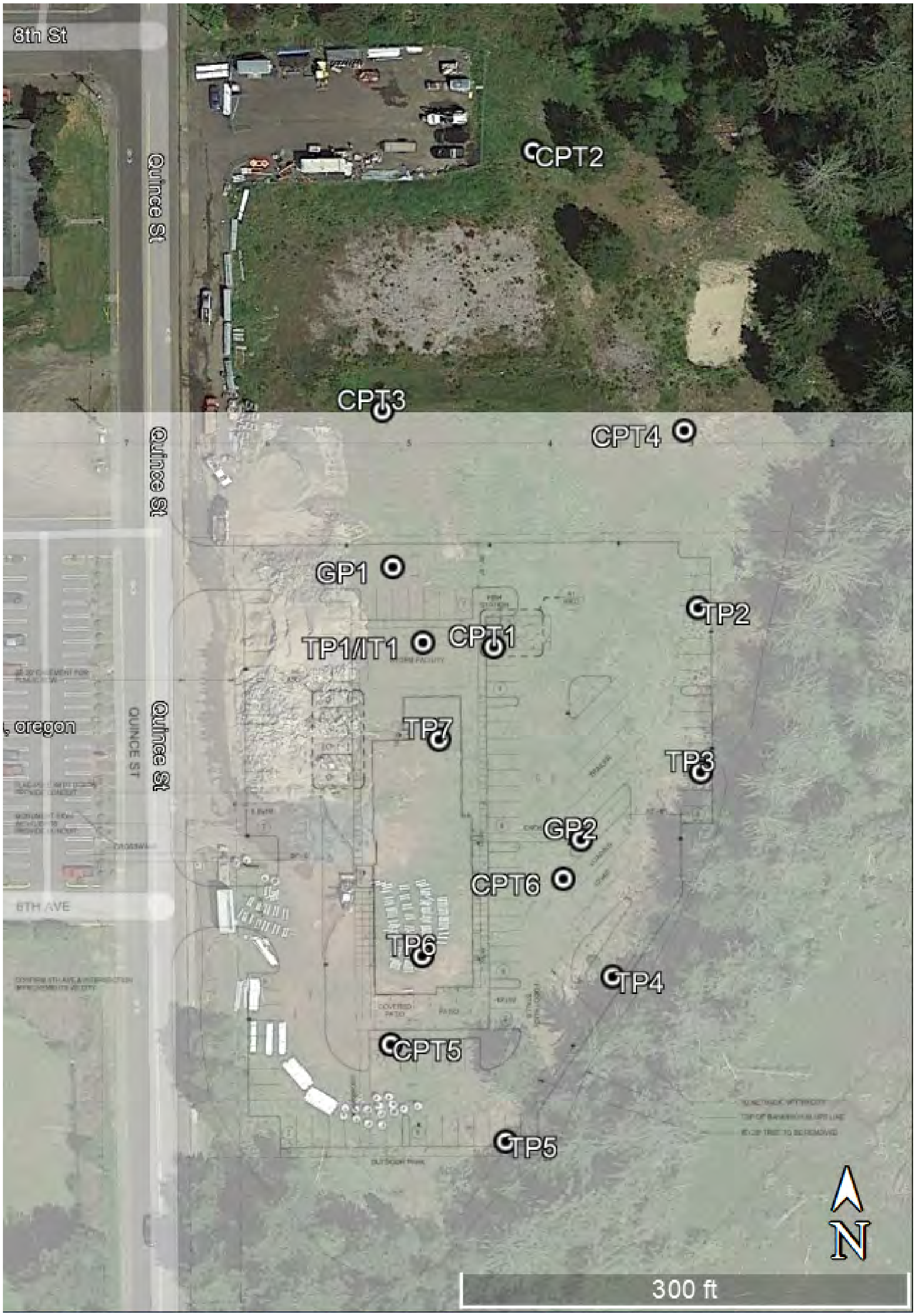
FIGURES



USGS Florence Quadrangle Oregon - Lane County 7.5 Minute Series

intertek psi

Microtel Inn and Suites- Florence, OR		JOB NO.	7041434
Site Vicinity Map		FIGURE NO.	1



intertek psi	DATE January 31 2022	Microtel Inn and Suites Florence, OR	PSI PROJECT #: 07041434
Obtained from Google Earth	DRAWN BY: SRS	**INVESTIGATION LOCATION PLAN**	**FIGURE 2**

APPENDIX A

FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATION PROGRAM

PSI completed the original field exploration of the project site on February 22, 2021, through February 24, 2021, using a track-mounted rig owned and operated by Oregon Geotechnical Exploration, Inc. of Kaiser, Oregon. The scope of the exploration included completion of six CPT probes and two direct push probes at the site. The CPT probes were designated CPT1 through CPT6 and the direct push probes were designated GP1 and GP2.

The supplemental explorations were conducted on January 4, 2022, using a tracked excavator provided by Dan J. Fisher Excavating, Inc. of Forest Grove, Oregon. The scope included the completion of seven test pits designated TP1 through TP7. The exploration locations were located in the field by PSI using handheld GPS. These exploration locations are presented on Figure 2. PSI notified Oregon's Utility Notification to locate public underground utilities and a Private Utility Locator to locate any potential private utilities in the vicinity of the proposed exploration locations prior to commencing the field activities.

Table 1 – Investigation Depths

Boring	Proposed Depth (feet)	Completion/Refusal Depth (feet)
CPT1	100	36.4*
CPT2	100	37.1*
CPT3	50	32.9*
CPT4	50	33.5*
CPT5	100	49.2*
CPT6	50	50.5*
GP1	20	38.5*
GP2	20	38.5*
TP1	10	5½**
TP2	10	8**
TP3	10	8**
TP4	10	8**
TP5	10	8**
TP6	10	7**
TP7	10	8**

* Refusal
**Caving

A representative from PSI's office observed the explorations and prepared borings logs of the conditions encountered. It should be noted that the subsurface conditions presented on the boring logs are representative of the conditions at the specific locations drilled. Variations may occur and should be expected across the site. The soil morphology represents the approximate boundary between subsurface materials and the transitions may be gradual and indistinct. Elevations referenced were obtained from the National Map developed by the United States Geological Survey (USGS) and should be considered approximations.

Infiltration Testing Procedure and Results

Based on the provided site plan, we understand that an infiltration facility is proposed in the northern portion of the site.

PSI performed a falling-head infiltration tests in general accordance with the EPA Design Manual, Onsite Wastewater Treatment and Disposal Systems, Table 3-8 Falling Head Percolation Test Procedure. Test pit TP-1 was excavated to a depth of 5 feet bgs and a 6-inch outside diameter pipe was set in the pit. The pipe was pushed down by the excavator bucket approximately 8 inches. At each infiltration location, the pipe was filled with between one to two feet of water a total of four times and the falling water level was recorded a various time interval during the test. Results of the infiltration testing are summarized below:

Table 1 – Field Infiltration Test Results

Infiltration Test	Duration (minutes)	Head (inches)	Average Infiltration Rate (inches/hour)
1	13	12.5	57
2	10	12	72
3	13	13	60
4	11	12.5	68

Please note that the infiltration rates shown above are measured rates and do not include a factor of safety. PSI recommends that a factor of safety of at least 2 be applied to this rate for design of infiltration systems.

Seismic Cone Penetration Test with Pore-Pressure Readings (SCPTu)

SCPTu is an in-situ testing method used to determine the geotechnical engineering properties of soils and to delineate soil lithology. SCPTu data is used in the analysis and design of foundations. SCPTu probing is a fast and cost-effective method for identifying subsurface soil types and evaluating the engineering properties of soils. The SCPTu records are presented in Appendix A.

During an SCPTu sounding, the electric cone (tip angle 60°, section area 10 cm^2) and the sounding rods are pushed continuously into the ground. Intermittent measurements of the cone resistance (q_t) and sleeve friction (f_s) are measured and recorded by the electric cone while it is being pushed into the ground.

The measurements from a SCPTu can be used to correlate a multitude of geotechnical parameters, including:

- Undrained shear strength (su)
- Effective friction angle (ϕ', degree)
- Coefficient of consolidation (Cv, cm^2/sec)
- Overconsolidation Ratio (OCR)

The results of the measured and correlated data are used in various geotechnical analyses, including soil behavior type, soil bearing capacity, estimated settlement, liquefaction settlement, lateral spread, foundation-design criteria, slope stability, and seismic site class.

Pore Pressure Dissipation Tests

Pore Pressure Dissipation Tests (PPDTs) were conducted at various intervals to measure equilibrium water pressure at the time of the SCPTu sounding. As the conditions are assumed to be hydrostatic, the equilibrium water pressure can be used to determine the approximate depth of the groundwater table. A PPDT is conducted when penetration is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (u) with time is measured using a piezometer fitted between the cone and the sleeve and recorded. Pore Pressure Dissipation Tests are provided below.

Downhole Shear Wave Velocity Measurements

Down hole shear wave velocity measurements were made while advancing each of the probes. This test consists of generating a shear wave by striking a hammer equipped with a trigger on a source beam located on the ground surface under the outrigger of the cone rig. The seismic cone consists of a piezocone unit with a receiver above it. The seismic cone penetrometer is pushed into the ground and penetration is stopped at 1-meter intervals. During the pause in penetration, a shear wave is generated at the ground surface and the time required for the shear wave to reach the seismometer in the cone penetrometer is recorded. The shear wave velocity measurements are used with elastic theory to estimate the mass density of the soil layers. Shear wave velocity measurements are provided below.

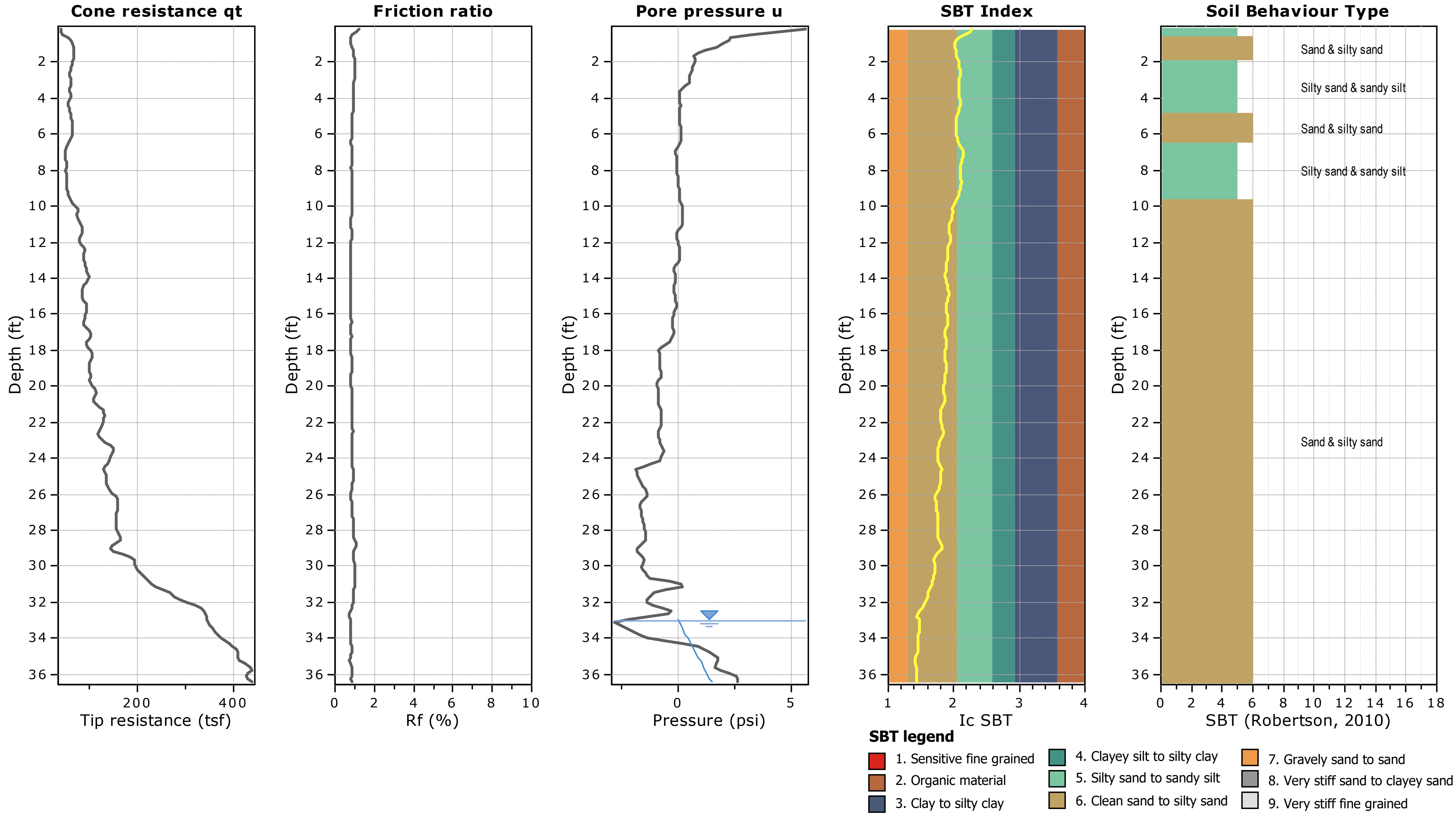
Field Classification

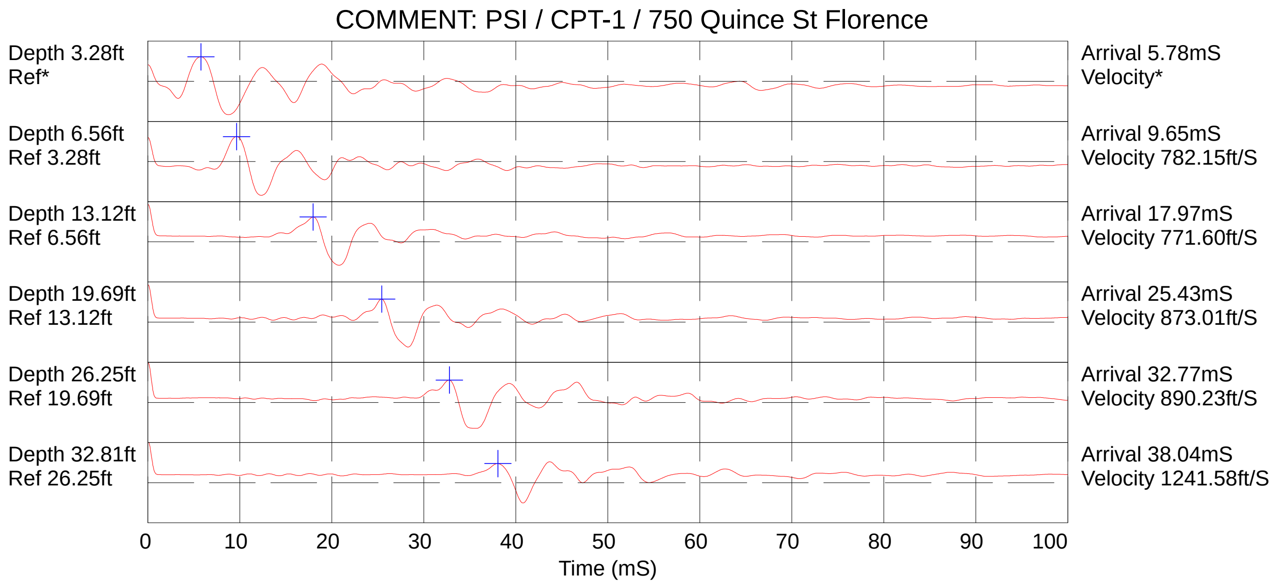
Soil samples were initially classified visually in the field. Consistency, color, relative moisture, degree of plasticity, and other distinguishing characteristics of the soil samples were noted. The terminology used in the soil classifications and other modifiers are depicted in the General Notes and Soil Classification Chart.

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-1 Text File
Total depth: 36.42 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

Project: **Microtel Inn and Suites - 07041434**
Location: **43.9727, -124.1003**

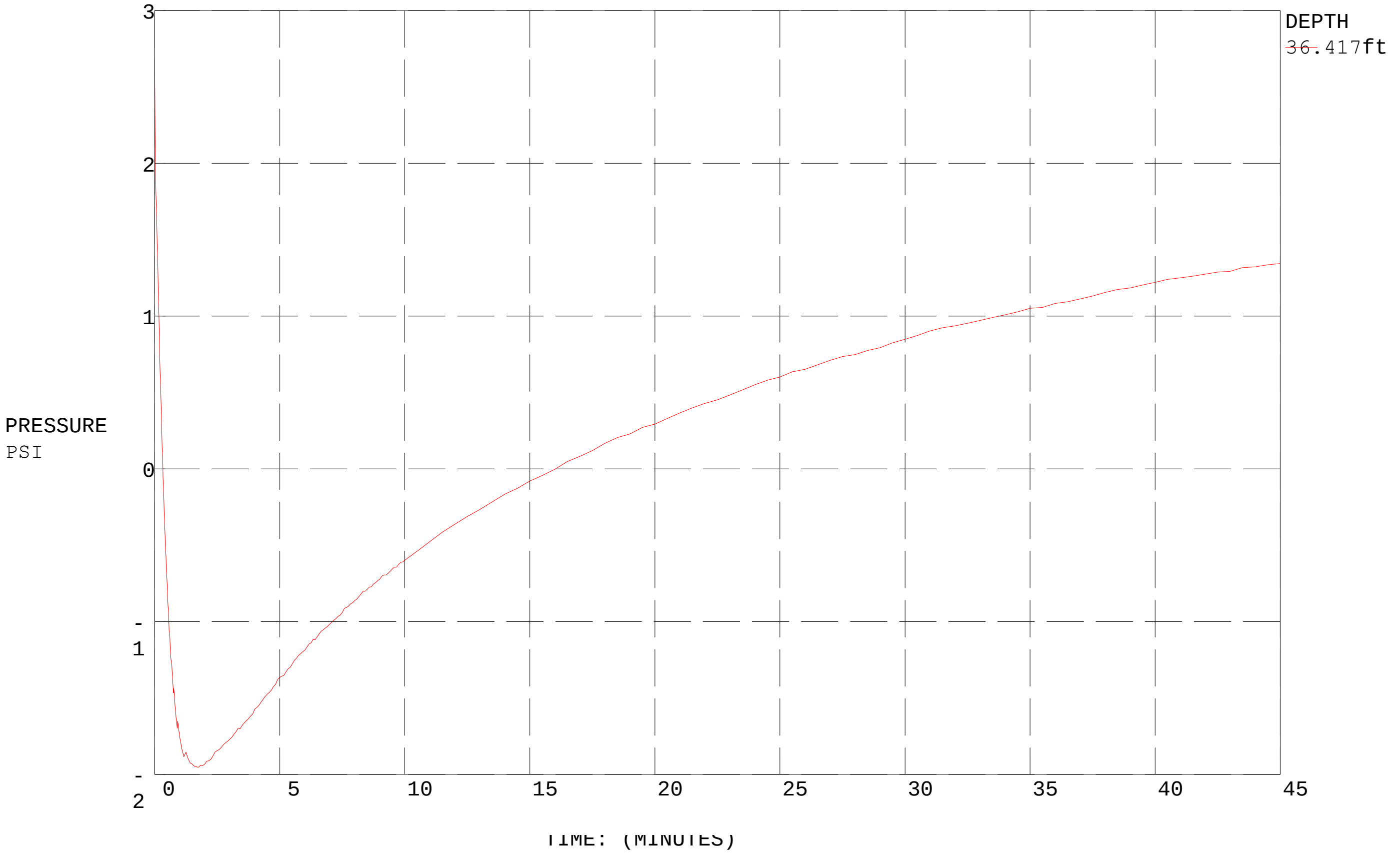




Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**

6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-1 SHEAR WAVE VELOCITY MEASUREMENTS**	**FIGURE A2**



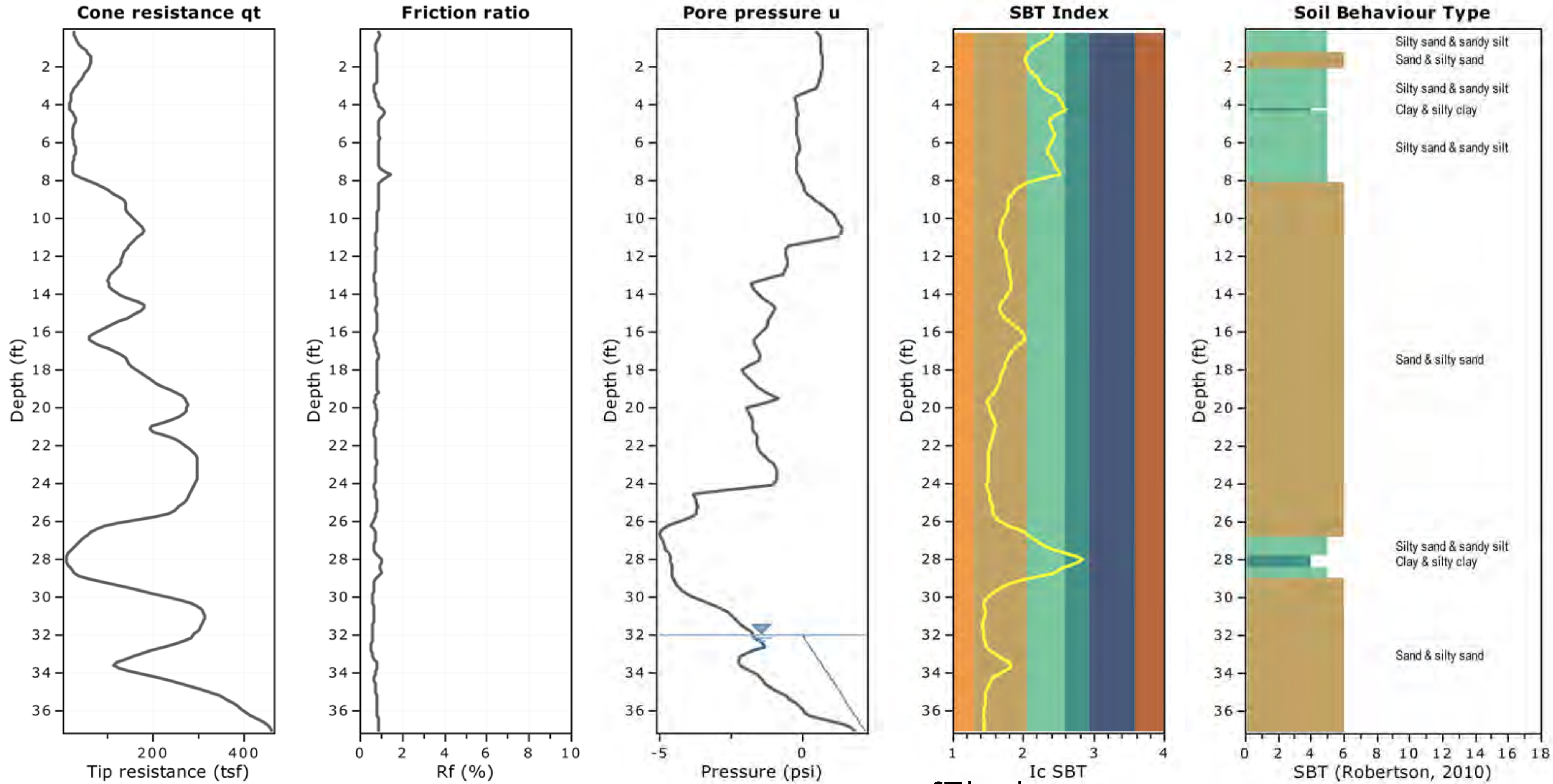
MAXIMUM PRESSURE = 2.582 (PSI)
HYDROSTATIC PRESSURE = 1.499 (PSI), WATER TABLE: 32.96 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-1 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A3**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-2 Text File
Total depth: 37.07 ft, Date: 2/23/2021
Surface Elevation: 44.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

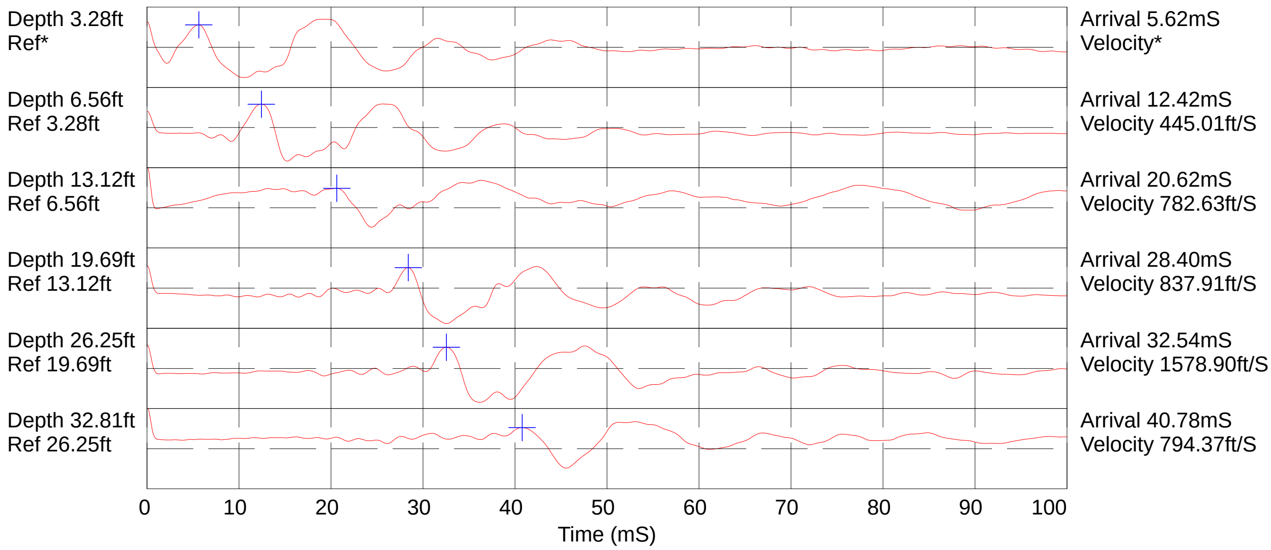
Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



SBT legend

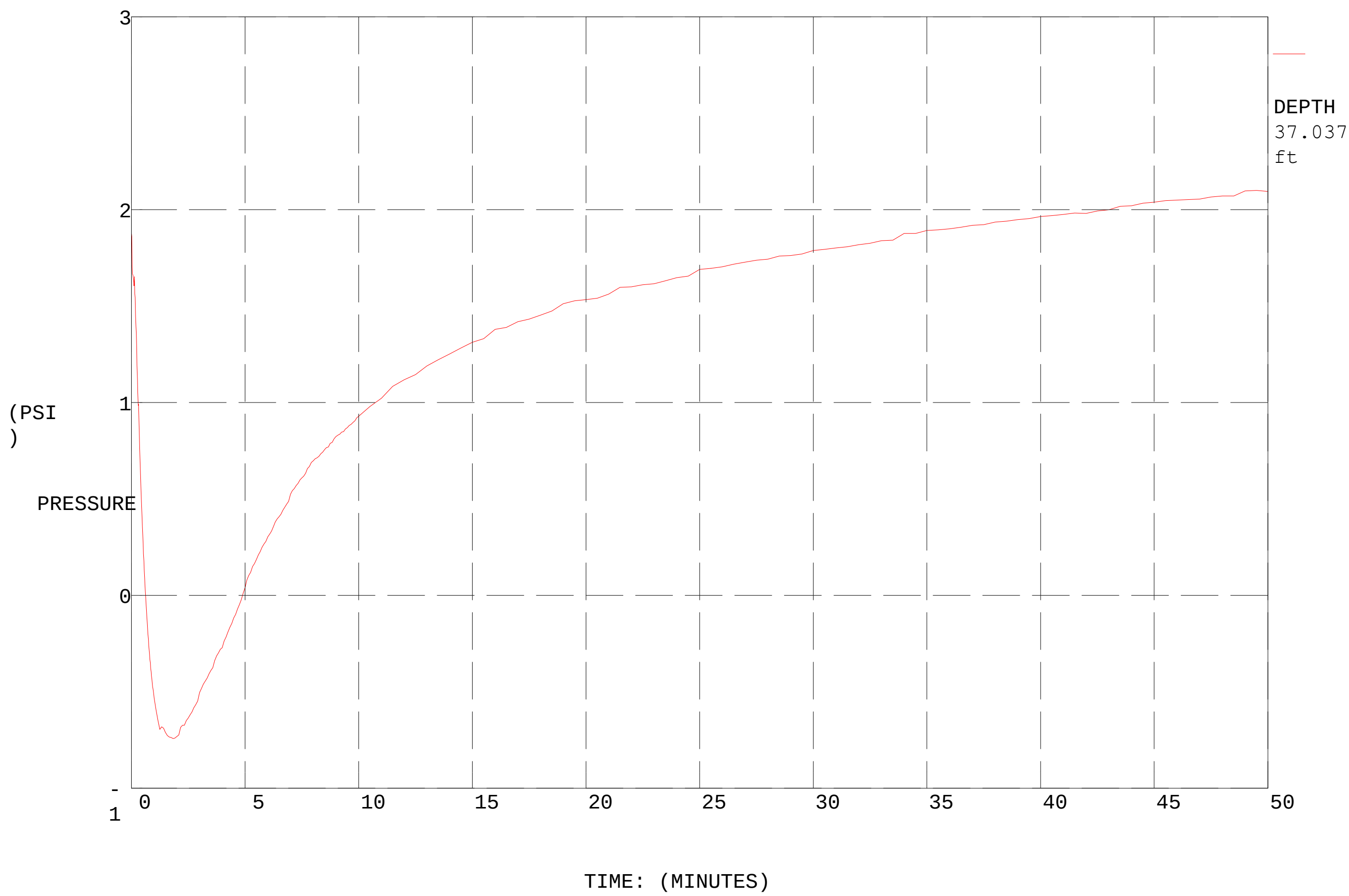
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

COMMENT: PSI / CPT-2 / 750 Quince St Florence



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-2 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A5**



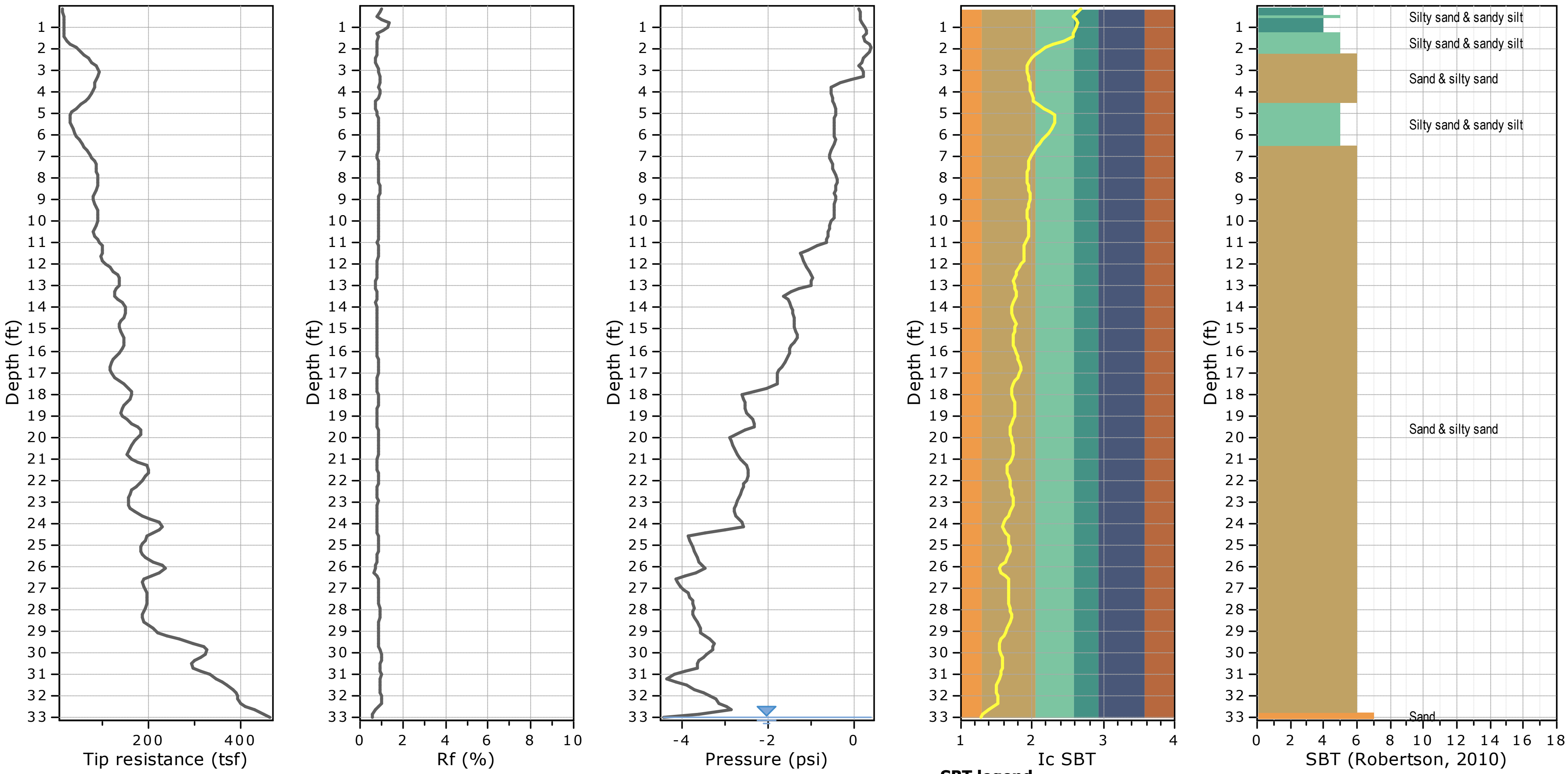
MAXIMUM PRESSURE = 2.1 (PSI)
HYDROSTATIC PRESSURE = 2.15 (PSI), WATER TABLE: 32.11 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-2 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A6**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-3 Text File
Total depth: 32.97 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

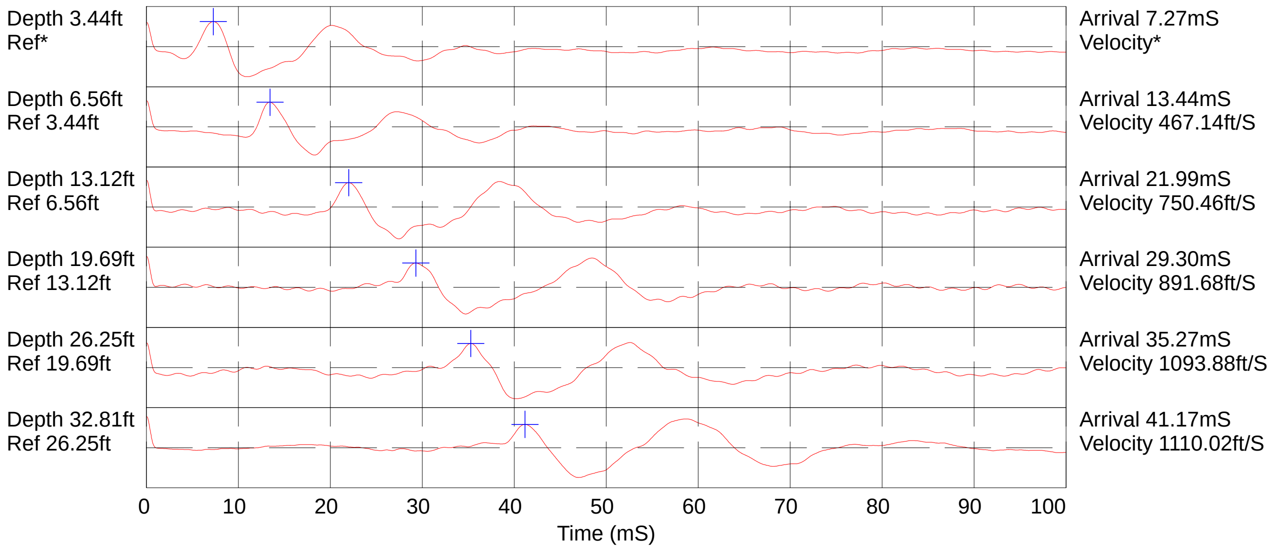
Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

COMMENT: PSI / CPT-3 / 750 Quince St Florence

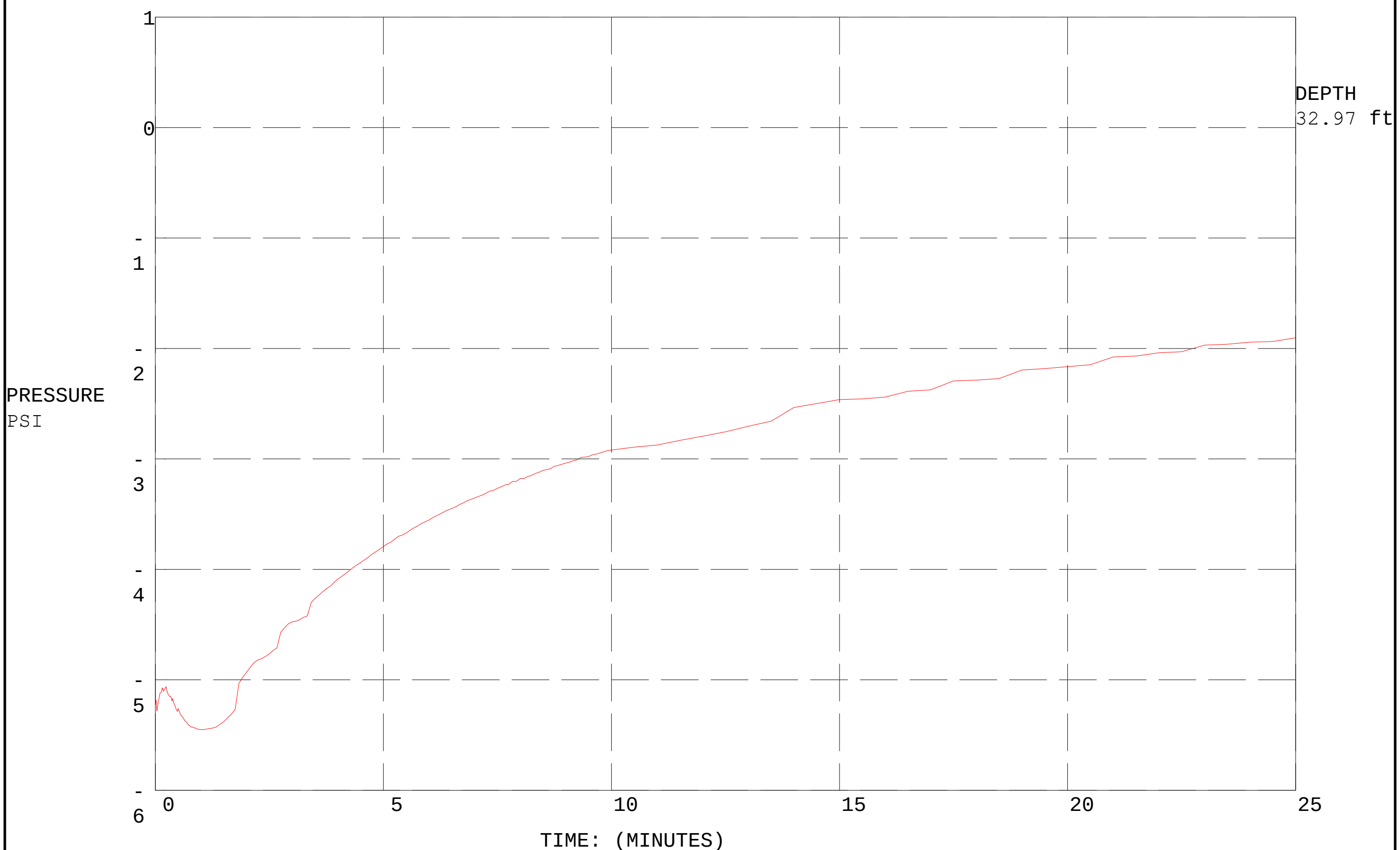


Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**

6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-3 SHEAR WAVE VELOCITY MEASUREMENTS**	**FIGURE A8**

COMMENT: PSI / CPT-3 / 750 Quince St
Florence



MAXIMUM PRESSURE = -1.903 (PSI)

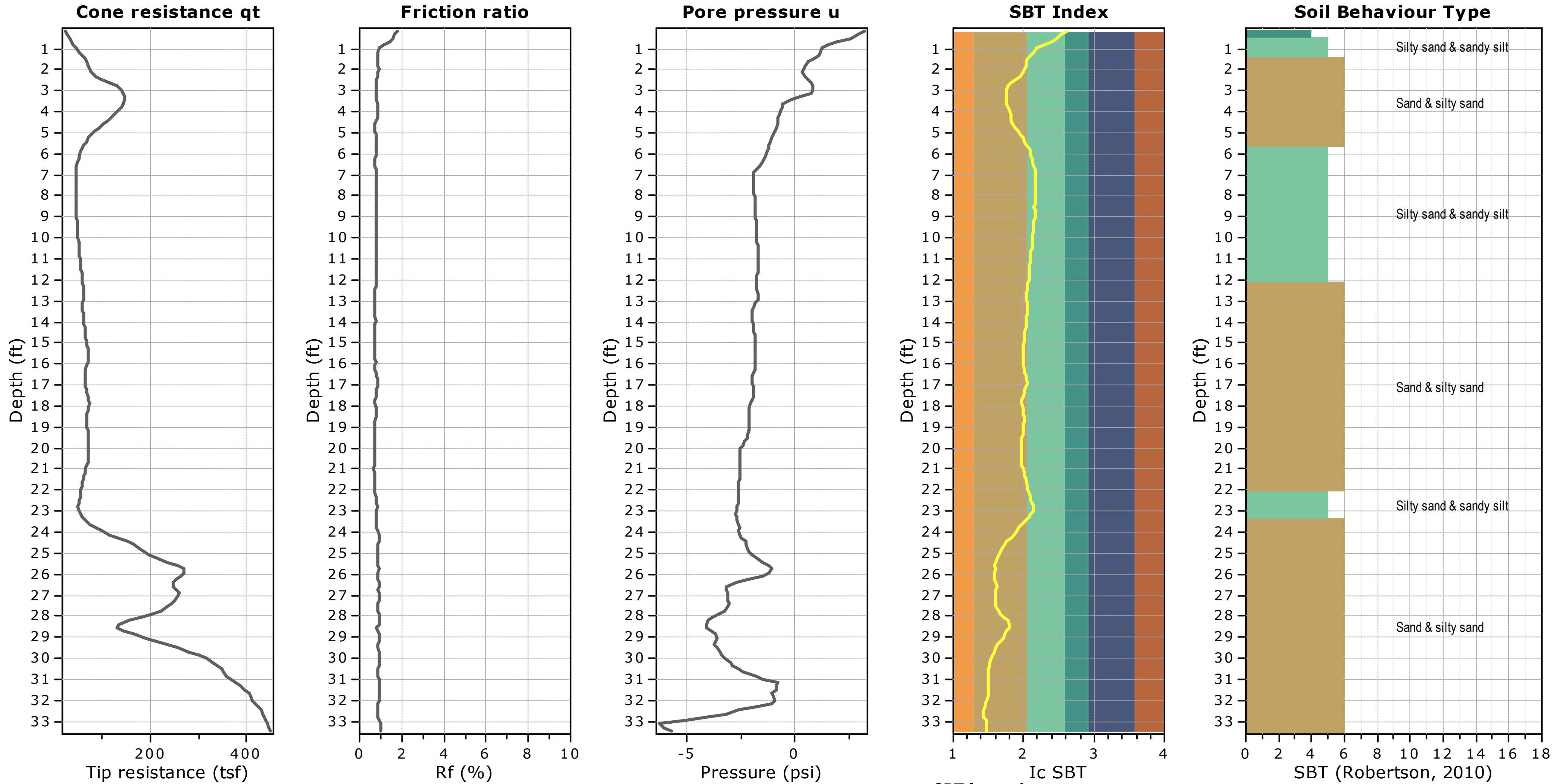
HYDROSTATIC PRESSURE = 0.0 (PSI), WATER TABLE:
33.14 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-3 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A9**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

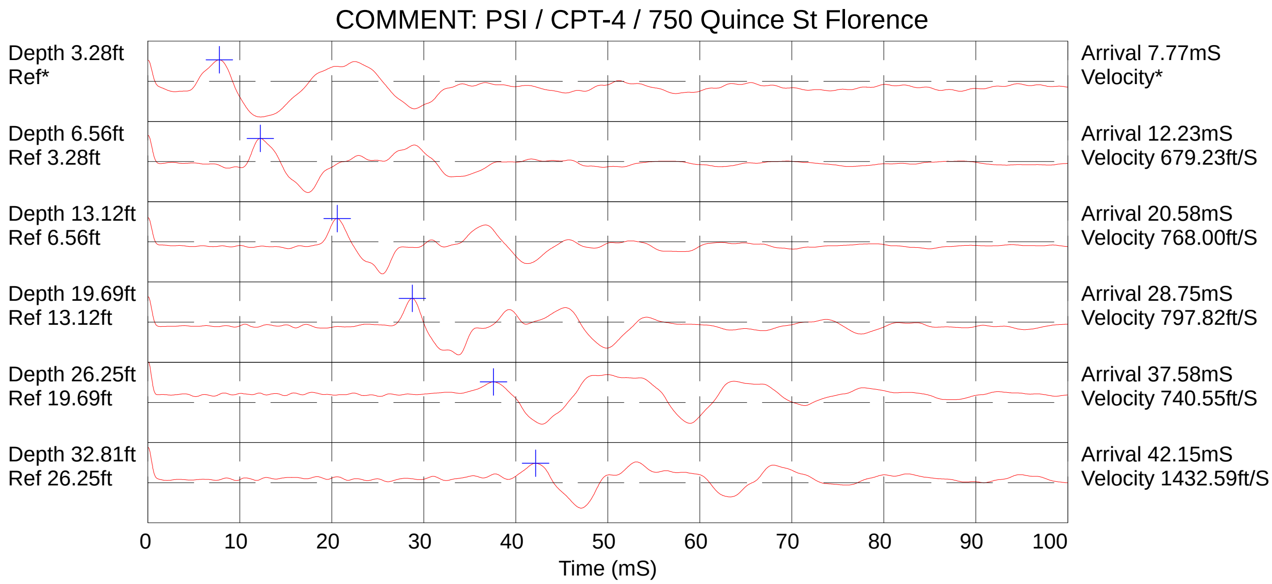
CPT: 21020 CPT-4 Text File
Total depth: 33.47 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



SBT legend

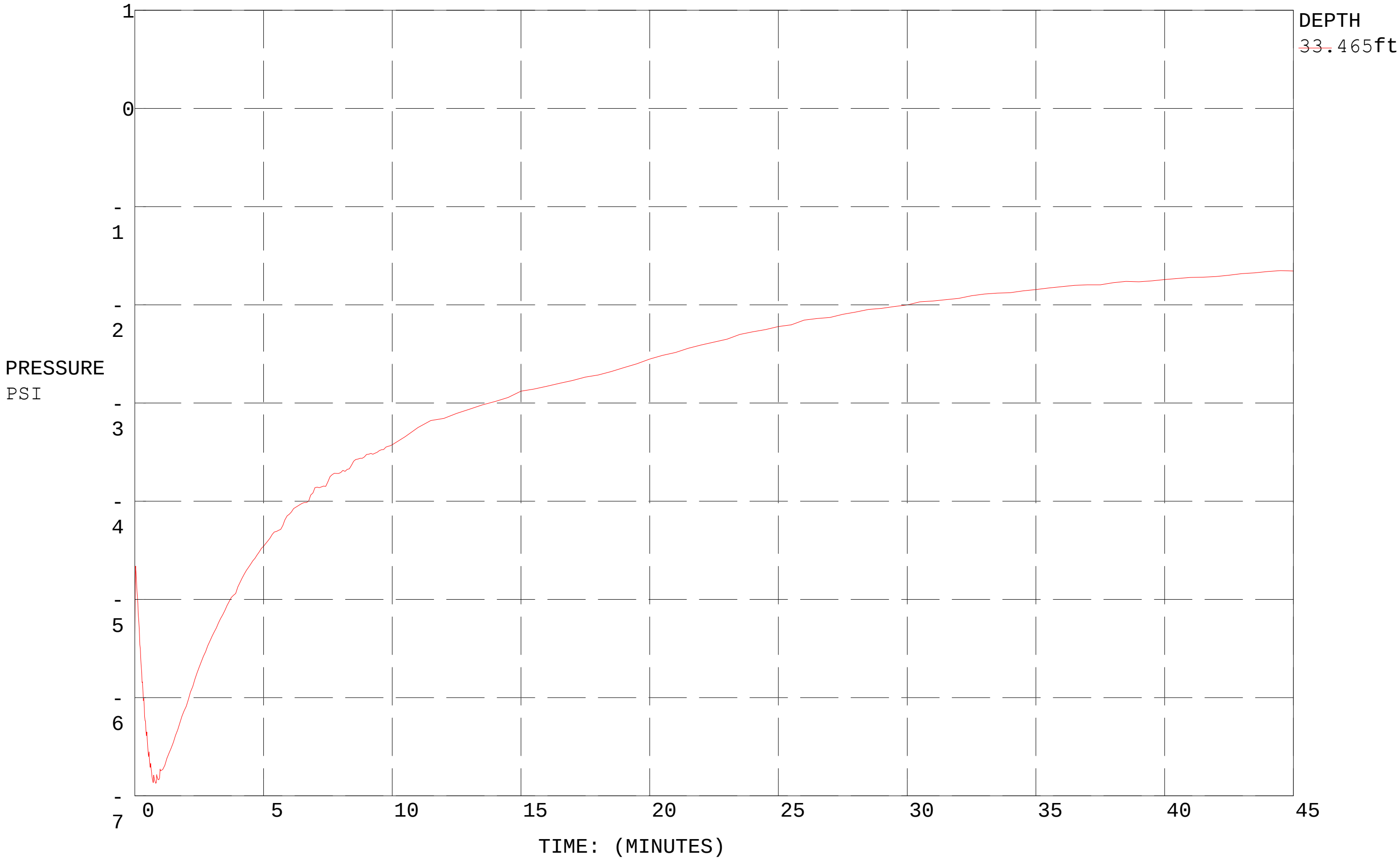
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-4 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A11**

COMMENT: PSI / CPT-4 / 750 Quince St Florence



MAXIMUM PRESSURE = -1.653 (PSI)

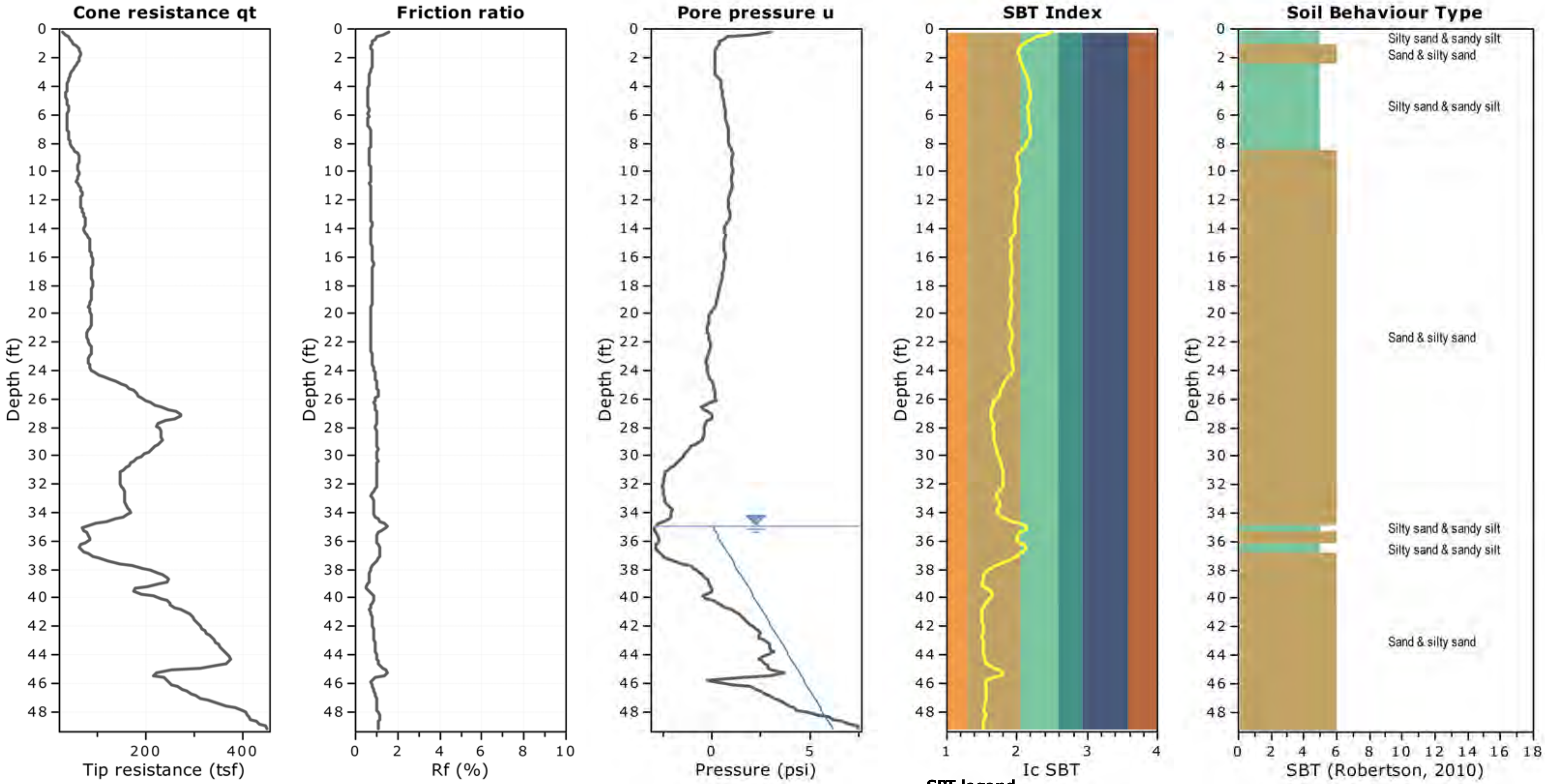
HYDROSTATIC PRESSURE = 0.0 (PSI), WATER TABLE: 35.01 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-4 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A12**

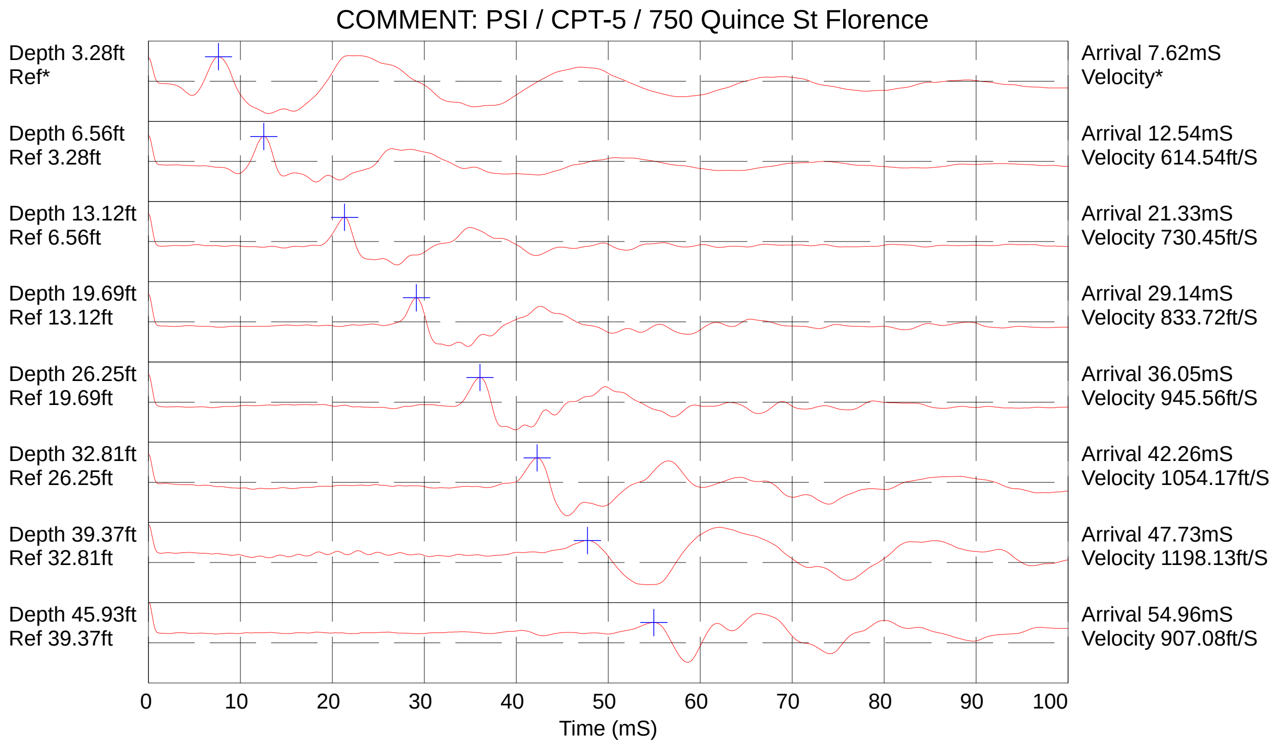
Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003

CPT: 21020 CPT-5 Text File
Total depth: 49.21 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations



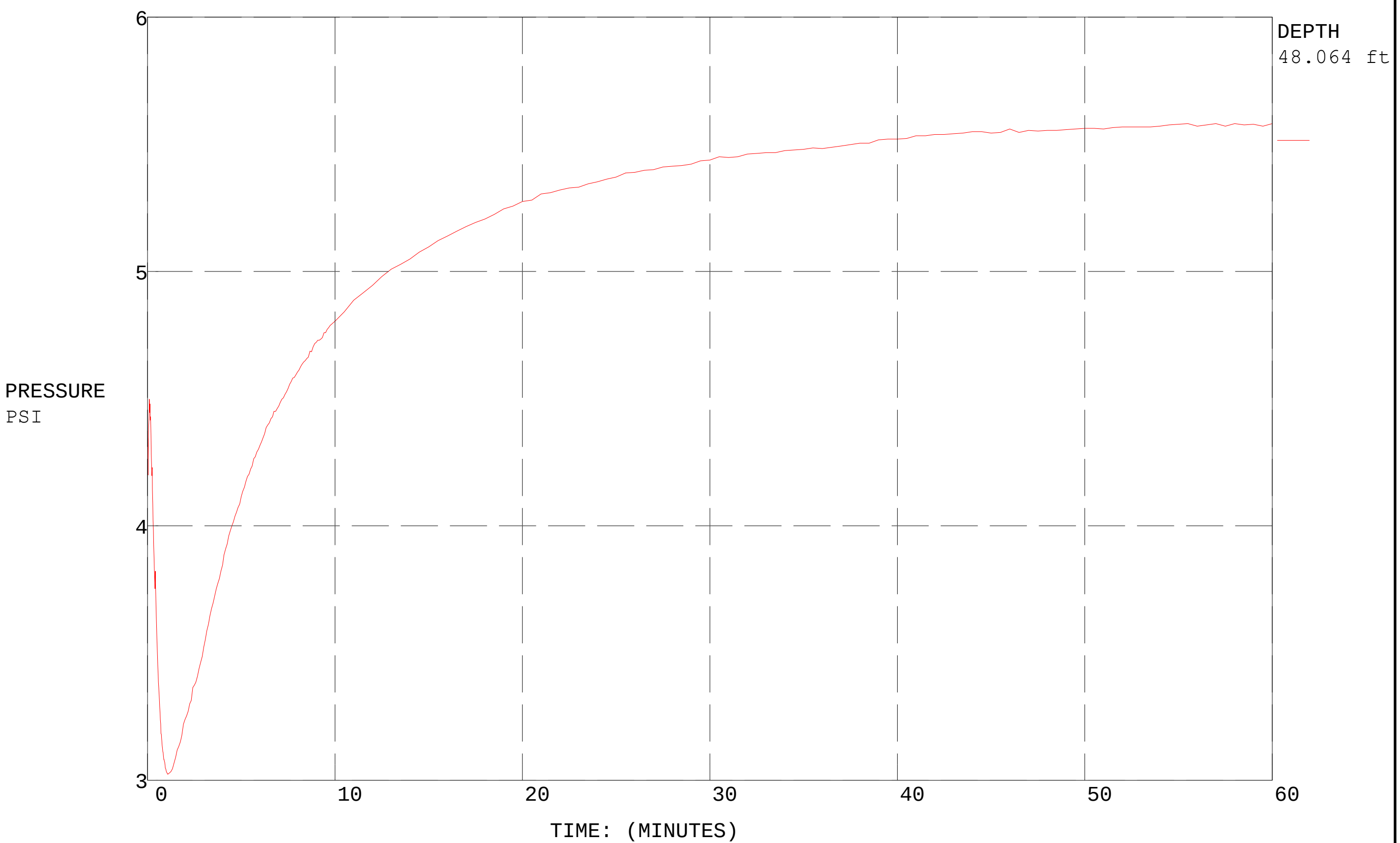
SBT legend
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-5SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A14**

COMMENT: PSI / CPT-5 / 750 Quince St Florence



MAXIMUM PRESSURE = 5.581 (PSI)

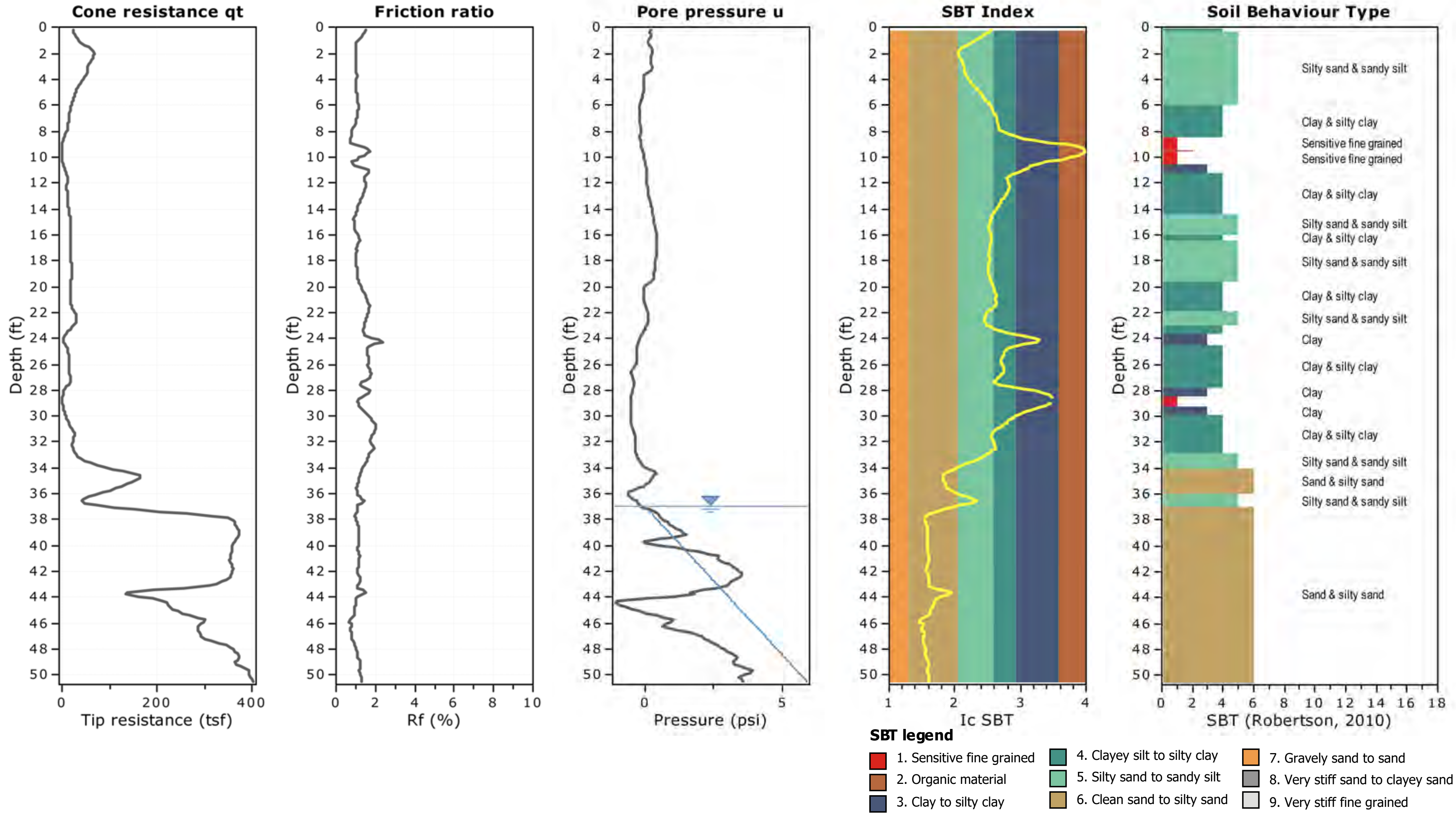
HYDROSTATIC PRESSURE = 5.584 (PSI), WATER TABLE: 35.18 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-5 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A15**

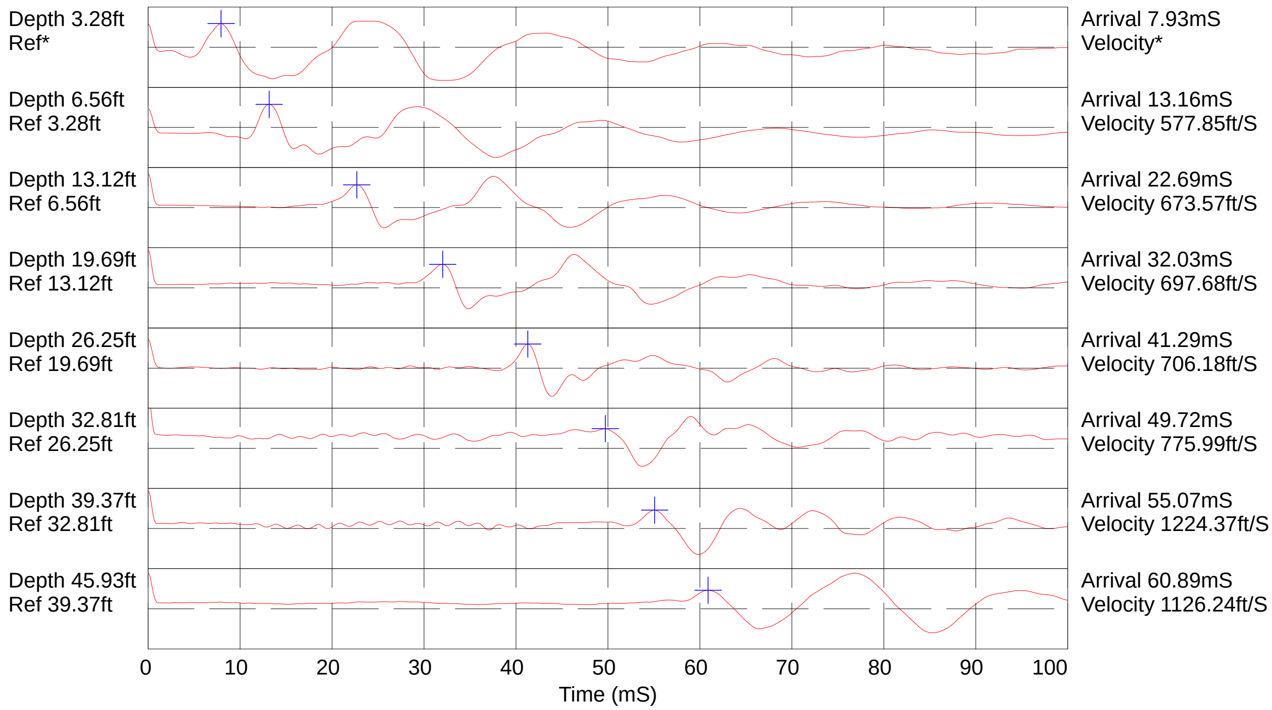
Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-6 Text File
Total depth: 50.53 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:121.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



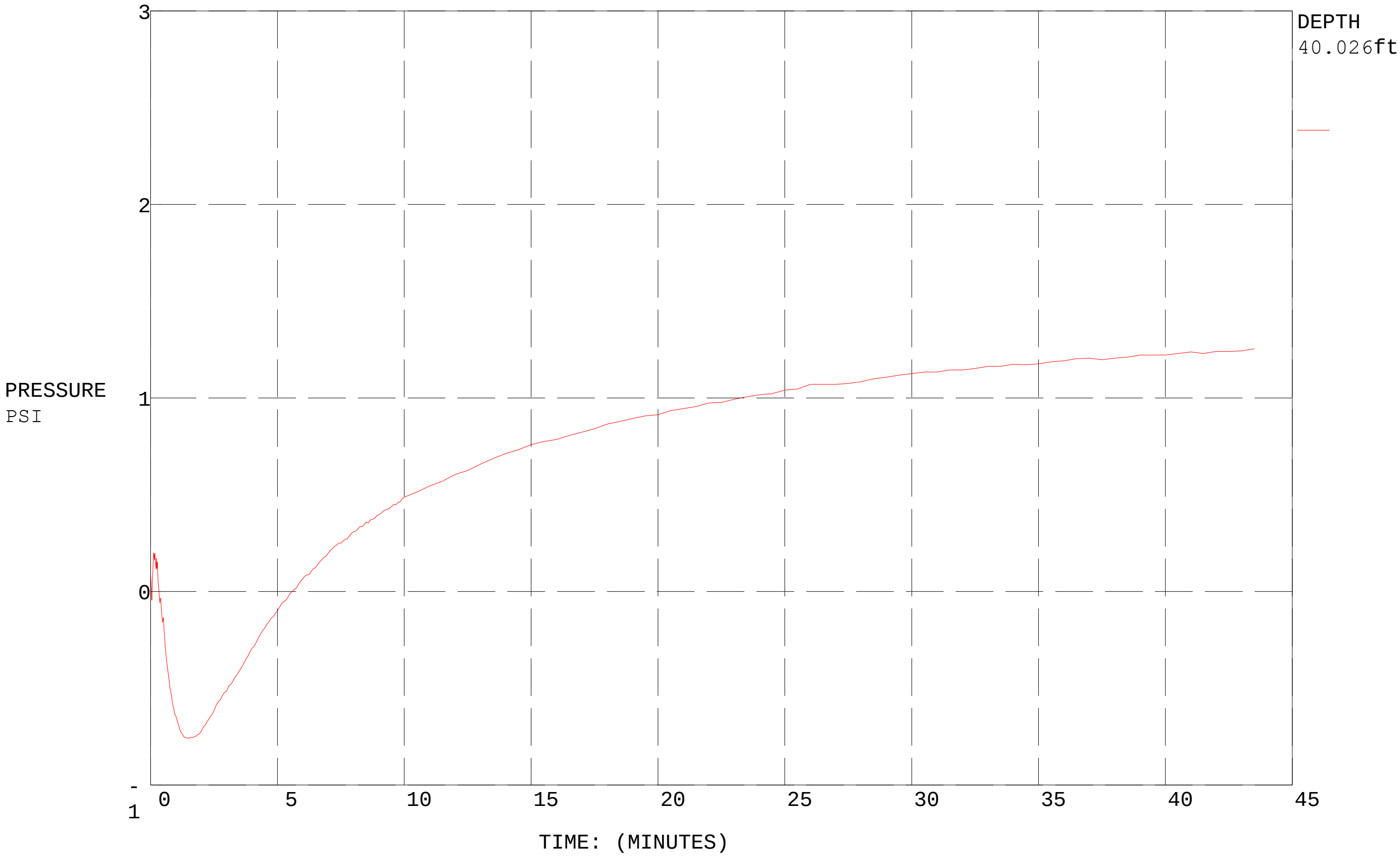
COMMENT: PSI / CPT-6 / 750 Quince St Florence



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-6 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A17**

COMMENT: PSI / CPT-6 / 750 Quince St Florence



MAXIMUM PRESSURE = 1.254 (PSI)

HYDROSTATIC PRESSURE = 1.297 (PSI), WATER TABLE: 37.03 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-6 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A18**

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.: Diamond Bit Core Sampler
H.A.: Hand Auger
P.A.: Power Auger - Handheld motorized auger

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
RC: Rock Core
TC: Texas Cone
BS: Bulk Sample
PM: Pressuremeter
CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N_{60}: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q_u: Unconfined compressive strength, TSF
Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼,▽,▼: Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES
(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

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

DATE STARTED:	2/23/20	**DRILL COMPANY:**	Oregon Geotechnical Exploration, Inc
DATE COMPLETED:	2/23/20	**DRILLER:** Dom	**LOGGED BY:** Staci Shub
COMPLETION DEPTH	45.0 ft	**DRILL RIG:**	GeoProbe Rig
BENCHMARK:	N/A	**DRILLING METHOD:**	GeoProbe
ELEVATION:	47 ft	**SAMPLING METHOD:**	GP
LATITUDE:	43.972804°	**HAMMER TYPE:**	Automatic
LONGITUDE:	-124.100541°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	SRS
REMARKS:			

BORING GP-1

Water		
While Drilling	35	feet
Upon Completion	35	feet
Delay		N/A

BORING LOCATION:

Column headings: Elevation (feet); Depth, (feet); Graphic Log; Sample Type; Sample No.; Recovery (inches); MATERIAL DESCRIPTION; USCS Classification; Moisture, %; STANDARD PENETRATION TEST DATA, N in blows/ft ◎, × Moisture, PL, LL (0, 25, 50); STRENGTH, tsf, ▲ Qu, ✳ Qp (0, 2.0, 4.0); Additional Remarks

Depth (feet)	Material Description	USCS Classification
0	**Approximately 4 inches of grassy Topsoil**	Topsoil
0.3–5	Light brown to brown, moist, **Well graded silty SAND**, fine to coarse grained, trace black staining	SM
5–38.5	Gray to light brown, moist, **Poorly graded SAND**, fine to medium grained, trace intermitten silt lenses	SP
18	Black staining and trace orange and gray mottling below 18 feet bgs	
35	Wet below 35 feet bgs	
38.5	Geoprobe terminated at 38.5 due to refusal on very dense sand	

Sample No.	Moisture, %	N (blows/ft)	Additional Remarks
1	46	>>	Gradation: Fines = 25%
2	4	>>	
3	7	>>	Gradation: Fines = 5%
4	8	>>	
5	6	>>	
6	6	>>	Gradation: Fines = 1%
7	7	>>	Gradation: Fines = 0%
8	6	>>	
9	6	>>	
10	5	>>	
11	6	>>	Gradation: Fines = 0%
12	18	>>	Gradation: Fines = 3%

intertek psi
Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778

PROJECT NO.: 07041434
PROJECT: Microtell Inn and Suites
LOCATION: 750 Quince Street
Florence, Oregon

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING GP-2

DATE STARTED:	2/23/20	**DRILL COMPANY:**	Oregon Geotechnical Exploration, Inc
DATE COMPLETED:	2/23/20	**DRILLER:**	Dom
		LOGGED BY:	Staci Shub
COMPLETION DEPTH	45.0 ft	**DRILL RIG:**	GeoProbe Rig
BENCHMARK:	N/A	**DRILLING METHOD:**	GeoProbe
ELEVATION:	47 ft	**SAMPLING METHOD:**	GP
LATITUDE:	43.972073°	**HAMMER TYPE:**	Automatic
LONGITUDE:	-124.100257°	**EFFICIENCY**	N/A
STATION:	N/A	**REVIEWED BY:**	SRS
OFFSET:	N/A		

REMARKS:

Water

▽	While Drilling	35 feet
▼	Upon Completion	35 feet
▽	Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft	Additional Remarks
47	0	1	**Approximately 4 inches of grassy Topsoil**	Topsoil	45	>>	Gradation: Fines =28%
45	2	2	Light brown to brown, moist, **Poorly graded silty SAND** , fine to medium grained, trace black staining and organge mottling	SM	5	>>	Fines = 0% Gradation:
42	5		Gray to light brown, moist, **Poorly graded SAND**, fine to medium grained, trace intermitten silt lenses	SP			
	9	3			9	>>	
	10	4			6	>>	
	15	5			5	>>	
	18		Black staining and trace orange and gray mottling below 18 feet bgs				
	21	6			5	>>	Gradation: Fines = 1%
	24	7			5	>>	
	26	8			5	>>	Gradation: Fines = 1%
	31	9			7	>>	Gradation: Fines = 1%
	32		Light gray to gray below 32 feet bgs				
	35	10	Wet below 35 feet bgs		17	>>	Gradation: Fines = 0%
	38.5		Geoprobe terminated at 38.5 due to refusal on very dense sand				

STANDARD PENETRATION TEST DATA: N in blows/ft ◎; × Moisture; PL; LL; scale 0 – 25 – 50. STRENGTH, tsf: ▲ Qu; ✳ Qp; scale 0 – 2.0 – 4.0.

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PROJECT NO.:	07041434
PROJECT:	Microtell Inn and Suites
LOCATION:	750 Quince Street
	Florence, Oregon

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP1

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ (0–15–30); × Moisture, PL, LL (0–25–50); STRENGTH, tsf ▲ Qu ✳ Qp (0–2.0–4.0)	Additional Remarks
						Surface Elev.: 47 ft					
	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining	SP				
	2								19		Fines=7%
44	3		Grab	1						>>	
	4										
42	5		Grab	2						>>	
						Test pit terminated at approximately 5 feet bgs					

Completion Depth: 5.5 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9727°
Longitude: -124.1005°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP2

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method:Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ (0 15 30); × Moisture, PL, LL (0 25 50); STRENGTH, tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
						Surface Elev.: 47 ft					
	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP				
	2										
44	3		Grab	1						>>◎	
	4										
42	5										
	6		Grab	2						>>◎	
40	7										
	8					Test pit terminated at approximately 8 feet bgs due to caving					

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9727°
Longitude: -124.0998°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP3

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION (Surface Elev.: 47 ft)	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎	Additional Remarks
	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP				
	2–3		Grab	1						>>◎	
44	3										
	4										
42	5										
	6–7		Grab	2						>>◎	
40	7										
	8		Grab	3		Test pit terminated at approximately 7 feet bgs due to caving				>>◎	

Chart scales: Blows per 1¾-inch 0 – 15 – 30; Moisture (×), PL, LL 0 – 25 – 50; STRENGTH, tsf ▲ Qu, ✳ Qp 0 – 2.0 – 4.0

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9724°
Longitude: -124.0998°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP4

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	Additional Remarks
47	0			**Surface Elev.:** 47 ft			
	0–0.33			**Approximately 4 inches of grassy Topsoil**	Topsoil		
46	1			Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining	SP		
44	3	Grab Sample	1			26	>> Fines=0.2%
42	5	Grab Sample	2			20	>> Fines=0.2%
40	7	Grab Sample	3				>>
	8			Test pit terminated at approximately 8 feet bgs due to caving			

DYNAMIC CONE PENETRATION TEST DATA: Blows per 1¾-inch ◎ (0, 15, 30); × Moisture (0, 25, 50); PL; LL; STRENGTH, tsf: ▲ Qu, ✳ Qp (0, 2.0, 4.0)

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9721°
Longitude: -124.1°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP5

PSI Job No.:	07041434
Project:	Microtel Inn and Suites
Location:	750 Quince Street Florence, Oregon
Excavation Method:	Excavation
Sampling Method:	
DCP Type:	N/A
Boring Location:	

WATER LEVELS

Surface Elev.: 47 ft

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	Additional Remarks
47	0			**Approximately 4 inches of grassy Topsoil**	Topsoil		
	0.3–6			Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining	SP		
	~6	Grab Sample	1			8	>>@Fines=0.3%
	6			Test pit terminated at approximately 6 feet bgs due to caving			

DYNAMIC CONE PENETRATION TEST DATA: Blows per 1¾-inch ◎ (0, 15, 30); × Moisture, PL, LL (0, 25, 50); STRENGTH, tsf: ▲ Qu, ✳ Qp (0, 2.0, 4.0)

Completion Depth:	6.0 ft
Date Boring Started:	1/4/21
Date Boring Completed:	1/4/21
Logged By:	S. Shub
Excavation Contractor:	Dan Fisher Excavating, Inc

Sample Types: Shelby Tube; Dynamic Cone (DCP); Grab Sample

Latitude: 43.9718°
Longitude: -124.1003°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP6

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ (0, 15, 30); × Moisture, PL, LL (0, 25, 50); STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
						Surface Elev.: 47 ft					
47	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
						Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt and gravel, trace black staining No gravel observed below 1.5 feet	SP				
42	5		Grab	1					12	>>◎	Fines=0.2%
	6.5		Grab	2						>>◎	
40	7					Test pit terminated at approximately 7 feet bgs due to caving					

Completion Depth: 7.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9721°
Longitude: -124.1005°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

LOG OF TP7

PSI Job No.:	07041434	Excavation Method:	Excavation
Project:	Microtel Inn and Suites	Sampling Method:	
Location:	750 Quince Street, Florence, Oregon	DCP Type:	N/A
		Boring Location:	

WATER LEVELS

Surface Elev.: 47 ft

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch	Additional Remarks
47	0				**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	0.33–8				Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP				
39	8	Grab Sample	1		Test pit terminated at approximately 8 feet bgs due to caving				>>	

Chart scales: Blows per 1¾-inch 0, 15, 30; Moisture / PL / LL 0, 25, 50; STRENGTH, tsf (▲ Qu, ✳ Qp) 0, 2.0, 4.0

Completion Depth:	8.0 ft	Sample Types:	Latitude: 43.9725°
Date Boring Started:	1/4/21	Shelby Tube	Longitude: -124.1004°
Date Boring Completed:	1/4/21	Dynamic Cone (DCP)	Excavation Equipment: Excavator
Logged By:	S. Shub	Grab Sample	Remarks:
Excavation Contractor:	Dan Fisher Excavating, Inc		

The stratification lines represent approximate boundaries. The transition may be gradual.

Geophysical Testing

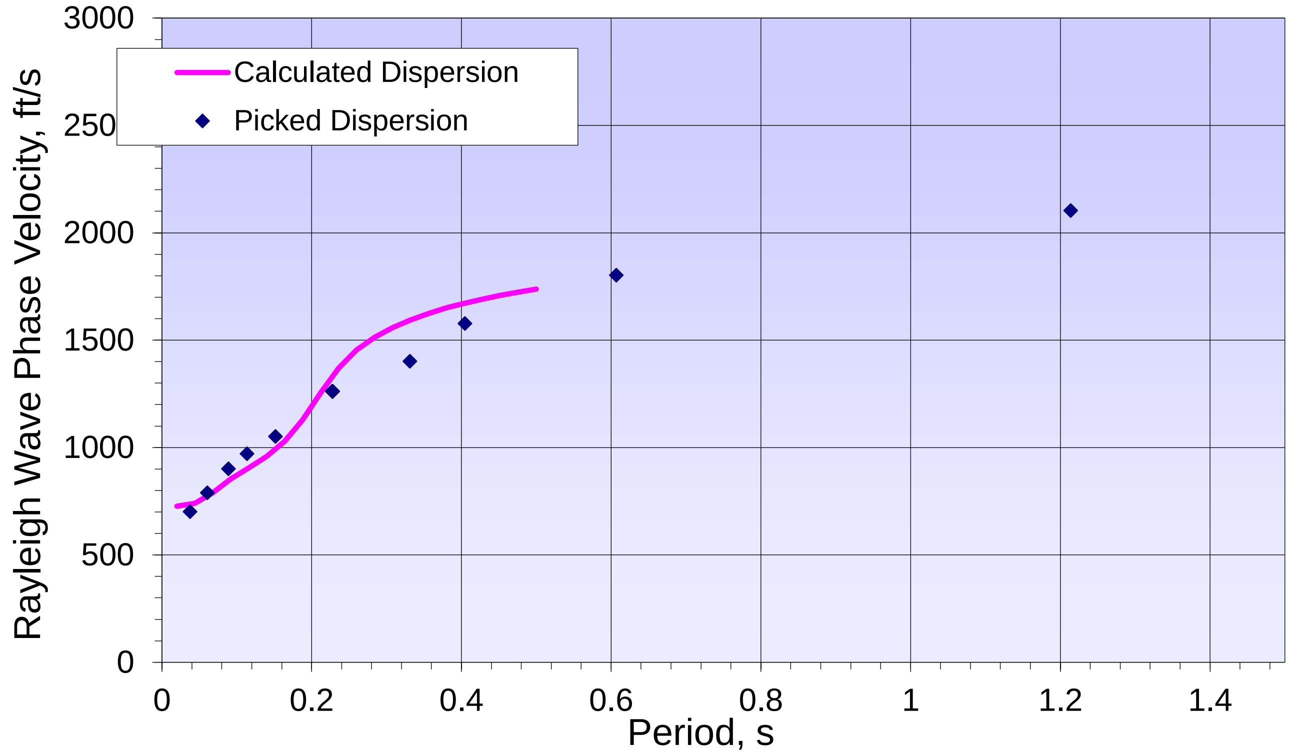
Three Refraction Microtremor (ReMi) arrays were performed at the project site (see Figure 2). The ReMi method uses standard P-wave recording equipment and ambient noise to determine shear-wave velocities. The equipment used for our ReMi evaluation included a Seismic Source DAQLink III 24-Bit ADC acquisition system and STC-85-SM-4 10-hertz geophones developed by Seismic Source Technology. Field acquisition of the data incorporated 24 geophone locations with equal spacing of 15 feet. SeisOpt ReMi Version 4.0 (Vspect and Disper modules) software developed by Optim LLC was used to process the collected data, and to create the shear wave velocity profile. To provide a robust data profile, both individual recordings and multiple summed (stacked) recordings were evaluated.

Each individual record of the traces is pre-processed to reduce or eliminate anomalies in the raw data. The data is then processed to produce a velocity spectrum. This process involves computing a surface wave, phase velocity dispersion spectral ratio image by p-tau and Fourier transforms across the array. This process is described in the document titled, "Faster, Better: Shear-wave Velocity to 100 Meters Depth from Refraction Microtremor Arrays", Bulletin of the Seismological Society of America by Louie, J, N. (2001). The resulting spectrum is in the slowness-frequency (p-f) domain. The p-f transformation helps segregate the Rayleigh Wave arrivals from other surface waves, body waves, sound waves, etc. The p-f image is generated for each record, and a final p-f image for each test is generated by combining some, or all, of the individual images.

The fundamental mode dispersion curve on the final p-f image can be seen as a distinct trend from the aliasing and wave-field transformation truncation artifact trends in the spectra. Once the fundamental mode dispersion curve is visually interpreted, data points along this curve are picked. Using the picked data points, an interactive forward-modeling process is used to model a shear wave velocity profile, with a resulting dispersion curve that approximately matches the picked data points. The process and resulting velocity profiles are able to identify the various velocity layers in the subsurface, including velocity inversions within the profile.

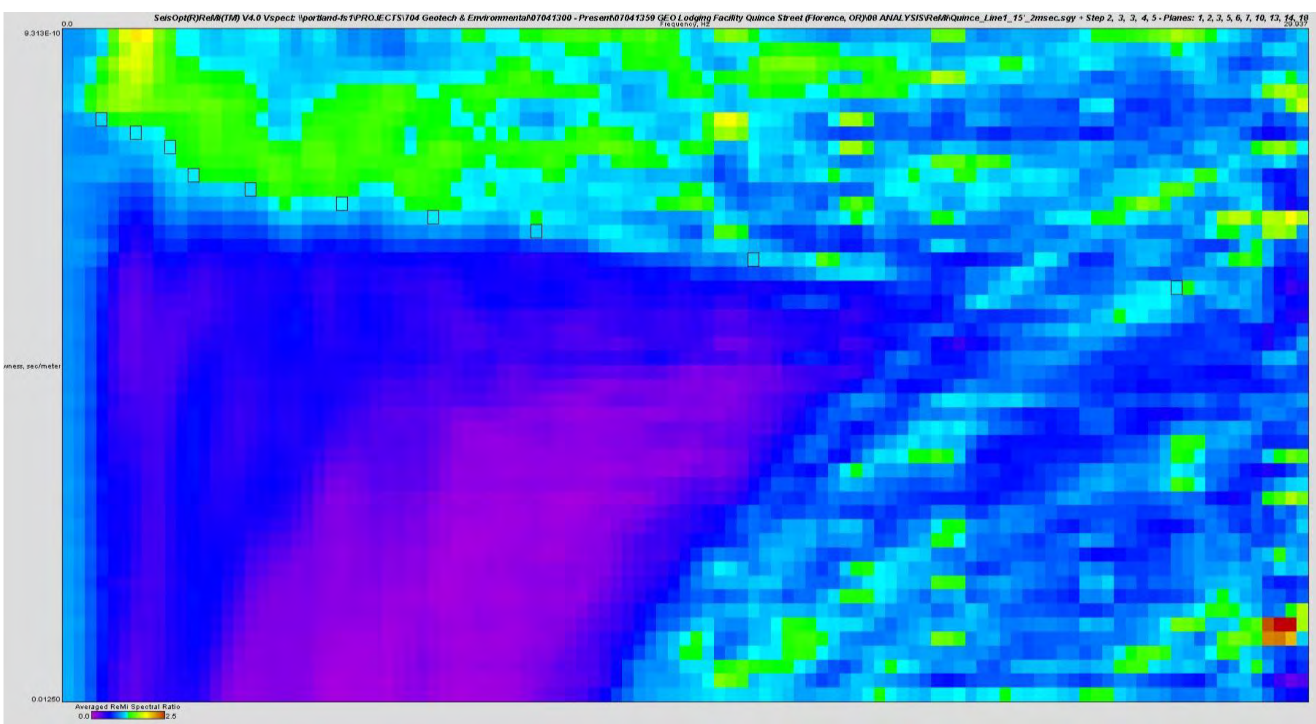
The results of the ReMi testing indicates that the weighted-average shear wave velocity in the upper 100 feet of the project site (VS) is approximately 1,000 feet per second. This indicates that the project site is classified as a Site Class D, in accordance with ASCE 7-16.

