

REPORT OF GEOTECHNICAL INVESTIGATION SITE DEVELOPMENT SDSU MISSION VALLEY SAN DIEGO, CALIFORNIA

Prepared for

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Attention: Mr. Michael Masterson

SUBJECT: REPORT OF GEOTECHNICAL INVESTIGATION

Site Development SDSU Mission Valley San Diego, California

Mr. Masterson:

Group Delta Consultants (Group Delta) is submitting this geotechnical investigation report for the grading and civil works (*Site Development*) that is part of the redevelopment of the former SDCCU site (overall site) into the San Diego State University Mission Valley (SDSU MV) campus. The ultimate development of the site (*Full Build Out*) will consist of a Stadium, Campus Expansion, Tailgate Park, Hotel and Conference Center, Residential, and Park Space.

Group Delta prepared this report per our Agreement for Consulting Services dated January 23rd, 2019. This issue of the report is the first draft of the Report of Geotechnical Investigation. The purpose of this report is to provide preliminary information to support the collaborative design-build procurement of the Site Development package. Revisions may be needed for design development and to obtain construction permits.

This report provides interpretations of the geologic and geotechnical conditions observed and preliminary recommendations for design and construction of the grading and civil works for Phases 1B to 4. Group Delta is submitting a separate geotechnical report for the Stadium along with another report for subsurface environmental conditions of the overall site. This report does not provide geotechnical recommendations for the Full Build Out, but it does discuss mitigation of geotechnical conditions that could be included in the Site Development package.

We appreciate this opportunity to be of continued professional service. Please contact us with questions or comments, or if you need anything else.

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1.0 INTRODUCTION

This report presents the results of a geotechnical investigation by Group Delta Consultants (Group Delta) for the grading and civil works (referred to as the *Site Development* package) to redevelop the former SDCCU stadium site (overall site) into the San Diego State University Mission Valley (SDSU MV) campus. Figure 1, Site Location, shows the location of the project. Figure 2, Proposed Development, shows the plan layout of the project.

The purpose of this report is to provide preliminary information to support the collaborative design-build procurement of the Site Development package. This report provides interpretations of the geologic and geotechnical conditions observed and preliminary recommendations for design and construction the grading and civil works for Phases 1B to 4. Revisions may be needed for design development and to obtain construction permits.

This report does not provide geotechnical recommendations for the buildings and parking structures planned for the ultimate development of the overall site (referred to as *Full Build Out*). However, this report discusses potential mitigation of geotechnical conditions that could be included in the Site Development package to facilitate construction of these structures.

Group Delta (2019b) submitted a separate geotechnical investigation report for the Stadium, the Phase 1A Grading, and the portion of Phase 1B Grading, that are the responsibility of Stadium Contractor. Group Delta (2019c) also submitted a report for subsurface environmental conditions of the overall site.

Group Delta developed the recommendations from reviewing the referenced previous studies, recent subsurface exploration and laboratory testing, geologic and geotechnical engineering interpretation and analyses, and our previous experience with similar geologic conditions.

1.1 Scope of Services

This report was prepared in general accordance with the provisions of the referenced proposal (GDC, 2019a). In summary, we provided the following scope of services.

- Review of the previous geologic and geotechnical studies referenced in this report.
 Plate 1, Geotechnical Map, shows the locations of relevant prior exploratory borings. Appendix A provides the records from these explorations.
- Subsurface exploration consisting of 29 exploratory borings, 10 Cone Penetration Tests (CPTs) and three infiltration tests at the approximate locations shown on Plate 1, Geotechnical Map. Appendix B provides records from these explorations and Appendix D provides the results of the infiltration testing.
- Laboratory testing of soil samples collected from the borings. Laboratory tests included sieve analysis, Plasticity Index, Expansion Index, corrosion (pH, resistivity,



soluble sulfate and chloride), shear strength (direct shear) and compressibility (consolidation). Appendix C provides the laboratory test results.

- Engineering analysis of the field and laboratory data to develop geotechnical parameters and preliminary recommendations for design and construction.
- Preparation of this report with our findings, conclusions and recommendations.

1.2 Site Description

The former SDCCU stadium site occupies about 170 acres in the Mission Valley area of the City of San Diego as shown on Figure 1, Site Location. The existing stadium is in the center of the site. Asphalt paved surface parking covers the remainder of site. The Mission Valley West Light Rail Transit runs east-west near the southern perimeter of the site.

Surface elevations vary from about 45 to 100 feet NAVD 88 from southeast to northwest. The basis of elevations stated further in this report is NAVD 88, unless noted otherwise.

1.3 Proposed Development

We have based our understanding of the project on information in the San Diego State University 100% Design Development Architectural and Landscape Plans (Carrier Johnson, 2019), and the 100% Design Development Civil Plans and the Conceptual Phasing Plan (Rick Engineering, 2019a,b). Figure 2, Proposed Development, shows the plan layout of the project. Plate 1, Geotechnical Map uses the "Opening Day" cut/fill exhibit as the base map.

The site will be developed in two main phases referred to as *Opening Day* and *Full Build Out*. The Opening Day configuration comprises the new Aztec Stadium (Stadium), temporary surface parking surrounding the Stadium and Park Space along the southern and eastern perimeter of the overall site. Full Build Out replaces the temporary surface parking with a Campus Expansion, Tailgate Park, Hotel & Conference Center, and Residential areas.

The grading and civil works to prepare the site and planned for in the Site Development package will be completed in the following phases:

Phase 1A: Initial grading of Stadium pad (by Stadium Contractor, not part of this report).

Phase 1B: Demolition of the western portion of SDCCU stadium (by Stadium Contractor) and rough grading of the western half of site.

Phase 2: Construct Stadium (not part of this report)

Phase 3: Demolition of the eastern portion of SDCCU stadium and rough grading for the

residential pads.

Phase 4: Precise grading of residential pads.



1.3.1 Cut and Fill Earthwork

Cut and fill earthwork will reform the site to create new streets and building pads and raise it above the 100-year floodplain. Cut and fill volumes are estimated to be 750,000 cubic yards (CY) and 1,065,000 CY with a net import of 315,000 CY, exclusive of shrinkage and bulkage, and remedial grading.

Cut will remove some of the fill placed to create the SDCCU stadium pad, form the Stadium lower seating bowl and field level, and form the eastern half of the Stadium Zone of the Campus Expansion (this area will be a designated borrow area for the Stadium grading). The Stadium Contractor will complete all the earthwork in the Stadium site and demolish the southeast portion of the SDCCU stadium.

Fill will raise grades within the former SDCCU stadium field level and create large level areas across the northern and southwest portion of the site. The table below summarizes approximate grading data for the various development areas.

GRADING DATA

Development Area	Finished Subgrade Elevation, feet	Maximum Cut Thickness, feet	Maximum Fill Thickness, feet
Campus Expansion – Campus Zone	55	10	20
Campus Expansion – Stadium Zone	75	10	20
Tailgate Park	80 to 85	10	25
Hotel & Conference Center	85	10	20
Residential – North (R1 to R9)	70 to 75	20	15
Residential – South (R10 to R15)	65	25	20
Park Space (Southwest)	55	5	5
Park Space (Southeast to Northeast)	55	10	10

A fill slope inclined at 3:1 provides a separation between the eastern portion of the building pads for the Residential areas and Park Space. Cut and fill slopes formed at 2:1 will create new interior streets and the temporary surface parking in the areas west and south of the Stadium.



1.3.2 Civil Site Work

Surface parking covered with asphalt concrete or gravel is planned for Opening Day in areas north, west and south of the Stadium. Above- and below-ground parking structures for the Campus Expansion and Hotel & Conference Center will ultimately replace the Opening Day surface parking.

New interior streets will be 6-Lane Major, 4-Lane Major and 2-Lane Collectors covered with asphalt concrete pavement constructed according to City of San Diego Standard Drawings, Schedule J, Pavement Design Standards. There are multiple paving types for roads, parking lots and trails. This report provides recommendations for Paving Type 2, Asphalt Concrete with Aggregate Base.

The existing Friars Road, Mission Village Drive (including the bridge over Friars Road) and San Diego Mission Road will be widened or reconstructed. A new connection to Fenton Parkway will be needed as well. This report only provides recommendations for new interior streets.

Existing sewer, storm drain, water and dry utilities will be abandoned. There will be new sewer, storm drain, water, dry utilities, and fireline. A new 30-foot wide box culvert will be constructed in the northeast portion of the site extending under the proposed Murphy Creek Road. Gravity flow utilities have a minimum gradient of 0.5 percent.

Storm water improvements include several new infiltration basins in the Park Space area along the southern and eastern portions of the property.

1.3.3 Full Build Out

Full Build Out will consist of the development areas listed below.

- Campus Expansion
- Hotel & Conference Center
- Residential
- Tailgate Park and Park Space

The following sections describe the structures planned for in these areas (except for Stadium that is a separate Group Delta report).

1.3.3.1 Campus Expansion

The Campus Expansion will occupy about 28 acres, and it consists of a *Campus Zone* south of the Stadium and a *Stadium Zone* east of the Stadium. The Campus Zone will have 14 buildings that range from 3 to 5 stories with plan areas ranging from 17,000 to 28,000 square feet. The Stadium Zone will have two 5-story buildings with plan areas of 31,000 square feet each. Most of the Campus Zone will have two levels of partially underground parking and most of the Stadium Zone will have a ground level and an underground level of parking.



1.3.3.2 Hotel & Conference Center

The Hotel & Conference Center parcel will occupy about 7 acres north of the Stadium. It will have a 9-story steel and concrete tower, a 3-story wood framed building and a 4-level above ground concrete parking structure.

1.3.3.3 Residential

The 15 Residential parcels will occupy 44 acres of the eastern portion of the overall site. The buildings range from two at 3-stories, eight at 5-stories and five at 21- to 24-stories. The taller structures are steel and concrete construction. The shortest structures are wood-frame construction. Most of the structures use: 1) a "wrap" configuration that consists of a central, above ground multi-story concrete parking structure surrounded by multiple stories of wood-frame construction living units, 2) a concrete podium parking structure with multiple levels of wood-framed living units above the podium, or 3) combinations of these types of construction.

1.3.3.4 Tailgate and Park Space

The Tailgate and Park Space will provide 84 acres of open space. The Tailgate is two active parks that will occupy 8 acres west of the Stadium. The Park Space will be a 34-acre Community River Park along the southern and eastern perimeter of the site. It will consist of active and passive park and green spaces with hiking and biking trails.

1.4 Previous Site Use and Development

AECOM (2015) prepared a Geotechnical and Geologic Evaluation Report for a proposed National Football League stadium to the replace the SDCCU stadium that opened in 1967. This report summarized the prior use and development of the site. Salient information is provided below.

- There were two previous quarries. They were located near the northeast and western perimeters of SDCCU stadium. We noted an anomalously thick clay layer in Group Delta explorations S-2 and CPT-2 that may be related to prior mining.
- About 35 feet of fill, or more in localized areas, was placed around the perimeter of SDCCU stadium. The fill was placed to raise the stadium site above the floodplain and to establish a field level at +50 feet Mean Sea Level (MSL). The fill was sourced from hillsides located north and northwest of the overall site in areas mapped as underlain by the Stadium Conglomerate (Kennedy and Tan, 2008). The Stadium Conglomerate possesses a relatively high percent of gravel, cobbles and boulders.
- Steel H-Piles (HP 8X36, 12X53, 12X74 and 14X102) support the original stadium. AECOM indicated that based on as-built drawings, the piles were driven to refusal and they extend 10 to 20 feet into formational materials. Recorded pile tip elevations on the south side of the stadium ranged from +1 to +9 feet MSL (66 to 77 feet long) and recorded pile tip elevations on the north site of the stadium ranged from -12 to -24 feet MSL (70 to 100 feet



long). Tip levels varied because the formational materials were shallower on the south side of the stadium. Batter piles support lateral loads.

 Cast-in-Drilled-Hole (CIDH) piles support the enclosure of the southeast side of the stadium that opened in 1997. AECOM indicated that based on the geotechnical report and structural drawings, the piles were designed considering end bearing and they extend 5 feet into formational materials, or the basal gravels that overlies this formation. Pile diameters ranged from 36 to 72 inches and specified pile tip levels ranged +12.6 to -9 feet MSL (70 to 95 feet long). As-built or construction records were not available.

1.5 Previous Geotechnical Studies

AECOM (2015) and Geocon (2016) completed prior geotechnical and geologic evaluations for the redevelopment of the SDCCU stadium site. These evaluations reviewed existing geotechnical and geologic information and did not include any additional subsurface exploration. Relevant information from these evaluations is included in this report.

It is important to note these evaluations provided different opinions regarding the potential for liquefaction. Geocon made a qualitative evaluation by assuming that most of the alluvial soils are geologically old, and therefore should not be susceptible to liquefaction. AECOM made a quantitative evaluation by using the few geotechnical test borings completed at the site with soil resistance data (Standard Penetration Test blow counts) to estimate about 2 to 6 inches of liquefaction-induced settlement. AECOM therefore concluded there was "moderate to high" potential for liquefaction. Note also that Geocon's assessment was for the entire site, while AECOM's assessment was limited to a stadium located in the northeast portion of the site, and an alternate stadium located in the northwest portion of the site. The assessment of liquefaction in this report using site specific subsurface data supersedes these desk study type evaluations.

Additional data is available from the geotechnical studies completed for the Mission Valley West Light Rail Transit (LRT) that runs east-west near the southern perimeter of the overall stadium site. The As-Built Log of Test Borings (dated 1999, as referenced in Gillingham Water and CH2M, 2018) for the portion of the alignment within the site includes 21 geotechnical explorations. The records from these explorations indicate subsurface conditions similar to those interpreted from Group Delta's current explorations and described in the report.

Large diameter Cast-In-Drilled (CIDH) piles support this segment of the LRT that derive support in the underlying gravels and formational materials. We understand from anecdotal construction information (Curt Scheyhing, 2019 personal communication) that construction of some of these piles experienced unusual difficulties with soft soils that may have been the remnants of prior local mining operations. CIDH pile construction was able to remove gravels with some difficultly using conventional rock drilling and excavating equipment and tooling.



1.6 Previous Environmental Subsurface Explorations

Since 1992, numerous groundwater monitoring wells have been constructed within the overall site. These wells are part of on-going investigation and remediation activities for petroleum hydrocarbon impacts to soil and groundwater resulting from operations at an adjacent tank farm. The records from these well installations include descriptions of soil and rock types and layers observed from drilling cuttings. Most of the well installations did not collect samples of the soil and rock and they did not obtain geotechnical sampler resistance data, such as Standard Penetration Tests. Plate 1, Geotechnical Map, shows the locations of relevant prior exploratory borings. Appendix A provides the records from these explorations. We have used the data from some of these installations to help develop the Geologic Cross Sections.

2.0 FIELD AND LABORATORY INVESTIGATION

2.1 Current Subsurface Exploration

The current subsurface exploration for the Site Development consisted of 16 exploratory borings (designated as B-) and three infiltration tests that were advanced using a combination of hollow stem auger, rotary wash, casing advancement, and rock coring drilling methods to depths ranging from 30 to 85 feet. The 13 explorations from the Stadium (designated a S-) are included in the interpretation and analyses for this report. The borings were completed during February and March 2019.

Ten Cone Penetrometer Tests (CPTs) were also completed. Downhole seismic data were recorded for three of the CPTs, which are further designated as Seismic CPTs (SCPTs). CPT-2 and CPT-26 initially encountered refusal at depths of about 25 feet due to gravel and cobbles causing resistance to further advancement and flexure of the CPT rods. CPT-2 and CPT-26 were reattempted by locating a second CPT location a few feet away from the original location, which was able to be advanced to a depth of about 45 and 40 feet, respectively, where refusal on gravel and cobbles was encountered. SCPT-7 and CPT-11 both encountered relatively shallow refusal on gravel and cobbles at about 17 feet. The CPTs were advanced on March 18 and April 8, 2019.

Note the SDCCU stadium precluded exploration within a large area of the site. The stadium occupies about 20 acres of the overall 170-acre site. Plate 1, Geotechnical Map, shows the approximate locations of the explorations. Appendix B provides records from these explorations.

2.2 Laboratory Testing

Soil samples were collected from the borings for laboratory testing. The geotechnical testing program included sieve analyses and Plasticity Index testing to aid in soil classification using the ASTM Unified Soil Classification System (USCS). Index tests were also conducted to help evaluate the soil expansion potential and corrosivity. Direct shear and consolidation tests were conducted on relatively intact samples to evaluate soil strength and compressibility. The laboratory test results are shown on the Current Exploration Records in Appendix B and in Appendix C.



3.0 GEOLOGY AND SUBSURFACE CONDITIONS

The site is located within the Peninsular Ranges geomorphic province of southern California. This province stretches from the Los Angeles basin to the tip of Baja California. It is characterized as a series of northwest trending mountain ranges separated by subparallel fault zones. The site is located within the coastal plain transected by the west-flowing San Diego River drainage known as Mission Valley and it is underlain at depth by Eocene-age sedimentary deposits mapped as the Friars Formation (Map Symbol Tf).

The Friars Formation consists of six intertonguing, depositionally time-equivalent facies ranging from deep-marine, fine-grained siltstone and claystone to the southwest and continental, coarse-grained sandstone and conglomerate to the northeast. The Friars Formation are nonmarine and near-shore deposits of lagoonal sandstone, siltstone, and claystone. The Friars Formation is found in Mission Valley at elevations below approximately 160 feet Mean Sea Level. Regionally, the Friars Formation dips gently to the southwest between 3 and 5 degrees.

Thick deposits of poorly consolidated, mostly granular alluvium associated with the San Diego River and Murphy Creek drainages, local deposits of slopewash and colluvium, and fill soils associated with the original stadium construction overlies the Friars Formation. These materials are collectively referred to as Surficial Soils - Undifferentiated (Map Symbol su).

Figure 3, Geologic Map depicts the general geology in the site. Plates 2A through 2G are geologic cross sections through the site. The sections below describe the geologic units encountered.

3.1 Friars Formation

As encountered in the explorations completed for this investigation and those conducted for the previous environmental monitoring well installations, the elevation of the top of Friars Formation ranges from 25 feet in the northwest portion of the overall site to less than 0 feet in the central portion of the overall site (including the SDCCU stadium footprint). The elevation of the top of the Friars Formation rises in the southeast portion of the overall site to about 25 feet. Plate 4, Estimated Settlements Summary, provides these elevations for each exploration.

The overall site is located at the confluence of two major drainages - the San Diego River and Murphy Creek. We interpret that the variability of the elevation of the top of Friars Formation occurs from erosion of the San Diego River and Murphy Canyon paleochannels into this formation below the SDCCU stadium. Significant and abrupt declines in elevation occur northwest to southeast from transitions at the margins of the paleochannels. Geologic Cross Sections B-B' (Plate 2B) and C-C' (Plate 2C) depicts this paleochannel as the significant drop in the elevation of the Friars Formation across a short horizontal distance. Note the eastern margin of the paleochannel is inferred because we were unable to conduct subsurface exploration in the existing stadium.

As observed in all our deep borings, the Friars Formation generally consists of gray to yellowish brown, interbedded, fine- to coarse-grained silty sandstone with some fine gravel and gray, sandy siltstone with minor amounts of gray claystone. Auger cuttings and drive samples obtained from



these materials were observed to be sand with silt (SP-SM), silty and clayey sand (SM, SC), and lean to fat clay (CL, CH). The apparent density was dense to very dense considering SPT blow counts and the consistency was very stiff to hard considering the undrained shear strength obtained from hand-held Pocket Penetration and Torvane tests.

3.2 Surficial Soils - Undifferentiated

The thickness of the soils in the Surficial Soils - Undifferentiated unit varies across the overall site based on the elevation of the top of Friars Formation. The thickness of these materials ranged from an average of 25 to 60 feet in the northwest portion of the overall site, to more than 50 to 75 feet in the central portion of the overall site. The table below summarizes the thickness within the development areas.

THICKNESS OF SURFICIAL SOILS - UNDIFFERENTIATED

Development Area	Thickness, feet
Campus Expansion – Campus Zone	25 to 80 (deepening to the east)
Campus Expansion – Stadium Zone	70 to 75
Hotel & Conference Center	40 to 60 (deepening to the east)
Residential – North (R1 to R9)	50 to 70 (deepening to the northwest)
Residential – South (R10 to R15)	30 to 65 (deepening to the west)

The soils in this unit are subdivided into Surface Gravel/Fill, Middle Sand/Fine-Grained Soils, and Basal Gravel. These units are described in more detail in the following sections.

3.2.1 Surface Gravel/Fill

Historical topographic maps indicate that at least three separate active river channels existed through the overall site with the broadest U-shaped meander near Murphy Canyon extending north almost to the current Friars Road alignment (U.S Department of the Interior, 1903). The Murphy Canyon drainage empties into the site from the north. Deposition of coarse-grained alluvium within these river and stream channels has created locally discontinuous gravel layers across the site in the near surface elevations.

Various amounts of fill placed during previous quarrying activities and the original stadium and parking lot construction also cover the site. Historical records indicate that up to 35 feet of fill, or more in localized areas, was placed around the perimeter of the stadium to raise grades above the floodplain. The fill materials were apparently imported from nearby excavations.



These soils were observed in the borings to mostly consist of poorly to well graded sand (SP, SW), silty and clayey sand (SM, SC), silty to clayey gravel (GM, GC) and gravel and cobbles. The apparent density ranged from loose to dense considering SPT blow counts, some of which were erroneously impacted by gravel and cobbles.

3.2.2 Middle Sand/Fine-Grained Soils

Sea level transgressions in the last 10,000 years backfilled the San Diego River channels with finer grained alluvial deposits including silt, clay, sand, and finer gravel. The Middle Sand/Fine-Grained Soils unit was encountered in all the explorations.

These soils were observed in the borings to mostly consist of poorly to well graded sand (SP, SW), silty and clayey sand (SM, SC), silty to clayey gravel (GM, GC) and gravel and cobbles. The clay soils observed in the borings were mostly medium plasticity lean clay (CL). The apparent density ranged from loose to dense and the consistency ranged medium stiff to stiff, considering SPT blow counts and hand-held Pocket Penetration and Torvane tests. Some of the SPT test were erroneously impacted by flowing sands or gravel and cobbles.

3.2.3 Basal Gravel

The Basal Gravel consists of San Diego River alluvium deposited unconformably on the erosional contact with the Friars Formation. The Basal Gravel appears to be located within the old San Diego River paleochannels that formed from sea level changes and regional uplift over the past several hundred thousand years.

These soils were observed in the borings to mostly consist of sandy coarse gravel and boulders up to two feet in diameter. Since the subsurface exploration used small diameter drilling methods (augers and drill bits less than 8-inches in diameter) maximum clast sizes were not directly observed. However, historical documents, nearby riverbed exposures, and our experience with construction projects in Mission Valley provide us with these data. The apparent density ranged from dense to very dense considering SPT blow counts, most of which were erroneously impacted by the gravel and cobbles.

3.3 Groundwater

Groundwater was measured during drilling in the subsurface explorations completed for this investigation (except S-9, S-13, B-14, B-19, B-26, B-29 and B-32 where the drilling method, depth and/or conditions did not allow for measurement) at elevations of 47 to 49 feet along the northern portion of the overall site and at elevations of 37 to 40 feet in the southwest portion of the overall site.

Local variations in groundwater elevation up to 7 feet were measured in adjacent explorations. This variation may be due to: 1) groundwater measurements were conducted when the drilling was finished, and the groundwater level may not have stabilized; 2) groundwater may be locally



perched on less-permeable, fine grained soils; or 3) a combination of the two. The apparent gradient across the site from northwest to southwest is approximately 7 degrees as measured in the explorations.

Groundwater was also measured in select existing monitoring wells constructed by others at the site following our site investigation. Groundwater was measured at elevations ranging from approximately 41 to 49 feet. Plate 3 shows an interpretation of the groundwater elevations using groundwater measurements from: 1) select explorations by Group Delta and 2) select environmental monitoring wells constructed by others.

The table below summarizes groundwater levels within the development areas.

MEASURED GROUNDWATER LEVELS

Development Area	Average Finished Subgrade Elevation, Feet	Measured Elevation of Groundwater, Feet
Campus Expansion – Campus Zone	55 (Cut)	43 to 45
Campus Expansion – Stadium Zone	75 (Cut)	45 to 48
Hotel & Conference Center	85 (Fill)	43 to 49
Residential – North (R1 to R9)	70 (Cut)	44 to 49
Residential – South (R10 to R15)	65 (Cut)	44 to 52

4.0 GEOLOGIC HAZARDS

We anticipate the primary geologic hazards to be strong ground shaking from earthquakes and the associated soil liquefaction. As shown in Figure 4, Seismic Safety Map, the site is within Geologic Hazard Category 31, which is characterized as having high potential for liquefaction due to "shallow groundwater, major drainages, or hydraulic fills". Geologic hazards for the site are described below.

4.1 Strong Ground Motion

The site could be subject to moderate to strong ground shaking from a nearby or more distant, large magnitude earthquakes occurring during the expected life span of the project. This hazard is managed by structural design of the buildings per the latest edition of the California Building Code (CBC, 2016) and California State University requirements. Seismic design parameters are provided in the Recommendations section.



4.2 Earthquake Induced Ground Failure

Potentially liquefiable soils underlie the site. Liquefaction is the sudden loss of soil shear strength within saturated, loose to medium dense, sands and non-plastic silts. Liquefaction is caused by the build-up of pore water pressure during strong ground shaking from an earthquake.

We interpret liquefaction-induced settlement to be the most likely secondary effect to occur given the site surface and subsurface conditions. The secondary effects of liquefaction are sand boils, settlement, and instabilities within sloping ground (lateral spreading, seismic deformation and flow sliding). Associated with earthquake-induced ground failure is seismic compaction, which is the densification of loose to medium dense granular soils that are above groundwater.

4.2.1 Results of Liquefaction Analyses

Based on the results of analyses to evaluate the triggering of liquefaction, the potential for liquefaction is widespread throughout the Surficial Soils - Undifferentiated that are below groundwater. Significant variations in the estimated liquefaction-induced settlement occur from differences in the thickness of these soils and the depth to groundwater, which varies with changes in surface elevations. In addition, there are local zones of relatively thick non-liquefiable clayey soils. Provided below is a summary of the main findings of the analyses.

- Total settlement is estimated to range from 1 to 5 inches.
- The estimates of total settlement could increase by about one-third, ranging from 1.5 to 6.5 inches, depending on the assumptions used in the analyses.
- The estimates of total settlement increase by 0.5 inches using seismic design inputs from expected Building Code revisions (ASCE 7-16: PGAM = 0.58g, Mw = 6.89).
- The largest settlements are estimated to occur within the Campus Expansions and the Residential North areas.

The table below provides estimated total dynamic (liquefaction and seismic compaction) settlement within each development area. A summary of these estimated settlements is also included on Plate 4.

ESTIMATED DYNAMIC SETTLEMENT

Exploration	Location	Thickness of Liquefiable Soils, Feet	Total Settlement, Inches
B-14		15	2
B-15	Campus Expansion –	25	4
B-16	Campus Zone	20	1
B-17		25	4



ESTIMATED DYNAMIC SETTLEMENT

Exploration	Location	Thickness of Liquefiable Soils, Feet	Total Settlement, Inches
B-27		25	1
S-8	Campus Expansion –	25	5
S-5	Stadium Zone	25	4
S-13		20	4
B-20		10	1
B-21	Decidential Courts	15	2
B-23	Residential - South	20	3
B-24		25	4
B-26		30	4
B-27	Residential - North	20	1
B-28	Residential - North	25	3
B-30		35	3
B-31		20	1
S-1	Hotel	10	1
S-2		10	2

- 1. Settlement is the combination of liquefaction-induced and seismic compaction. Estimated magnitude of seismic compaction insignificant.
- 2. Settlement is a "free-field" estimate that does not consider: a) the shear strain due to foundation loading, b) contribution of ejecta-related settlement and c) the ability of thick non-liquefiable soils above groundwater to attenuate the estimated settlement.

Differential settlement over a horizontal distance of 30 to 40 feet may be estimated to be two-thirds of the total settlement. Consequently, differential settlement in some areas exceed thresholds that allow for conventional shallow foundations, such as 1 to 2 inches over 30 feet for multistory structures and 2 to 4 inches over 30 feet for single story structures (ASCE 7-16, Risk Category III). The thickness of non-liquefiable soils at the surface, removal and recompaction of this material, and the placement of fill could attenuate differential settlement to the extent that conventional shallow foundations could be suitable in some areas for certain structures.

Silt and clay soils should not be susceptible to liquefaction or have the potential to lose shear strength from strong ground shaking considering the plasticity characteristics obtained from Plasticity Index testing (Boulanger and Idriss, 2006; Bray and Sancio, 2006).



4.2.2 Methodology

The liquefaction triggering calculations used Standard Penetration Test data (blow counts per foot) and laboratory test data on the percentage of fines (silt and clay) to obtain the resistance of the soil to liquefaction, as recommended by the NCEER Workshops (Youd and Idriss, 2001) and Boulanger and Idriss (2014). Free-field volumetric settlement was estimated using Tokimatsu and Seed (1987) and Pradel (1998). The analyses adopted the following ASCE 7-10 input parameters:

Peak Ground Acceleration (PGA _M):	0.46g
Earthquake Magnitude (Mw):	6.7
Groundwater Level:	+ 50 feet NAVD 88

The PGA_M was developed using the maximum considered earthquake geometric mean (MCE_G) peak ground acceleration adjusted for Site Class effects obtained from the SEAOC/OSHPD Seismic Design Maps Tool in accordance with the 2016 CBC (as referenced in SEAOC/OSHPD, 2019). The controlling magnitude used in the liquefaction evaluation was selected by reviewing deaggregation results obtained from the USGS Unified Hazard Tool (2018b).

4.3 Landslides and Slope Stability

Based on the relatively flat topography of the site and proximity to nearby hillsides, landslides are not design considerations. Cut and fill slopes planned to form the site should possess adequate surface and overall stability if designed and constructed as recommended in this report.

4.4 Tsunami, Seiche, and Flooding

The site is above the mapped tsunami inundation line and it is outside of the mapped tsunami inundation area (CalEMA et al, 2009). The site is not located below any lakes or confined bodies of water so there is no potential for seiches or earthquake induced flooding. The site is outside of mapped high-risk dam inundation areas on the County of San Diego draft dam failure hazard map (County of San Diego, 2018).

We understand that a Conditional Letter of Map Revision (CLOMR) prepared by others is revising the Federal Emergency Management Agency (FEMA) 100-year floodplain in consideration of site grading and elevations changes.

4.5 Subsidence

Subsidence is customarily associated with long term groundwater extraction. The City of San Diego (City) is assessing the feasibility of developing the Mission Valley groundwater basin as a sustainable source of water (Gillingham Water and CH2M, 2018). The City is considering installing three groundwater extraction wells south and southwest of the Stadium site. The City's consultants should address the potential for subsidence considering the proposed SDSU MV redevelopment. Group Delta should review the assessment made by the City's consultant.



5.0 GEOTECHNICAL CONDITIONS

Fill and thick alluvium underlies the Stadium site. We have not differentiated the fill soils from alluvial soils as discussed in Section 3.0 (Geology and Subsurface Conditions). A northeast to southwest trending paleochannel (ancient buried stream or river channel) causes the thickness of these undifferentiated soils to increase from 45 to 55 feet in the northwest portion of the overall site to more than 65 to 75 feet in the southeast portion of the overall site. Formational materials (geologically mapped as Friars Formation) underlie these soils.

The Surficial Soils - Undifferentiated unit is predominately coarse-grained soils with apparent densities that vary from loose to dense with a corresponding variable shear strength and stiffness. However, there are also significant zones of gravel and clay. Relatively thick (ranging from 5 to 20 feet) layers of gravel were encountered near the ground surface, at an intermediate depth, or above the formational material in 14 of the 18 explorations. In addition, a relatively thick (ranging from 5 to 10 feet) layer of clay was observed at an intermediate depth in nine of the 18 explorations. Therefore, for geotechnical engineering purposes we subdivided the Surficial Soils-Undifferentiated into *Surface Gravel/Fill*, *Middle Sand/Fine-Grained Soils*, and *Basal Gravel* to emphasize the distribution of the gravel and clay soils, as summarized below.

- The gravel in the Surface Gravel/Fill is not widespread (encountered in 5 of 18 explorations) and it was observed to range from 10 to 15 feet thick. This gravel was observed mostly in explorations located in the western portion of the site.
- The gravel in the Middle Sand/Fine-Grained Soil is not widespread (encountered in 2 of 18 explorations) and it was observed to range from 5 to 10 feet thick. This gravel was observed mostly in explorations located the western portion of the site. There are also zones of clay (encountered in 8 of 18 explorations) that were observed to be 5 to 10 feet thick.
- The Basal Gravel is found along the bottom of the channels eroded into the underlying formational materials. This gravel is more widespread (encountered in 11 of 18 explorations) and it was observed to be 10 to 20 feet thick.

Note that gravel can possess relatively high shear strength and stiffness relative to the other soils, even with the low apparent densities that may exist within the Surface Gravel/Fill. Overburden stresses and confinement should substantially increase the shear strength and stiffness of the Basal Gravel. However, the amount of gravel, cobbles and boulders, the distribution of these sizes, and their roundness or angularity influences their geotechnical engineering characteristics. Apart from the thickness, the current subsurface data only allows for qualitative, rather than quantitative assessment of these properties.

The formational materials are intermediate geomaterials (informally referred to as soft rock) consisting mostly of sandstone with localized, strongly cemented concretions (sediment that



hardened into rock) and some thin layers of claystone. We interpret the formational materials to have geotechnical engineering characteristics similar to a very dense sand, or where there is claystone, a clay with a hard consistency, all with a corresponding relatively high shear strength and stiffness.

Plates 2A through 2G, Geologic Cross Sections A-A' through G-G' depicts the interpreted subsurface conditions. Figures 6A through D, Parameter Plots, provides Standard Penetration Test blow counts (N, corrected for sampler type only with depth) and the Undrained Shear Strength measures from hand-held Pocket Penetration and Torvane tests.

5.1 Expansive Soils

Laboratory tests indicate the soils in proposed cut and borrow areas should have a "Very Low" to "Medium" Potential Expansion. The results of 17 Expansion Index (EI) tests conducted on bulk soils samples obtained from the surface to a depth of about 5 feet below existing surface levels in the proposed cut and borrow areas ranged from 6 to 75, averaging 40 (Low Potential Expansion) with a median of 36 (Low Potential Expansion). Appendix C provides this data.

5.2 Compressible Soils

Compressible soils underlie the site. Most of these soils are sands and gravels that should settle elastically with the initial fill and structure loading. However, there are local zones of thick clay that should experience some time dependent consolidation settlement. The clay has a medium plasticity and we interpret it to be relatively stiff and slightly overconsolidated from Plasticity Index data. The insitu moisture contents are near the Plastic Limit and the Liquidity Indices are less than 0.7, which indicate relatively stiff and low compressibility soils. Most of the long-term settlement should occur in a relatively short time following initial loading. The zones of clay are usually surrounded by sand, which allows horizontal drainage to more quickly dissipate the excess porewater pressures that develop from loading. However, there are local variations in the estimated duration where this condition does not exist.

Provided below is a summary of the main findings of the analyses.

- Total long-term settlement is estimated to range from 1 to 5.5 inches.
- The estimated duration for settlement to be substantially complete in most areas is 1 to 3 months.
- The largest settlements and durations are estimated to occur within the Campus Expansion

 South and the Residential North areas. An anomalously high settlement and duration was estimated using data from boring S-2 within the Hotel area.

The table below provides the estimated settlement and durations where new fill will be placed. A summary of these estimated settlements is also included on Plate 4.



ESTIMATED STATIC SETTLEMENT

Exploration	Location	New Fill Thickness, Feet	Depth to Formation, Feet	Saturated Clay Thickness, Feet	Short-Term Settlement, Inches	Long-Term Settlement, Inches	Duration for Substantial Completion, Months
B-14		5	26	NA	0.5	NA	NA
B-15	Campus Expansion –	5	28	NA	0.5	NA	NA
B-16	Campus Zone			Cl	JT		
B-17		5	50	NA	1.0	NA	NA
B-27		5	70	10	1.0	1.0	1 - 3
S-5	Campus Expansion –	25	59	10	4.0	5.5	1 - 3
S-8	Stadium Zone	20	73	5	4.0	2.0	0.5 - 1
S-13		10	75	NA	2.5	NA	NA
B-20				Cl	JT		
B-21	Residential –			Cl	JT		
B-23	South	10	40	NA	1.0	NA	NA
B-24				Cl	JT		
B-26		10	48	NA	1.5	NA	NA
B-27	Residential -	5	70	10	1.0	1.0	1-3
B-28	North	10	52	10	1.5	3.5	4 – 12
B-30		15	54	NA	2.5	NA	NA
B-31		5	61	10	1.0	1.0	1-3
S-1	Hotel	5	57	NA	1.0	NA	NA
S-2		20	43	15	2.0	4.5	8 -24

The assessment of settlement and duration is based on engineering analyses using data obtained from widely spaced explorations, where subsurface conditions could vary significantly across the site. Due to these uncertainties, the estimated settlement and duration could vary across relatively short distances.

Note also that higher long-term settlement was estimated in the Stadium site when compared to the Site Development area, and the extent of this possible trend of higher potential settlement to



the east is not known. Much of the Site Development area to east was inaccessible for subsurface exploration due the SDCCU stadium that occupies about 20 acres of the overall 170-acre site. The eastern margin of a north to south trending paleochannel underlies the stadium.

Settlement analyses were conducted using the soil profiles and groundwater conditions encountered in the recent explorations and laboratory test data. The settlement magnitude and areal distribution was estimated with conventional elastic and consolidation soil mechanics methods that used SPT correlations to elastic modulus and index property correlations to consolidation parameters.

Settlement monitoring is recommended to confirm these estimates and to plan the timing for construction of settlement sensitive improvements.

5.3 Reactive Soils

Thirteen suites of corrosion tests were completed on bulk soil samples obtained from proposed cut and borrow areas. Appendix C provides the test results.

To assess the sulfate exposure of concrete in contact with the site soils, samples were tested for water-soluble sulfate content. The test results suggest the site soils have a negligible potential for sulfate attack based on commonly accepted criteria. The sulfate content of the finish grade soils should be established at the completion of earthwork.

The pH, resistivity and chloride contents were estimated to assess the reactivity of the site soils with buried metals. The test results suggest the on-site soils are moderately corrosive to very corrosive to buried metals. A Corrosion Consultant should be contacted for specific recommendations.

5.4 Reuse of Onsite Soils

Most of the soils from proposed cut and borrow areas at the site should be sand, sand and gravel and gravel that should require minimal processing and generally possess good geotechnical engineering characteristics when used for fill. The On-Site Soils and Materials Management section provide recommendations for processing.

5.5 Storm Water Infiltration

Based on the preliminary test results in the table below, the site should support a partial infiltration condition. However, the storm water BMP design will need to consider:

- The depth to groundwater and potential for mounding;
- The potential for future groundwater pumping for the Pure Water San Diego project;
- The potential for flooding at the site, which could inundate the proposed basins;
- Other factors or conditions that arise as the project design develops.



SUMMARY OF PRELIMINARY INFILTRATION TEST RESULTS

Test No. (Exploration No.)	Test Method	Corrected Percolation Rate, inches/hour	Unfactored Infiltration Rate, inches/hour	Factored Infiltration Rate, inches/hour
I-1 (B-19)	Borehole Percolation	0.20	0.02	0.01
I-2 (B-32)	Borehole Percolation	13.5	1.1	0.49
I-3 (B-29)	Borehole Percolation	9.9	0.79	0.34

If remedial grading results in different soil conditions in the proposed infiltration zones, further testing may be warranted. The results should only be considered valid for the design assumptions used for testing, including the location and elevation of the soils tested, and the amount of pressure head in the test. The test results performed at this time are preliminary, and final design of the infiltration basins may require additional field testing and exploration in accordance with the applicable Design Manual and/or comments from the governing agency. These results may not be applicable if significant changes to the design occur.

Our field testing considers the guidance provided in the City of San Diego Storm Water Standards (City of San Diego, 2018; referred to as the *Design Manual*). The Borehole Percolation Test method was performed in general accordance with the *Design Manual* to approximate infiltration rates of the soils near the proposed infiltration basins. The preliminary testing was conducted at a depth of ranging from 2½ to 5 feet below existing surface levels to approximate the likely infiltration zone above the groundwater table. The factor of safety applied for planning phase feasibility screening is two. A temperature correction factor is also used to account for the difference in water viscosity of rain water (assumed to be 50°F) and the test water (measured to be approximately 60°F).



6.0 CONCLUSIONS

In our opinion, the grading and civil works for the Site Development will need to manage the substantial geotechnical variability observed in the subsurface materials. In addition, the Site Development construction should consider mitigation of static and dynamic settlement to economically manage the low gradient and settlement tolerances of gravity fed utilities and to facilitate the construction of the structures for the Full Build Out.

The site is within a broad east-west trending valley that is part of the San Diego River floodplain and it is located at the confluence of the large Murphy Canyon drainage basin. Consequently, geologically young alluvial soils with variable physical characteristics have filled the valley and there is shallow groundwater. The thickness of these soils can fluctuate substantially across the site. Prior episodes of fill placement and quarrying operations in local areas adds to this variability. Competent geotechnical materials occur at depths ranging from 25 to 80 feet. Specific conclusions are provided below.

- The soils in the Surficial Soils Undifferentiated unit consist mostly of sand with significant
 zones of gravel and clay. A north to south trending paleochannel causes large variations of
 the thickness of this unit at the margins of the channel. The gravel is pervasive while the
 clay occurs locally. Sandstone with local concretions and thin layers of claystone are below
 these soils.
- The soils in the Surficial Soils Undifferentiated unit are mostly coarse-grained with apparent densities that vary from loose to dense with a corresponding variable soil shear strength and stiffness. When excavated, these materials should generally be a good source of fill. There may be some processing of wet soils.
- Gravels within the Surficial Soils Undifferentiated unit have a higher shear strength and stiffness compared to the other soils. The gravels are resistant to the installation of ground improvement columns and piles, but they provide a high geotechnical resistance. When excavated, they should be a good source of fill with some processing of oversize material.
- There are local zones of thick clay that will experience time dependent settlement that exceeds thresholds that would allow for shallow foundations. Most of the settlement should occur in a relatively short time following initial loading. However, there are local variations where the estimated duration could impact the construction schedule.
- The potential for liquefaction is widespread and there are significant variations in the estimated liquefaction-induced settlement. Consequently, differential settlement is likely to exceed thresholds that would allow for shallow foundations.
- Groundwater will influence deep construction activities, such as CIDH piling and installation of deeper underground utilities. It may also need to be managed during construction of the underground parking for the Campus Expansion Campus Zones since it was measured to be about 15 feet below the deepest cut.
- New and existing underground utilities below new fill will experience time dependent settlement locally depending on the timing of their installation following grading.



7.0 RECOMMENDATIONS

The remainder of this report presents recommendations for earthwork and the design and construction of the proposed improvements. These recommendations are based on empirical and analytical methods typical of the standards of practice in southern California and San Diego area construction methods and practice. They are provided for preliminary design and may need to be updated for design development, the results of field testing (e.g., pile load testing) or actual subsurface conditions encountered during construction. If these recommendations do not address a specific feature of the project, please contact Group Delta for additions or revisions.

7.1 General

7.1.1 Design Groundwater Level

We preliminarily recommend a design groundwater level of 3 feet higher than the groundwater elevation shown on Plate 3, which is estimated to range between +44 to +52 feet.

Note that changes in rainfall, irrigation, site drainage may produce seepage or perched groundwater at any location within the Surficial Soils - Undifferentiated underlying the site. Such conditions are difficult to predict and are typically mitigated if and where they occur.

7.1.2 Seismic Design

Seismic design parameters should be evaluated by the Structural Engineer per the California State University Seismic Design Requirements (CSU, 2016). For reference, seismic design parameters were also developed in accordance with the 2016 CBC and ASCE 7-10 using the online SEAOC/OSHPD Seismic Design Maps tool (SEAOC/OSHPD, 2019). They are based on: 1) an estimated average shear wave velocity (V_{s30}) of about 900 feet per second, 2) an assumed structure fundamental period of less than 0.5 seconds and 3) Risk Category = III (Populous, 2018). Our office should be contacted if the structure fundamental period is 0.5 seconds or greater, as the applicable classification would be Site Class F per Section 20.3.1 of ASCE 7-10 due to the liquefiable soils at the site, which requires site-specific ground motion analysis. The table below provides the parameters.

2016 CBC SEISMIC DESIGN PARAMETERS

Latitude: 32.7843°N Longitude: 117.1224°W	
Site Class	D*
MCE _R Spectral Response Acceleration for Short Periods, S₅	1.017 g
MCE _R Spectral Response Acceleration at 1-second Period, S ₁	0.390 g
Site Coefficient Fa	1.093
Site Coefficient F _v	1.621



2016 CBC SEISMIC DESIGN PARAMETERS

Latitude: 32.7843°N Longitude: 117.1224°W		
Adjusted MCE _R Spectral Response Acceleration at Short Periods, S _{MS}	1.112 g	
Adjusted MCE _R Spectral Response Acceleration at 1-second Period, S _{M1}	0.632 g	
Design Spectral Response Acceleration at Short Periods, S _{DS}	0.741 g	
Design Spectral Response Acceleration at 1-second Period, S _{D1}	0.421 g	
MCE Geometric Mean Peak Ground Acceleration, PGA _M	0.456 g	

^{*}Assumes structure fundamental period is 0.5 seconds or less. Subject to change for longer structure periods.

7.1.3 Surface Drainage

Foundation and slab performance depend on how well surface runoff drains from the site. The ground surface should be graded so that water flows rapidly away from the structures and tops of slopes without ponding. The surface gradient needed to achieve this may depend on the planned landscaping. Planters should be built so that water will not seep into the foundation, slab, or pavement areas. If roof drains are used, the drainage should be channeled by pipe to storm drains or discharged 10 feet or more from buildings. Irrigation should be limited to that needed to sustain landscaping. Excessive irrigation, surface water, water line breaks, or rainfall may cause perched groundwater to develop within the underlying soil.

7.2 Ground Improvement

7.2.1 Purpose and Need

Ground improvement could reduce static and dynamic settlement to economically facilitate construction of the structures for the Full Build Out and mitigate potentially adverse settlement of utilities. Group improvement is typically completed within the footprint of the more lightly loaded buildings to reduce settlement or within the footprint of the heavier loaded to reduce liquefaction-induced loads on the piling used to support these structures. Ground improvement can also be completed to protect Lifelines, which are structures that are critical for communities and must remain operational following an earthquake. They are typically selected major roadways, inflexible essential pipelines, powerlines and communications facilities.

The purposes of ground improvement are to increase the allowable bearing pressure and to reduce the static and dynamic (liquefaction-induced) settlement. The improved ground will often support allowable bearing pressures up to 4,000 pounds per square foot (psf) and provide settlement tolerances ranging from ½ to 1 inch over a horizontal distance of 30 to 40 feet.

The following types of ground improvement may be suitable considering the subsurface conditions at the site.



- Deep Dynamic Compaction
- Vibro-Replacement
- Deep Soil Mixing
- Vertical Drains

Note the variability of the soil physical characteristics, the pervasive gravel, and the observation of the mineral mica and its corresponding structure in the soil can complicate the use of these methods at the site. Therefore, an evaluation of their applicability should consider the following factors:

- Schedule and cost implications associated with a pilot study program with a large upfront equipment mobilization fee.
- Additional evaluation and design period following the pilot study program.
- Difficulty conducting pre-and post-improvement subsurface exploration for quality control where there are pervasive gravels.
- Additional construction costs associated with penetrating through pervasive gravels.

The following sections provide additional discussions of the above ground improvement methods. There is a summary evaluation of their effectiveness at this site, followed by details regarding the specifics of each of the methods. Note Vertical Drains are included mainly to decrease the duration of the time-dependent settlement, or as a secondary measure to increase the effectiveness of the other methods.

7.2.2 Summary Assessment of Effectiveness

To assess the effectiveness of these methods, Group Delta undertook a matrix evaluation of the geotechnical conditions at the locations of 26 subsurface explorations. The evaluation focused on conditions observed in the explorations, such as: a) the depth and thickness of potentially liquefiable soils; b) the depth and thickness of gravel, and c) the depth, thickness and saturation of the clay, that could hinder the various methods of ground improvement in mitigating liquefaction-induced settlement.

Provided below is a summary of the evaluation of the effectiveness of Deep Dynamic Compaction (DDC) in terms of Potentially, Marginal and Ineffective:

- Potentially effective at 25% of the locations, mostly in the eastern portion of Residential site.
- Marginally effective at 45% of the locations, mostly in Stadium site (improvement mainly needed in eastern portion of this site).
- Ineffective at 30% of the locations, mostly in Hotel and southern portions of the Campus Extension Campus and Residential sites.



Since the "Marginally Effective to Ineffective" rankings predominated, this evaluation also indicates the need for a carefully thought out and planned pilot study program to further assess the effectiveness of DDC within the marginally effective areas, along with its ability to manage and consistently improve the soil (i.e., meet performance objectives) given the variability of subsurface conditions interpreted at the site. An additional method of ground improvement may need to be planned for and used where DDC does not entirety meet the performance objectives. FHWA (2017) reports that DDC has been combined with Aggregate Columns (stone columns and rammed aggregate piers).

Vibro-Replacement and Deep Soil Mixing should be feasible to mitigate liquefaction. However, the gravels could substantially impede installation of these methods. Since this is a constructability concern, further feasibility evaluation should include preliminary consultation with reputable geotechnical contractors that specialize in the methods of these methods of ground improvement.

If feasible, the Geotechnical and Structural Engineer will develop a performance specification for design by a specialist geotechnical contractor. The design is often further evaluated by pilot studies along with pre-and post-improvement subsurface exploration (typically Cone Penetration Testing), which is also used for production ground improvement quality control.

7.2.3 Deep Dynamic Compaction

Deep Dynamic Compaction (DDC) uses a crane to drop a static weight from a defined height in a grid pattern over the treatment area to improve soils to a depth ranging from 10 to 35 feet. There is typically more than one pass of compaction over the treatment area to improve the deeper zones first. The design develops the static weight and drop height to determine the applied energy needed to increase the apparent density of the soils to meet the performance objectives.

This method is mostly suitable for coarse grained soils (fines content less 15%) that are not saturated (depth to groundwater is 6 feet or more) and possess a relatively high permeability (SHRP2, 2012). DDC can produce unacceptable levels of noise and vibration and therefore it has not been used in urban areas of San Diego.

7.2.4 Vibro-Replacement

Vibro-Replacement systems install "stone columns" that are typically 24 to 36 inches in diameter and filled with compacted gravel, spaced at 6 to 10 feet (center to center) and installed uniformly over the entire treatment area to depths ranging from 30 to 50 feet. The design uses an area replacement ratio over a treatment area and depth to meet the required performance objectives.

This method is suitable for coarse grained soils that are saturated that do not have thick gravel, cobble or boulder obstructions. It has commonly been used to mitigate liquefaction in San Diego. However, the extensive gravels at the site would require predrilling that could substantially



increase the cost. Micaceous soils encountered in our some of our explorations may also reduce the effectiveness of this method.

7.2.5 Deep Soil Mixing

Deep Soil Mixing (DSM) mixes a binder (typically cement) with the soils to create a column or panel (an element) with increased shear strength and stiffness and reduced compressibility. Typically, the elements overlap to create a block or cellular structure in the ground that uniformly improves a large volume of soil supporting a foundation or creates cellular structures that confine the soil to mitigate the potential for liquefaction. The design uses an area replacement ratio over a treatment area and depth to meet the required performance objectives.

The method is suitable for most soil types that are saturated and do not have thick gravel, cobble or boulder obstructions. The cross-sectional area and depth of the element is a function of the equipment used and the area replacement ratio. This method has recently been used to mitigate liquefaction in San Diego. The extensive gravels at the site could preclude this method entirely or substantially increase installation costs, which could also limit using this method.

7.2.6 Vertical Drains

Vertical drains may be prefabricated and pushed in the ground with a mandrel or be corrugated pipe installed with a vibrating mandrel. They are installed in triangular or gird patterns with a horizontal spacing ranging from 3 to 8 feet. They can: a) increase the effectiveness of DDC and Vibro-Replacement methods in certain soil types, b) partially mitigate the shear strength loss associated with liquefaction and/or c) decrease the duration for substantial completion of long-term settlement by providing a drainage path to more quickly dissipate the excess porewater pressures that develop from dynamic and static loading.

7.3 Earthwork

Earthwork should be conducted per applicable requirements of The California State University, the current California Building Code and the project specifications. This report provides the following recommendations for specific aspects of earthwork, which may need to be revised based on the conditions observed during construction.

7.3.1 Site Preparation

General site preparation should begin with the removal of deleterious materials and demolition debris from the site, such as asphalt pavements, concrete slabs and pavements, existing structures, remnant foundations, landscaping and topsoil and any expansive (EI>50) located within 36 inches of the planned finished subgrade elevations. Areas disturbed by demolition should be restored with a subgrade that is stabilized to the satisfaction of the Geotechnical Engineer.



Existing subsurface utilities that will be abandoned should be removed and the excavations backfilled and compacted as described in the Fill Compaction section. Alternatively, abandoned pipes may be grouted using a two-sack sand-cement slurry under the observation of the Geotechnical Engineer.

Areas to receive fill should be scarified 12 inches and recompacted to 90 percent of the maximum dry density based on ASTM D1557. In areas of saturated or "pumping" subgrade, a geogrid such as Tensar BX-1200, Terragrid RX1200 or Mirafi BXG120 may be placed directly on the excavation bottom, and then covered with at least 12 inches of ¾-inch Aggregate Base (AB). Once the subgrade is firm enough to attain compaction within the AB, the remainder of the excavation may be backfilled. It may be necessary to place additional AB to stabilize the subgrade sufficiently to place fill.

7.3.2 Remedial Grading

For planning purposes, we recommend removing the existing soils to a depth of 2 feet below existing surface levels (following removal of asphalt paving) across the site to provide a uniform surface for additional fill placement, a uniform fill surface in cut areas and to allow for observation of unsuitable soils (clayey, wet, loose) in the exposed subgrade. Plate 5, Remedial Grading Exhibit, illustrates this recommendation. The recommendation does not consider the following factors that could increase the depth of the remedial grading:

- Some areas may require additional remedial grading based on demolition activities.
- The period of placement for the existing fill (1960s) and the lack of documentation regarding placement may increase its physical variability and consequently increase the need for remedial grading.
- The variability inherent in native subgrades where there may be loose and/or soft areas.
- The findings from additional subsurface exploration and/or observations by the Geotechnical Engineer during earthwork.
- The residential development building areas may require additional remedial grading depending on final product and foundation designs.
- Planned hardscape, graded paths, pavements, concrete slabs, and structural improvements in the park sites could require some remedial grading for subgrade preparation.

The fill may be recompacted provided it is processed as recommended in the On-Site Soils and Materials Management section.

7.3.3 Fill Compaction

All fill and backfill should be placed at slightly above optimum moisture content using equipment that can produce a uniformly compacted product. The loose lift thickness should be 8 inches, unless performance observed and testing during earthwork indicates a thinner loose lift is needed, or a thicker loose lift is possible, up to a loose lift thickness of 12 inches. The recommended relative compaction is 90 percent or more, or 95 percent or more where specified, of the



maximum dry density based on ASTM D1557.

A two-sack sand and cement slurry may also be used for structural fill as an alternative to compacted soil. It has been our experience that slurry is often useful in confined areas which may be difficult to access with typical compaction equipment. Samples of the slurry should be fabricated and tested for compressive strength during construction. A 28-day compressive strength of 100 pounds per square inch (psi) or more is recommended for the sand and cement slurry. Gravel (¾-inch) completely wrapped in filter fabric (Mirafi 140N, or approved equivalent) may also be used as backfill in confined areas.

7.3.4 On-Site Soils and Materials Management

The following existing soils and materials are available for processing and reuse.

- Soil
- Asphalt Concrete (AC)
- Portland Cement Concrete (PCC)

The following sections provide recommendations for processing and reuse as fill.

7.3.4.1 Soil

Most of the existing soils above groundwater should be suitable for reuse. They should be processed to produce fill soil with a well graded particle distribution with a suitable moisture content for compaction. Some processing of wet soils should be anticipated. Soil with an EI > 50 should be removed and disposed of offsite. Rocks or concrete fragments greater than 3 inches in maximum dimension should not be reused. They could be stockpiled on site for processing as part of the stadium demolition.

7.3.4.2 Asphalt Concrete

Existing AC should be crushed to less than 1 inch in maximum dimension and blended with approved fill soils. Existing AC can be recycled, reprocessed, and reused as a base course for new AC paving. City of San Diego personnel have anecdotally observed paving fabric in portions of the AC. We did not observe this fabric in the explorations.

7.3.4.3 Portland Cement Concrete

Concrete may be crushed to less than 1 inch in maximum dimension for use as fill. It should be added to other soils to create a well graded fill material. Reinforcing steel should be removed prior to crushing the concrete. Properly crushed concrete will often meet the gradation and quality criteria from Section 200-2.4 of the Standard Specifications for Public Works Construction for use as Crushed Miscellaneous Base (CMB).

7.3.5 Import Soil

The project proposes to import approximately 315,000 CY of soil for use as fill. Imported fill sources should be observed and tested by the Geotechnical Engineer prior to hauling onto the site to determine the suitability for use. Imported soil for common fill should consist of granular soil



that is free of organic materials, with an Expansion Index less than 50 based on ASTM D4829, and a gradation that meets the criteria shown in the table below.

RECOMMENDED GRADATION FOR IMPORT SOIL

Sieve Size	(% Passing)
3 inches	100
3/4 inch	100 - 80
No. 4	100 - 65
No. 200	0 - 35

Soils should also have a minimum resistivity value greater than 1,000 ohm-centimeters, chloride content of less than 500 ppm and sulfate content of less than 1,000 ppm and pH greater than 5.5.

Additional testing per the guidelines provided by the Department of Toxic Substances Control (DTSC, 2001) is required by the Owner prior to accepting soil for import. Test results should meet the most stringent State and Federal residential screening levels including the most up-to-date DTSC-Modified Screening Levels (DTSC-SLs) and United States Environmental Protection Agency Regional Screening Level (RSL).

During earthwork, soil types may be encountered by the Contractor that do not appear to conform to those discussed within this report. The Geotechnical Engineer should evaluate the suitability of these soils for their proposed use.

For each proposed fill source, the Contractor should provide a submittal to the Geotechnical Engineer demonstrating the proposed site and materials meet the geotechnical and environmental guidelines for import. Prior to import of the proposed materials, samples of all proposed import should be tested by the Geotechnical Engineer to evaluate the suitability of these soils for their proposed use. The following screening tests should be performed for every 1,000 cubic yards of import, with a minimum of two sets of screening tests for each proposed import site.

- Particle Size Distribution (ASTM D6913)
- Maximum Density (ASTM D1557)
- Expansion Index (ASTM D4829)
- Sulfate Content (ASTM D516)
- Chloride Content (ASTM D512)
- pH & Resistivity (CT 643)

If a long-term, steady source of import material is utilized that consistently meets the import soil recommendations described above, the import material testing frequency may be reduced at the discretion of the Geotechnical Engineer and SDSU.



7.3.6 Cut and Fill Slope Construction

Cut and fill slopes should be formed at inclinations no steeper than 2:1 (horizontal to vertical). Fill slopes above cut slopes or natural slopes with gradient steeper than 5:1 should be formed with a keyway at the base and benches into competent materials as fill is placed according to the following dimensions, or as recommended by the Geotechnical Engineer.

- Minimum width of keyway should be 15 feet.
- Base of the keyway should tilt back 2 percent, or a minimum of 1 vertical foot.
- Minimum depth and height for benches should be 4 feet.
- Minimum horizontal thickness of the fill from the face to the forward edge of the bench should be 10 feet.

The face of fill slopes should be thoroughly compacted and tested for in-place density after each 4-foot increase in slope height. When finished pad grade is achieved, the face of the fill slope should be further compacted along a vertical grid that overlaps with appropriate equipment, such as a cable-lowered "sheepsfoot" pad roller, or similar.

7.3.7 Grading Factors

Fill soils derived from cut areas should consist of a heterogeneous mixture of sand, gravel and clay. The grading factors (shrinkage or swell) of these materials will also vary from their in-situ to compacted condition. We estimate soils derived from onsite excavations and cuts that are ultimately placed as compacted fill (at 90 to 95 percent relative compaction per ASTM D1557) will have a net shrink of about five to ten percent by volume. Existing fill soils near the ground surface that are moderately to well compacted should have a grading factor of about 1 (plus or minus five percent shrink/swell).

7.4 Asphalt Concrete Pavements

New interior streets will be 6-Lane Major, 4-Lane Major and 2-Lane Collectors with Traffic Indices of 9.0, 10.5 and 11.0 that are covered with asphalt concrete pavement and constructed according to City of San Diego Standard Drawings, Schedule J, Pavement Design Standards. Temporary surface parking covered with asphalt concrete or gravel is planned for Opening Day in areas north, west and south of the Stadium.

An R-Value of 20 should be assumed for preliminary assessment of Asphalt Concrete surfaced pavements or landscaping type of surfaces. Based on our review of the available geotechnical information, the subgrade R-Value within the upper 36 inches of subgrade could range from 20 to 40 or more, assuming some selective placement of fill to from the subgrade. The design subgrade R-Value should be confirmed by R-Value testing of the actual pavement subgrade soils during fine grading operations within the pavement areas.



Schedule J provides the standard sections for the range of subgrade R-Values for Traffic Indices representative of the planned streets and surface parking. Alternative pavement sections designed in accordance with the Caltrans Design Method, Topic 633.1 (Caltrans, 2018b) that use aggregate base rather than the cement treated base used in the Schedule J are summarized in the table below. A 20-year pavement design life was assumed for the analyses.

PRELIMINARY ASPHALT CONCRETE PAVEMENT SECTIONS

Traffic Index	Asphalt Section	Base Section (R-Value ~20)
9.0	5 Inches	17 Inches
10.5	7 Inches	20 Inches
11.0	7 Inches	22 Inches

7.5 Underground Utilities

Civil site works include new sewer (8- to 18-inch diameter PVC and temporary 30-inch CMP), storm drain (18- to 36-inch diameter RCP), water and fireline (12-inch diameter), and dry utilities. Gravity flow utilities mostly have a minimum gradient of 0.5 percent. The following sections provide preliminary geotechnical recommendations for design and construction.

7.5.1 Settlement

New and existing underground utilities below new fill will experience time dependent consolidation settlement depending on the timing of their installation following grading. Some form of mitigation will be needed if the utility cannot tolerate the total and differential settlement estimated in the Compressible Soils section. Mitigation could be delaying the installation until the settlement is substantially complete, preloading the utility alignment area (prior to utility installation) with a fill surcharge or the various forms of Ground improvement discussed in this report.

7.5.2 Soil Loads

A soil unit weight of 130 pounds per cubic (pcf) may be used to evaluate soil loads for pipe above groundwater. The permissible depth of cover should be checked were new fill will be placed over underground utilities that will remain.

7.5.3 Thrust Blocks

Lateral resistance for thrust blocks may be determined by a passive pressure value of 200 pounds per square foot (psf) per foot of embedment, assuming a triangular distribution. This value may be used for thrust blocks embedded into the soils in the Surficial Soils - Undifferentiated unit described in this report that are above groundwater.



7.5.4 Modulus of Soil Reaction

The modulus of soil reaction (E') is used to characterize the stiffness of soil backfill placed along the sides of buried flexible pipelines. To evaluate deflection due to the load associated with trench backfill over the pipe, we recommend using 1,000 pounds per square inch (psi) assuming granular bedding material is placed around the pipe.

7.5.5 Pipe Bedding

Typical pipe bedding as specified in the Standard Specifications for Public Works Construction or City of San Diego Standard Drawings may be used. We recommend using a filter fabric separator (such as Mirafi 140N or an approved similar product) between the soil and open graded rock used for bedding and/or backfill where the alignment is within roadways or near settlement sensitive improvements. The use of a filter fabric separator may be waived by the Geotechnical Engineer based on site specific soil conditions observed in the trench excavation.

7.5.6 Existing Utilities

The permissible depth of cover and settlement tolerances should be checked were new fill will be placed over underground utilities that will remain, particularly the existing fuel pipeline that is 3 feet deep in the eastern portion of the site. The permissible depth of cover and settlement tolerances for construction traffic and equipment loads should also be evaluated.

8.0 CONSTRUCTION CONSIDERATIONS

Construction of the project will need to manage substantial variability within the subsurface materials. Summarized below are the primary geotechnical-related construction considerations known at this time.

- The materials encountered in construction excavations could vary significantly across the site. Excavations should be prepared to encounter thick layers of gravel and cohesionless soils that are prone to caving and/or sloughing.
- Subgrade stabilization may be needed anywhere in the project area. The Contractor should anticipate the need for stabilization of the subgrade using geotextiles or gravel as recommended in the Site Preparation section of this report.
- Settlement monuments should be installed in all fill areas where construction needs to be delayed. Settlement instrumentation and monitoring can be conducted per the latest version of California Test Method 112 (Caltrans, 2012). Figures 7A and 7B (to follow), Settlement Monument Details – Surface Monument and Riser Plate provide details for the instrumentation.



- The variability of the soil physical characteristics, the pervasive gravel, and the observation
 of the mineral mica and its corresponding structure in the soil can complicate the use of
 ground improvement at the site, as outlined in the Ground Improvement section of this
 report.
- Existing piles obstruct underground construction, such as ground improvement and new piling within the footprint of the SDCCU stadium.
- Shallow fuel lines in the eastern portion of the overall site may need to be protected from construction traffic and new fill loads.

9.0 LIMITATIONS

The recommendations in this report are preliminary and subject to revision from changes that occur during design development or from the results of field testing or actual subsurface conditions encountered during construction. Group Delta needs to continue to be part of the project design and construction for these recommendations to remain valid. If another geotechnical consultant provides these services, they should prepare a letter indicating their intent to assume the responsibilities of the project Geotechnical Engineer-of-Record. This letter should also indicate their concurrence with the recommendations in the report or revise them as needed to assume the role of the project Geotechnical Engineer-of-Record.

This report was prepared using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in similar localities. No warranty, express or implied, is made as to the conclusions and professional opinions included in this report.

The findings of this report are valid as of the present date. However, changes in the condition of a property can occur with the passage of time, whether due to natural processes or the work of humans on this or adjacent properties. In addition, changes in applicable or appropriate standards of practice may occur from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.



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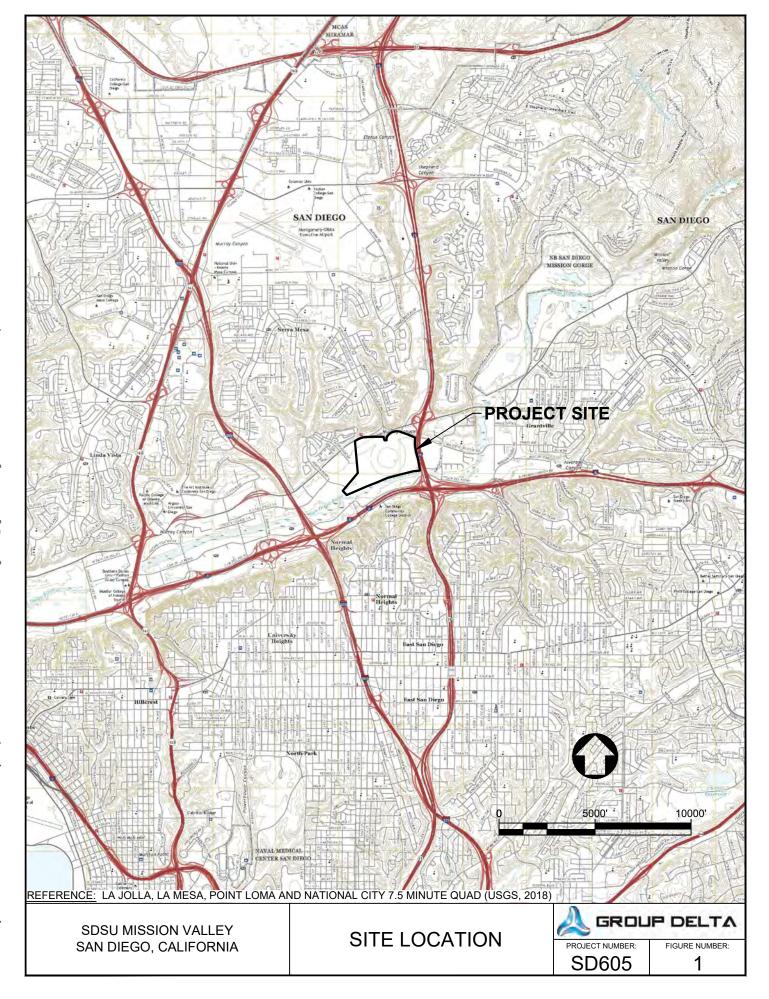


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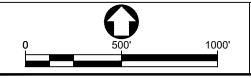
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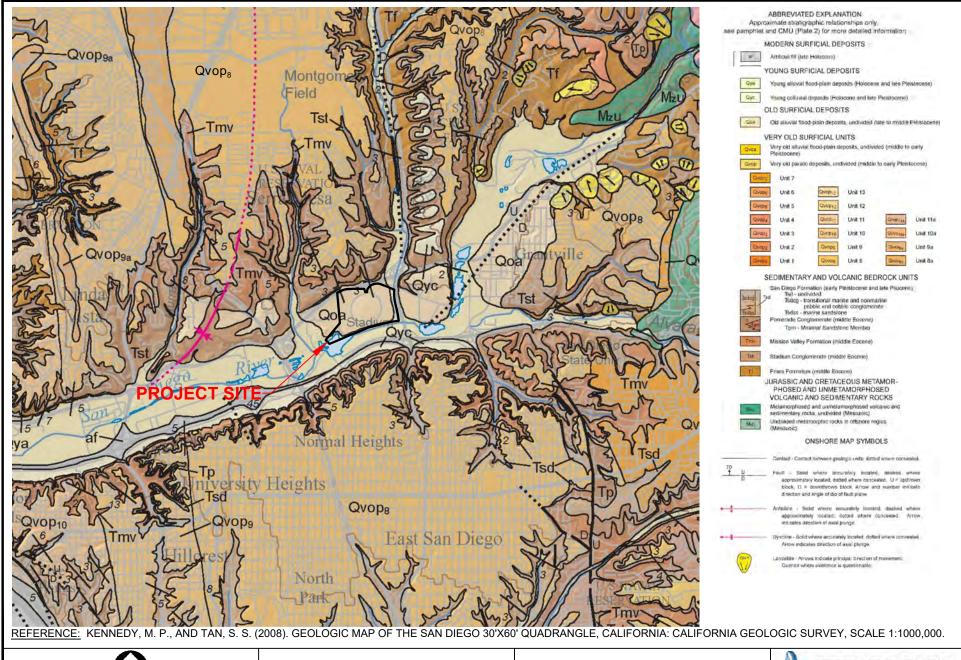
SDSU MISSION VALLEY SAN DIEGO, CALIFORNIA

PROPOSED DEVELOPMENT



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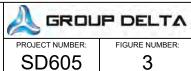
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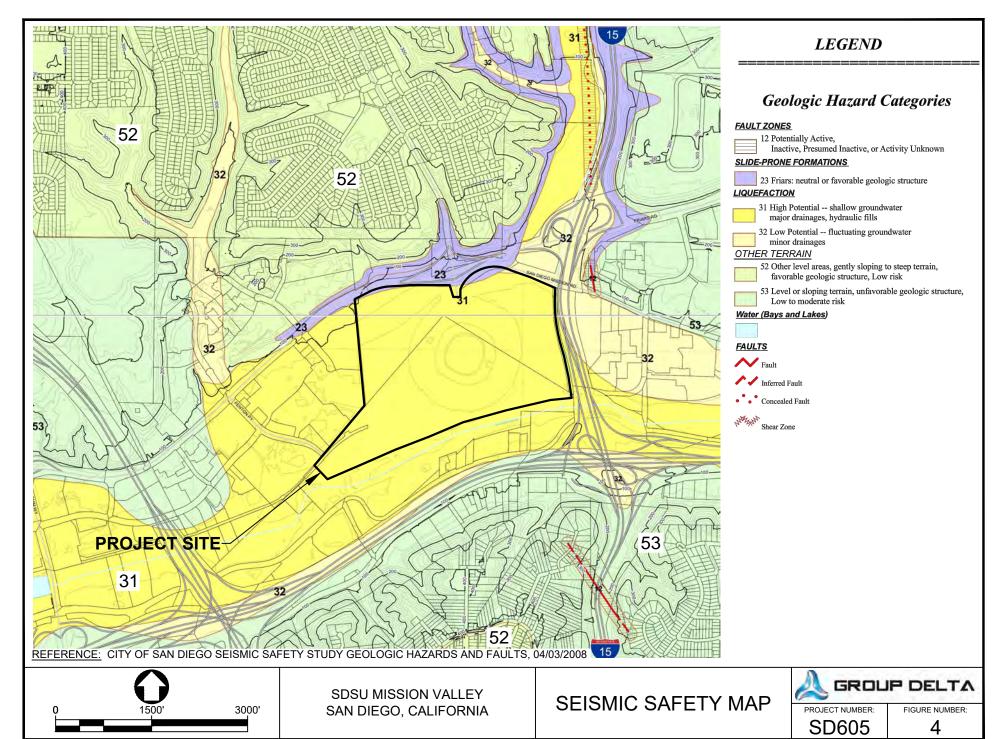


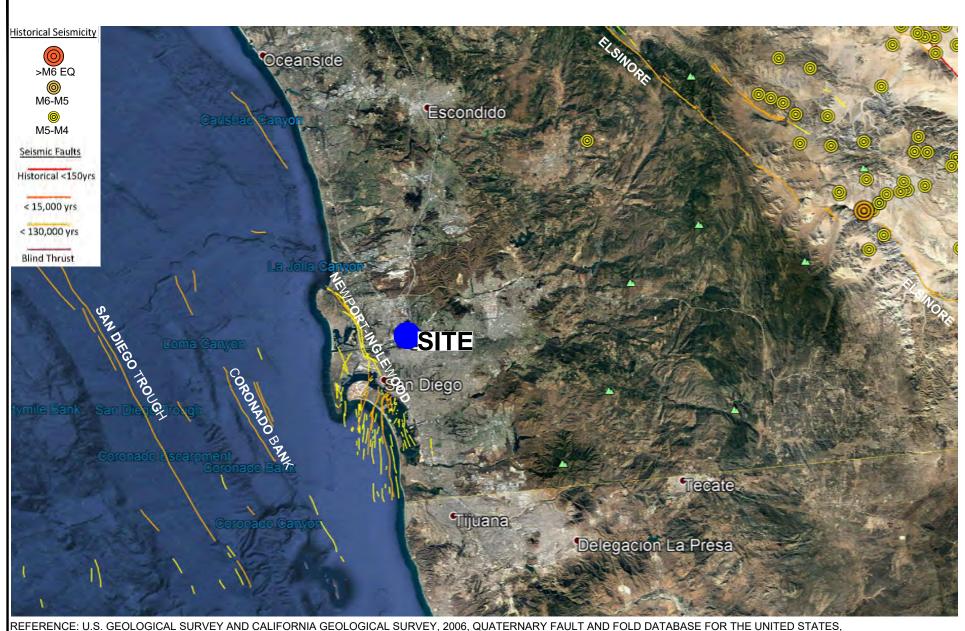
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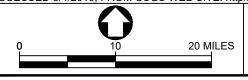
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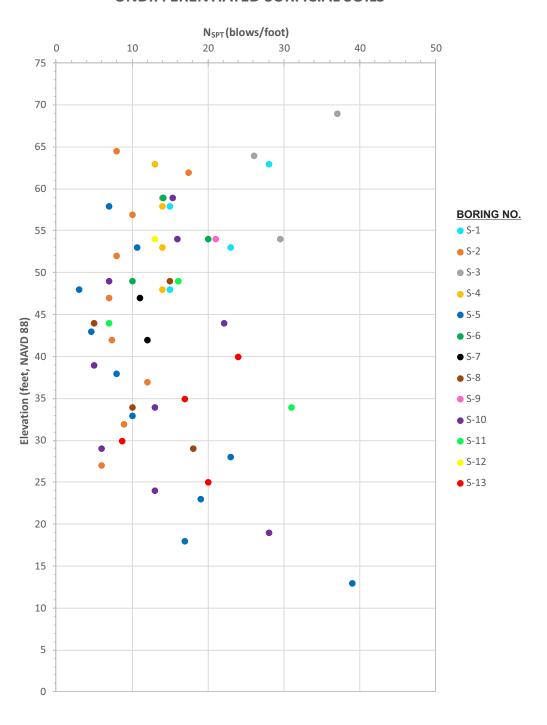
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SDSU MISSION VALLEY SAN DIEGO, CALIFORNIA

FAULT MAP



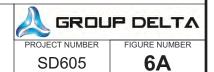


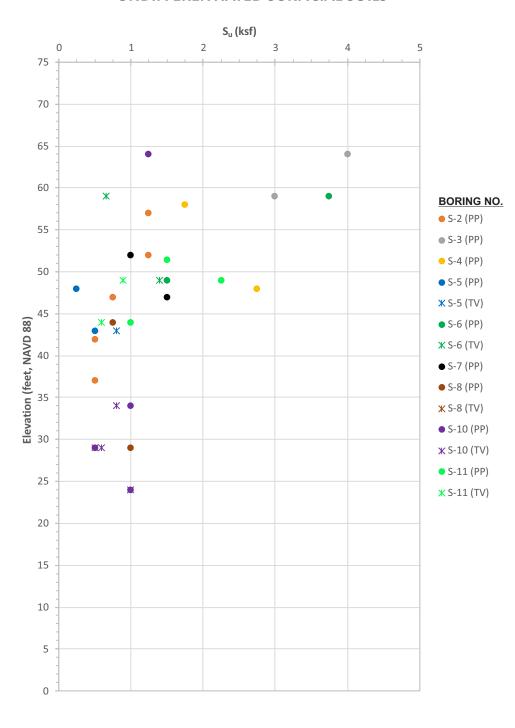
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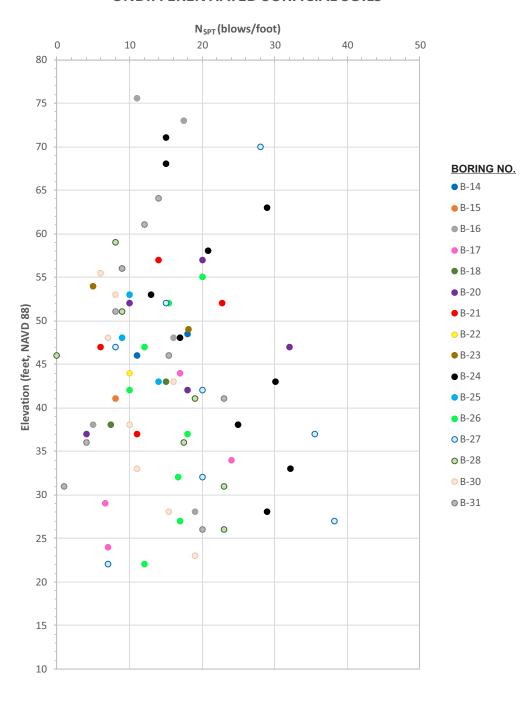
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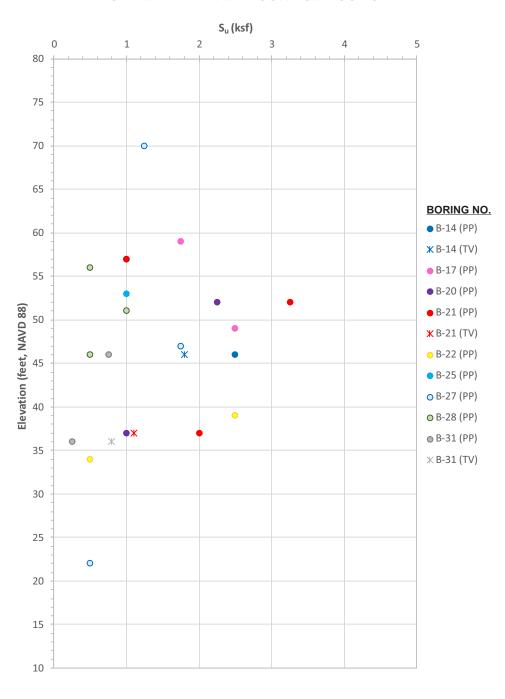
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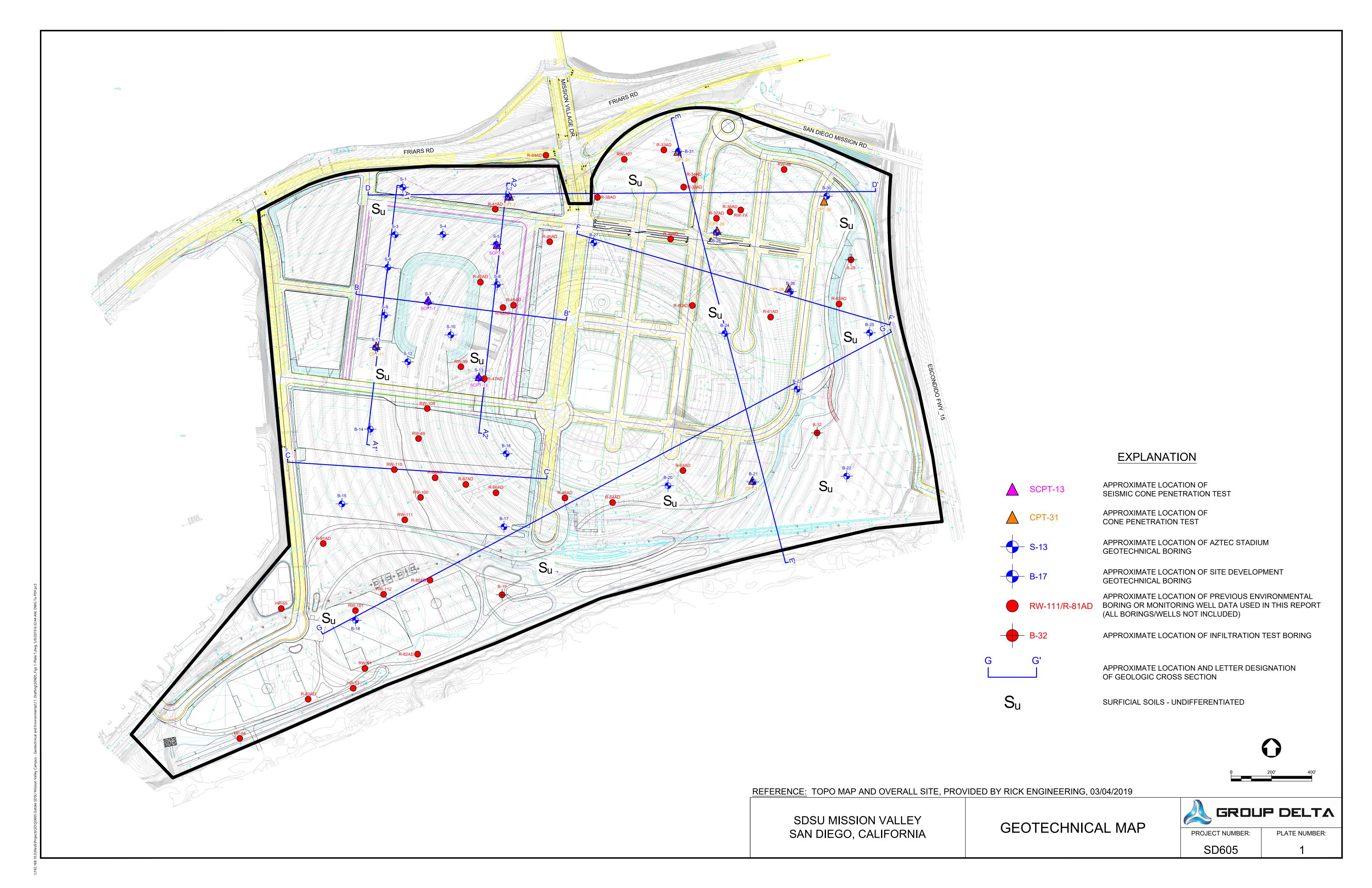
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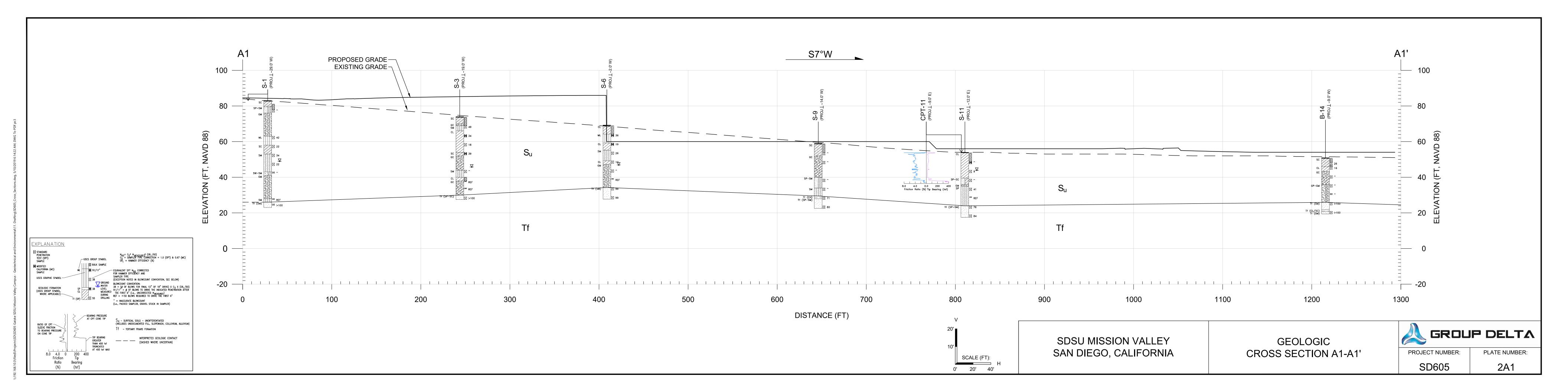
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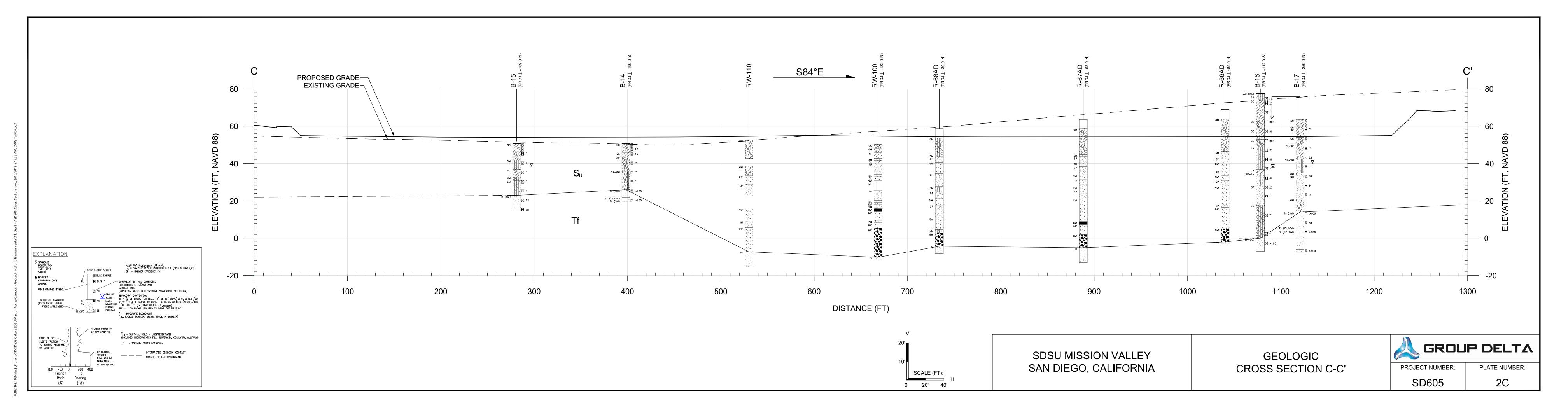


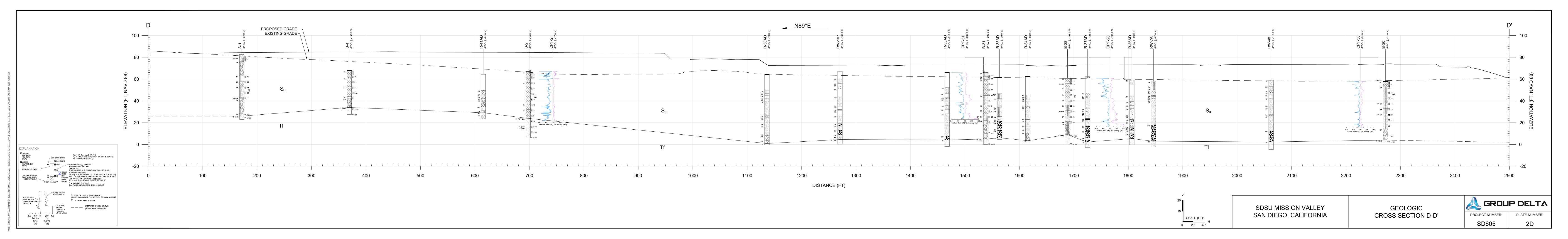
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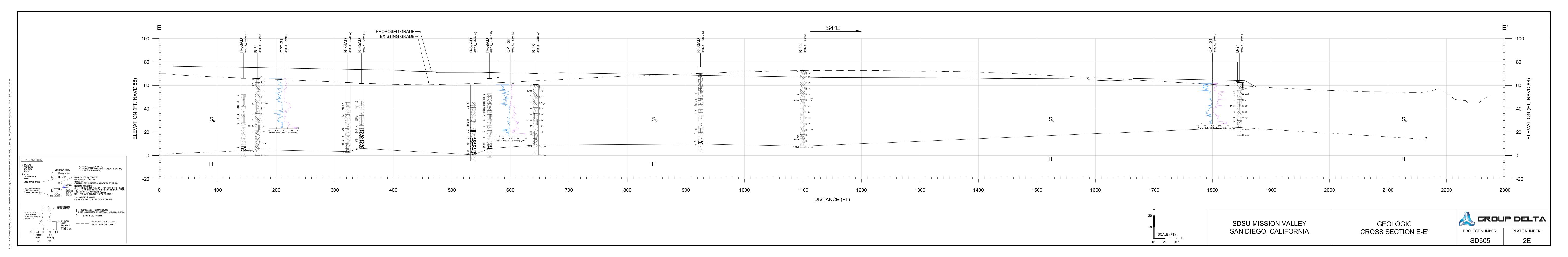
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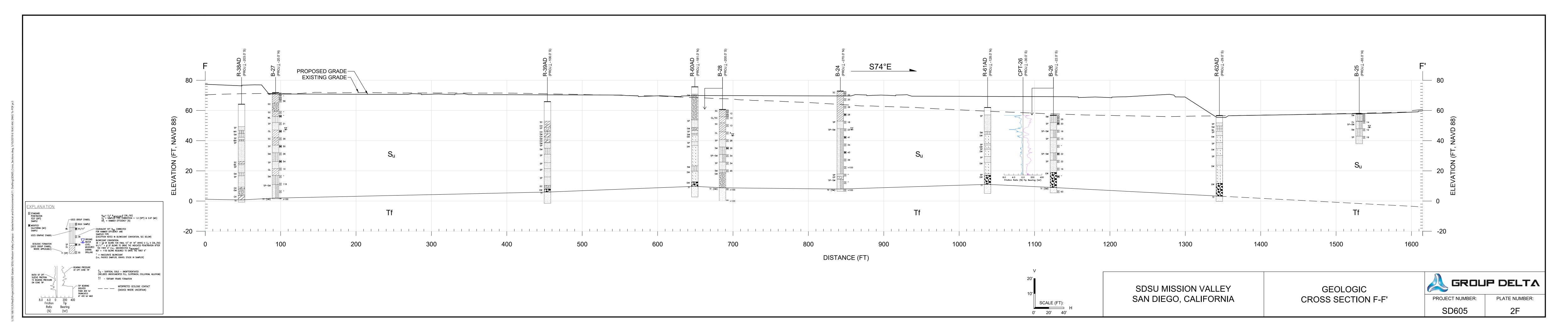


