GeoDesign Inc

June 13, 2016

PacTrust
15350 SW Sequoia Parkway, Suite 300
Portland, OR 97224

Attention: Mr. Matt Oyen

Report of Geotechnical Engineering Services
Kuebler Gateway Retail
27th Avenue SE and Kuebler Boulevard SE
Salem, Oregon
GeoDesign Project: PacTrust-162-09

INTRODUCTION

This report provides our geotechnical engineering services for the Kuebler Gateway Retail site located southwest of the intersection of 27th Avenue SE and Kuebler Boulevard SE in Salem, Oregon. The site is shown in relation to surrounding physical features on Figure 1. Based on preliminary plans, we understand the site will be developed with medium box retail developments at the southeast portion of the site, east of the existing medical office buildings and on the north side of Boone Road SE. Restaurants, shops, and retail buildings are planned at the north portion of the site, along the south side of Kuebler Boulevard SE. The remainder of the site, including the middle portion of the site, will be asphalt concrete- (AC) paved parking areas. Figure 1 shows our approximate exploration locations. Logs of the borings, the site plan showing the prior test pit locations from our March 2012 geotechnical report, a preliminary sketch showing proposed buildings provided by PacTrust, the preliminary site grading plan provided by Westech Engineering, and the previous 2012 mass grading plan are presented in Attachments, A, B, C, D, and E, respectively.

At the time of this report, structural loads were not available. However, we have assumed the medium box buildings will have maximum column loads of 200 kips and maximum wall loads of 4 to 5 kips per linear foot. The smaller restaurant and shop buildings are assumed to have maximum column loads of 100 kips and maximum wall loads of 3 to 4 kips per linear foot. Maximum floor loads of the medium box and smaller buildings are assumed to be approximately 200 and 150 pounds per square foot (psf), respectively.

The preliminary grading plan provided by Westech Engineering (Attachment D), shows a slightly different building layout from the preliminary sketch provided by PacTrust (Attachment C); however, in general, it shows the medium box buildings at the south portion of the site with finish floor elevations of 362 feet and the smaller buildings at the north portion of the site with finish floor elevations ranging from 367 to 368 feet.

In general, preliminary proposed grading includes cuts of approximately 6 feet at the medium box buildings with small portions of the building pads that may require up to 8 feet of cut. The parking areas surrounding the medium box buildings have preliminary planned grades ranging from approximately 360 to 361, which will involve cuts and fills of up to approximately 3 feet each. At the north boundary of the site, the site grades range from approximately 360 to 365 feet; therefore, in this area, proposed buildings with a finish floor elevation of 367 and 368 feet and parking lots with planned finish grades of 365 to 367 feet could require approximately 3 to 7 feet of fill. The proposed parking lot extending across the central portion of the site has preliminary grades ranging from approximately 361 to 366 feet. Up to approximately 6 feet of fill would be required to achieve these grades. In addition, the parking lot grading requires filling the existing drainage ponds and channels in the central portion of the site, which could require up to approximately 12 to 14 feet of fill in the large pond that is center-east.

BACKGROUND

GeoDesign completed a geotechnical report[1] to support the mass grading completed in 2012 and to include recommendations for one office building (at that time only one building was under consideration). We subsequently prepared an addendum[2] to the geotechnical report to include updated recommendations for development of two office buildings (Buildings 1 and 2) at the southwest corner of the site. We observed the 2012 mass grading at the site, which included cuts up to approximately 11 feet at the northwest corner of the site. The site formerly had draws located at the northeast and southeast corners of the site. These areas were filled during the mass grading efforts, up to approximately 22 feet thick at the northeast corner of the site and up to 12 feet thick at the southeast corner of the site.

During our initial work on the site, we completed 32 test pits across the site. The former explorations encountered clay and silt underlain by decomposed and/or intensely weathered basalt. The rock varies in hardness, with the shallower rock being relatively friable and the hardness increasing with depth. Cobbles and boulders were encountered in the near-surface clay/silt as well as in the underlying decomposed/weathered basalt.

[1] GeoDesign, Inc., 2012. *Report of Geotechnical Engineering Services; Kuebler Boulevard Property; Mass Grading and Medical Office Building Phase; 27th Avenue and Kuebler Boulevard SE; Salem, Oregon,* dated March 30, 2012. GeoDesign Project: PacTrust-162-01

[2] GeoDesign, Inc., 2012. *Addendum 1; Geotechnical Engineering Services; Kuebler Boulevard Property; Office Buildings 1 and 2; 27th Avenue and Kuebler Boulevard SE; Salem, Oregon,* dated November 16, 2012. GeoDesign Project: PacTrust-162-04

SCOPE OF SERVICES

The purpose of our geotechnical services was to evaluate the existing site conditions relative to the proposed development plans. The specific scope of our services included the following:

- Reviewed the prior work completed at the site.
- Drilled 14 borings to depths ranging between 6.0 and 41.3 feet below ground surface (BGS0 in or near proposed building locations. Our boring locations were chosen based on the sketch provided by PacTrust (Attachment C).
- Completed the following laboratory tests:
  - Twenty moisture content determinations in general accordance with ASTM D 2216
  - Two Atterberg limits tests in general accordance with ASTM D 4318
  - Two percent fines tests in general accordance with ASTM D 1140
- Prepared this report summarizing the results of our field testing and analysis. Relative to the prior report, this report includes the following items:
  - Recommendations for site preparation, grading and drainage, stripping depths, fill type for imported material, compaction criteria, cut and fill slope criteria, temporary excavations, use of on-site soil, and wet and dry weather earthwork
  - Geotechnical engineering recommendations for design and construction of shallow spread foundations, including allowable design bearing pressure and minimum footing depth and width
  - Geotechnical engineering recommendations for the design and construction of concrete slabs-on-grade, including an anticipated value for subgrade reaction modulus
  - Recommended design criteria for retaining walls, including lateral earth pressure, allowable bearing pressure for retaining wall footings, backfill type, compaction requirements, and drainage
  - Design pavement sections, including base course and asphalt concrete thicknesses, for both standard- and heavy-duty pavements for parking areas and access roads and for concrete pavements for parking pads based on design criteria provided by others
  - Recommendations for subsurface drainage of footings and floor slabs, if necessary
  - Recommendations for the International Building Code (IBC) site coefficient and our evaluation of the liquefaction potential of site soil

SITE CONDITIONS

SURFACE CONDITIONS

The site is bound on the north by Kuebler Boulevard SE, on the east by 27th Avenue SE, on the south by Boones Road SE, and on the west by Battle Creek Road SE. The southwest corner of the site is developed with two medical office buildings and associated AC-paved parking areas. As discussed above, the site consists primarily of a vacant field that was mass graded in 2012 and the ground surface consists of sparse grass and brush. To the east of the medical office development at the southwest corner of the site, there is an area vegetated with trees, brush, and grass, which was formerly a single residential property that was not graded during the 2012 earthwork activities. The ground surface is relatively level, where the grading activities took place, and range from approximately 360 to 365 feet. The north boundary of the property slopes down towards Kuebler Boulevard SE with a gradient of approximately 2 horizontal to 1

vertical (H:V). There is a drainage basin at the bottom of the slope at the northeast corner of the site, at the intersection of Kuebler Boulevard SE and 27th Avenue SE. Three drainage basins and associated channels extend through the center of the site. Cobbles and boulders were observed at the ground surface during our explorations.

SUBSURFACE CONDITIONS

Current Explorations

We explored subsurface conditions at the site by drilling 14 borings (B-1 through B-14) to depths ranging from 6.0 to 41.3 feet BGS. Our explorations supplement previous explorations completed for the overall site in 2012. The locations of the current explorations are shown on Figure 1. Our current exploration logs and results of the laboratory testing are presented in Attachment A. The previous site plan and exploration logs are presented in Attachment B. Note that the surface grades are different between the 2012 and 2016 explorations.

The root zone encountered at the surface of our 2016 borings ranged from approximately 2 to 4 inches thick. At borings B-2, B-11, and B-12, bare soil with sparse weeds was encountered at the ground surface. Subsurface conditions encountered in our current explorations generally confirm the mass grading activities that occurred on site and consist of approximately 3 to 20.5 feet of fill composed of primarily of medium stiff to hard silt or clay with varying amounts of sand and gravel and occasional trace organics (rootlets). In boring B-3, a 2-foot layer of medium dense gravel was encountered within the fill layer. The fill is underlain by native soil composed of medium stiff to very stiff silt and clay with varying amounts of sand and gravel; medium dense, silty sand with gravel; and medium dense to very dense gravel with sand. Cobbles and boulders were encountered in several of the borings during our explorations. Laboratory testing indicates that the moisture contents of the fill and native soil ranged from approximately 32 to 57 percent at the time of our explorations. Atterberg limits tests of selected samples of the soil matrix indicated relatively high plasticity.

Mud rotary drilling methods prevented accurate measurement of groundwater levels during drilling. Groundwater was observed at a depth of approximately 35 feet BGS in boring B-6 during our explorations, but was not encountered in the other explorations.

The fill soil encountered in our borings was placed during mass grading in 2012. GeoDesign tested (on a part-time basis) the fill placed in 2012. To the extent tested, all fill was placed as structural fill. The mass grading completed at the site is depicted on the 2012 conceptual mass grading plan (Attachment E). As indicated above, the fill was planned to be up to approximately 22 feet thick in the northeast portion of the site and up to approximately 12 feet thick in the southeast portion of the site. Our explorations confirm the general fill thicknesses placed.

Prior Explorations

Site and subsurface conditions prior to the 2012 earthwork activities are described in our March 2012 geotechnical report. As described above, 32 test pit explorations were completed prior to the mass grading in 2012 and were, therefore, completed from different ground surface elevations than the current. A site plan and the test pit exploration logs are presented in Attachment B. As indicated above, the subsurface conditions in our prior explorations consist of clay and silt underlain by decomposed and/or intensely weathered basalt. The rock varies in

hardness, with the shallower rock being relatively friable and the hardness increasing with depth. Cobbles and boulders were encountered in the near-surface clay/silt as well as in the underlying decomposed/weathered basalt. Several of the test pit explorations in the middle of the site and the area north of the medical office buildings met refusal in the underlying cobbles, boulders, and rock. Groundwater seepage was encountered in the test pits at depth ranging from approximately 2.5 to 12 feet BGS (elevations of 336 to 364 feet, with most groundwater levels averaging between approximately 351 to 358 feet) during our explorations. A complete description of our prior explorations and subsurface conditions is available in our prior report.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

Based on our review of the proposed grading plan, the results of our explorations, and our analyses, it is our opinion that the proposed structures can be supported on conventional spread footings. Our recommendations are provided in the following sections of this report.

SITE PREPARATION

Demolition

Site development will include demolition and removal of existing structures or utilities that may be present underneath areas to be improved. It is our understanding that former structures that had occupied the central portion of the site were removed between December 2005 and August 2006. If prior structures or utilities are encountered during construction, they should be removed and the resulting excavations should be backfilled as structural fill.

Grubbing and Stripping

The existing topsoil zone should be stripped and removed from all structural areas. Based on our explorations, the depth of stripping will be approximately 2 to 4 inches, although greater stripping depths may be required to remove localized zones of loose or organic soil. The area vegetated with trees and brush at the south portion of the site will likely encounter topsoil and root zone. The actual stripping depth should be based on field observations at the time of construction. Stripped material should be transported off site for disposal or used in landscaped areas as directed by the contract documents.

Trees and shrubs should be removed from fill areas. In addition, root balls should be grubbed out to the depth of the roots, which could exceed 3 feet BGS. Depending on the methods used to remove the root balls, considerable disturbance and loosening of the subgrade could occur during site grubbing. We recommend that soil disturbed during grubbing operations be removed to expose firm, undisturbed subgrade. The resulting excavations should be backfilled with structural fill.

Subgrade Evaluation

Upon completion of stripping and subgrade stabilization and prior to the placement of fill, structural, or pavement improvements, the exposed subgrade should be evaluated by proof rolling. The subgrade should be proof rolled with a fully loaded dump truck or similarly heavy, rubber-tired construction equipment to identify soft, loose, or unsuitable areas. A member of our geotechnical staff should observe the proof rolling to evaluate yielding of the ground

surface. During wet weather, subgrade evaluation should be performed by probing with a foundation probe rather than proof rolling. Areas that appear soft or loose should be improved in accordance with subsequent sections of this report.

CONSTRUCTION CONSIDERATIONS

The fine-grained soil present on this site is easily disturbed. If not carefully executed, site preparation, utility trench work, and roadway excavation can create extensive soft areas and significant repair costs can result. Earthwork planning, regardless of the time of year, should include considerations for minimizing subgrade disturbance.

If construction occurs during or extends into the wet season or if the moisture content of the surficial soil is more than a couple percentage points above the optimum moisture content, site stripping and cutting may need to be accomplished using track-mounted equipment. The use of granular haul roads and staging areas will be necessary for support of construction traffic during the rainy season, or when the moisture content of the surficial soil is more than a few percentage points above optimum. The base rock thickness for pavement areas is intended to support post-construction design traffic loads. This design base rock thickness may not support construction traffic or pavement construction when the subgrade soil is wet. Accordingly, if construction is planned for periods when the subgrade soil is wet, staging and haul roads with increased thicknesses of base rock will be required. The amount of staging and haul road areas, as well as the required thickness of granular material, will vary with the contractor's sequencing of a project and type/frequency of construction equipment. Based on our experience, between 12 and 18 inches of imported granular material is generally required in staging areas and between 18 and 24 inches in haul roads areas. The actual thickness will depend on the contractor's means and methods and, accordingly, should be the contractor's responsibility. In addition, a geotextile fabric should be placed as a barrier between the subgrade and imported granular material in areas of repeated construction traffic. The imported granular material and the geotextile fabric should meet the specifications in the "Structural Fill" section of this report.

As an alternative to thickened crushed rock sections, haul roads and utility work zones may be constructed using cement-amended subgrade overlain by a crushed rock wearing surface. If this approach is used, the thickness of granular material in staging areas and along haul roads can typically be reduced to 6 inches. This recommendation is based on an assumed minimum unconfined compressive strength of 100 pounds per square inch (psi) for subgrade amended to a depth of 12 to 16 inches. The actual thickness of the amended material and imported granular material will depend on the contractor's means and methods and, accordingly, should be the contractor's responsibility. Cement amendment is discussed in the "Structural Fill" section of this report.

EXCAVATION

Rock Excavation

The preliminary grading plans indicate that the majority of the cut greater than 2 to 3 feet will be completed in the south portion of the site, in the area vegetated with trees. The borings drilled near this area indicate that decomposed basalt composed of silt or clay with gravel and sand, or silty sand with gravel, will be encountered within the proposed cuts. Cobbles and boulders were observed at the ground surface in this area. In borings B-12 and B-14, hard drilling and refusal

blow counts in basalt bedrock was encountered at a depth of 18.5 and 18.0 feet (corresponding to an elevation of 345.5 feet), respectively. The borings drilled in the northwest portion of the site (B-9, and B-10) encountered slow and hard drilling near the ground surface (elevations of 365 and 368 feet, respectively) in very dense, silty sand and very stiff silt with sand and gravel. The sand and silt also includes cobbles and boulders. Boring B-11 encountered hard, slow drilling in bedrock at a depth of 18 feet BGS (elevation 350 feet). As discussed in our previous report, several of our previous explorations, which were completed with a trackhoe equipped with rock teeth, encountered refusal. Refusal was encountered at several of the explorations (TP-1, TP-2, TP-6, TP-9, TP-10, TP-15, TP-17, TP-18, TP-21, and TP-25) and, when encountered, varied between depths of 7.5 (TP-17) and 13.5 (TP-1) feet BGS. The majority of the refusal conditions were due to excavation obstruction by a boulder, which in the confined space of a test pit, could not be removed. In TP-15, TP-17, TP-18, TP-21, and TP-25, which were excavated near the middle to south portion of the site, refusal was encountered at depths ranging from 7 to 11 feet BGS (corresponding to elevations of 355 to 361.5 feet). Based on our results, we anticipate that excavation equipment with hardened rock teeth can complete the grading to the proposed depths. If relatively competent and intact bedrock is encountered, we recommend defining rock excavation as material that cannot be excavated using a CAT 345 equipped with rock excavation teeth (or equivalent) or a CAT D8 dozer equipped with a rock ripper (or equivalent).

Utility trenches may result in slowed excavation and larger backfill volumes due to the presence of rock, the presence of cobbles and boulders, and related caving. Deep excavations that extend into relatively competent and intact bedrock material will likely require the use of special techniques, such as hydraulic breakers, drilling, and blasting.

Excavation and Shoring

Temporary excavation sidewalls should stand vertical to a depth of approximately 4 feet provided groundwater seepage is not observed in the sidewalls. Open excavation techniques may be used to excavate trenches with depths between 4 and 8 feet provided the walls of the excavation are cut at a slope of 1H:1V and groundwater seepage is not present. At this inclination, the slopes with loose gravel and cobbles may ravel and require some ongoing repair. Excavations should be flattened to 1½H:1V or 2H:1V if excessive sloughing or raveling occurs. In lieu of large open cuts, approved temporary shoring may be used for excavation support. A wide variety of shoring and dewatering systems are available. Consequently, we recommend that the contractor be responsible for selecting the appropriate shoring and dewatering systems.

If box shoring is used, it should be understood that box shoring is a safety feature used to protect workers and does not prevent caving. If the excavations are left open for extended periods of time, then caving of the sidewalls may occur. The presence of caved material will limit the ability to properly backfill and compact the trenches. The contractor should be prepared to fill voids between the box shoring and the sidewalls of the trenches with sand or gravel before caving occurs.

All temporary excavation slopes and shoring systems are the sole responsibility of the contractor, as the contractor is in the best position to select these systems based on their means and methods.

Trench Dewatering

Dewatering will be required if groundwater is encountered. Groundwater is likely to be encountered at elevations between approximately 351 to 358 feet. Pumping from a sump located within the trench may be effective in dewatering localized sections of trench. However, this method is unlikely to prove effective in dewatering long sections of trench or large excavations. In addition, the sidewalls of trench excavations will need to be flattened or shored if seepage is encountered.

Where groundwater seepage into shored excavations occurs, we recommend placing at least 1 foot of stabilization material at the base of the excavations. Trench stabilization material should meet the requirements provided in the "Structural Fill" section of this report.

We note that these recommendations are for guidance only. The dewatering of excavations is the sole responsibility of the contractor, as the contractor is in the best position to select these systems based on their means and methods.

DRAINAGE

Where possible, the finished ground surface around the buildings should be sloped away from the structures at a minimum 2 percent gradient for a distance of at least 5 feet. Downspouts or roof scuppers should discharge into a storm drain system that carries the collected water to an appropriate stormwater system. Trapped planter areas should not be created adjacent to the buildings without providing means for positive drainage (e.g., swales or catch basins).

PERMANENT SLOPES

Permanent cut and fill slopes should not exceed 2H:1V. Access roads and pavements should be located at least 5 feet from the top of cut and fill slopes. The setback should be increased to 10 feet for buildings. The slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face of the slope.

STRUCTURAL FILL

General

Fill should be placed on subgrade that has been prepared in conformance with the "Site Preparation" section of this report. A variety of material may be used as structural fill at the site. However, all material used as structural fill should be free of organic matter or other unsuitable material and should meet the specifications provided in Oregon Standard Specifications for Construction - 2015 (OSSC) 00330 (Earthwork), OSSC 00400 (Drainage and Sewers), and OSSC 02600 (Aggregates), depending on the application. A brief characterization of some of the acceptable materials and our recommendations for their use as structural fill is provided below.

In locations where fill is to be placed against the side slopes of depressions, such as the drainage ravine at the east edge of proposed Building 10, level benches should be cut into the existing sloping surfaces to remove the loose surface material and should extend into the structural fill of the existing embankment. The benches should be a minimum of 10 feet wide or 1½ times the width of the compaction equipment, whichever is wider.

On-Site Soil

The material at the site should be suitable for use as general structural fill, provided it is properly moisture conditioned; free of debris, organic material, and particles over 6 inches in diameter; and meets the specifications provided in OSSC 00330.12 (Borrow Material). Material generated from cuts on site will consist of silt, clay, or decomposed basalt composed of gravel and rock in a silt or clay matrix. Fine-grained soil is generally sensitive to small changes in moisture content and is difficult, if not impossible, to compact adequately during wet conditions or when its moisture content is more than a few percentage points above optimum. Laboratory testing indicates that the moisture content of the on-site silt and clay is considerably greater than the anticipated optimum moisture content required for satisfactory compaction, which, based on our experience, is approximately 16 percent. Therefore, moisture conditioning will be required to achieve adequate compaction. As an alternative, use of the on-site silt or clay material as structural fill may be acceptable if it is properly amended with portland cement.

When used as structural fill, native soil should be placed in lifts with a maximum uncompacted thickness of 6 to 8 inches and compacted to not less than 92 percent of the maximum dry density for fine-grained soil and 95 percent of the maximum dry density for granular soil, as determined by ASTM D 1557.

Imported Granular Material

Imported granular material used as structural fill should be pit- or quarry-run rock, crushed rock, or crushed gravel and sand and should meet the specifications provided in OSSC 00330.14 (Selected Granular Backfill) or OSSC 00330.15 (Selected Stone Backfill). The imported granular material should also be angular, fairly well graded between coarse and fine material, have less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve, and have at least two fractured faces.

Imported granular material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557. During the wet season or when wet subgrade conditions exists, the initial lift should be approximately 18 inches in uncompacted thickness and should be compacted by rolling with a smooth-drum roller without using vibratory action.

Floor Slab Base Rock

Imported granular material placed beneath building floor slabs should be clean crushed rock or crushed gravel and sand that is fairly well graded between coarse and fine. The granular material should have a maximum particle size of 1½ inches, have less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve, have at least two mechanically fractured faces, and meet OSSC 02630 (Base Aggregate).