Dispersion Curve Showing Picks and Fit



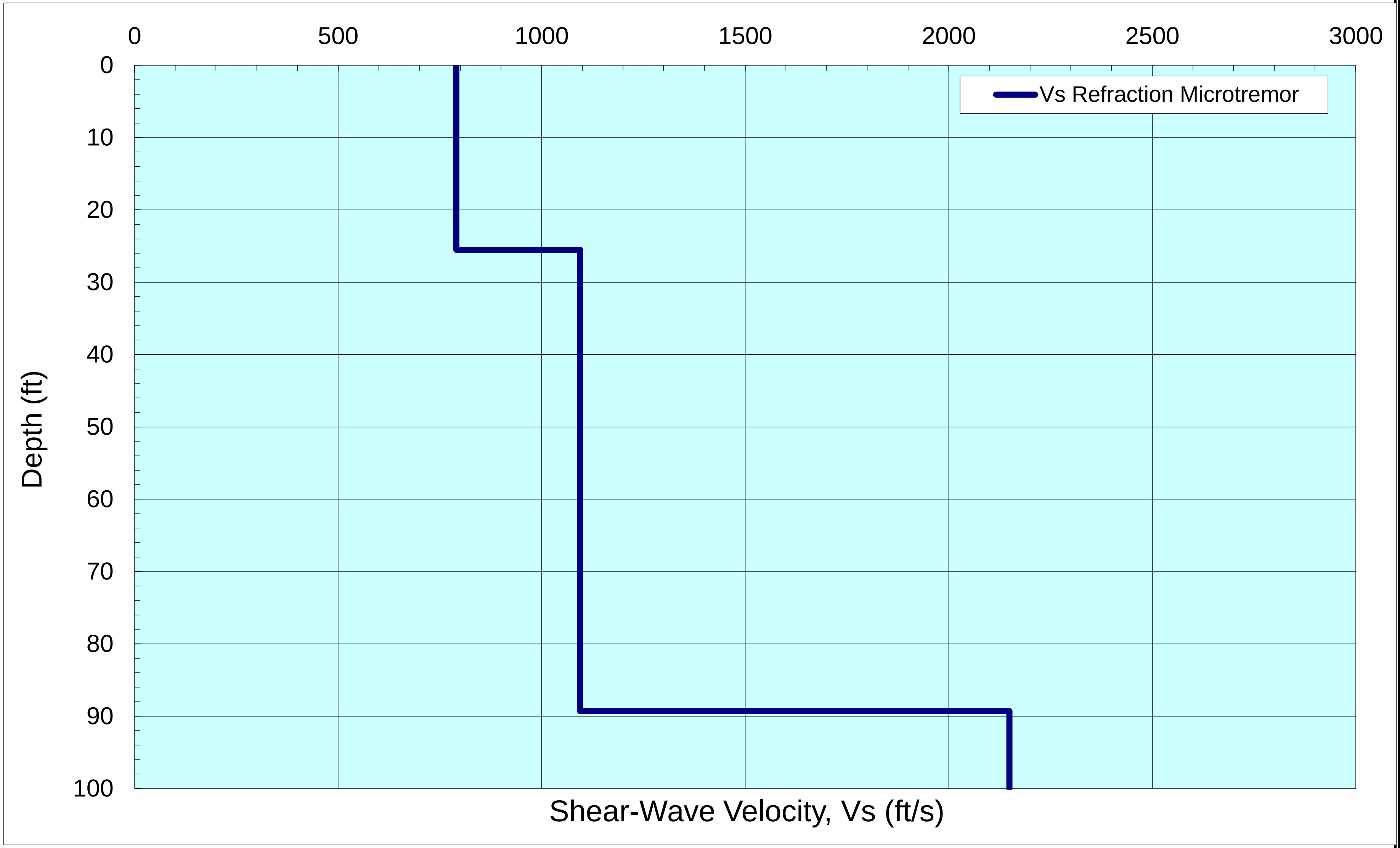
Geophone Spacing (ft) 15 Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



Line Number	**Array 1 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

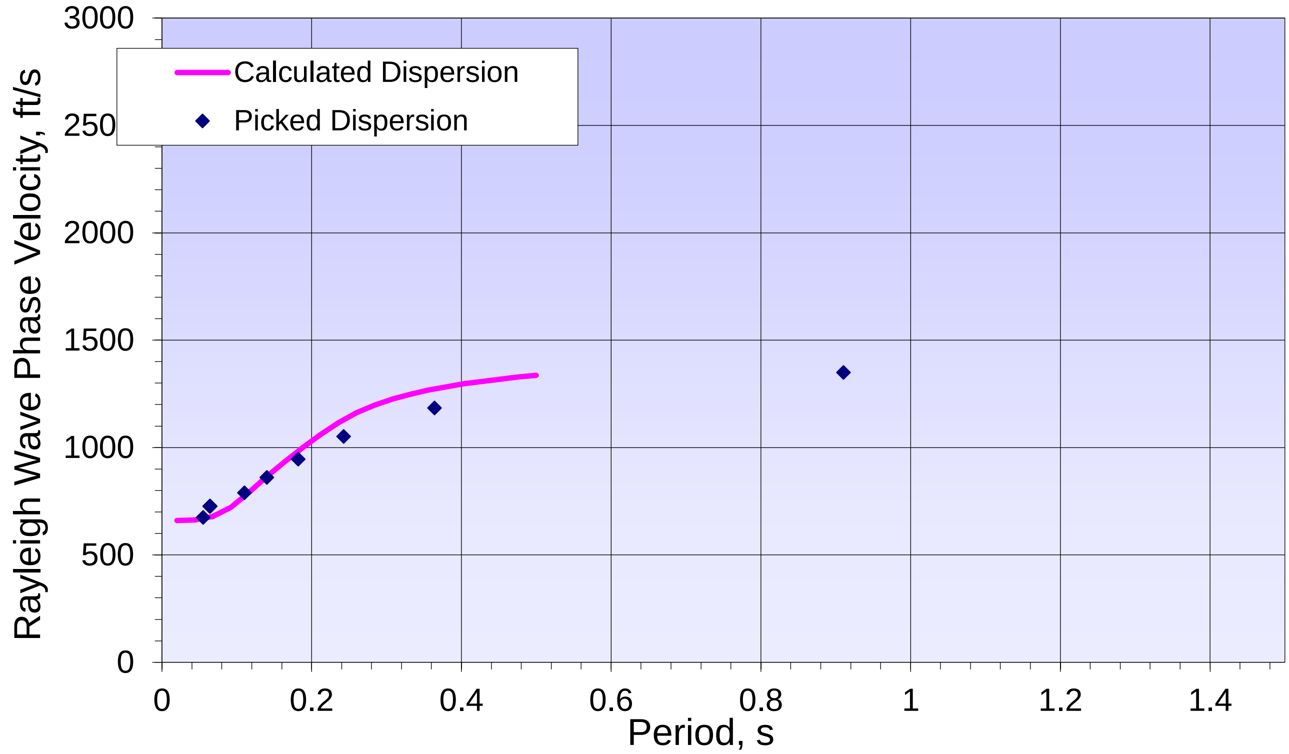
Shear Wave Velocity Profile Vs. Depth



intertek psi	IBC Site Class	D
	Average Shearwave Velocity within 100 feet, V_s (ft/s)	1,047

Line Number	**Array 1 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A10

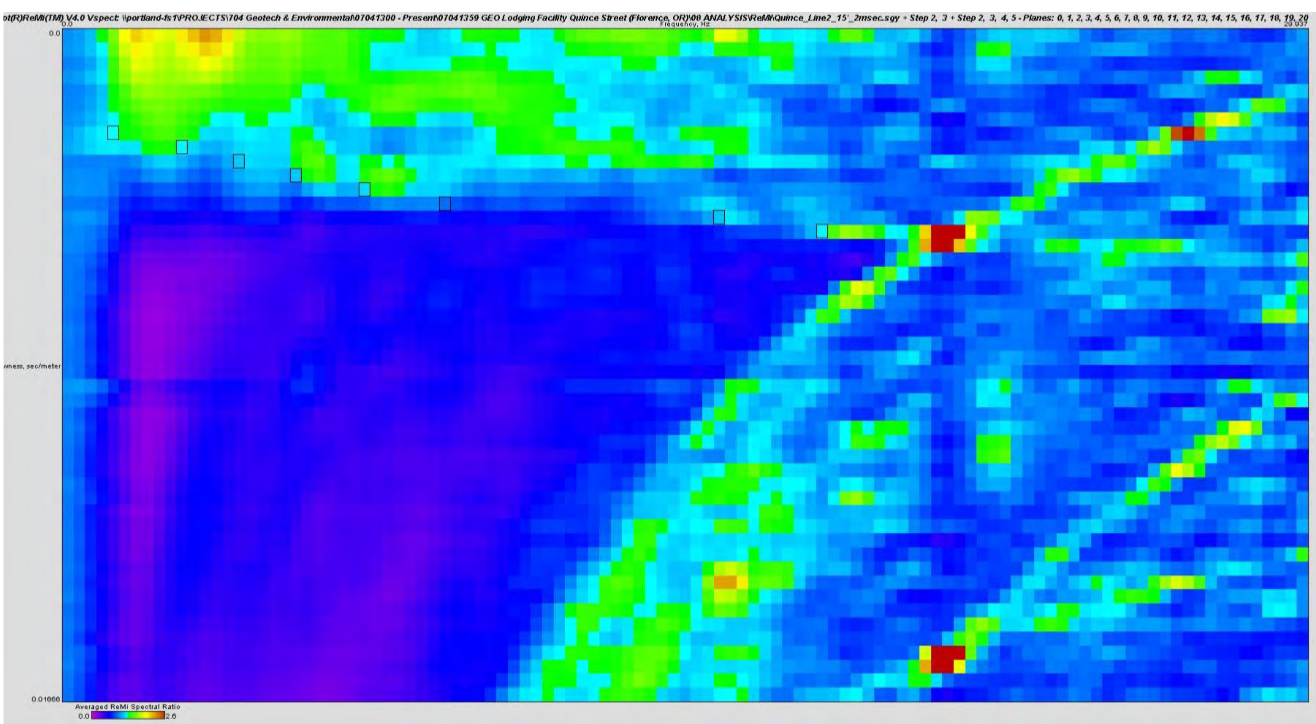
Dispersion Curve Showing Picks and Fit



Geophone Spacing (ft) 15

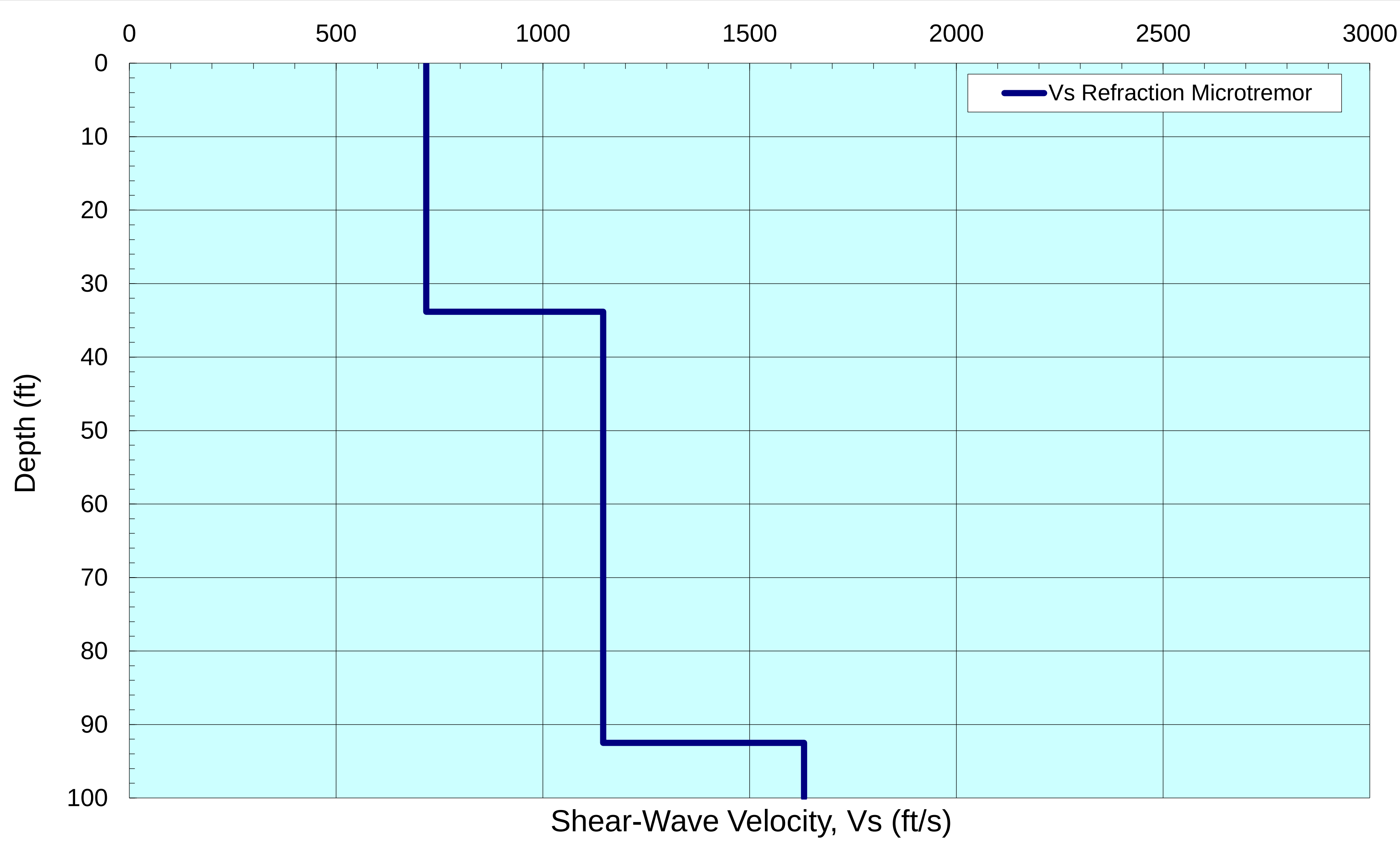
Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



Line Number	**Array 2 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

Shear Wave Velocity Profile Vs. Depth



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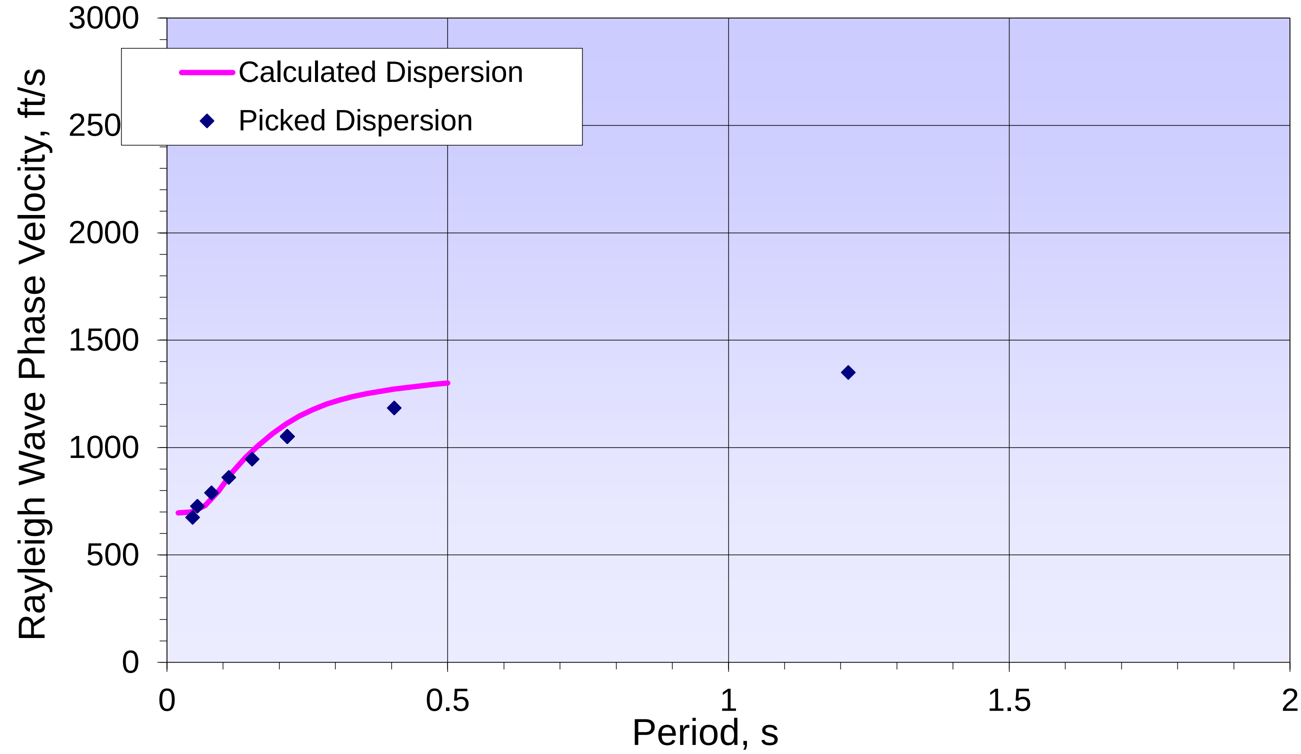
IBC Site Class	D
Average Shearwave Velocity within 100 feet, V_s (ft/s)	972

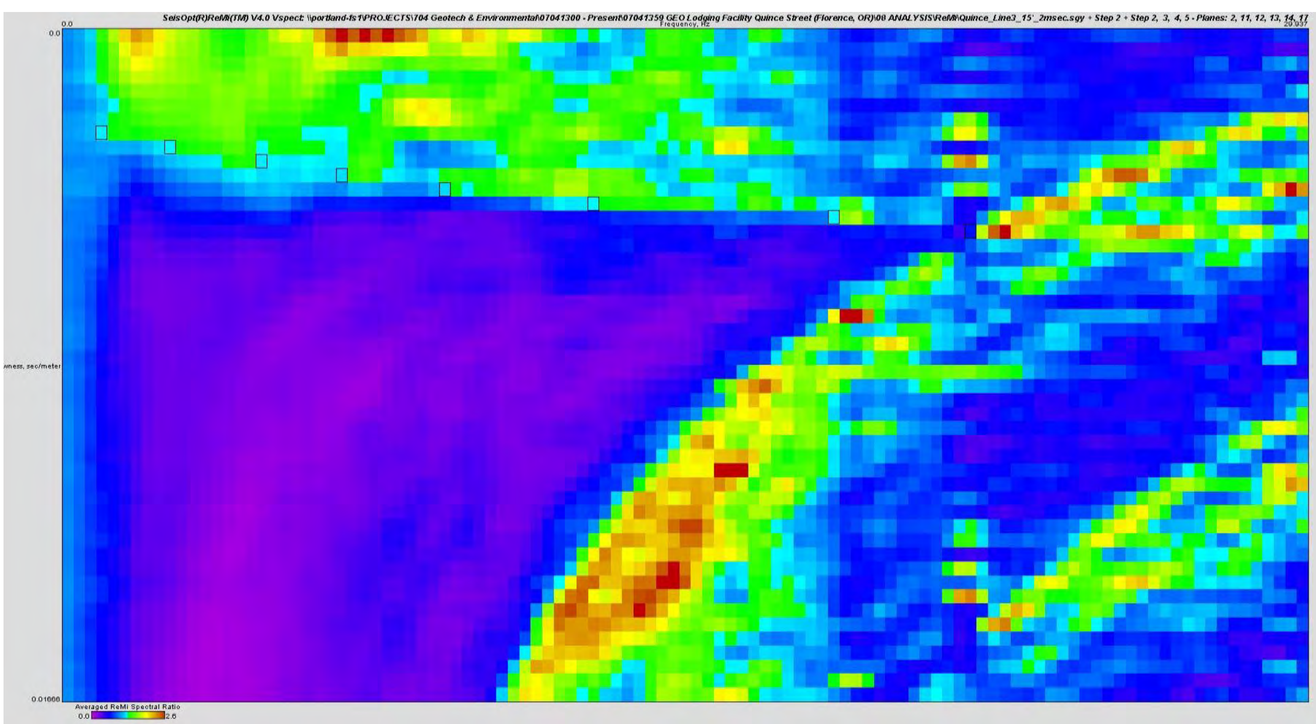
Line Number	**Array 2 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A10

Dispersion Curve Showing Picks and Fit



Geophone Spacing (ft) 15 Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



Line Number	Array 2 (Geophones 1-24)	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

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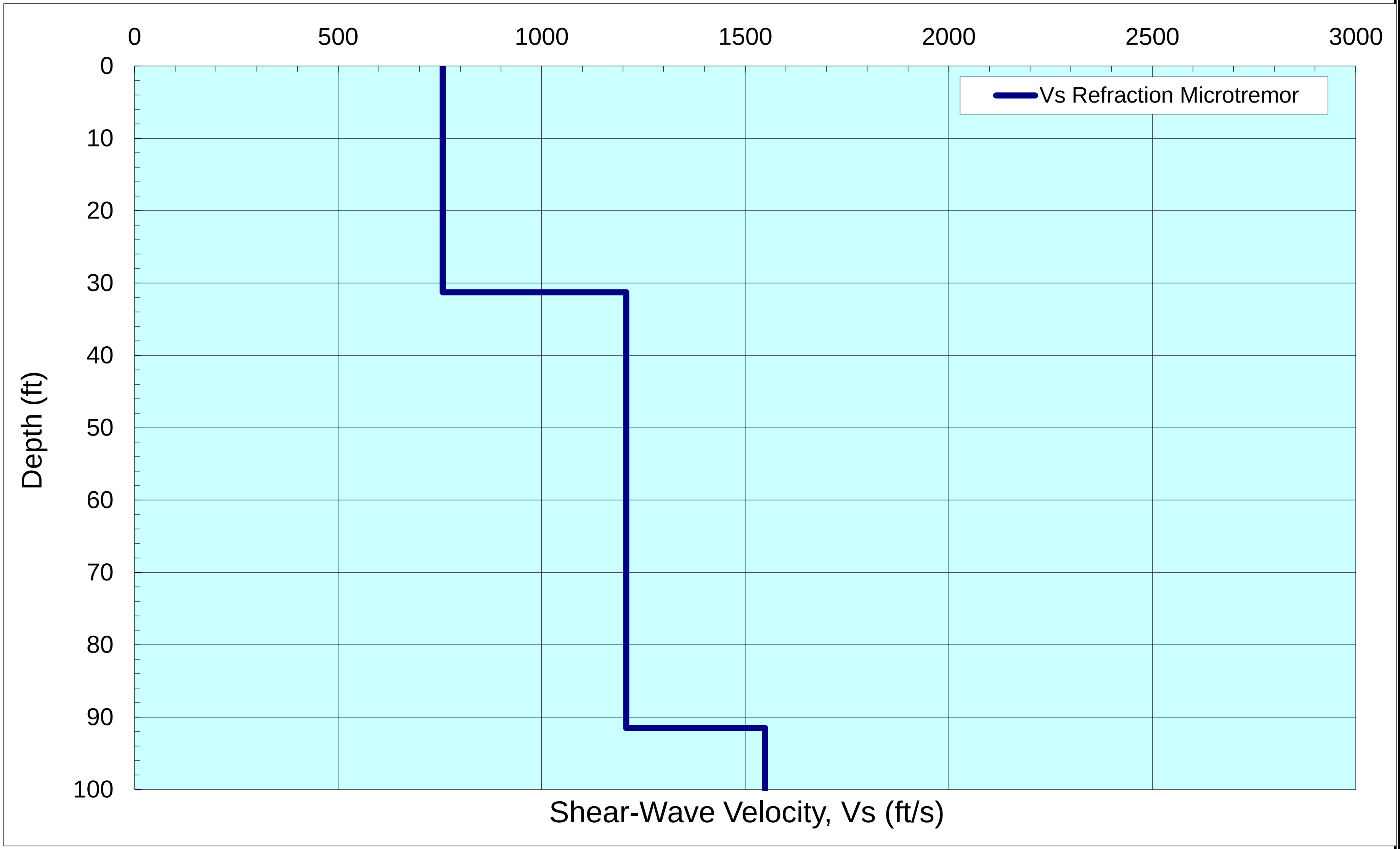
Shear Wave Velocity Profile Vs. Depth



IBC Site Class	**D**	
Average Shearwave Velocity within 100 feet, V_s (ft/s)	**1,034**	
Line Number	**Array 2 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A10

LABORATORY TESTING PROGRAM AND PROCEDURES

Soil samples obtained during the field explorations were examined in our laboratory. The physical characteristics of the samples were noted, and the field classifications were modified, where necessary. Representative samples were selected during the course of the examination for further testing.

Moisture Content

Natural moisture content determinations were made on selected soil samples in general accordance with ASTM D2216. The natural moisture content is defined as the ratio of the weight of water to the dry weight of soil, expressed as a percentage.

Visual-Manual Classification

The soil samples were classified in general accordance with guidelines presented in ASTM D2487. Certain terminology incorporating current local engineering practice, as provided in the Soil Classification Chart, included with, or in lieu of, ASTM terminology. The term which best described the major portion of the sample was used in determining the soil type (i.e., gravel, sand, silt or clay).

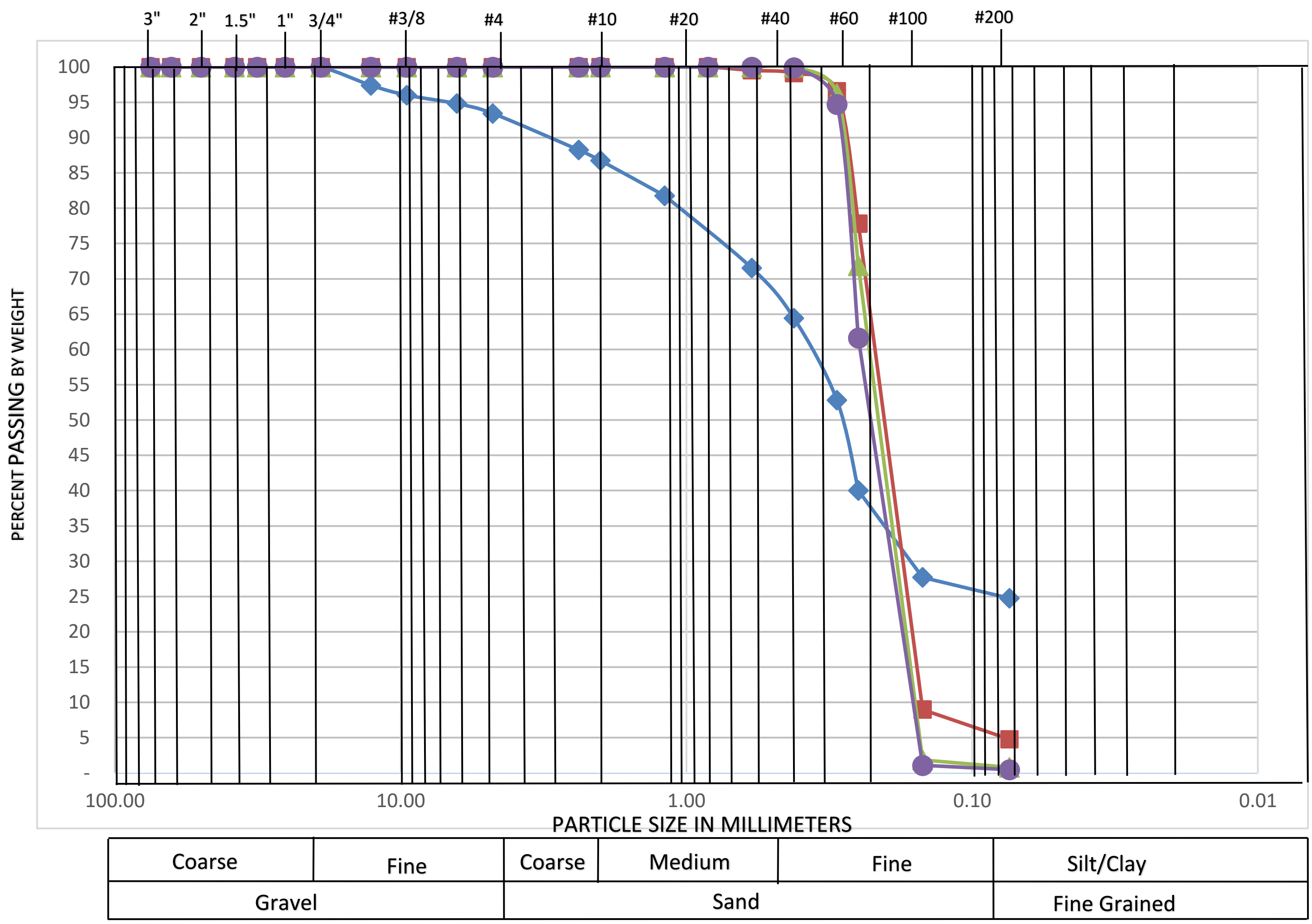
Sieve Analysis

The determination of the amount of material finer than the U.S. Standard No. 200 (75-µm) sieve was made on selected soil sample in general accordance with ASTM D1140. In general, the sample was dried in an oven and then washed with water over the No. 200 sieve. The mass retained on the No. 200 sieve was dried in an oven, and the dry weight recorded. Results from this test procedure assist in determining the fraction, by weight, of coarse-grained and fine-grained soils in the sample.

The determination of the gradation curve of the coarse-grained material was made on selected soil samples in general accordance with ASTM D6913. In general, the oven dried mass retained on the No. 200 sieve is passed over progressively smaller sieve openings, by agitating the sieves by hand or by a mechanical apparatus. The mass retained on each sieve is recorded as a fraction of the total sample, including the percent passing the No. 200 sieve.

PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP1	0	7	69	25				46
GP1	6	0	95	5				7
GP1	13	0	99	1				6
GP1	16	0	100	0				7

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	0	SM	Well Graded Silty SAND	
GP1	6	SP	Poorly Graded SAND	
GP1	13	SP	Poorly Graded SAND	
GP1	16	SP	Poorly Graded SAND	

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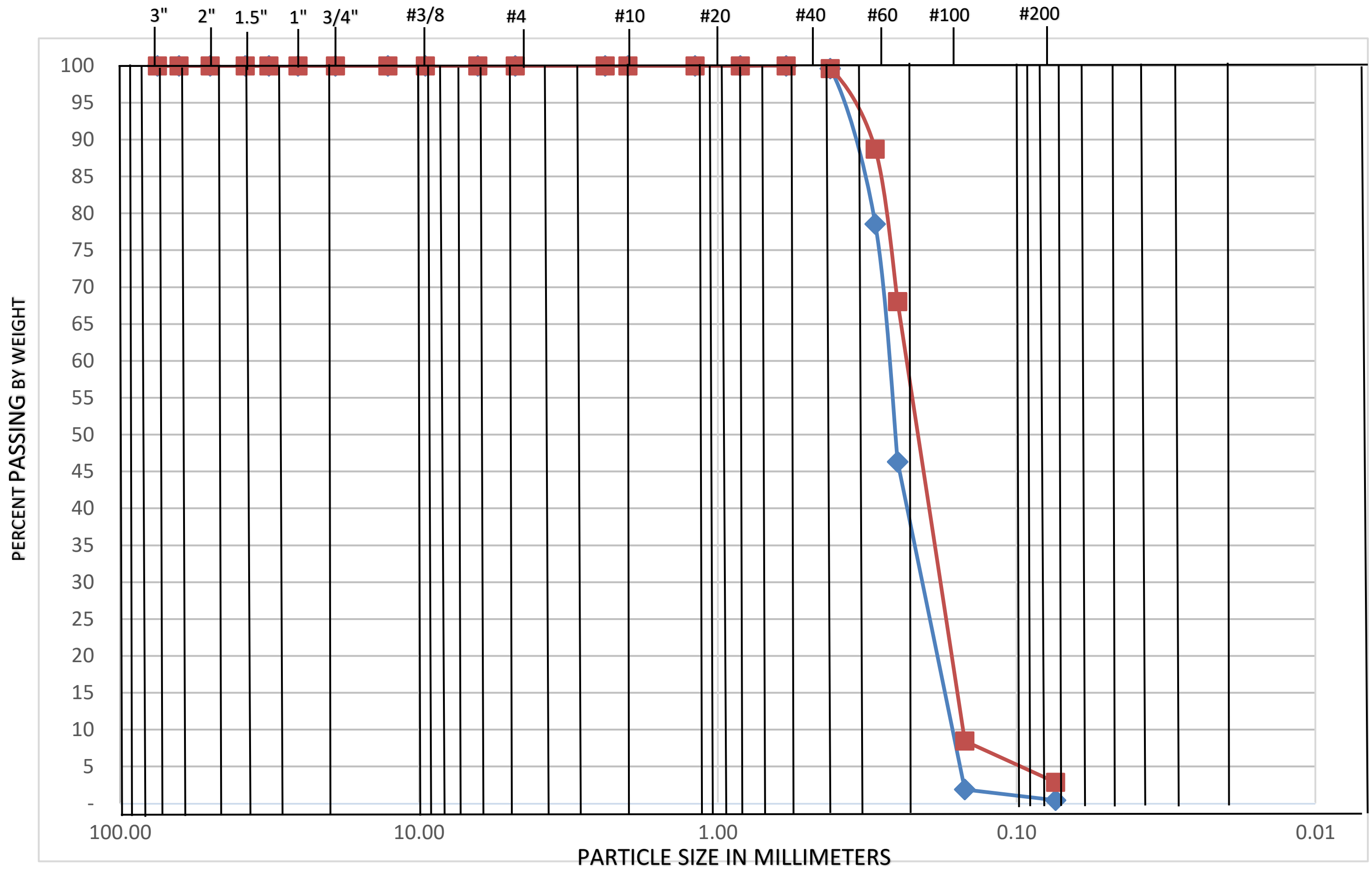
PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP1	34	0	100	0				6
GP1	36	0	97	3				18

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	34	SP	Poorly Graded SAND	
GP1	36	SP	Poorly Graded SAND	

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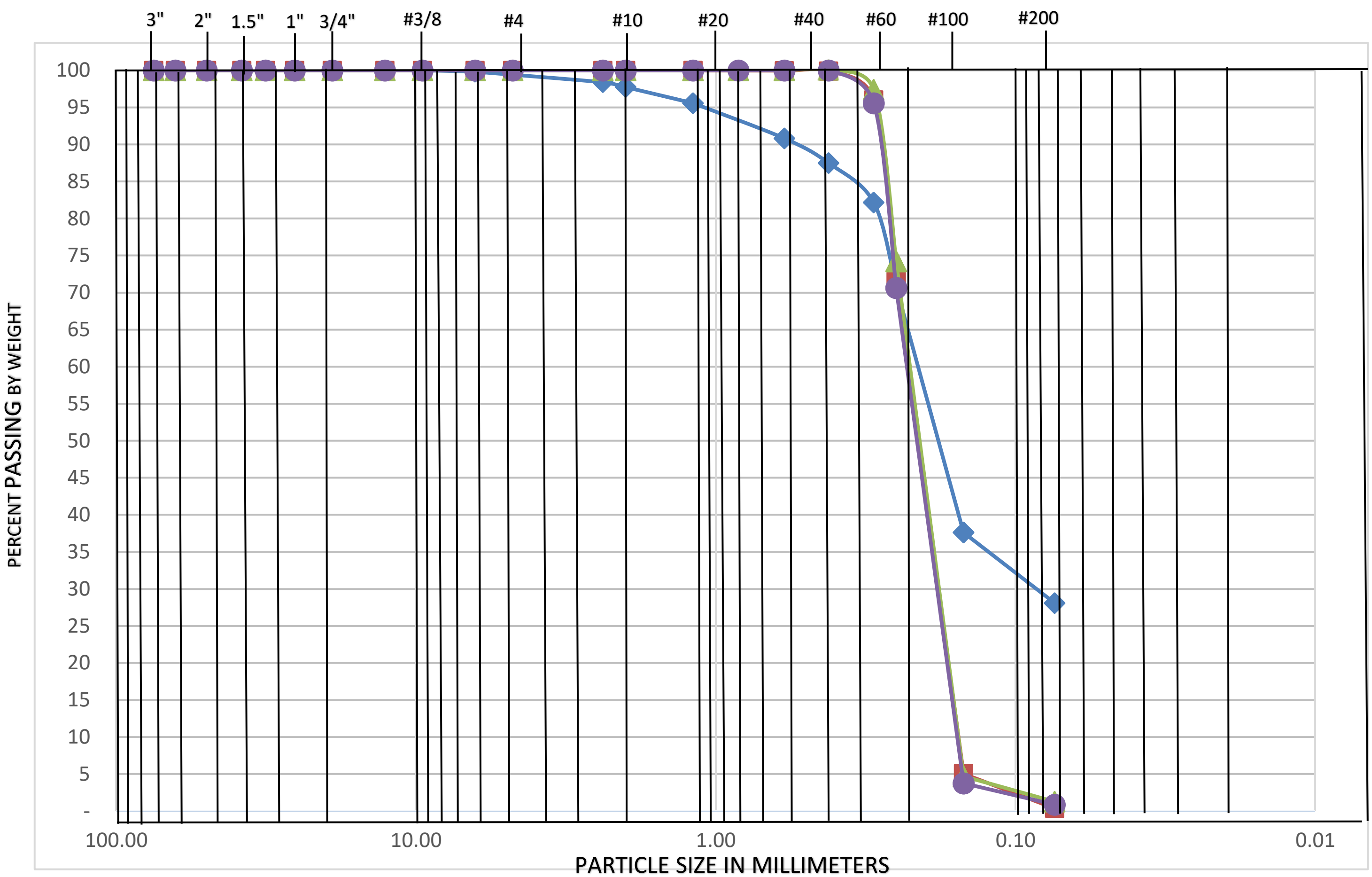
PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP2	0	0	72	28				45
GP2	2	0	100	0				5
GP2	21	0	99	1				5
GP2	26	0	99	1				5

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP2	0	SM	Poorly Graded Silty SAND	
GP2	2	SP	Poorly Graded SAND	
GP2	21	SP	Poorly Graded SAND	
GP2	26	SP	Poorly Graded SAND	

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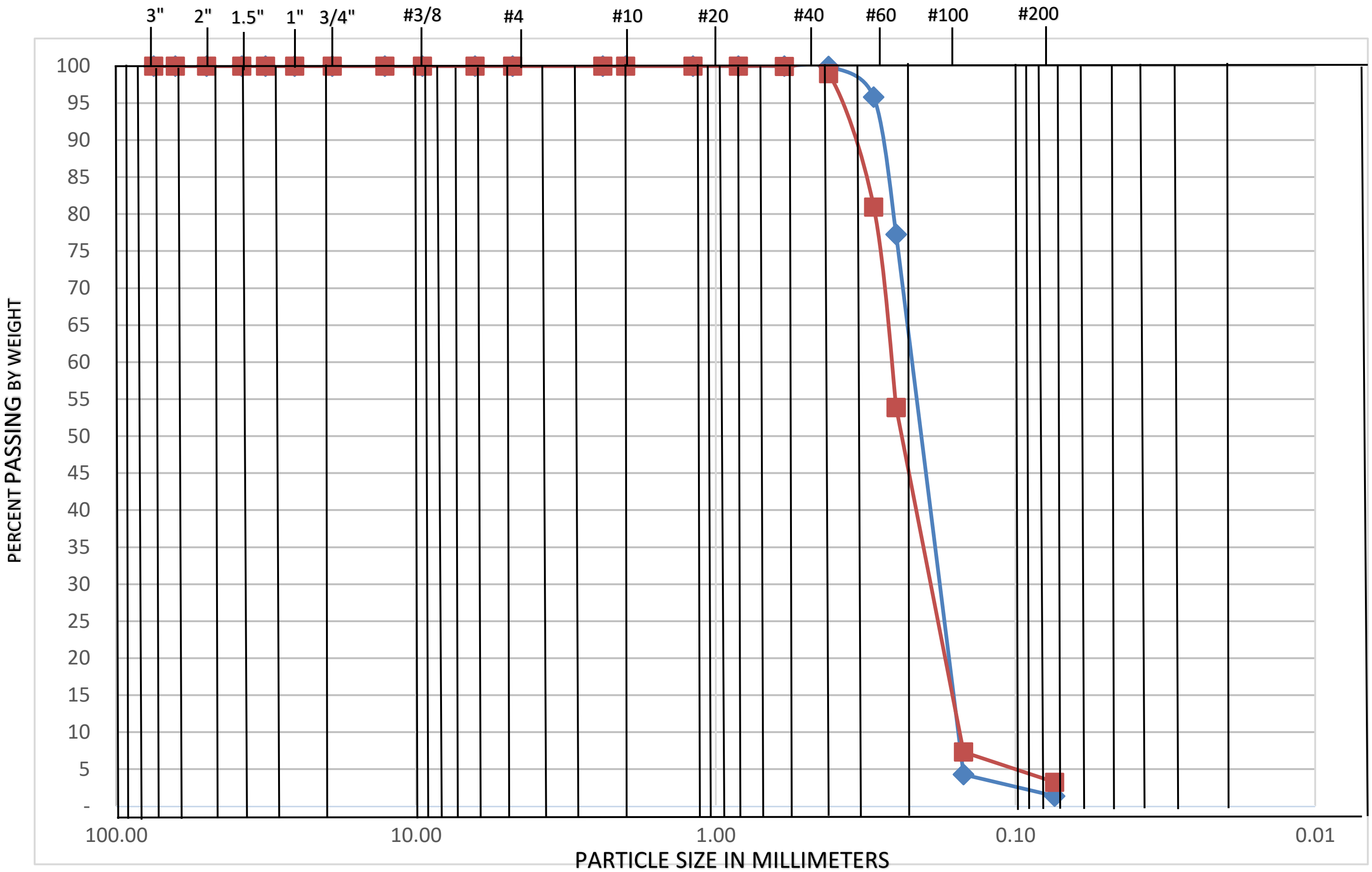
PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture
GP1	31	0	99	1				7
GP1	35	0	97	3				17

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	31	SP	Poorly Graded SAND	
GP1	35	SP	Poorly Graded SAND	

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: MAT:07041434-1-S1
Issue No: 1

Material Test Report

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID: 07041434-1-S1
Feature:
Client Sample ID:
Contractor:
Date Sampled: 12/30/21
Sampled By: Staci Shub
Specification: Proctor / Grad
Supplier:
Source: Native
Material: Sand
Sampling Method: Sub-Surface Grab Sample
General Location: TP 4
Location:
Lift:

Other Test Results

Description	Method	Result	Limits
Maximum Dry Unit Weight (lbf/ft³)	ASTM D 1557	102.8	
Corrected Maximum Dry Unit Weight (lbf/ft³)		102.8	
Optimum Water Content (%)		8.2	
Corrected Optimum Water Content (%)		8.2	
Method		A	
Preparation Method		Moist	
Rammer Type		Mechanical	

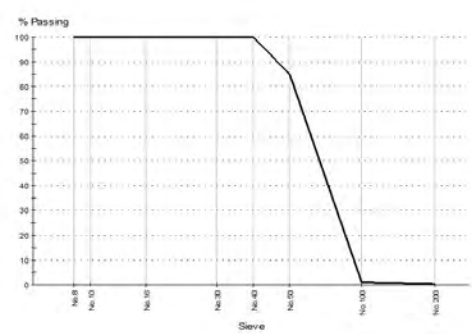
Particle Size Distribution

Method: ASTM C 136, ASTM C 117

Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.8 (2.36mm)	100	
No.10 (2.0mm)	100	
No.16 (1.18mm)	100	
No.30 (600µm)	100	
No.40 (425µm)	100	
No.50 (300µm)	85	
No.100 (150µm)	1	
No.200 (75µm)	0.20	

Chart



Comments

N/A

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Proctor Report

Report No: PTR:07041434-1-S1
Issue No: 1

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

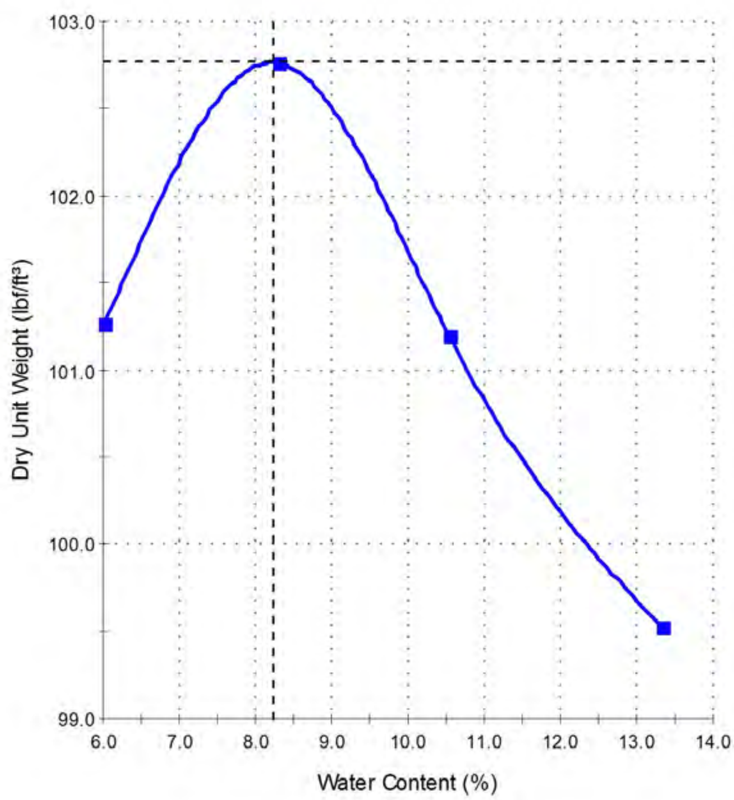
Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID:	07041434-1-S1	**Date Sampled:**	12/30/2021
Sampled By:	Staci Shub	**Specification:**	Proctor / Grad
Source:	Native	**Material:**	Sand
Sampling Method:	Sub-Surface Grab Sample	**General Location:**	TP 4
Location:			

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 1557

Maximum Dry Unit Weight (lbf/ft³):	**102.8**
Optimum Water Content (%):	**8.2**
Method:	A
Preparation Method:	Moist
Rammer Type:	Mechanical
Tested By:	
Date Tested:	

Comments

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: MAT:07041434-1-S2
Issue No: 1

Material Test Report

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID: 07041434-1-S2
Feature:
Client Sample ID:
Contractor:
Date Sampled:
Sampled By: Staci Shub
Specification: Proctor / Grad
Supplier:
Source: Native
Material: Sand
Sampling Method: Sub-Surface Grab Sample
General Location: TP 6
Location:
Lift:

Other Test Results

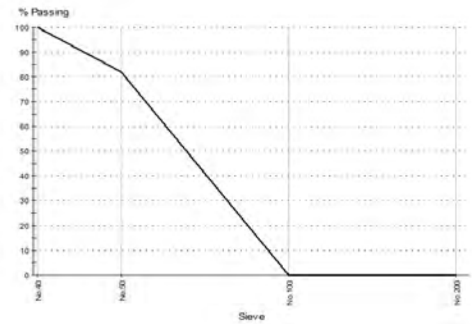
Description	Method	Result	Limits
Maximum Dry Unit Weight (lbf/ft³)	ASTM D 1557	102.2	
Corrected Maximum Dry Unit Weight (lbf/ft³)		102.2	
Optimum Water Content (%)		9.5	
Corrected Optimum Water Content (%)		9.5	
Method		A	
Preparation Method		Moist	
Rammer Type		Mechanical	

Particle Size Distribution

Method: ASTM C 136, ASTM C 117
Drying By: Oven
Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.40 (425µm)	100	
No.50 (300µm)	82	
No.100 (150µm)	0	
No.200 (75µm)	0.10	

Chart



Comments

N/A

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: PTR:07041434-1-S2
Issue No: 1

Proctor Report

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Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

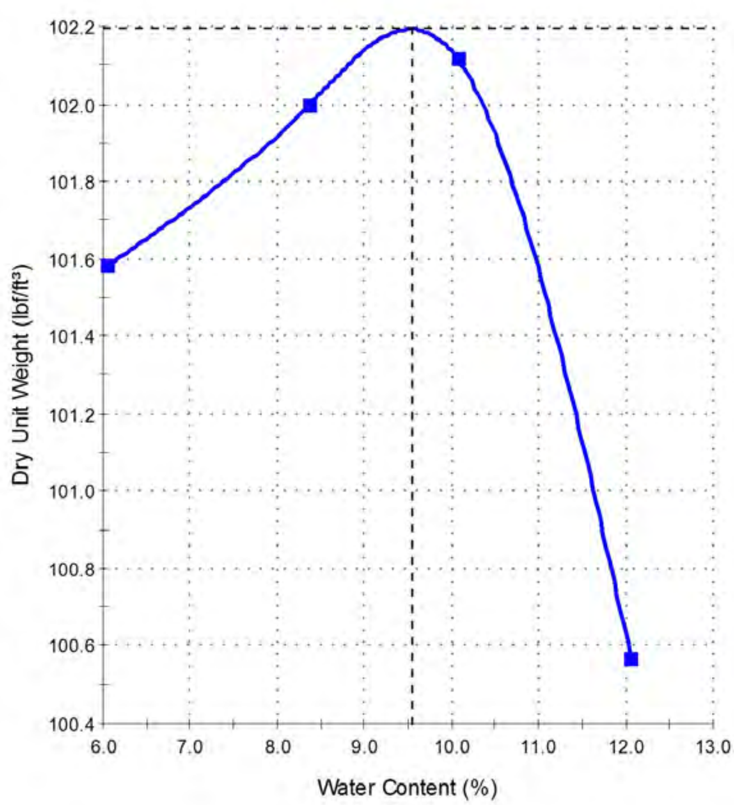
Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID:	07041434-1-S2	**Date Sampled:**	
Sampled By:	Staci Shub	**Specification:**	Proctor / Grad
Source:	Native	**Material:**	Sand
Sampling Method:	Sub-Surface Grab Sample	**General Location:**	TP 6
Location:			

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 1557

Maximum Dry Unit Weight (lbf/ft³):	**102.2**
Optimum Water Content (%):	**9.5**
Method:	A
Preparation Method:	Moist
Rammer Type:	Mechanical
Tested By:	
Date Tested:	

Comments

APPENDIX B

LIQUEFACTION RESULTS

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

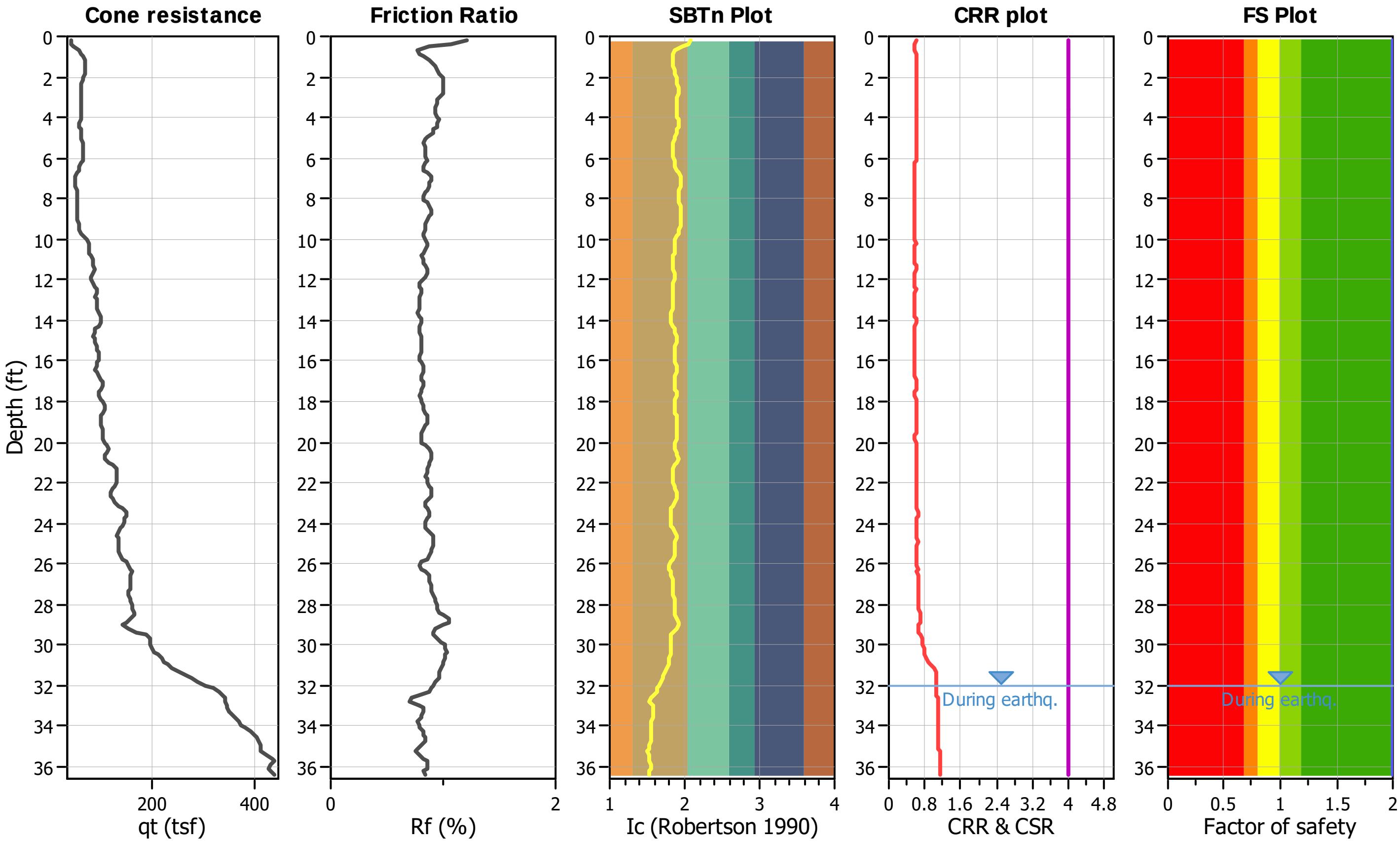
LIQUEFACTION ANALYSIS REPORT

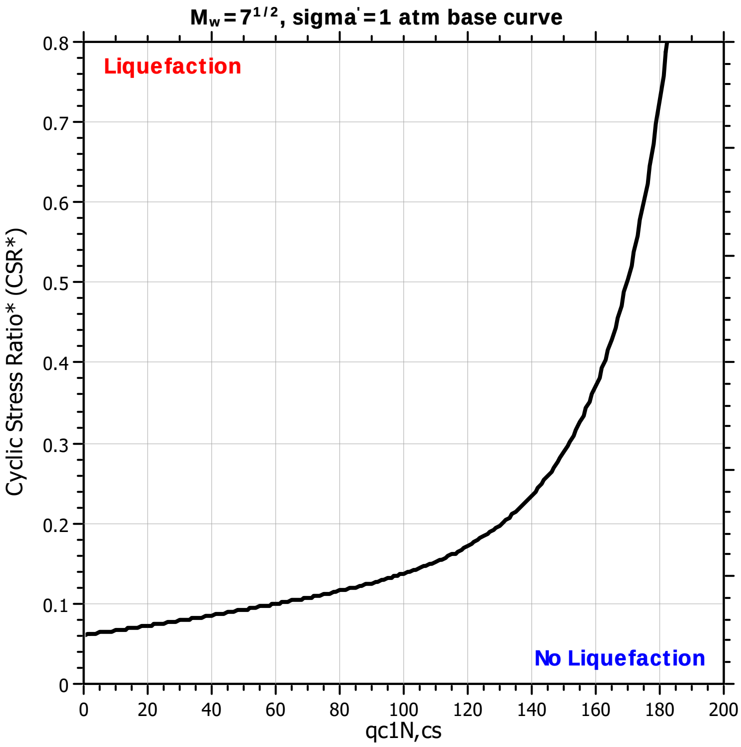
Project title : Microtel Inn and Suites **Location : Florence, OR**

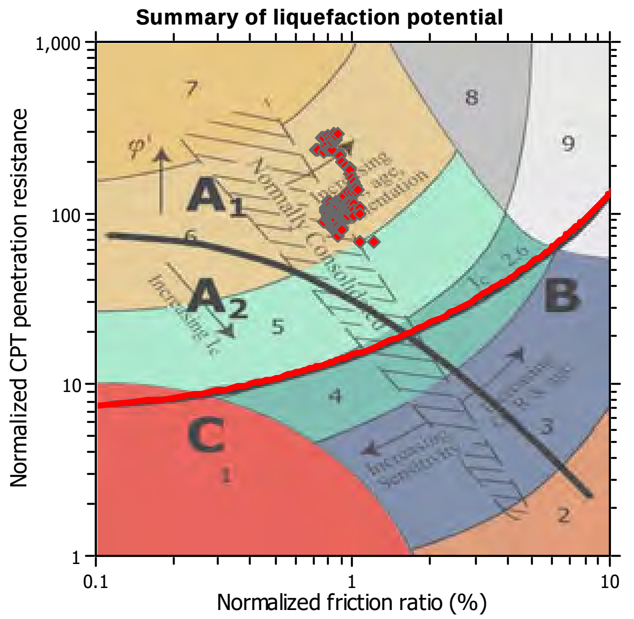
CPT file : 21020 CPT-1 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

LIQUEFACTION ANALYSIS REPORT

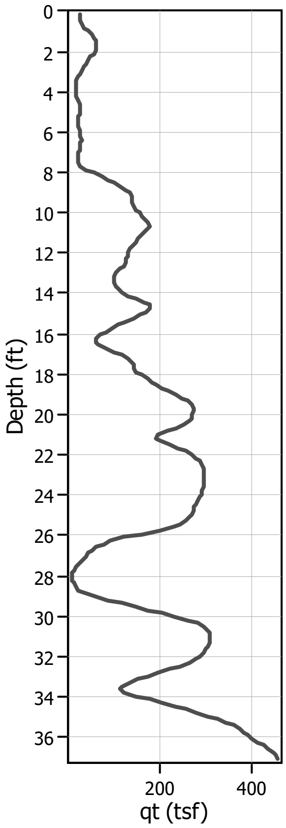
Project title : Microtel Inn and Suites **Location : Florence, OR**

CPT file : 21020 CPT-2 Text File Input

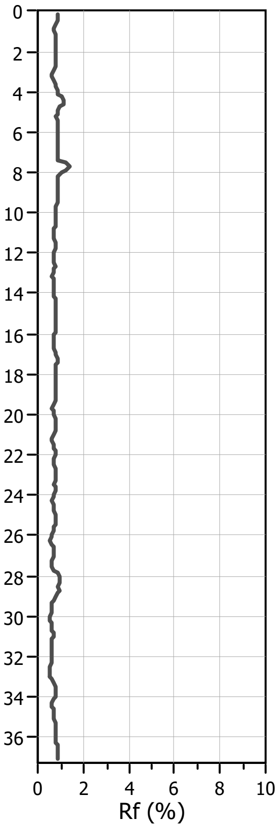
parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		

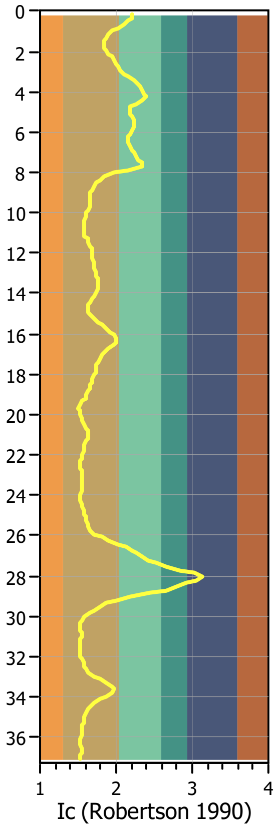
Cone resistance



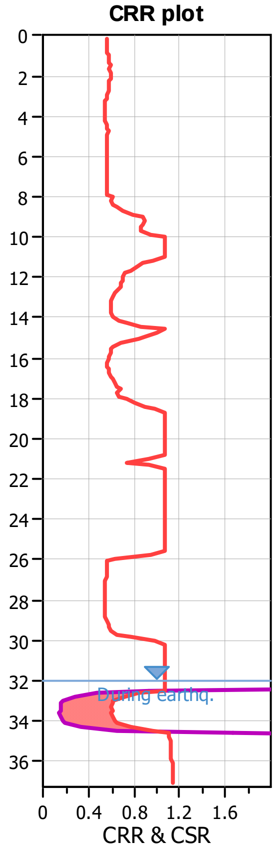
Friction Ratio



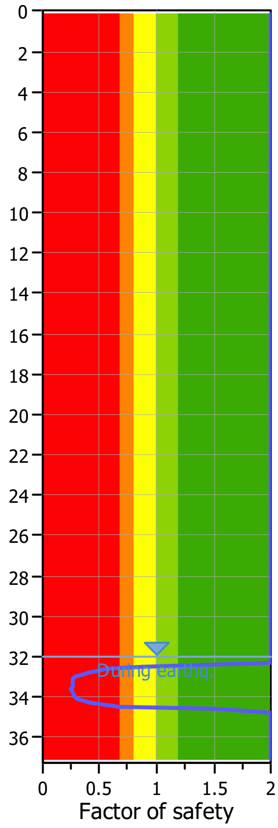
SBTn Plot



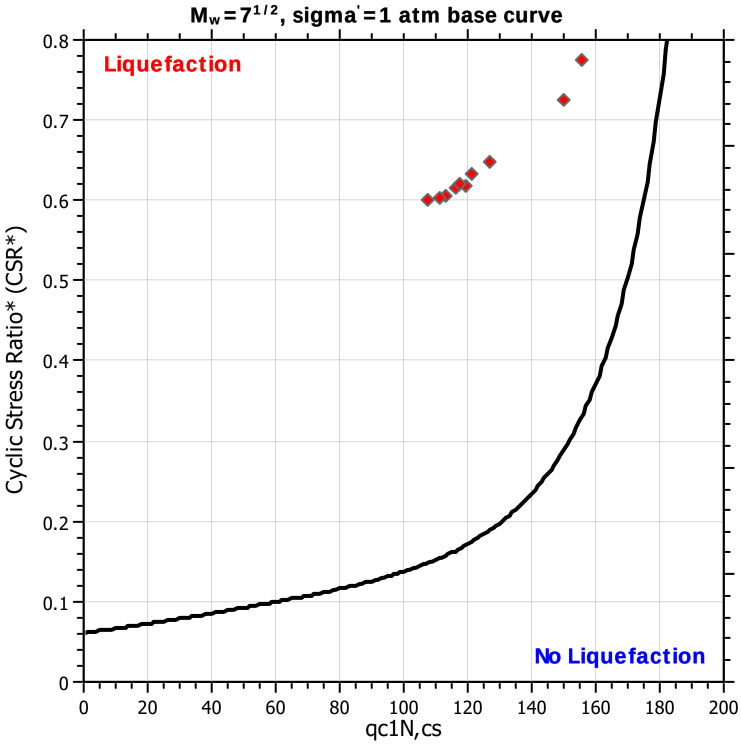
CRR plot



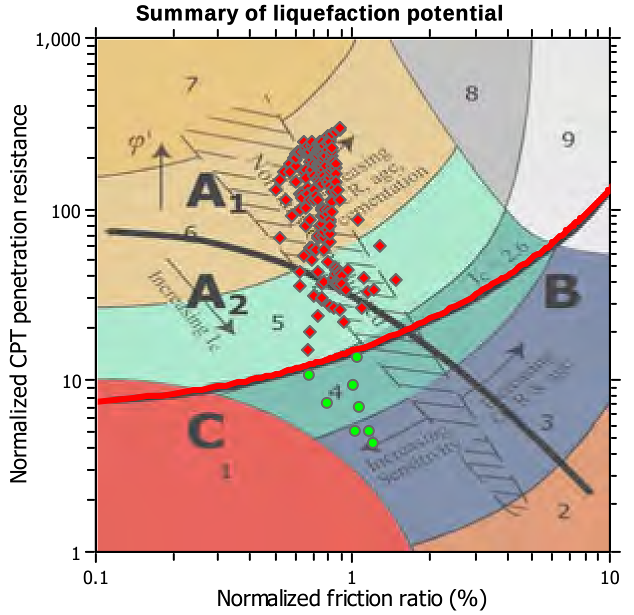
FS Plot



$M_w = 7^{1/2}$, sigma' = 1 atm base curve



Summary of liquefaction potential



Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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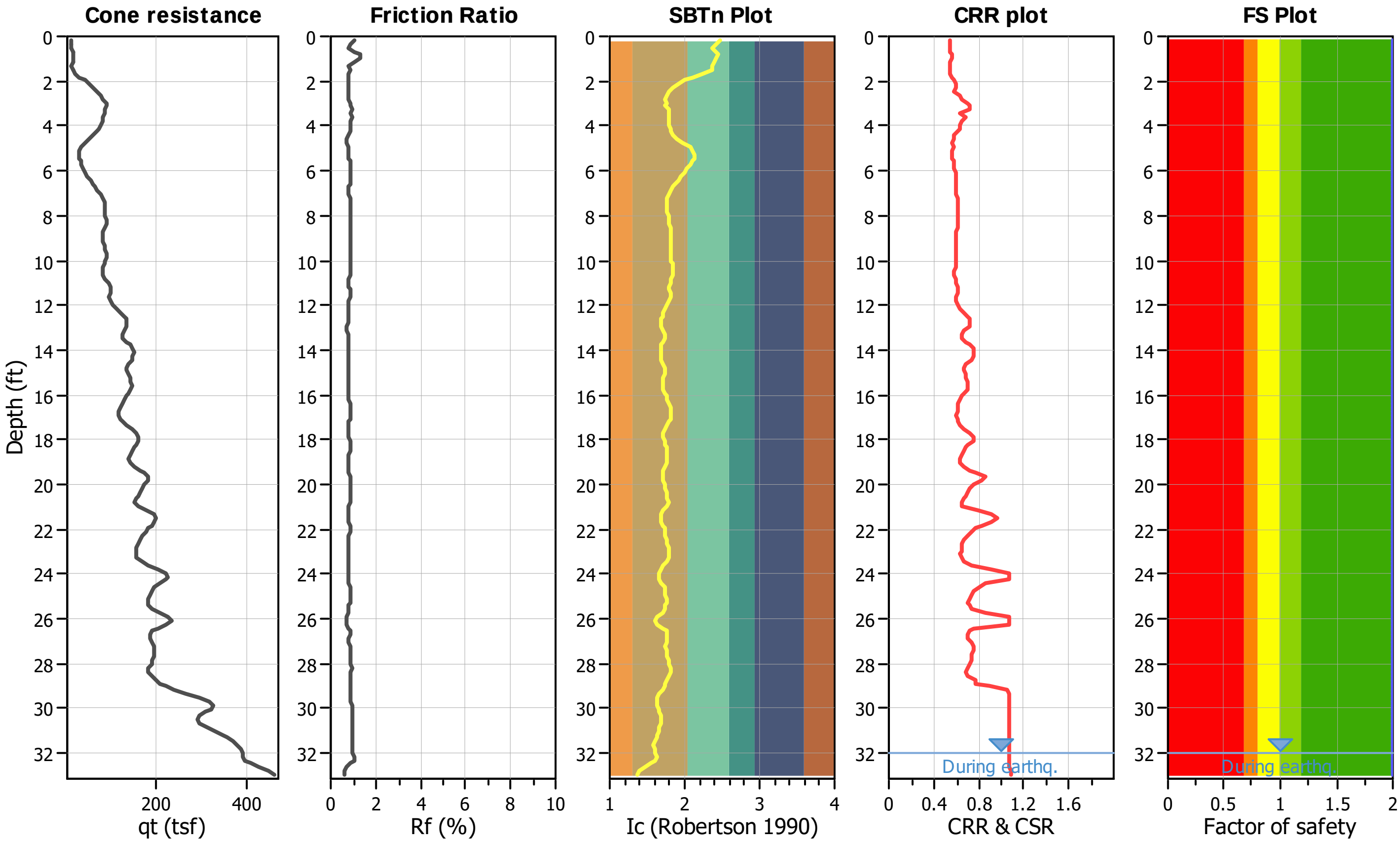
LIQUEFACTION ANALYSIS REPORT

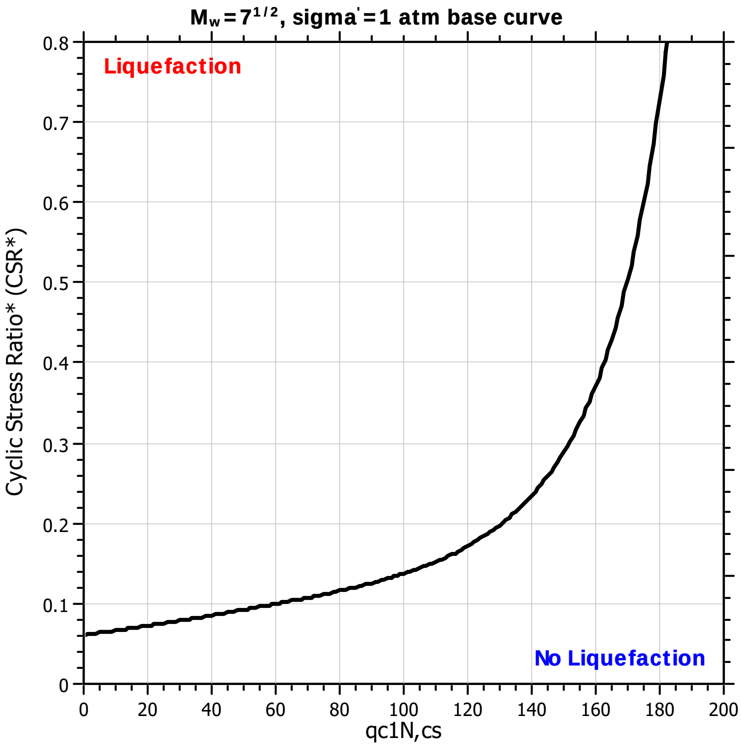
Project title : Microtel Inn and Suites **Location : Florence, OR**

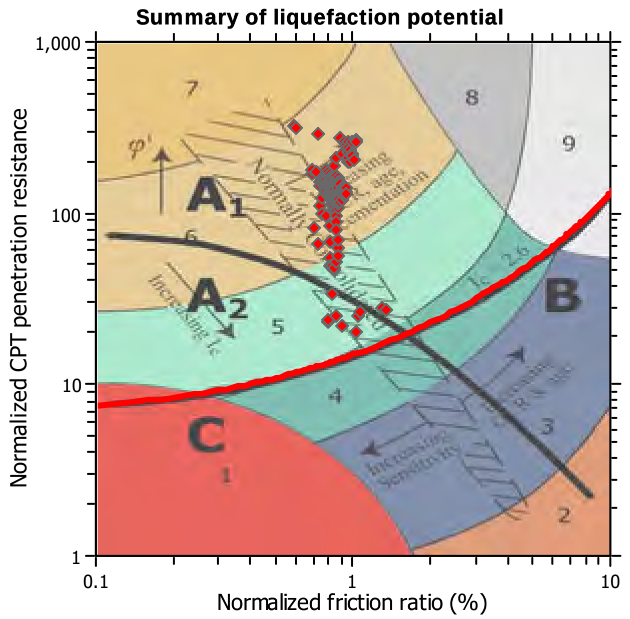
CPT file : 21020 CPT-3 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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LIQUEFACTION ANALYSIS REPORT

Project title : Microtel Inn and Suites **Location : Florence, OR**

CPT file : 21020 CPT-4 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
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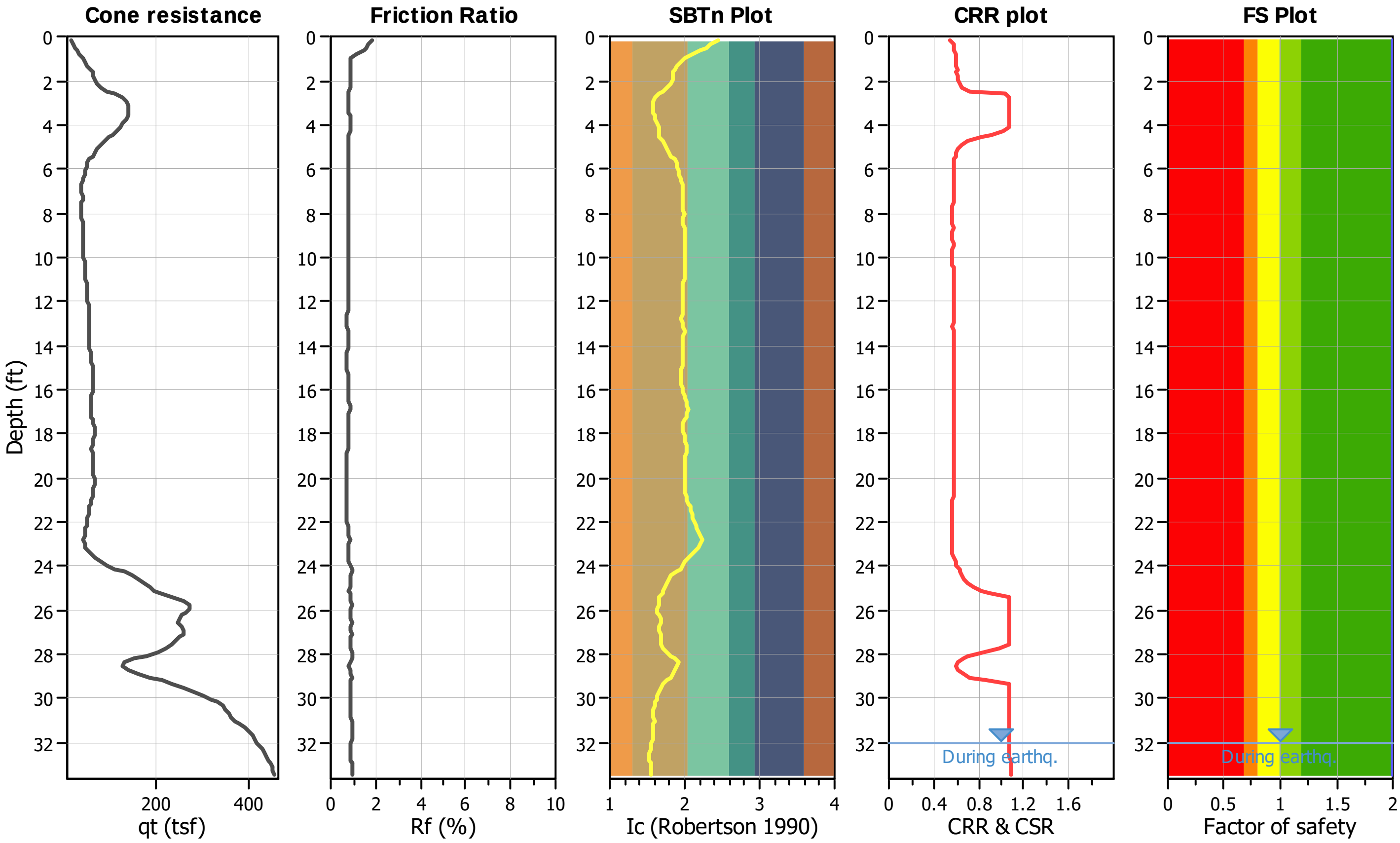
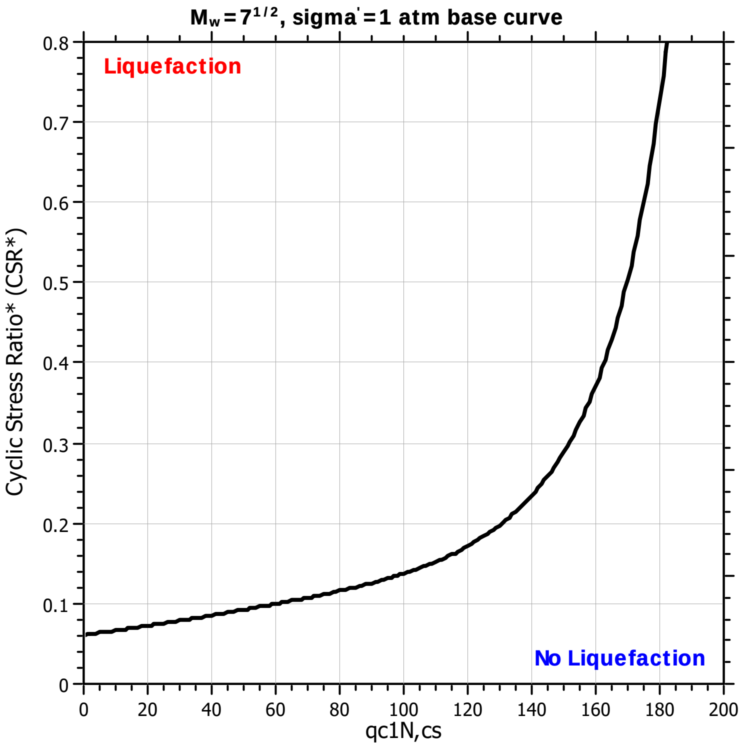
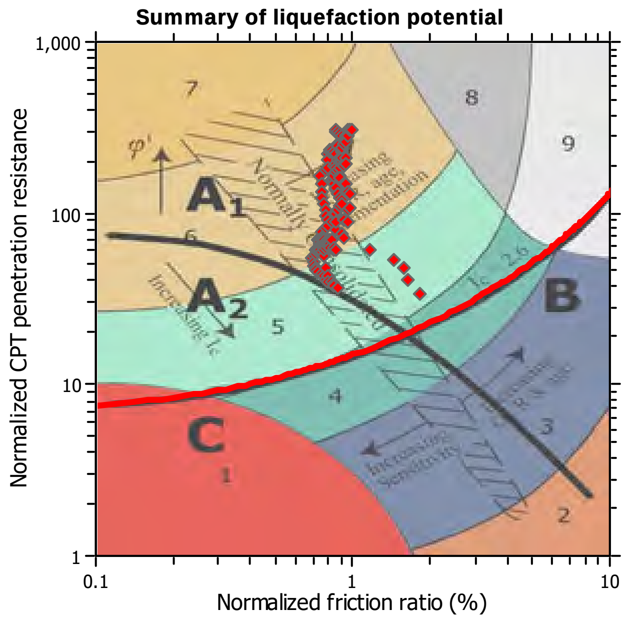
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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LIQUEFACTION ANALYSIS REPORT

Project title : Microtel Inn and Suites **Location : Florence, OR**

CPT file : 21020 CPT-5 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
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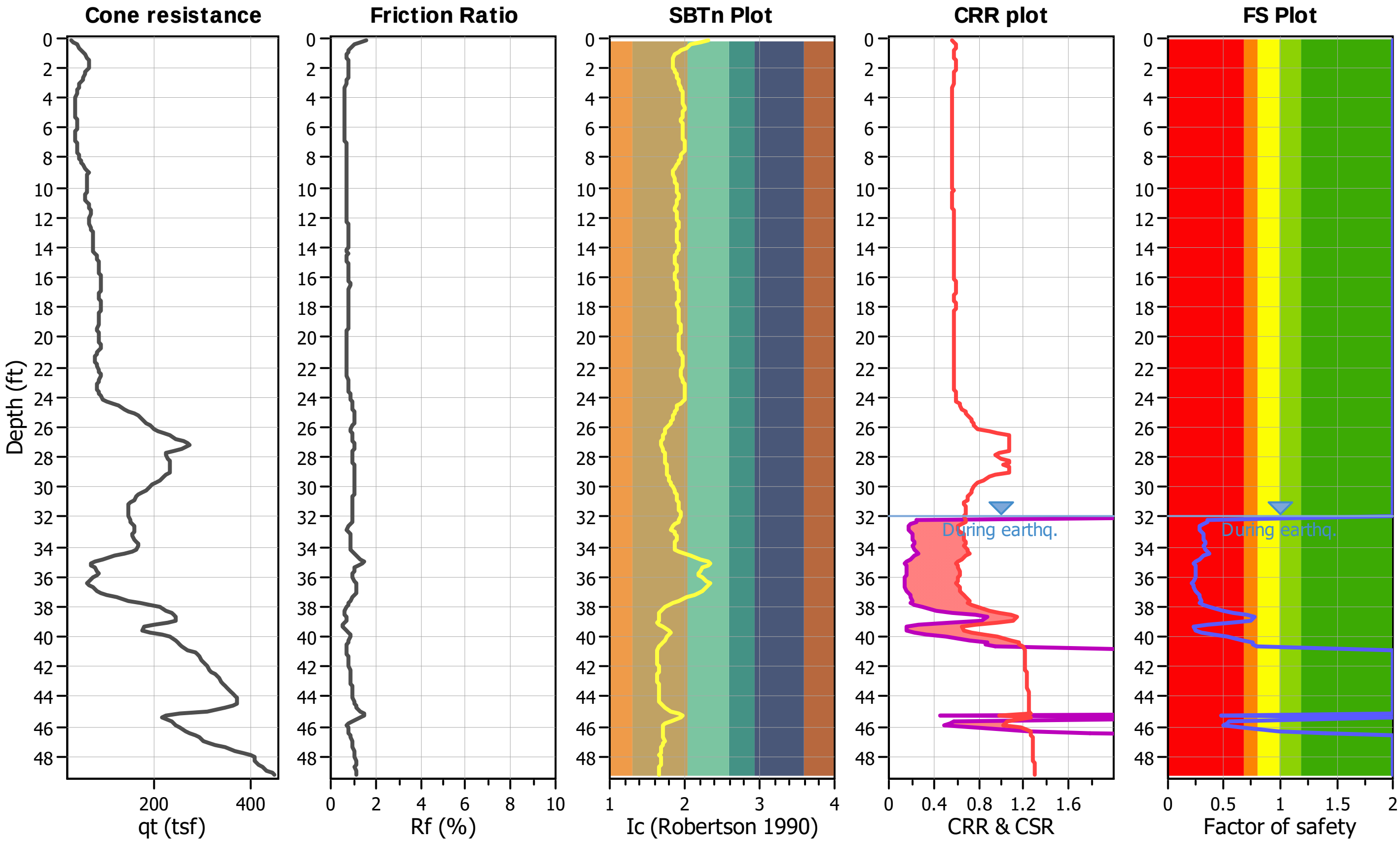
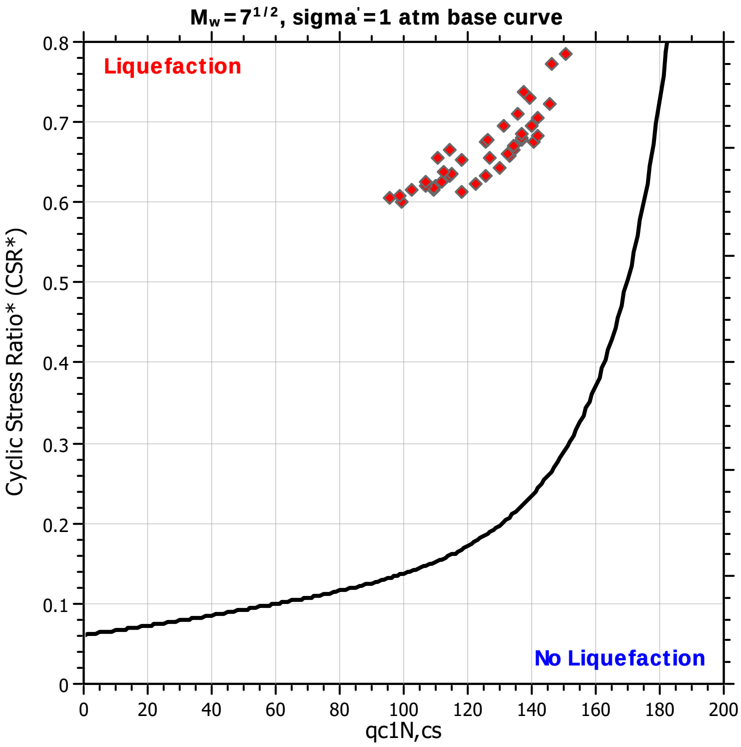
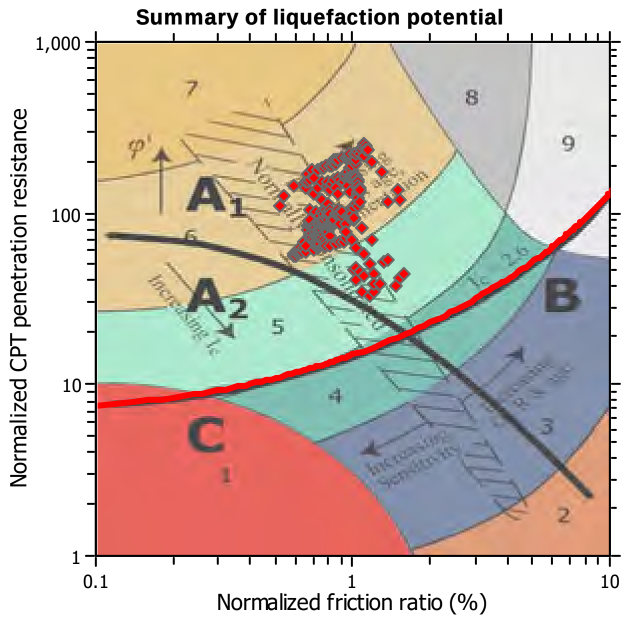
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
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LIQUEFACTION ANALYSIS REPORT

Project title : Microtel Inn and Suites **Location : Florence, OR**

CPT file : 21020 CPT-6 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sand & Clay
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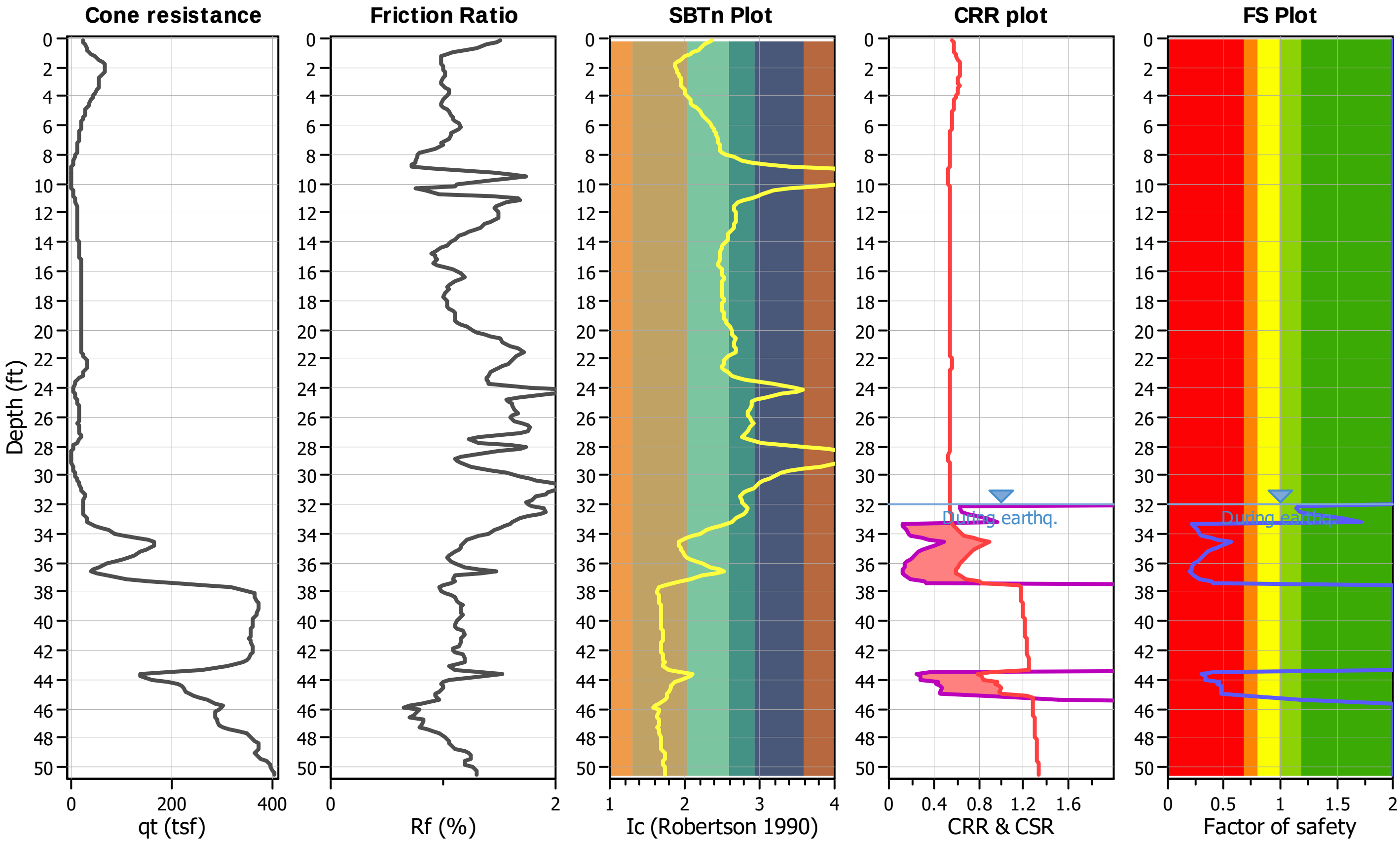
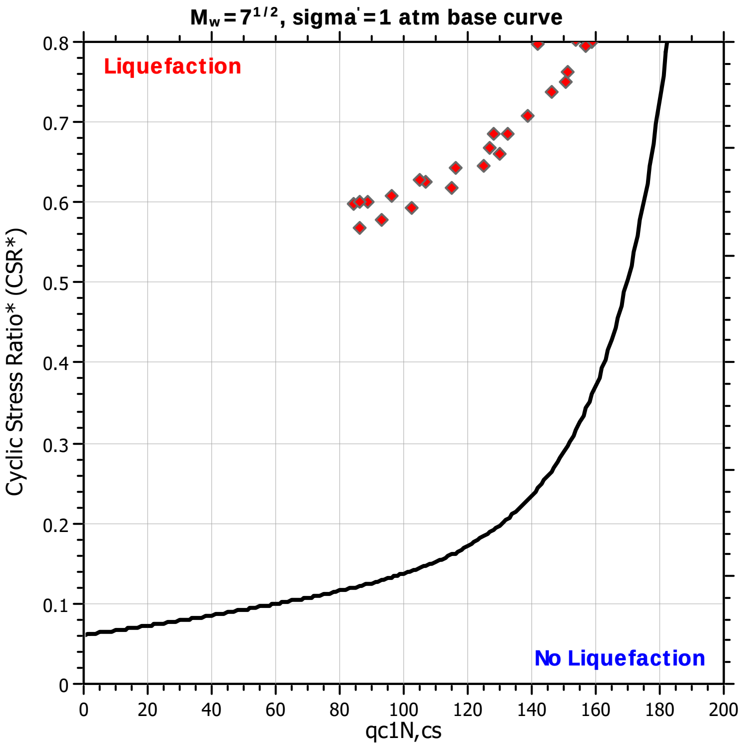
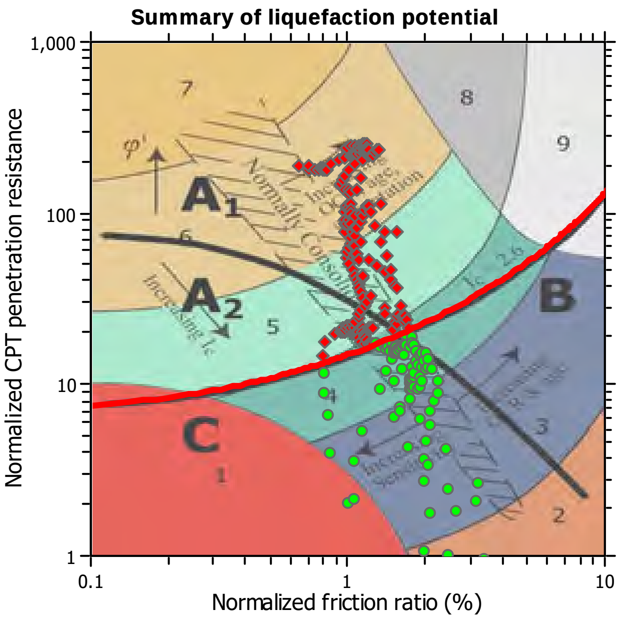
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Exhibit I2

GeoEngineers

Preliminary Geotechnical Engineering Services
750 Quince Street Property
Florence, Oregon

January 15, 2008

For
Wyndham Vacation Ownership, Inc.

Earth Science + Technology

PRELIMINARY GEOTECHNICAL ENGINEERING SERVICES
750 QUINCE STREET PROPERTY
FLORENCE, OREGON

JANUARY 15, 2008

FOR
WYNDHAM VACATION OWNERSHIP, INC.

GEOENGINEERS

File No. 12708-016-01

Preliminary Geotechnical Engineering Services
750 Quince Street Property
Florence, Oregon
File No. 12708-016-01

January 15, 2008

Prepared for:

Wyndham Vacation Ownership, Inc.
9805 Willows Road
Redmond, Washington 98052

Attention: Wayne Helm and Connie Andrews

Prepared by:

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Nancy L. Tochko

Nancy L. Tochko, PE
Geotechnical Engineer

Daniel J. Campbell

Daniel J. Campbell, PE
Principal, Geotechnical Engineer

1/15/08

REGISTERED PROFESSIONAL ENGINEER
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NOV. 12, 1996
DANIEL JOHN CAMPBELL

EXPIRES 12/31/09

NLT:DJC:ja
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Preliminary Geotechnical Engineering Services
750 Quince Street Property
Florence, Oregon
For
Wyndham Vacation Ownership, Inc.

INTRODUCTION

This report presents the results of our preliminary geotechnical engineering services for the Quince Street Property located at 750 Quince Street in Florence, Oregon. The Subject Property encompasses tax lot 900 in Florence. The location of the Subject Property is shown on the Vicinity Map, Figure 1. The preliminary footprint of the proposed buildings with respect to existing Subject Property features is shown on the Site Plan, Figure 2. This site plan is based on a preliminary site plan developed by the Myhre Group dated December 4, 2007.

Our studies were completed at the request of Wyndham Vacation Ownership, Inc. (Wyndham). We understand that Wyndham is interested in purchasing the property for us as a vacation facility. We further understand that the results of our Preliminary Geotechnical Assessment will be used by Wyndham as part of their evaluation of potential environmental liabilities associated with ownership and redevelopment of the property. This assessment was conducted concurrently with a Sensitive Areas Assessment and Phase I ESA and Limited Subsurface Assessment for the property, both by GeoEngineers.

The purpose of our preliminary geotechnical services is to evaluate subsurface conditions at the Subject Property as a basis for providing preliminary conclusions and general recommendations for development of the Subject Property as planned. Our evaluations included 1) review of available subsurface information, and 2) exploration of Subject Property subsurface soil conditions by completing three borings. Our services were completed in general accordance with our proposal dated November 29, 2007. We have also completed a Phase I environmental site assessment (ESA) and a wildlife and sensitive areas assessment for this property, the results of which are presented in separate reports.

PROJECT DESCRIPTION

The Subject Property is approximately 8.1 acres in size and triangular in shape, and includes an existing unused school building. The northwestern half of the Subject Property, which contains the existing building and cleared areas, is an upland terrace situated higher in elevation than the east and southeastern portion of the Subject Property, which consists of a low-lying wetland area along the north side of the Siuslaw River. We understand that Wyndham is interested in constructing a resort consisting of three four-high-story condominium buildings. The development plans for the Subject Property are preliminary at this time, and as such, structural loads are unknown at this time. We anticipate the loading to be similar to those of other three- to four-story residential structures.

FIELD EXPLORATIONS AND LABORATORY TESTING

Field Explorations

The subsurface soil and ground water conditions near the proposed building locations were evaluated by drilling three borings with subcontracted mud rotary drilling equipment owned and operated by Subsurface Technologies of North Plains, Oregon. The approximate locations of the borings completed for this project are shown the Site Plan, Figure 2. Details of the field explorations and logs of the explorations are presented in Appendix A.

LABORATORY TESTING

Soil samples were collected during drilling and taken to GeoEngineeers' laboratory for further evaluation. Representative samples were tested to determine their gradation characteristics. A description of the laboratory testing and the test results are presented in Appendix B.

SITE CONDITIONS

GEOLOGY

Published geologic information for the project vicinity includes the U.S. Geological survey of Oregon (Walker and MacLeod, 1991). Mapped soils in the project vicinity consist of dune deposits with younger alluvial deposits adjacent to the river banks.

TOPOGRAPHY AND SURFACE CONDITIONS

The Subject Property is located just north of the Siuslaw River and approximately 3 miles southeast of where the mouth of the Siuslaw River enters the Pacific Ocean. The Siuslaw River is located approximately 850 feet south of the Subject Property. The majority of the Subject Property consists of a relatively level upland area situated about 45 feet higher than the lower wetland area adjacent to the Siuslaw River. The upland area is roughly triangular in shape, with the upland area about 150 feet wide east to west at the southern end, about 300 to 325 feet wide east to west near the northern end, and about 700 feet long in the north-south direction. The Subject Property slopes down gradually to the north of the existing vacant school building with abrupt downward slopes east and south of the building. Between the upland and lower wetland area, the ground surface slopes moderately to steeply down to the lower portion of the Subject Property. Munsel Creek flows south through the northeastern portion of the Subject Property directly to the Siuslaw River.

A vacant school building currently occupies about half of the upland area, with the school and associated parking situated near Quincy Street. The remainder of the upland area is mostly covered with grass and scattered scotchbroom. The slopes that exist within the Subject Property are generally less than 45 feet high. The slope gradient between the upland and wetland area varies from about 30 percent on the south-southeastern slopes to 60 percent on the northeastern slopes. The slopes are vegetated with coniferous and deciduous trees, with undergrowth. We observed no evidence of slope instability or mass-wasting processes occurring on the slopes during our field reconnaissance.

SUBSURFACE CONDITIONS

Based on the three borings completed for this project, the subsurface conditions generally consist of upper loose to medium dense sand dune deposits underlain by denser sand deposits. GEI-1, situated in the northern portion of the Subject Property, encountered 10 to 12 feet of loose fine sand. At a depth of about 12 feet, the sand grades to medium dense, becoming dense to very dense below a depth of about 20 feet. GEI-2 and GEI-3 encountered medium dense sand with looser zones to a depth of about 20 to 25 feet, below which the sand grades to dense to very dense. These deposits were encountered to the maximum depth explored (52 feet).

Groundwater Conditions

Ground water was encountered at a depth of about 45 feet in GEI-3, which corresponds closely to the elevation of the lower wetland area. No groundwater was encountered in the remaining borings. We anticipate that groundwater levels will fluctuate as a result of season, precipitation and other factors.

GEOLOGIC HAZARD/SENSITIVE AREA CONSIDERATIONS

General

Sensitive areas with respect to steep slopes are discussed in this section. Sensitive areas pertaining to streams and wetlands are described in a separate report. The City of Florence regulates development on slopes inclined greater than 12 percent. Specifically, Florence Code Title 10, Chapter 7, Section 3G states:

> *Slopes greater than 12 percent and development on steep slopes, a foundation design and grading provision for retaining walls or excavated banks shall be carried out according to plans prepared by a registered engineer and approved by the City of Florence* (FCC 10-7-2).

The City further regulates development on steep slopes that are defined as slopes inclined at gradients of 25 percent or steeper (City of Florence Development Code, Draft #2-April 2007). Based on a telephone conversation with a City of Florence representative in the planning department, there is no codified setback from steep slopes. However, the City typically requires a 50-foot setback from steep slopes, similar to the standard buffer for other sensitive areas. Other sections of the Code refer to a "Hazard Map"; however, we were unable to locate the City of Florence hazard map at the time this report was prepared.

The slopes at the Subject Property were evaluated for slope percentage using a hand held slope inclinometer instrument. Our initial reconnaissance of the slope indicates that the slopes are inclined from about 30 to 60 percent, with the majority of the slopes inclined between 30 and 50 percent. We observed no evidence of slope instability or mass-wasting processes occurring on the slopes during our field reconnaissance.

It is our opinion that specific construction methods consisting of appropriate foundations and setbacks, erosion control measures, and drainage enhancements can be utilized at the Subject Property to mitigate potential hazards that might be associated with the steep slopes.

Slope Stability Evaluation

The stability of the slopes adjacent to the seasonal watercourse was evaluated using the computer program SlopeW version 5.20 (GEO Slope International, Ltd, 2004). We evaluated both static conditions and seismic conditions. The seismic conditions were evaluated for a horizontal coefficient of acceleration equal to two thirds of the peak ground acceleration (PGA) according to the Unites States Geologic Survey (USGS). The analysis was primarily carried out to determine the setback distance for the buildings from the top of the slope.

The slope geometry was constructed from our inclinometer measurements of the slope. A slope inclination of 55 percent was used for our analyses. Soil parameters and water levels used in our analyses are based on our subsurface explorations and our geologic reconnaissance. Stability analyses for existing and anticipated loading conditions, including seismic loading, were performed.