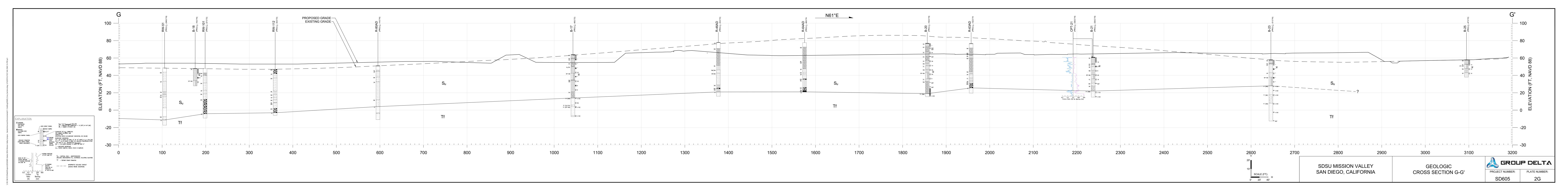


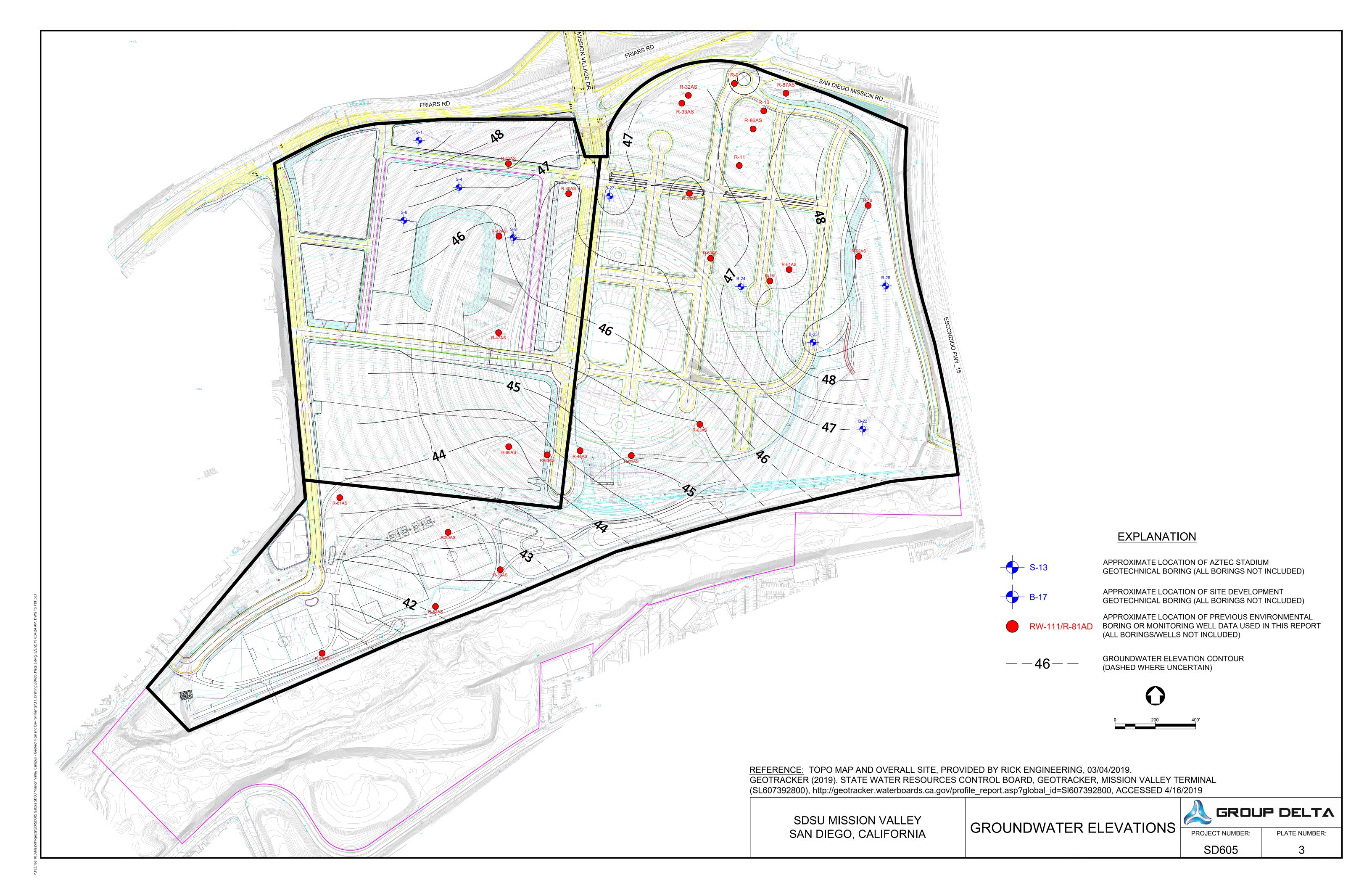


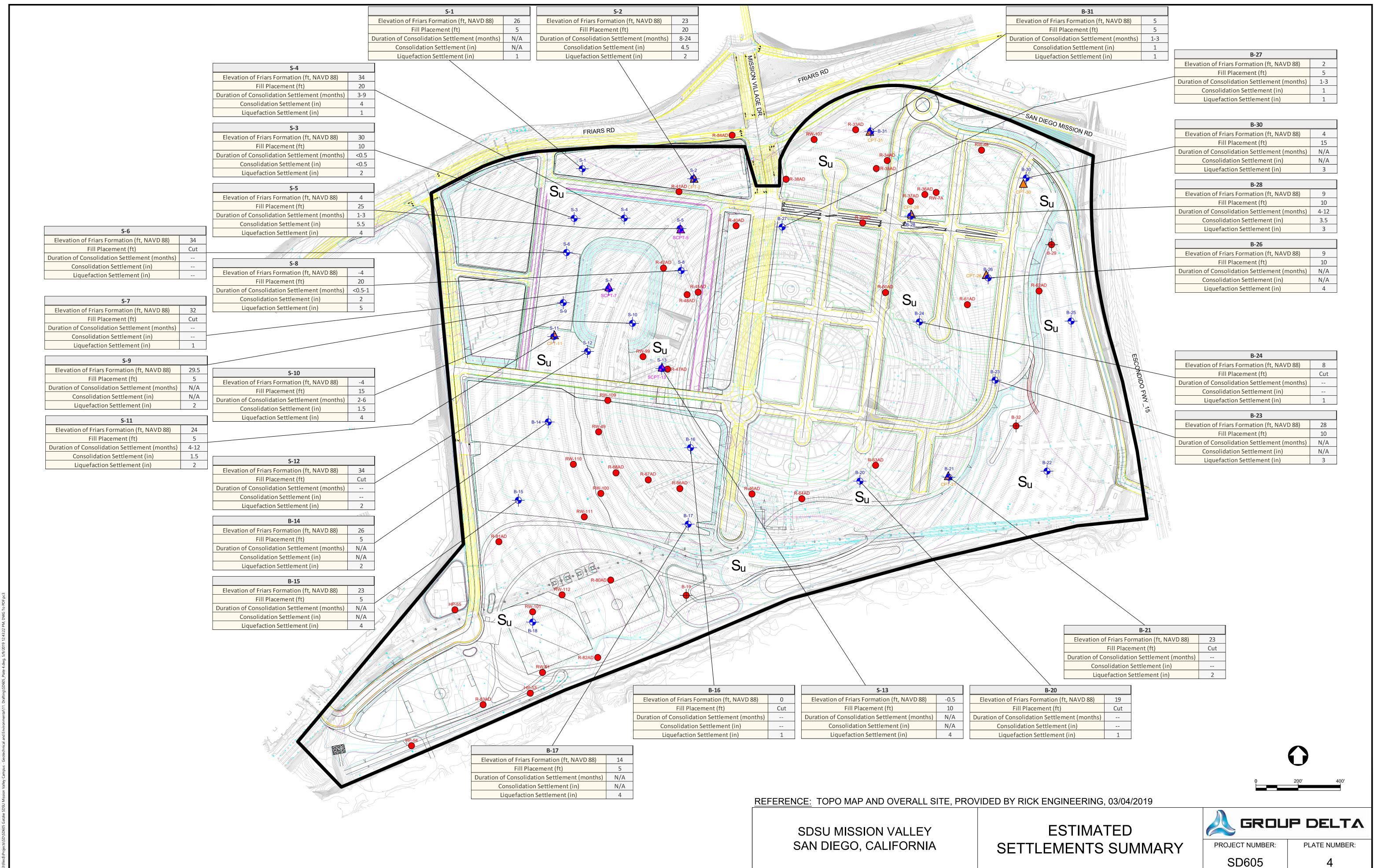


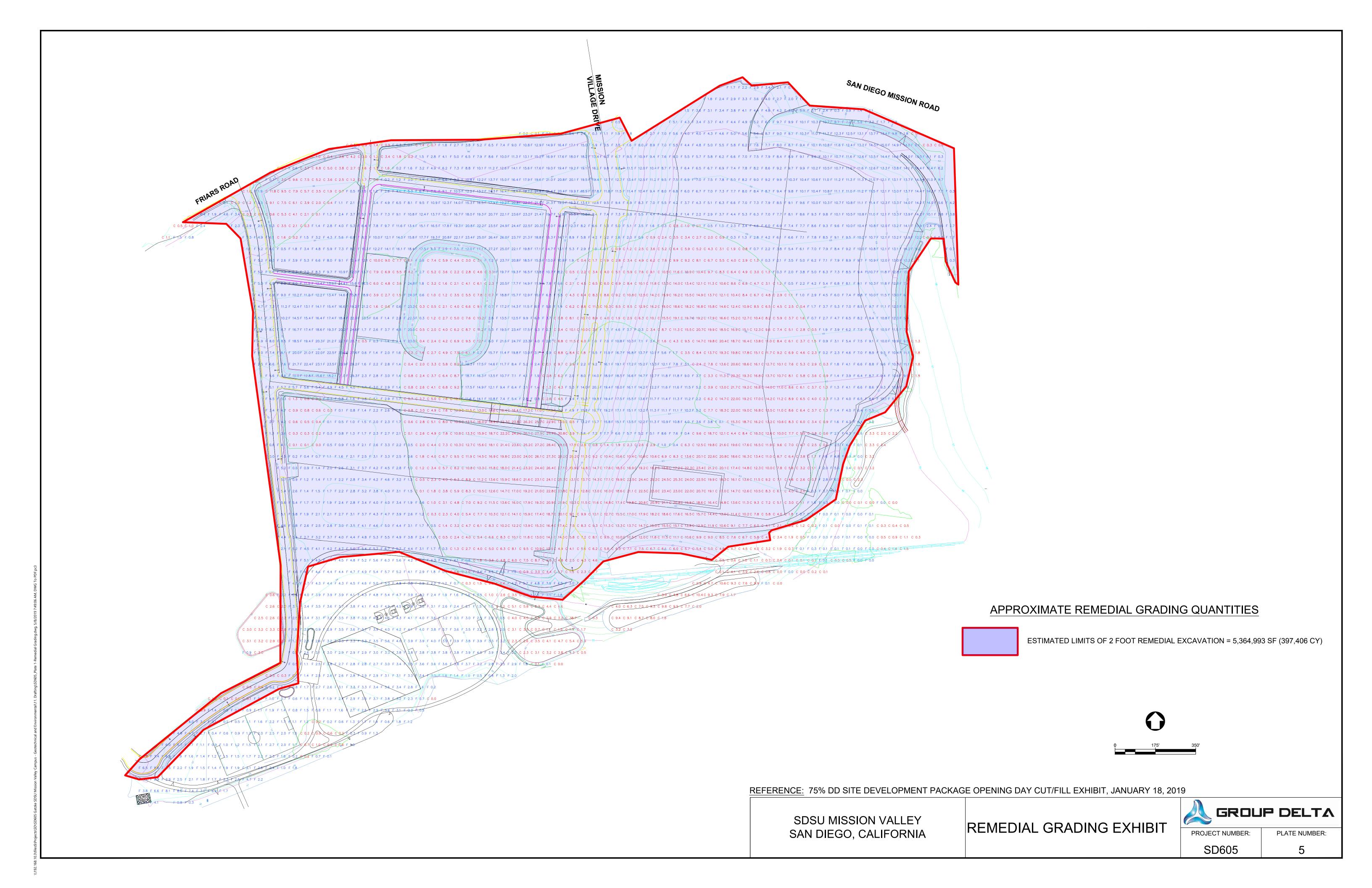














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MEET LOG SOSIO	Ŷ	T		KLE 5015 S SAN DIEG	SHOR	EHAM	PLACE	<u>.</u>	THIS B SUBSU LOCAT MTH T IS A SI	ORING AND AT THE IRFACE CONDITIONS AND MAY CHE THE PASSAGE OF MPLIFICATION OF JNTERED.	IE TIMI NS MA HANGE TIME.	E OF DRILLIN \Y DIFFER AT E AT THIS LO THE DATA P	IG, I OTHER CATION, RESENTED	C 5	

PR	ROJECT	NO.	: 5	1-5690	0-00				LOG (F BOR	ING H	IP-53	· · · · · · · · · · · · · · · · · · ·	SH	EET 2	of 4
	DRILLING METHOD: Hollow Stem Auger							JECT M	ISSION V ERMINAL	ALLEY		LOCATION	Wester Wainte	rn Porti	on of Sit	e
DR EQ	ILLING UIPMENT		CME-85	5				PLING	California S		S	URFACE LEVATION:	14101110	TOTAL		131 ft
-	STARTE		9	/27/00		DRILLING COMPANY:	L	est Hazma	t Drilling	BOREHOLE DIAMETER:	8" (O.E	·	GROUNDWA DEPTHIELE	ATER	MEASUR DATE and	
DATE	CDMPLE	TEC	D: 9.	/28/00		SURFACE CONDITION)irt/Sand		l			¥ 15.0 / na		9/27/2000	
	BACKFI	LLE	D; 9,	/28/00		LOGGED B	Y: B	l. Breitenba	ıch	REVIEWED E	3Y: J. St	ock	Дna/ <i>na</i> Дna/ <i>na</i>			
			AMPLE		70		ğ	· . · · · ·	***************************************							
*, 1T030	BLOW COUNTS		=	<u>□</u>	TPHg, TPHd	PID/OVA (mdd)	GRAPHIC LOG	Same		DESC	RIPTION	AND CLASS	IFICATION			
- - - 40				53-40				Same								
- 4 5	50/5	ş \	HPS	33-45				Same								
- 50	100		HP5	3-50				Same Pushed Collecte	hydropunch d water sam	rods 55' to 57' ple						
- 55 -	63		НР5	3-55				Same								
- 60 	50/5	*	HP5	3-60					FORMATIC	<mark>N;</mark>), gray with red,	, (some silt), moist, very	dense, coarse	3		,
- 65 -	100/3	3"	ЧР5	3-65				Same								
	<u> </u>		- 5	015 SH	ORE	F E L I EHAM PLA LIFORNIA	CE		THIS BO SUBSUI LOCATI WITH TI IS A SIN	JMMARY APPL DRING AND AT RFACE CONDI ONS AND MAY HE PASSAGE C IPLIFICATION (NTERED.	THE TIME TIONS MAY CHANGE OF TIME. T	OF DRILLING Y DIFFER AT AT THIS LOC THE DATA PF	G. OTHER CATION RESENTED		FIGURE C5	· ,,-

	PROJECT NO.: 51-5690-00								LOG OF BORING HP-53 SHEET 3 of 4								
	DRIL	LING HOD:	Но	llow Stem Au	ger			PRO.	JECT MIS	SION V RMINAL	ALLEY		LOCATION	. West Maint	ern Portion of Site tenance Yard		
	DRIL	LING IPMENT:	CN	ИЕ-85				SAMPLING METHOD: California Sampler SURFACE ELEVATION: C							TOTAL DEPTH OF BOREHOLE: 131	ft	
		STARTED;		9/27/00	·	DRIL	LING	W	West Hazmat Drilling BOREHOLE 8" (O.D.) GROUNDWATER MEASU DEPTH/ELEV. (ft) DATE 2								
	DATE	COMPLETE	D:	9/28/00		SUR	FACE	NS: Dirt/Sand ¥ 15.0 / n									
		BACKFILL	 ED:	9/28/00			GED BY		3. Breitenbaci	h	REVIEWED BY: J. Stock		ock	⊈ na/ <i>na</i> ⊈ na/ <i>na</i>			
		3	٩	APLE		T		GRAPHIC LOG						(IG / 1/3			
	DEPTH (ft)	(t) DEPTH (ft) CTOON COUNTS (BLOWS/FOOT) TYPE TYPE TYPE TYPE TYPE TAME (mqq/kg) PHD23-122							Same		DESCRIF	MOIT	AND CLASS	IFICATION	1		
	- - - - 75 -								Same Pushed hydropunch rods 75' Collected water sample								
	- 80 	100/4" HP53-80							Same								
	- 85 	; 100/4" HP53-85					CLAYEY	CLAYEY SAND (SC), gray, very moist, very dense, coarse-grained, pieces of shell									
	- 90 - -	100/4"		HP53-90					SANDY	CLAY (CL),	gray, moist, very o	dense, f	ine-grained,	with shell fra	agments, cobbles		
	- - 95 - -	100/4"		HP53-95					Same				·				
SESOLOG GPJ TROLLEY GDT 226/01	- 100 - -	-100 100/4" HP53-100 Same Push Colle							Same Pushed h Collected	nydropunch I groundwa	rods 100' to 101' ter sample			·			
WELL LOG SEGUOG.		8		KLE 5015 S SAN DIEG	HOF	REHA	AM PL	ACE		THIS B SUBSU LOCAT WITH 1 IS A SI	UMMARY APPLIES ORING AND AT THE PRESCRIPTIONS AND MAY COME THE PASSAGE OF MPLIFICATION OF JNTERED.	HE TIME ONS MA HANGE TIME.	E OF DRILLIN LY DIFFER AT LAT THIS LO THE DATA P	IG. 1 OTHER CATION RESENTED	FIGURE C5		

PROJECT NO.: 51-5690-00)		LOG OF BORING HP-53 SHEET 4 of 4							
	ILLIN		Hol	low Stem A	uger		PRO.	JECT MIS	SION V		n Portion of Site nance Yard				
	RILLIN	IG IENT:	CM	IE-85			SAMPLING METHOD: SURFACE ELEVATION:						TOTAL DEPTH 131 ft		
	STA	ARTED:		9/27/00		DRILLING COMPANY	. W	/est Hazmat D	TER MEASUREMENT V. (ft) DATE and TIME						
DATE	col	MPLETE	D:	9/28/00		SURFACE CONDITION	vs:	Dirt/Sand	9/27/2000						
-	BACKFILLED: 9/28/00 LOGGED						Y; E	3. Breitenbach							
	DEPTH (ft)	BLOW COUNTS (BLOWS/FOOT)	TYPE	Ω U		(mg/kg) PID/OVA (ppm)	GRAPHIC LOG			DESCRIPTION					
- - - -	10	120/2"		HP53-105				odor or st Pocket pe SANDST CLAYEY	ains, with enetrometronetrone: SAND (SC	, dark brown, wet, stiff, a occasional gravels and der - 1.0 tsf C), gray, moist, very densing with lean sandy clay	se, fine-graine		fine sand, no hydrocarbon to 40% lean clay		
1	15		Y	HP53-115				Grades vo Has some	ery fine to a cementa						
- -1	20	1	7	HP53-120											
- - - -	25		7	HP53-125				Less moi:	h SAND ((CL), dark gray, moist, ha I cementation, very low p					
- - 1	30			HP53-130				Let set fo	r 70 min, r	131' to 132' no recovery of water ith bentonite grout					
1	35							Note: Driller ou	t of HP roc	d - hole terminated					
***************************************		7		5015	SHO	IFEL REHAM PL	_ACE		THIS (SUBS LOCA WITH IS A S	SUMMARY APPLIES ON BORING AND AT THE TI URFACE CONDITIONS INTONS AND MAY CHARLE THE PASSAGE OF TIME IMPLIFICATION OF THE DUNTERED.	ME OF DRILLI MAY DIFFER A GE AT THIS LO E. THE DATA I	ING. AT OTHER OCATION PRESENTED	FIGURE C5		

PI	ROJI	ECT NO).:	51-569	0-00			1	LOG C	F BORIN	IG I	HP-54		SHEET 1 of 3		
	RILLII ETHO		Hol	llow Stem A	uger		PRO NAM	JECT MIS	SSION V RMINAL	ALLEY		LOCATION	v: Practice	e Field		
DF	RILLII	NG MENT:	ÇM	E-75 w/DH	Hamm	ner		IOL INIO	alifornia Sa			SURFACE ELEVATION:		TOTAL DEPTH OF BOREHOLE: 80 ft		
	ST	ARTED:		10/3/00		DRILLING COMPAN	γ: V	Vest Hazmat	Drilling	BOREHOLE DIAMETER:	8" (0	P.D.)	GROUNDWA DEPTH/ELE			
DATE	cc	MPLETI	D:	10/3/00		SURFACE		Grass ▼ 15.0 / na 10/3/. ▼ na / na								
	BACKFILLED: 10/3/00 LOGGED							K. Wells		REVIEWED BY	': J. \$	Stock	¥ na <i>i na</i> V⊈ na <i>i na</i>			
	_		SAM	PLE	Þ		၁၉	90								
	DEРТН (R)	BLOW COUNTS (BLOWS/FOOT)	TYPE	Q	TPHg, TPHd	PID/OVA	R. G.			DESCRI	IPTIO!	N AND CLASS	SIFICATION			
								ARTIFIC	6" thick				· · · · · · · · · · · · · · · · · · ·			
	5	50/4*	7	HP54-5				CLAYEY small co		c), brown, moist, c	dense,	fine to medium	n grained, with I	fine to coarse gravel and		
<u> </u>	10	·														
-		100	1	HP54-10												
- 1	15	55	1	HP54-15				y Wet								
- -								ALLUVI		D/SM) dark aray	wat r	nadium danse	fine to medium	n grained, no hydrocarbon		
- 2	20	55	1	HP54-20				odor, hy	dropunch a	-/sm), dark gray, 21 - 23 ft. bble noted at au		neaium aerise,	tine to median	gramed, no nydrocurson		
-											-					
-2	25	53]	HP54-25				Frequen	it interbeds	with seams of fine	e grain	ed silty sand				
2001								Heaving	sands							
% -3 2-	30	44	1	HP54-30												
PJ IROLLEY.G																
30 %			┴┴ \		_	<u>l</u>	P-3445	<u>. </u>	THIS S	UMMARY APPLI	ES ON	LY AT THE LO	CATION OF	FIGURE		
ברר בספ פפת	Á	Z	ŧ.	5015 S SAN DIEG	SHOF	REHAM P	LACE		SUBSI LOCAT WITH IS A SI	ORING AND AT JRFACE CONDIT TONS AND MAY THE PASSAGE O MPLIFICATION C JNTERED.	TONS N CHANG F TIME	MAY DIFFER A SE AT THIS LO :. THE DATA P	T OTHER CATION PRESENTED	C6		

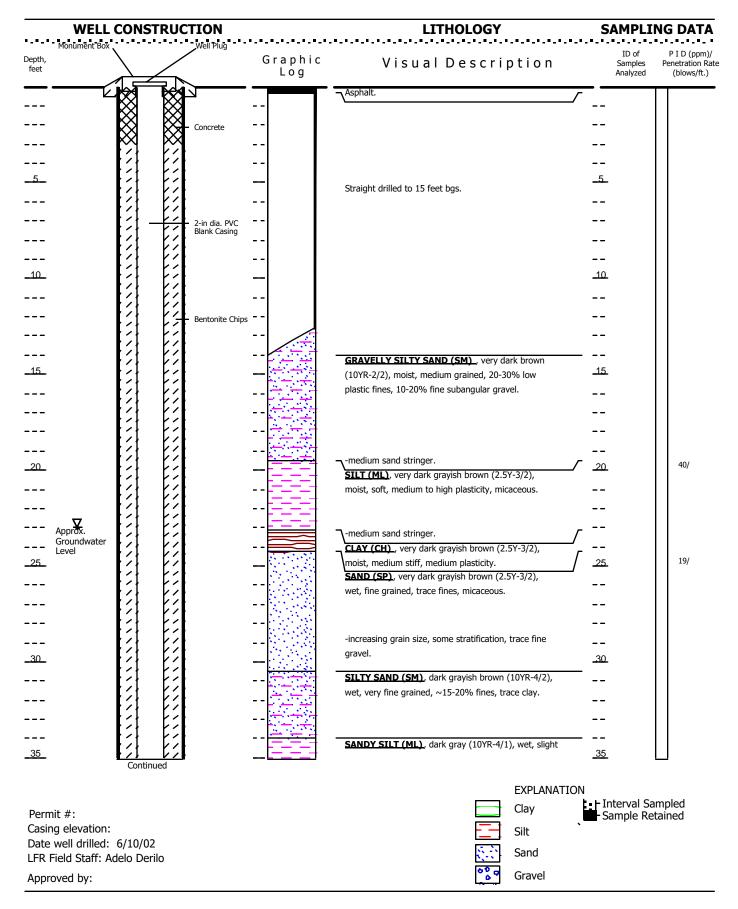
	PROJECT NO.: 51-5690-00									LOG OF BORING HP-54 SHEET 2 of 3									
,		ILLIN		Ho	llow Stem A	uger				OJECT ME:	MIS	SSION V RMINAL	ALLEY		LOCATION	: Practic	e Field	<u> </u>	
,	DRI	ILLIN	G ENT:	CV	/IE-75 w/DH	Hamr	ner										DEPTH REHOLE:	80 ft	
		STA	RTED:	•	10/3/00			ILLING MPANY:		West Hazmat Drilling BOREHOLE 8" (O.D.) GROUNDWA							MEASUF DATE ar	REMENT	
	DATE	COM	IPLETE	D;	10/3/00			RFACE NDITION	S:	S: Grass ▼ 15.0 / na ▼ na / na								10/3/200	00
		ВАС	KFILLE	ED:	10/3/00		LO	GGED B	Y:	K. Wells REVIEWED BY: J. Stock Y na / na									
	SAMPLE								90	90									
	HLABO		BLOW COUNTS (BLOWS/FOOT)	TYPE	<u>Q</u>	TPH9, TPH4	(mg/kg)	PID/OVA (ppm)	GRAPHIC LOG				DESCR	RIPTION	AND CLASS	IFICATION			
					HP54-35														
	-																		
	- 40 -			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	HP54-40						SILTY SA nydrocari	AND (SM), bon odor, s	dark gray, wet, o ilt content 15%	dense, fin	e to medium (grained (predo	minately	fine), na	
	-																		
ŀ	- 45	45 HP54-45							<u>설립</u> 14일										
ř										-lydropür	nch at 46 to	47.5 ft							
ŀ										1 3	SAND wi		P/SM), dark gray	, wet, den	se, fine to me	edium grained	, with mic	ca, no	·
	- 50	,			HP54-50						iyurocari	DOI! 0001							
ļ					HF34-30														
-	- - - - 55 -				HP54-55						SILTY SA blasticity	AND (SM),	gray, wet, dense	e, fine to π	nedium graind	ed, no hydroca	arbon odd	or, has little	,
	- - 60		-		HP54-60						RIARS I	FORMATIO	DN:					· · · · · · · · · · · · · · · · · · ·	
/01		*									SANDST	ONE consi	sting of CLAYE			very dense, fir	ne ta med	dium graine	ed, no
7 2/26	- 65																		. 1-14
EY.G0										Attempt at hydropunch failed due to inability to drive hydropunch beyond 6", hydropunch no yield due to very dense sands									
TROLL									Second attempt at hydropunch failed at 70 ft., sands are very dense, no yield, no drive							drive beyor	nd ~4"		
Age										<u>'</u>	vote: 50	ils are still						FIGURE	
WELL LOG SEGULO	KLEINFEL 5015 SHOREHAM PL SAN DIEGO, CALIFORNIA								AÇE	<u>:</u> .		THIS B SUBSU LOCAT WITH T IS A SI	UMMARY APPL ORING AND AT RFACE CONDI IONS AND MAY HE PASSAGE (MPLIFICATION I	THE TIME TIONS MA CHANGE OF TIME.	E OF DRILLIN LY DIFFER AT E AT THIS LOO THE DATA PI	IG. OTHER CATION RESENTED		C6	

PF	ROJE	ECT NO).:	5 1-569	0-00	I			ì	LOG C	F BORING	HP-54		SHEET 3 of 3	
	DRILLING METHOD: Hollow Stem Auger							PROJECT MISSION VALLEY LOCATION: Pr						e Field	
DF	RILLIN	NG MENT:	CN	IE-75 w/DH	Hamn	ner		SAME	PLING IOD:	alifornia Sa	impler	SURFACE ELEVATION:		TOTAL DEPTH OF BOREHOLE: 80 ft	
	STARTED: 10/3/00 DRILLING COMPANY:				W	est Hazmat	Drilling	BOREHOLE 8" (C	D.D.)	GROUNDWA DEPTHIELE	ATER MEASUREMENT EV. (ft) DATE and TIME				
DATE	СО	MPLETE	D:	10/3/00		SURF	FACE DITION	s: G	s: Grass ¥ 15.0 / ne 1						
	1	CKFILLI	ED:	10/3/00		LOGO	GED B	Y: K	Wells		REVIEWED BY: J.	Stock	⊈ na/ <i>na</i> ⊈ na/ <i>n</i> a		
	<u> </u>		SAN	IPLE				ပ္ခ							
	DEPTH (ft)	BLOW COUNTS (BLOWS/FOOT)	TYPE	Q ·	TPHg, TPHd	(mg/kg)	PID/OVA (ppm)	GRAPHIC LOG			DESCRIPTIO	N AND CLAS	SIFICATION		
- 7	5	100/5.5		HP54-75											
-8	0	100/5"	-	HKP54-80					Boring s	topped at 8	0 ft.				
-									Groundy	water obser	ved at 15 ft. with bentonite grout				
											ample taken at 21 to 20		17.5 ft.		
-				·					Hydropu	ınch refusal	at greater depths than	~55 to 60 ft.			
-8	5														
}															
- 9															
-9															
-														••	
ŧ													-		
_ _9	5														
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1	00														
25. 25.							:								
NO.				,											
3											, , , , , , , , , , , , , , , , , , ,		<u> </u>		
WELL LUG SOBULUA				K L E 5015 S SAN DIEC	SHOF	REHA	M PL	ACE		THIS B SUBSU LOCAT WITH IS A SI	LUMMARY APPLIES ON ORING AND AT THE TI JEFACE CONDITIONS ON MAY CHAN THE PASSAGE OF TIME MPLIFICATION OF THE JUTTERED.	IME OF DRILLI MAY DIFFER A GE AT THIS LO E. THE DATA I	NG. TOTHER COATION PRESENTED	FIGURE C6	

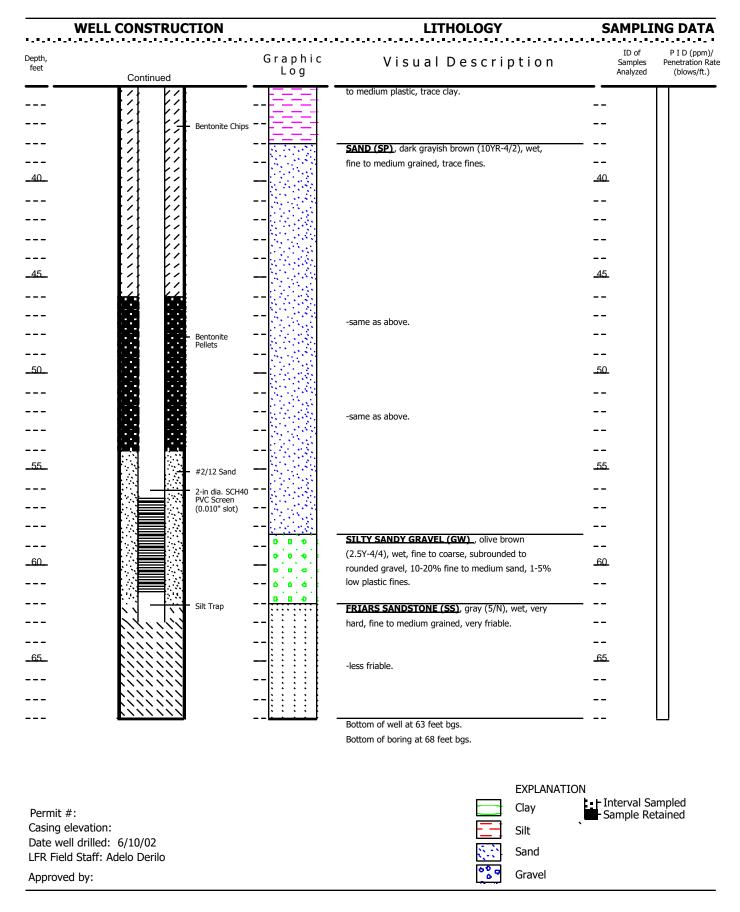
PR	DJECT	NO.:	:	51-569	0-00			L	OG C	F BORIN	G I	HP-55		SHEET 1 of 3
	LLING	 H	lolk	w Stem A	uger		PROJE	CT MIS	SION V	ALLEY		LOCATION	v: Qualco	mm Service Station
DRI	THOD: LLING JIPMENT			-75 w/Auto		r	SAMPI	LING Ca	lifornia Sa	ımpler		SURFACE ELEVATION:		TOTAL DEPTH OF BOREHOLE: 81 ft
EGI	STARTE			12/19/00		RILLING	L	County Drilli	ing	BOREHOLE DIAMETER:	8" (O	.D,)	GROUNDWA DEPTHIELE	ATER MEASUREMENT V. (ft) DATE and TIME
DATE	COMPL	ETEC);	12/21/00	s	URFACE		oncrete					¥ 11.5 / na	12/19/2000
	BACKFI	LLE	 D:	12/21/00		OGGED B		Wells		REVIEWED BY:	J. S	Stock	⊈ na/ <i>na</i> ⊈ na/ <i>na</i>	
OFPTH (#)	BLOW COUNTS		J Y F	PLE Q	TPHg, TPHd (mg/kg)	PID/OVA (ppm)	GRAPHIC LOG			DESCRI	PTIO	N AND CLASS	SIFICATION	
 	BL	(8)			,				AL FILL; SAND (SC ravel and c th some SII					fine to coarse gravel and e, fine to medium grained,
-5	8		•	1				No hydro	carbon sta	ining				
- - - -	1	6	1	2				ALLUMU CLAYEY		c), brown, moist, r	nediur	n dense, fine g	grained ,	
- 15 -	50,	/2*	1	3				coarse), v	with some !	LT (SP-SM), olive large gravel with a sample at 10 to 18	піса	n, dense, wet,	fine to medium	grained (with some
- 20	4	3	1	4				Note: mì	nor heavin	g				
- 25	5 , 50	/2"		5				Flowing f	mpler drive	se sands with gra	vel ar	nd occasional o	cobbles	
5690LOG.GPJ TROLLEY.GDT 2/26/01	50	/6*		6				SANDST	ONE (SC)), moi worke	st to wet, very d	dense, fine to s	medium grained, lightly
WELL LOG 5690LOG.				K L E 5015 SAN DIEG	SHORE	EHAM P	LACE		THIS E SUBSI LOCA' WITH IS A S	SUMMARY APPLII BORING AND AT URFACE CONDIT TIONS AND MAY THE PASSAGE O IMPLIFICATION C UNTERED.	THE T IONS CHAN IF TIMI	IME OF DRILL MAY DIFFER A IGE AT THIS LO E. THE DATA	ING. AT OTHER OCATION PRESENTED	FIGURE C7

PF	OJEC	OT NO).:	51-569	0-00				LOG C	F BORI	NG H	IP-55		SHEET 2 of	f 3
	HLLING		Но	llow Stem A	uger			DJECT M	ISSION V ERMINAL	ALLEY		LOCATION	v: Qualco	mm Service Stat	tion
DR	UIPME	3	СМ	IE-75 w/Aut	ohamr	ner	SAI	UDI INO	California S		S	URFACE LEVATION:		TOTAL DEPTH OF BOREHOLE:	81 ft
	Τ	RTED:		12/19/00)	DRILLING		Tri-County D	rilling	BOREHOLE DIAMETER:	8" (O.I	O.)	GROUNDWA DEPTH/ELE		
DATE	COMPLETED: 12/21/00 SURFACE			Concrete					¥ 11.5 / na	12/19/2000)				
	ВАС	KFILLI	ED:	12/21/00)	LOGGED	BY:	K. Wells		REVIEWED B	Y: J.St	ock	⊈ na/ <i>na</i> ⊈ na/ <i>na</i>		
	DEPTH (II)	BLOWCOUNTS (BLOWS/FOOT)	TYPE	IPLE Q	рнд, трна	PID/OVA	GRAPHIC LOG			DESCF	RIPTION	AND CLASS	BIFICATION		
- 41		50/4"		8				Hydrop		sample at 41 ft. t	o 42 ft.				
- 45	5								action is very	lean .	and (as re	worked)			
50 	0	50/5*	Z	9								·			
- 5: -	5	50/5"	1	10	-										
-6	0	50/2"	1	11	-			Large (gravels and o	cobbles from 61	ft. to 62.5	fl. (up to 30%	6 gravels and c	cobbles)	
GPJ IKOLLET GDI ZZANI	5	60/0*		12				Note: h	nydropunch v	vater sample wa	s refused	due to hard t	formation		
WELL LOG SBOLOGIC	$\hat{\lambda}$	F		KLE 5015 SAN DIEC	S HOF	REHAM !	PLACE	Ē	THIS E SUBSI LOCA WITH IS A S	SUMMARY APPL BORING AND AT JURFACE CONDI TIONS AND MAY THE PASSAGE (IMPLIFICATION UNTERED.	THE TIM TIONS MA CHANGI OF TIME.	IE OF DRILLII AY DIFFER A E AT THIS LO THE DATA F	NG. IT OTHER OCATION PRESENTED	FIGURE	

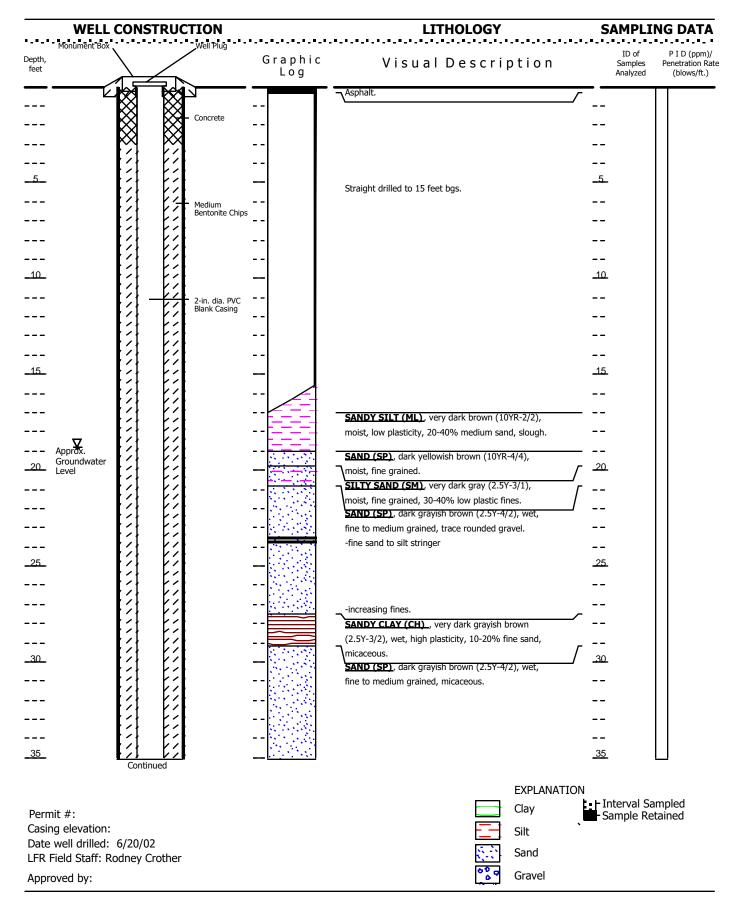
PROJ	IECT NO.:	51-5690-0	00	L	OG OF BORING	HP-55		SHEET 3 of 3
DRILL	ING Holle	ow Stem Auge	er	PROJECT MIS	SSION VALLEY RMINAL	LOCATION	n: Qualco	mm Service Station
DRILL	INC	E-75 w/Autoha	mmer		alifornia Sampler	SURFACE ELEVATION:	······	TOTAL DEPTH 81 ft
ST	TARTED:	12/19/00	DRILLING COMPANY	Tri County Dri	BOREHOLE 8"	(O.D.)	GROUNDWA DEPTHIELE	TER MEASUREMENT V. (ft) DATE and TIME
DATE	OMPLETED:	12/21/00	SURFACE CONDITIO	NS: Concrete			¥ 11.5 / na	12/19/2000
1 1	ACKFILLED:	12/21/00	LOGGED E	Y: K. Wells	REVIEWED BY:	J. Stock	¥ na/na ⊈ na/na	
	SAME	PLE	<u> </u>	90				
DEРТН (ft)	BLOWCOUNTS (BLOWS/FOOT) TYPE	O S	(mg/kg) PID/OVA (ppm)	GRAPHIC LOG	DESCRIPTI	ON AND CLASS	SIFICATION	
- 75 75 80				Bottom	ne contains up to 50% lean clay			
- - - 8 5				Borehole	a reamed to 10" for well construct	tion (nested well))	
- - 90 - -								
95								-
100								
		K L E I I 5015 SHO SAN DIEGO,	OREHAM PI	_ACE	THIS SUMMARY APPLIES OF THIS BORING AND AT THE SUBSURFACE CONDITION: LOCATIONS AND MAY CHAWITH THE PASSAGE OF THE IS A SIMPLIFICATION OF THE ENCOUNTERED.	TIME OF DRILLI S MAY DIFFER A NGE AT THIS LO ME. THE DATA F	NG. TOTHER DCATION PRESENTED	FIGURE C7



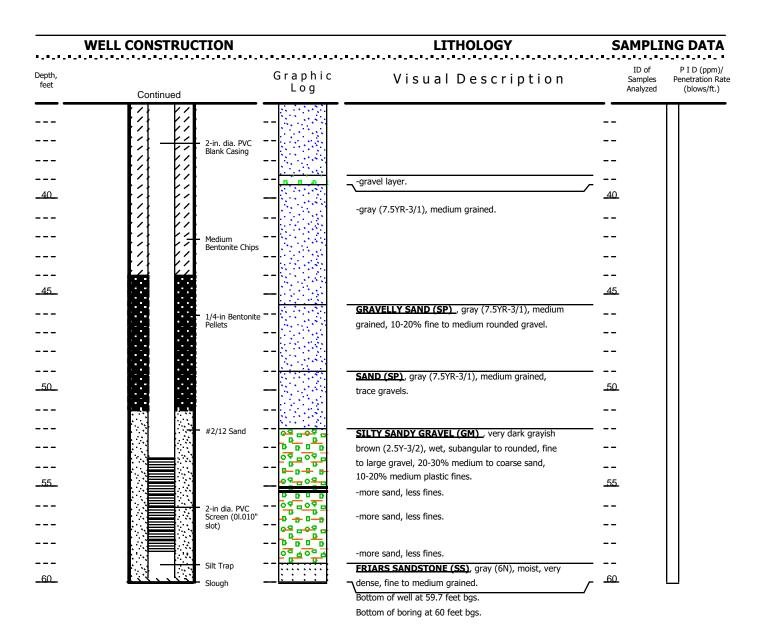
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-33AD



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-33AD (CONTINUED)



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-34AD



Permit #: Casing elevation:

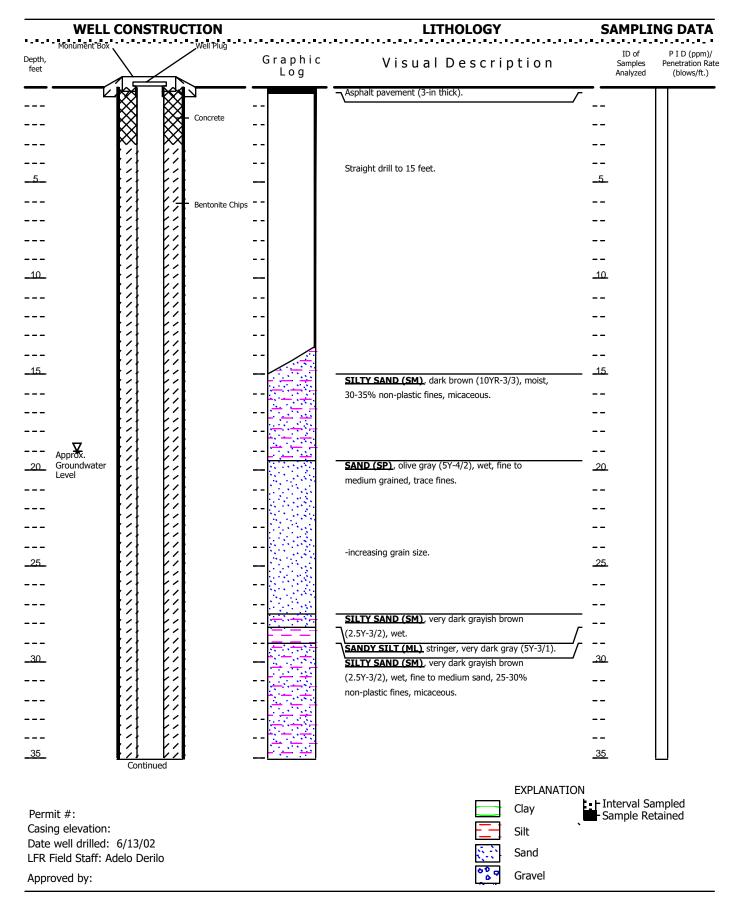
Date well drilled: 6/20/02 LFR Field Staff: Rodney Crother

Approved by:

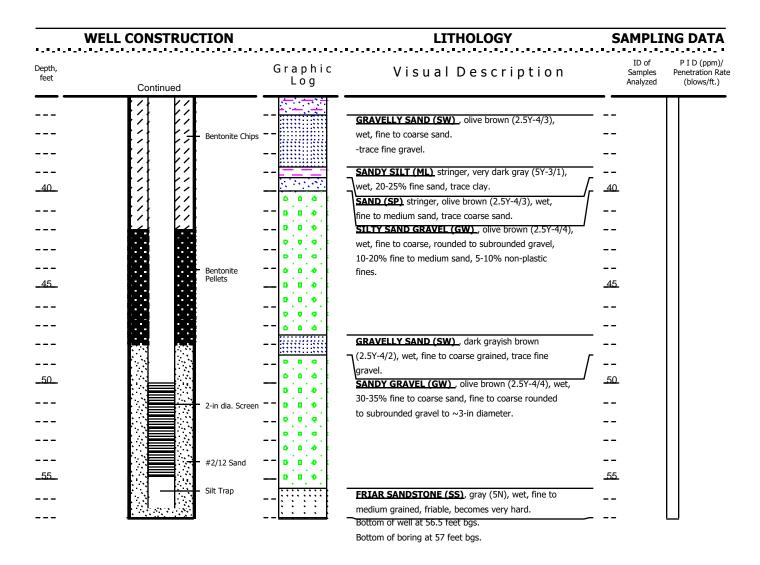
Clay Clay Silt Sand

Gravel

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-34AD (CONTINUED)



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-35AD



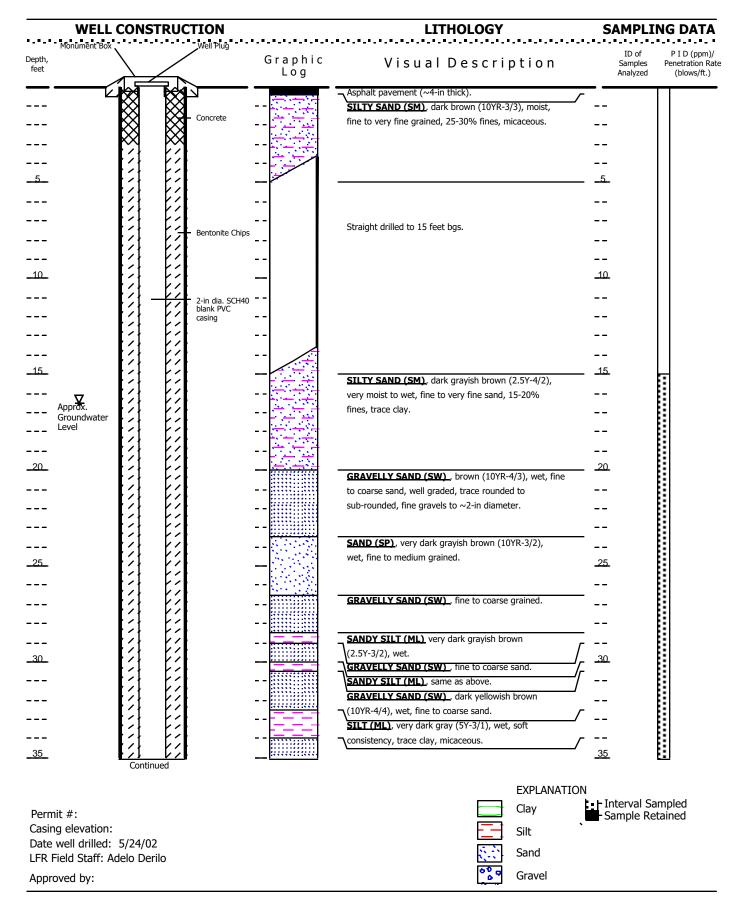
Permit #: Casing elevation:

Date well drilled: 6/13/02 LFR Field Staff: Adelo Derilo

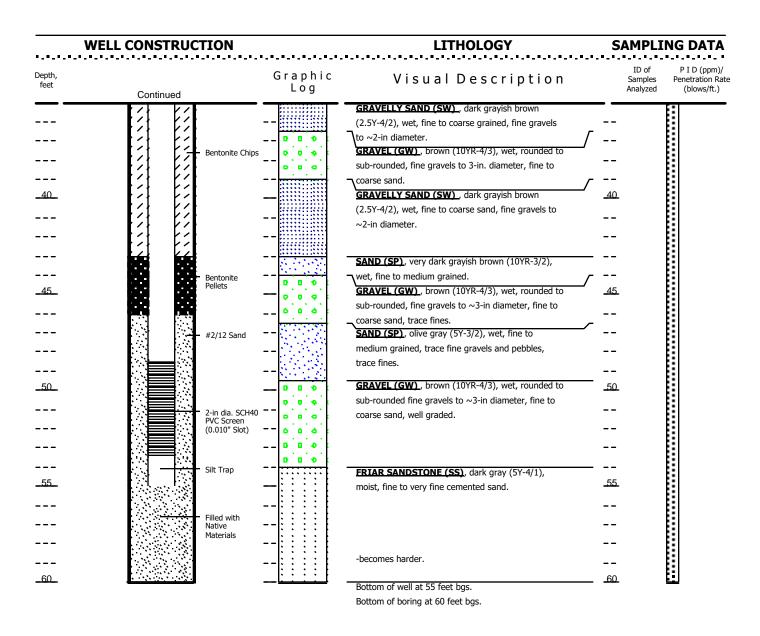
Approved by:

EXPLANATION Clay Silt Sand Gravel

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-35AD (CONTINUED)



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-36AD



Permit #: Casing elevation:

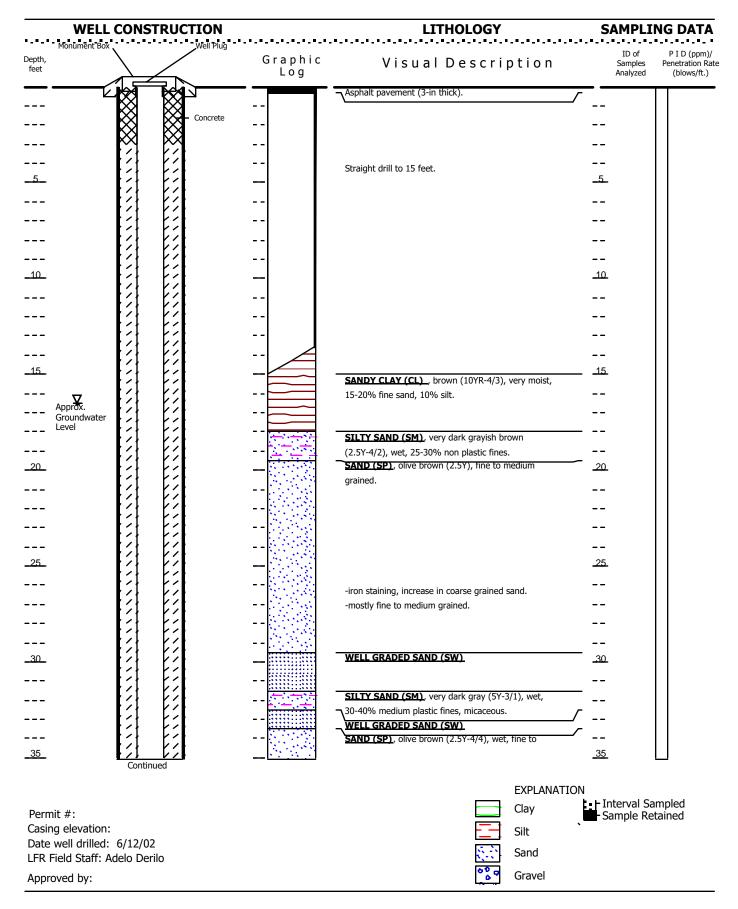
Date well drilled: 5/24/02 LFR Field Staff: Adelo Derilo

Approved by:

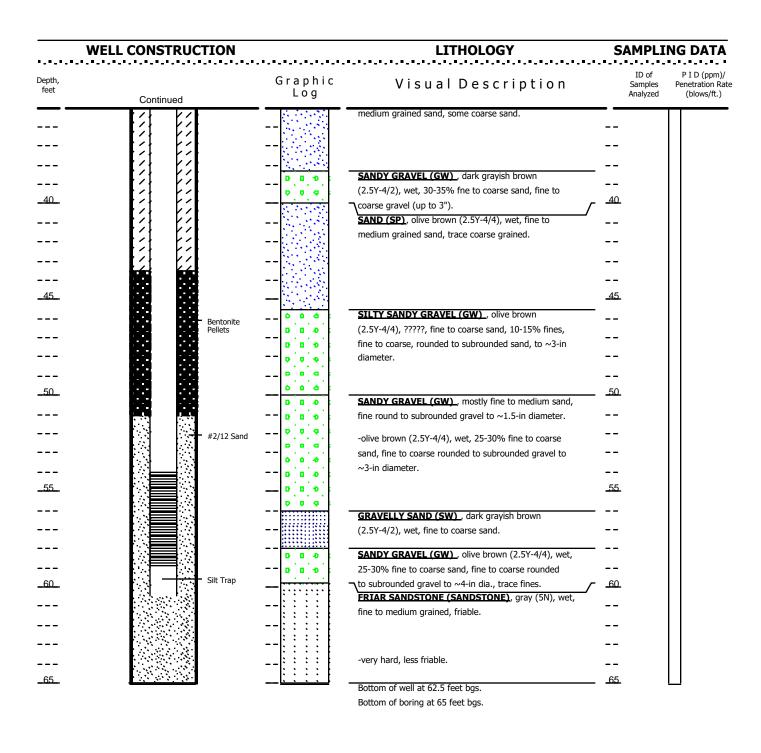
Clay Silt Sand

Gravel

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-36AD (CONTINUED)



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-37AD



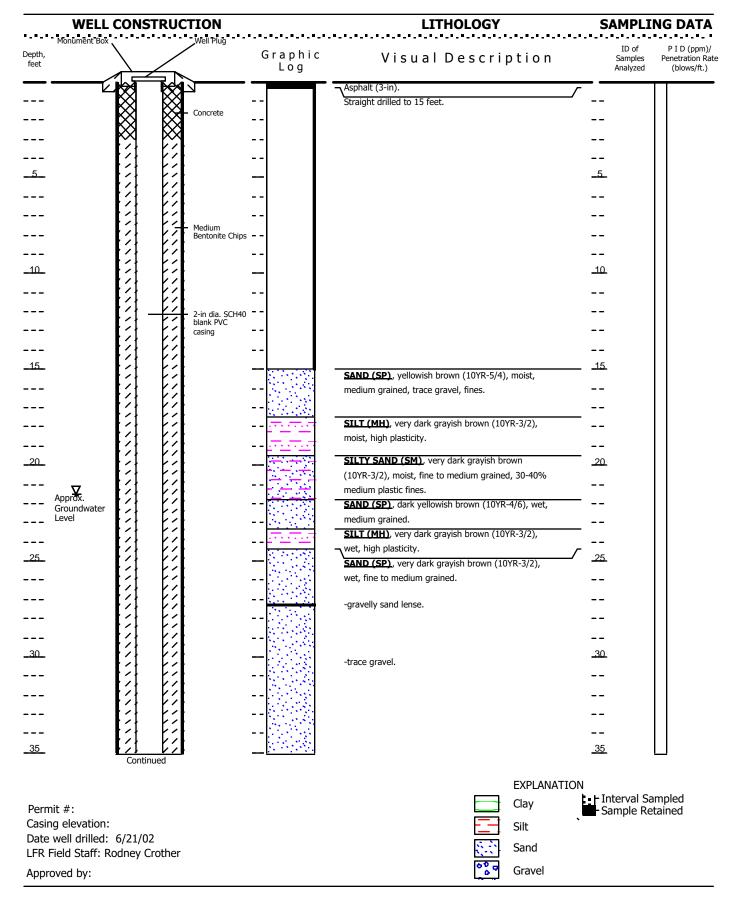
Permit #: Casing elevation:

Date well drilled: 6/12/02 LFR Field Staff: Adelo Derilo

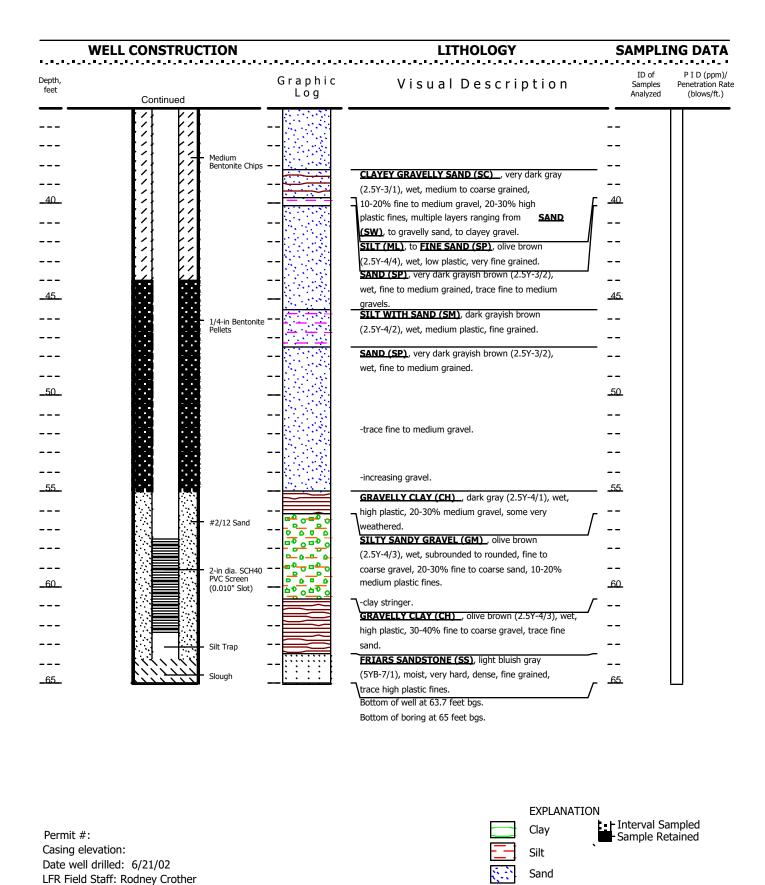
Approved by:

EXPLANATION Clay Silt Sand Gravel

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-37AD (CONTINUED)



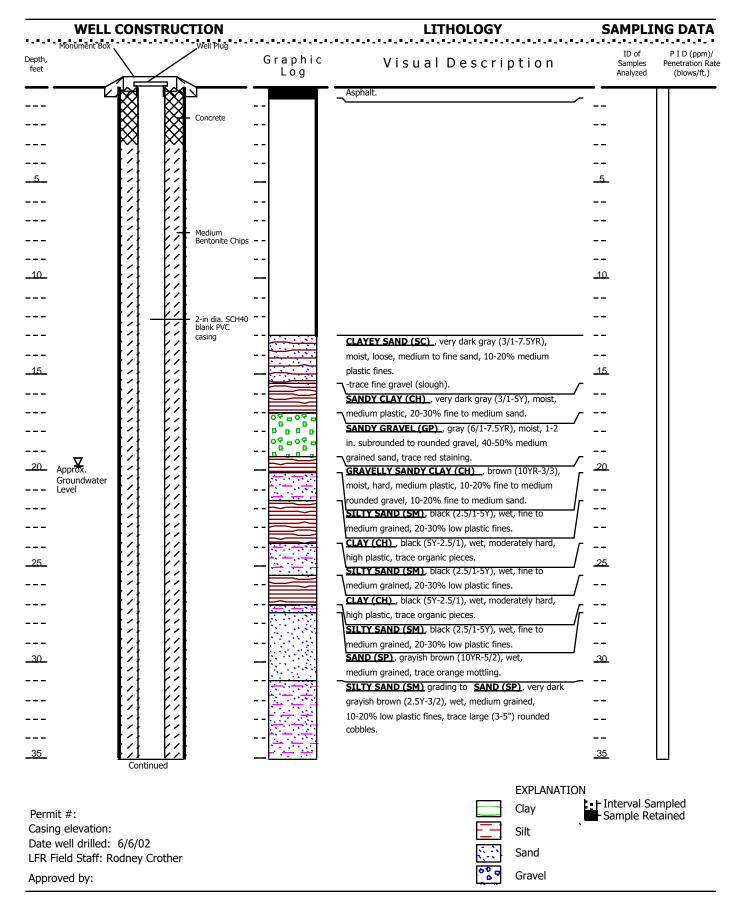
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-38AD



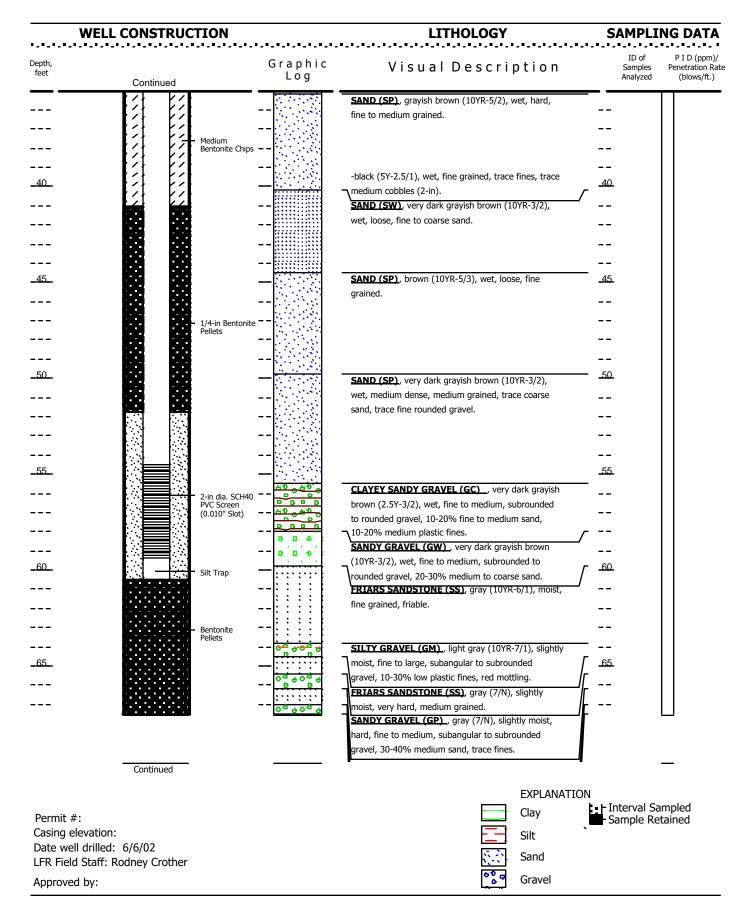
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-38AD (CONTINUED)

Approved by:

Gravel



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-39AD



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-39AD (CONTINUED)

WELL CONSTRUCTION LITHOLOGY SAMPLING DATA Depth, feet Graphic Log Visual Description ID of Samples Analyzed (blows/ft.)

FRIARS SANDSTONE (SS), gray (7/N), slightly

SANDY GRAVEL (GP), gray (7/N), slightly moist,

hard, fine to medium subangular to subrounded gravel, 30-40% medium sand, trace fines.

Bottom of well at 60.5 feet bgs. Bottom of boring at 67.5 feet bgs.

moist, very hard, medium grained.

Permit #: Casing elevation: Date well drilled: 6/6/02 LFR Field Staff: Rodney Crother

Approved by:

EXPLANATION

Clay

- Interval Sampled - Sample Retained

Silt Sand

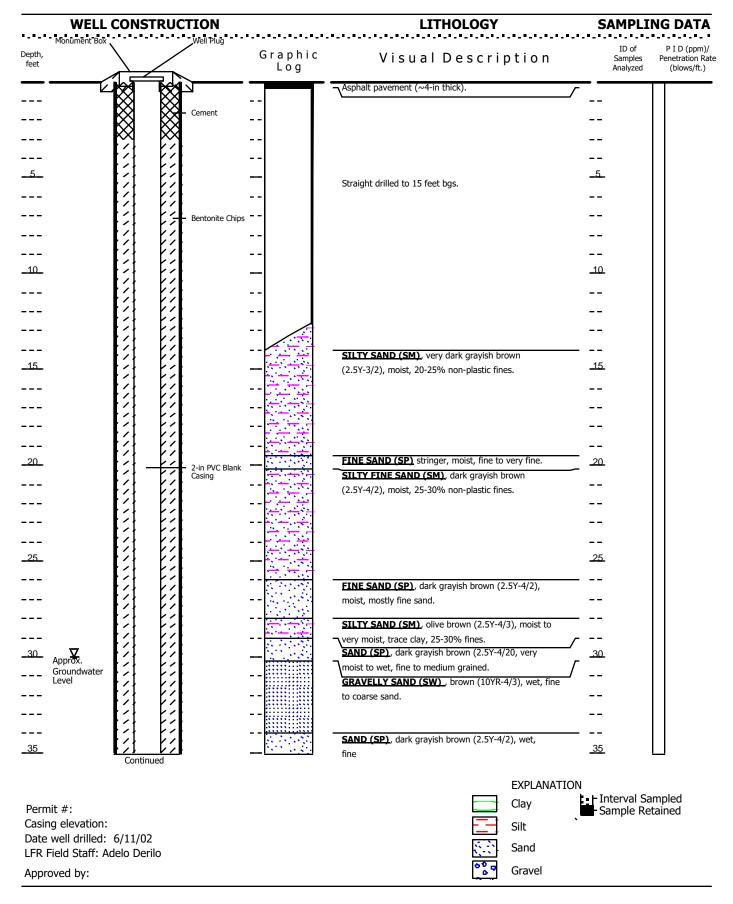
, - \ , - \

Gravel

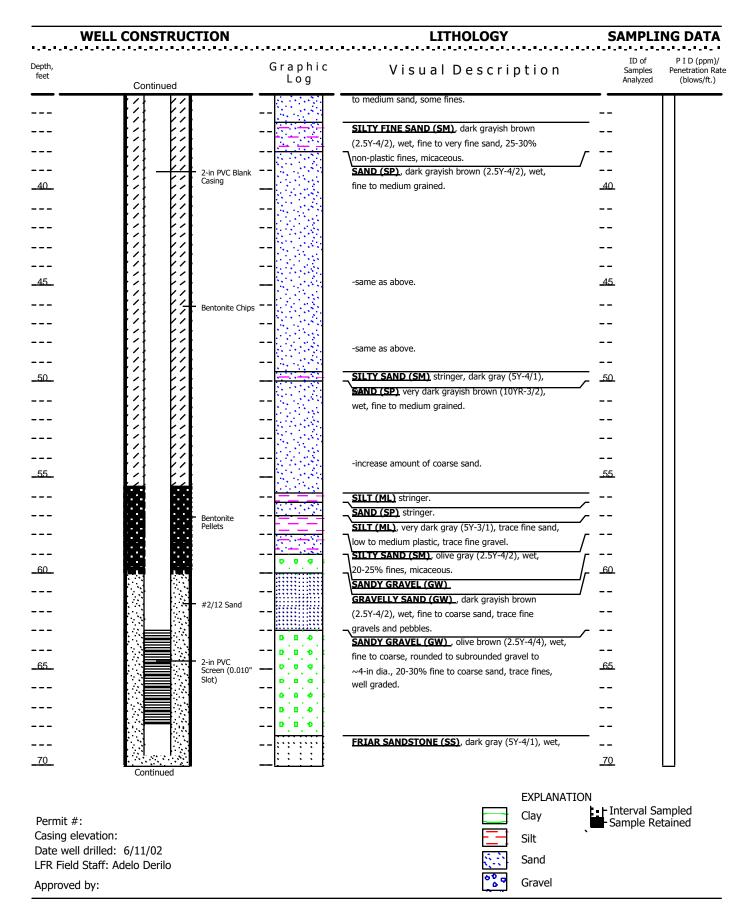
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-39AD (CONTINUED)

Levine Fricke
Project No. 002-10135-00

Mission Valley Terminal



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-40AD



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-40AD (CONTINUED)

	WELL CONSTRUCTION		LITHOLOGY	SAMPLING DAT	
Depth, feet		Graphic	Visual Description	ID of P I D (ppr Samples Penetration	m)/ n Rate
	Continued	Log	fine to medium grained friable.	Analyzed (blows/ft	t.)
	2000 200 miles	[:::::]	Bottom of well at 69.5 feet bgs. Bottom of boring at 71 feet bgs.	· U	

Permit #: Casing elevation:

Date well drilled: 6/11/02 LFR Field Staff: Adelo Derilo

Approved by:

EXPLANATION

Clay

I - Interval Sampled - Sample Retained



Silt Sand

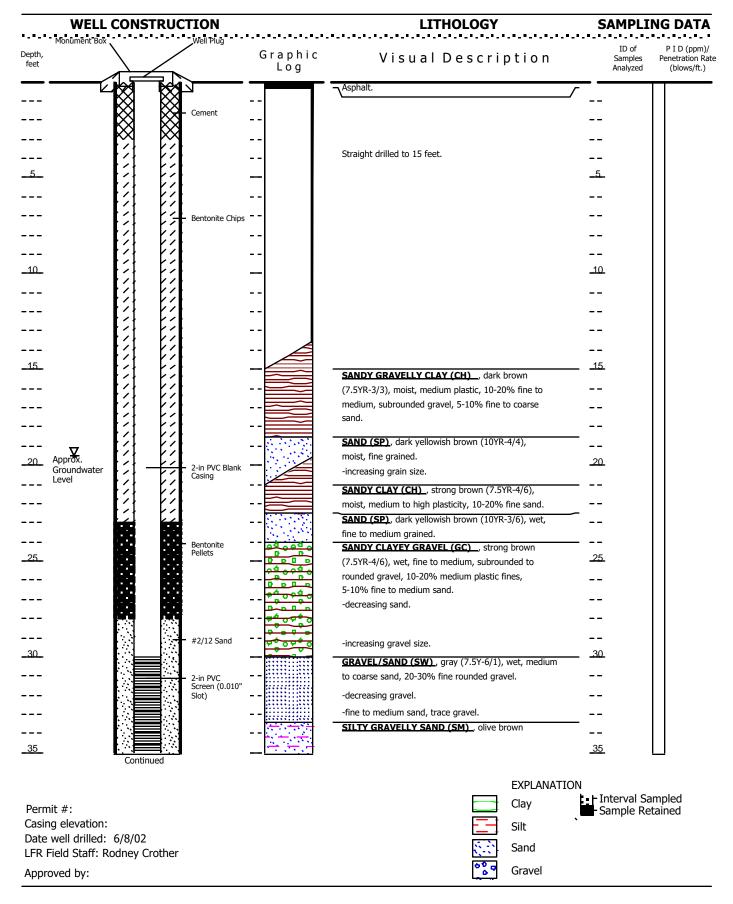


Gravel

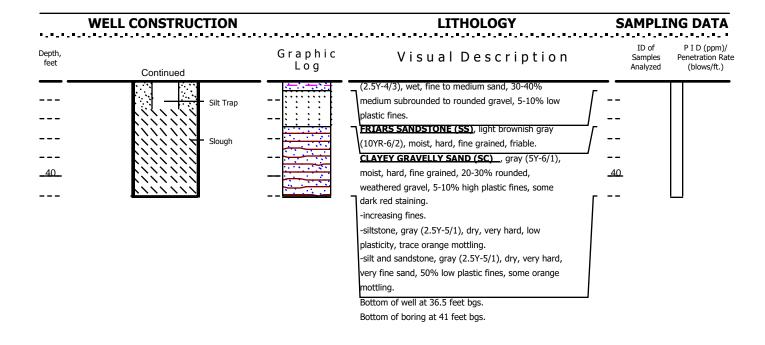
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-40AD (CONTINUED)

Levine Fricke
Project No. 002-10123-00

Mission Valley Terminal



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-41AD



Permit #: Casing elevation: Date well drilled: 6/8/02 LFR Field Staff: Rodney Crother

Approved by:

EXPLANATION

Clay

- Interval Sampled - Sample Retained



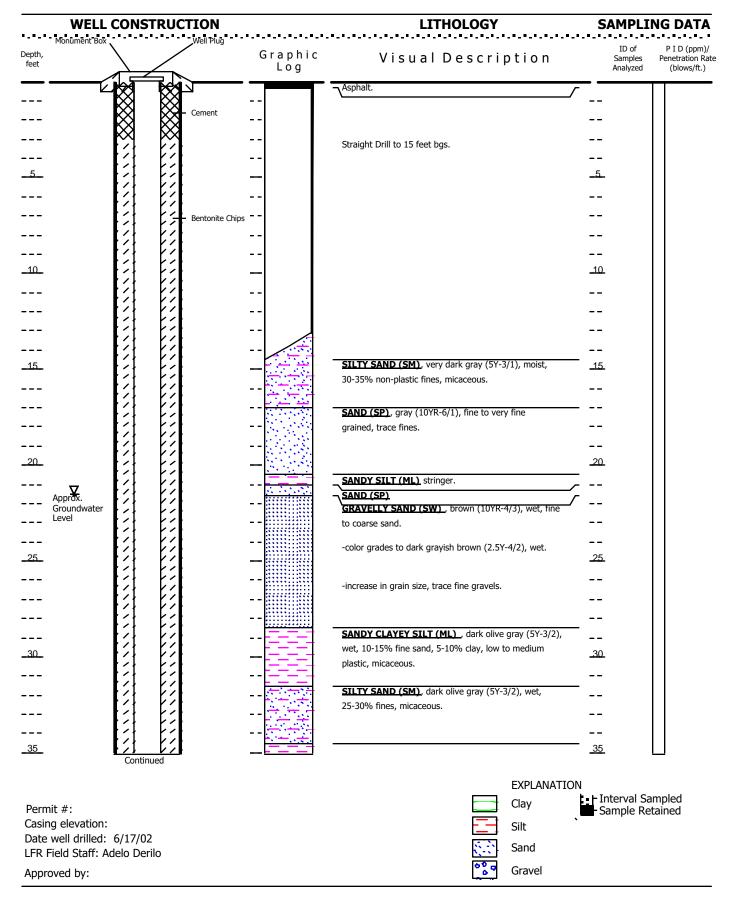
Silt Sand

Sa G

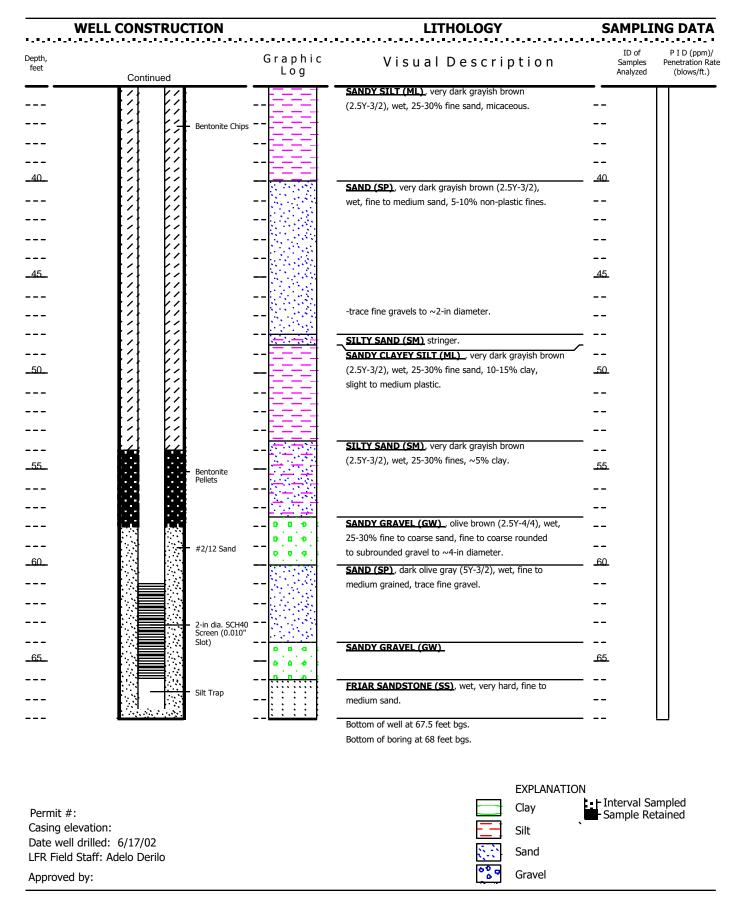
Gravel

Graver

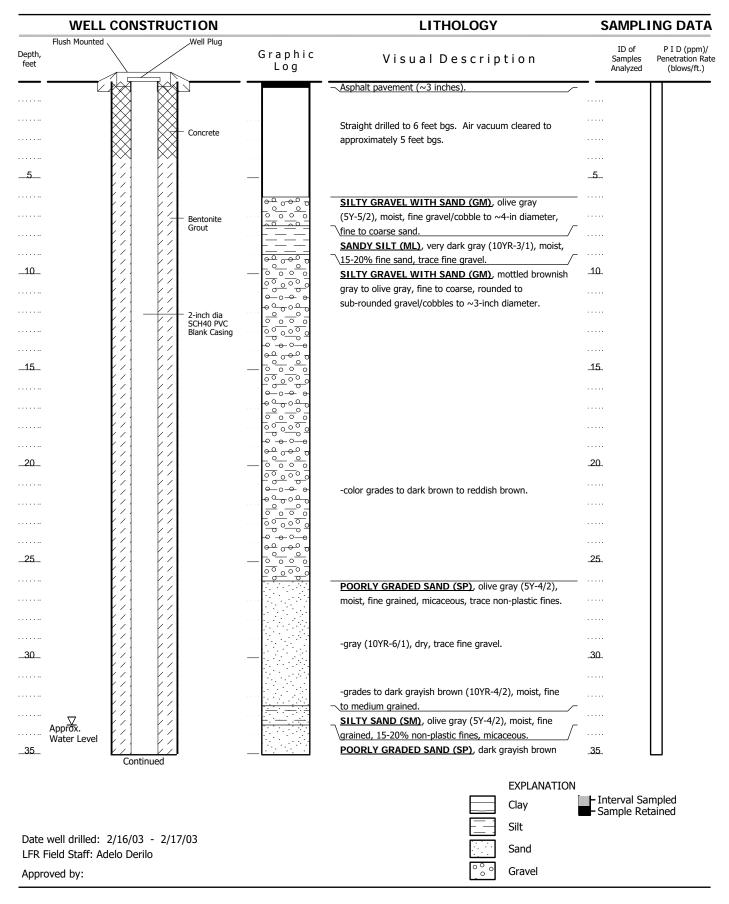
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-41AD (CONTINUED)



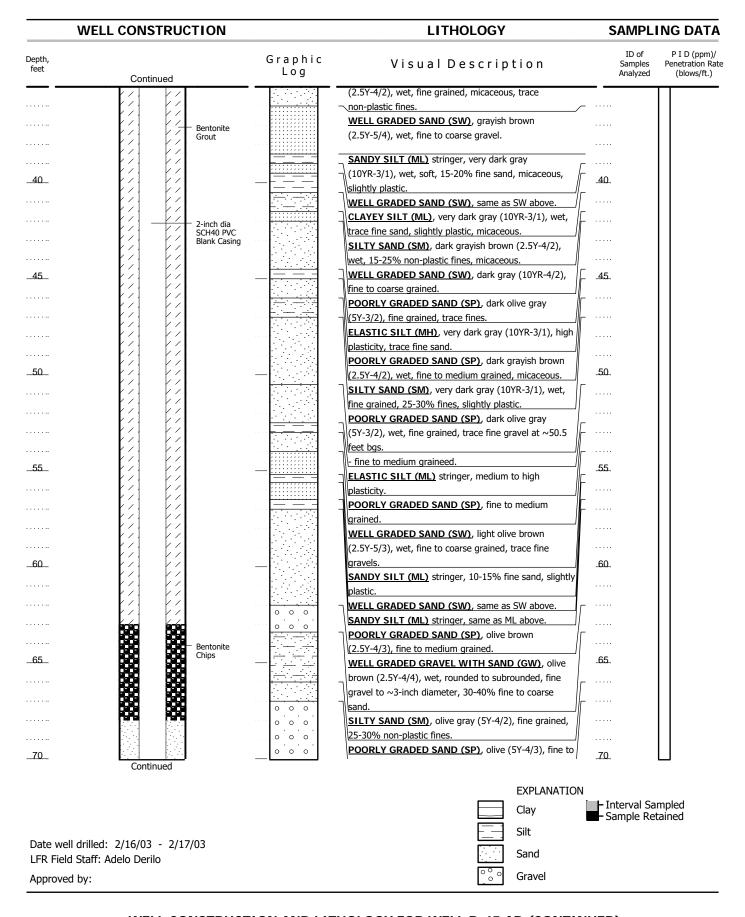
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-42AD



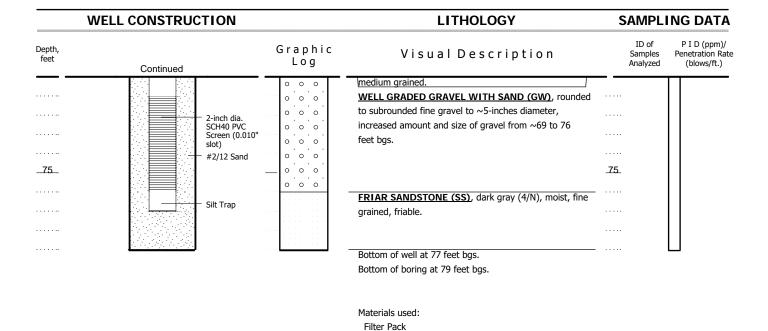
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-42AD (CONTINUED)



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-45 AD



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-45 AD (CONTINUED)



- 2 1/2 bags #2/12 sand

1 1/2 bags bentonite chips 6 bags bentonite grout

Annular Seal

Date well drilled: 2/16/03 - 2/17/03 LFR Field Staff: Adelo Derilo

Approved by:

	EXPLANATION	
	Clay	Interval SampledSample Retained
	Silt	•
	Sand	
000	Gravel	

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-45 AD (CONTINUED)

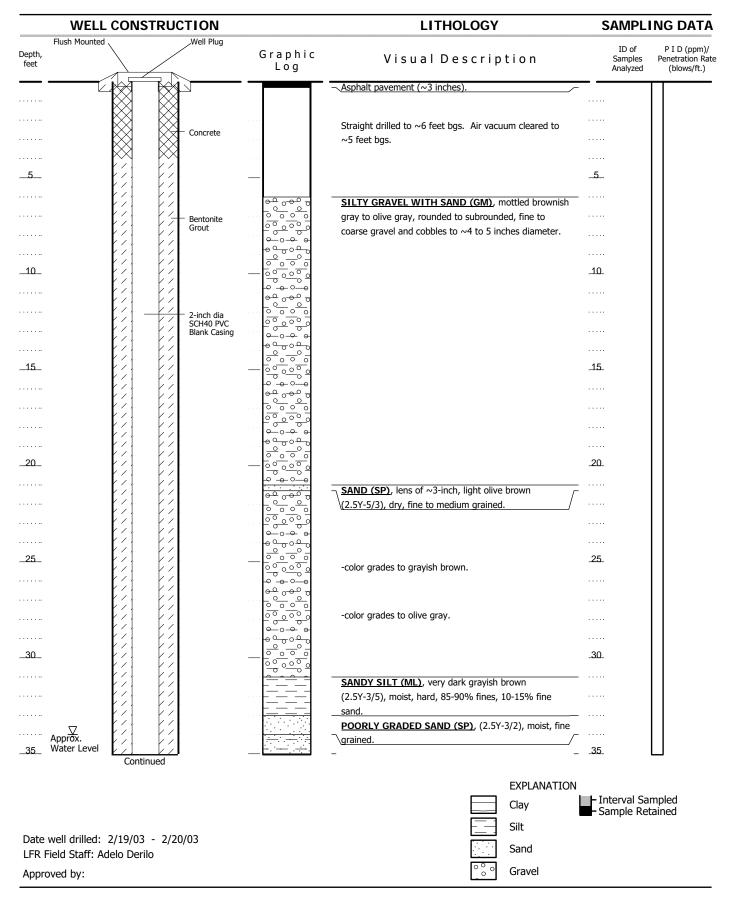
Levine • Fricke
Project No. 10180

	WELL CONS	STRUCTION		LITHOLOGY	SAMPLING DATA		
Depth, feet	Flush Mounted	Well Plug	Graphic Log	Visual Description	ID of Samples Analyzed	P I D (ppm)/ Penetration Rate (blows/ft.)	
—				_Asphalt pavement (~3-inches).	-	П	
				<u>FILL</u> materials, sand and gravel, mottled.			
		Concrete					
	\bowtie						
5					_5_		
				-brown to gray with red streak.			
	(2)	Bentonite Grout	0 0	SILTY GRAVEL WITH SAND (GM), mottled, dark			
		//		brown to grayish brown, rounded to subrounded, fine			
			— o— o	gravel to ~2-in diameter.			
10	kál				_10_		
			00000				
		2-inch dia SCH40 PVC	0 0 0 0				
	[2]	Blank Casing	00000				
			· · · · · · · · · · · · · · · · · · ·				
15			— 0000		_15_		
	kál		00000				
			0000				
	[2]	//	o—o—o o				
20			— 0000		_20_		
				-reddish brown.			
	k 2 l		0 0 0 0				
			<u> </u>				
25			-0-0-0	-yellowish mottling, cobbles to ~5-inch diameter.	.25		
25	(2)	(/	°;		-20		
			00000				
				SANDY SILT (ML), dark grayish brown (10YR-4/2),			
	kál	(2)		moist, 25-30% fine to medium grained sandvery dark gray (10YR-3/1), moist, 15-20% fine sand.			
				-micaceous.			
_30			_ ====		_30_		
	(2)	()		MELL CRADED CAND (CMA gray (10VP 6/1) dry	-		
				<u>WELL GRADED SAND (SW)</u> , gray (10YR-6/1), dry, fine to medium sand, 10-15% fine gravel.			
	k /			Time to mediani sana, 10 13 % fine graven			
	<u> </u>		· · · · · · · · · · · · · · · · · · ·	SILTY SAND (SM), very dark grayish brown			
35	[2]	1/2			35		
LFR Fi	well drilled: 2/18/03 ield Staff: Adelo Der ved by:			EXPLANATION Clay Silt Sand Gravel	i	mpled :ained	