The floor slab base rock material should be placed in one lift and compacted to not less than 95 percent of the maximum dry density as determined by ASTM D 1557.

Pavement Base Rock

Imported granular material used as base rock for pavements should consist of ¾- or 1½-inch-minus material meeting the requirements in OSSC 00641 (Aggregate Subbase, Base, and

Shoulders), with the exception that the aggregate has less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve and at least two mechanically fractured faces.

The pavement base rock material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557.

Trench Backfill

Trench backfill for the utility pipe base and pipe zone should consist of well-graded, granular material with a maximum particle size of 1 inch and less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve and meet OSSC 00405.12 (Bedding) and OSSC 00405.13 (Pipe Zone). The material should be free of roots, organic matter, and other unsuitable material. Backfill for the pipe base and pipe zone should be compacted to at least 90 percent of the maximum dry density, as determined by ASTM D 1557, or as recommended by the pipe manufacturer.

Within building and pavement areas, trench backfill placed above the pipe zone should consist of imported granular material meeting requirements of OSSC 00405.14 (Trench Backfill, Class B). The backfill should be compacted to at least 92 percent of the maximum dry density, as determined by ASTM D 1557, at depths greater than 2 feet below the finished subgrade and 95 percent of the maximum dry density, as determined by ASTM D 1557, within 2 feet of finished subgrade. In all other areas, trench backfill above the pipe zone should be compacted to at least 92 percent of the maximum dry density, as determined by ASTM D 1557.

Stabilization Material

Stabilization material used in staging or haul road areas, or as trench stabilization material, should consist of 4- or 6-inch-minus pit- or quarry-run rock, crushed rock, or crushed gravel and sand meeting the requirements set forth in OSSC 00330.16 (Stone Embankment Material); have at least two mechanically fractured faces; and have less than 5 percent by dry weight passing the U.S. Standard No. 4 sieve. The material should be free of organic matter and other deleterious material. Stabilization material should be placed in one lift and compacted to a firm condition.

Drain Rock

Drain rock should consist of angular granular material with a maximum particle size of 2 inches and should meet OSSC 00430.11 (Granular Drain Backfill Material). The material should be free of roots, organic matter, and other unsuitable material; have less than 2 percent by dry weight passing the U.S. Standard No. 200 sieve (washed analysis); and have at least at least two mechanically fractured faces.

Retaining Wall Select Backfill

Backfill material placed behind retaining walls and extending a horizontal distance of ½H, where H is the height of the retaining wall, should consist of select granular material that meets the specifications provided in OSSC 00510.12 (Granular Wall Backfill). We recommend the select granular wall backfill be separated from general fill, native soil, and/or topsoil using a geotextile fabric that meets the specifications provided below for drainage geotextiles.

The wall backfill should be compacted to a minimum of 95 percent of the maximum dry density, as determined by ASTM D 1557. However, backfill located within a horizontal distance of 3 feet from a retaining wall should only be compacted to approximately 90 percent of the maximum dry density, as determined by ASTM D 1557. Backfill placed within 3 feet of the wall should be compacted in lifts less than 6 inches thick using hand-operated tamping equipment (such as jumping jack or vibratory plate compactors). If flatwork (sidewalks or pavements) will be placed atop the wall backfill, we recommend that the upper 2 feet of material be compacted to 95 percent of the maximum dry density, as determined by ASTM D 1557.

Cement Amendment

General

In conjunction with an experienced contractor, the on-site soil can be amended with portland cement to obtain suitable support properties. Successful use of soil amendment depends on the use of correct mixing techniques, soil moisture content, and amendment quantities. Soil amending should be conducted in accordance with the specifications provided in OSSC 00344 (Treated Subgrade). The amount of cement used during treatment should be based on an assumed soil dry unit weight of 110 pounds per cubic foot (pcf). Variable amounts of oversize materials (cobble- and boulder-size material) exists at the site and these materials generally need to be removed prior to treatment to prevent damage to the specialty tilling equipment used in cement amendment. Efforts to remove oversize material should not damage the subgrade below the cement treatment depth.

Stabilization

Specific recommendations based on exposed site conditions for soil amending can be provided if necessary. However, for preliminary design purposes, we recommend a target strength for cement-amended subgrade for building and pavement subbase (below base aggregate) soil of 100 psi. The amount of cement used to achieve this target generally varies with moisture content and soil type. It is difficult to predict field performance of soil to cement amendment due to variability in soil response, and we recommend laboratory testing to confirm expectations. Generally, 4 percent cement by weight of dry soil can be used when the soil moisture content does not exceed approximately 20 percent. If the soil moisture content is in the range of 25 to 35 percent, 6 to 8 percent by weight of dry soil is recommended. The amount of cement added to the soil may need to be adjusted based on field observations and performance. Moreover, depending on the time of year and moisture content levels during amendment, water may need to be applied during tilling to appropriately condition the soil moisture content.

For building and pavement subbase, we recommend assuming a minimum cement ratio of 6 percent (by dry weight). If the soil moistures are in excess of 30 percent, a cement ratio of 7 percent will likely be needed.

A minimum curing of four days is required between treatment and construction traffic access. Construction traffic should not be allowed on unprotected cement-amended subgrade. To protect the cement-amended surfaces from abrasion or damage, the finished surface should be covered with 4 to 6 inches of imported granular material.

Treatment depths for building/pavement, haul roads, and staging areas are typically on the order of 12, 16, and 12 inches, respectively. The crushed rock typically becomes contaminated with soil during construction. Contaminated base rock should be removed and replaced with clean rock in pavement areas. The actual thickness of the amended material and imported granular material for haul roads and staging areas will depend on the anticipated traffic, as well as the contractor's means and methods, and, accordingly, should be the contractor's responsibility.

Structural

On-site soil that would not otherwise be suitable for structural fill may be amended and placed as fill over a subgrade prepared in conformance with the "Site Preparation" section of this report. The cement ratio for general cement-amended fill can generally be reduced by 1 percent (by dry weight). Typically, a minimum curing of four days is required between treatment and construction traffic access. Consecutive lifts of fill may be treated immediately after the previous lift has been amended and compacted (e.g., the four-day wait period does not apply). However, where the final lift of fill is a building or roadway subgrade, then the four-day wait period is in effect.

Compaction

A static, sheepsfoot or segment pad roller with a minimum static weight of 40,000 pounds should be used for compaction of fine-grained soil followed by final compaction using a smooth-drum roller with a minimum applied lineal force of 700 pounds per inch. The amended soil should be compacted to at least 92 percent of the achievable dry density at the moisture content of the material, as defined by ASTM D 1557.

Specifications Recommendations

We recommend that the following comments be included in the specifications for the project:

- Mixing Equipment
  - Use a pulverizer/mixer capable of uniformly mixing the cement into the soil to the design depth. Blade mixing will not be allowed.
  - Pulverize the soil-cement mixture such that 100 percent by dry weight passes a 1 inch sieve and a minimum of 70 percent passes a No. 4 sieve, exclusive of gravel or stone retained on these sieves. If water is required, the pulverizer should be equipped to inject water to a tolerance of ¼ gallon per square foot of surface area.
  - Use machinery that will not disturb the subgrade, such as using low-pressure "balloon" tires on the pulverizer/mixer vehicle. If subgrade is disturbed, the tilling/treatment depth shall extend the full depth of the disturbance.
  - Multiple "passes" of the tiller will likely be required to adequately blend the cement and soil mixture.

- Spreading Equipment
  - Use a spreader capable of distributing the cement uniformly on the ground to within 5 percent variance of the specified application rate.
  - Use machinery that will not disturb the subgrade, such as using low-pressure "balloon" tires on the spreader vehicle. If subgrade is disturbed, the tilling/treatment depth shall extend the full depth of the disturbance.

- Compaction Equipment
  - Use a static, sheepsfoot or segmented pad roller with a minimum static weight of 40,000 pounds for initial compaction of fine-grained soil (silt and clay), or an alternate approved by the geotechnical engineer.
  - Use a vibratory, smooth-drum roller with a minimum applied lineal force of 600 pounds per inch for final compaction, or an alternate approved by the geotechnical engineer.

SHALLOW FOUNDATIONS

General

Based on the results of our subsurface explorations and analyses, it is our opinion that the proposed structures, with the anticipated design foundation loads as previously described, can be supported on shallow foundations. The foundations should be founded on granular pads underlain by undisturbed native soil or approved structural fill underlain by undisturbed native soil.

Granular Pads

The granular pads should be a minimum of 4 inches thick, increasing to a minimum of 6 inches thick during the wet winter months, and extend 6 inches beyond the margins of the footings for every foot excavated below the base grade of the footing. The granular pads should consist of imported granular material, as defined in the "Structural Fill" section of this report. The imported granular material should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557, or, as determined by one of our geotechnical staff, until well-keyed. We recommend that a member of our geotechnical staff observe the prepared footing subgrade.

Dimensions and Capacities

We recommend using an allowable bearing pressure of 2,500 psf for the footings bearing on undisturbed native soil or approved structural fill underlain by undisturbed native soil. This is a net bearing pressure; the weight of the footing and overlying backfill can be ignored in calculating footing sizes. The recommended allowable bearing pressure applies to the total of dead plus long-term live loads and may be increased by 50 percent for short-term loads such as those resulting from wind or seismic forces. Continuous wall and spread footings should be at least 18 and 24 inches wide, respectively. The bottom of exterior footings should be at least 18 inches below the lowest adjacent final grade. The bottom of interior footings should be placed at least 12 inches below the base of the floor slab.

Resistance to Sliding

Lateral loads on footings can be resisted by passive earth pressure on the sides of the structures and by friction on the base of the footings. Our analysis indicates that the available passive earth pressure for footings confined by native silt and structural fill is 350 pcf. Typically, the movement required to develop the available passive resistance may be relatively large; therefore, we recommend using a reduced passive pressure of 250 pcf. Adjacent floor slabs, pavements, or the upper 12-inch depth of adjacent unpaved areas should not be considered when calculating passive resistance. A coefficient of friction equal to 0.35 may be used when calculating resistance to sliding for footings in direct contact with the native silt, or structural fill bearing on native soil.

SEISMIC CONSIDERATIONS

The seismic design criterion in accordance with the 2012 IBC and 2014 State of Oregon Structural Specialty Code are summarized in Table 1.

Table 1. IBC Seismic Design Parameters

Parameters	Short Period	1 Second
Maximum Considered Earthquake Spectral Acceleration	S_s = 0.91 g	S_1 = 0.43 g
Site Class	D	
Site Coefficient	F_a = 1.14	F_v = 1.57
Adjusted Spectral Acceleration	S_{MS} = 1.03 g	S_{M1} = 0.68 g
Design Spectral Response Acceleration Parameters	S_{DS} = 0.69 g	S_{D1} = 0.45 g
Design Peak Ground Acceleration	0.28 g	

FLOOR SLABS

General

Satisfactory subgrade support for building floor slabs supporting up to 200 psf area loading can be obtained provided the building areas are prepared as described previously. A 6-inch-thick layer of imported granular material should be placed and compacted over the prepared subgrade to assist as a capillary break. Imported granular material should meet the requirements for building slab base rock, as described in the "Structural Fill" section of this report.

We recommend that we be allowed to review the grading plan once it is available to identify areas that might require under slab drainage. Flooring manufacturers often require vapor barriers to protect flooring and flooring adhesives. Many flooring manufacturers will warrant their product only if a vapor barrier is installed according to their recommendations. However, several office/warehouse facilities have successfully been constructed near the site without using a vapor barrier. Selection and design of an appropriate vapor barrier, if needed, should be based on discussions among members of the design team. We can provide additional information to assist you with your decision.

Slabs should be reinforced according to their proposed use and per the structural engineer's recommendations. Load-bearing concrete slabs may be designed assuming a modulus of subgrade reaction (k) of 150 psi per inch.

PAVEMENT RECOMMENDATIONS

General

Pavements should be installed on compacted subgrade or new engineered fills prepared in conformance with the "Site Preparation" section of this report. Our pavement recommendations are based on the following assumptions:

- The top 12 inches of soil subgrade below the roadway alignment is compacted to at least 92 percent of its maximum density per ASTM D 1557.
- A resilient modulus of 4,000 psi was estimated for a compacted soil or undisturbed firm native subgrade.
- A resilient modulus of 20,000 psi was estimated for base rock.
- Initial and terminal serviceability indices of 4.2 and 2.5, respectively.
- Reliability and standard deviation of 85 percent and 0.45, respectively.
- Structural coefficients of 0.42 and 0.10 for the AC and base rock, respectively.
- Structural coefficient of 0.08 for cement-amended subgrade.

The traffic loading for the development is not known. Based on our experience with similar developments, we have assigned equivalent single-axle load (ESAL) values of 8,000 and 60,000 for automobile parking areas and access lanes, respectively. If any of these assumptions are incorrect, our office should be contacted with the appropriate information so that the pavement designs can be revised.

Table 2. Minimum Pavement Thicknesses with Compacted Soil Subgrade

Traffic Loading (ESALs)	AC (inches)	Base Aggregate (inches)
8,000	3.0	7.0
60,000	3.5	11.0

Due to the moist soil conditions found at the site, it may be very difficult, particularly during rainy periods, to properly moisture condition and compact the roadway subgrade in accordance with the "Site Preparation" section of this report. As an alternative to moisture conditioning and compaction, the subgrade may be amended with cement. This will allow for construction of the pavement sections without disturbing the sensitive soil subgrade. If this method is chosen, the subgrade should be amended to a depth of 12 inches. The pavement sections may also be modified as shown in Table 3.

Table 3. Alternative Minimum Pavement Sections with Amended Subgrade[1]

Traffic Loading (ESALs)	AC (inches)	Base Rock (inches)
8,000	3.0	4.0
60,000	3.5	6.0

1. Cement-amended soil to a depth of 12 inches with a minimum seven-day unconfined compressive strength of 100 psi.

Construction traffic should be limited to non-building unpaved portions of the site or haul roads. Construction traffic should not be allowed on new pavements. If construction traffic is to be allowed on newly constructed road sections, an allowance for this additional traffic will need to be made in the design pavement section.

The AC should be Level 2, ½-inch, dense asphalt concrete pavement (ACP) according to OSSC 00745 (Asphalt Concrete Pavement) and compacted to 91 percent of the maximum specific gravity of the mix, as determined by AASHTO T 209. The minimum and maximum lift thicknesses are 2.0 and 3.0 inches, respectively, for ½-inch ACP. Asphalt binder should be performance graded and conform to PG 64-22 or better. The base rock should meet the specifications for pavement base rock provided in the "Structural Fill" section of this report.

Cold Weather Paving Considerations

In general, AC paving is not recommended during the cold weather (temperatures less than 40 degrees Fahrenheit). Compacting under these conditions can result in low compaction and premature pavement distress

Each AC mix design has a recommended compaction temperature range that is specific for the particular AC binder used. In colder temperatures, it is more difficult to maintain the temperature of the AC mix as it can lose heat while stored in the delivery truck, as it is placed, and in the time between placement and compaction. In Oregon, the AC surface temperature during paving should be at least 40 degrees Fahrenheit for lift thickness greater than 2.5 inches and at least 50 degrees Fahrenheit for lift thickness between 2.0 and 2.5 inches.

If paving activities must take place during cold-weather construction as defined above, the project team should be consulted and a site meeting should be held to discuss ways to lessen low compaction risks.

OBSERVATION OF CONSTRUCTION

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

LIMITATIONS

We have prepared this report for use by PacTrust and members of the design and construction teams for the proposed project. The data and report can be used for bidding or estimating purposes, but our report, conclusions, and interpretations should not be construed as warranty of the subsurface conditions and are not applicable to other nearby building sites.

Exploration observations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect soil strata or water level variations that may exist between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, re-evaluation will be necessary.

The site development plans and design details were preliminary at the time this report was prepared. When the design has been finalized and if there are changes in the site grades or location, configuration, design loads, or type of construction for the buildings and walls, the conclusions and recommendations presented may not be applicable. If design changes are made, we request that we be retained to review our conclusions and recommendations and to provide a written modification or verification.

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

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

♦ ♦ ♦

We appreciate the opportunity to submit this report. Please contact us of you have questions or require additional information.

Sincerely,

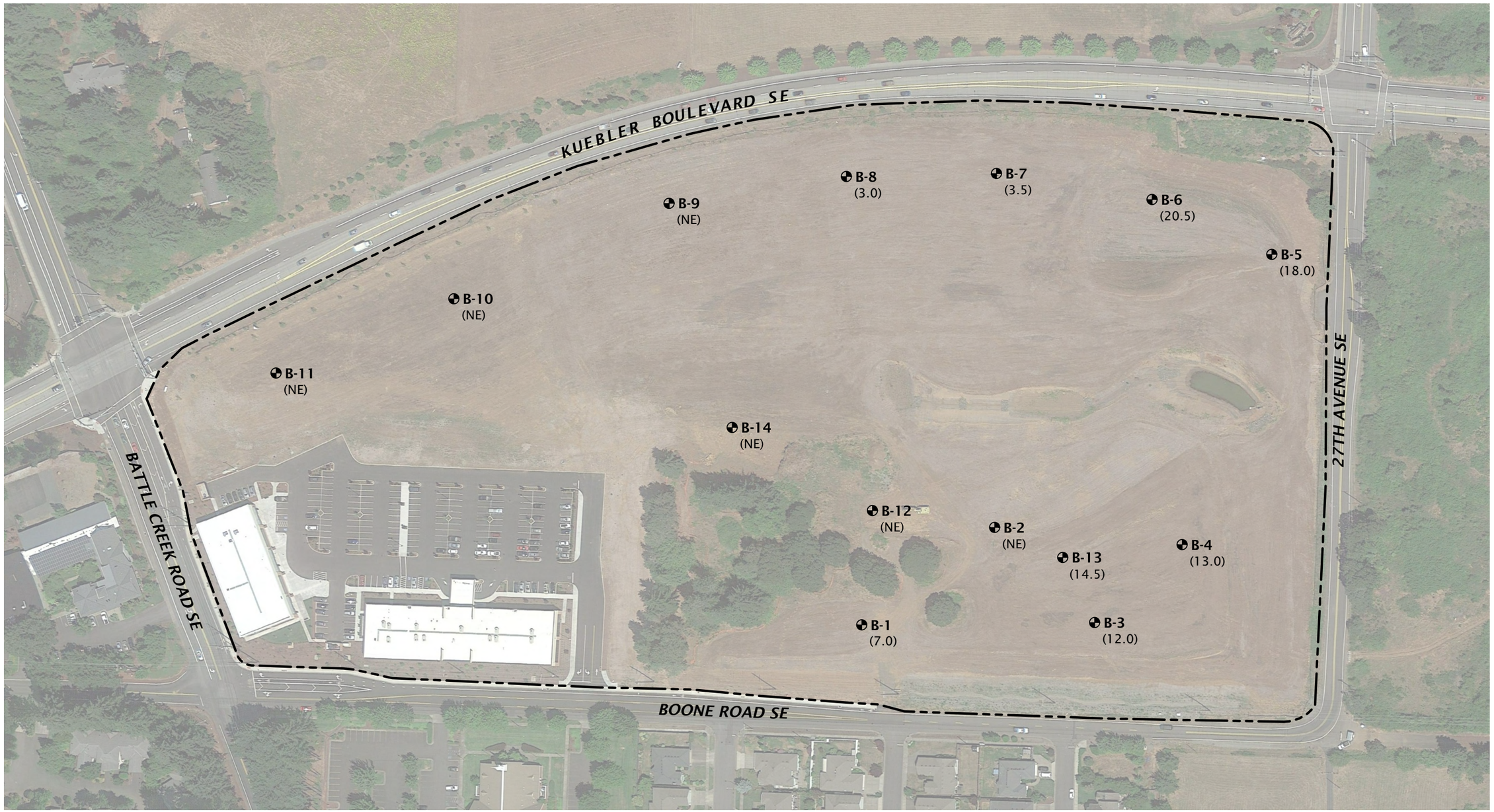
GeoDesign, Inc.

Viola C. Lai, P.E., G.E.
Project Engineer

George Saunders, P.E., G.E.
Principal Engineer

VCL:GPS:kt
Attachments
One copy submitted (via email only)
Document ID: PacTrust-162-09-061316-geolr.docx

FIGURES



LEGEND:

B-1 ⊕	BORING
(7.0)	FILL THICKNESS (FEET)
(NE)	NOT ENCOUNTERED
— — —	APPROXIMATE SITE BOUNDARY

N

0 150 300

(SCALE IN FEET)

SITE PLAN BASED ON AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO®, JUNE 2, 2016

SITE PLAN

KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE 1

PACTRUST-162-09

JUNE 2016

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Printed By: aday | Print Date: 6/13/2016 11:23:51 AM
File Name: J:\M-R\PacTrust\PacTrust-162\PacTrust-162-09\Figures\CAD\PacTrust-162-09-SP01.dwg | Layout: FIGURE 1

ATTACHMENT A

ATTACHMENT A

FIELD EXPLORATIONS

GENERAL

Subsurface conditions at the site were explored by drilling 14 borings (B-1 through B-14) to depths of 6.0 to 41.3 feet BGS. The borings were drilled on May 24 through 26, 2016 using mud rotary drilling methods by Western States Soil Conservation, Inc. of Hubbard, Oregon. The explorations were observed by a member of our geology staff. The exploration logs are presented in this attachment.

Approximate locations of our explorations are shown on Figure 1. Exploration locations were chosen based on preliminary site plans provided to our office by PacTrust. The locations of the explorations were determined in the field using a hand-held differential GPS unit. This information should be considered accurate only to the degree implied by the methods used.