The results of our analysis indicate that, locally, the slopes at the Subject Property are stable against deep seated failures (factor of safety greater than 1.5 for static conditions and 1.1 for seismic conditions). Potential for deep-seated slope instability that would affect the structural integrity of the proposed buildings is low, provided the slopes are maintained and the structures are supported as recommended in subsequent sections. Our stability analyses show shallow surface failures could develop on the steeper portions of the slope surfaces during extreme wet weather conditions or during the design earthquake events.

Slope Setback

The preliminary site plan shows the proposed buildings located about 35 to 50 feet from the approximate crest of the slope. Based on our understanding of the proposed locations of the new buildings in relation to the existing slope and other Subject Property features, it is our opinion that from a geotechnical standpoint, the buildings may be located closer than 50 feet from the top of the slope provided the foundations for the buildings extend a sufficient depth below grade to provide a suitable horizontal setback to the face of the slope to protect the structures in the event of shallow slope failures. We recommend that shallow foundations be set back at least 20 feet from the crest of the slope (measured horizontally from the face of the foundation). This recommendation assumes that the construction of the proposed development will not result in an increased discharge of water over the slope face and that drainage recommendations presented in the following section are incorporated into the design and construction of the project. If the buildings are situated within 30 feet of the crest of the slope, GeoEngineers should review the foundation layout and plans to verify that all foundations are setback the recommended distance.

Slope Maintenance and Surface Drainage

Although the Subject Property slopes are considered stable against deep-seated failure, excessive disturbance and/or poor Subject Property drainage can destabilize the near surface soils. At no time should loose uncontrolled fill or debris (including organic debris) be cast over or placed on the slope. Excavated or import material should not be stockpiled on or near the top of the slopes. At this time, we do not anticipate that the project will include any construction activity on the slope. However, if any slope areas are disturbed during construction, we recommend that disturbed slope areas be protected by placing plastic sheeting on the slope face until the slope can be replanted. Final landscaping should include deep rooted low growing plants to provide stability to the surface soils. Proper maintenance of vegetation on steep slopes will further reduce the potential for surface soil movement.

Proper drainage is imperative for long-term slope stability. The influx of water is a major factor in the destabilization of slopes. At no time during or after construction should surface water be discharged to or near slopes or retaining structures. Surface water from downspouts, foundation drains, upslope retaining wall drains and runoff from the driveway and other surfaces should be collected and tightlined to the bottom of the steep slope or other approved location. Curbs or other appropriate measures should be used to direct surface water runoff to collection points. Drain lines, catch basins and other drainage features should be inspected and maintained on a regular basis. Preferably, drainage should not be infiltrated on this Subject Property; if infiltration facilities are required, we should be consulted to evaluate the potential of infiltration on the stability of the existing slopes.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

We conclude that the proposed development can be successfully completed from a geotechnical perspective provided the considerations presented in this report are incorporated into the project planning and design. Building foundation loads are expected to be relatively light. We anticipate that most of the buildings can be supported on conventional spread footings bearing on a zone of structural fill underlain by the native sand deposits. As discussed previously, the buildings will need to be set back an appropriate distance from the existing slope.

EARTHQUAKE ENGINEERING

GeoEngineers evaluated the Subject Property for seismic hazards including liquefaction, lateral spreading, fault rupture and earthquake-induced slope instability. Our evaluation indicates that the Subject Property has a low risk of seismic hazards..

We recommend the IBC 2006 seismic design parameters for Average Field Standard Penetration Resistance, Site Class, short period spectral response acceleration (S_S), 1-second period spectral response acceleration (S_1), and Seismic Coefficients F_A and F_V presented in Table 1.

Table 1. IBC Seismic Parameters

2006 IBC Parameter	Recommended Value
Site Class	D
Short Period Spectral Response Acceleration, S_S (percent g)	141
1-Second Period Spectral Response Acceleration, S_1 (percent g)	69
Seismic Coefficient, F_A	1.0
Seismic Coefficient, F_V	1.5

The spectral response values are based on the 2002 United States Geologic Survey Seismic Hazard Maps available at http://earthquake.usgs.gov/research/hazmaps/interactive/index.php.

Liquefaction Evaluation

Liquefaction refers to a condition where vibration or shaking, usually from earthquake forces, results in the development of excess pore water pressures in saturated soils causing loss of soil strength. In general, soils susceptible to liquefaction include loose to medium dense saturated cohesionless soils, but can occur in soils with grain sizes varying from silt to gravel. Ground settlement, lateral spreading and/or sand boils may results from soil liquefaction. Structures supported on liquefied soils could suffer foundation settlement or lateral movement that could cause structural damage.

Our subsurface explorations conducted at the Subject Property indicate deposits of loose sand to a depth of about 20 feet below the topsoil. However, groundwater was encountered at a depth of about 45 feet, and based on the presence of free-draining sand at the Subject Property, we do not anticipate that groundwater will typically be within the upper 20 feet of the surface. Thus, in our opinion there is a low risk of liquefaction at the Subject Property.

Fault Rupture

The nearest mapped active fault to the Subject Property is located about 20 miles from Florence. Because no known active faults are situated in the vicinity of the Subject Property, the risk of fault rupture is low in our opinion.

Earthquake Induced Slope Instability

As previously discussed, we evaluated the stability of the steep slope that separates the upland and lowland areas of the Subject Property under seismic conditions consistent with those described in Table 1. Our analyses indicate sufficient safety factors under earthquake induced loading for deep-seated failure surfaces; shallow failures could develop on the slope surfaces under seismic conditions with factors of safety less that 1.1.

FOUNDATIONS

Based on the soil conditions encountered at the Subject Property, we believe it is feasible to support three- to four-story buildings on conventional spread footings across the Subject Property. Due to the loose to medium dense condition of the native sand in the upper 20 feet across the Subject Property, we recommend that the proposed buildings be supported on shallow spread footings founded on a zone of properly compacted structural fill. In addition, foundations located along the top of steep slopes must be located at a depth such that the horizontal distance from the face of the foundation to the face of the slope is at least 20 feet.

We recommend that all spread foundations be founded on a thickness of structural fill equal to half of the footing width, or 2 feet, whichever is greater. The zone of structural fill should extend laterally beyond the footing edges a horizontal distance at least equal to the thickness of the fill. Exterior footings should be founded a minimum of 18 inches below the lowest adjacent grade. Interior footings should be founded a minimum of 12 inches below slab subgrade. Continuous wall footings should have minimum widths of 16 inches, and column footings should have a minimum width of 24 inches. All footing subgrades should be compacted to at least 95 percent maximum dry density (MDD) as determined in accordance with ASTM D-1557, after the footing excavation is complete and prior to placing reinforcing steel and concrete.

An allowable soil bearing value of 3,000 psf (pounds per square feet) may be used for footings supported on a zone of structural fill as described above. This allowable soil bearing value applies to the total of dead and long-term live loads and may be increased by up to one-third for wind or seismic loads.

We estimate that post-construction settlement of footings founded as recommended above will be less than 1 inch and differential settlements will be less than ½ inch over a 25-foot length of continuous wall footing or between comparably loaded column footings.

Loose or disturbed soil not removed from the footing excavations prior to pouring concrete will result in increased settlement. We recommend that the footing subgrades be observed by a representative of GeoEngineers, Inc. prior to placement of concrete to confirm that the foundation subgrade has been adequately prepared and the zone of structural fill is placed and compacted in accordance with our recommendations.

Lateral Resistance

Lateral loads can be resisted by passive resistance on the sides of the footings and by friction on the base of the footings. Passive resistance should be evaluated using an equivalent fluid density of 300 pcf where footings are surrounded by structural fill compacted to at least 95 percent of MDD, as recommended. The structural fill should extend out at least a distance equal to two and one-half times the depth of the foundation element from its face. Resistance to passive pressure should be calculated from the bottom of adjacent floor slabs and paving or below a depth of 1 foot where the adjacent area is unpaved, as appropriate. Frictional resistance can be evaluated using 0.30 for the coefficient of base friction against footings. The above values incorporate a factor of safety of about 1.5.

If soils adjacent to footings are disturbed during construction, the disturbed soils must be recompacted, otherwise the lateral passive resistance value must be reduced.

SLAB-ON-GRADE FLOOR

Properly compacted structural fill prepared as recommended in the Earthwork Section of this report will provide satisfactory support for on-grade slabs. We recommend that there should be at least 12 inches of properly compacted structural fill below on-grade slabs. We recommend that a GeoEngineers representative evaluate all slab subgrades before placing structural fill. As discussed in the "Subgrade Preparation" section of this report, the subgrade soils, if disturbed by construction activities, should be recompacted, if possible, or excavated and replaced with structural fill to provide firm support of the floor slab. A 6-inch layer of imported clean washed gravel with a maximum particle size of 1-1/2 inches and negligible sand and silt should be placed directly below the slab to provide uniform support and form a capillary break beneath the slab. Prior to placing structural fill or the gravel layer, the subgrade should be proofrolled and compacted as described below in the "Earthwork" section of this report.

If water vapor migration through the slabs is objectionable, the gravel should be covered with a heavy plastic sheet, such as 10-mil plastic sheeting, to act as a vapor retarder. This will be desirable where the slabs will be surfaced with tile or will be carpeted. The contractor should be made responsible for maintaining the integrity of the vapor barrier during construction. It may also be prudent to apply a sealer to the slab to further retard the migration of moisture through the floor.

EARTHWORK

General

Based on the subsurface soil conditions encountered in our subsurface explorations, we expect that the soils at the Subject Property may be excavated using conventional construction equipment. Ideally, earthwork should be undertaken during extended periods of dry weather when the surficial soils will be less susceptible to disturbance and provide better support for construction equipment. Dry weather construction will help reduce earthwork costs.

Clearing and Subject Property Preparation

Areas to be developed or graded should be cleared of surface and subsurface deleterious matter including organic-rich topsoil, debris, shrubs, trees and associated stumps and roots. Vegetation, including the root mass and organic-rich topsoil, should be stripped and removed from the building and paving areas.

All unsuitable soils should be removed from below the building footprints to expose undisturbed native soils. If unsuitable soil is identified during grading, it should be removed and replaced with structural fill.

All existing utilities should be removed from the building footprints and rerouted if needed. All utility trenches leading into the structures should be backfilled with structural fill. Existing building foundations within the new planned building areas should be removed.

Subgrade Preparation

Prior to placing structural fill to support foundations or on-grade floor slabs, all subgrade areas should be evaluated by probing with a steel probe rod to locate any soft or pumping soils. If soft or pumping soils are observed they should be removed and replaced with structural fill.

After evaluating the exposed subgrade areas, the subgrade areas should be recompacted to a firm and unyielding condition, if possible. We recommend that the upper 12-inch thickness of all subgrade areas be recompacted to at least 95 percent of MDD.

Subgrade disturbance or deterioration may occur if the subgrade is wet and can not be dried. If the subgrade deteriorates during compaction, it may become necessary to modify the compaction criteria, soil material, or contractor's methods. The geotechnical engineer should evaluate the subgrade areas.

Structural Fill

All fill, whether existing on-site soil or imported soil, that will support floor slabs or foundations, or be placed as backfill in utility trenches, should generally meet the criteria for structural fill presented below. The suitability of soil for use as structural fill depends on its gradation and moisture content. We recommend all-weather structural fill consist of either crushed or well-graded sand and gravel containing less than 5 percent fines (material pass U.S. Standard No. 200 sieve) by weight relative to the fraction of the material passing the 3/4 inch sieve. During dry weather conditions, soils with a higher fines content may be suitable for use as structural fill. The fill material should be free of rock fragments larger than 4 inches, debris and organic material. We recommend that the suitability of structural fill material from proposed borrow sources be evaluated by the Geotechnical Engineer before the earthwork contractor is allowed to transport any material to the Subject Property.

Import and on-site soils planned for use as structural fill must be protected from moisture, and soil stockpiles should be covered with plastic sheeting.

Reuse of On-site Native Soils

Based on our explorations, most of the soils excavated for this project will be fine sand with less than 5 percent fines, if the upper siltier sod layer is carefully stripped and separated from the underlying sand. We anticipate that the sand deposits will be suitable for reuse for structural fill during dry and wet weather, although the sand may need to be moisture conditioned to achieve the required compaction.

Fill Placement and Compaction Criteria

Structural fill should be mechanically compacted to a firm, non-yielding condition. Structural fill should be placed in loose lifts not exceeding 8 to 10 inches in thickness. The actual thickness will be dependent on the structural fill material used and the type and size of compaction equipment. Each lift should be conditioned to the proper moisture content and compacted to the specified density before placing subsequent lifts. Structural fill should be compacted to the following criteria:

1. Structural fill in new pavement and hardscape areas, including utility trench backfill, should be compacted to at least 95 percent of the MDD estimated in accordance with ASTM D 1557.
2. Structural fill placed to support floor slabs and foundations should be compacted to at least 95 percent of the MDD estimated in accordance with ASTM D 1557.
3. Structural fill placed as crushed surfacing base course to support new pavements should be compacted to at least 95 percent of the MDD estimated in accordance with ASTM D 1557.
4. Non-structural fill, such as fill placed in landscape areas, should be compacted to at least 90 percent of the MDD estimated in accordance with ASTM D 1557. In areas intended for future development, a higher degree of compaction should be considered to reduce the settlement potential of the fill soils.

We recommend that a representative from our firm be present during placement of structural fill. Our representative will evaluate the adequacy of the subgrade soils and identify areas needing further work, perform in-place moisture-density tests in the fill to evaluate if the work is being done in accordance with the compaction specifications, and advise on any modifications to procedure that may be appropriate for the prevailing conditions.

Temporary Excavations

We anticipate that construction of utility, drainage, or sewer lines will require open excavations 3 to 5 feet deep. Vertical unsupported cuts should be limited to a 4 foot depth. This maximum depth may need to be reduced to a depth of 3 feet or less if sloughing occurs within zones of loose sand. All excavations should be designed to meet requisite shoring regulations. For planning purposes, excavations deeper than 3 to 4 feet should be inclined at 1½H:1V (horizontal to vertical) or flatter.

Foundation or utility excavations should be protected against any significant change in moisture content and disturbance by construction activity. These disturbed areas should be overexcavated and brought to design elevation with compacted structural fill or concrete. The bottom of the excavation should be free of all soft, loose, or disturbed material, and water prior to placement of concrete.

DRAINAGE CONSIDERATIONS

Design of Subject Property drainage should provide rainfall runoff and avoid ponding of water. We recommend that the ground surface be sloped to drain away from the proposed buildings such that surface water runoff is collected and routed to suitable discharge points.

Retaining wall and perimeter building footing drains should consist of perforated pipe, a minimum of 4 inches in diameter, and enveloped within a minimum thickness of 6 inches of washed gravel drain rock. A nonwoven geotextile fabric such as Mirafi 140N should be placed between the drain rock and on-site soils to prevent movement of fines into the drainage material. We recommend that the drain pipe consist of either heavy-wall solid pipe (SDR-35 PVC, or equal) or rigid corrugated smooth interior polyethylene pipe (ADS N-12, or equal). We also recommend against using flexible tubing for footing drain pipes. The drains should be sloped to drain by gravity, if practicable, and tightlined to a suitable discharge point, preferably a storm drain. We recommend that the cleanouts be covered and placed in flush mounted utility boxes. Water collected in roof downspout lines <u>must not</u> be routed to the footing drain lines. Collected downspout water should be routed to appropriate discharge points in a separate pipe system. Any collected water or runoff <u>must</u> be routed away from the top of the existing slope.

EROSION CONTROL

As previously discussed, weathering, erosion, and the resulting surficial sloughing and shallow soil movement are natural processes that affect steeply sloped areas. To reduce the risk of and slow these natural processes on the sloping portion of the Subject Property, we recommend the following:

- No discharge of concentrated surface water or sheet flow onto the slope area.
- Collect groundwater seepage from areas encountered during construction and route to a pipe system away from the slopes.
- No infiltration of surface water.
- Enhance vegetation along the top and face of the steep slopes. The vegetation should consist of ground cover, grass, shrubs, and low-growing (dwarf) trees which are indigenous to this area.

Temporary erosion control should be provided during construction activities and maintained until permanent erosion control measures are functional. Surface water runoff should be properly contained and channeled using drainage ditches, berms, swales, temporary ponds, and/or silt fences. To the extent practicable, construction techniques that minimize disturbance and removal of vegetation are recommended.

The removal of natural vegetation should be minimized and limited to active construction areas or areas where debris removal is necessary. Permanent measures for erosion control should include reseeding or replanting the disturbed areas as soon as possible and protecting those areas until new vegetation has been established. Permanent Subject Property grading should be accomplished in such a manner that stormwater runoff is not concentrated and not directed to steeply sloping areas. Catch basins and tightlines should be used where necessary to direct storm or other surface water away from sloped areas. Surface water should be directed to appropriate stormwater disposal facilities in portions of the Subject Property away from slopes. Sheet flow from impervious surfaces should be directed to catch basins and the storm drainage system. Roof downspouts should be tightlined to stormwater disposal systems.

Recommended Additional Geotechnical Services

Throughout this report, recommendations are provided where we consider additional geotechnical services to be appropriate. These additional services are summarized below:

- GeoEngineers, Inc. should be retained to review the project plans and specifications when complete to confirm that our design recommendations have been implemented as intended.
- During construction, GeoEngineers should observe temporary cut slopes, observe removal of unsuitable soils from below building areas, evaluate the suitability of the foundation subgrades, evaluate the suitability of floor slab and hardscape subgrades, observe installation of subsurface drainage measures, observe and test structural backfill, and provide a summary letter of our construction observation services. The purpose of GeoEngineers construction phase services would be to confirm that the subsurface conditions encountered during construction are consistent with those observed in the explorations and for other reasons described in Appendix C titled Report Limitations and Guidelines for Use.

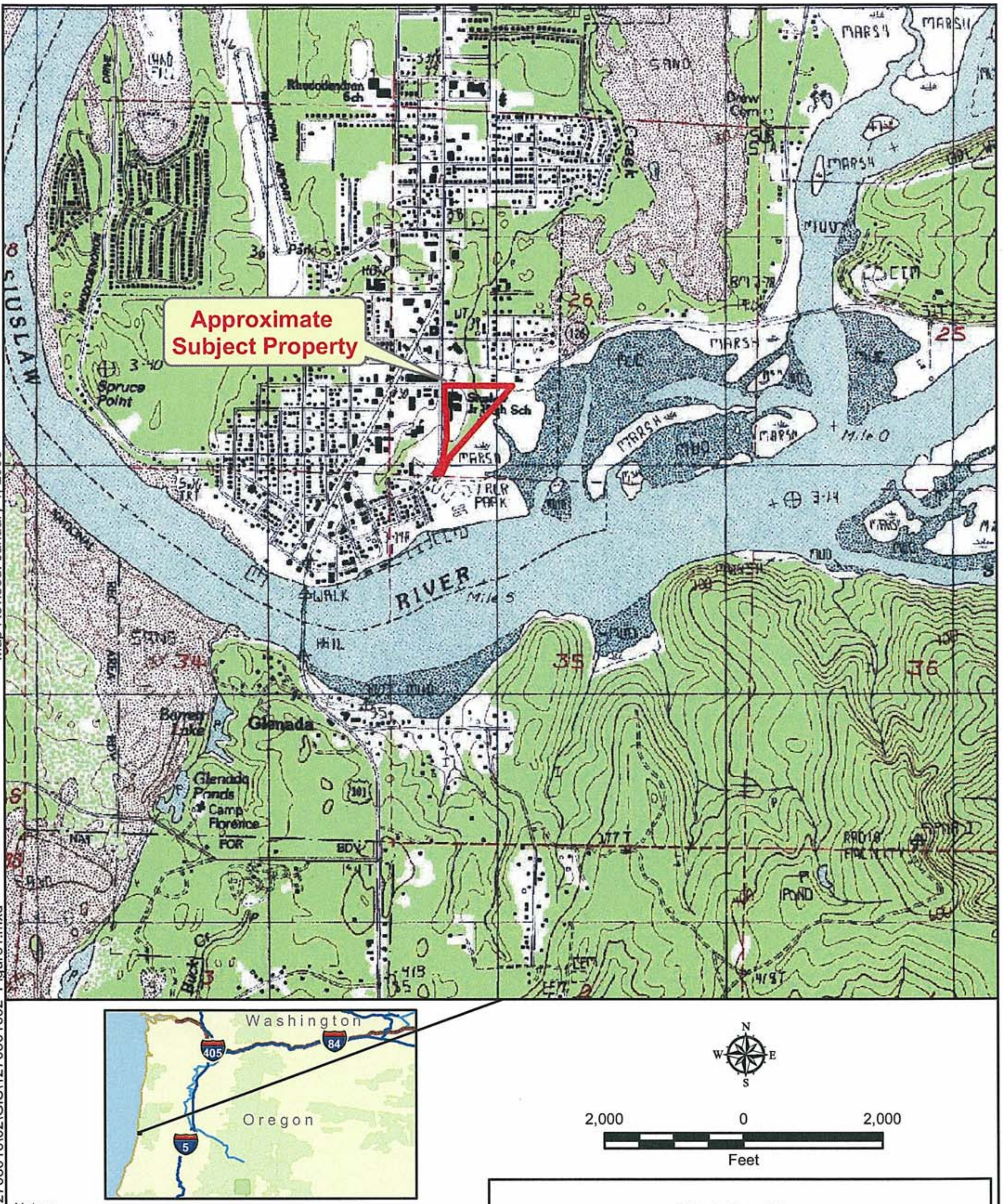
LIMITATIONS

We have prepared this report for the exclusive use of Wyndham Vacation Ownership Inc and their authorized agents for the proposed buildings at 750 Quince Street in Florence, Oregon.

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

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

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



Vicinity Map

Quince Street Property
Florence, Oregon

GEOENGINEERS

Figure 1

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

Data Sources: ESRI Data & Maps, Street Maps 2005
US Topographic map from National Geographic Society
Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Office: PORT Path: P:\12\12708016\02\GIS\1270801602 Figure1.mxd Map Revised: January 4, 2008

\REDMOND\PROJECTS\2\2708060\01\CAD\2708060\01F2.DWG\TAB:F2 MODIFIED BY LKNOWLTON ON JAN 14, 2008 - 11:55

Legend

GEI-1 Boring Location Completed on 12/17/2007

Notes:

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

Reference: Aerial image from PDF file converted to a image provided by Myhre Group, entitled Site Plan

Site Plan

750 Quince Street Property
Florence, Oregon

GEOENGINEERS

Figure 2

APPENDIX A
FIELD EXPLORATIONS

APPENDIX A
FIELD EXPLORATIONS

Subsurface conditions were explored at the Subject Property by drilling three borings. The borings were completed to depths ranging from about 36 to 52 feet below the existing ground surface by Subsurface Technologies of North Plains, Oregon on December 17, 2007. The locations of the explorations were located in the field by measuring distances from existing Subject Property features. The approximate locations of the borings are shown on the Site Plan, Figure 2.

Borings GEI-1,GEI-2, and GEI-3 were completed using truck-mounted, continuous-flight, mud rotary drilling equipment. The borings were continuously monitored by an engineer from our firm who examined and classified the soils encountered, obtained representative soil samples, observed groundwater conditions, and prepared a detailed log of each exploration.

The soils encountered in the borings were sampled at 2½- or 5-foot vertical intervals with a 2-inch outside diameter split-barrel standard penetration test (SPT) sampler. The samples were obtained by driving the sampler 18 inches into the soil with a 140-pound auto-hammer free-falling 30 inches. The number of blows required for each 6 inches of penetration was recorded. The blow count ("N-value") of the soil was calculated as the number of blows required for the final 12 inches of penetration. This resistance, or N-value, provides a measure of the relative density of granular soils and the relative consistency of cohesive soils. Where very dense soil conditions preclude driving the full 18-inches, the penetration resistance for the partial penetration was entered on the logs. The blow counts are shown on the boring logs at the respective sample depths.

Soils encountered in the borings were visually classified in general accordance with the classification system described in Figure A-1. A key to the boring log symbols is also presented in Figure A-1. The logs of the borings are presented in Figures A-2 and through A-4. The boring logs are based on our interpretation of the field and laboratory data and indicate the various types of soils and groundwater conditions encountered. The logs also indicate the depths at which these soils or their characteristics change; although, the change may actually be gradual. If the change occurred between samples, it was interpreted. The densities noted on the boring logs are based on the blow count data obtained in the borings and judgment based on the conditions encountered.

Observations of groundwater conditions were made during drilling. The groundwater conditions encountered during drilling are presented on the boring logs. Groundwater conditions observed during drilling represent a short term condition and may or may not be representative of the long term groundwater conditions at the Subject Property. Groundwater conditions observed during drilling should be considered approximate.

SOIL CLASSIFICATION CHART

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

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

ADDITIONAL MATERIAL SYMBOLS

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

Measured groundwater level in exploration, well, or piezometer

Groundwater observed at time of exploration

Perched water observed at time of exploration

Measured free product in well or piezometer

Stratigraphic Contact

Distinct contact between soil strata or geologic units

Gradual change between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Sampler Symbol Descriptions

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

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

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

Laboratory / Field Tests

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

Sheen Classification

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

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

KEY TO EXPLORATION LOGS

GEOENGINEERS

Figure A-1

Date(s) Drilled	12/17/07	Logged By	MCL	Checked By	NLT
Drilling Contractor	Subsurface Tech	Drilling Method	Mud Rotary	Sampling Methods	SPT
Auger Data	6 inches ID	Hammer Data	140 lb hammer/30 in drop automatic	Drilling Equipment	Truck Mounted
Total Depth (ft)	41.5	Surface Elevation (ft)	NA	Groundwater Level (ft. bgs)	Not Encountered
Vertical Datum		Datum/ System		Easting(x): Northing(y):	

Elevation feet	Depth feet	SAMPLES: Interval	SAMPLES: Recovered (in)	SAMPLES: Blows/foot	SAMPLES: Sub-Sample Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft^3	OTHER TESTS AND NOTES
	0							SOD	0 to 2 inches grass topsoil			
								ML	Dark brown silt with roots (soft, moist)			
								SP	Light brown fine sand (loose, moist)			
			8	6	1							
	5		12	7	2							
			14	4	3							
	10		12	12	4					16		SA; %F = 1.2
	15		10	17	5							
								SP	Brown fine sand with a trace of silt with orange mottling (medium dense, moist)			
	20		12	35	6				Grades to dense	16		SA; %F = 4
	25		12	50/6"	7				Grades to very dense			
	30											

Note: See Figure A-1 for explanation of symbols.

LOG OF BORING GEI-1

GeoEngineers

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Figure A-2
Sheet 1 of 2

Depth feet	Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft^3	OTHER TESTS AND NOTES
30		12	55	8							
35		10	50/4"	9			SP-SM	Light gray fine sand with silt (very dense, moist)			
40		10	50/4"	10							

45

50

55

60

65

V6_GTBORING P:\12\1270801601\FINALS\1270801601.GPJ GEIV6_1.GDT 1/14/08

LOG OF BORING GEI-1 (continued)

GEOENGINEERS

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Figure A-2
Sheet 2 of 2

Date(s) Drilled	12/17/07	Logged By	MCL	Checked By	NLT
Drilling Contractor	Subsurface Tech	Drilling Method	Mud Rotary	Sampling Methods	SPT
Auger Data	6 inches ID	Hammer Data	140 lb hammer/30 in drop automatic	Drilling Equipment	Truck Mounted
Total Depth (ft)	36.5	Surface Elevation (ft)	NA	Groundwater Level (ft. bgs)	Not Encountered
Vertical Datum		Datum/ System		Easting(x): Northing(y):	

Elevation feet	Depth feet	SAMPLES: Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft³	OTHER TESTS AND NOTES
	0							SOD	0 to 2 inches grass topsoil			
								ML	Dark brown silt with roots (soft, moist)			
								SP	Light brown fine sand (medium dense, moist)			
			12	15	1							
	5		14	17	2							
			8	4	3							
	10		6	7	4							
	15		8	13	5							
	20		18	22	6							
	25		12	42	7			SP-SM	Dark brown fine sand with silt (dense, moist)			
								SP	Light brown fine sand with orange mottling (dense, moist)			
	30											

Note: See Figure A-1 for explanation of symbols.

V6_GTBORING P:\12\12708016\01\FINALS\1270801601.GPJ GEIV6_1.GDT 1/14/08

LOG OF BORING GEI-2

GEOENGINEERS

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Elevation feet	Depth feet	SAMPLES: Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft^3	OTHER TESTS AND NOTES
	30		12	60	8							
								SP-SM	Gray fine sand with silt (very dense, moist)			
	35		4	50/4"	9			SP	Light brown fine sand (very dense, moist)			

40

45

50

55

60

65

LOG OF BORING GEI-2 (continued)

GeoEngineers

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Figure A-3
Sheet 2 of 2

Date(s) Drilled	12/17/07	Logged By	MCL	Checked By	NLT
Drilling Contractor	Subsurface Tech	Drilling Method	Mud Rotary	Sampling Methods	SPT
Auger Data	6 inches ID	Hammer Data	140 lb hammer/30 in drop automatic	Drilling Equipment	Truck Mounted
Total Depth (ft)	51.5	Surface Elevation (ft)	NA	Groundwater Level (ft. bgs)	45
Vertical Datum		Datum/ System		Easting(x): Northing(y):	

Elevation feet	Depth feet	SAMPLES Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft^3	OTHER TESTS AND NOTES
	0							SOD	0 to 5 inches grass topsoil			
								ML	Dark brown sit with roots (soft, moist)			
								SP	Light brown fine sand (medium dense, moist)			
			12	15	1							
	5		8	15	2					18		SA; %F = 2
			8	10	3							
	10		12	11	4							
	15		10	12	5							
	20		10	14	6							
								SP-SM	Light brown with orange mottling fine sand with silt (medium dense, moist)			
								SP	Light brown fine sand (dense, moist)			
	25		16	36	7					44		SA; %F = 1
	30											

Note: See Figure A-1 for explanation of symbols.

V6_GTBORING P:\12\12708016\01\FINALS\1270801601.GPJ GEIV6_1.GDT 1/14/08

LOG OF BORING GEI-3

GeoEngineers

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Figure A-4
Sheet 1 of 2

Elevation feet	Depth feet	Interval	Recovered (in)	Blows/foot	Sub-Sample / Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft^3	OTHER TESTS AND NOTES
	30		16	37	8							
	35		12	74	9			SP	Light gray fine sand (very dense, moist)			
	40		12	66	10			SP	Brown fine sand (very dense, moist to wet)			
								SP-SM	Light brown to gray fine sand with silt (dense, wet)			
	45		18	46	11	▼						
	50		18	50/4"	12							

55

60

65

V6_GTBORING P:\12\1270801601\FINALS\1270801601.GPJ GEIV6_1.GDT 1/14/08

LOG OF BORING GEI-3 (continued)

GeoEngineers

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Figure A-4
Sheet 2 of 2

GeoEngineers

Appendix B
Laboratory Testing

APPENDIX B
LABORATORY TESTING

GENERAL

Soil samples obtained from the borings were transported to our laboratory and examined to confirm or modify field classifications, as well as to evaluate engineering and index properties of the soil samples. Representative samples were selected for laboratory testing consisting of moisture content and grain size distribution determination. The tests were performed in general accordance with test methods of the American Society for Testing and Materials (ASTM) or other applicable procedures.

FULL SIEVE ANALYSES

Full sieve analyses were performed on four selected samples in general accordance with ASTM-D 422. The wet sieve analysis method was used to determine the percentage of soil greater than the U.S. No. 200 mesh sieve. The results of the sieve analyses were plotted, were classified in general accordance with the Unified Soil Classification System (USCS), and are presented in Figure B-1. The fines content (material pass U.S. Standard No. 200 sieve) for each sieve analyses performed are shown on the exploration logs at the respective sample depth.

12708-016-01 : CTS : saw 1-03-08 (Sieve.ppt)

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	EXPLORATION NUMBER	DEPTH (ft)	SOIL CLASSIFICATION
◆	B-1	10-11.5'	Light Brown fine sand (SP)
□	B-1	20-21.5'	Brown fine sand with a trace of silt (SP)
●	B-3	5-6.5'	Light Brown fine sand (SP)
▲	B-3	25-26.5'	Light Brown fine sand (SP)

GEOENGINEERS

SIEVE ANALYSIS RESULTS

FIGURE B-1

GeoEngineers

Appendix C
Report Limitations And Guidelines For Use

APPENDIX C
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

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

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES, PERSONS AND PROJECTS

This report has been prepared for the exclusive use of Wyndham Vacation Ownership, Inc. and his authorized agents for this project. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

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

A GEOTECHNICAL ENGINEERING OR GEOLOGIC REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

This report has been prepared for the proposed project at 750 Quince Street in Florence, Oregon. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

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

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

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

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

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

SUBSURFACE CONDITIONS CAN CHANGE

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

MOST GEOTECHNICAL AND GEOLOGIC FINDINGS ARE PROFESSIONAL OPINIONS

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

GEOTECHNICAL ENGINEERING REPORT RECOMMENDATIONS ARE NOT FINAL

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

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

A GEOTECHNICAL ENGINEERING OR GEOLOGIC REPORT COULD BE SUBJECT TO MISINTERPRETATION

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

DO NOT REDRAW THE EXPLORATION LOGS

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

Give Contractors a Complete Report and Guidance

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

Contractors Are Responsible for Site Safety on Their Own Construction Projects

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

Read These Provisions Closely

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

Geotechnical, Geologic and Environmental Reports Should Not Be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

Biological Pollutants

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

GeoEngineers

www.geoengineers.com

Exhibit I3

Wyndham Microtel

750 Quince Street

Florence, Oregon

STORMWATER PLAN

June 2022

Prepared by:

REGISTERED PROFESSIONAL ENGINEER
89522PE
OREGON
SEP 11, 2018
SEAN DEAN LLOYD
RENEWS: 12/31/22

Civil West Engineering Services, Inc.

Designer's Certification and Statement: I hereby certify that this Stormwater Management Report for Wyndham Microtel has been prepared by me or under my supervision and meets minimum standards of the City of Florence and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by me.

Table of Contents:

STORMWATER PLAN

WYNDHAM MICROTEL
FLORENCE, OREGON

1. Project Overview and Description

1.1 Size and Location of Project Site

The proposed development is a Microtel Hotel by Wyndham. The proposed hotel would be situated to the east of Quince Street in Florence, Oregon, across from the Florence Event Center, as shown in Figure 1, below. After proposed property line adjustments, the site would be approximately 3.05 acres.

Figure 1: Project Location

1.2 Property Zoning

The site is located in the Mixed use – Old Town Area C zone. There are areas of the existing site boundaries that are within the Natural Estuary zone, but this will be changed with the proposed lot line adjustments.

1.3 Type of Development/ Proposed Improvements

The proposal is to construct a commercial hotel on the site. This will consist of the hotel, asphalt parking lot, concrete sidewalks, and all necessary utilities, including an underground stormwater system. Please see attached Project Exhibits (Appendix A) for more details regarding the proposed improvements.

1.4 Watershed Description

The existing site and most of the surrounding area either sheet flows or is otherwise conveyed to either Munsel Creek to the northeast, or to the sloping hillside directly to the east. Both areas then flow into a low lying wetland before mixing with the Siuslaw River.

1.5 Permits Required

The project will require a DEQ 1200-C erosion control permit and any other construction permits that the City requires. Construction does not fall within a wetland, so no permitting with the Corps of Engineers or Department of State Lands will be required.

1.6 Existing vs. Post-Construction Conditions

The parcel in question at one point had a school on the site. Since then, it has been demolished and left undeveloped, occasionally being used as a material stockpiling area. Slopes range between 0-5% with the majority of the site sheet flowing to the east over the hillside. There is a mix of low lying vegetation and grass over predominantly soil sands, with some buried rubble from the previous school still remaining in some areas.

The proposed development will include an underground stormwater conveyance system and on site detention pond in order to infiltrate the stormwater, as well as provide treatment. This pond will entirely disperse the stormwater through infiltration.

2. Methodology

2.1 Drainage at Existing Site

2.1.1 Potential Impacts on the Proposed Site from Existing Conditions

Civil West Engineering does not foresee any measurable impacts to the existing site from the proposed development. The site is not currently being used and the proposed stormwater detention and treatment will discharge the drainage into the same aquifer that it is currently entering.

2.1.2 Potential Impacts from the Proposed Site on Existing Drainage

The existing site allows stormwater to either infiltrate or to sheet flow over the slope down into the wetland area to the east before ultimately entering the Siuslaw River. Because our proposed stormwater design relies on infiltration, we do not foresee any impacts to the drainage patterns.

2.1.3 Techniques for Mitigating Potential Conflicts or Problems

One concern that has been raised during planning discussions is that an outfall on the eastern slope could potentially cause erosion issues or unwanted concentrated flow onto an area that is planned to be developed into a trail along the estuary; however, by significantly oversizing our pond and utilizing the well drained soil in the area, emergency overflow will not occur even through the 100-year storm event. In the event that the pond was overtopped, the parking lot and system piping would provide extra storage.

2.2 Depth to Groundwater Testing Results

The Geotechnical Engineering Report attached (Appendix B) describes that the groundwater in the area is approximately 35-45' below ground surface, corresponding to the elevation of the lower marsh area.

2.3 Stormwater Management Narrative

Currently, the undeveloped site handles runoff primarily through infiltration. Anything that does not infiltrate sheet flows to the east, over the bank and into the estuary below. Our proposal is to develop the site while eliminating the need for additional outfalls.

We will install an underground storm drainage system that will convey the water to a stormwater treatment pond. Double chambered catch basins will be utilized in order to ensure that hydrocarbons and other pollutants are adequately removed. The stormwater will then infiltrate while being stored in the treatment ponds. Modeling shows that even with the 100-year storm event, the system will not overflow.

2.4 Demonstration of Maximized Infiltration and Vegetative Treatment

By using a large storage pond and the well drained native soil, our proposal utilizes infiltration to the maximum extent possible. The treatment ponds will be planted with a native wetland mix in order to provide additional treatment to the water.

3. Analysis

3.1 Design Assumptions

3.1.1 Design Storm Used

The design storm is an SCS Type 1A storm using the values below, taken from the Florence Stormwater Design Manual.

Figure 2: Design Storm

Return Frequency	24-hr Rainfall Depth (inches)
Water Quality Design Storm	
	0.83
Flow Control (or Flood Control) Storms[1]	
2- year	3.46
10-year	4.48
25-year	5.06
100-year	5.95

3.1.2 Computation Methods

The Performance Approach was the chosen method provided by the Florence Stormwater Design Manual. Specifically, we used NRCS TR-55 methodology utilizing SCS hydrographs.

3.1.3 Software Used

The software used for stormwater modeling was Autodesk Hydraflow Hydrographs. Impervious and pervious area calculations were performed using Autodesk Civil3D.

3.1.4 Safety Factors, Curve Numbers, and Design Coefficients

To evaluate the pre-developed site, the following curve numbers were used:

- 98 for any impervious areas
- 76 for gravel with group A soils
- 72 for dirt with group A soils
- 49 for fair condition open space with group A soils
- 39 for good condition open space with group A soils

To evaluate the proposed site, the following curve numbers were used:

- 98 for any impervious areas
- 39 for good condition open space with group A soils (landscaping)

See Figure 3 below, displaying the areas for each basin along with the corresponding curve numbers.

Figure 3: Basins

Areas (Acres):

Curve Numbers:	Pre-Developed Site	Proposed West
98 (Impervious)	0.06	1.86
76 (Gravel - Group A)	0.49	
72 (Dirt - Group A)	1.02	
49 (Open Space - Group A)	1.02	

39 (Open Space - Group A)	0.62	1.35
Composite Curve Number:	59.4	73

The Geotechnical Engineering Report provided an average infiltration rate of 64.25 in./hr. Our calculations used a value of 25 in./hr, providing a factor of safety of approximately 2.57.

When calculating time of concentration during pipe flow segments, a velocity of 3.5 feet/second was used. The remaining time of concentration segments were calculated using the TR-55 method to compute overland sheet flow.

3.1.5 Clarify Variations from the Norm

We are using a higher infiltration rate than the assumed values allowed by the Florence Stormwater Design Manual. Per the manual, this is allowed with a supporting Geotechnical Engineering Report. Please see the attached report in Appendix B.

3.1.6 Flow Rate Comparisons

Please see Figure 4 below, comparing the pre-developed vs. proposed site flow rates for each basin.

Figure 4: Flow Rates

Flow Rates (cfs):	Pre-Developed Site	Proposed
2 - Year Storm	0.103	0
10 - Year Storm	0.368	0
25 - Year Storm	0.61	0
100 - Year Storm	1.033	0

3.1.7 Emergency Overflow

As previously discussed, the emergency overflow will be to utilize the parking lot and piping as additional storage, but this will not occur until an event larger than the 100-year storm.

4. Engineering Conclusions

4.1 Compliance with Stormwater Design Manual

This design and corresponding report have been specifically tailored to the Florence Stormwater Design Manual. We believe that the proposed design will be an effective solution to the treatment and detention of stormwater on the proposed site.

4.2 Satisfaction of Water Quality, Flow Control, and Discharge Requirements

4.2.1 Water Quality

The primary treatment of stormwater will be via the sand and vegetation in the stormwater detention pond. Sand is an extremely effective filtration tool, and the wetland vegetation mix will help to keep the stormwater cool and allow for pollutants to be removed. In order to reduce maintenance in the pond and preserve the life of the wetland vegetation, double chambered catch basins will be installed prior to the pond inlet in order to pre-emptively remove hydrocarbons and other pollutants.

4.2.2 Flow Control

The attached stormwater modeling shows that the sizing and infiltration rates of the proposed facilities allows us to actually reduce the amount of runoff that travels off-site onto the eastern slope.

4.2.3 Discharge Requirements

By actually reducing flow off site with the development, we are complying with discharge requirements.

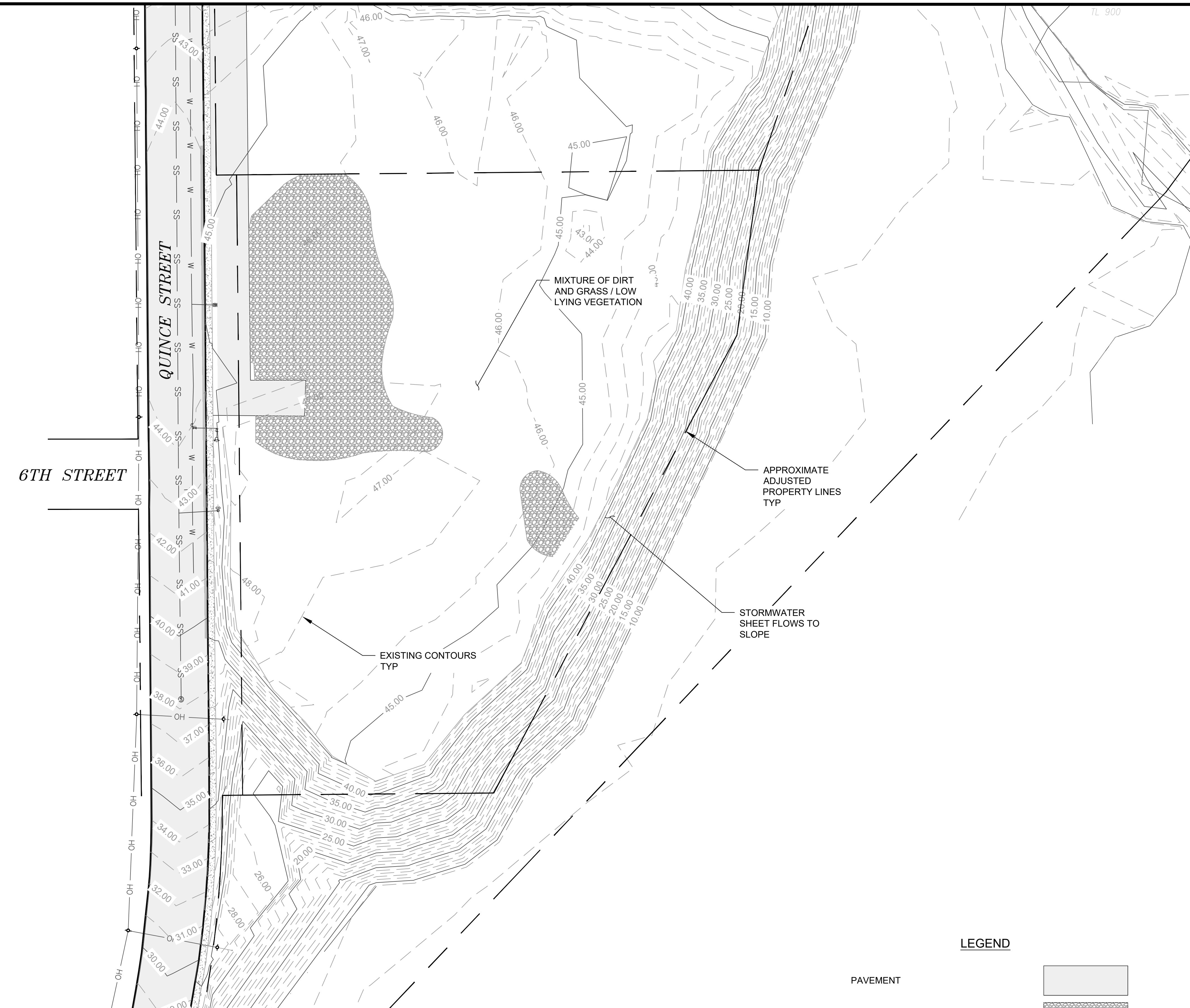
5. Stormwater Facility Details/Exhibits

Please see the attached Project Exhibits in Appendix A for a display of contours, impervious areas, and basin delineation. Please see separate landscape plans within the Land Use Submittal Package for Project Landscape Plans.

6. Operations and Maintenance Plan and O&M Form.

Please see the required O&M Form attached in Appendix D. An Operations & Maintenance Plan adhering to the requirements of Chapter 3 of the Portland Stormwater Management Manual will be submitted once land use approval is granted.

APPENDIX A: Project Exhibits



PLAN SCALE

40 0 20 40 80

1"=80'

1 EX 1 HYDROLOGY - PRE-DEVELOPED

N

LEGEND

PAVEMENT

GRANULAR MATERIALS SUCH AS CRUSHED ROCK OR GRAVEL

PRELIMINARY

Civil West Engineering Services, Inc.
609 SW Hurbert Street
Newport, Oregon 97365
541-266-8601
www.civilwest.com

REV.	DATE	DESCRIPTION	BY

Designed By: SDL Drawn By: SDL Checked By: SDL

Project No: 2204-165

WYNDHAM MICROTEL
QUINCE ST., LANE COUNTY, FLORENCE, OR

PRELIMINARY SUBMITTAL

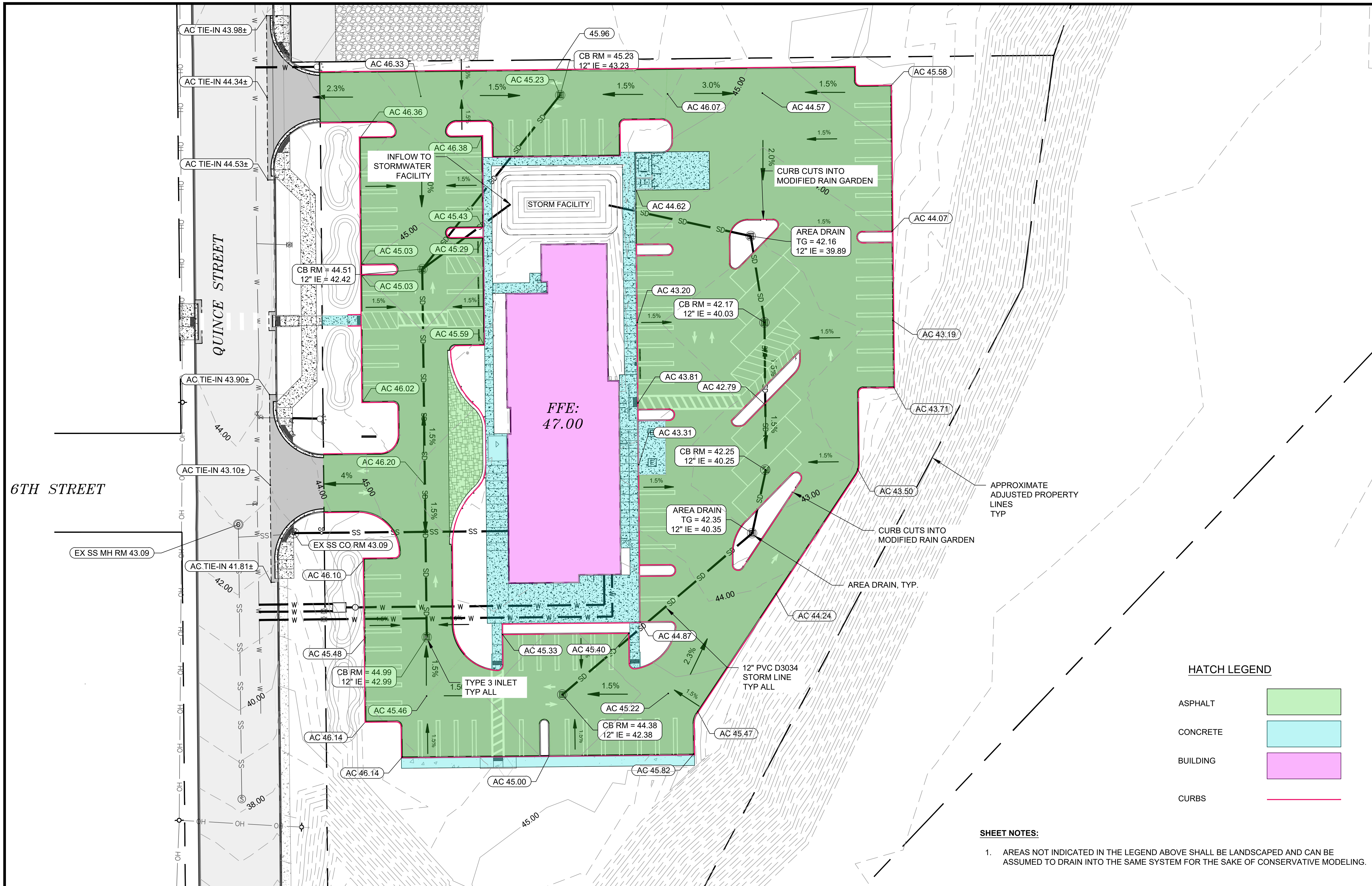
HYDROLOGY - PRE-DEVELOPED

Sheet No. EX 1

Date MAY 2022

DATE:5/23/22 FILE:O:\CW_Projects\2204 Misc Private Engineering Work\2204-165 Woodblock Architecture - Windham Microtel Florence Oregon\04 Final Design\Drawings\Dwg\Hydrology Pre-Dev.dwg

DATE:6/1/22 FILE:O:\CW_Projects\2204 Misc Private Engineering Work\2204-165 Woodblock Architecture - Windham Microtel Florence Oregon\04 Final Design\Drawings\Dwg\Hydrology Single Basin Revision 06012022.dwg



HATCH LEGEND

ASPHALT	
CONCRETE	
BUILDING	
CURBS	

SHEET NOTES:

1. AREAS NOT INDICATED IN THE LEGEND ABOVE SHALL BE LANDSCAPED AND CAN BE ASSUMED TO DRAIN INTO THE SAME SYSTEM FOR THE SAKE OF CONSERVATIVE MODELING.

PLAN SCALE

25 0 12.5 25 50

1"=50'

1 / EX 2 HYDROLOGY - DEVELOPED SITE

N

PRELIMINARY

Civil West Engineering Services, Inc.
609 SW Hurbert Street
Newport, Oregon 97365
541-266-8601
www.civilwest.com

REV.	DATE	DESCRIPTION	BY

Designed By: SDL
Drawn By: SDL & CSK
Checked By: SDL
Project No: 2204-165

WYNDHAM MICROTEL
QUINCE DR., FLORENCE, LANE COUNTY, OR

PRELIMINARY SUBMITTAL

HYDROLOGY - DEVELOPED SITE

Sheet No. EX 2

Date JUNE 2022

APPENDIX B: Geotechnical Engineering Report

PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

Proposed Microtel Inn and Suites
Tax Lots 18-12-26-33-00900 and 18-12-26-33-00901
Florence, Oregon 97439

Prepared for

Mr. Matt Braun
Braun Development Services
PO Box 13223
Portland, Oregon 97213

Prepared by

Professional Service Industries, Inc.
6032 North Cutter Circle, Suite 480
Portland, Oregon 97217

February 1, 2022

PSI Project No. 07041434

Staci Shub
Staff Geologist
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RENEWS: 06/30/2023
Britton W. Gentry, PE GE
Chief Engineer
britton.gentry@intertek.com

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1 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

This report presents the results of PSI's geotechnical investigation performed for the proposed l Microtel Inn and Suites located on a 13.41 acre site consisting of two connecting tax lots, 18-12-26-33-00900 and 18-12-26-33-00901, east of the intersection between Quince Street and 6th Street in Florence, Oregon. A Vicinity Map of the site location is presented on Figure 1. This investigation was performed for Mr. Matt Braun of Braun Development Services in general accordance with PSI proposal number 0704-359739, dated November 23, 2021. The proposal was authorized by Mr. Braun on December 14, 2021.

1.2 PROJECT DESCRIPTION

Based on correspondence with Matt Braun of Bran Development Services, Logan Miller of SFA Design Group, and Michael Parshall of Woodblock Architecture, and the provided site information, PSI understands that an approximately 10,000 square foot four story hotel will be constructed. A storm facility to the north of the building a parking lot and associated drive lanes will be on all sides, and a pergola and an uncovered patio to the south of the building will be construed. Currently the site is undeveloped. Prior to 2009 the site was occupied with a local middle school. The site school and associated structures have been demolished but evidence of a concrete slab on grade and concrete foundations are currently visible at the ground surface. We anticipate that the majority of the structural material from the school demolition has been removed from the site.

PSI anticipates the project will consist of construction of a 3 or 4 story structure supported on shallow foundations and slab on grade floors. Structural loads were provided by Mr. Logan Miller of SFA Design Group with column loads not to exceed 50 kips,and wall loads not to exceed 3 kips per foot.. Cuts and fills at the site are expected to be less than 4 feet. Maximum depth of utilities will be less than 8 feet.

Traffic loading for associated parking and pavement areas was not provided. However, we anticipate the proposed parking and drive lanes will be paved with asphalt concrete. Should any of the above information or design basis made by PSI be inconsistent with the planned construction, it is requested that you contact us immediately to allow us to make any necessary modifications to this report. PSI will not be held responsible for changes to the project if not provided the opportunity to review the information and provide modifications to our recommendations.

2 SITE AND SUBSURFACE CONDITIONS

2.1 SITE DESCRIPTION

The property is located east of the intersection between Quince Street and 6th Street in Florence, Oregon. The site is covered mostly with grass and brush. Remnants of the concrete pad from the

school still exist along Quince Street and the asphalt parking lot is still used for parking. It is bound on the north, west, and south by commercial and residential developments. Trees and tidal flats are located to the east with Munsel Creek and the Siuslaw River approximately ¼ mile further.

2.2 TOPOGRAPHY

A review of available USGS topographic maps indicate that the site consists of an upper terrace above the Siuslaw River at an elevation of about 47 feet above mean sea level (AMSL) The ground surface slopes moderately to steeply down to a wooded area adjacent to the marsh about 45 feet below the upper terrace.

2.3 GEOLOGY

The project site is mapped as being underlain by a layer of fine sandy and silty loam over Stabilized Dunes consisting of unconsolidated fine to medium grained sand. The sand is underlain by the Tyee Formation, rhythmically bedded siltstone and sandstone layers. Alluvial deposits and Tidal flats are mapped to the east, bordering Munsel Creek. These consist of alluvial clay, silt, sand, and gravel.

2.4 SUBSURFACE CONDITIONS

PSI completed the initial field exploration for Sycan B Corp on February 22, 2021 through February 24, 2021. The supplemental explorations for Braun Development services were performed on January 4, 2022. Field activities consisted of drilling six cone penetration test (CPT) probes, two GeoProbe explorations, and three geophysical refraction-microtremor (ReMi) lines. Supplemental explorations consisted of excavating 7 test pits to depths of 5 to 8 feet.

Soils

The materials and conditions disclosed by the recent explorations are generally consistent with our previous experience and understanding of the subsurface conditions at the site. In the vicinity of the proposed building, the site is typically mantled with sandy silt topsoil and dune sand underlain by alluvial soils consisting of predominantly silt and sand to a depth of about 113 ft to 116 ft. The alluvial silt and sand are interbedded and the interbeds are often massive and indistinct. The alluvial silt and sand are underlain by medium-dense to dense sandy gravel.

For the purpose of discussion, the materials encountered in the explorations have been grouped into the following categories based on their physical characteristics and engineering properties. Listed as they were encountered from the ground surface downward, the categories are as follows:

1. **SAND**
2. **SILT**

The following paragraphs provide a detailed description of the materials encountered and a discussion of the groundwater conditions at the site.

1. **SAND.** Native sand layers were encountered at the ground surface in all 6 CPT probes and extend to depths ranging from about 33 feet to 50 ½ feet. CPT probe tip resistances indicate the relative density of the sand are generally medium dense in the upper 10 to 12 feet and dense to very dense below.
2. **SILT.** Layers of silt were encountered within the sand in both CPT- 2 and CPT- 6 at depths of 4 feet and 8 feet and extend to depths ranging from about 8 feet to 34 feet, respectively. CPT probe tip resistances indicate the relative consistency of the silt are generally very soft to stiff.

2.5 GROUNDWATER

Our review of available subsurface information from previous investigations indicates the groundwater level in the project area is about 45 feet below the ground surface, which corresponds closely to the elevation of the lower marsh area. At the time of our initial investigation, groundwater was observed at a depth of approximately 35 feet in GeoProbe explorations GP1 and GP2. at the estimated groundwater elevations at the site based on pore pressure dissipation testing in the CPT probes is provided below:

Table 1 - Summary of Pore Pressure Dissipation Test Results

CPT	Pore Dissipation calculated Groundwater Depth (feet bgs)
1	33.4
2	32.2
5	35.2
6	37.1

Fluctuations in the groundwater level should be anticipated. It is recommended that the contractor determine the groundwater levels at the time of the construction to evaluate groundwater impact on construction procedures. Discontinuous zones of perched water may also exist, or develop, within the silt layer encountered during our exploration. If groundwater conditions are found to be different from those determined in this report PSI should be notified to determine if changes to our recommendations are warranted.

2.6 LOCAL FAULTING AND SEISMIC DESIGN PARAMETERS

PSI has reviewed the USGS Quaternary Fault and Fold Database of the United States. Table 1 summarizes distance and names of the closest mapped faults within about 10 miles of the project site.

Table 2 - Summary of Published, Nearby Faults

Fault Name	Approximate Distance (miles) and Direction from the Site
Cascadia Fault and Fold Belt	6.2, southwest
Unnamed Siuslaw River Anticline	8.6, northeast

For preliminary seismic design considerations, we have assumed that a fundamental period of less than 0.5 seconds and a damping ratio of 5% are appropriate to characterize the planned structure. Based on the results of subsurface explorations, geophysical testing, and our review of geologic mapping, we recommend using soil Site Class D to evaluate the seismic design of the structure. Site coefficients and spectral acceleration parameters for structural design are provided in Table 2.

Table 3 - Seismic Design Parameters

(43.9727 °, -124.1003 °) – SITE CLASS "D"

ASCE 7-16 CODE BASED RESPONSE SPECTRUM MCER GROUND MOTION - 5% DAMPING 1% IN 50 YEARS PROBABILITY OF COLLAPSE	
S_S	1.402
S_1	0.737
MAPPED MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL RESPONSE ACCELERATION PARAMETER (SITE CLASS D)	
F_A	1.0
F_V	1.7 - SEE ASCE 7-16 SECTION 11.4.8*
S_{MS}	1.682
S_{M1}	1.253 - SEE ASCE 7-16 SECTION 11.4.8*
DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETER	
S_{DS}	0.935
S_{D1}	0.835 - SEE ASCE 7-16 SECTION 11.4.8*

*Factors dependent on structural design

Notes: SS = Short period (0.2 second) Mapped Spectral Acceleration
S1 = 1.0 second period Mapped Spectral Acceleration
SMS = Spectral Response adjusted for site class effects for short period = FA • SS
SM1 = Spectral Response adjusted for site class effects for 1-second period = Fv • S1
SDS = Design Spectral Response Acceleration for short period = 2/3 • SMS
SD1 = Design Spectral Response Acceleration for 1-second period =2/3 • SM1
FA = Short Period Site Coefficients
FV = Long Period Site Coefficients

2.7 LIQUEFACTION POTENTIAL

The potential for liquefaction and cyclic softening at the site was evaluated using the methods recommended by Idriss and Boulanger (I&B) 2008 and revised to Boulanger and Idriss (B&I) in 2014. For this procedure, the earthquake-induced cyclic shear stresses within the soil profile, designated by the term cyclic stress ratio (CSR), were estimated using the CPT data, earthquake magnitude distance pairs, estimated PGA values and the computer program CLIQ v3.0.3.4.

Based on our review of the 2014 USGS interactive deaggregation the Cascadia Subduction Zone (CSZ) represents the majority of the the seismic hazard at the site. For our liquefaction analysis, we considered MW 9.1 Cascadia earthquakes, and assumed a groundwater level of approximately 32 to 37 feet below the ground surface. The results of our evaluation indicate the poorly graded

sand that extend beyond a depth of about 32 feet in CPT2, 35 feet in CPT5, and 43 feet in CPT6 are susceptible to minor liquefaction during an MCE event. The silt soil encountered in CPT-6 will be subject to cyclic softening and could undergo some vertical or lateral deformation during a strong seismic event.

Our preliminary analysis indicates the potential for less than about 1 or 2 inches of seismically induced liquefaction settlement at the surface. Additional earthquake induced dry sand settlements is possible in the upper loose sands. Preliminary estimates of lateral spreading are on the order of about 6 inches based on evaluation of silt soil in CPT-6. However, we estimate that earthquake induced settlements experienced at the ground surface will be limited to dry sand settlement in the loose sands, due to the depth of the groundwater table and the unlikelihood that it would become perched in the well-drained sand at the ground surface.

2.8 TSUNAMI HAZARD

DOGAMI performed a government funded tsunami inundation assessment along the Oregon coast in 1995. In 2013, DOGAMI has performed a more thorough probabilistic assessment based on different magnitude CSZ events and prepared their findings in the “Local Source (Cascadia Subduction Zone) Tsunami Inundation Map” showing the current Tsunami Regions.

Based on the referenced map the site is located in a zone outside of Tsunami Hazard Areas based on “extra-large and large” CSZ earthquake events, correlating to magnitudes of approximately 9.0 and 9.1.

3 CONCLUSIONS AND RECOMMENDATIONS

The following preliminary geotechnical recommendations have been developed based on the subsurface conditions encountered at the site and PSI’s preliminary understanding of the proposed project. In PSI’s opinion, based on an evaluation of the data obtained, the proposed site is suitable for construction of the new additions, provided the geotechnical engineering recommendations in this report are followed.

The primary geotechnical related concerns at the site is the potential presence of concrete foundations and floor slab from the demolished buildings, the presence of the near surface loose sand, and the presence of over steepened sand slopes down to the lower elevation portion of the site. In this regard some over excavation and replacement of loose or disturbed sand should be anticipated, especially in the footprint of the proposed structures, in areas where the concrete foundations and floor slabs remain, or at the top of sand slope.

In addition, we recommend the geotechnical engineer to be involved in the layout of the proposed structures with respect to the slopes along the east and southern sides of the upper terrace. However, general recommendations for setbacks provided in the previous geotechnical report should be sufficient for preliminary layout planning purposes.

3.1 SITE PREPARATION

PSI recommends that construction debris, loose, soft, or otherwise unsuitable soils at the project site be stripped and removed from structural areas. Strippings will not be suitable for use as

structural fill and should be disposed of off-site or used only in landscape areas. Following stripping and prior to placement of structural fill, the exposed surface should be evaluated by a geotechnical engineer. Buried foundations, piping and utilities, if encountered, must be completely removed from below proposed building foundations and pavement areas. Should below-grade pipes remain, a risk of seepage or underground soil erosion may occur in the future.

PSI should observe the subgrade to identify any loose/soft or unsuitable areas. Any undocumented or uncontrolled fill should be completely removed, cleaned of any debris, and replaced as engineered fill. Where loose, soft or otherwise unsuitable soils are identified within structural areas of the project, these soils should be completely removed and replaced with structural fill. The Contractor should provide a contingency for the repair of loose, soft or otherwise unsuitable areas identified by the Geotechnical Engineer. Geotextile fabric or geotextile grid should be utilized to provide stabilization of the subgrade.

A proof roll using a fully loaded tandem-axle truck should be performed on finished subgrade elevations to identify any loose, soft or unsuitable areas of subgrade. Loose, soft or otherwise unsuitable soils in these areas should be over-excavated and replaced with properly placed and properly compacted structural fill.

3.2 EXCAVATION CONSIDERATIONS

Open excavations exceeding four feet are not anticipated; however, if they do occur, excavations should be performed in accordance with OSHA regulations as stated in 29 CFR Part 1926. The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor should evaluate the soil exposed in the excavations as part of the required safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified by local, state, and federal safety regulations. PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties’ compliance with local, state, and federal safety or other regulations.

During wet weather, earthen berms or other methods should be used to prevent runoff water from entering the excavations. The bottom of the excavations should be sloped to a collection point. Collected water within the foundation and utility trench excavations should be discharged to a suitable location outside the construction limits.

3.3 STRUCTURAL FILL MATERIALS

PSI should observe the subgrade prior to placing structural fill or structures to document the subgrade condition and stability. In areas where unsuitable soils are encountered and over excavation occurs below footings, the over excavation and structural fill should extend laterally a minimum distance that is equal to the depth of the excavation below the footing. In general, we anticipate the near surface sand soil will be suitable as structural fill.

General. All fill within building, pavement, and sidewalk areas should be placed as compacted structural fill. In areas where unsuitable soils are encountered and over excavation occurs below

footings, the over excavation and structural fill should extend laterally a minimum distance that is equal to the depth of the excavation below the footing. All structural fill materials should be compacted to at least 95% of the maximum dry density, at a moisture content within about 3% of optimum, as determined by ASTM D 1557. Coarse granular fill should be compacted until well keyed. No brush, roots, construction debris, or other deleterious material should be placed within the structural fills. The earthwork contractor's compactive effort should be evaluated on the basis of field observations, and lift thicknesses should be adjusted accordingly to meet compaction requirements. Additional information regarding specific types of fill is provided below.

Granular Fill. Imported granular fill materials should consist of sand, gravel, or fragmental rock with a maximum size on the order of 4 inches and with not more than about 5% passing the No. 200 sieve (washed analysis). Material satisfying these requirements can usually be placed during periods of wet weather. The first lift of granular fill placed over a fine-grained subgrade should be about 18 in. thick and subsequent lifts about 12 inches thick when using medium- to heavy-weight vibratory rollers. Granular structural fill should be limited to a maximum size of about 1 ½ inches when compacted with hand-operated equipment. We also recommend that lift thicknesses be limited to less than 8 inches when using hand-operated vibratory plate compactors.

Utility Trench Backfill. Utility trench backfill should consist of granular fill limited to a maximum size of about 1 ½ inches. The granular trench backfill should be compacted to at least 95% of the maximum dry density as determined by ASTM D 1557 in the upper 4 feet of the trench and to at least 90% of this density below this depth. The use of hoe-mounted vibratory plate compactors is usually most efficient for compaction of trench backfill. Lift thicknesses should be evaluated on the basis of field density tests; however, particular care should be taken when operating hoe-mounted compactors to prevent damage to the newly placed conduits. Flooding or jetting to compact the trench backfill should not be permitted. Native materials can be used for trench backfill in unimproved areas where a soft trench and future settlement of the backfill can be tolerated.

Free-Draining Fill. Free-draining material should have less than 2% passing the No. 200 sieve (washed analysis). Examples of materials that would satisfy this requirement include pea gravel and ¾ - to ¼ - inch, 1 ½ - to 3/4-inch, or 3- to 1-inch crushed rock.

3.4 FOUNDATIONS

Based on the subsurface conditions encountered, PSI anticipates that a building with four or less stories can be supported on spread footing foundations bearing on 12-inch thick section of crushed rock placed as structural fill. Based primarily on settlement considerations and minimum column and strip footing width of 3 feet and 24 -inches, respectively and minimum embedment depth of 1½ feet (deeper footing embedment's may be required to achieve adequate setback from slopes), footings established in accordance with these criteria can be designed on the basis of an allowable soil bearing pressure of 3,000 psf. This value applies to the total of dead load plus frequently and/or permanently applied live loads and can be increased by one third for the total of all loads; dead, live, and wind or seismic. If fill and/or other unsuitable soils are encountered at footing depth, the unsuitable material should be over excavated to firm subgrade material and replaced with granular structural fill. The over excavated areas should be backfilled with clean crushed rock and compacted to at least 95% of the maximum dry density as determined by ASTM

D 698 (Modified Proctor).

The total static settlement of footings designed in accordance with the recommendations presented above is estimated to be less than one inch. Differential settlements between adjacent foundation units should be less than half the total settlement across a distance of 40 feet. If the structure is not designed to accommodate these differential settlements, the use of grade beams may be considered to limit differential settlement across individual foundation elements under seismic events.

Horizontal shear forces can be resisted partially or completely by frictional forces developed between the base of spread footings and the underlying soil. The total shearing resistance between the foundation footprint and the soil can be computed as the normal force, i.e., the sum of all vertical forces (dead load plus real live load), times the coefficient of friction equal to 0.40 (ultimate value). If additional lateral resistance is required, passive earth resistance against embedded footings or walls can be computed using a pressure based on an equivalent fluid with a unit weight of 300 pcf. This design passive earth pressure assumes granular structural fill is used to backfill the footing excavation or the footings will be neat formed in situ.

3.5 FLOOR SLAB SUPPORT

PSI recommends the slab-on-grade be underlain by at least 12-inches of native sand soil removed and replaced as structural fill and capped with a minimum of 6-inch thick section of crushed angular "drain rock." The drain rock should be compacted until it is well keyed. In addition, it will be appropriate to install a durable vapor-retarding membrane beneath the slab-on-grade to limit the risk of damp floors in areas that will have moisture-sensitive materials placed directly on the floor. The vapor-retarding membrane should be installed in accordance with the manufacturer's recommendations.

In our opinion, a coefficient of subgrade reaction, k, of 150 pci can be used to characterize the support with a minimum thickness of 12-inches of "structural fill" (based on a 1x1-foot plate load). Depending on how the slab load is applied, the value should be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesionless soil:

Modulus of Subgrade Reaction, for $k_s = k\left(\frac{B+1}{2B}\right)^2$ cohesionless soil,

where: k_s = coefficient of vertical subgrade reaction for loaded area;
k = coefficient of vertical subgrade reaction for 1x1 square foot area; and,
B = width of area loaded, in feet.

3.6 EMBEDDED WALL DESIGN

We anticipate embedded walls for the project will be limited to elevator pits or loadings docks with a height of less than five feet. Design lateral earth pressures against a retaining wall or other embedded structure depend on the drainage condition provided behind the wall, the geometry of the backfill slope, and the type of construction, i.e., the ability of the wall to yield. The two possible conditions regarding the ability of the wall to yield include the active and at-rest earth pressure cases. The active earth pressure case is applicable to a wall that is capable of yielding slightly away from the backfill by either sliding or rotating about its base. A conventional cantilever retaining wall is an example of a wall that can develop the active earth pressure case

by yielding. The at-rest earth pressure case is applicable to a wall that is considered to be relatively rigid and laterally supported at the top and bottom and therefore is unable to yield. The following general recommendations for embedded wall design assume the wall backfill is compacted to 90% of ASTM D 1557, and the embedded wall is fully drained, i.e., hydrostatic pressure cannot act on the wall.

Walls that are allowed to yield by tilting about their base should be designed using a lateral earth pressure based on an equivalent fluid having a unit weight of 25 pcf for horizontal backfill. Non-yielding walls should be designed using a lateral earth pressure based on an equivalent fluid having a unit weight of 45 pcf for horizontal backfill. Surcharge loads on walls should be accounted for in the structural design of the walls.

Over compaction of the backfill behind walls should be avoided. In this regard, we recommend compacting the backfill to about 90% of the maximum dry density (ASTM D 1557). Heavy compactors and large pieces of construction equipment should not operate within 5 ft of any embedded wall to avoid the buildup of excessive lateral pressures. Compaction close to the walls should be accomplished using hand-operated vibratory plate compactors.

3.7 PAVEMENT

In lieu of project-specific traffic estimates, the following pavement design recommendations are based on our past experience with similar facilities and subgrade conditions.

For automobile parking areas, we recommend a pavement section consisting of 3 in. of asphaltic concrete (AC) over 8 in. of crushed rock base (CRB). For heavy truck traffic areas, the pavement section should consist of 4 in. of AC over 12 in. of CRB. These recommended pavement sections are based on the assumption that the subgrade consists of firm, undisturbed soil or sand structural fill and that the pavements will be constructed during the dry summer months. Proof rolling should be used to evaluate pavement subgrades. Any soft areas disclosed by the proof rolling will likely require over excavation and replacement with structural fill. Some contingency should be provided for the repair of any soft areas. If pavement construction is scheduled for the wet season, it will be necessary to increase the above-recommended base course sections.

Permanent, properly installed drainage is also an essential aspect of pavement design and construction. All paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as in sunken loading dock areas or around stormwater catch basins. Effective means to prevent saturation of the base course include installing subdrain systems below sunken loading docks and weep holes in the sidewalls of catch basins.

To provide quality materials and construction practices, we recommend that the pavement work conform to the "Standard Specifications for Highway Construction" used by the Oregon Department of Transportation.

3.8 DESIGN REVIEW AND CONSTRUCTION MONITORING

After plans and specifications are complete, PSI should review the final design and specifications so that the earthwork and foundation recommendations are properly interpreted and implemented. It is considered imperative that the Geotechnical Engineer and/or their representative be present during earthwork operations and foundation installations to observe the field conditions with respect to the design assumptions and specifications. PSI will not be responsible for changes in the project design or project information it was not provided, or interpretations and field quality control observations made by others. PSI would be pleased to provide these services for this project.

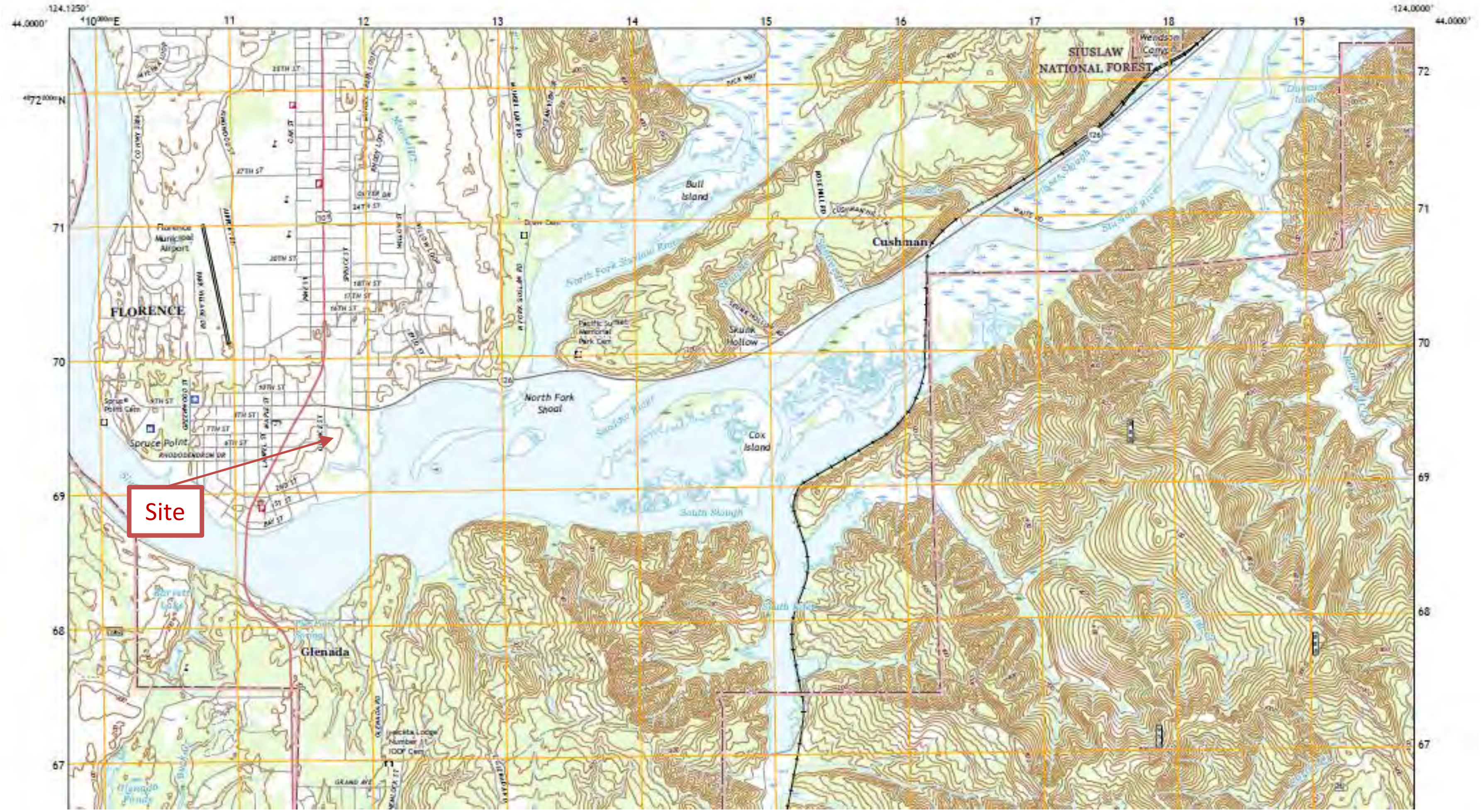
4 GEOTECHNICAL RISK AND REPORT LIMITATIONS

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the building and proposed pavement section will perform as planned. The engineering recommendations presented in the preceding sections constitute PSI's professional estimate of those measures that are necessary for the proposed building addition to perform according to the proposed design based on the information generated and referenced during this evaluation, and PSI's experience in working with these conditions.

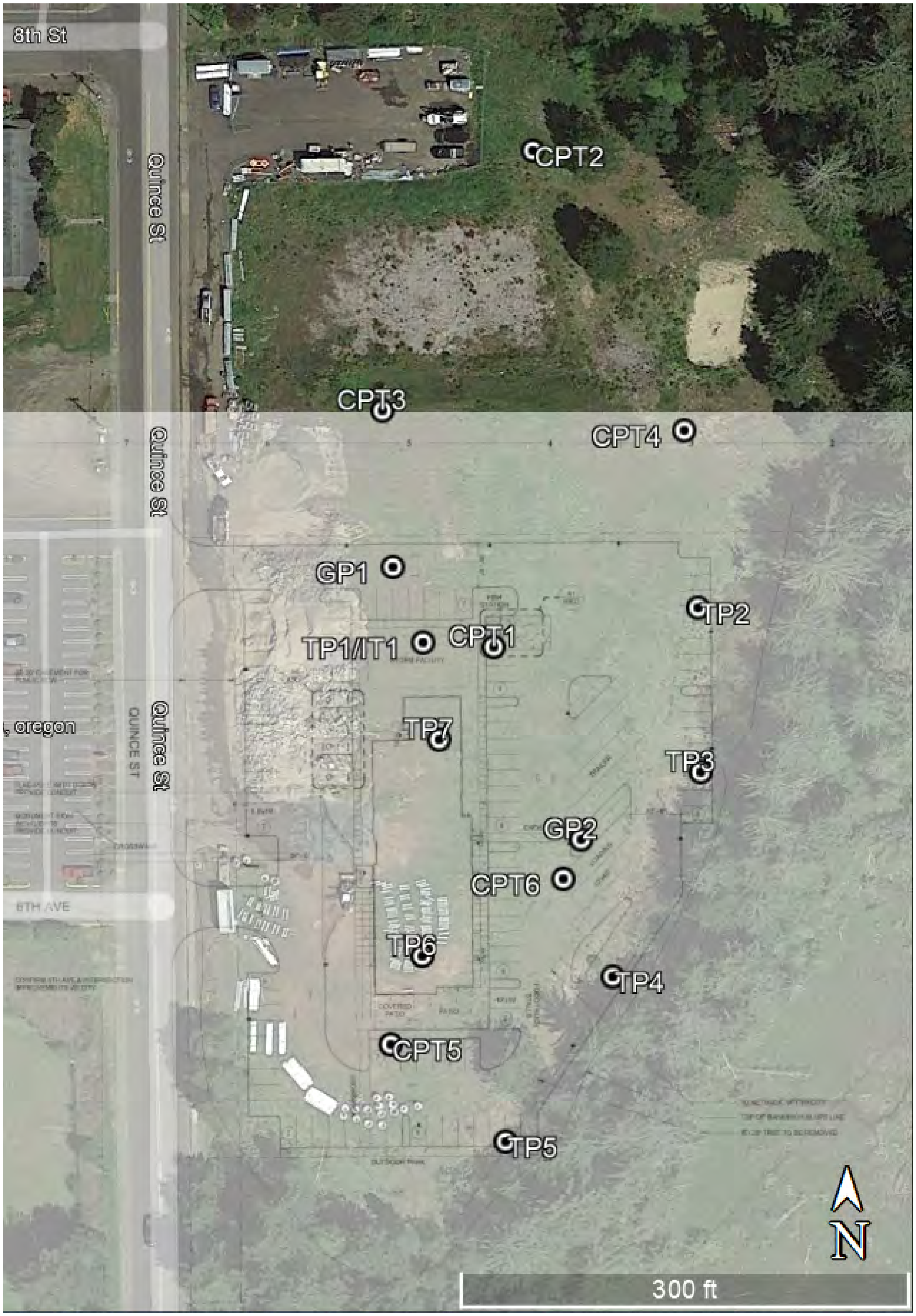
The recommendations submitted are based on the available subsurface information obtained by PSI, and information provided by Mr.Matt Braun. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the recommendations are required. If PSI is not retained to perform these functions, PSI cannot be responsible for the impact of those conditions on the performance of the project.

The Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of Mr. J. B. Jaramillo and his design consultants for the specific application to the proposed Microtel Inn and Suites located east of the intersection between Quince Street and 6th Street in Florence, Oregon.

FIGURES



USGS Florence Quadrangle Oregon - Lane County 7.5 Minute Series	intertek psi	Microtel Inn and Suites- Florence, OR	JOB NO.	7041434
		Site Vicinity Map	FIGURE NO.	1



intertek psi	DATE January 31 2022	Microtel Inn and Suites Florence, OR	PSI PROJECT #: 07041434
Obtained from Google Earth	DRAWN BY: SRS	**INVESTIGATION LOCATION PLAN**	**FIGURE 2**

APPENDIX A

FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATION PROGRAM

PSI completed the original field exploration of the project site on February 22, 2021, through February 24, 2021, using a track-mounted rig owned and operated by Oregon Geotechnical Exploration, Inc. of Kaiser, Oregon. The scope of the exploration included completion of six CPT probes and two direct push probes at the site. The CPT probes were designated CPT1 through CPT6 and the direct push probes were designated GP1 and GP2.

The supplemental explorations were conducted on January 4, 2022, using a tracked excavator provided by Dan J. Fisher Excavating, Inc. of Forest Grove, Oregon. The scope included the completion of seven test pits designated TP1 through TP7. The exploration locations were located in the field by PSI using handheld GPS. These exploration locations are presented on Figure 2. PSI notified Oregon's Utility Notification to locate public underground utilities and a Private Utility Locator to locate any potential private utilities in the vicinity of the proposed exploration locations prior to commencing the field activities.

Table 1 – Investigation Depths

Boring	Proposed Depth (feet)	Completion/Refusal Depth (feet)
CPT1	100	36.4*
CPT2	100	37.1*
CPT3	50	32.9*
CPT4	50	33.5*
CPT5	100	49.2*
CPT6	50	50.5*
GP1	20	38.5*
GP2	20	38.5*
TP1	10	5½**
TP2	10	8**
TP3	10	8**
TP4	10	8**
TP5	10	8**
TP6	10	7**
TP7	10	8**

* Refusal
**Caving

A representative from PSI's office observed the explorations and prepared borings logs of the conditions encountered. It should be noted that the subsurface conditions presented on the boring logs are representative of the conditions at the specific locations drilled. Variations may occur and should be expected across the site. The soil morphology represents the approximate boundary between subsurface materials and the transitions may be gradual and indistinct. Elevations referenced were obtained from the National Map developed by the United States Geological Survey (USGS) and should be considered approximations.

Infiltration Testing Procedure and Results

Based on the provided site plan, we understand that an infiltration facility is proposed in the northern portion of the site.

PSI performed a falling-head infiltration tests in general accordance with the EPA Design Manual, Onsite Wastewater Treatment and Disposal Systems, Table 3-8 Falling Head Percolation Test Procedure. Test pit TP-1 was excavated to a depth of 5 feet bgs and a 6-inch outside diameter pipe was set in the pit. The pipe was pushed down by the excavator bucket approximately 8 inches. At each infiltration location, the pipe was filled with between one to two feet of water a total of four times and the falling water level was recorded a various time interval during the test. Results of the infiltration testing are summarized below:

Table 1 – Field Infiltration Test Results

Infiltration Test	Duration (minutes)	Head (inches)	Average Infiltration Rate (inches/hour)
1	13	12.5	57
2	10	12	72
3	13	13	60
4	11	12.5	68

Please note that the infiltration rates shown above are measured rates and do not include a factor of safety. PSI recommends that a factor of safety of at least 2 be applied to this rate for design of infiltration systems.

Seismic Cone Penetration Test with Pore-Pressure Readings (SCPTu)

SCPTu is an in-situ testing method used to determine the geotechnical engineering properties of soils and to delineate soil lithology. SCPTu data is used in the analysis and design of foundations. SCPTu probing is a fast and cost-effective method for identifying subsurface soil types and evaluating the engineering properties of soils. The SCPTu records are presented in Appendix A.

During an SCPTu sounding, the electric cone (tip angle 60°, section area 10 cm^2) and the sounding rods are pushed continuously into the ground. Intermittent measurements of the cone resistance (q_t) and sleeve friction (f_s) are measured and recorded by the electric cone while it is being pushed into the ground.

The measurements from a SCPTu can be used to correlate a multitude of geotechnical parameters, including:

- Undrained shear strength (su)
- Effective friction angle (ϕ', degree)
- Coefficient of consolidation (Cv, cm^2/sec)
- Overconsolidation Ratio (OCR)

The results of the measured and correlated data are used in various geotechnical analyses, including soil behavior type, soil bearing capacity, estimated settlement, liquefaction settlement, lateral spread, foundation-design criteria, slope stability, and seismic site class.

Pore Pressure Dissipation Tests

Pore Pressure Dissipation Tests (PPDTs) were conducted at various intervals to measure equilibrium water pressure at the time of the SCPTu sounding. As the conditions are assumed to be hydrostatic, the equilibrium water pressure can be used to determine the approximate depth of the groundwater table. A PPDT is conducted when penetration is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (u) with time is measured using a piezometer fitted between the cone and the sleeve and recorded. Pore Pressure Dissipation Tests are provided below.

Downhole Shear Wave Velocity Measurements

Down hole shear wave velocity measurements were made while advancing each of the probes. This test consists of generating a shear wave by striking a hammer equipped with a trigger on a source beam located on the ground surface under the outrigger of the cone rig. The seismic cone consists of a piezocone unit with a receiver above it. The seismic cone penetrometer is pushed into the ground and penetration is stopped at 1-meter intervals. During the pause in penetration, a shear wave is generated at the ground surface and the time required for the shear wave to reach the seismometer in the cone penetrometer is recorded. The shear wave velocity measurements are used with elastic theory to estimate the mass density of the soil layers. Shear wave velocity measurements are provided below.

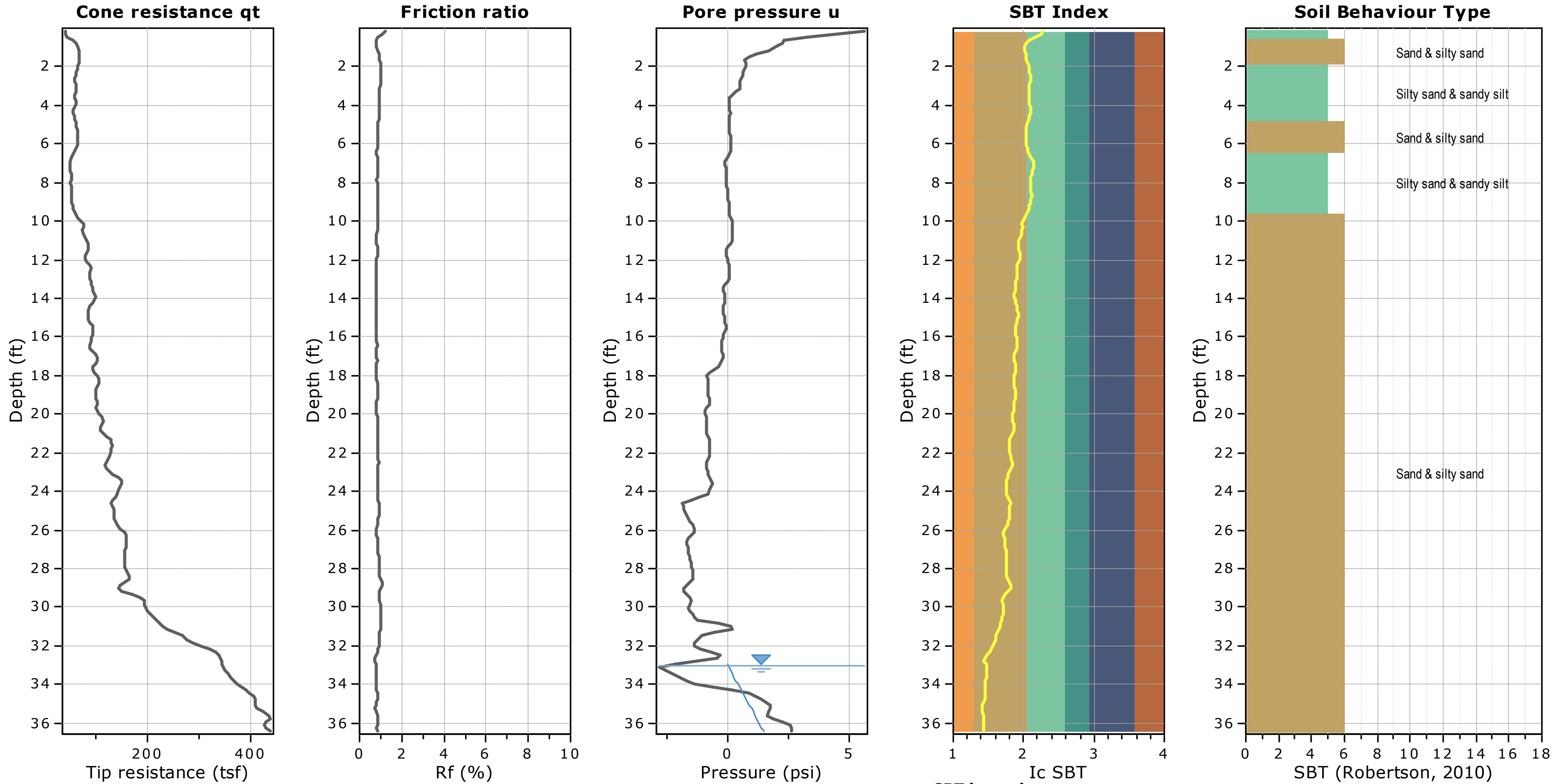
Field Classification

Soil samples were initially classified visually in the field. Consistency, color, relative moisture, degree of plasticity, and other distinguishing characteristics of the soil samples were noted. The terminology used in the soil classifications and other modifiers are depicted in the General Notes and Soil Classification Chart.