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-46 AD

	WELL	CONSTRUC	TION		LITHOLOGY	SAIVIPLI	NG DATA
Depth, feet		Continued		Graphic Log	Visual Description	ID of Samples Analyzed	P I D (ppm)/ Penetration Rate (blows/ft.)
	Approx. Water Level	Continued	Bentonite Grout Bentonite Chips		(2.5Y-3/2), moist, fine gravel, 15-20% non-plastic fines, micaceous. WELL GRADED SAND (SW), very dark grayish brown (2.5Y-3/2), grayish mottling, fine to coarse grained, trace fine gravel. POORLY GRADED SAND (SP), dark olive gray (5Y-3/2), wet, fine to medium grained, micaceous. SILTY SAND (SM), very dark gray (5Y-3/1), wet, fine grained, 15-20% non-plastic fines, micaceous. POORLY GRADED SAND (SP), very dark gray (5Y-3/1), wet, fine to medium grained, micaceous. SILTY SAND (SM), dark grayish brown (2.5Y-3/2). POORLY GRADED SAND (SP), dark olive gray (5Y-3/2), wet, fine to medium grained. SILTY SAND (SM), dark brown (7.5YR-3/2), wet, fine grained, 20-25% non-plastic fines.		
50			 #2/12 Sand 2-inch dia. SCH40 PVC Screen (0.010" slot) 	0 0 0	POORLY GRADED SAND (SP), dark olive gray (5Y-3/2), wet, fine to medium grained. SILTY SAND (SM), dark brown (7.5YR-3/2), wet, fine grained, 20-25% non-plastic fines. -trace cobbles to ~3 inch diameter. WELL GRADED GRAVEL WITH SAND (GW), brown (10YR-4/3), wet, fine gravel to ~3-inch diameter. SILTY SAND WITH GRAVEL (SM), dark brown	 .50. 	
_55			- Silt Trap - Bentonite Chips		(7.5YR-3/2), wet, fine grained, 20-25% non-plastic fines, fine gravel/cobbles to ~5-inch diameter. FRIAR SANDSTONE (SS), mottled gray and brown, highly weathered, moist, fine to medium grained.	 	
			— Slough		Bottom of well at 58 feet bgs. Bottom of boring at 62 feet bgs. Materials used: Filter Pack - 2 bags #2/12 sand Annular Seal - 2 bags bentonite chips - 3 1/2 bags bentonite grout		
LFR I	well drilled: 2 Field Staff: Ad oved by:				EXPLANATION Clay Silt Sand Gravel	- Interval Sar - Sample Ret	mpled ained

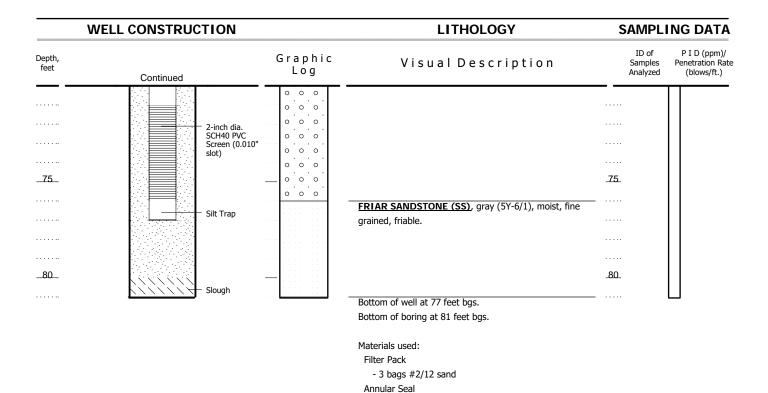
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-46 AD (CONTINUED)



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-47 AD

WELL CONSTRUCTION			LITHOLOGY	SAMPLING DATA		
Depth, feet	Conti	inued	Graphic Log	Visual Description	ID of Samples Analyzed	P I D (ppm)/ Penetration Rat (blows/ft.)
	11	//	4.4.44	SILTY SAND (SM), dark gray (10YR-4/1), wet,		
				70-75% fine grained sand, 25-30% non-plastic fines.		
	k ≥ }	Bentonite		POORLY GRADED SAND (SP), dark gray (10YR-4/1),		
		Grout		wet, fine to medium grained, micaceous.		
	K 5				ı	
	[2]	//				
40			— <u> </u>	WELL GRADED SAND (SW), olive gray (5Y-4/2), wet,	40	
	(2)			fine to coarse grained sand, rounded to subrounded		
		2-inch dia		fine gravel.		
		SCH40 PVC				
	<u>k</u> al	Blank Casing	<u> </u>			
				10-15% fine sand, slightly plastic.		
45			-	POORLY GRADED SAND (SP), olive gray (5Y-4/2),	45	
	[2]	//		\\		
				SILTY SAND (SM) lens stringer		
		(/	:::::::::::::::::::::::::::::::::::::::	WELL GRADED SAND (SW), olive gray (5Y-4/2), wet,		
	[2]			fine to coarse grained, fine gravel to ~2-inch diameter.		
50	k2}	()	_ <u></u>	POORLY GRADED SAND (SP), olive gray (5Y-4/2),	.50_	
	[2]			wet, fine to medium grained, fine gravel to ~2-inch		
	K 5			diameter, rounded to subrounded.	ı	
	[2]	//	<u> </u>	SIETT SAIRE (SIN), Very dark gray (51 5/1), Wet,		
				\		
	k c l			SANDY SILT (ML), (5Y-3/1), wet, 15-20% fine sand. WELL GRADED SAND (SW), dark olive gray (5Y-3/2),		
55	[2]				55.	
				fine gravel to ~2-inches diameter		
	<u> </u>	(2)				
				•		
	[2]	//				
60					60	
	k d		:::::::::::::::::::::::::::::::::::::::		ı	
	[2]			CLAYEY SILT (ML), very dark grayish brown		
				(2.51 5/2), wee, trace fine sand, slightly plastic,		
	5-6-			rounded to subrounded, trace fine gravel to ~2-inch		
	888	Danta site		\\\diameter.		
65	1888	Bentonite Chips		SANDY SILT (ML), dark grayish brown (2.5Y-4/2),	65	
				wet, 10-15% fine sand, micaceous, slightly plastic. SILTY SAND (SM), dark olive gray (5Y-3/2), wet,		
	888			10-15% non-plastic fines, fine grained, micaceous.		
	1898	200	0 0 0			
	100	199	0,00			
			0 0 0	diameter, rounded to subrounded, fine to coarse sand,		
70		#2/12 Sand	0,0,0	trace fines	70	
	Conti	inued		•	10.	
				= V2(1)(=====		
				EXPLANATION	L Intorval Ca	mplad
				Clay	Interval SarSample Ret	
				Silt		
Date well dri	illed: 2/19/03	- 2/20/03				
LFR Field Sta	aff: Adelo Der	ilo		Sand		
Approved by	:			° ° o Gravel		
FF				<u> </u>		

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-47 AD (CONTINUED)



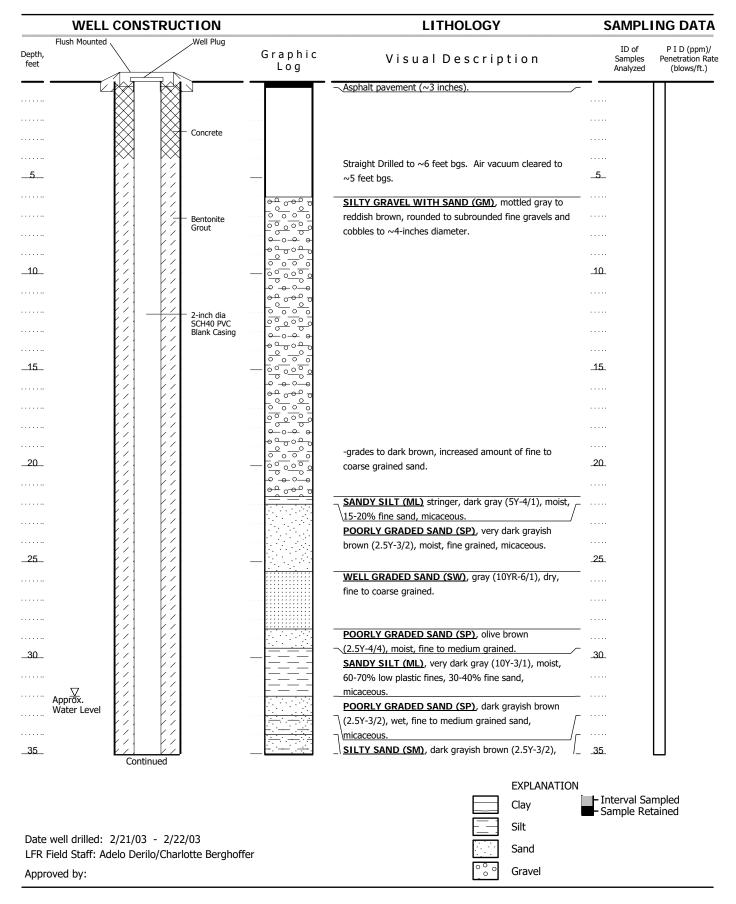
2 bags bentonite chips 6 bags bentonite grout

Date well drilled: 2/19/03 - 2/20/03 LFR Field Staff: Adelo Derilo

	EXPLANATION	N
	Clay	Interval SampleSample Retained
	Silt	,
	Sand	
000	Gravel	

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-47 AD (CONTINUED)

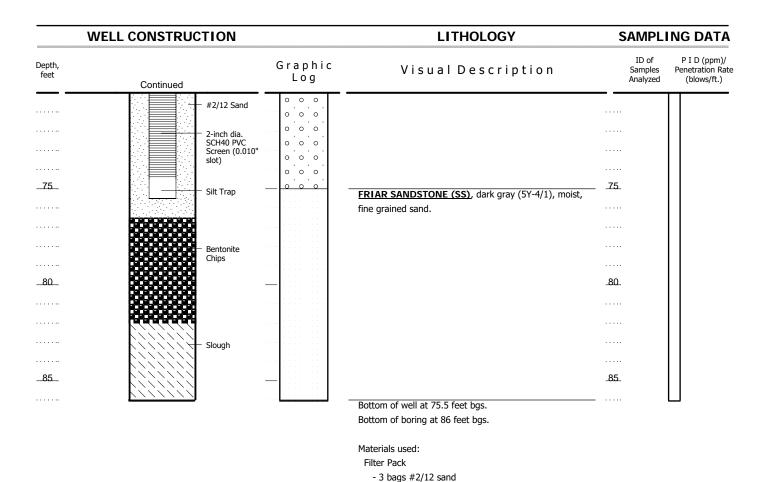
Approved by:



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-48 AD

	WELL CONS	TRUCTION		LITHOLOGY	SAMPLI	ING DATA
Depth, feet	Contir	nued	Graphic Log	Visual Description	ID of Samples Analyzed	P I D (ppm)/ Penetration Rate (blows/ft.)
	(/)	/ / / / / / / / / / / / / / / / / / /		wet, 60-70% fine sand, 30-40% medium plastic fines, micaceous. SILTY SAND (SM), dark grayish brown (2.5Y-3/2),		
		Bentonite Grout		wet, 70-80% fine to medium sand, 20-30% low plastic fines, micaceous.		
				POORLY GRADED SAND WITH GRAVEL (SP), olive gray (5Y-4/2), wet, medium to coarse sands, slightly		
40		2-inch dia		micaceous, with some gravels. ELASTIC SILT (MH), black (5Y-2.5/1), moist, trace	40	
		SCH40 PVC Blank Casing		fine sand.		
				SANDY SILT (ML), very dark gray (5Y-3/1), moist, 40-60% non-plastic fines, 40-50% fine sand,		
45				micaceous. SILT WITH SAND (ML), very dark gray (5Y-3/1),	_45_	
				moist, 75-85% plastic fines, 15-25% fine sand, slightly micaceous.		
				SANDY SILT (ML), very dark gray (5Y-3/1), moist, 50-60% non-plastic fines, 40-50% fine sands,		
50				micaceous. ELASTIC SILT (MH) stringer, black (5Y-2.5/1), moist, trace fine sand.	_50_	
				POORLY GRADED SAND (SP), dark gray (2.5Y-4/1), wet, medium grained, micaceous.		
				welf mediani granica, medecodo.		
55				SILTY SAND (SM), very dark gray (5Y-3/1), moist, 80-90% fine sand, 10-20% non-plastic fines,	 . <u>55</u> .	
				micaceous. POORLY GRADED SAND (SP), olive gray (5Y-4/2),		
				wet, medium to coarse sand.		
60				SILTY SAND (SM), very dark gray (5Y-3/1), moist,	_60_	
				60-70% fine to medium sand, 30-40% non-plastic fines, slightly micaceous.		
		■ Bentonite	0 0 0	WELL GRADED SAND WITH GRAVEL (SW), olive gray $\ \ \ \ \ \ \ \ \ \ \ \ \ $		
		Chips	0 0 0	\(\frac{10-20\%}{200}\) gravels 1 to 2 inches diameter.\(\) \(\begin{align*} \text{WELL GRADED GRAVEL WITH SAND (GW)}, olive \end{align*}		
65				(5Y-4/3), wet, 70-80% gravels, 10-20% coarse sands, gravels up to 6 inch diameter.		
			0 0 0	graves up to 0 men diameter.		
		#2/12 Sand	0 0 0			
70	Contir	nued	0 0 0		70	
				EXPLANATION Clay Silt	– Interval Sai – Sample Ret	mpled :ained
	vell drilled: 2/21/03 eld Staff: Adelo Deril		er	Sand		
Approv		3 ·		°°° Gravel		

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-48 AD (CONTINUED)



Annular Seal

2 bags bentonite chips 6 bags bentonite grout

Date well drilled: 2/21/03 - 2/22/03 LFR Field Staff: Adelo Derilo/Charlotte Berghoffer

Approved by:

EXPLANATION

Clay

Interval Sampled
Sample Retained

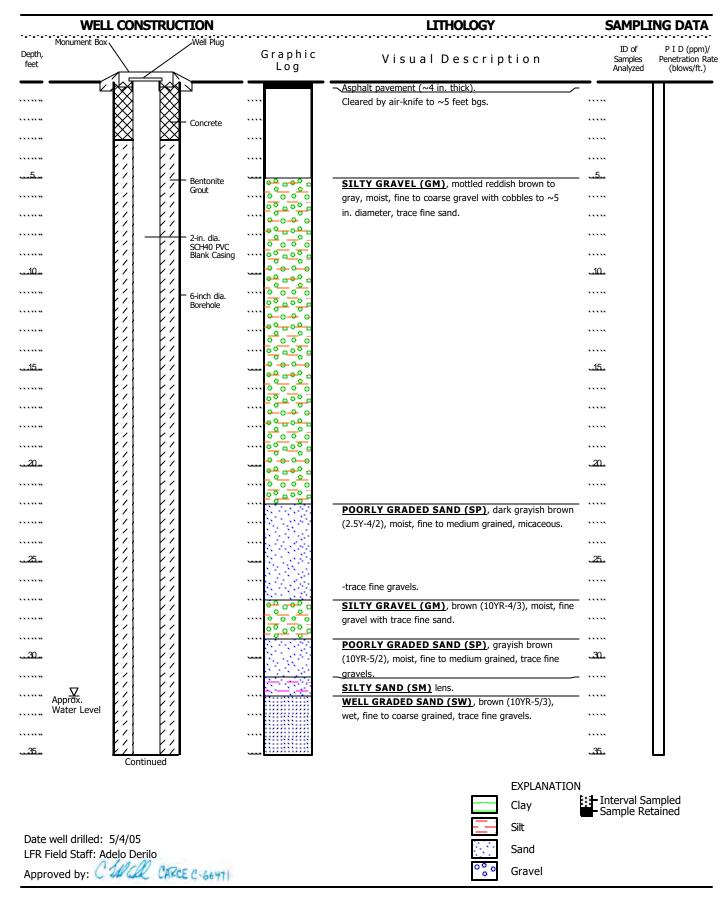
Silt

Sand

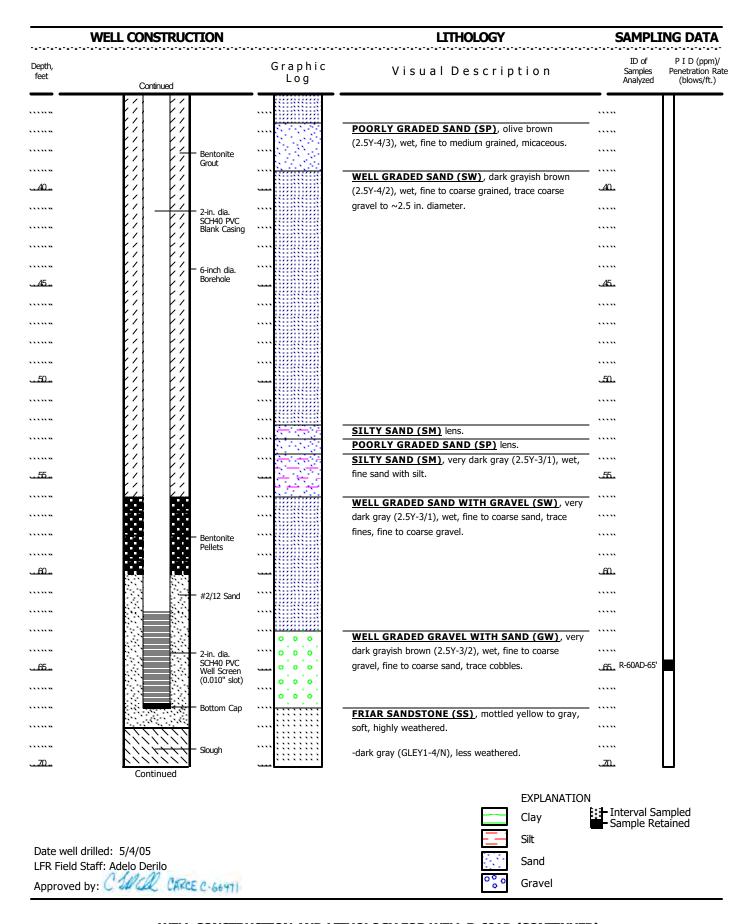


Gravel

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-48 AD (CONTINUED)



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-60AD



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-60AD (CONTINUED)

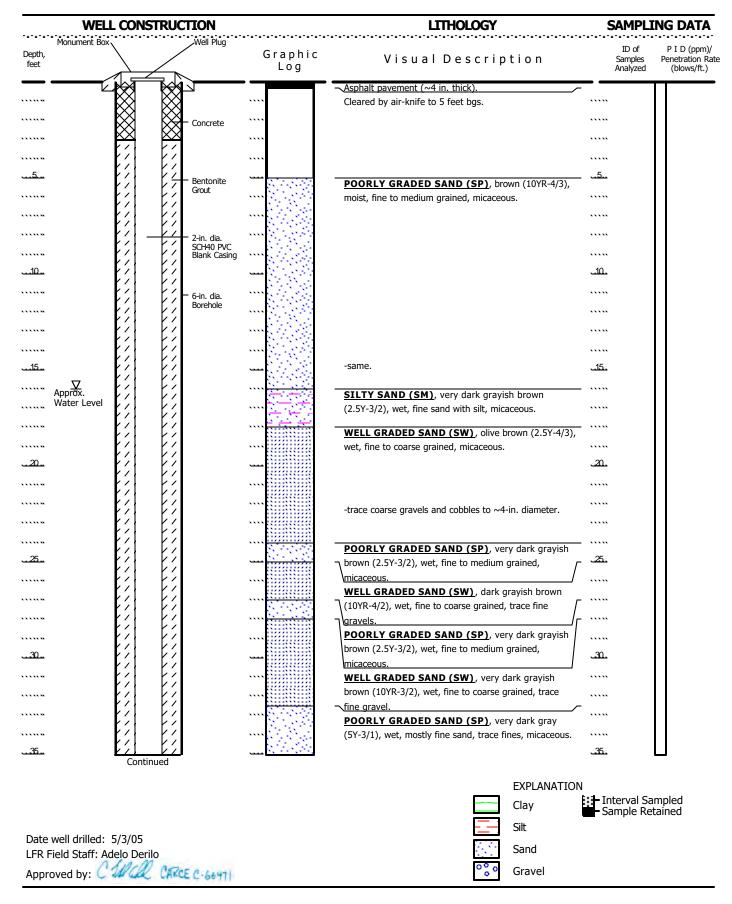
	WELL CONSTRUCTION		LITHOLOGY	SAMPL	ING DATA
Depth, feet	Continued	Graphic Log	Visual Description	ID of Samples Analyzed	P I D (ppm)/ Penetration Rat (blows/ft.)
	Slough		Bottom of boring at 73 feet bgs. Bottom of well at 67 feet bgs.		
			Materials used: Filter Pack - 1.42 cubic feet of #2/12 sand Annular Seal - 0.875 cubic feet of bentonite pellets transition seal - 9.275 cubic feet of bentonite grout - 0.525 cubic feet of concrete surface seal		
			Drilling Method - Sonic Drilling Drilling Company - Prosonic Corporation		

Date well drilled: 5/4/05
LFR Field Staff: Adelo Derilo
Approved by: CARCE C-66971

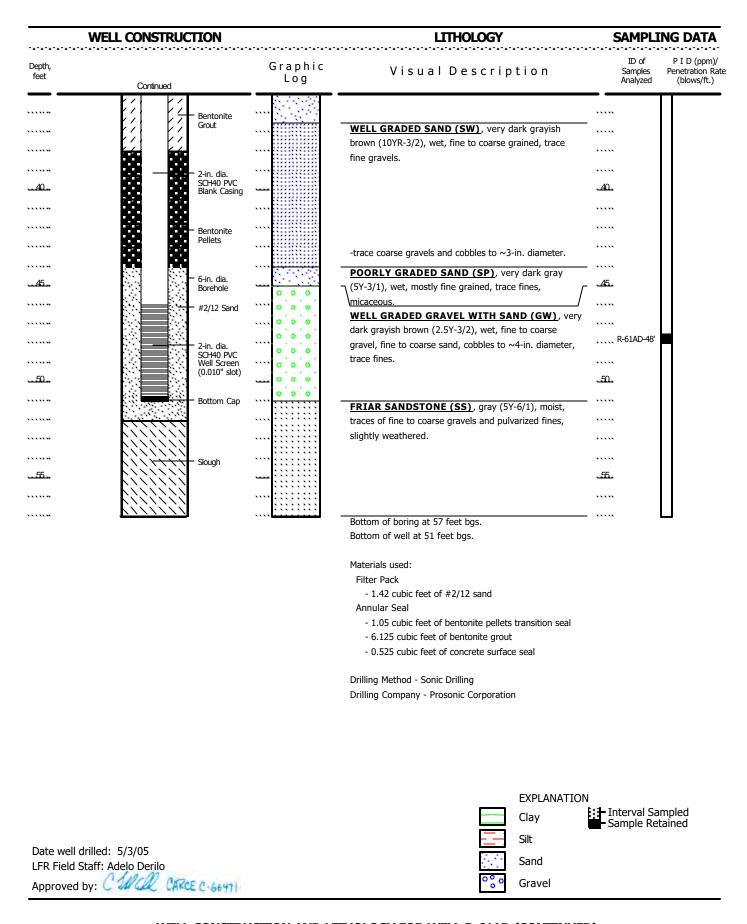
EXPLANATION Clay Interval Sampled Sample Retained Silt Sand Gravel

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-60AD (CONTINUED)

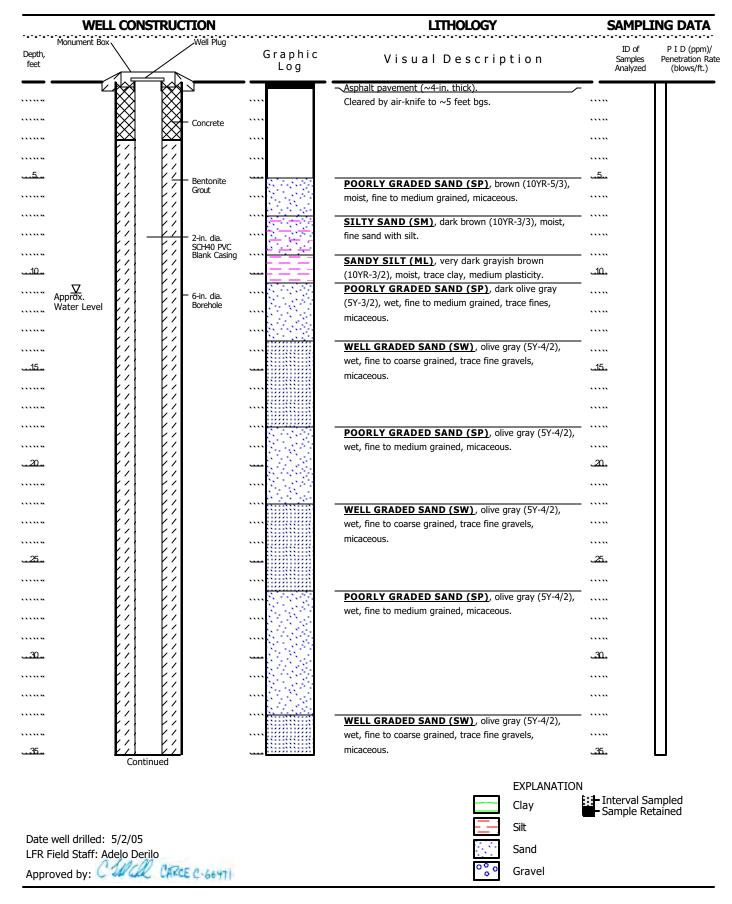
Levine Fricke
Project No. 002-10180-32



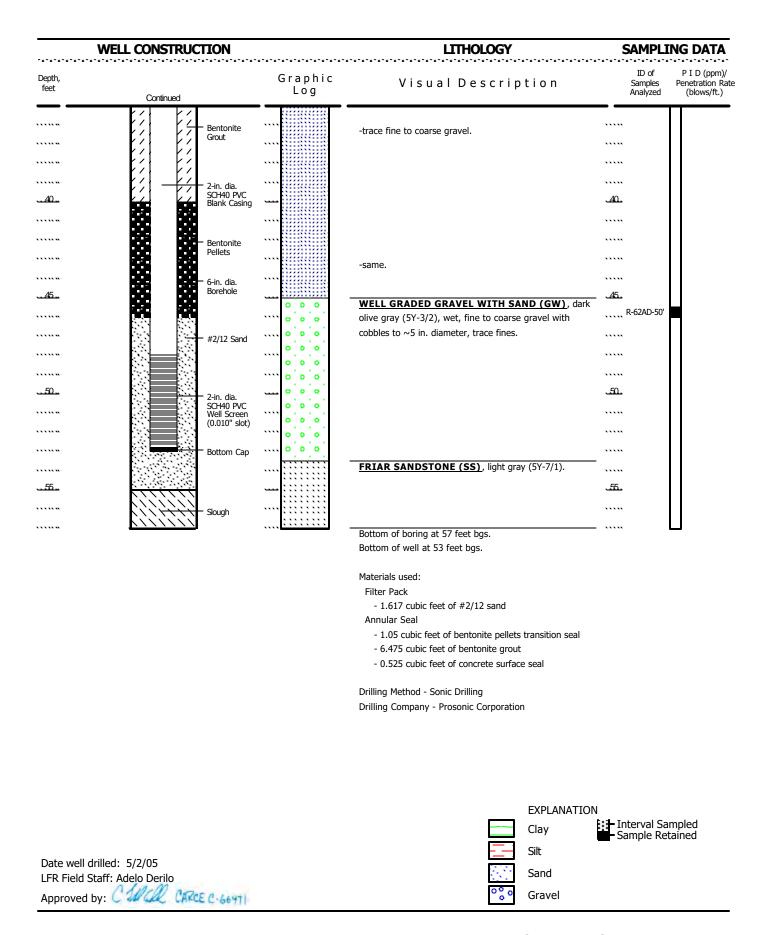
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-61AD



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-61AD (CONTINUED)

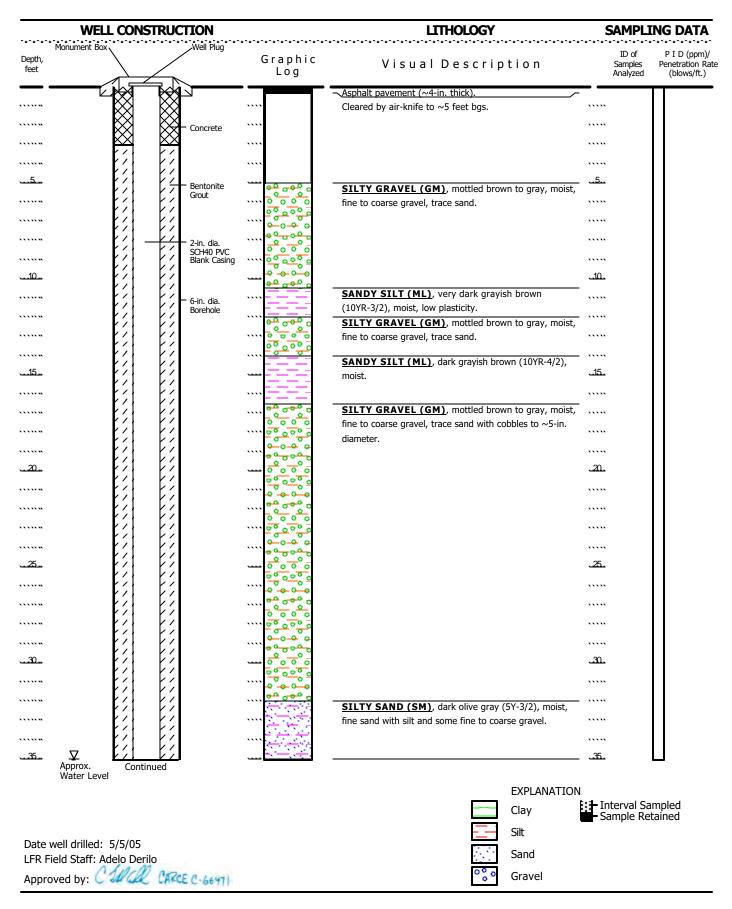


WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-62AD

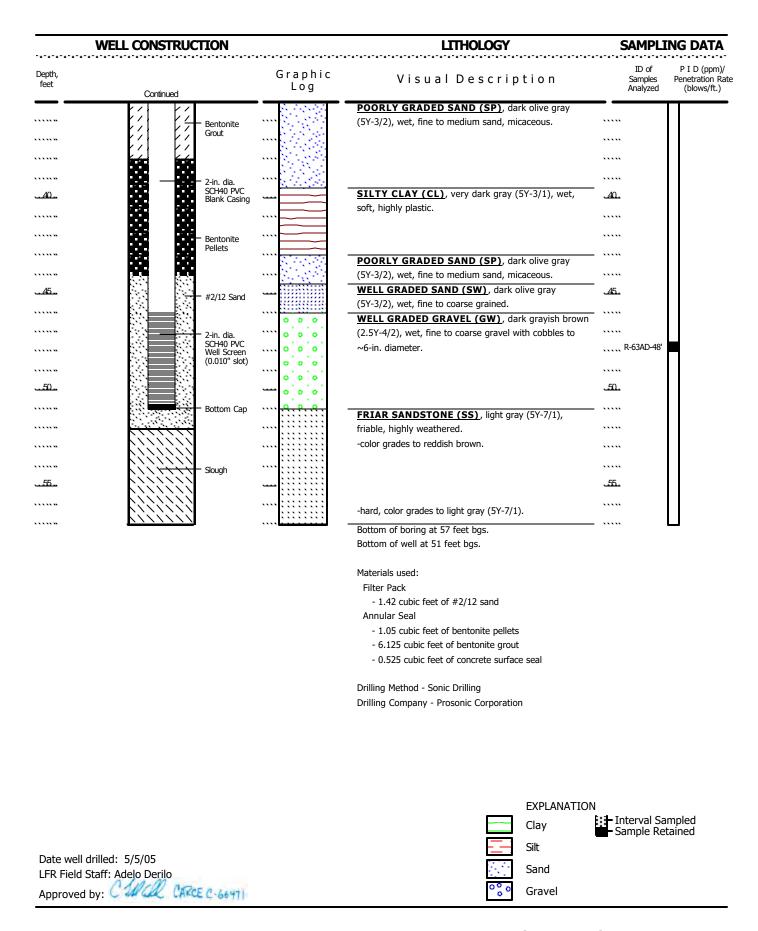


WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-62AD (CONTINUED)

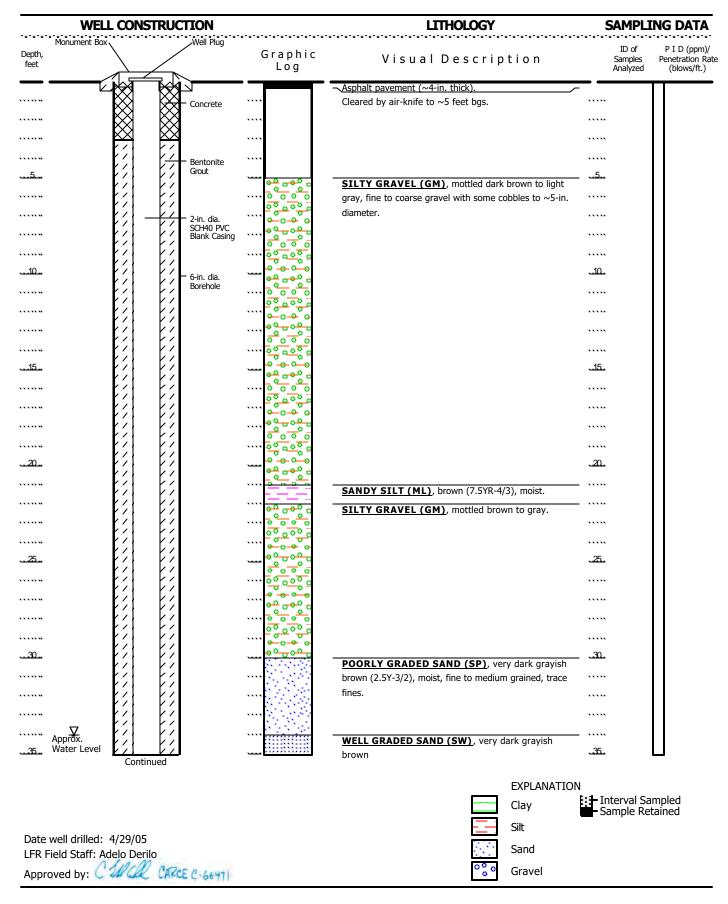




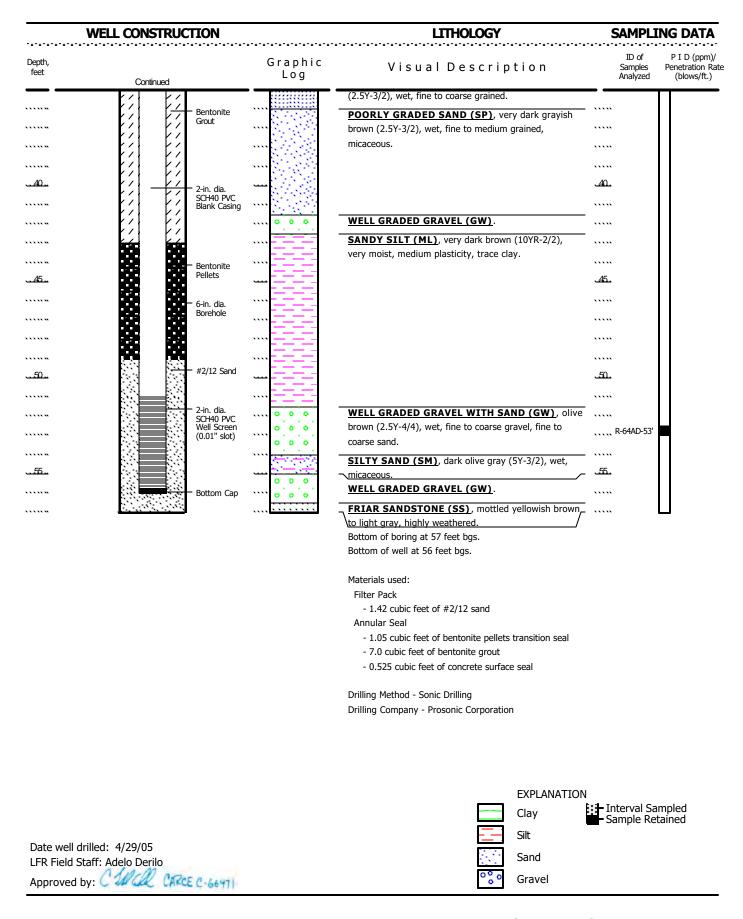
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-63AD



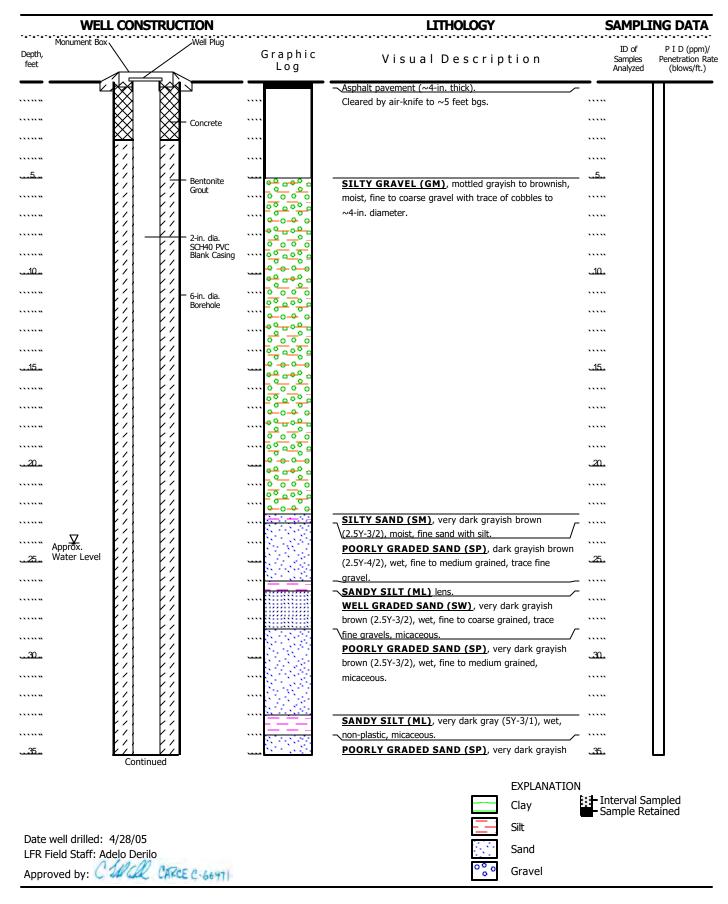
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-63AD (CONTINUED)



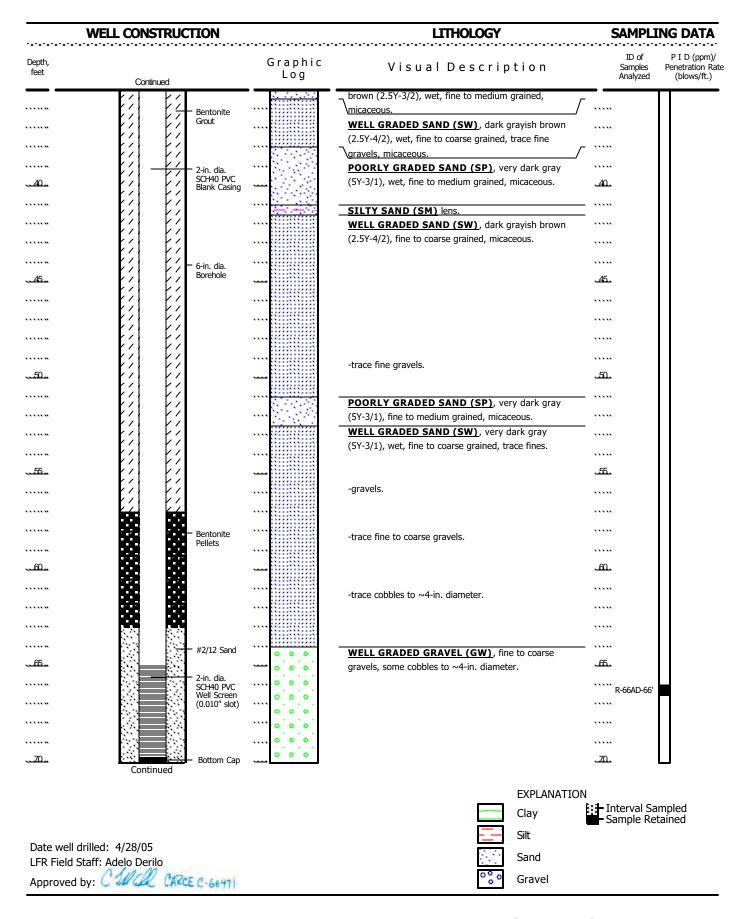
WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-64AD



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-64AD (CONTINUED)



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-66AD



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-66AD (CONTINUED)

	WELL CONSTRUCTION		LITHOLOGY	 SAMPL	ING DATA
Depth, feet	Continued	Graphic Log	Visual Description	 ID of Samples Analyzed	P I D (ppm)/ Penetration Rat (blows/ft.)
	#2/12 Sand	0,0,0	FRIAR SANDSTONE (SS), weathered, mottled orange-gray. Bottom of boring at 72 feet bgs. Bottom of well at 71 feet bgs.		
			Materials used: Filter Pack - 1.519 cubic feet of #2/12 sand Annular Seal - 1.05 cubic feet of bentonite pellets transition seal - 9.45 cubic feet of bentonite grout - 0.525 cubic feet of concrete surface seal		
			Drilling Method - Sonic Drilling Drilling Company - Prosonic Corporation		

Date well drilled: 4/28/05 LFR Field Staff: Adelo Derilo Approved by: CARCE C-66971

EXPLANATION

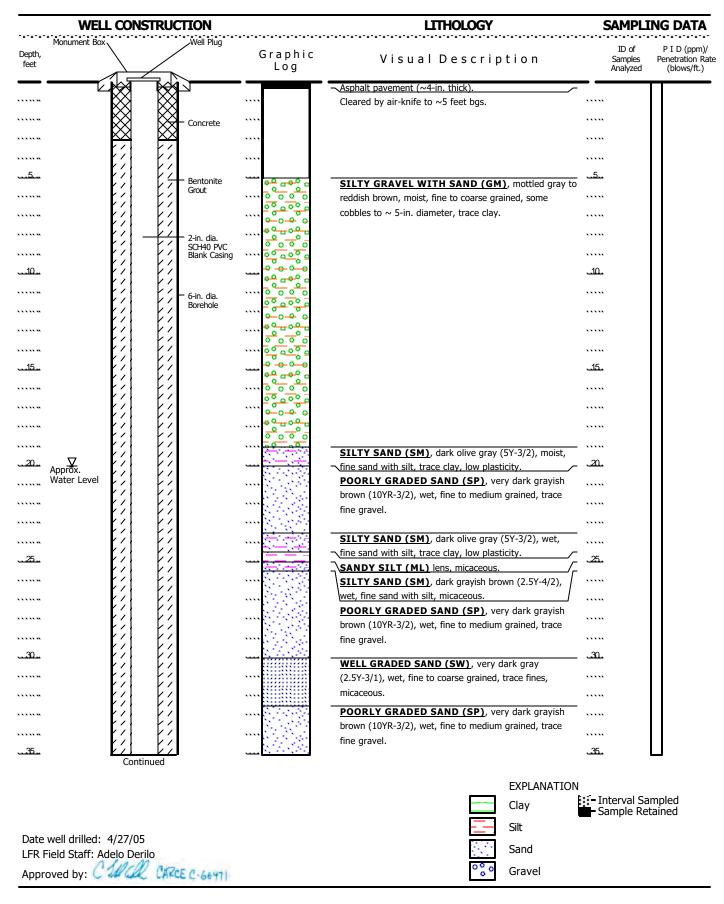
Clay Silt Interval Sampled
Sample Retained

Sand

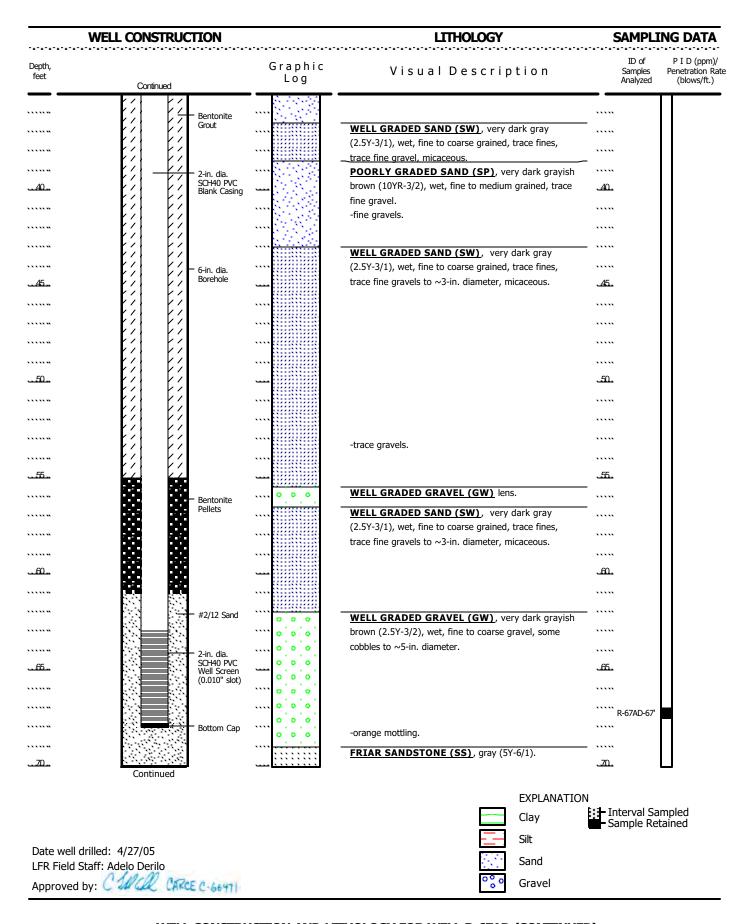
000

Gravel

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-66AD (CONTINUED)



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-67AD



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-67AD (CONTINUED)

	WELL CONSTRUCTION		LITHOLOGY	SAMPLI	NG DATA
Depth, feet	Continued	Graphic Log	Visual Description	ID of Samples Analyzed	P I D (ppm)/ Penetration Rat (blows/ft.)
	Slough		FRIAR SANDSTONE (SS), gray (5Y-6/1).		
<u>75</u>				<u>75.</u>	
			Bottom of boring at 77 feet bgs.		
			Bottom of well at 68 feet bgs.		
			Materials used:		
			Filter Pack		
			- 1.519 cubic feet of #2/12 sand		
			Annular Seal		
			- 1.05 cubic feet of bentonite pellets transition seal		
			- 9.1 cubic feet of bentonite grout		
			- 0.525 cubic feet of concrete surface seal		
			Drilling Method - Sonic Drilling		
			Drilling Company - Prosonic Corporation		

Clay
Silt
Sand
Gravel

WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-67AD (CONTINUED)

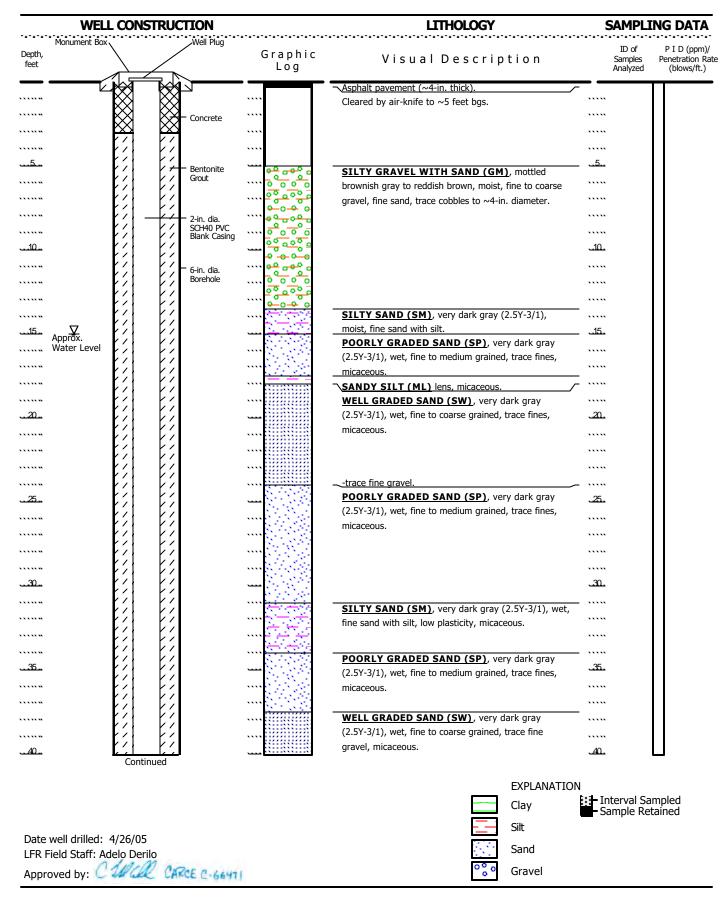


Date well drilled: 4/27/05

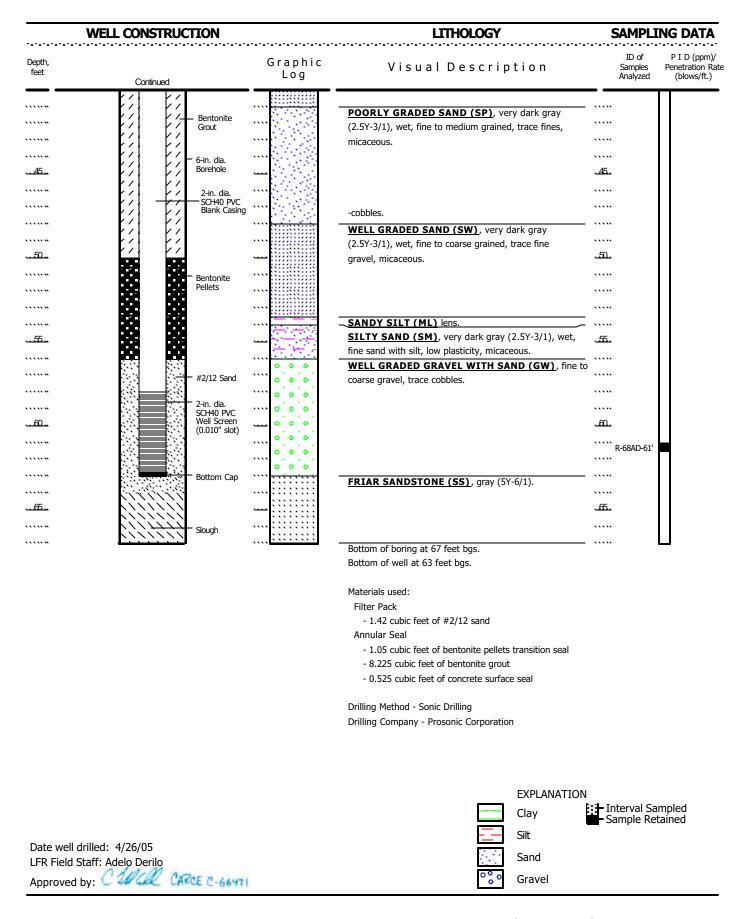
LFR Field Staff: Adelo Derilo

Approved by: CMCL CARCE C-66971

EXPLANATION



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-68AD



WELL CONSTRUCTION AND LITHOLOGY FOR WELL R-68AD (CONTINUED)

PROJECT CLIENT	NAME Mis	ssion	Valley	/ Term	inal			WE	ELL N	NUM	IBER R-80	_
	LOCATION	l Qu	alcom	m Stad	dium	DRILLING CONTR	ACTO	R Boa	rt Longy	ear		U . U
PROJECT	NUMBER_	002-	10180	-92		DRILLING METHO	D Sor	nic Drill	ling			
LOCATIO	N Qualcom	m - S	SW Pa	rking L	_ot	STAMP (IF APPLIC	CABLE	E) AND	OOR NO	TES		
	IPMENT M					Developed on 5/8/0 Purged approximate	8 usin	g Sme	al Devel		t rig.	
	ELEVATIO				HOLE DIAMETER 6 inches	i diged approximate	51y 43	ganon	J.			
					-msl HOLE DEPTH 62.0 ft							
					Oft bgs/ Elev 40.9 ft							
	LIZED WAT											
	BY Dana B				DATE 4/25/08							
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRII	PTION	ELEVATIONS	PID (ppm)	,	WELL I	DIAGRAM	DEPTH (feet)
					Asphalt (~4" thick). Air knife to 5 feet bgs.						Concrete	_
 5 -	-	CL		5.0	GRAVELLY CLAY (CL), dark yellov 3/4) and very dark grayish brown (1 to moderate plasticity, trace cobble	0YR 3/2), moist, low (~4" dia.).	43.9				—Bentonite Chips	_ 5
10		SP		<u>▼</u>	POORLY GRADED SAND (SP), ve 3/1), moist, fine to medium grainedas above, wet.	ry dark gray (10YR		3.5	000000000000000000000000000000000000000	900000000000000000000000000000000000000	⋖ -6" dia. Borehole	10
15		SW		13.0	WELL GRADED SAND (SW), olive fine to coarse grained.	gray (5Y 4/2), wet,	35.9	4.1	900000000000000000000000000000000000000	200000000000000000000000000000000000000	─2" dia. SCH40 PVC Blank Casing	15
20		SP			POORLY GRADED SAND (SP), ve 3/1), wet, fine to medium grained, tr trace gravel.	race coarse grained,						20
15 20	ED BY:	10	al	CARCE	(Continued Next Page 6-6647) DATE: 8/6/08	ge)					Image: Control of the property o	R

	CT NAME_N T_KMEP	lission	Valley	Term	inal		WE	ELL NUMBER R-80A PAGE 2 OF			
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL DIAGRAM			
					POORLY GRADED SAND (SP), very dark gray (10YR 3/1), wet, fine to medium grained, trace coarse grained, trace gravel.		2.1				
25					-as above, cobbles (1 to 2" dia.).		8.0				
30		SP			-as above, few gravel, trace cobbles.		5.9	- 2" dia. SCH40 — PVC Blank Casing			
35					-as above, fine to coarse grained.		15.5	PVC Blank Casing			
40		SW		39.0	GRAVELLY SAND (SW), very dark gray (10YR 3/1), wet, fine grained to gravel, well graded, cobbles (1 to 4" dia.).	9.9	16.9	#2/12 Sand 			
MATE	MATERIALS USED										
			Talling and		(Continued Next Page)			(5) F5			
APPR	OVED BY:_	CIA	all	CARCE	C-66471 DATE: 8/6/08			□ LFR			



	NT KMEP	ission	Valley	/ Term	inal		WE	ELL NUM	PAGE 3 OF 3	
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL	DIAGRAM	DEPTH (feet)
45		SW		47.0	GRAVELLY SAND (SW), very dark gray (10YR 3/1), wet, fine grained to gravel, well graded, cobbles (1 to 4" dia.). (continued) -as above.	1.9	15.4		—2" dia. SCH40 PVC Well Screen (0.010" slot)	45
		SS	×××	<u>54.0</u> 55.0	FRIARS FORMATION (SS), light gray (2.5Y 5/1) to dark gray (2.5Y 4/1), weathered interface, fine to medium grained. SILTSTONE, dark gray, wood pieces. FRIARS FORMATION (SS), light gray (2.5Y 5/1) to dark gray (2.5Y 4/1), weathered interface, fine to medium grained.	-5.1 -6.1			—Bottom Cap	50
60 MAT Filter Source Botto APP		33		62.0	Bottom of boring at 62 feet bgs. Bottom of well at 47.5 feet bgs.	-13.1				60
Filter Annu Surfa Botto	r Pack - 1.2 cub r Pack - 1.2 cub ular Seal - 6.5 c ace Seal - 0.5 c om Plug - 2.7 cu	ic feet ubic fe ubic fe	eet of b	enton concre	ite chips te					
APP	ROVED BY:_	CIA	ral	CARCE	DATE: 8/6/08				回 L F	R



PROJECT LOCATION Qualcomm Stadium PROJECT NUMBER 002-10180-92 DRILLING CONTRACTOR Boart Longyear PROJECT NUMBER 002-10180-92 DRILLING METHOD Sonic Drilling STAMP (IF APPLICABLE) AND/OR NOTES Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallions. Purged approximately 40 gallions. Purged approxi	PROJECT NA	-	n Valley	/ Term	inal			WE	ELL N	IUM	BER R-81	
COCATION Qualcomm - SW Parking Lot OVA EQUIPMENT Mini Rae 2000 GROUND ELEVATION 48.63 ft-msl HOLE DIAMETER 6 inches TOP OF CASING ELEVATION 48.17 ft-msl HOLE DEPTH 32.0 ft FIRST ENCOUNTERED WATER 7.0 ft bgs/ Elev 41.6 ft T STABILIZED WATER 8.85 ft TOC LOGGED BY Tania Alarcon DATE 4/28/08 Air knife to 5 feet bgs. Air knife to 5 feet bgs. POORLY GRADED SAND (SP), very dark gray (10YR 49.1) molerately graded. SP SP 3/10, moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5' dia). SP SILTY SAND (SM), dark brown (10'R 3/3), moist, hard, trace STAMP (IF APPLICABLE) AND/OR NOTES Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR NOTES Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR NOTES Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. Purged approximately 30 gallons. STAMP (IF APPLICABLE) AND/OR Development rig. P	PROJECT LO	CATION Q	ualcom	m Stad	dium	DRILLING CONTRA	АСТО	R Boa	rt Longye	ar		
Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons. Developed on 5/8/08 using Smeal Development rig. Purged approximately 30 gallons.	PROJECT NU	JMBER 002	-10180	-92		DRILLING METHO	D Sor	ic Dril	ling			
Purged approximately 30 gallons. GROUND ELEVATION 48.63 ft-msl HOLE DIAMETER 6 inches TOP OF CASING ELEVATION 48.17 ft-msl HOLE DEPTH 32.0 ft FIRST ENCOUNTERED WATER 7.0 ft bgs/ Elev 41.6 ft T STABILIZED WATER 8.85 ft TOC LOGGED BY Tania Alarcon DATE 4/28/08 Air knife to 5 feet bgs. Air knife to 5 feet bgs. Air knife to 5 feet bgs. Purged approximately 30 gallons. GROUND ELEVATION 48.17 ft-msl HOLE DIAMETER 6 inches T STABILIZED WATER 8.85 ft TOC LOGGED BY Tania Alarcon DATE 4/28/08 WELL DIAGRAM Air knife to 5 feet bgs. Air knife to 5 feet bgs. SP 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia), as above, dark gray (10YR 4/1), moderately graded. SP 3/1 Ty SAN (15Wh, dark brown (10YR 3/2), wet, medium to coarse grained, trace diay. LITHOLOGIC DESCRIPTION VALUE Alarchic Al	LOCATION (Qualcomm -	SW Pa	rking L	_ot	STAMP (IF APPLIC	ABLE	E) ANI	O/OR NO	ΓES		
GROUND ELEVATION 48.63 ft-msl HOLE DIAMETER 6 inches TOP OF CASING ELEVATION 48.17 ft-msl HOLE DEPTH 32.0 ft FIRST ENCOUNTERED WATER 7.0 ft bgs/ Elev 41.6 ft TSTABILIZED WATER 8.85 ft TOC LOGGED BY Tania Alarcon DATE 4/28/08 LITHOLOGIC DESCRIPTION Air knife to 5 feet bgs. Air knife to 5 feet bgs. POORLY GRADED SAND (SP), very dark gray (10YR 3/1), moist, loose, fine to medium grained, some silt, some subnagular to subrounded gravel (up to 1.5' dia), as above, dark gray (10YR 4/1), moderately graded. SP SP SP SITY SAND (SP), very dark gray (10YR 3/2), very medium grained, some silt, some subnagular to subrounded gravel (up to 1.5' dia), as above, dark gray (10YR 4/1), moderately graded. SP SP SITY SAND (SP), very dark gray (10YR 4/1), moderately graded. SP SITY SAND (SM), dark brown (10YR 3/2), wet, medium to coarse grained, trace CLAY (CH), dark brown (7.5YR 3/3), moist, hard, trace	OVA EQUIPM	MENT Mini R	Rae 200	10		Developed on 5/8/0	8 usin	g Sme	al Develo	pment	rig.	
TOP OF CASING ELEVATION 48.17 ft-msl HOLE DEPTH 32.0 ft FIRST ENCOUNTERED WATER 7.0 ft bgs/ Elev 41.6 ft The stabilized water 8.85 ft TOC LOGGED BY Tania Alarcon DATE 4/28/08 LITHOLOGIC DESCRIPTION Air knife to 5 feet bgs. Air knife to 5 feet bgs. POORLY GRADED SAND (SP), very dark gray (10YR 3/1), moist, loose, fine to medium grained, some silt, some subtangular to subrounded gravel (up to 1.5° dia)					HOLE DIAMETER 6 inches	Purged approximate	ely 30	gallon	S.			
FIRST ENCOUNTERED WATER 7.0 ft bgs/ Elev 41.6 ft The stabilized water 8.85 ft Toc LOGGED BY Tania Alarcon DATE 4/28/08 LITHOLOGIC DESCRIPTION Air knife to 5 feet bgs. Air knife to 5 feet bgs. Sp. 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). as above, dark gray (10YR 4/1), moderately graded. Sp. 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). Sm. 1.7.0y Sp. 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). Sm. 1.7.0y Sp. 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). Sp. 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). Sp. 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). Sp. 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). Ais to the first business of the first bus												
STABILIZED WATER 8.85 ft TOC LOGGED BY Tania Alarcon DATE 4/28/08 LITHOLOGIC DESCRIPTION SOLUTION Air knife to 5 feet bgs. Air knife to 5 feet bgs. Air knife to 5 feet bgs. Concrete 2" dia. SCH40 PVC Blank Casing SP SM [] 7.0V SP SM [] 7.0V SR POORLY GRADED SAND (SP), very dark gray (10YR 3/3), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). as above, dark gray (10YR 4/1), moderately graded. POORLY GRADED SAND (SP), very dark gray (10YR 3/3), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). SM [] 7.0V SR POORLY GRADED SAND (SP), very dark gray (10YR 3/3), moist, loose, fine to medium grained, portly graded. POORLY GRADED SAND (SP), very dark gray (10YR 3/3), moist, loose, fine grained, portly graded. POORLY GRADED SAND (SP), very dark gray (10YR 3/3), moist, loose, fine grained, portly graded. POORLY GRADED SAND (SP), very dark gray (10YR 3/3), moist, loose, fine grained, portly graded. CLAY (CH), dark brown (7.5YR 3/3), moist, hard, trace												
DATE 4/28/08 DATE 4/28/08 LITHOLOGIC DESCRIPTION DATE 4/28/08 LITHOLOGIC DESCRIPTION DATE 4/28/08 WELL DIAGRAM WELL DIAGRAM Air knife to 5 feet bgs. Air knife to 5 feet bgs. Sp 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia), as above, dark gray (10YR 4/1), moderately graded. Sp Sp 3/1), Toty Sp Sl 17 7.07 Sp 8, 000 dark gray (10YR 4/1), moderately graded. Sp Sp 3/1), moist, loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark gray (10YR 3/2), moist, loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark gray (10YR 3/2), moist, loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark gray (10YR 3/2), moist, loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark gray (10YR 3/2), moist, loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark gray (10YR 3/2), moist, loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark gray (10YR 3/2), moist, loose to dense, fine grained, poorly graded. CLAY (CH), dark brown (7,5YR 3/3), moist, hard, trace					0 ft bgs/ Elev 41.6 ft							
Air knife to 5 feet bgs. Air knife to 5 feet bgs. POORLY GRADED SAND (SP), very dark gray (10YR 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5° dia). as above, dark gray (10YR 4/1), moderately graded. SP SP SN 7.0 \times SILTY SAND (SM), dark brown (10YR 3/3), moist, loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark gray in the first state of the state o	▼ STABILIZI	ED WATER_	8.85 ft	TOC								
LITHOLOGIC DESCRIPTION Air knife to 5 feet bgs. Air knife to 5 feet bgs. Air knife to 5 feet bgs. Concrete 2" dia. SCH40 PVC Blank Casing POORLY GRADED SAND (SP), very dark gray (10YR 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). SBM 7.70 SP BOORLY GRADED SAND (SM), dark brown (10YR 3/3), moist, loose dense, fine grained, poorly graded. SP BOORLY GRADED SAND (SP), very dark gray (10YR 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). SSM 7.70 SILTY SAND (SM), dark brown (10YR 3/3), moist, loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark grayish brown (10YR 3/2), wet, medium to coarse grained, trace clay. CLAY (CH), dark brown (7.5YR 3/3), moist, hard, trace		Tania Alaro	con		DATE <u>4/28/08</u>				1			
5.0 POORLY GRADED SAND (SP), very dark gray (10YR 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). as above, dark gray (10YR 4/1), moderately graded. SM 7.0 SILTY SAND (SM), dark brown (10YR 3/3), moist, loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark grayish brown (10YR 3/2), wet, medium to coarse grained, trace clay. CLAY (CH), dark brown (7.5YR 3/3), moist, hard, trace	DEPTH (feet) SAMPLE TYPE	NUMBER U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRI	PTION	ELEVATIONS	PID (ppm)	V	VELL [DIAGRAM	DEPTH (feet)
2" dia. SCH40 PVC Blank Casing POORLY GRADED SAND (SP), very dark gray (10YR 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). 6.5 - as above, dark gray (10YR 4/1), moderately graded. SM 7.0♥ SILTY SAND (SM), dark brown (10YR 3/3), moist, loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark gray ish to brown (10YR 3/2), wet, medium to coarse grained, trace clay. CLAY (CH), dark brown (7.5YR 3/3), moist, hard, trace					Air knife to 5 feet bgs.							
SP DOORLY GRADED SAND (SP), very dark gray (10YR 3/1), moist, loose, fine to medium grained, some silt, some subangular to subrounded gravel (up to 1.5" dia). SM 7.0 SILTY SAND (SM), dark brown (10YR 3/3), moist, d1.6 loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark gray (10YR 4/1), moderately graded. SP BOORLY GRADED SAND (SP), very dark gray (10YR 3/3), moist, d1.6 loose to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark grayish brown (10YR 3/2), wet, medium to coarse grained, trace clay. CLAY (CH), dark brown (7.5YR 3/3), moist, hard, trace												-
SP SP SP SP SILTY SAND (SM), dark brown (7.5YR 3/3), moist, hard, trace clay. CLAY (CH), dark brown (7.5YR 3/3), moist, hard, trace 5.0 43.6 43.6 43.6 43.6 42.1 42.1 41.6 100se to dense, fine grained, poorly graded. POORLY GRADED SAND (SP), very dark grayish brown (10YR 3/2), wet, medium to coarse grained, trace clay. CLAY (CH), dark brown (7.5YR 3/3), moist, hard, trace											PVC Blank	_
fine grained and high placticity											Casing	
fine grained and high placticity												_
fine grained and high placticity												-
fine grained and high placticity	5		ļ	5.0			43.6					5
fine grained and high placticity		SP			3/1), moist, loose, fine to medium of	rained, some silt,						
fine grained and high placticity				6.5	some subangular to subrounded gras above, dark gray (10YR 4/1), m	ravel (up to 1.5" dia).	42.1					-
fine grained and high placticity			1	7.0∑	SILTY SAND (SM), dark brown (10	YR 3/3), moist,	41.6	3.8				-
fine grained and high placticity		SP		8.0	POORLY GRADED SAND (SP), ve	ery dark grayish	40.6					
fine grained and high placticity				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\trace clay.							
-as above, very hard. -as above, hard. -as above, brown (10YR 5/3), some fine grained sand. -as above, trace fine gravel (up to 1" dia.). SILTY SAND (SM), brown (10YR 5/3), wet, loose, fine grained with subrounded gravel (up to 2" dia.). GRAVEL WITH SAND (GP), brown (10YR 4/3), wet, loose, subangular to subrounded gravel (up to 3" dia.), trace silt, fine to coarse grained sand, cobbles (up to 4" dia.).				-	fine grained sand, high plasticity.	s), moist, nard, trace						-
Chips -as above, hard. -as above, brown (10YR 5/3), some fine grained sand. -as above, trace fine gravel (up to 1" dia.). SILTY SAND (SM), brown (10YR 5/3), wet, loose, fine grained with subrounded gravel (up to 2" dia.). GRAVEL WITH SAND (GP), brown (10YR 4/3), wet, loose, subangular to subrounded gravel (up to 3" dia.), trace silt, fine to coarse grained sand, cobbles (up to 4" dia.).	10				-as above, very hard.			3.7				_ 10
-as above, hard. -as above, brown (10YR 5/3), some fine grained sand. 14.0 -as above, trace fine gravel (up to 1" dia.). SILTY SAND (SM), brown (10YR 5/3), wet, loose, fine grained with subrounded gravel (up to 2" dia.). GRAVEL WITH SAND (GP), brown (10YR 4/3), wet, loose, subangular to subrounded gravel (up to 3" dia.), trace silt, fine to coarse grained sand, cobbles (up to 4" dia.).		CH									Chips	
-as above, hard. -as above, brown (10YR 5/3), some fine grained sand. 14.0 -as above, trace fine gravel (up to 1" dia.). SILTY SAND (SM), brown (10YR 5/3), wet, loose, fine grained with subrounded gravel (up to 2" dia.). GRAVEL WITH SAND (GP), brown (10YR 4/3), wet, loose, subangular to subrounded gravel (up to 3" dia.), trace silt, fine to coarse grained sand, cobbles (up to 4" dia.).		Cit			as above hard							
-as above, brown (10YR 5/3), some fine grained sand. 14.0 -as above, trace fine gravel (up to 1" dia.). 34.6 SM SILTY SAND (SM), brown (10YR 5/3), wet, loose, fine grained with subrounded gravel (up to 2" dia.). GRAVEL WITH SAND (GP), brown (10YR 4/3), wet, loose, subangular to subrounded gravel (up to 3" dia.), trace silt, fine to coarse grained sand, cobbles (up to 4" dia.).					-as above, naru.							-
14.0 -as above, trace fine gravel (up to 1" dia.). SILTY SAND (SM), brown (10YR 5/3), wet, loose, fine grained with subrounded gravel (up to 2" dia.). GRAVEL WITH SAND (GP), brown (10YR 4/3), wet, loose, subangular to subrounded gravel (up to 3" dia.), trace silt, fine to coarse grained sand, cobbles (up to 4" dia.).					-as above, brown (10YR 5/3), some	e fine grained sand.						-
SILTY SAND (SM), brown (10YR 5/3), wet, loose, fine grained with subrounded gravel (up to 2" dia.). GRAVEL WITH SAND (GP), brown (10YR 4/3), wet, loose, subangular to subrounded gravel (up to 3" dia.), trace silt, fine to coarse grained sand, cobbles (up to 4" dia.).				14.0			34.6					
GRAVEL WITH SAND (GP), brown (10YR 4/3), wet, loose, subangular to subrounded gravel (up to 3" dia.), trace silt, fine to coarse grained sand, cobbles (up to 4" dia.).	15	SM		45.0	SILTY SAND (SM), brown (10YR 5 grained with subrounded gravel (up	5/3), wet, loose, fine to 2" dia.).	20.0					15
loose, subangular to subrounded gravel (up to 3" dia.), trace silt, fine to coarse grained sand, cobbles (up to 4" dia.).	15		• -	15.0			33.6	0.0				15
dia.).					loose, subangular to subrounded g	ravel (up to 3" dia.),						-
` 1						na, 0000100 (ap to 1						
GP ♠	7	GP								-	-#2/12 Sand	
											٥١ ماند ١٩٥٥	-
2" dia SCH40 PVC Well PVC Well	_				as above medium to seem to	ad aand					PVC Well	-
-as above, medium to coarse grained sand. Screen (0.010" slot)	20				-as above, medium to coarse grain	eu sana.						20
(Continued Next Page)					(Continued Next Pa	nge)						n
APPROVED BY: C MICAL CARCE C-66471 DATE: 8/6/08	APPROVED	BY: CI	Pall	CARCE	C-66471 DATE: 8/6/08						LE LE	ň

		ECT NAME M NT KMEP	ission	Valley	/ Term	inal		WE	LL NUN	IBER R-81 PAGE 2 0	
	DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL	DIAGRAM	DEPTH (feet)
BORING+WELL 2006 002-10180-92.GPJ LFR SEPT 2006.GDT 5/19/08	25		GP		32.0	-as above. FRIARS FORMATION (SS), highly weathered sandstone, iron staining, moderate induration. -as above, light gray (5Y 7/2). -as above, strong induration. -as above, some iron staining. Bottom of boring at 32 feet bgs. Bottom of well at 23.5 feet bgs.	25.6	0.0		—2" dia SCH40 PVC Well Screen (0.010" slot) —Bottom Cap —#2/12 Sand —Bentonite Chips	
NG+WELL 2006 002-10180-9	Filter Annu Surfa Botto	Pack - 1.2 cub lar Seal - 2.4 c cce Seal - 0.5 c m Plug - 1.6 cu	ic feet ubic fe ubic fo ibic fe	eet of I oot of o et of b	centon concre entoni	ite chips te te chips				□ LFI	R
BORII	APPI	ROVED BY:	- su	well	CHRCE	DATE: 8/6/08					



	ECT NAME_Mi IT_KMEP	ission	Valley	/ Term	inal			WE	ELLI	NUN	IBER R-82	
	ECT LOCATIO	N Qu	ıalcom	m Sta	dium	DRILLING CONTRA	АСТО	R Boa	ırt Longy	ear		
PROJ	ECT NUMBER	002-	10180	-92		DRILLING METHO	D _Sor	nic Dril	ling			
	TION Qualcon					STAMP (IF APPLIC				OTES		
	EQUIPMENT M					Developed on 5/8/0 Purged approximat	08 usir	ng Sm	eal Deve		nt rig.	
	IND ELEVATIO				HOLE DIAMETER 6 inches	. argod approximat	.0., .0	gano				
					t-msl HOLE DEPTH 47.0 ft							
_					5 ft bgs/ Elev 37.7 ft							
	ABILIZED WAT				o R bgd, Elev or r R							
	ED BY Tania			100	DATE _4/29/08							
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRII	PTION	ELEVATIONS	PID (ppm)		WELL	DIAGRAM	DEPTH (feet)
	0)				Air knife to 5 feet bgs.							
 											← Concrete	- ·
· -											■Bentonite Chips	
5				5.0			42.2					5
		СН		6.0	CLAY (CH), very dark grayish brow hard, high plasticity, some fine grain	n (10YR 3/2), moist, ned sand, trace	41.2		[3	1		
		CL		7.0	subrounded gravel (up to 2"dia.). SANDY CLAY (CL), dark brown to mottling, moist, soft to firm, medium coarse grained sand. No core recovery.	grayish brown n plasticity, fine to	40.2					
 				¥	·						Bentonite Grout	
10				11.0	(Tagged from open hole.)		36.2					10
- -	,				SANDY CLAY (CL), dark grayish by wet, soft to firm, medium plasticity, grained sand, trace fine to coarse g subrounded cobbles (up to 4" dia.)as above, olive gray (5Y 3/2), cobb	fine to medium ravel, subangular to					⋖ -6" dia. Borehole	
15		CL			-as above, olive gray to dark greeni cobbles (up to 4.5" dia.).	sh gray mottling,		0.0		∀ / / / / / / / / / / / / / / / / / / /	—2" dia. SCH40 PVC Blank Casing	15
 				18.0	-as above, black stainingas above, low to medium plasticity -as above, very dark greenish gray increase sand with depth. POORLY GRADED SAND (SP), ve	(GLEY1 3/10Y),	29.2					
 20		SP			3/1), wet, loose, medium to coarse to coarse gravel (up to 2" dia.), cob	grained, some fine						20
	ROVED BY:	2 su	al (CARCE	(Continued Next Pa	ge)			/1	× /1	国LF	

	JECT NAME_N NT_KMEP	Mission	Valley	y Term	inal		WEL	L NU	MBER R-82	
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WEL	L DIAGRAM	DEPTH (feet)
		SP					0.7		1	
-	-	CL		21.0	SANDY CLAY (CL), very dark gray (10YR 3/1), very	26.2			Bentonite Grout	-
-	-		<i>VIIII</i>	22.0	SILTY SAND (SM), black (10YR 2/1), loose, fine to medium grained.	25.2				
-	_	SM			-as above, dark gray (10YR 4/1), medium to coarse					-
-	_			24.0	grainedas above, black (10YR 2/1), loose, fine to medium grained.	23.2			←6" dia. Borehole	-
25		SP		:	POORLY GRADED SAND (SP), dark gray (10YR 4/1), loose, fine to medium grained.		1.6			_ 25
	-			26.5	-as above, medium to coarse grained.	20.7				-
	-	SM		27.0	OU TV OAND (ON) 1 1 (10) (D 1/4) 1	20.2			←Bentonite	
-	-	CD			loose, fine grained, increasing grain size with depth.				Pellets	-
ļ		SP			-as above, fine to medium grained, some fines.					
30		ML		29.5	SILT (ML), very dark gray (10YR 3/1), very soft, low plasticity.	17.7	2.1		—2" dia. SCH40	30
ļ.				30.5	SANDY CLAY (CH), very dark gray (10YR 3/1), soft to	16.7			PVC Blank Casing	
		СН		32.0		15.2				
		SP		33.0	POORLY GRADED SAND (SP), dark gray (10YR 4/1), loose, medium to coarse grained.	14.2			#2/12 Sand	
		SM		34.0	SILTY SAND (SM), very dark gray (10YR 3/1), fine	13.2				
35		SP		35.0	POORLY GRADED SAND (SP), dark gray (10YR 4/1),	12.2				35
			·/-	200.0	GRAVEL WITH SAND (GP), very dark gray (10YR 3/1), fine to coarse gravel (up to 3" dia.), medium to coarse	12.2	0.0		2" dia. SCH40 PVC Well Screen (0.010"	_ 00_
-	-	GP	-		grained sand.				slot)	
-										
-			• •	38.0	FRIARS FORMATION (SS), weathered, light gray to	9.2			Bottom Cap	-
-	-				brown mottling.			388888		
80/6	-									40
1/2 		SS							—Bentonite	
2006.6	_								Chips	
SEPT										_
PJ LFR					-as above, some iron staining.					
BORING+WELL 2006 002-10180-92.GPJ LFR SEPT 2006.GPT 5/19/08 M Advantage Advant	<u>FERIALS US</u>	<u>E</u> D								
3+WEL		^			(Continued Next Page)				(a) C	D
MAPP	ROVED BY:_	CI	a call	CARC	E C-66471 DATE: 8/6/08				团	n



	PROJECT NAME Mission Valley Terminal CLIENT KMEP PAGE 3 OF 3											
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	BID (ppm) MELL DIAGRAM					
45		SS			-as above, light gray (10YR 7/1).				—Bentonite Chips	45		
BORNG+WELL 2006 002-10180-92.GPJ LFR SEPT 2006.GDT 5/19/08 WAS BOTTON B				47.0	Bottom of boring at 47 feet bgs. Bottom of well at 38.5 feet bgs.	0.2						
Filte 7000 005-10180-950 Filte 7000 National Police	r Pack - 1.2 cub sition Seal - 1.0 ular Seal - 3.9 c ace Seal - 0.5 c om Plug - 1.4 cu	ic feet cubic ubic fe ubic fe	foot cet of boot of o	of bent benton concre	onite pellets ite grout te					_		
APP APP	APPROVED BY: CARCE C-66471 DATE: 8/6/08											



	JECT NAME M	ission	Valley	y Term	ninal			WE	ELL	NUI	MBER R-83	
PROJ	JECT LOCATIO	N Qu	ıalcom	ım Sta	dium	DRILLING CONTR	ACTO	R Boa	ırt Long	year		
PROJ	JECT NUMBER	002-	10180	-92		DRILLING METHO	D Sor	nic Dril	ling			
LOCA	ATION Mainten	ance	Yard -	Qualo	comm	STAMP (IF APPLIC	CABLI	E) ANI	O/OR N	OTES		
OVA	EQUIPMENT_N	∕lini R	ae 200	00		Developed on 5/8/0 Purged approximat				elopme	nt rig.	
	UND ELEVATION				HOLE DIAMETER 6 inches	r diged approximat	ely oo	gallori	J.			
					t-msl HOLE DEPTH 67.0 ft							
					6.5 ft bgs/ Elev 33.0 ft							
	ABILIZED WA											
				100								
	GED BY <u>Dana</u> ш	Brodie	2	_	DATE 4/29/08		"					
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRII	PTION	ELEVATIONS	PID (ppm)		WELL	_ DIAGRAM	DEPTH (feet)
Air knife to 5 feet bgs.												
											—Concrete	-
												-
											Bentonite	
-	_										Chips	-
5	-		7.7.7	5.0	CLAYEY SAND WITH GRAVEL (S	C) very dark gravish	44.5	9.5			}	5
		sc			brown (10YR 3/2), moist, fine to me trace coarse grained sand, poorly g	edium grained sand,						
				7.0	cobbles (up to 3" dia.).	raded, graver to	42.5				1	
<u></u>	-		7.7.	7.0	No core recovery.		42.5				}	
-											Bentonite Grout	-
ļ -	_										Glout	-
10			///	9.5	CLAYEY SAND WITH GRAVEL (S	C), dark grayish	40.0	- 0			1	10
		sc		10.5	brown (10YR 4/2), moist, fine to coan well graded.		39.0	5.8				
-	-				SANDY GRAVELLY CLAY (CL), da (10YR 4/2), moist, firm, low to no pl	ark grayish brown asticity, fine grained						<u> </u>
	-			Ţ	sand, trace medium to coarse grain cobbles (up to 4" dia.).						⋖ -6" dia.	-
5/19/08					-as above, olive gray (5Y 4/2), soft,						Borehole	L
		CL			plasticity, fine grained sand to cobb	les (up to 4" dia.).						
]06.G[-										}	-
K 15	<u> </u>							6.5			2" dia. SCH40	15
2 2											PVC Blank Casing	
1 [GPJ 1		SP		16.5 <u>\</u> 17.0	<u>7</u> POORLY GRADED SAND (SP), da	ark gray (2.5Y 4/1),	33.0 32.5				1	
80-92		SC		17.5	∖wet, fine to medium grained, trace o CLAYEY SAND WITH GRAVEL (Section 1)	coarse grained.	32.0					
22-101	-			1	brown (10YR 4/2), wet, fine to medi poorly graded.							-
BORNAG+WELL 2006 002-10180-92.GPJ LFR SEPT 2006.GDT		SP			POORLY GRADED SAND (SP), da wet, fine to medium grained, trace of trace clay, trace gravel.							20
# N					(Continued Next Pa	ge)			. 			
APP	ROVED BY:	100	al C	CARCE	C-66471 DATE: 8/6/08						四上	n

	PROJECT NAME Mission Valley Terminal CLIENT KMEP						WELL NUMBER R-83AD PAGE 2 OF 3				
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION LEVALUE VICTORIAN LEVALUE LEVA	PID (ppm)					
		SP			POORLY GRADED SAND (SP), dark gray (2.5Y 4/1), wet, fine to medium grained, trace coarse grained, trace clay, trace gravel. (continued) -as above, trace gravel and cobbles (4" dia.).	7.9	Bentonite Grout				
30				28.0	-as above, gravel. SILTY SAND (SM), very dark gray (2.5Y 3/1), wet, fine to medium grained, poorly graded.	7.5	PVC Blank Casing				
BORING+WELL 2006 002-10180-92.GPJ LFR SEPT 2006.GDT 5/19/08 A A A A A A A A A A A A A		SM			-as above, trace gravel.	15.4					
2006 002-10180-92.GF	TERIALS US	ED	<u>1. T. 1. 1</u>								
1G+WELL		011	arm	10-	(Continued Next Page)		(a) I ED				
APP	ROVED BY:_	CU	all	CAKCE	C-66471 DATE: 8/6/08		□ LFR				



DATE: 8/6/08

MATERIALS USED

Filter Pack - 1.2 cubic feet of #2/12 Sand Transition Seal - 1.0 cubic foot of bentonite pellets Annular Seal - 7.1 cubic feet of bentonite grout Surface Seal - 0.5 cubic foot of concrete Bottom Plug - 1.8 cubic feet of bentonite chips

APPROVED BY:





	ECT NAME M				ninal - Qualcomm Stadium		W	ELL N	IUN	IBER R-84	
PROJ	ECT LOCATIO	N 94	49 Fria	ars Rd	, San Diego, CA	DRILLING CONTRAC	TOR Box	art Longye	ear	-	
PROJ	ECT NUMBER	002-	10143	3-41		DRILLING METHOD	Sonic Dri	lling			
LOCATION Friars Road Off-ramp						STAMP (IF APPLICABLE) AND/OR NOTES					
	EQUIPMENT_N										
	JND ELEVATION				HOLE DIAMETER 6 inches						
	OF CASING EL										
					7.0 ft / Elev 26.2 ft						
	ABILIZED WA										
	SED BY James			/ LIEV							
		S Gon.	Zaies		DATE 8/24/09 to 8/25/09						
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRI	PTION PTION	FID (ppm)	1	WELL	DIAGRAM ≺ -12" Emco	DEPTH (feet)
			****	0.5	Asphalt at surface.	82	2.7			Wheaton Flush Mounted	
-					Air knife to 5 feet bgs.					Well Box	<u> </u>
-										Concrete	ļ .
_											
-									14		-
5				5.0	SILTY SAND WITH GRAVEL (SM)		0.0		[]	← 6" Dia.	5
					to gray (N4) mottled coloring, dry, lo subrounded sand, appreciable silt,	oose, fine to coarse				Borehole	
					subangular fine to coarse gravel, so cobbles.	ome pulverized		[]	1/1		
							0.0				
									//		-
									[]		ļ .
10		SM					0.0		1	Bentonite	10
					-as above.			[4	1/4	Grout	
							0.0		1/1		-
					-as above.		0.0		[]		
				14.0			9.2				
15					SILTY GRAVEL WITH SAND (GM) to gray (N4) mottled coloring, dry, lo	oose, 50% fine			<u> </u>		15
					gravel, 30% fine to coarse subroun- pulverized cobbles.	ded sand, 20% silt,	0.0		1	—2" Dia. SCH40 PVC Blank	-10
				•						Casing	<u> </u>
		GM		•					14		ļ .
				1			0.0		[]		
				4							
-									K 1		-
20			<u> •</u> ↓ ↓•	1	(Continued Next Pa	ge)		111	11		20
	ROVED BY:	Saver	CBe	adle	P6-			F	R	ARCADIS	
APP	ROVED BY:				DATE: 10/1/20	<u>09</u>				AKCADIS .	company

	ECT NAME M				inal - Qualcomm Stadium		WE	ELL NUMBER R-84AD PAGE 2 OF 4
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	FID (ppm)	WELL DIAGRAM DEPTH (feet)
		GM		22.0	SILTY GRAVEL WITH SAND (GM), brown (10YR 4/3) to gray (N4) mottled coloring, dry, loose, 50% fine gravel, 30% fine to coarse subrounded sand, 20% silt, pulverized cobbles.	61.2	0.0	
					SILTY SAND WITH GRAVEL (SM), black organic material, trace plant roots, organic smell.		24.6	
					SILTY SAND WITH GRAVEL (SM), brown (10YR 4/3) to gray (N4) mottled coloring, loose, soft, 40% silt, 30% fine to coarse subrounded sand, 30% fine gravel and pulerized cobbles.		0.0	-6" Dia. Borehole
							0.0	
30		SM					0.0	Bentonite Grout
					-as above, dry.		0.0	
_ 35 _							0.0	2" Dia. SCH40 35
-							0.0	Casing
					-as above.		0.0	
-				39.0		44.2	0.0	
40			7	33.0	SILTY GRAVEL WITH SAND (GM), 50% fine gravel and pulverized cobbles, 25% fine to coarse	77.2	0.0	
					subrounded sand, 25% silt.		0.0	
		GM					45.4	
							655.5	
				44.0		39.2	2,290	
MAT	ERIALS USE	<u>:</u> D	-	-		•		

(Continued Next Page)