SOIL SAMPLING

We obtained representative samples of the various soil encountered in the explorations for geotechnical laboratory testing. Soil samples were obtained from the borings using standard penetration test (SPT) sampling methods. SPTs were performed in general conformance with ASTM D 1586. The sampler was driven with a 140-pound hammer free-falling 30 inches. The number of blows required to drive the sampler 1 foot, or as otherwise indicated, into the soil is shown adjacent to the sample symbols on the exploration logs. Disturbed samples were obtained from the split barrel for subsequent classification and index testing. Sampling intervals are shown on the exploration logs.

SOIL CLASSIFICATION

The soil samples were classified in accordance with the "Exploration Key" (Table A-1) and "Soil Classification System" (Table A-2), which are presented in this attachment. The exploration logs indicate the depths at which the soils or their characteristics change, although the change could be gradual. A horizontal line between soil types indicates an observed (visual or drill action) change. If the change occurred between sample locations and was not observed or obvious, the depth was interpreted and the change is indicated using a dashed line. Classifications are shown on the exploration logs.

The average efficiency of the automatic SPT hammer used by Western States Soil Conservation, Inc. was 94.2 percent. The calibration testing results are presented at the end of this attachment.

LABORATORY TESTING

CLASSIFICATION

The soil samples were classified in the laboratory to confirm field classifications. The laboratory classifications are shown on the exploration logs if those classifications differed from the field classifications.

MOISTURE CONTENT

The natural moisture content of selected soil samples was determined in general accordance with ASTM D 2216. The natural moisture content is a ratio of the weight of the water to soil in a test sample and is expressed as a percentage. The test results are presented in this attachment.

ATTERBERG LIMITS TESTING

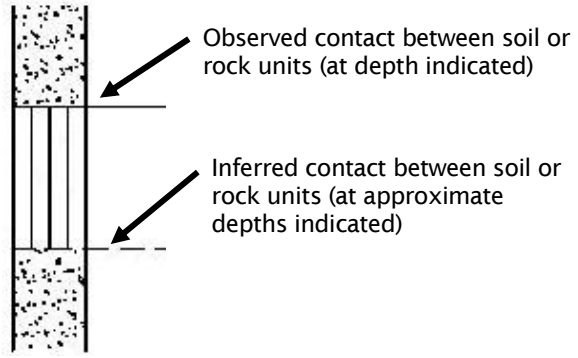
Atterberg limits (plastic and liquid limits) testing was performed on selected samples in general accordance with ASTM D 4318. The plastic limit is defined as the moisture content where the soil becomes brittle. The liquid limit is defined as the moisture content where the soil begins to act similar to a liquid. The plasticity index is the difference between the liquid and plastic limits. The test results are presented in this attachment.

GRAIN-SIZE TESTING

Grain-size testing was performed on selected soil samples to determine the distribution of soil particle sizes. The testing consisted of particle-size analysis completed in accordance with percent fines determination (percent passing the U.S. Standard No. 200 sieve) completed in general accordance with the ASTM C 117 or ASTM D 1140 (P200). Test results are presented in this attachment.

SYMBOL	SAMPLING DESCRIPTION
	Location of sample obtained in general accordance with ASTM D 1586 Standard Penetration Test with recovery
	Location of sample obtained using thin-wall Shelby tube or Geoprobe® sampler in general accordance with ASTM D 1587 with recovery
	Location of sample obtained using Dames & Moore sampler and 300-pound hammer or pushed with recovery
	Location of sample obtained using Dames & Moore and 140-pound hammer or pushed with recovery
	Location of sample obtained using 3-inch-O.D. California split-spoon sampler and 140-pound hammer
	Location of grab sample
	Rock coring interval
	Water level during drilling
	Water level taken on date shown

Graphic Log of Soil and Rock Types



GEOTECHNICAL TESTING EXPLANATIONS

ATT	Atterberg Limits	PP	Pocket Penetrometer
CBR	California Bearing Ratio	P200	Percent Passing U.S. Standard No. 200 Sieve
CON	Consolidation		
DD	Dry Density	RES	Resilient Modulus
DS	Direct Shear	SIEV	Sieve Gradation
HYD	Hydrometer Gradation	TOR	Torvane
MC	Moisture Content	UC	Unconfined Compressive Strength
MD	Moisture-Density Relationship	VS	Vane Shear
OC	Organic Content	kPa	Kilopascal
P	Pushed Sample		

ENVIRONMENTAL TESTING EXPLANATIONS

CA	Sample Submitted for Chemical Analysis	ND	Not Detected
P	Pushed Sample	NS	No Visible Sheen
PID	Photoionization Detector Headspace Analysis	SS	Slight Sheen
		MS	Moderate Sheen
ppm	Parts per Million	HS	Heavy Sheen

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EXPLORATION KEY

TABLE A-1

RELATIVE DENSITY - COARSE-GRAINED SOILS

Relative Density	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)
Very Loose	0 – 4	0 - 11	0 - 4
Loose	4 – 10	11 - 26	4 - 10
Medium Dense	10 – 30	26 - 74	10 - 30
Dense	30 – 50	74 - 120	30 - 47
Very Dense	More than 50	More than 120	More than 47

CONSISTENCY - FINE-GRAINED SOILS

Consistency	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)	Unconfined Compressive Strength (tsf)
Very Soft	Less than 2	Less than 3	Less than 2	Less than 0.25
Soft	2 - 4	3 – 6	2 - 5	0.25 - 0.50
Medium Stiff	4 - 8	6 – 12	5 - 9	0.50 - 1.0
Stiff	8 - 15	12 – 25	9 - 19	1.0 - 2.0
Very Stiff	15 - 30	25 – 65	19 – 31	2.0 - 4.0
Hard	More than 30	More than 65	More than 31	More than 4.0

PRIMARY SOIL DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOILS (more than 50% retained on No. 200 sieve)	GRAVEL (more than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVELS (< 5% fines)	GW or GP	GRAVEL
		GRAVEL WITH FINES (≥ 5% and ≤ 12% fines)	GW-GM or GP-GM	GRAVEL with silt
			GW-GC or GP-GC	GRAVEL with clay
		GRAVELS WITH FINES (> 12% fines)	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND (50% or more of coarse fraction passing No. 4 sieve)	CLEAN SANDS (<5% fines)	SW or SP	SAND
		SANDS WITH FINES (≥ 5% and ≤ 12% fines)	SW-SM or SP-SM	SAND with silt
			SW-SC or SP-SC	SAND with clay
		SANDS WITH FINES (> 12% fines)	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS (50% or more passing No. 200 sieve)	SILT AND CLAY	Liquid limit less than 50	ML	SILT
			CL	CLAY
			CL-ML	silty CLAY
			OL	ORGANIC SILT or ORGANIC CLAY
		Liquid limit 50 or greater	MH	SILT
			CH	CLAY
			OH	ORGANIC SILT or ORGANIC CLAY
HIGHLY ORGANIC SOILS			PT	PEAT

MOISTURE CLASSIFICATION

Term	Field Test
dry	very low moisture, dry to touch
moist	damp, without visible moisture
wet	visible free water, usually saturated

ADDITIONAL CONSTITUENTS

Secondary granular components or other materials such as organics, man-made debris, etc.

Percent	Silt and Clay In: Fine-Grained Soils	Silt and Clay In: Coarse-Grained Soils	Percent	Sand and Gravel In: Fine-Grained Soils	Sand and Gravel In: Coarse-Grained Soils
< 5	trace	trace	< 5	trace	trace
5 – 12	minor	with	5 – 15	minor	minor
> 12	some	silty/clayey	15 – 30	with	with
			> 30	sandy/gravelly	Indicate %

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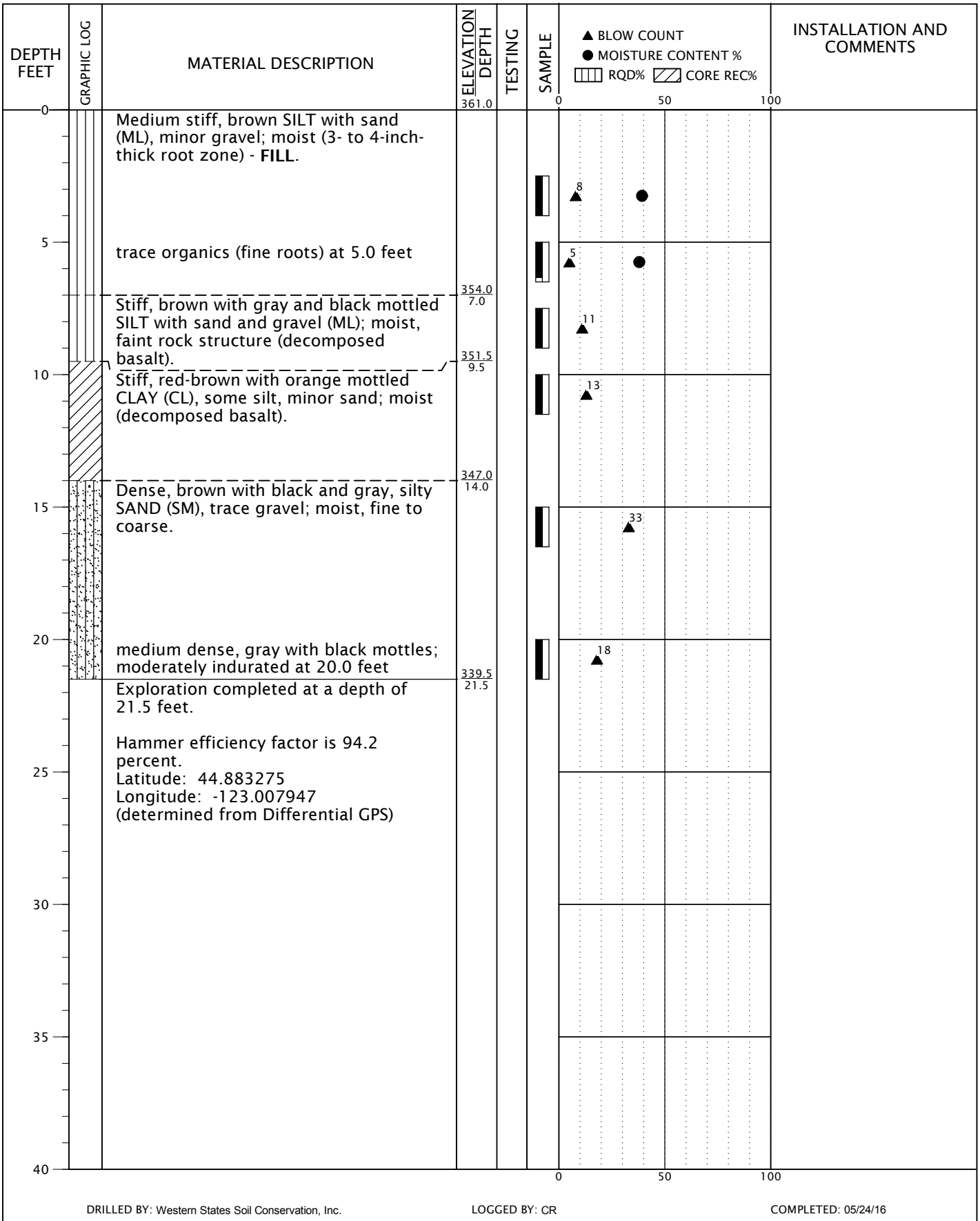
SOIL CLASSIFICATION SYSTEM

TABLE A-2



DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 05/24/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

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KUEBLER GATEWAY RETAIL
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FIGURE A-1

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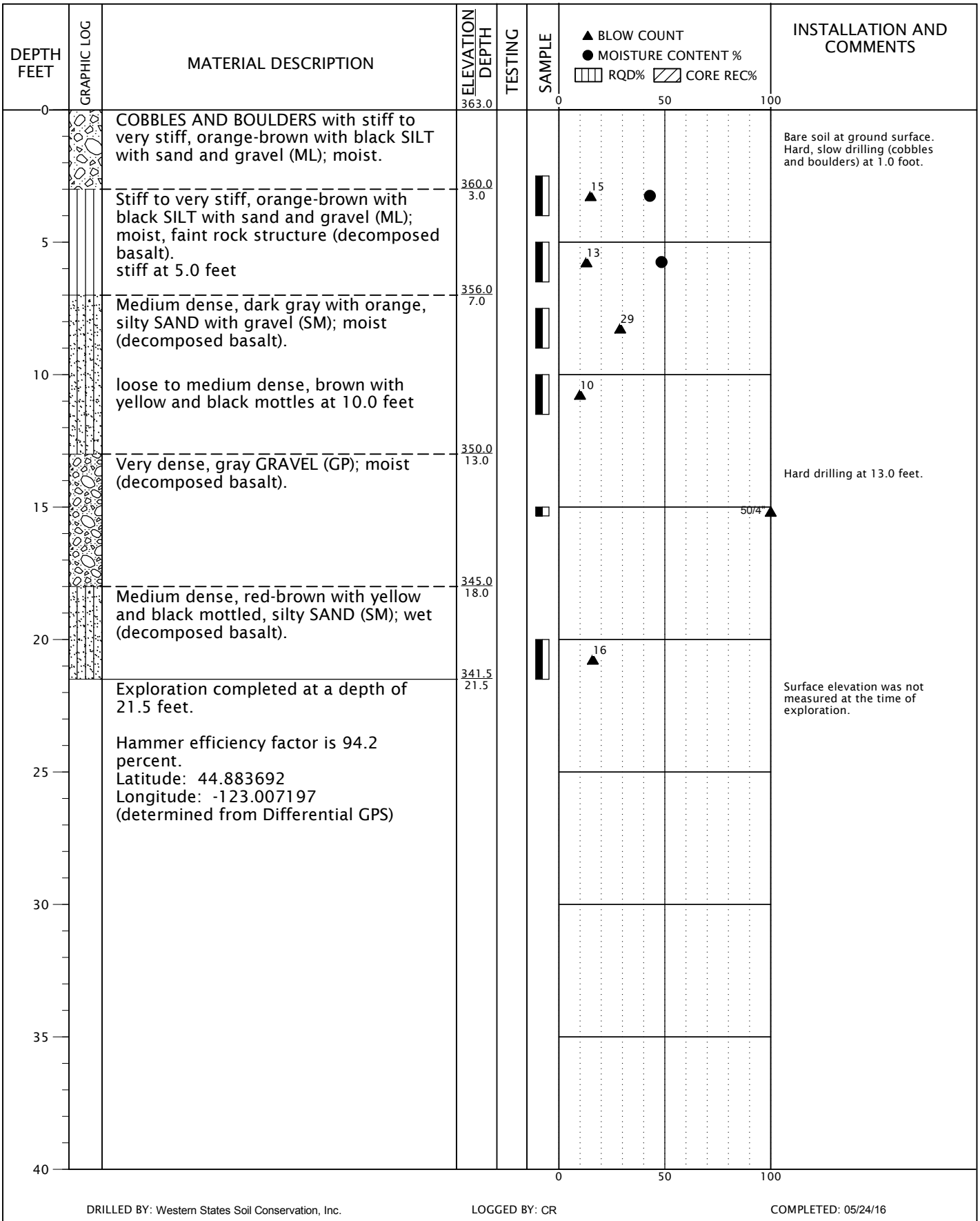

DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 05/24/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

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BORING B-2

JUNE 2016

KUEBLER GATEWAY RETAIL
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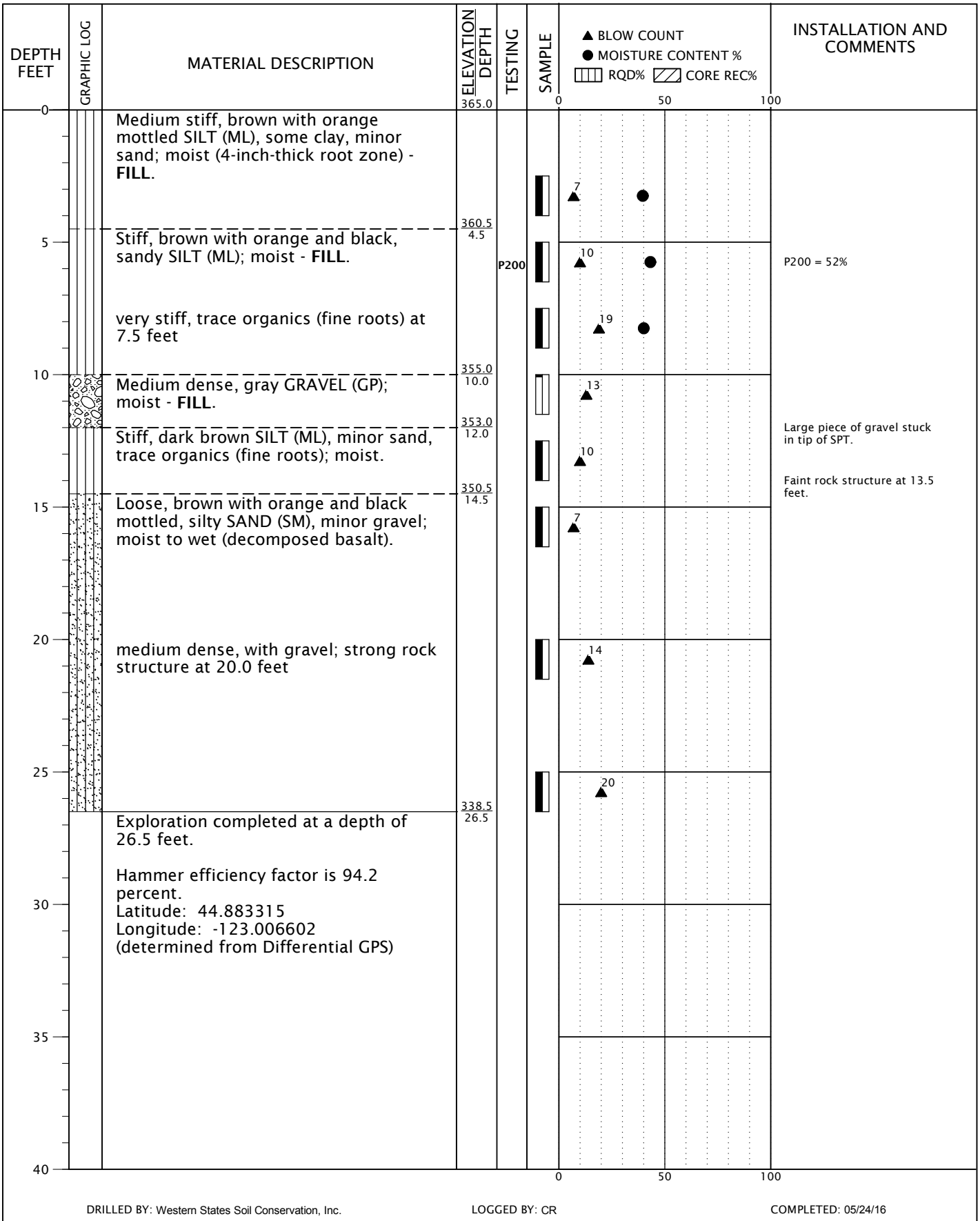
FIGURE A-2



DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 05/24/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

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BORING B-3

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FIGURE A-3

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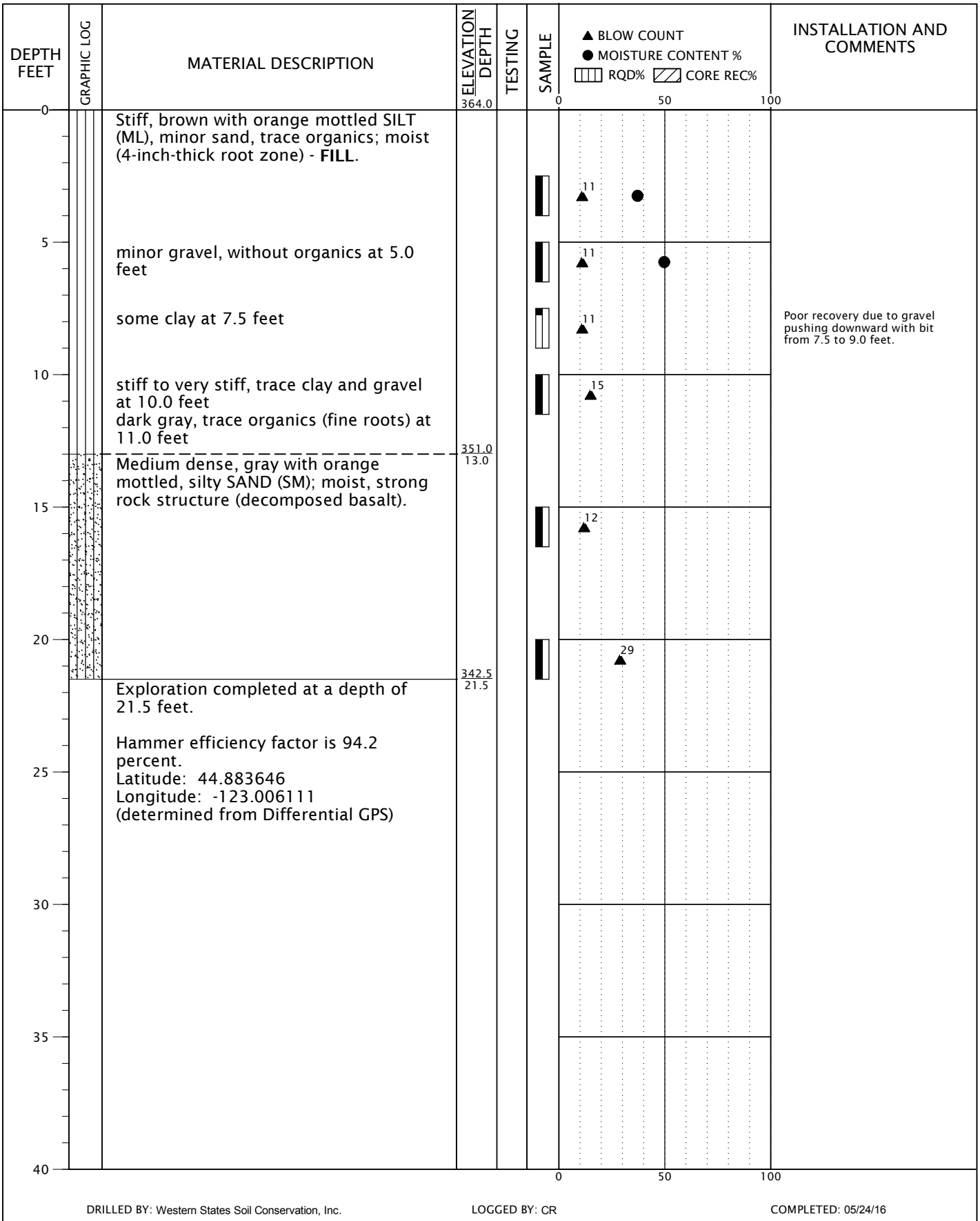

DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 05/24/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

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FIGURE A-4

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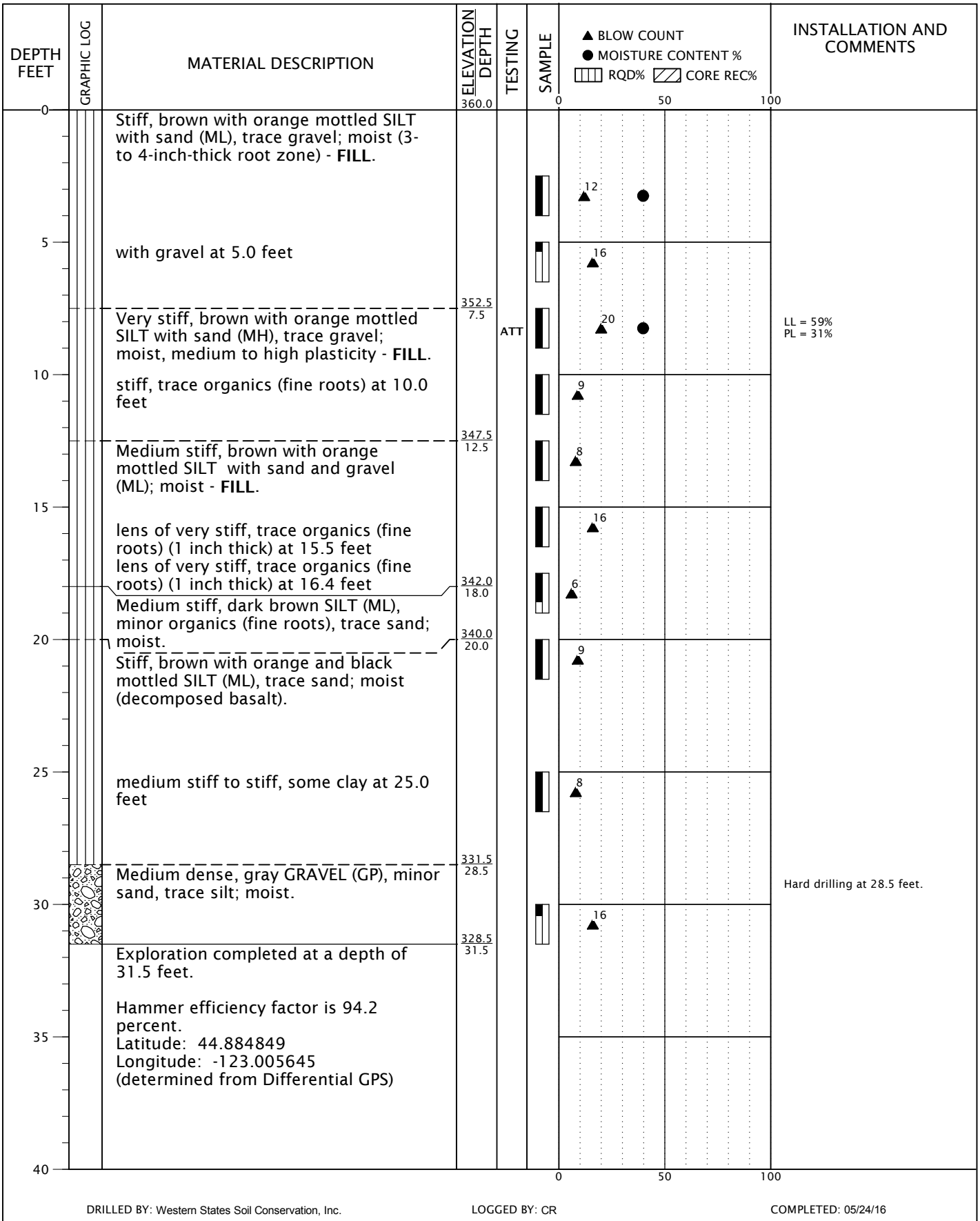

DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 05/24/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

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BORING B-5

JUNE 2016

KUEBLER GATEWAY RETAIL
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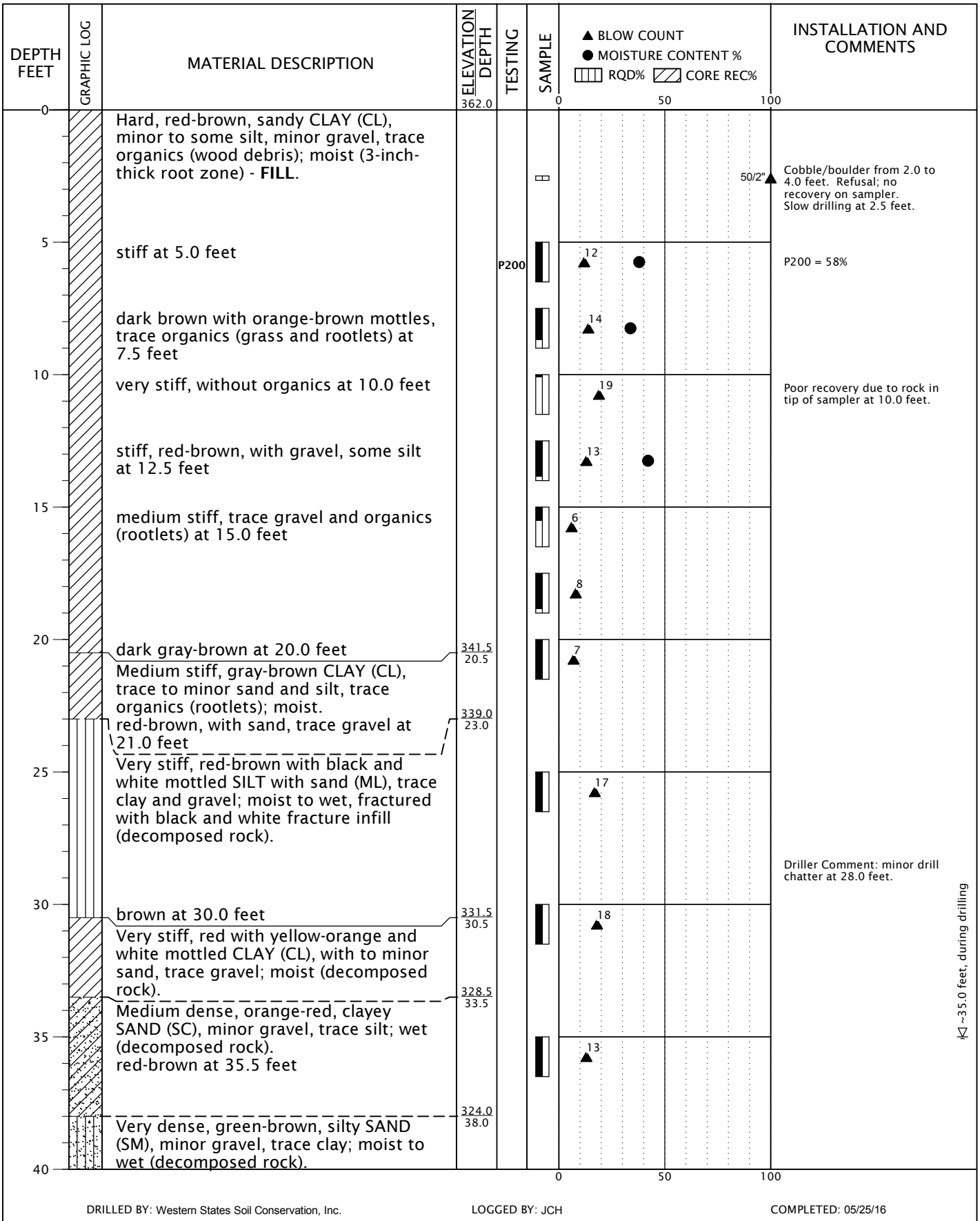
FIGURE A-5



DRILLED BY: Western States Soil Conservation, Inc.

LOGGED BY: JCH

COMPLETED: 05/25/16

BORING METHOD: mud rotary (see document text)

BORING BIT DIAMETER: 3 7/8 inches

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BORING B-6

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KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE A-6

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	▲ BLOW COUNT ● MOISTURE CONTENT % RQD% CORE REC%	INSTALLATION AND COMMENTS
40		(continued from previous page)				0 50 100	
			320.7 / 41.3			18-21-50/3" ▲	
		Exploration completed at a depth of 41.3 feet.					
		Hammer efficiency factor is 94.2 percent. Latitude: 44.885059 Longitude: -123.006346 (determined from Differential GPS)					
45							
50							
55							
60							
65							
70							
75							
80						0 50 100	

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BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

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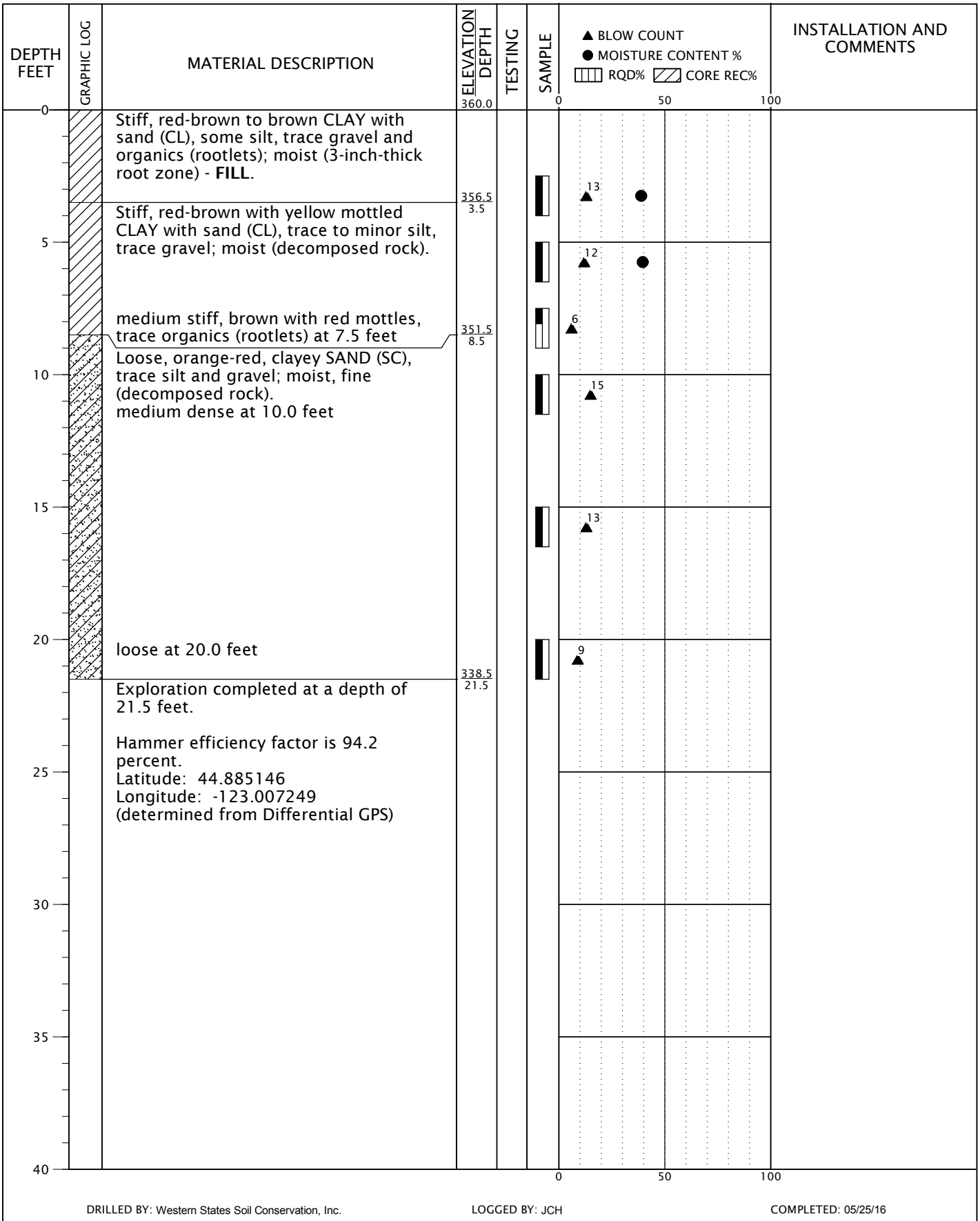
BORING B-6
(continued)

JUNE 2016

KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE A-6



DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: JCH COMPLETED: 05/25/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

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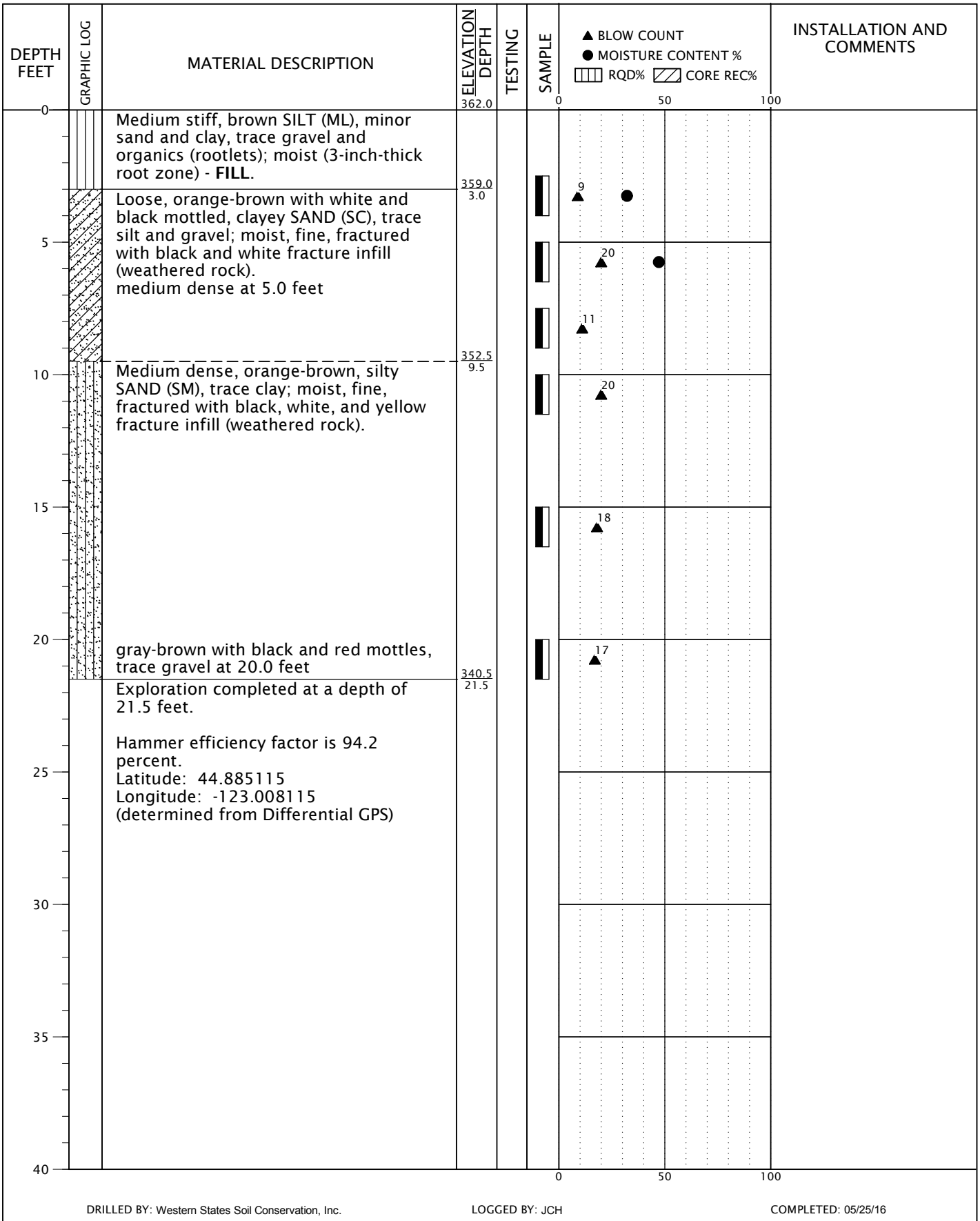
BORING B-7

JUNE 2016

KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE A-7

BORING LOG PACTRUST-162-09-B1_14.GPJ GEODESIGN.GDT PRINT DATE: 6/13/16:RC:KT



DRILLED BY: Western States Soil Conservation, Inc.

LOGGED BY: JCH

COMPLETED: 05/25/16

BORING METHOD: mud rotary (see document text)

BORING BIT DIAMETER: 3 7/8 inches

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PACTRUST-162-09

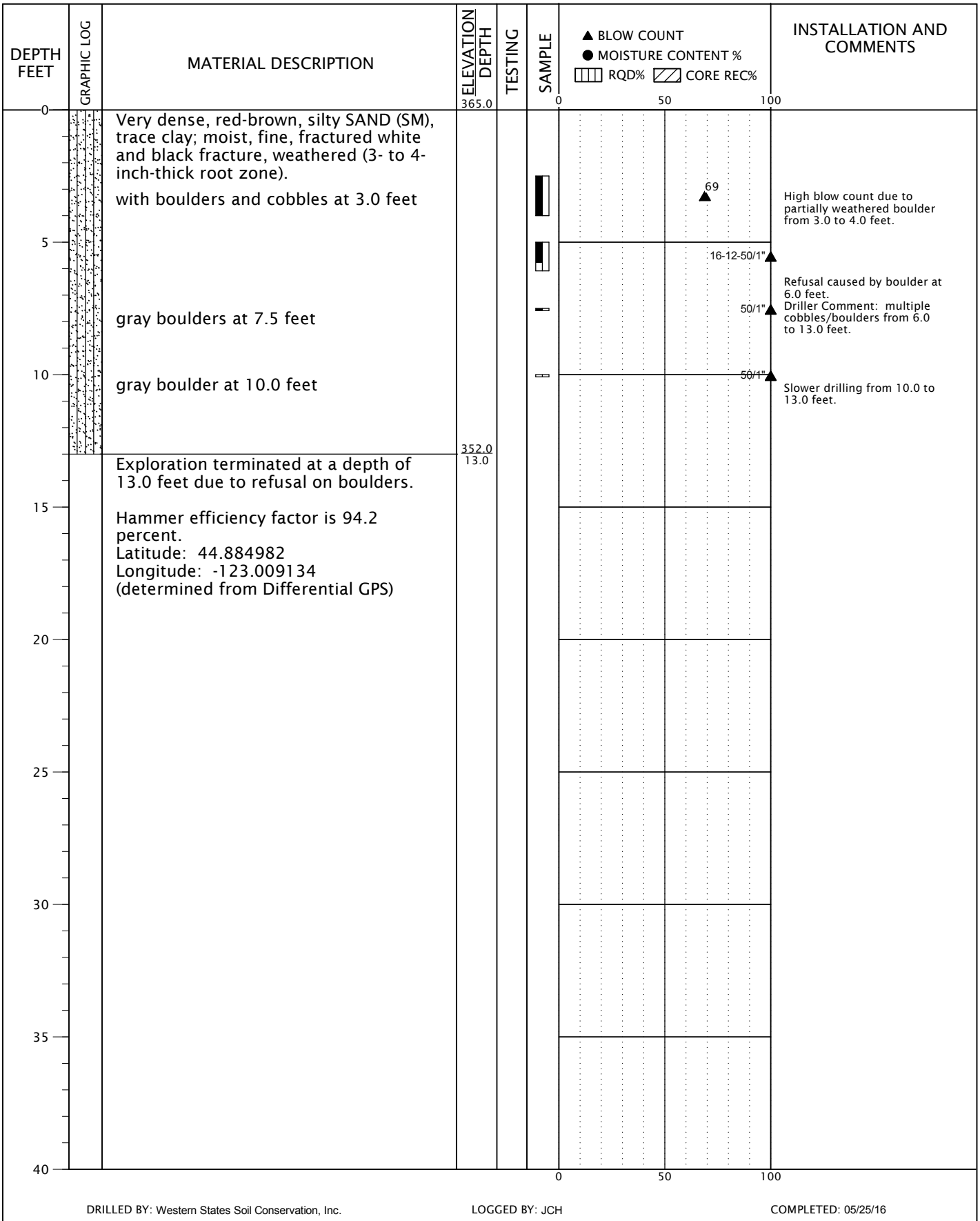
JUNE 2016

BORING B-8

KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE A-8

BORING LOG PACTRUST-162-09-B1_14.GPJ GEODESIGN.GDT PRINT DATE: 6/13/16:RC:KT



DRILLED BY: Western States Soil Conservation, Inc.