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-1 Text File
Total depth: 36.42 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

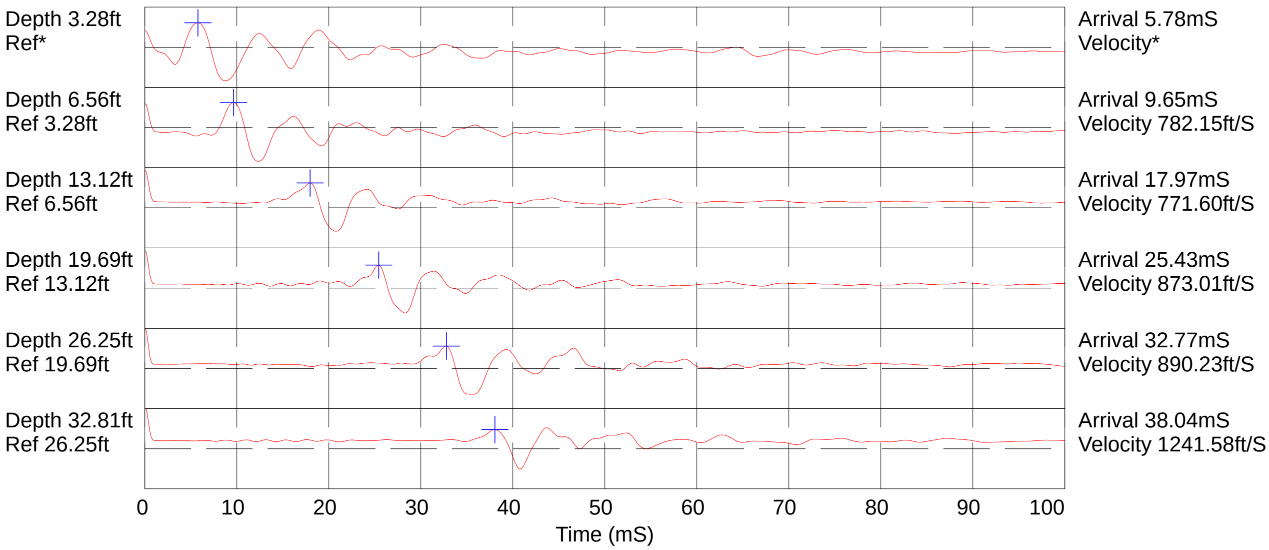
Project: **Microtel Inn and Suites - 07041434**
Location: **43.9727, -124.1003**



SBT legend

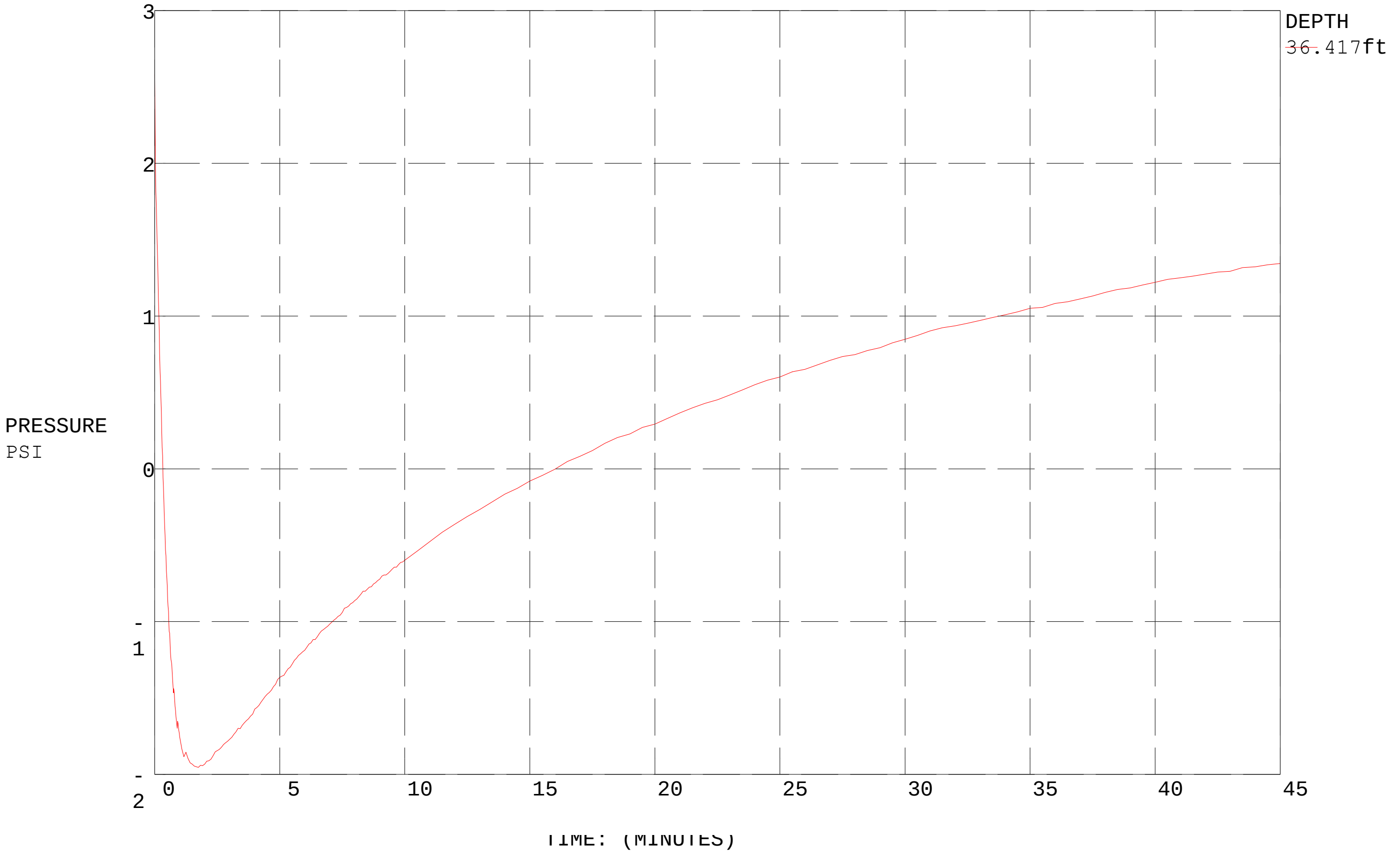
- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained

COMMENT: PSI / CPT-1 / 750 Quince St Florence



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-1 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A2**



MAXIMUM PRESSURE = 2.582 (PSI)
HYDROSTATIC PRESSURE = 1.499 (PSI), WATER TABLE: 32.96 ft

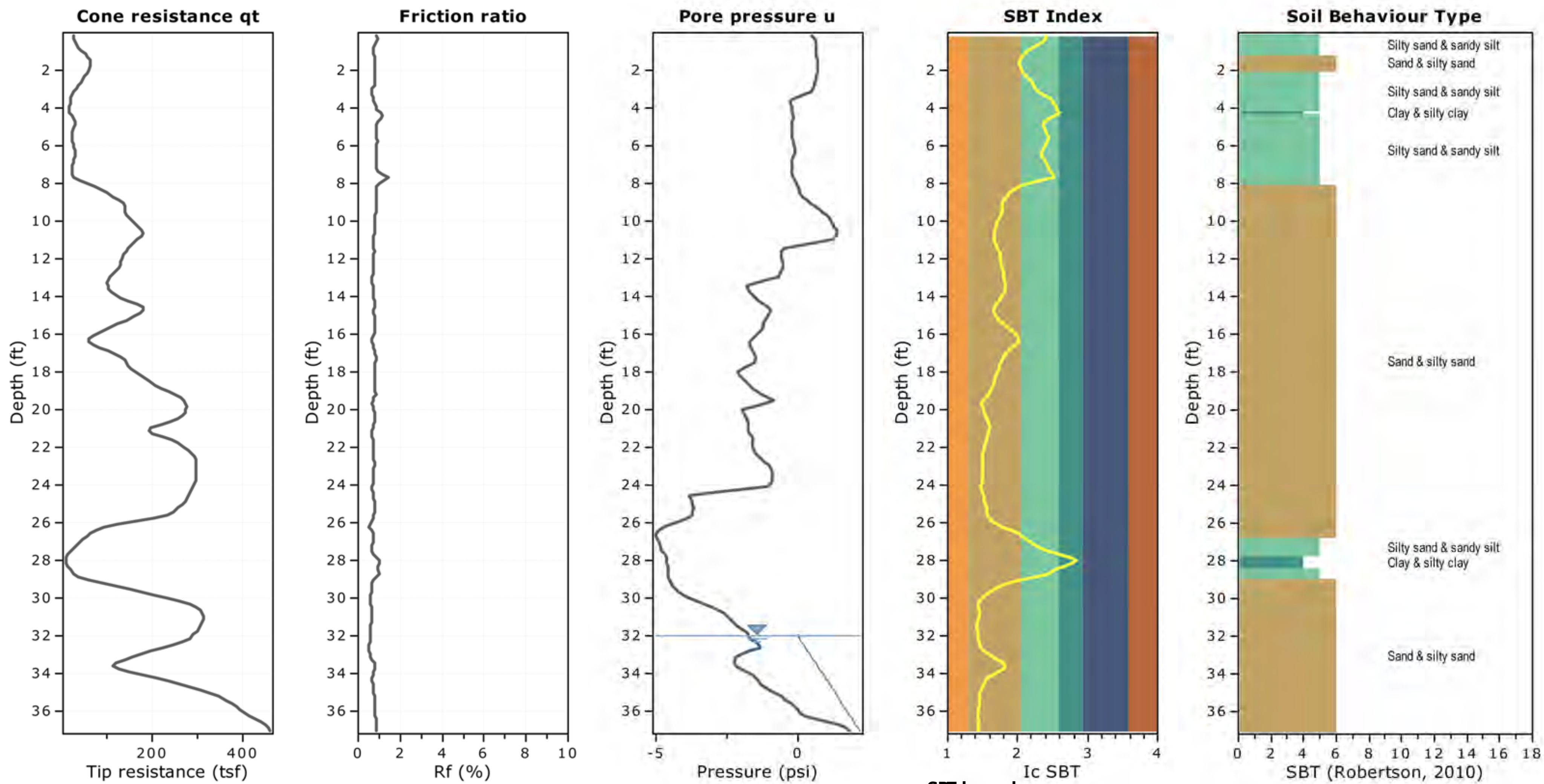
intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**

6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-1 PORE PRESSURE DISSAPATION MEASUREMENTS**	**FIGURE A3**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

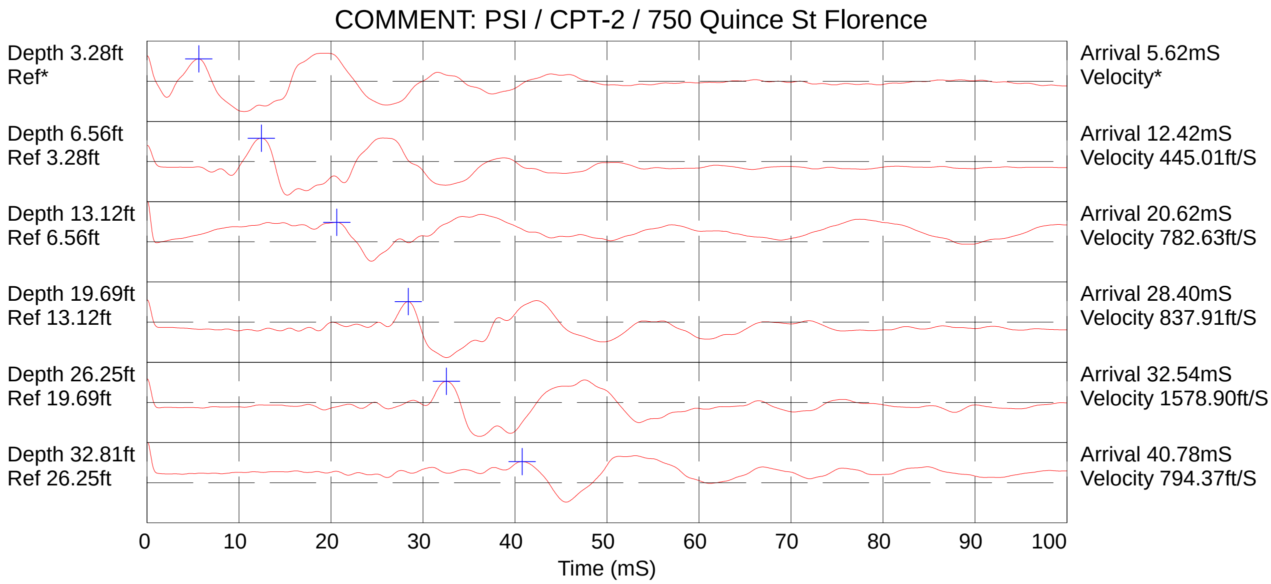
Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003

CPT: 21020 CPT-2 Text File
Total depth: 37.07 ft, Date: 2/23/2021
Surface Elevation: 44.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations



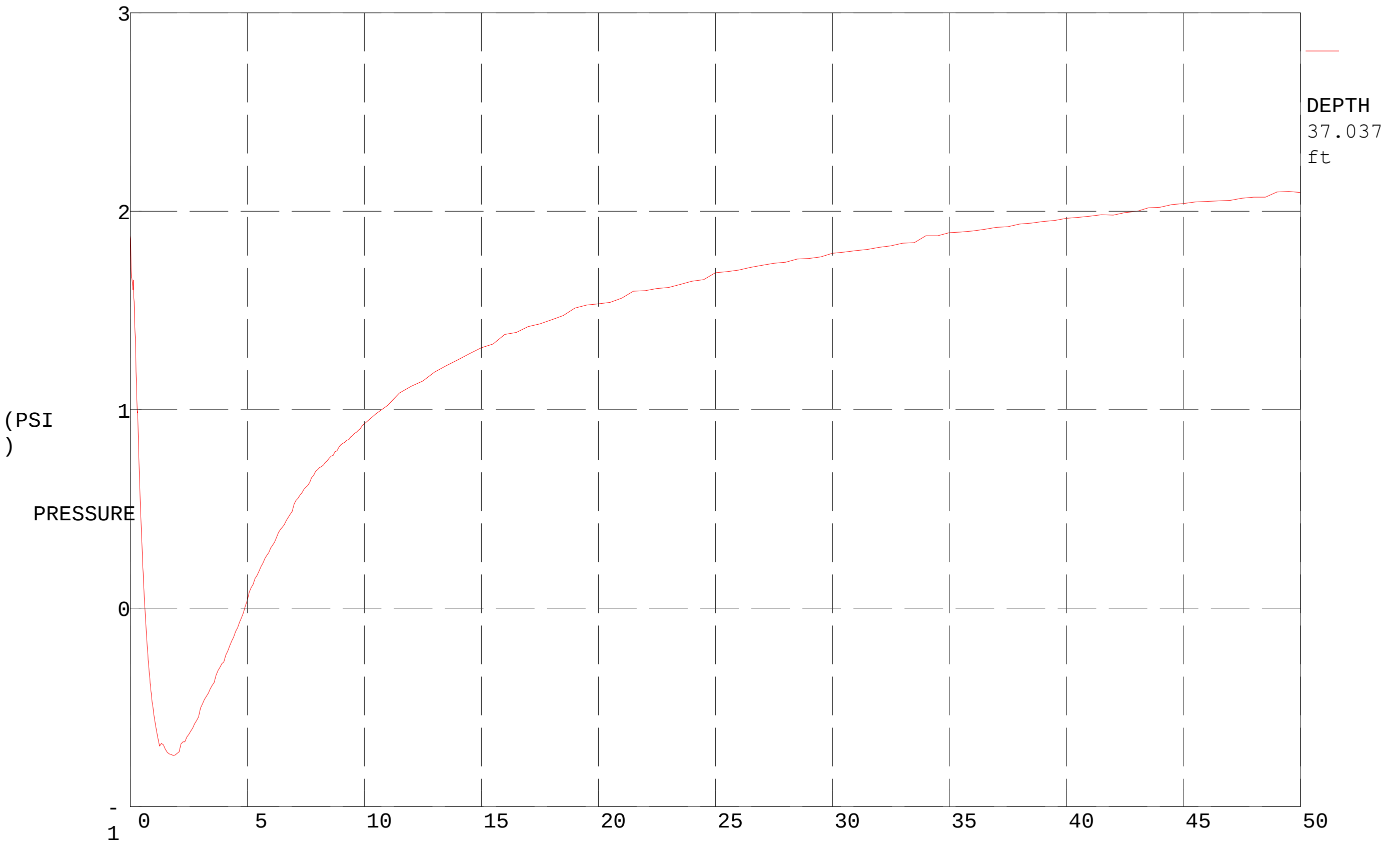
SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**	
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-2 SHEAR WAVE VELOCITY MEASUREMENTS**	**FIGURE A5**



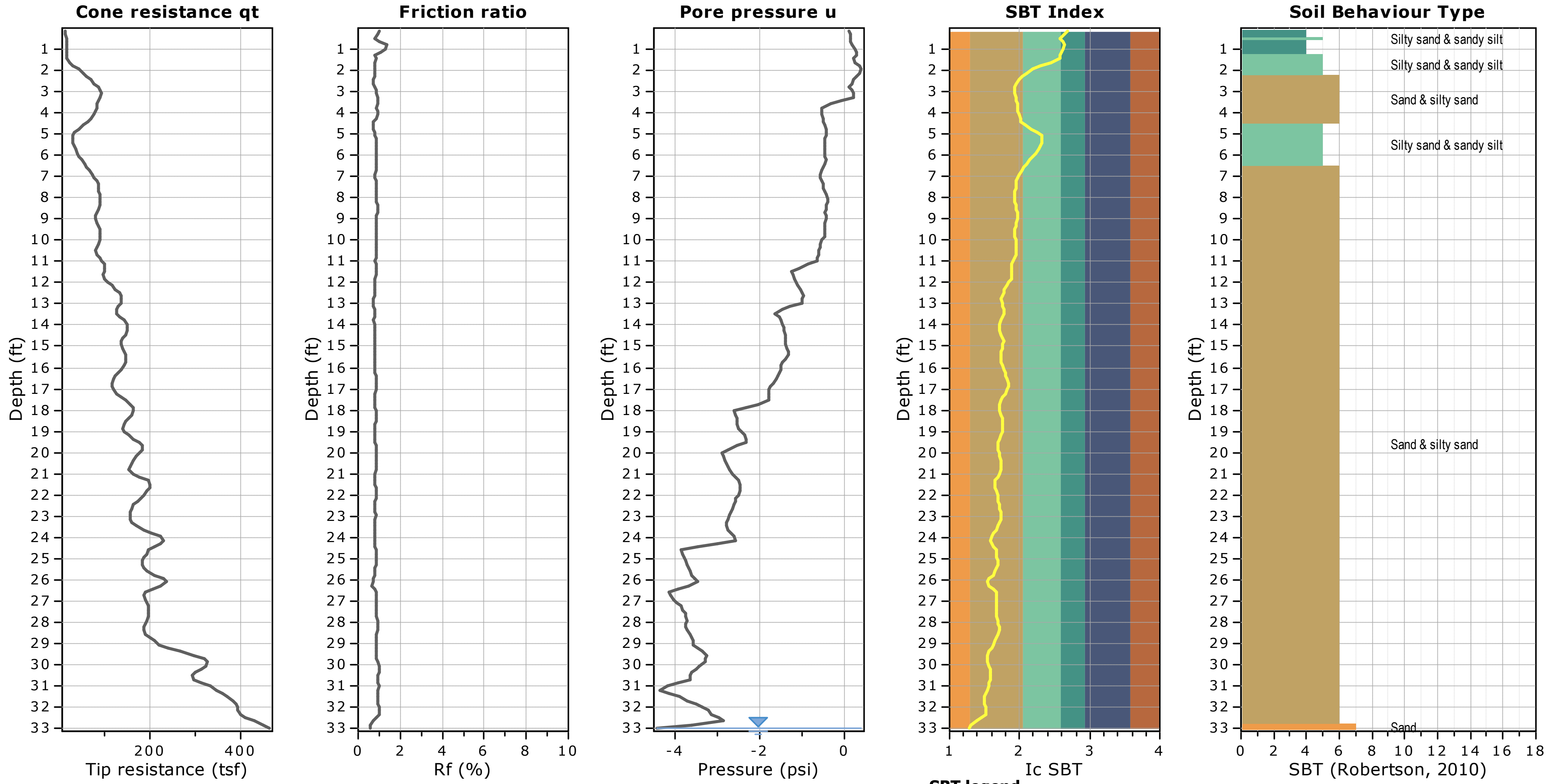
MAXIMUM PRESSURE = 2.1 (PSI)
HYDROSTATIC PRESSURE = 2.15 (PSI), WATER TABLE: 32.11 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-2 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A6**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-3 Text File
Total depth: 32.97 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

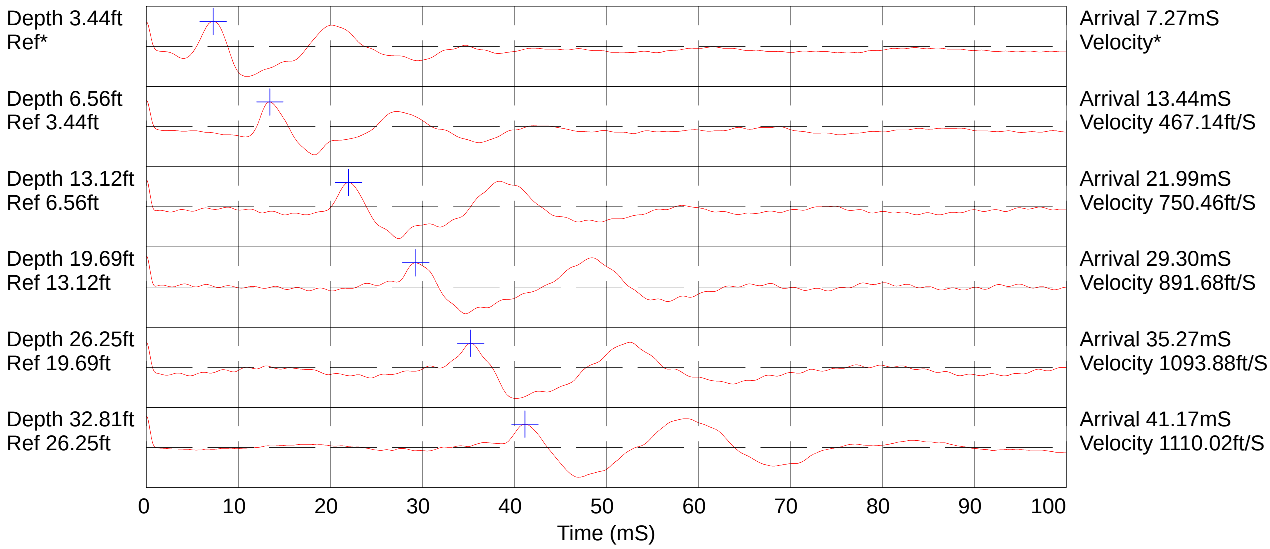
Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

COMMENT: PSI / CPT-3 / 750 Quince St Florence

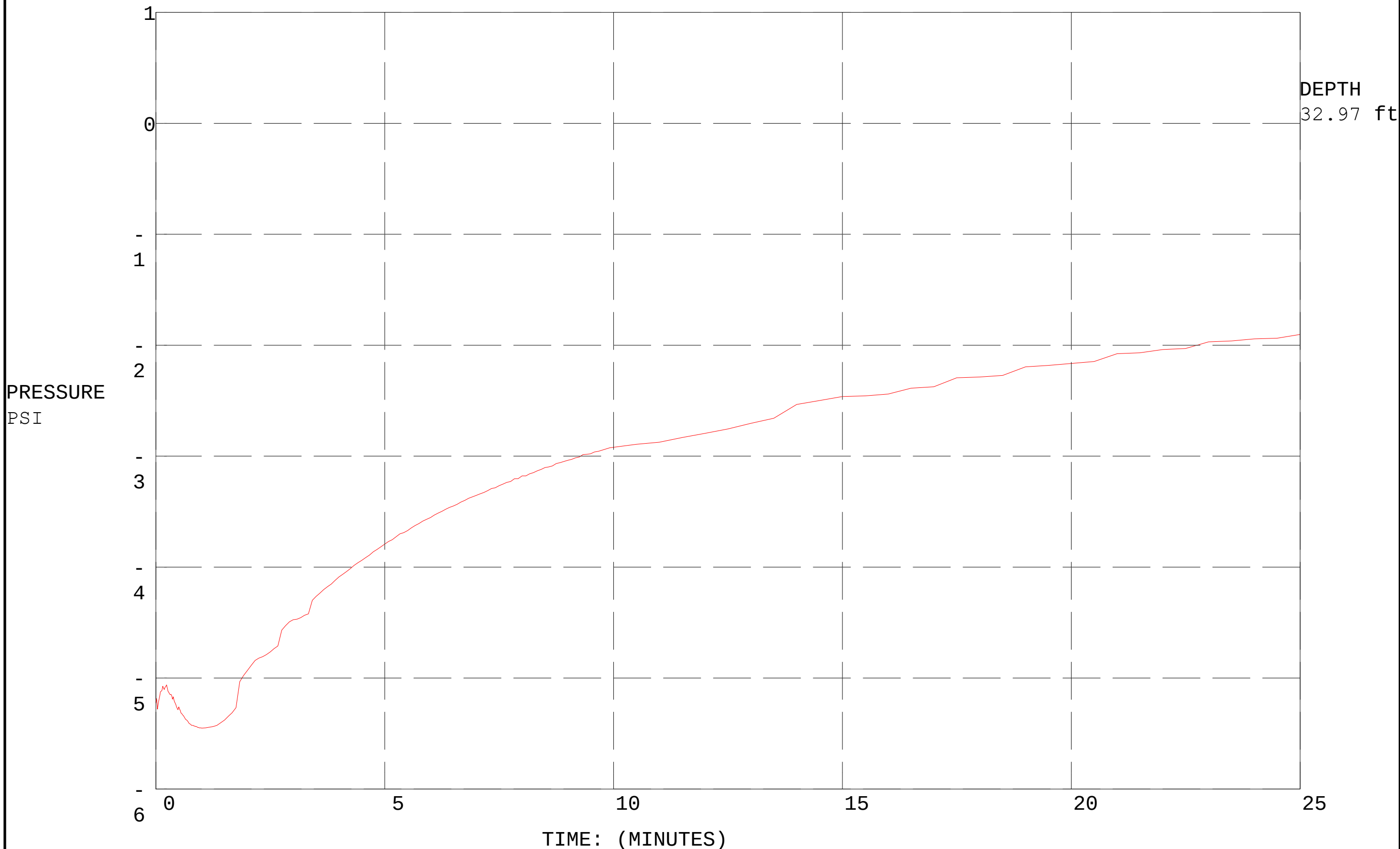


Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**

6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-3 SHEAR WAVE VELOCITY MEASUREMENTS**	**FIGURE A8**

COMMENT: PSI / CPT-3 / 750 Quince St Florence



MAXIMUM PRESSURE = -1.903 (PSI)

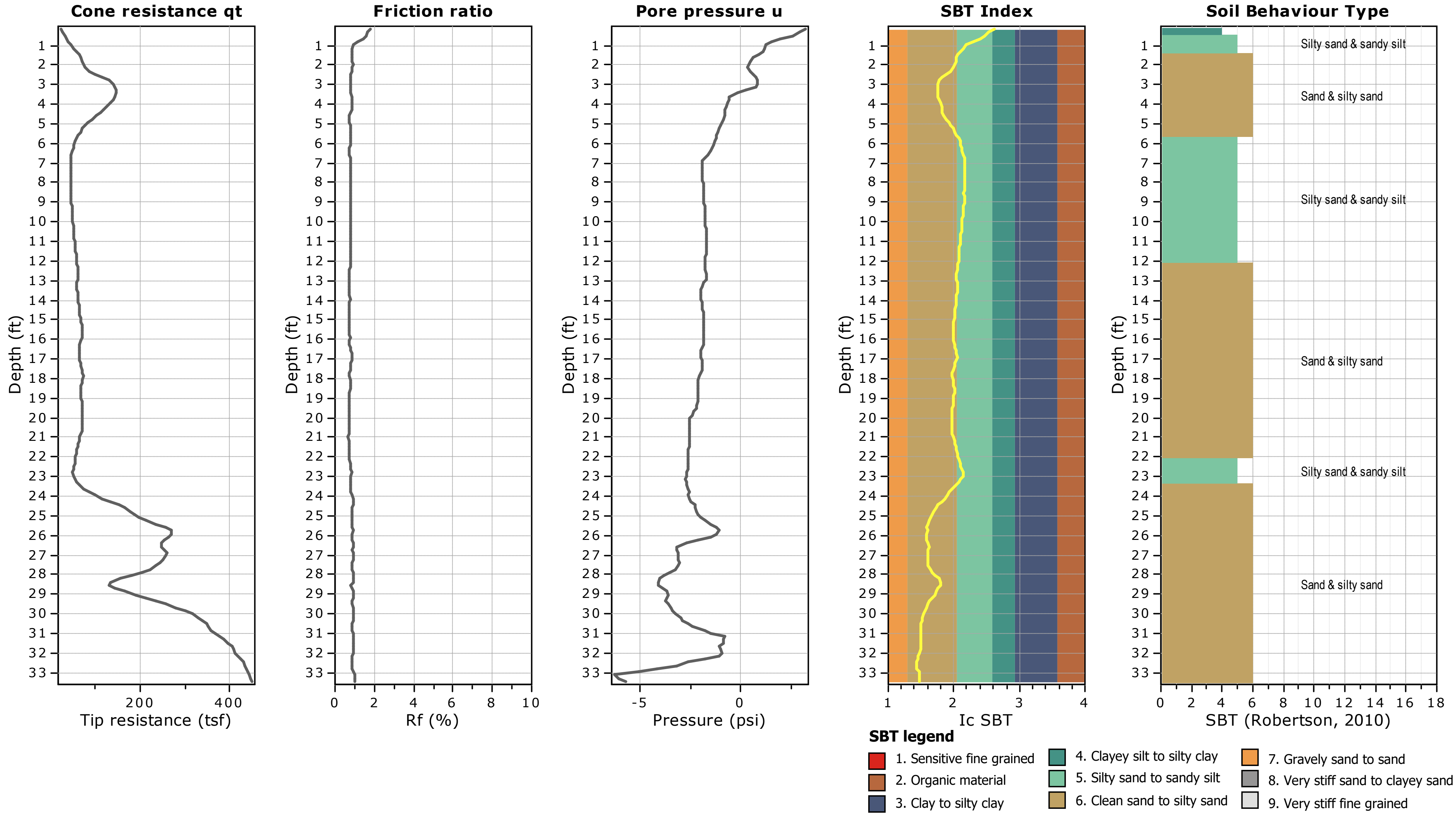
HYDROSTATIC PRESSURE = 0.0 (PSI), WATER TABLE: 33.14 ft

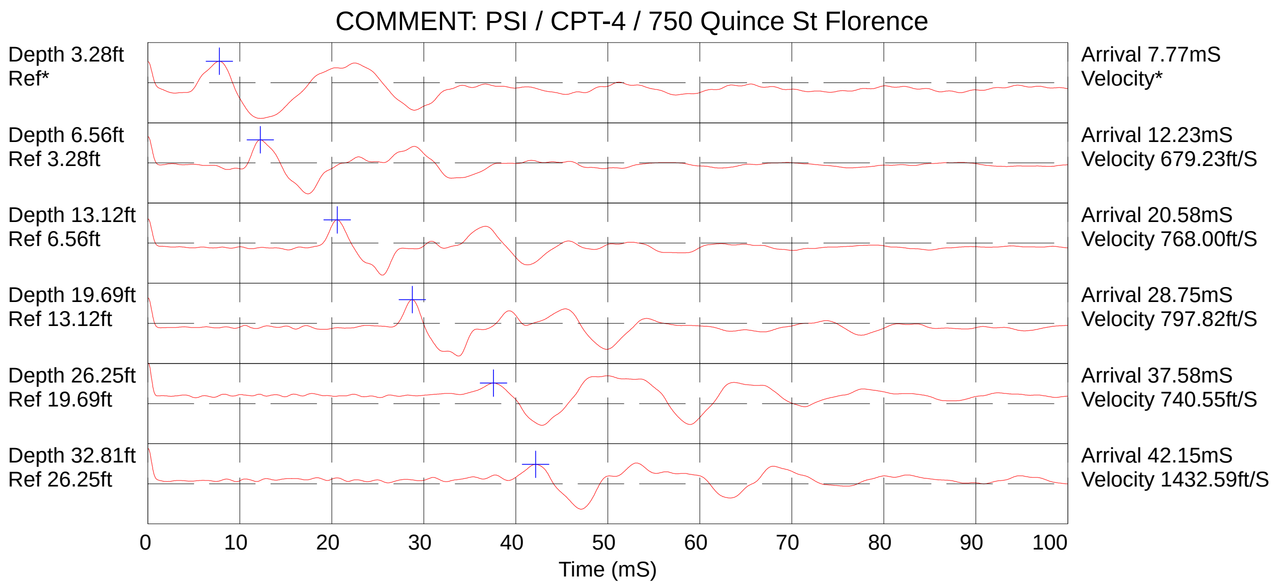
intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-3 PORE PRESSURE DISSAPATION MEASUREMENTS** / **FIGURE A9**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-4 Text File
Total depth: 33.47 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



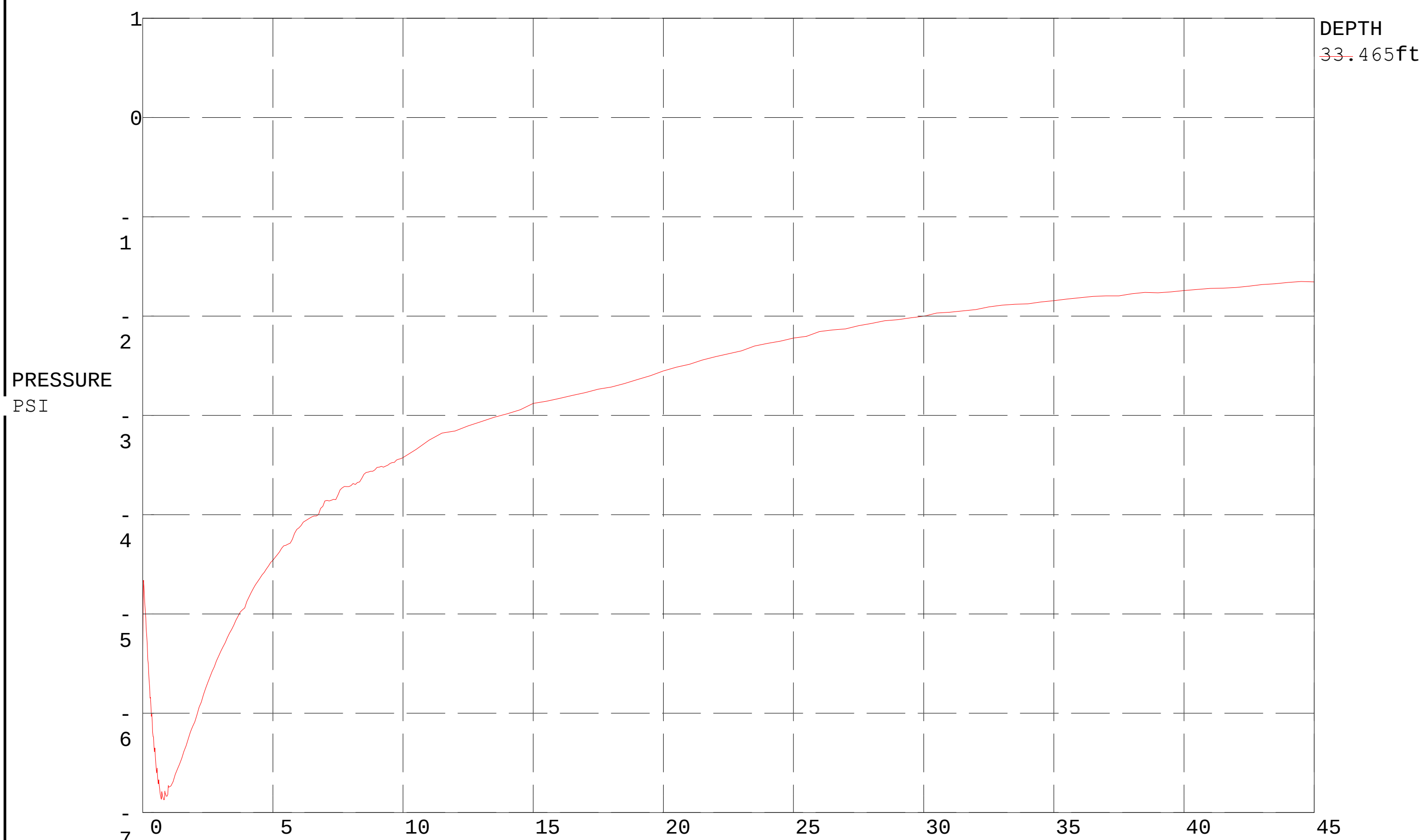


Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**

6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-4 SHEAR WAVE VELOCITY MEASUREMENTS**	**FIGURE A11**

COMMENT: PSI / CPT-4 / 750 Quince St Florence



MAXIMUM PRESSURE = -1.653 (PSI)

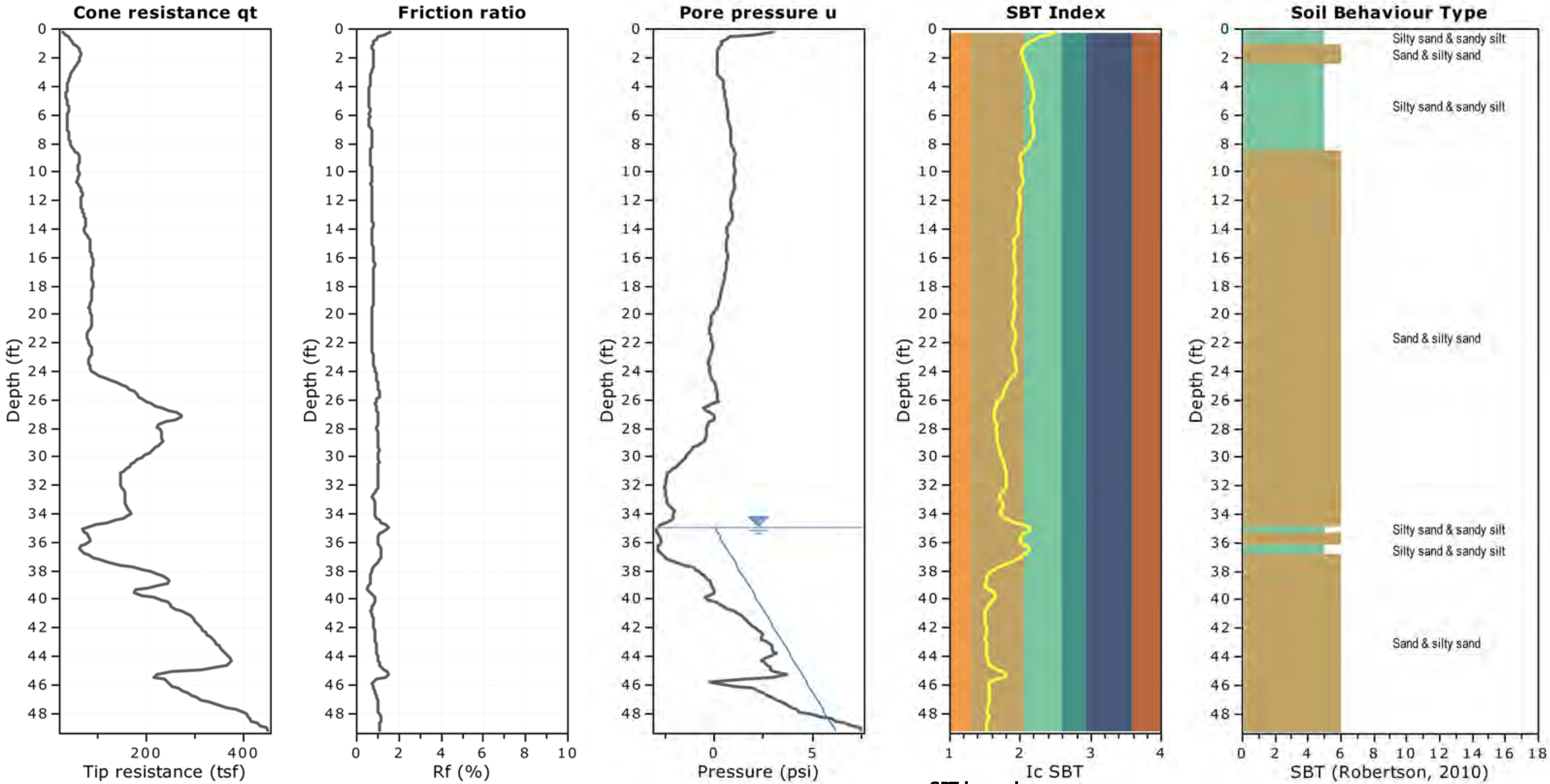
HYDROSTATIC PRESSURE = 0.0 (PSI), WATER TABLE: 35.01 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-4 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A12**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

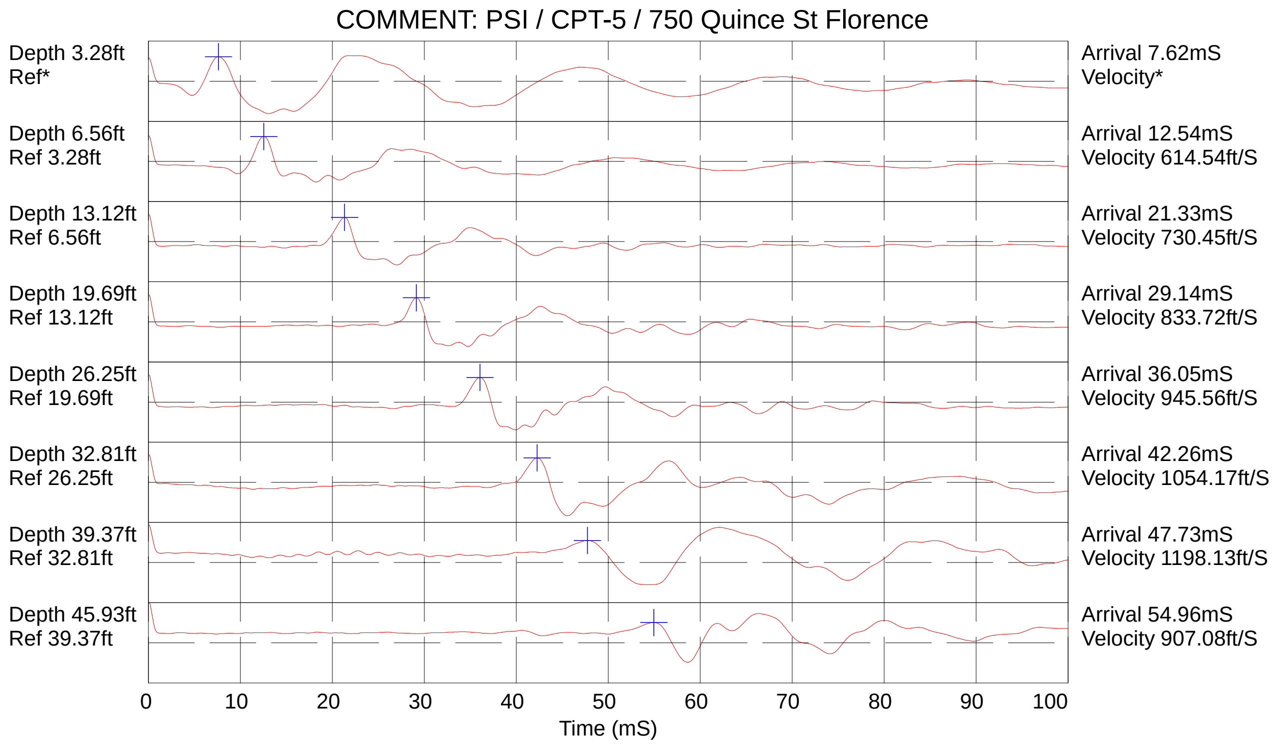
CPT: 21020 CPT-5 Text File
Total depth: 49.21 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**

6032 North Cutter Circle, Suite 480
Portland, Oregon 97217

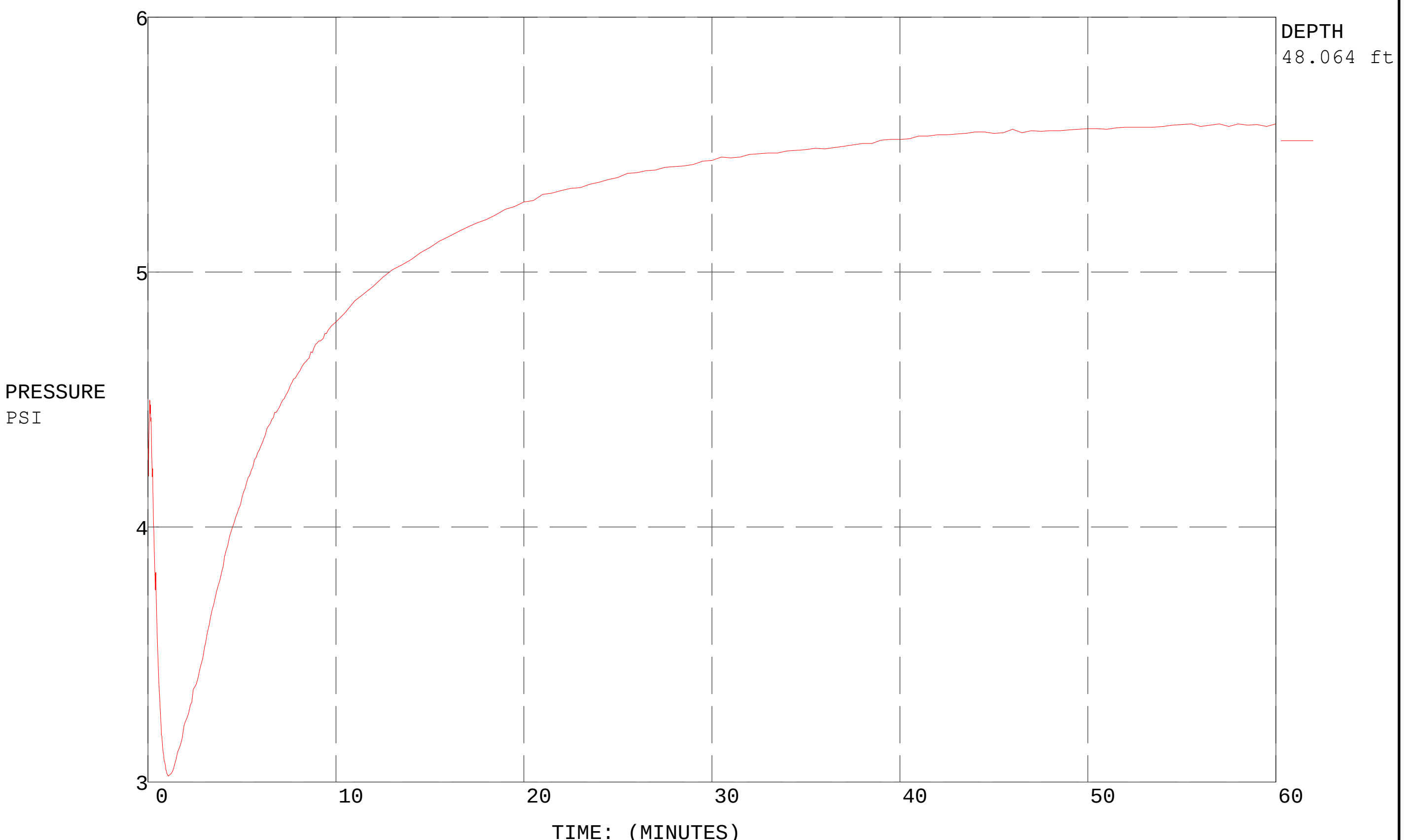
March 2021

Drawn By: SRS

CPT-5SHEAR WAVE VELOCITY MEASUREMENTS

FIGURE A14

COMMENT: PSI / CPT-5 / 750 Quince St Florence



MAXIMUM PRESSURE = 5.581 (PSI)

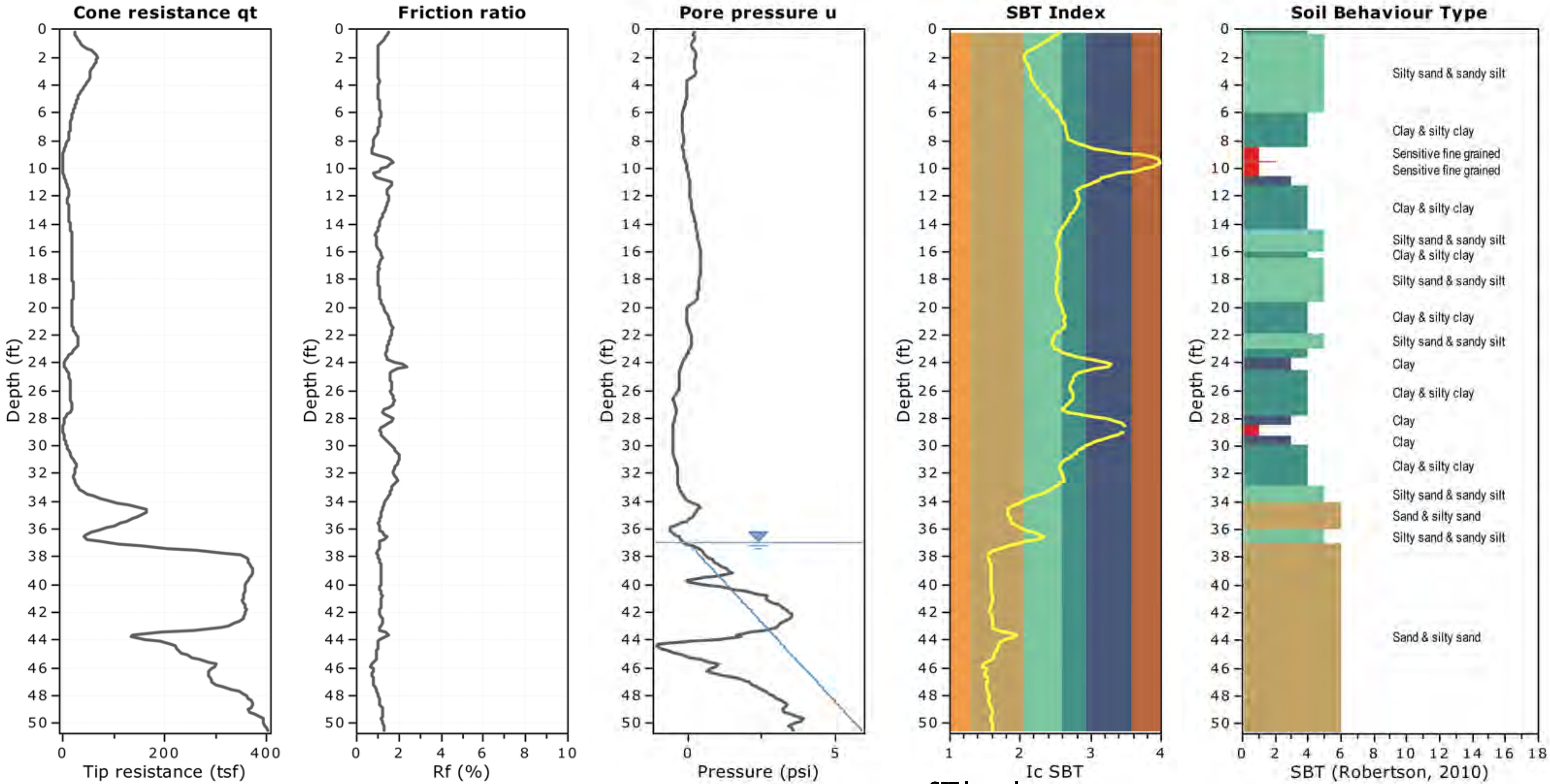
HYDROSTATIC PRESSURE = 5.584 (PSI), WATER TABLE: 35.18 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-5 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A15**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-6 Text File
Total depth: 50.53 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:121.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

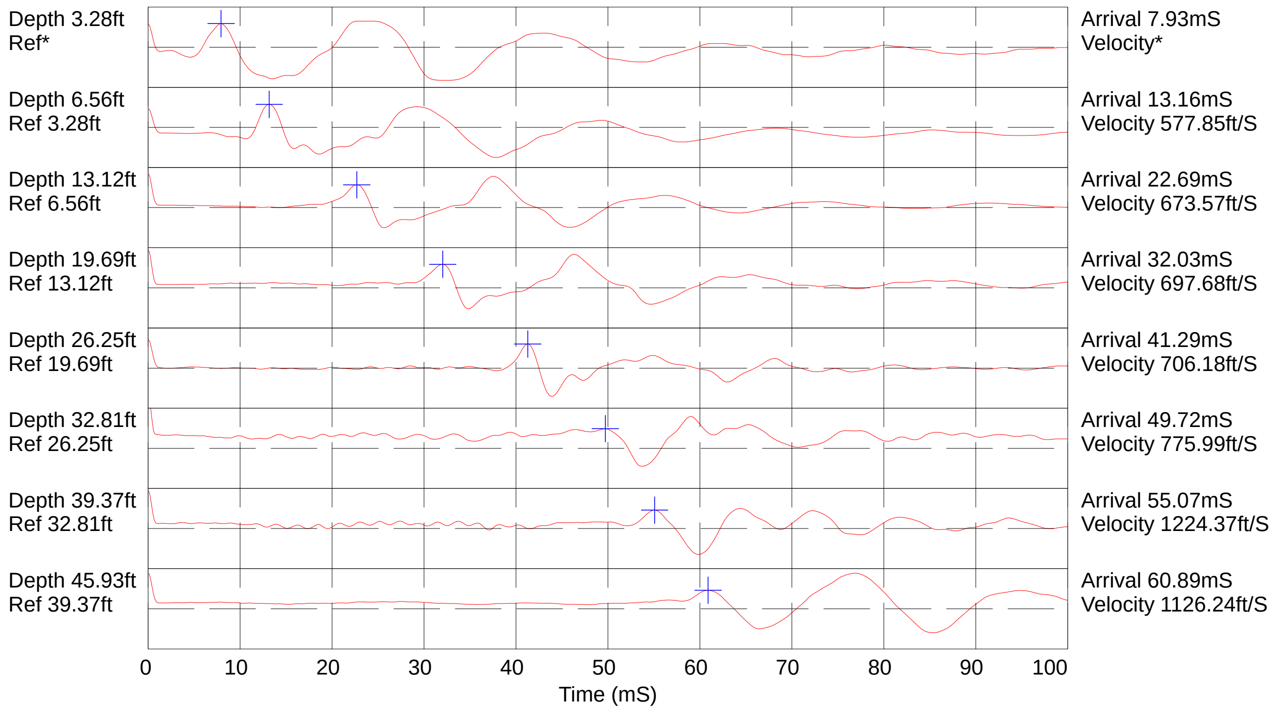
Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

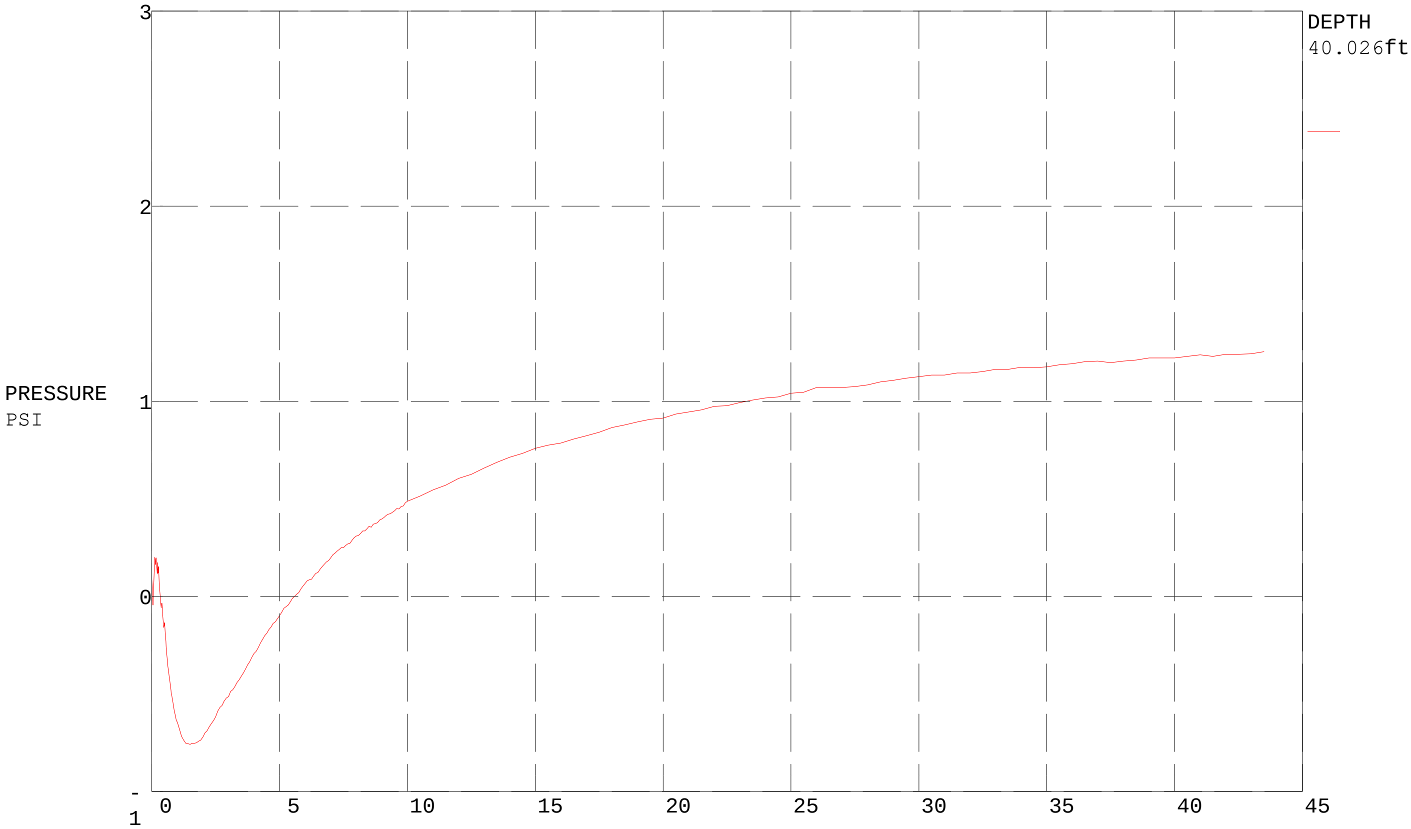
COMMENT: PSI / CPT-6 / 750 Quince St Florence



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-6 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A17**

COMMENT: PSI / CPT-6 / 750 Quince St Florence



MAXIMUM PRESSURE = 1.254 (PSI)

HYDROSTATIC PRESSURE = 1.297 (PSI), WATER TABLE: 37.03 ft

intertek psi	Project No. 07041434	Microtel Inn and Suites Florence, Oregon

6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	CPT-6 PORE PRESSURE DISSAPATION MEASUREMENTS	FIGURE A18

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.: Diamond Bit Core Sampler
H.A.: Hand Auger
P.A.: Power Auger - Handheld motorized auger

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
RC: Rock Core
TC: Texas Cone
BS: Bulk Sample
PM: Pressuremeter
CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N_{60}: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q_u: Unconfined compressive strength, TSF
Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼, ▽, ▼: Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES
(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated

Description	Criteria
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY
(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	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
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	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

BORING GP-1

DATE STARTED:	2/23/20	**DRILL COMPANY:**	Oregon Geotechnical Exploration, Inc
DATE COMPLETED:	2/23/20	**DRILLER:** Dom	**LOGGED BY:** Staci Shub
COMPLETION DEPTH	45.0 ft	**DRILL RIG:**	GeoProbe Rig
BENCHMARK:	N/A	**DRILLING METHOD:**	GeoProbe
ELEVATION:	47 ft	**SAMPLING METHOD:**	GP
LATITUDE:	43.972804°	**HAMMER TYPE:**	Automatic
LONGITUDE:	-124.100541°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	SRS
REMARKS:			

Water		
While Drilling	35	feet
Upon Completion	35	feet
Delay		N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	Additional Remarks
47	0	1	**Approximately 4 inches of grassy Topsoil**	Topsoil	46	Gradation: Fines = 25%
		2	Light brown to brown, moist, **Well graded silty SAND**, fine to coarse grained, trace black staining	SM	4	
	5	3	Gray to light brown, moist, **Poorly graded SAND**, fine to medium grained, trace intermitten silt lenses	SP	7	Gradation: Fines = 5%
		4			8	
		5			6	
		6			6	Gradation: Fines = 1%
		7			7	Gradation: Fines = 0%
		8	Black staining and trace orange and gray mottling below 18 feet bgs		6	
		9			6	
		10			5	
		11			6	Gradation: Fines = 0%
	35	12	Wet below 35 feet bgs		18	Gradation: Fines = 3%
	38.5		Geoprobe terminated at 38.5 due to refusal on very dense sand			

STANDARD PENETRATION TEST DATA: N in blows/ft ◎; × Moisture; PL; LL; scale 0, 25, 50. STRENGTH, tsf: ▲ Qu; ✳ Qp; scale 0, 2.0, 4.0. All SPT values plotted as >>.

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778

PROJECT NO.: 07041434
PROJECT: Microtell Inn and Suites
LOCATION: 750 Quince Street, Florence, Oregon

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING GP-2

DATE STARTED:	2/23/20	**DRILL COMPANY:**	Oregon Geotechnical Exploration, Inc
DATE COMPLETED:	2/23/20	**DRILLER:**	Dom **LOGGED BY:** Staci Shub
COMPLETION DEPTH	45.0 ft	**DRILL RIG:**	GeoProbe Rig
BENCHMARK:	N/A	**DRILLING METHOD:**	GeoProbe
ELEVATION:	47 ft	**SAMPLING METHOD:**	GP
LATITUDE:	43.972073°	**HAMMER TYPE:**	Automatic
LONGITUDE:	-124.100257°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	SRS
REMARKS:			

Water

While Drilling		35 feet
Upon Completion		35 feet
Delay		N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	Additional Remarks
	0	1	**Approximately 4 inches of grassy Topsoil**	Topsoil	45	Gradation: Fines =28%
45		2	Light brown to brown, moist, **Poorly graded silty SAND** , fine to medium grained, trace black staining and organge mottling	SM	5	Fines = 0% Gradation:
40	5		Gray to light brown, moist, **Poorly graded SAND**, fine to medium grained, trace intermitten silt lenses	SP		
		3			9	
	10	4			6	
35	15	5			5	
30			Black staining and trace orange and gray mottling below 18 feet bgs			
25	20	6			5	Gradation: Fines = 1%
		7			5	
20	25	8			5	Gradation: Fines = 1%
15	30	9			7	Gradation: Fines = 1%
			Light gray to gray below 32 feet bgs			
	35	10	Wet below 35 feet bgs		17	Gradation: Fines = 0%
10			Geoprobe terminated at 38.5 due to refusal on very dense sand			
5	40					
	45					

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture PL LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778

PROJECT NO.:	07041434
PROJECT:	Microtell Inn and Suites
LOCATION:	750 Quince Street
	Florence, Oregon

The stratification lines represent approximate boundaries. The transition may be gradual.

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

LOG OF TP1

PSI Job No.:	07041434	Excavation Method:	Excavation
Project:	Microtel Inn and Suites	Sampling Method:	
Location:	750 Quince Street	DCP Type:	N/A
	Florence, Oregon	Boring Location:	

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DCP Blows per 1¾-inch (0–30) / Moisture, PL, LL (0–50) / Strength, tsf Qu, Qp (0–4.0)	Additional Remarks
47	0					**Surface Elev.:** 47 ft					
	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining					
	2								19		Fines=7%
	2.5		Grab	1						>>	
44	3						SP				
	4										
42	5		Grab								
	5.5			2						>>	
						Test pit terminated at approximately 5 feet bgs					

Completion Depth:	5.5 ft	Sample Types:	Latitude: 43.9727°
Date Boring Started:	1/4/21	Shelby Tube	Longitude: -124.1005°
Date Boring Completed:	1/4/21	Dynamic Cone (DCP)	Excavation Equipment: Excavator
Logged By:	S. Shub	Grab Sample	Remarks:
Excavation Contractor:	Dan Fisher Excavating, Inc		

The stratification lines represent approximate boundaries. The transition may be gradual.

intertek psi
Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

LOG OF TP2

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎	Additional Remarks
					Surface Elev.: 47 ft					
	0				**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1				Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP				
	2									
44	3									
	3.5	Grab	1						>>	
	4									
42	5									
	6									
	6.5	Grab	2						>>	
40	7									
	8				Test pit terminated at approximately 8 feet bgs due to caving					

DCP chart scales: Blows per 1¾-inch 0, 15, 30; Moisture (×), PL, LL 0, 25, 50; STRENGTH, tsf ▲ Qu, ✳ Qp 0, 2.0, 4.0

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9727°
Longitude: -124.0998°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

LOG OF TP3

Sheet 1 of 1

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch ◎
47	0			Surface Elev.: 47 ft		
				Approximately 4 inches of grassy Topsoil	Topsoil	
46	1			Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP	
	2					
44	3	Grab	1			>>
	4					
42	5					
	6					
40	7	Grab	2			>>
	8	Grab	3	Test pit terminated at approximately 7 feet bgs due to caving		>>

Moisture, % — DYNAMIC CONE PENETRATION TEST DATA: Blows per 1¾-inch ◎ (0, 15, 30); Moisture, PL, LL (0, 25, 50); STRENGTH, tsf: Qu, Qp (0, 2.0, 4.0). Additional Remarks

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9724°
Longitude: -124.0998°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

LOG OF TP4

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Surface Elev.: 47 ft

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	Moisture (×, PL, LL: 0–25–50)	Dynamic Cone Blows per 1¾-inch (0–15–30)	Additional Remarks
47	0			**Approximately 4 inches of grassy Topsoil**	Topsoil				
46–39	0.3–8			Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining	SP				
44	3–4	Grab	1			26	×	>>	Fines=0.2%
42	5–6	Grab	2			20	×	>>	Fines=0.2%
40	7–8	Grab	3					>>	
	8			Test pit terminated at approximately 8 feet bgs due to caving					

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9721°
Longitude: -124.1°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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Fax: (503) 289-1918

LOG OF TP5

PSI Job No.:	07041434	Excavation Method:	Excavation
Project:	Microtel Inn and Suites	Sampling Method:	
Location:	750 Quince Street	DCP Type:	N/A
	Florence, Oregon	Boring Location:	

WATER LEVELS
▽
▼
▽

DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ (0 – 15 – 30)
× Moisture ◪ PL ✚ LL (0 – 25 – 50)
STRENGTH, tsf ▲ Qu ✳ Qp (0 – 2.0 – 4.0)

Surface Elev.: 47 ft

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	Additional Remarks
	0 – 0.3				**Approximately 4 inches of grassy Topsoil**	Topsoil			
46, 44, 42	0.3 – 6	Grab Sample	1		Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining	SP		8	>>@Fines=0.3%
	6				Test pit terminated at approximately 6 feet bgs due to caving				

Completion Depth:	6.0 ft
Date Boring Started:	1/4/21
Date Boring Completed:	1/4/21
Logged By:	S. Shub
Excavation Contractor:	Dan Fisher Excavating, Inc

Sample Types:
- Shelby Tube
- Dynamic Cone (DCP)
- Grab Sample

Latitude: 43.9718°
Longitude: -124.1003°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP6

PSI Job No.:	07041434
Project:	Microtel Inn and Suites
Location:	750 Quince Street Florence, Oregon
Excavation Method:	Excavation
Sampling Method:	
DCP Type:	N/A
Boring Location:	

WATER LEVELS

Surface Elev.: 47 ft

DYNAMIC CONE PENETRATION TEST DATA: Blows per 1¾-inch ◎ (0, 15, 30); Moisture × ; PL, LL (0, 25, 50); STRENGTH, tsf: ▲ Qu, ✳ Qp (0, 2.0, 4.0)

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DCP Test Data	Additional Remarks
47	0				**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1				Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt and gravel, trace black staining No gravel observed below 1.5 feet	SP				
42	5	Grab	1					12	>>	Fines=0.2%
	6.5	Grab	2						>>	
40	7				Test pit terminated at approximately 7 feet bgs due to caving					

Completion Depth:	7.0 ft
Date Boring Started:	1/4/21
Date Boring Completed:	1/4/21
Logged By:	S. Shub
Excavation Contractor:	Dan Fisher Excavating, Inc

Sample Types: Shelby Tube; Dynamic Cone (DCP); Grab Sample

Latitude: 43.9721°
Longitude: -124.1005°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

LOG OF TP7

PSI Job No.:	07041434	Excavation Method:	Excavation
Project:	Microtel Inn and Suites	Sampling Method:	
Location:	750 Quince Street Florence, Oregon	DCP Type:	N/A
		Boring Location:	

WATER LEVELS

Surface Elev.: 47 ft

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DCP Blows per 1¾-inch	Additional Remarks
47	0				**Approximately 4 inches of grassy Topsoil**	Topsoil				
46–39	0.3–8				Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP				
39	8	Grab Sample	1						>>	
					Test pit terminated at approximately 8 feet bgs due to caving					

DYNAMIC CONE PENETRATION TEST DATA: Blows per 1¾-inch ◎ (0, 15, 30); Moisture × / PL / LL (0, 25, 50); STRENGTH, tsf: ▲ Qu, ✳ Qp (0, 2.0, 4.0)

Completion Depth:	8.0 ft	Latitude:	43.9725°
Date Boring Started:	1/4/21	Longitude:	-124.1004°
Date Boring Completed:	1/4/21	Excavation Equipment:	Excavator
Logged By:	S. Shub	Remarks:	
Excavation Contractor:	Dan Fisher Excavating, Inc		

Sample Types: Shelby Tube; Dynamic Cone (DCP); Grab Sample

The stratification lines represent approximate boundaries. The transition may be gradual.

Geophysical Testing

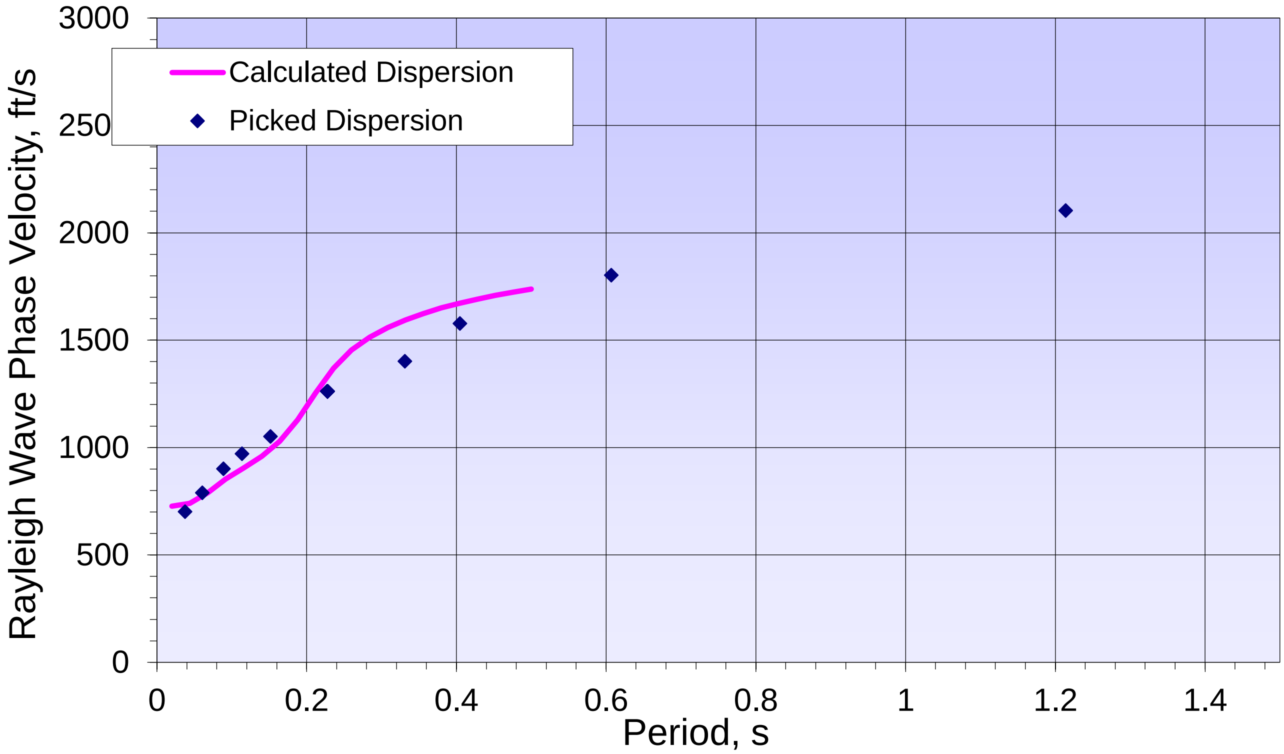
Three Refraction Microtremor (ReMi) arrays were performed at the project site (see Figure 2). The ReMi method uses standard P-wave recording equipment and ambient noise to determine shear-wave velocities. The equipment used for our ReMi evaluation included a Seismic Source DAQLink III 24-Bit ADC acquisition system and STC-85-SM-4 10-hertz geophones developed by Seismic Source Technology. Field acquisition of the data incorporated 24 geophone locations with equal spacing of 15 feet. SeisOpt ReMi Version 4.0 (Vspect and Disper modules) software developed by Optim LLC was used to process the collected data, and to create the shear wave velocity profile. To provide a robust data profile, both individual recordings and multiple summed (stacked) recordings were evaluated.

Each individual record of the traces is pre-processed to reduce or eliminate anomalies in the raw data. The data is then processed to produce a velocity spectrum. This process involves computing a surface wave, phase velocity dispersion spectral ratio image by p-tau and Fourier transforms across the array. This process is described in the document titled, "Faster, Better: Shear-wave Velocity to 100 Meters Depth from Refraction Microtremor Arrays", Bulletin of the Seismological Society of America by Louie, J, N. (2001). The resulting spectrum is in the slowness-frequency (p-f) domain. The p-f transformation helps segregate the Rayleigh Wave arrivals from other surface waves, body waves, sound waves, etc. The p-f image is generated for each record, and a final p-f image for each test is generated by combining some, or all, of the individual images.

The fundamental mode dispersion curve on the final p-f image can be seen as a distinct trend from the aliasing and wave-field transformation truncation artifact trends in the spectra. Once the fundamental mode dispersion curve is visually interpreted, data points along this curve are picked. Using the picked data points, an interactive forward-modeling process is used to model a shear wave velocity profile, with a resulting dispersion curve that approximately matches the picked data points. The process and resulting velocity profiles are able to identify the various velocity layers in the subsurface, including velocity inversions within the profile.

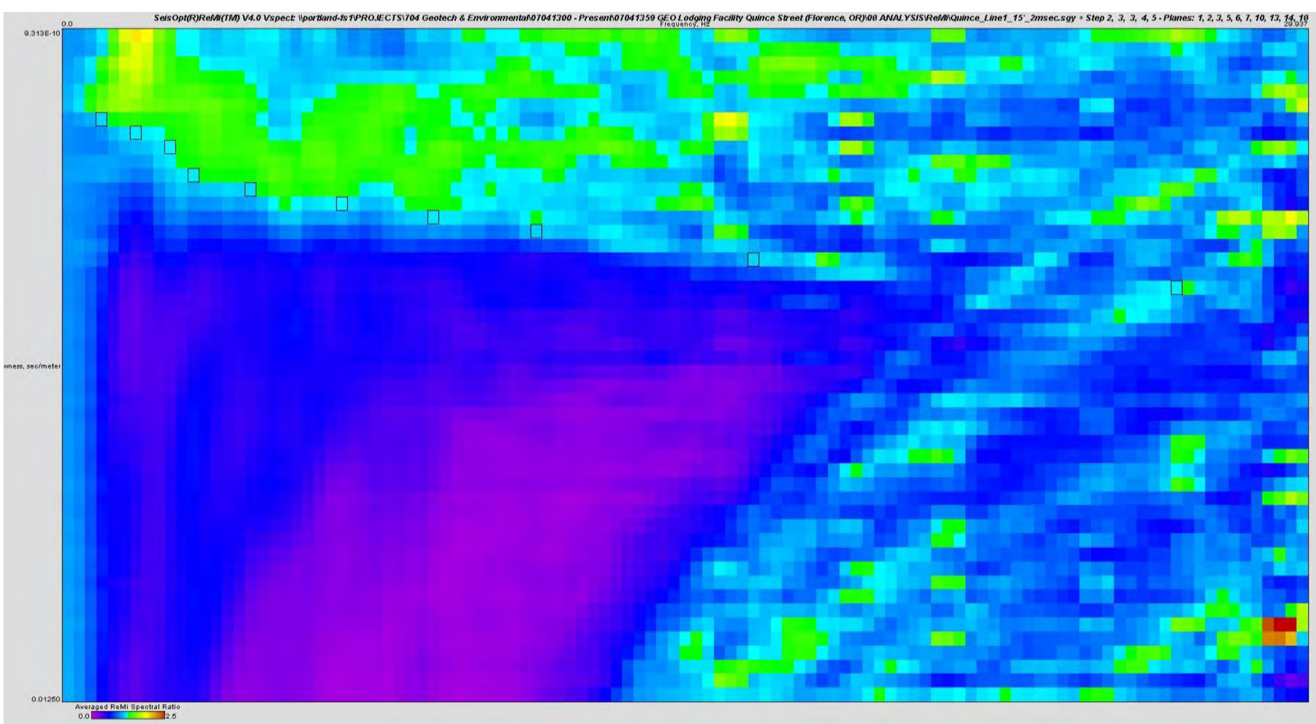
The results of the ReMi testing indicates that the weighted-average shear wave velocity in the upper 100 feet of the project site (VS) is approximately 1,000 feet per second. This indicates that the project site is classified as a Site Class D, in accordance with ASCE 7-16.

Dispersion Curve Showing Picks and Fit



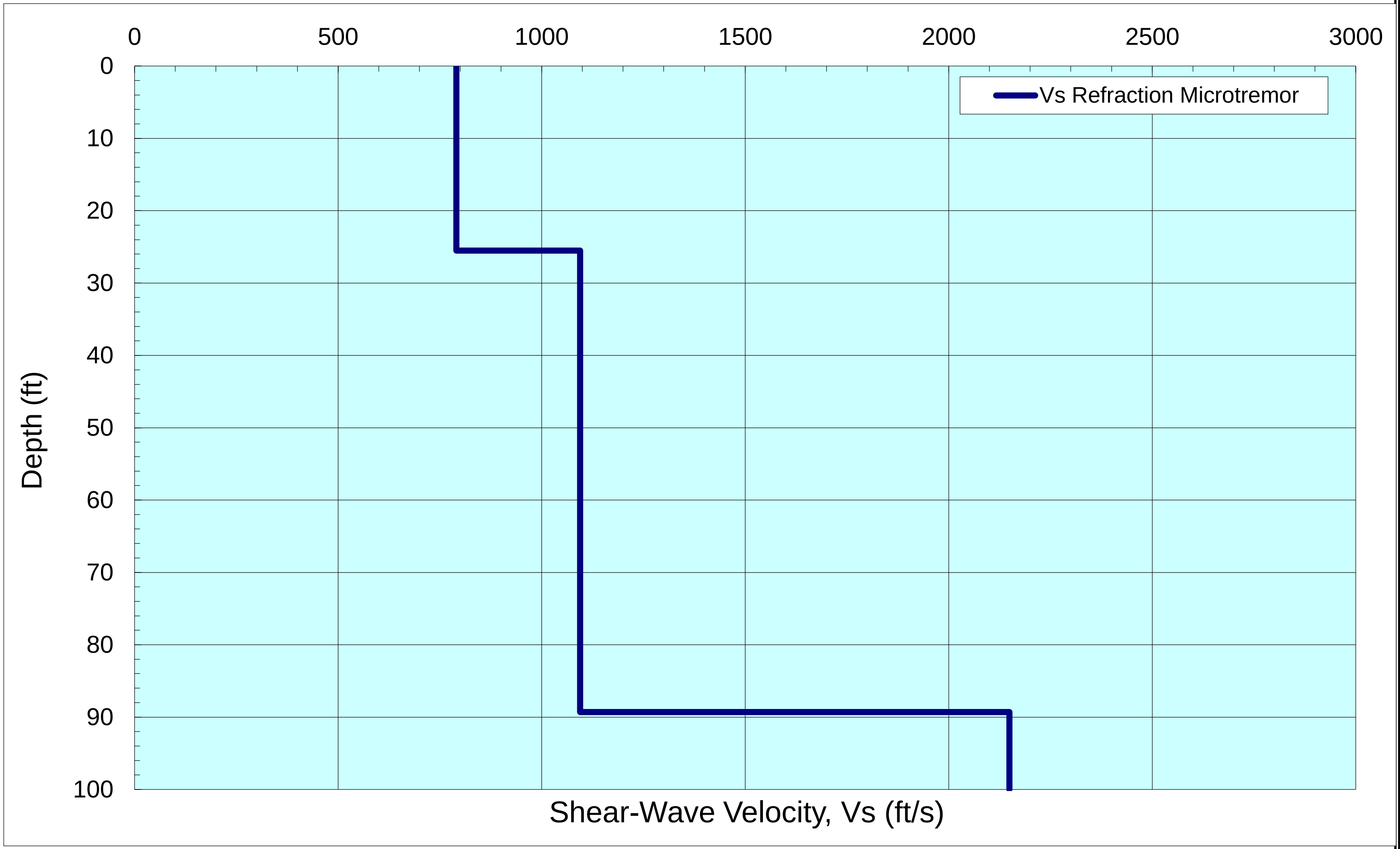
Geophone Spacing (ft)	15	Sampling Interval (ms)	2

p-f Image with Dispersion Modeling Picks



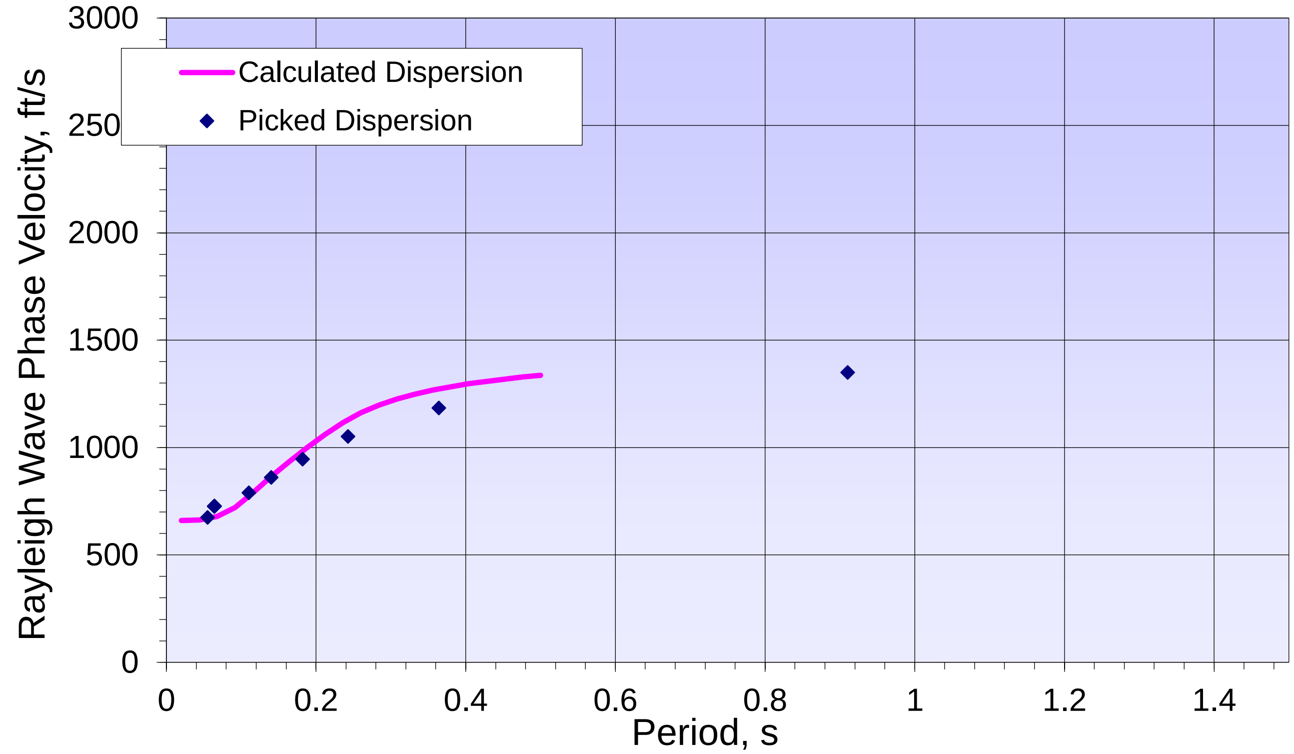
Line Number	**Array 1 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

Shear Wave Velocity Profile Vs. Depth



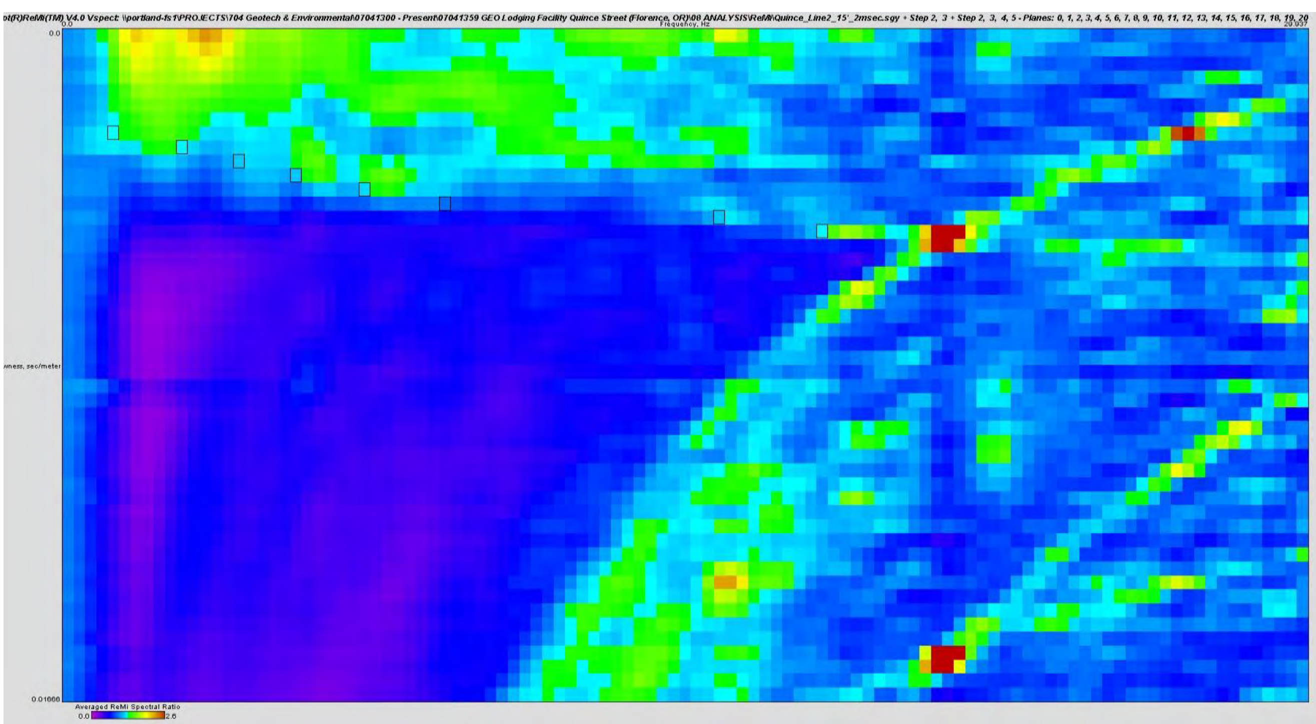
intertek psi	**IBC Site Class**	**D**	**Line Number**	**Array 1 (Geophones 1-24)**
			Project Number	07041434
	Average Shearwave Velocity within 100 feet, V_s (ft/s)	**1,047**	Project Name	Microtell Inn and Suites
			Location	43.972804, -124.100541 Florence, Oregon — Figure: A10

Dispersion Curve Showing Picks and Fit



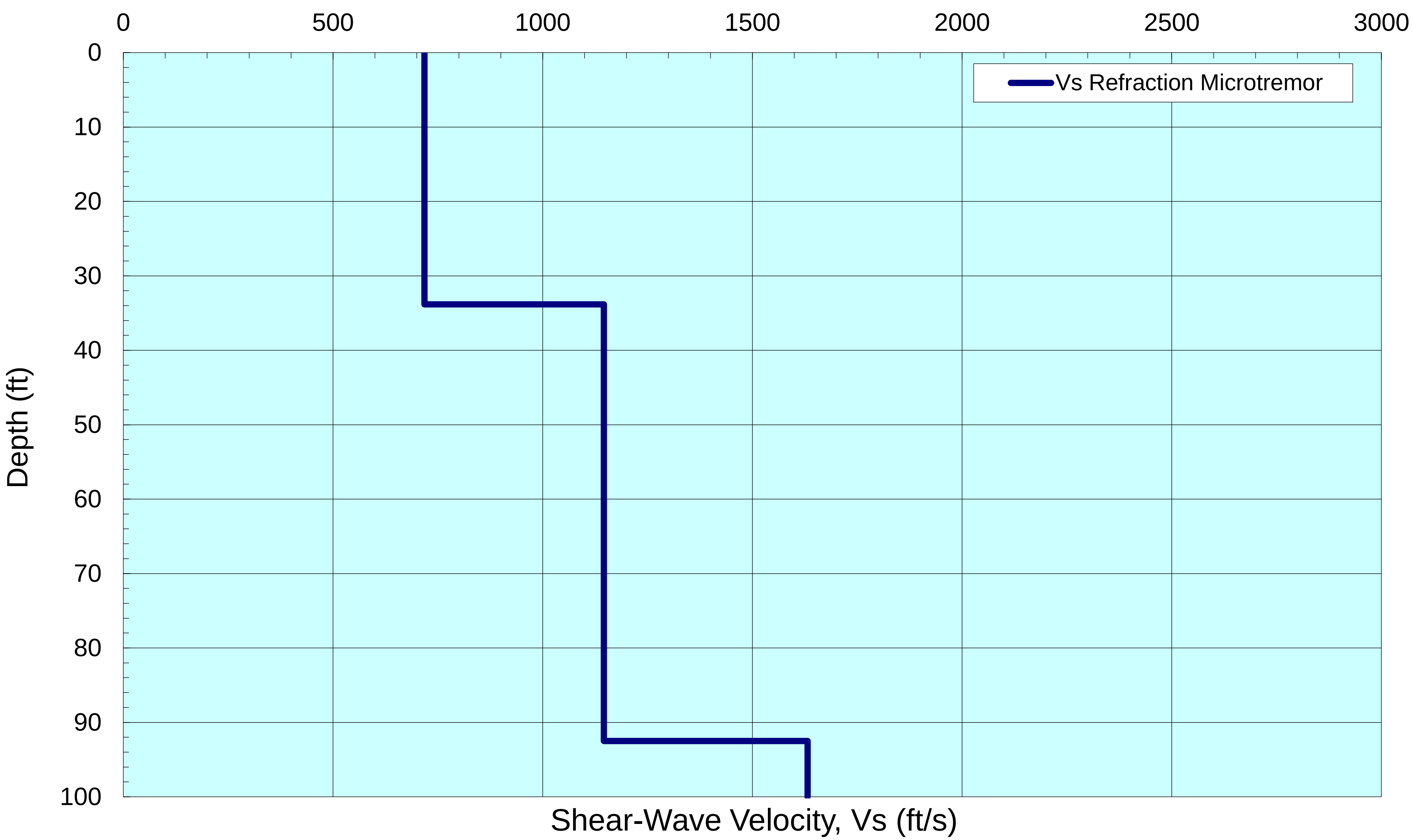
Geophone Spacing (ft) 15 Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



Line Number	**Array 2 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

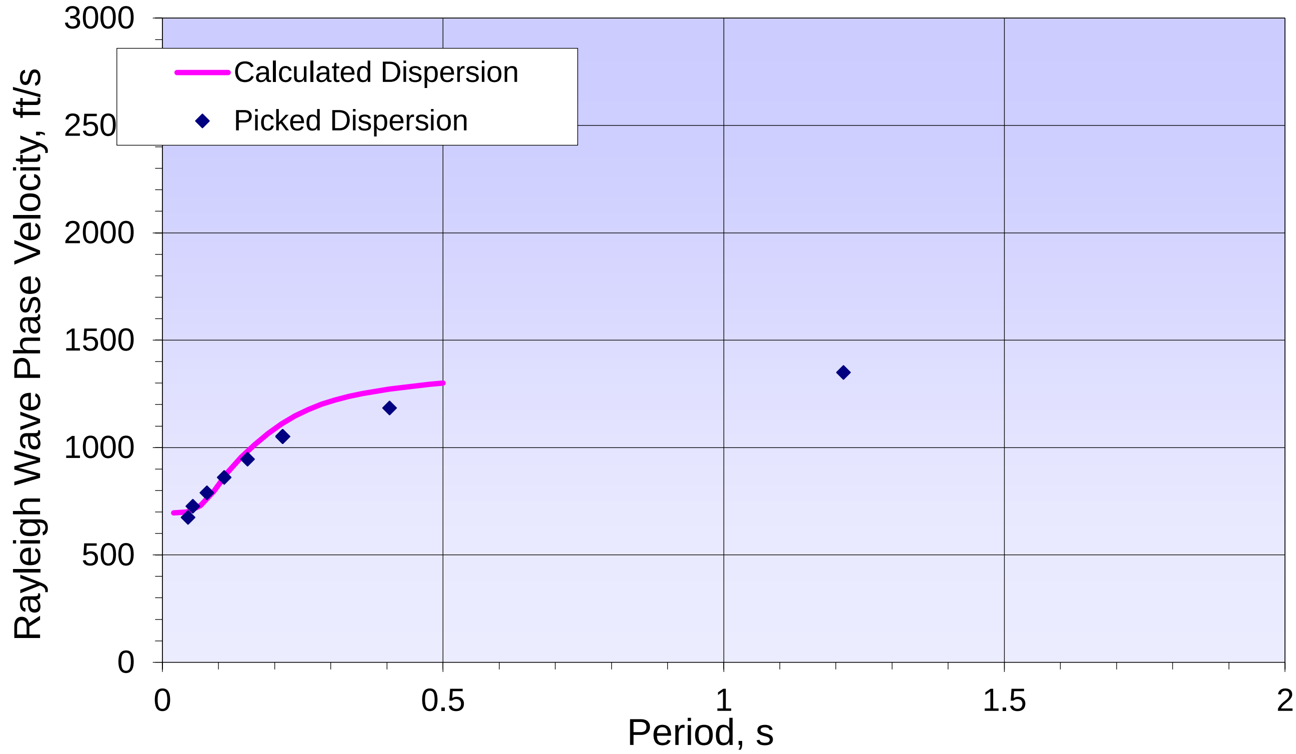
Shear Wave Velocity Profile Vs. Depth



intertek psi	IBC Site Class	D	
	Average Shearwave Velocity within 100 feet, V_s (ft/s)	972	

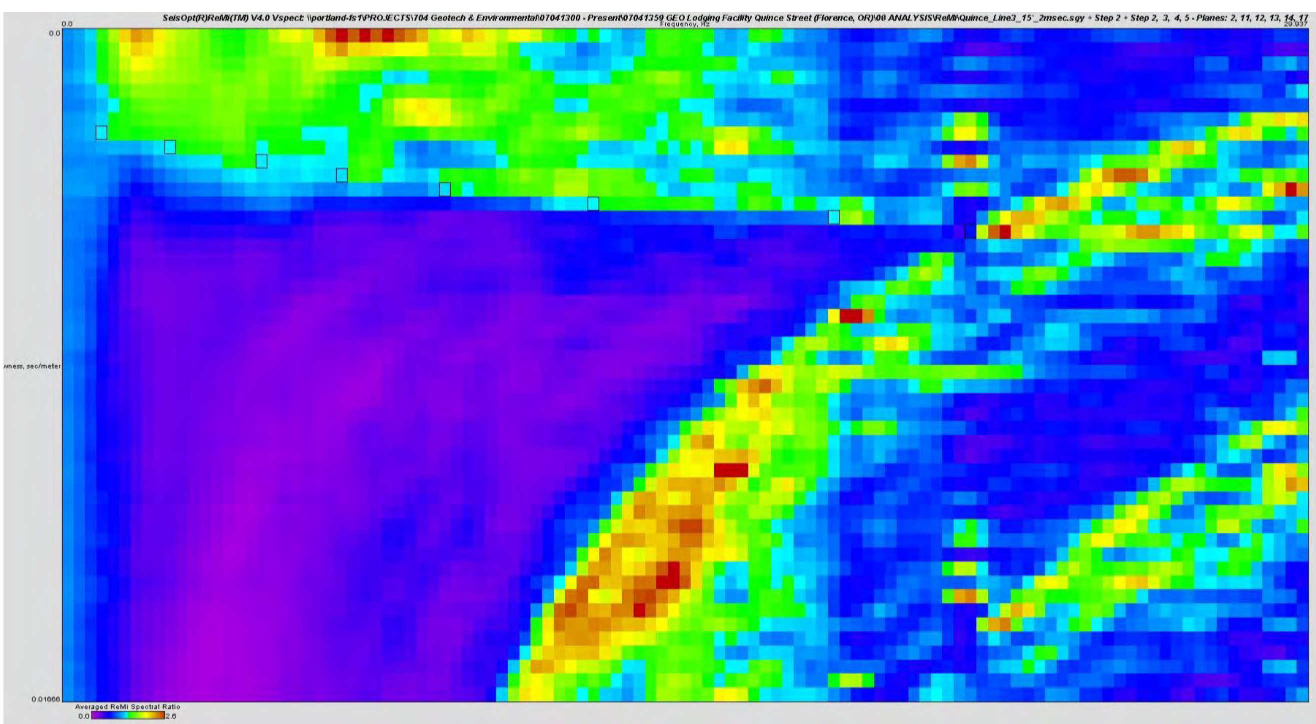
Line Number	**Array 2 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A10

Dispersion Curve Showing Picks and Fit



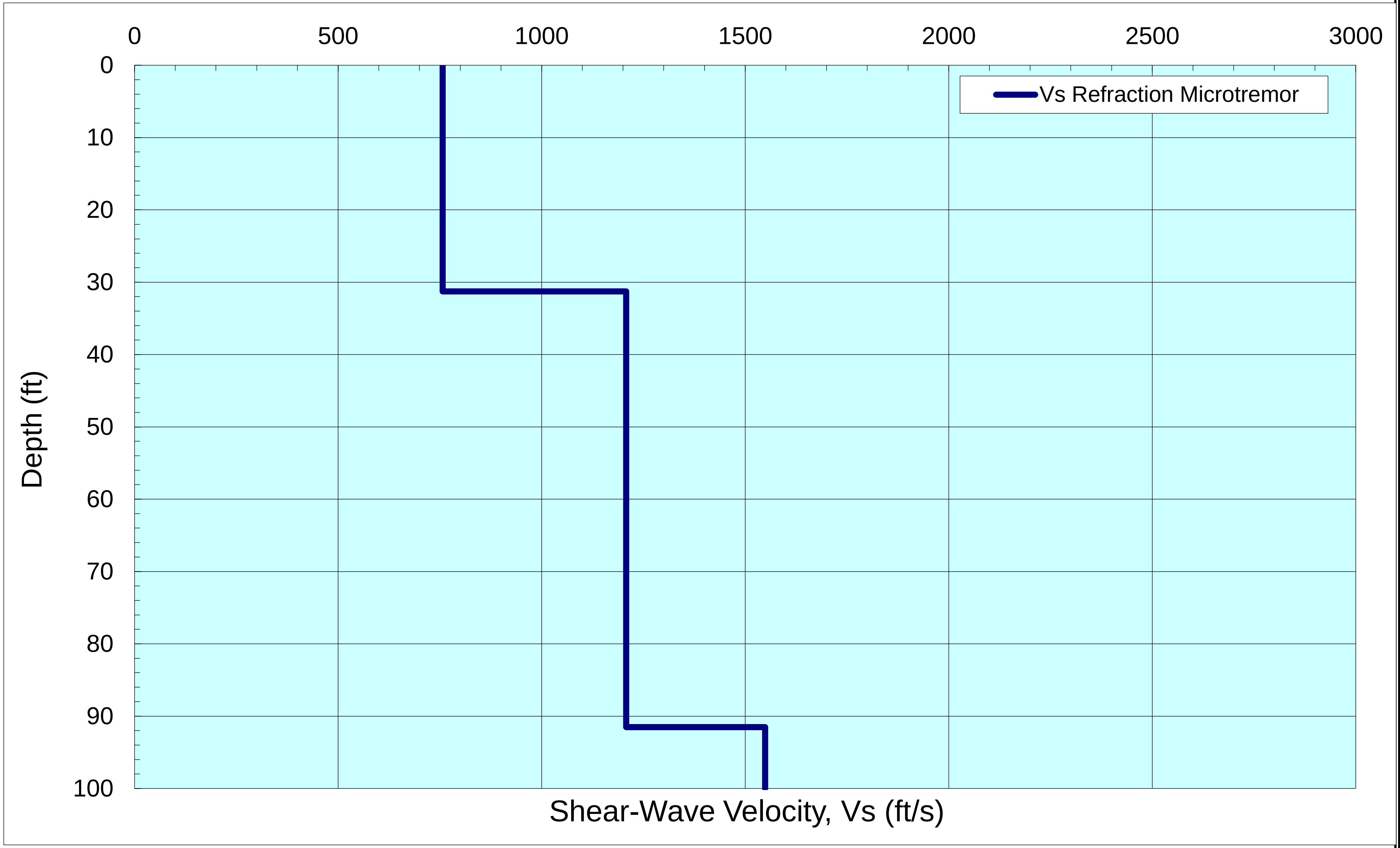
Geophone Spacing (ft) 15 Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



Line Number	**Array 2 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

Shear Wave Velocity Profile Vs. Depth



intertek psi	IBC Site Class	D	**Line Number** Array 2 (Geophones 1-24)
			Project Number 07041434
	Average Shearwave Velocity within 100 feet, V_s (ft/s)	**1,034**	Project Name Microtell Inn and Suites
			Location 43.972804, -124.100541 Florence, Oregon — Figure: A10

LABORATORY TESTING PROGRAM AND PROCEDURES

Soil samples obtained during the field explorations were examined in our laboratory. The physical characteristics of the samples were noted, and the field classifications were modified, where necessary. Representative samples were selected during the course of the examination for further testing.