DATE: 10/1/2009

BORING+WELL 2006 002-10143-41.GPJ LFR SEPT 2006.GDT 10/2/09

APPROVED BY: Start Beadle 6129

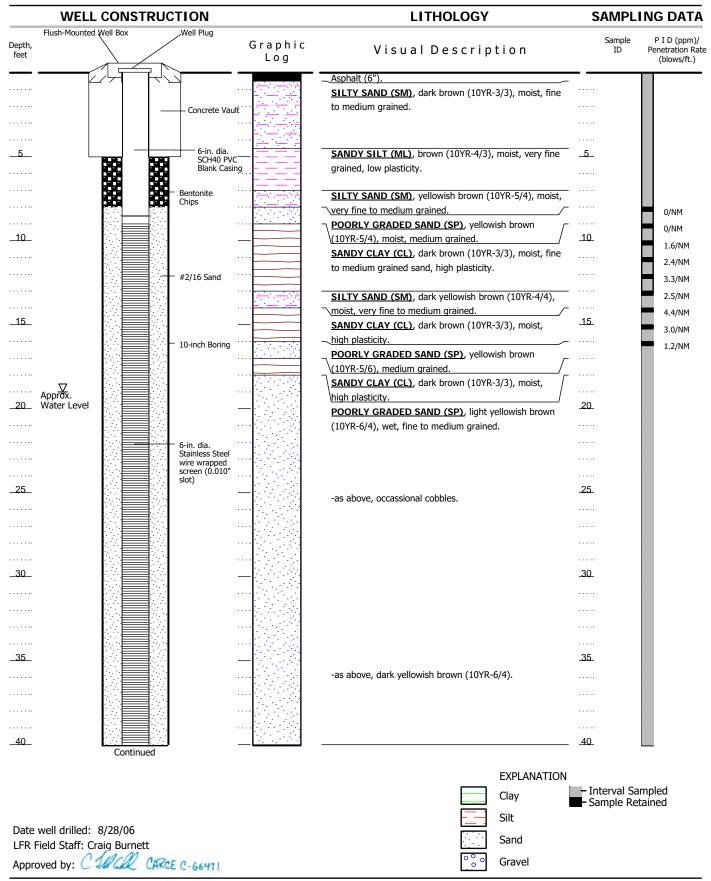


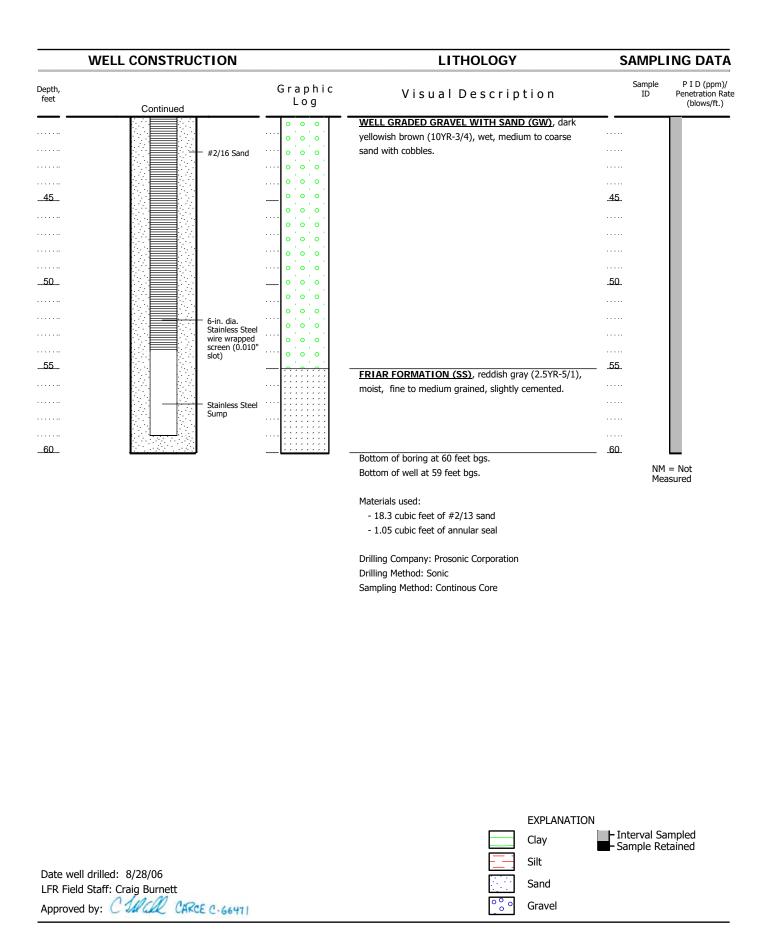
PROJECT NA CLIENT Kind		'alley Terminal - Qualcomm Stadium ergy Partners	WELL NUME	BER R-84A PAGE 3 OF
DEPTH (feet)		SH CANADA SH CAN	ELEVATIONS FID (ppm)	
45	GM	SILTY GRAVEL WITH SAND (GM), dry, loose, soft 40% fine gravel and pulverized cobbles, 30% silt, 3 fine to coarse sand.	0% 5,291 1	6" Dia. Borehole
-		48.0 No recovery.	35.2	-
50	GM	49.0 SILTY GRAVEL WITH SAND (GM), dry, loose, soft 40% fine gravel and pulverized cobbles, 30% silt, 3 fine to coarse sand.	88.9	Bentonite Grout
		52.0 SILTY GRAVEL (GM), damp, loose, soft, predomin fine to coarse gravel with pulverized cobbles.	31.2 26.3 26.3	-
55	GM		173.2	
		56.0 SILTY SAND (SM), brown (10YR 4/3), wet, loose, s 60% fine to coarse subrounded sand, 40% silt.	27.2	2" Dia. SCH40 PVC Blank Casing
	SM		0.0	
60			0.0	
_		SANDY SILT (ML), brown (10YR 4/3), wet, dense, 75% silt, 25% fine sand.	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	-
65	ML		0.0	-
-	SM	-as above. 66.0 SILTY SAND (SM), brown (10YR 4/3), wet, loose, so the fine to coarse sand with appreciable silt.		Bentonite Pellets _
MATERIAL	S USED		0.0	
	·	(Continued Next Page) Beedle 6129 DATE: 10/1/2009	IED	ARCADIS com



PROJECT NAME_ CLIENT Kinder Mo		-		inal - Qualcomm Stadium ers		WE	ELL NUMBER R-84A PAGE 4 OF
DEPTH (feet) SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	FID (ppm)	WELL DIAGRAM
70				SILTY SAND (SM), brown (10YR 4/3), wet, loose, soft, fine to coarse sand with appreciable silt.		0.0	→ Bentonite Pellets - 2" Dia. SCH40 PVC Blank Casing - 7
-	SM			-as above. SILTY SAND WITH GRAVEL (SM), brown (10YR 4/3), wet, loose, soft, fine to coarse sand with appreciable silt, increase fine gravel and pulverized cobbles.		0.0	#2/12 Sand -
75 - -						0.0	2" Dia. SCH40 PVC Well Screen (0.010" slot)
80			78.0	FRIARS FORMATION (SS), gray, friable sandstone.	5.2	0.0	Bottom Cap
				-as above.		0.0	Pellets Plug – - Formation
- 85			85.0	Bottom of boring at 85 feet bgs. Bottom of well at 78.5 feet bgs.	-1.8	0.0	Slough
MATERIALS US							
16.33 cubic feet of 1.25 cubic feet of 1.75 cubic feet of 1.00 cubic foot of	Bentoni #2/12 N	te pelle Iontere	ets trar ey San	d			
APPROVED BY:_	Stern	CBe	edle	P6- 6129 DATE: 10/1/2009			LFR an ARCADIS comp

MATERIALS USED

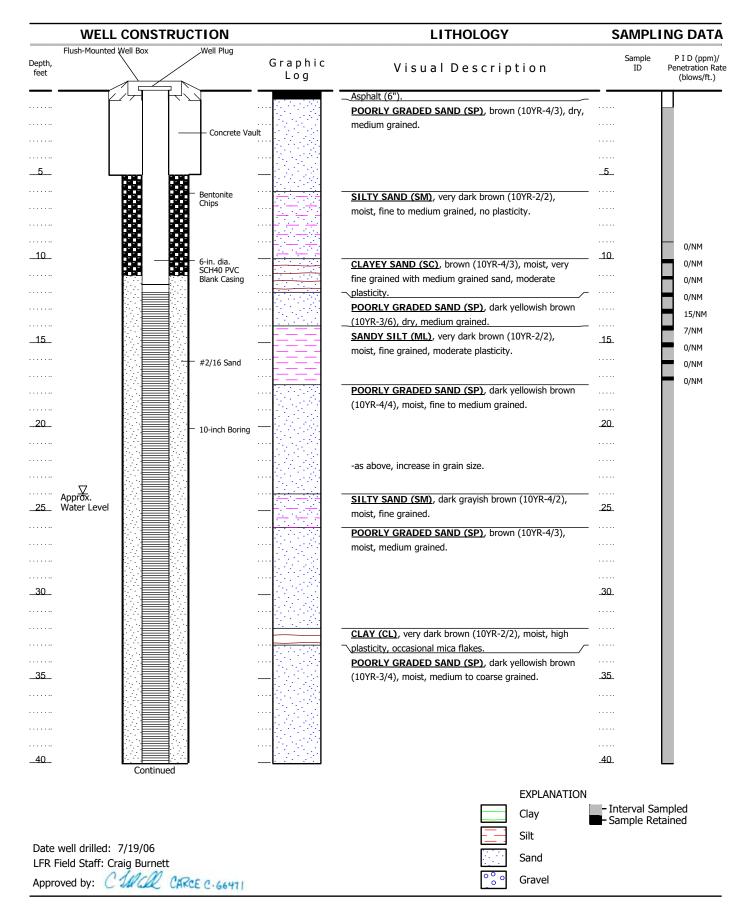




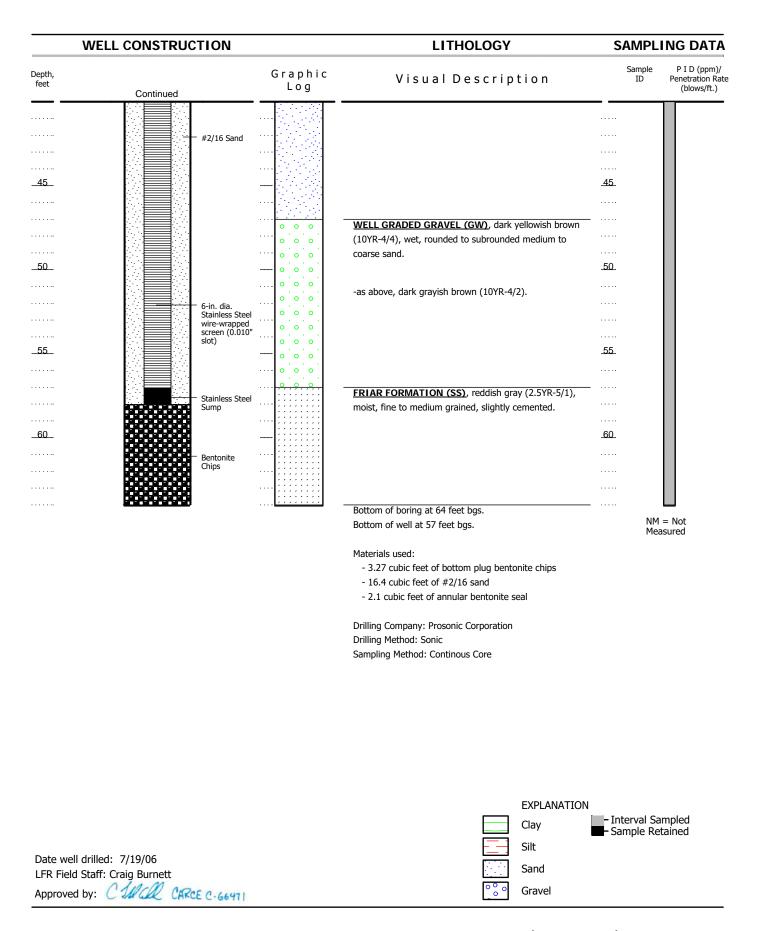
WELL CONSTRUCTION AND LITHOLOGY FOR WELL RW-7A (CONTINUED)

Project No. 10180-56

Mission Valley Terminal
Page 2 of 2



WELL CONSTRUCTION AND LITHOLOGY FOR WELL RW-48



WELL CONSTRUCTION AND LITHOLOGY FOR WELL RW-48 (CONTINUED)

Project No. 10180-56

Mission Valley Terminal

Page 2 of 2

080106CMB/exv

PROJECT NAME_N CLIENT Kinder Mo				inal - Qualcomm Stadium ers		W	ELL	. NU	MBER RV PAGE 1	
PROJECT LOCATI	ON 94	49 Fria	ars Rd,	San Diego, CA	DRILLING CONTRAC	TOR Boa	rt Long	year		· ·
PROJECT NUMBE	R 002-	10180	-78-00	1	DRILLING METHOD_S	Sonic Dril	ling			
LOCATION Southy	vest Pa	arking l	Lot		STAMP (IF APPLICAE	BLE) AND	OR N	OTES		
OVA EQUIPMENT_	Mini R	ae 200	00		Developed on 5/6/08 u Purged approximately	sing Sme 475 gallo	eal Deve ns.	elopme	nt rig.	
GROUND ELEVAT	ION 56	6.56 ft-	msl	HOLE DIAMETER 10 inches	. 3,	3 3 4				
TOP OF CASING E	LEVAT	ΓΙ ΟΝ Ν	ΙA	HOLE DEPTH 66.0 ft						
abla FIRST ENCOUN	TERE	- TAW C	ER 17	7.0 ft bgs/ Elev 39.6 ft						
▼ STABILIZED WA			· ·							
LOGGED BY Jame				DATE _2/6/08						
DEPTH (feet)	U.S.C.S.	GRAPHIC	DEPTHS	LITHOLOGIC DESCRIP	OTION E	PID (ppm)		WELL	. DIAGRAM	DEPTH (feet)
				Air knife to 5 feet bgs.						
, <u>-</u>									Concrete vault	-
										-
5			5.0	WELL OR DEPOSIT (OLD)	51	<u>.6</u> 6.7				5
				WELL GRADED GRAVEL (GM), da 3/3), moist, some areas damp, no di coarse gravel (up to 5" dia.), some si plasticity, gray to brown mottled grav subangular cobbles.	ry strength, loose, silt, very low				←Cement Grout ←6" dia. SCH40	-
10	GM					5.1			PVC Blank Casing ←Hydrated	10
-									Bentonite Chips	-
15			15.0		41	.6		***************************************	- —#2/16 Sand	- - 15
				POORLY GRADED SAND (SP) with dark brown to gray mottled, moist, n loose, fine to medium subrounded s coarse sand, non-plastic, non-cohes	n silt and gravel, o dry strength, soft, and with trace	3.1			—6" dia. SS Wire-wrap Screen (0.010"	
	SP			micas.					slot) 10" dia.	-
20			:						Borehole	20
APPROVED BY:_	CSW	all	CARCE	(Continued Next Pag C-6647 DATE: 8/6/08	ge)				a LF	R

PROJECT NAME_ CLIENT Kinder Mo		-		inal - Qualcomm Stadium ers		W	ELL NUMBER RW-4 PAGE 2 OF
DEPTH (feet) SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL DIAGRAM
	SP			POORLY GRADED SAND (SP) with silt and gravel, dark brown to gray mottled, moist, no dry strength, soft, loose, fine to medium subrounded sand with trace coarse sand, non-plastic, non-cohesive, quartz and micas.		9.7	-6" dia. SS Wire-wrap Screen (0.010" _ slot)
30	SM		26.0	SILTY SAND (SM), black (10YR 2/2) to brown mottled, wet, medium soft, loose, fine to medium subrounded sand, some coarse sand, very low plasticity to no plasticity, poorly graded, micas and quartz.	30.6	12.1	- 10" dia. Borehole
35	SP		32.0	POORLY GRADED SAND (SP) with silt and gravel (up to 6" dia.), dark brown to gray mottled, wet, no dry strength, soft, loose, fine to medium subrounded sand with trace coarse sand, non-plastic, non-cohesive.	24.6	11.0	
40			41.5	SILTY SAND (SM), black (10YR 2/2) to brown mottled,	15.1	7.9	
	SM			wet, medium soft, loose, fine to medium subrounded sand, some coarse sand, very low plasticity to no plasticity, poorly graded, micas and quartz.			
MATERIALS US		ral	CARCE	(Continued Next Page) C-66471 DATE: 8/6/08			□ LFR



	JECT NAME_Mi NT_Kinder Moro				inal - Qualcomm Stadium ers		W	ELL NU	MBER RW PAGE 3 (
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL	DIAGRAM	DEPTH (feet)
45 		SM			SILTY SAND (SM), black (10YR 2/2) to brown mottled, wet, medium soft, loose, fine to medium subrounded sand, some coarse sand, very low plasticity to no plasticity, poorly graded, micas and quartz. (continued) -as above, with trace gravel.				—6" dia. SS Wire-wrap Screen (0.010" slot)	45
				50.0	WELL GRADED SAND WITH GRAVEL (SW), brown to gray mottling, wet, soft, loose, no dry strength, medium to coarse subrounded sand, trace silt, cobbles (6 to 7" dia.), micas and quartz.	6.6			#2/16 Sand #2/16 Sand 10" dia. Borehole	50
60		SW			-as above, increase gravel with depth.				Borenoie	60
006.GDT 5/14/08		SS		66.0	FRIARS FORMATION (SS), gray sandstone, hard, arenite, cemented, weathered interface.	-7.4 -9.4			—Stainless Steel Sump —Slough	65
LFR SEPT 20			1::::::	66.0	Bottom of boring at 66 feet bgs. Bottom of well at 65 feet bgs.	<u>-9.4</u>				
Filte Annu	TERIALS USE r pack - 18.5 cut ular Seal - 1.0 cu 1.5 cu	oic fee ubic fe ubic f	oot of leet of	bentor cemer	ite chips t grout				a LFI	R

MATERIALS USED

PROJECT NAME Mis				inal - Qualcomm Stadium		W	ELL NU	JMBER RW	
PROJECT LOCATION					DRILLING CONTRACT	TOR Boa	rt Longyear	TAGET	01 3
PROJECT NUMBER_					DRILLING METHOD S				
LOCATION Southwes	st Pa	rking L	_ot		STAMP (IF APPLICAB	LE) AND	O/OR NOTES		
OVA EQUIPMENT Mi	ini Ra	ae 200	0		Developed on 5/7/08 us Purged approximately	sing Sme 490 gallo	eal Developme ons.	ent rig.	
GROUND ELEVATION				HOLE DIAMETER 10 inches		are gamen			
TOP OF CASING ELE	VAT	I ON N	ΙA	HOLE DEPTH 66.0 ft					
 FIRST ENCOUNTE	RED	WAT	ER 15	5.0 ft bgs/ Elev 31.5 ft					
▼ STABILIZED WATI	ER_8	8.9 ft b	gs/ Ele	ev 37.6 ft					
LOGGED BY James				DATE _2/13/08					
DEPTH (feet) SAMPLE TYPE NUMBER		GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIF	NOIT9	PID (ppm)	WELI	L DIAGRAM	DEPTH (feet)
				Air knife to 5 feet bgs.					
								Concrete vault	_
									_
5			5.0	WELL CRADED CAND (CM):45 -:	41	.5 8.5			5
				WELL GRADED SAND (SW) with si reddish brown (5YR 6/3) to dark gra mottling, damp, inconsistent dry stre medium subrounded sand, subangu gravel with trace cobbles (up to 5cm fines, micas.	y (5YR 4/1) ength, fine to lar fine to coarse	G.G		Cement GroutHydrated	- -
10			Ā					Bentonite Chips 6" dia. SCH40 PVC Blank Casing	_ _ 10
	SW					4.7		Guomig	
 15			∇					#2/16 Sand	- - 15
	SP		<u>∇</u> 15.5	POORLY GRADED SAND (SP), light mottling, wet, loose, soft, no dry streemedium subrounded sand, no plastif and feldspar.	ength, fine to	14.8		6" dia. SS Wire-wrap Screen (0.010" slot)	-
20								d -10" dia. Borehole	20
APPROVED BY:	100	e c	ARCE ((Continued Next Pag C-66471 DATE: 8/6/08	ge)			2 LF	R

	F NAME M Kinder Mor				ninal - Qualcomm Stadium ers		W	ELL NUMBER RW-5 PAGE 2 OF
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL DIAGRAM
25		SP			POORLY GRADED SAND (SP), light brown to black mottling, wet, loose, soft, no dry strength, fine to medium subrounded sand, no plasticity, micas, quartz, and feldspar.	10.0		-6" dia. SS Wire-wrap Screen (0.010" slot)
30		SM		31.0	SILTY SAND (SM), black (2.5Y 2.5/1), wet, fine to medium subrounded sand, appreciable amounts of silt and clay, low plasticity, micas.	19.0 15.5		-10" dia. Borehole
-		SP			POORLY GRADED SAND (SP), light brown to black mottling, wet, loose, soft, no dry strength, fine to medium subrounded sand, no plasticity, micas, quartz, and feldspar.			
35		sw		33.0	WELL GRADED SAND (SW) with silt and gravel, dark grayish brown (10YR 3/2), loose, soft, fine to coarse subrounded sand, fine to coarse gravel, trace cobbles (up to 2.5 inches), trace silt, no plasticity, micas, quartz, and feldspar.	13.5		
MATER	IALS USE	<u>D</u>			(Continued Next Page)			
APPRO\	/ED BY:	Sec	De C	CARCE	C-66471 DATE: 8/6/08			□ LFR



	JECT NAME M NT Kinder Mor				inal - Qualcomm Stadium ers		W	ELL NU	MBER RW PAGE 3 (
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL	DIAGRAM	DEPTH (feet)
45		sw		46.0	WELL GRADED SAND (SW) with silt and gravel, dark grayish brown (10YR 3/2), loose, soft, fine to coarse subrounded sand, fine to coarse gravel, trace cobbles (up to 2.5 inches), trace silt, no plasticity, micas, quartz, and feldspar. No soil/core recovery.	0.5			6" dia. SS Wire-wrap Screen (0.010" slot)	45
50									:—#2/16 Sand	50
55				56.0	WELL GRADED SAND (SW) with silt and gravel, dark grayish brown (10YR 3/2), loose, soft, fine to coarse subrounded sand, fine to coarse gravel, trace cobbles (up to 2.5 inches), trace silt, no plasticity, micas, quartz,	-9.5			⋖ -10" dia. Borehole	55
60		SW		60.0	FRIARS FORMATION (SS), dark gray (10YR 4/1), no	-13.5				60
 		SS			cementation, fine to coarse grained sand.				—Stainless Steel Sump —Slough	
2006.GDT 5/14/08				66.0	-increasing clay and fines with depth.	-19.5				65
J LFR SEPT					Bottom of boring at 66 feet bgs. Bottom of well at 61 feet bgs.					
Filte Anni	FERIALS USE r pack - 18 cubi ular seal - 0.5 cu 0.7 c	c feet ubic fo ubic f	oot of b	enton cemen	ite chips t grout				□ LFI	R

MATERIALS USED

ON_Qualcor		dium	DRILLING CONTRAC	CTOP Book		_	PAGE 1	
	0.02		DIGIZZINO CONTINU	CION Boar	t Longyea	<u> </u>		
	0-92		DRILLING METHOD	Sonic Drill	ng			
nm - West	Parking	J Lot	STAMP (IF APPLICA	BLE) AND	OR NOTE	S		
/lini Rae 20	000		Developed on 5/7/08 Purged approximately	using Smea	ıl Developr s.	ment r	ig.	
DN 67.90 ft	-msl	HOLE DIAMETER 10 inches	. 3,	J				
.EVATION_	NA	HOLE DEPTH 87.0 ft						
ERED WA	TER 33	3.0 ft bgs/ Elev 34.9 ft						
TER_29.3 f	t bgs/ E	Elev 38.6 ft						
Brodie		DATE 5/1/08						
	DEPTHS		PTION	ELEVATIONS PID (ppm)	WE	ELL DI	IAGRAM	DEPTH (feet)
		Air knife to 5 feet bgs.				H		
						_	Concrete Vault	- -
	5.0	SANDY GRAVELLY CLAY (CL), mo	ottled brown (10YR	>9999			-Bentonite Chips	- 5_
		-as above, mottled very dark grayish very dark brown (10Y grained sand.	to cobbles (4" dia.). R 4/2), more coarse n brown (2.5Y 3/2),					- - -
CL		3/2).		>9999			-10" dia. Borehole	<u>10</u>
							-Bentonite Grout	_ _ _ 15
	16.5	GRAVELLY SANDY CLAY (CL), mo (10YR 3/3) and dark olive gray (5Y 3	ottled dark brown				-6" dia. SCH40	-
CL		plasticity, fine to medium grained sa -as above, pale yellow (2.5Y 8/2), m	and. noist, no plasticity,				PVC Blank Casing	_ 20
	TERED WA TER 29.3 f Brodie SO'S'O CL	TER 29.3 ft bgs/ EBrodie SOUTH SOUT	TERED WATER 33.0 ft bgs/ Elev 34.9 ft TER_29.3 ft bgs/ Elev 38.6 ft Brodie DATE _5/1/08 LITHOLOGIC DESCRIF Air knife to 5 feet bgs. Air knife to 5 feet bgs. SANDY GRAVELLY CLAY (CL), mm 5/3) and olive gray (5Y 5/2), moist, I fine to coarse grained sand, gravel in above, and the same of	TERED WATER 33.0 ft bgs/ Elev 34.9 ft TER 29.3 ft bgs/ Elev 38.6 ft Brodie DATE 5/1/08 LITHOLOGIC DESCRIPTION Air knife to 5 feet bgs. SANDY GRAVELLY CLAY (CL), mottled brown (10YR 5/3) and olive gray (5Y 5/2), moist, hard, no plasticity, fine to coarse grained sand, gravel to cobbles (4" dia.). -as above, dark grayish brown (10YR 4/2), more coarse grained sand. -as above, mottled very dark grayish brown (2.5Y 3/2), very dark brown (10YR 2/2) and dark olive gray (5Y 3/2). CL GRAVELLY SANDY CLAY (CL), mottled dark brown (10YR 3/3) and dark olive gray (5Y 3/2), moist, hard, no plasticity, fine to medium grained sand. -as above, pale yellow (2.5Y 8/2), moist, no plasticity, fine to coarse grained sand, gravel to cobbles (4" dia.). (Continued Next Page)	THER 29.3 ft bgs/ Elev 38.6 ft Brodie DATE 5/1/08 SOUTH STANDY GRAVELLY CLAY (CL), mottled brown (10YR 5/3) and olive gray (5Y 5/2), moist, hard, no plasticity, fine to coarse grained sand. -as above, mottled very dark grayish brown (2.5Y 3/2), very dark brown (10YR 2/2) and dark olive gray (5Y 3/2), very dark brown (10YR 2/2) and dark olive gray (5Y 3/2), moist, hard, no plasticity. CL 16.5 GRAVELLY SANDY CLAY (CL), mottled dark brown (10YR 2/2) and dark olive gray (5Y 3/2), very dark brown (10YR 2/2) and dark olive gray (5Y 3/2), moist, hard, no plasticity, fine to medium grained sand. -as above, pale yellow (2.5Y 8/2), moist, no plasticity, fine to coarse grained sand, gravel to cobbles (4* dia.). CCNIfinued Next Page)	TREED WATER 33.0 ft bgs/ Elev 34.9 ft TRE 29.3 ft bgs/ Elev 38.6 ft Brodie DATE 5/1/08 LITHOLOGIC DESCRIPTION SANDY GRAVELLY CLAY (CL), mottled brown (10YR 5/3) and olive gray (5Y 5/2), moist, hard, no plasticity, fine to coarse grained sand. -as above, dark grayish brown (10YR 4/2), more coarse grained sand. -as above, mottled very dark grayish brown (2.5Y 3/2), very dark brown (10YR 2/2) and dark olive gray (5Y 3/2), well dark olive gray (5Y 3/2), moist, hard, no plasticity, fine to coarse grained sand. CL GRAVELLY SANDY CLAY (CL), mottled dark brown (10YR 3/3) and dark olive gray (5Y 3/2), moist, hard, no plasticity, fine to medium grained sand. CL (Continued Next Page)	TREED WATER 33.0 ft bgs/ Elev 34.9 ft TER 29.3 ft bgs/ Elev 38.6 ft Brodie DATE 5/1/08 LITHOLOGIC DESCRIPTION Air knife to 5 feet bgs. SANDY GRAVELLY CLAY (CL), mottled brown (10YR 5/3) and olive gray (5'7 5/2), moist, hard, no plasticity, fine to coarse grained sand, gravel to cobbles (4" dia.). -as above, dark grayish brown (10YR 4/2), more coarse grained sand. -as above, mottled very dark grayish brown (2.5Y 3/2), very dark brown (10YR 2/2) and dark olive gray (6Y 3/2), moist, hard, no plasticity, fine to medium grained sand. -18.5 GRAVELLY SANDY CLAY (CL), mottled dark brown (10YR 3/3) and dark olive gray (5Y 3/2), moist, hard, no plasticity, fine to medium grained sand. -2.5 GRAVELLY SANDY CLAY (CL), mottled dark brown (10YR 3/3) and dark olive gray (5Y 3/2), moist, hard, no plasticity, fine to coarse grained sand, gravel to cobbles (4" dia.). (Continued Next Page)	TRE 29.3 ft bgs/ Elev 38.6 ft Brodie DATE 5/1/08 STORY S

	JECT NAME N ENT KMEP	dission	Valley	/ Term	inal		WELL NUMBER RW-99 PAGE 2 OF 4					
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL	. DIAGRAM	DEPTH (feet)		
-	-	CL		24.0	GRAVELLY SANDY CLAY (CL), pale yellow (2.5Y 8/2), moist, no plasticity, fine to coarse grained sand, gravel to cobbles (4" dia.).	42.0			← Bentonite Chips			
25	-	sc		24.0	CLAYEY SAND (SC), dark olive gray (5Y 3/2), moist, fine grained, trace medium grained, poorly graded.	43.9	>9999		6" dia. SCH40 PVC Blank Casing			
30	_			29.5	-as above, trace coarse grained. SILTY SAND (SM), gray (2.5Y 6/1), moist, fine to	38.4	5115		≪ -10" dia. Borehole —6" dia			
-	-			∑	medium grained, poorly graded. -as above, olive gray (5Y 5/2), wet.				Stainless Steel Well Screen (0.010" slot)	 		
35	-	SM					>9999		 #2/12 Sand	35		
40	-			38.5	-as above, more coarse grained, trace gravel. POORLY GRADED SAND (SP), gray (10YR 5/1), wet, fine to medium grained, few coarse grained. -as above, more coarse grained.	29.4	2134			40		
SPJ LFR SEPT 2006.G	-	SP			-as above, gravel (1" dia.).							
NG+WELL 2006 002-10180	TERIALS US		ran .	CARCE	(Continued Next Page) C-6647 DATE: 8/6/08				@LFI	R		
M APF	PROVED BY:_	According to		TITLE	DATE: <u>8/6/08</u>							



	DJECT NAME M ENT KMEP	lission	Valley	/ Term	inal	V	WELL NUMBER RW-99 PAGE 3 OF 4
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION . VNO IL VA II II	PID (ppm)	WELL DIAGRAM (feet)
		SP CL SM SW		54.0 54.2 55.0	POORLY GRADED SAND (SP), very dark gray (5Y 3/1), wet, fine to medium grained, trace clay. 20.9 SANDY CLAY (CL), dark gray (10YR 4/1), wet, soft, moderate plasticity, fine to medium grained sand. SILTY SAND (SM), very dark gray (10YR 3/1), wet, fine grained, poorly graded. WELL GRADED SAND (SW), gray (10YR 5/1), wet, fine to coarse grained. SILTY SAND (SM), dark gray (10YR 3/1), fine to medium grained sand, poorly graded, trace cobbles.	8.0	6" dia Stainless Steel Well Screen (0.010" slot)
BORING+WELL 2006 002-10180-92.GPJ LFR SEPT 2006.GDT 5/19/08 A P		SW		58.5	-as above, fine to medium grained. 9.4 GRAVELLY SAND (SW), dark gray (10YR 3/1), fine to medium grained sand, few coarse grained sand, moderately graded, gravel (1 to 3" dia.), trace fines. -as above, more coarse grained sand.	6.7	60
ORING+WELL 2006 002-10180-9			isl (CARCE	(Continued Next Page) C-6647 DATE: 8/6/08		□ LFR



	IECT NAME MI NT KMEP	ission	Valley	/ Term	inal		W	ELL NU	MBER RW PAGE 4	
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL	DIAGRAM	DEPTH (feet)
70		sw			GRAVELLY SAND (SW), dark gray (10YR 3/1), fine to medium grained sand, more coarse grained sand, moderately graded, gravel (1 to 3" dia.).				4-10" dia. Borehole —6" dia Stainless Steel	70
		SM	*****	72.0	SILTY SAND (SM), gray (10YR 5/1), wet, medium to coarse grained sand, few fine grained sand, poorly graded, trace gravel.	-4.1			Well Screen (0.010" slot)	
75		SW		73.5	GRAVELLY SAND (SW), gray (10YR 5/1), wet, fine to coarse grained, gravel (up to 3" dia.), trace fines.	-5.6			#2/12 Sand	75
				77.5	-as above, gravel to cobbles (6" dia.). FRIARS FORMATION (SS), gray (10YR 5/1), weathered sandstone.	-9.6			—Bottom Cap	
80										80
		SS							─Bentonite Chips	 - ·
85				87.0		-19.1			-Slough	85
				07.0	Bottom of boring at 87 feet bgs. Bottom of well at 78 feet bgs.	-19.1				
i : :										
Filter Trans	MATERIALS USED iilter Pack - 18.7 cubic feet of #2/12 Sand ransition Seal - 1.8 cubic foot of bentonite chips unular Seal - 5.8 cubic feet of bentonite grout bottom Plug - 2.7 cubic feet of bentonite chips									
APP	ROVED BY:	CSA	al	CARCE	C-66471 DATE: 8/6/08				☐ LF	R



l	ECT NAME Mis	ssion	Valley	Term	ninal			WE	LL N	NUM	IBER RW-	
PROJ	ECT LOCATION	N Qu	ıalcom	m Sta	dium	DRILLING CONTR	RACTO	R Boa	rt Longy	ear	-	
PROJ	ECT NUMBER	002-	10180	-92		DRILLING METHO	DD Sor	ic Drill	ing			
LOCA	TION Qualcom	nm - \$	SW Pa	rking	Lot	STAMP (IF APPLI	CABLE	E) AND	OR NC	TES		
	EQUIPMENT M					Developed on 5/8/	08 usin	, g Sme	al Deve		t rig.	
	JND ELEVATIO				HOLE DIAMETER 10 inches	Purged approxima	tely 490	gallor	1S.			
	OF CASING ELI				HOLE DEPTH 67.0 ft							
					5.0 ft bgs/ Elev 38.1 ft							
	ABILIZED WAT			bgs/ E								
	SED BY Tania /	Alarc	on		DATE <u>5/5/08</u>							
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIF	PTION	ELEVATIONS	PID (ppm)		WELL	DIAGRAM	DEPTH (feet)
					Air knife to 5 feet bgs.						3	
											Concrete	-
											Vault	_
										8		
5			911	5.0	CLAYEY GRAVEL WITH SAND (G	C), brown (10YR	48.1					5
<u> </u>		GC			5/3), moist, coarse to subrounded g to 3.5" dia.), some fine to medium g	ravel, cobbles (up					Bentonite	
				7.0	9		46.1				Chips	
_					SILTY GRAVEL WITH SAND (GM). (2.5Y 5/4), moist, fine to coarse gra	light olive brown		3.8				
		GM			subrounded (up to 3" dia.), fine to m sand, some fines.	nedium grained						-
				9.5	-as above, brown to light olive gray	(5Y 6/2) mottled	43.6			4	—6" dia. SCH40	-
10	-			3.3	\cobbles (up to 4" dia.). SANDY CLAY (CL), dark brown (10)	`	45.0	1.1			PVC Blank Casing	10
		01			hard, medium plasticity, fine grained (up to 1.5" dia.).							
		CL			-as above, dark brown to dark gray (up to 5" dia.), with some medium g	mottled, cobbles				▋↓	#2/12 Sand	
				12.5	-as above, dark brown (10YR 3/3), plasticity, fine grained sand with gra	moist, hard, medium	40.6					-
		SM		40.5	SILTY SAND (SM), dark gray (10YF medium grained sand, poorly grade	R 4/1), moist, fine to	20.0					-
	_			13.5	\gravel (up to 3" dia.). SANDY CLAY (CL), dark brown to o		39.6					
15		CL		▼	moist, firm, medium plasticity, fine to sand, with gravel and cobbles (up to	o coarse grained	38.1					15
- 10	-		<i>VIIII</i>	13.0 \(\sqrt{2}	POORLY GRADED SAND (SP), ve 3/1), wet, fine to medium grained, s	ry dark gray (10YR	30.1	0.0			—6" dia Stainless Steel	13
					gravel and cobbles (up to 5" dia.).	·					Well Screen (0.010" slot)	-
					-as above, dark gray (10YR 4/1), fir grained, pocket of clay at 16.5 feet	ogs, black (10YR						-
_		SP			2/1), plastic.-as above, less fines and more coal						 10" dia.	
					with depth, some gravel (up to 2" di	a.).					Borehole	
20					(Continued Next Page	ge)					400	20
ADDI	ROVED BY:	211	all	CARCI		J - /					ZI L F	R
	KOVED BY:			T	DATE: 8/6/08							

PROJECT N	IAME Mission	n Valley	Term	inal		WE	LL NUMBER RW-	
DEPTH (feet)	NUMBER U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL DIAGRAM	(+cc+)
	SP		21.0	-as above, trace fine gravel.	32.1	3.4	##2/12 Sand	
	ML		22.0	SILT (ML), very dark gray (10YR 3/1), very soft, low plasticity, some clay, trace fine grained sand.	31.1		#2/12 Sand	
-	SW		22.5	CLAY (CL), black (10YR 2/1), firm, medium plasticity. WELL GRADED SAND (SW), light gray to light brown mottled, fine to coarse grained.	30.6			 - -
25		*****	24.5	SILT (ML), very dark gray (10YR 3/1), firm, medium plasticity, trace clay.	28.6	31.4	4 -10" dia. Borehole	_ :
-	ML			-as above, very soft, some fine grained sand, trace clay, less sand with depth.				_
30			29.5	-as above, with fine to medium grained sand. POORLY GRADED SAND (SP), dark gray (10YR 4/1), fine to medium grained, trace coarse sand, trace fines.	23.6	1.2	6" dia Stainless Steel	_
-	SP			-as above, no fines.			Well Screen (0.010" slot)	_
35			35.0	-as above, fine to medium grained. SILT (ML), very dark gray (10YR 3/1), soft, medium	18.1	36.6		_
-	SW	*****	36.0	plasticity, some clay. GRAVELLY SAND (SW), dark gray (10YR 4/1), fine to	17.1			F
-	SM	****	37.0	coarse grained, trace subrounded gravel (up to 1.5" dia.), some fines. SILTY SAND WITH GRAVEL (SM), very dark to dark gray, fine to coarse grained, trace gravel (up to 2" dia.), low plasticity. -as above, fine to medium grained sand, gravel (up to	16.1			_
40	GW	- 1 -	39.5 41.0	3" dia.). WELL GRADED GRAVEL WITH SAND (GW) mixture, very dark grayish brown (10YR 3/2), fine to coarse subangular to rounded cobbles (up to 6" dia.).	13.6 12.1	1.3		_
	sw			WELL GRADED SAND (SW), very dark grayish brown (10YR 3/2), fine to coarse grained, trace angular to subrounded gravel (up to 2" dia.)as above, trace rounded gravel (up to 1" dia.).				_
				-as above, increase coarse grained sand with depth, gravel (up to 3" dia.).				
<u>MATERIA</u>	<u>LS USE</u> D							
	01	oran	Con	(Continued Next Page) E C-66471 DATE: 8/6/08			☐ LFI	P
APPROVE	D BY:	a week	CMAC	DATE: <u>8/6/08</u>				1



	CT NAME_N _KMEP	Mission	valley	y Term	inal		WE	LL NUN	IBER RW- PAGE 3	
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL	DIAGRAM	:
45		sw		46.0	-as above, cobbles (up to 3.5" dia.).	7.1	2.8			
		SM		47.0	SILTY SAND (SM), very dark gray (10YR 3/1), fine grained sand.	6.1			#2/12 Sand	T
- - -		SW			GRAVELLY SAND (SW), very dark grayish brown (10YR 3/2), fine to coarse grained, with gravel (up to 3" dia.), increasing gravel with depth.	6.1				-
50				50.0	WELL GRADED GRAVEL WITH SAND (GW), very dark grayish brown (10YR 3/2), increasing gravel and cobble size with depth, fine to coarse grained sand.	3.1	2.7		⋖ -10" dia. Borehole	-
-					-as above, cobbles (up to 6.5" dia.).					-
55					-as above, cobbles (up to 6" dia.)as above, gravel (up to 3" dia.), increasing gravel and cobble size with depth.		2.0		6" dia Stainless Steel Well Screen (0.010" slot)	
60		GW			-as above, cobbles (up to 4" dia.).		5.4			-
-					-as above, cobbles (up to 4" dia.).					-
65_		SS		65.5 67.0	-as above, cobbles (up to 5" dia.). FRIARS FORMATION (SS), gray (10YR 5/1), iron staining at 66 feet bgs.	-12.4 -13.9	3.5		—Bottom Cap	-
					Bottom of boring at 67 feet bgs. Bottom of well at 66 feet bgs.					
Filter P	RIALS US Pack - 20.7 c r Seal - 1.4	ubic fe								
	OVED BY:_	CSA	all	CARCE	C-66471 DATE: 8/6/08				D LF	R

	JECT NAME MI	ssion	Valley	/ Term	inal			WE	LL NU	MBER R\	V-101
PRO	JECT LOCATIO	N Qu	alcom	m Sta	dium	DRILLING CONTR	АСТО	R Boai	rt Longyear		
PRO	JECT NUMBER	002-	10180	-92		DRILLING METHO	D Sor	nic Drilli	ing		
LOCA	ATION Qualcon	nm - S	SW Pa	ırking l	Lot	STAMP (IF APPLIC	CABLE	E) AND	OOR NOTES	3	
	EQUIPMENT_M					Developed on 5/7/0 Purged approximate	08 usir	g Sme	al Developm		
	UND ELEVATION				HOLE DIAMETER 10 inches	r urged approximat	icly 40	o ganoi	113.		
	OF CASING EL										
1_			_		HOLE DEPTH 57.0 ft						
					5 ft bgs/ Elev 38.2 ft						
	ABILIZED WAT			gs/ Ele							
LOG	GED BY Tania	Alarco	on		DATE <u>4/30/08</u>						
DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIF	PTION	ELEVATIONS	PID (ppm)	WEL	LL DIAGRAM	DEPTH (feet)
					Air knife to 5 feet bgs.						
										Concrete Vault	-
 _ 5				5.0	SILTY GRAVEL WITH SAND (GM), moist, fine to coarse angular to sub-	ounded gravel, fine	40.7			—Bentonite Chips	- 5
		GM		<u>⊽</u> <u>▼</u> 8.0	to coarse grained sand, cobbles (up silt. -as above, dark gray (5Y 4/1), wet. POORLY GRADED SAND (SP), ve	, , ,	37.7				-
10					3/1), fine to coarse grained, increas depth, trace gravel (up to 1" dia.), tr -as above, dark gray (5Y 4/1), medi grained.	ing grain size with ace fines.		2.9		—2" dia. SCH PVC Blank Casing	10
5/19/08		SP			-as above, very dark gray (10YR 3/grained, no gravel.	I), fine to coarse				⋖ -6" dia. Borehole	- - -
BORNG4+WELL 2006 002:10180-82:GPJ LFR SEPT 2006:GDJ 5/19/08	-			16.5	-as above, dark gray (5Y 4/1), medi grained. -as above, very dark gray (10YR 3/ grained, increasing coarse grained gravel.	I), fine to coarse sand with depth, no	29.2	1.2		2" dia SCH ² PVC Well Screen (0.0 slot)	
2006 002-10180-92.GF		SW			WELL GRADED SAND (SW), dark fine to coarse grained, trace fine gra					#2/12 Sand	-
20 APP APP	ROVED BY:	CIA	MAL	CARCE	(Continued Next Page 20-6647) DATE: 8/6/08	ge)				a L	FR

PROJECT NAME Mission Valley Terminal CLIENT KMEP PAGE 2 OF 3												
DEPTH (feet)	NUMBER U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL DIAGRAM	DEPTH (feet)				
 25	sw		25.0	-as above, fine to coarse grained, some gravel (up to 3" dia.).	20.7	1.6	2" dia SCH40 PVC Well Screen (0.010" slot)					
 	SP		29.0	POORLY GRADED SAND (SP), very dark gray (10YR 3/1), fine to medium grained.	16.7	4.1	de dia. Borehole	- - -				
30	sw			WELL GRADED SAND (SW), fine to coarse grained, trace fine gravel. -as above, fine to medium grained, trace fines, cobble (3.5" dia.).		0.8	#2/12 Sand	3 				
35			35.5	-as above, black (10YR 2/1), some clayas above, very dark gray (10YR 3/1), fine to coarse grained, gravel (up to 2.5" dia.), increasing gravel with depth. WELL GRADED GRAVEL WITH SAND (GW), very	10.2	0.0		- - _ 3				
40	GW			dark gray (10YR 3/1), subangular to subrounded, fine to coarse gravel, cobbles (up to 6" dia.), fine to coarse grained sand.		0.6		- - - 4				
 				-as above, trace clay. -as above, dark gray (10YR 4/1), cobbles (up to 7" dia.).				- - -				
MATERIA	LS USED	- V -					f · ├── ↑ · l					
APPROVE	рву:СД	ese	CARCE	(Continued Next Page) C-66471 DATE: 8/6/08			□ LFI	R				



		ECT NAME_M NT_KMEP	lission	Valley	/ Term	inal		WE	LL NUN	IBER RW-	
	DEPTH (feet)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	PID (ppm)	WELL	DIAGRAM	DEPTH (feet)
Ī						-as above, cobbles (up to 7" dia.), well graded.					
	45 _					-as above, increasing gravel with depth.		4.1		—2" dia SCH40 PVC Well Screen (0.010" slot)	
	50		GW		52.0	-as above, mostly gravel.	-6.3			#2/12 Sand	 - 50
	 		SS		02.10	FRIARS FORMATION (SS), gray (10YR 6/1), weathered.	0.0			—Bottom Cap	
-	55 _				57.0	Bottom of boring at 57 feet bgs.	-11.3				_ 55
3PJ LFR SEPT 2006.GDT 5/19/08						Bottom of boring at 57 feet bgs. Bottom of well at 54.5 feet bgs.					
BORING+WELL 2006 002-10180-92.GPJ LFR SEPT 2006.GDT 5/19/08	Filter Annu	Pack - 17.2 cu lar Seal - 1.4 c	ubic fe	eet of I	Bentor	and lite chips C-66471 DATE: 8/6/08				□ LFI	R



			Partners	-0.10 6.1	120000000000000000000000000000000000000	15.67		PAGE 1	OF :
ROJECT LOCATI				Diego, CA	DRILLING CONTRACT		art Longyear		
PROJECT NUMBE	R 002-	10143	-24		DRILLING METHOD So		N. 155 (N. 155)		
OCATION NE Pa	rking L	ot			STAMP (IF APPLICABL			Danue de la constant	
OVA EQUIPMENT	3,115	.93 ft-ı	msl	HOLE DIAMETER 10 inches	FID did not work proper Developed on 2/26/09 to Purged approximately 8	ising Sr	meal Developn	nd high humidity. nent rig.	
OP OF CASING E		7-77		HOLE DEPTH 66.5 ft					
FIRST ENCOUN									
STABILIZED W			F.1.5						
OGGED BY Darr	en Burg	gett	DA	TE 2/16/09 - 2/17/09	- A-C		T .		
DEPTH (feet) SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIF	NOITS	FID (ppm)	WELL	DIAGRAM	DEPTH (faat)
- 0,		500000	0.3 _ Aspl	nalt (3" thick).	<u></u>	,	AT.	9	
1			Air k	nife to 5 feet bgs.				Concrete Vault	-
-							+	6" dia. SCH40 PVC Blank Casing	
5			5.0	soil recovery.	59.9	9		I —Concrete	_ 5
-				on recovery.	57.0			Concrete	-
1	SM		SIL1	TY SAND (SM), dark brown (10\dagged, 15% silt.	67.9 (R 3/3), moist, fine	31		►Hydrated Bentonite Chips	
10						0.0	1 83 83		_1
4			11.0	IDV CILT (MI) dock become (40)	53.9 (P. 3/3) moist firm	9			4
4	ML		low sand	IDY SILT (ML), dark brown (10\ plasticity, 20% fine sand, 5% cla d.	rR 3/3), moist, firm, ay, trace coarse	1		- #2/16 Sand	
	sw		WEI	L GRADED SAND (SW), dark 'R 3/4), moist, fine grained, som	yellowish brown				-
15	200							—6" dia. SS	1
			46.0		26.			Wire-wrap	
			16.0 SAN low sand	IDY SILT (ML), dark brown (10\ plasticity, 20% fine sand, 10% c d.	/R 3/3), moist firm, lay, 5% coarse	21		Screen (0.010" slot)	1
	ML			above, with roots. above, no roots, increasing clay				≺- 10" dia. Borehole	2

LIENT Kinder Mo	rgan E		Partners	σ l		LL NUMBER RW	OF
DEPTH (feet) SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC	오 LITHOLOGIC DESCRIPTION	ELEVATIONS	FID (ppm)	WELL DIAGRAM	Talk and the same of
	ML		-as above, decreasing clay, increasing fine sand.	41.4		#2/16 Sand	T T J
25	SP		POORLY GRADED SAND (SP), dark yellowish brown (10YR 3/4), moist, fine grained, 15% silt, micaceous.	41.4		6" dia. SS Wire-wrap Screen (0.010" slot)	
30			→ clayey silt lens at 28.5 feet bgs. -as above, increasing silt and clay, wet. 32.0 SANDY SILT (ML), brown (10YR 5/3), wet, fine sand,	32.9			
35	ML		5% clay, micaceous. 35.0 POORLY GRADED SAND (SP), dark yellowish brown	29.9			-
	SP		36.0 (10YR 3/4), wet, fine grained, 20% silt, micaceous. SILT (ML), brown (10YR 5/3), wet, soft, non-plastic, micaceous.	28.9			1 1 1
40	SP		-as above, increasing fine sandclay lens at 40 feet bgs. 41.0 POORLY GRADED SAND (SP), dark yellowish brown (10YR 3/4), wet, fine grained, 10% silt, micaceous.	23.9			
8		•					



DEPTH (feet)	SAMPLE TYPE NUMBER	0.5.0.5.	GRAPHIC LOG	DEPTHS	LITHOLOGIC DESCRIPTION	ELEVATIONS	FID (ppm)	WELL	DIAGRAM	OF DITILITY
45		iP.			POORLY GRADED SAND (SP), dark yellowish brown (10YR 3/4), wet, fine grained, 10% silt, micaceous. -as above, 10% gravel.	-1-14			#2/16 Sand	4
50	G	w		48.0	WELL GRADED GRAVEL (GW), dark yellowish brown (10YR 3/4), wet, subrounded gravel, fine to coarse sand, micaceous.	16.9				- 5
50	s	SP.		0.0	POORLY GRADED SAND (SP), dark yellowish brown (10YR 3/4), wet, fine to medium grained, trace coarse grained.	14.9			—6" dia. SS Wire-wrap Screen (0.010" slot)	_
- 55 -	G	w		54.0	WELL GRADED GRAVEL (GW), dark yellowish brown (10YR 3/4), wet, subrounded gravel, fine to medium sand, few cobbles, micaceous.	10.9				_ (
-	s	м		58.0	SILTY SAND (SM), dark grayish brown (10YR 4/2), wet, fine to medium sand, low plasticity, micaceous.	6.9				-
-	G	25.		60.0	SILTY GRAVEL (GM), dark yellowish brown (10YR 3/4), wet, fine to medium sand, subrounded gravel, micaceous, rhyolite, dacite, quartzite clasts, few cobbles.	4.9				-
65	S	ss		62.5	FRIARS SANDSTONE (SS), bluish gray (5/3 5/1), moist, weak, fine sand, 35% silt, 5% clay, weak foliation.				—Bottom SS Sump ←Hydrated Bentonite Chips Plug	
			:::::::	66.5	Bottom of boring at 66.5 feet bgs. Bottom of well at 63 feet bgs.	-1.6		(1111		
Filter Pack	ALS USED c - ~18 cubic eal - ~1 cubic									



Date Start/Finish: 4/14/11

Drilling Company: Cascade Drilling Driller's Name: Val Godoy Drilling Method: Rotary Sonic

Sampling Method: 10' x 6" Dia. Sonic Core Barrell

Rig Type: Sonic Drill

Northing: 1865761.16 Easting: 6293593.55 Casing Elevation: NA

Borehole Depth: 74' bgs Borehole Diameter: 8.5" Surface Elevation: 63.11' MSL Descriptions By: James Gonzales Well/Boring ID: RW-109P (Pilot Boring)

Client: Kinder Morgan Energy Partners

Location: Mission Valley Terminal - Qualcomm

Stadium

9950 San Diego Mission Rd San Diego, CA 92108

Reviewed By: Store Beadle 6129

Stratigraphic Description Stratigraphic Description Well/Boring Construction As who to it is go on 41711, Soil logges from an indicating and a strategy of the strategy of			
All xolle to 5 tigs on 41911. Soll logged from all knills cutlings. SRTY GRAVEL (GM), the to coates substraining reywork authorized cobities (up to 5 tigs, something substraining). SSRTY GRAVEL (GM), the to coates graved and the soll to coates graved and control to the coates graved and the soll to the coates graved and the coates graved and the soll to the coates graved and	Sample ID Secovery (feet) PID/FID (ppm) USCS Code Seologic Column	Stratigraphic Description	=
Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 66 feet NE of well RW-109. Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Date Depth Elev. 4/14/11 27' ATD NA	0.0/NA	SILTY GRAVEL (GM), fine to coarse subangular gravel, subrounded cobbles (up to 5° dia.), some fine grained sand with trace medium to coarse grained sand, poorly sorted, trace clay, low plasticity silt, no dilatancy, dry, medium dense, mottled gray to brown coloring. No recovery from 10' to 16' bgs. Slough from 16' to 18' bgs, interpreted as SILTY GRAVEL (GM) with cobbles. SILTY GRAVEL (GM), mostly fine to coarse subangular gravel, subrounded cobbles (up to 5° dia.), some fine grained sand, poorly sorted, trace clay, low plasticity silt, no dilatancy, dry, medium dense, mottled	backfilled with Bentonite Grout / Chips
Surface capped with cold asphalt. Depth measured from top of casing		Applicable/Available; MSL = Mean Sea Level; ATD = A Time of Drilling Drilled approximately 66 feet NE of well RW-109. Material Used: 59 cubic feet of Bentonite Grout / Chips	Date Depth Elev. 4/14/11 27' ATD NA

Well/Boring ID: RW-109P (Pilot Boring)

Borehole Depth: 74' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

DEРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description			Well/Borin Constructio	
	-					GM	0.	gray to brown coloring.				
_ 20	_			1.4/0.0			<u> </u>	No second from 2014a 221 has				
	_							No recovery from 20' to 22' bgs.				
	_					GM	0	SILTY GRAVEL (GM) as above, moist.				
-	40 -					GIVI	\triangle	POODLY CRAPE CAND WITH CRAVEL (CD) mostly fine to cooke during				
-	-							POORLY GRADED SAND WITH GRAVEL (SP), mostly fine to coarse grained, subrounded, some fine to coarse subrounded gravel, trace subrounded gravel, trace silt, dry, gray (2.5Y 5/1) sand, brown to gray gravel and cobbles.				
- 25	-			0.0/0.0								
						SP						
	1											
ŀ	_							-as above, wet.	모			
								as above, wet.				
	35 –			0.0/0.0				Slough from 28' to 30' bgs, interpreted as POORLY GRADED SAND WITH GRAVEL (SP) to WELL GRADED SAND (SW).				
-						SP- SW		GRAVEE (GF) IO WELL GRADED SAND (GW).		_		Borehole
											E	eackfilled with Bentonite Grout / Chips
30	_			0.0/0.0		SM		SILTY SAND (SM), mostly fine sand, low plasticity silt, medium dense, olive brown (2.5Y 4/3).				Silips
	٦							WELL GRADED SAND (SW), mostly fine to coarse grained, subrounded, poorly sorted, trace silt, trace subangular fine gravel, wet, loose, soft, olive brown (2.5Y				
-	4							4/3), micaceous.				
	30 -					CW						
-	_					SW						
- 35	-			1.3/2.4								
-												
						<u> </u>	<u> </u> —	SILTY SAND (SM), low plasticity silt, no dilatency, fine subrounded sand, olive				
<u> </u>	-					SM	H.H.H.H.H.H.H.H.H.H.H.H.H.H.H.H.H.H.H.	brown (2.5Y 4/3).				
-	25 –						<u> </u>					
	2,5-7							No recovery from 38' to 44' bgs.				
			<u> </u>			<u> </u>		Remarks: ft bgs = feet below ground surface; NA = Not		١٨	/ater Lev	al Data
		AF	1	- 1		-		Applicable/Available; MSL = Mean Sea Level; ATE Time of Drilling	O = At	Date		Elev.
9		AF	KL	A	D	15				4/14/1		
		cture - Wa										
1								Material Used: 59 cubic feet of Bentonite Grout / C	hips.			

Depth measured from top of casing

Surface capped with cold asphalt.

Client: Kinder Morgan Energy Partners Well/Boring ID: RW-109P (Pilot Boring)

Borehole Depth: 74' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

	San	Diego, CA	921	80								
DEРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description			ell/Boring	
- 40 	20 -	RW-109-46		0.9/1.1	X	SW		WELL GRADED SAND (SW), fine to coarse grained, subrounded, poorly sorted, trace silt, trace subangular fine gravel, wet, loose, soft, olive brown (2.5Y 4/3), micaceous.				
- - 50	15 - - -	RW-109-50		0.1/0.9	X	SM- SM- SW		SILTY SAND (SM), low plasticity silt and fine to medium subrounded sand, low density, loose, dark olive brown (2.5Y 3/3). Slough from 50' to 52' bgs, interpreted as SILTY SAND (SM) to WELL GRADED SAND WITH GRAVEL (SW).		_		filled with onite Grout /
_ 55	- 10 - - - - 5-	RW-109-56		0.0/0.0	X	SW		WELL GRADED SAND WITH GRAVEL (SW), fine to coarse subrounded sand, some subangular to subrounded fine to coarse gravel (up to 2* dia.), wet, loose, soft, dark olive brown (2.5Y 3/3), brown to gray mottled coloring.				
								Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD =	= At	Wat	er Level	Data
	6	AF	20	V	ח	C		Time of Drilling		Date	Depth	Elev.
								Drilled approximately 66 feet NE of well RW-109.	4	1/14/11	27' ATD	NA
ir	iirastri	ucture · Wa	ier · E	riviroi	imen	r · Bui	iaings	Material Used: 59 cubic feet of Bentonite Grout / Chi Surface capped with cold asphalt.	_	D	esured from to	

Client: Kinder Morgan Energy Partners Well/Boring ID: RW-109P (Pilot Boring)

Borehole Depth: 74' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

=											
DEPTH	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description		Well/Boring Construction	
- 60 65 70		RW-109-62 RW-109-67		2.2/1.9	X	sw		-as above, wet. WELL GRADED SAND (SW), fine to coarse grained sand, subrounded, trace silt, wet, loose, soft, micaceous. WELL GRADED SAND WITH GRAVEL (SW), fine to coarse grained sand, subrounded, some fine to coarse subangular gravel, trace cobbles (up to 3.5" dia.), trace silt, loose, soft. -as above, wet. FRIARS SANDSTONE (SS), gray.		Borehole backfilled Bentonite Chips	d with
		AF						Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD Time of Drilling Drilled approximately 66 feet NE of well RW-109. Material Used: 59 cubic feet of Bentonite Grout / Cl Surface capped with cold asphalt.	4/1 hips.	· · · · · · · · · · · · · · · · · · ·	Elev. NA

Date Start/Finish: 6/3/11 - 6/4/11 Drilling Company: Cascade Drilling Driller's Name: Val Godoy Drilling Method: Rotary Sonic

Sampling Method: 10' x 6" Dia. Sonic Core Barrell

Rig Type: Sonic Drill

Northing: 1865726.60 Easting: 6293537.80 Casing Elevation: NA

Borehole Depth: 71' bgs Borehole Diameter: 10" Surface Elevation: 60.15' MSL Descriptions By: James Gonzales Well/Boring ID: RW-109 (GWE Well)

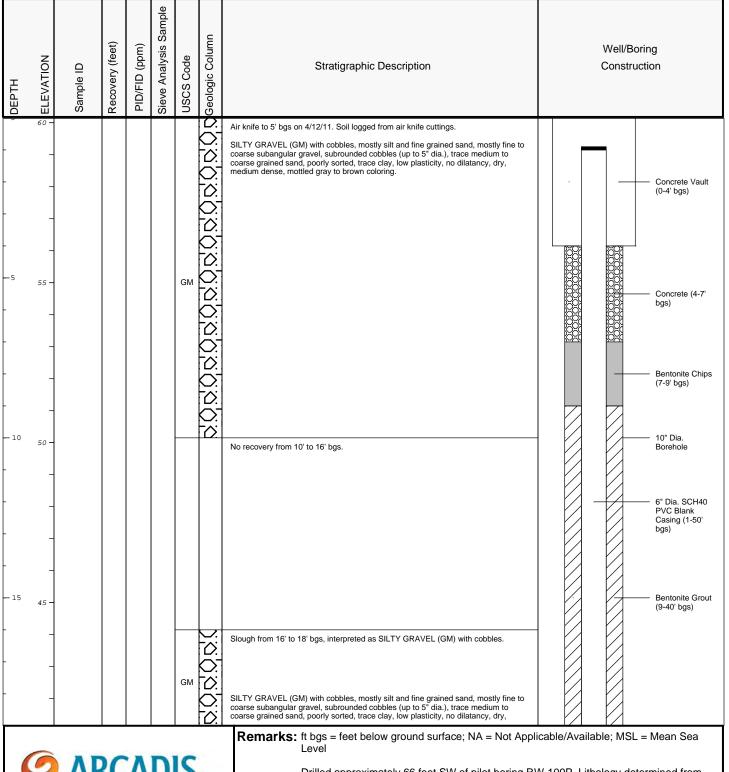
Client: Kinder Morgan Energy Partners

Location: Mission Valley Terminal - Qualcomm

Stadium

9950 San Diego Mission Rd San Diego, CA 92108

Reviewed By: Sava C Beedle 6129





Drilled approximately 66 feet SW of pilot boring RW-109P. Lithology determined from pilot boring RW-109P. Actual Friars Sandstone contact determined from well RW-109.

Well/Boring ID: RW-109 (GWE Well)

Borehole Depth: 71' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

To Disable Section S	DЕРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
SILTY GRAVEL (GM) as above, moist. POORLY GRADED SAND WITH GRAVEL (SP), mostly fine to coarse grained, subtracted, gravel, trace stift, dry, gray (2.5Y 5.1) sand, brown to gray gravel and cookless. SP SP SP SR SR SR SR SR SR SR	_ 20	40					GM	0.0		
POORLY GRADED SAND WITH GRAVEL (SP), mostly fine to coarse grained, subrounded gravel, trace sit, day, gray (2.5Y 5°1) sand, brown to gray gravel and codbles. SP SP Solver, wet. Slover, wet. SILTY SAND (SM), mostly fine sand and silt, low plasticity, medium dense, clive brown (2.5Y 4/3). WELL GRADED SAND (SW), mostly fine to coarse grained, subrounded, poorly sorted, trace silt, race subrangular fine gravel, wet, toose, soft, clive brown (2.5Y 4/3), microecous. SW SILTY SAND (SM), mostly fine to coarse grained, subrounded, poorly sorted, trace silt, race subrangular fine gravel, wet, toose, soft, clive brown (2.5Y 4/3), microecous. SW SILTY SAND (SM), mostly low plasticity silt, no dilatency, some fine subrounded and, olive brown (2.5Y 4/3). No recovery from 38 to 44 bgs.	-	40 -								
SP -as above, wet. -as above, wet. Slough from 28 to 30 bgs, interpreted as POORLY GRADED SAND WITH GRAYEL (SP) to WELL GRADED SAND (SW). SP, SW -30 au -30 au	-						GM			
SP Sicusify from 28' to 30' bgs, interpreted as POORLY GRADED SAND WITH GRAVEL (SP) to Wiell GRADED SAND (SW). SM TT SILTY SAND (SM), mostly fine sand and silt, low plasticity, medium dense, olive brown (2.5Y 4(3)). WELL GRADED SAND (SW), mostly fine to coarse grained, subrounded, poorly sorded, trace silt, trace subangular fine gravel, wet, loose, soft, olive brown (2.5Y 4/3), micaceous. SW SILTY SAND (SM), mostly fow plasticity silt, no dilatency, some fine subrounded and, olive brown (2.5Y 4/3). No recovery from 38' to 44' bgs.	- - 25	-							subrounded, some fine to coarse subrounded gravel, trace subrounded gravel, trace	Bentonite Grout
SP-SW SILTY SAND (SM), mostly line sand and silt, low plasticity, medium dense, olive prown (2.5Y 4/3). WELL GRADED SAND (SW), mostly fine to coarse grained, subrounded, poorly sorted, trace silt, trace subangular fine gravel, wet, loose, soft, olive brown (2.5Y 4/3), micaceous. SW SILTY SAND (SM), mostly low plasticity silt, no dilatency, some fine subrounded and, olive brown (2.5Y 4/3). SW No recovery from 38' to 44' bgs.	_	35 - -					SP		-as above, wet.	
SILTY SAND (SM), mostly fine sand and silt, low plasticity, medium dense, olive brown (2.5Y 4/3). WELL GRADED SAND (SW), mostly fine to coarse grained, subrounded, poorly sorted, trace silt, trace subangular fine gravel, wet, loose, soft, olive brown (2.5Y 4/3), micaceous. SW SILTY SAND (SM), mostly fine to coarse grained, subrounded, poorly sorted, trace subangular fine gravel, wet, loose, soft, olive brown (2.5Y 4/3), micaceous. SW TITY SAND (SM), mostly low plasticity silt, no dilatency, some fine subrounded sand, olive brown (2.5Y 4/3). No recovery from 38' to 44' bgs.	30	-							Slough from 28' to 30' bgs, interpreted as POORLY GRADED SAND WITH GRAVEL (SP) to WELL GRADED SAND (SW).	S" Dia SCH40
WELL GRADED SAND (SW), mostly fine to coarse grained, subrounded, poorly sorted, trace silt, trace subangular fine gravel, wet, loose, soft, olive brown (2.5Y 4/3), micaceous. SW TTTT SILTY SAND (SM), mostly low plasticity silt, no dilatency, some fine subrounded sand, olive brown (2.5Y 4/3). No recovery from 38' to 44' bgs.	30	30 -					SM	T . ' I	SILTY SAND (SM), mostly fine sand and silt, low plasticity, medium dense, olive brown (2.5Y 4/3).	PVC Blank Casing (1-50'
No recovery from 38' to 44' bgs.	_ 35	25 -					sw		sorted, trace silt, trace subangular fine gravel, wet, loose, soft, olive brown (2.5Y 4/3), micaceous.	
	-	-					SM		sand, olive brown (2.5Y 4/3).	



Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level

Drilled approximately 66 feet SW of pilot boring RW-109P. Lithology determined from pilot boring RW-109P. Actual Friars Sandstone contact determined from well RW-109.

Well/Boring ID: RW-109 (GWE Well)

Borehole Depth: 71' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

Sample **Seologic Column** Sieve Analysis Recovery (feet) PID/FID (ppm) Well/Boring **USCS** Code ELEVATION Stratigraphic Description Construction ample ID DEPTH No recovery from 38' to 44' bgs. Bentonite Grout (9-40' bgs) 40 20 Bentonite Chips (40-45' bgs) WELL GRADED SAND (SW), mostly fine to coarse grained, subrounded, poorly sorted, trace silt, trace subangular fine gravel, wet, loose, soft, olive brown (2.5Y $\,$ 6" Dia. SCH40 4/3), micaceous. 45 PVC Blank Casing (1-50) 15 bgs) SW #3 Sand (45-71) SILTY SAND (SM), low plasticity silt and fine to medium subrounded sand, low bgs) density, loose, dark olive brown (2.5Y 3/3). SM - 50 10 Slough from 50' to 52' bgs, interpreted as SILTY SAND (SM) to WELL GRADED SAND WITH GRAVEL (SW). WELL GRADED SAND WITH GRAVEL (SW), mostly fine to coarse subrounded sand, some subangular to subrounded fine to coarse gravel (up to 2" dia.), wet, 6" Dia. SS Wirewrapped Well loose, soft, dark olive brown (2.5Y 3/3), brown to gray mottled coloring. Screen 0.030" Slot (50-70' bgs) 55 10" Dia. SW



Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level

Drilled approximately 66 feet SW of pilot boring RW-109P. Lithology determined from pilot boring RW-109P. Actual Friars Sandstone contact determined from well RW-109.

Well/Boring ID: RW-109 (GWE Well)

Borehole Depth: 71' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

ОЕРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
- 60	0-							-as above, wet. WELL GRADED SAND (SW), fine to coarse grained sand, subrounded, trace silt, wet, loose, soft, micaceous.	10" Dia. Borehole
- - 65	-5 -					sw		WELL GRADED SAND WITH GRAVEL (SW) and cobbles, fine to coarse grained sand, subrounded, some fine to coarse subangular gravel, trace cobbles (up to 3.5" dia.), trace silt, loose, soft.	6" Dia. SS Wire-wrapped Well Screen 0.030" Slot (50-70' bgs) #3 Sand (45-71' bgs)
- 70	-10 -							-as above, wet. ✓ FRIARS SANDSTONE (SS) at 71' bgs, gray.	Integrated Bottom Cap Slough
_	-								
— 75 -	-15 - -								
-	-							Remarks: ft bgs = feet below ground surface; NA = Not Appli	icable/Available: MSL = Mean Sea



Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level

Drilled approximately 66 feet SW of pilot boring RW-109P. Lithology determined from pilot boring RW-109P. Actual Friars Sandstone contact determined from well RW-109.

Date Start/Finish: 4/15/11 Drilling Company: Cascade Drilling Driller's Name: Val Godoy

Drilling Method: Rotary Sonic

Sampling Method: 10' x 6" Dia. Sonic Core Barrell

Rig Type: Sonic Drill

Northing: 1865429.40 Easting: 6293489.21 Casing Elevation: NA

Borehole Depth: 68' bgs Borehole Diameter: 8.5" Surface Elevation: 54.56' MSL **Descriptions By:** James Gonzales Well/Boring ID: RW-110P (Pilot Boring)

Client: Kinder Morgan Energy Partners Location: Mission Valley Terminal - Qualcomm

Stadium

9950 San Diego Mission Rd San Diego, CA 92108

PG Reviewed By: Store Beadle 6129

DEРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description		Well/Boring Construction		
5	550			0.9/0.0		GM		Air knife to 5' bgs on 4/12/11. Soil logged from air knife cuttings. SILTY GRAVEL (GM), fine to coarse subangular gravel, cobbles (up to 3-4" dia.), some fine grained sand with some medium and coarse grained sand, low plastic silt, dry to moist, brown to gray mottled coloring.			back	ehole dilled with tonite Grout / s
15 - -	40 -			6.3/0.2		GM	0000000000	SILTY GRAVEL (GM) as above.	abla			
ARCADIS Infrastructure · Water · Environment · Buildings								Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD Time of Drilling Drilled approximately 115 ft east of well RW-110. Material Used: 54 cubic feet of Bentonite Grout / Cl Surface capped with cold asphalt.	= At	V Date 4/15/1	•	Data Elev. NA

Well/Boring ID: RW-110P (Pilot Boring)

Borehole Depth: 68' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

DEРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction		
- 20 - -	35 -					sw		WELL GRADED SAND (SW), fine to coarse grained, subrounded, trace silt, moderate dilatancy, wet, low density, loose, dark olive brown (2.5Y 3/3), micaceous.			
25 - - -	30 - - - - 25 -			0.3/0.0		SP		POORLY GRADED SAND (SP), mostly medium to coarse grained sand, some fine grained sand, subrounded, rapid dilatancy, wet, low density, dark olive brown (2.5Y 3/3), micaceous.	Borehole backfilled with Bentonite Grout / Chips		
- 30 - - - - 35				0.5/0.0				No recovery from 30' to 37' bgs.	Chips		
-	-	RW-110-39				SW		WELL GRADED SAND (SW), mostly fine to medium grained sand, subrounded, some coarse subrounded sand, moderate dilatancy, trace silt, trace subangular gravel.			
	ARCADIS Infrastructure · Water · Environment · Buildings							Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 115 ft east of well RW-110. Material Used: 54 cubic feet of Bentonite Grout / Chips.	Date Depth Elev. 4/15/11 19' ATD NA		

Depth measured from top of casing

Surface capped with cold asphalt.

Well/Boring ID: RW-110P (Pilot Boring)

Borehole Depth: 68' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

DЕРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
45 50 55	15	RW-110-42 RW-110-44 RW-110-56		0.2/0.0	X	sw sw	**************************************	-decreasing fines, increasing coarse grained sand with depth, increasing subangular and subrounded gravel. -as above, wet. SILTY SAND (SM), fine subrounded sand, slow dilatancy, low plastic silt, well sorted, medium to low density, black (2.5Y 2.5/1). -as above, decreasing fines. WELL GRADED SAND (SW), fine to medium grained sand, subrounded, moderate to rapid dilatancy. -as above, mostly medium to coarse grained sand, subrounded, rapid dilatancy, trace subangular fine gravel, low density, black (2.5Y 2.5/1). -as above, wet. Poor recovery from 54' to 56' bgs.	Borehole backfilled with Bentonite Grout / Chips
		AF ucture · Wa						Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD : Time of Drilling Drilled approximately 115 ft east of well RW-110. Material Used: 54 cubic feet of Bentonite Grout / Ch Surface capped with cold asphalt.	Date Depth Elev. 4/15/11 19' ATD NA

Client: Kinder Morgan Energy Partners Well/Boring ID: RW-110P (Pilot Boring)

Site Location:

Project: CM010143.0091 Data File:RW-110P.dat

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108 Borehole Depth: 68' bgs

DEPTH	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description			Well/Boring construction	1
-5 60 65					sw		FRIARS SANDSTONE (SS), weathered gray sandstone, weakly cemented, moist, light to dark gray.			ba Be	rehole ckfilled with ntonite Grout / ips
-15 = -70 = -70 = -75 =											
ARCADIS Infrastructure · Water · Environment · Buildings							Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD Time of Drilling Drilled approximately 115 ft east of well RW-110. Material Used: 54 cubic feet of Bentonite Grout / C Surface capped with cold asphalt.	-	Date 4/15/11		Elev. NA

Page: 4 of 4

Date Start/Finish: 6/1/11 - 6/2/11 Drilling Company: Cascade Drilling Driller's Name: Val Godoy Drilling Method: Rotary Sonic

Sampling Method: 10' x 6" Dia. Sonic Core Barrell

Rig Type: Sonic Drill

Northing: 1865424.21 Easting: 6293374.76 Casing Elevation: NA

Borehole Depth: 63' bgs Borehole Diameter: 10" Surface Elevation: 50.48' MSL Descriptions By: James Gonzales Well/Boring ID: RW-110 (GWE Well)

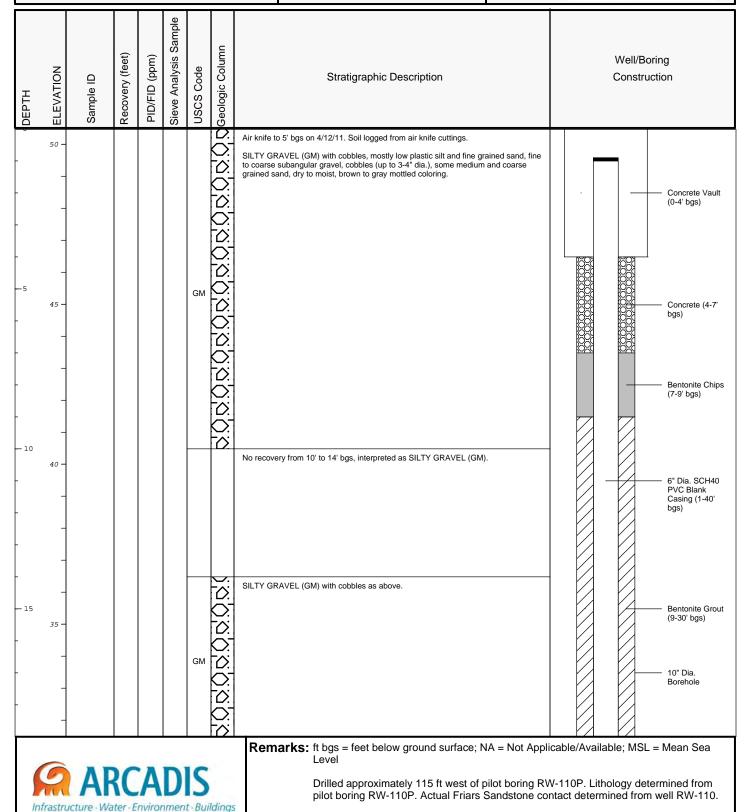
Client: Kinder Morgan Energy Partners

Location: Mission Valley Terminal - Qualcomm

Stadium

9950 San Diego Mission Rd San Diego, CA 92108

Reviewed By: Sava C Beadle 6129



Concrete Seal.

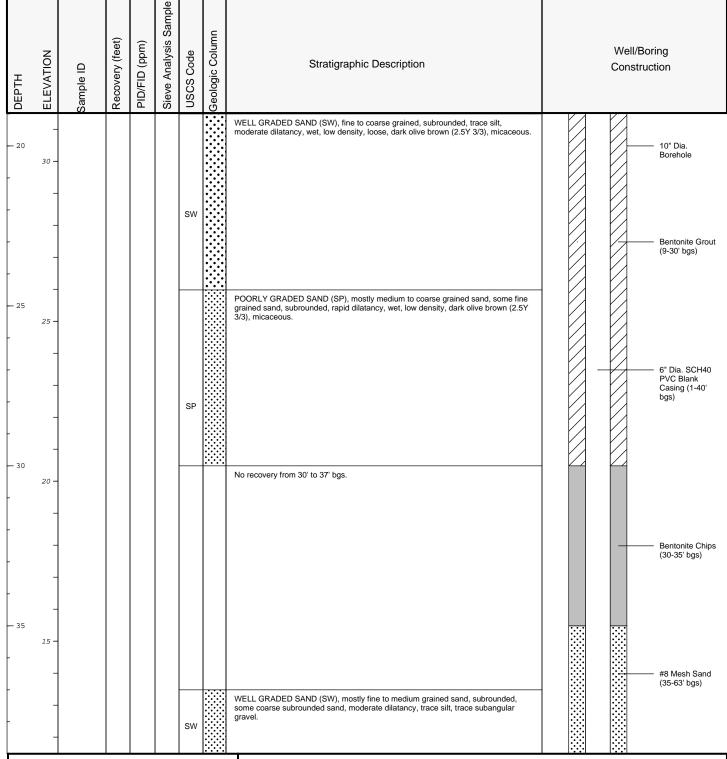
Material Used: 21 cubic ft of #8 Sand, 20 cubic ft of Bentonite Grout/Chips, 2 cubic ft of

Well/Boring ID: RW-110 (GWE Well)

Borehole Depth: 63' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108





Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level

Drilled approximately 115 ft west of pilot boring RW-110P. Lithology determined from pilot boring RW-110P. Actual Friars Sandstone contact determined from well RW-110.

Well/Boring ID: RW-110 (GWE Well)

Borehole Depth: 63' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

DEРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
40 	10 -					sw		-decreasing fines, increasing coarse grained sand with depth, increasing subangular and subrounded gravel. -as above, wet.	6° Dia. SCH40 PVC Blank Casing (1-40' bgs)
- 45 -	5-					SM	•	SILTY SAND (SM), fine subrounded sand, slow dilatancy, low plastic silt, well sorted, medium to low density, black (2.5Y 2.5/1). -as above, decreasing fines.	#8 Mesh Sand (35-63' bgs)
- 50	- - -							WELL GRADED SAND (SW), fine to medium grained sand, subrounded, moderate to rapid dilatancy. -as above, mostly medium to coarse grained sand, subrounded, rapid dilatancy, trace subangular fine gravel, low density, black (2.5Y 2.5/1).	6" Dia. SS Wire- wrapped Well Screen 0.040" Slot (40-60' bgs)
- 55	-					sw		-as above, wet. Poor recovery from 54' to 56' bgs.	10" Dia.
-	-5 -							WELL GRADED SAND (SW), fine to coarse grained, moderate to rapid dilatancy, non-cohesive, loose, soft, black (2.5Y 2.5/1). Remarks: ft bgs = feet below ground surface; NA = Not Appli	Borehole



Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level

Drilled approximately 115 ft west of pilot boring RW-110P. Lithology determined from pilot boring RW-110P. Actual Friars Sandstone contact determined from well RW-110.

Well/Boring ID: RW-110 (GWE Well)

Borehole Depth: 63' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

DEРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
- 60	-10 -					SW		WELL GRADED SAND (SW), fine to coarse grained, moderate to rapid dilatancy, non-cohesive, loose, soft, black (2.5Y 2.5/1).	Integrated Bottom Cap
-	-					SS		FRIARS SANDSTONE (SS), weathered gray sandstone, weakly cemented, moist, light to dark gray.	#8 Mesh Sand (35-63' bgs)
- 65	_								
-	-15 -								
-	- - -								
— 70 -	-20 -								
-	-								
— 75 -	-25 -								
-	- -							Demontor these fact below ground purfece. NA Net Appli	



Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level

Drilled approximately 115 ft west of pilot boring RW-110P. Lithology determined from pilot boring RW-110P. Actual Friars Sandstone contact determined from well RW-110.

Material Used: 21 cubic ft of #8 Sand, 20 cubic ft of Bentonite Grout/Chips, 2 cubic ft of Concrete Seal.

Date Start/Finish: 4/19/11

Drilling Company: Cascade Drilling **Driller's Name:** Val Godoy Drilling Method: Rotary Sonic

Sampling Method: 10' x 6" Dia. Sonic Core Barrell

Rig Type: Sonic Drill

Northing: 1865177.82 Easting: 6293419.52 Casing Elevation: NA

Borehole Depth: 65' bgs Borehole Diameter: 8.5" Surface Elevation: 49.61' MSL **Descriptions By:** James Gonzales Well/Boring ID: RW-111P (Pilot Boring)

Client: Kinder Morgan Energy Partners Location: Mission Valley Terminal - Qualcomm

Stadium

9950 San Diego Mission Rd San Diego, CA 92108

PG Reviewed By: Saun C Beadle 6129

ФБРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description			Boring truction	
- 5	45 -			1.4/0.1		GM	7606060606060606	Air knife to 5' bgs on 4/14/11. Soil logged from air knife cuttings. Asphalt at surface. SILTY GRAVEL (GM), low to medium plastic silt, no dilatancy, subrounded to subangular fine to coarse gravel, some subrounded to subangular cobbles (up to 3-4" dia.), poorly sorted, moist, dense, mottled gray to brown coloring. -as above, moist.				
- - -10	40 -			1.7/0.3		GW) 0000000	WELL GRADED GRAVEL WITH SAND (GW), fine to coarse grained sand, subrounded, moderate dilatancy, fine to coarse subangular gravel, some silt, trace subrounded cobbles, poorly sorted, wet, very dark brown (10YR 2/2). -as above, moist. POORLY GRADED SAND (SP), fine to medium grained sand, subrounded, moderate dilatancy, some coarse subrounded sand, some non-plastic silt, moderately sorted, very dark brown (10YR 2/2), micaceous.	-		Boreho backfill Benton Chips	
- - 15 -	35 -			0.2/0.0		SW		WELL GRADED SAND (SW), fine to coarse grained sand, subrounded, rapid dilatancy, trace subrounded fine to coarse gravel, trace silt, moderately sorted, wet, loose, soft, dark yellowish brown (10YR 3/4). -as above, increasing silt content.				
		AF						Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATE Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / C Surface capped with cold asphalt.	Dat 4/19/	e I /11 1	r Level C Depth 13-17' ATD	Elev. NA

Well/Boring ID: RW-111P (Pilot Boring)

Borehole Depth: 65' bgs

Site Location:

DEPTH ELEVATION Sample ID Recovery (feet) PID/FID (ppm) Sieve Analysis Sample USCS Code Geologic Column	Stratigraphic Description	Well/Boring Construction
30 20 - 20 - 20 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30 30 - 30	SILTY SAND (SM), fine to medium subrounded sand, slow to moderate dilatancy, non-plastic silt, moderately sorted, wet, medium dense, medium loose, very dark prown (10YR 2/2). POORLY GRADED SAND (SP), fine to medium grained sand, subrounded, moderate dilatancy, some non-plastic silt, moderately to well sorted, wet, low density, loose, very dark brown (10YR 2/2). SILTY SAND (SM), fine to medium subrounded sand, slow to moderate dilatancy, non-plastic silt, moderately sorted, wet, medium dense, very dark brown (10YR 2/2), micaceous. POORLY GRADED SAND (SP), fine to medium grained sand, subrounded, moderate dilatancy, trace coarse sand, some non-plastic silt, moderately to well sorted, loose, soft, dark brown (10YR 3/3). SILTY SAND (SM), fine to medium subrounded sand, slow to moderate dilatancy, non-plastic silt, moderately sorted, dark brown. WELL GRADED SAND (SW), fine to coarse grained sand, subrounded, rapid dilatancy, some fine to coarse subrounded gravel, trace silt, dark brown. SILTY SAND (SM), non-plastic silt and fine sand, no dilatancy, well sorted, wet, dense, very dark brown (10YR 2/2). WELL GRADED SAND (SW), fine to coarse grained sand, subrounded, rapid dilatancy, some fine to coarse subrounded to subangular gravel, trace subrounded cobbles (up to 2-3" dia.), wet, loose, dark yellowish brown (10YR 3/4), micaceous.	Borehole backfilled with Bentonite Grout / Chips
ARCADIS Infrastructure · Water · Environment · Buildings	Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = A Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips Surface capped with cold asphalt.	Date Depth Elev. 4/19/11 13-17' ATD NA

Well/Boring ID: RW-111P (Pilot Boring)

Borehole Depth: 65' bgs

Site Location:

DEРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description		Well/Boring Construction
40 45 50 55	10	RW-111-42	<u>4</u>	0.5/0.0	X		30000000000000000000000000000000000000	-as above, increasing cobbles. -as above, some fine gravel, soft, dark yellowish brown (10YR 3/4). WELL GRADED GRAVEL WITH SAND (GW), fine to coarse grained sand, subrounded, moderate dilatancy, fine to coarse subrounded to subangular gravel, some subrounded cobbles (up to 3-4" dia.), trace to some non-plastic silt, very poorly sorted, wet, loose, mottled gray to brown coloring. No recovery from 55' to 60' bgs.		Borehole backfilled with Bentonite Grout / Chips
		AF						Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chip Surface capped with cold asphalt.	At Da 4/19	Water Level Data te Depth Elev. 9/11 13-17' ATD NA oth measured from top of casing

Client: Kinder Morgan Energy Partners Well/Boring ID: RW-111P (Pilot Boring)

Borehole Depth: 65' bgs

Site Location:

Remarks: It bgs = feet below ground surface: NA = Not. Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.					et)	(u	is Sample		umr			
No recovery from SS to 60 bgs: FRARS SANGSTONE (SS), partially cemented alterators to sardatone, weathered Braylow FRARS SANGSTONE (SS), partially cemented alterators to sardatone, weathered Braylow FRARS SANGSTONE (SS), partially cemented alterators to sardatone, weathered Braylow FRARS SANGSTONE (SS), partially cemented alterators to sardatone, weathered Braylow FRANCE SANGSTONE (SS), partially cemented alterators to sardatone, weathered Braylow FRANCE SANGSTONE (SS), partially cemented alterators, weathered FRANCE SANGSTONE (SS), partially c	- F		ELEVATION	sample ID	Recovery (fe	PID/FID (ppn	Sieve Analys	USCS Code	Seologic Colu	Stratigraphic Description		
FRIARS SANDSTONE (8S), partially commenced silettines to sandstorne, weathered Boorkhole beautiful with the specified with the			.0 -	U)						No recovery from 55' to 60' bgs.		
Boratols baselified with a chapter Grout. -15 - -76 - -76 - -76 - -76 - -76 - -76 - -76 - -76 - -77 - -78 - -	F					0.0/0.0			::::			
Remarks: It bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	-		-							gray.		
Remarks: It bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	-		-									
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Dilling Dilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.			-					SS				Bentonite Grout /
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Dilling Dilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.			_									
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.		-1.	.5 -									
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.		55										
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	+											
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	+											
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	-											
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	-		-									
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	L		20 -									
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.			-									
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.			_									
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	ŀ											
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	+											
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	+											
Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	-		25 -									
Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.	-											
Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.			-									
Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.			-									
Applicable/Available; MSL = Mean Sea Level; ATD = At Time of Drilling Drilled approximately 7 ft east of well RW-111. Material Used: 52 cubic feet of Bentonite Grout / Chips.			-									
Time of Drilling Date Depth Elev. 4/19/11 13-17' ATD NA Infrastructure · Water · Environment · Buildings Material Used: 52 cubic feet of Bentonite Grout / Chips.	T									Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available: MSL = Mean Sea Level: ATD =	= At	Water Level Data
Infrastructure · Water · Environment · Buildings Material Used: 52 cubic feet of Bentonite Grout / Chips.		0	9	AF	20	Δ		5		Time of Drilling	D	
Material Used: 52 cubic feet of Bentonite Grout / Chips.												IS/II IS II AID INA
Surface capped with cold asphalt. Depth measured from top of casing										Material Used: 52 cubic feet of Bentonite Grout / Chill Surface capped with cold asphalt.		epth measured from top of casing

Date Start/Finish: 5/25/11 Drilling Company: Cascade Drilling

Driller's Name: Val Godoy Drilling Method: Rotary Sonic

Sampling Method: 10' x 6" Dia. Sonic Core Barrell

Rig Type: Sonic Drill

Northing: 1865175.32 Easting: 6293426.34 Casing Elevation: NA

Borehole Depth: 57.5' bgs Borehole Diameter: 10" Surface Elevation: 49.73' MSL Descriptions By: James Gonzales Well/Boring ID: RW-111 (GWE Well)

Client: Kinder Morgan Energy Partners Location: Mission Valley Terminal - Qualcomm

Stadium

9950 San Diego Mission Rd San Diego, CA 92108

Reviewed By: Sture C Beadle 6129

DEРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
- -	45 -					GM	70000000000	Air knife to 5' bgs on 4/14/11. Soil logged from air knife cuttings. Asphalt at surface. SILTY GRAVEL (GM), low to medium plastic silt, no dilatancy, subrounded to subangular fine to coarse gravel, some subrounded to subangular cobbles (up to 3-4" dia.), poorly sorted, moist, dense, mottled gray to brown coloring.	Concrete Vault (0-4' bgs)
- - - -						GW	000000000000000000000000000000000000000	-as above, moist. -as above, dark yellowish brown (10YR 4/4). WELL GRADED GRAVEL WITH SAND (GW), fine to coarse grained sand, subrounded, moderate dilatancy, fine to coarse subangular gravel, some silt, trace subrounded cobbles, poorly sorted, wet, very dark brown (10YR 2/2).	Concrete (4-7' bgs) Bentonite Chips (7-9' bgs)
	-					SP	Δ ····································	-as above, moist. POORLY GRADED SAND (SP), fine to medium grained sand, subrounded, moderate dilatancy, some coarse subrounded sand, some non-plastic silt, moderately sorted, very dark brown (10YR 2/2), micaceous. WELL GRADED SAND (SW), fine to coarse grained sand, subrounded, rapid dilatancy, trace subrounded fine to coarse gravel, trace silt, moderately sorted, wet,	6" Dia. SCH40 PVC Blank Casing (1-37' bgs)
- 15	35 - - -					sw		loose, soft, dark yellowish brown (10YR 3/4). -as above, increasing silt content.	Bentonite Grout (9-27' bgs) 10" Dia. Borehole

boring RW-111P. Actual Friars Sandstone contact determined from well RW-111.

Material Used: 18 cubic ft of #8 Sand, 18 cubic ft of Bentonite Grout/Chips, 2 cubic ft of Concrete Seal.