LOGGED BY: JCH

COMPLETED: 05/25/16

BORING METHOD: mud rotary (see document text)

BORING BIT DIAMETER: 3 7/8 inches

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PACTRUST-162-09

BORING B-9

JUNE 2016

KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE A-9

BORING LOG PACTRUST-162-09-B1_14.GPJ GEODESIGN.GDT PRINT DATE: 6/13/16:RC:KT

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	▲ BLOW COUNT ● MOISTURE CONTENT % RQD% CORE REC%	INSTALLATION AND COMMENTS
0		Very stiff, brown SILT with sand and gravel (ML), minor clay, trace organics (rootlets); moist (3- to 4-inch-thick root zone).	368.0				
		gray, bedrock/boulders at 1.5 feet				50/1"	Slow drilling from 1.5 to 6.0 feet.
5						50/1"	
		Exploration terminated at a depth of 6.0 feet due to refusal on bedrock/boulders.	362.0 / 6.0				
		Hammer efficiency factor is 94.2 percent. Latitude: 44.884562 Longitude: -123.01036 (determined from Differential GPS)					
10							
15							
20							
25							
30							
35							
40							

0 50 100

DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: JCH COMPLETED: 05/25/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

BORING LOG PACTRUST-162-09-B1_14.GPJ GEODESIGN.GDT PRINT DATE: 6/13/16:RC:KT

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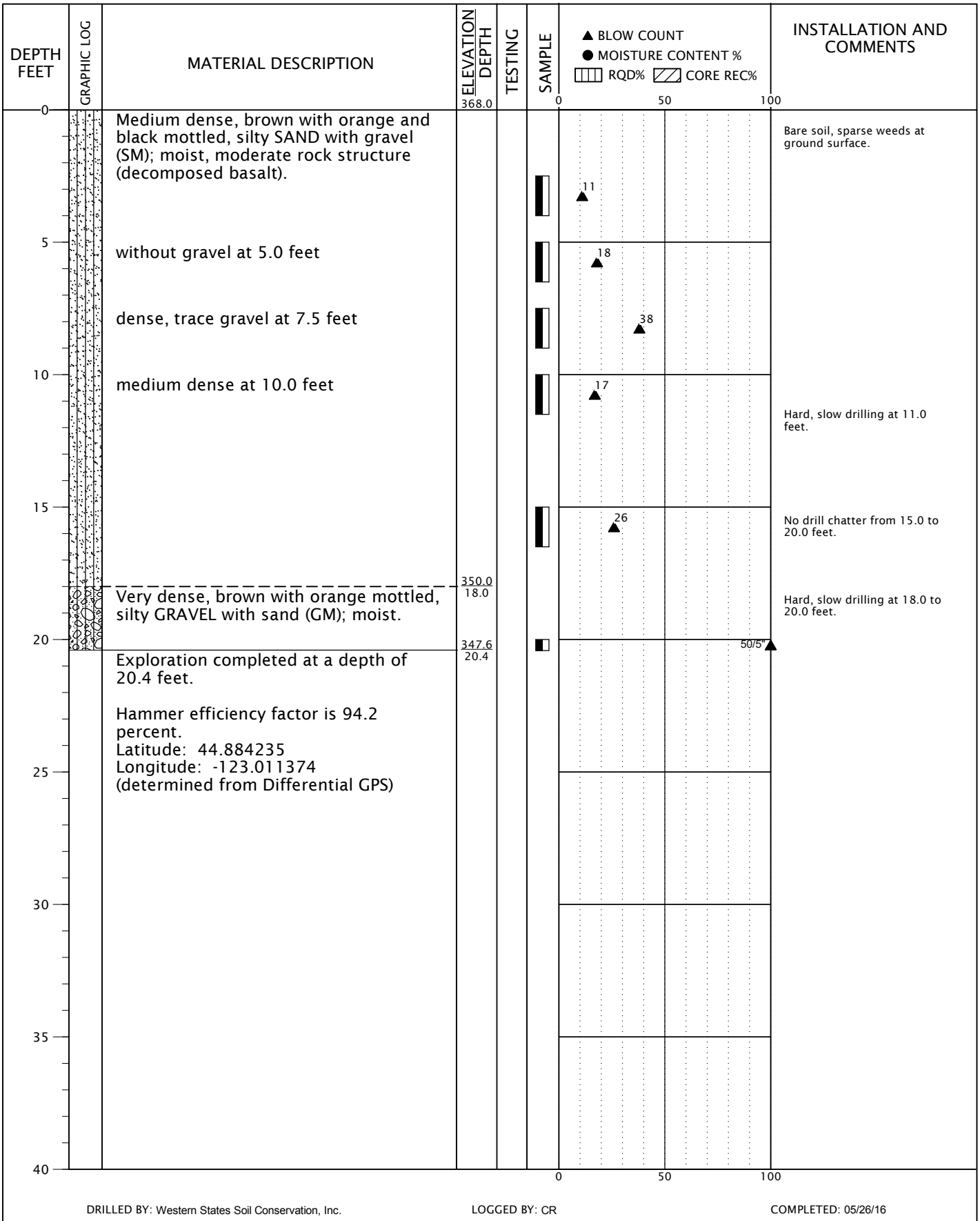
PACTRUST-162-09

BORING B-10

JUNE 2016

KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE A-10



DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 05/26/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

BORING LOG PACTRUST-162-09-B1_14.GPJ GEODESIGN.GDT PRINT DATE: 6/13/16:RC:KT

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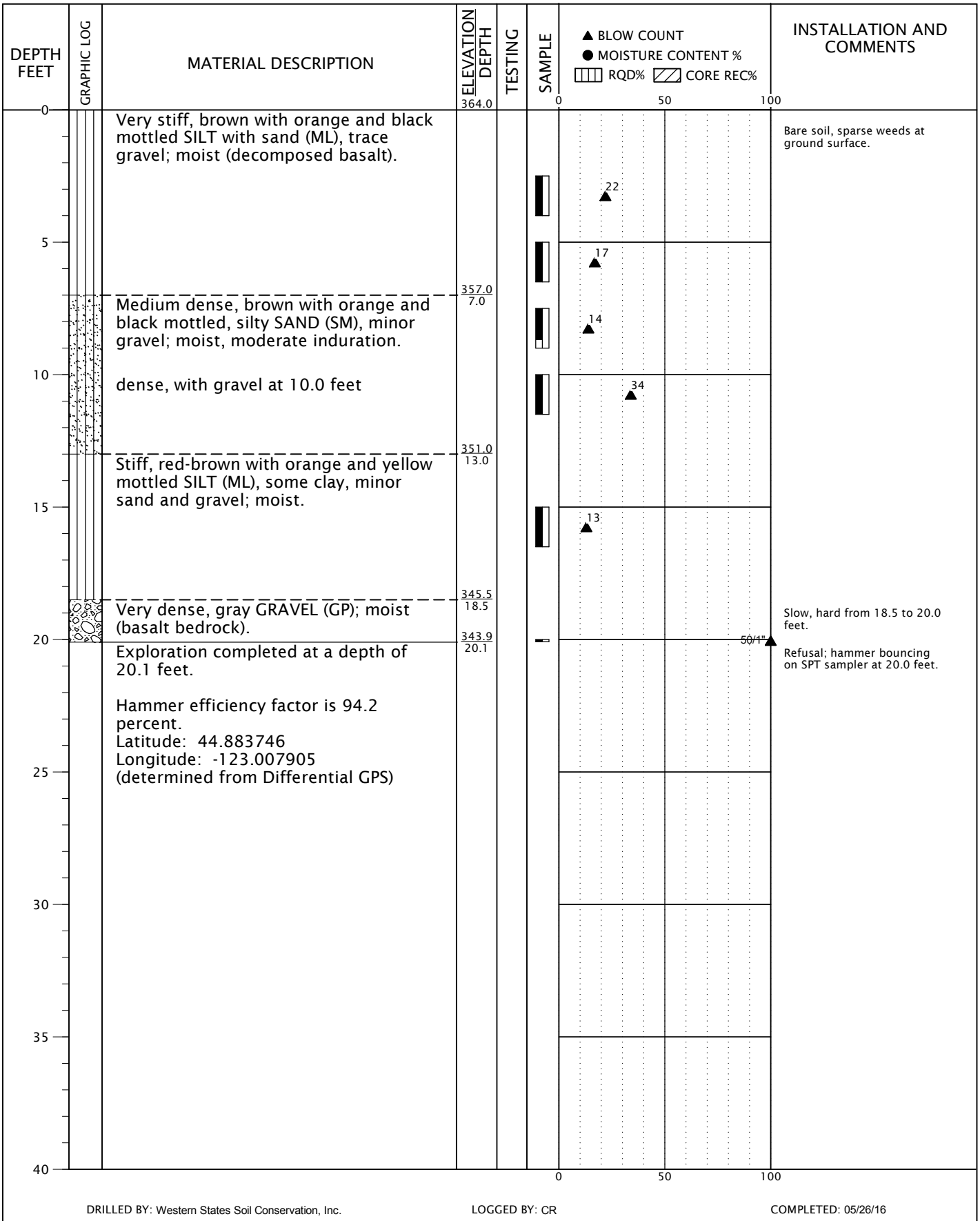
PACTRUST-162-09

BORING B-11

JUNE 2016

KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE A-11



DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: CR COMPLETED: 05/26/16

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 7/8 inches

BORING LOG PACTRUST-162-09-B1_14.GPJ GEODESIGN.GDT PRINT DATE: 6/13/16:RC:KT

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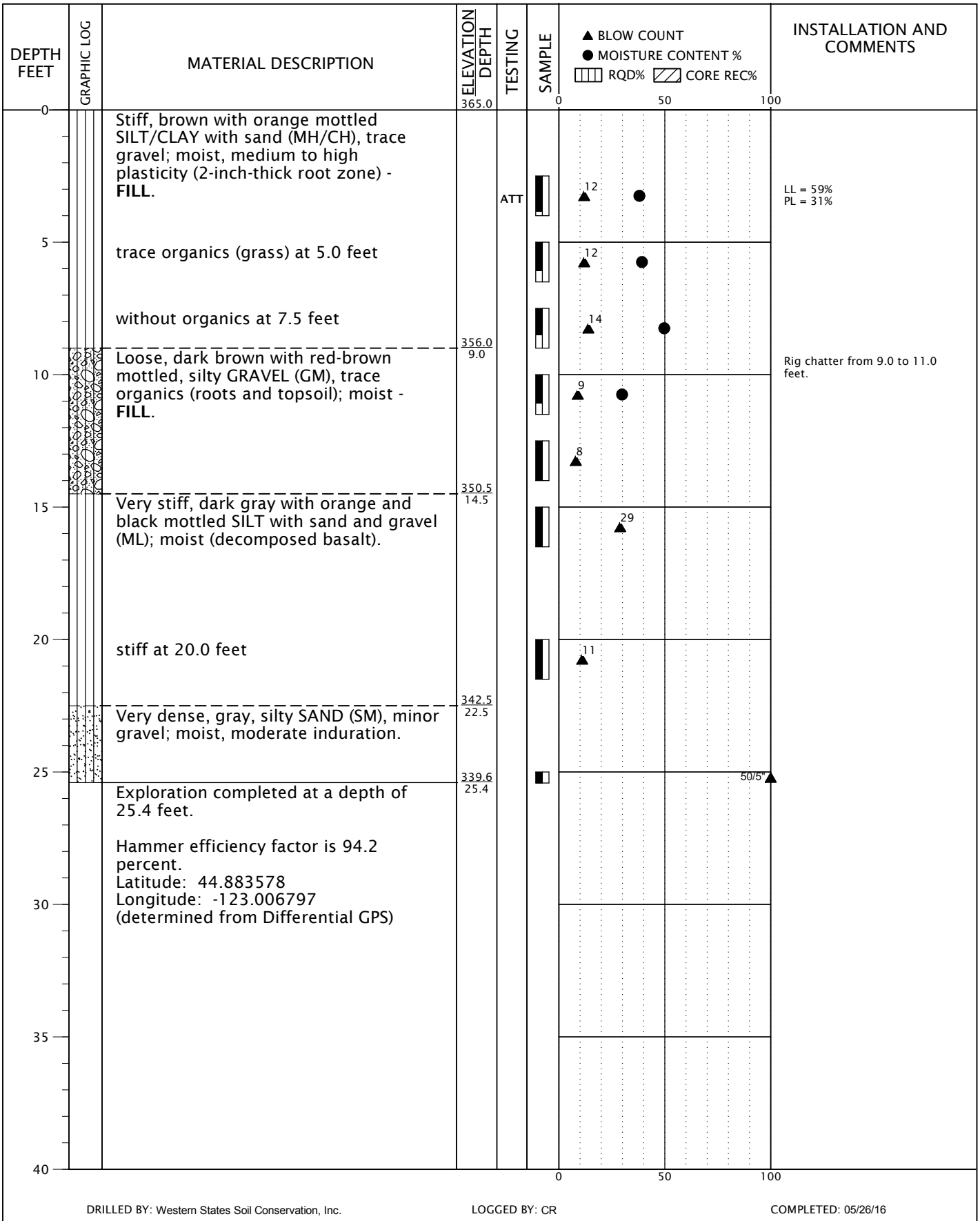
PACTRUST-162-09

BORING B-12

JUNE 2016

KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE A-12



DRILLED BY: Western States Soil Conservation, Inc.

LOGGED BY: CR

COMPLETED: 05/26/16

BORING METHOD: mud rotary (see document text)

BORING BIT DIAMETER: 3 7/8 inches

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PACTRUST-162-09

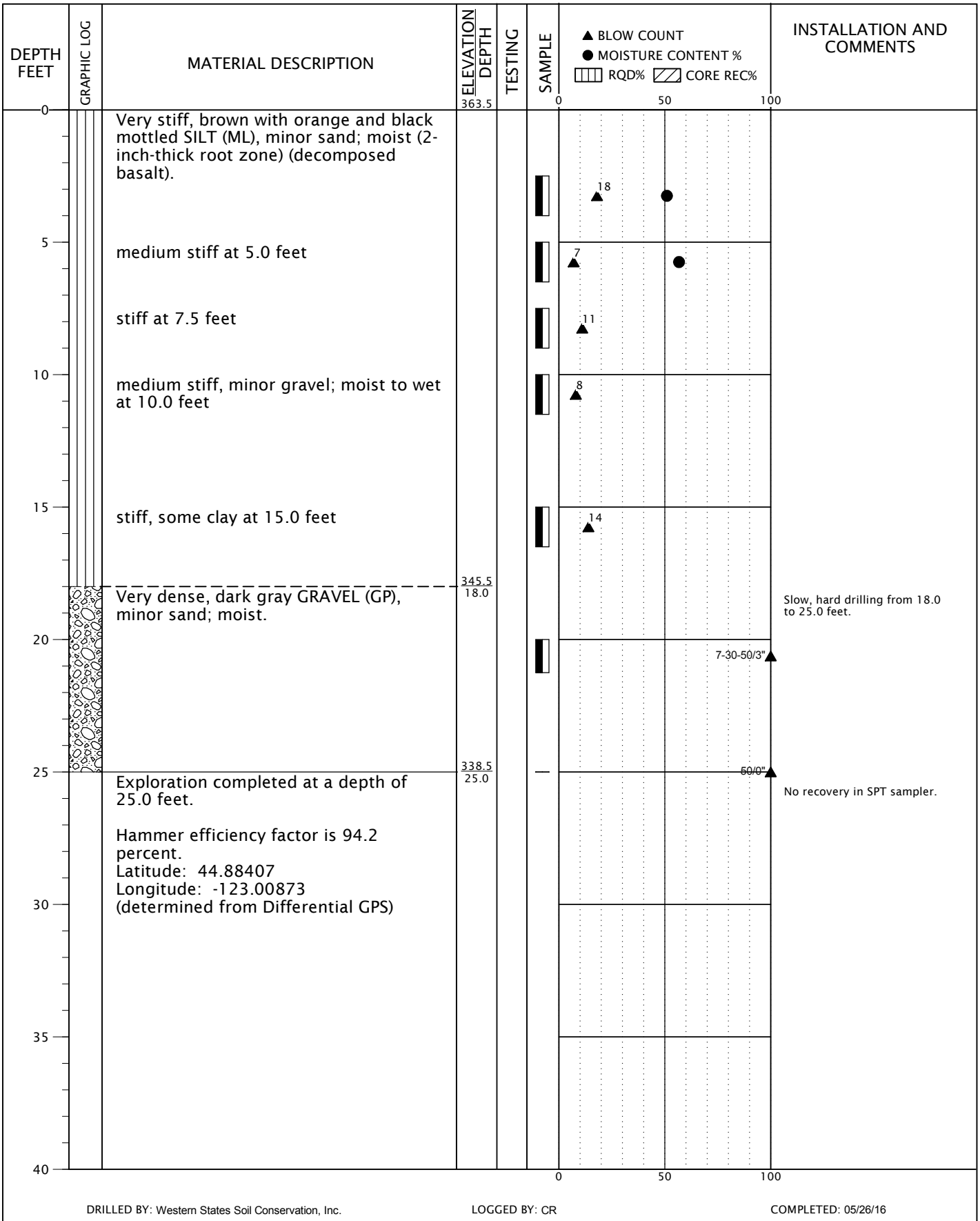
BORING B-13

JUNE 2016

KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE A-13

BORING LOG PACTRUST-162-09-B1_14.GPJ GEODESIGN.GDT PRINT DATE: 6/13/16:RC:KT



BORING LOG PACTRUST-162-09-B1_14.GPJ GEODESIGN.GDT PRINT DATE: 6/13/16:RC:KT

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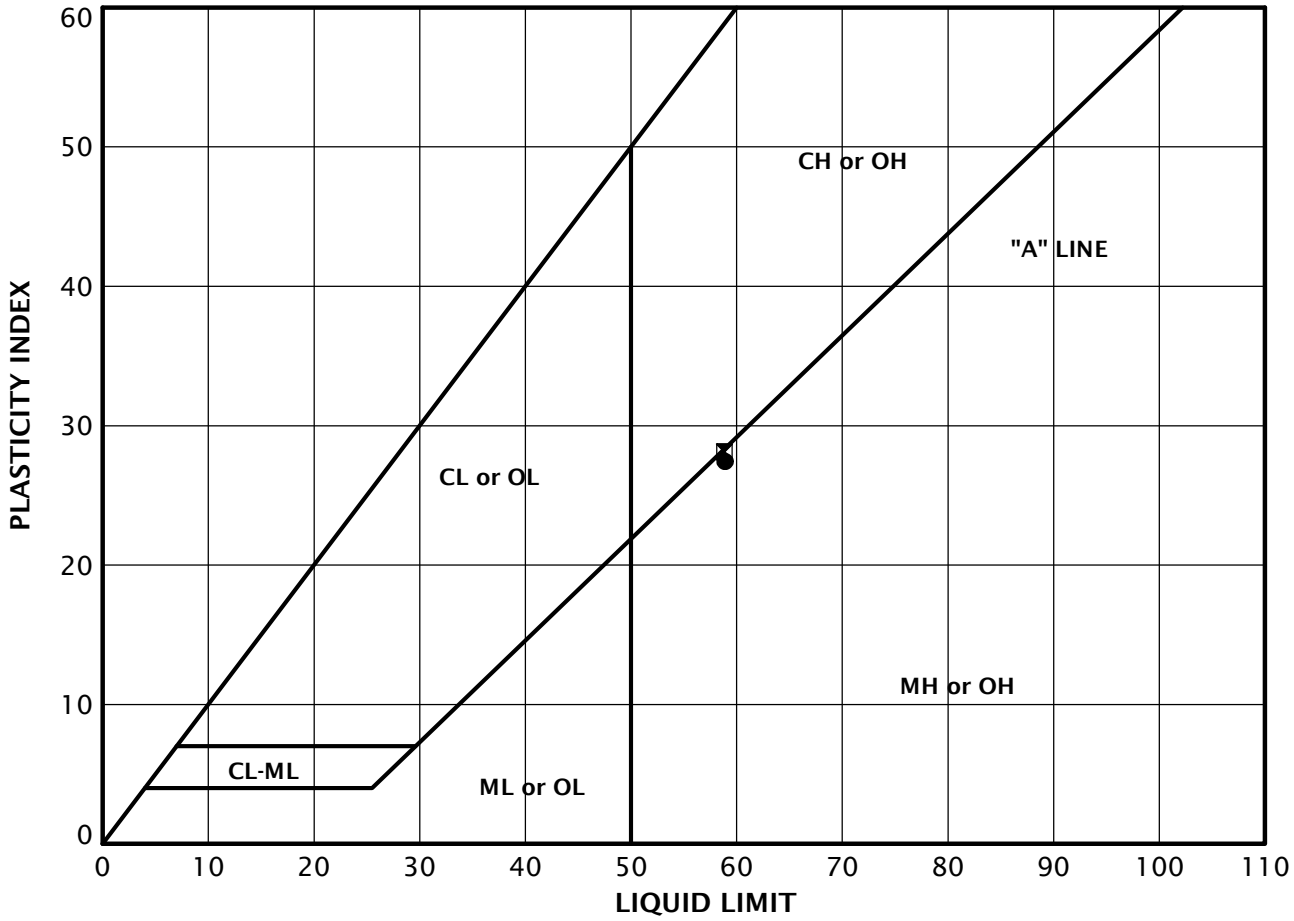
PACTRUST-162-09

BORING B-14

JUNE 2016

KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE A-14



KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
●	B-5	7.5	40	59	31	28
⊠	B-13	2.5	38	59	31	28

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PACTRUST-162-09	**ATTERBERG LIMITS TEST RESULTS**	
JUNE 2016	KUEBLER GATEWAY RETAIL SALEM, OR	**FIGURE A-15**

SAMPLE INFORMATION			MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)			GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
B-1	2.5		39							
B-1	5.0		38							
B-2	2.5		43							
B-2	5.0		48							
B-3	2.5		40							
B-3	5.0		43				52			
B-3	7.5		40							
B-4	2.5		37							
B-4	5.0		50							
B-5	2.5		40							
B-5	7.5		40					59	31	28
B-6	5.0		38				58			
B-6	7.5		34							
B-6	12.5		42							
B-7	2.5		39							
B-7	5.0		40							
B-8	2.5		32							
B-8	5.0		47							
B-13	2.5		38					59	31	28
B-13	5.0		39							
B-13	7.5		50							
B-13	10.0		30							
B-14	2.5		51							
B-14	5.0		57							