Moisture Content

Natural moisture content determinations were made on selected soil samples in general accordance with ASTM D2216. The natural moisture content is defined as the ratio of the weight of water to the dry weight of soil, expressed as a percentage.

Visual-Manual Classification

The soil samples were classified in general accordance with guidelines presented in ASTM D2487. Certain terminology incorporating current local engineering practice, as provided in the Soil Classification Chart, included with, or in lieu of, ASTM terminology. The term which best described the major portion of the sample was used in determining the soil type (i.e., gravel, sand, silt or clay).

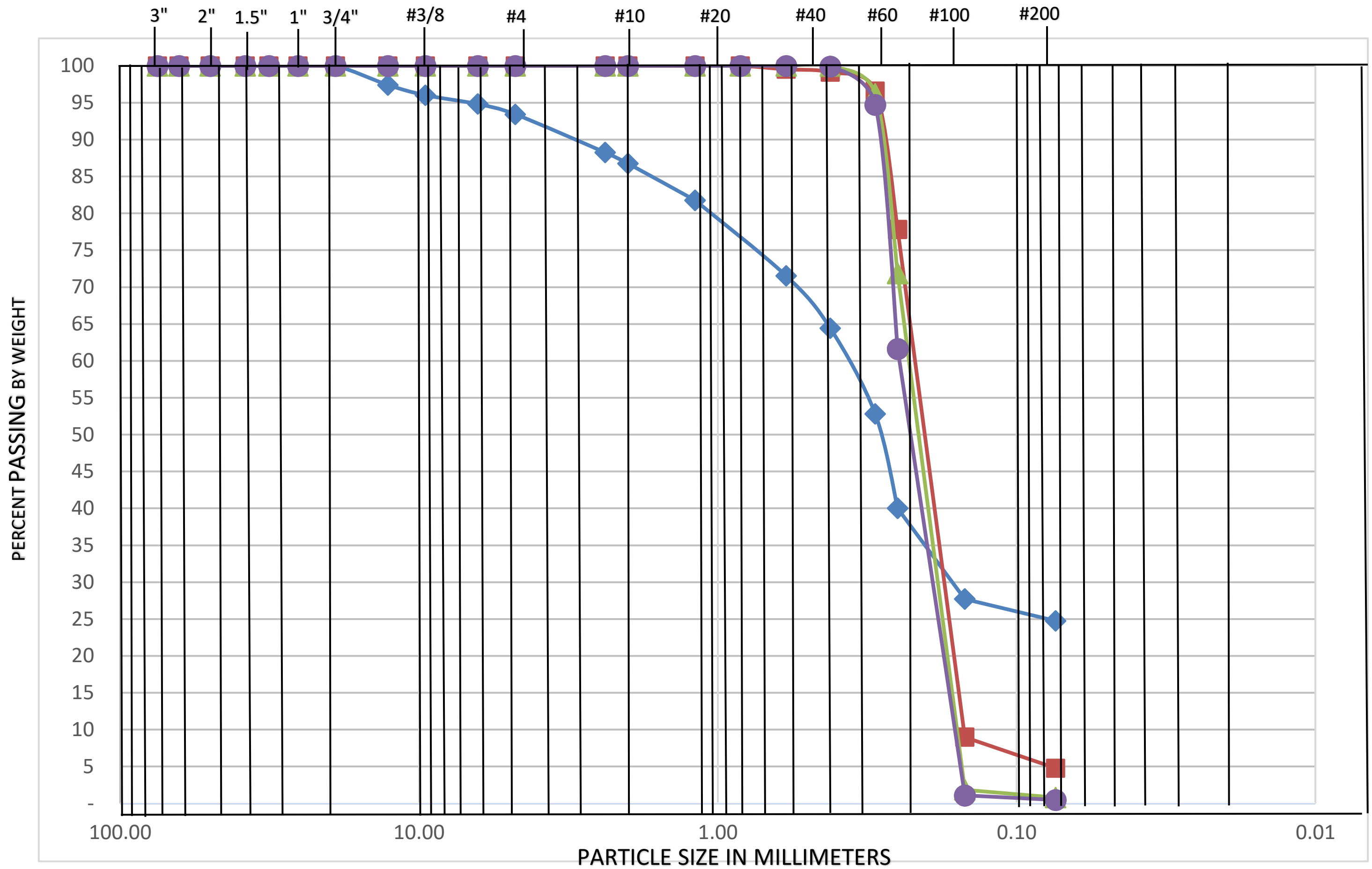
Sieve Analysis

The determination of the amount of material finer than the U.S. Standard No. 200 (75-µm) sieve was made on selected soil sample in general accordance with ASTM D1140. In general, the sample was dried in an oven and then washed with water over the No. 200 sieve. The mass retained on the No. 200 sieve was dried in an oven, and the dry weight recorded. Results from this test procedure assist in determining the fraction, by weight, of coarse-grained and fine-grained soils in the sample.

The determination of the gradation curve of the coarse-grained material was made on selected soil samples in general accordance with ASTM D6913. In general, the oven dried mass retained on the No. 200 sieve is passed over progressively smaller sieve openings, by agitating the sieves by hand or by a mechanical apparatus. The mass retained on each sieve is recorded as a fraction of the total sample, including the percent passing the No. 200 sieve.

PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



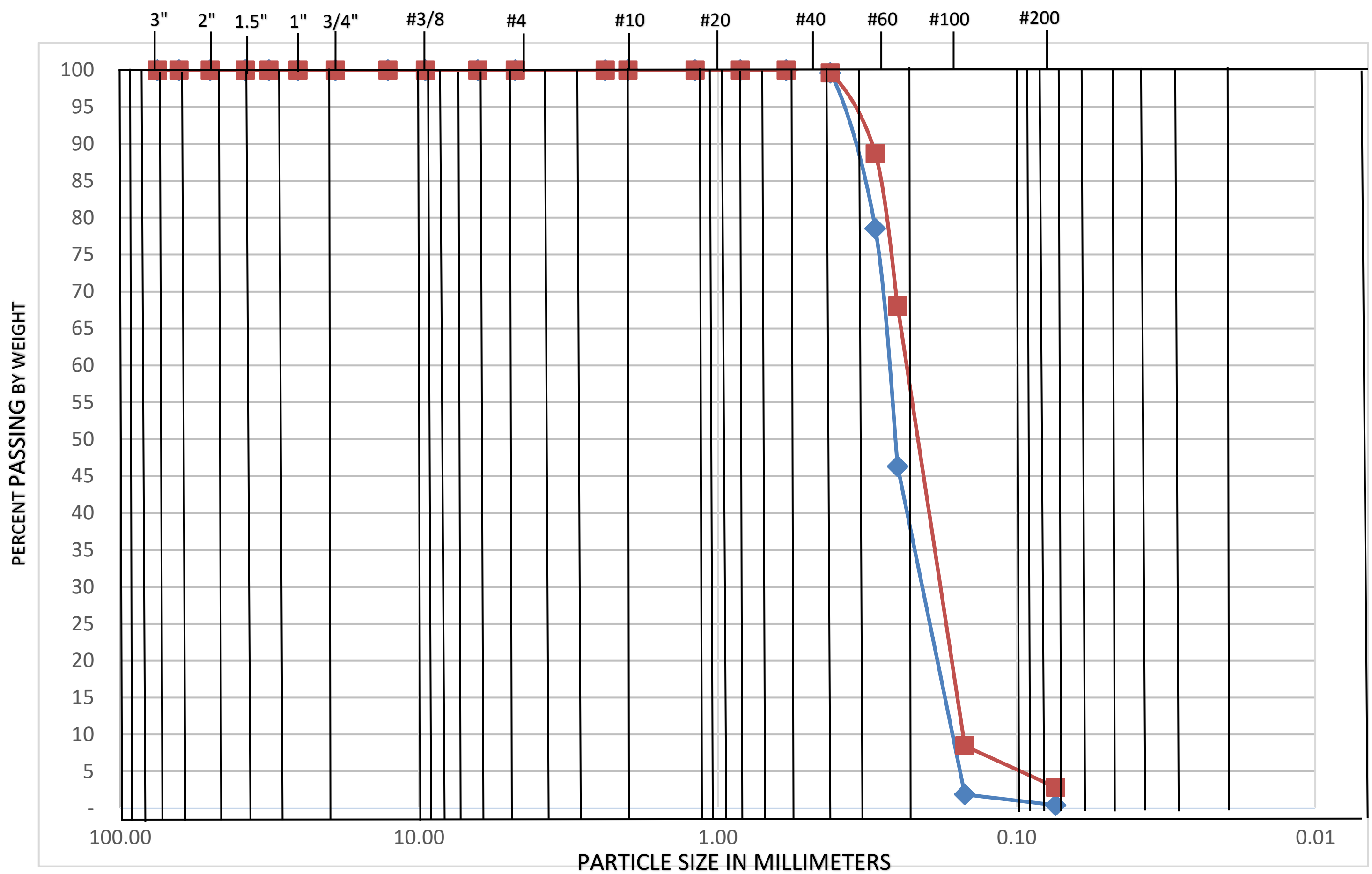
Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP1	0	7	69	25				46
GP1	6	0	95	5				7
GP1	13	0	99	1				6
GP1	16	0	100	0				7

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	0	SM	Well Graded Silty SAND	
GP1	6	SP	Poorly Graded SAND	
GP1	13	SP	Poorly Graded SAND	
GP1	16	SP	Poorly Graded SAND	

PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



Gravel		Sand			Fine Grained
Coarse	Fine	Coarse	Medium	Fine	Silt/Clay

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP1	34	0	100	0				6
GP1	36	0	97	3				18

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	34	SP	Poorly Graded SAND	
GP1	36	SP	Poorly Graded SAND	

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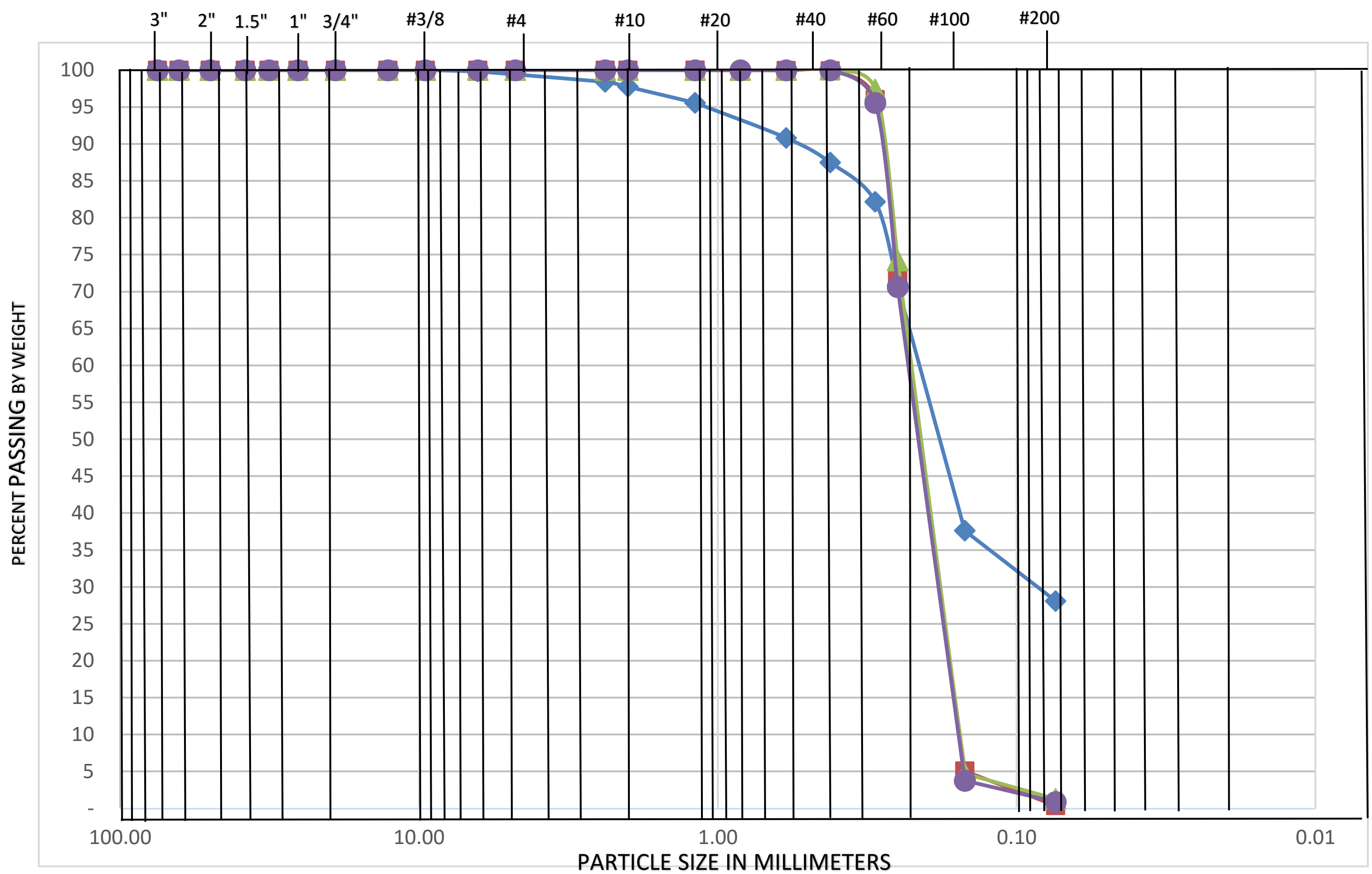
PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



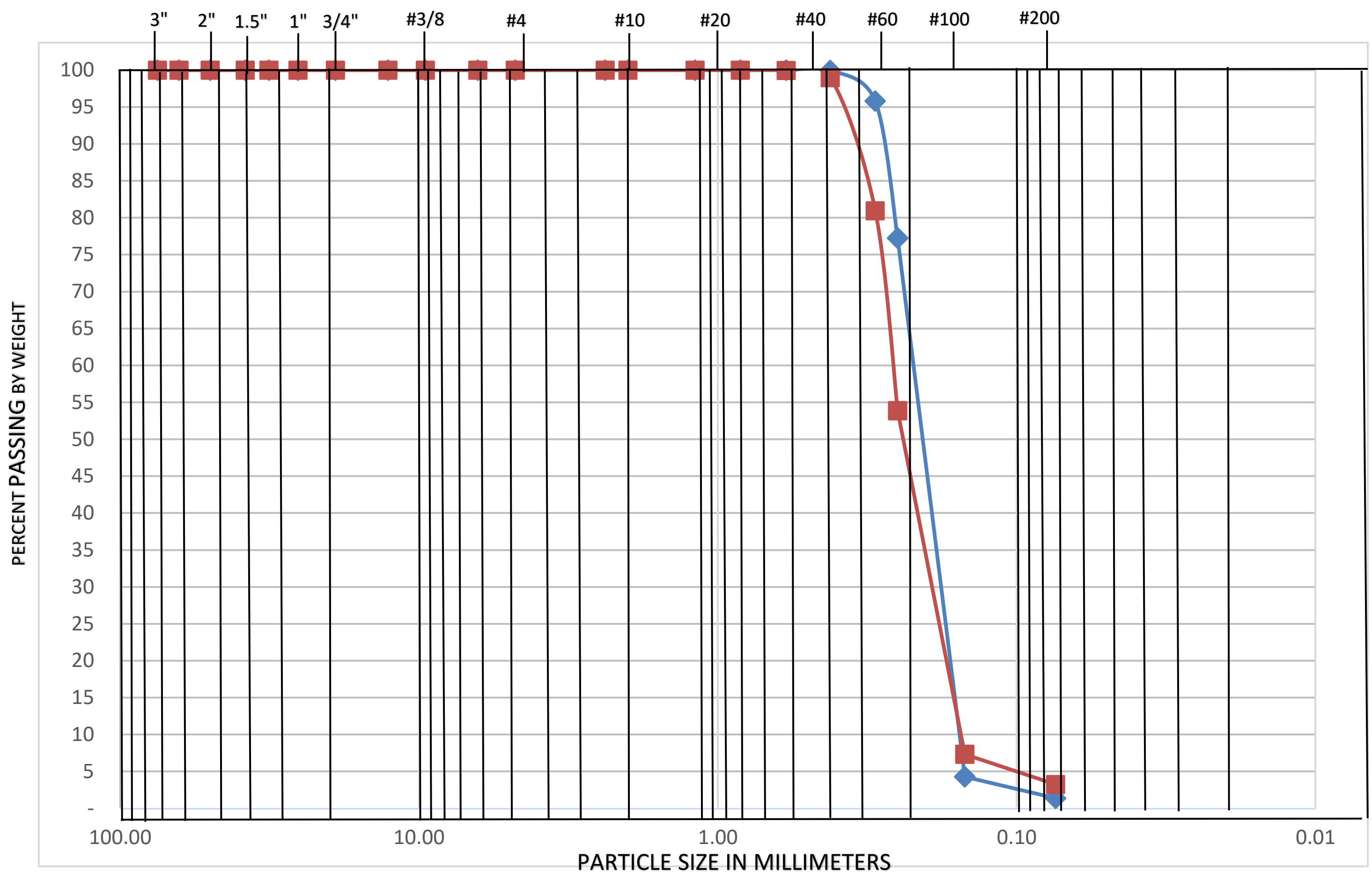
Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP2	0	0	72	28				45
GP2	2	0	100	0				5
GP2	21	0	99	1				5
GP2	26	0	99	1				5

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP2	0	SM	Poorly Graded Silty SAND	
GP2	2	SP	Poorly Graded SAND	
GP2	21	SP	Poorly Graded SAND	
GP2	26	SP	Poorly Graded SAND	

PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



Gravel		Sand			Fine Grained
Coarse	Fine	Coarse	Medium	Fine	Silt/Clay

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture
GP1	31	0	99	1				7
GP1	35	0	97	3				17

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	31	SP	Poorly Graded SAND	
GP1	35	SP	Poorly Graded SAND	

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Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: MAT:07041434-1-S1
Issue No: 1

Material Test Report

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

Project: MICROTEL INN AND SUITES

Sample Details

Sample ID:	07041434-1-S1	**Feature:**	
Client Sample ID:		**Contractor:**	
Date Sampled:	12/30/21		
Sampled By:	Staci Shub		
Specification:	Proctor / Grad		
Supplier:			
Source:	Native		
Material:	Sand		
Sampling Method:	Sub-Surface Grab Sample		
General Location:	TP 4		
Location:			
Lift:			

Other Test Results

Description	Method	Result	Limits
Maximum Dry Unit Weight (lbf/ft³)	ASTM D 1557	102.8	
Corrected Maximum Dry Unit Weight (lbf/ft³)		102.8	
Optimum Water Content (%)		8.2	
Corrected Optimum Water Content (%)		8.2	
Method		A	
Preparation Method		Moist	
Rammer Type		Mechanical	

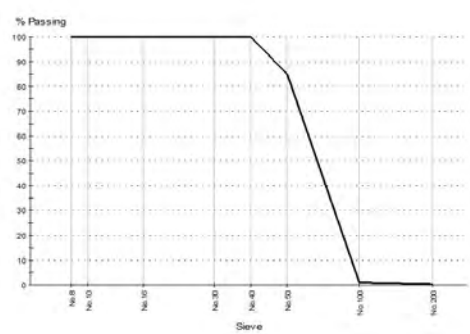
Particle Size Distribution

Method: ASTM C 136, ASTM C 117

Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.8 (2.36mm)	100	
No.10 (2.0mm)	100	
No.16 (1.18mm)	100	
No.30 (600µm)	100	
No.40 (425µm)	100	
No.50 (300µm)	85	
No.100 (150µm)	1	
No.200 (75µm)	0.20	

Chart



Comments

N/A

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CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: PTR:07041434-1-S1
Issue No: 1

Proctor Report

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

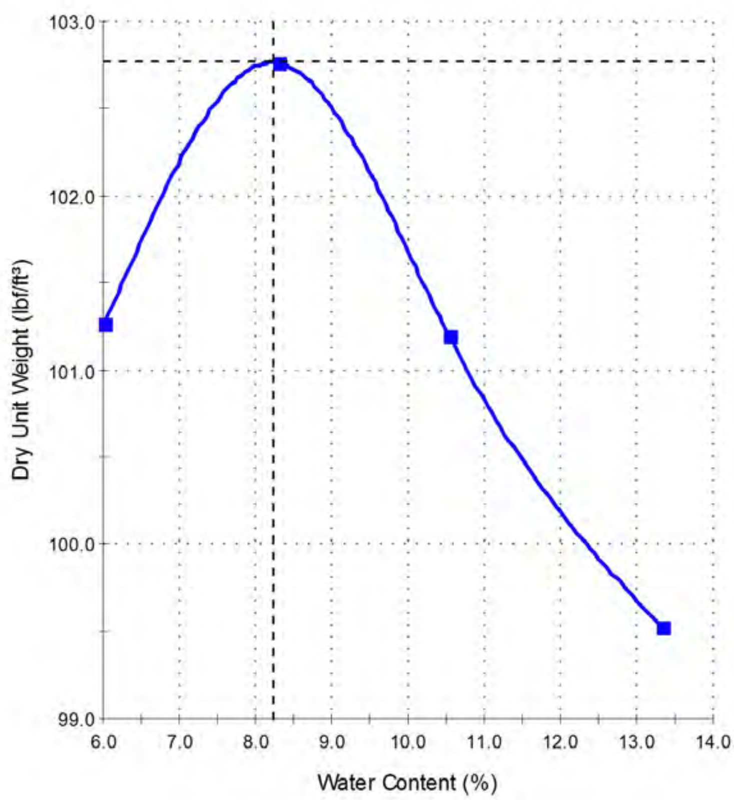
Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID:	07041434-1-S1	**Date Sampled:**	12/30/2021
Sampled By:	Staci Shub	**Specification:**	Proctor / Grad
Source:	Native	**Material:**	Sand
Sampling Method:	Sub-Surface Grab Sample	**General Location:**	TP 4
Location:			

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 1557

Maximum Dry Unit Weight (lbf/ft³):	**102.8**
Optimum Water Content (%):	**8.2**
Method:	A
Preparation Method:	Moist
Rammer Type:	Mechanical
Tested By:	
Date Tested:	

Comments

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: MAT:07041434-1-S2
Issue No: 1

Material Test Report

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID: 07041434-1-S2
Feature:
Client Sample ID:
Contractor:
Date Sampled:
Sampled By: Staci Shub
Specification: Proctor / Grad
Supplier:
Source: Native
Material: Sand
Sampling Method: Sub-Surface Grab Sample
General Location: TP 6
Location:
Lift:

Other Test Results

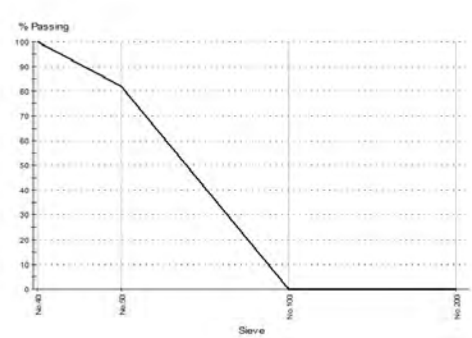
Description	Method	Result	Limits
Maximum Dry Unit Weight (lbf/ft³)	ASTM D 1557	102.2	
Corrected Maximum Dry Unit Weight (lbf/ft³)		102.2	
Optimum Water Content (%)		9.5	
Corrected Optimum Water Content (%)		9.5	
Method		A	
Preparation Method		Moist	
Rammer Type		Mechanical	

Particle Size Distribution

Method: ASTM C 136, ASTM C 117
Drying By: Oven
Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.40 (425µm)	100	
No.50 (300µm)	82	
No.100 (150µm)	0	
No.200 (75µm)	0.10	

Chart



Comments

N/A

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CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: PTR:07041434-1-S2
Issue No: 1

Proctor Report

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

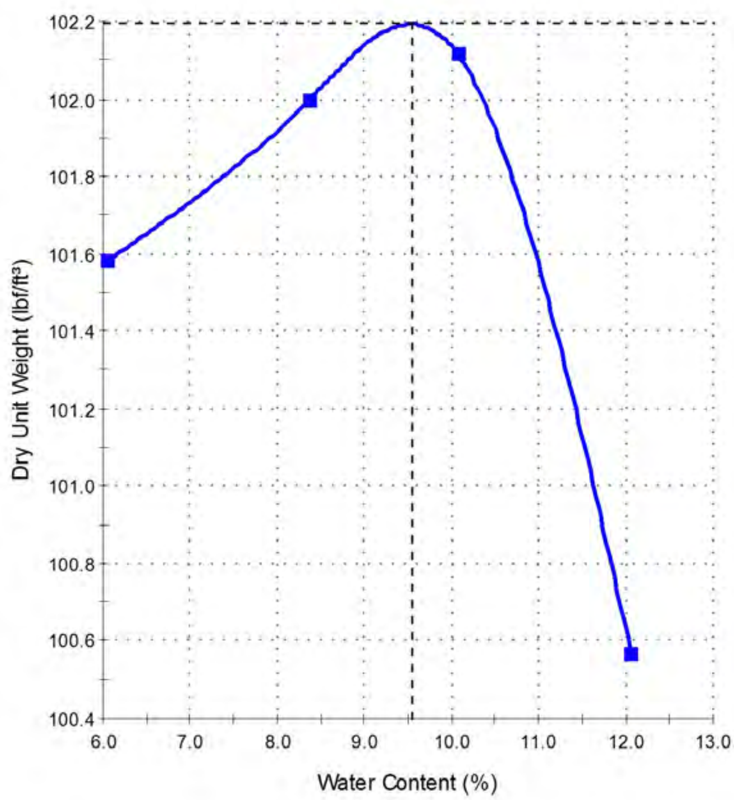
Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID:	07041434-1-S2	**Date Sampled:**	
Sampled By:	Staci Shub	**Specification:**	Proctor / Grad
Source:	Native	**Material:**	Sand
Sampling Method:	Sub-Surface Grab Sample	**General Location:**	TP 6
Location:			

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 1557

Maximum Dry Unit Weight (lbf/ft³):	**102.2**
Optimum Water Content (%):	**9.5**
Method:	A
Preparation Method:	Moist
Rammer Type:	Mechanical
Tested By:	
Date Tested:	

Comments

APPENDIX B

LIQUEFACTION RESULTS

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

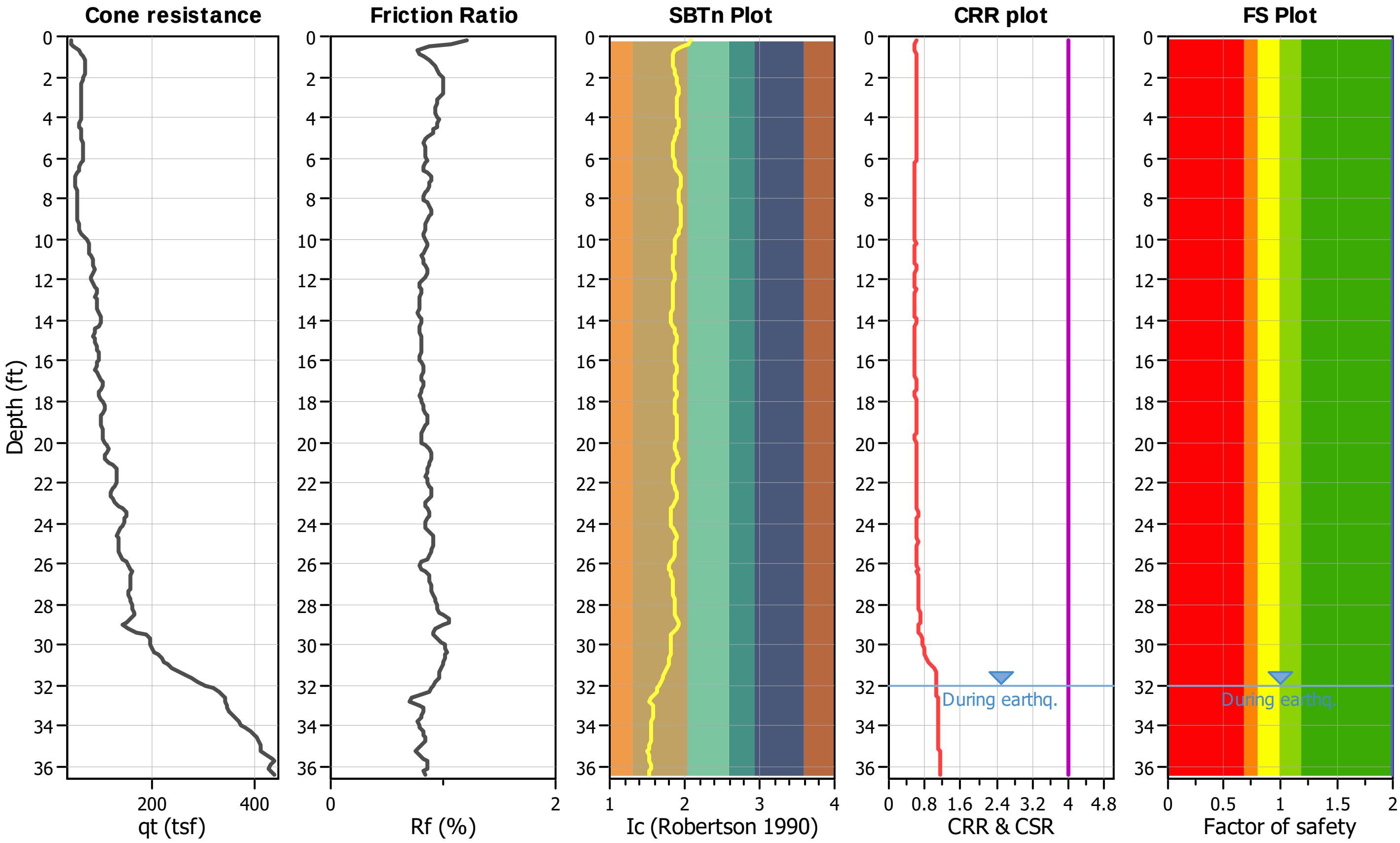
LIQUEFACTION ANALYSIS REPORT

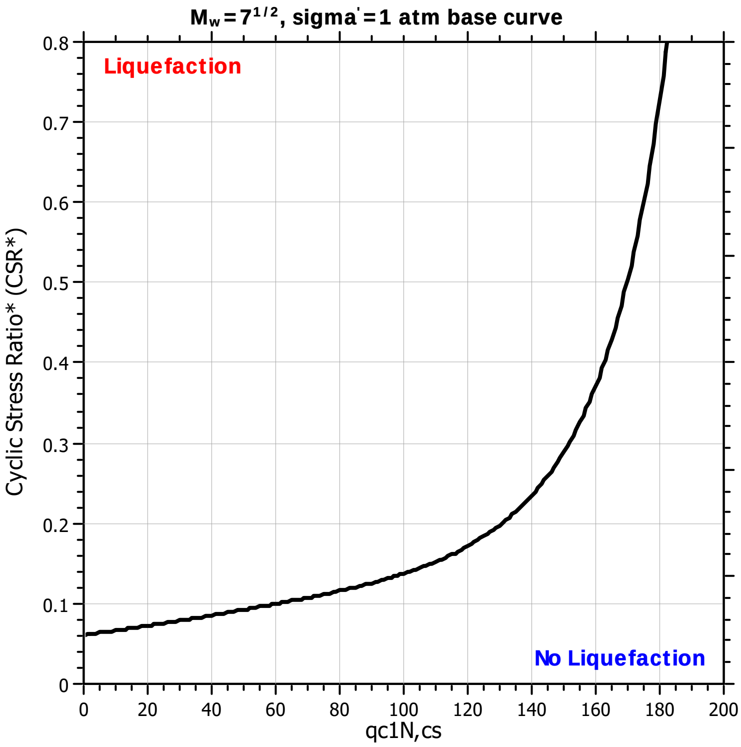
Project title : Microtel Inn and Suites **Location : Florence, OR**

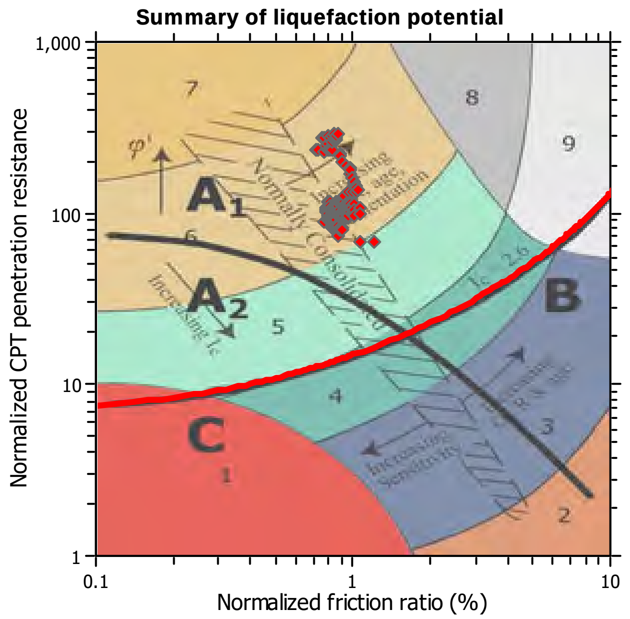
CPT file : 21020 CPT-1 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

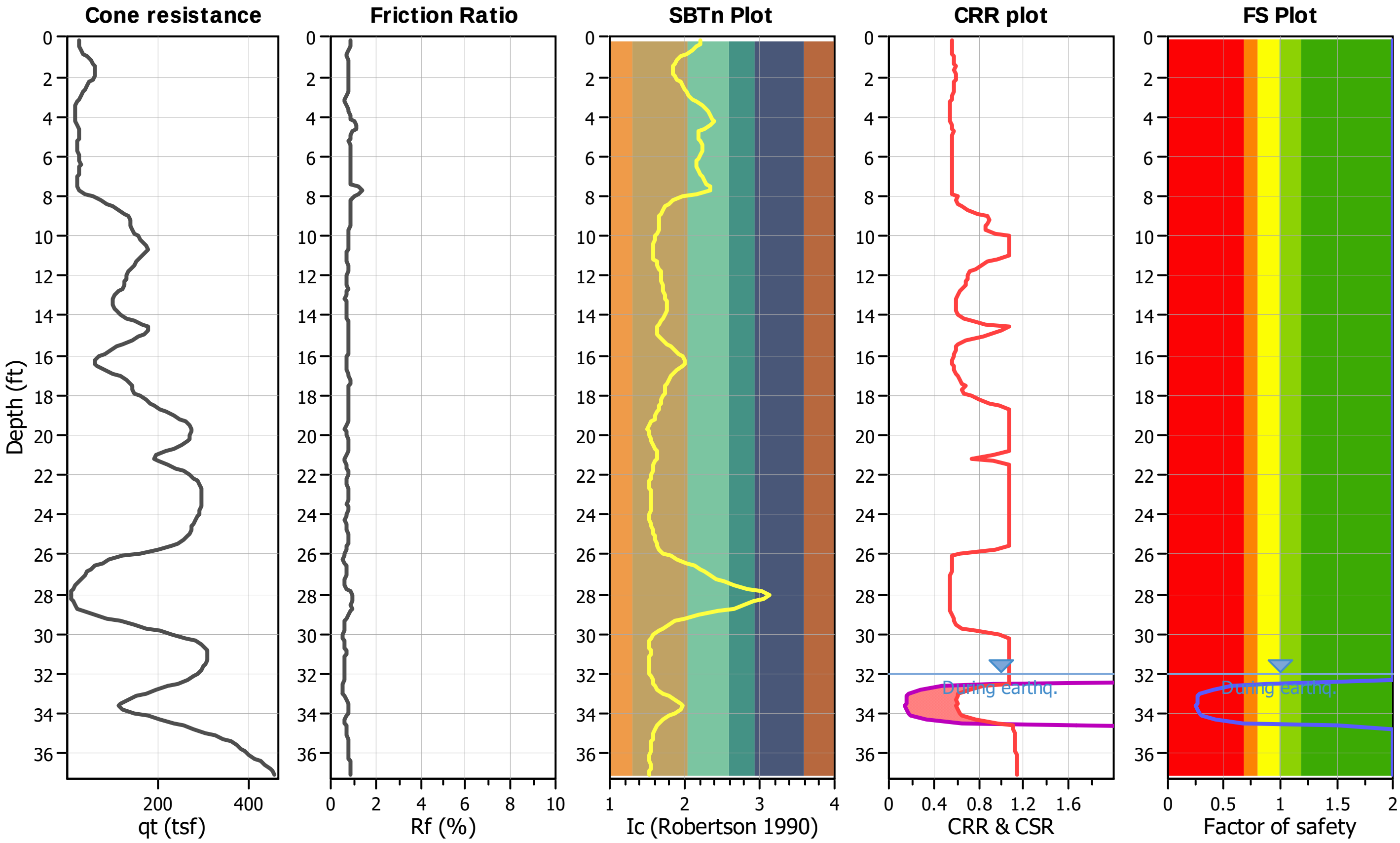
LIQUEFACTION ANALYSIS REPORT

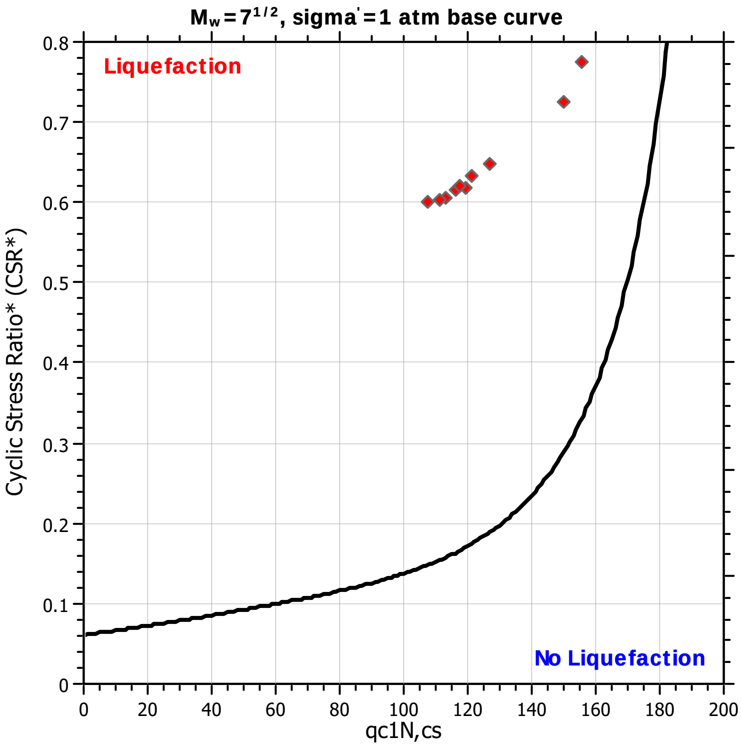
Project title : Microtel Inn and Suites **Location : Florence, OR**

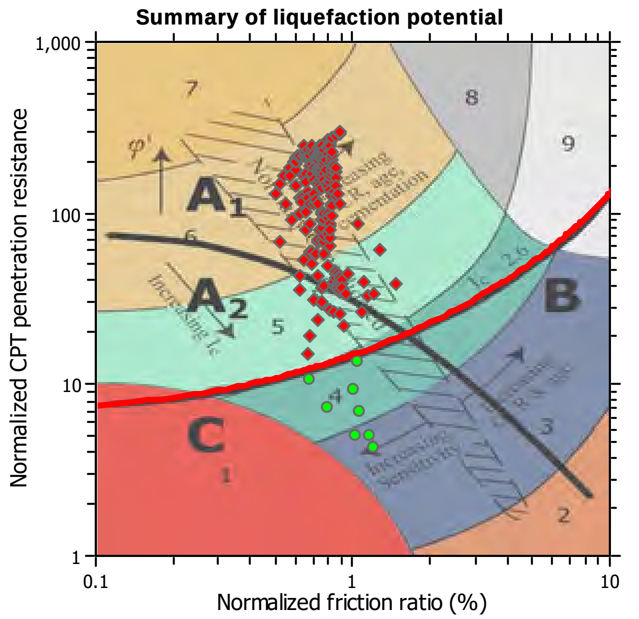
CPT file : 21020 CPT-2 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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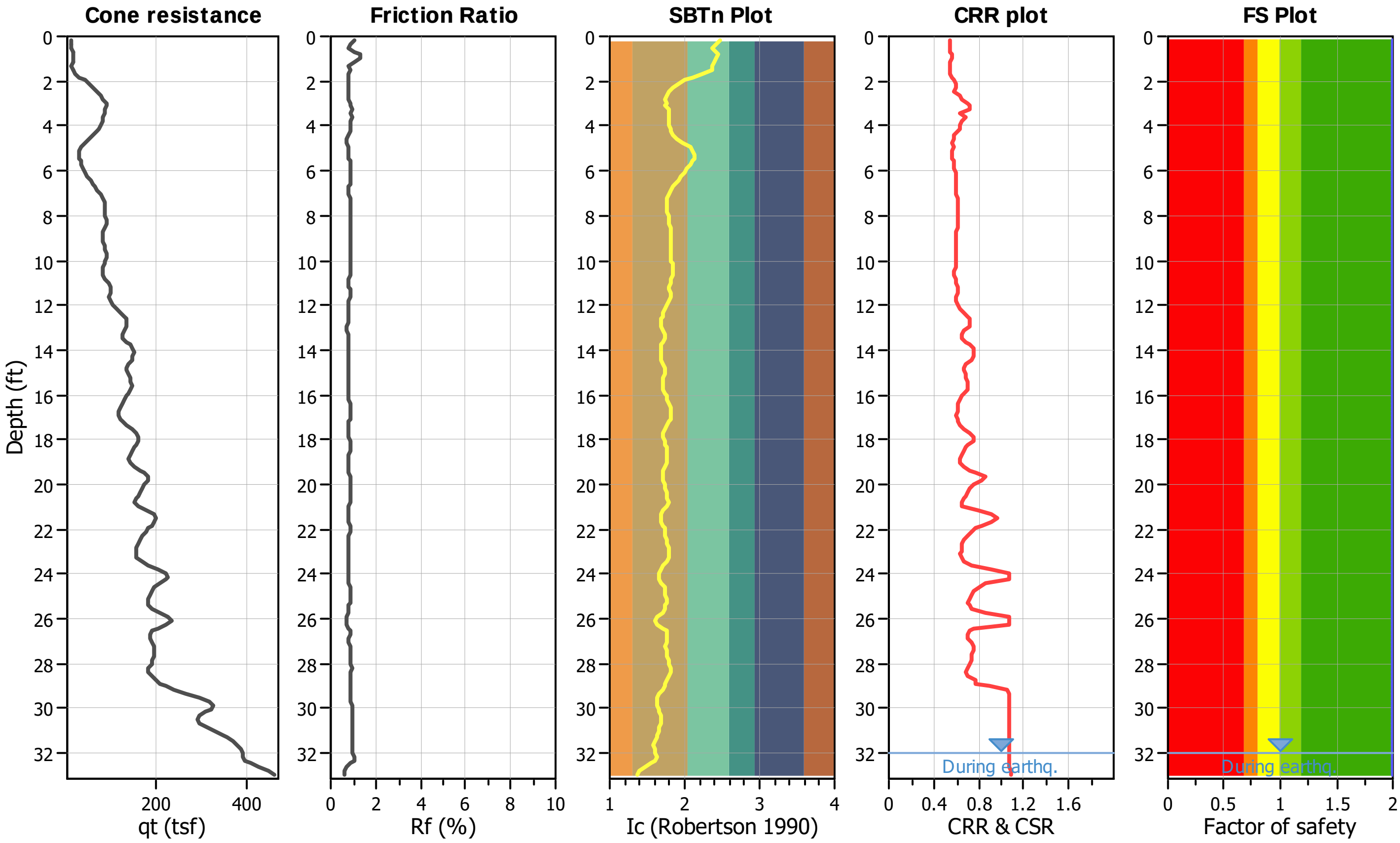
LIQUEFACTION ANALYSIS REPORT

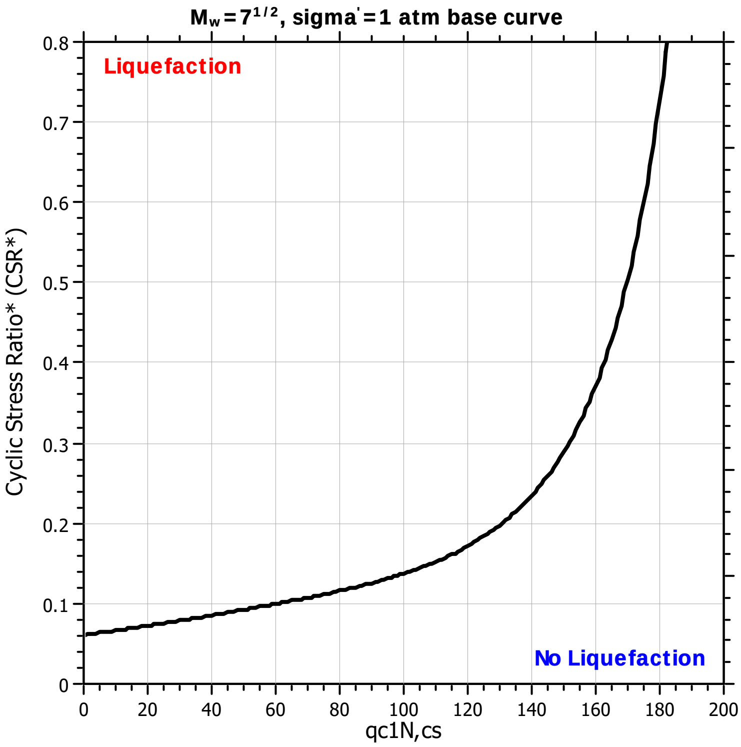
Project title : Microtel Inn and Suites **Location : Florence, OR**

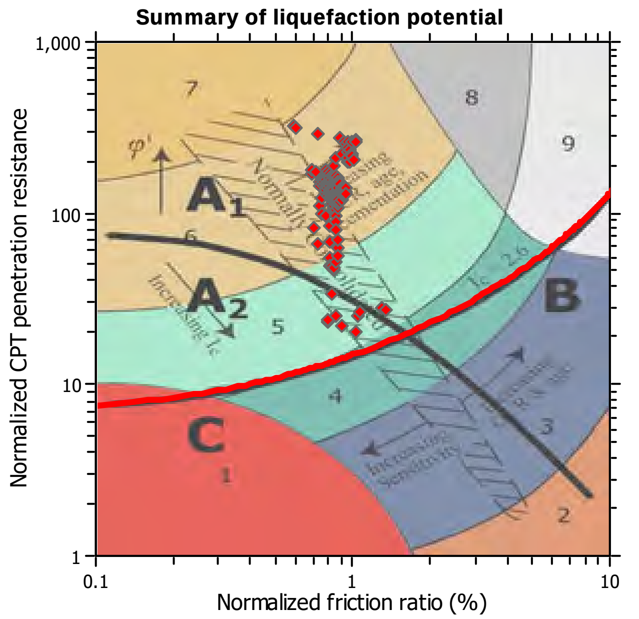
CPT file : 21020 CPT-3 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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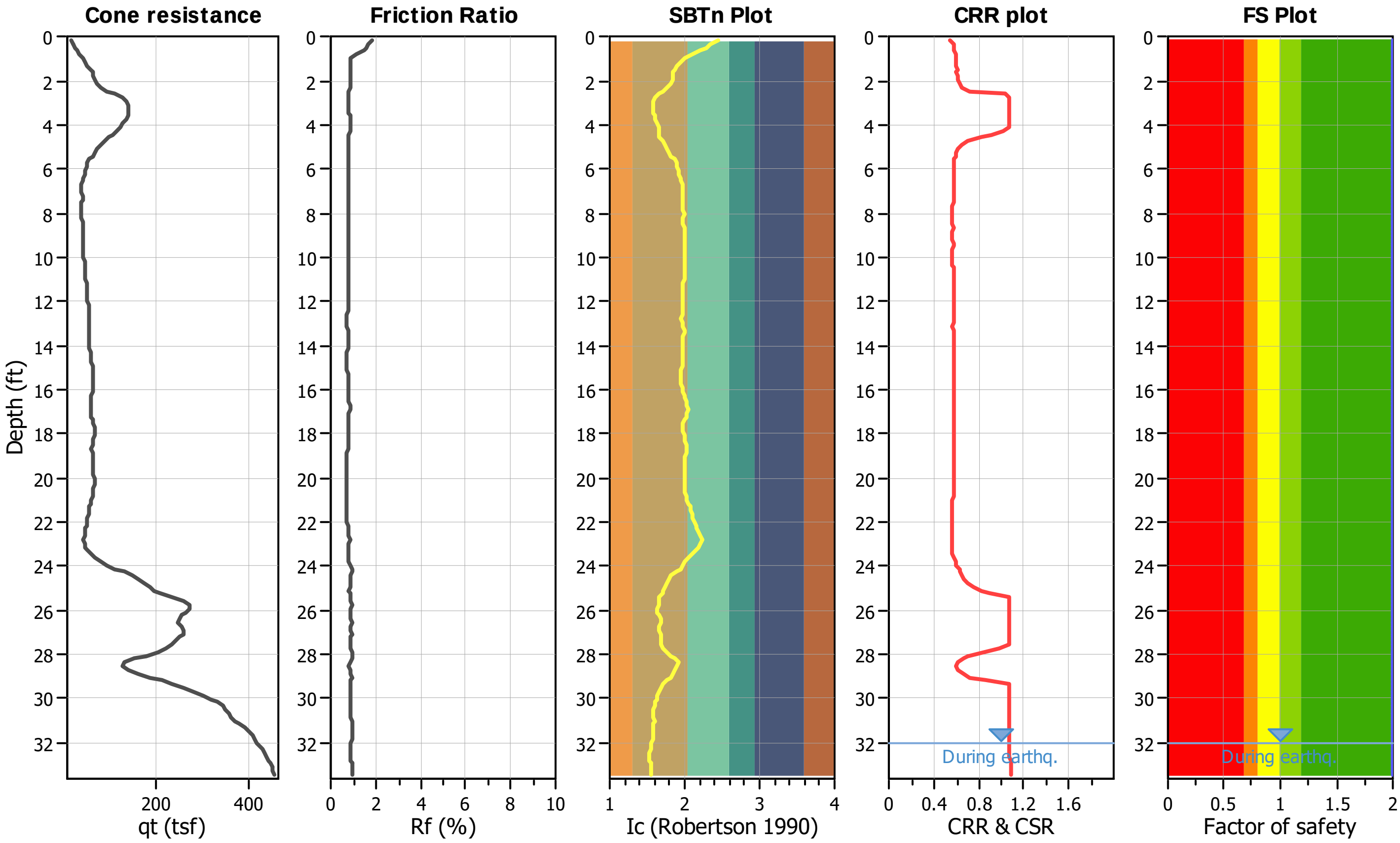
LIQUEFACTION ANALYSIS REPORT

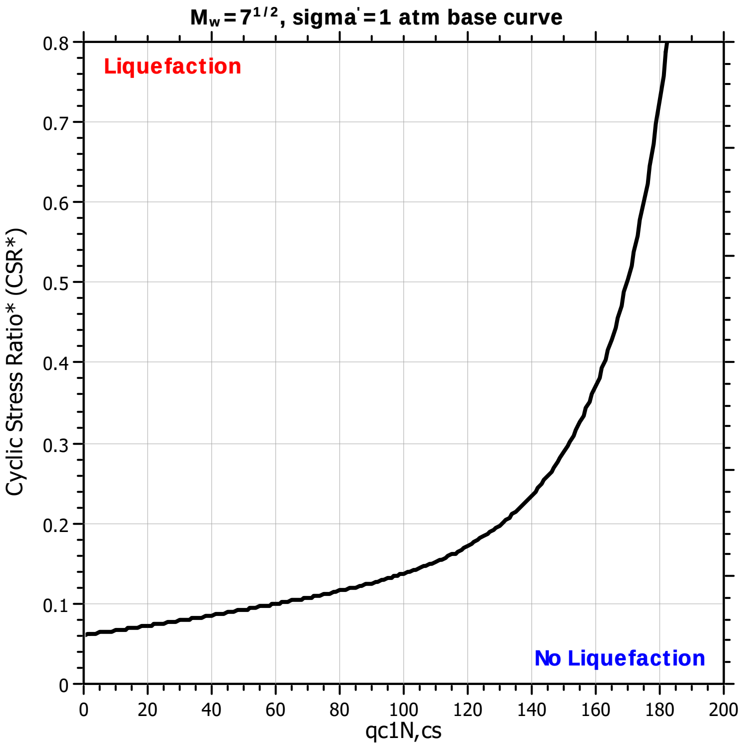
Project title : Microtel Inn and Suites **Location : Florence, OR**

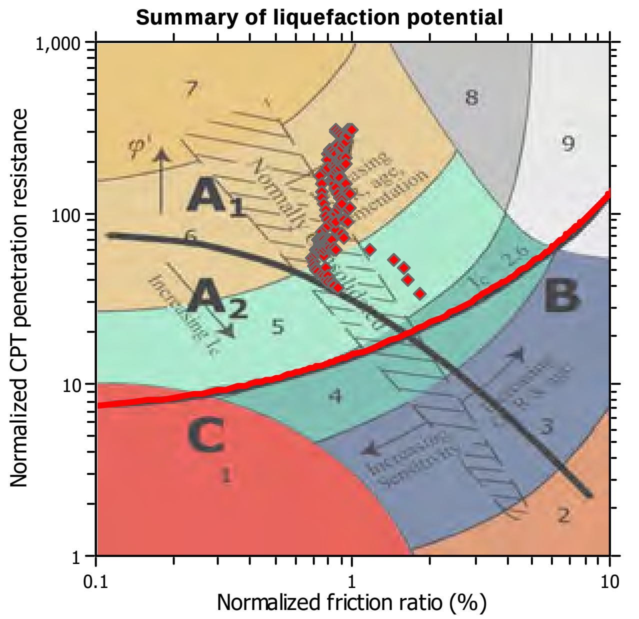
CPT file : 21020 CPT-4 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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Portland, OR 97217
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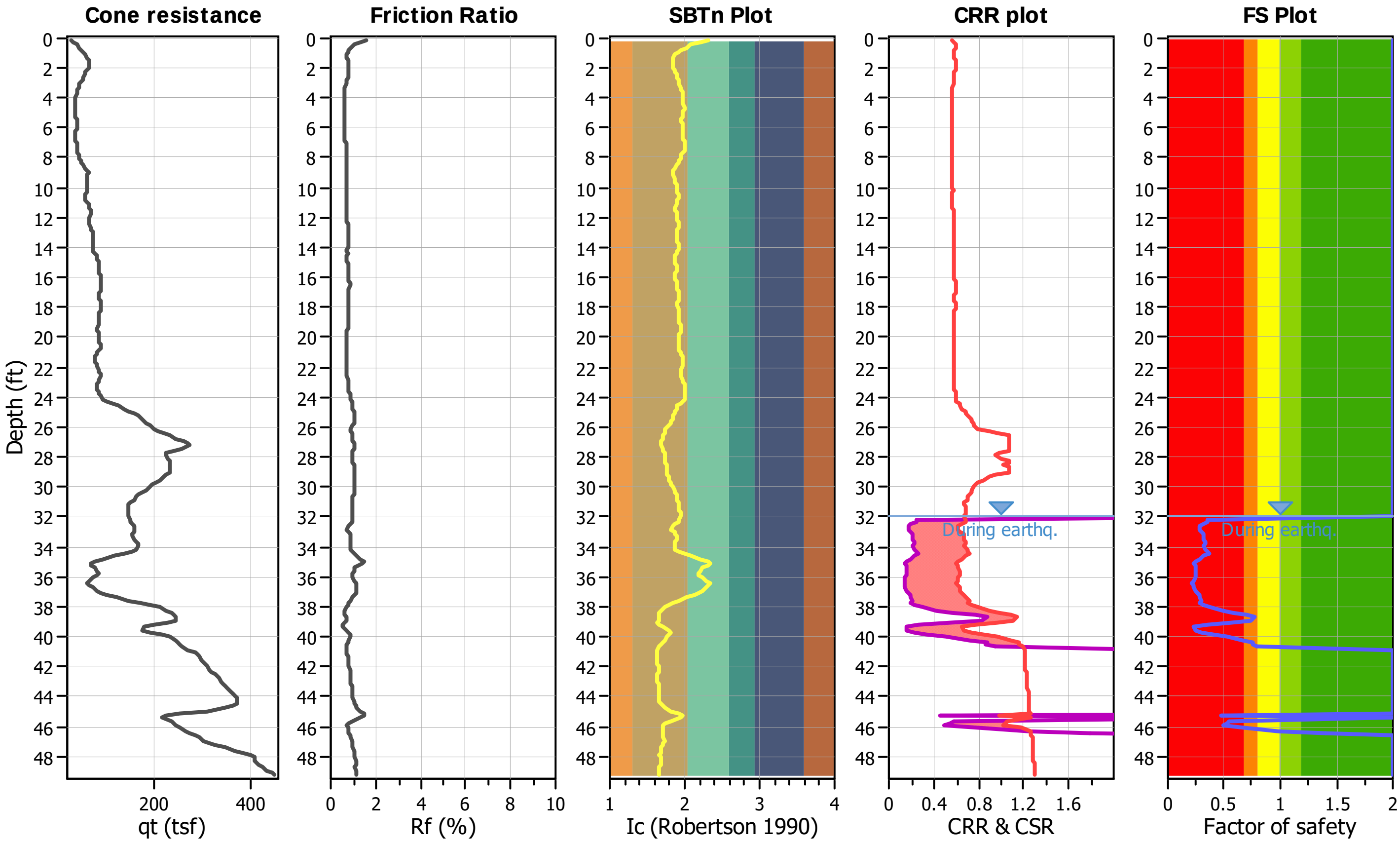
LIQUEFACTION ANALYSIS REPORT

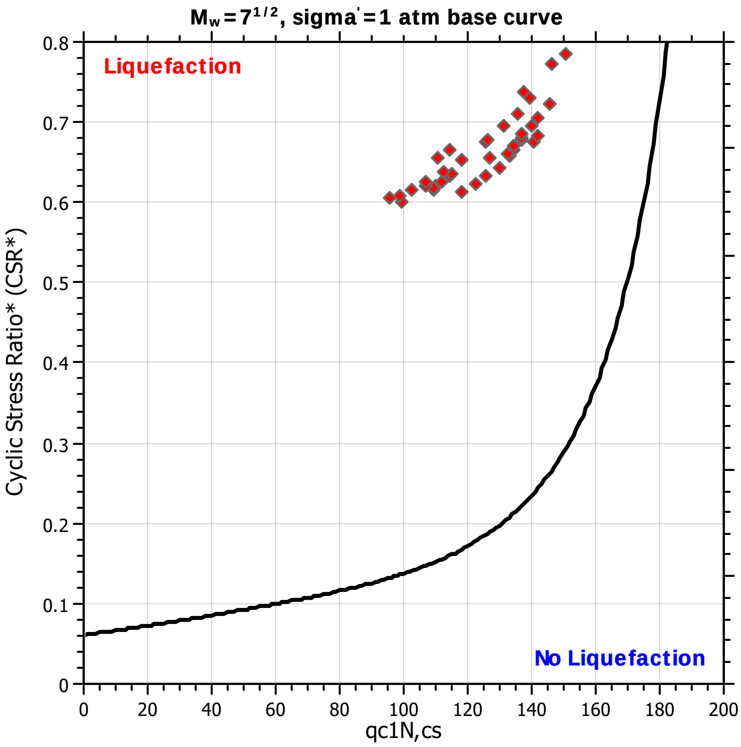
Project title : Microtel Inn and Suites **Location : Florence, OR**

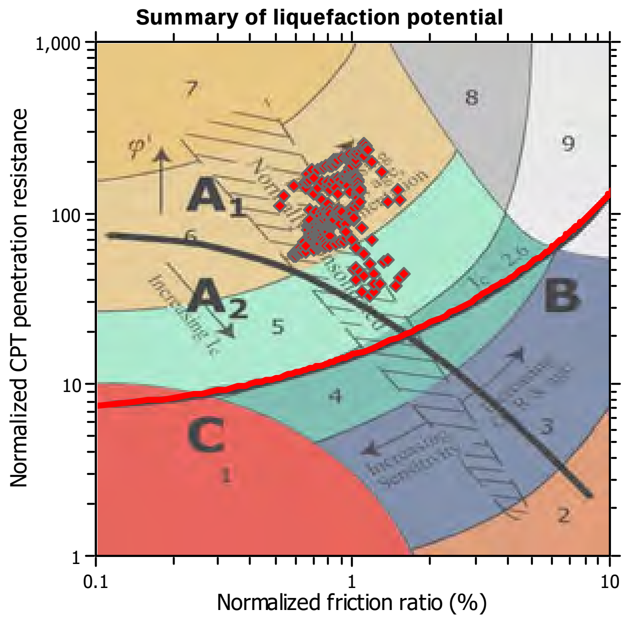
CPT file : 21020 CPT-5 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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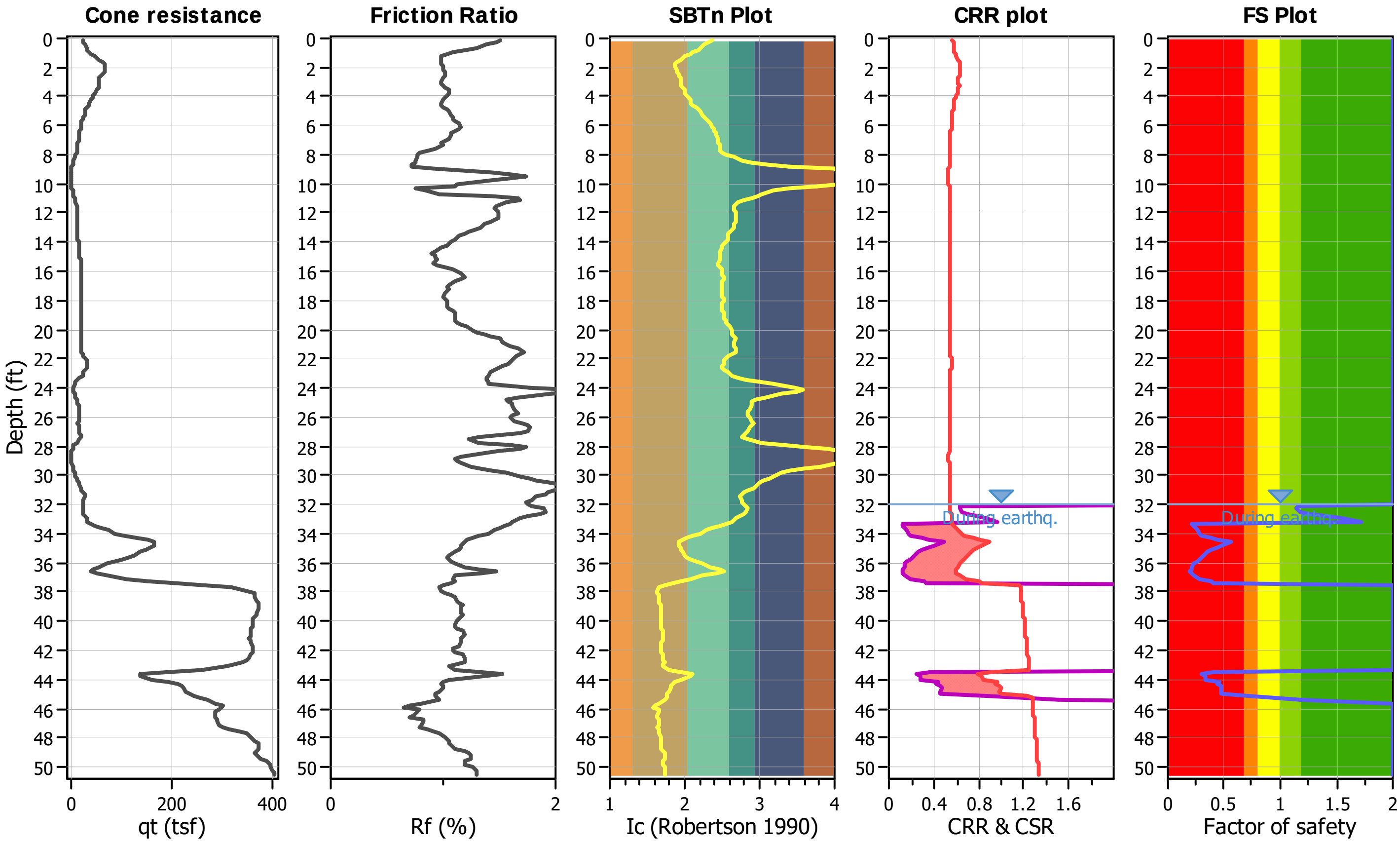
LIQUEFACTION ANALYSIS REPORT

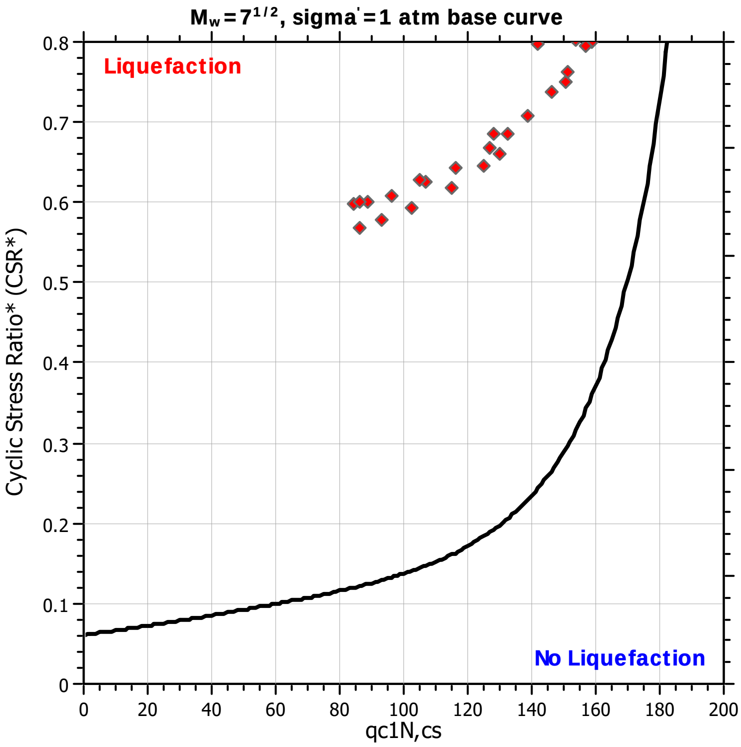
Project title : Microtel Inn and Suites **Location : Florence, OR**

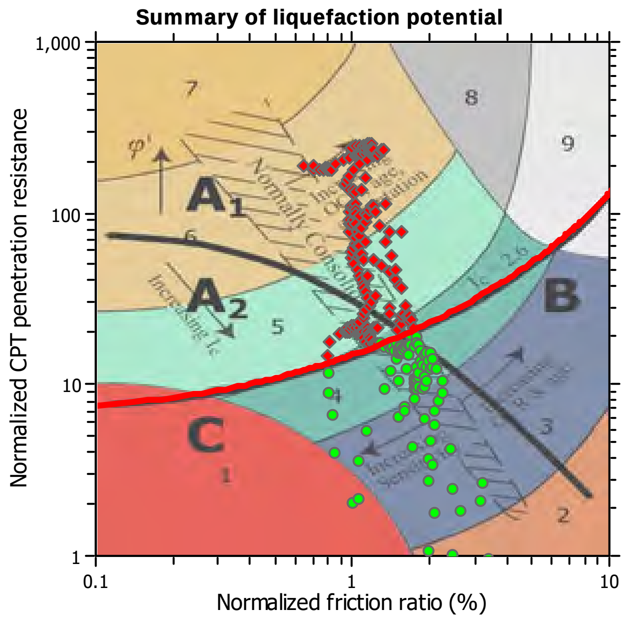
CPT file : 21020 CPT-6 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		





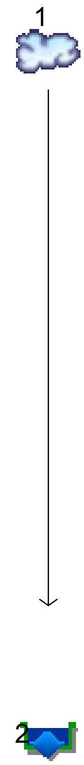


Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

APPENDIX C: Runoff Calculations

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022



Legend

Hyd.	Origin	Description
1	SCS Runoff	Developed Site
2	Reservoir	Infiltration

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	0.730	-------	-------	1.338	1.721	-------	2.343	Developed Site
2	Reservoir	1	-------	0.000	-------	-------	0.000	0.000	-------	0.000	Infiltration

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.730	1	480	13,433	------	------	------	Developed Site
2	Reservoir	0.000	1	673	0	1	98.30	752	Infiltration

Hydrograph Report

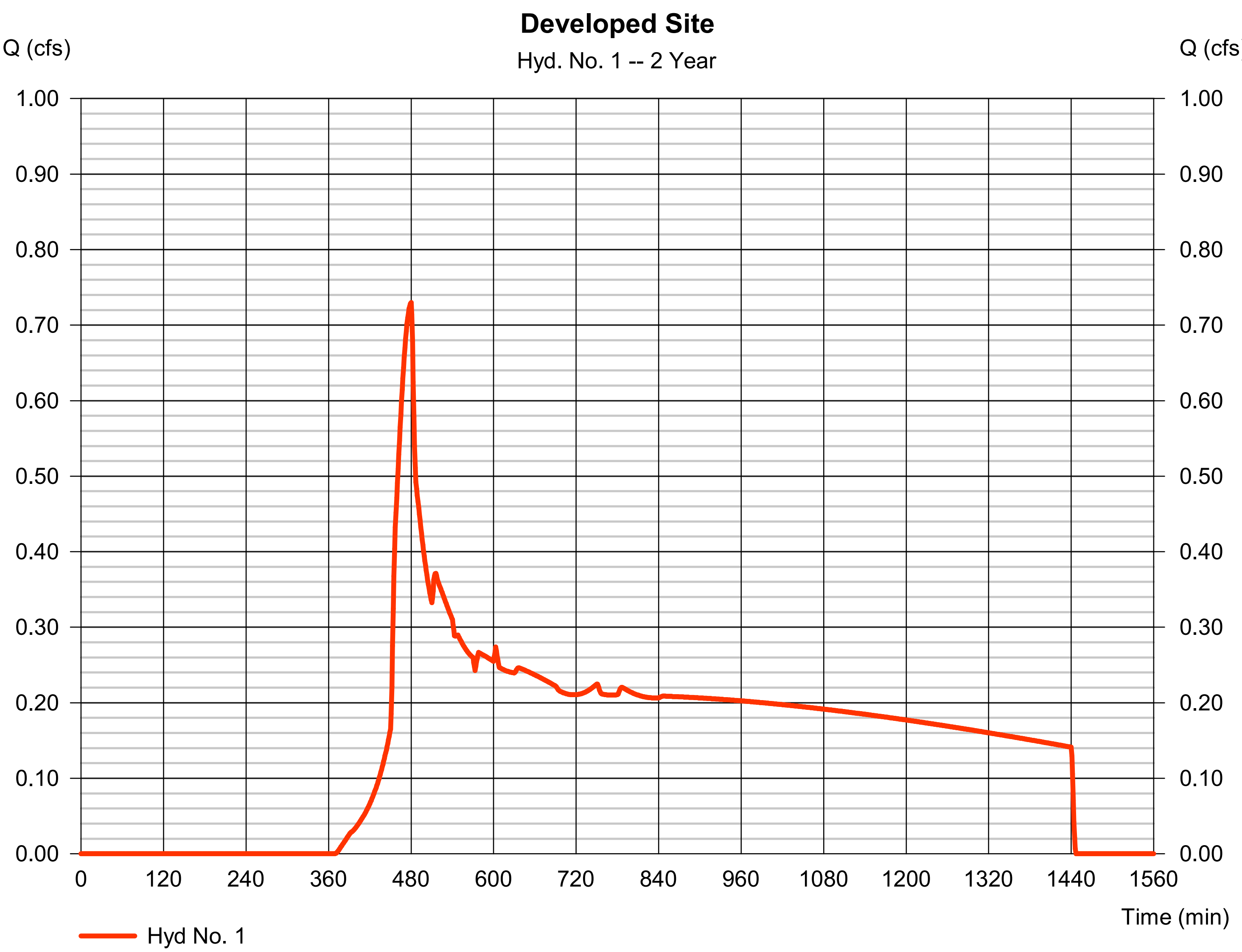
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 — Wednesday, 06 / 1 / 2022

Hyd. No. 1

Developed Site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.730 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 1 min	Hyd. volume	= 13,433 cuft
Drainage area	= 3.210 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 4.00 min
Total precip.	= 3.46 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.860 x 98) + (1.350 x 39)] / 3.210



Hydrograph Report

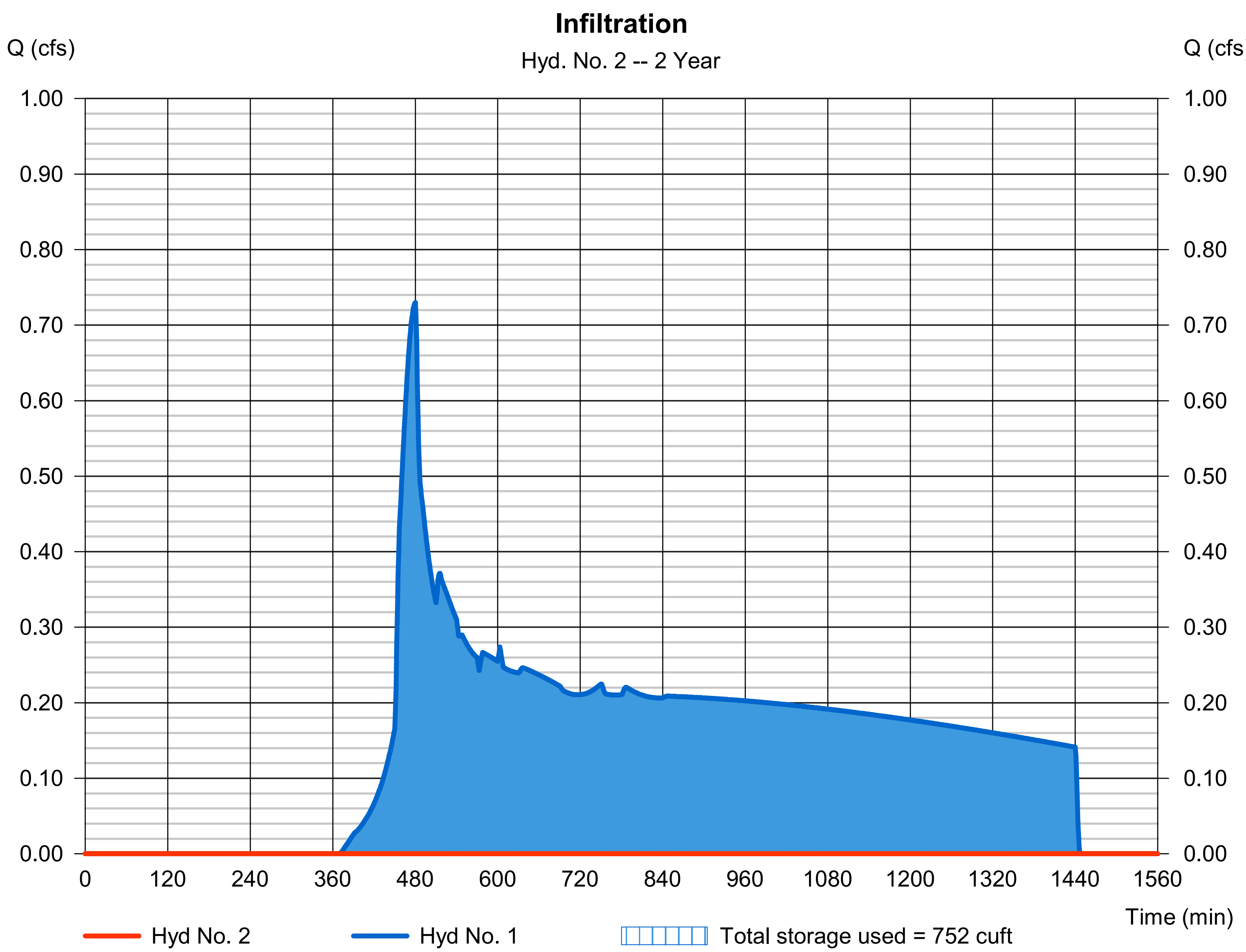
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 2

Infiltration

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 673 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 1 - Developed Site	Max. Elevation	= 98.30 ft
Reservoir name	= Detention Pond	Max. Storage	= 752 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - Detention Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 38.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	38.50	153	0	0
0.50	39.00	277	106	106
1.50	40.00	580	419	525
2.50	41.00	955	760	1,285
3.50	42.00	1,399	1,170	2,455
4.50	43.00	1,899	1,642	4,097

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	0.00	0.00
Span (in)	= 3.20	12.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 97.00	96.50	0.00	0.00
Length (ft)	= 1.00	50.00	0.00	0.00
Slope (%)	= 0.10	5.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 25.000 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	38.50	0.00	0.00	---	---	---	---	---	---	0.000	---	0.000
0.50	106	39.00	0.00	0.00	---	---	---	---	---	---	0.160	---	0.160
1.50	525	40.00	0.00	0.00	---	---	---	---	---	---	0.336	---	0.336
2.50	1,285	41.00	0.00	0.00	---	---	---	---	---	---	0.553	---	0.553
3.50	2,455	42.00	0.00	0.00	---	---	---	---	---	---	0.810	---	0.810
4.50	4,097	43.00	0.00	0.00	---	---	---	---	---	---	1.099	---	1.099

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.338	1	478	21,913	------	------	------	Developed Site
2	Reservoir	0.000	1	478	0	1	99.42	1,771	Infiltration

Hydrograph Report

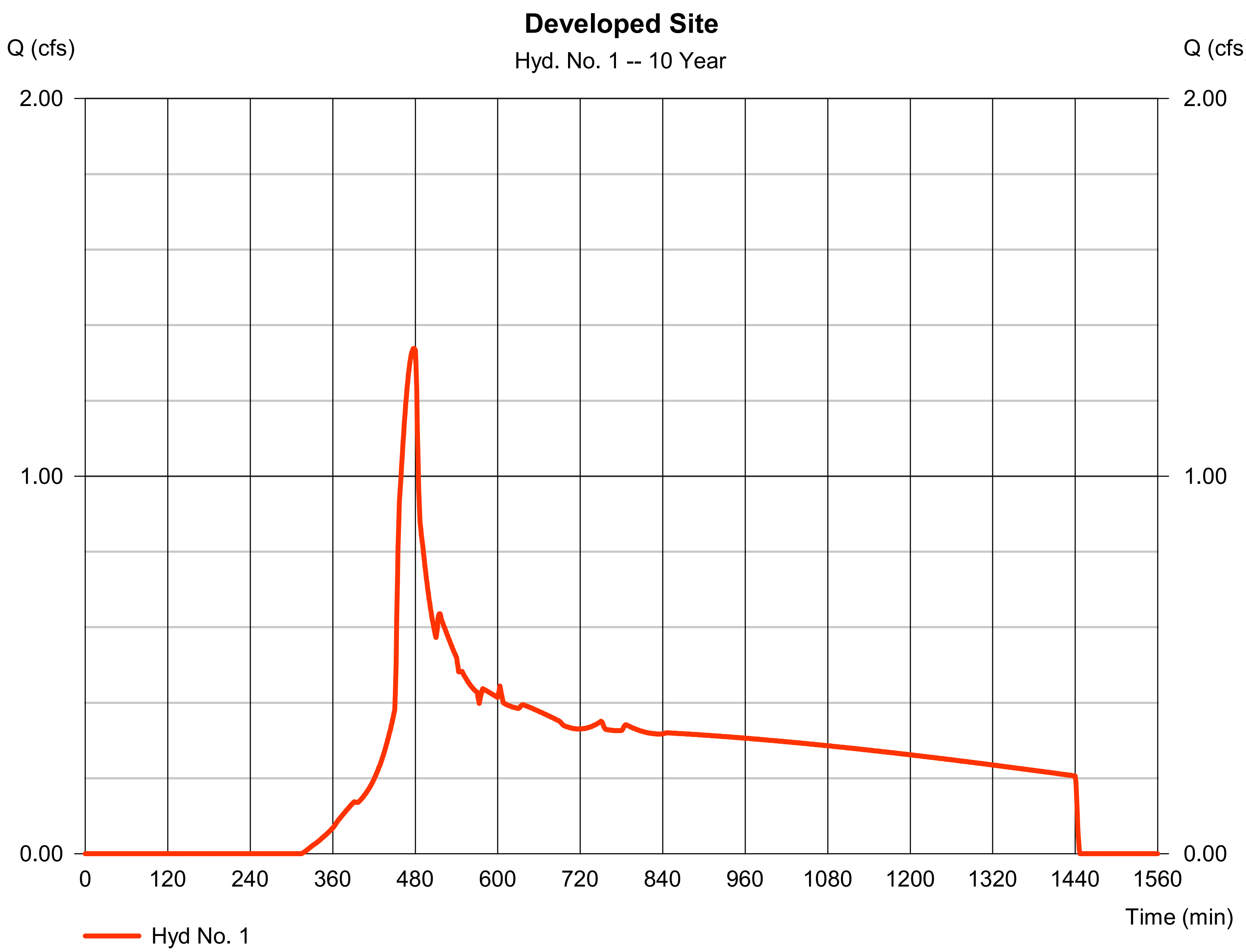
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 1

Developed Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.338 cfs
Storm frequency	= 10 yrs	Time to peak	= 478 min
Time interval	= 1 min	Hyd. volume	= 21,913 cuft
Drainage area	= 3.210 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 4.00 min
Total precip.	= 4.48 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.860 x 98) + (1.350 x 39)] / 3.210



Hydrograph Report

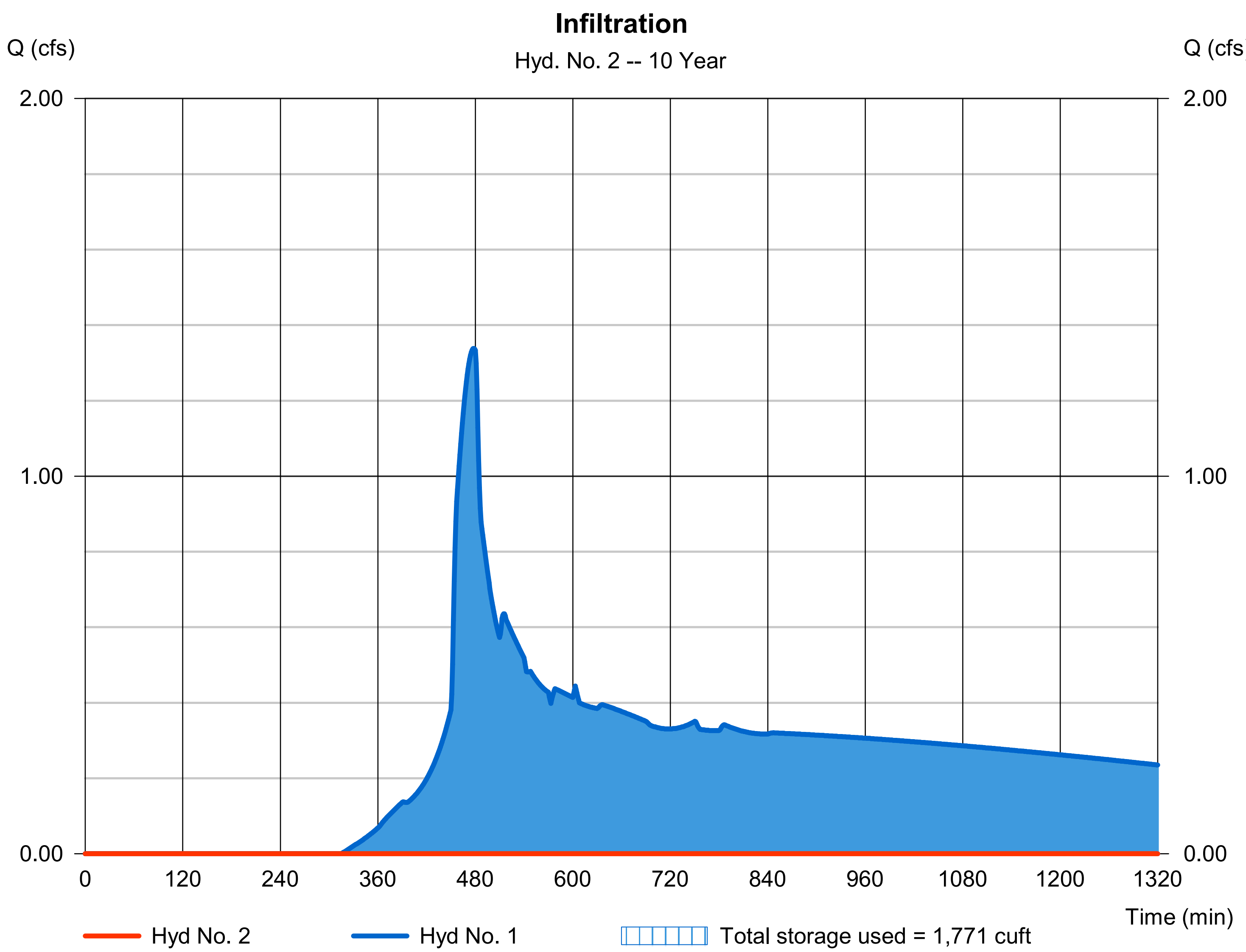
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 2

Infiltration

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 478 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 1 - Developed Site	Max. Elevation	= 99.42 ft
Reservoir name	= Detention Pond	Max. Storage	= 1,771 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.721	1	477	27,122	------	------	------	Developed Site
2	Reservoir	0.000	1	538	0	1	100.02	2,492	Infiltration

Hydrograph Report

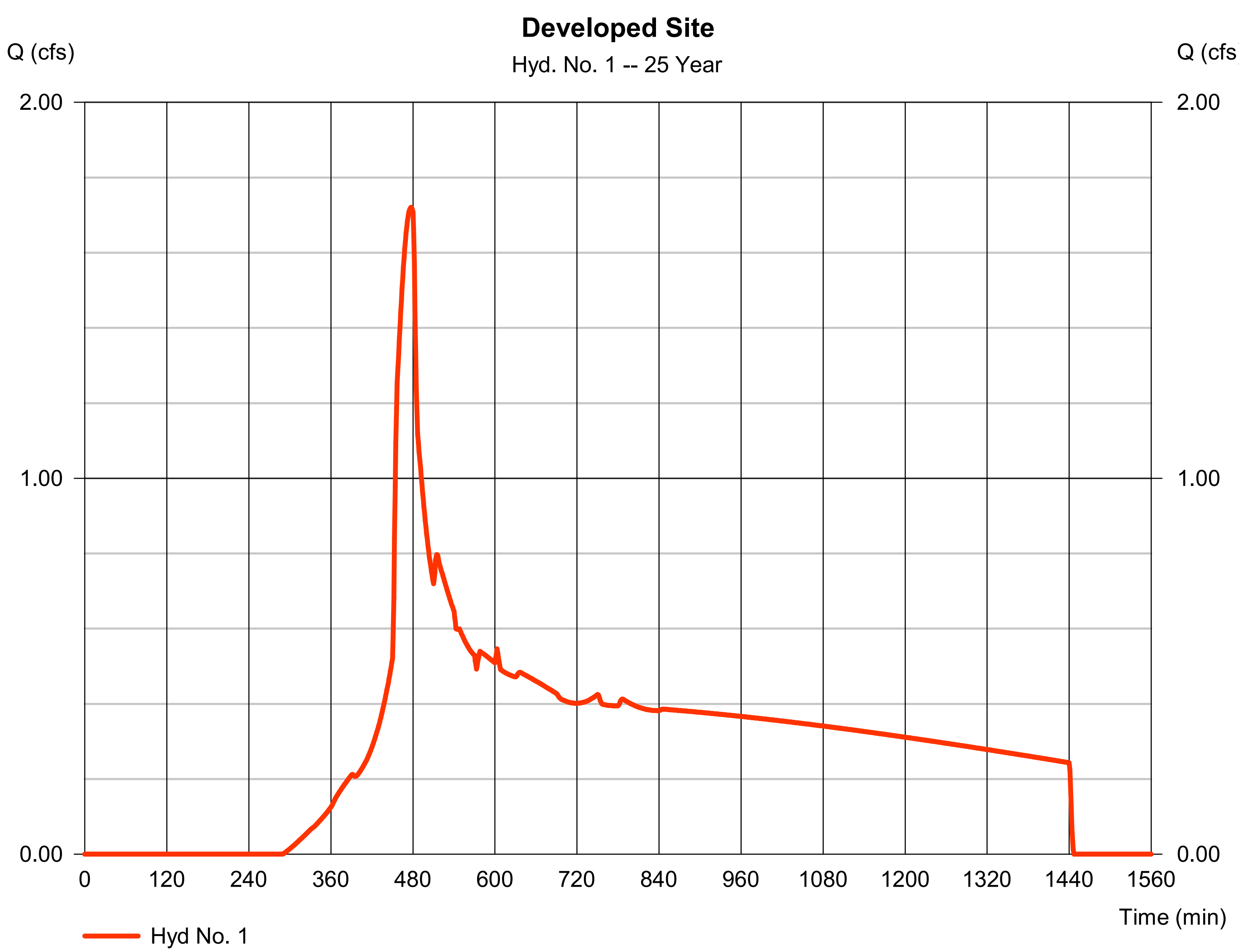
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 1

Developed Site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.721 cfs
Storm frequency	= 25 yrs	Time to peak	= 477 min
Time interval	= 1 min	Hyd. volume	= 27,122 cuft
Drainage area	= 3.210 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 4.00 min
Total precip.	= 5.06 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.860 x 98) + (1.350 x 39)] / 3.210



Hydrograph Report

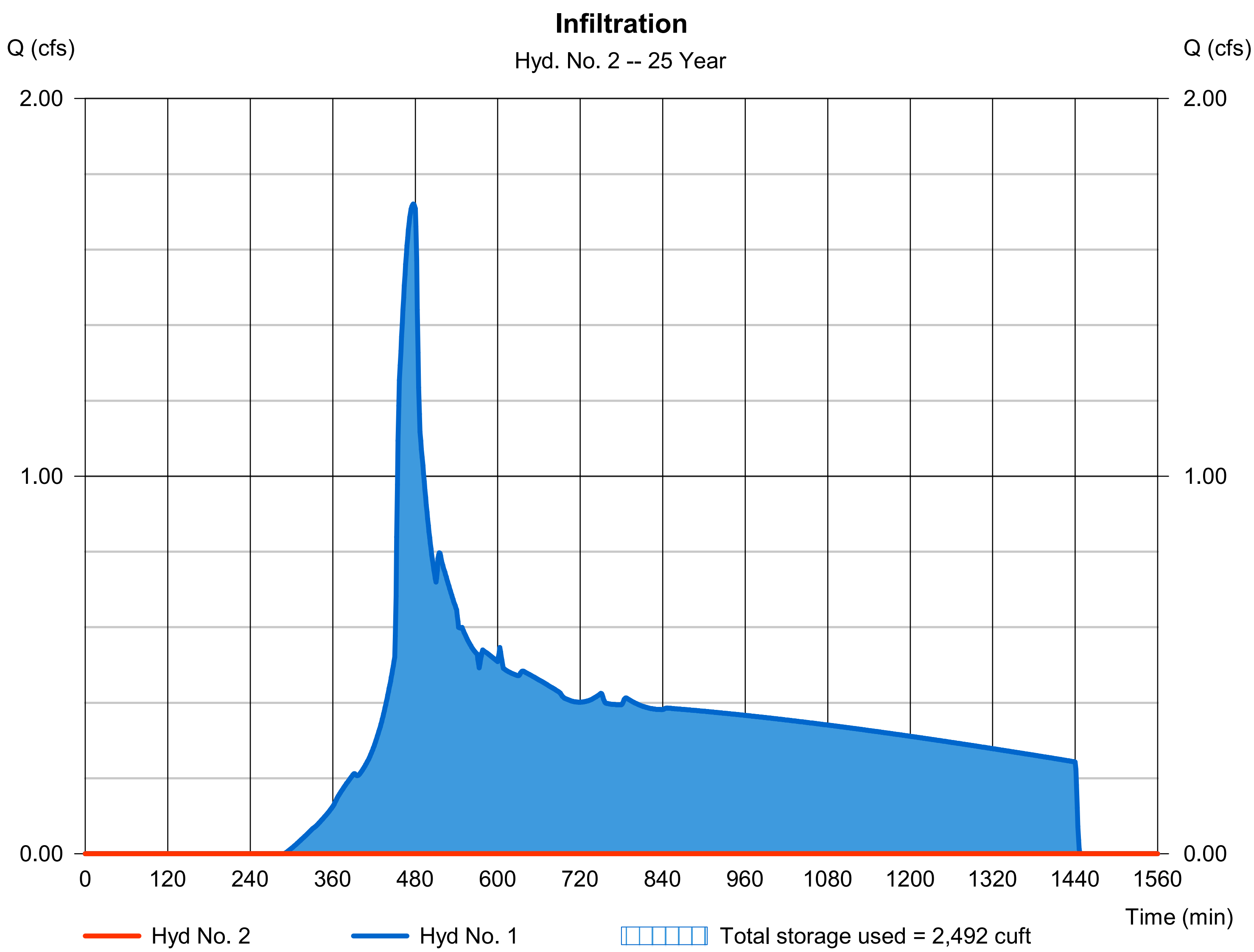
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 | Wednesday, 06 / 1 / 2022

Hyd. No. 2

Infiltration

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= 538 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 1 - Developed Site	Max. Elevation	= 100.02 ft
Reservoir name	= Detention Pond	Max. Storage	= 2,492 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.343	1	476	35,507	------	------	------	Developed Site
2	Reservoir	0.000	1	504	0	1	100.81	3,783	Infiltration

Hydrograph Report

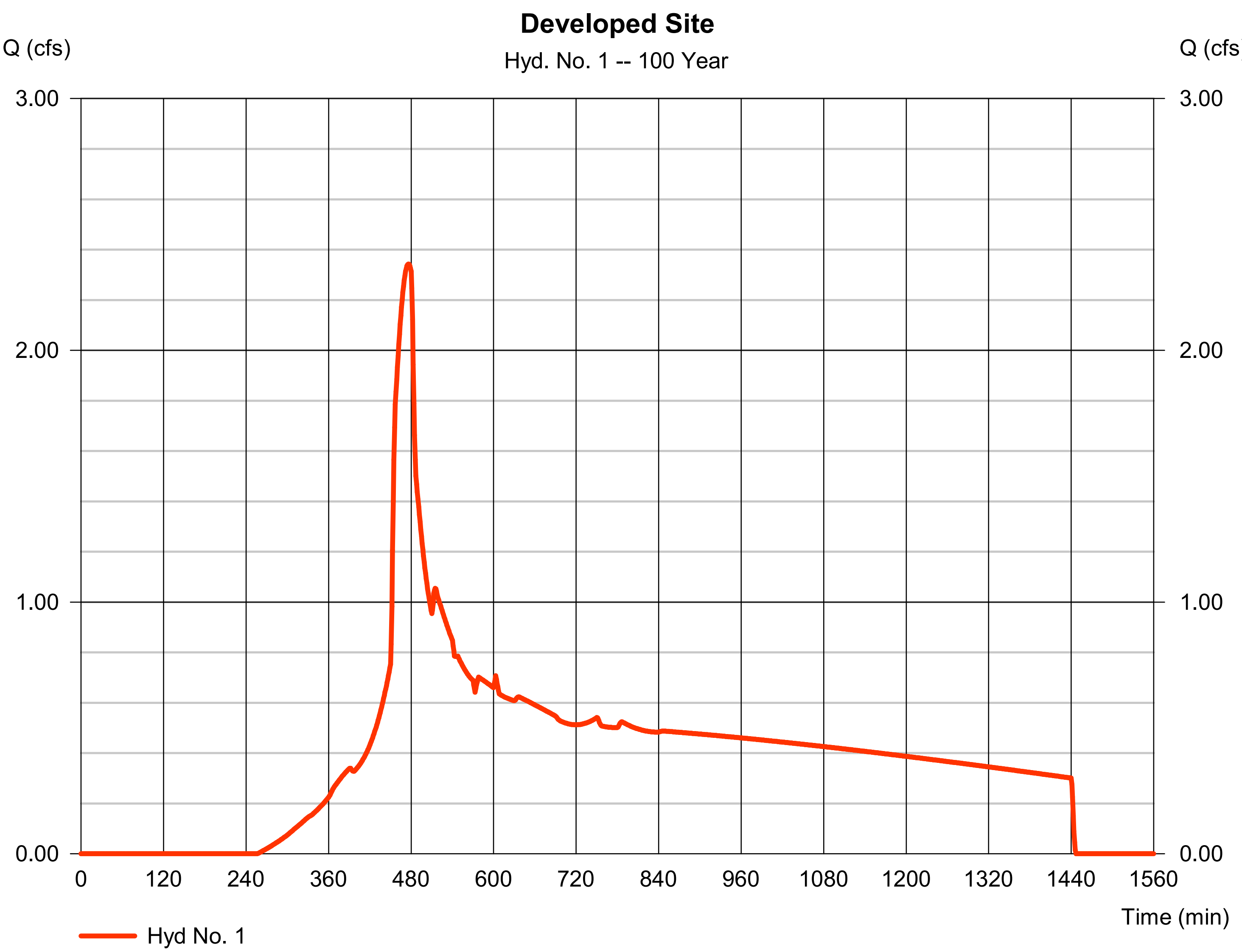
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 1

Developed Site

Hydrograph type	= SCS Runoff	Peak discharge	= 2.343 cfs
Storm frequency	= 100 yrs	Time to peak	= 476 min
Time interval	= 1 min	Hyd. volume	= 35,507 cuft
Drainage area	= 3.210 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 4.00 min
Total precip.	= 5.95 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.860 x 98) + (1.350 x 39)] / 3.210



Hydrograph Report

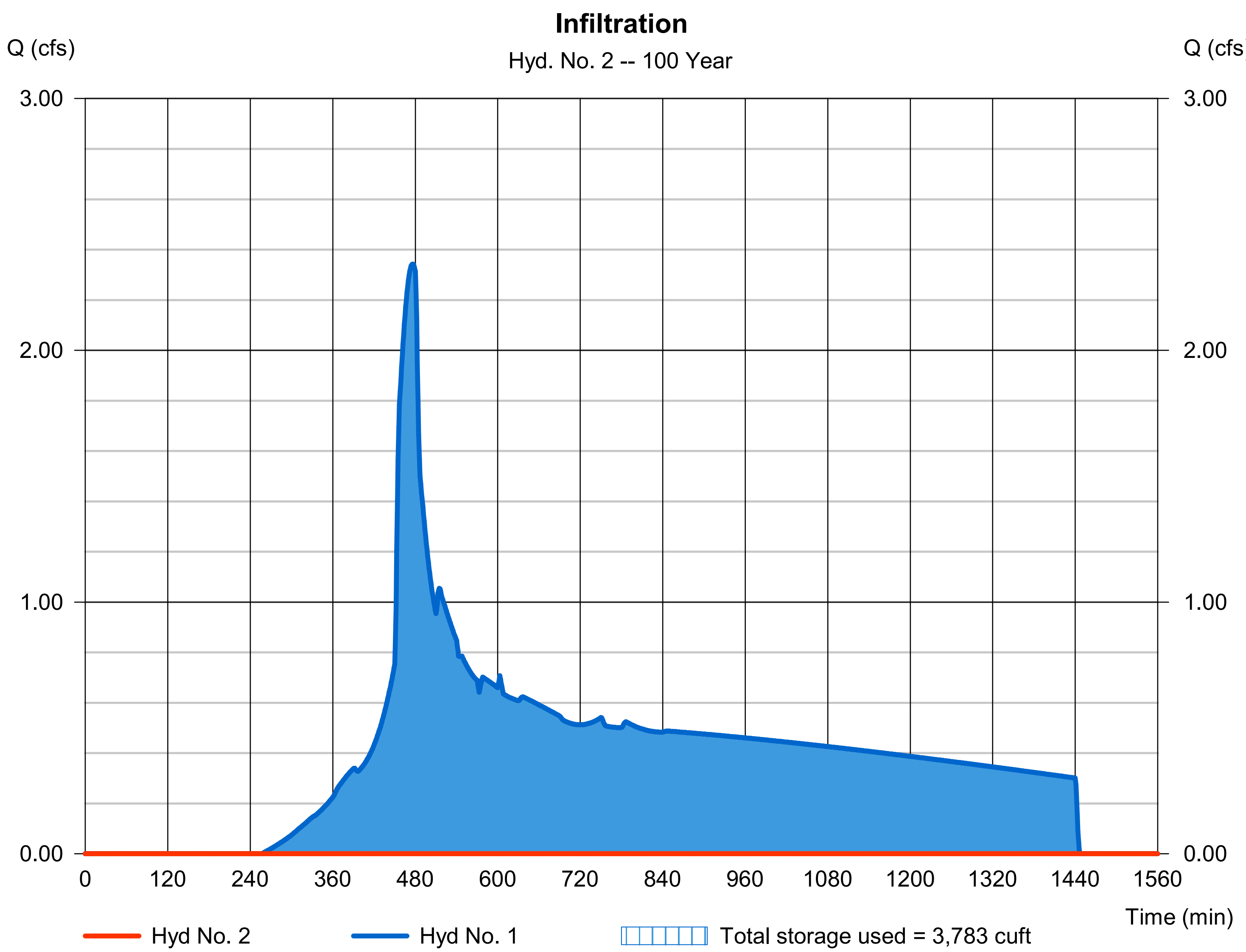
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022 Wednesday, 06 / 1 / 2022

Hyd. No. 2

Infiltration

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 504 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 1 - Developed Site	Max. Elevation	= 100.81 ft
Reservoir name	= Detention Pond	Max. Storage	= 3,783 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



APPENDIX D: Operations & Maintenance

After Recording Return to:
Name:
Address:

Place Recording Label Here

APPENDIX A.4

Form O&M: Operations and Maintenance Plan

Permit Application No .____

Owner Name: ____

Phone: (*area code required)* ____

Mailing Address: *(return address for records)* ____

City/State/Zip:____

Site Address: ____

City/State/Zip:____

Site Legal Description:

____

____

____

1 Responsible Party for Maintenance (*check one)*
_ Homeowner association _ Property Owner _ Other *(describe)*
____

2 Contact Information for Responsible Party(ies) if Other than Owner

Daytime Phone: (*area code required)* ________- __________-_____________
Emergency/After Hours Phone: ________- __________-______________
Contact Name and Address:
____

Instructions

Simplified Sizing Approach: *Attach O&M Specifications from the Florence Stormwater Design Manual Appendix H.*

Presumptive and Performance Sizing Approach: *Attach the site-specific O&M Plan (See Stormwater Design Manual Section 6).*

3 Site Plan
Show all facility locations in relation to labeled streets, buildings, or other permanent features on the site. Also show the sources of runoff entering the facility, and the final onsite/offsite discharge point.
Please complete the table below

Maintaining the stormwater management facility on this site plan is a required condition of building permit approval for the identified property. The property owner is required to operate and maintain this facility in accordance with the O&M specifications or plan on file with the City of Florence. That requirement is binding on all current and future owners of the property. Failure to comply with the O&M specifications or plan may result in enforcement action, including penalties. The O&M specifications or plan may be modified by written consent of new owners and written approval by re-filing with the Community Development Department.