Well/Boring ID: RW-111 (GWE Well)

Borehole Depth: 57.5' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

DEPTH	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description		Well/Bo Construc	•
- 20	30 –	.				sw					- 10" Dia.
-	-					SM		SILTY SAND (SM), fine to medium subrounded sand, slow to moderate dilatancy, non-plastic silt, moderately sorted, wet, medium dense, medium loose, very dark brown (10YR 2/2).			Bentonite Grout (9-27' bgs)
- 25	- 25 -					SP		POORLY GRADED SAND (SP), fine to medium grained sand, subrounded, moderate dilatancy, some non-plastic silt, moderately to well sorted, wet, low density, loose, very dark brown (10YR 2/2).			- 6" Dia. SCH40
-	-					SM		SILTY SAND (SM), fine to medium subrounded sand, slow to moderate dilatancy, non-plastic silt, moderately sorted, wet, medium dense, very dark brown (10YR 2/2), micaceous.			PVC Blank Casing (1-37' bgs)
_	_					SP		POORLY GRADED SAND (SP), fine to medium grained sand, subrounded, moderate dilatancy, trace coarse sand, some non-plastic silt, moderately to well sorted, loose, soft, dark brown (10YR 3/3).			- Bentonite Chips
- 30	20 -					SM	-:::::::::::::::::::::::::::::::::::::	SILTY SAND (SM), fine to medium subrounded sand, slow to moderate dilatancy, non-plastic silt, moderately sorted, dark brown.			(27-32' bgs)
	-					sw		WELL GRADED SAND (SW), fine to coarse grained sand, subrounded, rapid dilatancy, some fine to coarse subrounded gravel, trace silt, dark brown.	• • •	•.•.•	
	-						- - - - - - - - - - - - - - - - - - -				
- - 35 -	- 15 - -					SW		WELL GRADED SAND (SW), fine to coarse grained sand, subrounded, rapid dilatancy, some fine to coarse subrounded to subangular gravel, trace subrounded cobbles (up to 2-3" dia.), wet, loose, dark yellowish brown (10YR 3/4), micaceous.			- #8 Mesh Sand (32-57.5' bgs)
-	-										- 6" Dia. SS Wire- wrapped Well Screen 0.040" Slot (37-57' bgs)



Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level

Drilled approximately 7 ft west of pilot boring RW-111P. Lithology determined from pilot boring RW-111P. Actual Friars Sandstone contact determined from well RW-111.

Material Used: 18 cubic ft of #8 Sand, 18 cubic ft of Bentonite Grout/Chips, 2 cubic ft of Concrete Seal.

Well/Boring ID: RW-111 (GWE Well)

Borehole Depth: 57.5' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

DЕРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
DEF	EE	Sam	Rec	B □	Sie	ίSη			
- 40 - - - - - 45	10 -					sw		-as above, increasing cobblesas above, some fine gravel, soft, dark yellowish brown (10YR 3/4).	#8 Mesh Sand (32-57.5' bgs)
- 50	- - -						0000	WELL GRADED GRAVEL WITH SAND (GW), fine to coarse grained sand, subrounded, moderate dilatancy, fine to coarse subrounded to subangular gravel, some subrounded cobbles (up to 3-4" dia.), trace to some non-plastic silt, very poorly sorted, wet, loose, mottled gray to brown coloring.	6" Dia. SS Wire-
- 55	-5-					GW	00000000000		wrapped Well Screen 0.040" Slot (37-57' bgs)
-	-					SS		No recovery from 55' to 57' bgs. FRIARS SANDSTONE (SS), weathered, gray.	Integrated Bottom Cap
	-						••••	Remarks: ft bgs = feet below ground surface; NA = Not Appli	[



Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level

Drilled approximately 7 ft west of pilot boring RW-111P. Lithology determined from pilot boring RW-111P. Actual Friars Sandstone contact determined from well RW-111.

Material Used: 18 cubic ft of #8 Sand, 18 cubic ft of Bentonite Grout/Chips, 2 cubic ft of Concrete Seal.

Date Start/Finish: 4/18/11

Drilling Company: Cascac

Drilling Company: Cascade Drilling Driller's Name: Val Godoy Drilling Method: Rotary Sonic

Sampling Method: 10' x 6" Dia. Sonic Core Barrell

Rig Type: Sonic Drill

Northing: 1864912.57 Easting: 6293271.05 Casing Elevation: NA

Borehole Depth: 60' bgs Borehole Diameter: 8.5" Surface Elevation: 45.35' MSL

Descriptions By: James Gonzales

Well/Boring ID: RW-112P (Pilot Boring)

Client: Kinder Morgan Energy Partners

Location: Mission Valley Terminal - Qualcomm

Stadium

9950 San Diego Mission Rd San Diego, CA 92108

Reviewed By: Store Beadle 6129

DЕРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description			Well/Boring Construction
-	45 -					GW	00000000000	Air knife to 5' bgs on 4/15/11. Soil logged from air knife cuttings. Asphalt at surface. WELL GRADED GRAVEL WITH SAND (GW), fine to medium grained sand, trace coarse grained sand, fine to coarse gravel and cobbles (up to 2-3" dia.).			
-5	40 -			0.5/0.0		SP		POORLY GRADED SAND (SP), mostly fine to medium grained sand, subrounded, moderate to rapid dilatancy, trace fine gravel, trace silt, moist, very dark grayish brown (2.5Y 3/2). -as above, rapid dilatancy, trace coarse grained sand, subrounded, trace silt, no plasticity, loose, soft, very dark grayish brown (10YR 3/3).	∇.	_	Borehole
- 10	35 -			0.9/0.0		sw		WELL GRADED SAND (SW), fine to coarse grained sand, subrounded to subangular, moderate to rapid dilatancy, trace non-plastic silt, trace subrounded to subangular fine to coarse gravel, trace subrounded cobbles (up to 2-3° dia.), wet, loose, soft, very dark brown (10YR 2/2).			Bentonite Grout / Chips
-	-							-as above, increasing gravel and cobbles, none to very trace fine sand matrix, rapid dilatancy. Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD) = At	V	Vater Level Data
		AF octure - Wa						Time of Drilling Drilled approximately 120 ft NW of well RW-112.		Date 4/18/	•

Well/Boring ID: RW-112P (Pilot Boring)

Borehole Depth: 60' bgs

Site Location:

ОЕРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description			Well/Boring Construction	
_ 2	25 - - -			0.2/0.0		sw		WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded to subangular, moderate to rapid dilatancy, trace non-plastic silt, non-cohesive, wet, loose, soft, very dark gray (10YR 3/1), micaceous.				
-	20 - - -	RW-112-26		0.0/0.0	X	ML		SILT (ML), mostly low plastic silt, no dilatancy, some fine subrounded sand, trace medium and coarse sand, moist to wet, black (10YR 2/1). WELL GRADED SAND (SW), fine to coarse grained sand, subrounded, with trace gravel.		_		lled with
- 3	0 15 –			0.0/0.0		ML		SILT (ML) as above. WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid dilatancy, no plasticity, some subrounded fine to coarse gravel and cobbles, dark brown (10YR 3/3). POORLY GRADED SAND (SP), mostly fine to medium grained sand, subrounded,			Bento Chips	nite Grout /
- 3	- - 5	RW-112-34		0.0/0.0	X	SP		moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium dense, loose, dark brown (10YR 3/3). WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid				
-	-	RW-112-38			X	SW ML		dilatancy, some fine to coarse subrounded gravel, trace subounded cobbles, wet, loose, soft, dark brown (10YR 3/3). SILT (ML), medium plastic silt, no dilatancy, firm, dense, stiff, dark brown. WELL GRADED SAND (SW), fine to coarse subrounded sand, rapid dilatancy,				
-						SW	::::	Remarks: ft bgs = feet below ground surface; NA = Not	1	100		
					P 1			Applicable/Available; MSL = Mean Sea Level; ATD : Time of Drilling	= At	Wa Date	Depth	Data Elev.
		AF	K	A	D	5		Drilled approximately 120 ft NW of well RW-112.	ŀ	4/18/11		NA
	Infrastructure · Water · Environment · Buildings								ips.			
	Torrelate CVD							очнасе сарреч жил соги аэрнан.			neasured from top	of casing

Well/Boring ID: RW-112P (Pilot Boring) Client: Kinder Morgan Energy Partners

Borehole Depth: 60' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium

	9950	sion Valley San Dieg Diego, CA	o Mi	ssion		aicom	m Sta	agium			
DEРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description		Well/Boring Construction	
- 40 - -	5-	RW-112-43		0.0/0.0	X	SW		some cobbles (up to -4" dia.), loose, soft, dark brown (10YR 3/3). -as above, moderate to rapid dilatancy, trace non-plastic silt, trace subangular fine gravel, wet.			
- 45	0-	RW-112-48		0.0/0.0	X	GW	00000000000	WELL GRADED GRAVEL WITH SAND (GW), fine to coarse grained sand, subrounded, rapid dilatancy, fine to coarse subrounded gravel, trace cobbles (up to 2" dia.), loose, soft, dark brown (10YR 3/3). -as above, increasing cobbles (up to 3" dia.). -as above, increasing cobbles (up to 4" dia.).	_		lled with nite Grout /
- 50 - - - -	-5 - - - - -10 -					SS		FRIARS SANDSTONE (SS), weathered, partially cemented silt and sand, wet, dense, gray (10YR 5/1).			
	- -	AF	RC	Ά	D	IS		Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = A Time of Drilling	At Date 4/18/*	•	Data Elev.
		ucture Wa						Drilled approximately 120 ft NW of well RW-112. Material Used: 48 cubic feet of Bentonite Grout / Chips Surface capped with cold asphalt.	S.	measured from top	

Client: Kinder Morgan Energy Partners Well/Boring ID: RW-112P (Pilot Boring)

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108 ,

Borehole Depth: 60' bgs

DEРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description		Well/Boring Construction
	-					SS		FRIARS SANDSTONE (SS), weathered, partially cemented silt and sand, wet, dense, gray (10YR 5/1).		
- 6!	-20 - - -					55				
	-30 -	AF ucture · Wa						Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level; ATD = Time of Drilling Drilled approximately 120 ft NW of well RW-112. Material Used: 48 cubic feet of Bentonite Grout / Chip Surface capped with cold asphalt.	4/1 ps.	Water Level Data ate Depth Elev. 8/11 9-12' ATD NA pth measured from top of casing

Date Start/Finish: 5/31/11 - 6/1/11 Drilling Company: Cascade Drilling Driller's Name: Val Godoy Drilling Method: Rotary Sonic

Sampling Method: 10' x 6" Dia. Sonic Core Barrell

Rig Type: Sonic Drill

Northing: 1864806.32 Easting: 6293321.53 Casing Elevation: NA

Borehole Depth: 53' bgs Borehole Diameter: 10" Surface Elevation: 44.79' MSL Descriptions By: James Gonzales Well/Boring ID: RW-112 (GWE Well)

Client: Kinder Morgan Energy Partners

Location: Mission Valley Terminal - Qualcomm

Stadium

9950 San Diego Mission Rd San Diego, CA 92108

Reviewed By: Swall Beadle 6129

DEРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description		Well/Boring Construction
	- - -					GW	0000000000	Air knife to 5' bgs on 4/15/11. Soil logged from air knife cuttings. Asphalt at surface. WELL GRADED GRAVEL WITH SAND (GW), fine to medium grained sand, trace coarse grained sand, some fine to coarse gravel and cobbles (up to 2-3" dia.).		Concrete Vau (0-4' bgs)
-5	40 -					SP	Δ ·	POORLY GRADED SAND (SP), mostly fine to medium grained sand, subrounded, moderate to rapid dilatancy, trace fine gravel, trace silt, moist, very dark grayish brown (2.5Y 3/2). -as above, rapid dilatancy, trace coarse grained sand, subrounded, trace silt, no plasticity, loose, soft, very dark grayish brown (10YR 3/3).		Concrete (4-7 bgs) Bentonite Chi (7-9' bgs)
- 10	35 -							WELL GRADED SAND (SW), fine to coarse grained sand, subrounded to subangular, moderate to rapid dilatancy, trace non-plastic silt, trace subrounded to subangular fine to coarse gravel, trace subrounded cobbles (up to 2-3" dia.), wet, loose, soft, very dark brown (10YR 2/2).	_	6" Dia. SCH4 PVC Blank Casing (1-31' bgs)
- 15	30 -					sw				Bentonite Gro (9-21' bgs)
	_							-as above, increasing gravel and cobbles, none to very trace fine sand matrix, rapid dilatancy.		le; MSL = Mean Sea

ARCADIS
Infrastructure - Water - Environment - Buildings

Drilled approximately 120 ft SE of pilot boring RW-112P. Lithology determined from pilot boring RW-112P. Actual Friars Sandstone contact determined from well RW-112.

Material Used: 20 cubic ft of #8 Sand, 13 cubic ft of Bentonite Grout/Chips, 2 cubic ft of Concrete Seal.

Well/Boring ID: RW-112 (GWE Well)

Borehole Depth: 53' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded to subrounded in				et)	(۳	sis Sample		nmn		Well/Poring
WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded to subrounded subrounded to subrounded to subrounded subrounded subrounded subrounded subrounded to subrounded sub	DEPTH	ELEVATION	Sample ID	Recovery (fe	PID/FID (pp	Sieve Analys	USCS Code		Stratigraphic Description	_
SILT (ML), mostly low plastic silt, no dilatancy, some fine subrounded sand, trace medium and coarse sand, moist to wet, black (10YR 2/1). MIL WELL GRADED SAND (SW), fine to coarse grained sand, subrounded, with trace gravel. MIL SILT (ML) as above. WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid dilatancy, or plasticity, some subrounded fine to coarse grained sand, subrounded, moderate dilatancy, some subrounded fine to medium grained sand, subrounded, moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium dense, loose, dark brown (10YR 3/3). WELL GRADED SAND (SP), mostly fine to medium grained sand, subrounded, moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium dense, loose, dark brown (10YR 3/3). WELL GRADED SAND (SP), mostly fine to medium grained sand, subrounded, moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium dense, loose, dark brown (10YR 3/3). WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium dense, loose, dark brown (10YR 3/3).	- 20	25 -					SW		subangular, moderate to rapid dilatancy, trace non-plastic silt, non-cohesive, wet,	Bentonite Grout (9-21' bgs)
medium and coarse sand, moist to wet, black (10YR 2/1). ML WELL GRADED SAND (SW), fine to coarse grained sand, subrounded, with trace gravel. ML SILT (ML) as above. WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid diatancy, so p basicity, some subrounded fine to coarse grained sand, subrounded, moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium dense, loose, dark brown (10YR 3/3). POORLY GRADED SAND (SP), mostly fine to medium grained sand, subrounded, moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium dense, loose, dark brown (10YR 3/3). SP WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid dilatancy, some fine to coarse subrounded gravel, trace subounded cobbles, wet, loose, soft, dark brown (10YR 3/3).	- - - 25	20 -							SILT (ML), mostly low plastic silt, no dilatancy, some fine subrounded sand, trace	Bentonite Chips (21-26' bgs)
SW SILT (ML) as above. WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid dilatancy, no plasticity, some subrounded fine to coarse gravel and cobbles, dark brown (10YR 3/3). POORLY GRADED SAND (SP), mostly fine to medium grained sand, subrounded, moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium dense, loose, dark brown (10YR 3/3). SP WELL GRADED SAND (SP), mostly fine to medium grained sand, subrounded, moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium dense, loose, dark brown (10YR 3/3). SP WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid dilatancy, some fine to coarse subrounded gravel, trace subounded cobbles, wet, loose, soft, dark brown (10YR 3/3). SIT (ML) as above. #8 Mesh (26-53' brown (10YR 3/3).	-	-					ML			6" Dia. SCH40 PVC Blank Casing (1-31' bgs)
WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid dilatancy, no plasticity, some subrounded fine to coarse gravel and cobbles, dark brown (10YR 3/3). POORLY GRADED SAND (SP), mostly fine to medium grained sand, subrounded, moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium dense, loose, dark brown (10YR 3/3). SP WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid dilatancy, some fine to coarse subrounded gravel, trace subounded cobbles, wet, loose, soft, dark brown (10YR 3/3). SP WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid dilatancy, some fine to coarse subrounded gravel, trace subounded cobbles, wet, loose, soft, dark brown (10YR 3/3).		15 –					SW		gravel.	
moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium dense, loose, dark brown (10YR 3/3). SP WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid dilatancy, some fine to coarse subrounded gravel, trace subounded cobbles, wet, loose, soft, dark brown (10YR 3/3). G* Dia. St wrapped Screen O Slot (31-8)	- 30	-							dilatancy, no plasticity, some subrounded fine to coarse gravel and cobbles, dark	#8 Mesh Sand (26-53' bgs)
WELL GRADED SAND (SW), mostly fine to coarse grained sand, subrounded, rapid dilatancy, some fine to coarse subrounded gravel, trace subounded cobbles, wet, loose, soft, dark brown (10YR 3/3).	-	10 -					SP		moderate dilatancy, some non-plastic silt, trace coarse grained sand, wet, medium	
	- 35	-					SW		dilatancy, some fine to coarse subrounded gravel, trace subounded cobbles, wet,	6° Dia SS Wire- wrapped Well Screen 0.040° Slot (31-51' bgs)
							ML			10" Dia. Borehole
Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean So		-						::::	+	



Remarks: ft bgs = feet below ground surface; NA = Not Applicable/Available; MSL = Mean Sea Level

Drilled approximately 120 ft SE of pilot boring RW-112P. Lithology determined from pilot boring RW-112P. Actual Friars Sandstone contact determined from well RW-112.

Material Used: 20 cubic ft of #8 Sand, 13 cubic ft of Bentonite Grout/Chips, 2 cubic ft of Concrete Seal.

Well/Boring ID: RW-112 (GWE Well)

Borehole Depth: 53' bgs

Site Location:

Mission Valley Terminal - Qualcomm Stadium 9950 San Diego Mission Rd San Diego, CA 92108

ОЕРТН	ELEVATION	Sample ID	Recovery (feet)	PID/FID (ppm)	Sieve Analysis Sample	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
- 40	5-					SW		some cobbles (up to ~4* dia.), loose, soft, dark brown (10YR 3/3). -as above, moderate to rapid dilatancy, trace non-plastic silt, trace subangular fine gravel, wet.	10" Dia. Borehole
- 45 - - - - 50	-5 -					GW	00000000000000	WELL GRADED GRAVEL WITH SAND (GW), fine to coarse grained sand, subrounded, rapid dilatancy, fine to coarse subrounded gravel, trace cobbles (up to 2" dia.), loose, soft, dark brown (10YR 3/3). -as above, increasing cobbles (up to 3" dia.). -as above, increasing cobbles (up to 4" dia.).	#8 Mesh Sand (26-53' bgs) 6" Dia. SS Wirewrapped Well Screen 0.040" Slot (31-51' bgs)
_	_					SS		FRIARS SANDSTONE (SS), weathered, partially cemented silt and sand, wet, dense, gray (10YR 5/1).	Bottom Cap
_ 55 -	-10 -								
		AF						Remarks: ft bgs = feet below ground surface; NA = Not Appl Level Drilled approximately 120 ft SE of pilot boring RW-boring RW-112P. Actual Friars Sandstone contact	-112P. Lithology determined from pilot

Infrastructure · Water · Environment · Buildings

Concrete Seal.

Material Used: 20 cubic ft of #8 Sand, 13 cubic ft of Bentonite Grout/Chips, 2 cubic ft of



APPENDIX B

CURRENT EXPLORATION RECORDS

Field exploration included a visual reconnaissance of the site, the drilling of 32 exploratory borings, and the advancement of 10 cone penetration tests (CPTs). The borings were drilled between February 11 and March 16, 2019 and the CPTs were advanced on March 18 and April 8, 2019. The maximum depth of exploration was about 101½ feet below surrounding grades. The approximate exploration locations are shown in Plate 1. Logs of the explorations are provided in Figures B-01 through B-42, immediately after the Boring Record Legends.

The exploratory borings were advanced by Pacific Drilling and Tri-County Drilling using several truck mounted drill rigs. Disturbed samples were collected from the borings using a 2-inch outside diameter unlined Standard Penetration Test (SPT) sampler. Less disturbed samples were collected using a 3-inch outside diameter ring lined sampler (a modified California sampler). Bulk samples were also collected. The samples were sealed in plastic bags, labeled, and returned to the laboratory for testing. A summary of the exploratory boring locations, elevations and depths is shown on the following page.

The drive samples were collected from the exploratory borings using several different automatic hammers with average Energy Transfer Ratios (ETR) ranging from approximately 79 to 89 percent. For each sample, the 6-inch incremental blow counts was recorded on the logs. The field blow counts (N) were normalized to approximate the standard 60 percent ETR, as shown on the logs (N_{60}). The California ring samples were also corrected for the 3-inch sampler diameter using Burmister's correction factor. Blowcounts that were influenced by flowing/heaving sands, gravel and cobbles are noted on the logs with a caret (^) as being inaccurate. Where sampler refusal was encountered (i.e., unable to drive the sampler more than the first six inches with 50 hammer blows), the blowcount is denoted as "REF".

The exploratory borings were logged using the Caltrans Soil and Rock Logging, Classification and Presentation Manual (2010) as a guideline. The Friars Formation materials are described in general accordance with Section 2.6.1.3 (i.e., Description of Poorly Indurated Rock) of the Caltrans Manual (2010).

The CPT soundings were advanced by Kehoe Testing and Engineering in general accordance with ASTM D5778. The CPT soundings were carried out by KTE using an integrated electronic cone system manufactured by Vertek. The CPTs were advanced using a 30-ton CPT rig. The cone used during the program was a 15 cm² cone and recorded the following parameters at approximately 2.5 cm depth intervals:

- Cone Resistance (qc)
- Sleeve Friction (f_s)
- Dynamic Pore Pressure (u)
- Inclination
- Penetration Speed



APPENDIX B

CURRENT EXPLORATION RECORDS (Continued)

CPT-2 and CPT-26 initially encountered refusal at depths of about 25 feet due to gravel and cobbles causing resistance to further advancement and flexure of the CPT rods. CPT-2 and CPT-26 were reattempted by locating a second CPT location a few feet away from the original location, which was able to be advanced to a depth of about 45 and 40 feet, respectively, where refusal on gravel and cobbles was encountered. SCPT-7 and CPT-11 both encountered relatively shallow refusal on gravel and cobbles at about 17 feet.

At locations SCPT-5, SCPT-7 and SCPT-13, shear wave velocity measurements were obtained at various depths. The shear wave was generated using an air-actuated hammer located inside the front jack of the CPT rig. The cone was equipped with a triaxial geophone, which recorded the shear wave signal generated by the air hammer. The above parameters were recorded and viewed in real time using a laptop computer. A summary of the collected shear wave measurements is presented in Figure B-42. Note: SCPT-13 was intentionally advanced through the previously grouted borehole of boring S-13 to obtain shear wave velocity measurements. Therefore, the CPT parameters (q_c , f_s and u) are not representative of the actual soil conditions at that location and are not presented in this report.

Note: the exploration locations were measured in the field using a Garmin GPSMAP 64st Global Positioning System (GPS) receiver and by visually estimating, pacing or taping distances from nearby landmarks, if available. The exploration elevations were estimated by interpolation using the referenced plans provided by Rick Engineering (see Plate 1). The locations and elevations provided should not be considered more accurate than is implied by the scale of the map and the accuracy of the equipment used to locate the explorations. The lines designating the interface between differing soil materials on the logs may be abrupt or gradational. Further, soil conditions at locations between the explorations may be substantially different from those at the specific locations we explored. The Boring Records are part of a geotechnical report which must be considered in its entirety.

	Exploratory Borings Summary (see Plate 1)										
Exploration ID	Latitude [°]	Longitude [°]	Top Elevation NAVD 88 [FT]	Exploration Depth [FT]	Bottom Elevation NAVD 88 [FT]	Figure No.					
S-1	32.78583	-117.12281	83	60	23	B-1					
S-2	32.78575	-117.12112	66	61	5	B-2					
S-3	32.78518	-117.12293	74	46.5	28	B-3					
S-4	32.78519	-117.12216	68	40.5	28	B-4					
S-5	32.78506	-117.12130	63	61	2	B-5					
S-6	32.78473	-117.12305	69	41.5	28	B-6					
S-7	32.78427	-117.12239	57	100.9	-44	B-7					



Exploratory Borings Summary (see Plate 1)									
Exploration ID	Latitude [°]	Longitude [°]	Top Elevation NAVD 88 [FT]	Exploration Depth [FT]	Bottom Elevation NAVD 88 [FT]	Figure No.			
S-8	32.78454	-117.12129	69	75.5	-7	B-8			
S-9	32.78409	-117.12310	59	36.5	23	B-9			
S-10	32.78382	-117.12202	66	71.3	-5	B-10			
S-11	32.78364	-117.12323	54	36.5	18	B-11			
S-12	32.78345	-117.12271	58	41.5	17	B-12			
S-13	32.78324	-117.12156	75	101.5	-27	B-13			
B-14	32.78253	-117.12331	51	31.5	20	B-14			
B-15	32.78151	-117.12375	51	36.3	15	B-15			
B-16	32.78221	-117.12111	78	85	-7	B-16			
B-17	32.78121	-117.12114	64	71.5	-8	B-17			
B-18	32.77992	-117.12352	48	20	28	B-18			
B-19	32.78029	-117.12116	54	4.4	49	B-19			
B-20	32.78179	-117.11850	77	61.5	16	B-20			
B-21	32.78185	-117.11713	62	45.9	16	B-21			
B-22	32.78194	-117.11562	54	21.5	33	B-22			
B-23	32.78312	-117.11643	58	70.4	-12	B-23			
B-24	32.78387	-117.11760	73	66.5	7	B-24			
B-25	32.78390	-117.11527	58	20	38	B-25			
B-26	32.78445	-117.11655	57	51.5	6	B-26			
B-27	32.78509	-117.11973	72	70.6	1	B-27			
B-28	32.78525	-117.11775	61	60.8	0	B-28			
B-29	32.78489	-117.11558	58	4.8	53	B-29			
B-30	32.78575	-117.11598	58	55.8	2	B-30			
B-31	32.78635	-117.11838	66	65.9	0	B-31			
B-32	32.78253	-117.11610	54	5	49	B-32			

	Exploratory Cone Penetration Test Soundings Summary (see Plate 1)										
Exploration ID	Latitude	Longitude	Top Elevation NAVD 88 [FT]	Exploration Depth [FT]	Bottom Elevation NAVD 88 [FT]	Figure No.					
CPT-2	32.78570	-117.12109	67	45.5	21	B-33					
SCPT-5	32.78504	-117.12129	63	57.4	6	B-34					
SCPT-7	32.78428	-117.12239	57	17.5	40	B-35					
CPT-11	32.78365	-117.12322	54	17.5	36	B-36					
SCPT-13	32.78324	-117.12156	75	66.8	8						
CPT-21	32.78186	-117.11714	61	35.2	26	B-37					
CPT-26	32.78448	-117.11658	57	39.8	17	B-38					
CPT-28	32.78526	-117.11774	61	45.0	16	B-39					
CPT-30	32.78567	-117.11602	58	42.8	15	B-40					
CPT-31	32.78633	-117.11839	66	43.0	23	B-41					



SOIL IDENTIFICATION AND DESCRIPTION SEQUENCE

9		Refe Sec		9	_
Sequence	Identification Components	Field	Lab	Required	Optional
1	Group Name	2.5.2	3.2.2		
2	Group Symbol	2.5.2	3.2.2		
	Description Components				
3	Consistency of Cohesive Soil	2.5.3	3.2.3	•	
4	Apparent Density of Cohesionless Soil	2.5.4		•	
5	Color	2.5.5			
6	Moisture	2.5.6			
	Percent or Proportion of Soil	2.5.7	3.2.4	•	0
7	Particle Size	2.5.8	2.5.8	•	0
	Particle Angularity	2.5.9			0
	Particle Shape	2.5.10		2-4	0
8	Plasticity (for fine- grained soil)	2.5.11	3.2.5		0
9	Dry Strength (for fine-grained soil)	2,5,12			0
10	Dilatency (for fine- grained soil)	2.5.13			0
11	Toughness (for fine-grained soil)	2.5.14			0
12	Structure	2.5.15			0
13	Cementation	2.5.16			
14	Percent of Cobbles and Boulders	2.5.17		•	
14	Description of Cobbles and Boulders	2.5.18		•	
15	Consistency Field Test Result	2.5.3		•	
16	Additional Comments	2.5.19			0

Describe the soil using descriptive terms in the order shown

Minimum Required Sequence:

USCS Group Name (Group Symbol); Consistency or Density; Color; Moisture; Percent or Proportion of Soil; Particle Size; Plasticity (optional).

= optional for non-Caltrans projects

Where applicable:

Cementation; % cobbles & boulders; Description of cobbles & boulders; Consistency field test result

REFERENCE: Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010).

HOLE IDENTIFICATION

Holes are identified using the following convention:

H - YY - NNN

Where:

H: Hole Type Code

YY: 2-digit year

NNN: 3-digit number (001-999)

Hole Type Code and Description

Hole Type Code	Description
Α	Auger boring (hollow or solid stem, bucket)
R	Rotary drilled boring (conventional)
RC	Rotary core (self-cased wire-line, continuously-sampled)
RW	Rotary core (self-cased wire-line, not continuously sampled)
Р	Rotary percussion boring (Air)
HD	Hand driven (1-inch soil tube)
НА	Hand auger
D	Driven (dynamic cone penetrometer)
CPT	Cone Penetration Test
0	Other (note on LOTB)

Description Sequence Examples:

SANDY lean CLAY (CL); very stiff; yellowish brown; moist; mostly fines; some SAND, from fine to medium; few gravels; medium plasticity; PP=2.75.

Well-graded SAND with SILT and GRAVEL and COBBLES (SW-SM); dense; brown; moist; mostly SAND, from fine to coarse; some fine GRAVEL; few fines; weak cementation; 10% GRANITE COBBLES; 3 to 6 inches; hard; subrounded.

Clayey SAND (SC); medium dense, light brown; wet; mostly fine sand,; little fines; low plasticity.



Project No. SD605

SDSU Mission Valley Site Development

BORING RECORD LEGEND #1

raphic	/ Symbol	Group Names	Graphic	/ Symbol	Group Names	
	GW	Well-graded GRAVEL Well-graded GRAVEL with SAND		CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY	
000	GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND			SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND	
	GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND		CL-ML	SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY.	
Ş	GW-GC	Well-graded GRAVEL with CLAY (or SILTY- CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		CL-ME	SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY With SAND	
0000	GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND			SILT SILT with SAND SILT with GRAVEL SANDY SILT	
	GP-GC	Poorly graded GRAVEL with CLAY (or St.LTY CLAY). Poorly graded GRAVEL with CLAY and SAND. (or St.LTY CLAY and SAND)		ML	SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT	
00000	GM	SILTY GRAVEL SILTY GRAVEL with SAND	3	01	ORGANIC lean-CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL	
	GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND	1	OL	SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND	
30	GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	333	0.	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT	
	sw	Well-graded SAND Well-graded SAND with GRAVEL	355	OL	SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND	
	SP	Poorly graded SAND Poorly graded SAND with GRAVEL		СН	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY	
	sw-sm	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL			SANDY fall CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND	
1	sw-sc	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAYEL (or SILTY CLAY and GRAVEL)		мн	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT	
	SP-SM	Poorly graded SAND with SILT and GRAVEL			SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND	
	SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY). Poorly graded SAND with CLAY and GRAYEL (or SILTY CLAY and GRAYEL)	B,	он	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY	
	SM	SILTY SAND with GRAVEL		- Ch	SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND	
	sc	SC CLAYEY SAND CLAYEY SAND with GRAVEL		0.1	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL	
	SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL	3	он	SANDY elastic ELASTIC SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SANI	
77. 4 7. 46 9. 6	PT	PEAT		OI /ON	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL	
SE		COBBLES COBBLES and BOULDERS BOULDERS	The state of the s	OL/OH	SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND	

_	FIELD AND LABORATORY TESTING
C	Consolidation (ASTM D 2435)
CL	Collapse Potential (ASTM D 5333)
	Compaction Curve (CTM 216)
CR	Corrosion, Sulfates, Chlorides (CTM 643; CTM 417 CTM 422)
CU	Consolidated Undrained Triaxial (ASTM D 4767)
DS	Direct Shear (ASTM D 3080)
EI	Expansion Index (ASTM D 4829)
M	Moisture Content (ASTM D 2216)
oc	Organic Content (ASTM D 2974)
P	Permeability (CTM 220)
PA	Particle Size Analysis (ASTM D 422)
PI	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89, AASHTO T 90)
PL	Point Load Index (ASTM D 5731)
PM	Pressure Meter
R	R-Value (CTM 301)
SE	Sand Equivalent (CTM 217)
SG	Specific Gravity (AASHTO T 100)
SL	Shnnkage Limit (ASTM D 427)
sw	Swell Potential (ASTM D 4546)
	Unconfined Compression - Soil (ASTM D 2166) Unconfined Compression - Rock (ASTM D 2938)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850)
UW	Unit Weight (ASTM D 4767)
	Passing No. 200 Sieve (ASTM D 1140)

SAMPLER GRA	PHIC SYMBOLS
Standard Penetrat	tion Test (SPT)
Standard Californi	a Sampler
Modified California	a Sample(2.4" ID, 3" OD)
Shelby Tube	Piston Sampler
NX Rock Core	HQ Rock Core
Bulk Sample	Other (see remarks)

Auger Drilling Rotary Drilling Dynamic Cone or Hand Driven Diamond Core

1)

▼ Static Water Level Readin (after drilling, date)

Term	Definition	Symbol
Material Change	Change in material is observed in the sample or core and the location of change can be accurately located.	1 10
Estimated Material Change	Change in material cannot be accurately located either because the change is gradational or because of limitations of the drilling and sampling methods.	
Soil / Rock Boundary	Material changes from soil characteristics to rock characteristics.	\approx

REFERENCE: Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010).



Project No. SD605

SDSU Mission Valley Site Development

BORING RECORD LEGEND #2

CONSISTENCY OF COHESIVE SOILS												
Description	Shear Strength (tsf)	Pocket Penetrometer, PP Measurement (tsf)	Torvane, TV. Measurement (tsf)	Vane Shear, VS, Measurement (tsf)								
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12								
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25								
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5								
Stiff	0.5 - 1	1-2	0.5 - 1	0.5 - 1								
Very Stiff	1 - 2	2 - 4	1-2	1-2								
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2								

Description	SPT N ₆₀ (blows / 12 inches)
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Greater than 50

	MOISTURE
Description	Criteria
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS										
Description Criteria										
Trace	Particles are present but estimated to be less than 5%									
Few	5 - 10%									
Little	15 - 25%									
Some	30 - 45%									
Mostly	50 - 100%									

	PA	RTICLE SIZE					
Descriptio	n	Size (in)					
Boulder		Greater than 12					
Cobble		3 - 12					
Caerral	Coarse	3/4 - 3					
Gravel	Fine	1/5 - 3/4					
	Coarse	1/16 - 1/5					
Sand	Medium	1/64 - 1/16					
	Fine	1/300 - 1/64					
Silt and Cla	ıy	Less than 1/300					

	CEMENTATION
Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

Plasticity

REFERENCE: Caltrans Soil and Rock Logging,
Classification, and Presentation Manual (2010), with
the exception of consistency of cohesive soils vs.
N ₆₀ .

Description	Criteria
Nonplastic	A 1/8-in. thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CONSISTENCY OF COHESIVE SOILS								
Description SPT N ₆₀ (blows/12 inches)								
Very Soft	0 - 2							
Soft	2 - 4							
Medium Stiff	4 - 8							
Stiff	8 - 15							
Very Stiff	15 - 30							
Hard	Greater than 30							

Ref: Peck, Hansen, and Thornburn, 1974, "Foundation Engineering," Second Edition.

Note: Only to be used (with caution) when pocket penetrometer or other data on undrained shear strength are unavailable. Not allowed by Caltrans Soil and Rock Logging and Classification Manual, 2010.



Project No. SD605

SDSU Mission Valley Site Development

BORING RECORD LEGEND #3

E	3OR	IN	G F	RECC	ORD	۱ ۱	PROJE SDSU			alley				PROJECT SD605		BORING S-1
9449 RILLIN Tri-C	NG COMI Ounty [NG EQUI	Road PANY Drilling PMEN	9	Diego, (Califorr			DRILL Hol BORII	ING M	ETHOD tem Au	TOTAL DI		/2019 GROUN	FINI 3/ LOGGED J. San	sh 8/2019 BY ders DEPTH/ <i>EL</i>	SHEET NO. 1 of 3 CHECKED BY C. Vonk EV. GROUNDWATER (
SAMPLI	rich D12 ING MET mer: 14	HOD	. Dro	p: 30 in.	(Auton	natic)	NOTES		%. No	= 1.4	60 $48N_{SPT} = 0.$	99Nua	83		▼ 34.0	/ 49.0
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	z°	MOISTURE (%)	DRY DENSITY (pcf)		DEPTH (feet)	GRAPHIC LOG	MC	DESC	CRIPTION A	AND CLASS	SIFICATION
_5	80 		B1	7 18	٨	٨	12.2	-	PA -200	- - - 5 —		UNDIF SAND trace g (2% Gr	FERENT (SC); bro ravel; lov avel; 52° graded S moist; mavel and	FIATED SU own; moist w to mediu % Sand; 40 	JRFICIAL; mostly firm plasticite (6% Fines) — — — silt and grate of medium	SOILS: CLAYEY ne sand; some fines; y. ravel (SP-SM); light a sand; few fines; trace mica.
–10	75 		31	50^			4.2		-200	- - - 10 — - -			- -	sampler sl	 n GRAVE	LS and COBBLES
-15 -20	65									15 —						
	60 		S2	7 13 15	28	42	18.3	-	-200	- - -	-		fines; so			dark brown; moist; and; few gravel.
GR	924	5 A	ctivi	A CONity Road	ad, S	uite	103	INC	OF SU LO WI' PR	THIS B BSURF/ CATION TH THE ESENTI	MARY APPL ORING AND ACE CONDIT IS AND MAY PASSAGE OF ED IS A SIMP NS ENCOUN	AT THE TIONS MA CHANGE OF TIME. PLIFICAT	TIME OF AY DIFFE E AT THIS THE DA	DRILLING. ER AT OTHE S LOCATIO TA	ER N	FIGURE B-1 a

E	BOR	IN(G F	RECC	DRD	١ ١	PROJE SDSU			allev				ROJI SD(ECT NU 605	MBER		BORING S-1		
SITE LO	CATION	1					0000					STAI	RT		FINISH	0010		SHEET NO.		
	NG COM		, San	Diego, (Jaillorr	ııa		DRILL	ING M	ETHOD		3/6	3/2019 	LOGO	3/8/2 SED BY		CHE	2 of 3 CKED BY		
	ounty [tem Au		EDTIL (C)			Sande			Vonk		
	NG EQUI		ı					8	NG DIA	. (IN)	60	ΈΡΙΗ (π)	83	ELEV) / 49.0	ROUNDWATER (ft)		
	ING MET		_				NOTES		٥, ١,		-					_				
Ham	mer: 14	IU IDS.	., Dro	p: 30 in.	(Auton	natic)	EIR	(~ 89	%, N ₆	0 = 1.4	$8N_{SPT} = 0$).99N _{MC}								
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ް	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESCF	RIPTI	ON AND) CLAS	SIFICAT	ΓΙΟΝ		
-	55	X	\$3	4 6 9	15	22	19.4	-	PA	-		Clayey mostly plastici	SAND (SO	C); m dium on o	nedium i sand; xide sta	dense some	; dark l	S (continued): brown; moist; nedium to high		
30 _ _ _ _	50		S4	3 8 15	23	34	18.3	-	-200	30 —			fine sand; g.	D (SM); medium dense; dark brown; moist; e sand; some fines; nonplastic; trace mica; noss)						
0CLOG.GDT 5/8/19			S5	5 7 8	15	22	25.6	-	-200	35 — - - -		Wet; m (30% F	iicaceous. iines)							
GBC_LOG_BORING_MMX_SOIL_SD_SD605_LOGS_PHASE_01-STADIUM.GPJ_GDCL_ATADIUM.GPJ_GPJ_GDC_ATADIUM.GPJ_GPJ_GDC_ATADIUM.GPJ_GPJ_GDC_ATADIUM.GPJ_GPJ_GDC_ATADIUM.GPJ_GPJ_GDC_ATADIUM.GPJ_GPJ_GDC_ATADIUM.GPJ_GDC_ATADIU	40		S6	26 50/3"	^	^	16.7	-	РА	40 — - - - 45 — -		wet; m fines; r (16% 0	ostly fine to nonplastic; Gravel; 78%	o coa trace <u>% Sa</u> drilli	arse sa e mica. nd; 6% ng on 0	nd; littl Fines	e coars	W-SM); brown; se gravel; few		
GRC_LOG_BORING_T	924	5 A	ctivi	A CON ity Roa o, Calif	ad, S	uite	103	INC	OF SU LO WI PR	THIS BOURFACATION TH THE ESENTE	ORING AND ACE CONDI S AND MAY PASSAGE	O AT THE ITIONS M. Y CHANG OF TIME. IPLIFICAT	Y AT THE L TIME OF D AY DIFFER E AT THIS I THE DATA ION OF TH	RILL AT C LOCA	ING. OTHER ATION		F	FIGURE B-1 b		

F	30R	INC	- F	RECO)RD	\	PROJE			alles				PROJECT		BORING S-1
SITE LC	CATION	1					SDSU	IVIISS	ion va	alley		STAF		FINIS	SH	SHEET NO.
	Friars		, San	Diego,	Califorr	nia		DDILL	INIC M	ETHOD		3/8	/2019	LOGGED	3/2019	3 of 3
	ounty [1							tem Au	ger			J. Sand		C. Vonk
	IG EQUI								NG DIA			DEPTH (ft)	GROUNI			EV. GROUNDWATER (
	ich D1	-						8			60		83		▼ 34.0	/ 49.0
	ING MET		D	20 i-	/ A 4 = . =	4:-\	NOTES		0/ NI	4.4	ONI	0.00N				
Hami	ner: 14	IDS.	, Dro	p: 30 in.	Auton	natic)	EIR	(~ 89 ⊤	%, N ₆	₀ = 1.4	BIN _{SPT} =	0.99N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	ND CLASS	IFICATION
_55	30		S7	75/6"	REF	REF	17.5	-	-200	- - - 55 —		Continuation and CC and	AND with fine to co sticity; tra	(Estimated of gravel (Si parse sand ace mica.	ficult drillir I 20% COE	g on GRAVELS
_60 _65 _70	2520201515		\$8	40 50/3"	50/3"	>100	17.3	-	-200	60 —		FRIAR SANDS yellowis unforcement (18% F Total D Ground feet. Boring benton concret This Bo must be A = Inar All soils (subrou on drill evaulat than 10 classific encour 15 feet	S FORM STONE; is she brown ured (Silt in sand; lited). grines) Pepth = 6 Awater m backfiller ite grout ite. bring Rece conside ccurate be sencoun unded, 3- rig chattr ion of dri % are no cation, w tetred in thick.	n; moist; moity SAND (\$ ittle fines; I of feet (Tar- easured do on 3/8/19 and capped cord is partered in its explowed by the cord is partered in its exploration of the cord in the cord i	get depth of a geotectivety. include up a diameter, ve auger if Percent C boring recurred. C ation were	ed; massive; weathered; very soft; dense; mostly fine to ty; mottled; weakly
GR	924	5 A	ctivi	A CON ity Roa	ad, S	uite	103	INC	OF SU LO WI PR	THIS BOBSURFACATION TH THE ESENTE	ORING AN ACE CONE S AND MA PASSAGE ED IS A SII	ID AT THE TOTIONS MAY CHANGE OF TIME.	TIME OF AY DIFFE E AT THIS THE DAT	R AT OTHE S LOCATIO	ER N	FIGURE B-1 c

F	30R	INI	3 F	RECO)RD	١	PROJE SDSU			alles :				PROJECT SD605		E	BORING S-2
	CATION		<u> </u>	·LOC			รมรบ	IVIISS	ion va	alley		STAF)	SD605		9	SHEET NO.
-			, San	Diego, 0	Califorr	nia							9/2019	I .	19/2019		1 of 3
	NG COM		-							ETHOD				LOGGED			KED BY
	ic Drilli									tem Au	•			S. Nar		C. V	
	vig EQUI		Γ					BORII 8	NG DIA	. (in)	61	EPTH (ft)	GROUNI 66	D ELEV (ft)	DEPTH/EI		OUNDWATER (
	ING MET	-					NOTE	_			01		00		₹ 25.0	742.2	
Hamı	mer: 14	l0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETF	R ~ 79	%, N ₆	0 = 1.3	$32N_{SPT} = 0$.88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	AND CLASS	SIFICATI	ON
	<u>65</u>									_		CONCI		pproximat	ely 3 inche	es of AS	SPHALT
-			B1 S2	2 2 6	8	11	16.2	-	PA EI	-		SAND mostly mediun PID=0.	(SC); me fine to co n plastici 6 ppm	edium dens parse sand ty; micace	d; some fin	(10YR 4 nes; few	4/3); moist;
_5	_		B1	10					CR	5 —		PID= 0	•	770 Garia,	0470111103	3)	
	60 		R3	10 10 16	26	23				-							
- 	55		S4	3 5 5	10	13	19.8	-	-200 Pl	- 10 — - -		4/2); m trace fi	oist; mos ne grave !5 tsf; PII	AY (CL); st stly fines; s l; medium D=0.5 ppm	some fine to plasticity.	– – – – rayish b to medii	- — — — - rown (2.5Y um sand;
- —15 -	50		S5	2 3 5	8	11	21.3	-		- 15 — -		No grav PP=1.2	vel; mica 25 tsf; PII	ceous. D=0.6 ppm	n		
_20	45		S6	2 3 4	7	9	19.7	-		- 20 — - -	\			ace fine gra D=0.4 ppm	avel; iron o	oxide sta	aining.
GR	924	5 A	ctivi	A CON ty Roa o, Calif	ad, S	uite	103	INC	OF SU LO WI PR	THIS BOBSURFACATION TH THE ESENTE	MARY APPL ORING AND ACE CONDI'S S AND MAY PASSAGE (ED IS A SIMINS ENCOUN	AT THE TIONS MATE OF TIME. PLIFICAT	TIME OF AY DIFFE E AT THIS THE DAT	DRILLING. R AT OTHI S LOCATIO FA	ER N		GURE B-2 a

F	30R	IN	G F	RECC)RD	١ ١	PROJEC SDSU			alley				OJECT	NUMBER	BORING S-2
ITE LC	CATION	ı		Diego, (รบรบ	IVIISS	ion va	alley		START 2/19/20		FIN		SHEET NO. 2 of 3
Pacif Pacif RILLIN Diedr	i G COM ic Drilli i G EQUI rich D5	PANY ng PMEN ⁻ 0						Hol BORII 8		ETHOD tem Au (in)			L	ogged S. Nar	BY veson	CHECKED BY C. Vonk EV. GROUNDWATER
	ng met ner: 14		, Dro	p: 30 in.	(Auton	natic)	NOTES		%, N ₆	_{io} = 1.3	32N _{SPT} = 0.	88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	DI	ESCRI	PTION /	AND CLASS	IFICATION
	40 	X	R7	3 4 7	11	10	22.8	-	-200 Pl	-		Sandy lean (brown (2.5Y	CLAY 4/2); \ d; trac rbed.	(CL); s wet; mo e fine o	oft to medi	SOILS (continued): um stiff; dark grayish some fine to lium plasticity;
-30	35 		S8	4 5 7	12	16	19.0	-		30 —			4/2); ne gra	mostly avel; m	fines; little	stiff; dark grayish fine to medium ticity.
35	30 		S9	15 4 5	9	12	15.8	-	-200	35 — - - -			vet; m ne gra	ostly fi	ne to medi	dark grayish brown um sand; some ticity.
.40	25 25		S10	5 3 3	6	8	24.7	-	-200	40 — - -		Loose; grayis coarse sand; PID=0.3 ppm (38% Fines)	low to			ostly medium to y.
45	20		R11-1 R11-2	12 14 15	29	26	22.4	102	DS	- 45 — - - -		(2.5YR 5/1); (poorly grade	E; fine highly ed SAI ine to	to coa weath ND with coarse	erse graine ered; very n silt (SP-S sand; few	d; massive; gray soft; unfractured; M); medium dense; to little fines; trace
GR	924	5 A	ctivi	A CON ty Roa o, Calif	ad, S	uite	103	INC	OF SU LO WI' PR	THIS BOBSURFACATION TH THE ESENTE	ORING AND ACE CONDIT S AND MAY PASSAGE C	ES ONLY AT T AT THE TIME (TIONS MAY DIF CHANGE AT T OF TIME. THE I PLIFICATION O	OF DR FER A HIS LO DATA	ILLING AT OTH OCATIO	ER ON	FIGURE B-2 b

F	3OR	INC	3 R	RECO)RD	١ ١	PROJE			llov					NUMBER	BORING S-2
	CATION		<i>-</i> '		·		SDSU	IVIISS	IUII V	шеу		START	- 1	SD605		SHEET NO.
			San	Diego,	Californ	nia						l l	/2019		/19/2019	3 of 3
	IG COM		, Can	Diego,	Camon	iiu —		DRILL	ING M	ETHOD		2/10	72013	LOGGED		CHECKED BY
	ic Drilli									tem Au	ner			S. Nar		C. Vonk
	IG EQUI	_	r						NG DIA			OFPTH (ft)	ROUNE			.EV. GROUNDWATER
	ich D5							8	10 5	. (,	61	(,	66	, (11)	▼ 23.8	
	NG MET						NOTES								<u>¥</u> 20.0	1 72.2
			. Droi	p: 30 in.	(Auton	natic)			%. N.	。= 1.3	32N _{SPT} = (0.88Nuc				
			, =		(, , , , , , ,				70, 116	0	- 1561	3.33. IMC				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	N° 2	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CLASS	SIFICATION
	15 		S12-1 S12-2	25 35 50/5"	85/11"	>100	17.5	-	PI	- - -		CLAYST moderat with san	ONE; fi ely wear d (CH); d; high p	ne graine thered; ve	d; massive ery soft; un ist; mostly	: *Poorly-indurated e; gray (2.5Y 5/1); fractured (fat CLAY fines; few to little
_55	10 10 		S13	20 28 50/3"	78/9"	>100	17.4	-		-55 — - - -		grained; weather very der	massive ed; very ise; wet; ic, weak	e; gray (2 soft; unfr ; mostly fi	.5YR 5/1);	
–60	— —5	X	S14	30 50/6"	50/6"	>100	17.3	-	-200	60 —		(Little fin (18% Fir				
												Total De	pth = 61	feet (Tar	get depth	reached).
	_									_		Groundy feet.	vater me	easured d	luring drillir	ng at a depth of 23.8
-65	-									- 65 —			e grout a			after drilling with ck-dyed rapid set
	0									-					t of a geoto d in its enti	echnical report rety.
										-		(granitic based o	subroundrill rig	inded, 3-i	to 12-inch	o to 10% COBBLES diameter), estimated auger inclination, s.
-70										70 —		*Geolog	ic Descr	ription; (D	isturbed So	oil Description).
	 -5									-						
	_									-						
]					
										_						
	_									_						
GR				A COI				INC) OF	THIS BO	ORING ANI	LIES ONLY D AT THE T ITIONS MA	ME OF I	DRILLING	.	FIGURE
				ty Ro					LO WI PR	CATION TH THE ESENTE	S AND MA PASSAGE	Y CHANGE OF TIME. 1 IPLIFICATIO	AT THIS HE DAT	LOCATIC A	N	B-2 c

E	BOR	ZINO	G R	RECC	DRD	١ ١	PROJE SDSU			allev					ECT N 605	IUMBER		BORING S-3
SITE LO	CATION	1					0000	IVIIOO	ion ve	шсу		STAF			FINIS			SHEET NO.
9449 DRILLIN			, San	Diego, (Californ	nia		DRILL	ING M	ETHOD		2/2	6/2019	LOGG	3/1 GED E	/2019	CHE	1 of 3 ECKED BY
	ic Drilli							1			asing Advar	ice (36	-45')	S.	Narv	eson	C.	. Vonk
	IG EQUI		Γ						NG DIA	. (in)		PTH (ft)		ELE\	V (ft)			ROUNDWATER (f
	ich D5	-					NOTE	8 S			46.5		74			₹ 28.2	2 / 45	8
			, Dro	p: 30 in.	(Auton	natic)	_		%, N ₆	0 = 1.3	$32N_{SPT} = 0.8$	8N _{MC}						
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTI	ON AI	ND CLAS	SIFICA	ATION
_												PAVEN Conci		pproxi	imate	ly 4 inch	es of	ASPHALT
-			B1				11.1	-	PA	-		SAND mostly plastici (0% Gr	(SC); dar fine to co ty. avel; 68%	rk yello barse : % San	owish sand; nd; 32	brown (some fi % Fines	(10YR nes; ti	_S: Clayey 4/4); moist; race gravel; low
<u>_</u> 5	_			15						5 –		Slow a	nd difficu · — — — -	ılt drilli — — —	ing or	GRAVI	ELS a	nd COBBLES.
-		X	S2	14 23	37	49	10.1	-				moist; r	mostly fir nonplast	ne to c				n (10YR 5/4); nes; trace
- - 10 -	65 		R3-1 R3-2	9 16 23	39	34	18.3	107	-200 PI	10 —		fines; s	ome fine on oxide) tsf	sand	; trace	own (10\ e gravel;	— — — YR 5/3 ; medi	s); moist; mostly um plasticity;
- 15 -	60 		S4	4 5 9	14	18	18	-		15 _		micace	iff; very c ous.) tsf; PID:	J	,	n brown	(10YR	3/2);
- 20 -	55 		R5-1 R5-2	9 8 36	44	39	16.6	113	-200	20 –		4/4); m (44% F — — —	oist; mos ines)	stly fin	e san - – –	d; some	fines; 	h brown (10YR low plasticity.
	 50									-		(Estima	nd difficu ated 10-2 nent failu	20% C	OBBI	LES).		d COBBLES.
GR				A CON				INC	OF SU	THIS B BSURF	MARY APPLIE ORING AND A ACE CONDITI	T THE T ONS MA	TIME OF AY DIFFE	DRILL R AT (ING. OTHE			FIGURE
				ty Roa , Calif					WI ⁻ PR	TH THE ESENT	NS AND MAY (PASSAGE OF ED IS A SIMPI NS ENCOUNT	TIME. IFICAT	THE DAT	ГΑ				B-3 a

E	BOR	RINC	3 F	RECC	DRD	\	PROJE SDSU			ıllev				PROJECT SD605		BORING S-3
SITE LO 9449	CATION Friars	N Road		Diego, (0200					STAR 2/2	т 6/2019	FINI	sн 1/2019	SHEET NO. 2 of 3
	IG COM ic Drilli									ETHOD 6') / Ca	asing Adv	ance (36	-45')	S. Nar		C. Vonk
ORILLIN	IG EQUI	PMEN1	•					BORII	NG DIA		TOTAL D		GROUNI		DEPTH/E	LEV. GROUNDWATER
	ich D5	-					NOTES	8			46.5		74		▼ 28.2	2 / 45.8
			, Dro	p: 30 in.	(Auton	natic)			%, N ₆	0 = 1.3	$32N_{SPT} = 0$.88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	% 2	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	ND CLASS	SIFICATION
	 45			224						- - - 30 —		Slow a	nd difficu		n GRAVE	SOILS (continued) L and COBBLES.
			S6	22^ 25^ 47^	^	۸			PA	- - -		wet; monplas (34% G Gravel	ostly fine stic. Gravel; 52 in sampl	e to coarse 2% Sand; ler; PID=0	sand; sor	
_35			B10 S7	100/6"	REF	REF			-200 PI	35 — - -		4/4); we gravel; (59% F	et; mostly medium ines). GRAVE	y fines; son plasticity. ————— L with sand	me fine to 	rish brown (10YR o coarse sand; trace
- -40 -	35		S8	100/6"	REF	REF				- 40 — - -		sand and Equipm casing	nd fines; nent failu advance	low plastic	city. d drive ca tri-cone d	ome fine to coarse ap at 36 ft). Switch to
45 - -	30 		S 9	23 37 34	71	>100			-200	45 — - -		SANDS (2.5Y 6 unfract to medi plastici (16% F	STONE; f /1); wet; ured (Cla um sand ty; weakl ines).	moderatel ayey SANE d; little fine ly cemente	dium grair y weather) (SC); ve s; trace fir ed).	ned; massive; gray red; very soft; ery dense; mostly fine ne gravel; low
	<u>25</u>									-			stem au			th Reached). ing advancement (36
GR				A CON				INC	OF SU	THIS BO BSURF	ORING AND ACE CONDI	IES ONLY AT THE TIONS MA	AT THE	R AT OTHE	≣R	FIGURE
				, Calif					WI ⁻ PR	TH THE ESENTE	PASSAGE	OF TIME. PLIFICAT	THE DA	S LOCATIO TA THE ACTUA		B-3 b

		111				. [PROJE	CT NAI	ME						Г NUMBER	₹	BORING
			ז כ	RECC	ノベレ	'	SDSU	Miss	ion Va	alley				SD60			S-3
SITE LO			C	Diaz-	O 0 1:4	.i.						STAF		I	NISH		SHEET NO.
9449 DRILLIN			, ຣan	Diego,	Jaiitorr	ııa		י ייםת	ING M	ETHOD		2/2	6/2019	LOGGE	3/1/2019		3 of 3 ECKED BY
	ic Drillii										eina ^ d	vance (36	:_15'\		rveson		ECKED BY C. Vonk
DRILLIN			Г						NG DIA							- 1	GROUNDWATER (ft)
	ich D5		•					8	10 5.71	(,	46.5	D (,	74	J (., JE. 11. ▼ 28		
SAMPLI							NOTES				1 .0.0				1 + =0	,	
Hamn	ner: 14	0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	2 ~ 79	%, N ₆	0 = 1.3	2N _{SPT} =	$0.88N_{MC}$					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	N ₀	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CLA	SSIFIC	ATION
55										- - - 55 —		feet. Boring benton concre This Bo which I	backfille ite grout te. oring Rec nust be c	d on 3/1/ and capp cord is pa considere	19 shortly bed with b art of a ge ed in its en	after of lack-dynamics of the contract of the	drilling with yed rapid set alical report
- -60 -	15 									60 —		(graniti based and vis greater descrip Cobble approx	c, subrou on drill ri- ual evau than 10 tion and -rich laye imately 5	unded, 3- g chatter, llation of % are no classifica ers encou 5 to 10 fee	to 12-inc excessived drill cutting ted in the ation, whe untered in et thick.	th diam ye auge gs. Pe boring ere end this ex	neter), estimated er inclination, rcent COBBLES
65 _ _ _										65 — - -							
70 - 70 - 										70 — - - -							
GR	924	5 A	ctivi	A CON ty Roa o, Calif	ad, S	uite	103	INC	OF SU LO WI PR	THIS BO BSURFA CATIONS TH THE I ESENTE	ORING AN CE CONI S AND MA PASSAGE D IS A SI	PLIES ONL' ND AT THE DITIONS MAY CHANGI E OF TIME. MPLIFICAT UNTERED.	TIME OF AY DIFFE E AT THIS THE DA	DRILLING R AT OTH LOCATH TA	G. HER ON		FIGURE B-3 c

E	3OR	IN	G F	RECC	ORD	١ ١	PROJE SDSU			allev				PROJECT SD605		BORING S-4
9449	Friars	Road	l, San	Diego, (Califorr					ETHOD		3/8/2	018	FINI	sн 8/2019	SHEET NO. 1 of 3 CHECKED BY
	ounty [_							tem Au				J. San		C. Vonk
	NG EQUI		Γ					BORII 8	NG DIA	(in)	40.5		ROUND 68	ELEV (ft)	DEPTH/EL	EV. GROUNDWATER / 47.0
AMPLI	ING MET	HOD					NOTES	3								
Hamr	mer: 14	0 lbs	., Dro	p: 30 in.	(Auton	natic)	ETR	~ 89	%, N ₆	_{:0} = 1.4	$48N_{SPT} = 0.9$	99N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION A	ND CLASS	SIFICATION
											777	PAVEME CONCRE		oproximate	ely 4 inche	es of ASPHALT
	 65 		B1				15.6	-	PA	- - -		UNDIFFE	RENTI C); brog	wn; moist; ; low plast	; mostly fir ticity.	SOILS: Clayey ne sand; little fines;
_5	_	X	S1	4 6 7	13	19	19.5	-		5 <u> </u>		Medium o	dense;	trace mica	a. 	
	60 									-		Lean CLA				moist; mostly fines; plasticity.
-10	55		S2	4 6 8	14	21	20.2	-	-200 PI	10 — - -		Stiff; brov PP=1.75 (71% Find	tsf	rbedded.		
-15			S3	2 7 7	14	21	18.8	-	РА	- 15 — - -		mostly fin	ies; sor a; som	ne sand; ı e mottling	medium pl	- — — — — — — stiff; brown; moist; lasticity; thin layers;
-20			S4	3 7 7	14	21	19.8	-	-200 PI	- 20 — - -	*	Very stiff; bedding; PP=2.75 (59% Find	organio tsf			m plasticity; no
GR				A CON				INC	C OF	THIS B	MARY APPLII ORING AND A ACE CONDIT	AT THE TIN	ME OF [ORILLING.		FIGURE
				ty Roa , Calif					LO WI PR	CATION TH THE ESENTE	IS AND MAY PASSAGE O ED IS A SIMP NS ENCOUN	CHANGE A F TIME. TH LIFICATION	AT THIS HE DAT	LOCATIO A	N	B-2 a

E	BOR	INC	G F	RECC	ORD	\	PROJE SDSU			alley				PROJEC SD6	CT NUMBER 05		BORING S-4
9449		Road	, San	Diego, (Californ							START 3/8/2			INISH 3/8/2019		SHEET NO. 2 of 3
	IG COM									ETHOD				LOGGE		1 -	CKED BY
	ounty [IG EQUI		-						IOW S	tem Au		DTU (f+) C	POLINE		anders		Vonk ROUNDWATER
	ich D1							8	NG DIA	. (111)	40.5	.F 111 (II)	68	, LLLV ((it) DEF117/2 ▼ 21.0		
	NG MET						NOTES				10.0				± =	J ,	
Hamr	ner: 14	0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	² ~ 89	%, N ₆	₅₀ = 1.4	$18N_{SPT} = 0.9$	$99N_{MC}$					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	:RIPTIO	N AND CLAS	SIFICA	TION
		\times	S5	18^ 50/2" ^	٨	^	11.9	-				UNDIFFI	FRFNT	IATED	SURFICIAL	SOII	.S (continued)
-30	40 40 			30/2						30 — - - - -		Poorly-graph brown; wasome grayon cobble	raded S ret; mos avel and es. d difficul ad polyn	AND welly med cobble	vith gravel ardium to coar es; trace mid 	nd cob se sar ca; sar EL and	bbles (SP); nd; little to mpler refusal d COBBLES.
35			\$6 \$7	17 34 50	84	>100	16.6	-	PA	35 — 40 —		SANDST brown; w unfractur to mediu cemente	ONE; f ret; mod red; *(Si m sand d).	ine to n derately ilty SAN ; little fi	weathered;	ned; m ; very : ry den stic; m	nassive; yellow soft; se; mostly fine
			0.	00/0						-		Total Dor	oth - 40) 5 foot	(Target dep	th roo	chod)
	 25									_		Groundw			d after drillin		
45										- 45 —		heaving	sand.		added dowr		
	_									-					3/19 with ber I rapid set co		
	_									_	-	^ = Inacc				ا - المحدد	ool ro
	20 									-		which mu	ust be c	onside	part of a geo red in its ent	irety.	cai report 0% COBBLES
												(granitic,	subrou	nded, 3	3- to 12-inch		eter), estimated
GR				A CON				INC	OF SU	THIS BOBSURF	MARY APPLII ORING AND A ACE CONDIT	AT THE TI IONS MAY	ME OF I ' DIFFEI	DRILLIN R AT OT	IG. THER	F	FIGURE
				ty Roa , Calif					WI [*] PR	TH THE ESENTE	IS AND MAY PASSAGE O ED IS A SIMP NS ENCOUN	F TIME. T	HE DAT	Α			B-2 b

F	3OR	·····	 G F	RECC)RD	\	PROJE			allav				PROJECT		R	BORING S-4
	CATION		<u> </u>				SDSU	IVIISSI	IOH Va	alley		STAF	RT	FIN			SHEET NO.
			l, San	Diego, (Californ	nia							3/2018	3,	/8/2019		3 of 3
	NG COM		_					l		ETHOD		•		LOGGED		1 -	CKED BY
	ounty [NG EQUI								NG DIA	tem Au		DEPTH (ft)	GROUNI	J. Sar			. Vonk SROUNDWATER (ft)
	rich D1							8		,	40.5		68	()		1.0 / 47	
	ing MET mer: 14		., Dro	p: 30 in.	(Auton	natic)	NOTES		%, N ₆	0 = 1.4	8N _{SPT} =	0.99N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CL/	ASSIFICA	ATION
55 - 60 - 65 - 70	151010500									60 — 65 — 70 —		and vis greater descrip Cobble approx	tual evalue than 10° otion and rich laye imately 5	ation of c % are not classifica ers encou to 10 fee	Irill cutti ed in the tion, wh ntered i t thick.	ngs. Pei e boring iere enc n this ex	er inclination, recent COBBLES record ountered. exploration were escription).
										_							
GR				A CON				INC	OF SU	THIS BO BSURFA	ORING A	PLIES ONL' ND AT THE IDITIONS MA IAY CHANGI	TIME OF AY DIFFE	DRILLING R AT OTH	ER		FIGURE
				o, Calif					WI [*] PR	TH THE ESENTE	PASSAG D IS A S	E OF TIME. IMPLIFICAT OUNTERED.	THE DAT	A			B-2 c

F	$R \cap R$	INI	3 F	RECC	RD)	PROJE			. 11				PROJECT NUM	BER	BORING S-5
	CATION		<u> </u>	,)	-	SDSU	IVIISS	ion va	aney		START		SD605		SHEET NO.
			, San	Diego,	Califorr	nia						3/8/20)19	3/8/20	19	1 of 3
RILLIN	IG COMI	PANY						DRILL	ING M	ETHOD				LOGGED BY	С	HECKED BY
	ic Drilli										ud Rotary			S. Narveso		C. Vonk
	IG EQUI		Γ					l	NG DIA	. (in)						GROUNDWATER
	ich D5	-					NOTE	8/4			61	0	3	Ā	21.0 / 4	42.0
			, Dro	p: 30 in.	(Auton	natic)			%, N ₆	o = 1.3	$32N_{SPT} = 0$.88N _{MC}				
				Zws						-						
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	3LOW/FT "N"		MOISTURE (%)	(pcf)	ا _د س	DEPTH (feet)	<u>0</u>					
<u> </u>	/AT eet)		PLE	TR/ IST/ NS/	N/F	zº	STU %)	Scf)	OTHER TESTS	Ξ	GRAPHIC LOG		DESC	RIPTION AND	CLASSIFI	CATION
EP.	E.E.	MP	AMI	ENE SESI	LO S		Q	DRY D	5#	Ē.	GR,					
	ш	δ	o)	E = @	ш		_	띰								
		XXXX									/ . /			oproximately 4	inches	of ASPHALT
												CONCRET	IE.			
												UNDIFFER	RENT	IATED SURFI	CIAL SC	DILS: Clayey
		\bowtie	B1				11.0	_	PA					ei (SC); yellow e to coarse sa		vn (10YR 5/4); e fines; little
-	60		Β,				11.0		PI			gravel; me	dium	plasticity.	•	,
-												•		% Sand; 35%	·	
5										5 –		Rig chatter	r at 3.	5 ft on gravel a	and pote	ntial cobble layer
				4		_				J –		Loose; trad	ce org	anics (plant ro	ots).	
-			S2	3 4	7	9										
				_												
	55															
	_															
40										40						
10	_			5 7						10 –		C:It. CANE		·		
-	_		R3	7 9	16	14	12.2	95	-200			moist; mos	stly fin	e sand; few to	little fine	n (7.5 YR 5/2); es; nonplastic;
												grading to \ (20% Fine:	poorly	y-graded SAN	D .	
												·				
-	 50										1			AND (SP); me ist; mostly fine		
-												nonplastic.		ist, mostly mie	Sanu, iii	ace illes,
15										15						
15				1	_					15 –	V//			(CL):	ft. dad.	arovich brown
ļ	_	X	S4	1 2	3	4	34.5	-			$\frac{1}{2}$	(10YR 4/2)	r with); mois	sand (CL); so st; mostly fines	ιι, αark (s; little fir	grayish brown ne sand; medium
				_								to high pla PP=0.25 ts				
												11-0.20 8	JI, I`IL	-0.0 ppiii		
-	45									•						
-											1///					
20										20 –						
∠∪				2	_				_	20 –		Madium at	:ff. ~-	rk grov (Class	/NI\a+	· modium
			R5-1 R5-2	3 4	7	6	41.6	79	-200 PI		///	plasticity.		rk gray (Gley 4		, mealum
	_								С		1//	PP=0.5 tsf (75% fines		0.4 tsf PID=0.2	2 ppm	
												(10/0111165	,,			
}	40										1///					
}	_															
CD4		רב	. T		16111	T ^ •	ITC	INIC	ŢH			IES ONLY AT				EICHDE
GK(CON				INC	OF SU			OAT THE TIM TIONS MAY D				FIGURE
				ty Roa							NS AND MAY PASSAGE (CHANGE AT				B-5 a
	_			, Calif												

₽∩	DINI4	2 5	RECC	חסל	١ ١	PROJE								NUMBER	BORING
SITE LOCATION		Jr	_(\	ノベレ	,	SDSU	Miss	ion Va	alley		STAF) ,	SD60	5 ііѕн	S-5 SHEET NO.
9449 Fria		l, San	Diego, (Califorr	nia							/2019		л эн /8/2019	2 of 3
DRILLING CO	MPANY								ETHOD				LOGGED		CHECKED BY
Pacific Dr	_	_						A (0-4 ng dia		ud Rotary (rveson	C. Vonk
Diedrich E	-	•					8/4		. (III)	61	P 1 H (II)	63	D ELEV (III	1) / 42.0
SAMPLING M						NOTE								1 +	
Hammer:	140 lbs	., Dro	p: 30 in.	(Auton	natic)	ETR	R ~ 79	%, N ₆	0 = 1.3	$32N_{SPT} = 0.3$	38N _{MC}				
DEPTH (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z ^o	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CLASS	SIFICATION
- — - — - —35		S6	2 3 5	8	11	24.0	-	-200	- - -		Poorly- 5/1); w	graded Set; mostlestic; mica 8 ppm	SAND (SF y fine to n); medium	SOILS (continued): dense; gray (10YR nd; trace fines;
30		S7	1 2 8	10	13	21.9	-	-200	30 —		gray (1 to little PID=5. (12% F	OYR 5/1) fines; no 2 ppm ines)); wet; mo	stly fine to trace mica	SM); medium dense; o medium sand; few DBBLES from 32 to
35		S8	9 11 12	23	30	21.6	-	-200	35 — - -		(Estima Well-gr gray (7	aded SA .5YR 3/1 fines; no ines)	l); wet; mo	silt (SW-SN	M); dense; very dark o medium sand; few
40		, S9	10 10 9	19	25	14.5	-	PA	- 40 — - -		bit) Mediun fine to	n dense; medium	yellowish	brown (10	ry (Tricone rotary drill DYR 5/4); few to little s)
		S10	8 8 9	17	22	21.0	-	-200	- 45 — - - -		No gra (9% Fir		aceous; tra	ace oxide s	staining.
	45 A	ctivi	A CON ity Roa o, Calif	ad, S	uite	103	INC	OF SU LO WI	THIS BOBSURFACATION TH THE	MARY APPLII DRING AND A ACE CONDIT S AND MAY PASSAGE O ED IS A SIMP	AT THE ' IONS MA CHANGE F TIME.	TIME OF AY DIFFE E AT THIS THE DA	DRILLING ER AT OTH S LOCATION TA	i. IER ON	FIGURE B-5 b

E	BOR	INC	G F	RECO	DRD	١ ١	PROJE SDSU			allev				PROJECT SD605		BORING S-5		
SITE LO	CATION	ı					0000	111100	1011 70			STAI		FINI	SH	SHEET NO.		
	Friars IG COMI		, San	Diego,	Californ	nia		DRILL	ING M	ETHOD		3/8	3/2019	LOGGED	8/2019 BY	3 of 3		
Pacif	ic Drilli	ng						l			ud Rotary			S. Nar	veson	C. Vonk		
	IG EQUI		Γ					l	NG DIA	. (in)	I	EPTH (ft)	l .	D ELEV (ft)		EV. GROUNDWATER (
	rich D5						NOTES	8/4 s			61		63		▼ 21.0 /	/ 42.0		
Hamr	mer: 14	0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	R ~ 79	%, N ₆	0 = 1.3	$32N_{SPT} = 0.$	88N _{MC}						
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	o° Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DES	CRIPTION A	.ND CLASSI	FICATION		
_55	10 10 		S11	13 18 21	39	51	16.0	-		- - - 55 — -		Well-g (75YR trace fi Slow a from 5	raded SA 5/1); we nes; nor nd diffict 3 to 59 ft	AND with singler; mostly firm of the contraction of	It (SW-SM) ne to mediu ce mica n GRAVEL	SOILS (continued):); very dense; gray um sand; few gravel;		
_60	0		S12	24 50/6"	50/6"	>100	20.2	-	-200	60 — - - - - 65 —		FRIARS FORMATION: *Poorly-indurated SANDSTONE; fine to medium grained; massive; gra (2.5YR 6/1); moderately weathered; very soft; unfractured (Silty SAND (SM); mostly fine to mediun sand; some fines; low plasticity; weakly to moderate cemented). (48% Fines) Total Depth = 61.0 feet (Target depth reached). Groundwater measured during drilling at a depth of feet.						
										-		benton concre This B	iite grout te. oring Re	and cappe	ed with blac of a geote	ter drilling with ck-dyed rapid set echnical report which		
	5 									-				lered in its of the blowcount.	entirety.			
70 - -										70 — - -		All soil (graniti based and vis greate descrip Cobble	s encouric, subro on drill risual eval than 10 otion and	ntered may unded, 3- to ig chatter, equation of dro 0% are noted I classificati	o 12-inch dexcessive a rill cuttings. ed in the botton, where tered in this	to 10% COBBLES diameter), estimated auger inclination, Percent COBBLES oring record encountered. is exploration were		
	_									-		*Geolo	gic Desc	cription; (Di	sturbed So	il Description).		
GR	924	5 A	ctivi	A CON ty Roa o, Calif	ad, S	uite	103	INC	SU LO WI	THIS BOBSURFACATION TH THE	MARY APPLI DRING AND ACE CONDIT S AND MAY PASSAGE C ED IS A SIMF	AT THE TONS M CHANG OF TIME.	TIME OF AY DIFFE E AT THI THE DA	TDRILLING. ER AT OTHE S LOCATIO TA	ER N	FIGURE B-5 c		

Е	BOR	IN(G R	RECC	ORD	١ ١	PROJE SDSU			allev				PROJECT SD605		BORING S-6
SITE LO				D: /	2 111							STAR		FINI	SH	SHEET NO.
	Friars		, San	Diego, (Jalitorr	nia		DRILL	ING M	ETHOD		3///	2019	LOGGED	7/2019 ву о	1 of 3
	ic Drilli									tem Au				S. Nar	1.3	C. Vonk
	IG EQUI		Γ						NG DIA	. (in)	I	PTH (ft)		ELEV (ft)		V. GROUNDWATER (
	ich D5						NOTE	8			41.5		69		▼ 22.3 /	46.7
			, Dro	p: 30 in.	(Auton	natic)	_		%, N ₆	0 = 1.3	$32N_{SPT} = 0.8$	88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	ND CLASSIF	ICATION
												PAVEN CONCF	ENT: A	oproximate	ely 4 inches	of ASPHALT
	 65		B1				19.5	-	PA CR EI	-		CLAY w moist; n	vith sand nostly fin avel; 28% 6 ppm	(CL); darl	fine sand; lo	orown (10YR 4/6);
_5			R2	9 15 26	41	36				5 -	1		oist; mos			sh brown (10YR nd; nonplastic.
_10	60 		R3-1 R3-2	5 8 13	21	19	29.0	93	-200	10 –		yellowis little fine	h brown sand; lo 5 tsf; TV); medium (10YR 4/4 ow plastici =0.33 tsf;	ty.	stiff; dark ostly fines; few to
_15	55 		S 5	4 9 11	20	26	6.7	-	РА	15 –		5/2); mo trace fin PID=0	oist; mos le gravel	tly fine to	medium san ic; trace mic	vish brown (10YR d; few to little fine; a.
-20	50 		\$6	3 4 6	10	13	20.3	-	-200 PI	20		(10YŘ 3 trace gr PP=1.5 (66% Fi Slow ar from 22	3/2); moi: avel; me tsf; TV= nes) d difficu to 35 fe	st; mostly dium plas 0.70 tsf Pl It drilling o	fines; little to ticity; trace r D=0.3 ppm 	grayish brown o some fine sand; nica. and COBBLES
GR	924	5 A	ctivi	ty Roa	ad, S	uite	103	INC	OF SU LO WI	THIS B BSURF CATION TH THE	MARY APPLIE ORING AND A ACE CONDITI IS AND MAY O PASSAGE OF ED IS A SIMPL	T THE TONS MACHANGE	IME OF I Y DIFFE AT THIS THE DAT	DRILLING. R AT OTHE LOCATIO A	ER N	FIGURE B-6 a

F	3OR	INIC	- F	RECC)RD	١ ١	PROJEC			.lla			1	CT NUMBER	BORING
SITE LO	CATION	l		Diego, (SDSU	Missi	ion Va	illey		START 3/7/2019		05 INISH 3/7/2019	S-6 SHEET NO. 2 of 3
Pacif	IG COMI ic Drilli IG EQUI ich D5	PANY ng PMEN1		Diego, C	Jamon	Па		Holl		ethod em Au			LOGGE S. N	arveson	CHECKED BY C. Vonk LEV. GROUNDWATER (f
AMPLI	NG MET	HOD	, Dro	p: 30 in.	(Auton	natic)	NOTES ETR	3	%, N ₆	0 = 1.3	$32N_{SPT} = 0$.,
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	% 2	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	DES	CRIPTIO	N AND CLASS	SIFICATION
			S7	39^ 22^ 30^	۸	۸	12.3	-	-200	- - -		Silty GRAVEL	with sand ly fine to ttle fines;	d (GM); yello coarse grav nonplastic.	SOILS (continued): owish brown (10YR rel; some fine to
30			S8	50/5" ^	REF	REF				30		Sampler refusa	al on grav	vel and cobb	oles.
_35	 		S9	19 25 50	75	99	7.5	-	-200	35 — - -		brown (10YR 5	fine to m 5/2); wet; ilty SANI d; some	nedium grain moderately D (SM); very fines; nonpla	ned; massive; grayish weathered; very soft; dense; mostly fine
- 40	—30 —		S10	19 25 50	75	99	18.5	-	-200	40 —		Gray (7.5YR 5, (26% Fines)	/1); little f	fines.	
_45	25 25									- - 45 —		feet. Boring backfille	neasured	I during drilli	th reached). ng at a depth of 22.3 after drilling with ack-dyed rapid set
										- - -		This Boring Re which must be ^ = Inaccurate All soils encoun	consider blowcou ntered m	red in its enti nt. ay include u	p to 10% COBBLES diameter), estimated
GR	924	5 A	ctivi	A CON ty Roa o, Calif	ad, S	uite	103	INC	OF SUI LOO WIT PR	THIS B BSURFA CATION TH THE ESENTI	ORING AND ACE CONDI IS AND MAY PASSAGE (LIES ONLY AT THE AT THE TIME OF TIONS MAY DIFFI CHANGE AT THE OF TIME. THE DA PLIFICATION OF NTERED.	F DRILLIN ER AT OT IS LOCAT ITA	IG. THER TION	FIGURE B-6 b

DOI		~ E) D D	١ ١	PROJE							PROJECT I		BORING
		JF	RECC	ノベレ	' :	SDSU	Missi	on Va	alley				SD605		S-6
SITE LOCATIO											STAF		FINIS		SHEET NO.
9449 Friar		, San	Diego, 0	Californ	nia						3/7	/2019		7/2019	3 of 3
DRILLING COI									ETHOD				LOGGED		CHECKED BY
Pacific Dril		_							em Au				S. Nar		C. Vonk
DRILLING EQU		ı						NG DIA	. (IN)	1			D ELEV (II)		LEV. GROUNDWATER (ft)
Diedrich D						NOTES	8			41.5		69		▼ 22.3	/ 46.7
Hammer: 1		Dro	n: 20 in	(Autor	natio)			0/. NI	_ 1 2	2NI _	0.88N _{MC}				
паншет. і	40 105	., DIO	p. 30 III.	(Auton	ialic)	LIK	~ 19	70, IN ₆₀	$_{0} = 1.3$	ZIN _{SPT} =	U.0011 _{MC}				
DEPTH (feet) ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z°	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DES(CRIPTION A	ND CLASS	SIFICATION
									- - - 55 — -		and vis greater descrip Cobble approx	ual evalue than 10 tion and rich laye imately 1	uation of dr % are note classificati ers encoun 10 to 13 fee	ill cuttings d in the b on, where tered in the t thick.	auger inclination, s. Percent COBBLES oring record e encountered. his exploration were oil Description).
									60 —						
5 65 									65 — -						
									7						
0									4						
_70									70 —						
									10						
.									_						
· -									4						
									7						
5									4						
	45 A	ctivi	A CON ty Roa , Calif	ad, S	uite	103	INC	SUI SUI LOO WIT	THIS BO BSURFA CATIONS TH THE F	ORING AI CE CON S AND M PASSAG	PLIES ONLY ND AT THE DITIONS MA AY CHANGE E OF TIME. IMPLIFICAT	TIME OF AY DIFFE E AT THIS THE DA	DRILLING. ER AT OTHE S LOCATIOI TA	ER N	FIGURE B-6 c

E	BOR	IN	G F	RECO	ORD	1	PROJEC SDSU			alley				PROJECT SD605		BORING S-7
9449 RILLIN Pacif ORILLIN	IG COM ic Drilli IG EQUI	Road PANY ng PMEN		Diego,	Califorr	nia		Hol BORII		ETHOD tem Au (in)	TOTAL	DEPTH (ft)	1/2019 GROUNE	LOGGED S. Nar	11/2019 BY veson DEPTH/EL	SHEET NO. 1 of 5 CHECKED BY C. Vonk EV. GROUNDWATER (
SAMPLI	rich D5 ING MET	HOD	Dro	p: 30 in.	(Auton	natic)	NOTES		% N.	. – 1 3	100.9 2N	0.88N _{MC}	57		▼ 16.8	/ 40.2
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	z°	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	O.OOI V _{MC}	DESC	CRIPTION A	ND CLASS	SIFICATION
_5	55		B1	2^ 11^ 23^	٨	٨	12.9	-	PA PI CR EI	- - - 5 — -		UNDIF lean Cl fines; s plastici (1% Gr Little gr	FERENT AY (CL) ome fine ty; grade: avel; 349 ravel. very stiff;	; dark brow to coarse s finer with % Sand; 69	JRFICIAL wn (7.5YR sand; trac n depth. 5% Fines)	SOILS: Sandy 3/2); moist; mostly ce gravel; low ining; gravel in
-10	 45		\$3	6 5 6	11	14	17.8	-		- 10 — - -		(10YŘ	4/6); moi low plast	AY (CL); st st; mostly ticity; trace	fines; som	ellowish brown e fine sand; trace
-15	40		S4	15 6 6	12	16	19.6	-	-200	- 15 — - -	•	(10YR	5/4); moi stic; trace	st; mostly	- — — — — dense; ye fine sand;	ellowish brown little to some fines;
-20			R5	50/6"	REF	REF				 20 - - -		No rec	overy; w	et.		
GR	924	5 A	ctivi	A CON ty Roality, Calif	ad, S	uite	103	INC	OF SU LO WI' PR	THIS BOURFACATION TH THE ESENTE	ORING AN ACE CONE S AND MA PASSAGE ED IS A SII	PLIES ONLY ID AT THE DITIONS MAY CHANGE OF TIME. MPLIFICAT JNTERED.	TIME OF AY DIFFE E AT THIS THE DAT	DRILLING. R AT OTHE LOCATIO FA	ER N	FIGURE B-7 a

E	BOR	ZINC	G R	RECO	DRD	١ ١	PROJEC SDSU			allev				PROJECT SD605		BORING S-7	
SITE LC	CATION	1					0000	IVIIOOI	ion ve	alley		START		FINI	SH	SHEET NO.	
	IG COM		, San	Diego,	Callion	ııa		DRILL	ING M	ETHOD		3/11/		LOGGED	11/2019 BY	2 of 5	—
	ic Drilli									tem Au				S. Nar		C. Vonk	
	ich D5		Γ					BORII 8	NG DIA	. (in)	100.9		ROUND 57	ELEV (ft)	DEPTH/E. ▼ 16.8	LEV. GROUNDWATE	ER (f
	ING MET	-					NOTES	-			100.8	<u> </u>	51		<u>¥</u> 10.0	7 40.2	
Hamr	mer: 14	l0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	~ 79	%, N ₆	0 = 1.3	2N _{SPT} =	0.88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION A	ND CLASS	SIFICATION	
- -	30 		S6	8 18 24	42	55	18.7	-	PA	- - -		SANDST brownish weathere	ONE; fi gray (1 ed; very ostly fir c; trace	OY 5/2); versoft; unfrance to media mica; we	dium grair vet; mode actured (S ium sand;	ned; massive; erately to highly Silty SAND (SM); ve ; few to little fines;	ery
_30 - -	25 25		R7	50/6"	REF	REF				30 —		No recove material.	ery; pos	ssible mod	derately to	o strongly cemente	d
- 35 - -			S8	18 27 34	61	80	18.0	-	-200	35 — -		Little fine: (17% Fine		kly to mod	erately ce	emented.	
- 40 -	15		S9	40 50/3"	50/3"	>100	11.5	-		- 40 — -		Gray (10\ gravel; lo	YR 5/1) w plast	; (Clayey icity).	SAND wit	th gravel (SC); little	÷
- -45 - -	10		S10	25 37 50/4"	87/10"	>100	18.0	-		- 45 — - - -		Thinly be	dded.				
GR	924	5 A	ctivi	A CON ty Roa o, Calif	ad, S	uite	103	INC	OF SU LO WI PR	THIS BO BSURFA CATIONS TH THE F ESENTE	ORING AN CE COND S AND MA PASSAGE D IS A SIN	LIES ONLY A D AT THE TIM DITIONS MAGE A OF TIME. TI MPLIFICATION JNTERED.	ME OF [DIFFER AT THIS HE DAT	DRILLING. R AT OTHE LOCATIO A	ER N	FIGURE B-7 b	

F	3OR	IN	GR	RECO)RD	\	PROJE			llov				PROJECT		I	BORING S-7
	CATION		<u> </u>	,	ノ. 、L		SDSU	IVIISS	ion va	шеу		STAR	т	SD605		9	SHEET NO.
			l, San	Diego,	Califorr	nia							1/2019		11/2019	`	3 of 5
	IG COM		,	<u> </u>				1		ETHOD				LOGGED		CHEC	KED BY
	ic Drilli									tem Au				S. Nar		C. V	
	IG EQUI		Т						NG DIA	. (in)	1			D ELEV (ft)	1		OUNDWATER (
	rich D5	-					NOTE	8 			100.9)	57		▼ 16.8	7 40.2	
			., Dro	p: 30 in.	(Auton	natic)			%, N ₆	0 = 1.3	32N _{SPT} =	0.88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	AND CLASS	SIFICATI	ON
	5 5		R11	43 50/5"	50/5"	>100			-200	- - -		*Poorly massive very so wet; mo	indurate; gray (ft; unfracestly fine to mode	ed SANDS 10YR 5/1) ctured; (Cl	; wet; mod ayey SANI to little fin	e to coa lerately D (SC):	arse grained; weathered; very dense; aplastic;
55 - - -	0		S12	17 50/1"	50/1"	>100	20.7	-		55 — - - -		Friable.					
–60	 5 		l R13	50/4"^	REF^	REF				60 —					lly cement stuck in sa		
65 - - - - 70 - -	10 10 15		S14	35 50/3"	50/3"	>100				65 — 70 —		No reco materia		ossible mo	derately to	o strong	ly cemented
GR	924	5 A	ctivi	A CON ty Roa	ad, S	uite	103	INC	OF SU LO WI PR	THIS BOURFACATION TH THE ESENTE	ORING AN ACE CONE S AND MA PASSAGE ED IS A SII	PLIES ONLY ID AT THE DITIONS MA Y CHANGE OF TIME. MPLIFICATI JNTERED.	TIME OF AY DIFFE AT THIS THE DAT	DRILLING. R AT OTHI S LOCATIO TA	ER N		GURE B-7 c

B	OR	INC	3 R	RECC	RC	\	PROJE SDSU			llov				PROJECT SD60	NUMBER		BORING S-7
SITE LOC	ATION						3030	IVIISS	IOII Va	шеу		STAF	RT		ISH		SHEET NO.
9449 F			, San	Diego, (Califor	nia		DDILL	INC M	ETHOD		3/1	1/2019	LOGGED	/11/2019		4 of 5 CKED BY
Pacific										em Au	ger				veson	- 1	Vonk
DRILLING			Γ						NG DIA	. (in)		PTH (ft)		ELEV (ft			ROUNDWATER (f
Diedric SAMPLIN	-						NOTES	8			100.9		57		▼ 16.8	3 / 40.	2
			, Dro	p: 30 in.	(Autor	natic)			%, N ₆	0 = 1.3	$2N_{SPT} = 0.$	88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z ⁰	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION	AND CLAS	SIFICA	TION
	_ 20 		S15	23 30 40	70	92	22.6	-		- - -		SANDS (Gley 6 unfract	STONE; fi s/N); wet; ured; (Cla	ine to coa moderate ayey SAN	arse grain ely weathe ID (SC); v	ed; ma ered; ve ery de	orly-indurated ssive; gray erry soft; nse; mostly cemented).
80				37						80 — - - - 85 — -		(Trace	gravel; la	minated.)		
90	_ _ 35 _ _ _		S16	40 50	90	>100	16.2	-		90 — 95 —							
				A CON			ITS, 103	INC) OF	THIS BO	MARY APPLI DRING AND ICE CONDIT	AT THE	TIME OF I	DRILLING	.	F	FIGURE