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PACTRUST-162-09

SUMMARY OF LABORATORY DATA

JUNE 2016

KUEBLER GATEWAY RETAIL
SALEM, OR

FIGURE A-16

LAB SUMMARY PACTRUST-162-09-B1_14.GPJ GEODESIGN.GDT PRINT DATE: 6/7/16:RC

WSSC-7-01 - TEST BORING B-6 25FT
OP: WMN

TRUCK NO. 5
Date: 30-May-2015

AR: 1.41 in²
LE: 29.42 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft³
EM: 30,000 ksi
JC: 0.00 ∏

ETR: Energy Transfer Ratio
EMX: Max Transferred Energy
CSB: Compression Stress at Bottom
BPM: Blows per Minute
FFS: Force Full Scale

DMX: Maximum Displacement
SFR: Skin friction w/ damping correction
MEX: Maximum Strain
VMX: Maximum Velocity

BL#	depth ft	BLC bl/ft	ETR (%)	EMX k-ft	CSB ksi	BPM bpm	FFS kips	DMX in	SFR kips	MEX µE	VMX f/s
10	25.00	6	87.8	0.3	0.0	42.9	60	1.16	0	1,087	17.7
11	25.18	6	92.2	0.3	0.0	43.1	60	1.86	0	1,119	18.6
12	25.36	6	95.3	0.3	0.0	43.1	60	0.87	0	1,116	18.4
13	25.54	6	94.2	0.3	0.0	43.1	60	1.08	0	1,183	18.6
14	25.71	6	88.3	0.3	0.0	43.3	60	0.66	0	1,113	17.4
15	25.89	6	90.2	0.3	0.0	43.1	60	1.41	0	1,064	17.6
16	26.07	6	95.2	0.3	0.0	43.2	60	1.38	0	1,105	18.3
17	26.25	6	86.0	0.3	0.0	43.2	60	0.90	0	1,060	17.0
18	26.43	6	88.7	0.3	0.0	43.2	60	1.02	0	1,139	17.3
19	26.61	6	89.6	0.3	0.0	43.2	60	1.53	0	1,125	18.0
20	26.79	6	93.7	0.3	0.0	43.1	60	1.02	0	1,150	18.0
21	26.96	6	91.3	0.3	0.0	43.2	60	1.44	0	1,098	17.4
22	27.14	6	93.2	0.3	0.0	43.1	60	0.91	0	1,123	17.9
23	27.32	6	90.9	0.3	0.0	43.2	60	0.98	0	1,111	17.3
24	27.50	6	94.6	0.3	0.0	43.1	60	0.85	0	1,201	18.0
25	27.68	6	95.9	0.3	0.0	43.1	60	0.89	0	1,197	18.1
26	27.86	6	92.4	0.3	0.0	43.2	60	1.63	0	1,066	17.0
27	28.04	6	85.8	0.3	0.0	43.2	60	0.52	0	1,116	16.0
28	28.21	6	90.5	0.3	0.0	43.2	60	0.62	0	1,120	16.6
29	28.39	6	89.1	0.3	0.0	43.2	60	0.97	0	1,133	16.4
30	28.57	6	89.5	0.3	0.0	43.4	60	0.62	0	1,146	16.2
31	28.75	6	90.7	0.3	0.0	43.0	60	0.80	0	1,092	16.3
38	30.00	6	92.2	0.3	0.0	48.0	60	0.92	0	1,004	18.2
39	30.17	6	90.3	0.3	0.0	47.8	60	1.17	0	1,025	18.2
40	30.33	6	94.2	0.3	0.0	47.9	60	0.90	0	1,008	18.2
41	30.50	6	96.5	0.3	0.0	47.5	60	1.02	0	1,027	18.3
42	30.67	6	92.7	0.3	0.0	47.9	60	1.27	0	1,000	18.1
43	30.83	6	91.8	0.3	0.0	47.9	60	1.00	0	1,018	18.4
44	31.00	6	94.9	0.3	0.0	47.8	60	1.42	0	1,023	18.1
45	31.17	6	95.2	0.3	0.0	47.7	60	1.20	0	1,072	18.4
46	31.33	6	97.9	0.3	0.0	47.8	60	1.57	0	998	18.0
47	31.50	6	93.0	0.3	0.0	47.8	60	0.90	0	1,008	18.0
48	31.67	6	91.1	0.3	0.0	47.7	60	0.92	0	981	17.7
49	31.83	6	94.3	0.3	0.0	48.1	60	1.01	0	1,013	18.2
50	32.00	6	95.1	0.3	0.0	47.8	60	0.92	0	1,073	18.5
51	32.17	6	90.9	0.3	0.0	47.8	60	0.72	0	1,003	17.7
52	32.33	6	93.5	0.3	0.0	47.7	60	0.91	0	1,005	17.8
53	32.50	6	97.8	0.3	0.0	48.0	60	0.96	0	1,065	18.4
54	32.67	6	100.2	0.4	0.0	47.8	60	1.31	0	1,017	18.2
55	32.83	6	91.6	0.3	0.0	47.6	60	0.64	0	1,054	18.1
56	33.00	6	84.5	0.3	0.0	48.0	60	0.80	0	983	17.3
57	33.17	6	88.4	0.3	0.0	47.9	60	0.40	0	1,050	18.1
58	33.33	6	99.6	0.3	0.0	47.6	60	1.72	0	1,012	17.9
68	35.00	6	96.0	0.3	0.0	46.9	60	0.85	0	1,023	17.8
69	35.12	8	89.8	0.3	0.0	47.0	60	0.70	0	972	17.1

WSSC-7-01 - TEST BORING B-6 25FT
OP: WMN

TRUCK NO. 5
Date: 30-May-2015

BL#	depth	BLC	ETR	EMX	CSB	BPM	FFS	DMX	SFR	MEX	VMX
	ft	bl/ft	(%)	k-ft	ksi	bpm	kips	in	kips	µE	f/s
70	35.24	8	96.5	0.3	0.0	46.9	60	0.75	0	1,089	18.4
71	35.37	8	73.6	0.3	0.0	46.5	60	0.96	0	906	15.5
72	35.49	8	99.6	0.3	0.0	47.4	60	0.67	0	1,028	18.3
73	35.61	8	93.9	0.3	0.0	47.0	60	0.68	0	1,018	17.5
74	35.73	8	93.0	0.3	0.0	47.0	60	0.71	0	1,007	17.6
75	35.85	8	93.1	0.3	0.0	46.9	60	0.94	0	1,014	17.3
76	35.98	8	97.3	0.3	0.0	46.9	60	1.05	0	1,013	17.7
77	36.10	8	92.0	0.3	0.0	47.1	60	0.56	0	1,024	17.3
78	36.22	8	95.5	0.3	0.0	46.9	60	0.82	0	1,015	17.6
79	36.34	8	96.7	0.3	0.0	47.0	60	1.26	0	1,037	17.9
80	36.46	8	97.5	0.3	0.0	47.0	60	0.66	0	1,051	18.2
81	36.59	8	99.7	0.3	0.0	47.1	60	0.57	0	1,071	18.4
82	36.71	8	93.1	0.3	0.0	47.0	60	0.75	0	1,041	17.6
83	36.83	8	101.8	0.4	0.0	46.9	60	1.14	0	1,043	18.4
84	36.95	8	93.0	0.3	0.0	47.0	60	0.54	0	1,033	17.6
85	37.07	8	101.3	0.4	0.0	46.9	60	1.11	0	1,076	18.4
86	37.20	8	96.0	0.3	0.0	47.0	60	0.75	0	1,030	18.1
87	37.32	8	94.5	0.3	0.0	47.1	60	0.38	0	1,069	18.0
88	37.44	8	100.3	0.4	0.0	46.9	60	1.11	0	1,079	18.4
89	37.56	8	103.0	0.4	0.0	47.0	60	1.24	0	1,065	18.4
90	37.68	8	92.4	0.3	0.0	46.9	60	0.61	0	1,022	17.7
91	37.80	8	97.4	0.3	0.0	47.0	60	0.46	0	1,034	18.4
92	37.93	8	94.7	0.3	0.0	47.0	60	0.83	0	1,044	18.0
93	38.05	8	97.4	0.3	0.0	47.1	60	0.98	0	1,026	17.8
94	38.17	8	97.9	0.3	0.0	46.9	60	0.75	0	1,030	17.9
95	38.29	8	95.1	0.3	0.0	46.9	60	0.44	0	1,050	18.0
96	38.41	8	93.9	0.3	0.0	47.0	60	0.34	0	1,046	17.9
97	38.54	8	94.2	0.3	0.0	47.1	60	0.33	0	1,069	18.4
109	40.00	8	95.5	0.3	0.0	49.4	60	0.81	0	1,056	18.7
110	40.12	8	96.5	0.3	0.0	49.5	60	1.18	0	1,080	18.9
111	40.24	8	99.1	0.3	0.0	49.6	60	1.42	0	1,119	19.4
112	40.37	8	97.5	0.3	0.0	49.6	60	1.07	0	1,110	19.0
113	40.49	8	93.5	0.3	0.0	49.3	60	1.35	0	1,041	18.8
114	40.61	8	91.0	0.3	0.0	49.4	60	0.66	0	1,091	17.7
115	40.73	8	99.7	0.3	0.0	49.4	60	0.78	0	1,084	19.6
116	40.85	8	97.6	0.3	0.0	49.5	60	1.32	0	1,114	19.7
117	40.98	8	97.9	0.3	0.0	49.4	60	1.24	0	1,070	19.5
118	41.10	8	93.1	0.3	0.0	49.5	60	1.26	0	1,055	18.9
119	41.22	8	97.5	0.3	0.0	49.5	60	1.29	0	1,133	19.6
120	41.34	8	96.8	0.3	0.0	49.3	60	1.29	0	1,134	19.2
121	41.46	8	94.7	0.3	0.0	49.5	60	0.79	0	1,107	18.4
122	41.59	8	94.3	0.3	0.0	49.4	60	0.55	0	1,044	17.9
123	41.71	8	96.3	0.3	0.0	49.4	60	2.00	0	1,073	19.4
124	41.83	8	98.9	0.3	0.0	49.4	60	0.68	0	1,114	19.0
125	41.95	8	95.9	0.3	0.0	49.5	60	0.66	0	1,092	18.4
126	42.07	8	98.3	0.3	0.0	49.4	60	1.12	0	1,069	18.3
127	42.20	8	95.6	0.3	0.0	49.3	60	1.41	0	1,075	18.0
128	42.32	8	96.9	0.3	0.0	49.6	60	0.84	0	1,079	18.1
129	42.44	8	94.7	0.3	0.0	49.6	60	0.47	0	1,146	18.5
		Average	94.2	0.3	0.0	46.8	60	0.96	0	1,064	18.0
		Std. Dev.	4.2	0.0	0.0	2.2	0	0.34	0	52	0.7

Total number of blows analyzed: 94

BL#	Sensors
10-129	F3: [SPT B1] 217.8 (1.00); F4: [SPT B2] 218.9 (1.00); A3: [K0232] 290.0 (1.00); A4: [K0231] 325.0 (1.00)

BL#	Comments
31	N: 8,10,11
38	LE = 35.10 ft; WC = 16,715.9 f/s
58	5, 7, 14
68	LE = 40.10 ft; WC = 16,794.3 f/s
97	N: 8,13,17
109	LE = 45.10 ft; WC = 16,714.3 f/s
129	N: 10,10,11

Time Summary

Drive	29 seconds	4:13 PM - 4:13 PM (5/30/2015) BN 10 - 31
Stop	37 minutes 37 seconds	4:13 PM - 4:51 PM
Drive	25 seconds	4:51 PM - 4:51 PM BN 38 - 58
Stop	23 minutes 16 seconds	4:51 PM - 5:14 PM
Drive	37 seconds	5:14 PM - 5:15 PM BN 68 - 97
Stop	26 minutes 48 seconds	5:15 PM - 5:42 PM
Drive	24 seconds	5:42 PM - 5:42 PM BN 109 - 129

Total time [01:29:38] = (Driving [00:01:55] + Stop [01:27:43])

ATTACHMENT B

ATTACHMENT B

MARCH 2012 GEOTECHNICAL REPORT SITE PLAN AND EXPLORATION LOGS

The explorations completed at the site from the March 2012 report included test pits TP-1 through TP-32. The exploration logs are presented in this attachment. The approximate locations of the explorations are shown on Figure 2 of the original report, which is presented in this attachment. A complete summary of our field explorations is provided in our March 2012 geotechnical report.

KUEBLER BOULEVARD SE

27TH AVENUE

BATTLE CREEK ROAD SE

BOONE ROAD SE

TP-1 (13.5)

TP-2 (10.0)

TP-3 (>12.5)

TP-4 (>15.0) [7]

TP-5 (>15.0) [5]

TP-6 (10.0)

TP-7 (>14.5)

TP-8 (>14.5)

TP-9 (12.5)

TP-10 (11.5) [10']

TP-11 (>13.0) [6]

TP-12 (>13.5) [6]

TP-13 (>10.0) [2.5]

TP-14 (>14.0) [4]

TP-15 (9.0)

TP-16 (>13.0)

TP-17 (7.5)

TP-18 (11.0)

TP-19 (>12.0) [3.5]

TP-20 (>14.0) [6.5]

TP-21 (7.0)

TP-22 (>10.0) [5.5]

TP-23 (>13.0) [8]

TP-24 (>10.0) [9]

TP-25 (8.0)

TP-26 (>8.0) [2.5]

TP-27 (>9.0)

TP-28 (>10.0) [9.5]

TP-29 (>8.0)

TP-30 (>11.0) [5]

TP-31 (>11.0)

TP-32 (>11.0) [4.5]

RETAIL
14,400 SF

RESTAURANT
6,500 SF

OFFICE
14,000 SF

OFFICE
14,000 SF

RETAIL
20,500 SF
2.50 ACRES
4.0/1,000 PARKING

GROCERY
51,500 SF
4.24 ACRES
4.0/1,000 PARKING RATIO

RETAIL
132,362 SF
9.95 ACRES
3.0/1,000 PARKING RATIO

RETAIL
10,000 SF
0.88 ACRES

BANK
4,000 SF
0.62 ACRES

RESTAURANT
6,500 SF
1.22 ACRES

276.76'

315.17'

58.80'

682.34'

166.6'

456.41'

LEGEND:

TP-1	TEST PIT
(13.0)	DEPTH TO REFUSAL (FEET)
[5]	DEPTH TO GROUNDWATER SEEPAGE (FEET)

N

0 150 300

(SCALE IN FEET)

SITE PLAN BASED ON DRAWING PROVIDED BY PACTRUST AND WESTECH, FEBRUARY 23, 2012

SITE PLAN

FIGURE 2

KUEBLER BOULEVARD PROPERTY
SALEM, OR

PACTRUST-162-01

MARCH 2012

GeoDesign Inc
15575 SW Sequoia Parkway - Suite 100
Portland OR 97224
Off 503.968.8787 Fax 503.968.3068

Printed By: mmiller | Print Date: 3/30/2012 10:01:48 AM
File Name: J:\M-R\PacTrust\PacTrust-162\PacTrust-162-01\Figures\CAD\PacTrust-162-01-SP01.dwg | Layout: FIGURE 2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 – 50 – 100)	COMMENTS
0.0	Medium stiff, red-brown CLAY (CL/CH), trace to minor gravel; moist (topsoil to 8 inches, 3-inch-thick root zone).		PP			PP = 1.0 tsf
2.5	Dense, black stained red-brown, coarse, clayey GRAVEL with sand, cobbles, and boulders (GC); moist, angular to subangular (decomposed basalt bedrock).	2.5	PP	☒	●	PP = 0.5 tsf
			PP			PP = 0.5 tsf Boulders 1- to 2-foot diameter from 3.0 to 5.0 feet
5.0	becomes dense to very dense, green-gray to yellow-brown; relict rock structure (decomposed to intensely weathered basalt) at 6.0 feet			☒	●	
7.5				☒		Hard boulder bench at 7.0 feet
10.0	becomes decomposed to intensely weathered, very intensely fractured (random, irregular, very close, open filled with sandy clay, silt, and oxide mineral) at 10.0 feet					
12.5				☒		
	Exploration terminated at a depth of 13.5 feet due to difficulty with bench at 7.0 feet.	13.5				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.8840529464 Longitude: -123.011922782
15.0						
17.5						
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CMC COMPLETED: 01/30/12

EXCAVATION METHOD: trackhoe (see report text)

GEODESIGN INC
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Portland OR 97224
Off 503.968.8787 Fax 503.968.3068

PACTRUST-162-01

TEST PIT TP-1

MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-1

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, red-brown CLAY (CL/CH); moist (topsoil to 8 inches, 3-inch-thick root zone).		PP			PP = 0.5 tsf
			ATT PP	☒	●	PP = 0.5 tsf LL = 51% PL = 21%
2.5	Medium dense to dense, black stained red-brown, fine to coarse, clayey GRAVEL with boulders (GC); moist, subangular, boulders are 1- to 2-foot diameter (decomposed bedrock).	2.5	PP			PP = 0.5 tsf
5.0	becomes yellow-brown, coarse; angular at 5.5 feet					
7.5	becomes intensely weathered, very intensely fractured (random, irregular, very close, open filled with clay, silt, and oxide) at 7.0 feet			☒	●	
	becomes dense to very dense, with boulders at 9.0 feet					
10.0	Exploration terminated at a depth of 10.0 feet due to refusal on boulder.	10.0				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88347627930 Longitude: -123.01166478500
12.5						
15.0						
17.5						
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CMC COMPLETED: 01/30/12

EXCAVATION METHOD: trackhoe (see report text)

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Portland OR 97224
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TEST PIT TP-2

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KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-2

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium stiff, red-brown CLAY (CL/CH); moist (topsoil to 10 inches, 3-inch-thick root zone).					
2.5					☒	●	
		Stiff, black stained red-brown CLAY with sand and gravel (CL/CH); moist, block structure (decomposed bedrock).	3.0				
5.0		Dense, black stained red-brown to yellow-brown, fine to coarse, clayey GRAVEL with cobbles (GC); moist, subangular to angular (decomposed to intensely weathered basalt bedrock).	5.0				
7.5		boulder at 8.0 feet					
		becomes dense to very dense; relict rock structure at 9.0 feet			☒		
10.0							
12.5		Exploration completed at a depth of 12.5 feet.	12.5		☒		No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88304327880 Longitude: -123.01138845400
15.0							
17.5							
20.0						0 50 100	

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EXCAVATION METHOD: trackhoe (see report text)

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PACTRUST-162-01

TEST PIT TP-3

MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-3

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff to stiff, brown CLAY (CL/CH); moist (topsoil to 8 inches, 3-inch-thick root zone).		PP			PP = 1.0 tsf
			PP			PP = 1.0 tsf
2.5	Dense, black stained red-brown to green-gray, fine to coarse, clayey GRAVEL (GC); moist, subangular to angular, relict rock structure (decomposed basalt).	2.0				
5.0						
7.5	becomes moist to wet at 7.0 feet					Slow groundwater seepage observed at 7.0 feet.
	becomes vesicular at 9.0 feet					Bottom of lava flow
10.0	Very stiff to hard, red, fine to coarse, gravelly CLAY (CH); wet, interflow zone.	10.0				Moderate groundwater seepage observed at 10.0 feet.
	Dense, red-brown and yellow, fine to coarse, clayey GRAVEL with sand (GC); wet, subangular, relict rock structure (decomposed basalt).	12.0				
12.5						
15.0	Exploration completed at a depth of 15.0 feet.	15.0				No caving observed to the depth explored.
						Surface elevation was not measured at the time of exploration.
17.5						Latitude: 44.88308044390 Longitude: -123.01045412100
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CMC COMPLETED: 01/30/12

EXCAVATION METHOD: trackhoe (see report text)

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PACTRUST-162-01

TEST PIT TP-4

MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-4

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, red-brown CLAY with boulders (CL/CH); moist (topsoil to 10 inches, 2-inch-thick root zone).		PP			PP = 1.0 tsf
			PP			PP = 1.0 tsf
2.5			PP			PP = 1.0 tsf
	Medium dense, black stained red-brown to yellow-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular (decomposed basalt).	3.0				
5.0						Slow groundwater seepage observed at 5.5 feet.
	becomes dense, coarse; moist to wet, angular to subangular, relict rock structure at 6.0 feet					
7.5	becomes dense to very dense at 8.0 feet					
10.0						
12.5	with yellow veining at 13.0 feet					
	becomes dark gray-brown, red, and yellow; vesicular at 14.0 feet					
15.0	Exploration completed at a depth of 15.0 feet.	15.0				No caving observed to the depth explored.
						Surface elevation was not measured at the time of exploration.
17.5						Latitude: 44.88357061070 Longitude: -123.01050161800
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CMC COMPLETED: 01/30/12

EXCAVATION METHOD: trackhoe (see report text)

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PACTRUST-162-01

TEST PIT TP-5

MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-5

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium stiff, red-brown CLAY (CL/CH); moist (topsoil to 8 inches, 2-inch-thick root zone).		PP			PP = 1.0 tsf
		Dense, black stained red-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular to angular (decomposed basalt).	1.5				
2.5							
5.0		becomes dense to very dense, yellow-brown and red-brown; relict rock structure at 6.0 feet					
7.5							
		with yellow veining at 9.5 feet					
10.0		boulder at 10.0 feet	10.0				No groundwater seepage observed to the depth explored. No caving observed to the depth explored.
		Exploration terminated at a depth of 10.0 feet due to refusal.					Surface elevation was not measured at the time of exploration.
12.5							Latitude: 44.88383777850 Longitude: -123.01118728300
15.0							
17.5							
20.0							