Complete and recorded O&M Forms shall be submitted to:
Community Development Department, 250 Highway 101, Florence, OR, 97439
Office hours are 8 - 5, Monday through Friday. Call 541-997-3436 for assistance.

Required Site Plan (insert here or attach separate sheet)

☐ I Have Attached a Site Plan

Please complete this table

Facility Type	Size (sf)	Drainage is from:	Impervious Area Treated (sf)	Discharge Point	

BY SIGNING BELOW *filer accepts and agrees to the terms and conditions contained in this O&M Form and in any document executed by filer and recorded with it. To be signed in the presence of a notary.*

____

Filer signature

____

INDIVIDUAL Acknowledgement
STATE of OREGON county of:

____

This instrument was acknowledged before me on:

____

By:

____

Notary Signature:

____

My Commission Expires: ________________________________ *for notary seal*

CORPORATE Acknowledgement
STATE of OREGON county of:
____

This instrument was acknowledged before me on:
____

By:
____

As (title):
____

Of (corporation):
____

Notary Signature:
____

My Commission Expires: ______________________________

(SAMPLE)
STORMWATER MANAGEMENT FACILITY
CITY OF FLORENCE, OREGON
OPERATION & MAINTENANCE AGREEMENT

Sediment and other pollutants that degrade water quality will accumulate in urban stormwater facilities. The operation and maintenance of stormwater management facilities including the implementation of pollution reduction facilities is essential to the protection of the city's water quality. Removal of accumulated pollutants and sediment is important for proper operation. All property owners are expected to conduct business in a manner that promotes resource protection. This agreement contains specific provisions with respect to city maintenance of private stormwater management facilities and use of pollution reduction facilities.

Property Address:

Legal description:

Whereas, ____________________, herein referred to as Owner, has constructed improvements, including but not limited to buildings, pavement, and stormwater management facilities on the property described above. In order to further the goals of the City of Florence to ensure the protection and enhancement of water quality, the City of Florence and Owner hereby enter into this Agreement. The responsibilities of each party to this Agreement are identified below.

Recitals

1. Owner owns the above described property within the City of Florence, Lane County, Oregon.
2. Owner owns and operates stormwater management facilities approved and permitted as required by land use permit _________.
3. Owner has requested the city to provide the functional maintenance of the facility.
4. City approved construction plans dedicating the drainage system conveying the runoff from the residential properties to the stormwater facility as a public drainage system are on file.
5. Access routes for maintenance have been located within a dedicated public easement on private or commonly held property, within the public right-of-way or on city owned property.
6. Sufficient easement area, right-of-way width or property have been provided to accommodate the construction and maintenance of all existing and proposed utilities and public infrastructure.

Owner shall:

1. Implement the stormwater management plan included herein as Attachment "A". (Stormwater disposal and pollution reduction construction details, and source control protection, etc.)
2. Implement the stormwater maintenance plan included herein as Attachment "B". (Owner responsibilities such as vegetation control, debris pickup, etc.)
3. Inspect the facilities monthly and after significant storm events to determine if maintenance activity is warranted.
4. Maintain maintenance and inspection records (in the form of a log book) of steps taken to implement the programs referenced in (1) and (2) above. The log book shall be available for inspection by appointment at _________________________. The log book shall catalog any action taken, who took the action, when it was taken, how it was done, and any problems encountered or follow-on actions recommended. Maintenance items ("problems") listed in Attachment "A" shall be inspected as specified in the attached instructions or more often if necessary. The Owner and Users are encouraged to photocopy the individual checklists in Attachment "A" and use them to complete its inspections. These completed checklists would then, in combination, comprise the logbook.
5. Submit an annual report to the City of Florence regarding implementation programs referenced in (1) and (2) above. The report must be submitted on or before June 30 of each calendar year after execution of this agreement. At a minimum, the following items shall be included in the report:
    a. Name, address, and telephone number of the businesses, persons, or firms responsible for maintenance plan implementation, and the persons completing the report.

   b. Time period covered by the report.
   c. A chronological summary of activities conducted to implement the program and plan referenced in (1) and (2) above. A photocopy of the applicable sections of the logbook with any additional explanations needed shall suffice. For any activities conducted by paid parties, include a copy of the invoice for services.
   d. Any outline planned activities for the upcoming year.
6. Allow the City of Florence staff to inspect stormwater management facilities at the above referenced site.

City of Florence shall:

1. Execute the following periodic major maintenance on the subdivision's pollution reduction facilities: sediment removal from facilities, resetting orifice sizes and elevations, and adding baffles.
2. Maintain all stormwater management facility elements within the public rights of way and dedicated easements, such as catch basins, weirs, oil-water separators, and pipes.
3. Provide technical assistance to the Owner in support of its operation and maintenance activities conducted pursuant to its maintenance and source control programs. Said assistance shall be provided upon request and as the City of Florence's time and resources permit.
4. Review the annual report and conduct a minimum of one (1) site visit per year to discuss performance and problems with the stormwater management facilities.
5. Review the agreement with the Owner and modify it as necessary at least once every three (3) years.

Remedies:

1. If the City of Florence determines that maintenance that maintenance or repair work is required to be done to the stormwater management facilities located in the subdivision, the City of Florence shall give the Owner notice of the specific maintenance and/or repair required. The City of Florence shall set a reasonable time in which such work is to be completed the persons who were given notice. If the above required maintenance and/or repair is not completed within the time set by the City of Florence, written notice will be sent to the Owner stating the City of Florence's intention to perform such maintenance and bill the Owner for all incurred expenses.
2. If, at any time, the City of Florence determines that the existing facility creates any imminent threat to public health, safety, or welfare, the City of Florence may take immediate measures to remedy said threat. No notice to the persons listed in Remedies (1), above shall be required under such circumstances. All other

Owner responsibilities shall remain in effect.

1. The Owner shall grant unrestricted authority to the City of Florence for access to any and all stormwater management facilities for the purpose of performing maintenance or repair as may become necessary under Remedies (1) and/or (2).
2. The Owner shall assume responsibility for the cost of maintenance and repairs to the stormwater management facilities, except for those maintenance actions explicitly assumed by the City of Florence in the preceding section. Such responsibility shall include reimbursement to the City of Florence within 90 days of the receipt of the invoice for any such work performed. Overdue payments will require payment of interest at the current legal rate for liquidated judgments. If legal action ensues, any costs or fees incurred by the City of Florence will be borne by the parties responsible for said reimbursements. This Agreement is intended to protect the value and desirability of the real property described above and to benefit all the citizens of the City of Florence. It shall run with the land and be binding on all parties having or acquiring any right, title, or interest or any part thereof, of real property in the subdivision. They shall inure to the benefit of each present or future successor in interest of said property or any part thereof or interest therein, and to the benefit of all citizens of the City of Florence.

This instrument is intended to be binding upon the parties hereto, their heirs, successors and assignees.

In Witness whereof, the undersigned has executed this instrument on this _________ day of __________________,20____.

OWNER(s):

Signature ____

____
(print name)

STATE OF OREGON,
County of Lane, ss:
This instrument was acknowledged before me this ________ day of _______________________________,
20__,by _______________________________________, owner(s) of the above described premises.

____
Notary Public for Oregon

____
My commission expires

MANAGER, CITY OF FLORENCE
In Witness whereof, the undersigned agent of the City of Florence has executed this instrument and acknowledged
the said instrument to be free and voluntary act and deed on this _______ day of _____________________,
20____ for the purposes herein mentioned and on oath states he is authorized to execute said instrument.

____
City Manager

STATE OF OREGON,
County of Lane, ss:
This instrument was acknowledged before me this ________ day of _______________________________,
20__, by _______________________________________, owner(s) of the above described premises.

____
Notary Public for Oregon

____
My commission expires

PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

Proposed Microtel Inn and Suites
Tax Lots 18-12-26-33-00900 and 18-12-26-33-00901
Florence, Oregon 97439

Prepared for

Mr. Matt Braun
Braun Development Services
PO Box 13223
Portland, Oregon 97213

Prepared by

Professional Service Industries, Inc.
6032 North Cutter Circle, Suite 480
Portland, Oregon 97217

February 1, 2022

PSI Project No. 07041434

Staci Shub
Staff Geologist
staci.shub@intertek.com

RENEWS: 06/30/2023

Britton W. Gentry, PE GE
Chief Engineer
britton.gentry@intertek.com

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FIGURES

LIST OF APPENDICES

1 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

This report presents the results of PSI's geotechnical investigation performed for the proposed l Microtel Inn and Suites located on a 13.41 acre site consisting of two connecting tax lots, 18-12-26-33-00900 and 18-12-26-33-00901, east of the intersection between Quince Street and 6th Street in Florence, Oregon. A Vicinity Map of the site location is presented on Figure 1. This investigation was performed for Mr. Matt Braun of Braun Development Services in general accordance with PSI proposal number 0704-359739, dated November 23, 2021. The proposal was authorized by Mr. Braun on December 14, 2021.

1.2 PROJECT DESCRIPTION

Based on correspondence with Matt Braun of Bran Development Services, Logan Miller of SFA Design Group, and Michael Parshall of Woodblock Architecture, and the provided site information, PSI understands that an approximately 10,000 square foot four story hotel will be constructed. A storm facility to the north of the building a parking lot and associated drive lanes will be on all sides, and a pergola and an uncovered patio to the south of the building will be construed. Currently the site is undeveloped. Prior to 2009 the site was occupied with a local middle school. The site school and associated structures have been demolished but evidence of a concrete slab on grade and concrete foundations are currently visible at the ground surface. We anticipate that the majority of the structural material from the school demolition has been removed from the site.

PSI anticipates the project will consist of construction of a 3 or 4 story structure supported on shallow foundations and slab on grade floors. Structural loads were provided by Mr. Logan Miller of SFA Design Group with column loads not to exceed 50 kips,and wall loads not to exceed 3 kips per foot.. Cuts and fills at the site are expected to be less than 4 feet. Maximum depth of utilities will be less than 8 feet.

Traffic loading for associated parking and pavement areas was not provided. However, we anticipate the proposed parking and drive lanes will be paved with asphalt concrete. Should any of the above information or design basis made by PSI be inconsistent with the planned construction, it is requested that you contact us immediately to allow us to make any necessary modifications to this report. PSI will not be held responsible for changes to the project if not provided the opportunity to review the information and provide modifications to our recommendations.

2 SITE AND SUBSURFACE CONDITIONS

2.1 SITE DESCRIPTION

The property is located east of the intersection between Quince Street and 6th Street in Florence, Oregon. The site is covered mostly with grass and brush. Remnants of the concrete pad from the

school still exist along Quince Street and the asphalt parking lot is still used for parking. It is bound on the north, west, and south by commercial and residential developments. Trees and tidal flats are located to the east with Munsel Creek and the Siuslaw River approximately ¼ mile further.

2.2 TOPOGRAPHY

A review of available USGS topographic maps indicate that the site consists of an upper terrace above the Siuslaw River at an elevation of about 47 feet above mean sea level (AMSL) The ground surface slopes moderately to steeply down to a wooded area adjacent to the marsh about 45 feet below the upper terrace.

2.3 GEOLOGY

The project site is mapped as being underlain by a layer of fine sandy and silty loam over Stabilized Dunes consisting of unconsolidated fine to medium grained sand. The sand is underlain by the Tyee Formation, rhythmically bedded siltstone and sandstone layers. Alluvial deposits and Tidal flats are mapped to the east, bordering Munsel Creek. These consist of alluvial clay, silt, sand, and gravel.

2.4 SUBSURFACE CONDITIONS

PSI completed the initial field exploration for Sycan B Corp on February 22, 2021 through February 24, 2021. The supplemental explorations for Braun Development services were performed on January 4, 2022. Field activities consisted of drilling six cone penetration test (CPT) probes, two GeoProbe explorations, and three geophysical refraction-microtremor (ReMi) lines. Supplemental explorations consisted of excavating 7 test pits to depths of 5 to 8 feet.

Soils

The materials and conditions disclosed by the recent explorations are generally consistent with our previous experience and understanding of the subsurface conditions at the site. In the vicinity of the proposed building, the site is typically mantled with sandy silt topsoil and dune sand underlain by alluvial soils consisting of predominantly silt and sand to a depth of about 113 ft to 116 ft. The alluvial silt and sand are interbedded and the interbeds are often massive and indistinct. The alluvial silt and sand are underlain by medium-dense to dense sandy gravel.

For the purpose of discussion, the materials encountered in the explorations have been grouped into the following categories based on their physical characteristics and engineering properties. Listed as they were encountered from the ground surface downward, the categories are as follows:

1. **SAND**
2. **SILT**

The following paragraphs provide a detailed description of the materials encountered and a discussion of the groundwater conditions at the site.

1. **SAND.** Native sand layers were encountered at the ground surface in all 6 CPT probes and extend to depths ranging from about 33 feet to 50 ½ feet. CPT probe tip resistances indicate the relative density of the sand are generally medium dense in the upper 10 to 12 feet and dense to very dense below.
2. **SILT.** Layers of silt were encountered within the sand in both CPT- 2 and CPT- 6 at depths of 4 feet and 8 feet and extend to depths ranging from about 8 feet to 34 feet, respectively. CPT probe tip resistances indicate the relative consistency of the silt are generally very soft to stiff.

2.5 GROUNDWATER

Our review of available subsurface information from previous investigations indicates the groundwater level in the project area is about 45 feet below the ground surface, which corresponds closely to the elevation of the lower marsh area. At the time of our initial investigation, groundwater was observed at a depth of approximately 35 feet in GeoProbe explorations GP1 and GP2. at the estimated groundwater elevations at the site based on pore pressure dissipation testing in the CPT probes is provided below:

Table 1 - Summary of Pore Pressure Dissipation Test Results

CPT	Pore Dissipation calculated Groundwater Depth (feet bgs)
1	33.4
2	32.2
5	35.2
6	37.1

Fluctuations in the groundwater level should be anticipated. It is recommended that the contractor determine the groundwater levels at the time of the construction to evaluate groundwater impact on construction procedures. Discontinuous zones of perched water may also exist, or develop, within the silt layer encountered during our exploration. If groundwater conditions are found to be different from those determined in this report PSI should be notified to determine if changes to our recommendations are warranted.

2.6 LOCAL FAULTING AND SEISMIC DESIGN PARAMETERS

PSI has reviewed the USGS Quaternary Fault and Fold Database of the United States. Table 1 summarizes distance and names of the closest mapped faults within about 10 miles of the project site.

Table 2 - Summary of Published, Nearby Faults

Fault Name	Approximate Distance (miles) and Direction from the Site
Cascadia Fault and Fold Belt	6.2, southwest
Unnamed Siuslaw River Anticline	8.6, northeast

For preliminary seismic design considerations, we have assumed that a fundamental period of less than 0.5 seconds and a damping ratio of 5% are appropriate to characterize the planned structure. Based on the results of subsurface explorations, geophysical testing, and our review of geologic mapping, we recommend using soil Site Class D to evaluate the seismic design of the structure. Site coefficients and spectral acceleration parameters for structural design are provided in Table 2.

Table 3 - Seismic Design Parameters

(43.9727 °, -124.1003 °) – SITE CLASS "D"

ASCE 7-16 CODE BASED RESPONSE SPECTRUM MCER GROUND MOTION - 5% DAMPING 1% IN 50 YEARS PROBABILITY OF COLLAPSE	
S_S	1.402
S_1	0.737
MAPPED MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL RESPONSE ACCELERATION PARAMETER (SITE CLASS D)	
F_A	1.0
F_V	1.7 - SEE ASCE 7-16 SECTION 11.4.8*
S_{MS}	1.682
S_{M1}	1.253 - SEE ASCE 7-16 SECTION 11.4.8*
DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETER	
S_{DS}	0.935
S_{D1}	0.835 - SEE ASCE 7-16 SECTION 11.4.8*

*Factors dependent on structural design

Notes: SS = Short period (0.2 second) Mapped Spectral Acceleration
S1 = 1.0 second period Mapped Spectral Acceleration
SMS = Spectral Response adjusted for site class effects for short period = FA • SS
SM1 = Spectral Response adjusted for site class effects for 1-second period = Fv • S1
SDS = Design Spectral Response Acceleration for short period = 2/3 • SMS
SD1 = Design Spectral Response Acceleration for 1-second period =2/3 • SM1
FA = Short Period Site Coefficients
FV = Long Period Site Coefficients

2.7 LIQUEFACTION POTENTIAL

The potential for liquefaction and cyclic softening at the site was evaluated using the methods recommended by Idriss and Boulanger (I&B) 2008 and revised to Boulanger and Idriss (B&I) in 2014. For this procedure, the earthquake-induced cyclic shear stresses within the soil profile, designated by the term cyclic stress ratio (CSR), were estimated using the CPT data, earthquake magnitude distance pairs, estimated PGA values and the computer program CLIQ v3.0.3.4.

Based on our review of the 2014 USGS interactive deaggregation the Cascadia Subduction Zone (CSZ) represents the majority of the the seismic hazard at the site. For our liquefaction analysis, we considered MW 9.1 Cascadia earthquakes, and assumed a groundwater level of approximately 32 to 37 feet below the ground surface. The results of our evaluation indicate the poorly graded

sand that extend beyond a depth of about 32 feet in CPT2, 35 feet in CPT5, and 43 feet in CPT6 are susceptible to minor liquefaction during an MCE event. The silt soil encountered in CPT-6 will be subject to cyclic softening and could undergo some vertical or lateral deformation during a strong seismic event.

Our preliminary analysis indicates the potential for less than about 1 or 2 inches of seismically induced liquefaction settlement at the surface. Additional earthquake induced dry sand settlements is possible in the upper loose sands. Preliminary estimates of lateral spreading are on the order of about 6 inches based on evaluation of silt soil in CPT-6. However, we estimate that earthquake induced settlements experienced at the ground surface will be limited to dry sand settlement in the loose sands, due to the depth of the groundwater table and the unlikelihood that it would become perched in the well-drained sand at the ground surface.

2.8 TSUNAMI HAZARD

DOGAMI performed a government funded tsunami inundation assessment along the Oregon coast in 1995. In 2013, DOGAMI has performed a more thorough probabilistic assessment based on different magnitude CSZ events and prepared their findings in the "Local Source (Cascadia Subduction Zone) Tsunami Inundation Map" showing the current Tsunami Regions.

Based on the referenced map the site is located in a zone outside of Tsunami Hazard Areas based on "extra-large and large" CSZ earthquake events, correlating to magnitudes of approximately 9.0 and 9.1.

3 CONCLUSIONS AND RECOMMENDATIONS

The following preliminary geotechnical recommendations have been developed based on the subsurface conditions encountered at the site and PSI's preliminary understanding of the proposed project. In PSI's opinion, based on an evaluation of the data obtained, the proposed site is suitable for construction of the new additions, provided the geotechnical engineering recommendations in this report are followed.

The primary geotechnical related concerns at the site is the potential presence of concrete foundations and floor slab from the demolished buildings, the presence of the near surface loose sand, and the presence of over steepened sand slopes down to the lower elevation portion of the site. In this regard some over excavation and replacement of loose or disturbed sand should be anticipated, especially in the footprint of the proposed structures, in areas where the concrete foundations and floor slabs remain, or at the top of sand slope.

In addition, we recommend the geotechnical engineer to be involved in the layout of the proposed structures with respect to the slopes along the east and southern sides of the upper terrace. However, general recommendations for setbacks provided in the previous geotechnical report should be sufficient for preliminary layout planning purposes.

3.1 SITE PREPARATION

PSI recommends that construction debris, loose, soft, or otherwise unsuitable soils at the project site be stripped and removed from structural areas. Strippings will not be suitable for use as

structural fill and should be disposed of off-site or used only in landscape areas. Following stripping and prior to placement of structural fill, the exposed surface should be evaluated by a geotechnical engineer. Buried foundations, piping and utilities, if encountered, must be completely removed from below proposed building foundations and pavement areas. Should below-grade pipes remain, a risk of seepage or underground soil erosion may occur in the future.

PSI should observe the subgrade to identify any loose/soft or unsuitable areas. Any undocumented or uncontrolled fill should be completely removed, cleaned of any debris, and replaced as engineered fill. Where loose, soft or otherwise unsuitable soils are identified within structural areas of the project, these soils should be completely removed and replaced with structural fill. The Contractor should provide a contingency for the repair of loose, soft or otherwise unsuitable areas identified by the Geotechnical Engineer. Geotextile fabric or geotextile grid should be utilized to provide stabilization of the subgrade.

A proof roll using a fully loaded tandem-axle truck should be performed on finished subgrade elevations to identify any loose, soft or unsuitable areas of subgrade. Loose, soft or otherwise unsuitable soils in these areas should be over-excavated and replaced with properly placed and properly compacted structural fill.

3.2 EXCAVATION CONSIDERATIONS

Open excavations exceeding four feet are not anticipated; however, if they do occur, excavations should be performed in accordance with OSHA regulations as stated in 29 CFR Part 1926. The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor should evaluate the soil exposed in the excavations as part of the required safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified by local, state, and federal safety regulations. PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.

During wet weather, earthen berms or other methods should be used to prevent runoff water from entering the excavations. The bottom of the excavations should be sloped to a collection point. Collected water within the foundation and utility trench excavations should be discharged to a suitable location outside the construction limits.

3.3 STRUCTURAL FILL MATERIALS

PSI should observe the subgrade prior to placing structural fill or structures to document the subgrade condition and stability. In areas where unsuitable soils are encountered and over excavation occurs below footings, the over excavation and structural fill should extend laterally a minimum distance that is equal to the depth of the excavation below the footing. In general, we anticipate the near surface sand soil will be suitable as structural fill.

General. All fill within building, pavement, and sidewalk areas should be placed as compacted structural fill. In areas where unsuitable soils are encountered and over excavation occurs below

footings, the over excavation and structural fill should extend laterally a minimum distance that is equal to the depth of the excavation below the footing. All structural fill materials should be compacted to at least 95% of the maximum dry density, at a moisture content within about 3% of optimum, as determined by ASTM D 1557. Coarse granular fill should be compacted until well keyed. No brush, roots, construction debris, or other deleterious material should be placed within the structural fills. The earthwork contractor's compactive effort should be evaluated on the basis of field observations, and lift thicknesses should be adjusted accordingly to meet compaction requirements. Additional information regarding specific types of fill is provided below.

Granular Fill. Imported granular fill materials should consist of sand, gravel, or fragmental rock with a maximum size on the order of 4 inches and with not more than about 5% passing the No. 200 sieve (washed analysis). Material satisfying these requirements can usually be placed during periods of wet weather. The first lift of granular fill placed over a fine-grained subgrade should be about 18 in. thick and subsequent lifts about 12 inches thick when using medium- to heavy-weight vibratory rollers. Granular structural fill should be limited to a maximum size of about 1 ½ inches when compacted with hand-operated equipment. We also recommend that lift thicknesses be limited to less than 8 inches when using hand-operated vibratory plate compactors.

Utility Trench Backfill. Utility trench backfill should consist of granular fill limited to a maximum size of about 1 ½ inches. The granular trench backfill should be compacted to at least 95% of the maximum dry density as determined by ASTM D 1557 in the upper 4 feet of the trench and to at least 90% of this density below this depth. The use of hoe-mounted vibratory plate compactors is usually most efficient for compaction of trench backfill. Lift thicknesses should be evaluated on the basis of field density tests; however, particular care should be taken when operating hoe-mounted compactors to prevent damage to the newly placed conduits. Flooding or jetting to compact the trench backfill should not be permitted. Native materials can be used for trench backfill in unimproved areas where a soft trench and future settlement of the backfill can be tolerated.

Free-Draining Fill. Free-draining material should have less than 2% passing the No. 200 sieve (washed analysis). Examples of materials that would satisfy this requirement include pea gravel and ¾ - to ¼ - inch, 1 ½ - to 3/4-inch, or 3- to 1-inch crushed rock.

3.4 FOUNDATIONS

Based on the subsurface conditions encountered, PSI anticipates that a building with four or less stories can be supported on spread footing foundations bearing on 12-inch thick section of crushed rock placed as structural fill. Based primarily on settlement considerations and minimum column and strip footing width of 3 feet and 24 -inches, respectively and minimum embedment depth of 1½ feet (deeper footing embedment's may be required to achieve adequate setback from slopes), footings established in accordance with these criteria can be designed on the basis of an allowable soil bearing pressure of 3,000 psf. This value applies to the total of dead load plus frequently and/or permanently applied live loads and can be increased by one third for the total of all loads; dead, live, and wind or seismic. If fill and/or other unsuitable soils are encountered at footing depth, the unsuitable material should be over excavated to firm subgrade material and replaced with granular structural fill. The over excavated areas should be backfilled with clean crushed rock and compacted to at least 95% of the maximum dry density as determined by ASTM

D 698 (Modified Proctor).

The total static settlement of footings designed in accordance with the recommendations presented above is estimated to be less than one inch. Differential settlements between adjacent foundation units should be less than half the total settlement across a distance of 40 feet. If the structure is not designed to accommodate these differential settlements, the use of grade beams may be considered to limit differential settlement across individual foundation elements under seismic events.

Horizontal shear forces can be resisted partially or completely by frictional forces developed between the base of spread footings and the underlying soil. The total shearing resistance between the foundation footprint and the soil can be computed as the normal force, i.e., the sum of all vertical forces (dead load plus real live load), times the coefficient of friction equal to 0.40 (ultimate value). If additional lateral resistance is required, passive earth resistance against embedded footings or walls can be computed using a pressure based on an equivalent fluid with a unit weight of 300 pcf. This design passive earth pressure assumes granular structural fill is used to backfill the footing excavation or the footings will be neat formed in situ.

3.5 FLOOR SLAB SUPPORT

PSI recommends the slab-on-grade be underlain by at least 12-inches of native sand soil removed and replaced as structural fill and capped with a minimum of 6-inch thick section of crushed angular "drain rock." The drain rock should be compacted until it is well keyed. In addition, it will be appropriate to install a durable vapor-retarding membrane beneath the slab-on-grade to limit the risk of damp floors in areas that will have moisture-sensitive materials placed directly on the floor. The vapor-retarding membrane should be installed in accordance with the manufacturer's recommendations.

In our opinion, a coefficient of subgrade reaction, k, of 150 pci can be used to characterize the support with a minimum thickness of 12-inches of "structural fill" (based on a 1x1-foot plate load). Depending on how the slab load is applied, the value should be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesionless soil:

Modulus of Subgrade Reaction, for $k_s = k\left(\frac{B+1}{2B}\right)^2$ cohesionless soil,

where: k_s = coefficient of vertical subgrade reaction for loaded area;
k = coefficient of vertical subgrade reaction for 1x1 square foot area; and,
B = width of area loaded, in feet.

3.6 EMBEDDED WALL DESIGN

We anticipate embedded walls for the project will be limited to elevator pits or loadings docks with a height of less than five feet. Design lateral earth pressures against a retaining wall or other embedded structure depend on the drainage condition provided behind the wall, the geometry of the backfill slope, and the type of construction, i.e., the ability of the wall to yield. The two possible conditions regarding the ability of the wall to yield include the active and at-rest earth pressure cases. The active earth pressure case is applicable to a wall that is capable of yielding slightly away from the backfill by either sliding or rotating about its base. A conventional cantilever retaining wall is an example of a wall that can develop the active earth pressure case

by yielding. The at-rest earth pressure case is applicable to a wall that is considered to be relatively rigid and laterally supported at the top and bottom and therefore is unable to yield. The following general recommendations for embedded wall design assume the wall backfill is compacted to 90% of ASTM D 1557, and the embedded wall is fully drained, i.e., hydrostatic pressure cannot act on the wall.

Walls that are allowed to yield by tilting about their base should be designed using a lateral earth pressure based on an equivalent fluid having a unit weight of 25 pcf for horizontal backfill. Non-yielding walls should be designed using a lateral earth pressure based on an equivalent fluid having a unit weight of 45 pcf for horizontal backfill. Surcharge loads on walls should be accounted for in the structural design of the walls.

Over compaction of the backfill behind walls should be avoided. In this regard, we recommend compacting the backfill to about 90% of the maximum dry density (ASTM D 1557). Heavy compactors and large pieces of construction equipment should not operate within 5 ft of any embedded wall to avoid the buildup of excessive lateral pressures. Compaction close to the walls should be accomplished using hand-operated vibratory plate compactors.

3.7 PAVEMENT

In lieu of project-specific traffic estimates, the following pavement design recommendations are based on our past experience with similar facilities and subgrade conditions.

For automobile parking areas, we recommend a pavement section consisting of 3 in. of asphaltic concrete (AC) over 8 in. of crushed rock base (CRB). For heavy truck traffic areas, the pavement section should consist of 4 in. of AC over 12 in. of CRB. These recommended pavement sections are based on the assumption that the subgrade consists of firm, undisturbed soil or sand structural fill and that the pavements will be constructed during the dry summer months. Proof rolling should be used to evaluate pavement subgrades. Any soft areas disclosed by the proof rolling will likely require over excavation and replacement with structural fill. Some contingency should be provided for the repair of any soft areas. If pavement construction is scheduled for the wet season, it will be necessary to increase the above-recommended base course sections.

Permanent, properly installed drainage is also an essential aspect of pavement design and construction. All paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as in sunken loading dock areas or around stormwater catch basins. Effective means to prevent saturation of the base course include installing subdrain systems below sunken loading docks and weep holes in the sidewalls of catch basins.

To provide quality materials and construction practices, we recommend that the pavement work conform to the “Standard Specifications for Highway Construction” used by the Oregon Department of Transportation.

3.8 DESIGN REVIEW AND CONSTRUCTION MONITORING

After plans and specifications are complete, PSI should review the final design and specifications so that the earthwork and foundation recommendations are properly interpreted and implemented. It is considered imperative that the Geotechnical Engineer and/or their representative be present during earthwork operations and foundation installations to observe the field conditions with respect to the design assumptions and specifications. PSI will not be responsible for changes in the project design or project information it was not provided, or interpretations and field quality control observations made by others. PSI would be pleased to provide these services for this project.

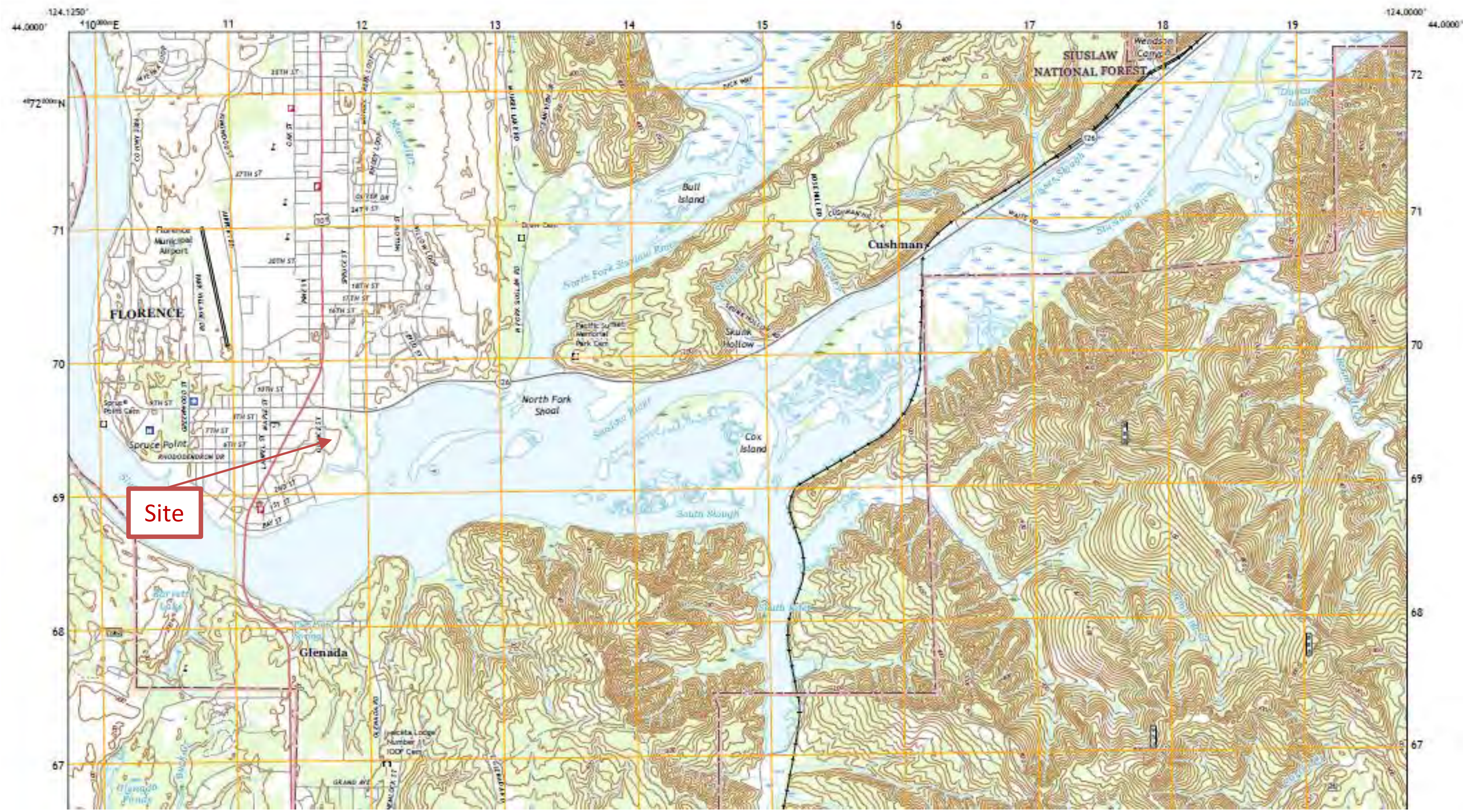
4 GEOTECHNICAL RISK AND REPORT LIMITATIONS

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the building and proposed pavement section will perform as planned. The engineering recommendations presented in the preceding sections constitute PSI's professional estimate of those measures that are necessary for the proposed building addition to perform according to the proposed design based on the information generated and referenced during this evaluation, and PSI's experience in working with these conditions.

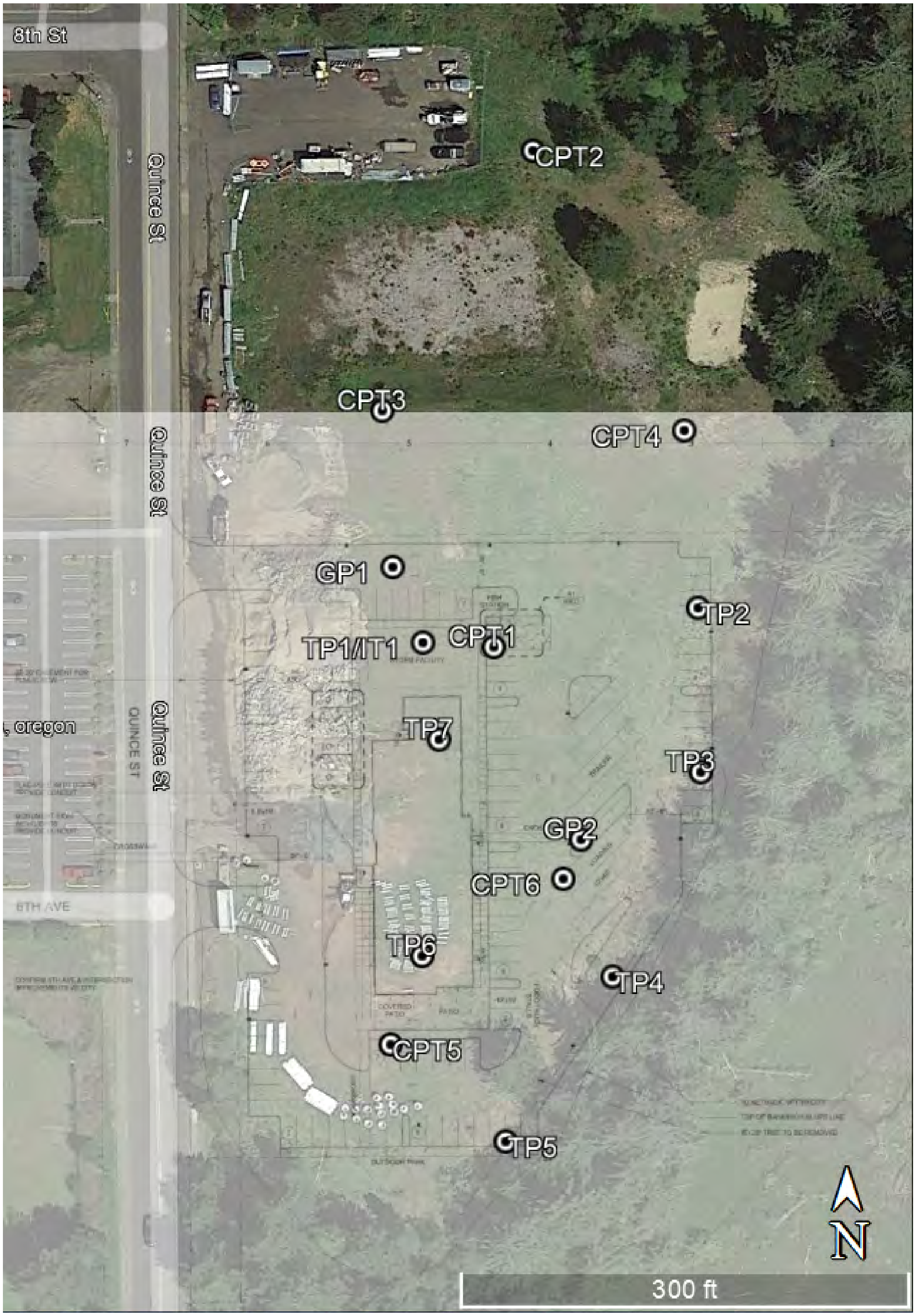
The recommendations submitted are based on the available subsurface information obtained by PSI, and information provided by Mr.Matt Braun. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the recommendations are required. If PSI is not retained to perform these functions, PSI cannot be responsible for the impact of those conditions on the performance of the project.

The Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of Mr. J. B. Jaramillo and his design consultants for the specific application to the proposed Microtel Inn and Suites located east of the intersection between Quince Street and 6th Street in Florence, Oregon.

FIGURES



USGS Florence Quadrangle Oregon - Lane County 7.5 Minute Series	intertek psi	Microtel Inn and Suites- Florence, OR	JOB NO.	7041434
		Site Vicinity Map	FIGURE NO.	1



intertek psi	DATE January 31 2022	Microtel Inn and Suites Florence, OR	PSI PROJECT #: 07041434
Obtained from Google Earth	DRAWN BY: SRS	**INVESTIGATION LOCATION PLAN**	**FIGURE 2**

APPENDIX A

FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATION PROGRAM

PSI completed the original field exploration of the project site on February 22, 2021, through February 24, 2021, using a track-mounted rig owned and operated by Oregon Geotechnical Exploration, Inc. of Kaiser, Oregon. The scope of the exploration included completion of six CPT probes and two direct push probes at the site. The CPT probes were designated CPT1 through CPT6 and the direct push probes were designated GP1 and GP2.

The supplemental explorations were conducted on January 4, 2022, using a tracked excavator provided by Dan J. Fisher Excavating, Inc. of Forest Grove, Oregon. The scope included the completion of seven test pits designated TP1 through TP7. The exploration locations were located in the field by PSI using handheld GPS. These exploration locations are presented on Figure 2. PSI notified Oregon's Utility Notification to locate public underground utilities and a Private Utility Locator to locate any potential private utilities in the vicinity of the proposed exploration locations prior to commencing the field activities.

Table 1 – Investigation Depths

Boring	Proposed Depth (feet)	Completion/Refusal Depth (feet)
CPT1	100	36.4*
CPT2	100	37.1*
CPT3	50	32.9*
CPT4	50	33.5*
CPT5	100	49.2*
CPT6	50	50.5*
GP1	20	38.5*
GP2	20	38.5*
TP1	10	5½**
TP2	10	8**
TP3	10	8**
TP4	10	8**
TP5	10	8**
TP6	10	7**
TP7	10	8**

* Refusal
**Caving

A representative from PSI's office observed the explorations and prepared borings logs of the conditions encountered. It should be noted that the subsurface conditions presented on the boring logs are representative of the conditions at the specific locations drilled. Variations may occur and should be expected across the site. The soil morphology represents the approximate boundary between subsurface materials and the transitions may be gradual and indistinct. Elevations referenced were obtained from the National Map developed by the United States Geological Survey (USGS) and should be considered approximations.

Infiltration Testing Procedure and Results

Based on the provided site plan, we understand that an infiltration facility is proposed in the northern portion of the site.

PSI performed a falling-head infiltration tests in general accordance with the EPA Design Manual, Onsite Wastewater Treatment and Disposal Systems, Table 3-8 Falling Head Percolation Test Procedure. Test pit TP-1 was excavated to a depth of 5 feet bgs and a 6-inch outside diameter pipe was set in the pit. The pipe was pushed down by the excavator bucket approximately 8 inches. At each infiltration location, the pipe was filled with between one to two feet of water a total of four times and the falling water level was recorded a various time interval during the test. Results of the infiltration testing are summarized below:

Table 1 – Field Infiltration Test Results

Infiltration Test	Duration (minutes)	Head (inches)	Average Infiltration Rate (inches/hour)
1	13	12.5	57
2	10	12	72
3	13	13	60
4	11	12.5	68

Please note that the infiltration rates shown above are measured rates and do not include a factor of safety. PSI recommends that a factor of safety of at least 2 be applied to this rate for design of infiltration systems.

Seismic Cone Penetration Test with Pore-Pressure Readings (SCPTu)

SCPTu is an in-situ testing method used to determine the geotechnical engineering properties of soils and to delineate soil lithology. SCPTu data is used in the analysis and design of foundations. SCPTu probing is a fast and cost-effective method for identifying subsurface soil types and evaluating the engineering properties of soils. The SCPTu records are presented in Appendix A.

During an SCPTu sounding, the electric cone (tip angle 60°, section area 10 cm^2) and the sounding rods are pushed continuously into the ground. Intermittent measurements of the cone resistance (q_t) and sleeve friction (f_s) are measured and recorded by the electric cone while it is being pushed into the ground.

The measurements from a SCPTu can be used to correlate a multitude of geotechnical parameters, including:

- Undrained shear strength (su)
- Effective friction angle (ϕ', degree)
- Coefficient of consolidation (Cv, cm^2/sec)
- Overconsolidation Ratio (OCR)

The results of the measured and correlated data are used in various geotechnical analyses, including soil behavior type, soil bearing capacity, estimated settlement, liquefaction settlement, lateral spread, foundation-design criteria, slope stability, and seismic site class.

Pore Pressure Dissipation Tests

Pore Pressure Dissipation Tests (PPDTs) were conducted at various intervals to measure equilibrium water pressure at the time of the SCPTu sounding. As the conditions are assumed to be hydrostatic, the equilibrium water pressure can be used to determine the approximate depth of the groundwater table. A PPDT is conducted when penetration is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (u) with time is measured using a piezometer fitted between the cone and the sleeve and recorded. Pore Pressure Dissipation Tests are provided below.

Downhole Shear Wave Velocity Measurements

Down hole shear wave velocity measurements were made while advancing each of the probes. This test consists of generating a shear wave by striking a hammer equipped with a trigger on a source beam located on the ground surface under the outrigger of the cone rig. The seismic cone consists of a piezocone unit with a receiver above it. The seismic cone penetrometer is pushed into the ground and penetration is stopped at 1-meter intervals. During the pause in penetration, a shear wave is generated at the ground surface and the time required for the shear wave to reach the seismometer in the cone penetrometer is recorded. The shear wave velocity measurements are used with elastic theory to estimate the mass density of the soil layers. Shear wave velocity measurements are provided below.

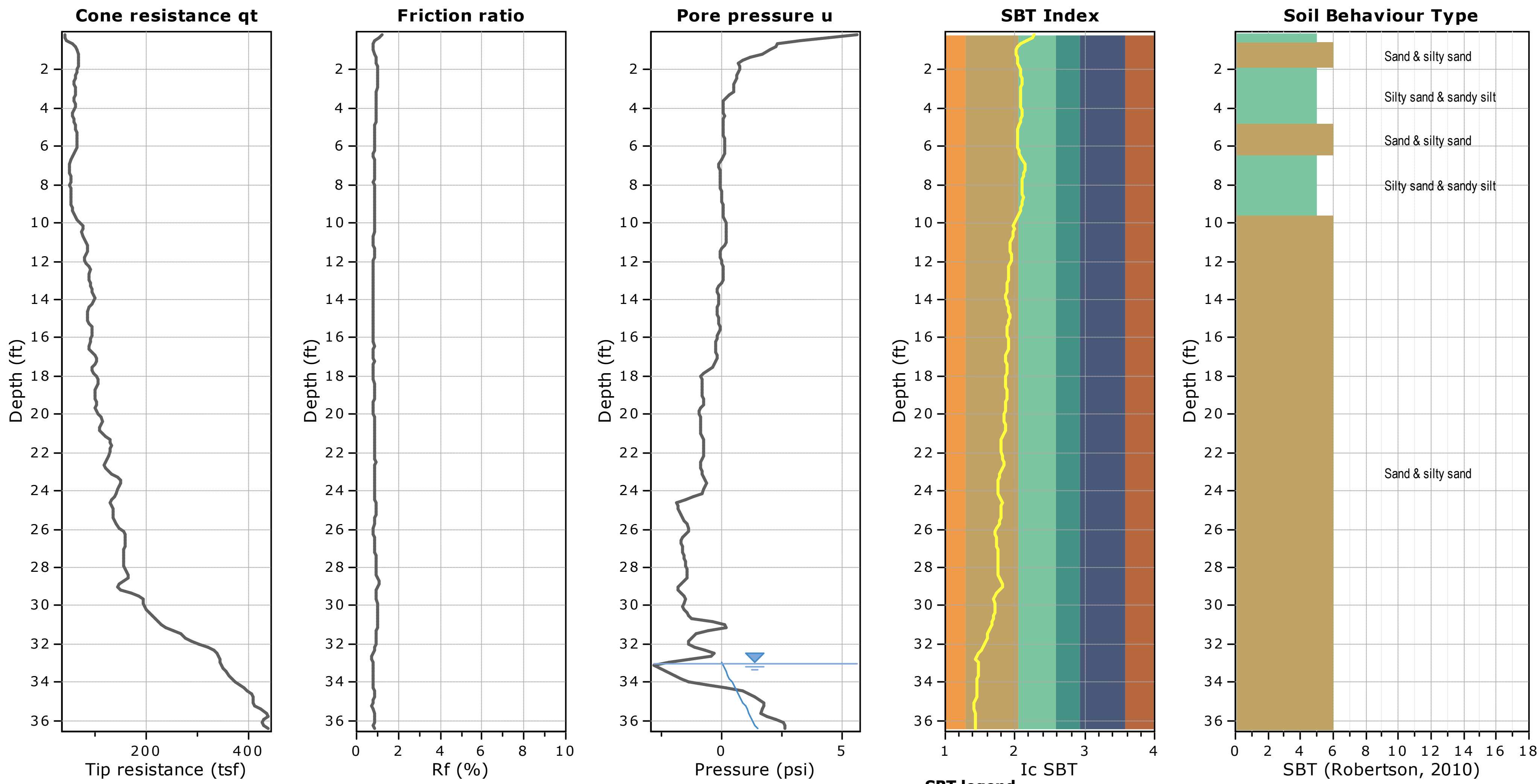
Field Classification

Soil samples were initially classified visually in the field. Consistency, color, relative moisture, degree of plasticity, and other distinguishing characteristics of the soil samples were noted. The terminology used in the soil classifications and other modifiers are depicted in the General Notes and Soil Classification Chart.

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

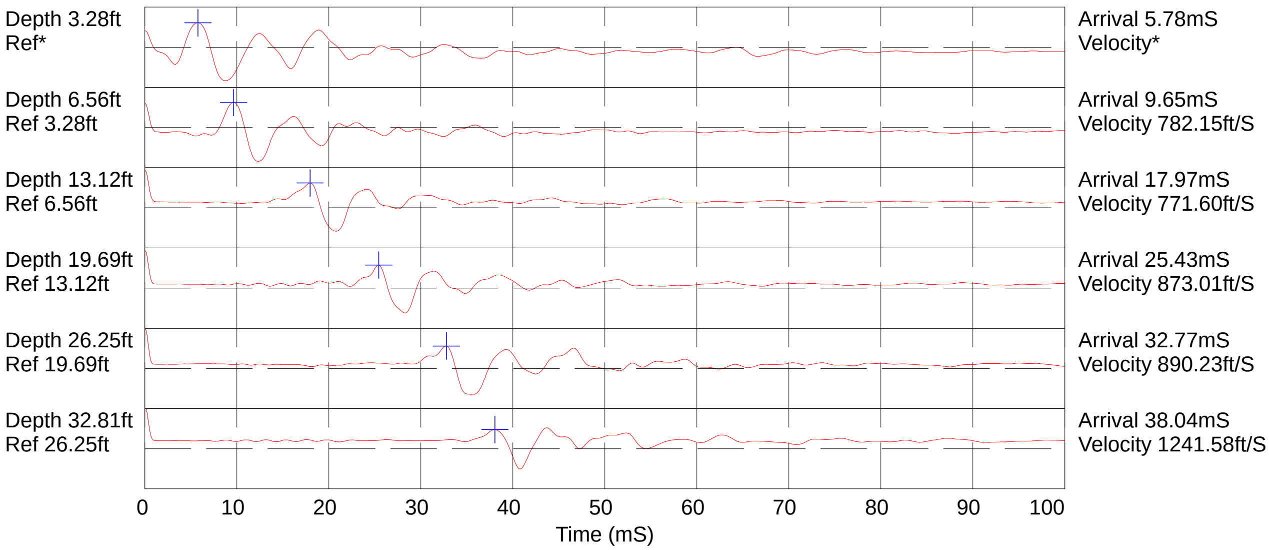
CPT: 21020 CPT-1 Text File
Total depth: 36.42 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

Project: **Microtel Inn and Suites - 07041434**
Location: **43.9727, -124.1003**



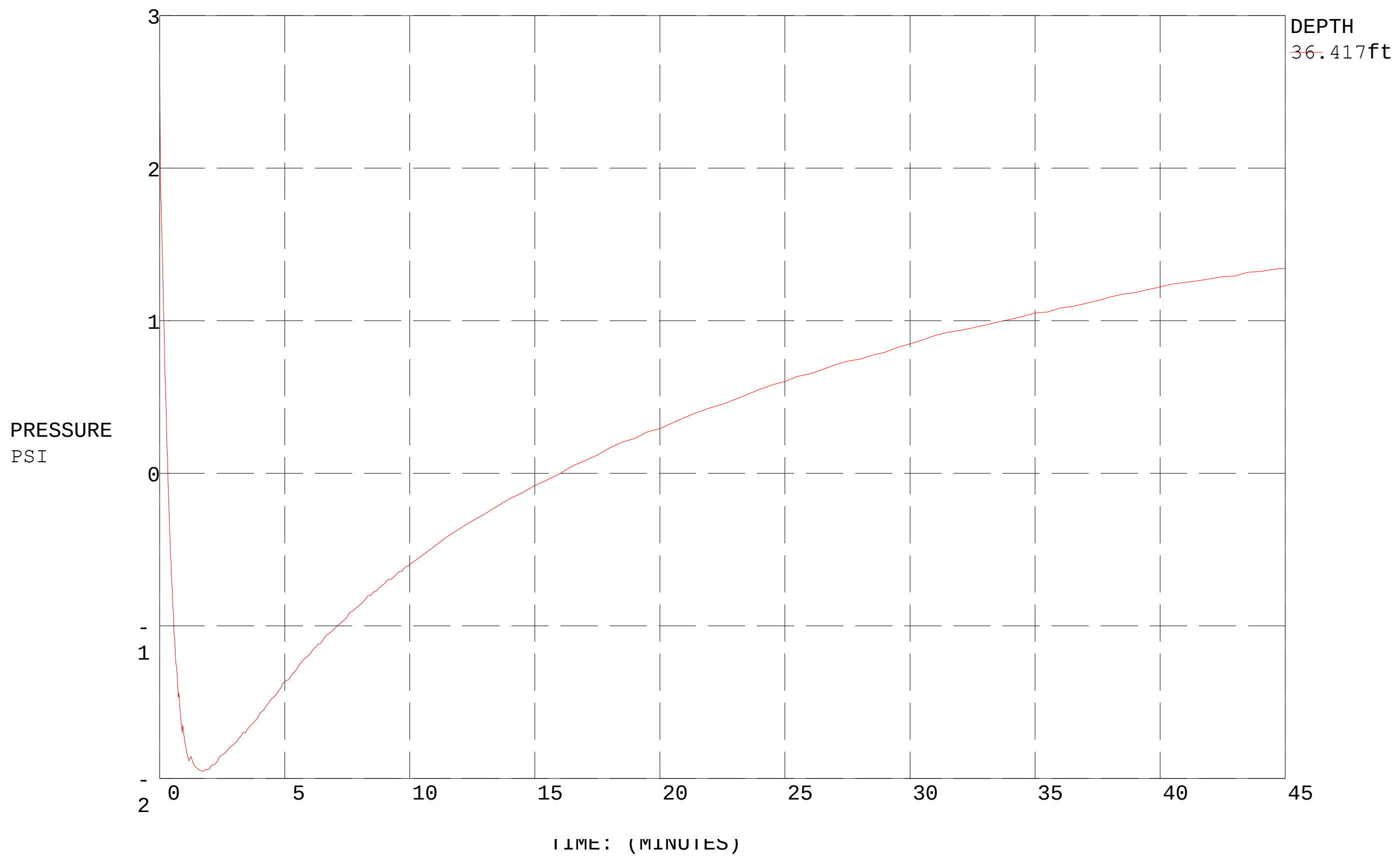
SBT legend
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

COMMENT: PSI / CPT-1 / 750 Quince St Florence



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-1 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A2**



MAXIMUM PRESSURE = 2.582 (PSI)

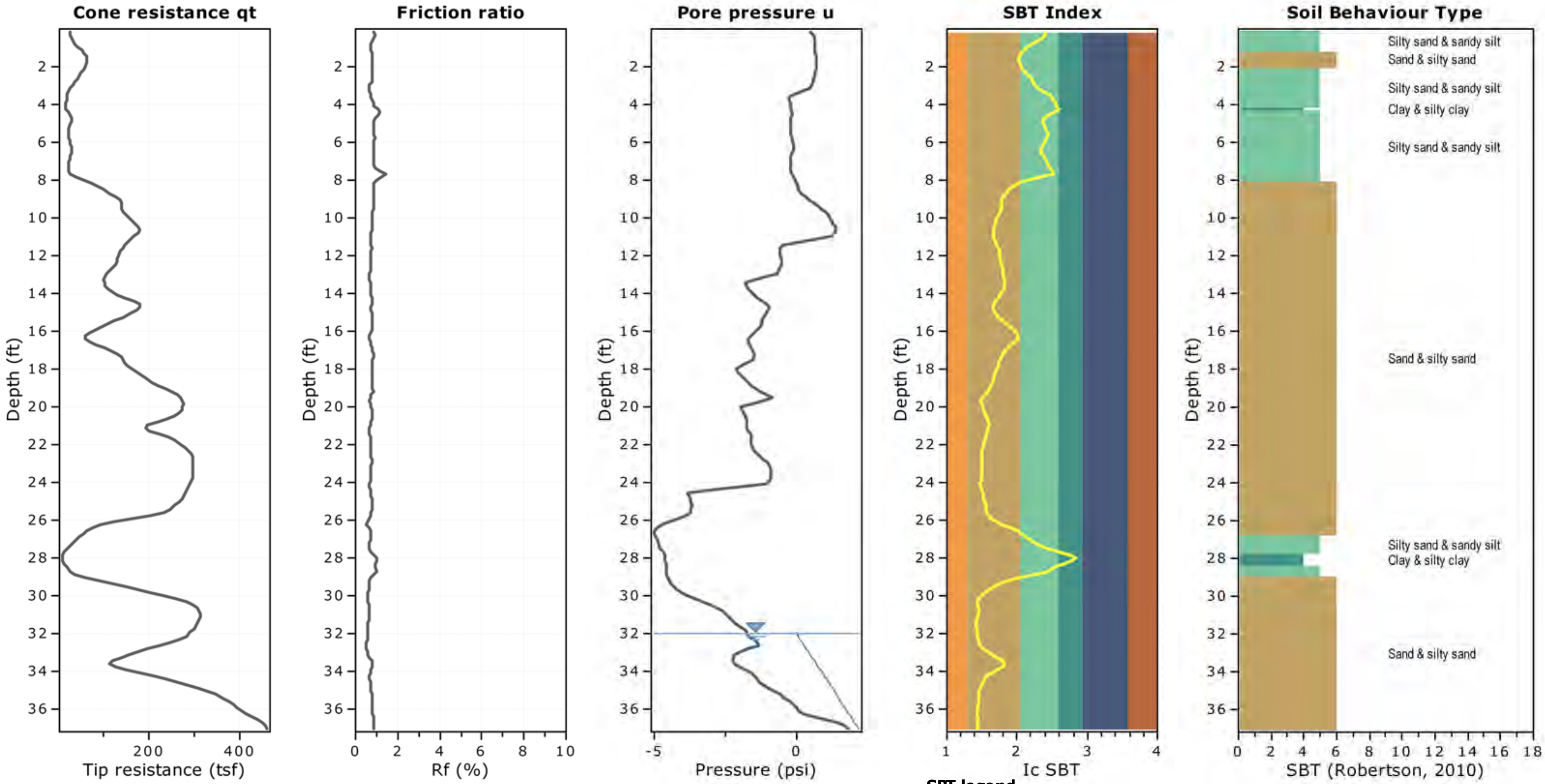
HYDROSTATIC PRESSURE = 1.499 (PSI), WATER TABLE: 32.96 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**	
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-1 PORE PRESSURE DISSAPATION MEASUREMENTS**	**FIGURE A3**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-2 Text File
Total depth: 37.07 ft, Date: 2/23/2021
Surface Elevation: 44.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

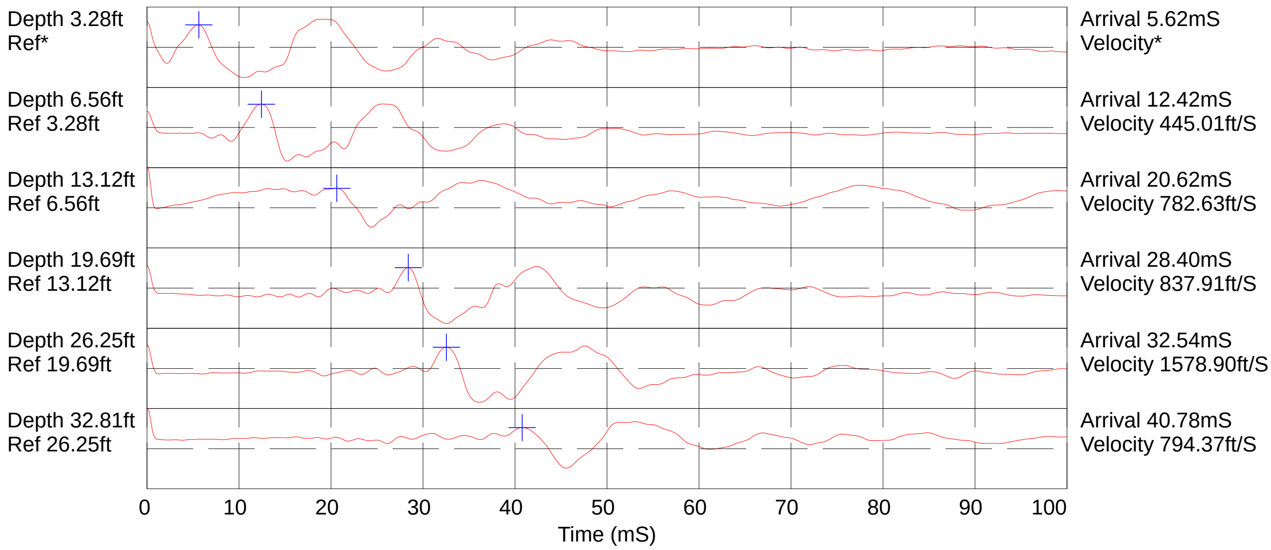
Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

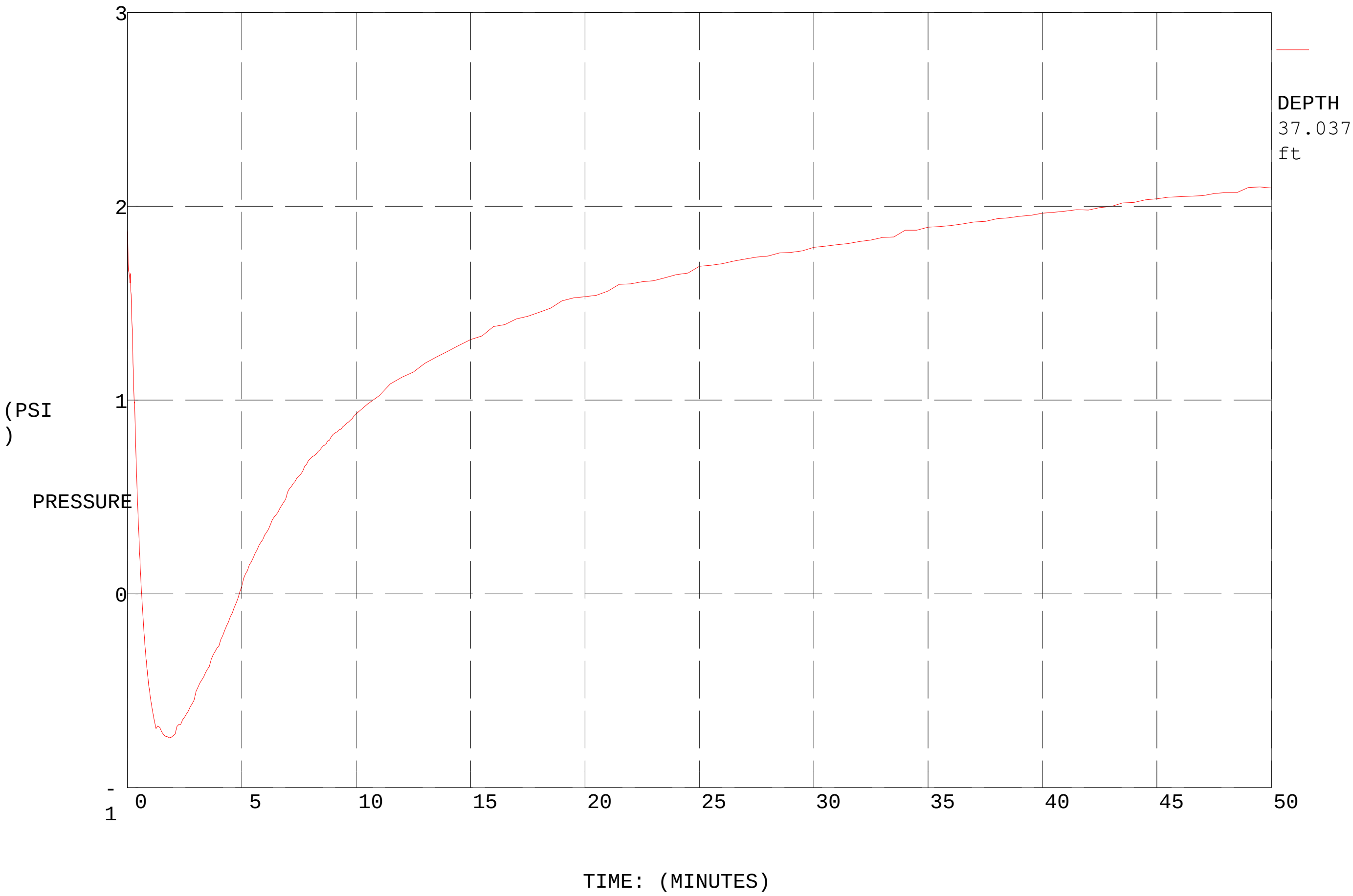
COMMENT: PSI / CPT-2 / 750 Quince St Florence



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

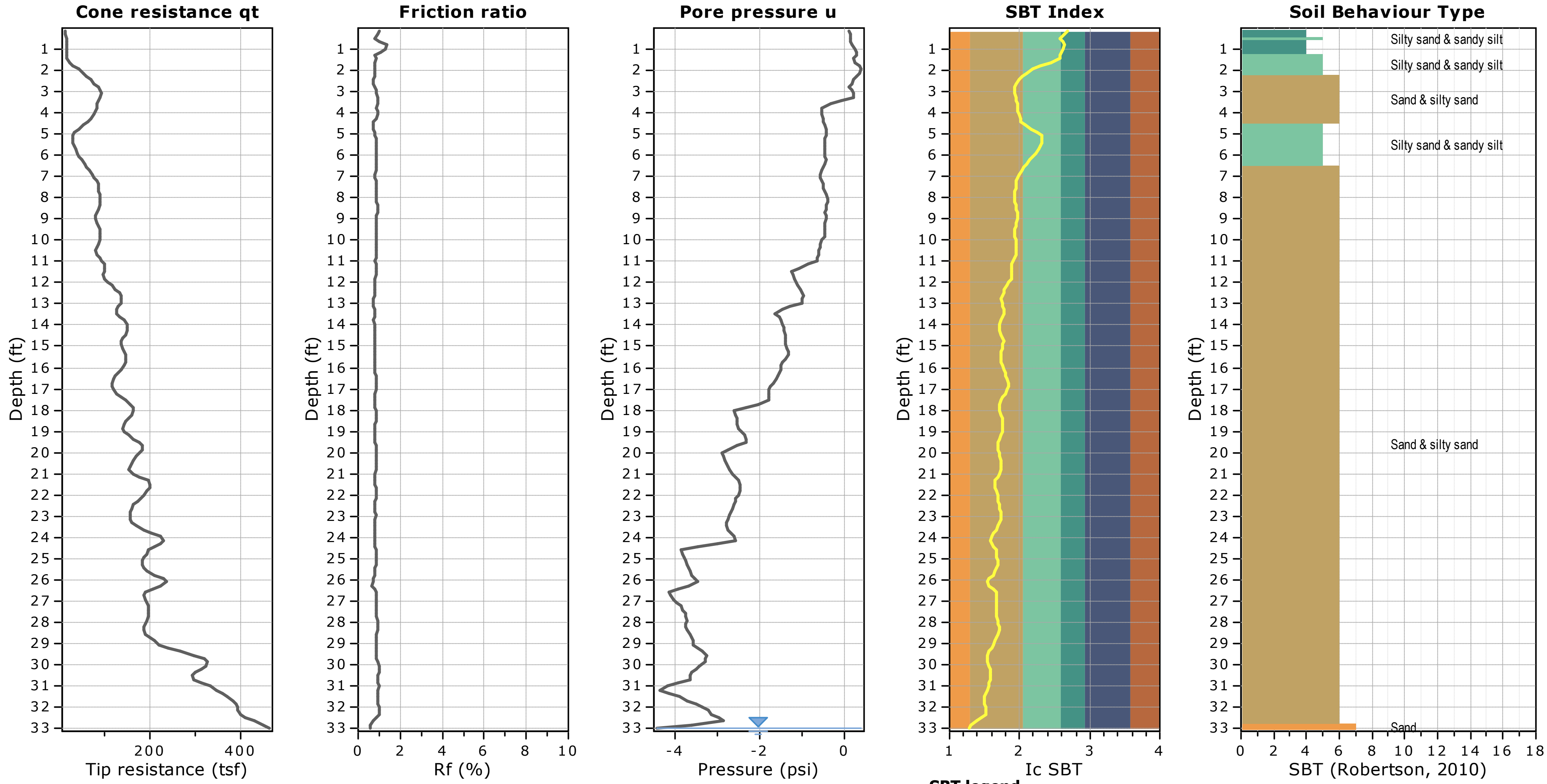
intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**

6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-2 SHEAR WAVE VELOCITY MEASUREMENTS**	**FIGURE A5**



MAXIMUM PRESSURE = 2.1 (PSI)
HYDROSTATIC PRESSURE = 2.15 (PSI), WATER TABLE: 32.11 ft

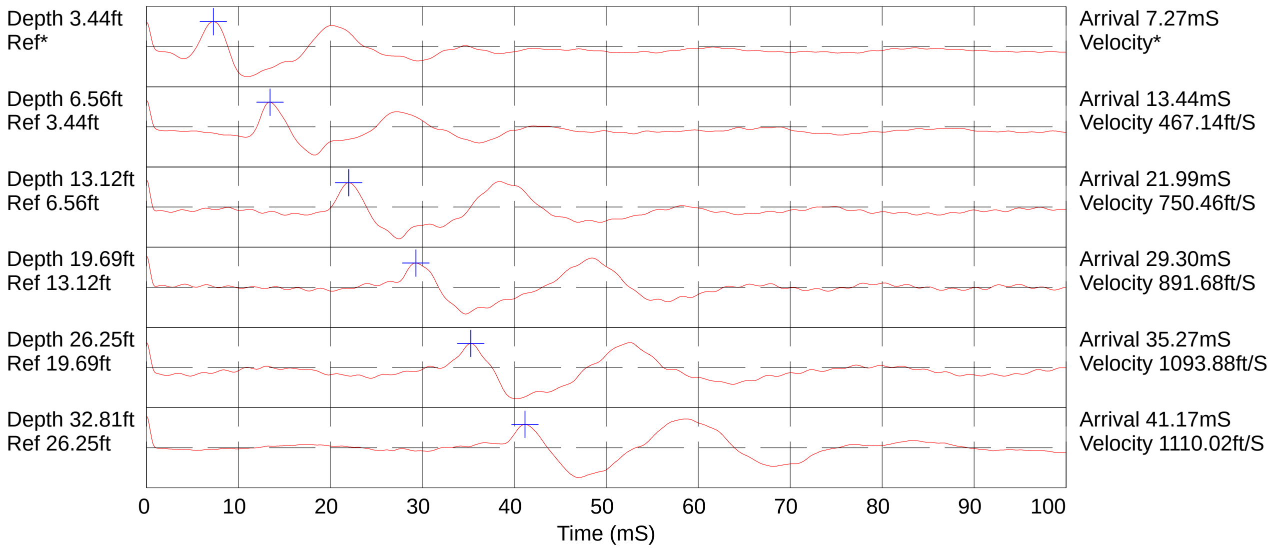
intertek psi	Project No. 07041434	**Microtel Inn and Suites** **Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-2 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A6**



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

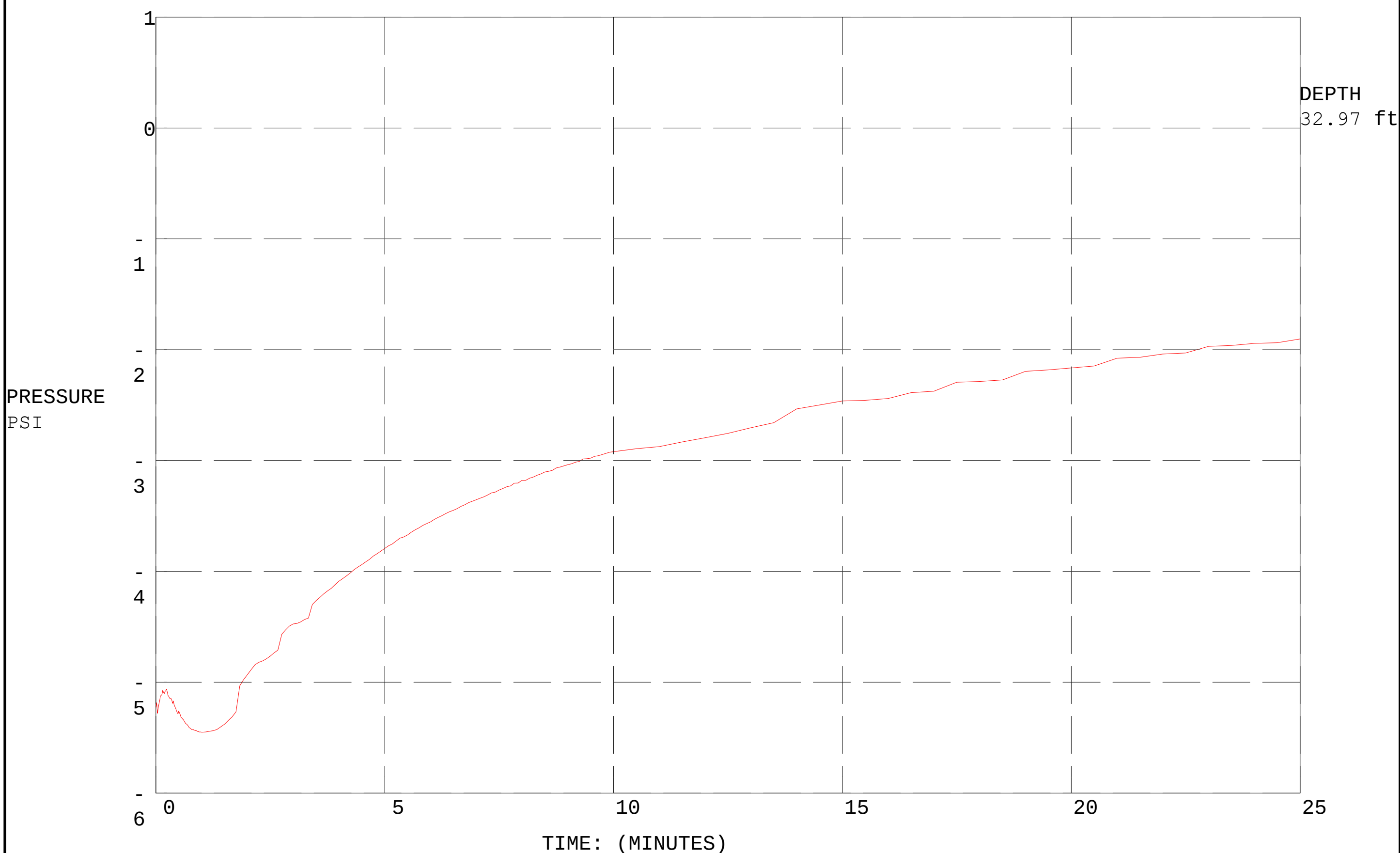
COMMENT: PSI / CPT-3 / 750 Quince St Florence



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-3 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A8**

COMMENT: PSI / CPT-3 / 750 Quince St Florence



MAXIMUM PRESSURE = -1.903 (PSI)

HYDROSTATIC PRESSURE = 0.0 (PSI), WATER TABLE: 33.14 ft

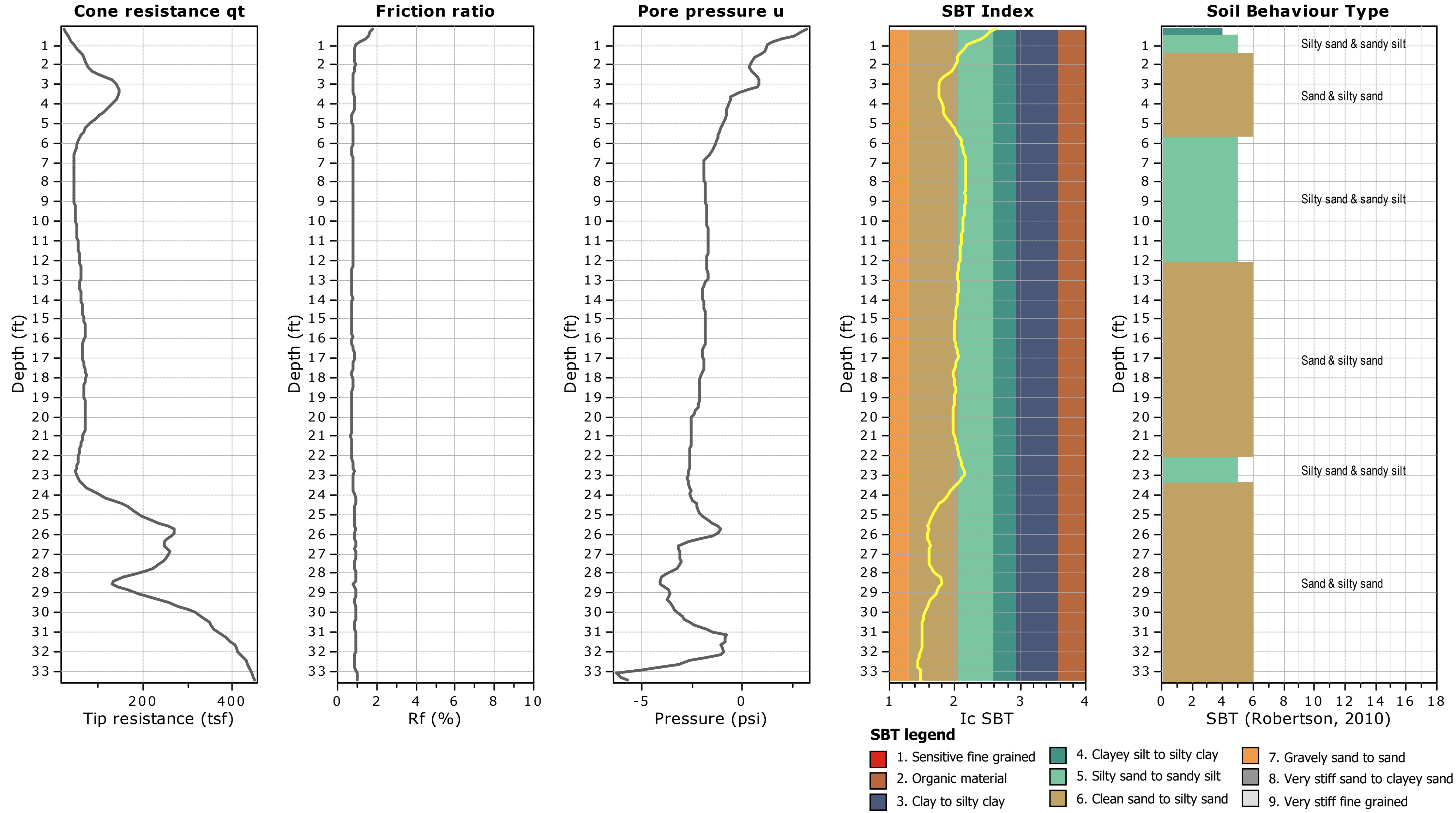
intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**

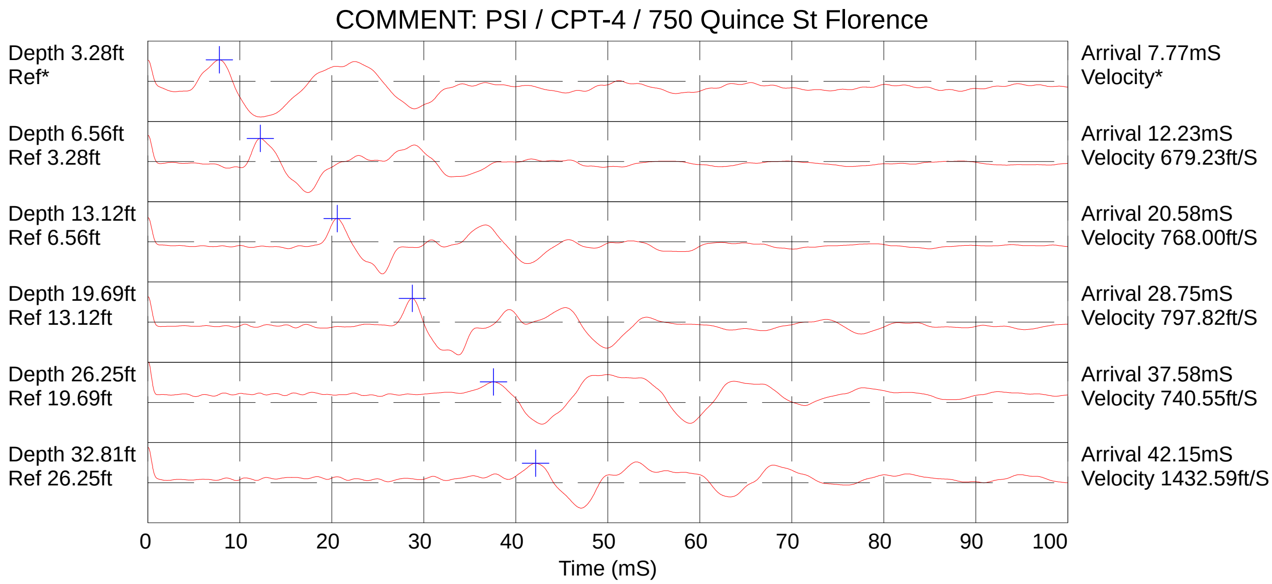
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-3 PORE PRESSURE DISSAPATION MEASUREMENTS**	**FIGURE A9**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-4 Text File
Total depth: 33.47 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003

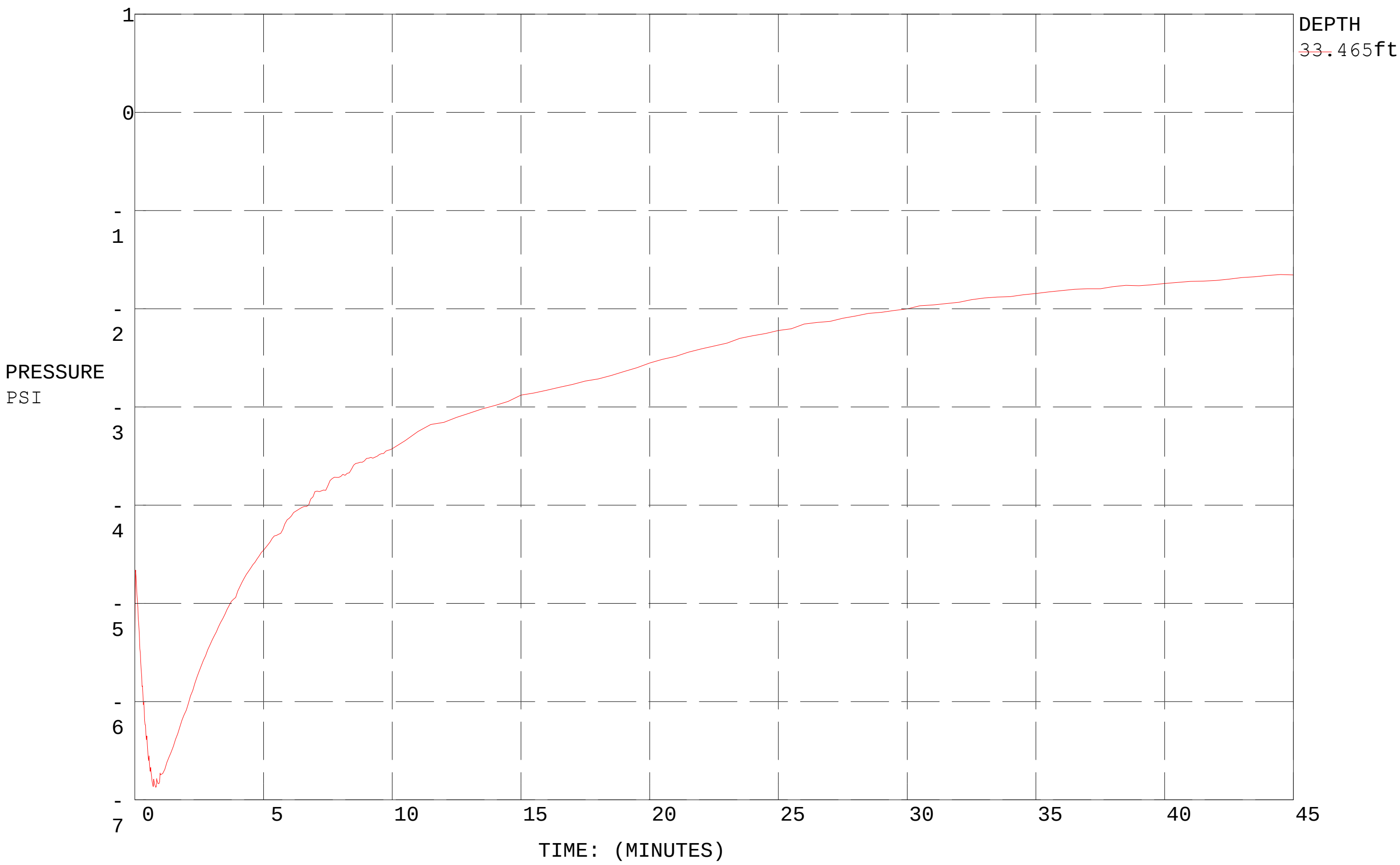




Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-4 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A11**