	\square		2 0	RECO	JDL	1	PROJE								T NUMBER		BORING
			י כ		אכ		SDSU	Miss	ion Va	alley				SD60			S-7
	CATION		San	Diogo	Califor	nia						STAR 3/1	t 1/2019		nish 3/11/2019		SHEET NO. 5 of 5
	Friars IG COM		, san	Diego,	CalliOff	ııa		DRII I	ING M	ETHOD		3/1	1/2019	LOGGE			CKED BY
	ic Drilli									tem Au	ner				arveson	1 -	Vonk
	IG EQUI		Γ						NG DIA		-	DEPTH (ft)	GROUNI	1			ROUNDWATER
Diedr	ich D5	0						8			100.	9	57		₹ 16.8	3 / 40.	.2
	NG MET						NOTES										
Hamr	ner: 14	l0 lbs.	, Dro	p: 30 in.	(Auton	natic)	FIR	~ 79	%, N ₆	0 = 1.3	2N _{SPT} =	0.88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	2°	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	N AND CLAS	SIFICA	TION
		\times	S17	45 50/5"	50/5"	>100	26.5	-				EDIAD	S EODM	ATION	(continue	1/-	
	_			50/5						+		→ *Poorly	-indurate	d SANE	STONE; fir	ne to c	coarse grained;
	45											laminat	ed; gray	(Gley 6	N); wet; mo	oderate	ely weathered; c); very dense;
										-		mostly	fine sand itely cem	d; little fi	nes; low pla	sticity	; weakly to
												Total Do	epth = 10	00.9 fee	t (Target de	pth rea	ached).
105										105		Ground feet.	water m	easured	during drill	ing at	a depth of 16.8
										-						entonit	e grout and
	50									_			with col	•	asphalt. art of a geo	techni	cal report
										-		which n	nust be o	consider	ed in its en	irety.	cai report
										-			ccurate b				
_110	_									110_		(granitio	c, subrou	ınded, 3	- to 12-inch	diame	0% COBBLES eter), estimated r inclination,
												and vis	ual evalu	ation of	drill cutting	s auge S.	i inclination,
	<u></u> -55											*Geolog	gic Desc	ription; (Disturbed S	Soil De	escription).
										1							
	_									-							
115										115							
	60									_							
										-							
-120										120_							
0										120-							
	_									-							
	65																
	_																
										-							
				\ CO1	16111	T A P	ITC	INIC	TH.			PLIES ONLY				-	EIGUDE
GK				A CON				INC	SU	BSURFA	CE CON	ND AT THE T DITIONS MA	Y DIFFE	R AT OT	HER	r	FIGURE
				ty Roa , Calif					LO WI	CATIONS TH THE F	S AND M PASSAG	AY CHANGE E OF TIME. IMPLIFICATI	AT THIS	S LOCAT FA	ION		B-7 e

ר אם	SIN($\Im R$	RECC	RD	١ ١	PROJE			llov						NUMBER		BORING S-8
ITE LOCATIO		<u> </u>		·		SDSU	IVIISSI	OU VS	шеу		STAR	т	SD6	US			SHEET NO.
9449 Friars		. San	Diego. (Califorr	nia							4/2019			14/2019		1 of 4
RILLING COM		, C a	Diogo, v	<u> </u>			DRILL	ING MI	ETHOD		0, 1	72010	LOGGI			CHEC	KED BY
Pacific Drill	ing						Holl	low St	em Au	ıger			S. N	lar\	eson/	C. \	/onk
RILLING EQU	IPMEN	Г					BORII	NG DIA	. (in)	TOTAL DEI	PTH (ft)	GROUNE	ELEV	(ft)	DEPTH/EL	EV. GR	OUNDWATER
Diedrich D5	50						8			75.5		69			▼ 22.4	/ 46.6	6
AMPLING ME						NOTES											
Hammer: 1	40 lbs.	., Dro	p: 30 in.	(Auton	natic)	ETR	~ 79	%, N ₆	$_{0} = 1.3$	$32N_{SPT} = 0.8$	8N _{MC}						
DEPTH (feet) ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	° Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTIO	N A	ND CLASS	IFICAT	ION
65		B1 S2	17^ 25^ 30^	^	^	7.8	-	РА	- - - 5 -		UNDIFI SAND v 4/4); me plasticit (18% G PID=1	FERENT with grav pist; mos y. iravel; 55 2 ppm	IATED el (SC) tly sand	SU ; da d; s d; 2	RFICIAL ark yellowiome fines PLES from	SOILS sh bro ; little (: Clayey wn (10YR gravel; low
5		S3-1 S3-2	6 12 17^	^	^	10.4	-	-200	5 —		mostly sample (41% F PID=1.	sand; sor r. ines). 0 ppm	me fine	s; l	ow plastic	ity; gra	/3); moist; vel lodged in
60 		S4	5^ 14^ 15^	^	^				10 —		5/4); monplas Gravel PID=0.8 Slow ar from 6fr	oist; mos stic. stuck in s 8 ppm nd difficu t to 14ft. GRAVEI	tly graves ample the drilling t	r sh g or — -	little sand noe. n GRAVEI 	; little f L and (own (1	COBBLES
55 		R5	14 13 26	39	34				- 15 — -				– – – - nse; sp	oils	are claye	y SAN	
50		В6				15.6	-		- 20 —			nd; some			ray (7.5Yl plasticity;		moist; mostly ic odor.
		S7	3 6 9	15	20	2	-	PA	- - -	¥	brown (trace fir Thinly t 20.5ft ir PID=1.0	10YR 7/3 nes; nonp nedded fe n sample	3); mois plastic; elsic an	st; r trac d m	nostly fine	to me	; very pale dium sand; om 20ft to
GROUF			A CON				INC	SUI LO	THIS B BSURF CATION	MARY APPLIE ORING AND A ACE CONDITI IS AND MAY O PASSAGE OF	T THE ONS MA CHANGE	TIME OF I AY DIFFE AT THIS	DRILLIN R AT O S LOCAT	IG. THE	:R		IGURE B-8 a

F	3OR	INC	3 R	RECC)RD	1	PROJE			llov				PROJECT		BORING S-8
	CATION		_ '				SDSU	IVIISS	IUII VE	шеу		STAR	<u> </u> RT	FIN		SHEET NO.
9449	Friars	Road	, San	Diego, 0	Californ	nia							4/2019		/14/2019	2 of 4
	IG COM		·					DRILL	ING M	ETHOD				LOGGED	ВҮ	CHECKED BY
	ic Drilli	_								tem Au				S. Nar		C. Vonk
	IG EQUI								NG DIA	. (in)		PTH (ft)		D ELEV (ft)	1	EV. GROUNDWATER
	ich D5						1	8			75.5		69		▼ 22.4	/ 46.6
	NG MET		D	20 i-	/ A t = . =	4:-\	NOTE		0/ NI		OON O	201				
Harm	ner: 14	O IDS.	, Dro	p: 30 in.	(Auton	natic)	EIR	~ 79	%, N ₆	0 = 1.3	$32N_{SPT} = 0.3$	BOIN _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	AND CLASS	SIFICATION
			\$8-1 \$8-2	3 2 3	5	7	12.7 35.2	-	-200	-	4 4	Well gra 5/2); we	aded SA et; mostly stic; trace 6 ppm	ND (SW); y fine to c	loose; gra	SOILS (continued): yish brown (10YR d; trace fines;
-30	40 		S 9	5^ 8^ 12^	٨	^	13.4	-	PA	30 —		(10YŘ: plasticit PID=0.	3/2); wet ty; micac 4 ppm; P graded S	mostly ficeous. PP=0.75 ts SAND (SP	nes; some if j; gray (10	f; very dark gray fine sand; medium YR 5/1); wet; mostly
35	 35									- - - 35 —		fine to r trace m Packed PID=6. (9% Gr	medium s nica. I samplei 7 ppm avel; 87%	sand; few r. % Sand; 4	gravel; tra % Fines).	ce fines; nonplastic;
	 		S10	7 6 4	10	13	21.4	-	-200	-		Mediun PID=24 (5% Fir	l.1 ppm	trace mic	a.	
40	30 		R11-1 R11-2	6 7 20	27	24	34.4 20.8	86 106	-200 PI	40 —		mostly sailty sai	fines; littl nd. sf; TV= 0	le fine sar		gray (10YR 4/1); wet; asticity; grading to
	25									- - -			ostly fine			ark gray (10YR 4/1); onplastic; grading to
45			S12	8^ 8^ 11^	۸	^	24.1	-	-200	45 — - - -		5/1); we nonplas	et; mostly stic; mica I samplei 0 ppm	y fine to maceous.		- — — — — — — — M); dark gray (10YR ld; few fines;
GR				A CON				INC	OF SU	THIS B BSURF	MARY APPLII ORING AND ACE CONDIT	AT THE T	TIME OF AY DIFFE	DRILLING R AT OTH	ER	FIGURE
				ty Roa , Calif					WI ⁻ PR	TH THE ESENTI	IS AND MAY PASSAGE O ED IS A SIMP NS ENCOUN	F TIME. LIFICATI	THE DAT	ГΑ		B-8 b

E	BOR	IN	G F	RECO	DRD	١ ١	PROJE SDSU			allev			PROJEC	T NUMBER	BORING S-8	— }
ITE LC	CATION	ı		Diego,			0000	IVIIOO	1011 V	ancy		START 3/14/2019	FI	NISH 3/14/2019	SHEET NO.	
	NG COM		i, Gaii	Diego,	Camon	ııa		DRILL	ING M	ETHOD		0/14/2013	LOGGE		CHECKED BY	
	fic Drilli									tem Au				arveson	C. Vonk	
	NG EQUI rich D5		Т					BORII 8	NG DIA	(in)	75.5	DEPTH (ft) GROUN	ID ELEV (LEV. GROUNDWATI 1 / 46.6	ER
	ING MET	-					NOTES	_			75.5	09		<u>¥</u> 22	+ / +0.0	
Hamr	mer: 14	0 lbs	., Dro	p: 30 in.	(Auton	natic)	ETR	~ 79	%, N ₆	= 1.3	B2N _{SPT} =	0.88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	zº	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	DES	CRIPTION	N AND CLAS	SIFICATION	
		X	S13	8 15 22	37	49	15.0	-	-200	-		Clayey SAND	(SC); der nedium s	nse; dark gra	SOILS (continue ay (10YR 5/1); wet nes; trace gravel; lo	t;
_55		X	S14	8^ 12^ 14^	٨	^	13.6	-	-200	55 — - -			d; few fin		5/1); wet; mostly fii	ne
-60	10 		S15	19^ 18^ 12^	^	٨	9.1	-		- - 60 —		from 56ft to 62 Poorly-graded	ft. GRAVEL et; mostly ce mica.	. (GP); dark / gravel; few	VELS and COBBLI grayish brown v sand; trace fines;	
_65	5									- - 65 — -		Slow and diffic from 62ft to 73 (Estimated 20	ft.	,	ELS and COBBLES	3
-70	0	>	S16	50/3"	REF	REF				- 70 — -		No recovery; s	ampler re	efusal on gra	avel and cobbles.	
	5									-		FRIARS FORI SANDSTONE: (see next page		*Poorly ind	lurated	
GR				CON				INC) OF	THIS B	ORING AN	PLIES ONLY AT TH ID AT THE TIME OF DITIONS MAY DIFF	DRILLIN	G.	FIGURE	
				ty Roalit					LO WI	CATION TH THE	IS AND MA PASSAGE	AY CHANGE AT THE DAMPLIFICATION OF	IS LOCAT NTA	ION	B-8 c	

F	ROR	INI		RECO)RD	۱ ۱	PROJE			.lla				PROJECT		В	BORING S-8
SITE LO			۱۱۰ ر		ノ. 、 レ	•	SDSU	IVIISS	ion va	шеу		STAR	<u> </u>	SD605		S	SHEET NO.
-			, San	Diego, 0	Califorr	nia							4/2019		14/2019	-	4 of 4
DRILLIN			<u> </u>					DRILL	ING M	ETHOD				LOGGED	ВҮ	CHECK	(ED BY
	ic Drilli									tem Au	_			S. Nar		C. V	
DRILLIN									NG DIA	(in)	1			D ELEV (ft)			DUNDWATER (f
Diear SAMPLI	ich D5	-					NOTES	8			75.5		69		▼ 22.4	1 / 46.6	
			Dro	p: 30 in.	(Auton	natic)			% N.	. = 1.3	2N ₂₂₇ =	0.88N _{MC}					
			, 2.0	<u>. </u>	(, , , , , , , , , , , , , , , , , , ,				70, 116	0	521	0.00.1MC					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION /	AND CLASS	SIFICATIO	ON
		\times	S17	50/6"	REF	REF	20.5	-	-200				S EODM	ATION (a	ontinuad)	. *Doorb	, indurated
-										-							y-indurated 7.5YR 5/1);
_												modera	itely wea	athered; ve	ry soft; ur	nfracture	d (Silty
												fines; n	onpĺastio	ry dense; c; weakly t			
-										_		(46% F				-	,
-	10									_		Total De	epth = 7	5.5 feet (T	arget dept	th reache	ed).
80										80 —		Ground feet.	water m	easured d	uring drilli	ng at a c	depth of 22.4
-										_		Boring I	backfille	d on 3/14/	19 shortly	after dri	lling with
-	_									_		bentoni concret		and cappe	ed with bla	ack-dyed	rapid set
-	_									_		This Bo which n	oring Red	cord is par	t of a geot I in its ent	technical	report
-	<u></u> -15									_				olowcounts		- ,	
 85										85 —		*Geolog	gic Desc	ription; (D	sturbed S	Soil Desc	ription).
-	_									_		(granitio	c, subrou	unded, 3- t	o 12-inch	diamete	6 COBBLES er), estimated
	_									_		and vis	ual evau		rill cutting:	s. Percei	nt COBBLES
														% are note classificat			
-	20									_		Cobble-	-rich laye	ers encour	ntered in the		oration were
_90										90 —		approxi	mately 1	0 to 20 fe	et tnick.		
- }										-							
-										_							
-										_							
- }	25									-							
_95	_									95 —							
-55	_									33 —							
-										_							
_	_																
- }	_									_							
-	30									_							
GR		DF		A CON	18111	TAN	JTS	INC	TH			PLIES ONLY			N	FI	GURE
JIV.								1146	SU	BSURFA	CE CON	DITIONS MA	Y DIFFE	R AT OTH		1 1	JUIL
				ty Roa , Calif					WI	TH THE I	PASSAG	AY CHANGE E OF TIME. IMPLIFICATI	THE DAT	TA		E	3-8 d

F	30R	INIC	- F	RECO)RD	۱ ۱	PROJE							PROJECT		BORING S-9
	CATION		۱ ر	, L O C) I (D		SDSU	IVIISS	on Va	uiey		STAR	RT.	SD605		SHEET NO.
9449	Friars	Road	, San	Diego,	Califorr	nia							/2019	3/	5/2019	1 of 2
	IG COM									ETHOD			00 =::	LOGGED		CHECKED BY
	ic Drillii I G EQU I	_	-						4 (0-1) NG DIA		asing Adva					C. Vonk EV. GROUNDWATER (
	ich D5							8/4	NG DIA	. (IN)	36.5	EPIH (II)	59	D ELEV (II)	DEPTH/EL	
	NG MET	-					NOTES				00.0				¥ IVIVI /	TIG .
Hamr	ner: 14	0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	R ~ 79	%, N ₆	0 = 1.3	$32N_{SPT} = 0$.88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	200	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DES	CRIPTION A	IND CLASS	IFICATION
										-		UNDIF	RETE. FERENT with grav	TIATED SU	IRFICIAL own (7.5Y	s of ASPHALT SOILS: Clayey R 4/4); moist;
	— —55		B1							-		plasticit PID=1.3 (17% G Increas	ty. 3 ppm Gravel; 4 ing grav	8% Sand; (35% Fines	es; little gravel; low) illing from 3 to 4
_5	_		S2	3 8^ 13^	^	^	7.7	-	PA	5			n plastic	ELS and CC ity; gravel i		
-10	— —50 —			15^						10 —		and CC Clayey mostly	BBLES GRAVE gravel; l	from 7 to 1	19 ft. own (7.5 Y ittle fines;	e feet on GRAVEL R 4/2); moist; nonplastic.
	_	X	S3	29^ 29^	^	^				-		Equipm	ent failu	ıre- sheare	d drive cap	o at 11 ft.
-15	— —45									- - 15 –		Switch difficult		/ casing ad	vancemen	t due to slow and
	_									-						
	— —40									-		Poorly	araded (SAND with	 silt (SD-St	. — — — — — — — · M); wet; gray (7.5
-20	_		S4	6^ 15^ 39^	۸	^				20 -		YR 6/1) nonplas); mostly stic. I sample	fine sand;		trace fine gravel;
,	— —35									-						
GR	OUP	DE	LT/	A CON	ISUL	_TAN	NTS,	INC	OF	THIS B	MARY APPL ORING AND	AT THE	TIME OF	DRILLING.		FIGURE
	924	5 A	ctivi	ity Roa , Calif	ad, S	uite	103		LO WIT PRI	CATION TH THE ESENTI	ACE CONDI' IS AND MAY PASSAGE (ED IS A SIMI NS ENCOUN	CHANGE OF TIME. PLIFICATI	AT THI THE DA	S LOCATIO .TA	N	В-9 а

F	30R	INIC	3 F	RECC)RD	۱ ۱	PROJE			.lla::				PROJECT		BORING S-9
	CATION		J 1	LUC			SDSU	Miss	ion Va	alley		STAR	т	SD605		SHEET NO.
			, San	Diego, (Califorr	nia							/2019		5/2019	2 of 2
	IG COMI									ETHOD				LOGGED		CHECKED BY
	ic Drilli	_	_									vance (13				C. Vonk
	i ch D5							8/4	NG DIA	. (in)	36.5	DEPIH (ft)	GROUN 59	ID ELEV (ft)	DEPTH/EL	EV. GROUNDWATER
	NG MET	-					NOTES				30.3		59		¥ INIVI /	Па
Hamr	ner: 14	0 lbs.	, Dro	p: 30 in.	(Auton	natic)			%, N ₆	0 = 1.3	2N _{SPT} =	0.88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DES	CRIPTION A	ND CLASS	IFICATION
			S5	18^ 25^ 32^	^	^	19.0	-	PA	- - -		Silty SA medium oxide s	ND (SN n sand; l taining t	//); brown (፣	7.5Y 5/4); v nonplastic; sample.	SOILS (continued): wet; mostly fine to trace mica; iron
_30			S6-1 S6-2	19 20 34	54	71	24.3 18.6	-	-200 PI	30 —		CLAYS - 4/1); we - (FAT C - plastic) - PP>4 ts - (95% F	TONE; et; mode LAY (Ch sf; PID= ines)	erately wea H); hard; m 1.8 ppm	d; massive thered; ver ostly fines;	; dark gray (10YR ry soft; unfractured trace sand; highly
<u>-</u> 35	25 		S 7	20 26 35	61	80	20.6	-		35 — -		massive very so (SP-SM	e; gray (ft; unfra 1); very o stic; wea	(10YR 5/1); ctured (Pod	wet; mode orly-graded stly fine sa	e to coarse grained; erately weathered; d SAND with silt nd; few fines;
	_									_		Total D	epth = 3	36.5 feet (T	arget deptl	h reached).
	<u> </u>									-			is added			ing drilling because ncountering
_40										40 —				ed on 3/6/19 ack-dyed ra		onite grout and norete.
										_				cord is part considered		echnical report ety.
										_		^ = Inac	ccurate l	blowcount.		
- 45	—15 —									- 45 — -		(granition based of and vise greater descrip	c, subro on drill ri ual eval than 10 tion and	unded, 3-tig chatter, equation of di wation of di % are noted classificat	o 12-inch of accessive a cill cuttings and in the botton, where	o to 10% COBBLES diameter), estimated auger inclination, . Percent COBBLES oring record encountered. is exploration were
										-		approxi	mately	10 to 13 fee	et thick.	bil Description).
	— —10									-		Geolo(gic DesC	oripuori, (Di	3.UIDEU 30	m pescription).
GR	OUP	DE	LT/	A CON	ISUL	LAN	⊥ NTS,	INC) OF	THIS BO	ORING AN	D AT THE T	TIME OF	E LOCATION DRILLING.		FIGURE
	924	5 A	ctivi	ty Roa , Calif	ad, S	uite	103		LO WI PR	CATION TH THE ESENTE	S AND MA PASSAGE	Y CHANGE OF TIME. MPLIFICATI	AT THI	ER AT OTHE S LOCATIO TA THE ACTUA	N	B-9 b

F	30R		G F	RECO)RD	١ ١	PROJE			lle:				PROJECT		BORING S-10
SITE LO	CATION	1		Diego, (SDSU	MISS	ion Va	alley		STAF	кт 2/2019	SD605		SHEET NO. 1 of 4
DRILLIN Pacifi DRILLIN	Friars IG COM ic Drilli IG EQUI rich D5	PANY ng PMEN		Diego, (Jamor	па		Hol		ETHOD tem Au . (in)				LOGGED S. Nar	BY veson	CHECKED BY C. Vonk EV. GROUNDWATER (f
SAMPLI	ING MET	HOD	Dro	p: 30 in.	(Auton	natic)	NOTE	S	% N.	. = 1 :	$32N_{SPT} = 0$	88N	00		₹ 22.1	7 43.9
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	z°	MOISTURE (%)	DRY DENSITY (pcf)		DEPTH (feet)	GRAPHIC LOG LOG	.001 4 MC	DESC	CRIPTION A	AND CLASS	IFICATION
	—65 —		B1						PA PI CR EI	- - - -		UNDIF SAND moist; I little gra (19% C	FERENT with grav mostly fir avel; low	rIATED SU yel (SC); yene to coars to medium 7% Sand;	JRFICIAL :	
5	60 		S2	23^ 22^ 14^	^	^	11.9	-		5 — - -		Light bi	rownish (25 tsf; PII	gray (10YF D=1.5 ppn	R 6/2); grav	vel in sampler.
–10	55 	X	R3	10 12 11	23	20	7.8	107		10		Poorly- gray (1 nonpla: PID=1.	ÕYR 5/1) stic.	— — — — - SAND with); moist; m	silt (SP-SI ostly fine s	M); medium dense; and; few fines;
_15	50		S4	9 8 8	16	21				15 — - -		No reco	overy.			
–20	45 		S5	3 3 4	7	9	19.5	-	PA	20		5/2); m nonpla: PID=6.	oist; mos stic; mica 2 ppm	stly fine to	medium sa	ayish brown (10YR and; trace fines;
GR	924	5 A	ctivi	A CON ity Roa o, Calif	ad, S	Suite	103	INC	OF SUI LOO WIT PR	THIS B BSURFA CATION TH THE ESENTI	MARY APPL ORING AND ACE CONDI' IS AND MAY PASSAGE (ED IS A SIMI NS ENCOUN	AT THE TIONS MAY CHANGE OF TIME. PLIFICAT	TIME OF AY DIFFE E AT THIS THE DAT	DRILLING. FR AT OTHI S LOCATIO TA	ER N	FIGURE B-10 a

Е	BOR	INC	G R	RECC	ORD	١	PROJE SDSU			alley			F	ROJECT SD605	NUMBER	BORING S-10
9449 RILLIN	CATION Friars G COMI c Drillin	Road PANY	, San	Diego, (Califorr	nia				ETHOD tem Au	ıger	3/12/2		FIN 3, LOGGED S. Nar	12/2019 BY	SHEET NO. 2 of 4 CHECKED BY C. Vonk
RILLIN Diedr AMPLI	G EQUI ich D50 NG MET	PMENT 0 'HOD					NOTES	BORII 8	NG DIA	. (in)	TOTAL DE 71.3	(ROUND 66	_		<i>EV.</i> GROUNDWATER
				p: 30 in.		natic)			%, N ₆		$\frac{32N_{SPT} = 0.8}{}$	B8N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	N N	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION	AND CLASS	IFICATION
	40 		R6	7 13 20	33	29	16.7	-	-200	-		Poorly-gra	aded Sa own (1	AND with 0YR 5/2)	silt (SP-S	SOILS (continued) M); medium dense; tly fine sand; few
30	35 		S7	3 2 3	5	7	19.7	-	-200	30		Well-grade 6/1); wet; gravel; no PID=1.9 p (1% Fines	mostly nplastion	fine to c	oarse sand	yish brown (10YR ; trace fines and fin
35	30 		\$8	15 7 6	13	17	22.7	-	-200 PI	35 — - -		gray (2.5Y medium p	′ 3/1);	wet; mos y; trace n	tly fines; lit	to stiff; very dark tle sand; few gravel
40	25 		S 9	3 3 3	6	8	24.1	-		40 — - -		Medium S PP=0.5 ts).3 tsf; Pl	D=1.3 ppn	1
45	20 20 		S10	P 6 7	13	17	24.9	-	-200 PI	45 — - - -			f; TV=0		avel; trace D=1.2 ppn	
GR	924	5 A	ctivi	A CON		uite	103	INC	OF SU LO	THIS B BSURF CATION	MARY APPLIE ORING AND A ACE CONDITI IS AND MAY (PASSAGE OI	AT THE TIM ONS MAY CHANGE A	1E OF D DIFFER T THIS	RILLING RAT OTH LOCATIO	ER	FIGURE B-10 b

E	BOR	IN	G R	RECO	DRD	١ ١	PROJE SDSU			المال				PROJECT		BORING S-10
	CATION						3030	IVIIOO	ion va	апсу		START		FIN		SHEET NO.
			, San	Diego,	Califorr	nia						3/12	/2019		12/2019	3 of 4
	IG COM									ETHOD				LOGGED S. Nar		CHECKED BY C. Vonk
	ic Drilli IG EQUI	_	Γ						NG DIA	tem Au		PTH (ft)	ROUNE			EV. GROUNDWATER (1
	rich D5							8		(,	71.3	(,	66	(,	▼ 22.1	
SAMPL	ING MET	HOD					NOTES									
Hamr	mer: 14	l0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	R ~ 79	%, N ₆	0 = 1.3	$32N_{SPT} = 0.8$	88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z ^o	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CLASSI	IFICATION
-	—15 —	X	S11	10 15 13	28	37	22.5	-	-200	-		Poorly-g	raded S /1); wet: ic; mica ppm	AND with mostly fi	silt (SP-SN	SOILS (continued): M); dense; dark gray ew to little fines;
_55	10		S12	10^ 22^ 49^	^	۸	16.6	-		55 — - - -		from 54 Silty GR 5/1); mo nonplast PID=1.4	feet and AVEL w stly grav ic; trace ppm	f 60 feet. vith sand (vel; little to	GM); wet; o some san	L and COBBLES dark gray (10YR nd; little fines;
_60	5									60			/1); wet:			iM); dark gray w to little fines;
_65 - -	0		S13	19^ 20^ 13^	۸	۸	16.1	-		65 — - -		Packed :	sampler	·.		
_70 70	5 5		S14	25 37 50/3"	87/9"	>100	16.2	-	PA	-70 —		SANDS wet; mod SAND (S fines; no	FONE; f derately SM); ver nplastic	ine graine weathere y dense; ; weakly o	d; very sof	e; gray (7.5YR 5/1); ft; unfractured; (Silty fine sand; some
GR	924	5 A	ctivi	A CON ty Roa , Calif	ad, S	uite	103	INC	OF SUI LOO WIT PR	THIS B BSURFA CATION TH THE ESENTI	MARY APPLIE ORING AND A ACE CONDITI IS AND MAY PASSAGE OF ED IS A SIMPL NS ENCOUNT	AT THE TI ONS MAY CHANGE TIME. T LIFICATIO	ME OF I Y DIFFE AT THIS THE DAT	DRILLING R AT OTH LOCATIC A	ER IN	FIGURE B-10 c

Е	3OR	IN	G F	RECC	DRD	\	PROJE SDSU			allev				PROJE SD6		NUMBER		BORING S-10
	CATION						0000	IVIIOO	ion ve	шсу		STA	RT		FINIS	SH .		SHEET NO.
			l, San	Diego, (Californ	nia						3/1	2/2019			2/2019		4 of 4
	IG COMI									ETHOD tem Au	aer			LOGG		eson		CKED BY Vonk
	IG EQUI		Т						NG DIA			DEPTH (ft)	GROUNI					ROUNDWATER
	rich D5	-						8			71.3		66			▼ 22.1	/ 43.	9
	ING MET mer: 14		., Dro	p: 30 in.	(Auton	natic)	NOTES ETR		%, N _s	o = 1.3	2N _{sdt} =	0.88N _{MC}						
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	z°	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	we	DESC	CRIPTIO	ON AI	ND CLASS	SIFICAT	ΓΙΟΝ
		0,										Total D	epth = 7°	1.3 fee	et (Ta	rget dept	h reac	hed).
										_		Ground feet.	dwater m	easure	ed du	ıring drillir	ng at a	a depth of 22.1
	_									-		cappe	d with bla	ck dye	ed rap	oid set co	ncrete	
80										80 —		which	must be o	conside	ered			cal report
	15									_		^ = Ina	ccurate b	lowco	unt.			
	_									- -		(granit based	ic, subrou	ınded, g chatt	3- to ter, e	12-inch xcessive	diame auger	0% COBBLES ter), estimated inclination,
	_									_		*Geolo	gic Desc	ription	; (Dis	sturbed S	oil Des	scription).
85										85 —								
00																		
	20									- -								
.90										90 —								
	25 									-								
	_									-								
95	30									95 — -								
										- -								
GR	OUP	DE	LTA	A CON	ISUL	_ _TAN	ITS.	INC) OF	THIS BO	DRING A	PLIES ONL ND AT THE	TIME OF	DRILLI	ING.		F	IGURE
-	924	5 A	ctivi	ity Roa , Calif	ad, S	uite	103		LO WI PR	BSURFA CATIONS TH THE I ESENTE	CE CON S AND M PASSAG D IS A S	DITIONS M AY CHANG E OF TIME. IMPLIFICAT UNTERED.	AY DIFFE E AT THIS THE DAT	R AT C S LOCA FA	ATION A	١		B-10 d

F	3OR	INC	- F	RECO)RD	\	PROJE			بالميا					NUMBER	BORING S-11
	CATION		J 1	,	, , , D		SDSU	IVIISS	ion va	uley		START		SD605		SHEET NO.
			, San	Diego, (Califorr	nia						3/6/201	19	- 1	7/2019	1 of 2
	IG COM		-							ETHOD			L	OGGED		CHECKED BY
	ic Drilli	_									ud Rotary (3			S. Nar		C. Vonk
	ich D5		Γ					BORII 8/4	NG DIA	. (in)	36.5	PTH (ft) GRC		ELEV (ft)	DEPTH/EI	LEV. GROUNDWATER
	ICH DS						NOTES				30.5	34	+		<u>¥</u> 10.0	1 / 44.0
			, Dro	p: 30 in.	(Auton	natic)			%, N ₆	0 = 1.3	$32N_{SPT} = 0.8$	8N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	zº	MOISTURE (%)	DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	-	DESCR	IPTION A	IND CLASS	SIFICATION
		SAS SAS	В1 R2	4 9^ 15^	۸	٨	14.6	 118	PA PI CR EI	- - - 5 —		CONCRETE UNDIFFER lean CLAY	ENTIA (CL); s s; som PID=9 ; 33%	ATED SU stiff; dark e sand; 1 0.5 ppm Sand; 66	IRFICIAL brown (7 race grav 6% Fines)	
-10	45 		\$3	3 3 4	7	9	19.0		PI	- 10 — - -	¥	Intermittant from 7 to 12 Medium stif PP=1 tsf; T\	2 ft. ff to sti	ff; wet.		/EL and COBBLES
-15			S4	5 9 32^	^	^	10.8		PA	15 — - -		yellowish br sand; some packed sam PID=1.3 ppi (34% Grave	rown (grave npler m el; 57%	10YR 4/6 el; few fir 6 Sand; 9	6); wet; moles; low pl	
-20	35 30		S 5	5 12 19	31	41	20.6		-200	- 20 — - -		19 ft. Silty SAND	(SM); ttle finataining m	— — — - dense; (es; trace	- – – – - gray (2.5Y	DBBLES from 18 to
GR				A CON				INC	OF SU	THIS B BSURF	MARY APPLIE ORING AND A ACE CONDITION	T THE TIME ONS MAY DI	OF DI	RILLING. AT OTHE	ER	FIGURE
				ity Roa , Calif					WI ⁻ PR	TH THE ESENTE	IS AND MAY C PASSAGE OF ED IS A SIMPL NS ENCOUNT	TIME. THE	DATA	ı		B-11 a

Е	3OR	IN	G F	RECC	ORD	۱ ۱	PROJE SDSU			allev				PROJECT SD605		BORING S-11
ITE LO	CATION	1					0000	111100	.0 70			STAR		FINI	SH	SHEET NO.
	Friars		I, San	Diego, (Califorr	nia		DBII I	ING M	ETHOD		3/6/	/2019	3/	7/2019	2 of 2
	ic Drilli										ud Rotarv	(30-36.5	i')	S. Nar		C. Vonk
	NG EQUI		Т						NG DIA							EV. GROUNDWATER
	rich D5							8/4			36.5		54		▼ 10.0	/ 44.0
	mer: 14		., Dro	p: 30 in.	(Auton	natic)	NOTES		%, N ₆	₀ = 1.3	2N _{SPT} =	0.88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	AND CLASS	IFICATION
20			- S6	50/3"	REF	REF				-		Silty SA little fine	ND (SM	l); gray (2. fine grave	5Y 5/1); w	SOILS (continued): et; mostly fine sand; tic; no recovery;
-30 -35			S7	20 22 36	58	76	18.9		-200	30 — - - - - 35 —		SANDS (2.5Y N unfractu to medi cement PID=0.1 (22% Fi	TONE; f /5/1); we ured; (Sil um sand ed). I ppm ines)	fine to medet; modera Ity SAND (It; little fine	tely weath (SM); very s; nonplas	ed; massive; gray ered; very soft; dense; mostly fine
		X	S8	23 27 37	64	84	20.7			- - -			epth = 36	,		n reached).
-40	——15 ——									40 —		Boring I bentoni concret	te grout	d on 3/7/19 and cappe	9 shortly at ed with blad	fter drilling with ck-dyed rapid set
	_									- -					t of a geote I in its enti	echnical report rety.
-45	10									- 45 — -		(granition based of and visual COBBL record of encountry)	c, subrou on drill riq ual evalu ES grea description tered. Co	unded, 3- t g chatter, o uation of d iter than 10 on and cla obble-rich	o 12-inch of excessive frill cuttings 0% are not essification layers end	o to 10% COBBLES diameter), estimated auger inclination, Percent ted in the boring , where sountered in this 2 feet thick.
	_									_		^=Inacc	urate blo	owcount.		
												*Geolog	aic Desc	ription (Dis	sturbed So	il Description)
	5									_			, , , , , ,	, - (1 7
									 	10 01 37	AADV ADD	LIEG ON L	AT TUE	LOCATION	<u>. I</u>	
GR	OUP	DE	LT/	A CON	NSUL	_TAN	NTS,	INC	CF	THIS BO	ORING AN	LIES ONLY D AT THE T	TIME OF	DRILLING.		FIGURE
	924	5 A	ctivi	ty Roa , Calif	ad, S	uite	103		LO WI PR	CATION TH THE ESENTE	S AND MA PASSAGE	ITIONS MA Y CHANGE OF TIME. MPLIFICATI	AT THIS	S LOCATIO TA	N	B-11 b

E	3OR	IN	G F	RECO	DRD	۱ ۱	PROJE SDSU			allev				PROJECT SD605	-		BORING S-12
	CATION						0000	IVIIOO	1011 V	шсу		STAR	Т	FINI			SHEET NO.
			, San	Diego,	Califorr	nia						3/8	/2019		8/2019		1 of 2
	NG COM									ETHOD				LOGGED		1 -	CKED BY
	ic Drilli		-							tem Au		-DTU (CO)	000:	S. Nar		_	Vonk
	NG EQUI rich D5		ı					BORII 8	NG DIA	. (in)	41.5	-PIH (ft)	GROUNE 58	LLEV (ft)	DEPTH/E ▼ 21.8		ROUNDWATER
	ING MET						NOTE	-			41.5		50		<u>¥</u> ∠1.0	J / 30.2	
			, Dro	p: 30 in.	(Auton	natic)	_		%, N ₆	₁₀ = 1.3	$32N_{SPT} = 0.$	88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z°	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION A	AND CLAS	SIFICAT	TON
												PAVEN CONCE	IENT: Ap	oproximate	ely 4 inch	es of A	SPHALT
	55 55		B1				13.2		PA EI			SAND (sand; so PID=1.2 (5% Gra	SC); bro ome fine 2 ppm avel; 48%	wn (10YR s; few gra 6 Sand; 4 10YR3/1)	4/3); mo vel; low to 7% Fines	stly fine o mediu	S: Clayey e to coarse um plasticity.
_5	50		S2	2 4 9	13	17	10.3			5 -			sticity; tra	yellowish ace mica.	brown (10	0YR 5/4	4); little fines;
-10		X	R3	11^ 22^ 38^	^	^	9.1		-200	10 -		4/2); mo	ostly fine plasticit	GC); mo to coarse y; gravel s	gravel; s	ome fir	n brown (10YR nes; little sand;
-15			S4	13^ 14^ 14^	^	^	15.9		PA	15 –		(10YR 4 gravel; PID= 1.	1/2); moi: little to so 4 ppm	ith gravel st; mostly ome fines; 3% Sand; 2	fine to co ; low plas	arse sa ticity; tr	and; little
-20			S5	14^ 29^ 15^	^	۸	10.0	_		20 –	1	(10YR 4	1/2); wet; tle fines;	vith sand (; mostly fir nonplasti	ne to med	lium gra	sh brown avel; some
											PU A			ATION:*P		ırated	
GR	OUP	DE	LTA	A CON	ISUL	_TAN	NTS,	INC	C OF	THIS B	MARY APPLI	ES ONLY AT THE 1	AT THE	LOCATION DRILLING.	N	F	IGURE
	924	5 A	ctivi	ty Roa	ad, S	uite	103		LO WI PR	CATION TH THE ESENT	ACE CONDIT NS AND MAY PASSAGE C ED IS A SIMF NNS ENCOUN	CHANGE F TIME. PLIFICATI	AT THIS	LOCATIO A	N		B-12 a

E	3OR	IN	G R	RECC	DRD	\	PROJE SDSU			alley				<mark>ЈЕСТ NUMB</mark> I 0605	ĒR	BORING S-12
SITE LO			San	Diego, (Califor	nia						STAR	т 2019	FINISH 3/8/201	<u> </u>	SHEET NO. 2 of 2
DRILLIN Pacifi DRILLIN Diedr	i G COM ic Drilli i G EQUI rich D5	PANY ng PMEN 0		Diego, V	Jamon	TIIA		Hol BORII 8		ETHOD tem Au (in)			LOC S.	GGED BY Narveson (ft) DEPT	CH	IECKED BY C. Vonk GROUNDWATER (f
	NG MET ner: 14		, Dro	p: 30 in.	(Autor	natic)	NOTES		%, N ₆	₀ = 1.3	$32N_{SPT} = 0$).88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESCRIPT	TION AND CL	ASSIFIC	ATION
			S6	45 25 39	64	84	14.7		-200	- - -		SANDS wet; mo SAND (TONE; fine of derately weal SM); very de onplastic; we pom.	rained; mas thered; very nse; wet; m	ssive; gr soft; upostly fin	porly-indurated ray (7.5YR 6/1); nfractured; (Silty e sand; little
_30	 25		S7	22 31 50	81	>100	26.0			30 —		Gray (7. plasticity PID=0.3	/).	ilayey SANE) (SC);	little fines; low
_35	-		S8-1 S8-2	7 16 22	38	50	21.7 17.6		-200 PI -200	35 — -		dark gra weather mostly f	indurated Clay (2.5Y 4/1); ed; very soft ines; few fines ppm; (61%	wet; unfrac ; (Sandy fat sand; high	tured; n CLAY (CH); hard;
_40	—20 —			16						- - 40 —		dark gra soft; unf	y (2.5Y 4/1); ractured; (Si ome fines; no	wet; moder Ity SAND (S	ately war at	ained; massive; eathered; very ise; mostly fine mented).
		\triangle	S9	24 50	74	97	20.3			-			nse; PID=0 p	<u>'</u>		
	 15									-	-		epth = 41.5 fe water measu	` 0	•	ached). t a depth of 21.8
_45	_									- 45 —			eackfilled on with black-dy			
.•										-			ring Record i lust be consi			
	— —10									-		(granitic based o	, subrounded	d, 3- to 12-in atter, excess	ich dian ive aug	10% COBBLES neter), estimated er inclination,
										_			curate blowco ic Descriptio		d Soil D	escription).
GR	924	5 A	ctivi	A CON ity Roa o, Calif	ad, S	Suite	103	INC	SU LO WI	THIS BOURFACATION TH THE	ORING AND ACE COND S AND MAY PASSAGE	O AT THE T ITIONS MA Y CHANGE OF TIME.	AT THE LOC IME OF DRIL Y DIFFER AT AT THIS LOC THE DATA ON OF THE A	LING. OTHER CATION		FIGURE B-12 b

F	3OR	INC	 G F	RECO	DRD	١ ١	PROJE SDSU			allev					ECT N	NUMBER	BORING S-13
SITE LO	CATION	ı					3030	IVIIOO	IOII V	шеу		STAI		30	FINIS		SHEET NO.
	Friars		, San	Diego, (Californ	nia		DDILL	ING M	ETHOD		2/1	3/2019	1.06	2/2 GED F	25/2019	1 of 5
	ic Drilli							I			lud Rotary (4	1 5-101	.5')	1		eson	C. Vonk
DRILLIN	IG EQUI	PMEN1	Г					BORII	NG DIA		TOTAL DE		GROUN			DEPTH/EL	EV. GROUNDWATER (
	rich D5						NOTE	8/4			101.5		75			▼ NM /	NM
			, Dro	p: 30 in.	(Auton	natic)			%, N ₆	0 = 1.3	$32N_{SPT} = 0.8$	8N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z 2	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DES	CRIPT	ION A	ND CLASSI	FICATION
			B1						PI EI			CONC UNDIF	RETE. FERENT	IATE	D SU	RFICIAL	s of ASPHALT SOILS: Clayey 2); moist; mostly
	_		S2	25 16 10	26	34	12.9	-	PA		///	PID=3.	3 ppm			gravel; med 1 <u>1% Fines</u>)	dium plasticity. ´
_ 5	70		B1	18			40 -			5 _	-867	(Estima	ated 20%	COB	BLES	S).	and COBBLES.
			S3	15^ 29^	۸	^	12.2	-				5/2); m broken	oist; mos	stly gra gment	avel a	and gravel-	ribown (101R)-sized freshly fines; little sand;
–10	65 		S4	11 24^ 18^	^	^				10 –							
_15	60 		S5	7 20^ 24^	٨	^				15 –		No rec	overy.				
											Y//J	moist;		nes; s	ome s	sand; little	rayish brown; gravel.
_20	55 		S6	7 50/3" ^	۸	۸				20		from 20 Clayey wet; m mediur Gravel PID=0.	to 30 ft GRAVE ostly fine n plastici stuck in	L (GC to co ty. samp	; ver arse (ler.	y dense; c gravel; sor	and COBBLES dark grayish brown; ne sand; little fines;
GR				A CON				INC	OF SU	THIS B BSURF	MARY APPLIE SORING AND A ACE CONDITI NS AND MAY (T THE ONS M	TIME OF AY DIFFE	DRILL R AT	JNG. OTHE	R	FIGURE
				o, Calif					WI [*] PR	TH THE ESENT	PASSAGE OF ED IS A SIMPL DNS ENCOUNT	TIME. JFICAT	THE DA	TA			B-13 a

F	30R	IN	G F	RECC	DRD	١ ١	PROJE SDSU			allev				PROJE SD6	CT NUN	MBER	BORING S-13
ITE LC	CATION	1					3D3U	IVIIOS	IOII V	апсу		STAI			FINISH	2042	SHEET NO.
	Friars IG COM		, San	Diego, (Californ	nia		DRILL	ING M	ETHOD		2/1	3/2019	LOGG	2/25/2 SED BY		2 of 5 CHECKED BY
	ic Drilli		_								ud Rotary				Varves		C. Vonk
	ich D5		•					8/4	NG DIA	(IN)	101AL D	EPIH (ft)	75	DELEV	- 1	· NM / N	V. GROUNDWATER (IM
	ING MET		_				NOTES	3								-	
Hamr	mer: 14	l0 lbs.	., Dro	p: 30 in.	(Auton	natic)	ETR	l ~ 79 ⊤	%, N ₆	₀ = 1.3	$\frac{32N_{SPT} = 0}{1}$.88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTIC	ON AND	CLASSIFI	ICATION
			S7	50/1"	REF	REF						LINDIE	EEDENI			"OLAL O	211 O (1)
	_									-		No rec	overy.				OILS (continued):
										_	XX	Clayey	GRAVE	L (GC)	(contin	iued).	
										_							
										_							
30	45	\geq	S8	50/4"	REF	REF				30 —		No rec	overy				
	_									_							; wet; gray (7.5YR
	_									_		5/1); m		to me	dium sa		fines; trace gravel
										_			,		-		
										_							
	_									-							
-35	40	/		15						35 —			; no grav	el; trac	e mica.		
	_	X	S9	9 15	24	32	23.2	-	PA	-		PID=0. (0% G	.8 ppm ravel; 94°	% Sand	d; 6% F	ines)	
	_									_							
										_							
										-							
40	35	/		6						40 —		Mediur	n dense;	trace i	ron oxid	de stainir	ng.
	_	X	S10	7 10	17	22	18.0	-	-200	-		PID=0 (7% Fi	o ppm nes)				
										-							
										_							
4.5										-							
45	30		D.	6	4.5		07.5			45 —		Quitab	to mud =	oton, d	Irillina /	Tricono =	otany drill bi+\
	_		R11	5 8	13	11	27.6	-		-		Dark g	ray (2.5Y			incone f	otary drill bit).
	_									_		PID=4	8 ppm				
	_									_							
										_							
<u> </u>						T	ITC	18:0	ТН		MARY APPL						
GR				A CON				INC	SU	BSURF	ORING AND ACE CONDI	TIONS M	AY DIFFE	R AT O	THER		FIGURE
				ty Roa					WI	TH THE	S AND MAY PASSAGE (OF TIME.	THE DA	TΑ			B-13 b
	Sa	וט ח	ego	, Calif	ornia	a 92'	126				ED IS A SIM NS ENCOU!		ION OF T	HE AC	TUAL		

E	BOR	IN	G F	RECC	ORD	١ ١	PROJEC SDSU			alley				PROJECT SD605		BORING S-13
9449 RILLIN Pacifi	<mark>i<mark>G СОМ</mark>і ic Drillii</mark>	Road PANY ng		Diego, (Califorr	nia		HS	A (0-4		ud Rotary (45-101	3/2019	LOGGED S. Nar	25/2019 BY veson	SHEET NO. 3 of 5 CHECKED BY C. Vonk
	i <mark>ch D</mark> 5		Т					BORII 8/4	NG DIA	. (in)	101.5	PTH (ft)	GROUNI 75	ELEV (ft)	DEPTH/EL ▼ NM /	EV. GROUNDWATER (
	NG MET	_					NOTES				101.5		75		¥ INIVI /	INIVI
Hamr	ner: 14	0 lbs	, Dro	p: 30 in.	(Auton	natic)	ETR	~ 79	%, N ₆	0 = 1.3	$32N_{SPT} = 0.8$	88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	, Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	AND CLASS	IFICATION
			S12	9 10 10	20	26				- - -		Clayey 4/1); w	SAND (Set; mostly low plas	SC); mediu	um dense; barse sand	SOILS (continued): dark gray (7.5YR ; some fines; few
- 55	20 		S13	17^ 17^ 16^	^	^	15.0	-	-200	55 — - - -		dark gr	ay (7.5Yl es; little g		t; mostly fii	vel (SW-SM); dense; ne to coarse sand;
-60	15 		S14	50/5"	REF	REF				60 —		PID=1. Slow a from 60	8 ppm nd difficu) to 75 ft.	lt drilling o	n GRAVEI	e of sampler.
-65	—10 — — —									65 — - - -						
-70	5		S15	50/5.5"	REF	REF				70 — - - -		PID=0				
GR	924	5 A	ctivi	A CON ty Roa	ad, S	uite	103	INC	OF SU LO WI PR	THIS BOURFACATION TH THE ESENTE	MARY APPLII ORING AND A ACE CONDIT S AND MAY PASSAGE O ED IS A SIMP NS ENCOUN	AT THE IONS MA CHANGI F TIME. 'LIFICAT	TIME OF AY DIFFE E AT THIS THE DAT	DRILLING. R AT OTHE LOCATIO FA	ER N	FIGURE B-13 c

E	30R	IN	G R	RECC	RD	١ ١	PROJE(SDSU			allov				PROJECT SD605			BORING S-13
	CATION						3030	IVIISS	IOII V	alley		STAR	<u> </u> !T	FINI			SHEET NO.
			, San	Diego,	Califorr	nia						2/1	3/2019		25/2019		4 of 5
	IG COM									ETHOD	ud Data		E'\	LOGGED			KED BY
	ic Drillir IG EQUI		Г						NG DIA			y (45-101		S. Nar			Vonk ROUNDWATER
	ich D50							8/4		(,	101.5		75	(,	▼ NM		
	NG MET		_		,, .		NOTES										
Hamn	ner: 14	0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	? ~ 79 ∣	%, N ₆	_o = 1.3	32N _{SPT} =	0.88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Ž ^o	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	AND CLASS	SIFICAT	ION
	_									- - -		SANDS (2.5Y 6 unfracti	STONE; f /1); mod- ured; (Cland; little f	erately to avev SAN	rse graine nighly wea D (SC); de	ed; mas athered ense; w	ssive; gray l; very soft; vet; mostly to moderately
-80 -85	5 		S16	15 17 24	41	54	25.8	-	-200	80 — - - - 85 —		Very de PID=0 (25% F Slow ar strongly concret	ines) nd difficu / cement	lt drilling 8 ted SAND	2 to 84 ft; STONE ar	moder nd poss	ately to sible
_90 _95	15 15 		S17	50/2"	REF	REF				90 —		strongly concret	cement cons.	lt drilling fi ted SAND: essible con	STONE ar	92 ft; m	noderately to le possible
	— — —									- - - -			/ cement	lt drilling f led SAND:			noderately to sible
GR	OUP	DE	LT/	A CON	ISUL	_TAN	NTS.	INC	TH OF			PLIES ONLY			١	F	IGURE
				ty Roa					SU	BSURF/	ACE COND	DITIONS MA AY CHANGE	Y DIFFE	R AT OTHI			
	UZ-T	J / N	JU VI		.u, U	Janto	126			TH THE							B-13 d

		111			<u> </u>	١ ١	PROJE							PROJECT I	NUMBER	BORING
			ノト	RECC	ノベレ	'	SDSU	Miss	ion Va	alley				SD605		S-13
9449		Road	, San	Diego,	Califorr	nia						STAF 2/1	RT 3/2019		25/2019	SHEET NO. 5 of 5
	IG COM									ETHOD	.d Data	m. (4E 4O4	C !\	LOGGED		CHECKED BY
	ic Drilli IG EQUI	_	-						4 (U-4 NG DIA			ry (45-101		S. Narv		C. Vonk LEV. GROUNDWATER (ft
	rich D5		•					8/4	10 DIA	. (,	101.		75	D LLLV (II)	▼ NM	
	ING MET	-					NOTES									
Hamr	mer: 14	l0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	~ 79	%, N ₆	0 = 1.3	2N _{SPT} =	$0.88N_{MC}$				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z 2	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	ND CLASS	SIFICATION
- -	_	X	S18	34 32 38	70	92	19.6	-		-		(2.5Y 6 unfract fine to modera	STONE; f 5/1); mod ured; (Si coarse sa ately cem	fine to coar erately to h Ity SAND (and; little fi nented.	rse graine nighly wea SM); very nes; low p	: *Poorly-indurated ed; massive; gray athered; very soft; dense; wet; mostly plasticity; weakly to
_										_			•	,		oth reached).
<u>105</u>	30									105_				ot measure d on 2/25/1		26/19 with bentonite
_										_				ed with col		
_										_				cord is part considered		echnical report irety.
_	_									_		^ = Ina	ccurate b	olowcount		
_										_						p to 10% COBBLES diameter), estimated
<u> 110 </u>	<u></u> -35									110-		based	on drill ri	g chatter, e	excessive	auger inclination, s. Percent COBBLES
_	_									_		descrip	tion and	classificati	on, where	oring record e encountered.
_	_									_		approx	imately 1	0 to 20 fee	et thick.	his exploration were
_										_		*Geolo	gic Desc	ription; (Dis	sturbed S	oil Description).
-										_						
<u>115</u>										115_						
_										_						
_										_						
-										-						
_																
120	<u></u>									120_						
-	_									_						
_										_						
_										_						
L										_						
GR				A CON				INC) OF	THIS BO	DRING AI	PLIES ONL' ND AT THE DITIONS MA	TIME OF	DRILLING.		FIGURE
				ity Ro					LO	CATION: TH THE I	S AND M. PASSAG	AY CHANGI E OF TIME.	E AT THIS	S LOCATIOI TA	N	B-13 e
	Sa	וט וו	ego	, Calif	iomia	3 9Z	ı∠b					MPLIFICAT UNTERED.	ION OF T	HE ACTUA	L	- -

			G F	RECC	RD	١ ١	PROJE SDSU			alley				D605		BORING B-	
9449 RILLIN	NG COM	Road PANY		Diego, (Califorr	nia				ETHOD		3/13/20	LO	GGED	13/2019 BY	SHEET N 1 of 2 CHECKED BY	
	ounty [NG EQUI							BORI	NG DIA	tem Au (in)		PTH (ft) GRO	OUND EL		veson DEPTH/EI ▼ NM	C. Vonk	ATER
AMPL	ING MET		., Dro	p: 30 in.	(Auton	natic)	NOTES	-	5%, N ₆	_{io} = 1.4	12N _{SPT} = 0.9		l		¥ INIVI	INIVI	
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG]	DESCRIP	TION A	AND CLASS	SIFICATION	
	50									_		PAVEMEN CONCRETI		ximat	ely 4 inche	es of ASPHALT	
-5			B1 S2 B3	699	18	26	9.0	-	EI PA	- - - 5 —		SAND (SC) medium sar	; brown ond; some onse; dark aceous.	(7.5YF e fines c gray	R 4/3); mo ;; few grav (10YR 5/1	SOILS: Clayey ist; mostly fine tel; low plasticity I); little fines; tra	
- ɔ	45 	X	S4	3 5 6	11	16	18.5	-	-200 PI	5 –		PID=0.5 pp	m. with sar 4/4); mo avel; mo TV= 0.9	oist; m edium	nostly fines plasticity;	ery stiff; reddishs; little fine sand trace mica.	- — – 1 ;
-10	40 		S5	16^ 25^ 29^	۸	٨				- 10 — - - -		Clayey GRA 4/3) and gra with fresh b low plasticit Gravel in sa Polymer/wa PID=1 ppm	AVEL with any (10YR) roken roy. Impler. ter mix and the difficult dries.	k 5/1) ck frag added	gravels; m gments; lit to hollow on GRAVE	ddish brown (5\ oist; mostly gra- tle sand; little fir stem. L and COBBLE	vel nes;
-15	35		S6	16^ 17^ 18^	^	^	11.1	-	-200	15 —			vn (10YF nes; non ampler. m.)	R 4/3); plasti	wet; mos c.	d sand (GP-GM)	
-20	30 		S7	45^ 50/2" ^	^	^				20		No recovery	,		S .	ivel and cobbles	S.
									1		600	-0.044.7.4-	THE	\A T! \!	,, T		
GR	924	5 A	ctivi	ty Roa ty Calif	ad, S	uite	103	INC	OF SU LO WI	THIS B BSURF. CATION TH THE	MARY APPLIE ORING AND A ACE CONDITI IS AND MAY (PASSAGE OI ED IS A SIMPI	AT THE TIME IONS MAY DI CHANGE AT F TIME. THE	OF DRIL FFER AT THIS LOO DATA	LING. OTHI CATIO	ER IN	FIGURI B-14 a	

F	3OR	INC	3 F	RECC	RD	`	PROJE			allov				PROJEC SD60	T NUMBER		BORING B-14
	CATION		<u> </u>		·	•	SDSU	IVIISS	IUII V	шеу		STAF			NISH		SHEET NO.
			San	Diego, 0	Californ	nia							3/2019		3/13/2019	١	2 of 2
	IG COM		, Can	Diego, v	Jamon	iiu		DRILL	ING M	ETHOD		0/ 1	0/2010	LOGGE			CKED BY
	ounty [1							tem Au	ner				arveson		Vonk
	IG EQUI		-						NG DIA			PTH (ft)	GROUNI				ROUNDWATER
CME								8	10 5	(,	31.5	(,	51	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	v, JEI IIIZ		
	NG MET	HOD					NOTES				01.0		01		· · · · · · ·	, , , , , , , , , , , , , , , , , , , ,	
			. Dro	p: 30 in.	(Auton	natic)			%. N.	。= 1.4	$2N_{SPT} = 0.$	95Nuc					
			,		(* 10.001				10,118	0	- 1361 - 1	IVIC					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CLAS	SIFICA	TION
_30 _35 _40	25		\$8 \$9	20 30 47 14 30 44	77	>100	17.6		-200	30 — 35 — 40 — 45 —		SANDS gray (7 unfract fine to cemen (79% S PID = 0 *Poorly redish unfract \text{fines; s} *Poorly grained weathed dense; nonpla All soils (subrou on drill visual o greatel descrip Cobble	STONE; for	fine to m); highly ty SAND sand; littl % Fines) ———— ed CLAY R 5/2); rn dy lean sand; m ed SAND ee; pinkis r soft; un stly fine t kly ceme 1.5 feet (as not m mix adde orior to e d on 3/13 ement an cord is pa considere blowcoun ription; (I tered ma to 12-in er, exces n of drill % are noc classificers encoders	weathered (SM); very e fines; no STONE; fir noderately CLAY (CL); fir noderately CN, and the sed of	ned; med; med; med; med; med; med; med; m	nassive; pinkish soft; a; wet; mostly ic; weakly ic; weakly ined; massive; ered; very soft; wet; mostly asticity). medium 2); highly AND (SM); very little fines; inedium control ndwater. er drilling because em to control ndwater. er drilling with ack-dyed rapid induced based ation, and COBBLES record
	_									_							
GR	OUP	DE	LTA	A CON	ISUL	_TAN	ITS,	INC) OF	THIS BO	MARY APPLI ORING AND	AT THE	TIME OF	DRILLING	Э. 	F	FIGURE
-				ty Roa					SU		CE CONDIT						
				, Calif					WI [*] PR	TH THE ESENTE	S AND MAY PASSAGE C ED IS A SIMF NS ENCOUN	F TIME. PLIFICAT	THE DAT	ГА			B-14 b

F	\mathbb{R}		3 E	RECC)BD	۱ ۱	PROJE							PROJECT		BORING D 1 E
L SITE LO			יו כ	LCC	טווע		SDSU	Miss	ion Va	alley		STAF)т	SD605		B-15 SHEET NO.
			. San	Diego, 0	Californ	nia							1/2019		15/2019	1 of 2
	IG COM		,					DRILL	ING M	ETHOD				LOGGED		CHECKED BY
	ic Drilli	_								tem Au				S. Nar		C. Vonk
	IG EQUI								NG DIA	. (in)		DEPTH (ft)		D ELEV (ft)	1	EV. GROUNDWATER (
	og Mai NG MET		& Dei	drich D5	0		NOTES	6			36.3		51		▼ 12.2	/ 38.8
			Dro	p: 30 in.	(Autor	natic)			% (Ma	arl M5)	/ 79% (D	eidrich D	50)			
1 101111			, 5.0		7 (313)					<u> </u>	, . 	olarion E				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG					SIFICATION
	50											CONC	MENT: A RETE.	pproximate	ely 5 inche	es of ASPHALT
	_ _ _		B1				11.4	-	PA	-		SAND mostly gravel a mediun	with grav fine to co and grav n plastici	rel (SC); lig parse sand el-sized fre	tht brown ; some fin eshly broke	SOILS: Clayey (10YR 5/3); moist; les; little to some en rock fragments;
_5	45 45		R2-1 R2-2	12^ 29^ 22^	۸	^	12.0 10.9	-	-200 PI	5 —		~2.5-in	ch diame 5 tsf; PII		clast in sa	es; approximately imple number R2-1.
-10	40		S 3	2 3 5	8	11	22.4	-		- 10 — - -	<u> </u>	moist; r	nostly fir stic; trace	ne to coars		ark gray (2.5Y 4/1); ome fines;
_15	35 35		S4	12^ 14^ 12^	۸	^	15.5	-		- 15 — -		(10YR) little gra	5/2); wet avel; med in sampl	; mostly fir dium plasti	ne to coars	se; grayish brown se sand; some fines;
-20	30 		S 5	16^ 23^ 20^	۸	۸	8.4	-		20 — - - -		(Estima 	AND with et; mostly nonplast in sampl	20% COI	BBLES) M); yellowi	L and COBBLES. ish brown (10YR l; some fines; little
GR	924	5 A	ctivi	CON ty Roa , Calif	ad, S	uite	103	INC	OF SUI LOO WIT PR	THIS BOURFACATION TH THE ESENTE	ORING ANI ACE COND S AND MA' PASSAGE	D AT THE T DITIONS MAY Y CHANGE OF TIME. MPLIFICAT	TIME OF AY DIFFE E AT THIS THE DAT	R AT OTHE S LOCATIO	ER N	FIGURE B-15 a

Е	3OR	IN	G R	RECO	ORD	١	PROJE SDSU			allev				ECT N 605	NUMBER		BORING B-15
	CATION									<u>J</u>		START		FINIS			SHEET NO.
	Friars		, San	Diego,	Californ	nia		DRILL	ING M	ETHOD		2/11/201		3/1 GED E	5/2019	CHEC	2 of 2
	ic Drilli									tem Au	ger				eson	1	Vonk
	NG EQUI								NG DIA	. (in)	I	DEPTH (ft) GROU	ND ELE	V (ft)			
	nog Mai I ng met		& Dei	drich D5	50		NOTES	6			36.3	51			▼ 12.2	/ 38.8	3
—			, Dro	p: 30 in.	(Auton	natic)	_		% (M	arl M5)	/ 79% ([Deidrich D50)					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	09	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	DE	SCRIPTI	ION AI	ND CLASS	IFICAT	TION
	25 	X	S6	7 10 50/3" ^	^	۸				-		UNDIFFEREN Silty SAND wi 6/2); wet; mos gravel; nonpla	th grave tly fine	el (SN to coa	/I); dark gr arse sand	ayish ; some	brown (10YR e fines; little
-30	20		S7	8 16 24	40	53	19.4	-		30 —		FRIARS FOR SANDSTONE gray (10YR 6/ unfractured (S fine sand; little	i; fine gr 2); high Silty SAN	rained ly we ND (S	d; massive athered; v SM); very o	e; light very so dense;	oft; ; wet; mostly
35	 15		R8-1 R8-2	10 33 50/4"	83/10"	88	6.1	120	PA DS	35 — -		Gray (10YR 6 sampler. (0% Gravel; 8	6% Sar	nd; 14	% Fines)		
	_									_		Total Depth = Groundwater feet on 2/11/1	measur	`			,
40	_									40		Marl M5 (0 to feet).	26.3 fee	et); D	eidrich D5	60 (26.	3 to 36.3
	10 									- -		Boring backfill bentonite grou concrete. Bori bentonite grou concrete.	ut and c ing redri	appe	d with blac on 3/15/19	ck-dye), back	ed rapid set filled with
	-									-		This Boring R which must be					al report
45	 5									45		^ = Inaccurate *Geologic Des				oil Des	scription).
	_									- - -		All soils encou (subrounded, on drill rig cha visual evaulat greater than 1 description an Cobble-rich la approximately	3- to 12 atter, exc ion of d 0% are d classi yers en	2-inch cessiverill cur noted ification	diameter) ve auger in ttings. Per d in the bo on, where tered in th), estir nclina rcent (oring re encou	nated based tion, and COBBLES ecord untered.
GR				CON				INC). OF	THIS BO	ORING AN	LIES ONLY AT TH D AT THE TIME O DITIONS MAY DIFF	F DRILL	JNG.		F	IGURE
				ty Roalit					LO WI	CATION TH THE	S AND MA PASSAGE	Y CHANGE AT TH OF TIME. THE D MPLIFICATION OF	IIS LOCA ATA	OITA	١	ļ	B-15 b

F	30R	INC	3 F	RECO)RD	\	PROJE			llov					T NUMBER		BORING B-16
	CATION		<u>ر</u> ر		/		SDSU	IVIISS	ion va	шеу		STAR	<u> </u>	SD60	NISH		SHEET NO.
			, San	Diego, (Califorr	nia							3/2019		2/15/2019		1 of 4
RILLIN	IG COM	PANY	-							ETHOD				LOGGE		- 1	CKED BY
	ic Drilli	_									ud Rotary (4				rveson		Vonk
	ich D5		Γ					8/4	NG DIA	. (in)	85	TH (ft)	GROUNI 78) ELEV (f	t) DEPTH/E ▼ 39.9		ROUNDWATER (
	ING MET						NOTES				00		70		¥ 39.8	9 / 30.	. 1
Hamr	ner: 14	0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	R ~ 79	%, N ₆	0 = 1.3	$32N_{SPT} = 0.8$	8N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CLAS	SIFICA	TION
												PAVEN CONCE	IENT: A _l RETE ov	pproxima er 6 inch	ately 3 inch es of AGG	es of A REGA	ASPHALT TE BASE.
	75		S 1	5 5 6	11	14	13.6	-		- - -		SAND (moist; r	(SM); me	edium de ne to med	dium sand;	h brov	S : Silty vn (2.5Y 5/2); fines; trace
_			B2				13.1	-	PA	_		Clavev	SAND (S	SC); med	lium dense	; grayi	sh brown (2.5Y
-5				8					CR EI	5 —	Y// !	5/2); mo	oist; mos	tly fine to	o medium s s; low plasti	sand; s	some fines;
			R3	10 16	26	23	16.4	109		-	//// 1	PID=0.0	O ppm		; 39% fines		
–10			S4	6^ 15^ 15^	^	^	13.1	-	-200	- 10 — -		orown (ew to l	10YR 4/2 ittle gravents; low p 0 ppm	2); moist el and gi	avel-sized	e sand	ark grayish d; some fines; y broken rock
_15			R5	50/2" ^	REF	REF				- 15 — -			———- nd difficu ited 20%			— — — EL and	. — — — — · I COBBLES.
-20	60 									- - - 20 —		No reco	overy; sa	mpler re	fusal.		
	 55 		S6	3 10 20	30	40	13.2	-	-200 PI	- - -			ome fines y. tsf		se; moist; r little gravel		
GR	OUP	DE	LT/	A CON	ISUL	LAN	NTS.	INC) OF	THIS B	MARY APPLIE ORING AND A	T THE T	TIME OF	DRILLING	3.	F	FIGURE
	924	5 A	ctivi	ity Roalif , Calif	ad, S	uite	103		LO	BSURFA CATION TH THE	ACE CONDITION IS AND MAY CONTROL PASSAGE OF ED IS A SIMPL	ONS MA HANGE TIME.	Y DIFFE AT THIS THE DAT	R AT OTI S LOCATI FA	HER ON		B-16 a

F	3OR	IN	3 F	RECO)RD	\	PROJE			llov					NUMBER		BORING B-16
	CATION		<u> </u>		, , <u>,</u> ,	,	SDSU	IVIISS	OH VE	шеу		STAR	 T	SD60	D IISH		SHEET NO.
			, San	Diego, (Califorr	nia							3/2019		/15/2019		2 of 4
RILLIN	IG COMI	PANY								ETHOD				LOGGE		CHE	CKED BY
	ic Drillii	_									ud Rotary (4				rveson	1 -	Vonk
	IG EQUI		Г						NG DIA	. (in)	I	TH (ft)		ELEV (ft	I		ROUNDWATER
	ich D50						NOTE	8/4			85		78		₹ 39.9	9 / 38.	. 1
			Dro	p: 30 in.	(Auton	natic)			% N.	. = 1.3	32N _{SPT} = 0.88	RN					
				<u>. </u>	(101011				1, 1,	0	- 15p1 - 110	- IVIC					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	zº	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION	AND CLAS	SIFICA	TION
			R7	50/5" ^	REF	REF					200	INDIE	EDENT	LATED C	LIDEICIAL	COIL	C (a antinua d)
	_									-		Hard dr	illing on	GRAVEL	and COB	<u>. SOIL</u> BLES.	.S (continued):
											600		-				
												no reco Estima	ted 20-3	mpler ref 0% COB	usai. BLES)		
	50									-					,		
										-	107×						
												Siltv SA	ND (SM): mediur	n dense: d	lark ar	ay (5YR 4/1);
30		7		16						30 —		noist; n	nostly fin	e sand;	some fines	; few o	gravel;
		X	S8	7	16	21	16.4	-	PA	-			itic; mica sample.		/2 inch cla	y lens	e in bottom
		\longrightarrow		9							[PID=0.3	3 ppm				
	_									-		6% Gra	avel; 62%	% Sand; :	32% Fines)	
	45									_							
	_									-							
35	_									35 —							
			R9	18 30	56	49						vo reco	very; de	nse.			
	_		110	26		40				-							
	_									_							
	40																
	40									-							
	_									-							
40										40						ostly r	medium to
ŧU				6						40 —		PID=13		ce mica.			
			S10-1 S10-2	3 2	5	7	18.5 45.6	-	-200 PI	-							
		${\vdash}$	J 10-2				75.0		'								(5Y 2.5/1);
										-			stly fines .4 ppm	s; some f	ine sand; l	nigh pl	asticity.
	35									-		57% Fi					
														· V ND · · · · ·		- — —	onco: darl
										-		grayish	brown (1	10YR 4/2); wet; mo	stly me	
15				14						45 —	1 1111 6	coarse	sand; fev	w fines; t	race grave	I; non	
			R11-1	20	53	47	13.6	116	-200			vell-gra PID=0.0		olioiti fin	gs of samp	JIE.	
			R11-2	33						-		9% Fin	es)		i (T::		micralia (U. l. 10)
	_									-		Switch 1 15 feet.		otary drill	ing (Tricor	ie rota	ry drill bit) at
	30									-							
										-							
	_			I	1												
		DE	 T <i>1</i>		וופו	TAN	JTC	INIC	TH		MARY APPLIES					ŗ	FIGURE
				A CON				INC	OF SU	THIS B BSURF	ORING AND A ^T ACE CONDITIO	T THE T ONS MA	IME OF I Y DIFFEI	DRILLING R AT OTH	S. HER	F	FIGURE
GR	924	5 A	ctivi	A CON ty Roa o, Calif	ad, S	uite	103	INC	OF SUI LO	THIS B BSURF CATION	ORING AND A	T THE T ONS MA HANGE	IME OF I Y DIFFEI AT THIS	DRILLING R AT OTH LOCATION	S. HER	F	FIGURE B-16 b

Е	BOR	IN	G F	RECC	DRD)	PROJE SDSU			alley				PROJECT SD60	NUMBER		BORING B-16
9449		Road	l, San	Diego, (Califor	nia						STAR 2/1	т 3/2019	FIN 2	ііѕн :/15/2019		SHEET NO. 3 of 4
	іс сом ғ ic Drillir									ETHOD .5') / Mi	ıd Rotar	y (45-85')		LOGGEI S Na	rveson		CKED BY Vonk
	IG EQUII		Т						NG DIA				GROUNE	1			ROUNDWATER
	ich D50							8/4			85		78		₹ 39.9	9 / 38.	1
	NG MET ner: 14		., Dro	p: 30 in.	(Autor	natic)	NOTES		%, N ₆	_{io} = 1.3	32N _{SPT} =	0.88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	%	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CLAS	SIFICAT	ΓΙΟΝ
	— — —25		S12	12 8 11	19	25	24.6	-	-200	-		Poorly-9 5/1); we	graded S et; mostly vel; non .2 ppm	SAND (SF	P); medium	n dense	S (continued): e; gray (10YR ce fines and
_55			R13	27 ^ 50/4" ^	^	^	16.6	-		55 — - - -		Heaving PID=0.0		packed s	sampler		
-60										60 —				– – – lt drilling 0% COB		EL and	COBBLES.
-65			S14	25^ 30^ 50/5" ^	^	^	12.2	-		65 — -		brown (gravel-s	2.5Y 4/2 sized fres some fin); wet; m shly brok	ostly grave	el, cobb igments	s; little fines;
-70										- 70 — - - -		COBBL	ES (cavi		illing on GI oit getting s ES)		
GR		5 A	ctivi	A CON	ad, S	Suite	103	INC	OF SU LO	THIS BOURFACATION	ORING AN ACE CONI	PLIES ONLY ID AT THE T DITIONS MA AY CHANGE	TIME OF AY DIFFE AT THIS	DRILLING R AT OTH S LOCATION	S. HER		FIGURE B-16 c

	3OR	INC	3 F	RECO)RC	\	PROJE			llov					NUMBER		BORING B-16
	CATION		<u> </u>		/ I \ L		SDSU	IVIISS	ion va	alley		STAF	<u></u>	SD60	S IISH		SHEET NO.
			, San	Diego, 0	Califori	nia							3/2019				4 of 4
	NG COM		•	<u> </u>				DRILL	ING M	ETHOD				LOGGE	BY	CHE	CKED BY
	fic Drilli	_										ry (45-85')			rveson		Vonk
	NG EQUI		Γ						NG DIA	. (in)		DEPTH (ft)		DELEV (ft	I		ROUNDWATER
	rich D5						NOTE	8/4			85		78		₹ 39.9	9 / 38	. 1
			Dro	p: 30 in.	(Autor	natic)	II .		% N.	. = 13	32N ₀₀₇ =	0.88N _{MC}					
· iuiii					(7 tator			1	70, 146	0 - 1.0	JZI ISPI —	0.001 1 MC					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CLAS	SIFICA	TION
-80	0		S15	30^ 30^ 35^ 21 29 50	79	>100	21.8	-		- - - 80 — -		Silty Gibrown (freshly fine to (Estima PID=0.) FRIAR SANDS (2.5Y 5 unfract very de	RAVEL w (2.5Y 5/3) broken recoarse sated 20% 0 ppm SFORM STONE; f (/1); modeured; (Pounse; wet	with sand b); wet; m ock fragn and; nonp COBBLI ATION: fine to co erately to porly grace	(GM); very ostly grave nents; little blastic. ES) *Poorly ind arse grains b highly we ded SAND fine sand;	y densel and el fines; durated ed; maeathere with c	e; light olive gravel-sized little to some
-85										85 - -		boreho Total D	le. epth = 85	5 feet (Ta	rget depth	reach	I caving into ned).
-90	10 									- - 90 —		bentoni concret This Bo which r	te grout a e. oring Red nust be d	and capp cord is pa considere	rt of a geo	ack-dy techni	drilling with ed rapid set
	_									_	4	^ = Ina	ccurate b	lowcoun	ts.		
	15											*Geolo	gic Desc	ription; (E	Disturbed S	Soil De	escription).
-95	20									- 95 — - - -		(subrou on drill visual e greater descrip Cobble	inded, 3- rig chatte evaulation than 109 tion and -rich laye	to 12-inder, exces n of drill of are not classifica	ch diamete sive auger cuttings. Poted in the lation, wher intered in the	er), est inclinatercent coring re enco	COBBLES record
GR				A CON				INC	OF SU LO	THIS B BSURF CATION	ORING AN ACE CON IS AND M	PLIES ONLY ND AT THE DITIONS MA AY CHANGE	TIME OF AY DIFFE E AT THIS	DRILLING R AT OTH S LOCATION	S. HER		FIGURE B-16 d
95 	924	5 A	ctivi		ad, S	Suite	103	INC	OF SU LO WI' PR	THIS B BSURF CATION TH THE ESENTE	ORING AN ACE CON IS AND M. PASSAGI ED IS A SI	ND AT THE T DITIONS MA	TIME OF AY DIFFE E AT THIS THE DAT	DRILLING R AT OTH LOCATION	B. HER ON		ı

F	$3 \cap R$; F	RECO)RD	۱ ۱	PROJE			.II.a. ·				PROJECT		BORING D 17
	CATION		יו כ	,LUC		'	SDSU	Miss	ion Va	illey		STAR	<u> </u>	SD605		B-17 SHEET NO.
			, San	Diego, (Califorr	nia							<u>2</u> /2019		12/2019	1 of 4
RILLIN	IG COMI	PANY								ETHOD		-		LOGGED		CHECKED BY
	c Drilli	_	_								ud Rotary			S. Narv		C. Vonk
	i ch D5							8/4	NG DIA	. (ın)	71.5	=PIH (ft)	GROUNL 64	ELEV (ft)	DEPTH/EL ▼ 23.6	EV. GROUNDWATER (
	NG MET	-					NOTES				71.5		04		₹ 23.0	7 40.4
Hamn	ner: 14	l0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	R ~ 79	%, N ₆	0 = 1.3	$32N_{SPT} = 0.$	88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ް	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG			CRIPTION A		
	_									-		CONCR	ETE.			s of ASPHALT SOILS: Clayey
	_		В1				13.8	-	PA CR	-		SAND (ine to comedium PID=0.0	SC); yell oarse sa plasticit ppm	lowish bro and; some ty; few cob	wn (10YR fines; trac bles.	5/4); moist; mostly ee gravel; low to
	60									-		~		<u>% Sand; 38</u>		
-5				20^						5 —				It drilling o COBBLE		L and COBBLES.
	_ 		R2	25^ 17^	^	^	17.5	106	-200 PI	- - -		brown (gravel, a	10YR 4/2 and grav nes; med	2); moist; r el-sized fr dium plasti	mostly fine eshly brok	se; dark yellowish to coarse sand, en rock fragments; le disturbed in
-10	55 		S 3	28^ 24^	_	_				10 —		PP=1.79 (43% Fi 	5 tsf; PII nes)	D=34.0 ppi		yellowish brown (10
			33	22^	, ,	,				-		YR 5/4) plasticity Slow an	; moist; ı /; low re d difficu	mostly gra covery.	vel; some n GRAVEI	fines; little sand; low L and COBBLES.
-15	——50 ——	X	R4-1 R4-2	7 7 22^	^	٨	18.8	105	-200	- 15 — -		stiff/"me moist; m low to m sampler	dium de nostly fin nedium p shoe.	ense"; dark nes and fin plasticity; 2	yellowish e to coars	CL to SC); very brown (10YR 4/2); e sand; few gravel; neter gravel in
-20	45									- - 20 —		(60% Fi	nes)	=1.4 ppm		
	_	X	S5	14 9 8	17	22	13.5	-	-200 PI	-		PID=11. (38% Fi	nes) — — — -			
	 40									-	¥		2.5Y 4/2); wet; mo		M); dark grayish m sand; little fines;
GR				A CON				INC) OF	THIS B	MARY APPLI ORING AND ACE CONDIT	AT THE T	IME OF	DRILLING.		FIGURE
				ty Roa , Calif					LO WIT PRI	CATION TH THE ESENTE	IS AND MAY PASSAGE C ED IS A SIMF NS ENCOUN	CHANGE OF TIME. PLIFICATION	AT THIS THE DAT	LOCATIO	N	B-17 a

			G F	RECC	ORD	١ ١	PROJE SDSU			alley				D605		BORING B-17
	OCATION Friors		San	Diego, (Californ	nia						START 2/12/20	10	FINI 2/	sн 12/2019	SHEET NO. 2 of 4
RILLII Pacif RILLII	NG COMI fic Drilli NG EQUI rich D5	PANY ng PMEN		Diego, v	Jamon	Па		HS.	A (0-2		ud Rotary (2	25-71.5')	LOC S. UND ELE	GED . Nar	BY veson	CHECKED BY C. Vonk LEV. GROUNDWATER
	ING MET mer: 14		., Dro	p: 30 in.	(Auton	natic)	NOTE		%, N ₆	₀ = 1.3	32N _{SPT} = 0.8	8N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	D	ESCRIPT	TION A	IND CLASS	SIFICATION
	_		R6	29 50/5"	۸	^				- - -		Poorly-grade grayish brov fines; few gr PID=11.7 pp	ed SANE vn (2.5Y avel; not om	0 with 4/2); nplas	silt (SP-S wet; most tic; trace n	SOILS (continued) M); very dense; dar ly medium sand; fev nica; few cobbles. e rotary drill bit) at
-30	35	X	S7	6 10 14	24	32	26.3	-	-200	30 —		(Estimated 2	20% COI	BBLE	S)	L and COBBLES. (2.5Y 4/1); wet;
	30	/		14						- - -			um to co			fines; nonplastic;
_35	_ _ _		R8-1 R8-2	4 4 6	10	9	28.7	95	-200	35 — - -		Very dark gr trace mica. PID=0.4 ppr (36% Fines)	n	′ 3/1);	mostly fir	ne sand; some fines;
-40	25 		S9	3 2 5	7	9	20.8	-	-200	- 40 — -		Dark grayish (34% Fines)		(10YF	R 4/2); mic	aceous.
.45	20									- 45 — -		————— Slow and dif (Estimated 2	 ficult dril 20 to 30%	– – – Iling a % CO	- — — — - n GRAVE BBLES)	- — — — — — — — — — — — — — — — — — — —
	 15									- - -		Interbedded	COBBL	ES, G	GRAVEL, a	and SAND.
GR	924	5 A	ctivi	CON ty Roalif	ad, S	uite	103	INC	OF SU LO WI PR	THIS BOBSURFACATION TH THE ESENTE	MARY APPLIE ORING AND A ACE CONDITION S AND MAY C PASSAGE OF ED IS A SIMPL NS ENCOUNT	T THE TIME ONS MAY DII HANGE AT TIME. THE IFICATION C	OF DRIL FFER AT THIS LOO DATA	LING. OTHE CATIO	ER N	FIGURE B-17 b

E	3OR	IN	G R	RECO	ORD	\	PROJE SDSU			allev				PROJECT SD605	NUMBER	BORING B-17
SITE LO	CATION	ı					3030	IVIISS	IOII V	шеу		STAF	rT	FIN	ISH	SHEET NO.
	Friars		, San	Diego,	Califorr	nia		DDU	INIO MI	ETHOD		2/1	2/2019	LOGGED	/12/2019	3 of 4
	ic Drilli										ud Rotary	(25-71 5	5')	S. Nar		C. Vonk
	NG EQUI		Γ						NG DIA							EV. GROUNDWATER (
	rich D5							8/4			71.5		64		▼ 23.6 /	
	ING MET		Dro	p: 30 in.	(Auton	ootio)	NOTE		0/ NI	_ 1 2	20N – C	1001				
Папп		IU 105.	, 510	p. 30 III.	Auton			\ ~ 19	70, IN ₆	0 = 1.3	$32N_{SPT} = 0$	7.0011 _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	o° Z°	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CLASSII	FICATION
		>	S10	30	50/1"	>100	15.5	-	PA					4 T ION #	<u> </u>	
- - - - - - -	10 10 		S11	23 26 38	64	84	20.0	-		- - - 55 — - -		SANDS (7.5YR unfract fine san cement PID=0 (78% S	STONE; f 6/1); mo ured; (Silnd; little fi ed). ppm and; 22% gravel; in ppm	ine to coa derately v ty SAND ines; nonp	veathered; v (SM); very c olastic; weal	; massive; gray
-60	_		R12-1 R12-2	40 50/5"	50/5"	>100	18.0 19.7	109 105	-200 DS	60 —		massiv weathe with silt	e; blueish red; very : (SP-SM	n gray (Gl soft; unfr); very de	ey 10B 5/1) actured; (Po	to coarse grained;; moderately corly-graded SAND ostly medium sand; semented).
_65	0 									-65 — 		PID=0 (11% F	ppm	,,	,	
_70	_		S13	25 35 43	78	>100	22.0	-		70 — -		Thinly I	ppm			
	 10									- -					arget depth	reached).
GR	924	5 A	ctivi	A CON ty Roa	ad, S	uite	103	INC	OF SUI LOO WIT PR	THIS BOBSURFACATION TH THE ESENTE	MARY APPL ORING AND ACE COND S AND MAY PASSAGE ED IS A SIM NS ENCOU	O AT THE TIONS MAY CHANGE OF TIME.	TIME OF I AY DIFFEI E AT THIS THE DAT	DRILLING R AT OTH LOCATIC A	ER DN	FIGURE B-17 c

			G F	RECC	ORD	۱ ۱	PROJE SDSU			alley				SD60		R	BORING B-17
	OCATION		l San	Diego, (Califor	nia						STAF	2/2019		NISH 2/12/201	a	SHEET NO. 4 of 4
	NG COMI		i, Gaii	i Diego, v	Camon	iia		DRILL	ING M	ETHOD		2/1	2/2013	LOGGE		-	IECKED BY
	fic Drillii							1		,		y (25-71.5			arveson		C. Vonk
	NG EQUI		T						NG DIA	. (in)		DEPTH (ft)		D ELEV (f			GROUNDWATER
	rich D50						NOTES	8/4			71.5		64		¥ 23	3.6 / <i>4</i>	0.4
			., Dro	p: 30 in.	(Autor	natic)			%, N ₆	₀ = 1.3	2N _{SPT} =	0.88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	I AND CLA	ASSIFIC	ATION
	_									- -		bentoni concret	ite grout ie.	and cap	oed with	bĺack-c	r drilling with dyed rapid set nical report
	15									-		which r	nust be o	consider	ed in its e	ntirety.	•
-80										80 —						l Soil D	escription).
	<u> </u>									- - -		(subrou on drill visual e greater	inded, 3- rig chatto evaulation than 10°	to 12-iner, excess n of drill % are no	ch diame sive aug cuttings. ted in the	eter), es er incli Percer e boring	
-85	20 									- 85 —		Cobble		ers enco	untered ir		countered. xploration were
										_							
	25									_							
-90	_									90 —							
	_									_							
	_									_							
	_									_							
	30									_							
-95	_									95 <u> </u>							
										_							
										_							
	-									-							
	35									-							
GR				L A CON ity Roa				INC	OF SU LO	THIS BO BSURFA CATION	ORING AN ACE CONI S AND MA	PLIES ONLY ID AT THE DITIONS MA	TIME OF AY DIFFE E AT THIS	DRILLING R AT OT S LOCATI	G. HER		FIGURE
				, Calif					PR	ESENTE	D IS A SI	OF TIME. MPLIFICAT JNTERED.			JAL		B-17 d

F	30F	NI/	, F	RECO)BL	١ ١	PROJE			. 11 -				PROJECT		BORING D 10
	CATION		را <u>ن</u>	<u>'_</u> (7	SDSU	Miss	ion Va	alley		STAF	PT	SD605		B-18 SHEET NO.
			, San	Diego,	Califorr	nia							1/2019		11/2019	1 of 2
DRILLI	NG COM	PANY								ETHOD		·		LOGGED		CHECKED BY
	ic Drilli	_								tem Au				S. Nar		C. Vonk
	NG EQUI		Г					BORII 6	NG DIA	. (in)	20	DEPTH (ft)	GROUNI 48	D ELEV (ft)		EV. GROUNDWATER (
	og Ma						NOTE	-			20		48		▼ 8.1 /	39.9
			., Dro	p: 30 in.	(Auton	natic)			%, N ₆	o = 1.3	35N _{SPT} =	$0.9N_{MC}$				
				<u> </u>	Ì	<u> </u>			Ĭ	<u> </u>						
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG			CRIPTION A		
	_									-		CONCI	MENT: A RETE.	pproximate	ely 4 inche	s of ASPHALT
																SOILS: Clayey
			B1				12.8		PA	-		SAND some fi	(SC); mo	oist; brown to little ar:	(10YR 5/3 avel: medii); mostly sand; um plasticity.
	45		ы				12.0	-	PI	-		PID=0.	1 ppm	_		, ,
										_		(14% 6	ravei; 44	4% Sand; 4	42% Fines)
_										_						
_5	_			11						5 —		NA - alicon				400 C/4);it-
	_	X	S2	8 7	15	20	13.1	-		-	1//1					10G 6/1); moist; es; few gravel; low
				'						_	$\mathbb{Z}//\mathbb{Z}$	plastići PID=0	ty.			
												FID-0	ppm			
	40									-		_				
	_									_						
10										40		Grayish	n brown ((2.5Y 5/2);	wet; most	ly fine to medium
_10	_			3						10 —		sand; to PID=0.		ew gravel;	medium pl	asticity.
	_		R3	4 7	11	10	14.7	-		-		1 10-0.	о рріп			
	_									_						
	35									-						
	_									-	////	Hole_ca	ving at 1	14 <u>feet; flo</u>	wing/heavi	ng sands.
_15										15 —						It (SP-SM); dark
-13			١.,	^						13		gray (5	Y 4/1); w es: nonn	vet; mostly blastic; trac	fine to me	dium sand; few to
	_		S4	^	^		26.0			-	- 111	PID=0.		naotio, trao	o moa.	
										_						
	30									-	1					
										-		Linable	to samn	ole at 20 fe	et due to h	ole caving.
_20										20 —		Jilabie	.o samp	at 20 le		
	_											Total D	epth = 2	0 feet (Tar	get depth r	reached).
-	_									-	_	Ground feet.	lwater m	easured d	uring drillin	ng at a depth of 8.1
	25									_		Boring	backfille	d on 2/11/	19 shortly	after drilling with
												benton	ite grout			ck-dyed rapid set
	_									-	1	concre	ie.			
									 _T	ייאו ופ פו	MARY ADI	PLIES ONLY	/ AT TUE		, l	
GR	OUP	DE	LT/	A CON	ISUL	AT_	NTS,	INC). OF	THIS B	ORING AN	ID AT THE	TIME OF	DRILLING.	l	FIGURE
	924	15 A	ctivi	ity Roa	ad, S	uite	103		LO	CATION	IS AND MA	DITIONS MA AY CHANGE	E AT THIS	S LOCATIO		
				o, Calit								E OF TIME. MPLIFICAT			,	B-18 a
			- 3	,								UNTERED.		 .		