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CMC COMPLETED: 01/30/12

EXCAVATION METHOD: trackhoe (see report text)

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TEST PIT TP-6

MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-6

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, red-brown CLAY (CL/CH); moist (topsoil to 8 inches, 2-inch-thick root zone).		PP			PP = 1.5 tsf
			PP			PP = 0.5 tsf
2.5	becomes sandy, some gravel at 2.0 feet			☒	●	
	Dense, black stained red-brown, fine to coarse, clayey GRAVEL with cobbles (GC); moist, subangular (decomposed basalt).	3.0				
5.0						
	becomes dense to very dense, yellow-brown and red-brown with black staining; relict rock structure (decomposed to intensely weathered basalt) at 6.5 feet					
7.5			ATT	☒	●	LL = 57% PL = 39%
10.0						
	becomes green-gray, red-brown, and black at 12.0 feet			☒		
12.5	with boulders at 14.0 feet					
	Exploration completed at a depth of 14.5 feet.	14.5				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88445077750 Longitude: -123.01057628000
15.0						
17.5						
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CMC COMPLETED: 01/30/12

EXCAVATION METHOD: trackhoe (see report text)

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PACTRUST-162-01

TEST PIT TP-7

MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-7

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, red-brown CLAY (CL/CH); moist (topsoil to 10 inches, 3-inch-thick root zone).		PP			PP = 1.0 tsf
			PP			PP = 1.0 tsf
2.5	Dense, black stained red-brown and yellow-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular to angular (decomposed basalt).	2.5		☒	●	
5.0	relict rock structure at 5.0 feet					
	with yellow veining at 6.0 feet					
7.5	becomes dense to very dense; intensely weathered at 8.0 feet					
10.0				☒	●	
12.5						
14.5	Exploration completed at a depth of 14.5 feet.	14.5		☒		No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88476544310 Longitude: -123.00994544500
15.0						
17.5						
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CMC COMPLETED: 01/30/12

EXCAVATION METHOD: trackhoe (see report text)

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TEST PIT TP-8

MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-8

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, red-brown CLAY (CL/CH); moist (topsoil to 10 inches, 3-inch-thick root zone).		PP			PP = 0.5 tsf
			PP			PP = 0.5 tsf
2.5			ATT	☒	●	LL = 51% PL = 22%
	Medium dense to dense, black stained red-brown to yellow-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular (decomposed basalt).	3.0				
5.0						
7.5	becomes dense to very dense; relict rock structure (intensely weathered basalt) at 8.0 feet					
10.0				☒	●	
12.5	Exploration terminated at a depth of 12.5 feet due to practical refusal.	12.5				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88449760890 Longitude: -123.00944444600
15.0						
17.5						
20.0						

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EXCAVATION METHOD: trackhoe (see report text)

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TEST PIT TP-9

MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-9

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, red-brown CLAY (CL/CH); moist (topsoil to 10 inches, 2-inch-thick root zone).		PP			PP = 0.5 tsf
			PP			PP = 0.5 tsf
2.5			ATT	☒	●	LL = 58% PL = 23%
			PP			PP = 2.0 tsf
	Medium dense, black stained red-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular.	3.5				
5.0	becomes dense to very dense, yellow-brown, with boulders (intensely weathered basalt) at 5.5 feet					
7.5				☒	●	
10.0	becomes red-brown and gray, with boulders; moist to wet at 10.0 feet					Slow groundwater seepage observed at 10.0 feet.
				☒		
	Exploration terminated at a depth of 11.5 feet due to practical refusal.	11.5				No caving observed to the depth explored.
12.5						Surface elevation was not measured at the time of exploration. Latitude: 44.88402227620 Longitude: -123.00982511600
15.0						
17.5						
20.0						

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EXCAVATION METHOD: trackhoe (see report text)

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TEST PIT TP-10

MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-10

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium stiff, brown CLAY (CL/CH); moist (topsoil to 8 inches, 3-inch-thick root zone).		PP			PP = 0.5 tsf
		Medium dense to dense, black stained red-brown to yellow-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular (decomposed basalt).	1.0				
2.5					☒	●	
		with cobbles at 4.0 feet					
5.0							Slow groundwater seepage observed at 6.0 feet.
		becomes dense to very dense; moist to wet, relict rock structure (decomposed to intensely weathered basalt) at 6.0 feet			☒		
7.5							
10.0							
12.5							
		Exploration completed at a depth of 13.0 feet.	13.0				No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88357910870 Longitude: -123.00935445200
15.0							
17.5							
20.0							

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CMC COMPLETED: 01/30/12

EXCAVATION METHOD: trackhoe (see report text)

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PACTRUST-162-01

TEST PIT TP-11

MARCH 2012

KUEBLER BOULEVARD PROPERTY
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FIGURE A-11

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 – 50 – 100)	COMMENTS
0.0	Medium stiff to stiff, red-brown CLAY (CL/CH); moist (topsoil to 8 inches, 3-inch-thick root zone).		PP			PP = 1.0 tsf
			PP			PP = 1.5 tsf
	becomes sandy, trace gravel at 2.0 feet			☒	●	
2.5	Medium dense to dense, black stained red-brown to green-brown, fine to coarse, clayey GRAVEL (GC); moist to wet, subangular (decomposed basalt).	2.5				
5.0						Slow to moderate groundwater seepage observed at 6.0 feet.
	becomes wet; vesicular at 7.0 feet			☒		
7.5						
10.0						
	Stiff, red to orange, gravelly CLAY (CL/CH); wet (interflow zone).	11.0				
12.5						
	Medium dense, red-brown, fine to coarse, clayey GRAVEL with sand (GC); wet, subangular (decomposed top of basalt flow).	13.0	ATT	☒	●	LL = 89% PL = 50%
	Exploration completed at a depth of 13.5 feet.	13.5				No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88328710950 Longitude: -123.00979345300
15.0						
17.5						
20.0						

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CMC COMPLETED: 01/30/12

EXCAVATION METHOD: trackhoe (see report text)

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TEST PIT TP-12

MARCH 2012

KUEBLER BOULEVARD PROPERTY
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FIGURE A-12

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	COMMENTS
0.0	Medium stiff, red-brown CLAY (CL/CH); moist (topsoil to 8 inches, 3-inch-thick root zone).		
2.5	becomes wet at 2.5 feet		Moderate to rapid groundwater seepage observed at 2.5 feet.
	Medium dense, red-brown to brown, fine to coarse, clayey GRAVEL (GC); wet, subangular (decomposed basalt).	3.5	
10.0	Exploration completed at a depth of 10.0 feet.	10.0	No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88298160850 Longitude: -123.00927112200
20.0			

GRAPHIC LOG | TESTING | SAMPLE | ● MOISTURE CONTENT % (0, 50, 100)

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EXCAVATION METHOD: trackhoe (see report text)

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PACTRUST-162-01

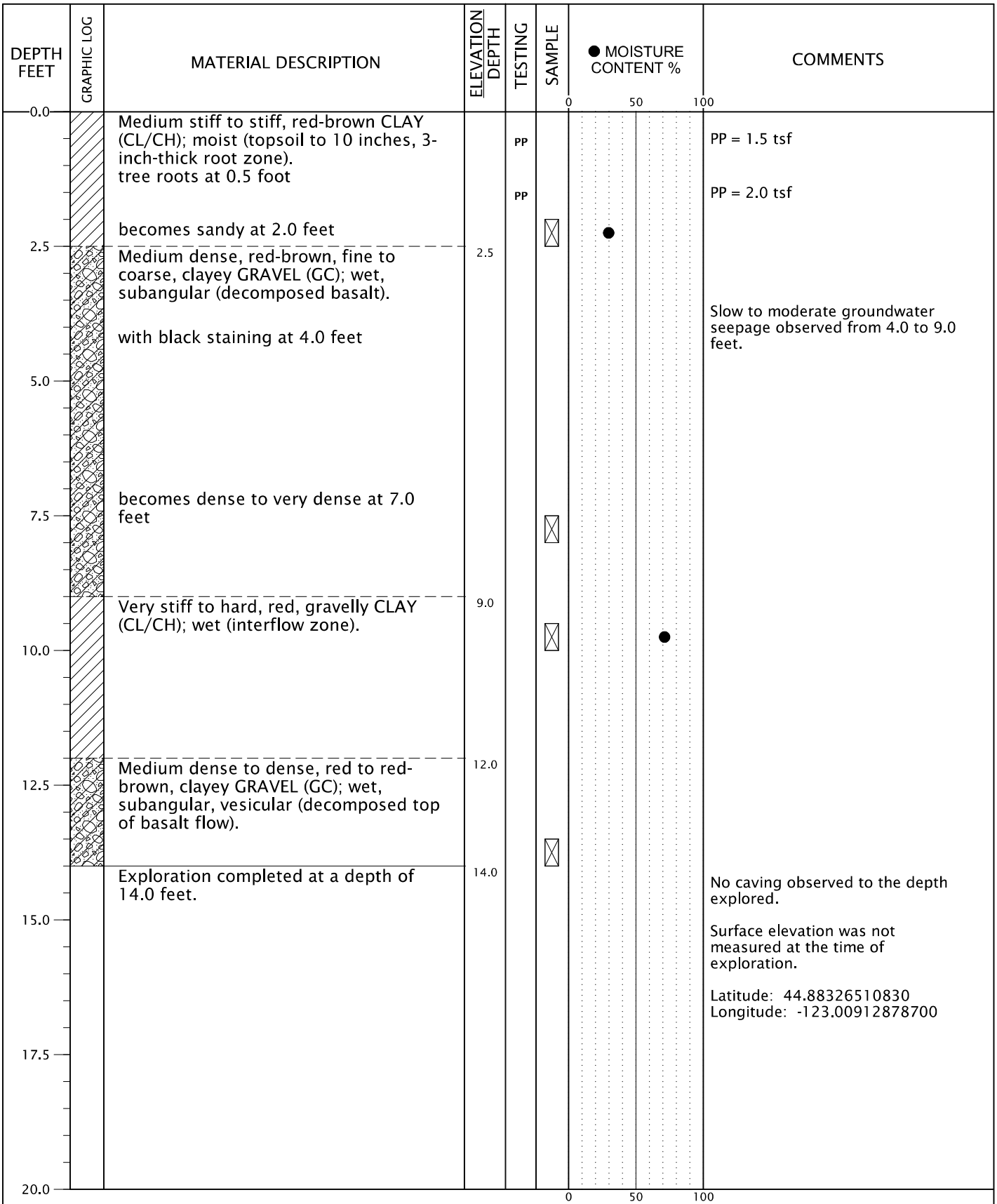
TEST PIT TP-13

MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-13

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT



EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CMC COMPLETED: 01/30/12

EXCAVATION METHOD: trackhoe (see report text)

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TEST PIT TP-14

MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-14

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium stiff, brown to red-brown CLAY (CL/CH); moist (topsoil to 10 inches, 2-inch-thick root zone).		PP			PP = 1.0 tsf
				PP			PP = 0.5 tsf
2.5		Medium dense, black stained red-brown to green-gray, fine to coarse, clayey GRAVEL with boulders (GC); moist, subangular (decomposed basalt).	2.5				
5.0		becomes dense to very dense at 5.5 feet					
7.5		with boulders at 7.0 feet					
		Exploration terminated at a depth of 9.0 feet due to practical refusal on boulders.	9.0				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88425744140 Longitude: -123.00895778100
10.0							
12.5							
15.0							
17.5							
20.0							

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: CMC COMPLETED: 01/30/12

EXCAVATION METHOD: trackhoe (see report text)

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TEST PIT TP-15

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FIGURE A-15

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DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, red-brown CLAY (CL/CH); moist (topsoil to 10 inches, 3-inch-thick root zone).					
2.5	becomes stiff, sandy at 2.0 feet					
	Medium dense, black stained red-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular (decomposed basalt).	3.0				
5.0						
7.5	becomes dense; relict rock structure (decomposed to intensely weathered basalt) at 6.0 feet					
10.0	becomes gray-brown with black staining (intensely weathered basalt) at 9.0 feet					
12.5	becomes vesicular at 12.5 feet					
	Exploration completed at a depth of 13.0 feet.	13.0				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88500210820 Longitude: -123.00898111000
15.0						
17.5						
20.0						

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EXCAVATION METHOD: trackhoe (see report text)

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FIGURE A-16

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff to stiff, red-brown CLAY (CL/CH); moist (topsoil to 10 inches, 3-inch-thick root zone).		PP			PP = 1.5 tsf
	with gravel at 2.0 feet		PP			PP = 1.0 tsf
2.5	Medium dense, black stained red-brown to orange, fine to coarse, clayey GRAVEL (GC); moist, subangular (decomposed basalt).	2.5				
5.0	becomes dense to very dense, coarse, with boulders; angular, relict rock structure at 5.0 feet					
	becomes very dense, red-brown and gray at 7.0 feet					Hard excavating at 7.0 feet
7.5	becomes intensely to moderately weathered, moderately fractured (competent bedrock) at 7.5 feet	7.5				No groundwater seepage observed to the depth explored. No caving observed to the depth explored.
	Exploration terminated due to refusal at a depth of 7.5 feet.					Surface elevation was not measured at the time of exploration.
10.0						Latitude: 44.88456127400 Longitude: -123.00852077900
12.5						
15.0						
17.5						
20.0						

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FIGURE A-17

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Stiff, red-brown CLAY with boulders and cobbles (CL/CH); moist (topsoil to 10 inches, 3-inch-thick root zone).		PP			PP = 1.5 tsf
				PP			PP = 1.0 tsf
2.5		Medium dense to dense, black stained red-brown, fine to coarse, clayey GRAVEL with cobbles and boulders (GC); moist, subangular (decomposed basalt).	2.5		☒	●	
5.0		becomes dense to very dense; angular, relict rock structure at 6.0 feet					
		becomes red-brown and gray, with boulders at 7.0 feet					
7.5		becomes intensely to moderately weathered, moderately fractured (competent bedrock) at 8.5 feet					Hard excavating at 8.5 feet
10.0					☒		
		Exploration terminated due to practical refusal at a depth of 11.0 feet.	11.0				No groundwater seepage observed to the depth explored. No caving observed to the depth explored.
12.5							Surface elevation was not measured at the time of exploration.
							Latitude: 44.88388377380 Longitude: -123.00840645000
15.0							
17.5							
20.0							