COMMENT: PSI / CPT-4 / 750 Quince St Florence



MAXIMUM PRESSURE = -1.653 (PSI)

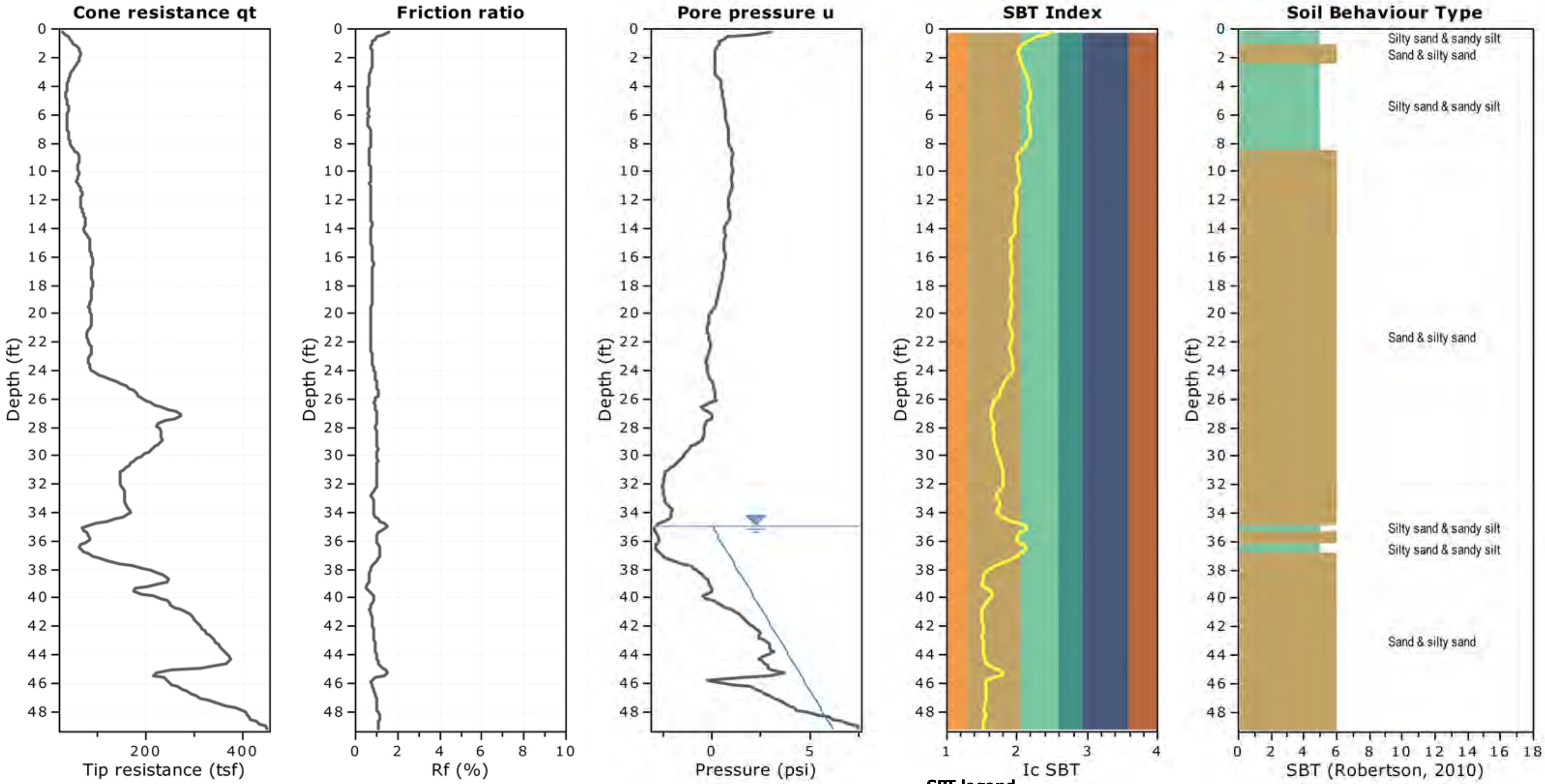
HYDROSTATIC PRESSURE = 0.0 (PSI), WATER TABLE: 35.01 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-4 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A12**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-5 Text File
Total depth: 49.21 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:-124.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

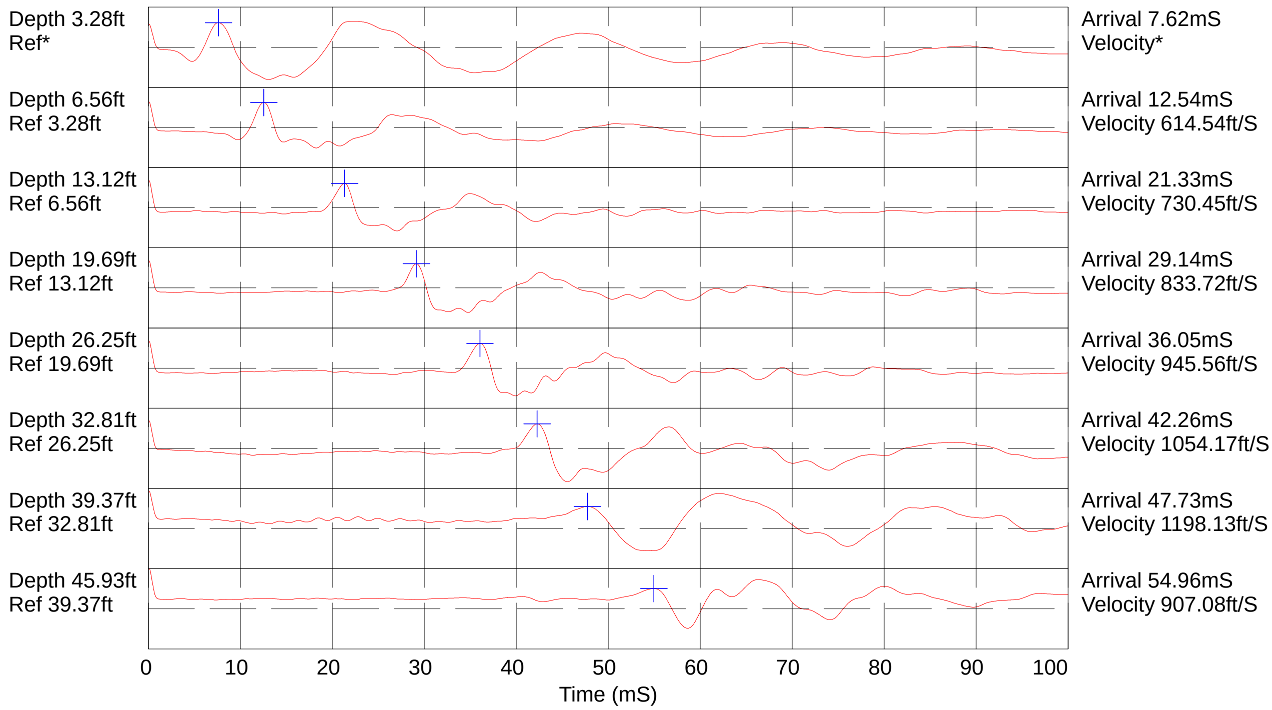
Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

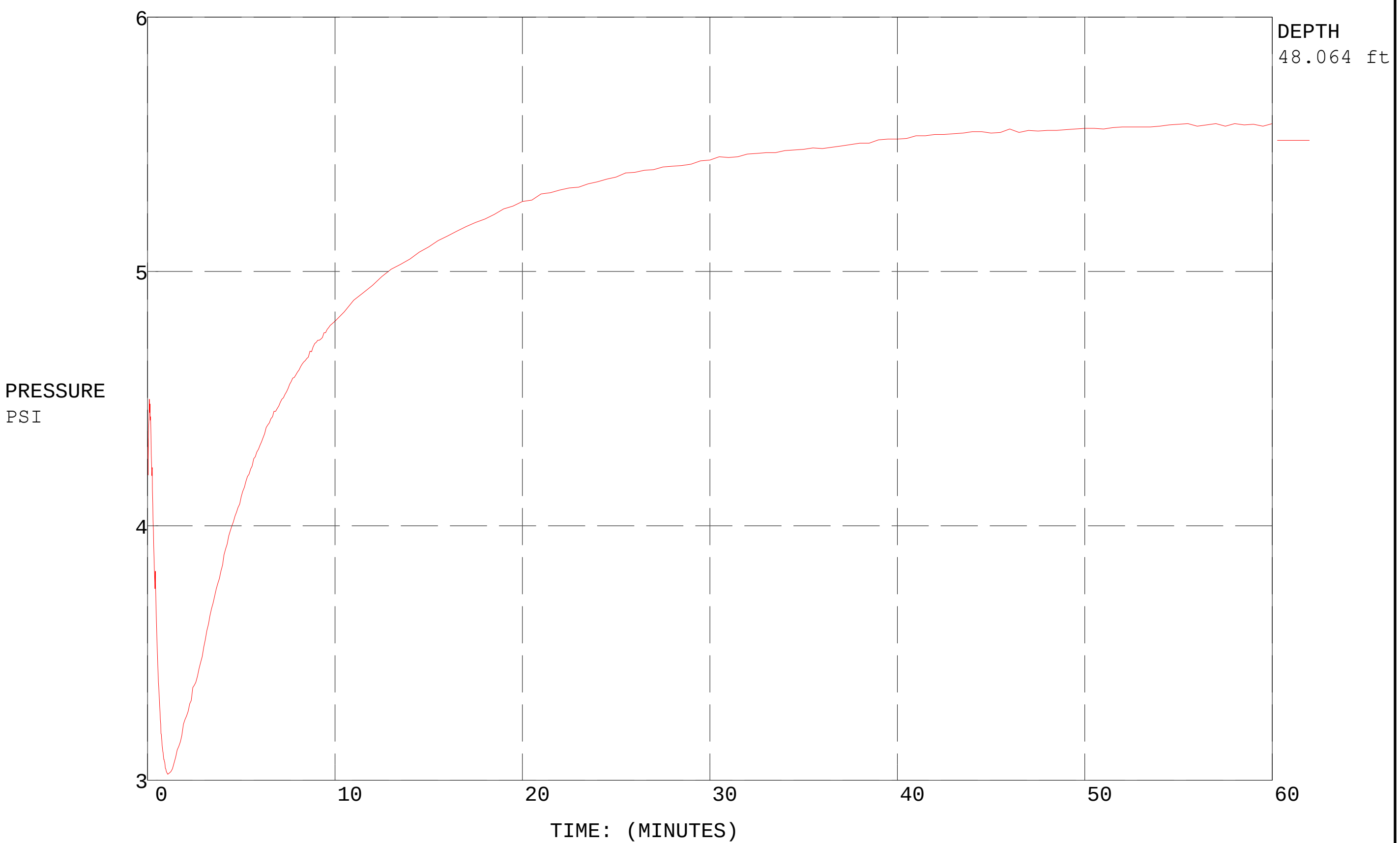
COMMENT: PSI / CPT-5 / 750 Quince St Florence



Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-5SHEAR WAVE VELOCITY MEASUREMENTS** / **FIGURE A14**

COMMENT: PSI / CPT-5 / 750 Quince St Florence



MAXIMUM PRESSURE = 5.581 (PSI)

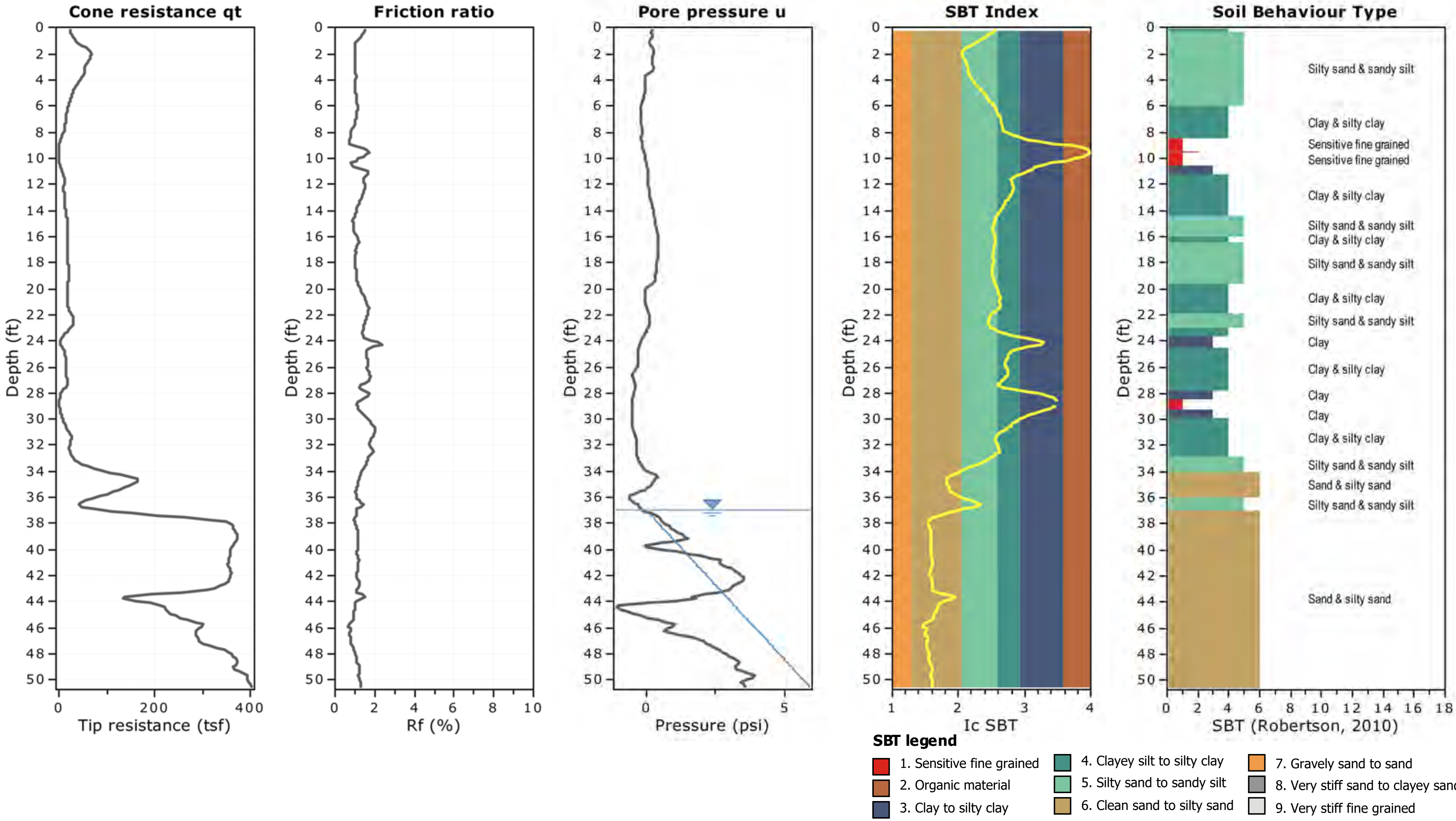
HYDROSTATIC PRESSURE = 5.584 (PSI), WATER TABLE: 35.18 ft

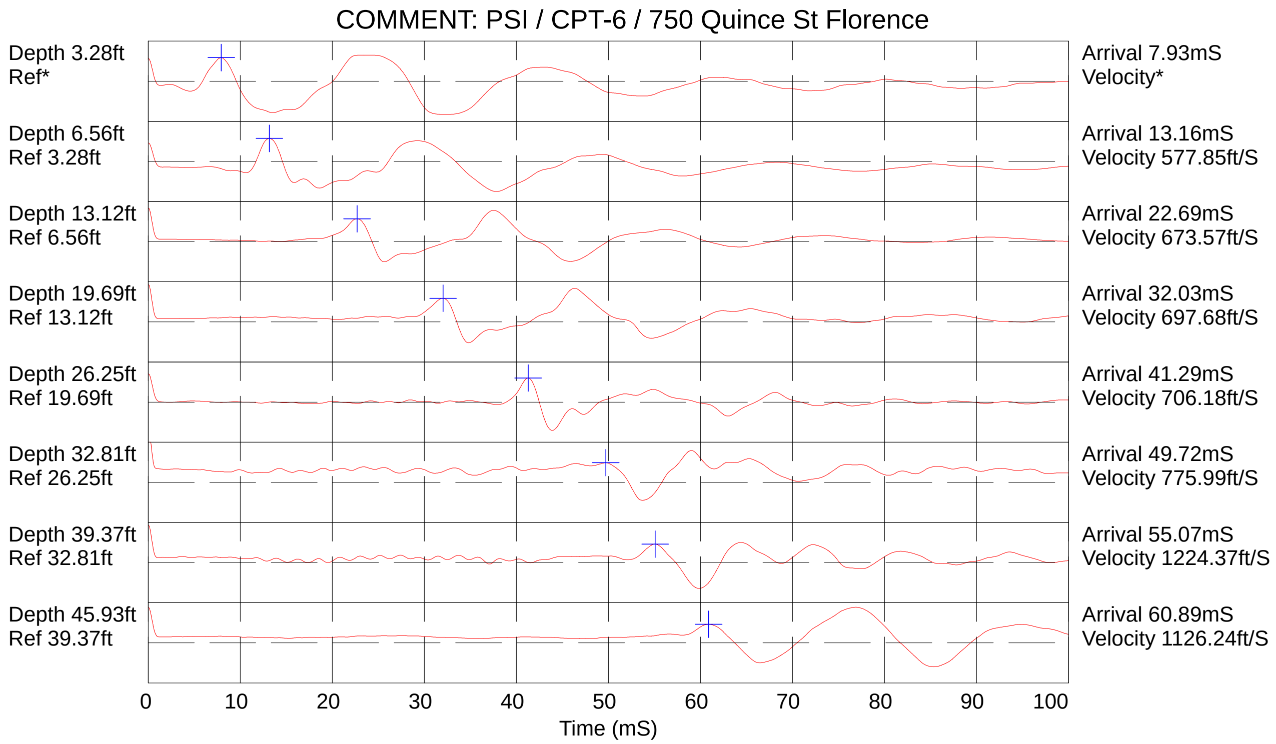
intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-5 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A15**

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

CPT: 21020 CPT-6 Text File
Total depth: 50.53 ft, Date: 2/23/2021
Surface Elevation: 47.00 ft
Coords: X:43.97, Y:121.10
Cone Type: Vertek
Cone Operator: Oregon Geotechnical Explorations

Project: Microtel Inn and Suites - 07041434
Location: 43.9727, -124.1003

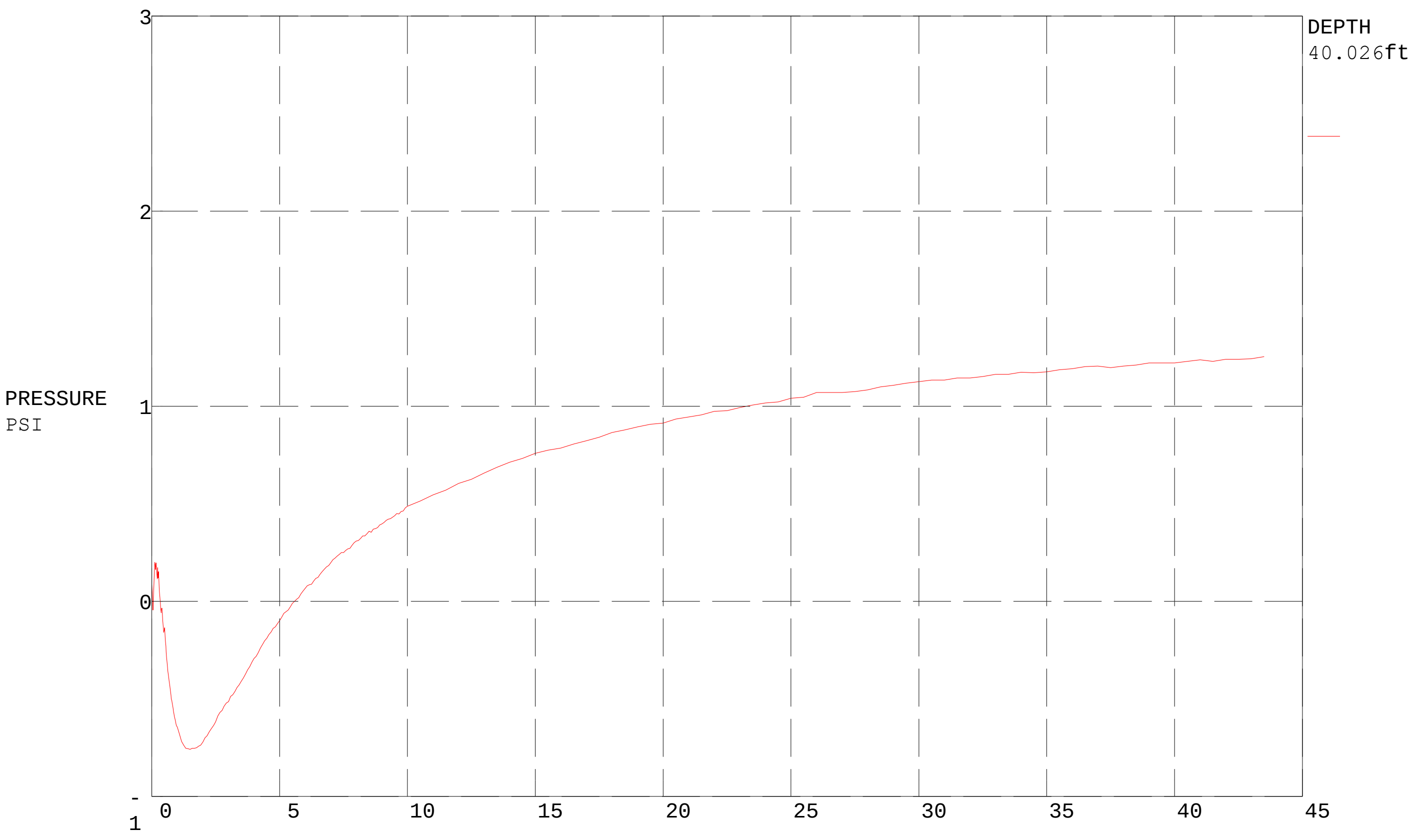




Hammer to Rod String Distance (ft): 1.97
* = Not Determine

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 / Drawn By: SRS	**CPT-6 SHEAR WAVE VELOCITY MEASUREMENTS** — **FIGURE A17**

COMMENT: PSI / CPT-6 / 750 Quince St Florence



MAXIMUM PRESSURE = 1.254 (PSI)

HYDROSTATIC PRESSURE = 1.297 (PSI), WATER TABLE: 37.03 ft

intertek psi	Project No. 07041434	**Microtel Inn and Suites Florence, Oregon**
6032 North Cutter Circle, Suite 480 Portland, Oregon 97217	March 2021 Drawn By: SRS	**CPT-6 PORE PRESSURE DISSAPATION MEASUREMENTS** — **FIGURE A18**

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

- SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
- HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
- M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
- R.C.: Diamond Bit Core Sampler
- H.A.: Hand Auger
- P.A.: Power Auger - Handheld motorized auger

- SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
- ST: Shelby Tube - 3" O.D., except where noted.
- RC: Rock Core
- TC: Texas Cone
- BS: Bulk Sample
- PM: Pressuremeter
- CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

- N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
- N_{60}: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
- Q_u: Unconfined compressive strength, TSF
- Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
- w%: Moisture/water content, %
- LL: Liquid Limit, %
- PL: Plastic Limit, %
- PI: Plasticity Index = (LL-PL),%
- DD: Dry unit weight, pcf
- ▼, ▽, ▼: Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated

Description	Criteria
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

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

BORING GP-1

DATE STARTED: 2/23/20	**DRILL COMPANY:** Oregon Geotechnical Exploration, Inc		
DATE COMPLETED: 2/23/20	**DRILLER:** Dom **LOGGED BY:** Staci Shub		
COMPLETION DEPTH 45.0 ft	**DRILL RIG:** GeoProbe Rig		
BENCHMARK: N/A	**DRILLING METHOD:** GeoProbe		
ELEVATION: 47 ft	**SAMPLING METHOD:** GP		
LATITUDE: 43.972804°	**HAMMER TYPE:** Automatic		
LONGITUDE: -124.100541°	**EFFICIENCY** N/A		
STATION: N/A **OFFSET:** N/A	**REVIEWED BY:** SRS		
REMARKS:			

Water

While Drilling	35	feet
Upon Completion	35	feet
Delay	N/A	

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft	Additional Remarks
47	0	1	**Approximately 4 inches of grassy Topsoil**	Topsoil	46		Gradation: Fines = 25%
		2	Light brown to brown, moist, **Well graded silty SAND**, fine to coarse grained, trace black staining	SM	4	>>	
		3	Gray to light brown, moist, **Poorly graded SAND**, fine to medium grained, trace intermitten silt lenses	SP	7	>>	Gradation: Fines = 5%
		4			8	>>	
		5			6	>>	
		6			6	>>	Gradation: Fines = 1%
		7			7	>>	Gradation: Fines = 0%
		8	Black staining and trace orange and gray mottling below 18 feet bgs		6	>>	
		9			6	>>	
		10			5	>>	
		11			6	>>	Gradation: Fines = 0%
		12	Wet below 35 feet bgs		18	>>	Gradation: Fines = 3%
	38.5		Geoprobe terminated at 38.5 due to refusal on very dense sand				

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778

PROJECT NO.: 07041434
PROJECT: Microtell Inn and Suites
LOCATION: 750 Quince Street
Florence, Oregon

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 2/23/20	**DRILL COMPANY:** Oregon Geotechnical Exploration, Inc		**BORING GP-2**
DATE COMPLETED: 2/23/20	**DRILLER:** Dom	**LOGGED BY:** Staci Shub	
COMPLETION DEPTH 45.0 ft	**DRILL RIG:** GeoProbe Rig		
BENCHMARK: N/A	**DRILLING METHOD:** GeoProbe		
ELEVATION: 47 ft	**SAMPLING METHOD:** GP		
LATITUDE: 43.972073°	**HAMMER TYPE:** Automatic		**BORING LOCATION:**
LONGITUDE: -124.100257°	**EFFICIENCY** N/A		
STATION: N/A **OFFSET:** N/A	**REVIEWED BY:** SRS		
REMARKS:			

Water

∇	While Drilling	35 feet
▼	Upon Completion	35 feet
∇	Delay	N/A

STANDARD PENETRATION TEST DATA: N in blows/ft ◎; × Moisture; PL; LL (scale 0 – 25 – 50). STRENGTH, tsf: ▲ Qu; ✳ Qp (scale 0 – 2.0 – 4.0)

Elevation (feet)	Depth, (feet)	Sample No.	MATERIAL DESCRIPTION	USCS Classification	Moisture, %	Additional Remarks
47	0	1	**Approximately 4 inches of grassy Topsoil**	Topsoil	45	Gradation: Fines =28%
45	2	2	Light brown to brown, moist, **Poorly graded silty SAND** , fine to medium grained, trace black staining and organge mottling	SM	5	Fines = 0% Gradation:
42	5		Gray to light brown, moist, **Poorly graded SAND**, fine to medium grained, trace intermitten silt lenses	SP		
	9	3			9	
	10	4			6	
32	15	5			5	
	18		Black staining and trace orange and gray mottling below 18 feet bgs			
	21	6			5	Gradation: Fines = 1%
	24	7			5	
	26	8			5	Gradation: Fines = 1%
	31	9			7	Gradation: Fines = 1%
	32		Light gray to gray below 32 feet bgs			
	35	10	Wet below 35 feet bgs		17	Gradation: Fines = 0%
	38.5		Geoprobe terminated at 38.5 due to refusal on very dense sand			

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PROJECT: Microtell Inn and Suites
LOCATION: 750 Quince Street
Florence, Oregon

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LOG OF TP1

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA (Blows per 1¾-inch ◎; Moisture × / PL / LL; STRENGTH, tsf ▲ Qu ✳ Qp)	Additional Remarks
						Surface Elev.: 47 ft					
	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining					
	2								19	×	Fines=7%
			Grab Sample	1						>>◎	
44	3						SP				
	4										
42	5		Grab Sample	2						>>◎	
						Test pit terminated at approximately 5 feet bgs					

Completion Depth: 5.5 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9727°
Longitude: -124.1005°
Excavation Equipment: Excavator
Remarks:

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LOG OF TP2

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	MATERIAL DESCRIPTION	USCS Classification	DCPT Blows per 1¾-inch	Additional Remarks
47	0			Surface Elev.: 47 ft			
	0–0.33			**Approximately 4 inches of grassy Topsoil**	Topsoil		
46	1			Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP		
44	3.5	Grab	1			>>	
41	6.5	Grab	2			>>	
39	8			Test pit terminated at approximately 8 feet bgs due to caving			

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9727°
Longitude: -124.0998°
Excavation Equipment: Excavator
Remarks:

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LOG OF TP3

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DCP Blows per 1¾-inch	Additional Remarks
					Surface Elev.: 47 ft					
47	0				**Approximately 4 inches of grassy Topsoil**	Topsoil				
					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP				
46	1									
	2									
		Grab	1						>>	
44	3									
	4									
42	5									
	6									
		Grab	2						>>	
40	7									
					Test pit terminated at approximately 7 feet bgs due to caving					
	8	Grab	3						>>	

DYNAMIC CONE PENETRATION TEST DATA: Blows per 1¾-inch ◎ (0, 15, 30); × Moisture, PL, LL (0, 25, 50); STRENGTH, tsf ▲ Qu, ✳ Qp (0, 2.0, 4.0)

Completion Depth: 8.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9724°
Longitude: -124.0998°
Excavation Equipment: Excavator
Remarks:

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LOG OF TP4

PSI Job No.:	07041434	Excavation Method:	Excavation
Project:	Microtel Inn and Suites	Sampling Method:	
Location:	750 Quince Street	DCP Type:	N/A
	Florence, Oregon	Boring Location:	

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ (0–15–30); × Moisture, PL, LL (0–25–50); STRENGTH, tsf ▲ Qu ✳ Qp (0–2.0–4.0)	Additional Remarks
						Surface Elev.: 47 ft					
47	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining					
44	3		Grab	1					26	>>◎	Fines=0.2%
							SP				
42	5		Grab	2					20	>>◎	Fines=0.2%
40	7		Grab	3						>>◎	
	8					Test pit terminated at approximately 8 feet bgs due to caving					

Completion Depth:	8.0 ft	Sample Types:	Latitude: 43.9721°
Date Boring Started:	1/4/21	Shelby Tube	Longitude: -124.1°
Date Boring Completed:	1/4/21	Dynamic Cone (DCP)	Excavation Equipment: Excavator
Logged By:	S. Shub	Grab Sample	Remarks:
Excavation Contractor:	Dan Fisher Excavating, Inc		

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP5

PSI Job No.: 07041434
Project: Microtel Inn and Suites
Location: 750 Quince Street
Florence, Oregon

Excavation Method: Excavation
Sampling Method:
DCP Type: N/A
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ (0 / 15 / 30); × Moisture, PL, LL (0 / 25 / 50); STRENGTH, tsf ▲ Qu ✳ Qp (0 / 2.0 / 4.0)	Additional Remarks
						Surface Elev.: 47 ft					
	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black staining	SP				
	2										
44	3										
	4										
42	5										
	6		Grab	1					8	×	>>◎Fines=0.3%
						Test pit terminated at approximately 6 feet bgs due to caving					

Completion Depth: 6.0 ft
Date Boring Started: 1/4/21
Date Boring Completed: 1/4/21
Logged By: S. Shub
Excavation Contractor: Dan Fisher Excavating, Inc

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 43.9718°
Longitude: -124.1003°
Excavation Equipment: Excavator
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP6

PSI Job No.:	07041434	Excavation Method:	Excavation
Project:	Microtel Inn and Suites	Sampling Method:	
Location:	750 Quince Street Florence, Oregon	DCP Type:	N/A
		Boring Location:	

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA: Blows per 1¾-inch (0–15–30); Moisture, PL, LL (0–25–50); STRENGTH, tsf: Qu, Qp (0–2.0–4.0)	Additional Remarks
						Surface Elev.: 47 ft					
	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt and gravel, trace black staining No gravel observed below 1.5 feet	SP				
	2										
44	3										
	4										
42	5								12	>>	Fines=0.2%
			Grab	1							
	6										
			Grab	2						>>	
40	7					Test pit terminated at approximately 7 feet bgs due to caving					

Completion Depth:	7.0 ft	Sample Types:	Latitude: 43.9721°
Date Boring Started:	1/4/21	Shelby Tube	Longitude: -124.1005°
Date Boring Completed:	1/4/21	Dynamic Cone (DCP)	Excavation Equipment: Excavator
Logged By:	S. Shub	Grab Sample	Remarks:
Excavation Contractor:	Dan Fisher Excavating, Inc		

The stratification lines represent approximate boundaries. The transition may be gradual.

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LOG OF TP7

Sheet 1 of 1

PSI Job No.:	07041434	Excavation Method:	Excavation
Project:	Microtel Inn and Suites	Sampling Method:	
Location:	750 Quince Street, Florence, Oregon	DCP Type:	N/A
		Boring Location:	

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA	Additional Remarks
						Surface Elev.: 47 ft					
	0					**Approximately 4 inches of grassy Topsoil**	Topsoil				
46	1					Light brown, moist, **Poorly graded SAND**, fine to medium grained, trace silt, trace black and orange staining	SP				
44	3										
42	5										
40	7										
	8		Grab Sample	1						>>	
						Test pit terminated at approximately 8 feet bgs due to caving					

DYNAMIC CONE PENETRATION TEST DATA: Blows per 1¾-inch ◎ (0, 15, 30); × Moisture, PL, LL (0, 25, 50); STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)

Completion Depth:	8.0 ft	Sample Types:	Latitude: 43.9725°
Date Boring Started:	1/4/21	Shelby Tube	Longitude: -124.1004°
Date Boring Completed:	1/4/21	Dynamic Cone (DCP)	Excavation Equipment: Excavator
Logged By:	S. Shub	Grab Sample	Remarks:
Excavation Contractor:	Dan Fisher Excavating, Inc		

The stratification lines represent approximate boundaries. The transition may be gradual.

Geophysical Testing

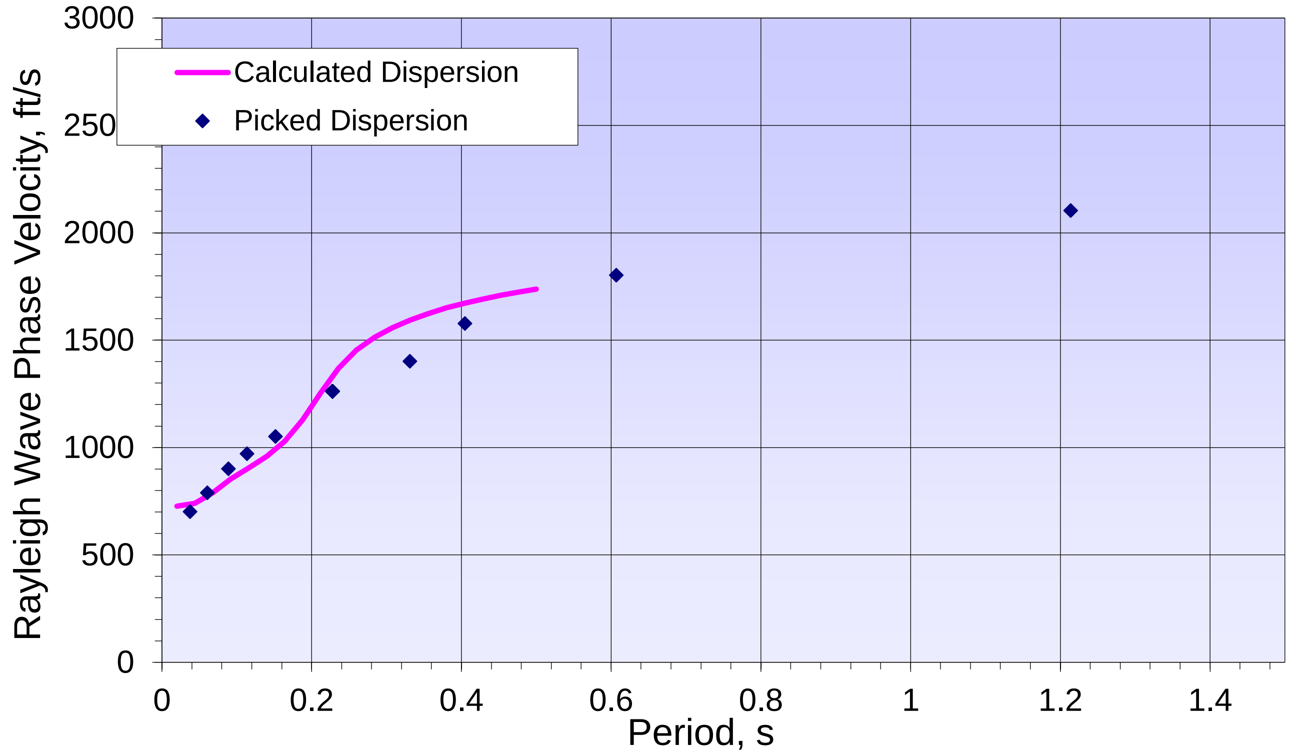
Three Refraction Microtremor (ReMi) arrays were performed at the project site (see Figure 2). The ReMi method uses standard P-wave recording equipment and ambient noise to determine shear-wave velocities. The equipment used for our ReMi evaluation included a Seismic Source DAQLink III 24-Bit ADC acquisition system and STC-85-SM-4 10-hertz geophones developed by Seismic Source Technology. Field acquisition of the data incorporated 24 geophone locations with equal spacing of 15 feet. SeisOpt ReMi Version 4.0 (Vspect and Disper modules) software developed by Optim LLC was used to process the collected data, and to create the shear wave velocity profile. To provide a robust data profile, both individual recordings and multiple summed (stacked) recordings were evaluated.

Each individual record of the traces is pre-processed to reduce or eliminate anomalies in the raw data. The data is then processed to produce a velocity spectrum. This process involves computing a surface wave, phase velocity dispersion spectral ratio image by p-tau and Fourier transforms across the array. This process is described in the document titled, "Faster, Better: Shear-wave Velocity to 100 Meters Depth from Refraction Microtremor Arrays", Bulletin of the Seismological Society of America by Louie, J, N. (2001). The resulting spectrum is in the slowness-frequency (p-f) domain. The p-f transformation helps segregate the Rayleigh Wave arrivals from other surface waves, body waves, sound waves, etc. The p-f image is generated for each record, and a final p-f image for each test is generated by combining some, or all, of the individual images.

The fundamental mode dispersion curve on the final p-f image can be seen as a distinct trend from the aliasing and wave-field transformation truncation artifact trends in the spectra. Once the fundamental mode dispersion curve is visually interpreted, data points along this curve are picked. Using the picked data points, an interactive forward-modeling process is used to model a shear wave velocity profile, with a resulting dispersion curve that approximately matches the picked data points. The process and resulting velocity profiles are able to identify the various velocity layers in the subsurface, including velocity inversions within the profile.

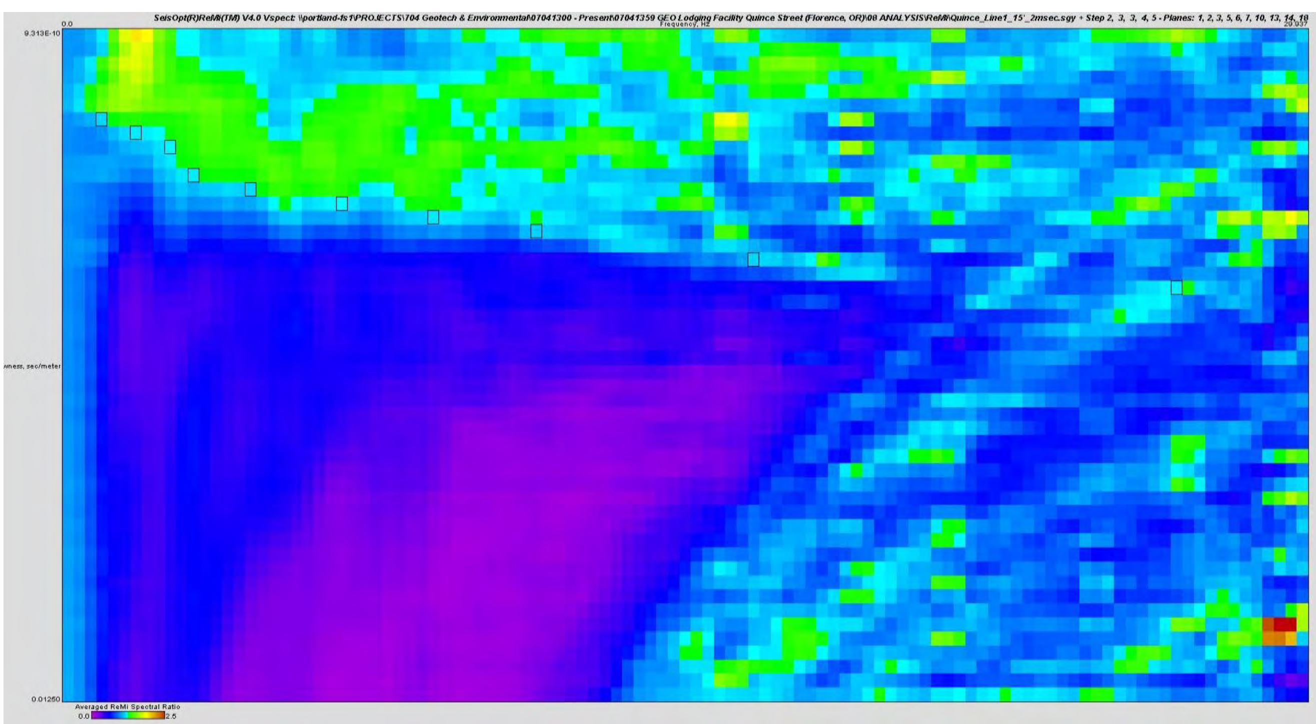
The results of the ReMi testing indicates that the weighted-average shear wave velocity in the upper 100 feet of the project site (VS) is approximately 1,000 feet per second. This indicates that the project site is classified as a Site Class D, in accordance with ASCE 7-16.

Dispersion Curve Showing Picks and Fit



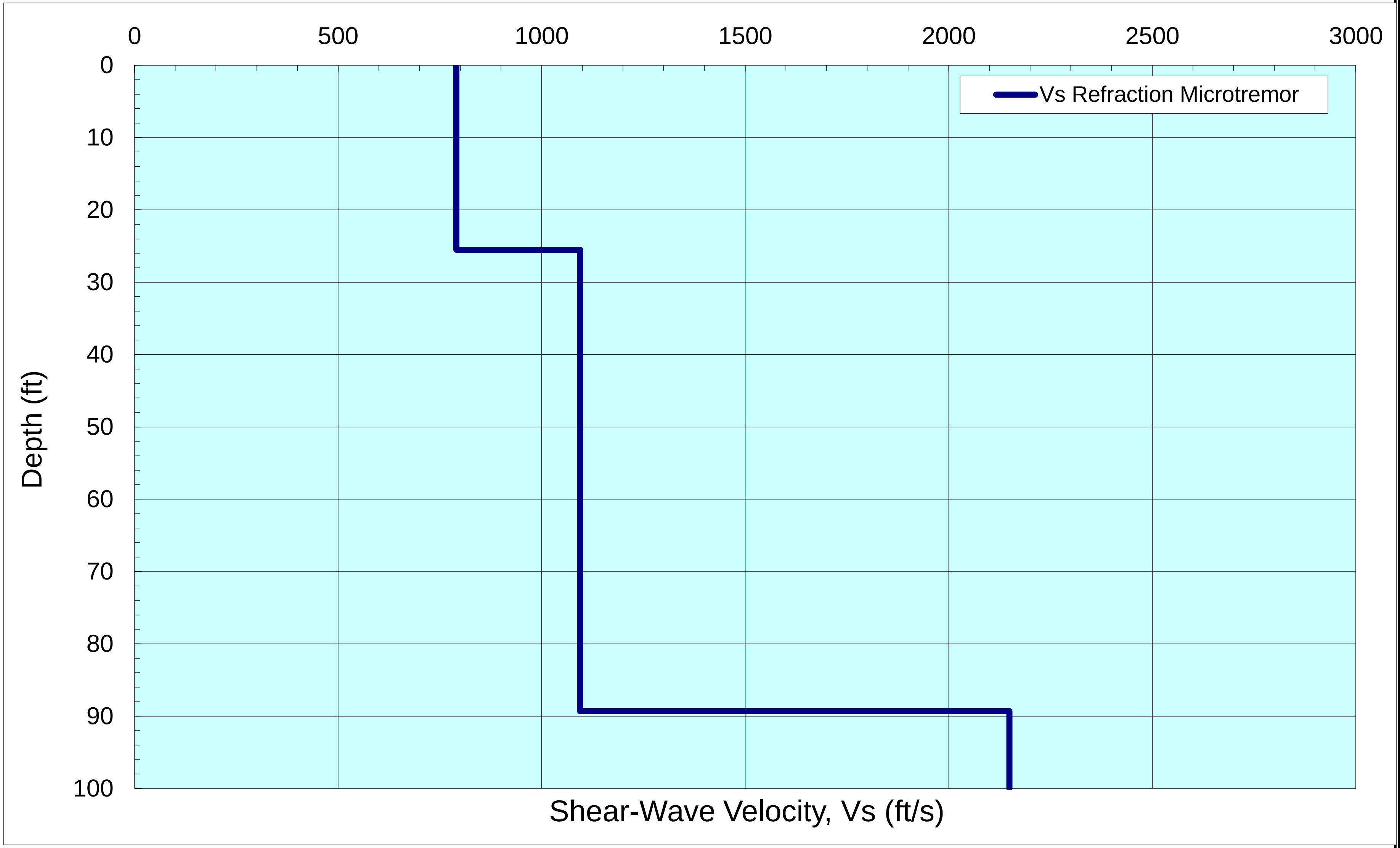
Geophone Spacing (ft) 15 Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



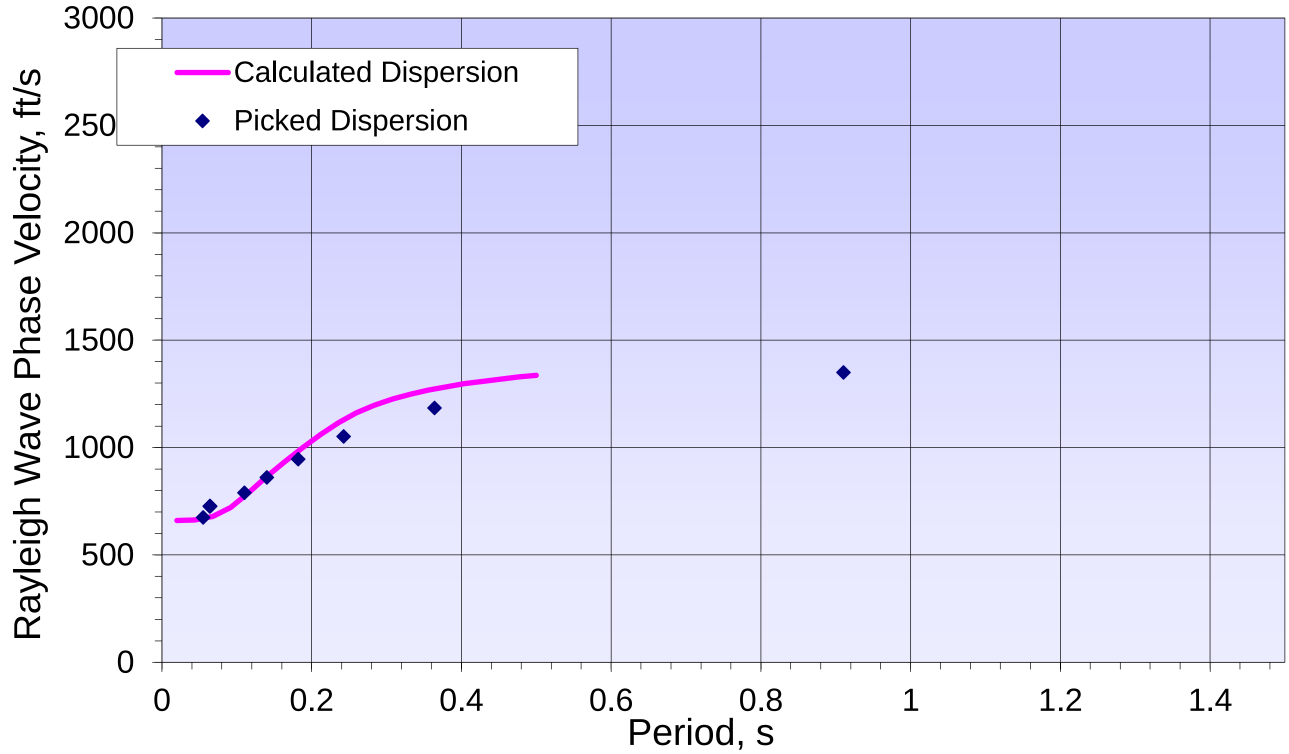
Line Number	**Array 1 (Geophones 1-24)**	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

Shear Wave Velocity Profile Vs. Depth



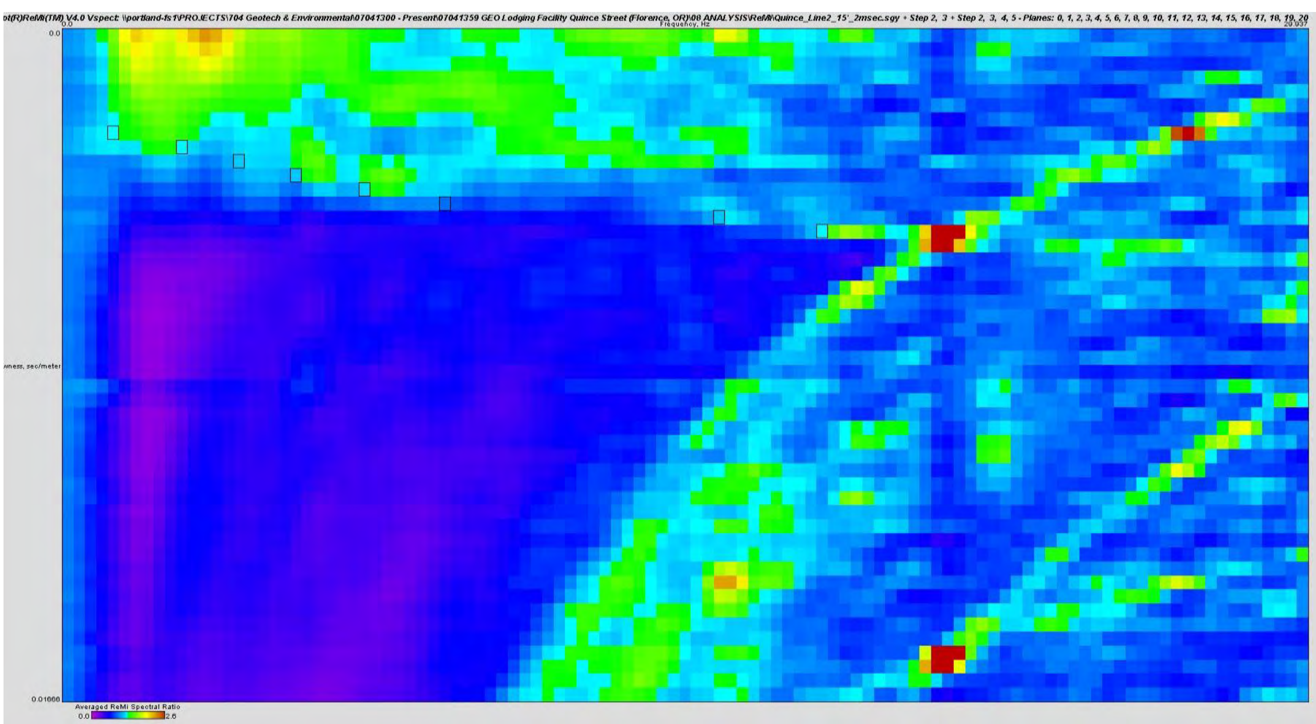
intertek psi	**IBC Site Class**	**D**	**Line Number**	**Array 1 (Geophones 1-24)**
			Project Number	07041434
	Average Shearwave Velocity within 100 feet, V_s (ft/s)	**1,047**	Project Name	Microtell Inn and Suites
			Location	43.972804, -124.100541 Florence, Oregon — Figure: A10

Dispersion Curve Showing Picks and Fit



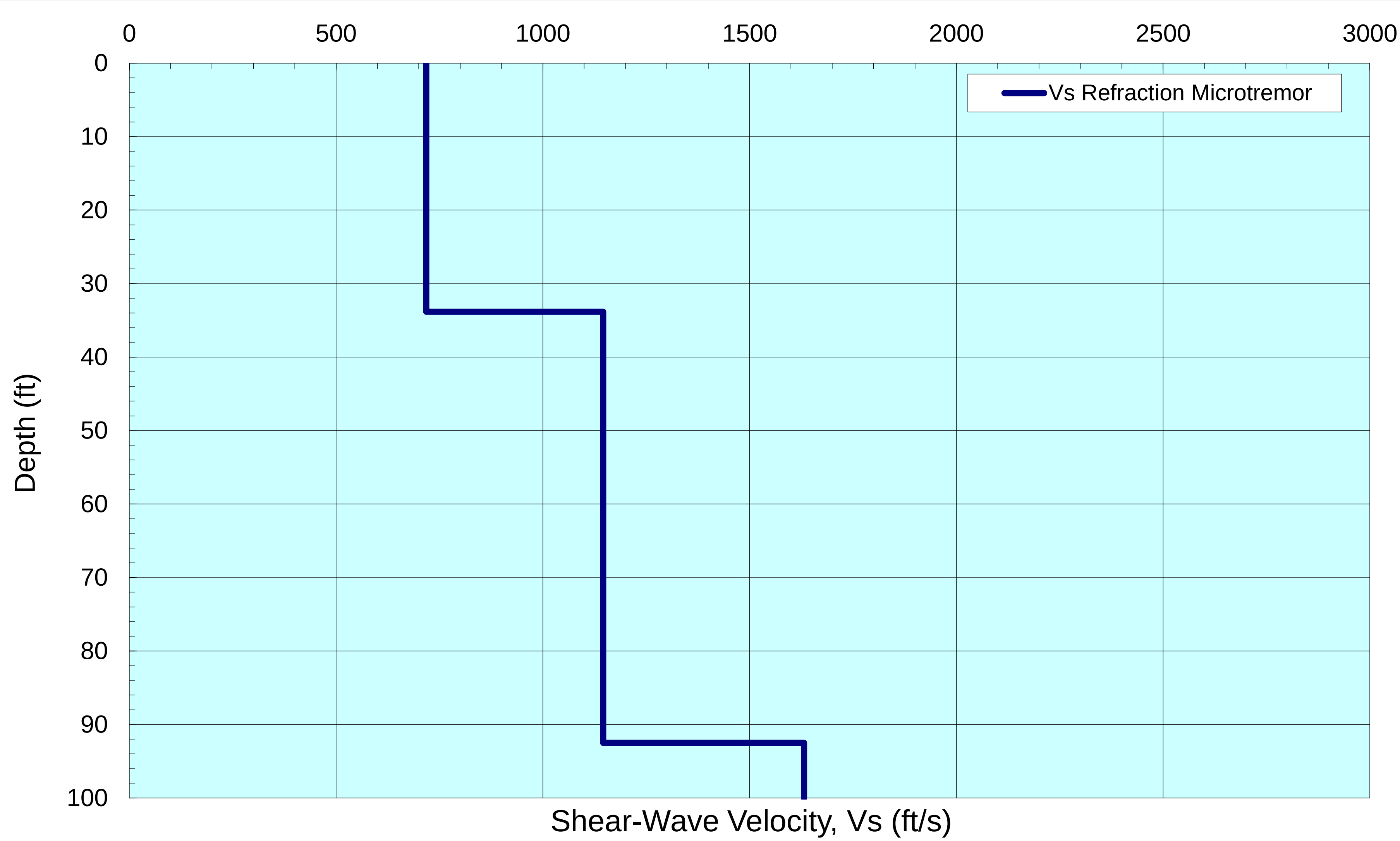
Geophone Spacing (ft) 15 Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



Line Number	Array 2 (Geophones 1-24)	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

Shear Wave Velocity Profile Vs. Depth



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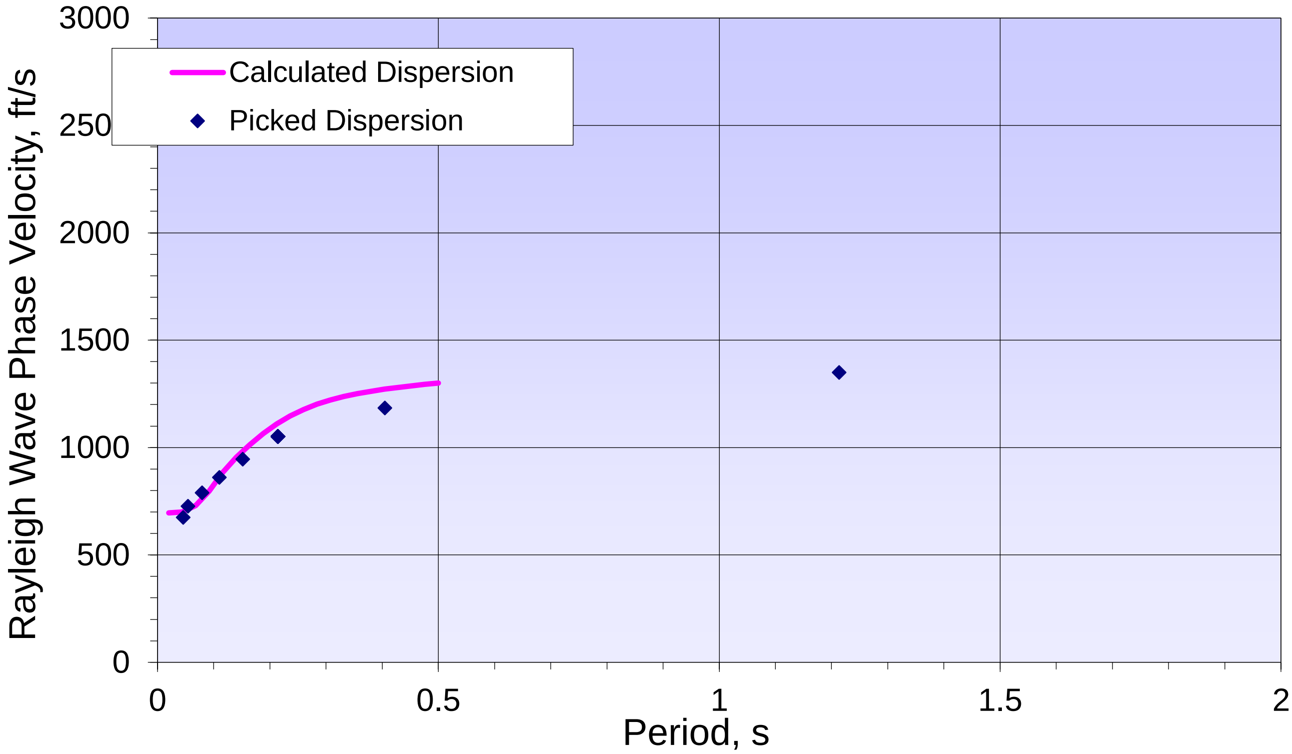
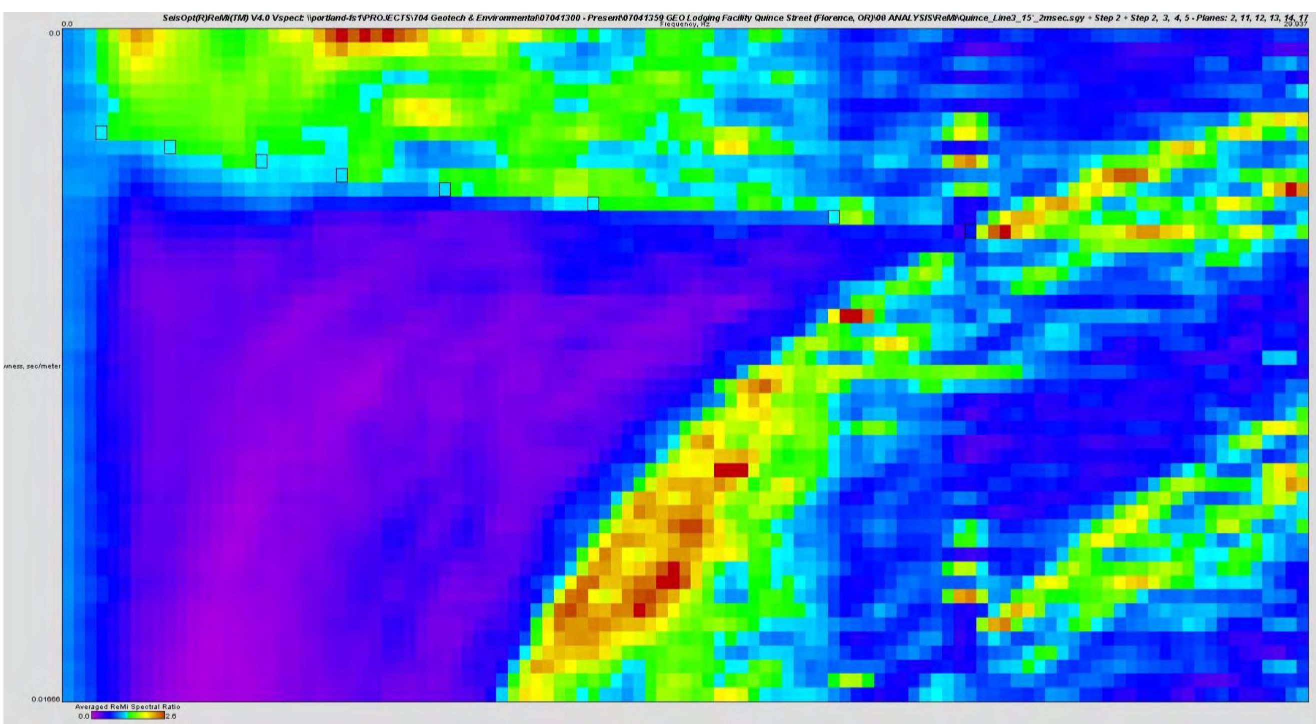
IBC Site Class	D	**Line Number**	**Array 2 (Geophones 1-24)**
Average Shearwave Velocity within 100 feet, V_s (ft/s)	972	Project Number	07041434
		Project Name	Microtell Inn and Suites
		Location	43.972804, -124.100541 Florence, Oregon
			Figure: A10

Dispersion Curve Showing Picks and Fit



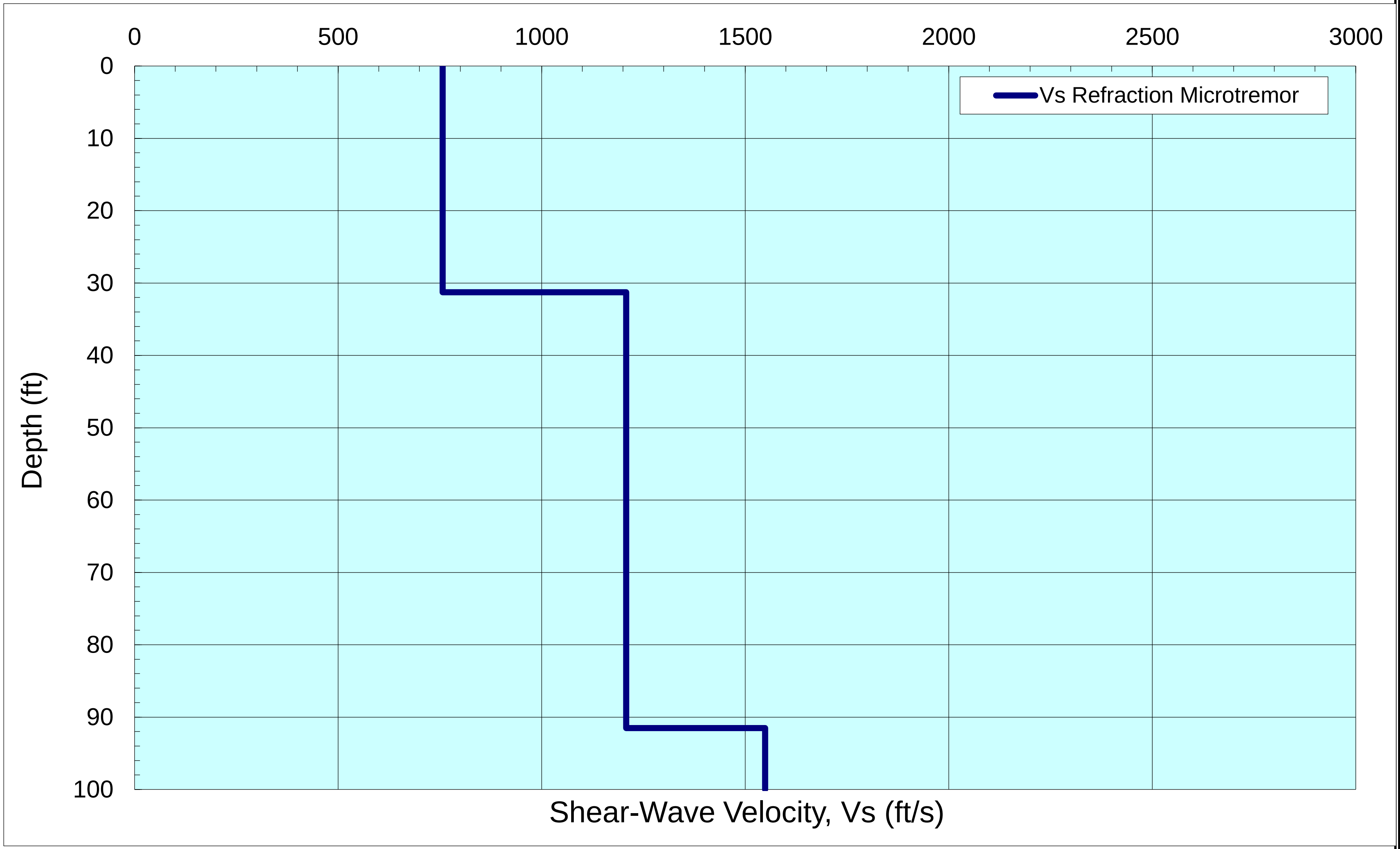
Geophone Spacing (ft) 15 Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



Line Number	Array 2 (Geophones 1-24)	
Project Number	07041434	
Project Name	Microtell Inn and Suites	
Location	43.972804, -124.100541 Florence, Oregon	Figure: A9

Shear Wave Velocity Profile Vs. Depth



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IBC Site Class	**D**
Average Shearwave Velocity within 100 feet, V_s (ft/s)	**1,034**

Line Number	**Array 2 (Geophones 1-24)**
Project Number	07041434
Project Name	Microtell Inn and Suites
Location	43.972804, -124.100541 Florence, Oregon

Figure: A10

LABORATORY TESTING PROGRAM AND PROCEDURES

Soil samples obtained during the field explorations were examined in our laboratory. The physical characteristics of the samples were noted, and the field classifications were modified, where necessary. Representative samples were selected during the course of the examination for further testing.

Moisture Content

Natural moisture content determinations were made on selected soil samples in general accordance with ASTM D2216. The natural moisture content is defined as the ratio of the weight of water to the dry weight of soil, expressed as a percentage.

Visual-Manual Classification

The soil samples were classified in general accordance with guidelines presented in ASTM D2487. Certain terminology incorporating current local engineering practice, as provided in the Soil Classification Chart, included with, or in lieu of, ASTM terminology. The term which best described the major portion of the sample was used in determining the soil type (i.e., gravel, sand, silt or clay).

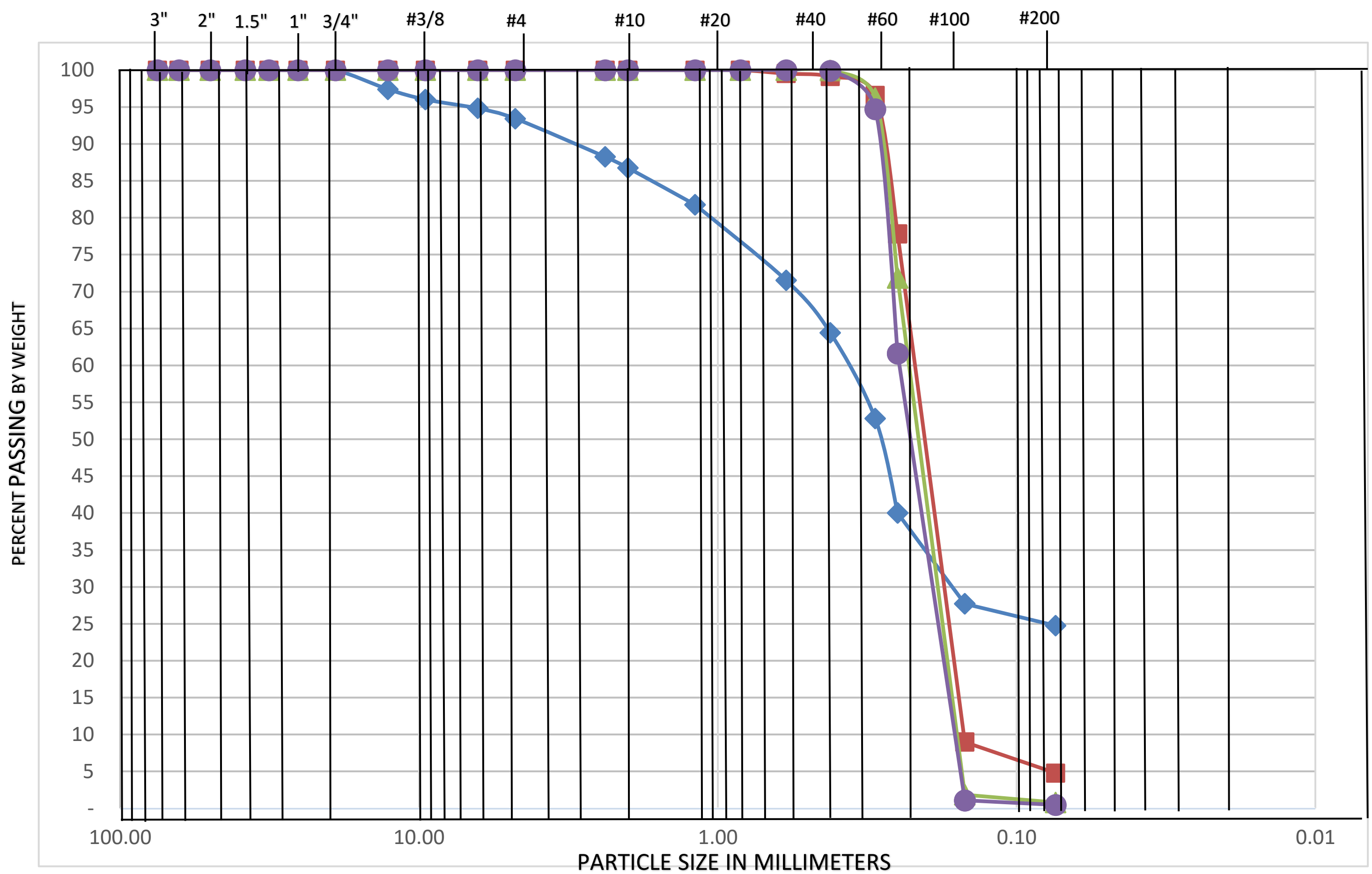
Sieve Analysis

The determination of the amount of material finer than the U.S. Standard No. 200 (75-µm) sieve was made on selected soil sample in general accordance with ASTM D1140. In general, the sample was dried in an oven and then washed with water over the No. 200 sieve. The mass retained on the No. 200 sieve was dried in an oven, and the dry weight recorded. Results from this test procedure assist in determining the fraction, by weight, of coarse-grained and fine-grained soils in the sample.

The determination of the gradation curve of the coarse-grained material was made on selected soil samples in general accordance with ASTM D6913. In general, the oven dried mass retained on the No. 200 sieve is passed over progressively smaller sieve openings, by agitating the sieves by hand or by a mechanical apparatus. The mass retained on each sieve is recorded as a fraction of the total sample, including the percent passing the No. 200 sieve.

PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



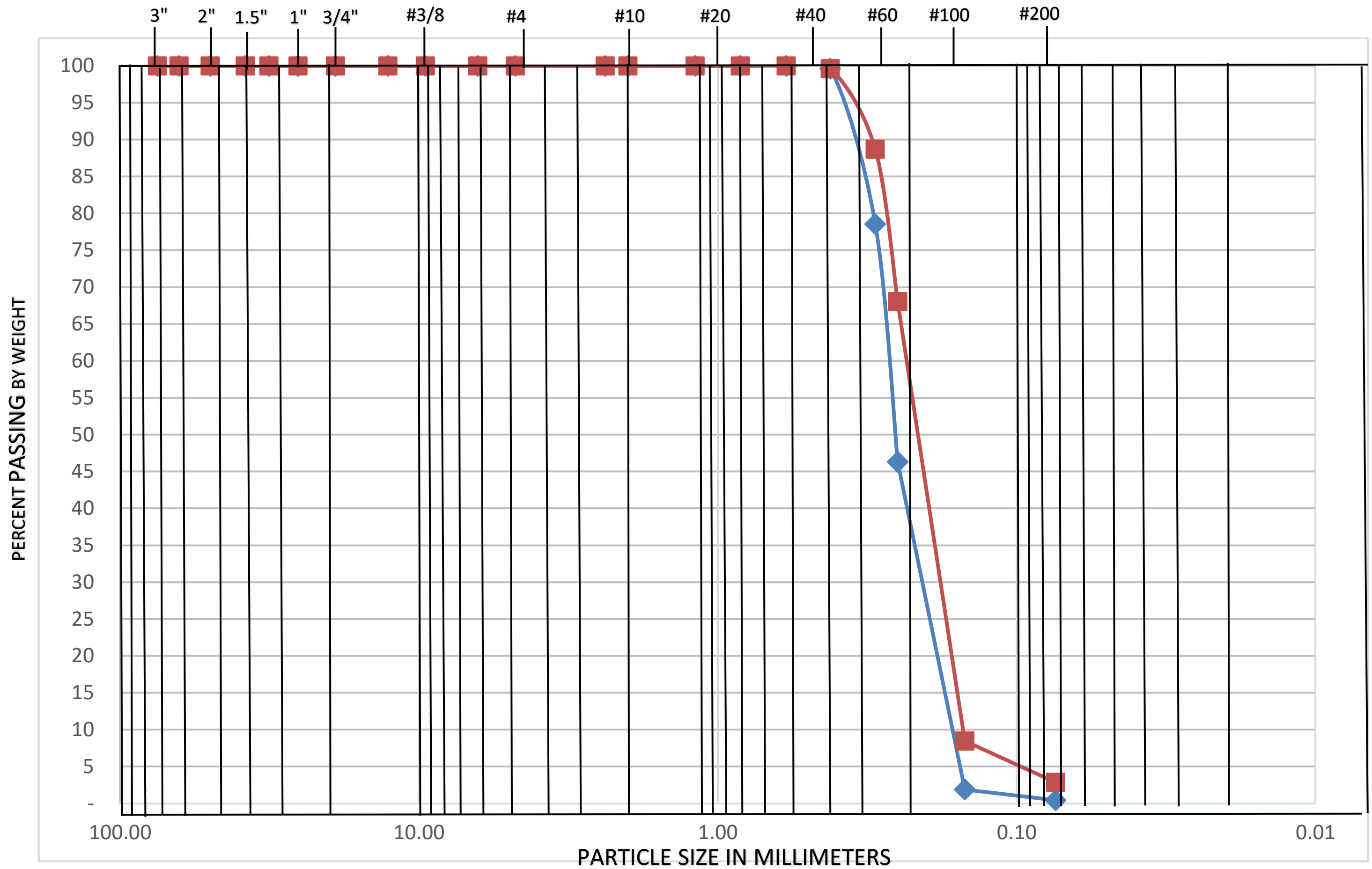
Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP1	0	7	69	25				46
GP1	6	0	95	5				7
GP1	13	0	99	1				6
GP1	16	0	100	0				7

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	0	SM	Well Graded Silty SAND	
GP1	6	SP	Poorly Graded SAND	
GP1	13	SP	Poorly Graded SAND	
GP1	16	SP	Poorly Graded SAND	

PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



Coarse	Fine	Coarse	Medium	Fine	Silt/Clay
Gravel		Sand			Fine Grained

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP1	34	0	100	0				6
GP1	36	0	97	3				18

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	34	SP	Poorly Graded SAND	
GP1	36	SP	Poorly Graded SAND	

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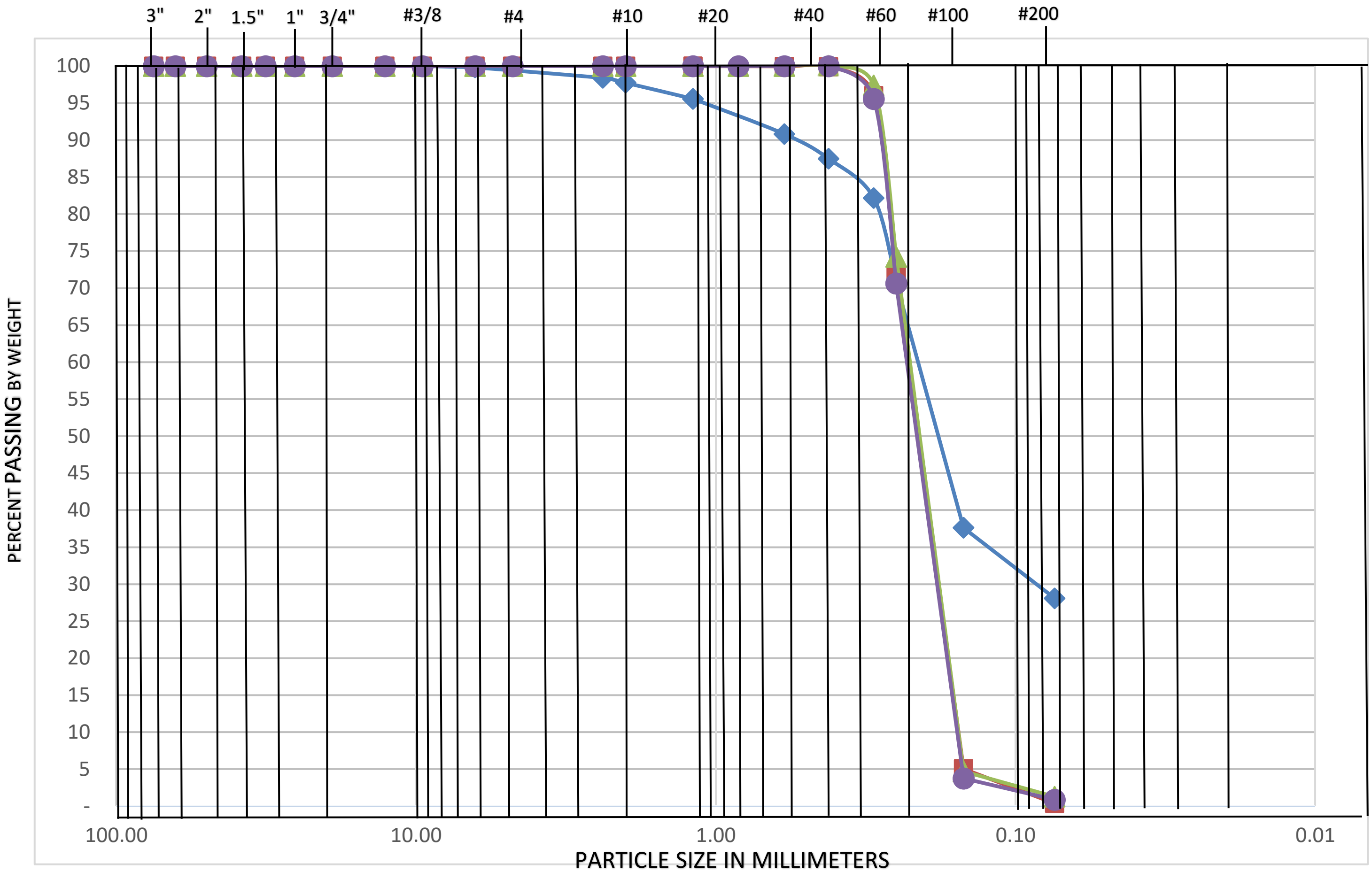
PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



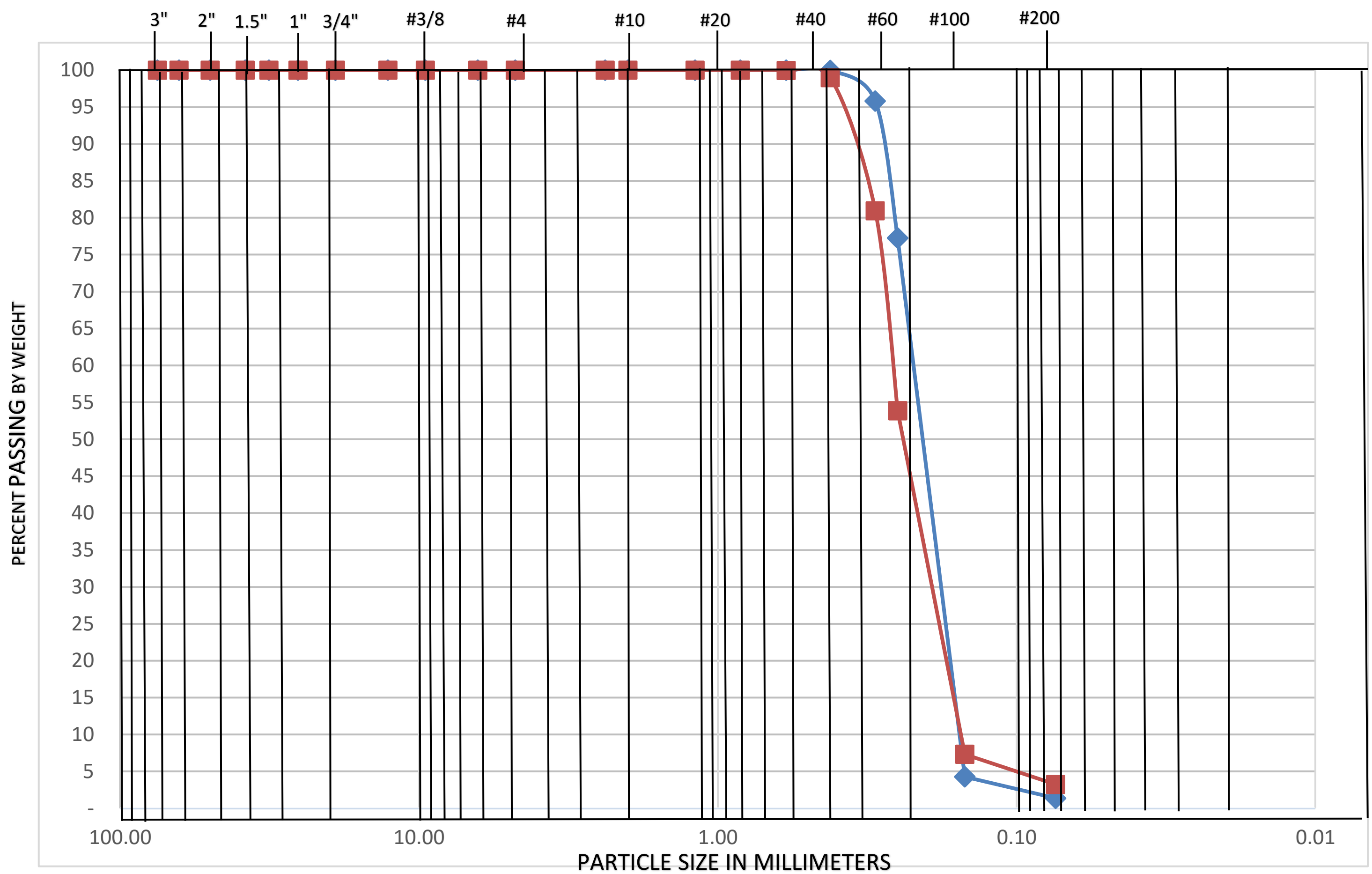
Gravel		Sand			Fine Grained
Coarse	Fine	Coarse	Medium	Fine	Silt/Clay

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture%
GP2	0	0	72	28				45
GP2	2	0	100	0				5
GP2	21	0	99	1				5
GP2	26	0	99	1				5

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP2	0	SM	Poorly Graded Silty SAND	
GP2	2	SP	Poorly Graded SAND	
GP2	21	SP	Poorly Graded SAND	
GP2	26	SP	Poorly Graded SAND	

PARTICLE SIZE ANALYSIS - ASTM (D-6913)

Project Name	Microtel Inn and Suites	Project Location	Florence, OR
Project Number	07041434	Tested By	Evans Linewire
Date of Sampling	2/23/2021	Date of Testing	2/28/2021
		Reviewed By	SRS



Gravel		Sand			Fine Grained
Coarse	Fine	Coarse	Medium	Fine	Silt/Clay

Boring #	Depth (ft)	Gravel%	Sand%	Fines%	PL	LL	PI	Moisture
GP1	31	0	99	1				7
GP1	35	0	97	3				17

Boring #	Depth	USCS Symbol	USCS Name	Plot Lines
GP1	31	SP	Poorly Graded SAND	
GP1	35	SP	Poorly Graded SAND	

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Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: MAT:07041434-1-S1
Issue No: 1

Material Test Report

These test results apply only to the specific locations and materials noted and may not represent any other locations or elevations. This report may not be reproduced, except in full, without written permission by Professional Service Industries, Inc. If a non-compliance appears on this report, to the extent that the reported non-compliance impacts the project, the resolution is outside the PSI scope of engagement. Tests and inspections are considered to be simple acceptance criteria

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID: 07041434-1-S1
Client Sample ID:
Date Sampled: 12/30/21
Sampled By: Staci Shub
Specification: Proctor / Grad
Supplier:
Source: Native
Material: Sand
Sampling Method: Sub-Surface Grab Sample
General Location: TP 4
Location:
Lift:
Feature:
Contractor:

Other Test Results

Description	Method	Result	Limits
Maximum Dry Unit Weight (lbf/ft³)	ASTM D 1557	102.8	
Corrected Maximum Dry Unit Weight (lbf/ft³)		102.8	
Optimum Water Content (%)		8.2	
Corrected Optimum Water Content (%)		8.2	
Method		A	
Preparation Method		Moist	
Rammer Type		Mechanical	

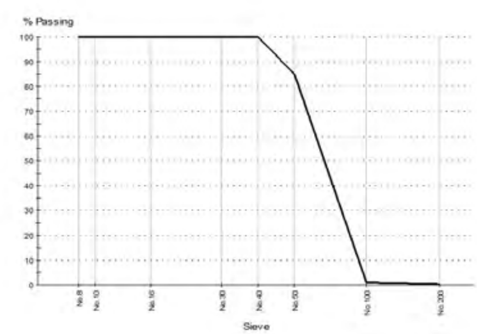
Particle Size Distribution

Method: ASTM C 136, ASTM C 117

Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.8 (2.36mm)	100	
No.10 (2.0mm)	100	
No.16 (1.18mm)	100	
No.30 (600µm)	100	
No.40 (425µm)	100	
No.50 (300µm)	85	
No.100 (150µm)	1	
No.200 (75µm)	0.20	

Chart



Comments

N/A

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: PTR:07041434-1-S1
Issue No: 1

Proctor Report

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

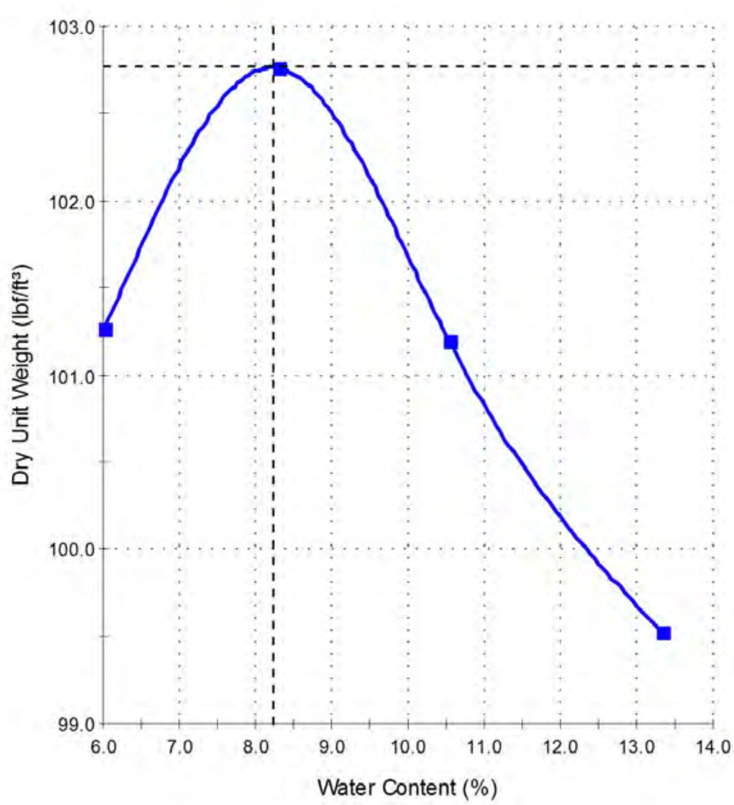
Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID:	07041434-1-S1	**Date Sampled:**	12/30/2021
Sampled By:	Staci Shub	**Specification:**	Proctor / Grad
Source:	Native	**Material:**	Sand
Sampling Method:	Sub-Surface Grab Sample	**General Location:**	TP 4
Location:			

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 1557

Maximum Dry Unit Weight (lbf/ft^3):	**102.8**
Optimum Water Content (%):	**8.2**
Method:	A
Preparation Method:	Moist
Rammer Type:	Mechanical
Tested By:	
Date Tested:	

Comments

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97217
CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: MAT:07041434-1-S2
Issue No: 1

Material Test Report

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID: 07041434-1-S2
Feature:
Client Sample ID:
Contractor:
Date Sampled:
Sampled By: Staci Shub
Specification: Proctor / Grad
Supplier:
Source: Native
Material: Sand
Sampling Method: Sub-Surface Grab Sample
General Location: TP 6
Location:
Lift:

Other Test Results

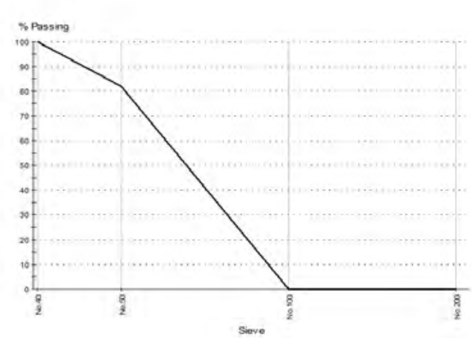
Description	Method	Result	Limits
Maximum Dry Unit Weight (lbf/ft³)	ASTM D 1557	102.2	
Corrected Maximum Dry Unit Weight (lbf/ft³)		102.2	
Optimum Water Content (%)		9.5	
Corrected Optimum Water Content (%)		9.5	
Method		A	
Preparation Method		Moist	
Rammer Type		Mechanical	

Particle Size Distribution

Method: ASTM C 136, ASTM C 117
Drying By: Oven
Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.40 (425µm)	100	
No.50 (300µm)	82	
No.100 (150µm)	0	
No.200 (75µm)	0.10	

Chart



Comments

N/A

Professional Service Industries, Inc.
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CCB No. 176269
Phone: (503) 289-1778
Fax: (503) 289-1918

Report No: PTR:07041434-1-S2
Issue No: 1

Proctor Report

Client: BRAUN DEVELOPMENT SERVICES
PO BOX 13223
PORTLAND, OR 97213

CC:

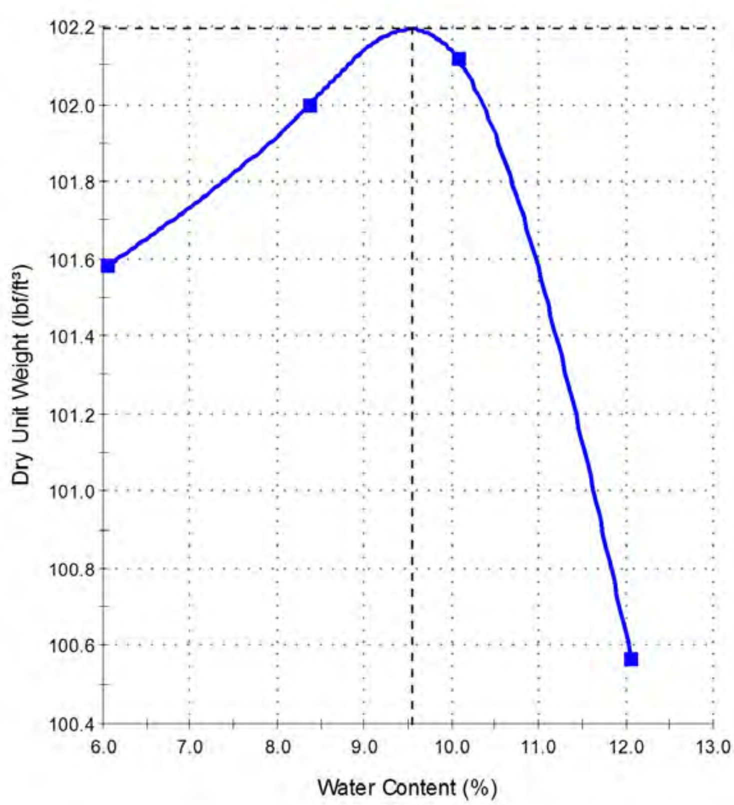
Project: MICROTEL INN AND SUITES

Approved Signatory: Staci Shub (Staff Engineer)
Date of Issue: 1/12/2022

Sample Details

Sample ID:	07041434-1-S2	**Date Sampled:**	
Sampled By:	Staci Shub	**Specification:**	Proctor / Grad
Source:	Native	**Material:**	Sand
Sampling Method:	Sub-Surface Grab Sample	**General Location:**	TP 6
Location:			