E	BOR	ZIN(G F	RECC	RD	\	PROJEC SDSU			allev				PROJECT SD605		R	BORING B-18
	CATION											STAR	RT	FINI			SHEET NO.
			, San	Diego, (Califorr	nia						2/1	1/2019		11/201		2 of 2
	NG COM									ETHOD				LOGGED			CKED BY
	fic Drilli NG EQUI		г						NG DIA	tem Au		DEDTH (ff)	GPOLIN	S. Nar			Vonk ROUNDWATER (ft)
	nog Mar		•					6	10 017	. (111)	20		48	D LLL¥ (II)	1	1 / 39.9	
SAMPL	ING MET	HOD					NOTES								-		
Ham	mer: 14	0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	~ 81	%, N ₆	0 = 1.3	$5N_{SPT} =$	0.9N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DES	CRIPTION A	AND CLA	SSIFICA	TION
- - - -30 -	20									30 —		which r ^ = Inac *Geoloo All soils (granitic based c	nust be ccurate l gic Desc s encour c, subro on drill ri	unded, 3-1	d in its ends. isturbed include to 12-include excessiv	Soil De up to 1 ch diame	·
35										35 — - -							
- 201E: GPJ GDCCLOG: GDJ 9/8/18	_ _ _									- 40 — -							
70 3 5 4 5 5 5 5 6 6 6 7 6 7 6 7 6 7 6 7 6 7 6 7	5									- 45 — - -							
GR	OUP 924	5 A	ctivi	A CON ty Roa o, Calif	ad, S	uite	103	INC	OF SU LO WI PR	THIS BO BSURFA CATIONS TH THE I ESENTE	ORING AI CE CON S AND M PASSAG D IS A S	PLIES ONLY ND AT THE T DITIONS MA AY CHANGE E OF TIME. IMPLIFICATI UNTERED.	TIME OF AY DIFFE AT THI THE DA	DRILLING: ER AT OTH S LOCATIC TA	ER DN	F	FIGURE B-18 b

	30E	PINI		RECO	<u> </u>	\	PROJE									NUMBER	1	BORING
	CATION		Э Г	'LCC	טאנ	<u>'</u>	SDSU	Miss	ion Va	alley		STAR) T	SD	605 FINIS	211		B-19 SHEET NO.
			, Sar	n Diego, (Califorr	nia							2/2019			12/2019)	1 of 1
DRILLII	NG COM	PANY	<u>-</u>					l		ETHOD					GED I	ЗҮ	CHE	CKED BY
	ic Drilli NG EQU									tem Au		DEDTU (#)	CROUNT		Bied			Vonk
	nog Ma		•					8	NG DIA	. (in)	4.4	. DEPTH (π)	54) ELE	ν (π)	▼ NE		ROUNDWATER (ft)
SAMPL	ING ME						NOTES	S										
Bulk		1		т			Bore	ehole	Perco	olation t	test I-1 p	performed	on 03/1	3/20	19			
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	⁰ 2	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG					ND CLAS		
											///		<u>MENT:</u> A RETE.	pprox	imate	ely 5 inch	nes of A	ASPHALT /
- - - - -5	50		B1				10.0	-	PA EI	- - - 5 —		SAND of fine to of medium (6% Gr	(SC); ligh coarse sa n plastici avel; 60% avel; little	nt olive and; s ty. % Sar e fine	e brovend; 34	wn (2.5\ fines; tra l% Fines arse gra	7 5/3); race fines)	
													epth = 4		•		tn reaci	nea).
										_		Ground	lwater no	t enc	ounte	ered.		
-										- -		03/12/2 03/13/2	converte 2019 sho 2019 and se after c	rtly af patch	ter dr ned w	illing, ar ith blacl	nd back k-dyed i	filled on rapid set
<u> 10 </u>	_									10 —		This Bo which n	oring Red nust be d	ord is consid	s part lered	of a ged in its en	otechnio itirety.	cal report
										_								
-	-									-	_							
-	<u></u> 40									_	_							
<u>15</u>	_									15 —	_							
}	_									_	_							
<u> </u> -	_									_	-							
										_								
	35																	
	33									_								
20	_									20 —	-							
<u> </u>	_									-								
}	<u> </u>									-	_							
-	_									-	_							
-	30									_								
GR				A CON				INC	OF SU	THIS BOBSURFA	ORING AI ACE CON	PLIES ONLY ND AT THE DITIONS MA AY CHANGE	TIME OF AY DIFFE	DRILL R AT (.ING. OTHE	:R	F	FIGURE
				o, Calif					WI PR	TH THE ESENTE	PASSAG ED IS A S	E OF TIME. IMPLIFICATI OUNTERED.	THE DAT	ГА				B-19

Е	3OR	IN	G F	RECO	ORD	1	PROJE SDSU			allev				PROJECT SD605	NUMBER		BORING B-20
	CATION						0000	IVIIOO	ion ve	инсу		STAR	T .	FINI			SHEET NO.
9449	Friars	Road	l, San	Diego,	Califorr	nia						2/2	7/2019	3/4	4/2019		1 of 3
	IG COMI							I		ETHOD				LOGGED		-	KED BY
	c Drilli										ore (52-61.			S. Nar		_	Vonk
	IG EQUI		ľ					l	NG DIA	. (in)		PTH (ft)		ELEV (ft)			OUNDWATER
	ich D5	-					NOTE	8/4			61.3		77		▼ 33.4	4 / 43.6)
			., Dro	p: 30 in.	(Auton	natic)	_		%, N ₆	0 = 1.3	$32N_{SPT} = 0.8$	88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	, N	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION A	.ND CLAS	SIFICAT	ION
									PA			PAVEN CONCE		proximate	ely 4 inch	es of A	SPHALT
	_	\bowtie	В1				13.5	-	CR	-		LINDIE	EEDENT	ATED SU	IDEICIAI	SOILS	: Clavey
}	<u>75</u>								EI	-	1//	SAND (SC); yell	owish bro	wn (10YF	R 5/4); r	noist; mostly
		ĽŽ	1	3						_			coarse sa n plasticit	ınd; little fi v	nes; trac	e grave	I; low to
		X	S2	15 36 ^	^	^						PID=0.8	3 ppm				
		${\vdash}$		307						-	\	(3% Gr	avel; 72%	6 Sand; 25 (2); low pla	5% Fines) Iravel in	sampler
- 5			S3	50/1"	REF	REF				5 –	[\$ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	PIOMII	(1.01K D)	<u></u>	asticity, g	avel In	sampler.
-			33	30/1	INLE	INLF					[%%]	Slow ar	nd difficul	t drilling o	n GRAVE	EL and	COBBLES.
}		$\overline{}$	S4	50/6"	REF	REF				-				20% ČOI mpler refu		avel an	d cobbles.
	70		1							_	16/0X		•	·			
	-											Sample	r refusal	on gravel	and cobb	oles.	
ŀ										-	17/8						
											(XX)						
-10	_	\	1	38						10 —	1997 -						
	_	X	S5	21	31	41	14.1	-	-200	_		Clayey	SAND (S	C); Dense	e; grayish	brown	(10YR 5/2); come fines;
		\vdash	1	10								trace gi	avel; low	plasticity	o sanu, II	ı 10 S	onic illics,
ŀ	 65									-	1//	PID=0.3 (27% F	3 ppm				
										_	\mathbb{Z}/\mathbb{Z}	(2170 F	11169)				
}	_									-							
-15			De.	50/5.5"	DEF	REF				15 _	[////- -						
			R6	50/5.5	REF	KEF						Slow ar	nd difficul	t drilling o	n GRAVE	EL and	COBBLES.
										-	16/02/	No reco	very.	to 20% C			
	60									-		(LSIIII)	u c u 10%	ι∪ ∠U% U	ODDLES	١.	
											Z&Z						
										-							
										-							
-20	_									20 –	100 X						
	_]	13	000	000				20 —		Clavov		- — — — - 6C); mediu	ım densa	· dark v	ellowich
}	_		S7	9	20	26	11.1	-	-200	-	///	brown (10YR 3/4	1); moist; ı	nostly sa	ind; son	ne fines; few
	55]							_	Y//	gravel; PP=1 ts		plasticity;	trace mic	a.	
												(40% F					
}	_									-	 						
	_); medium edium san			Y 5/1); moist;
												PID=0.		zuiuiii Säli	u, nue il	iico, lidi	ce graver.
GR	OUP	DF	LT/	A CON	ISUI	TΔN	JTS	INC	TH		MARY APPLII				1	F	IGURE
- 111									SU	BSURF.	ACE CONDIT	IONS MA	Y DIFFE	R AT OTHE		•	
				ity Ro							IS AND MAY PASSAGE O				N	ı	B-20 a
	Sa	n INi	മവവ	, Calif	ornia	ง 921	176				ED IS A SIMP				ı I		0 u

			G F	RECC	ORD	1	PROJE SDSU			alley				PROJECT SD605	i	BORING B-20
	CATION		l Can	Diego, (Californ	nio.						STAR	т 7/2019	FINI	sн 4/2019	SHEET NO. 2 of 3
	IG COM		ı, Sarı	Diego, v	Callion	IIa		DRILL	ING M	ETHOD		2/2	7/2019	LOGGED		CHECKED BY
Pacif	ic Drilli	ng									ore (52-61	.5')		S. Nar	veson	C. Vonk
	IG EQUI		T					l .	NG DIA	. (in)	I	EPTH (ft)	GROUND	ELEV (ft)		V. GROUNDWATER
	rich D5							8/4			61.3		77		▼ 33.4 /	43.6
	ner: 14		., Dro	p: 30 in.	(Auton	natic)	NOTE		%, N ₆	₀ = 1.3	$32N_{SPT} = 0$.88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	2 ⁰	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION A	ND CLASSIF	FICATION
	_	X	S8-1 S8-2	13 5 5	10	13	14.1 15.8		-200			<u>UNDIFI</u> \ (35% F		ATED SU	JRFICIAL S	OILS (continued):
	50		30-2	3			15.6	-		_		`		V (CL): of	iff to very et	iff: voru dork
	_									-		yellowis fine sar	sh brown nd; few gr	(2.5YR 3	/2); moist; m medium pla	iff; very dark lostly fines; some sticity.
-30			,	4						30 —	////					
		X	S9	15	32	42	13.7	-	-200	_						.5YR 4/1); moist; c; trace mica.
	45	\sim		17								PID=0.3	3 ppm	, iittie iirie	s, nonpiasiii	c, trace mica.
	45									-		(19% F	ines)			
										-						
										_						
												Poorly (araded S	AND with	silt (SP-SM); medium dense;
-35	_	$\overline{}$	1	3						35 —		dark gr	ay (7.5Y	4/1); wet;	mostly fine	to medium sand;
	_	X	S10	8 10	18	24	20.4	-	PA	-		PID=0.		gravel; no	npiastic.	
	40			10								(4% Gr	avel; 88%	6 Sand; 8	% Fines)	
										-						
										_						
_40										40						
-40			1	2	_	_				40		Trace n	nica; PID	=0 ppm.		
			S11-1 S11-2	2	4	5	20.3	-	-200	-						
	35 									-		wet; mo	stly fines sf; PID= 0	s; some fil		brown (7.5YR 4/2) dium plasticity;
	_									-				 • ala:00-		
4 5	_	<u>~</u>	S12	50/2"	REF	REF				45 —				t drilling c 30% CO		and COBBLES.
											1019	Sample	r refusal	on gravel	and gobble	s; no recovery.
												⊏quipm	en idilur	e- sneare	d drive cap	at 40 II.
	30									-	1019					
										-	5 P°C					
											[H6]					
										-	3: PF					
CP.			1 T		16111	T A B	ITC	INIC	Ţ		MARY APPL				N	FIGURE
GR				CON				IIIC	SU	BSURF	ORING AND ACE CONDI	TIONS MA	Y DIFFER	R AT OTH		IIGUKE
				ty Ro							IS AND MAY PASSAGE (N	B-20 b
	Sa	n Di	eao	, Calif	tornia	a 921	26				ED IS A SIM				L I	D 20 0

F	3OR	IN	G F	RECO)RD	١ ١	PROJE			allov			PROJECT NUM SD605	BER	BORING B-20
	CATION		<u> </u>), (D		SDSU	IVIISS	IOH Va	alley		START	FINISH		SHEET NO.
			I, San	Diego,	Califorr	nia						2/27/2019		-	3 of 3
	NG COM									ETHOD	/=0.04	- 0	LOGGED BY		HECKED BY
	ic Drilli NG EQUI	•	-						A (0-5 NG DIA		ore (52-61	.5') EPTH (ft) GROUN	S. Narveso	- 1	C. Vonk
	rich D5		•					8/4	NG DIA	. (111)	61.3	77	II	33.4 / <i>4</i>	
	ING MET	-					NOTES				01.0			00.17	.0.0
Hamr	mer: 14	0 lbs	., Dro	p: 30 in.	(Auton	natic)	ETR	~ 79	%, N ₆	0 = 1.3	$32N_{SPT} = 0$	0.88N _{MC}			
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	2	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	DES	SCRIPTION AND C	LASSIFIO	CATION
		\geq	S13	100/6"	REF	REF					FRIT.	UNDIFFEREN	TIATED CURE		NI C (continued)
	-									-		Silty GRAVEL	with sand (GM);	grayish	ILS (continued) brown (10YR
	25									_	16[d]	5/2); wet; most non-plastic.	ly gravel; some	sand; litt	le fines;
											SHY C	(Estimated 20 t	to 30% COBBLE		
	_									-	166	Blueish gray (G	GLEY 2 5PB 5/1		
	_									_	10 H	Equipment follo	uro obsercal alab	0.000 =1	EO ft Coultable
55										EE		coring.	ure-sheared driv	e cap at	JZ II. SWITCH TO
၁၁										55 —		-			
	_									-	1917				
	20														
										_	PAN				
	_									-	PAIGH				
	_									_	<u> </u>		MATION: *Poorl		
													fine to coarse get; moderately to		nassive; gray weathered; very
-60	_			13						60	1	soft; unfracture	ed; (Silty SAND (SM); vei	ry dense; wet;
	_	X	S14	22 50/4"	72/10"	>100	16.8	-	-200	-			akly cemented).	ie iiries,	trace fine gravel
	<u> </u>			00/4						_		PID=0 ppm (33% Fines)			
	_									-	-	Total Depth = 6	61.3 feet (Targe	depth re	eached).
	_									-		Groundwater m feet.	neasured during	drilling a	at a depth of 33.4
-65										65 —]	bentonite grout	ed on 3/4/19 sho t and patched w		
	10									_		concrete. This Boring Re	ecord is part of a	geotech	inical report
	_									-		which must be	considered in its		
												^ = Inaccurate	blowcount		
										-		*Geologic Desc	cription; (Disturb	ed Soil [Description).
70	-									70 —	1	All soils encour	ntered may inclu	de up to	10% COBBLES
	_									_		(subrounded, 3		neter), e	stimated based
	_											visual evaulation	on of drill cutting	s. Perce	nt COBBLES
	5									-			0% are noted in discription, volumes		
	_									_		Cobble-rich lay	ers encountered	l in this e	exploration were
	_									_	_	approximately	5 to 15 feet thick		
GP		DE	T/	A CON	12111	TAN	JTS	INIC	TH			LIES ONLY AT THE O AT THE TIME OF			FIGURE
J1\								4	SU	BSURF	ACE CONDI	TIONS MAY DIFFE	ER AT OTHER		
				ity Ro					WI	TH THE	PASSAGE	/ CHANGE AT THI OF TIME. THE DA	ATA		B-20 c
	Sa	n I)	eac	ı. Calı	fornia	ง 921	126		PR	ESENTE	ED IS A SIM	PLIFICATION OF	THE ACTUAL	1	0

F	3OR	IN	3 F	RECC)RD	۱ ۱	PROJE SDSU			llov				PROJEC SD6		NUMBER	BORING B-2)1
SITE LO 9449	CATION Friars	ı Road		Diego, (3030			- ·		STAR 3/1	T 2/2019	F	3/1	3/2019	SHEET NO 1 of 3	
	i G COM ic Drilli		Tri₋Ca	ounty.						ethod em Au	ıaer			LOGGI		eson	CHECKED BY C. Vonk	
	IG EQUI			Junty					NG DIA			PTH (ft)	GROUNE	_			EV. GROUNDWA	ΓER (
		•	cific) I	M5 & CN	1E 75 (Tri-Co		8			45.9		61			▼ 10.8	/ 50.2	
	NG MET ner: 14		, Dro	p: 30 in.	(Auton	natic)	NOTES		% (Ma	arl M5)	/ ~ 85%, (0	OME 75)					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		-	CRIPTIO	N A	ND CLASS	IFICATION	
	60 		B1				14.1		PA CR EI	-		UNDIFI SAND (mostly t gravel;	ERENT SC); dar ine to mo	IATED k grayis edium s	SU sh b	RFICIAL S	SOILS: Clayey YR 4/2); moist; nes; trace fine	
_5	55 5		S 2	3 6 8	14	19	16.5		-200 PI	5 — -		PP=1 ts (47% F	sf; PID=2 nes)	2.3 ppm		(5Y 4/1). ind COBB	1ES. ———-	
_10 -10	50 	X	R3-1 R3-2	7 17 17	34	31	4.9		-200	- 10 — - -	**************************************	Sandy I 3/1); mo plasticit PP=3.2	oist; mos y. <u>5 tsf; PIE</u> graded S ostly fine	Y (CL) tily fines 0=0.8 p	; ve s; so pm SP):	ry stiff; veome fine s	ry dark gray (2.5 and; medium ————————————————————————————————————	- — <i>-</i>);
_15	45 45 		S4	3 3 3	6	9			PA	- 15 — - -		Silty SA mostly to nonplast PID=1.	.ND (SM ine to m); loose edium s e mica.	– – e; da san		at 11.5 feet	
-20	40 40 		S5	6 16 16	32	45	2.1		-200	20 — - - -		dense;	dark grag ines; littl ppm.	y (2.5Y	3/1); wet; mo	avel (SP-SM); estly fine sand; fe micaceous; thin	
GR	924	5 A	ctivi	A CON ty Roa o, Calif	ad, S	uite	103	INC	SU SU LO WI	THIS B BSURFA CATION TH THE	MARY APPLIE ORING AND A ACE CONDITI IS AND MAY (PASSAGE OF ED IS A SIMP	AT THE TONS MACHANGE THANGE TIME.	IME OF I Y DIFFE AT THIS THE DAT	DRILLIN R AT O LOCA A	IG. THE TION	R N	FIGURE B-21 a	<u> </u>

			G F	RECO	DRD	1	PROJE SDSU			alley			I	605			BORING B-21
	OCATION Friars		l San	Diego,	Californ	nia						START 3/12/20	19	FINI 3/	sн 13/2019		SHEET NO. 2 of 3
DRILLII	NG COM	PANY	-		Jamon			DRILL	ING M	ETHOD		0/12/20		GED		CHE	CKED BY
	fic Drilli NG EQUI	•		ounty						tem Au		EDTU ((1) ODO			veson	_	Vonk
				M5 & CN	ЛЕ 75 (Tri-Co	untv)	8	NG DIA	(IN)	45.9	61 (it)		v (IT)	▼ 10.8		ROUNDWATER (2
SAMPL	ING MET	HOD	-				NOTE	S							<u> </u>		
Ham	mer: 14	l0 lbs	., Dro	p: 30 in.	(Auton	natic)	ETF	₹ ~ 81 	% (Ma	arl M5)	/ ~ 85%, ((CME 75)					
eet)	N N	/PE	Ŏ.	PENETRATION RESISTANCE (BLOWS / 6 IN)	ž		ш	≧	04.15	et)	U						
DEPTH (feet)	VATI feet)		PLE	TRA ISTA WS /	BLOW/FT "N"	zº	STUF (%)	ocf)	OTHER TESTS	H.	GRAPHIC LOG	D	ESCRIPT	ION A	ND CLASS	SIFICAT	ΓΙΟΝ
DEP	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	RES	BLO		MOISTURE (%)	DRY DENSITY (pcf)	6 F	DEPTH (feet)	GR.						
		Ŋ															
	35	X	S6	5	11	16	20.3		-200	_							S (continued):
				6					PI			mostly fines	; some fir	ne sa	nd; low pl	asticity	2.5Y 4/3); wet; y; trace mica.
										-		PP=2.0 tsf; (56% Fines)		tsf; P	'ID=2.9 pp	om.	
										-							
										-							
_30	_		R7	50/5" ^	REF	REF	14.7		-200	30 _	///						
	30		IX	30/3	IXLI	IXLI	14.7		-200	-	_ ^ _ ^ _	Heaving san				\. dork	grov /7 EVP
												4/1); wet; mo	ostly fine				gray (7.5YR gravel; trace
										-		fines; nonpla (5% Fines)	astic.				
	_									-	الرثا					 	
	_									-		Slow and dif from 33' to 3	39'.	_		L and	COBBLES
_35	_									35 —		(Estimated 2				n to co	ntrol heaving
	25											sands.			0011 0.0	10 00	g
										-							
										-							
	-									-							
	_									-	000						
_40	_		,	26						40 _		*Poorly-indu			TONE: fin	e to co	parse grained;
	20	X	S8	42 50/4"	92/10"	>100	16.3		PA	_		massive; gra	ay (7.5YF	R 6/1)	; wet; mo	derate	ly weathered;
				50/4								very soft; un mostly fine s	sand; son	ne fin	es; nonpl	astic; v	weakly
										-		cemented; in PID=0.6 ppr	n.		ning in low	er 1/3	" of sample).
	_									-	† : :	(70% Sand;	30% Fin	es)			
	_									-							
-45		X	S9	31 50/5"	50/5"	>100	21.1			45 —		Light gray (7	7.5Y 7/1);	; no ir	on oxide	stainin	g.
	15									-		Total Depth	= 45.9 fe	et (Ta	arget dept	h reac	hed).
										-		Switch rig from			-		
	_									-		Polymer/wat	ter mix ad	dded	down holl	low ste	em to control
CP		DE	 	\ CO\	16111	T A B	ITS	INIC	 世			IES ONLY AT T			ı T		IGURE
GK				A CON				IIIC	SU	BSURF	ACE CONDI	AT THE TIME FIONS MAY DI	FFER AT	OTHE		Г	IGUNE
				ity Ro					WI	TH THE	PASSAGE (CHANGE AT T OF TIME. THE	DATA				B-21 b
	Sa	וט וו	ego	, Cali	iomia	1 9 21	۷۵				ED IS A SIMI NS ENCOUN	PLIFICATION C	OF THE A	CTUA	r		-

F	3OR	IN	G F	RECC)RD	\	PROJEC SDSU			عالمر				PROJECT SD605		BORING B-21
ITE LO	CATION			Diego, (3030	IVIISS	IOII V	alley		STAR 3/1	 rт 2/2019	FINI		SHEET NO. 3 of 3
	IG COM		i, Jaii	Diego, (Janion	ııa		DRILL	ING M	ETHOD		3/1	2/2019	LOGGED		CHECKED BY
	ic Drillin			ounty						tem Au		D=D=11 ((1)		S. Nar		C. Vonk
	i G EQU II og Mar			M5 & CN	1F 75 (Tri-Co	untv)	8 BORII	NG DIA	ı. (ın)	45.9		GROUNI 61	D ELEV (ft)	DEPTH/EL ▼ 10.8	EV. GROUNDWATER (
AMPLI	NG MET	HOD					NOTES	3							¥ .0.0	, 00.2
Hamr	ner: 14	0 lbs.	., Dro	p: 30 in.	(Auton	natic)	ETR	~ 81	% (M	arl M5)	/ ~ 85%	6, (CME 75	5)			
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	200	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	AND CLASS	IFICATION
	10									_		Ground feet bgs		easured d	uring drillin	g at a depth of 10.8
										_			te grout			ly after drilling with ck-dyed rapid set
	_									_					of a geote I in its entir	echnical report ety.
-55	_									55 —		^ = Ina	ccurate b	olowcounts	i.	
	5									_		*Geolo	gic Desc	ription; (Di	sturbed Sc	oil Description).
																to 10% COBBLES
	_									_		on drill	rig chatte	er, excess	ive auger i), estimated based nclination, and
	_									_		visual e	vaulation than 10°	n of drill cu % are note	uttings. Per ed in the bo	cent COBBLES oring record
	_									_		descrip	tion and	classificat	ion, where	encountered. is exploration were
-60	_									60 —				to 8 feet t		
	0									_						
	_									_						
										_						
	_															
-65	_									65 —						
	5									-						
	_									_						
										_						
										_						
-70										70						
	40									''-						
	10									-						
	-									-						
	-									_						
	_									_						
GR	OUP	DE	LTA	A CON	ISUL	_TAN	ITS,	INC) OF	THIS BO	DRING A	PLIES ONLY ND AT THE	TIME OF	DRILLING.	l	FIGURE
	924	5 A	ctivi	ty Roa , Calif	ad, S	uite	103		LO Wi	CATION: TH THE I	S AND M PASSAG	IDITIONS MA AY CHANGE E OF TIME. IMPLIFICATI	AT THIS	S LOCATIO TA	N	B-21 c

			G F	RECC	RD	۱ ۱	PROJE SDSU			alley				SD605		BORING B-22
9449 RILLIN	NG COM	Road PANY	l, San	Diego, (Califorr	nia				ETHOD	Igor	3/11/2	L	FINI 3/ OGGED A. Bied	11/2019 BY	SHEET NO. 1 of 2 CHECKED BY C. Vonk
RILLIN	fic Drilli ng EQUI nog Mai	PMEN	F					1	NG DIA	tem Au (in)			I			V. GROUNDWATER
	ing MET mer: 14		., Dro	p: 30 in.	(Auton	natic)	NOTE		%, N ₆	₀ = 1.3	$35N_{SPT} = 0.$	9N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESCRI	IPTION A	AND CLASSIF	FICATION
										_		PAVEMEN CONCRET		roximat	ely 5 inches	of ASPHALT
-	50		B1-1 B1-2				9.3		PA	-		SAND with mostly fine medium gr	n gravel e to med ravel; lo	(SC); o lium sar w plasti	live brown (2 nd; little fines	OILS: Clayey 2.5Y 4/3); moist; s; little fine to
-5			S2	17 16 14	30	41				5 — - -	X	No recove Sandy lear mostly fine plasticity. PID=3.7 pp	n CLAY es; some	(ČL); ol	live gray (5Y ind; trace fin	′ 4/2); moist; le gravel; low
-10			S3	15 8 2	10	14	9.9		-200	10 — - - -		dense: dar	rk grayis sand; f ; trace n ppm.	sh browi ew fines	า (10YR 4/2	vel (SM); medium); wet; mostly fine o coarse gravel;
-15	_		S4	5 13 21	34	46	11.1		-200 PI	15 — - -		brown (2.5	SY 4/2); s s; little fir pm.	wet; mo		e; dark grayish nedium sand; icity.
-20	35 	X	S5	13 30 18	48	65	14.7			- 20 — -		Very dense	e; PID=	1.2 ppm	1	
	30									- - -					arget depth r	reached).
GR	924	5 A	ctivi	A CON ty Roa , Calif	ad, S	uite	103	INC	OF SU LO WI	THIS BOURFACATION TH THE	MARY APPLI ORING AND ACE CONDIT IS AND MAY PASSAGE O	AT THE TIM TIONS MAY I CHANGE AT OF TIME. TH	E OF DR DIFFER / T THIS L E DATA	RILLING. AT OTHI OCATIO	ER N	FIGURE B-22 a

			G F	RECC	ORD	\	PROJE SDSU			alley				SD60			BORING B-22
	OCATION			Diama (O-1:4	-:-						STAF			NISH		SHEET NO.
	NG COM		ı, San	Diego, (Californ	nia		DRILI	ING M	ETHOD		3/1	1/2019	LOGGE	3/11/2019		2 of 2 ECKED BY
	fic Drilli									tem Au	ger			A. Bi			. Vonk
	NG EQUI		Т						NG DIA			DEPTH (ft)	GROUNI				ROUNDWATER
Unim	nog Mar	rl M5						6			21.5		54		▼ 7.0		
	ING MET		_				NOTES	_									
Hami	mer: 14 ⊤	0 lbs	., Dro	p: 30 in.	(Auton	natic) ⊺	EIR	R ~ 81 ⊤	%, N ₆	₀ = 1.3	$5N_{SPT} =$	0.9N _{MC}					
æ	7	Ж	O.	PENETRATION RESISTANCE (BLOWS / 6 IN)	ż		l	>		÷.							
DEPTH (feet)	ELEVATION (feet)	Σ.	SAMPLE NO.	SATI TAN 3/6	BLOW/FT "N"		MOISTURE (%)	lsk (ER	DEPTH (feet)	GRAPHIC LOG						
Ŧ	(fee	H	₩	SIS) (zº	TSIC%)	Per	OTHER TESTS	Ӗ	PAP		DESC	CRIPTION	I AND CLAS	SSIFICA	ATION
DEI		SAMPLE TYPE	SAI	PEN RE (BL(BLC		Σ	DRY DENSITY (pcf)	0	DEF	5						
		0,															
												Boring	backfilled	d on 3/1	1/19 shortly	y after	drilling with
										_		benton	te grout	and cap	ped with co	old pat	ch asphalt.
	-									_		This Bo	ring Rec	ord is pa	art of a geo	otechni	ical report
	_									_		which r	nust be o	consider	ed in its en	tirety.	
	25											All soils	encoun	tered ma	ay include u	up to 1	0% COBBLES
	25									-		(subrou on drill	maea, 3- rig chatte	- το 12-ir er, exces	ich diamete ssive augei	∍r), est r inclin	imated based ation, and
-30										30 —		visual e	evaluatio	n of drill	cuttings.		,
										_							
	_									_							
										_							
	20									-							
_35	_									35 —							
										_							
	_									-							
	_									_							
	15									_							
_40	_									40 —							
										_							
	-									-							
	_									_							
	4.0																
	10									-							
-45	-									45 —							
	-									-							
	_									_							
	_																
	5									_							
									TLI	 	MARV ADE	PLIES ONLY	/ AT TUE	LOCATI			
GR	OUP	DE	LTA	A CON	ISUL	LTAN	NTS,	INC). OF	THIS BO	ORING AN	ID AT THE	TIME OF	DRILLIN	G.	ļ	FIGURE
				ity Roa					LO	CATION	S AND MA	DITIONS MA AY CHANGE	AT THIS	SLOCAT			
				, Calif								OF TIME. MPLIFICAT			IAI		B-22 b
	Jai	ال	Jyu	, Jaili	J11110	ا عن م						JNTERED.	011011		J, \L		

			G F	RECC	ORD)	PROJE SDSU			alley				SD605		BORING B-23
9449 PRILLIN	Friars GOUNTY TO COM TO COM	Road PANY		Diego,	Californ	nia				ETHOD tem Au		3/16/20	LC	FINI 3/ OGGED A. Bied	16/2019 BY	SHEET NO. 1 of 4 CHECKED BY C. Vonk
RILLIN	NG EQUI	PMEN	_						NG DIA		•	PTH (ft) GR	OUND E			EV. GROUNDWATER
	mer: 14		., Dro	p: 30 in.	(Auton	natic)	NOTE		%, N ₆	₀ = 1.4	48N _{SPT} = 0.9	99N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	J	DESCRI	PTION <i>F</i>	AND CLASSI	FICATION
												PAVEMEN CONCRET	<u>Т:</u> Аррі Е.	roximat	ely 5 inche	s of ASPHALT
	 55		B1				8.5		PA	-		SAND (SC)); very o to coar pm	dark gra se sand	ayish brown	SOILS: Clayey (10YR 3/2); moist; es; low plasticity.
_5	_									5 –		Slow and d	ifficult c	Irilling c	on GRAVEL	_at 4'.
	50	X	S2	2^ 2^ 3^	^	^	3.4		-200			Poorly grad 6/3); moist; nonplastic; Coarse gra PID=3.3 pp (1% Fines)	mostly trace m	fine to nica.	medium sa	ht olive brown (2.5Y ind; trace fines;
-10			R3-1 R3-2	6^ 12^ 15^	^	^	24.5	94	PA	10 —	1	Medium de PID=2.8 pp (97% Sand	m.	•	cobbles (<4	").
-15	40		S4	2 19 30^	^	^	20.9		-200	15 –		(2.5Y 6/3);	wet; mo vel; non hoe.	ostly fin	e to mediur	P); light olive brown m sand; some ; gravel (<3") in
-20			R5-1 R5-2	17 29^ 31^	۸	٨	16.2	110	-200	20 –			wet; mo 5"); non pm	ostly fin		M); light olive brown to little fines; few
GR	OUP	DE	LTA	A CON	ISUL	_TAN	NTS,	INC	C. OF	THIS B	MARY APPLIE	AT THE TIME	OF DR	ILLING.		FIGURE
				ty Roalit					LO WI PR	CATION TH THE ESENT	ACE CONDITI IS AND MAY (PASSAGE OI ED IS A SIMPI INS ENCOUNT	CHANGE AT TIME. THE LIFICATION	THIS LO	OCATIO	N	B-23 a

			G F	RECC	DRD	١ ١	PROJE SDSU			alley				SD60		BORING B-23
	CATION Friars		San	Diego, (Californ	nia						STAR 3/1	т 6/2019		іsн /16/2019	SHEET NO. 2 of 4
	IG COM		, Jan	2.0g0, (Jamon	.iu		DRILL	ING M	ETHOD		J 3/ 10		LOGGED		CHECKED BY
	ounty [tem Au				A. Bie		C. Vonk
	IG EQUI								NG DIA	. (in)		EPTH (ft)		ELEV (ft)		V. GROUNDWATER
	ich D1						NOTE	8 S			70.4		58		▼ 9.2 / 4	48.8
			, Dro	p: 30 in.	(Auton	natic)		-	%, N ₆	₅₀ = 1.4	$18N_{SPT} = 0.$.99N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	z ^o	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESCF	RIPTION	AND CLASSII	FICATION
	30 		S6	16 50/5" ^	۸	^	17.4		PA	- - -		Poorly-g dense; some g PP=0.5	graded SA dark gray ravel; few tsf; PID=	AND with (2.5 Y 4) to little 149.4 pp	n silt and gra /1); wet; mo fines; nonpla	
.30	 25 		S7	16 35 50/2"	85/8"	>100	17.2		-200	30 —		SANDS brown (unfractu	TONE; fir 2.5Y 5/2); ired (Silty i sand; litt .2 ppm.	ne to coa; ; wet; mo ; SAND (oderately we (SM); very d	rated; massive; grayish eathered; very soft; ense; mostly fine to weakly cemented).
35			S8	24 50/2"	50/2"	>100	19.0			35 —		PID=76	.6 ppm.			
.40	 15		S9	19 33 50	83	>100	20.0		PA	40 —		grayish very sof fines; so yellowis PID=6.6	brown (2. t; unfractome sand h oxide s ppm.	.5Y 5/2); ured (Sa ; trace g taining).	wet; moder andy SILT (M	rained; massive; ately weathered; fL); hard; mostly astic; 2" beds of
.45										45 — - - -						
GR	OUP	DF	I T	A CON	ISIII	TAN	ITS	INC	TH		MARY APPLI ORING AND					FIGURE
J1\\									SU	BSURF	ACE CONDIT	TIONS MA	Y DIFFER	AT OTH	ER	
				ty Roa , Calif							IS AND MAY PASSAGE C				אוע	B-23 b

E	BOR	IN	G F	RECO	DRD	\	PROJE SDSU			alley				PROJEC		JMBER		BORING B-23
9449 DRILLIN Tri-C DRILLIN	NG COM Ounty [NG EQUI	Road PANY Drilling PMEN	9	Diego,	Californ			DRILL Hol BORII	ING M	ETHOD tem Au	TOTAL	l	6/2019 GROUNI	LOGGE A. Bi	NISH 3/16 D BY eda ft) D	5/2019 ' EPTH/EL	CHEC C. \ <i>EV.</i> GR	SHEET NO. 3 of 4 KED BY /onk OUNDWATER
SAMPL	rich D1 ING MET mer: 14	HOD	., Dro	p: 30 in.	(Auton	natic)	NOTE:		%, N ₆	₀ = 1.4	$8N_{SPT} =$	0.99N _{MC}	58		-	▼ 9.2 /	48.8	
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	0	DESC	CRIPTION	N ANI	D CLASS	SIFICATI	ION
_55 _60 _65	5		S10	25 41 50/4"	91/4"	>100	19.7		-200 -200 PI	55 — 60 — 65 — -		massive	ndurated; grayis ed; very mostly fi tic; wea 2 ppm nes)	d SAND h brown r soft; ur ne to me kly to me	STO (2.5 fract ediur	NE; fine Y 5/2); v tured (S n sand;	to coa wet; mo ilty SAI little fir	arse grained; oderately ND (SM); very nes;
	15		S12	50/5" ^	REF	REF				70 — - - -		feet bgs.	on. ppm pth = 70 water m	0.4 feet easured	(targ	et depth	n reach	
GR	924	5 A	ctivi	A CON ity Roa	ad, S	Suite	103	INC	OF SU LO WI PR	THIS BO BSURFA CATIONS TH THE I ESENTE	ORING AN ACE CONI S AND MA PASSAGE ED IS A SI	PLIES ONLY ID AT THE TO DITIONS MAY AY CHANGE OF TIME. TO MPLIFICATION JNTERED.	IME OF Y DIFFE AT THIS THE DAT	DRILLIN R AT OT S LOCAT TA	G. HER ION			IGURE 3-23 c

E	3OR	IN	G F	RECC)RD	١ ١	PROJE SDSU			allev				PROJE SD6		NUMBER	BORING B-23
	CATION						0000	IVIIOO	1011 V	апсу		STAF	 ≀T		INIS	SH	SHEET NO.
	Friars		l, San	Diego, (Californ	nia						3/1	6/2019			6/2019	4 of 4
	ounty [7							ETHOD tem Au	ger			LOGG A. B			C. Vonk
	NG EQUI								NG DIA			DEPTH (ft)	GROUNI				/. GROUNDWATER
	rich D1							8			70.4		58			▼ 9.2 / 4	8.8
	ING MET mer: 14		., Dro	p: 30 in.	(Auton	natic)	NOTES		%, N ₆	₅₀ = 1.4	8N _{SPT} =	0.99N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z ⁰ 09	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTIO	N A	ND CLASSIF	CATION
		SA	Ø	9 R 8)	Δ.		2	DR		٥		Portlan	d cemen	it grout	and	capped wit	h black-dyed
	_									_			et concre				,
										_		This Bo which r	oring Red nust be d	cord is p conside	oart red	of a geotech in its entiret	nnical report y.
	20									-		^ = inac	ccurate b	olowcou	ınts		
	_									_		*Geolo	gic Desc	ription;	(Dis	sturbed Soil	Description).
-80	_									80 —		(subrou on drill	ınded, 3- rig chatte	- to 12-i er, exce	inch essi	diameter), ve auger inc	o 10% COBBLES estimated based lination, and
										_		visual e	evaluatio	n of dril	ll cu	ttings.	
	25																
	25																
0.5										0.5							
-85										85 —							
										_							
	_									_							
	30									_							
	-									_							
-90	_									90 —							
	-									_							
	_									_							
	35																
_95	L									95 —							
	`									55							
										_							
										_							
										_							
	_									_							
— GR	OUP	DE	LTA	A CON	ISUL	_TAN	NTS,	INC). OF	THIS BO	ORING A	PLIES ONLY	TIME OF	DRILLIN	۱G.		FIGURE
				ty Roa , Calif					LO WI PR	CATION: TH THE I ESENTE	S AND M. PASSAGI ED IS A SI	DITIONS MAY CHANGE E OF TIME. MPLIFICAT UNTERED.	AT THIS	S LOCA ^T TA	IOIT	١	B-23 d

Е	3OR	IN	G F	RECC	ORD	۱ ۱	PROJE SDSU			allev			F	ROJECT SD60	NUMBER	BORING B-24
TE LO	CATION	l					0000	IVIIOO	1011 V	anoy		START		FIN	ISH	SHEET NO.
	Friars		l, San	Diego, (Californ	nia		DRII I	ING M	ETHOD		3/12	/2019	LOGGED	/13/2019 BY	1 of 4
	c Drilli									tem Au	ger			A. Bie		C. Vonk
RILLIN	IG EQUI	PMEN							NG DIA	. (in)		EPTH (ft)	ROUND	ELEV (ft)		EV. GROUNDWATE
	og Mar ng met		& De	idrich D5	0		NOTE	8			66.5		73		▼ 25.7	/ 47.3
			., Dro	p: 30 in.	(Auton	natic)	_		% (Ma	arl M5)	/ ~ 79% ([Diedrich [D50)			
Œ	7	ᆽ	Ö	ZHŹ	ż		l	>		Œ.						
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	zº	MOISTURE (%)	DRY DENSITY (pcf)	TER STS	DEPTH (feet)	GRAPHIC LOG		5500	DIDTION.		JE10 4 T10 11
FPT	LEV/	MPLE	MPI	NET ESIS	No.	2	OIS (%)	H &	OTHER TESTS	∓PT	JRAI LC		DESC	RIPTION	AND CLASS	IFICATION
۵	Ш	SAI	8	H S B	<u> </u>		Σ	DR		ă						
												PAVEME	ΞΝΤ: Αρ	proxima	ely 4 inche	s of ASPHALT
-	_		B1						PA	_	$\mathbb{Z}/\mathbb{Z}^{n}$	CONCRI		ATED S	IRFICIAL	SOIL S: Clavey
		XXX	5'						CR EI			SAND (S	C); light	t brownis	h gray (2.5	SOILS: Clayey Y 6/2); moist; mos
			S2	8	15	20	111					fine to m		and; son	ne fines; tra	ace gravel; mediun
ŀ	70		32	7 8	15	20	14.1		-200	-		(2% Grav Medium	vel; 56%	Sand; 4	2% Fines)	
-	_									_		(30% Fin	nes)	io grave	•	
5										5 —		PID= 0.4				
		$\setminus \setminus$	S3	7 6	15	20						PID= 2 p	pm.			
ŀ				9	13	20				-						
}	_									-						
	65									_						
İ	_									-						
10	_			8						10 —		Dense; t		vel.		
		X	S4	14 15	29	39	13.8		PA	_		PID= 0.7		Sand: 3	88% fines)	
				15						_		(270 014	101, 007	o Carra, c	.070 111100)	
İ	<u> 60 </u>									-						
}	_									-						
15										15 —		Madium	donoo. ,	رمیر طمیار	arovioh hr	our (2 EV 2/2).
		M	R5	13 17	31	28	3.4					trace fine	e gravel.		. yıayısı br	own (2.5Y 3/2);
İ				14						_		PID= 45.	9 ppm.			
	_									-						
-	55									_						
										_						
20										00						
20	_		2-	4	4.5	4.5				20 —	-	Poorly a): modium	dense: light clivs
}	_	X	S6	6 7	13	18	2.0		-200	-		brown (2	.5Y 5/3)	; moist; r		dense; light olive to medium sand;
										_		trace fine PID=2.7		lastic.		
	50											(4% Fine				
	00									-						
-	_									-						
									T-L-	15 51 1848	MARY APPLI	ES ONLV	ΔT THE !	OCATIO	N T	
GR				A CON				INC). OF	THIS B	ORING AND ACE CONDIT	AT THE TI	ME OF D	PRILLING	.	FIGURE
				ity Roa					LO	CATION	S AND MAY	CHANGE A	AT THIS	LOCATIO		D 04 -
	_	- D:		, Calif	: : -	. 00	106				PASSAGE O ED IS A SIMP				l	B-24 a

E	BOR	IN	G F	RECC	ORD	١ ١	PROJEC SDSU			allev			- 1	ROJECT SD605		BORING B-24
ITE LC 9449	CATION	I Roac		Diego, (0000			ETHOD		START 3/12/201	9	FINI	sн 13/2019	SHEET NO. 2 of 4
Pacif RILLIN Unim	ic Drilli IG EQUI	ng PMEN 1 M5		idrich D5	0		NOTES	Hol BORII 8		em Au		DEPTH (ft) GROU		A. Bied	ła	C. Vonk .EV. GROUNDWATE
Hamr	mer: 14	0 lbs	., Dro	p: 30 in.	(Auton	natic)	ETR	~ 81	% (Ma	arl M5)	/ ~ 79%	(Diedrich D50))			
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG	DE	ESCR	RIPTION A	IND CLASS	SIFICATION
	 45		S7	5 7 10	17	23	12.6		PA	- - -		Poorly grade	d SA wn (es; n	AND with (2.5Y 5/3 nonplastic	silt (SP-SI); wet; mo	SOILS (continued M); medium dense stly fine to medium ca.
30	40		R8-1 R8-2	9 19 26	45	41	15.8	111	-200	30 —		Dense. PID=18.6 ppr (8% Fines)	m.			
35			S9	8 8 17	25	34	20.8		PA	35 — - -		PID=1.1 ppm (93% Sand; 7		Fines)		
40			R10-1 R10-2	15 20 28	48	43	20.4	108	-200	40 — - -		PID=0.8 ppm (8% Fines) Very dark gra		ı brown (10YR 3/2)	; trace fine gravel.
45			S11	11 13 16	29	39	22.0		-200	- 45 — - -		Trace mica. PID=7.9 ppm (7% Fines)				
GR	924	5 A	ctivi	A CON	ad, S	uite	103	INC	OF SUI LOO WIT PR	THIS BOBSURFACATION TH THE ESENTE	ORING AN ACE CONE S AND MA PASSAGE ED IS A SII	PLIES ONLY AT TI D AT THE TIME O DITIONS MAY DIF LY CHANGE AT TI OF TIME. THE I MPLIFICATION OI JNTERED.	OF D FER HIS I DATA	RILLING. AT OTHE LOCATIO	ER N	FIGURE B-24 b

E	BOR	IN	G R	RECC	ORD	\	PROJE SDSU			alley				PROJECT SD60	NUMBER	BORING B-24
	CATION		0	Diago () - 1:4 - ···	-:-						STAF		FIN		SHEET NO.
	Friars IG COM		, San	Diego, (Jailion	ııa		DRILL	ING M	ETHOD		3/1	2/2019	LOGGED	/13/2019 BY	3 of 4
Pacif	ic Drilli	ng								tem Au	ıger			A. Bie	da	C. Vonk
	IG EQUI				_				NG DIA	. (in)	I	EPTH (ft)		ELEV (ft)		EV. GROUNDWATER
	og Mai		& Dei	drich D5	0		NOTES	8			66.5		73		▼ 25.7	/ 47.3
			, Dro	p: 30 in.	(Auton	natic)		_	% (Ma	arl M5)	/ ~ 79% (Diedrich	D50)			
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	2 °	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CLASSI	IFICATION
	 20 		S12	10 31 46	77	>100	16.7		-200	- - - -		Poorly- dark gr mediun micace PID=10 (9% Fir	graded S ayish bro n sand; fe ous. 0.6 ppm. nes) to Deidri	SAND with own (10YF ew fines;	n silt (SP-SI R 3/2); wet;	SOILS (continued): M); very dense; very mostly fine to ravel; nonplastic; drilling on
55	 15 		S13	19^ 29^ 35^	^	^	18.0		PA	55 — - - -		Poorly 4/2); we nonplant Coarse PID=8. (96% S Difficult	graded Set; mostly stic; trace gravel ir 1 ppm. and; 4% drilling of drive cap	y fine to me mica. In sampling Fines)	nedium sand g shoe. EL and COI	enish brown (10YR d; trace fines; BBLES; equipment
80	 10 		S14	21^ 28^ 36^	^	۸	13.4		-200	60 —		brown	(10YR 4/: onplastic 5 ppm.	2); wet; m	ostly fine to	M); dark greenish o medium sand; few gravel in sampler
65	5		S15	22 30 50	80	>100	18.1		-200	65 — - - -		SANDS gray (5 unfract	STONE; f YR 4/1); ured (Silt ostly fine ted). 7 ppm.	ine to coa wet; mod y SAND (erately wea SM); very c	urated d; laminated; dark hthered; very soft; dense; dark gray (5\ nplastic; weakly
70										70 —		Total D	epth = 66	6.5 feet (ta	arget depth	reached).
	_									_		Ground feet bg		easured o	luring drillin	g at a depth of 25.7
	<u> </u>									-		Boring	backfilled	d on 3/13/ and capp	'2019 shortl ed with blac	ly after drilling with ck-dyed rapid set
										-	-				rt of a geote d in its entir	echnical report rety.
GR				L CON ty Roa				INC	OF SU	THIS BOURFA	MARY APPL ORING AND ACE CONDI' IS AND MAY	AT THE TIONS MA	TIME OF AY DIFFE	DRILLING R AT OTH	ER	FIGURE
				, Calif					WI ⁻ PR	TH THE ESENTE	PASSAGE O ED IS A SIMI NS ENCOUN	OF TIME. PLIFICAT	THE DAT	ГА		B-24 c

	BOR	INC		RECC)RD	\	PROJEC SDSU			llov			F	PROJECT	T NUMBEI	₹	BORING B-24
SITE L	OCATION	1					3030	IVIISS	IOII Va	alley		STAI		FIN	NISH		SHEET NO.
	9 Friars		, San	Diego, (Californ	nia		DRILI	ING M	ETHOD		3/1	12/2019	LOGGE	3/13/201		4 of 4 CKED BY
	ific Drilli									tem Au	ger			A. Bie		-	Vonk
	ING EQUI			idwich DC	.0				NG DIA	. (in)	1		1	ELEV (f	1		ROUNDWATER (ft)
	nog Mai		& Dei	idrich D5	0		NOTES	8			66.5)	73		¥ 25	.7 / 47.	3
Ham	mer: 14	l0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	~ 81	% (Ma	arl M5)	/ ~ 79%	6 (Diedrich	n D50)				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	N _{so}	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION	AND CLA	SSIFICA	TION
												^ = ina	ccurate bl	owcoun	ts		
+	-									_		*Geolo	gic Descri	iption; ([Disturbed	Soil De	scription).
- - -	5 5									<u>-</u> -		(subro	s encountounded, 3- I rig chatte evaluation	to 12-ind r, exces	ch diame sive auge	ter), esti	0% COBBLES mated based ation, and
80										80 —							
										_							
L																	
	10									_							
	10									_							
†	_									_							
<u> 85 </u>										85 —							
-	_									_							
-	_									_							
81/8/G - -	<u></u>									_							
										_							
9.901-090 										90 —							
90										90 —							
- - -										_							
	-									_							
70 - 0										_							
- - - -	_									_							
g 95										95 —							
1 5090																	
2																	
										_							
XMN -	25									_							
5 - -	-									_							
GLC, LOG, BOXING, SMIN, SOLL, SU SUBGO LOGS, PHASE UZ	924	5 A	ctivi	A CONity Road, Calif	ad, S	uite '	103	INC	OF SU LO WI PR	THIS BO BSURFA CATION: TH THE I ESENTE	ORING A CE CON S AND M PASSAG D IS A S	PPLIES ONL' ND AT THE IDITIONS M. IAY CHANG IE OF TIME. IMPLIFICAT DUNTERED.	TIME OF DAY DIFFER AT THIS THE DATA	ORILLING R AT OTH LOCATH A	G. HER ON		FIGURE B-24 d

F	30R	INC		RECO)RD	١ ١	PROJE			مالمد			F	ROJECT		BORING B-25
	CATION		<u> </u>)		SDSU	IVIISS	IOH V	alley		START		FINIS		SHEET NO.
			, San	Diego, (Califorr	nia						3/11/2	2019		11/2019	1 of 2
DRILLIN	IG COM	PANY						DRILL	ING M	ETHOD		1		LOGGED		CHECKED BY
	ic Drilli	_								tem Au	•			A. Bied		C. Vonk
	IG EQUI		Ī						NG DIA	(in)	I			ELEV (ft)		EV. GROUNDWATER (
	og Mai						NOTES	6			20		58		▼ 9.2 / 4	48.8
			. Dro	p: 30 in.	(Auton	natic)			%. N	。= 1.3	35N _{SPT} = 0.9	Nuc				
			, =	İ	(* 10.10.)				70, 116	0	Je. 15p1 - 616	· ·IMC				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESCI	RIPTION A	ND CLASSIF	FICATION
	 55		B1				4.7	-	PA	-		CONCRE UNDIFFE SAND (SI medium s	RENTI M); moi sand; litt	ATED SU st; olive b tle fines; t	AGGREGA IRFICIAL S rown (2.5Y	of ASPHALT TE BASE. COILS: Silty 4/3); mostly fine to avel; nonplastic.
_5			S2	5 5 5	10	14	4.6	-	-200	5 — - -		Sandy leabrown (2.4 low plastic PP=1.0 ts	5Y 4/2) city; tra	; moist; m ce mica.	edium stiff to	to stiff; dark grayish some fine sand;
-10	50 		\$3	3 4 5	9	12	17.5	-	PA	- 10 — -		light olive medium s (8% Fines ———— Silty SAN mostly fin- nonplastic PID=2.5 p	brown sand; fe s) D (SM) e to me c; trace opm	(2.5Y 5/3 w fines; tr ; medium dium san mica.); moist; mo race fine gra - — — — — dense; oliv	l); medium dense; ostly fine to avel; nonplastic.
_15	—45 — — —		S4	5 6 8	14	19	27.3	-	-200	- 15 -		Rig chatte — — — — Poorly gra 4/4); wet; nonplastic	er from aded SA mostly c; trace	13 ft to 14	ft; GRAVE	EL layer. ense; oilve (5Y; trace fines;
-20	40 									- - 20 —		sample.	ng at 20			sands; unable to
										_		Total Dep	th = 20	feet (Targ	get depth re	eached).
	_									-		Groundwa feet.	ater me	asured dı	uring drilling	g at a depth of 9.2
	35 									-						vafter drilling with k-dyed rapid set
GR				L A CON ity Roa				INC	OF SU	THIS B	MARY APPLIE ORING AND A ACE CONDITION IS AND MAY C	T THE TIN ONS MAY	NE OF D	RILLING. RAT OTHE	R	FIGURE
				o, Calif					WI [*] PR	TH THE ESENTI	PASSAGE OF ED IS A SIMPL NS ENCOUNT	TIME. TH	HE DATA	А		B-25 a

E	3OR	RIN	G F	RECO	ORD	\	PROJEC SDSU			allev				PROJECT SD605		R	BORING B-25
SITE L	OCATION	1					-	111100				STAF		FINI	SH		SHEET NO.
	Friars		, San	Diego, (Califorr	nia		DRILL	ING M	ETHOD		3/1	1/2019	3/ LOGGED	11/201 BY		2 of 2 CKED BY
Paci	fic Drilli	ng						Hol	low St	tem Au				A. Bied	da	C.	Vonk
	ng Equi nog Mai		T					BORII 6	NG DIA	. (in)	TOTAL 20	DEPTH (ft)	GROUNE 58	ELEV (ft)	1	1/ELEV. G 2 / 48.8	ROUNDWATER (ft
SAMPL	ING MET	HOD					NOTES	6					- 50		<u>¥</u> 3.	2 / 40.0	<u>'</u>
Ham	mer: 14 ⊤	l0 lbs	., Dro	p: 30 in.	(Auton	natic)	ETR	! ~ 81 □	%, N ₆	0 = 1.3	5N _{SPT} =	: 0.9N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z ^o	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	AND CLA	ASSIFICA	TION
												This Bo	oring Rec	ord is part	t of a ge	eotechnic	cal report
										_						•	0% COBBLES
	30									-		(subrou on drill	ınded, 3- rig chatte	to 12-incher, excession of drill cu	n diame ive aug	eter), esti	mated based
	_									_							
_30										30 —							
	_									_							
	_									-							
	25									_							
										_							
_35										35 —							
00										00							
										_							
										_							
	20									_							
	-									_							
_40	-									40 —							
	-									_							
	_									_							
	15									_							
	_									_							
_45										45 —							
-10										-10 —							
										_							
										_							
	10									_							
	_									-							
GR				A CON				INC	OF SU	THIS BO BSURFA	ORING A	PLIES ONLY ND AT THE	TIME OF I AY DIFFEI	DRILLING. R AT OTHE	ĒR	F	FIGURE
				ity Roa , Calif					WI ⁻ PR	TH THE I ESENTE	PASSAG D IS A S	AY CHANGE E OF TIME. IMPLIFICAT DUNTERED.	THE DAT	A	- 1		B-25 b

Е	3OR	IN	G F	RECC	ORD	۱ ۱	PROJE SDSU			allev				PROJECT SD605	NUMBER		BORING B-26
	CATION											STAF		FINI			SHEET NO.
	Friars IG COMI		l, San	Diego, (Californ	nia		וופח	INC M	ETHOD		3/1	5/2019	3/ LOGGED	15/2019	CHE	1 of 3
	ic Drilli										ud Rotary (43-51'\		S. Nar		1 -	Vonk
	IG EQUI		Т						NG DIA							_	ROUNDWATER
	ich D5	-						8/4			51.5		57		▼ NM	/ NM	
	NG MET ner: 14		., Dro	p: 30 in.	(Auton	natic)	NOTE		%, N ₆	o = 1.3	2N _{SPT} = 0.8	88N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z ⁰	MOISTURE (%)	DRY DENSITY (pcf)		DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION A	ND CLAS	SIFICA	TION
	55 		B1 S2	5 9 11	20	26	9.2		CR -200	- - -		CONCI UNDIF SAND sand; s PID=0. Mediur	RETE. FERENTI (SM); dar ome fines 9 ppm n dense; l race mica 0 ppm	ATED SU k brown (s; nonplas	JRFICIAL 10YR 3/3 stic.	. SOIL); mois	S: Silty st; mostly fine
_5	50 50		R3-1 R3-2	6 10 13	23	20	7.7	96	PA	5 — - -		brown nonpla PID=0.	(10YR 6/2 stic.	2); moist;	- — — — - I; medium mostly fin	– – – ı dense e sand	e; light grayish d; trace fines;
-10	 45 		, S4	5 5 7	12	16	22.0		-200	10 — - -		light gr	ayish brov es; nonpla 6 ppm	vn (10YR	 silt (SP-S 6/2); wet	– – – SM); m ; most	—————— edium dense; ly fine sand;
_15			S5	3 4 6	10	13	24.1		PA	- 15 — - -		brown trace g PID=0.	(10YR 5/4 ravel; trac 3 ppm.	l); wet; m	ostly fine onplastic	to med	 e; yellowish dium sand;
-20	35 		, S6	7 8^ 10^	٨	۸	20.5		-200	- 20 — - - -			ace graver. 5 ppm		fine to coa nica; nonp		and; trace packed
GR	924	5 A	ctivi	A CON ty Roa , Calif	ad, S	uite	103	INC	OF SU LO	THIS BO BSURFA CATION	MARY APPLII DRING AND ICE CONDIT S AND MAY PASSAGE O	AT THE IONS MA CHANGI	TIME OF D AY DIFFER AT THIS	ORILLING. R AT OTHE LOCATIO	≣R		FIGURE B-26 a

E	3OR	IN	G F	RECC	RD	١ ١	PROJE SDSU			بمالد				PROJECT SD60	NUMBER		BORING B-26
	CATION						ODGO	IVIIOO	1011 V	alley		STAF	RT		ISH		SHEET NO.
			l, San	Diego, (Califorr	nia						3/1	5/2019		/15/2019		2 of 3
	NG COMI fic Drilli							l		ETHOD	ud Rotary (4	2 54"		LOGGED	rveson	- 1	Vonk
	NG EQUI	•	т						NG DIA							1 -	ROUNDWATER
Died	rich D5	0						8/4		` ,	51.5	()	57		▼ NM		
	ING MET						NOTES	-							1		
Hamr	mer: 14	0 lbs	., Dro	p: 30 in.	(Auton	natic)	ETR	R ~ 79	%, N ₆	$_{50} = 1.3$	$32N_{SPT} = 0.8$	8N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	200	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	AND CLAS	SIFICA	TION
	30		R7-1 R7-2	4 10 15	25	22	19.1	108	PA	-		Poorly- dark gr ew find	graded S	SAND with R 4/1); we astic.	n silt (SP-S	SM); n	.S (continued): nedium dense; medium sand;
-30	25		S8	4 7 10	17	22	24.3		-200	30 —		5/1); w nonpla	et; mostly stic; trace 2.9 ppm	y fine tò m	P); medium nedium sa		e; gray (10YR ace fines;
35	20		S9	4 4 8	12	16	24.3		PA	35		PID=6.	ray (10YF 9 ppm Sand; 4%				
40			R10	9^ 18^ 31^	۸	^	3.8			- 40 — -		rom 38 Well-gr mostly ittle fin	3 to 48 fe aded GR fine to co e to coar	et. RAVEL wit barse, sub	th sand (Gorounded the trace fines	iW); d	d COBBLES ense; wet; nded gravel; plastic.
45	_									- 45 —				re at 43 fe cone drill b		n gim	ble. Switch to
	10									- -		Harder	drilling. ((Estimate	d 30% CO	BBLE	(S)
									1	-		SANDS gray (C	STONE; f SLEY 2 5	fine to coa PB 6/1); .	(SĔE NE	ed; ma	assive; bluish
GR	924	5 A	ctivi	ty Roa	ad, S	uite	103	INC	OF SU LO	THIS B BSURF CATION	MARY APPLIE ORING AND A ACE CONDITION IS AND MAY C PASSAGE OF	T THE DNS M HANGI	TIME OF AY DIFFE E AT THIS	DRILLING R AT OTH S LOCATION	ER	ı	FIGURE
	Sa	n Di	iego	, Calif	ornia	a 92′	126		PR	ESENTI	ED IS A SIMPL NS ENCOUNT	IFICAT			AL		B-26 b

		1111			חם/	١ ١	PROJE							PROJECT		BORING
			ין כ	RECC	ノスレ	'	SDSU	Miss	ion Va	alley				SD605		B-26
SITE LO			Con	Diago (Californ	ai a						STAF	rt 5/2019	FINI	sн 15/2019	SHEET NO.
DRILLIN			, San	Diego, (Janion	па		DRII I	ING M	ETHOD		3/1	J/ZU19	LOGGED		3 of 3
	ic Drilli										ud Rotai	y (43-51')		S. Nar		C. Vonk
DRILLIN			Γ						NG DIA							LEV. GROUNDWATER (f
	ich D5	-						8/4			51.5		57		▼ NM /	/ NM
	NG MET		_		/ ^ / ^	\	NOTES		٥, ١,			0.0011				
Hamn	ner: 14	l0 lbs.	, Dro	p: 30 in.	(Auton	natic)	EIR	~ 79	%, N ₆	0 = 1.3	$32N_{SPT} =$	0.88N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	ND CLASS	SIFICATION
			S11	20 28	71	93	21.9		-200): moderately
-	_		011	43						_						ilty SAND (SM); very nes; nonplastic;
-	5									_		weakly	cemente		na, iitile ii	ries, noripiastic,
												\PID=0. (16% F		ŕ		
_	_									_		(,		1.5 feet (ta	rget depth	n reached).
<u>_</u> 55										55 —		Ground	dwater no	ot measure	ed.	
												Borina	backfille	d on 3/15/2	2019 shor	tly after drilling with
- !										_		benton	ite grout			ck-dyed rapid set
-	0									-		concre This Bo	oring Red	cord is par	of a geot	echnical report
-										_				considered		rety.
<u>–</u> 60										60 —						oil Description).
_	_									_						p to 10% COBBLES
_	 -5									_		òn drill	rig chatte	er, excess	ve auger	r), estimated based inclination, and
	ŭ											visual e	evaulation than 10°	n of drill cu % are note	uttings. Pe ed in the b	rcent COBBLES oring record
-	_									-		descrip	tion and	classificat	ion, where	e encountered.
										_				ers encour 0 to 15 fee		nis exploration were
										0.5		арргол	inacory i	0 10 10 10	or unora	
_65										65 —						
.										_						
	10															
										_						
										_						
										_						
_70										70 —						
										_						
	15									_						
-	_									-						
_																
GR	OUP	DE	LT/	A CON	ISUL	AT_	NTS,	INC	OF 🌊	THIS BO	oring an	PLIES ONLY	TIME OF	DRILLING.		FIGURE
				ty Roa					SU			DITIONS M/ AY CHANGI				
				, Calif					WI ⁻ PR	TH THE ESENTE	PASSAGI D IS A SI	E OF TIME. MPLIFICAT UNTERED.	THE DAT	TA		B-26 c

H	3OR	INC	G R	RECC)RD	۱ ۱	PROJE SDSU			llev				PROJE SD(IUMBER	BORING B-27
TE LO	CATION	1					อบอบ	IVIISSI	on va	alley		STAF			FINIS		SHEET NO.
	Friars		, San	Diego, (Califorr	nia		DDILL	INC M	ETHOD		3/1	5/2019	LOGO		5/2019	1 of 4
	ounty [1							tem Au	iger				Bied		C. Vonk
	IG EQUI		-						NG DIA			PTH (ft)	GROUNE				EV. GROUNDWATE
CME								8			70.6		72			▼ 24.6	47.4
	NG MET		Dro	p: 30 in.	(Auton	natio)	NOTES		0/. NI	_ 1 /	12N _{SPT} = 0.9	SENI					
Iallii	1161. 14	105.	, DIO		(Auton		LIN	\ ~ 65	70, IN ₆₀	0 = 1.2	$\frac{ \mathbf{Z} \mathbf{N}_{SPT} = 0.3}{ \mathbf{Z} }$	JOINMC					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTIO	A NC	ND CLASSI	FICATION
	_		B1				13.9		PA	_		CONC	MENT: A	pproxi	mate	ly 4 inches	s of ASPHALT
	 70								PI CR	_		UNDIF	FERENT	IATEI	SU	RFICIAL S	SOILS:Clayey); moist; mostly fir
			S2	7^ 13^	٨				EI			sand; s	ome fine	s; few	fine	gravel; me	edium plasticity.
	_		-	15^						-		PID=17 (8% Gr	7.4 ppm avel: 53%	% San	ds: 3	9% Fines)	
		\bowtie								-		Gravel	in shoe. 25 tsf; PII			,	
5		\bowtie								5 —		FF=1.2	.5 (SI, FIL	J=41.C) ppi	11	
			S3	17 20	41	58			-200					nt yello	wish	brown (2.	5Y 6/4); little fine t
				21						-		coarse	gravel. 2.5 ppm				
	<u>65</u>									-		(26% F					
										_		Verv sl	ow and d	lifficult	drilli	ng on GR/	AVEL and
												COBBL	LES from	7 to 1	2.5 f	eet.	
	_									-		(Estima	ated 30%	COBI	BLES	5)	
10	_									10 —							
	_									_							
	60									-							
	_		S4	8^ 13^	^		8.1			-		Clayey	SAND w	ith gra	avel (SC); light	yellowish brown
			0,	26^			0.1			_		(2.5Y6	(4); mois	t; mos	tly fir		se sand; some fine
										4-		PID=19		i, iittie	IIIIes	, mealum	piasticity.
15				23^						15 —		PID=26		nn/ O-		00(5 :)	
			R5-1 R5-2	19^ 20^	^	^	10.8		PA	-	 	(38% G	eravei; 42	2% Sa	nd; 2	0% Fines)	
	55 		1.0 2	20						-	-						nish gray (GLEY 1 nd; nonplastic.
20	_			6						20 —	 						
		$ \times $	S6	6 7	15	21	5.2		-200	_							dense; grayish
		\vdash		8								trace fir	nes; non				to medium sand;
	50									-		PID=13 (5% Fir					
	_									-		, 5 / 5 11	,				
	_									_							
											¥						
 GR	OUP	DE	LTA	A CON	ISUL		NTS,	INC	OF	THIS B	MARY APPLIE	AT THE	TIME OF	DRILLI	NG.		FIGURE
				ty Roa					SU		ACE CONDITI IS AND MAY (
		-		,	, –						PASSAGE O						B-27 a

			G F	RECC	ORD	١ ١	PROJE SDSU			alley				SD605		BORING B-27
	CATION Friars		l. San	Diego, (Califorr	nia						STAR 3/1	т 5/2019	FIN 3/	іsн /15/2019	2 of 4
RILLIN	NG COM	PANY		2.090,	<u> </u>					ETHOD				LOGGED	BY	CHECKED BY
I ri-C	ounty [NG EQUI	Orillin PMEN	<u>g</u> т						NG DIA	tem Au		PTH (ft)	GROUND	A. Bie		C. Vonk EV. GROUNDWATER
CME			-					8		(,	70.6	(,	72	(,	▼ 24.6	
	ing met mer: 14		., Dro	p: 30 in.	(Auton	natic)	NOTE		%, N ₆	₀ = 1.4	12N _{SPT} = 0.	95N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž°	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION	AND CLASS	IFICATION
		Ø.	R7-1	3 5	12	11	28.5	93	-200			UNDIF	ERENTIA	ATED SI	URFICIAL	SOILS (continued):
	45 		R7-2	7					PI	-		4/2); mo	oist; mostl y. 5 tsf; PID:	y fines;	some fine s	ayish brown (10YR sand; medium
_30		X	S8	2 9 11	20	28	26.3		PA	30 — -		4/1); we micace PID=26	et; mostly ous.	fine sand		dark gray (2.5Y es; low plasticity;
-35	_		R9-1	7 20	53	50	17.3	109	PA	- 35 —		 Poorly-	 graded S <i>A</i>	— — — - AND (SP); very den	- — — — — — — se; dark brown
	35 		R9-2	33						-		fines; ne PID=7.5	onplastic.	•	ne to medii	um sand; trace
_40	30		S10	5 9 11	20	28	23.9		PA	40 — - -		wet; mo plasticit PID=16		o mediur ous.		ark gray (2.5Y 4/1); ttle fines; low
-45	_		R11-1	13 22 35	57	54	22.1	100		45 —						
	25 		11-2	. 33						- - -		(10YŔ 3				se; dark brown um sand; trace
GR				CON				INC	. OF	THIS B	MARY APPLI ORING AND ACE CONDIT	AT THE 1	TIME OF D	RILLING		FIGURE
				ty Roa , Calif					LO WI PR	CATION TH THE ESENTI	IS AND MAY PASSAGE O ED IS A SIMP NS ENCOUN	CHANGE F TIME. PLIFICATI	AT THIS	LOCATIC \	N	B-27 b

E	BOR	RIN	G R	RECO	ORD	1	PROJE SDSU			alley				PROJE		IUMBER	l	BORING B-27
	CATION			D: .	0 111							STAR			INIS			SHEET NO.
	Friars		, San	Diego,	Californ	nia		DDII I	ING M	ETHOD		3/1	5/2019	LOGG		5/2019		3 of 4
	ounty [n							tem Au	ider			A. B				Vonk
	NG EQUI								NG DIA			TH (ft)	GROUN	1				ROUNDWATER (ft)
CME	75							8			70.6		72			▼ 24.	6 / 47.	.4
-	ING MET						NOTES				'							
Ham	mer: 14 	IO Ibs.	., Dro	p: 30 in.	(Auton	natic)	ETR	R ~ 85	%, N ₆	₀ = 1.4	$12N_{SPT} = 0.95$	5N _{MC}						
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	2°	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DES	CRIPTIO	N AN	ND CLAS	SSIFICA	TION
-	20		S12	5 3 4	7	10	28.4		PI	-	\	Poorly (3/1); we Lean C noist; r	graded set; most LAY (Cl moistly f	SAND (Solve) Salve); medical (Salve); medical (Salve)	SP); and; um s v fin	dark gr trace fi stiff; dar	rayish b ines; no rk gray	S (continued): forown (10YR / onplastic. / (2.5Y 4/1); m plasticity.
55 - - -	 15 		S13	10^ 21^ 21^	^	^	20.3		-200	55 — - - -	r r r	nostly	fine to n ous; coa 2 ppm	———- A); dark nedium : arse gra	sand	d; little fi	ines; no	SY 4/2); wet; onplastic;
—60 -	 10		S14	13 35 48	83	118	16.4			60	c f	dark gr ines; fe	ay (5Y 3	———- SAND w 8/1); wet gravel; n	; mo	stly fine	e to me	ery dense; very dium sand; few ca.
- 65	5		S15	3 8 29^	^	^	20.1		-200	- 65 — - -		PID=17 12% F	7.2 ppm ines)					
- 100 GR	0		S16	40 50/1"	50/1"	>100	14.6			- 70 — - - -	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	SANDS gray (2 unfracti ine sar PID=4. 73% S	STONE; .5Y 4/1) ured (Si nd; some 1 ppm and; 27	; modera Ity SANI	coars ately O (S low p	se grain / weath M); very plasticit	ned; lam ered; ve y dense y; weak	ninated; dark ery soft; e; wet; mostly kly cemented).
GR	924	5 A	ctivi	A CON ty Roa	ad, S	uite	103	INC	OF SU LO WI' PR	THIS B BSURFA CATION TH THE ESENTI	MARY APPLIES ORING AND AT ACE CONDITIO IS AND MAY C PASSAGE OF ED IS A SIMPL NS ENCOUNTI	T THE TONS MA HANGE TIME. IFICATI	TIME OF AY DIFFE AT THI THE DA	DRILLING ER AT O' S LOCA' TA	NG. THEI TION	۱	F	FIGURE B-27 c

Е	BOR	IN	G F	RECO	ORD	١ ١	PROJEC SDSU			alley				PROJECT SD605	NUMBER	ВС	RING B-27
TE LO	CATION	I										STA		FIN	ISH		IEET NO.
	Friars IG COMI		, San	Diego, (Jalitori	nia		DRILI	ING M	ETHOD		3/	15/2019	LOGGED	/15/2019 BY	CHECKE	of 4
	ounty [g							tem Au	ger			A. Bie		C. Voi	
	IG EQUI	PMEN	T						NG DIA	. (in)			l	ELEV (ft)	DEPTH/EL		JNDWATER
CME	75 NG MET	HOD					NOTES	8			70.6		72		▼ 24.6	/ 47.4	
			., Dro	p: 30 in.	(Auton	natic)			%, N ₆	0 = 1.4	2N _{SPT} =	$0.95N_{MC}$					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	2°	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION A	AND CLASS	SIFICATION	N
	_									_		Groun feet bo		easured o	luring drillir	ng at a de	epth of 24.6
	5 									- -		Portlar		grout an	2019 short d capped v		
										-					t of a geote d in its enti		eport
80										80 —		^ = ina	ccurate bl	owcounts	5		
	_									-		*Geolo	gic Descr	iption; (D	isturbed So	oil Descrip	ption).
	10 									- - -		(subro on drill visual greate descri	unded, 3- rig chatte evaulatior r than 10% otion and o	to 12-incer, excess of drill common of drill common fare noted assification	include up h diameter sive auger i uttings. Pe ed in the botton, where), estimat inclination rcent COI oring reco e encounte	ed based n, and BBLES ord ered.
85	_									85 — -		Cobble	e-rich laye rimately 4	rs encou to 6 feet	ntered in th thick.	nis explora	ation were
,	15 									-							
ŀ										-							
90	_									90 —							
	20 									- -							
95	_									95 —							
										_							
	25																
										-							
	_									-							
GR				A CON				INC	OF	THIS BO	DRING A	PLIES ONL ND AT THE DITIONS M	TIME OF I	DRILLING	.	FIG	SURE
				ity Roa , Calif					LO WI PR	CATIONS TH THE I ESENTE	S AND M PASSAG D IS A S	AY CHANG E OF TIME. IMPLIFICAT UNTERED.	E AT THIS THE DAT	LOCATIO	DN	B-	27 d

F	3OR	INC	3 F	RECC)RD	1 1	PROJE			llov				PROJEC		NUMBER	BORING B-28
	CATION		- '				SDSU	IVIISS	OH V	шеу		STAF	 RT		JO INIS	Н	SHEET NO.
			, San	Diego, 0	Califorr	nia						3/1	6/2019			6/2019	1 of 3
	IG COM									ETHOD				LOGGE			CHECKED BY
	ounty [IOW ST	em Au		DTH (ft)	GROUNI	A. B			C. Vonk <i>ev.</i> groundwate
	ich D1							8	NG DIA	. (111)	60.8	111 (11)	61	J LLLV ('''	▼ 17.5	
	NG MET						NOTES				00.0					<u> </u>	, 10.0
Hamr	ner: 14	0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	~ 89	%, N ₆	0 = 1.4	$18N_{SPT} = 0.9$	9N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTIO	N A	ND CLASSI	FICATION
	—60 —		B1				13.7		PA EI	-		CONCI UNDIF	RETE.	IATED	SU	RFICIAL	s of ASPHALT SOILS: Clayey brown (10YR 5/2)
			S2	3 3 5	8	12				-		moist; r gravel; PID=1. (3% Gr Dark gr	nostly fir medium 4 ppm avel; 599 ay (2.5Y	ne to me plastici % Sand:	ediu ty; r	m sand; somicaceous % Fines)	ome fines; trace
_5	55 		S3	3 4 5	9	13				5 <u> </u>		(SC). CL: me	g from Sa	f; dark o	gray	(2.5Y 4/1	to Clayey SAND); moist; mostly city; PP=0.5 tsf;
10	50		S4	1 4 5	9	13	15.8		-200	- 10 — -		fine sar Clayey (10YR fines; n	edium dend; some 	e fines; r ————— SC); me st; mos blasticity	ned diu tly f	lium plasti ———— m dense;	4/1); moist; mostly city; trace mica. ———————————————————————————————————
.15	 45 		S5	P P P	Р	Р	28.1		-200 Pl	- 15 — - -		4/2); m plastici	oist; mos ty; trace i tsf; PID:	stly fines mica.	s; s		ayish brown (10YR and; medium
20	40 		S6	1 9 10	19	28	20.1		-200	- 20 — - -		$(2.5Y^{'}4)$	/̃3); wet; stic; trace 5 ppm	mostly			—————————dense; olive brown n sand; trace fines
GR				A CON				INC) OF	THIS B	MARY APPLIE ORING AND A	T THE	TIME OF	DRILLIN	G.		FIGURE
				ty Roa , Calif					LOO WIT PRI	CATION TH THE ESENTI	IS AND MAY (PASSAGE OF ED IS A SIMPI NS ENCOUNT	CHANGE TIME. LIFICAT	E AT THIS	S LOCAT FA	101	١	B-28 a

			G F	RECC	ORD)	PROJE SDSU			alley				PROJECT SD605	5	BORING B-28
9449 RILLIN	Friars GOM County [Roac PANY		Diego, (Califorr	nia				ETHOD tem Au	ıger	3/16	т 6/2019	LOGGED A. Bied	16/2019 BY	SHEET NO. 2 of 3 CHECKED BY C. Vonk
Deid	NG EQUI rich D1. ING MET	20	Т				NOTES	8	NG DIA	. (in)	60.8	PTH (ft)	GROUNI 61	ELEV (ft)	DEPTH/EL ▼ 17.5	EV. GROUNDWATER / 43.6
Hamr	mer: 14	l0 lbs	., Dro	p: 30 in.	(Auton	natic)	ETR	R ~ 89	%, N ₆	₀ = 1.4	$48N_{SPT} = 0.9$	9N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION /	AND CLASS	SIFICATION
	35 	X	R7-1 R7-2	3 8 18	26	26	14.9	113	PA	-		Silty SA (2.5Y 4/2) nonplast PID=0.8	ND (SM 2); wet; tic. ppm	l); medium	n dense; da	SOILS (continued): ark grayish brown m sand; little fines;
-30	30		S8	3 10 13	23	34	26.9		-200	30		grayish	brown (w fines; ppm	10YR 3/2)		M); dense; very dark tly fine to medium rus.
-35	25 		S9	7 11 12	23	34	27.2		PA	35 — - - -		Poorly-g 5/2); we nonplas PID=1.6 (95% Sa	t; mostly tic; trace ppm	y fine to m e mica.	– – – –); dense; g edium san	rayish brown (10YR d; trace fines;
. 40	20		S10	12 13 17	30	45	16.1		-200	40 — - - -		brown (7 fine to condition (13% Fine 13% 10YR 3/ oarse gr nes) d difficu ES from	2); wet; m ravel; few	ostly fine to to little fine to little fine hough GR feet.	very dark grayish o medium sand; littless; low plasticity.	
. 45	15 									45 — - - -						
GR	924	5 A	ctivi	A CON ty Roa , Calif	ad, S	uite	103	INC	OF SU LO WI PR	THIS B BSURF CATION TH THE ESENTI	MARY APPLIE ORING AND A ACE CONDITI IS AND MAY (PASSAGE OF ED IS A SIMPI NS ENCOUNT	AT THE T ONS MA' CHANGE TIME.	IME OF Y DIFFE AT THIS THE DAT	DRILLING. R AT OTH S LOCATIC FA	ER ON	FIGURE B-28 b

E	3OR	IN	G F	RECO	DRD	\	PROJEC SDSU			allev				PROJECT SD605		BORING	-28
ITE LC	CATION	1					0000	141100	1011 V	anoy		STAR		FINI	SH	SHEET	NO.
	Friars		l, San	Diego,	Californ	nia		DRILL	ING M	ETHOD		3/16	6/2019	LOGGED	16/2019 BY	3 of CHECKED BY	
	ounty [a							tem Au	ger			A. Bied		C. Vonk	l
RILLIN	NG EQUI	PMEN						BORII	NG DIA		TOTAL			ELEV (ft)		LEV. GROUNDY	VATER
	rich D1:	-					NOTES	8			60.8		61		▼ 17.5	5 / 43.6	
			., Dro	p: 30 in.	(Auton	natic)		-	%, N ₆	₁₀ = 1.4	8N _{SPT} =	0.99N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	z° Z°	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	.ND CLASS	SIFICATION	
	10									-		Slow an	d difficu	TATED SU It drilling o 30% COBB	n GRAVE	SOILS (conti	nued): ES.
_55	5		S11	17 50/5"	50/5"	>100	17.9		-200	- - 55 — - -		SANDS minor be very sof	TONE; fedding; it; unfractstly fine ed).	moderately tured (Silt	rse graine / weather / SAND (durated ed; massive wit ed; gray (10Y SM); very dens inplastic; weak	5/1); se;
-60	0		S12	23 50/3"	50/3"	>100	19.2			- 60 — -		PID=8.0) ppm epth = 60	`	rget depth	h reached).	
-65	_									- 65 —		feet bgs Boring b Portland rapid se	ackfilled cemen t concre	d on 3/16/2 t grout and te.	2019 shor d capped	ng at a depth on the street of	y with d
	5 									-		which m	ust be o	considered	in its enti	echnical repor irety. oil Description	
- 70	10									- 70 — -		All soils (subrour on drill r visual ev greater descript Cobble-	encounned, 3- ig chatte vaulation than 109 ion and rich laye	tered may to 12-incher, excessin of drill cu % are noted	include un diameter ve auger attings. Per din the boon, where tered in the	p to 10% COB r), estimated b inclination, and ercent COBBLE oring record e encountered, his exploration	BLES ased d
	_									-							
GR				A CON				INC). OF	THIS BO	ORING A	PLIES ONLY ND AT THE T DITIONS MA	IME OF	DRILLING.		FIGUE	RE
				ty Roality, Calif					LO WI PR	CATION TH THE ESENTE	S AND M PASSAG ED IS A S	AY CHANGE E OF TIME. MPLIFICATION UNTERED.	AT THIS THE DAT	S LOCATIO FA	N	B-28	С

	3 O E	PINI		RECO) D D	١	PROJE									NUMBER	R	BORING
SITE LO			J 1	\LCC	טאנ		SDSU	Miss	ion Va	alley		STAI) T	SL	0605			B-29 SHEET NO.
			, Sar	n Diego, (Califorr	nia							2/2019			12/2019	9	1 of 1
DRILLI	IG COM	PANY								ETHOD				LOG	GED			CKED BY
	ic Drill									tem Au					Bied			Vonk
DRILLIN	i o g Ma		Γ					BORII 8	NG DIA	. (in)	4.8	. DEPTH (ft)	GROUNI 58	D ELE	V (ft)	DEPTH// ▼ NE		ROUNDWATER (ft)
SAMPL							NOTES				7.0		- 50			Ā INC	. / / / L	
Bulk							Bore	ehole	Perco	lation	test I-3 p	performed	on 03/1	3/20	19			
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	Z ^o	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG					ND CLAS		
											///	<u>PAVEI</u> CONC	MENT: A RETE ov	pprox er 1-i	ximate inch A	ely 4 incl	hes of A SATE B	ASPHALT ASE. /
- - - - -5	55 5		B1				9.3	-	PA	- - - 5 —		UNDIF SAND to med plastici PID=10	FERENT (SC); gra ium sand	IATE ayish d; son	ED SU browr ne find	RFICIA n (2.5Y s es; trace	L SOIL 5/2); mo e fine gr	S: Clayey list; mostly fine avel; low
) 5 <u>—</u>		Total D	epth = 4	.8 fee	et (Tai	get dep	th reacl	ned).
F										-			· dwater no		•			,
										_								
												Boring 03/12/	converte 2019 sho	d to a	a perd	colation t	test hol	e on filled on
-	50									-		03/13/2	2019 and	patc	hed w	<i>r</i> ith blacl	k-dyed	rapid set
F	_									-	-	concre	te after c	ompl	etion	of perco	lation te	esting.
10										10								cal report
'												WITICIT	must be o	201151	uereu	III IIS EI	illety.	
-	_									-								
-	_									-	-							
	<u>45</u>									_								
	_									-								
15	_									15 —	-							
_										_								
										_								
<u> </u> -	40									-	-							
-										-	-							
20										20 —								
<u> </u>										-								
-	_									-								
	35									_								
										-								
GR	924	15 A	ctiv	A CON ity Roa o, Calif	ad, S	uite	103	INC	OF SU LO WI' PR	THIS BOURFACATION TH THE ESENTE	ORING AI ACE CON IS AND M PASSAG ED IS A S	PLIES ONL' ND AT THE DITIONS M. AY CHANG E OF TIME. IMPLIFICAT	TIME OF AY DIFFE E AT THIS THE DA	DRILI R AT S LOC TA	LING. OTHE CATIOI	ER N	F	FIGURE B-29

Е	3OR	IN	G F	RECC	ORD	۱ ۱	PROJE SDSU			alley				PROJECT SD605			BORING B-30
	CATION											STAR		FINI	SH		SHEET NO.
			l, San	Diego, (Califorr	nia						3/1	6/2019		16/2019		1 of 3
	NG COM Ounty [a					1		ETHOD tem Au	ıaer			LOGGED S. Nar			CKED BY Vonk
	NG EQUI							1	NG DIA			PTH (ft)	GROUND			1 -	ROUNDWATER
CME			-					8		. (,	55.8		58	(,	▼ 12.1		
	ING MET						NOTE	-									
Hamr	mer: 14	0 lbs	., Dro	p: 30 in.	(Auton	natic)	ETF	R ~ 85 ⊤	%, N ₆	0 = 1.4	$\frac{12N_{SPT} = 0.9}{12}$	95N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION A	AND CLAS	SIFICA ⁻	TION
	_		B1				15.7		PA PI	-			RETE.	oproximate	JRFICIAL	. SOIL	S: Clayey
	55 		S2	2 3 3	6	9	17.8		CR EI	-		fine sar PID= 1	nd; some	fines; low			ī; moiśt; mostly
_5	50		S3	3 4 4	8	11	14.1		-200	5 — - -		(10YR -	4/2); mois onplastic 2.0 ppm	st; mostly	dense; d	– – – lark ye edium	llowish brown sand; little
-10			S4	1 2 5	7	10	26.2		PA	- 10 — - -		PID=1	ines; trac 0.5 ppm and; 43%				
-15	40		S5	5 8 8	16	23	24.7		-200	- 15 — - -		micace	ous. 0.3 ppm.	own (10YF	R 4/2); we	t; little	fines;
-20	35		S6	3 5 5	10	14	26.5		-200	- 20 — - -		dark gr	ayish bro n sand; fe l. s.5 ppm	wn (10YR	(4/2); wet	t; most	——————edium dense; ly fine to ceous; thinly
GR				A CON				INC	OF SU	THIS BOURFA	MARY APPLII ORING AND A ACE CONDIT IS AND MAY	AT THE IONS MA	TIME OF I AY DIFFEI	DRILLING. R AT OTHE	≣R	F	FIGURE
				, Calif					WI ⁻ PR	TH THE ESENTE	PASSAGE O ED IS A SIMP NS ENCOUN	F TIME. LIFICATI	THE DAT	Α			B-30 a

			G F	RECC	ORD	١ ١	PROJE SDSU			alley			I	D605		BORING B-30
	CATION Friers		San	Diego, (^aliforr	nia						3/16/2	2010	FINI 3/	sн 16/2019	SHEET NO. 2 of 3
RILLIN Tri-C	NG COM COUNTY [NG EQUI	PANY Drilling	9	Diego, v	Jamon	iia .		Hol		ETHOD tem Au (in)		PTH (ft) GI	LO	GGED S. Nar	BY veson	CHECKED BY C. Vonk EV. GROUNDWATER
	ING MET mer: 14		., Dro	p: 30 in.	(Auton	natic)	NOTE	S	%, N ₆	₀ = 1.4	$12N_{SPT} = 0.9$	95N _{MC}				
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESCRIP	TION A	AND CLASS	IFICATION
	30		S7	5 4 7	11	16	34.6		PA	-		Silty SAN	D (SM); m ; wet; mos s. ppm	edium stly fin	dense; da	SOILS (continued): ark grayish brown le fines; nonplastic;
-30	25		R8	17 13 10	23	22	23.2	101	-200	30 —			own (2.5) fines; nor	/ 5/2);	wet; mostl	M); medium dense; y fine to medium
-35			S9	10 10 9	19	27	22.1		-200	35 — - -		Micaceou PID=181. (11% Fine	4 ppm			
- 40			S10	10^ 19^ 25^	^	^	19.6		PA	- 40 — - -			3 ppm. vel; 78% \$	Sand;	9% Fines)	natter from 41 to 44
. 45	15									- 45 — - - -		feet. Slow and from 44 to (Estimate	54 feet.	_		L and COBBLES
GR	924	5 A	ctivi	CON ty Roa , Calif	ad, S	Suite	103	INC	OF SU LO WI PR	THIS BOURFACATION TH THE ESENTE	MARY APPLIE MARY APPLIE ACE CONDITI S AND MAY PASSAGE OI ED IS A SIMP NS ENCOUN	AT THE TIM IONS MAY CHANGE A F TIME. TH LIFICATION	ME OF DRII DIFFER A ^T T THIS LO HE DATA	LLING. T OTHE CATIO	ER N	FIGURE B-30 b