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FIGURE A-18

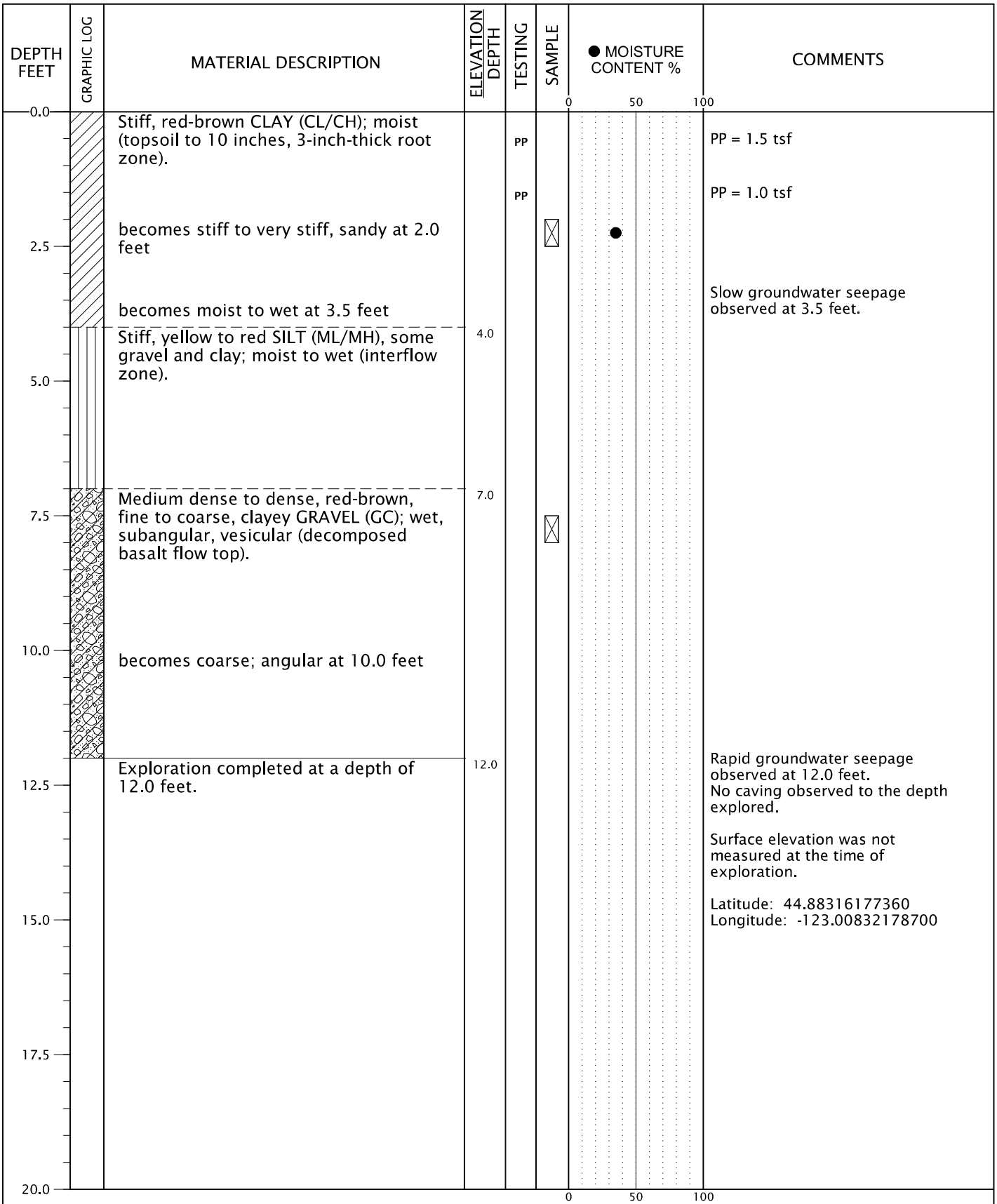

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FIGURE A-19

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

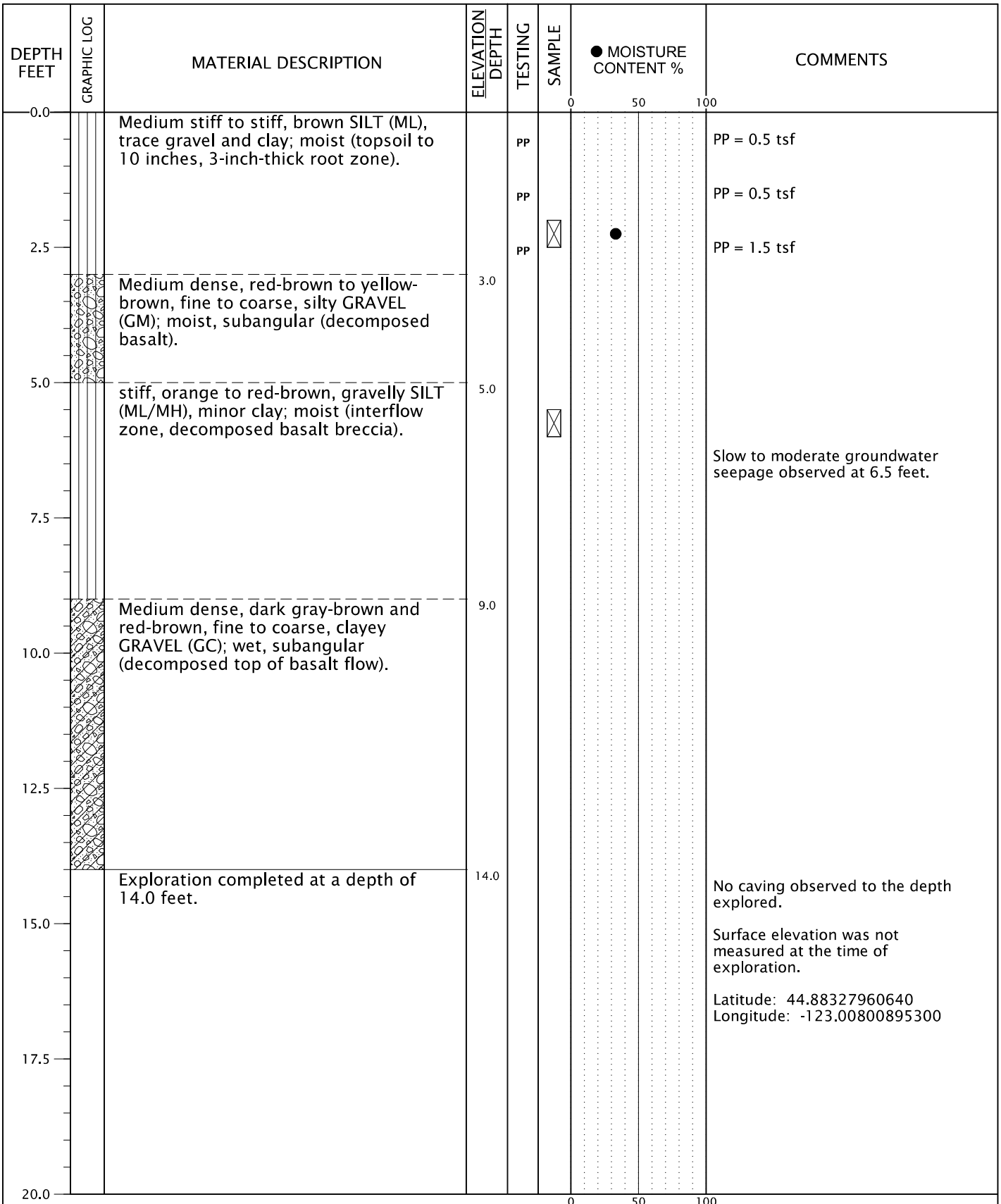

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FIGURE A-20

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

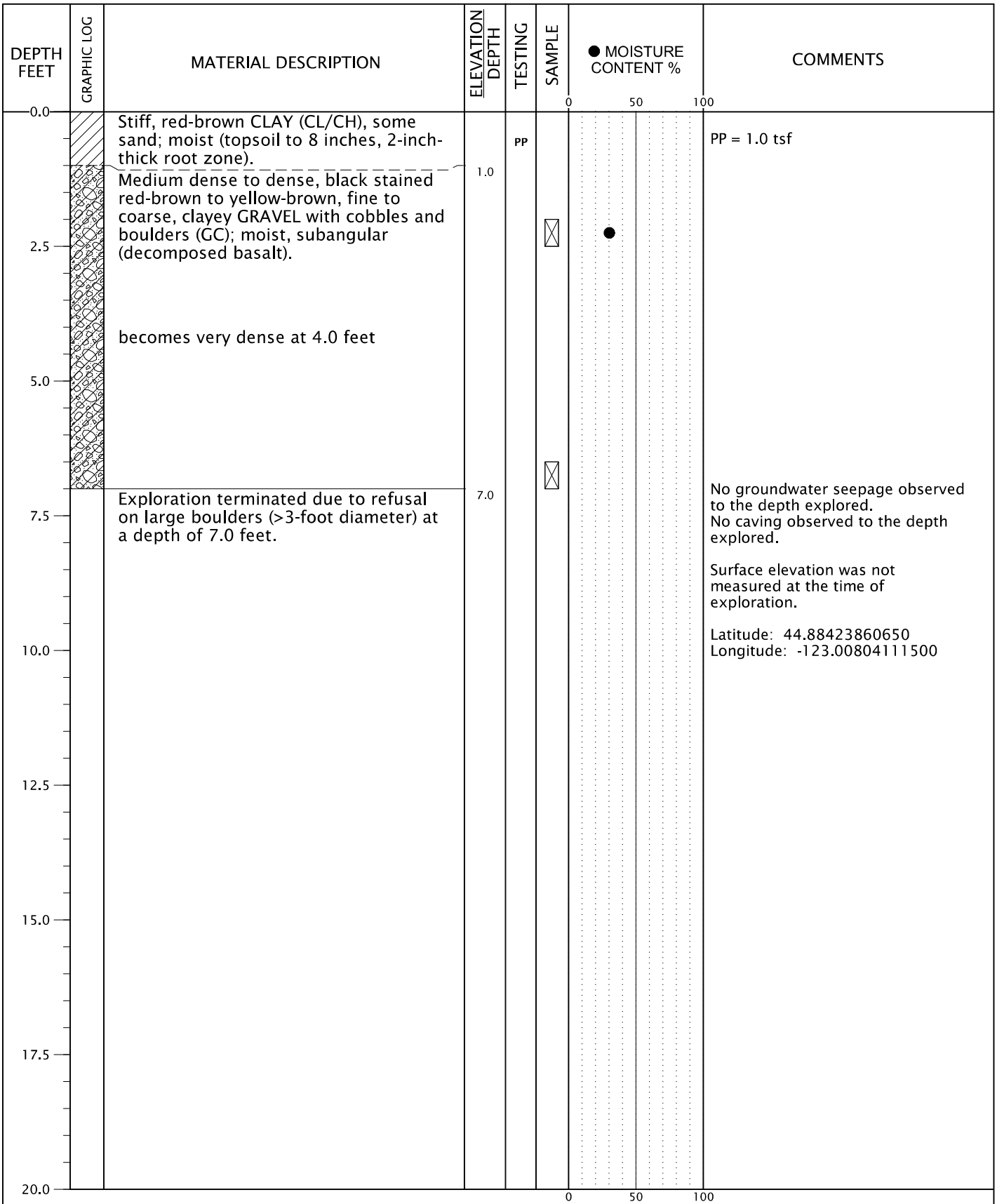

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FIGURE A-21

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium stiff, red-brown CLAY with boulders (CL/CH); moist (topsoil to 8 inches, 2-inch-thick root zone).		PP			PP = 1.0 tsf
				PP			PP = 0.5 tsf
2.5		Medium dense, black stained red-brown to yellow-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular (decomposed basalt).	2.5				
5.0		becomes medium dense to dense, coarse; moist to wet, angular, relict rock structure at 5.5 feet					Slow groundwater seepage observed at 5.5 feet.
7.5		becomes very dense, red-brown and gray, with boulders at 7.0 feet					
10.0		Exploration completed at a depth of 10.0 feet.	10.0				No caving observed to the depth explored.
							Surface elevation was not measured at the time of exploration.
							Latitude: 44.88519460650 Longitude: -123.00798010900
12.5							
15.0							
17.5							
20.0							

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FIGURE A-22

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, red-brown CLAY (CL/CH), minor gravel; moist (topsoil to 8 inches, 2-inch-thick root zone).		PP			PP = 0.5 tsf
	Medium dense to dense, black stained red-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular (decomposed basalt).	1.5				
2.5				☒	●	
5.0	becomes dense to very dense, coarse; angular at 6.0 feet			☒		
7.5						Slow groundwater seepage observed at 8.0 feet.
10.0	becomes red-brown and black; wet, vesicular at 10.0 feet			☒		
12.5						
	Exploration completed at a depth of 13.0 feet.	13.0				No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88483943890 Longitude: -123.00741827800
15.0						
17.5						
20.0						

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FIGURE A-23

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Stiff, red-brown CLAY (CL/CH); moist (topsoil to 10 inches, 2-inch-thick root zone).		PP			PP = 1.0 tsf
			PP			PP = 1.0 tsf
2.5	Medium dense to dense, black stained red-brown, fine to coarse, clayey GRAVEL with boulders (GC); moist, subangular (decomposed basalt).	2.5				
5.0	becomes dense to very dense; angular at 5.0 feet					
7.5	becomes moist to wet (intensely weathered basalt) at 9.0 feet					Slow groundwater seepage observed at 9.0 feet.
10.0	Exploration completed at a depth of 10.0 feet.	10.0				No caving observed to the depth explored.
						Surface elevation was not measured at the time of exploration.
						Latitude: 44.88401393850 Longitude: -123.00724978300
12.5						
15.0						
17.5						
20.0						

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FIGURE A-24

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Stiff, red-brown CLAY (CL/CH), minor gravel; moist (topsoil to 8 inches, 2-inch-thick root zone).					
		Dense to very dense, black stained red-brown, fine to coarse, clayey GRAVEL with cobbles and boulders (GC); moist to wet, subangular to angular (decomposed to intensely weathered basalt).	1.0				
2.5							Difficult excavating at 4.0 feet
5.0		becomes green-gray, black, and red-brown; angular (intensely weathered, intensely fractured basalt) at 5.0 feet			☒	●	
7.5		with boulders at 7.5 feet					
		Exploration terminated at a depth of 8.0 feet due to refusal on boulders.	8.0				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88353477200 Longitude: -123.00736578500
10.0							
12.5							
15.0							
17.5							
20.0							

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EXCAVATION METHOD: trackhoe (see report text)

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SALEM, OR

FIGURE A-25

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, brown CLAY (CL/CH); moist (topsoil to 12 inches, 3-inch-thick root zone).		PP			PP = 1.0 tsf
			PP			PP = 0.5 tsf
2.5	becomes gray-brown; wet at 2.5 feet		ATT	☒	●	LL = 48% PL = 25% Rapid groundwater seepage observed at 2.5 feet.
5.0	Medium dense, black stained and yellow veined gray-brown, fine to coarse, clayey GRAVEL (GC); wet, subangular to angular (decomposed basalt).	4.0				
7.5				☒		
	Exploration completed at a depth of 8.0 feet.	8.0				No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88306493760 Longitude: -123.00673862100
10.0						
12.5						
15.0						
17.5						
20.0						

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EXCAVATION METHOD: trackhoe (see report text)

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FIGURE A-26

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium dense, brown, silty GRAVEL with cobbles and boulders (GM); moist (topsoil to 6 inches, 3-inch-thick root zone).					
		Medium dense, black stained red-brown to yellow-brown, clayey GRAVEL (GC); wet, subangular to angular (decomposed to intensely weathered basalt).	2.0		☒	●	
5.0							
7.5		becomes dense to very dense, dark green-gray and red-brown at 8.0 feet			☒		
		Exploration completed at a depth of 9.0 feet.	9.0				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88376910470 Longitude: -123.00696728400
10.0							
12.5							
15.0							
17.5							
20.0							

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EXCAVATION METHOD: trackhoe (see report text)

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FIGURE A-27

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff to stiff, red-brown CLAY with boulders (CL/CH); moist (topsoil to 12 inches, 2-inch-thick root zone).		PP			PP = 1.0 tsf
			PP			PP = 1.0 tsf
2.5	Medium dense to dense, black stained red-brown to yellow-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular (decomposed basalt).	2.5				
5.0						
7.5	becomes dense, dark gray and red-brown, coarse; angular, vesicular at 7.0 feet					
	becomes moist to wet at 9.0 feet					Slow groundwater seepage observed at 9.5 feet.
10.0	Exploration completed at a depth of 10.0 feet.	10.0				No caving observed to the depth explored.
						Surface elevation was not measured at the time of exploration.
						Latitude: 44.88431677110 Longitude: -123.00677478100
12.5						
15.0						
17.5						
20.0						

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EXCAVATION METHOD: trackhoe (see report text)

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FIGURE A-28

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, red-brown CLAY with boulders (CL/CH); moist (topsoil to 10 inches, 3-inch-thick root zone).		PP			PP = 0.5 tsf
	Medium dense, black stained red-brown to yellow-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular (decomposed basalt).	1.5				
2.5						
	becomes medium dense to dense, with cobbles and boulders at 4.0 feet					
5.0						
7.5						
	Exploration completed at a depth of 8.0 feet.	8.0				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88524643810 Longitude: -123.00696777600
10.0						
12.5						
15.0						
17.5						
20.0						

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EXCAVATION METHOD: trackhoe (see report text)

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SALEM, OR

FIGURE A-29

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff to stiff, red-brown CLAY with cobbles (CL/CH); moist (topsoil to 10 inches, 3-inch-thick root zone).		PP			PP = 1.0 tsf
			PP			PP = 1.5 tsf
2.5	becomes stiff, sandy at 3.0 feet		PP	☒	●	PP = 3.0 tsf
5.0	becomes moist to wet, weakly indurated, blocky structure at 5.0 feet			☒		Slow groundwater seepage observed at 5.0 feet.
7.5						
	with red-brown and gray-brown mottles at 9.0 feet					Moderate groundwater seepage observed at 9.0 feet.
10.0				☒		
	Exploration completed at a depth of 11.0 feet.	11.0				No caving observed to the depth explored.
12.5						Surface elevation was not measured at the time of exploration.
						Latitude: 44.88491726930 Longitude: -123.00570877800
15.0						
17.5						
20.0						

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EXCAVATION METHOD: trackhoe (see report text)

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FIGURE A-30

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Medium stiff, red-brown CLAY (CL/CH), some gravel; moist (topsoil to 10 inches, 3-inch-thick root zone).		PP			PP = 0.5 tsf
	Medium dense, black stained red-brown, fine to coarse, clayey GRAVEL (GC); moist, subangular (decomposed basalt).	1.5				
2.5						
5.0	becomes dense to very dense, red-brown and dark gray with yellow veining, coarse; angular, vesicular (decomposed to intensely weathered basalt breccia) at 6.0 feet					
7.5						
10.0	becomes gray-brown, yellow-brown, and red-brown at 10.0 feet					
	Exploration completed at a depth of 11.0 feet.	11.0				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration. Latitude: 44.88424293620 Longitude: -123.00588761500
12.5						
15.0						
17.5						
20.0						

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Portland OR 97224
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SALEM, OR

FIGURE A-31

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0	Stiff, brown to red-brown CLAY (CL/CH); moist (topsoil to 10 inches, 3-inch-thick root zone).		PP			PP = 1.0 tsf
			PP			PP = 1.0 tsf
			PP			PP = 2.5 tsf
2.5	becomes very stiff, sandy at 3.0 feet		PP	☒	●	PP = 4.0 tsf
						Slow groundwater seepage observed at 4.5 feet.
5.0	with gravel and cobbles at 6.0 feet					
7.5	Stiff to very stiff, yellow-brown, red-brown, and dark gray, gravelly SILT (ML/MH), minor clay; moist to wet, vesicular, relict rock structure (decomposed basalt breccia).	7.5		☒		
10.0						
	Exploration completed at a depth of 11.0 feet.	11.0				No caving observed to the depth explored.
12.5						Surface elevation was not measured at the time of exploration.
						Latitude: 44.88360910260 Longitude: -123.00573978500
15.0						
17.5						
20.0						

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EXCAVATION METHOD: trackhoe (see report text)

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Portland OR 97224
Off 503.968.8787 Fax 503.968.3068

PACTRUST-162-01

TEST PIT TP-32

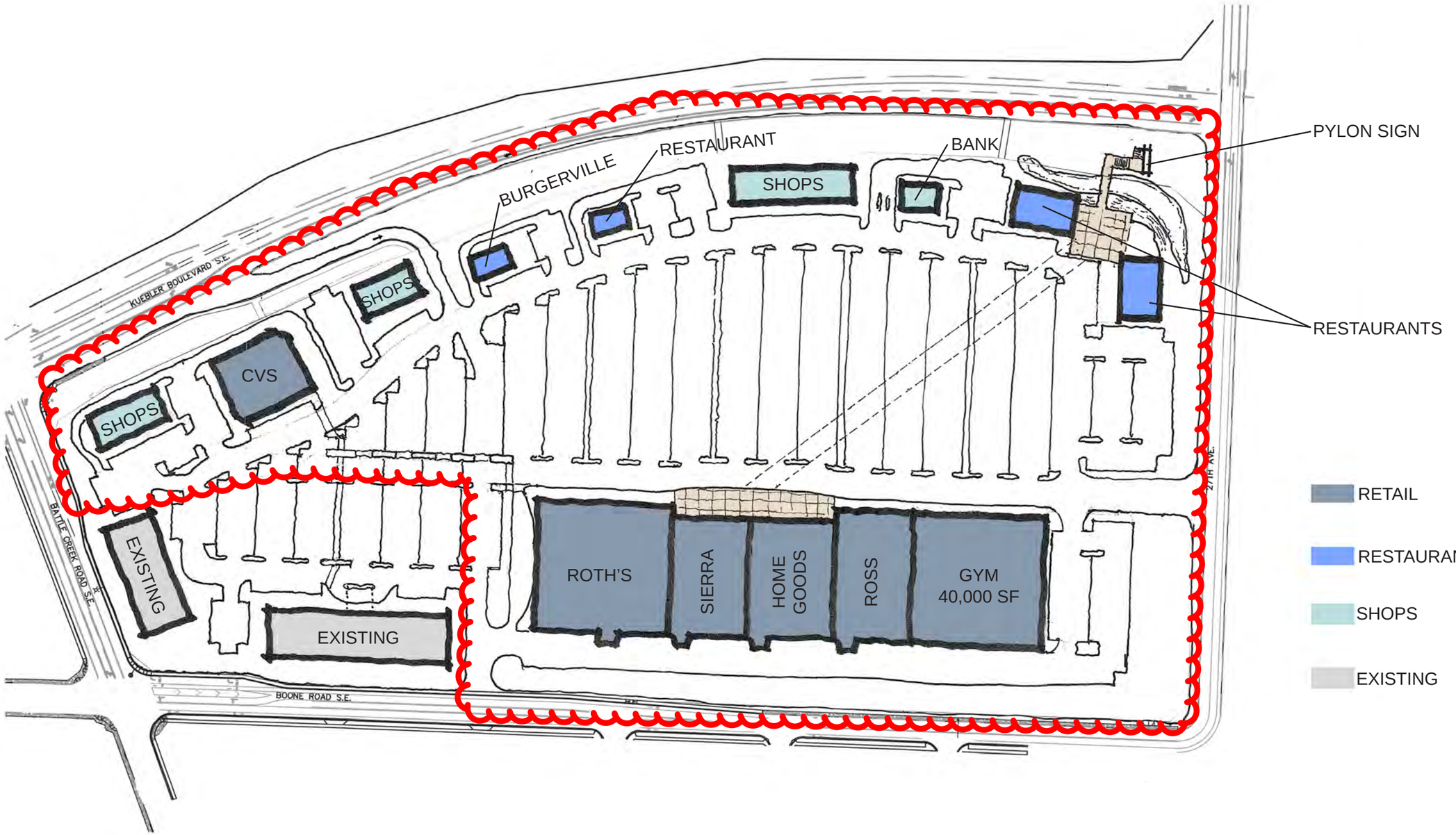
MARCH 2012

KUEBLER BOULEVARD PROPERTY
SALEM, OR

FIGURE A-32

TEST PIT LOG - 1 PER PAGE PACTRUST-162-01-TP1_32.GPJ GEODESIGN.GDT PRINT DATE: 3/30/12:KT

ATTACHMENT C



2120066.01

MACKENZIE.
DESIGN DRIVEN | CLIENT FOCUSED

OPTION 6

KUEBLER
SALEM, OREGON
03-22-16

NORTH

0 80 160 320 1"=160'

PACTRUST
Pacific Realty Associates, L.P.

ATTACHMENT D

PAC TRUST KUEBLER DEVELOPMENT

PRELIMINARY GRADING

PRELIMINARY GRADING PLAN – EAST

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

REGISTERED PROFESSIONAL ENGINEER
REVIEW
NOV. 12, 2008
WILLIAM J. WELLS
RENEWS: 6/30/2016

SCALE
HORIZ: AS SHOWN
VERT: AS SHOWN

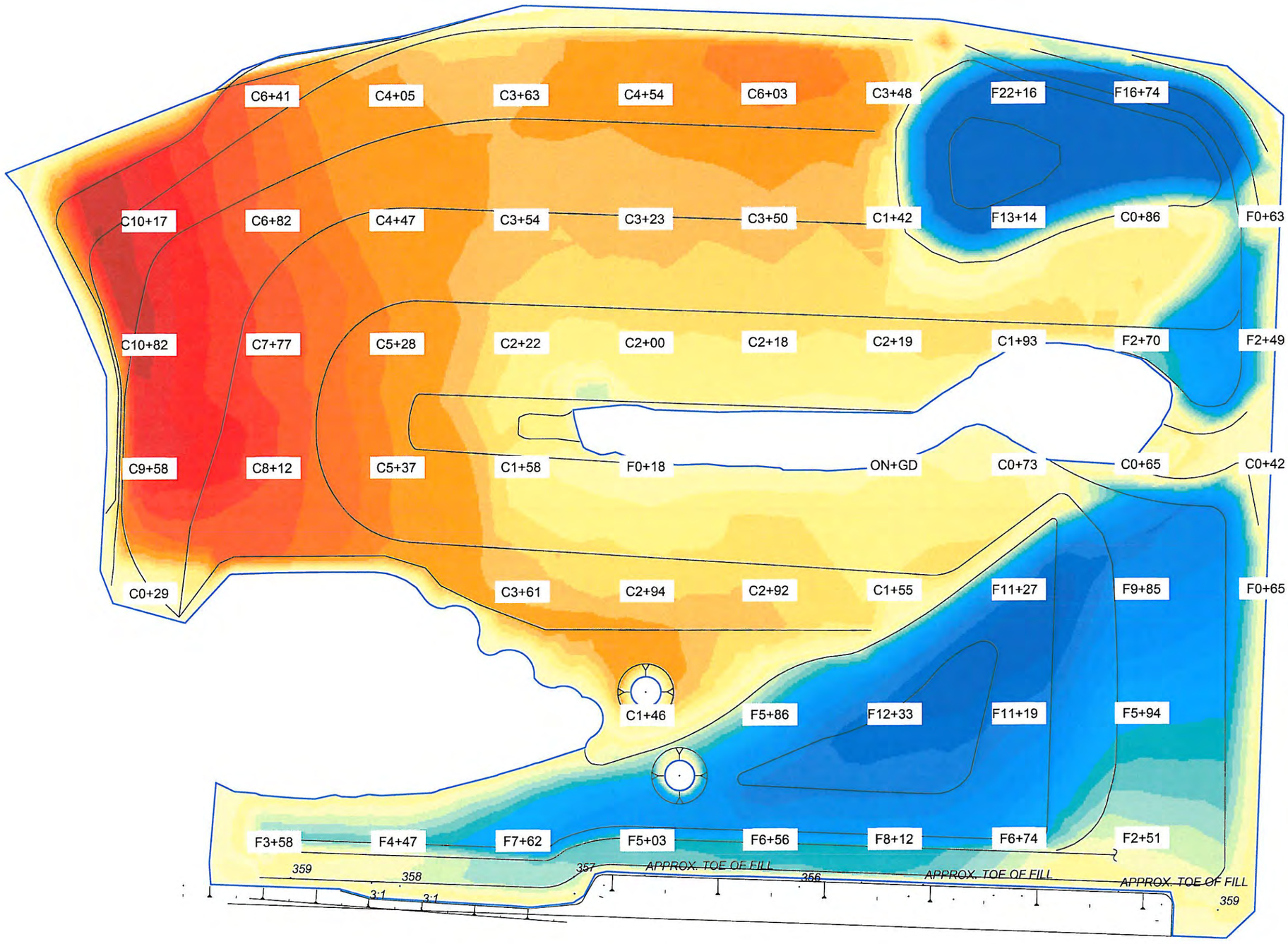
DSN. JW
DRN. RGS
CKD. JW
DATE: JUN 2016

NO.	DATE	DESCRIPTION	BY
		REVISIONS	

SHEET 1 OF 1

JOB NUMBER 2672.0000.0

ATTACHMENT E



AGTEK
0 100 200

Kuebler Mass Grading Version 2

NEI
NORTHWEST EARTHMOVERS
INCORPORATED