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 1557

Maximum Dry Unit Weight (lbf/ft³):	**102.2**
Optimum Water Content (%):	**9.5**
Method:	A
Preparation Method:	Moist
Rammer Type:	Mechanical
Tested By:	
Date Tested:	

Comments

APPENDIX B

LIQUEFACTION RESULTS

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
http://www.intertek.com/building

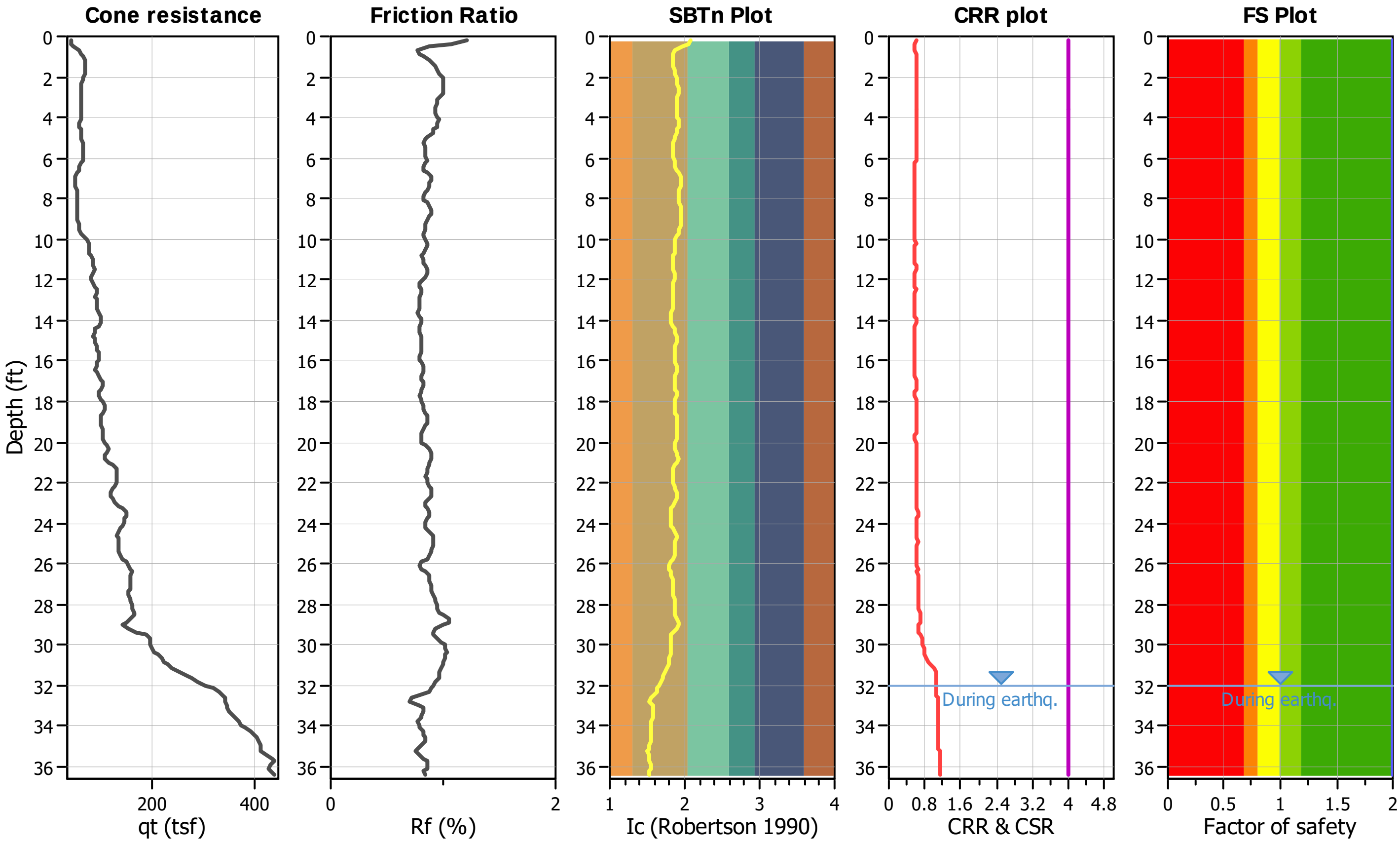
LIQUEFACTION ANALYSIS REPORT

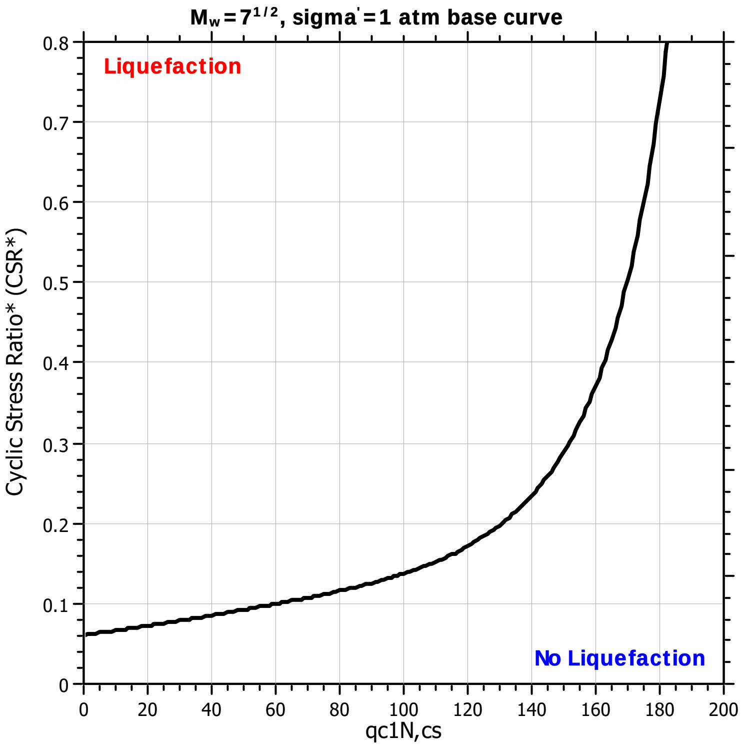
Project title : Microtel Inn and Suites **Location : Florence, OR**

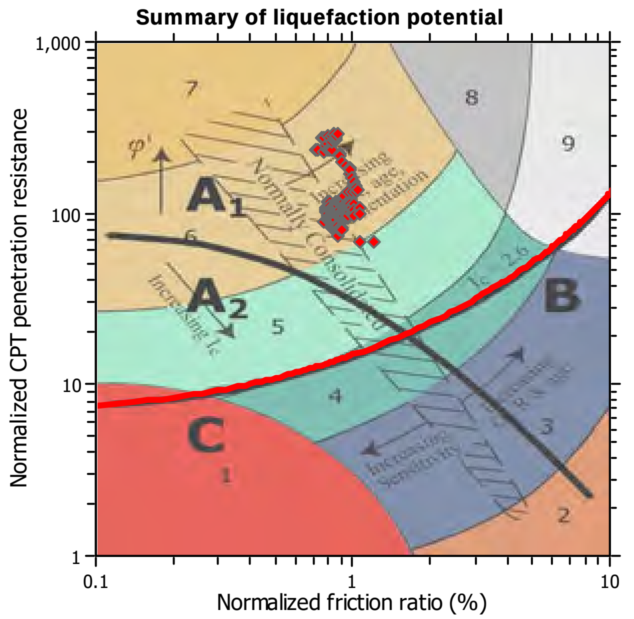
CPT file : 21020 CPT-1 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Intertek PSI
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Portland, OR 97217
http://www.intertek.com/building

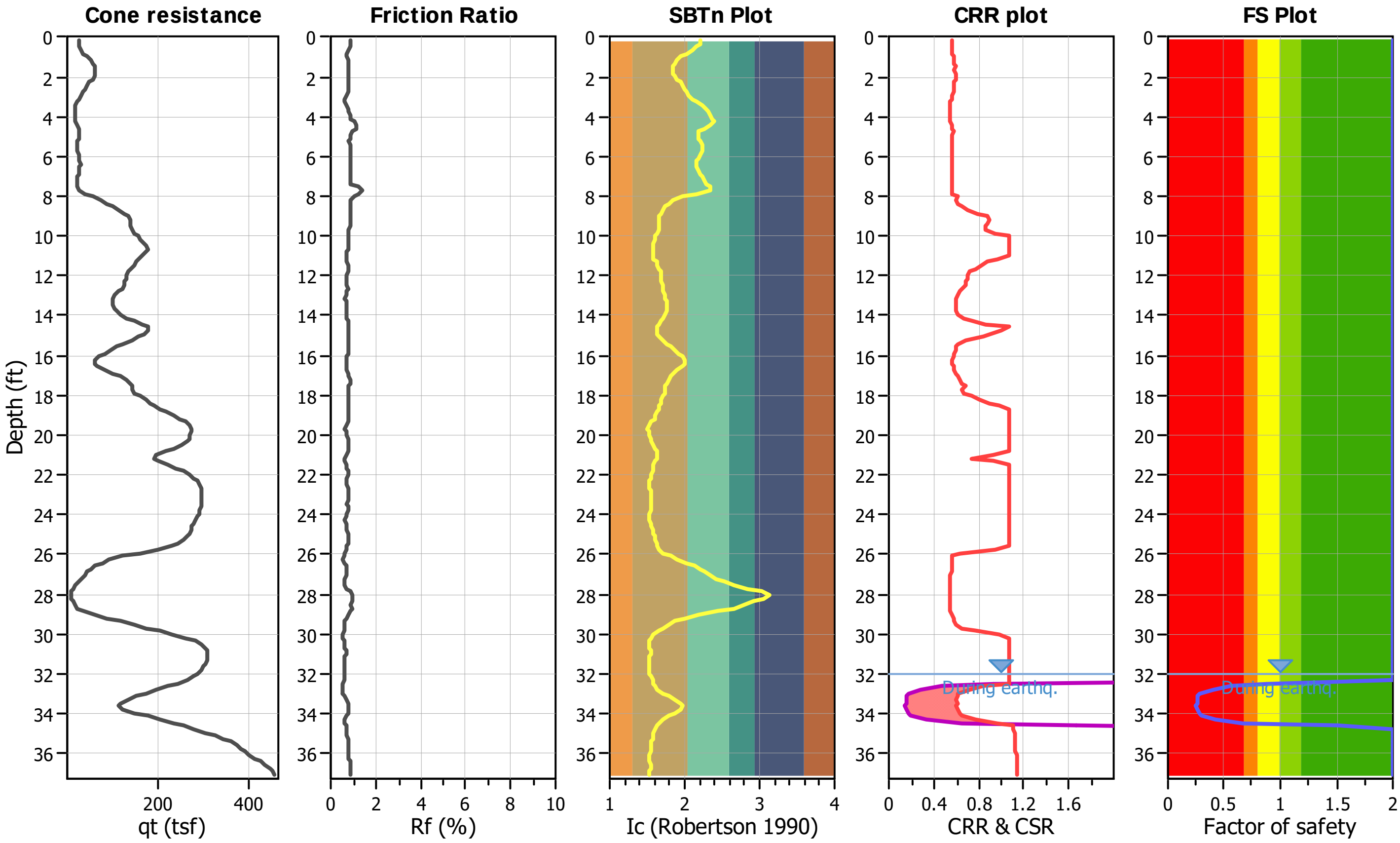
LIQUEFACTION ANALYSIS REPORT

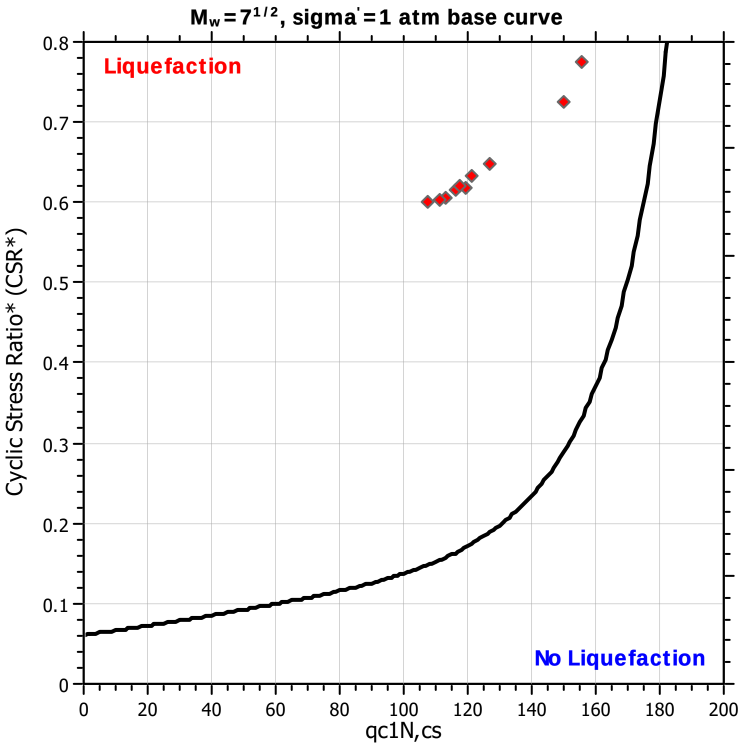
Project title : Microtel Inn and Suites **Location : Florence, OR**

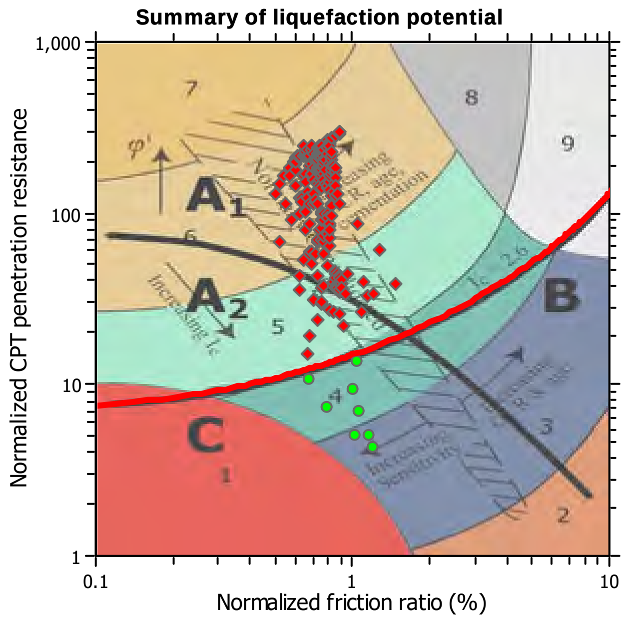
CPT file : 21020 CPT-2 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Intertek PSI
6032 N Cutter Circle #480
Portland, OR 97217
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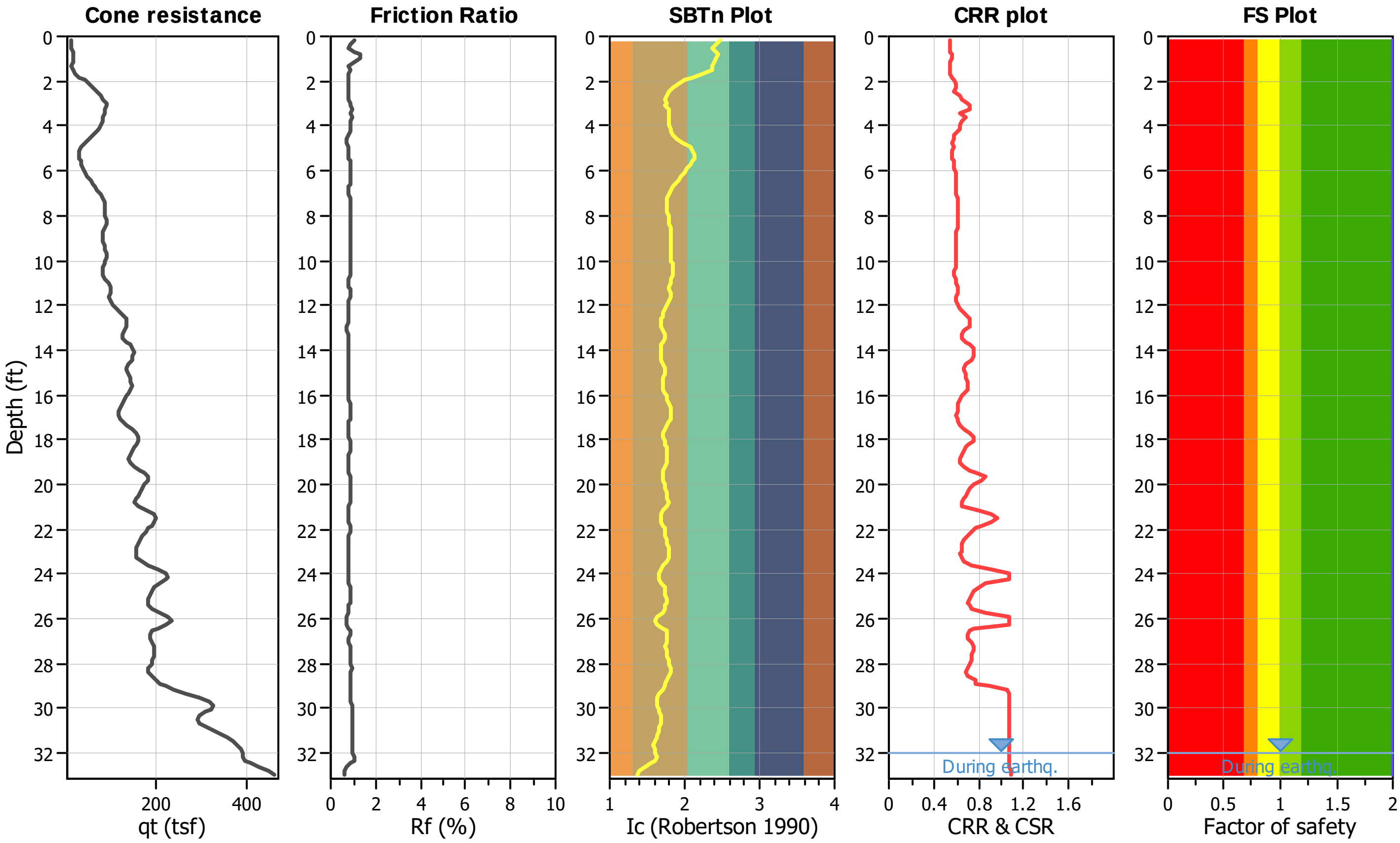
LIQUEFACTION ANALYSIS REPORT

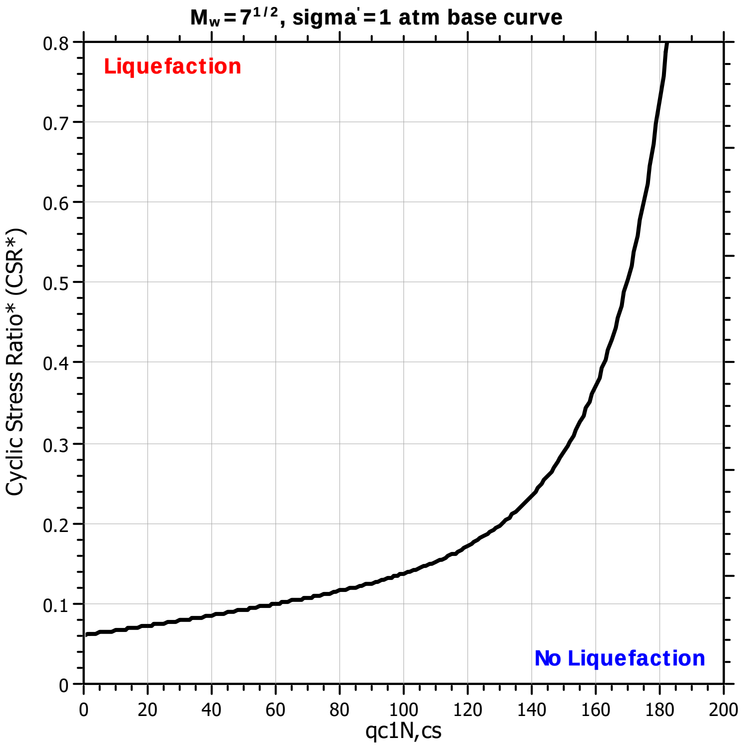
Project title : Microtel Inn and Suites **Location : Florence, OR**

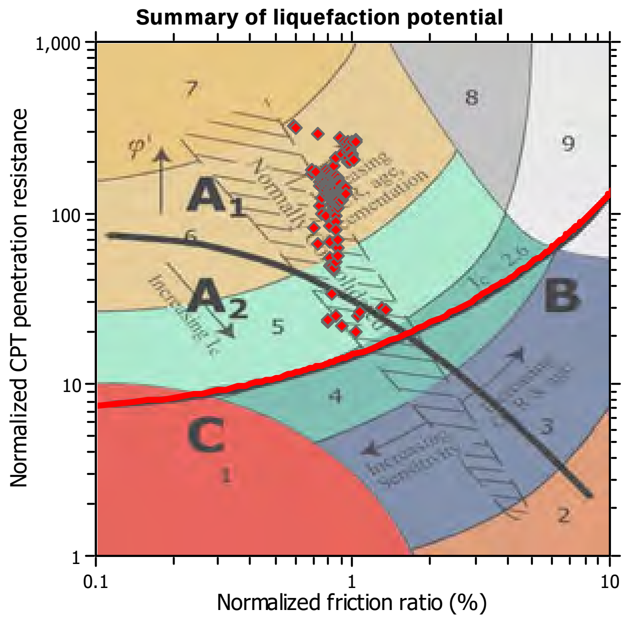
CPT file : 21020 CPT-3 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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LIQUEFACTION ANALYSIS REPORT

Project title : Microtel Inn and Suites **Location : Florence, OR**

CPT file : 21020 CPT-4 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
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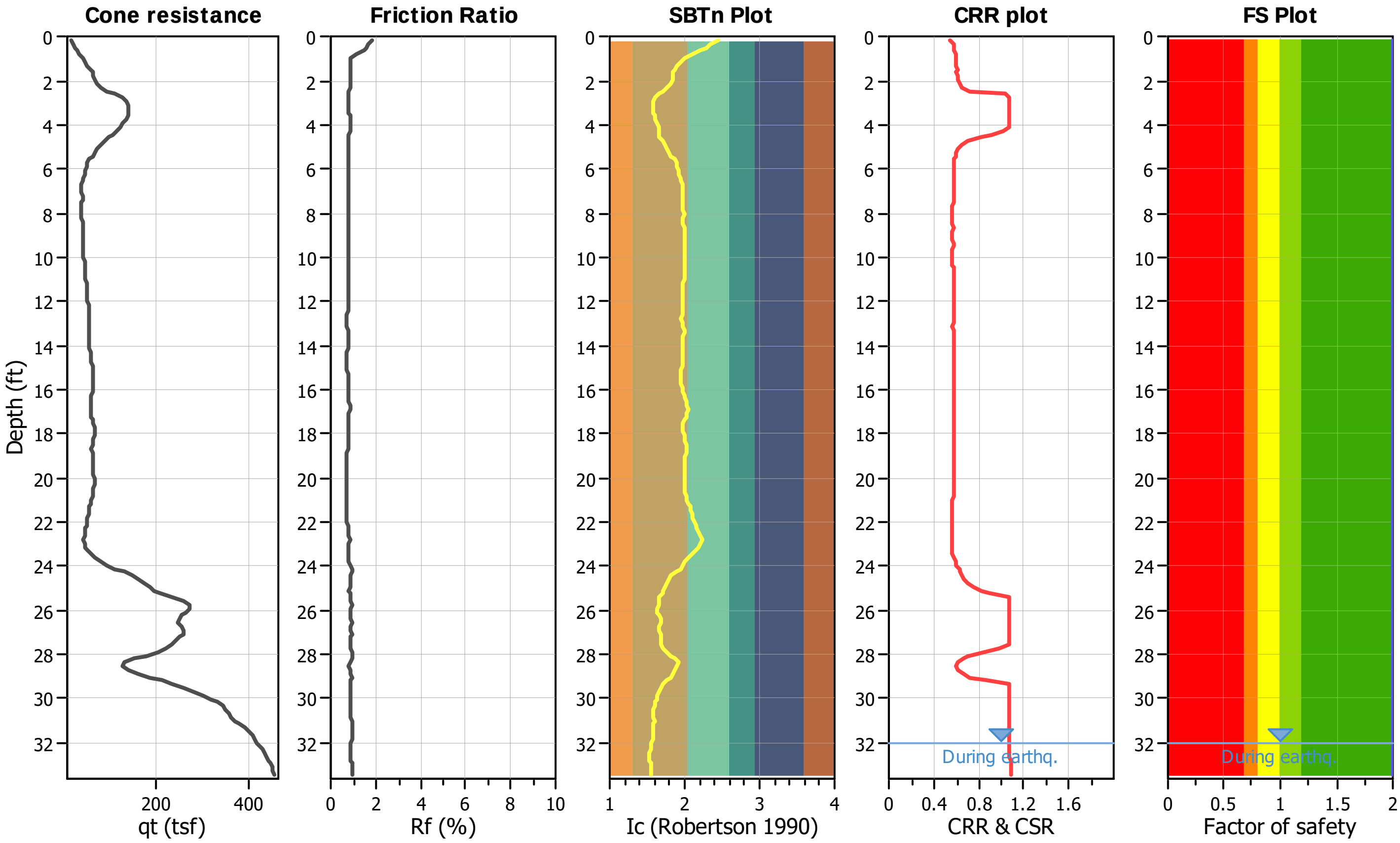
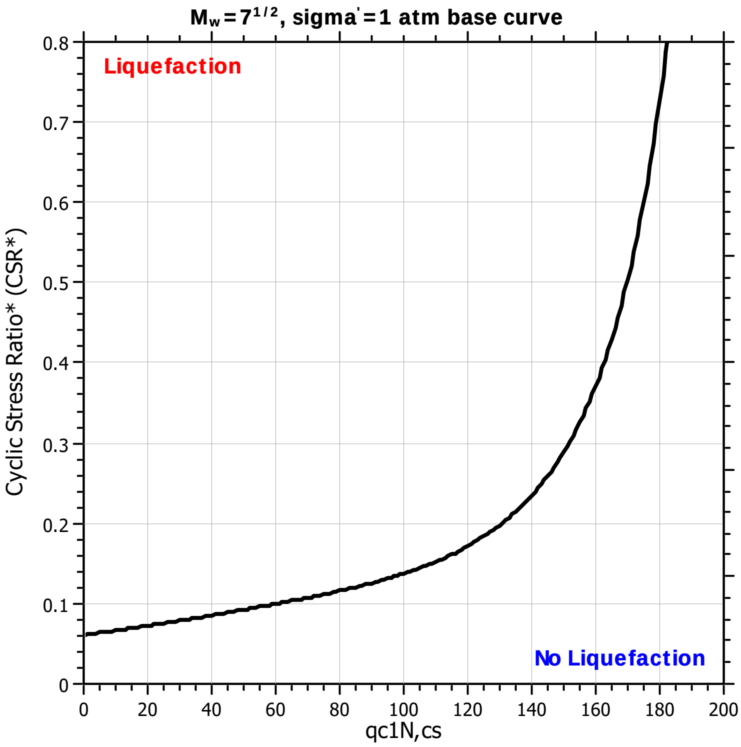
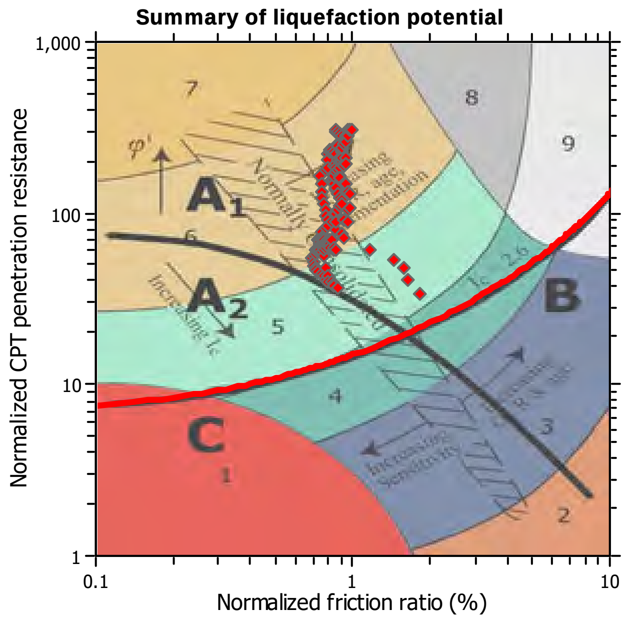
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

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LIQUEFACTION ANALYSIS REPORT

Project title : Microtel Inn and Suites **Location : Florence, OR**

CPT file : 21020 CPT-5 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
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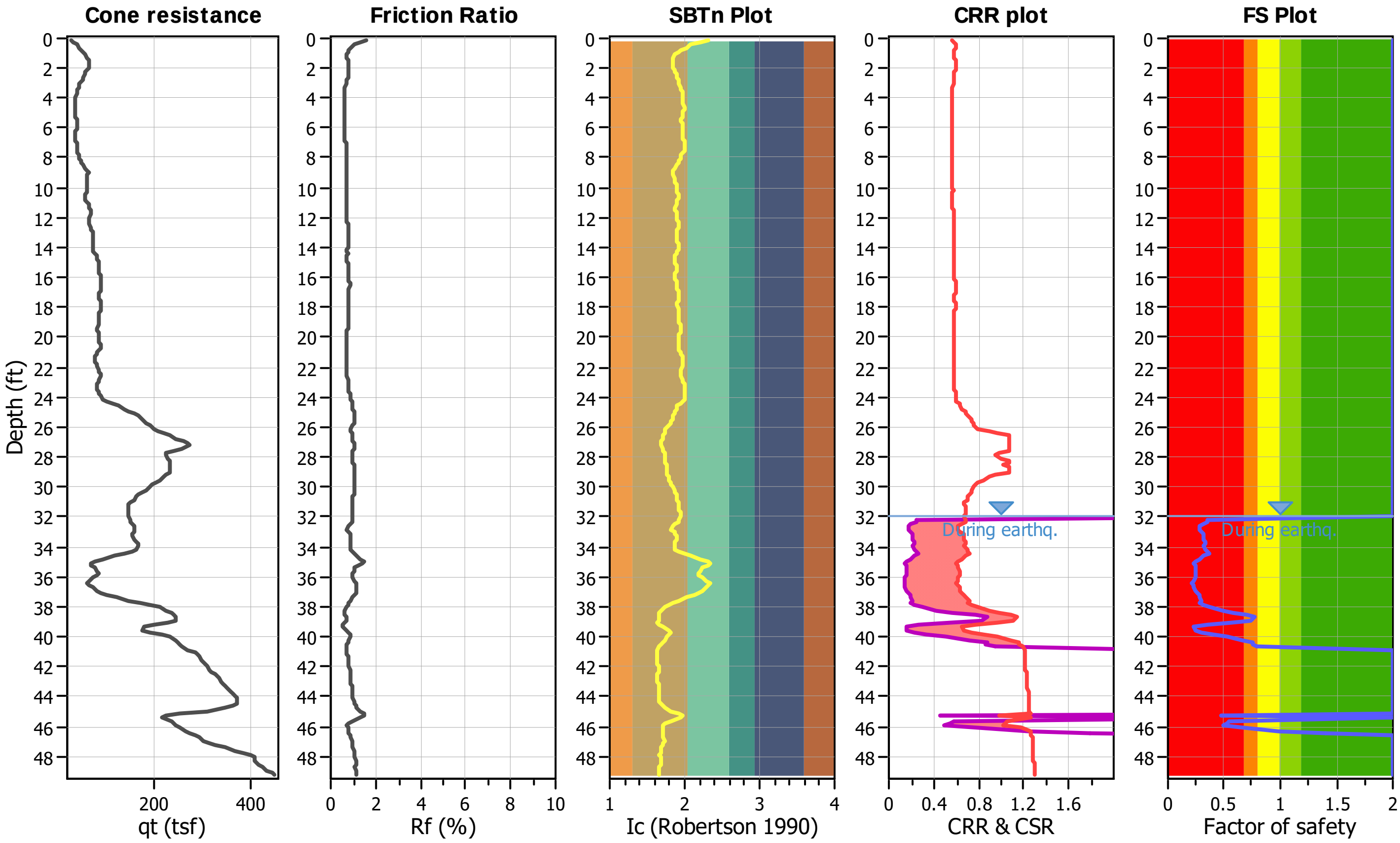
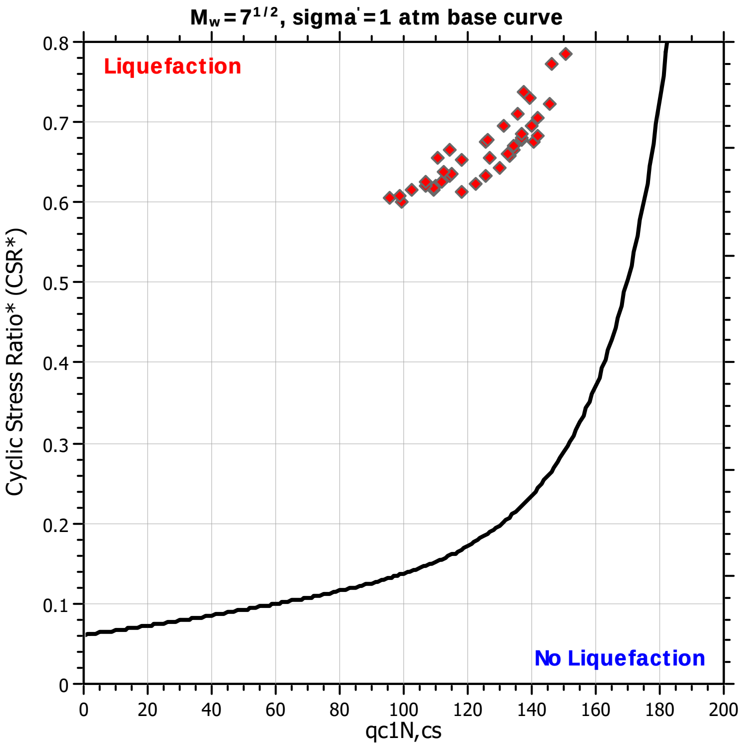
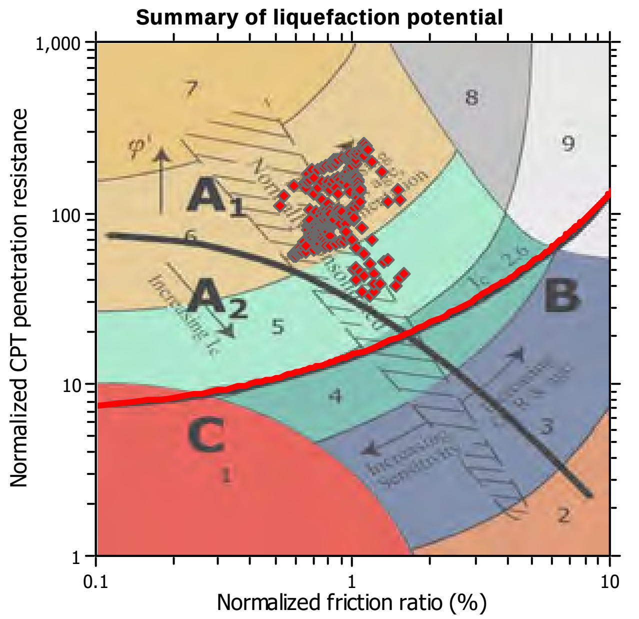
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.10	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	I&B, 2008
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
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LIQUEFACTION ANALYSIS REPORT

Project title : Microtel Inn and Suites **Location : Florence, OR**

CPT file : 21020 CPT-6 Text File Input

parameters and analysis data

Analysis method:	B&I (2014)	G.W.T. (in-situ):	32.00 ft	Use fill:	No	Clay like behavior applied:	Sand & Clay
Fines correction method:	B&I (2014)	G.W.T. (earthq.):	32.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
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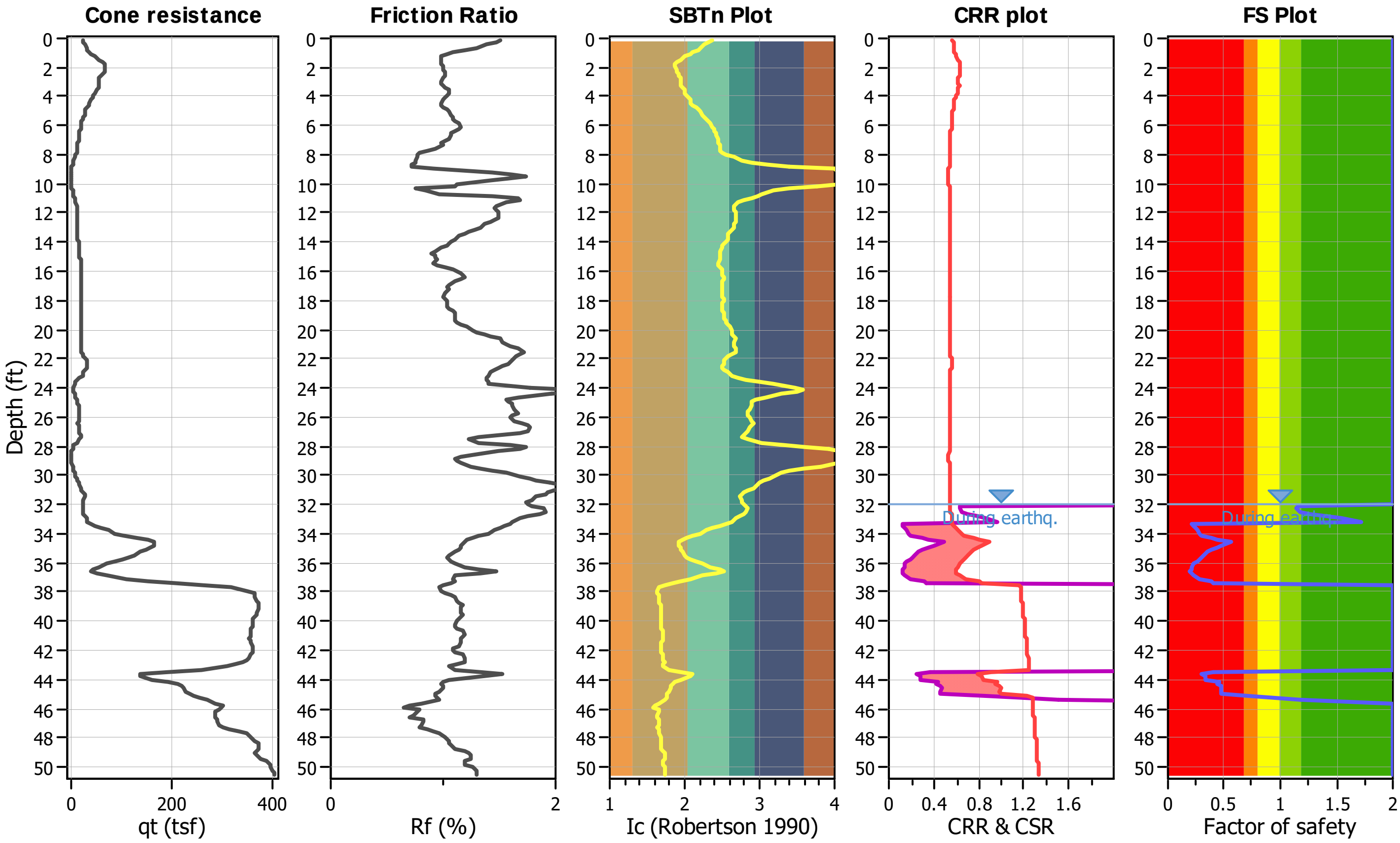
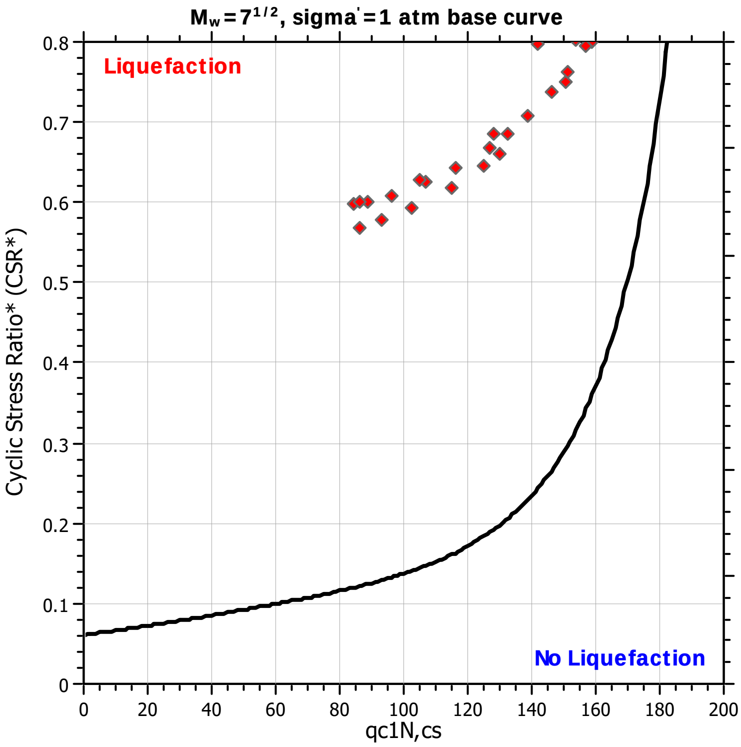
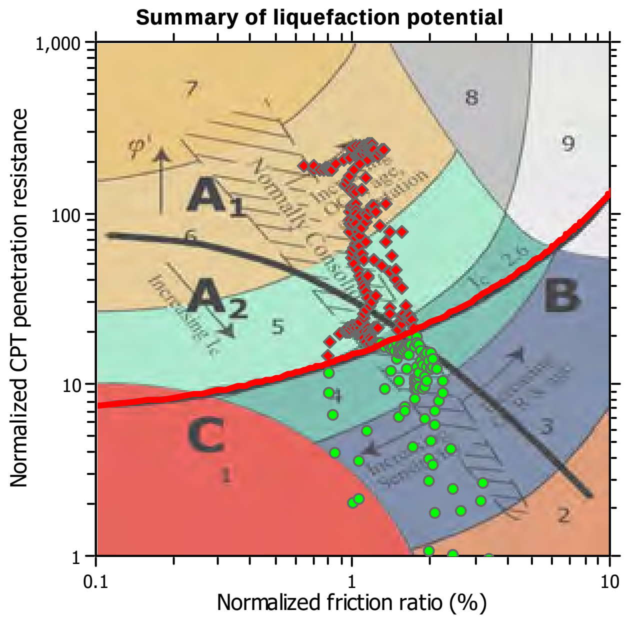
Peak ground acceleration:	0.78	Unit weight calculation:	Based on SBT	K_σ applied:	No		







Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
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GeoEngineers

Preliminary Geotechnical Engineering Services
750 Quince Street Property
Florence, Oregon

January 15, 2008

For
Wyndham Vacation Ownership, Inc.

Earth Science + Technology

Preliminary Geotechnical Engineering Services
750 Quince Street Property
Florence, Oregon

January 15, 2008

For
Wyndham Vacation Ownership, Inc.

GeoEngineers

File No. 12708-016-01

Preliminary Geotechnical Engineering Services
750 Quince Street Property
Florence, Oregon
File No. 12708-016-01

January 15, 2008

Prepared for:

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Attention: Wayne Helm and Connie Andrews

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Preliminary Geotechnical Engineering Services
750 Quince Street Property
Florence, Oregon
For
Wyndham Vacation Ownership, Inc.

INTRODUCTION

This report presents the results of our preliminary geotechnical engineering services for the Quince Street Property located at 750 Quince Street in Florence, Oregon. The Subject Property encompasses tax lot 900 in Florence. The location of the Subject Property is shown on the Vicinity Map, Figure 1. The preliminary footprint of the proposed buildings with respect to existing Subject Property features is shown on the Site Plan, Figure 2. This site plan is based on a preliminary site plan developed by the Myhre Group dated December 4, 2007.

Our studies were completed at the request of Wyndham Vacation Ownership, Inc. (Wyndham). We understand that Wyndham is interested in purchasing the property for us as a vacation facility. We further understand that the results of our Preliminary Geotechnical Assessment will be used by Wyndham as part of their evaluation of potential environmental liabilities associated with ownership and redevelopment of the property. This assessment was conducted concurrently with a Sensitive Areas Assessment and Phase I ESA and Limited Subsurface Assessment for the property, both by GeoEngineers.

The purpose of our preliminary geotechnical services is to evaluate subsurface conditions at the Subject Property as a basis for providing preliminary conclusions and general recommendations for development of the Subject Property as planned. Our evaluations included 1) review of available subsurface information, and 2) exploration of Subject Property subsurface soil conditions by completing three borings. Our services were completed in general accordance with our proposal dated November 29, 2007. We have also completed a Phase I environmental site assessment (ESA) and a wildlife and sensitive areas assessment for this property, the results of which are presented in separate reports.

PROJECT DESCRIPTION

The Subject Property is approximately 8.1 acres in size and triangular in shape, and includes an existing unused school building. The northwestern half of the Subject Property, which contains the existing building and cleared areas, is an upland terrace situated higher in elevation than the east and southeastern portion of the Subject Property, which consists of a low-lying wetland area along the north side of the Siuslaw River. We understand that Wyndham is interested in constructing a resort consisting of three four-high-story condominium buildings. The development plans for the Subject Property are preliminary at this time, and as such, structural loads are unknown at this time. We anticipate the loading to be similar to those of other three- to four-story residential structures.

FIELD EXPLORATIONS AND LABORATORY TESTING

Field Explorations

The subsurface soil and ground water conditions near the proposed building locations were evaluated by drilling three borings with subcontracted mud rotary drilling equipment owned and operated by Subsurface Technologies of North Plains, Oregon. The approximate locations of the borings completed for this project are shown the Site Plan, Figure 2. Details of the field explorations and logs of the explorations are presented in Appendix A.

LABORATORY TESTING

Soil samples were collected during drilling and taken to GeoEngineeers' laboratory for further evaluation. Representative samples were tested to determine their gradation characteristics. A description of the laboratory testing and the test results are presented in Appendix B.

SITE CONDITIONS

GEOLOGY

Published geologic information for the project vicinity includes the U.S. Geological survey of Oregon (Walker and MacLeod, 1991). Mapped soils in the project vicinity consist of dune deposits with younger alluvial deposits adjacent to the river banks.

TOPOGRAPHY AND SURFACE CONDITIONS

The Subject Property is located just north of the Siuslaw River and approximately 3 miles southeast of where the mouth of the Siuslaw River enters the Pacific Ocean. The Siuslaw River is located approximately 850 feet south of the Subject Property. The majority of the Subject Property consists of a relatively level upland area situated about 45 feet higher than the lower wetland area adjacent to the Siuslaw River. The upland area is roughly triangular in shape, with the upland area about 150 feet wide east to west at the southern end, about 300 to 325 feet wide east to west near the northern end, and about 700 feet long in the north-south direction. The Subject Property slopes down gradually to the north of the existing vacant school building with abrupt downward slopes east and south of the building. Between the upland and lower wetland area, the ground surface slopes moderately to steeply down to the lower portion of the Subject Property. Munsel Creek flows south through the northeastern portion of the Subject Property directly to the Siuslaw River.

A vacant school building currently occupies about half of the upland area, with the school and associated parking situated near Quincy Street. The remainder of the upland area is mostly covered with grass and scattered scotchbroom. The slopes that exist within the Subject Property are generally less than 45 feet high. The slope gradient between the upland and wetland area varies from about 30 percent on the south-southeastern slopes to 60 percent on the northeastern slopes. The slopes are vegetated with coniferous and deciduous trees, with undergrowth. We observed no evidence of slope instability or mass-wasting processes occurring on the slopes during our field reconnaissance.

SUBSURFACE CONDITIONS

Based on the three borings completed for this project, the subsurface conditions generally consist of upper loose to medium dense sand dune deposits underlain by denser sand deposits. GEI-1, situated in the northern portion of the Subject Property, encountered 10 to 12 feet of loose fine sand. At a depth of about 12 feet, the sand grades to medium dense, becoming dense to very dense below a depth of about 20 feet. GEI-2 and GEI-3 encountered medium dense sand with looser zones to a depth of about 20 to 25 feet, below which the sand grades to dense to very dense. These deposits were encountered to the maximum depth explored (52 feet).

GROUNDWATER CONDITIONS

Ground water was encountered at a depth of about 45 feet in GEI-3, which corresponds closely to the elevation of the lower wetland area. No groundwater was encountered in the remaining borings. We anticipate that groundwater levels will fluctuate as a result of season, precipitation and other factors.

GEOLOGIC HAZARD/SENSITIVE AREA CONSIDERATIONS

GENERAL

Sensitive areas with respect to steep slopes are discussed in this section. Sensitive areas pertaining to streams and wetlands are described in a separate report. The City of Florence regulates development on slopes inclined greater than 12 percent. Specifically, Florence Code Title 10, Chapter 7, Section 3G states:

> *Slopes greater than 12 percent and development on steep slopes, a foundation design and grading provision for retaining walls or excavated banks shall be carried out according to plans prepared by a registered engineer and approved by the City of Florence* (FCC 10-7-2).

The City further regulates development on steep slopes that are defined as slopes inclined at gradients of 25 percent or steeper (City of Florence Development Code, Draft #2-April 2007). Based on a telephone conversation with a City of Florence representative in the planning department, there is no codified setback from steep slopes. However, the City typically requires a 50-foot setback from steep slopes, similar to the standard buffer for other sensitive areas. Other sections of the Code refer to a "Hazard Map"; however, we were unable to locate the City of Florence hazard map at the time this report was prepared.

The slopes at the Subject Property were evaluated for slope percentage using a hand held slope inclinometer instrument. Our initial reconnaissance of the slope indicates that the slopes are inclined from about 30 to 60 percent, with the majority of the slopes inclined between 30 and 50 percent. We observed no evidence of slope instability or mass-wasting processes occurring on the slopes during our field reconnaissance.

It is our opinion that specific construction methods consisting of appropriate foundations and setbacks, erosion control measures, and drainage enhancements can be utilized at the Subject Property to mitigate potential hazards that might be associated with the steep slopes.

SLOPE STABILITY EVALUATION

The stability of the slopes adjacent to the seasonal watercourse was evaluated using the computer program SlopeW version 5.20 (GEO Slope International, Ltd, 2004). We evaluated both static conditions and seismic conditions. The seismic conditions were evaluated for a horizontal coefficient of acceleration equal to two thirds of the peak ground acceleration (PGA) according to the Unites States Geologic Survey (USGS). The analysis was primarily carried out to determine the setback distance for the buildings from the top of the slope.

The slope geometry was constructed from our inclinometer measurements of the slope. A slope inclination of 55 percent was used for our analyses. Soil parameters and water levels used in our analyses are based on our subsurface explorations and our geologic reconnaissance. Stability analyses for existing and anticipated loading conditions, including seismic loading, were performed.

The results of our analysis indicate that, locally, the slopes at the Subject Property are stable against deep seated failures (factor of safety greater than 1.5 for static conditions and 1.1 for seismic conditions). Potential for deep-seated slope instability that would affect the structural integrity of the proposed buildings is low, provided the slopes are maintained and the structures are supported as recommended in subsequent sections. Our stability analyses show shallow surface failures could develop on the steeper portions of the slope surfaces during extreme wet weather conditions or during the design earthquake events.

Slope Setback

The preliminary site plan shows the proposed buildings located about 35 to 50 feet from the approximate crest of the slope. Based on our understanding of the proposed locations of the new buildings in relation to the existing slope and other Subject Property features, it is our opinion that from a geotechnical standpoint, the buildings may be located closer than 50 feet from the top of the slope provided the foundations for the buildings extend a sufficient depth below grade to provide a suitable horizontal setback to the face of the slope to protect the structures in the event of shallow slope failures. We recommend that shallow foundations be set back at least 20 feet from the crest of the slope (measured horizontally from the face of the foundation). This recommendation assumes that the construction of the proposed development will not result in an increased discharge of water over the slope face and that drainage recommendations presented in the following section are incorporated into the design and construction of the project. If the buildings are situated within 30 feet of the crest of the slope, GeoEngineers should review the foundation layout and plans to verify that all foundations are setback the recommended distance.

Slope Maintenance and Surface Drainage

Although the Subject Property slopes are considered stable against deep-seated failure, excessive disturbance and/or poor Subject Property drainage can destabilize the near surface soils. At no time should loose uncontrolled fill or debris (including organic debris) be cast over or placed on the slope. Excavated or import material should not be stockpiled on or near the top of the slopes. At this time, we do not anticipate that the project will include any construction activity on the slope. However, if any slope areas are disturbed during construction, we recommend that disturbed slope areas be protected by placing plastic sheeting on the slope face until the slope can be replanted. Final landscaping should include deep rooted low growing plants to provide stability to the surface soils. Proper maintenance of vegetation on steep slopes will further reduce the potential for surface soil movement.

Proper drainage is imperative for long-term slope stability. The influx of water is a major factor in the destabilization of slopes. At no time during or after construction should surface water be discharged to or near slopes or retaining structures. Surface water from downspouts, foundation drains, upslope retaining wall drains and runoff from the driveway and other surfaces should be collected and tightlined to the bottom of the steep slope or other approved location. Curbs or other appropriate measures should be used to direct surface water runoff to collection points. Drain lines, catch basins and other drainage features should be inspected and maintained on a regular basis. Preferably, drainage should not be infiltrated on this Subject Property; if infiltration facilities are required, we should be consulted to evaluate the potential of infiltration on the stability of the existing slopes.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

We conclude that the proposed development can be successfully completed from a geotechnical perspective provided the considerations presented in this report are incorporated into the project planning and design. Building foundation loads are expected to be relatively light. We anticipate that most of the buildings can be supported on conventional spread footings bearing on a zone of structural fill underlain by the native sand deposits. As discussed previously, the buildings will need to be set back an appropriate distance from the existing slope.

EARTHQUAKE ENGINEERING

GeoEngineers evaluated the Subject Property for seismic hazards including liquefaction, lateral spreading, fault rupture and earthquake-induced slope instability. Our evaluation indicates that the Subject Property has a low risk of seismic hazards..

We recommend the IBC 2006 seismic design parameters for Average Field Standard Penetration Resistance, Site Class, short period spectral response acceleration (S_S), 1-second period spectral response acceleration (S_1), and Seismic Coefficients F_A and F_V presented in Table 1.

Table 1. IBC Seismic Parameters

2006 IBC Parameter	Recommended Value
Site Class	D
Short Period Spectral Response Acceleration, S_S (percent g)	141
1-Second Period Spectral Response Acceleration, S_1 (percent g)	69
Seismic Coefficient, F_A	1.0
Seismic Coefficient, F_V	1.5

The spectral response values are based on the 2002 United States Geologic Survey Seismic Hazard Maps available at http://earthquake.usgs.gov/research/hazmaps/interactive/index.php.

Liquefaction Evaluation

Liquefaction refers to a condition where vibration or shaking, usually from earthquake forces, results in the development of excess pore water pressures in saturated soils causing loss of soil strength. In general, soils susceptible to liquefaction include loose to medium dense saturated cohesionless soils, but can occur in soils with grain sizes varying from silt to gravel. Ground settlement, lateral spreading and/or sand boils may results from soil liquefaction. Structures supported on liquefied soils could suffer foundation settlement or lateral movement that could cause structural damage.

Our subsurface explorations conducted at the Subject Property indicate deposits of loose sand to a depth of about 20 feet below the topsoil. However, groundwater was encountered at a depth of about 45 feet, and based on the presence of free-draining sand at the Subject Property, we do not anticipate that groundwater will typically be within the upper 20 feet of the surface. Thus, in our opinion there is a low risk of liquefaction at the Subject Property.

Fault Rupture

The nearest mapped active fault to the Subject Property is located about 20 miles from Florence. Because no known active faults are situated in the vicinity of the Subject Property, the risk of fault rupture is low in our opinion.

Earthquake Induced Slope Instability

As previously discussed, we evaluated the stability of the steep slope that separates the upland and lowland areas of the Subject Property under seismic conditions consistent with those described in Table 1. Our analyses indicate sufficient safety factors under earthquake induced loading for deep-seated failure surfaces; shallow failures could develop on the slope surfaces under seismic conditions with factors of safety less that 1.1.

FOUNDATIONS

Based on the soil conditions encountered at the Subject Property, we believe it is feasible to support three- to four-story buildings on conventional spread footings across the Subject Property. Due to the loose to medium dense condition of the native sand in the upper 20 feet across the Subject Property, we recommend that the proposed buildings be supported on shallow spread footings founded on a zone of properly compacted structural fill. In addition, foundations located along the top of steep slopes must be located at a depth such that the horizontal distance from the face of the foundation to the face of the slope is at least 20 feet.

We recommend that all spread foundations be founded on a thickness of structural fill equal to half of the footing width, or 2 feet, whichever is greater. The zone of structural fill should extend laterally beyond the footing edges a horizontal distance at least equal to the thickness of the fill. Exterior footings should be founded a minimum of 18 inches below the lowest adjacent grade. Interior footings should be founded a minimum of 12 inches below slab subgrade. Continuous wall footings should have minimum widths of 16 inches, and column footings should have a minimum width of 24 inches. All footing subgrades should be compacted to at least 95 percent maximum dry density (MDD) as determined in accordance with ASTM D-1557, after the footing excavation is complete and prior to placing reinforcing steel and concrete.

An allowable soil bearing value of 3,000 psf (pounds per square feet) may be used for footings supported on a zone of structural fill as described above. This allowable soil bearing value applies to the total of dead and long-term live loads and may be increased by up to one-third for wind or seismic loads.

We estimate that post-construction settlement of footings founded as recommended above will be less than 1 inch and differential settlements will be less than ½ inch over a 25-foot length of continuous wall footing or between comparably loaded column footings.

Loose or disturbed soil not removed from the footing excavations prior to pouring concrete will result in increased settlement. We recommend that the footing subgrades be observed by a representative of GeoEngineers, Inc. prior to placement of concrete to confirm that the foundation subgrade has been adequately prepared and the zone of structural fill is placed and compacted in accordance with our recommendations.

Lateral Resistance

Lateral loads can be resisted by passive resistance on the sides of the footings and by friction on the base of the footings. Passive resistance should be evaluated using an equivalent fluid density of 300 pcf where footings are surrounded by structural fill compacted to at least 95 percent of MDD, as recommended. The structural fill should extend out at least a distance equal to two and one-half times the depth of the foundation element from its face. Resistance to passive pressure should be calculated from the bottom of adjacent floor slabs and paving or below a depth of 1 foot where the adjacent area is unpaved, as appropriate. Frictional resistance can be evaluated using 0.30 for the coefficient of base friction against footings. The above values incorporate a factor of safety of about 1.5.

If soils adjacent to footings are disturbed during construction, the disturbed soils must be recompacted, otherwise the lateral passive resistance value must be reduced.

SLAB-ON-GRADE FLOOR

Properly compacted structural fill prepared as recommended in the Earthwork Section of this report will provide satisfactory support for on-grade slabs. We recommend that there should be at least 12 inches of properly compacted structural fill below on-grade slabs. We recommend that a GeoEngineers representative evaluate all slab subgrades before placing structural fill. As discussed in the "Subgrade Preparation" section of this report, the subgrade soils, if disturbed by construction activities, should be recompacted, if possible, or excavated and replaced with structural fill to provide firm support of the floor slab. A 6-inch layer of imported clean washed gravel with a maximum particle size of 1-1/2 inches and negligible sand and silt should be placed directly below the slab to provide uniform support and form a capillary break beneath the slab. Prior to placing structural fill or the gravel layer, the subgrade should be proofrolled and compacted as described below in the "Earthwork" section of this report.

If water vapor migration through the slabs is objectionable, the gravel should be covered with a heavy plastic sheet, such as 10-mil plastic sheeting, to act as a vapor retarder. This will be desirable where the slabs will be surfaced with tile or will be carpeted. The contractor should be made responsible for maintaining the integrity of the vapor barrier during construction. It may also be prudent to apply a sealer to the slab to further retard the migration of moisture through the floor.

EARTHWORK

General

Based on the subsurface soil conditions encountered in our subsurface explorations, we expect that the soils at the Subject Property may be excavated using conventional construction equipment. Ideally, earthwork should be undertaken during extended periods of dry weather when the surficial soils will be less susceptible to disturbance and provide better support for construction equipment. Dry weather construction will help reduce earthwork costs.

Clearing and Subject Property Preparation

Areas to be developed or graded should be cleared of surface and subsurface deleterious matter including organic-rich topsoil, debris, shrubs, trees and associated stumps and roots. Vegetation, including the root mass and organic-rich topsoil, should be stripped and removed from the building and paving areas.

All unsuitable soils should be removed from below the building footprints to expose undisturbed native soils. If unsuitable soil is identified during grading, it should be removed and replaced with structural fill.

All existing utilities should be removed from the building footprints and rerouted if needed. All utility trenches leading into the structures should be backfilled with structural fill. Existing building foundations within the new planned building areas should be removed.

Subgrade Preparation

Prior to placing structural fill to support foundations or on-grade floor slabs, all subgrade areas should be evaluated by probing with a steel probe rod to locate any soft or pumping soils. If soft or pumping soils are observed they should be removed and replaced with structural fill.

After evaluating the exposed subgrade areas, the subgrade areas should be recompacted to a firm and unyielding condition, if possible. We recommend that the upper 12-inch thickness of all subgrade areas be recompacted to at least 95 percent of MDD.

Subgrade disturbance or deterioration may occur if the subgrade is wet and can not be dried. If the subgrade deteriorates during compaction, it may become necessary to modify the compaction criteria, soil material, or contractor's methods. The geotechnical engineer should evaluate the subgrade areas.

Structural Fill

All fill, whether existing on-site soil or imported soil, that will support floor slabs or foundations, or be placed as backfill in utility trenches, should generally meet the criteria for structural fill presented below. The suitability of soil for use as structural fill depends on its gradation and moisture content. We recommend all-weather structural fill consist of either crushed or well-graded sand and gravel containing less than 5 percent fines (material pass U.S. Standard No. 200 sieve) by weight relative to the fraction of the material passing the 3/4 inch sieve. During dry weather conditions, soils with a higher fines content may be suitable for use as structural fill. The fill material should be free of rock fragments larger than 4 inches, debris and organic material. We recommend that the suitability of structural fill material from proposed borrow sources be evaluated by the Geotechnical Engineer before the earthwork contractor is allowed to transport any material to the Subject Property.

Import and on-site soils planned for use as structural fill must be protected from moisture, and soil stockpiles should be covered with plastic sheeting.

Reuse of On-site Native Soils

Based on our explorations, most of the soils excavated for this project will be fine sand with less than 5 percent fines, if the upper siltier sod layer is carefully stripped and separated from the underlying sand. We anticipate that the sand deposits will be suitable for reuse for structural fill during dry and wet weather, although the sand may need to be moisture conditioned to achieve the required compaction.

Fill Placement and Compaction Criteria

Structural fill should be mechanically compacted to a firm, non-yielding condition. Structural fill should be placed in loose lifts not exceeding 8 to 10 inches in thickness. The actual thickness will be dependent on the structural fill material used and the type and size of compaction equipment. Each lift should be conditioned to the proper moisture content and compacted to the specified density before placing subsequent lifts. Structural fill should be compacted to the following criteria:

1. Structural fill in new pavement and hardscape areas, including utility trench backfill, should be compacted to at least 95 percent of the MDD estimated in accordance with ASTM D 1557.
2. Structural fill placed to support floor slabs and foundations should be compacted to at least 95 percent of the MDD estimated in accordance with ASTM D 1557.
3. Structural fill placed as crushed surfacing base course to support new pavements should be compacted to at least 95 percent of the MDD estimated in accordance with ASTM D 1557.
4. Non-structural fill, such as fill placed in landscape areas, should be compacted to at least 90 percent of the MDD estimated in accordance with ASTM D 1557. In areas intended for future development, a higher degree of compaction should be considered to reduce the settlement potential of the fill soils.

We recommend that a representative from our firm be present during placement of structural fill. Our representative will evaluate the adequacy of the subgrade soils and identify areas needing further work, perform in-place moisture-density tests in the fill to evaluate if the work is being done in accordance with the compaction specifications, and advise on any modifications to procedure that may be appropriate for the prevailing conditions.

Temporary Excavations

We anticipate that construction of utility, drainage, or sewer lines will require open excavations 3 to 5 feet deep. Vertical unsupported cuts should be limited to a 4 foot depth. This maximum depth may need to be reduced to a depth of 3 feet or less if sloughing occurs within zones of loose sand. All excavations should be designed to meet requisite shoring regulations. For planning purposes, excavations deeper than 3 to 4 feet should be inclined at 1½H:1V (horizontal to vertical) or flatter.

Foundation or utility excavations should be protected against any significant change in moisture content and disturbance by construction activity. These disturbed areas should be overexcavated and brought to design elevation with compacted structural fill or concrete. The bottom of the excavation should be free of all soft, loose, or disturbed material, and water prior to placement of concrete.

DRAINAGE CONSIDERATIONS

Design of Subject Property drainage should provide rainfall runoff and avoid ponding of water. We recommend that the ground surface be sloped to drain away from the proposed buildings such that surface water runoff is collected and routed to suitable discharge points.

Retaining wall and perimeter building footing drains should consist of perforated pipe, a minimum of 4 inches in diameter, and enveloped within a minimum thickness of 6 inches of washed gravel drain rock. A nonwoven geotextile fabric such as Mirafi 140N should be placed between the drain rock and on-site soils to prevent movement of fines into the drainage material. We recommend that the drain pipe consist of either heavy-wall solid pipe (SDR-35 PVC, or equal) or rigid corrugated smooth interior polyethylene pipe (ADS N-12, or equal). We also recommend against using flexible tubing for footing drain pipes. The drains should be sloped to drain by gravity, if practicable, and tightlined to a suitable discharge point, preferably a storm drain. We recommend that the cleanouts be covered and placed in flush mounted utility boxes. Water collected in roof downspout lines <u>must not</u> be routed to the footing drain lines. Collected downspout water should be routed to appropriate discharge points in a separate pipe system. Any collected water or runoff <u>must</u> be routed away from the top of the existing slope.

EROSION CONTROL

As previously discussed, weathering, erosion, and the resulting surficial sloughing and shallow soil movement are natural processes that affect steeply sloped areas. To reduce the risk of and slow these natural processes on the sloping portion of the Subject Property, we recommend the following:

- No discharge of concentrated surface water or sheet flow onto the slope area.
- Collect groundwater seepage from areas encountered during construction and route to a pipe system away from the slopes.
- No infiltration of surface water.
- Enhance vegetation along the top and face of the steep slopes. The vegetation should consist of ground cover, grass, shrubs, and low-growing (dwarf) trees which are indigenous to this area.

Temporary erosion control should be provided during construction activities and maintained until permanent erosion control measures are functional. Surface water runoff should be properly contained and channeled using drainage ditches, berms, swales, temporary ponds, and/or silt fences. To the extent practicable, construction techniques that minimize disturbance and removal of vegetation are recommended.

The removal of natural vegetation should be minimized and limited to active construction areas or areas where debris removal is necessary. Permanent measures for erosion control should include reseeding or replanting the disturbed areas as soon as possible and protecting those areas until new vegetation has been established. Permanent Subject Property grading should be accomplished in such a manner that stormwater runoff is not concentrated and not directed to steeply sloping areas. Catch basins and tightlines should be used where necessary to direct storm or other surface water away from sloped areas. Surface water should be directed to appropriate stormwater disposal facilities in portions of the Subject Property away from slopes. Sheet flow from impervious surfaces should be directed to catch basins and the storm drainage system. Roof downspouts should be tightlined to stormwater disposal systems.

RECOMMENDED ADDITIONAL GEOTECHNICAL SERVICES

Throughout this report, recommendations are provided where we consider additional geotechnical services to be appropriate. These additional services are summarized below:

- GeoEngineers, Inc. should be retained to review the project plans and specifications when complete to confirm that our design recommendations have been implemented as intended.
- During construction, GeoEngineers should observe temporary cut slopes, observe removal of unsuitable soils from below building areas, evaluate the suitability of the foundation subgrades, evaluate the suitability of floor slab and hardscape subgrades, observe installation of subsurface drainage measures, observe and test structural backfill, and provide a summary letter of our construction observation services. The purpose of GeoEngineers construction phase services would be to confirm that the subsurface conditions encountered during construction are consistent with those observed in the explorations and for other reasons described in Appendix C titled Report Limitations and Guidelines for Use.

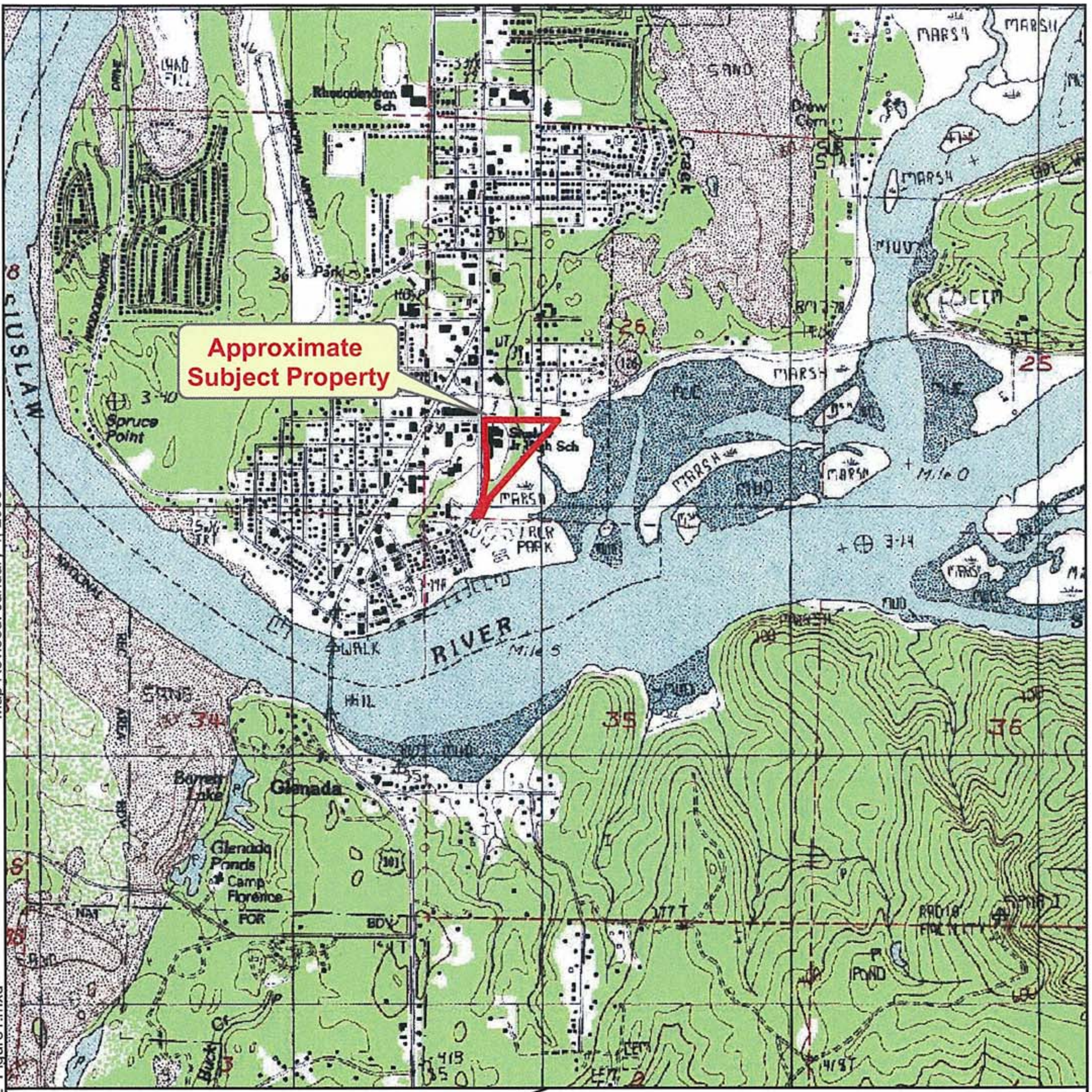
LIMITATIONS

We have prepared this report for the exclusive use of Wyndham Vacation Ownership Inc and their authorized agents for the proposed buildings at 750 Quince Street in Florence, Oregon.

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

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

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



N
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Feet

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

Data Sources: ESRI Data & Maps, Street Maps 2005
US Topographic map from National Geographic Society
Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Vicinity Map

Quince Street Property
Florence, Oregon

GEOENGINEERS

Figure 1

Office: PORT Path: P:\12\1270801602\GIS\1270801602 Figure1.mxd Map Revised: January 4, 2008

\REDMOND\PROJECTS\2\2708060\01\CAD\270806001F2.DWG\TAB:F2 MODIFIED BY LKNOWLTON ON JAN 14, 2008 - 11:55

Legend

GEI-1 Boring Location Completed on 12/17/2007

Notes:

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

Reference: Aerial image from PDF file converted to a image provided by Myhre Group, entitled Site Plan

Site Plan

750 Quince Street Property
Florence, Oregon

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Figure 2

GeoEngineers

Appendix A
Field Explorations

APPENDIX A
FIELD EXPLORATIONS

Subsurface conditions were explored at the Subject Property by drilling three borings. The borings were completed to depths ranging from about 36 to 52 feet below the existing ground surface by Subsurface Technologies of North Plains, Oregon on December 17, 2007. The locations of the explorations were located in the field by measuring distances from existing Subject Property features. The approximate locations of the borings are shown on the Site Plan, Figure 2.

Borings GEI-1,GEI-2, and GEI-3 were completed using truck-mounted, continuous-flight, mud rotary drilling equipment. The borings were continuously monitored by an engineer from our firm who examined and classified the soils encountered, obtained representative soil samples, observed groundwater conditions, and prepared a detailed log of each exploration.

The soils encountered in the borings were sampled at 2½- or 5-foot vertical intervals with a 2-inch outside diameter split-barrel standard penetration test (SPT) sampler. The samples were obtained by driving the sampler 18 inches into the soil with a 140-pound auto-hammer free-falling 30 inches. The number of blows required for each 6 inches of penetration was recorded. The blow count ("N-value") of the soil was calculated as the number of blows required for the final 12 inches of penetration. This resistance, or N-value, provides a measure of the relative density of granular soils and the relative consistency of cohesive soils. Where very dense soil conditions preclude driving the full 18-inches, the penetration resistance for the partial penetration was entered on the logs. The blow counts are shown on the boring logs at the respective sample depths.

Soils encountered in the borings were visually classified in general accordance with the classification system described in Figure A-1. A key to the boring log symbols is also presented in Figure A-1. The logs of the borings are presented in Figures A-2 and through A-4. The boring logs are based on our interpretation of the field and laboratory data and indicate the various types of soils and groundwater conditions encountered. The logs also indicate the depths at which these soils or their characteristics change; although, the change may actually be gradual. If the change occurred between samples, it was interpreted. The densities noted on the boring logs are based on the blow count data obtained in the borings and judgment based on the conditions encountered.

Observations of groundwater conditions were made during drilling. The groundwater conditions encountered during drilling are presented on the boring logs. Groundwater conditions observed during drilling represent a short term condition and may or may not be representative of the long term groundwater conditions at the Subject Property. Groundwater conditions observed during drilling should be considered approximate.

SOIL CLASSIFICATION CHART

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

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

ADDITIONAL MATERIAL SYMBOLS

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

Measured groundwater level in exploration, well, or piezometer

Groundwater observed at time of exploration

Perched water observed at time of exploration

Measured free product in well or piezometer

Stratigraphic Contact

Distinct contact between soil strata or geologic units

Gradual change between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

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

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

Laboratory / Field Tests

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

Sheen Classification

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

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

KEY TO EXPLORATION LOGS

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Figure A-1

Date(s) Drilled	12/17/07	Logged By	MCL	Checked By	NLT
Drilling Contractor	Subsurface Tech	Drilling Method	Mud Rotary	Sampling Methods	SPT
Auger Data	6 inches ID	Hammer Data	140 lb hammer/30 in drop automatic	Drilling Equipment	Truck Mounted
Total Depth (ft)	41.5	Surface Elevation (ft)	NA	Groundwater Level (ft. bgs)	Not Encountered
Vertical Datum		Datum/ System		Easting(x): Northing(y):	

Elevation feet	Depth feet	SAMPLES: Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft^3	OTHER TESTS AND NOTES
	0							SOD	0 to 2 inches grass topsoil			
								ML	Dark brown silt with roots (soft, moist)			
								SP	Light brown fine sand (loose, moist)			
			8	6	1							
	5		12	7	2							
			14	4	3							
	10		12	12	4					16		SA; %F = 1.2
	15		10	17	5							
								SP	Brown fine sand with a trace of silt with orange mottling (medium dense, moist)			
	20		12	35	6				Grades to dense	16		SA; %F = 4
	25		12	50/6"	7				Grades to very dense			
	30											

Note: See Figure A-1 for explanation of symbols.

LOG OF BORING GEI-1

GEOENGINEERS

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Figure A-2
Sheet 1 of 2

V6_GTBORING P:\12\12708016\01\FINALS\1270801601.GPJ GEIV6_1.GDT 1/14/08

Elevation feet	Depth feet	SAMPLES: Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft^3	OTHER TESTS AND NOTES
	30		12	55	8							
	35		10	50/4"	9			SP-SM	Light gray fine sand with silt (very dense, moist)			
	40		10	50/4"	10							
	45											
	50											
	55											
	60											
	65											

V6_GTBORING P:\12\12708016\01\FINALS\1270801601.GPJ GEIV6_1.GDT 1/14/08

LOG OF BORING GEI-1 (continued)

GeoEngineers

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Figure A-2
Sheet 2 of 2

Date(s) Drilled	12/17/07	Logged By	MCL	Checked By	NLT
Drilling Contractor	Subsurface Tech	Drilling Method	Mud Rotary	Sampling Methods	SPT
Auger Data	6 inches ID	Hammer Data	140 lb hammer/30 in drop automatic	Drilling Equipment	Truck Mounted
Total Depth (ft)	36.5	Surface Elevation (ft)	NA	Groundwater Level (ft. bgs)	Not Encountered
Vertical Datum		Datum/ System		Easting(x): Northing(y):	

Elevation feet	Depth feet	SAMPLES: Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft³	OTHER TESTS AND NOTES
	0							SOD	0 to 2 inches grass topsoil			
								ML	Dark brown silt with roots (soft, moist)			
								SP	Light brown fine sand (medium dense, moist)			
			12	15	1							
	5		14	17	2							
			8	4	3							
	10		6	7	4							
	15		8	13	5							
	20		18	22	6							
	25		12	42	7			SP-SM	Dark brown fine sand with silt (dense, moist)			
								SP	Light brown fine sand with orange mottling (dense, moist)			
	30											

Note: See Figure A-1 for explanation of symbols.

LOG OF BORING GEI-2

GEOENGINEERS

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Figure A-3
Sheet 1 of 2

V6_GTBORING P:\12\12708016\01\FINALS\1270801601.GPJ GEIV6_1.GDT 1/14/08

Elevation feet	Depth feet	Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft^3	OTHER TESTS AND NOTES
	30		12	60	8							
								SP-SM	Gray fine sand with silt (very dense, moist)			
	35		4	50/4"	9			SP	Light brown fine sand (very dense, moist)			

40

45

50

55

60

65

LOG OF BORING GEI-2 (continued)

GEOENGINEERS

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Figure A-3
Sheet 2 of 2

Date(s) Drilled	12/17/07	Logged By	MCL	Checked By	NLT
Drilling Contractor	Subsurface Tech	Drilling Method	Mud Rotary	Sampling Methods	SPT
Auger Data	6 inches ID	Hammer Data	140 lb hammer/30 in drop automatic	Drilling Equipment	Truck Mounted
Total Depth (ft)	51.5	Surface Elevation (ft)	NA	Groundwater Level (ft. bgs)	45
Vertical Datum		Datum/ System		Easting(x): Northing(y):	

Depth feet	Recovered (in)	Blows/foot	Sample Number	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft^3	OTHER TESTS AND NOTES
0				SOD	0 to 5 inches grass topsoil			
				ML	Dark brown sit with roots (soft, moist)			
				SP	Light brown fine sand (medium dense, moist)			
	12	15	1					
5	8	15	2			18		SA; %F = 2
	8	10	3					
10	12	11	4					
15	10	12	5					
20	10	14	6					
				SP-SM	Light brown with orange mottling fine sand with silt (medium dense, moist)			
				SP	Light brown fine sand (dense, moist)			
25	16	36	7			44		SA; %F = 1
30								

Note: See Figure A-1 for explanation of symbols.

LOG OF BORING GEI-3

GEOENGINEERS

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Figure A-4
Sheet 1 of 2

Elevation feet	Depth feet	SAMPLES Interval	Recovered (in)	Blows/foot	Sub-Sample / Sample Number	Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Moisture Content %	Dry Unit Weight, lbs/ft³	OTHER TESTS AND NOTES
	30		16	37	8							
	35		12	74	9			SP	Light gray fine sand (very dense, moist)			
	40		12	66	10			SP	Brown fine sand (very dense, moist to wet)			
								SP-SM	Light brown to gray fine sand with silt (dense, wet)			
	45		18	46	11	▼						
	50		18	50/4"	12							
	55											
	60											
	65											

V6_GTBORING P:\12\1270801601\FINALS\1270801601.GPJ GEIV6_1.GDT 1/14/08

LOG OF BORING GEI-3 (continued)

GEOENGINEERS

Project: Quince Street Property
Project Location: Florence, Oregon
Project Number: 12708-016-01

Figure A-4
Sheet 2 of 2

GeoEngineers

Appendix B
Laboratory Testing

APPENDIX B
LABORATORY TESTING

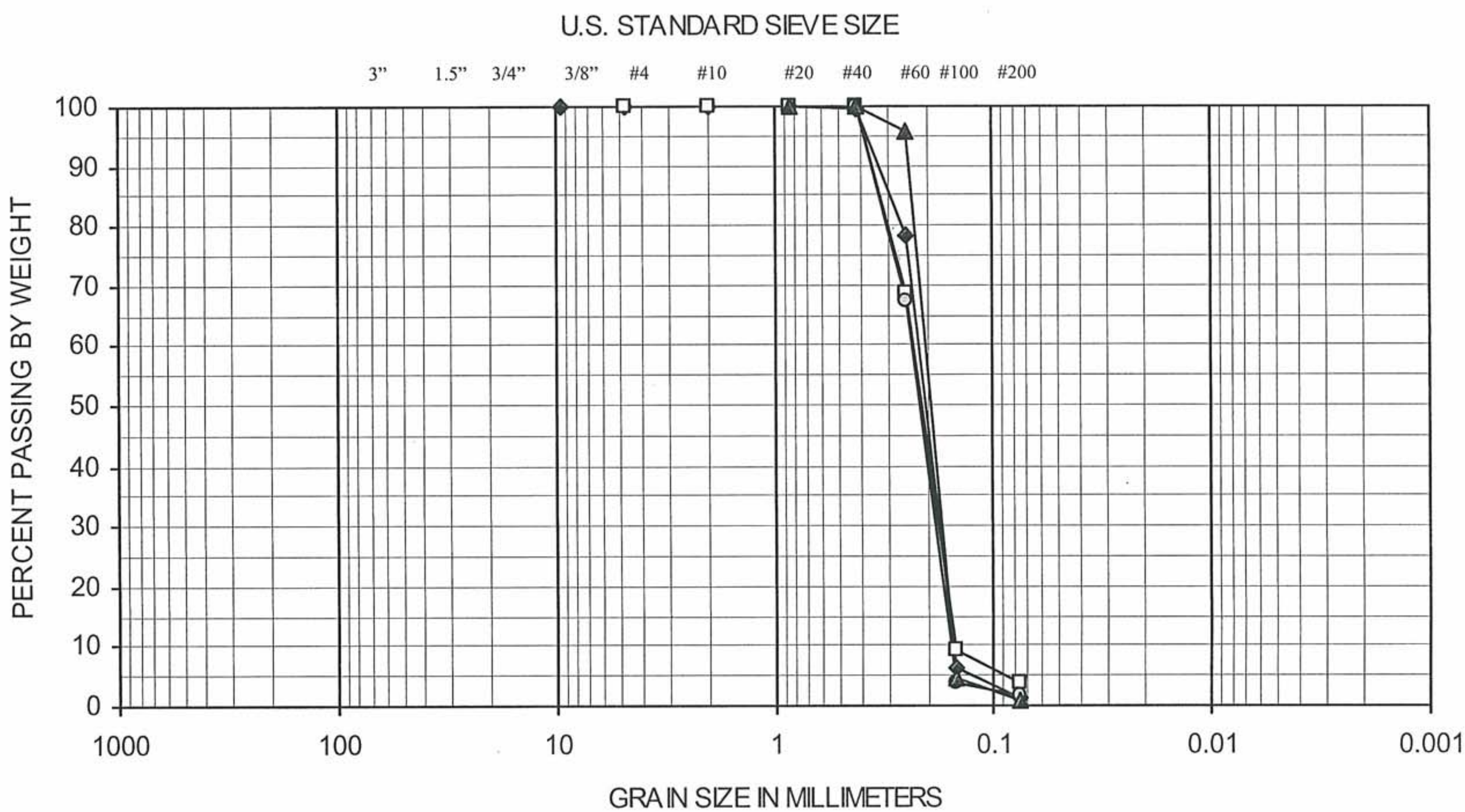
GENERAL

Soil samples obtained from the borings were transported to our laboratory and examined to confirm or modify field classifications, as well as to evaluate engineering and index properties of the soil samples. Representative samples were selected for laboratory testing consisting of moisture content and grain size distribution determination. The tests were performed in general accordance with test methods of the American Society for Testing and Materials (ASTM) or other applicable procedures.

FULL SIEVE ANALYSES

Full sieve analyses were performed on four selected samples in general accordance with ASTM-D 422. The wet sieve analysis method was used to determine the percentage of soil greater than the U.S. No. 200 mesh sieve. The results of the sieve analyses were plotted, were classified in general accordance with the Unified Soil Classification System (USCS), and are presented in Figure B-1. The fines content (material pass U.S. Standard No. 200 sieve) for each sieve analyses performed are shown on the exploration logs at the respective sample depth.

12708-016-01 : CTS : saw 1-03-08 (Sieve.ppt)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	EXPLORATION NUMBER	DEPTH (ft)	SOIL CLASSIFICATION
◆	B-1	10-11.5'	Light Brown fine sand (SP)
□	B-1	20-21.5'	Brown fine sand with a trace of silt (SP)
○	B-3	5-6.5'	Light Brown fine sand (SP)
▲	B-3	25-26.5'	Light Brown fine sand (SP)

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SIEVE ANALYSIS RESULTS

FIGURE B-1

APPENDIX C
REPORT LIMITATIONS AND GUIDELINES FOR USE

APPENDIX C
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

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

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES, PERSONS AND PROJECTS

This report has been prepared for the exclusive use of Wyndham Vacation Ownership, Inc. and his authorized agents for this project. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

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

A GEOTECHNICAL ENGINEERING OR GEOLOGIC REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

This report has been prepared for the proposed project at 750 Quince Street in Florence, Oregon. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

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

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

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

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

---

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

SUBSURFACE CONDITIONS CAN CHANGE

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

MOST GEOTECHNICAL AND GEOLOGIC FINDINGS ARE PROFESSIONAL OPINIONS

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

GEOTECHNICAL ENGINEERING REPORT RECOMMENDATIONS ARE NOT FINAL

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

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

A GEOTECHNICAL ENGINEERING OR GEOLOGIC REPORT COULD BE SUBJECT TO MISINTERPRETATION

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

DO NOT REDRAW THE EXPLORATION LOGS

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

Give Contractors a Complete Report and Guidance

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

Contractors Are Responsible for Site Safety on Their Own Construction Projects

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

Read These Provisions Closely

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

Geotechnical, Geologic and Environmental Reports Should Not Be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

Biological Pollutants

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

GeoEngineers

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CITY OF FLORENCE
PHASE I SITE INVESTIGATION REPORT

Braun Hospitality, LLC Applicant	25 November 2024 Date
Florence Microtel Proposal or Project	18122633 — 903 Map No. — Tax Lot
	 Comprehensive Plan Designation
New 86 room hotel Purpose of Proposal or Project (attach additional sheets, as needed)	Old Town Area C Zoning District
750 Quince Street, Florence, OR Street Address	Natural Resource Conservation Overlay Overlay District

Based on submitted information, zoning and comprehensive plan requirements, and the completed Site Investigation Report, this proposal **does** / **does not** comply with Title 10 of the City Code and the Comprehensive Plan. The proposal **will / will not** achieve the stated purpose. The site and/or building design **will / will not** have adverse impacts and **will / will not** mitigate any adverse impacts.

The completed Site Investigation Report is available at the Planning Department.

This investigation was done by:

Matthew M. Braun
Print

[signature]
Signature

President
Title

PHASE 1SITE INVESTIGATION
INITIAL PROPOSED DEVELOPMENT APPLICATION CHECKLIST

YES	NO		
X	___	1.	LOCAL ZONING REGULATIONS Does the proposed development site plan conform to City, or County Zoning Regulations regarding setback lines and other code provisions? (Contact the City or County Engineer for details.)
		2.	COMPREHENSIVE PLAN SETBACK LINE OR DESIGNATION
X	___		a. Has a Coastal Construction Setback line (CCSBL) been adopted for this County or city? (Inquire from the County or City Engineer.)
___	X		b. If a CCSBL has been adopted for this County or City is the proposed site seaward of the CCSBL?
___N/A	___		c. If the proposed site is seaward of the adopted CCSBL, has application for a variance or exception been made to the Planning Commission having jurisdiction?

PHASE 1SITE INVESTIGATION
INITIAL PROPOSED DEVELOPMENT APPLICATION CHECKLIST

YES	NO	
		3. <u>DUNAL FORMS</u>
		a. Does the property contain any of the following dune formations?
____	X	1. Active Dune
____	X	2. Newer Stablized Dune
____	X	3. Older Stablized Dune
____	X	4. Deflation Plan
____	X	5. leading Edge of Sand dune
____	X	6. Foredune
		3. <u>IDENTIFIED HAZARDOUS CONDITIONS</u>
____	X	a. Has any portion of the property been identified as being affected by any potential or existing geological hazard? (Contact County or City Planning Departments for information published by the State Department of Geology and Mineral Industries, US Department of Agriculture-Soil Conservation Service, US Geological Survey, US Army Corps of Engineers and other government agencies.)
		b. Are any of the following identified hazards present?
____	X	1. foredune
____	X	2. Active Dunes
____	X	3. Water erosion
____	X	4. Flooding
____	X	5. Wind erosion
____	X	6. Landslide or sluff activity
		7. leading edge of active Sand Dune
		c. Are there records of these hazards ever being present of the site? Describe:
		4. <u>EXISTING SITE VEGETATION</u>
X	____	a. Does the vegetation on the site, afford adequate protection against soil erosion from wind and surface water runoff?
____	X	b. Does the condition of vegetation present constitute a possible fire hazard or contributing factor to slide potential?
		(If answer is Yes, full details and possible remedies will be required.)
		5. <u>FISH AND WILDLIFE HABITAT</u>
____	X	a. Does the site contain any identified rare or endangered species or unique habitat (feeding, nesting or resting)?
____	X	b. Will any significant habitat be adversely affected by the development? (Contact Oregon Department of Fish and Wildlife,)
		6. <u>HISTORICAL AND ARCHEEOLOGICAL SITES</u>
____	X	Are there any identified historical or archaeological sites within the area proposed for development? (Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians).)
		7. <u>FLOOD PLAIN ELEVATION</u>
____	X	a. If the elevation of the 100 year flood plain or storm tide has been determined, does it exceed the existing ground elevation at the proposed building site? (Contact the Federal Insurance Administration, City or County Planning

PHASE 1SITE INVESTIGATION
INITIAL PROPOSED DEVELOPMENT APPLICATION CHECKLIST

YES	NO	
		Departments for information on 100 year flood plain. Existing site elevations can be identified by local registered surveyor.)
N/A		b. If elevations of the proposed development is subject to flooding during the 100 year flood or storm tide, will the lowest habitable floor be raised above the top of the highest predicted storm-wave cresting on the 100 year flood or storm tide?
		8. <u>CONDITION OF ADJOINING AND NEARBY AREAS</u>
		Are any of the following natural hazards present on the adjoining or nearby properties that would pose a threat to this site?
	X	a. Active dunes
	X	b. foredune
	X	c. Storm runoff erosion
	X	d. Wave undercutting or wave overtopping
	X	e. Slide areas
	X	f. Combustible vegetative cover
		(Contact County and City Planning staffs for local hazard information.)
		9. <u>DEVELOPMENT IMPACTS</u>
	X	a. Will there be adverse off-site impacts as a result of this development?
		b. Identify possible problem type
	X	1. Increased wind exposure
	X	2. Open sand movement
	X	3. Vegetative destruction
	X	4. Increased water erosion (storm runoff, driftwood removal, reduction of foredune, etc.)
	X	5. Increased slide potential
	X	6. Affect on aquifer
X		c. Has landform capability (density, slope failure, groundwater, vegetation, etc) been a consideration in preparing the development proposal?
X		d. Will there be social and economic benefits from the proposed development?
		e. Identified benefits
X		1. New jobs
X		2. Increased tax valuation
	X	3. Improved fish and wildlife habitat
X		4. Public access
	X	5. Housing needs
X		6. Recreation potential
	X	7. Dune stabilization (protection of other features)
		8. Other ____
		10. <u>PROPOSED DESIGN</u>
X		a. Has a site map been submitted showing in detail exact location of proposed structures?
	X	b. Have detailed plans showing structure foundations been submitted?
N/A		c. Have detailed plans and specifications for the placement of protective structures been submitted if need is indicated?
X		d. Has a plan for interim stabilization, permanent revegetation and continuing vegetative maintenance been submitted?
		e. Is the area currently being used by the following?

PHASE 1SITE INVESTIGATION
INITIAL PROPOSED DEVELOPMENT APPLICATION CHECKLIST

YES	NO	
____	x	1. Off-road vehicles
____	x	2. motorcycles
____	x	3. horses
____	x	f. Has a plan been developed to control or prohibit the uses of off-road vehicles, motorcycles and horses?
		11. LCDC COASTAL GOAL REQUIREMENTS
x	____	a. Have you read the LCDC Goals affecting the site? (contact LCDC, City or County office for copies of Goals.)
____	x	b. Have you identified any possible conflicts between the proposed development and the Goals or acknowledged comprehensive plans? (If so, list them and contact local planning staff for possible resolution.)
x	____	c. Have all federal and state agency consistency requirements been met? (Contact local planning office.)
x	____	d. Has applicant or investigator determined that the development proposal is compatible with the LCDD Beaches and Dunes Goal and other appropriate statewide land use planning laws?

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