F	30R	INC	G R	RECO)RD	\	PROJE SDSU			allev				PROJEC		BER	BORING B-30
	CATION)		3030	IVIISS	ion va	alley		STAF	RT		NISH		SHEET NO.
9449	Friars	Road	, San	Diego,	Califorr	nia							6/2019	I	3/16/20		3 of 3
	IG COMI									ETHOD				LOGGE		1 -	HECKED BY
	ounty [I G EQU I		-							tem Au		DEDTIL (4)	OBOUND	_	arveso		C. Vonk
CME		PIVIEN	l					8	NG DIA	(IN)	55.8	DEPTH (IT)	58) ELEV (- 1	1 <i>niele</i> v 12.1 / 4	GROUNDWATER
	NG MET	HOD					NOTES				00.0		- 50		<u>+</u>	12.17	
Hamr	ner: 14	0 lbs.	, Dro	p: 30 in.	(Auton	natic)	ETR	2 ~ 85	%, N ₆	0 = 1.4	$12N_{SPT} = 0$	0.95N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	2°	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION	N AND C	LASSIFI	CATION
			S11	50/1"	REF	REF					6901						
	5									- - -		No rec	overy. Sa sing drillir	ampler re	efusal o	n cobble	
55			S12	40 50/4"	50/4"	>100	16.4		-200	55 — - -		SANDS modera 5PB 6/ mostly cemen	ately wea 1); unfra fine sand ted) 7.6 ppm	fine to co athered; actured (oarse gi very so Silty SA	rained; r ft; bluish ND (SM	massive; n gray (GLEY 2 l); very dense;
20	_									- 60			epth = 55			•	ached). at a depth of 12.1
60	_									-		feet bg Boring	s. backfille	d on 3/1	6/2019	shortly a	after drilling with
	— —-5									-		rapid s	et concre	ete.			inical report
	_									_		which r	nust be o	consider	ed in its	entirety	<i>'</i> .
35										65 —		^Geolo	gic Desc	ription; (Disturb	ed Soil i	Description).
										- - -		(subrou on drill visual e greater descrip Cobble	unded, 3- rig chatte evaulation than 10° tion and	to 12-ir er, exce n of drill % are no classific ers enco	nch diant ssive au cuttings oted in teation, w unterec	neter), e uger incl s. Perce he borir where er I in this	o 10% COBBLES stimated based ination, and nt COBBLES ng record acountered. exploration were
70										70 —							
										_							
										_							
	15									-	1						
										_	-						
ЭR	OUP	DE	LT/	OO A	ISUL	_TAN	ITS,	INC) OF	THIS BO	MARY APP ORING ANI	D AT THE	TIME OF	DRILLIN	G.		FIGURE
	924	5 A	ctivi	ty Roa	ad, S	uite	103		LO WI	CATION TH THE	ACE COND S AND MA PASSAGE ED IS A SIN	Y CHANGI OF TIME.	E AT THIS THE DAT	S LOCAT TA	ION		В-30 с

F	30R	· · ·	3 F	RECO)RD	١ ١	PROJE			alles i				PROJECT		BORING B-31
SITE LO	CATION	١		Diego, (SDSU	MISS	ion va	alley		STAF	 кт 6/2019	SD605		SHEET NO. 1 of 4
DRILLIN Tri-C	IG COM Ounty [IG EQUI	PANY Drilling)	i Diego, v	Jamon	Па		Hol		ETHOD tem Au (in)				LOGGED S. Nan	BY veson	CHECKED BY C. Vonk EV. GROUNDWATER (1
SAMPLI	NG MET		. Dro	p: 30 in.	(Auton	natic)	NOTE	S	%. Na	o = 1.4	$12N_{SPT} = 0.$	95N _{MC}	00		<u>¥</u> 21.3	/ 44. /
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	zº	MOISTURE (%)	DRY DENSITY (pcf)		DEPTH (feet)	GRAPHIC LOG		DESC	CRIPTION A	IND CLASS	IFICATION
	—65 —		S1	3 6 8	14	20				-		UNDIF SAND moist; i	FERENT (SM); me mostly fir stic; trace	TIATED SU edium dens ne sand; so	IRFICIAL se; dark br	s of ASPHALT SOILS: Silty own (10YR 3/3); trace fine gravel;
_5	 60		B2 S3	9 6 6	12	17	11.8		PA EI -200	5 <u> </u>		mostly micace (2% Gr Silty SA	fine sand ous. avel; 60%	d; some fin <u>Sand; 38</u>); medium	es; trace g B% Fines) dense; gr	/R 3/3); moist; gravel; low plasticity;/ ayish brown (10YR
10	 55		S4	4 4 5	9	13	20.3		-200	- - 10 -		NPID=1. N(16% F Clayey (10YR	3 ppm ines) SAND (\$4/2); moi low plas	SC); mediu	m dense;	nes; nonplastic.
–1 5	50		S 5	3 3 5	8	11	21.8		PA	- 15 — - -			tsf; PID:	=1.2 ppm % Sand; 47	7% Fines)	
–20	45 45 		R6-1 R6-2	4 9 14	23	22	22.9	102	-200 -200		-		ines) AND (SM 4/2); moi			ark grayish brown little fines;
GR	924	15 A	ctivi	A CON ity Roa o, Calif	ad, S	uite	103	INC	OF SUI LOO WIT PR	THIS B BSURFA CATION TH THE ESENTI	MARY APPLI ORING AND ACE CONDIT IS AND MAY PASSAGE C ED IS A SIMF NS ENCOUN	AT THE TONS MA CHANGE F TIME. PLIFICAT	TIME OF AY DIFFE E AT THIS THE DAT	DRILLING. R AT OTHE LOCATIO TA	ER N	FIGURE B-31 a

		G F	RECC	ORD	١ ١	PROJE SDSU			alley			S	D605			BORING B-31
s ite Locati 9449 Friai		l San	Diego (Californ	nia						STAR 3/1	т 6/2019	FINI 3/	sн 16/2019		SHEET NO. 2 of 4
RILLING CO		i, Cari	Diogo, (Jamon			DRILL	ING M	ETHOD		0/1		GGED		CHE	CKED BY
Tri-County	/ Drillin	g					Hol	low St	tem Au	ıger		8	S. Nar	veson	C.	Vonk
RILLING EQ	UIPMEN	Т						NG DIA	. (in)	I	PTH (ft)		EV (ft)	1		ROUNDWATER
CME 75						1	8			65.9		66		▼ 21.3	3 / 44.	7
AMPLING M Hammer:		., Dro	p: 30 in.	(Auton	natic)	NOTES		%, N ₆	0 = 1.4	12N _{SPT} = 0.9	95N _{MC}					
DEPTH (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESCRIP	TION A	AND CLASS	SIFICAT	ΓΙΟΝ
40		S7	9^ 11^ 12^	^	^	20.3		PA	-		Silty SA mostly nonplas PID=1.9 (87% S	AND (SM); lig fine to medit stic; trace mi 5 ppm and; 13% Fi	ght gra um sar ca; sa nes)	yish brow nd; few to mpler pac	n (10Y little fir ked.	S (continued): 'R 6/2); wet; nes; entrol heaving
35 35 		S8	1 2 2	4	6	30.6		-200 PI	30 —		yellowis sand; m	nedium plast 5 tsf; TV=0.4	YR 4/- icity; n	4); wet; m nicaceous	ostly fi	ff; dark ine; some fine
35		, S9	1 0 1	1	1	30.2		-200	35 — - -		(10YR a	y. 5 tsf; TV=0.2	ostly fir	ne sand; s	some fi	wish brown ines; medium
	X	R10	10 15 15	30	28	20.4	107	PA	40		gray (1) fines; tr		et; mos vel; no	stly fine to nplastic.		edium dense; im sand; few
45 — —20 —		S11	11^ 25^ 33^	۸	۸	11.1					from 44 Poorly- (7.5YR subrour nonplas	nd difficult dr to 61 feet. graded GRA 4/1); wet; m nded gravel; stic; micaced ted 20% CC	VEL wostly fi	vith sand (ne to coal and; trace	GP); d	lark gray unded to
		ctivi	ty Roa	ad, S	uite	103	INC	OF SUI LO	THIS B BSURF CATION	MARY APPLII ORING AND A ACE CONDIT IS AND MAY PASSAGE O	AT THE T IONS M <i>A</i> CHANGE	TIME OF DRI AY DIFFER A AT THIS LO	LLING. T OTHE	≣R		FIGURE B-31 b

Е	3OR	IN	G F	RECO	DRD	\	PROJE SDSU			allev			F	ROJECT SD605	NUMBER		BORING B-31
	CATION						0200	111100	1011 V	anoy		STAR	T.	FIN			SHEET NO.
			l, San	Diego,	Califor	nia						3/1	6/2019		/16/2019		3 of 4
	NG COMI									ETHOD				LOGGED			KED BY
	ounty [1	IOW S	tem Au		-DTII (64)	ODOUND	S. Nar			onk OUNDWATER
CME		PIVIEN	•					8	NG DIA	A. (III)	65.9	=P1H (II)	66	ELEV (II)	▼ 21.3		
_	ING MET	HOD					NOTE	_			00.0				<u> </u>) / 11. 1	
Hamı	mer: 14	0 lbs	., Dro	p: 30 in.	(Autor	natic)	ETF	R ~ 85	%, N _∈	₅₀ = 1.4	$2N_{SPT} = 0.$	95N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	zº	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION /	AND CLAS	SIFICATI	ON
	15 									- - -		Poorly- dark grander	graded G ay (7.5YR	RAVEL v 2 4/1); we ounded g	vith sand (et; mostly f ravel; little	(GP); ve fine to c	(continued): ery dense; oarse, race to few
-55 -60	10		S12	50/4"	REF	REF	11.4			55 —		gravel a trace to PID=2.3 Increas	and freshl few fines 3 ppm	y broken s; nonplas BLES fror	rock fragi	ments; s	to coarse some sand; stimated
-65				22						- - - 65		SANDS gray (G soft; un mostly cement	STONE; fir LEY 2 5F fractured fine sand; ed).	ne to coa PB 6/1); n (Silty SA little fine	*Poorly-industriants *Poorly-industriants	ed; mas: / weathe very de	sive; bluish ered; very ense; wet; akly
	0	\times	S13	33 50/5"	50/5"	>100	16.4		-200	_			and; 20%				
										-		Ground	· water me	,	arget dept Iuring drilli		ed). depth of 21.3
	_									-		feet bgs Polyme sands.		ixture ad	lded to ho	llow ste	m for heaving
-70	5									70 —		Boring Portlan		grout an	2019 shor d capped		drilling with ck-dyed
										-					t of a geot d in its ent		al report
	-									-			ccurate bl		s isturbed S	Soil Des	cription).
GR	OUP	DE	LTA	A COI	∟ VSUI	_TAN	·— ITS,	INC	C OF	THIS B	MARY APPLI	ES ONLY	΄ AT THE L	OCATIO	N .		IGURE
	924	5 A	ctivi	ty Roali	ad, S	Suite	103		LO WI PR	CATION TH THE RESENTE	ACE CONDIT S AND MAY PASSAGE C ED IS A SIMF NS ENCOUN	CHANGE OF TIME. PLIFICATI	AT THIS	LOCATIC A	N N	E	3-31 c

	 30R			RECC)RD	•	PROJEC							PROJECT			BORING B-31
1	CATION			LOC			SDSU	IVIISSI	on va	ıııey		STAI	 RT	SD605			SHEET NO.
			, San	n Diego, (Californ	nia						3/1	6/2019		/16/2019		4 of 4
	NG COMI County [a							ETHOD tem Au	ner			LOGGED S. Nar			CKED BY Vonk
DRILLIN	NG EQUI	PMEN	<u>э</u> Г						NG DIA		TOTAL		GROUNE		DEPTH/E	LEV. G	ROUNDWATER (ft
CME	75 ING MET	רייסה					NOTES	8			65.9	1	66		▼ 21.3	3 / 44.	7
-			., Dro	p: 30 in.	(Auton	natic)			%, N ₆	_{i0} = 1.4	2N _{SPT} =	0.95N _{MC}					
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DESC	RIPTION A	AND CLAS	SIFICA	TION
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- - 85										- - 85 —							
- - -	20 									-							
- 90										90 —							
										_							
95 -	30 									95 — - -							
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			i, Sar	n Diego, (Califorr	nia							3/12/2019			12/2019	9	1 of 1
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	fic Drilli		т						NG DIA	tem Au		DEPTH (ft) GROUN		Bied			Vonk ROUNDWATER (ft)
Unim	nog Ma	rl M5	•					8		(,	5		54		(.,	▼ NE		
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Bulk							BOIL	Tiole	Perce	lation		enome	u 011 03/ 1	13/20	19			
DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	ž	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DEPTH (feet)	GRAPHIC LOG		DES	CRIPT	ION A	ND CLAS	SSIFICA	TION
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												Grou	ndwater no	ot enc	ounte	ered.		
										_		Borir	ng converte	ed to a	a perc	olation	test hole	e on
	— —45									-		03/1	2/2019 sho 3/2019 and rete after c	patch	hed w	ith blacl	k-dyed i	rapid set
10	45									10			Boring Red	-		•		•
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				o, Calif					WI PR	TH THE ESENTE	PASSAG ED IS A S	E OF TIM	E. THE DATATION OF T	TA				B-32

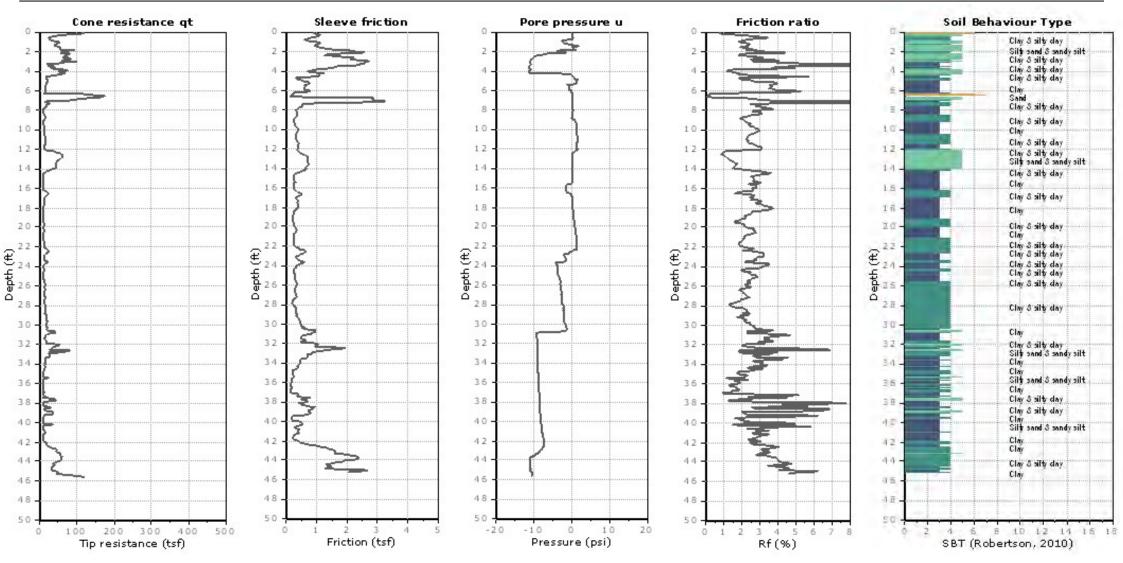


714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: Group Delta Consultants / SDSU Mission Valley

Location: San Diego, CA

Total depth: 45.54 ft, Date: 3/18/2019



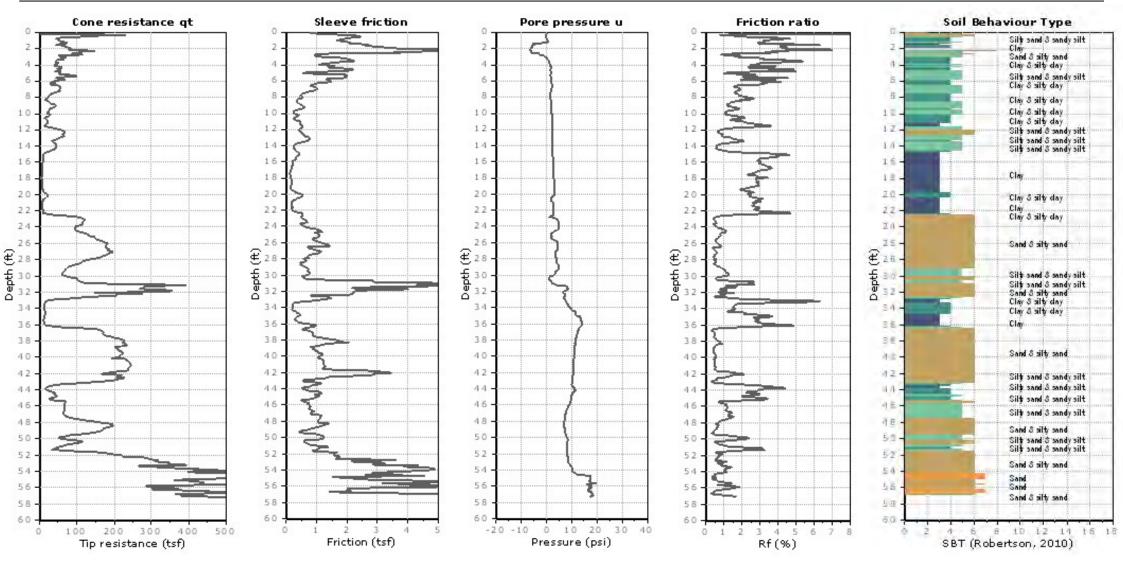


714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: Group Delta Consultants / SDSU Mission Valley

Location: San Diego, CA

Total depth: 57.36 ft, Date: 4/8/2019



SCPT-5

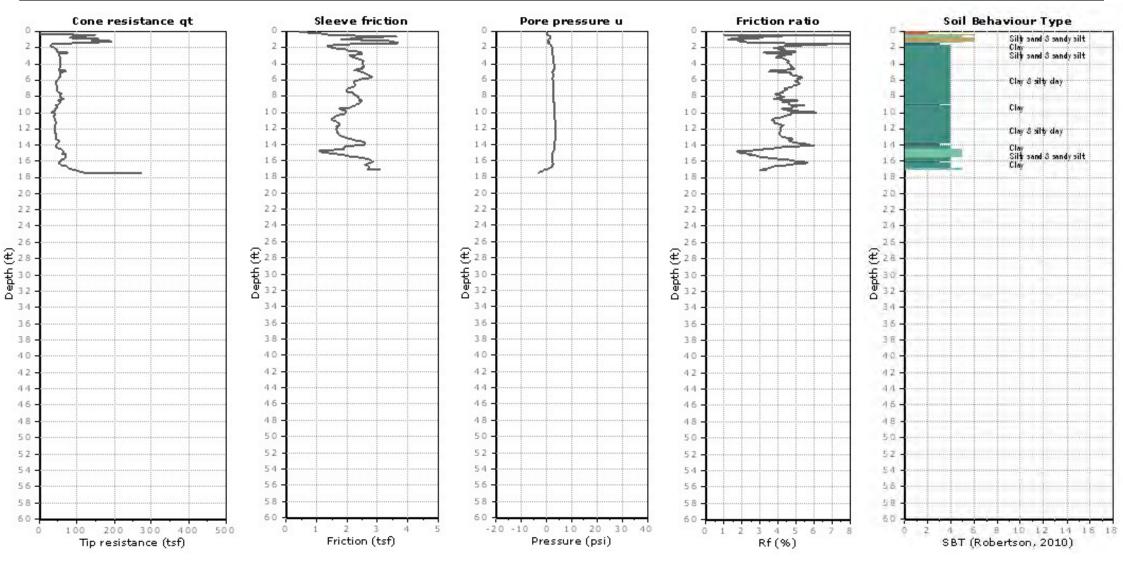


714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: Group Delta Consultants / SDSU Mission Valley

Location: San Diego, CA

Total depth: 17.48 ft, Date: 4/8/2019



SCPT-7

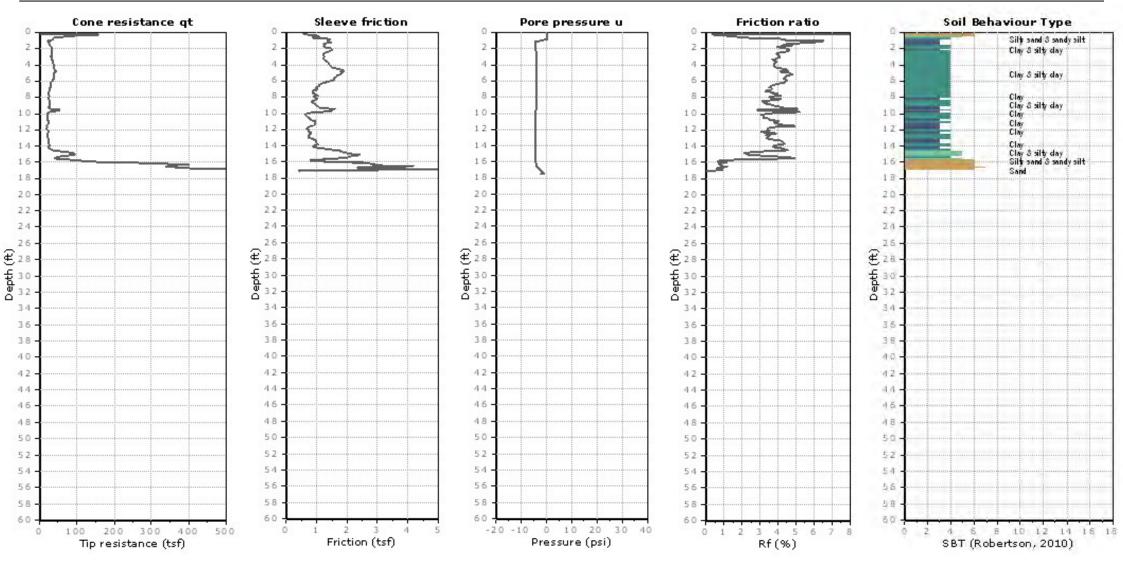


714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: Group Delta Consultants / SDSU Mission Valley

Location: San Diego, CA

Total depth: 17.52 ft, Date: 4/8/2019



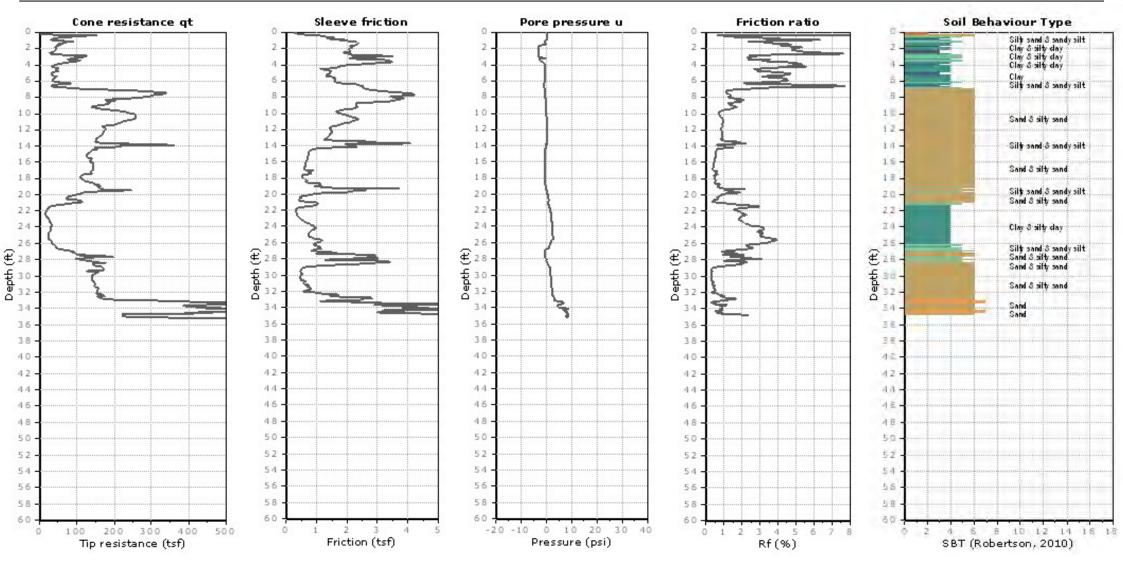


714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: Group Delta Consultants / SDSU Mission Valley

Location: San Diego, CA

Total depth: 35.17 ft, Date: 4/8/2019



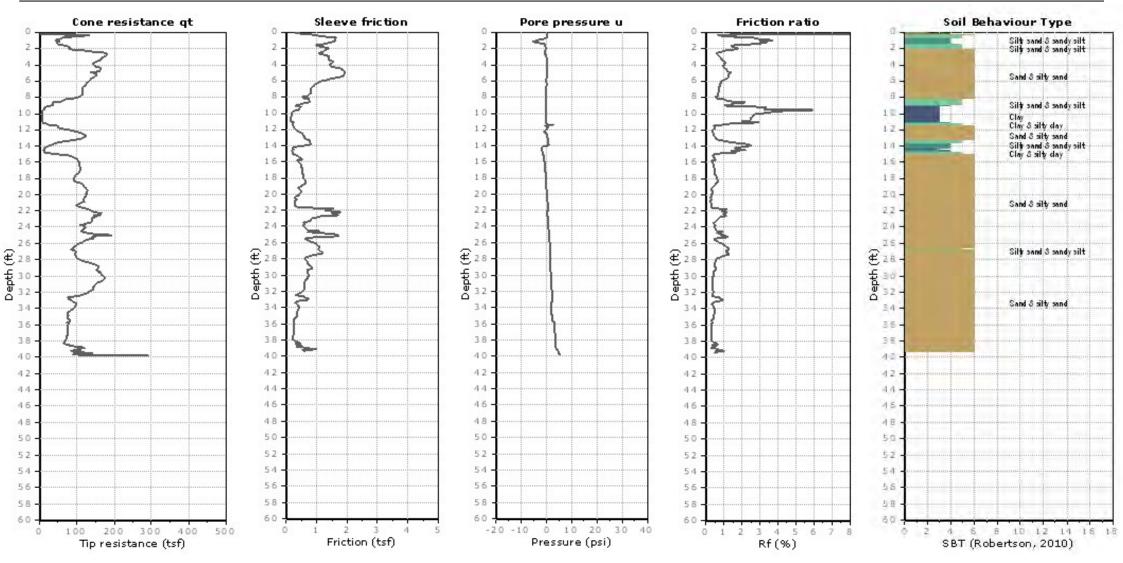


714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: Group Delta Consultants / SDSU Mission Valley

Location: San Diego, CA

Total depth: 39.77 ft, Date: 4/08/2019



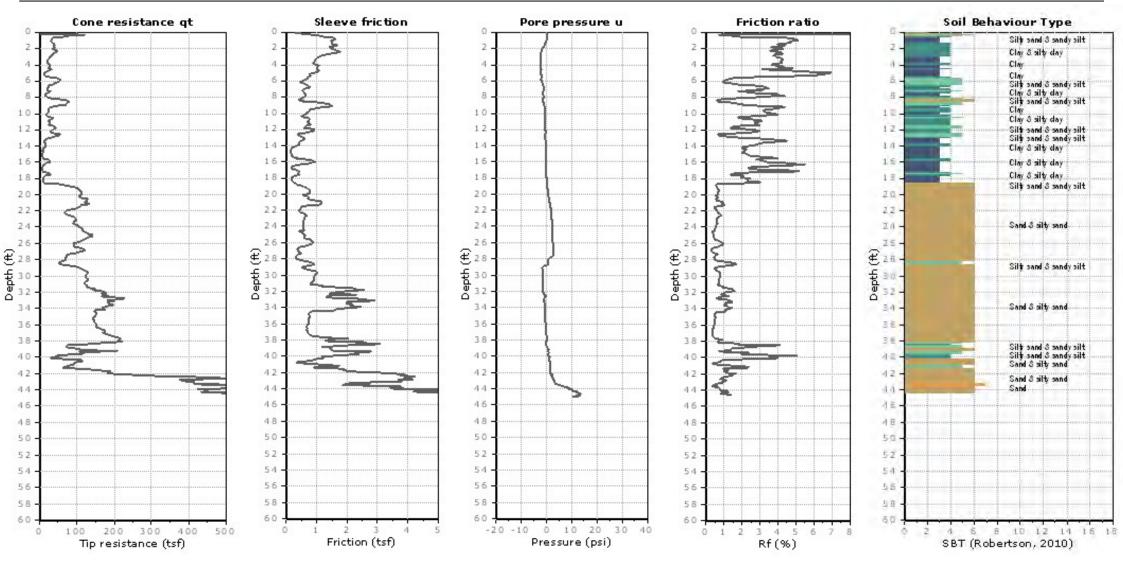


714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: Group Delta Consultants / SDSU Mission Valley

Location: San Diego, CA

Total depth: 44.96 ft, Date: 4/8/2019



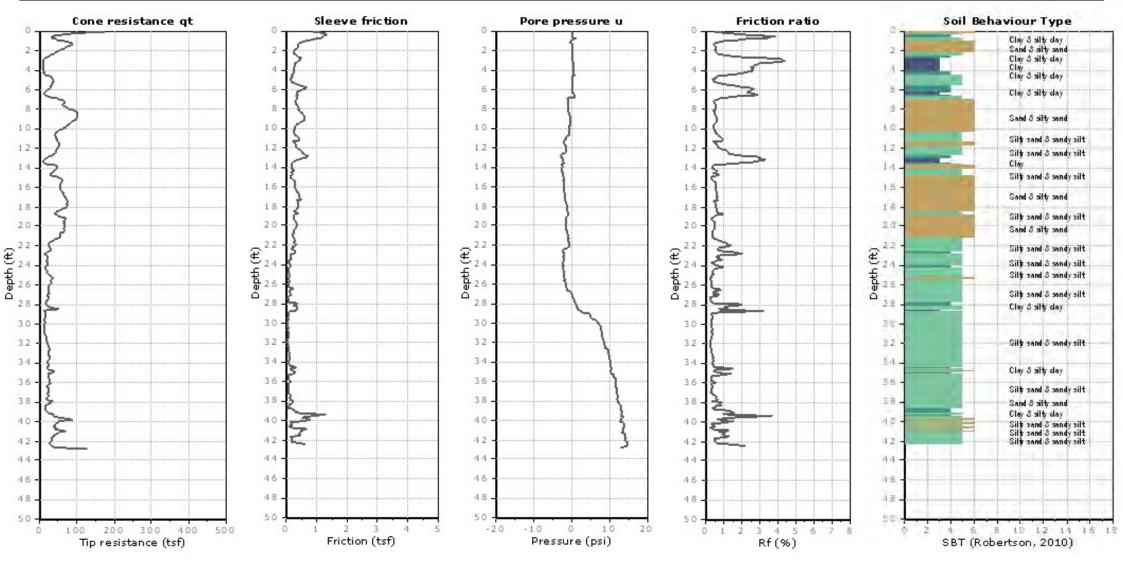


714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: Group Delta Consultants / SDSU Mission Valley

Location: San Diego, CA

Total depth: 42.79 ft, Date: 3/18/2019



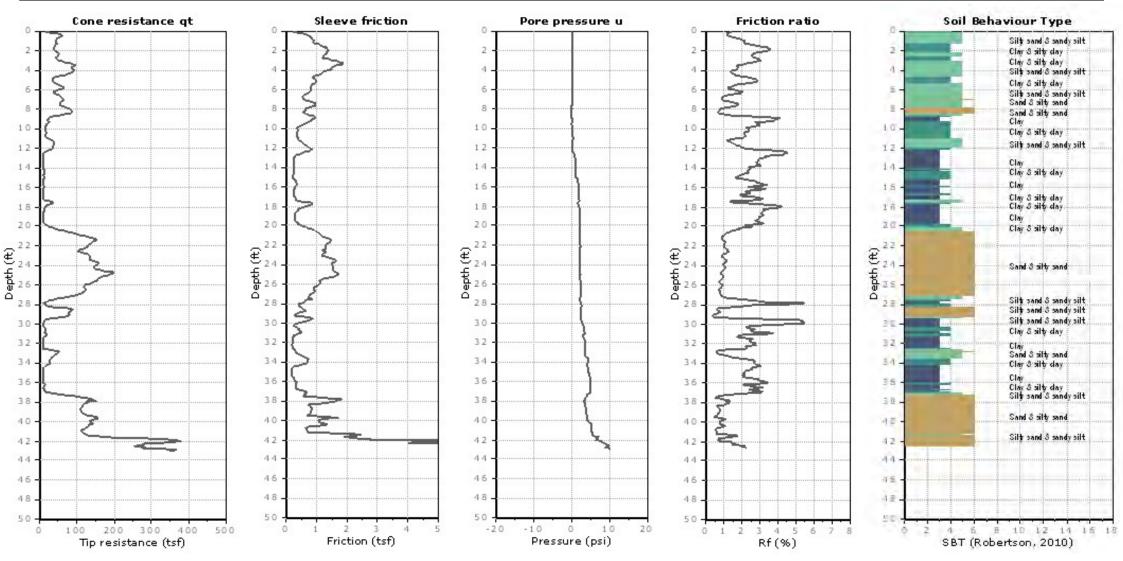


714-901-7270 steve@kehoetesting.com www.kehoetesting.com

Project: Group Delta Consultants / SDSU Mission Valley

Location: San Diego, CA

Total depth: 42.98 ft, Date: 3/18/2019



SDSU Mission Valley San Diego, CA

CPT Shear Wave Measurements

					S-Wave	Interval
	Tip	Geophone	Travel	S-Wave	Velocity	S-Wave
	Depth	Depth	Distance	Arrival	from Surface	Velocity
Location	(ft)	(ft)	(ft)	(msec)	(ft/sec)	(ft/sec)
SCPT-5	4.99	3.99	6.40	6.40	999.51	
	10.01	9.01	10.30	11.22	918.39	810.68
	14.99	13.99	14.86	17.86	831.84	685.58
	20.05	19.05	19.70	27.92	705.42	480.97
	25.00	24.00	24.52	37.48	654.09	504.19
	30.02	29.02	29.45	44.32	664.43	721.09
	35.01	34.01	34.38	51.80	663.62	658.82
	40.03	39.03	39.35	58.66	670.80	724.98
	45.01	44.01	44.29	64.64	685.23	826.78
	50.07	49.07	49.32	72.24	682.78	661.97
	54.99	53.99	54.22	76.64	707.48	1112.94
	57.35	56.35	56.57	77.92	726.02	1836.22
SCPT-7	5.05	4.05	6.43	5.10	1261.66	
_	9.97	8.97	10.27	10.16	1010.77	757.89
	14.99	13.99	14.86	14.12	1052.17	1158.39
	17.52	16.52	17.26	16.36	1055.02	1072.96
SCPT-13	4.99	3.99	6.40	6.10	1048.67	
001 1 10	10.10	9.10	10.38	11.36	914.01	757.85
	14.99	13.99	14.86	15.08	985.19	1202.55
	20.08	19.08	19.72	19.04	1035.94	1229.19
	25.00	24.00	24.52	23.24	1054.88	1140.72
	30.02	29.02	29.45	27.84	1057.74	1072.24
	35.01	34.01	34.38	34.04	1009.86	794.84
	40.06	39.06	39.38	40.44	973.76	781.74
	44.98	43.98	44.26	45.16	980.14	1034.87
	50.00	49.00	49.25	50.84	968.81	878.72
	55.02	54.02	54.25	57.48	943.82	752.48
	60.07	59.07	59.28	63.04	940.37	904.74
	66.83	65.83	66.02	71.40	924.64	806.03

S-Wave Velocity from Surface = Travel Distance/S-Wave Arrival Interval S-Wave Velocity = (Travel Dist2-Travel Dist1)/(Time2-Time1)

APPENDIX C LABORATORY TESTING



APPENDIX C

LABORATORY TESTING

Laboratory testing was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions and in the same locality. No warranty, express or implied, is made as to the correctness or serviceability of the test results, or the conclusions derived from these tests. Where a specific laboratory test method has been referenced, such as ASTM or Caltrans, the reference only applies to the specified laboratory test method, which has been used only as a guidance document for the general performance of the test and not as a "Test Standard". A brief description of the tests follows.

<u>Classification</u>: Soils were visually classified according to the Unified Soil Classification System as established by the American Society of Civil Engineers per ASTM D2487. The soil classifications are shown on the boring logs in Appendix C.

<u>Particle Size Analysis</u>: Particle size analyses were performed in general accordance with ASTM D422, and were used to supplement visual classifications. The test results are summarized on the Boring Records in Appendix B and are presented in detail in Figures C-1.1 through C-1.80.

<u>Atterberg Limits</u>: ASTM D4318 was used to determine the liquid and plastic limits, and plasticity index of selected soil samples. The test results are presented with the associated gradation analyses in Figures C-1.1 through C-1.80 and are also summarized in Figure C-1.81 and C-1.82.

Expansion Index: The expansion potential of selected soil samples was estimated in general accordance with ASTM D4829. The test results are summarized in Figure C-2, along with a summary of previous expansion index tests we conducted at the site. Figure C-2 also presents common criteria for evaluating the expansion potential based on the expansion index.

pH and Resistivity: To assess the potential for reactivity with buried metals, selected soil samples were tested for pH and minimum resistivity using Caltrans test method 643. The corrosivity test results are summarized in Figure C-3, along with previous corrosion tests we conducted on site.

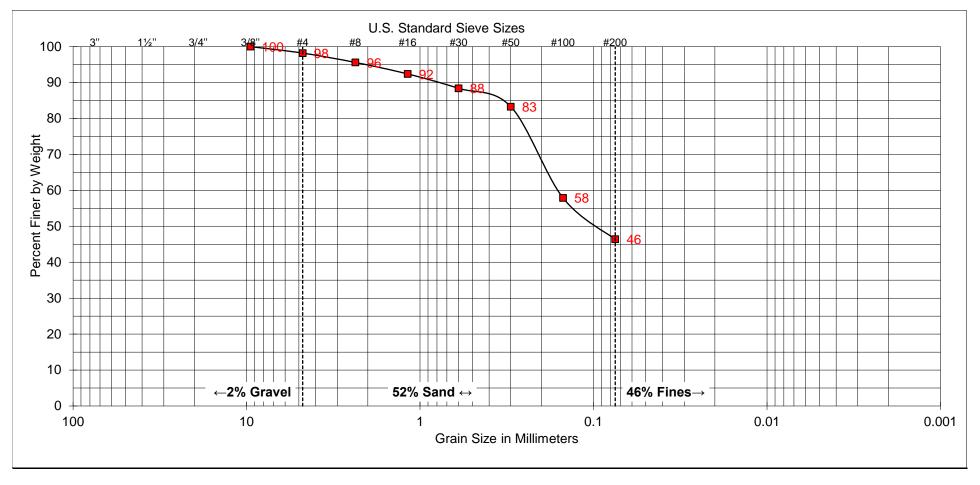
<u>Sulfate Content</u>: To assess the potential for reactivity with concrete, selected soil samples were tested for water soluble sulfate. The sulfate was extracted from the soil under vacuum using a 10:1 (water to dry soil) dilution ratio. The extracted solution was tested for water soluble sulfate in general accordance with ASTM D516. The test results are also presented in Figure C-3, along with common criteria for evaluating soluble sulfate content.

<u>Chloride Content:</u> Soil samples were also tested for water soluble chloride. The chloride was extracted from the soil under vacuum using a 10:1 (water to dry soil) dilution ratio. The extracted solution was then tested for water soluble chloride using a calibrated ion specific electronic probe in general accordance with ASTM D512. The test results are also shown in Figure C-3.

<u>Direct Shear:</u> The shear strength of selected partially intact samples of the soils from the site were assessed using direct shear testing performed in general accordance with ASTM D3080. The test results are shown in Figures C-4.1 through C-4.4.

<u>Consolidation</u>: The one-dimensional consolidation properties of a selected sample was evaluated in general accordance with ASTM D2435. The sample was inundated with water under a nominal seating load, allowed to swell, and then subjected to controlled stress increments while restrained laterally and drained axially. The test results are presented in Figure C-5.





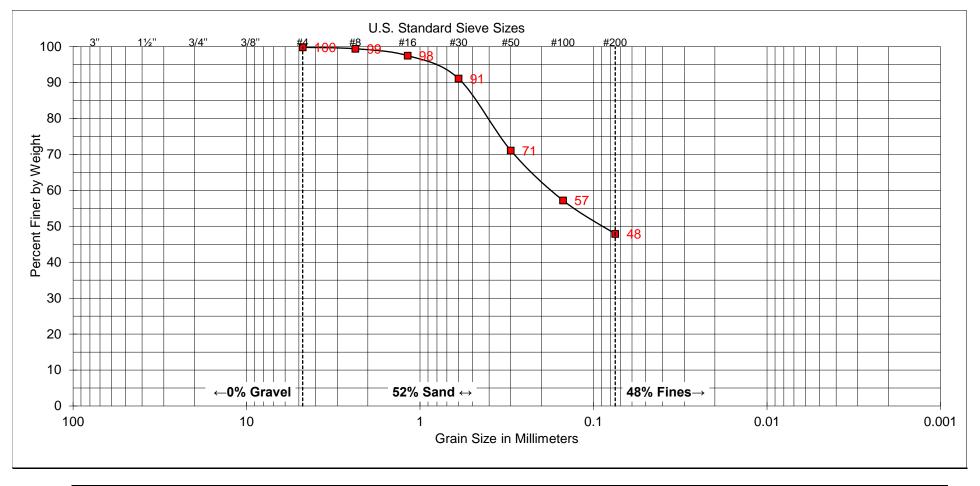
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	S-1
SAMPLE DEPTH:	2' - 5'

UNIFIED SOIL CLASSIFICATION:	sc
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIM	ITS
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





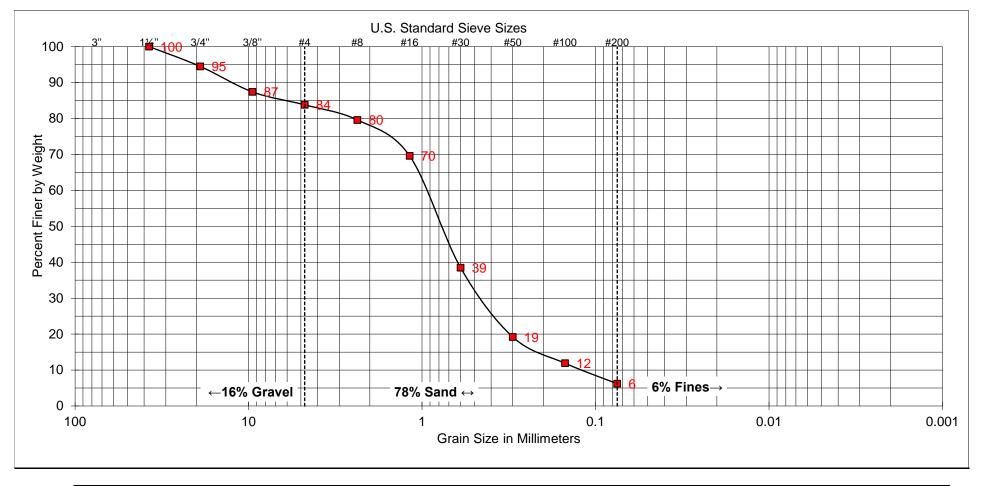
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	S-1
SAMPLE DEPTH:	25' - 26.5'

INITIED COIL OF ACCIEICATION.	00	
INIFIED SOIL CLASSIFICATION:	SC	
DESCRIPTION: CLAYEY SAND		

ATTERBERG LIM	ITS
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





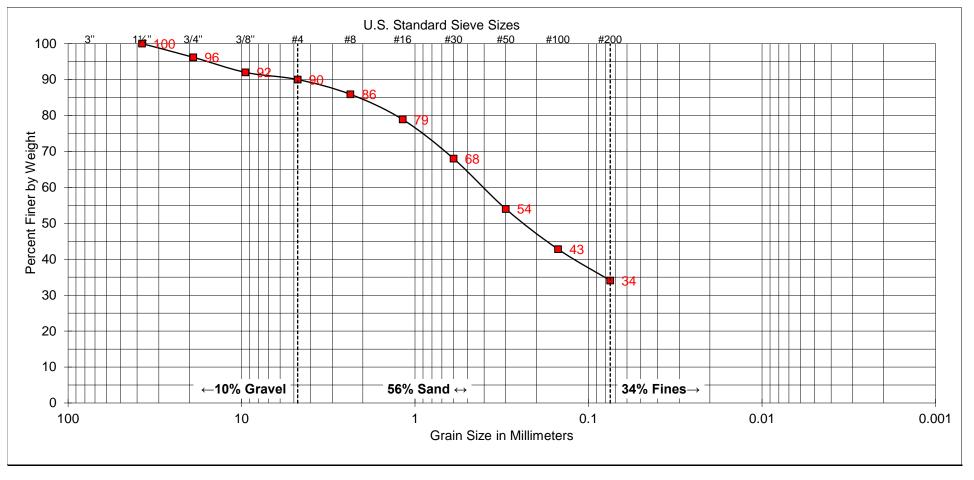
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	S-1
SAMPLE DEPTH:	40' - 40.8'

UNIFIED SOIL C	LASSIFICATION:	SW-SM
DESCRIPTION:	WELL GRADED SAN	D WITH SILT AND GRAVEL

ATTERBERG LIM	ITS
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





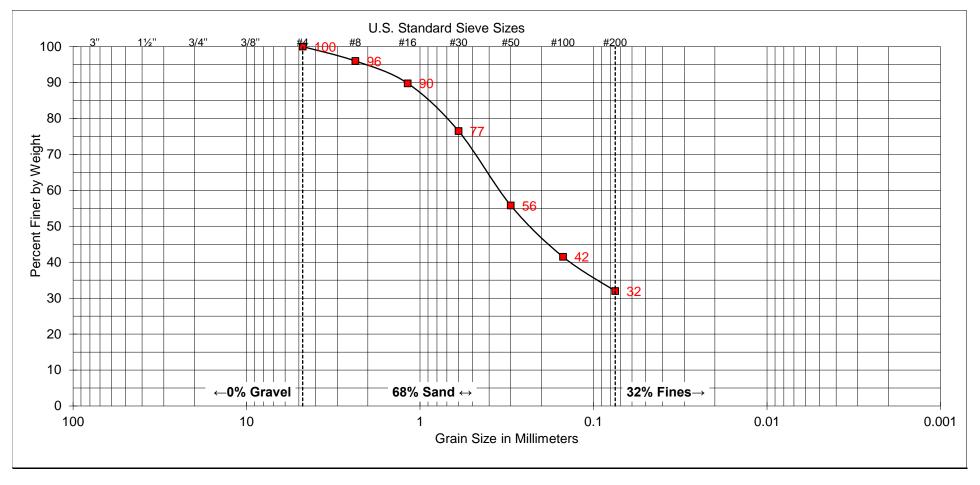
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	S-2
SAMPLE DEPTH:	0.5' - 5'

UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





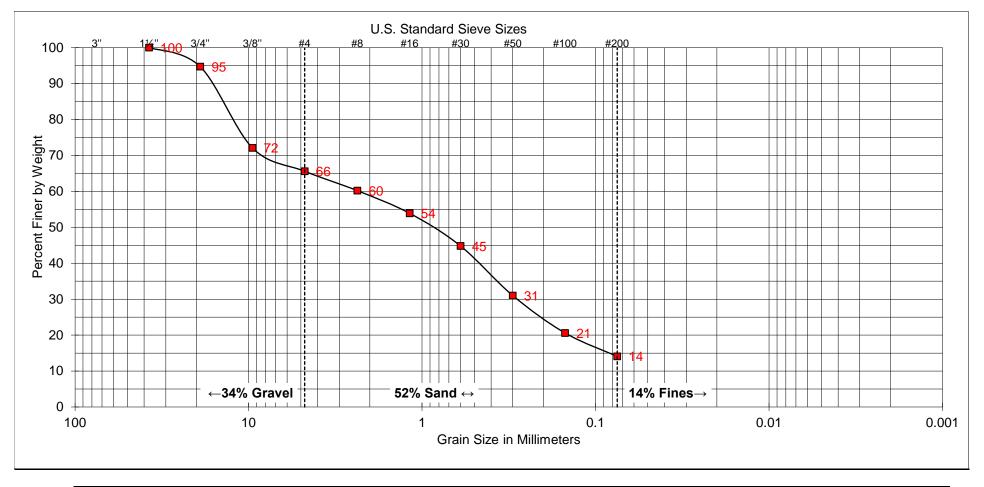
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	iL .	SAND			CLAY

SAMPLE	
BORING NUMBER:	S-3
SAMPLE DEPTH:	0.5' - 5'

UNIFIED SOIL CLASSIFICATION:	sc
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS					
LIQUID LIMIT:					
PLASTIC LIMIT:					
PLASTICITY INDEX:					





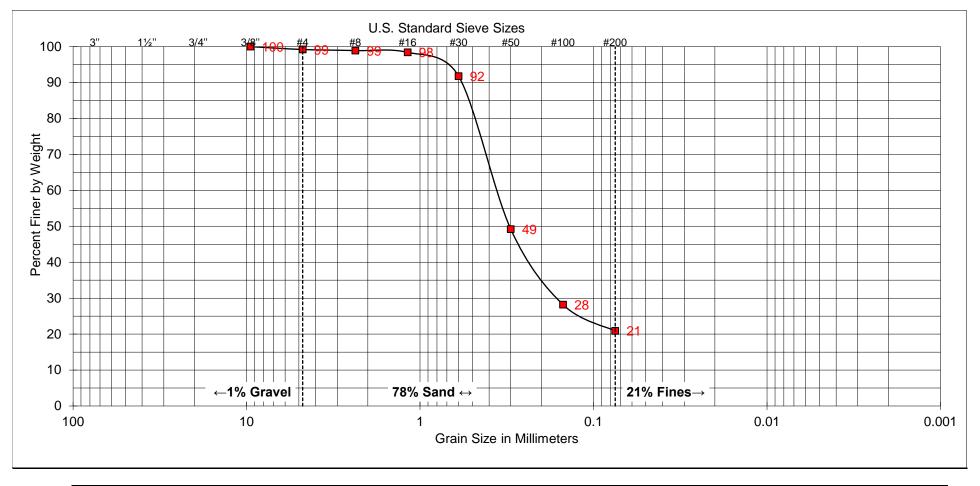
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	S-3
SAMPLE DEPTH:	30' - 31.5'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND WITH O	GRAVEL

ATTERBERG LIMITS					
LIQUID LIMIT:					
PLASTIC LIMIT:					
PLASTICITY INDEX:					





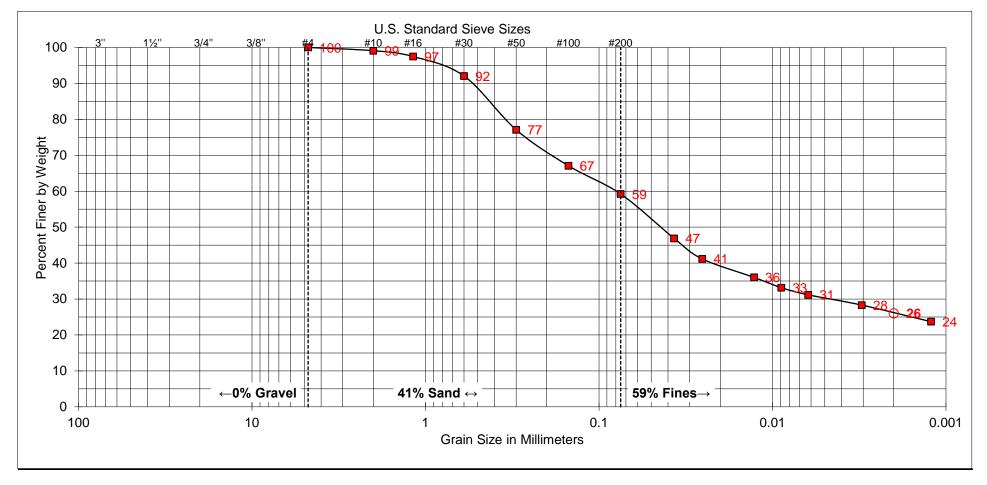
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	S-4
SAMPLE DEPTH:	0.5' - 4'

INITIED COIL OF ACCIEICATION.	00	
INIFIED SOIL CLASSIFICATION:	SC	
DESCRIPTION: CLAYEY SAND		

ATTERBERG LIM	ITS
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAV			SAND		CLAY

SAMPLE
SAMPLE NUMBER: S-4
SAMPLE DEPTH: 15' - 16.5'

UNIFIED SOIL CLASSIFICATION: CL

DESCRIPTION: SANDY LEAN CLAY

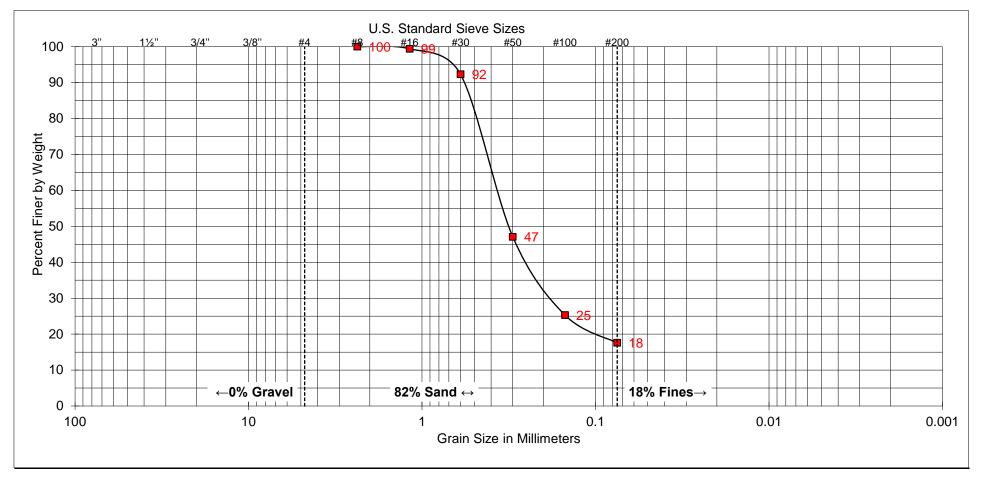
ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				



SOIL CLASSIFICATION

Project No. SD605

FIGURE C-1.8



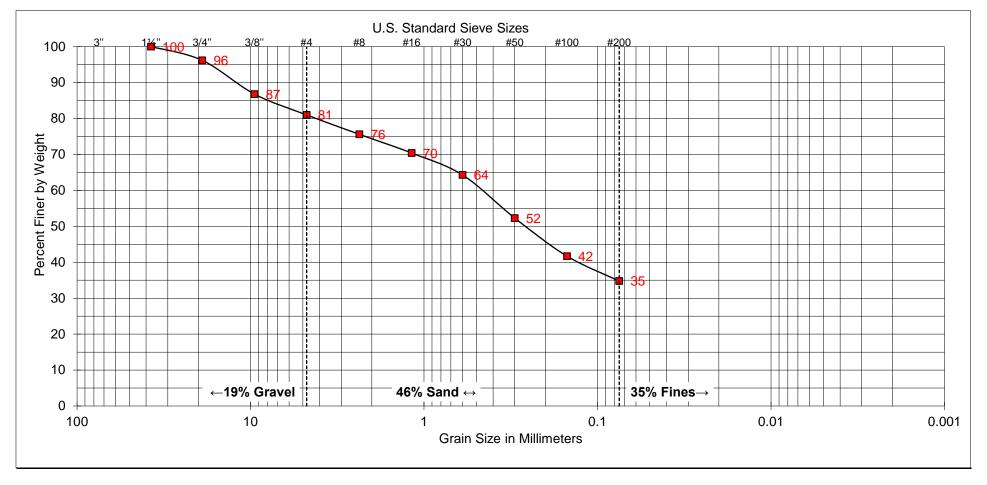
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	iL .		SAND		CLAY

SAMPLE	
BORING NUMBER:	S-4
SAMPLE DEPTH:	35' - 36.5'

JNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIM	ITS
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





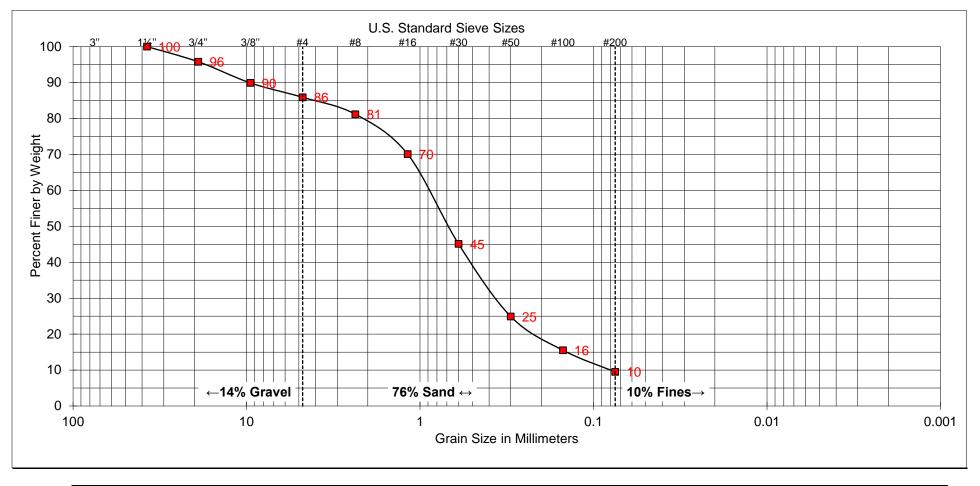
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	S-5
SAMPLE DEPTH:	0.5' - 5'

INIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION: CLAYEY SAND WITH	H GRAVEL

ATTERBERG LIMITS					
LIQUID LIMIT:	38				
PLASTIC LIMIT:	15				
PLASTICITY INDEX:	23				





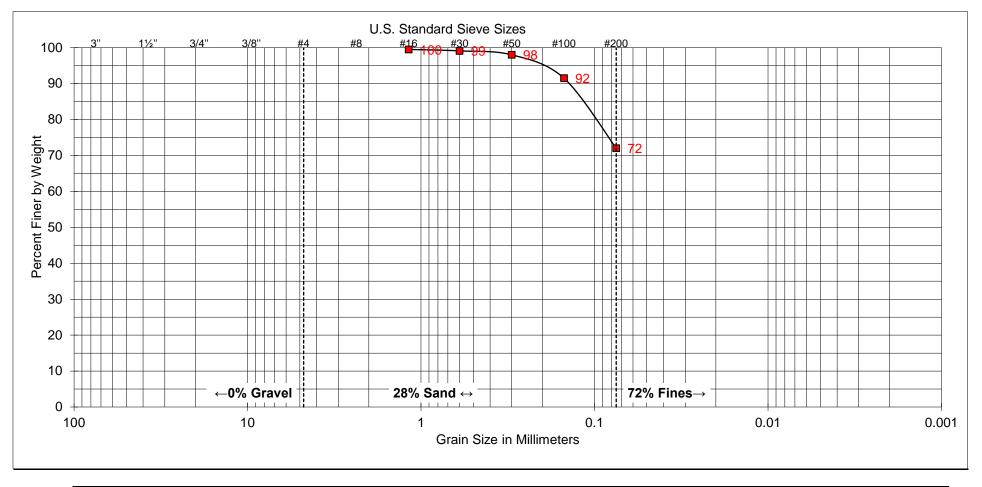
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	S-5
SAMPLE DEPTH:	40' - 41.5'

UNIFIED SOIL CLASSIFICATION:	SW
DESCRIPTION: WELL GRADED SAN	ID WITH SILT

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





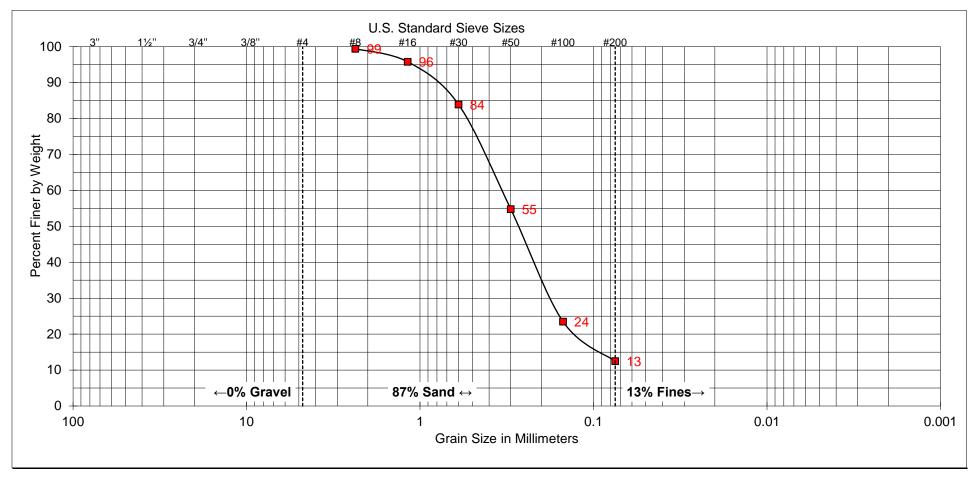
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	S-6
SAMPLE DEPTH:	0.5' - 5'

NIFIED SOIL C	LASSIFICATION:	CL
ESCRIPTION:	LEAN CLAY WITH	SAND

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





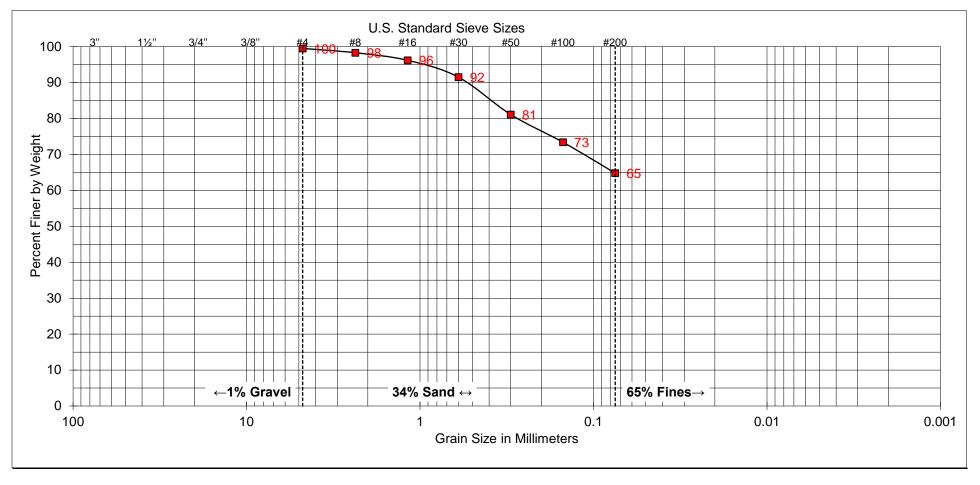
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	S-6
SAMPLE DEPTH:	15' - 16.5'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





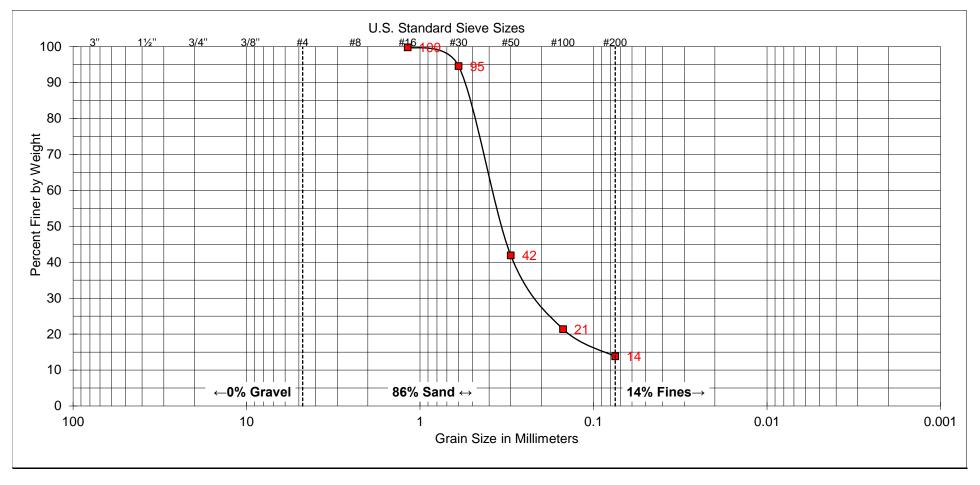
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	GRAVEL SAND		CLAY		

SAMPLE	
BORING NUMBER:	S-7
SAMPLE DEPTH:	0.5' - 5'

UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION: SANDY LEAN CLAY	

ATTERBERG LIMITS				
LIQUID LIMIT: 39				
PLASTIC LIMIT: 14				
PLASTICITY INDEX: 25				





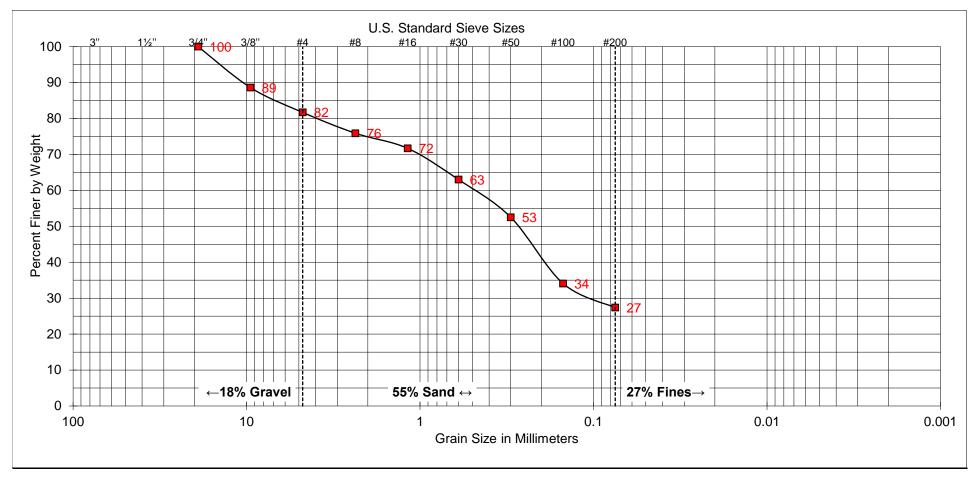
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	S-7
SAMPLE DEPTH:	25' - 26.5'

INIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS				
LIQUID LIMIT: -				
PLASTIC LIMIT: -				
PLASTICITY INDEX: -				





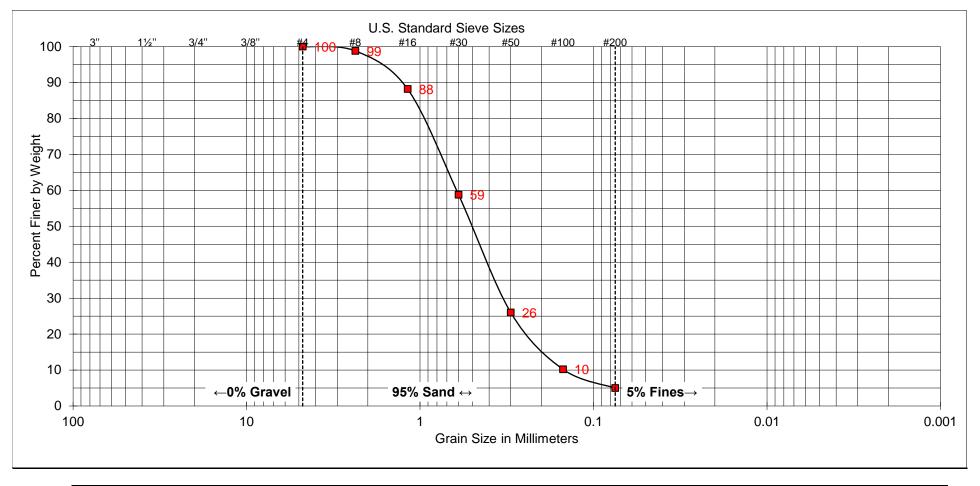
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	iL .		SAND		CLAY

SAMPLE	
BORING NUMBER:	S-8
SAMPLE DEPTH:	0.5' - 2.5'

JNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION: CLAYEY SAND WITH	H GRAVEL

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





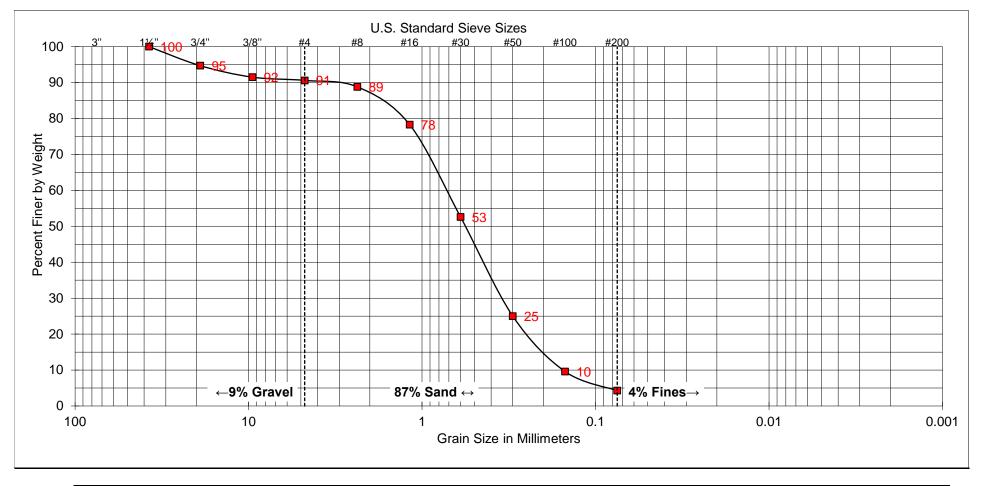
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	S-8
SAMPLE DEPTH:	20' - 21.5'

INIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED	SAND

ATTERBERG LIMI	TS
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





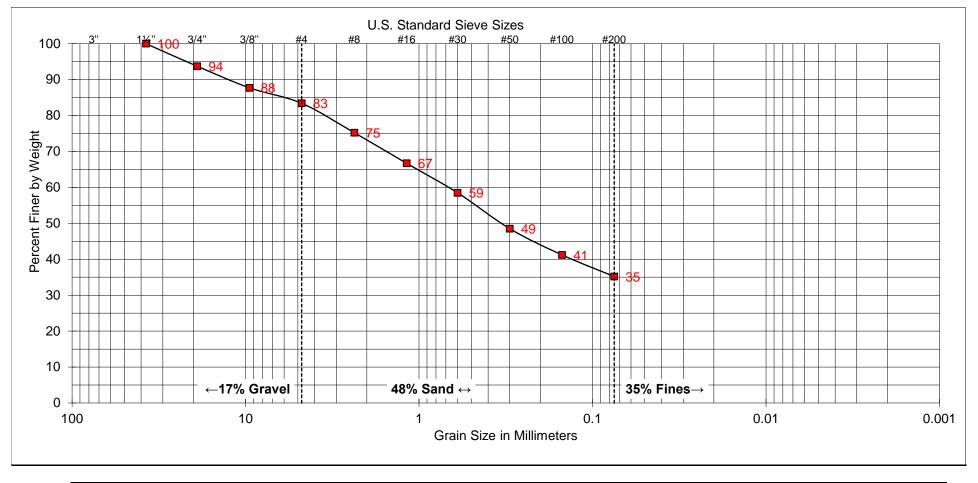
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	S-8
SAMPLE DEPTH:	30' - 31.5'

INIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED	SAND

ATTERBERG LIMITS	
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





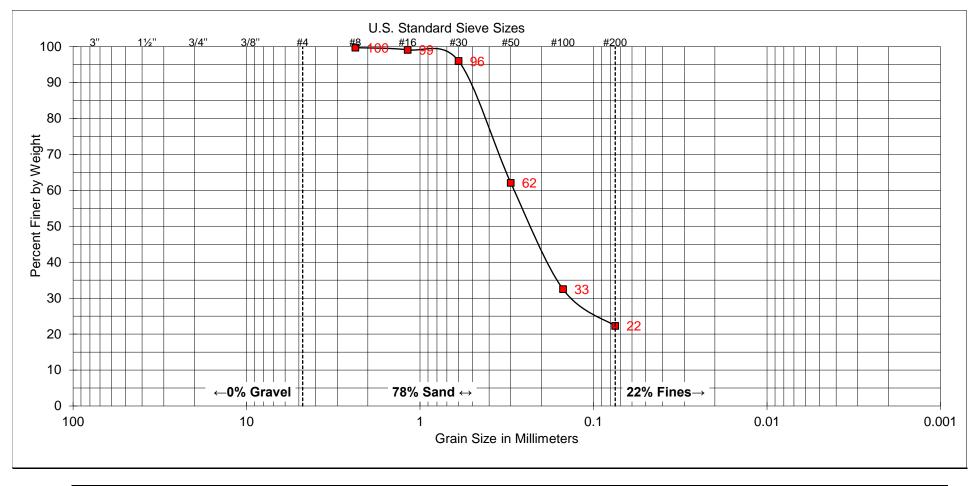
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	S-9
SAMPLE DEPTH:	0.5' - 5'

INIFIED SOIL CLASSIFICATION:	SC
PESCRIPTION: CLAYEY SAND WITH	H GRAVEL

ATTERBERG LIMITS
LIQUID LIMIT:
PLASTIC LIMIT:
PLASTICITY INDEX:





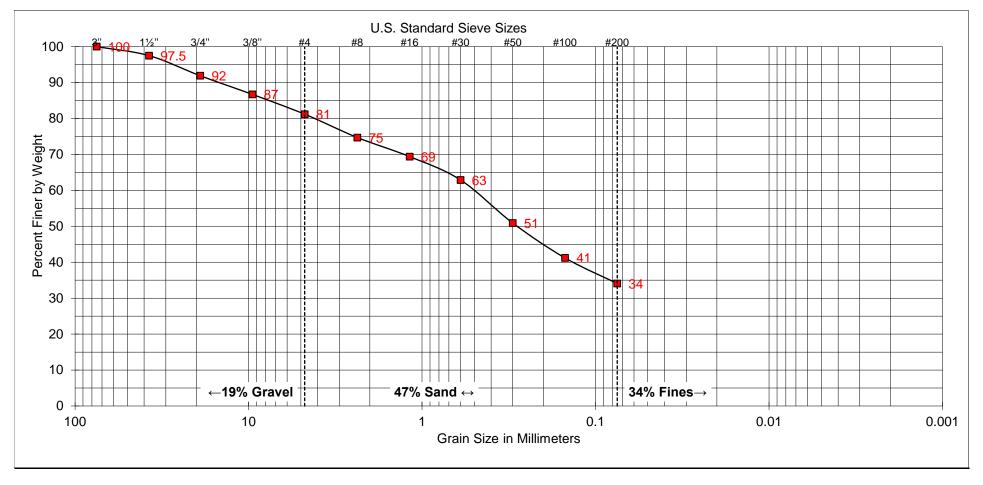
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
BORING NUMBER:	S-9
SAMPLE DEPTH:	25' - 26.5'

JNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS					
LIQUID LIMIT:					
PLASTIC LIMIT:					
PLASTICITY INDEX:					





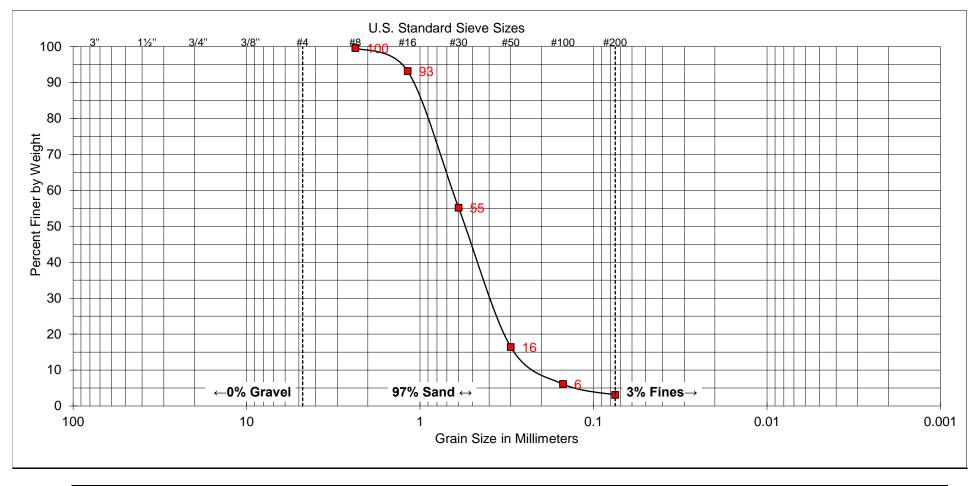
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	S-10
SAMPLE DEPTH:	0.5' - 5'

INIFIED SOIL CLASSIFICATION:	SC
ESCRIPTION: CLAYEY SAND WITH	H GRAVEL

ATTERBERG LIMITS				
LIQUID LIMIT: 39				
PLASTIC LIMIT: 15				
PLASTICITY INDEX: 24				





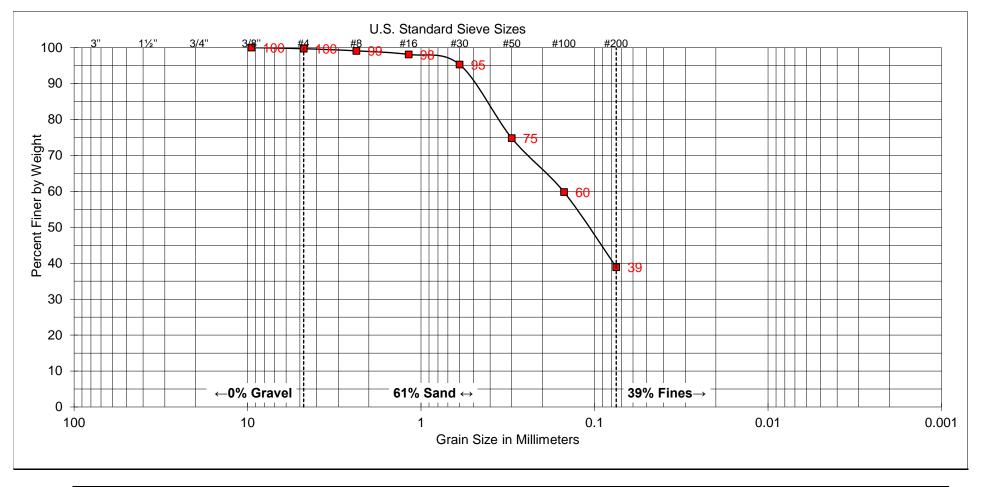
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
BORING NUMBER:	S-10
SAMPLE DEPTH:	20' - 21.5'

JNIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED	SAND

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





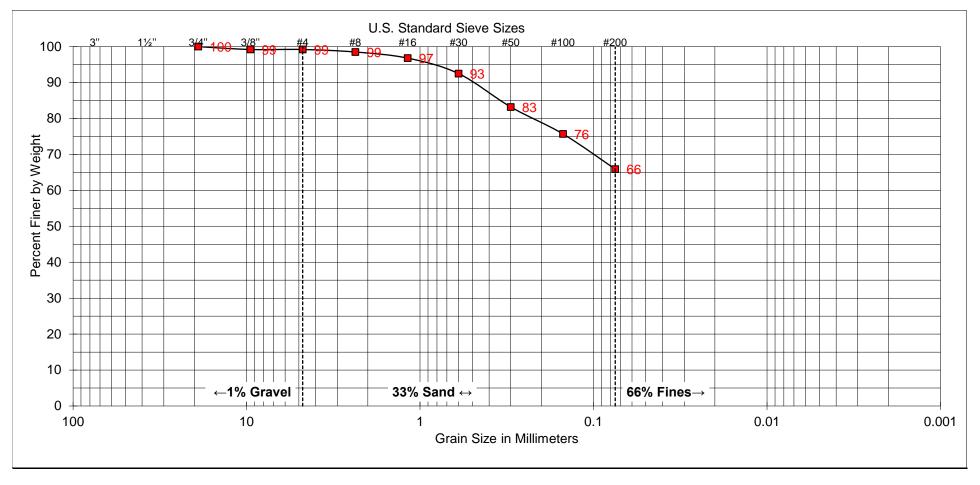
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	S-10
SAMPLE DEPTH:	70' - 71.3'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





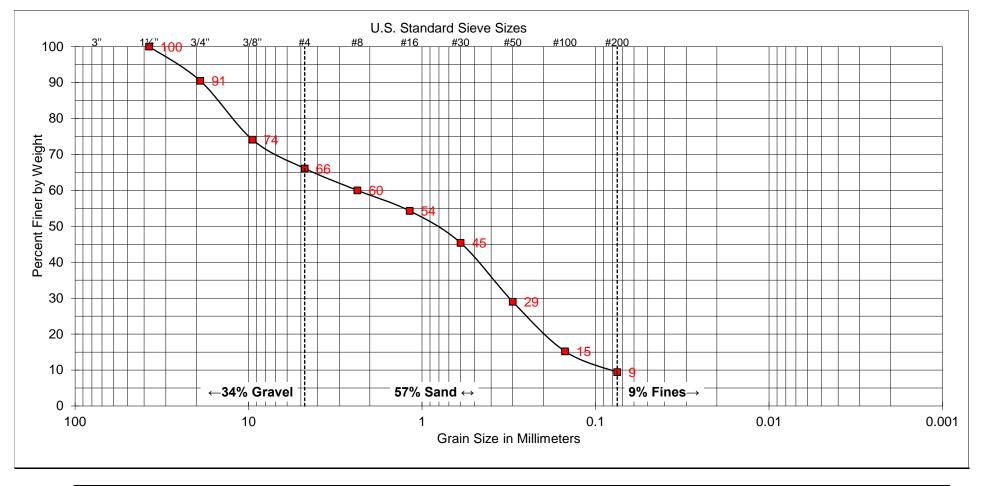
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	S-11
SAMPLE DEPTH:	0.5' - 5'

INIFIED SOIL CLASSIFICATION:	CL
ESCRIPTION: SANDY LEAN CLAY	

ATTERBERG LIN	IITS
LIQUID LIMIT:	38
PLASTIC LIMIT:	13
PLASTICITY INDEX:	25





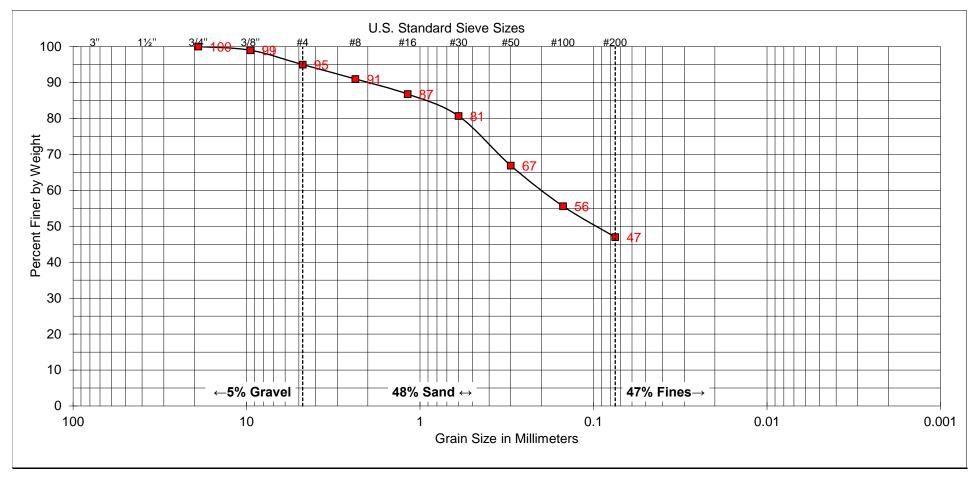
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	S-11
SAMPLE DEPTH:	15' - 16.5'

UNIFIED SOIL CLASSIFICATION:	SP-SM
DESCRIPTION: POORLY GRADED S	SAND WITH SILT AND GRAVEL

ATTERBERG LIMITS					
LIQUID LIMIT:					
PLASTIC LIMIT:					
PLASTICITY INDEX:					





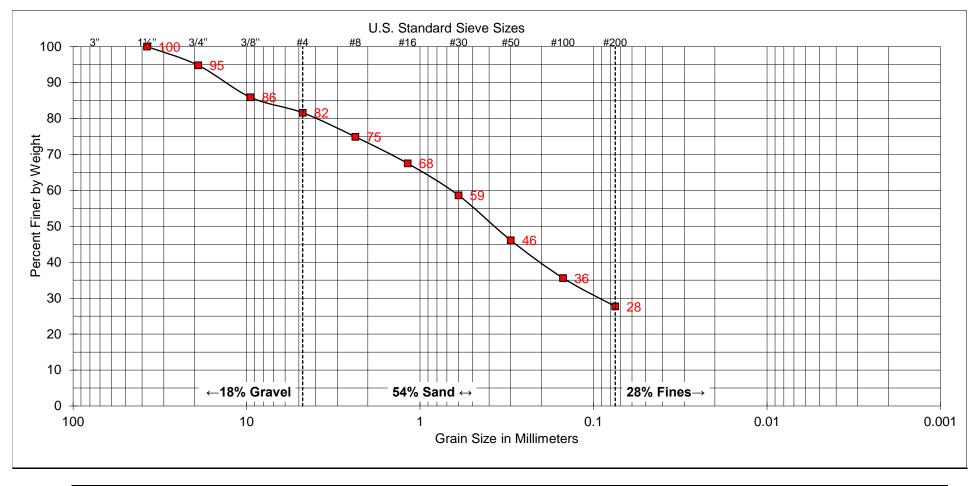
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	S-12
SAMPLE DEPTH:	0.5' - 5'

INIFIED SOIL CLASSIFICATION:	sc
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS					
LIQUID LIMIT:					
PLASTIC LIMIT:					
PLASTICITY INDEX:					





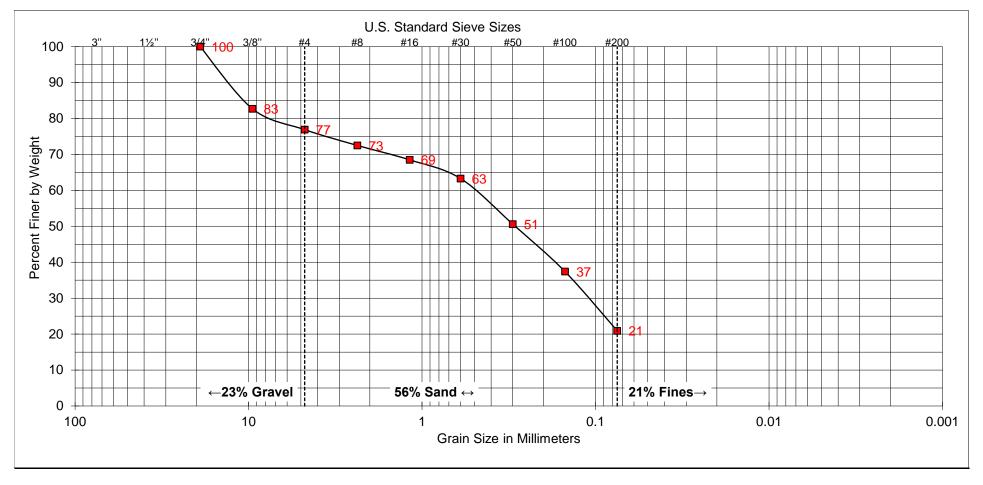
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	S-12
SAMPLE DEPTH:	15' - 16.5'

INIFIED SOIL CLASSIFICATION:	SC
PESCRIPTION: CLAYEY SAND WITH	H GRAVEL

ATTERBERG LIMITS					
LIQUID LIMIT: -	-				
PLASTIC LIMIT: -					
PLASTICITY INDEX: -					





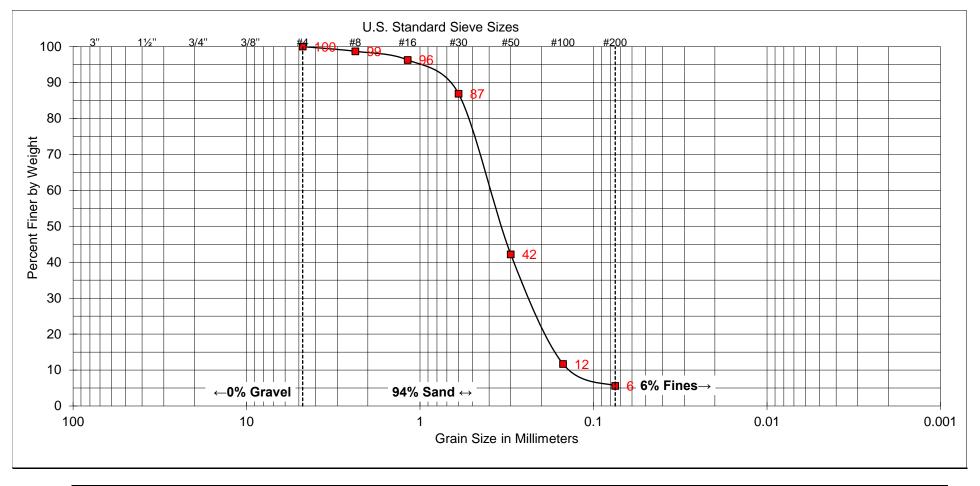
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	S-13
SAMPLE DEPTH:	2.5' - 4'

INIFIED SOIL CLASSIFICATION:	SC
PESCRIPTION: CLAYEY SAND WITH	H GRAVEL

ATTERBERG LIMITS					
LIQUID LIMIT:	0				
PLASTIC LIMIT:	0				
PLASTICITY INDEX:	0				





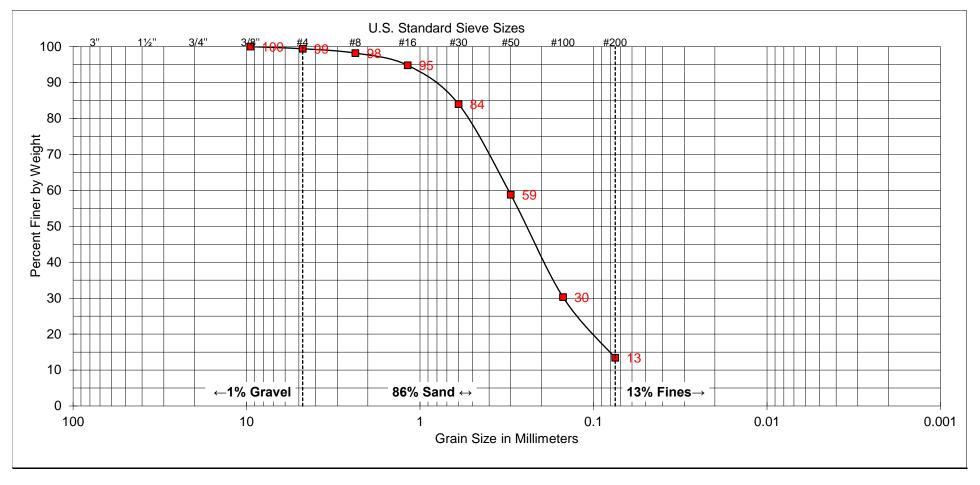
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	S-13
SAMPLE DEPTH:	35' - 36.5'

UNIFIED SOIL CLASSIFICATION:	SP-SM
DESCRIPTION: POORLY GRADED	SAND WITH SILT

ATTERBERG LIMITS					
LIQUID LIMIT:	-				
PLASTIC LIMIT:					
PLASTICITY INDEX:					





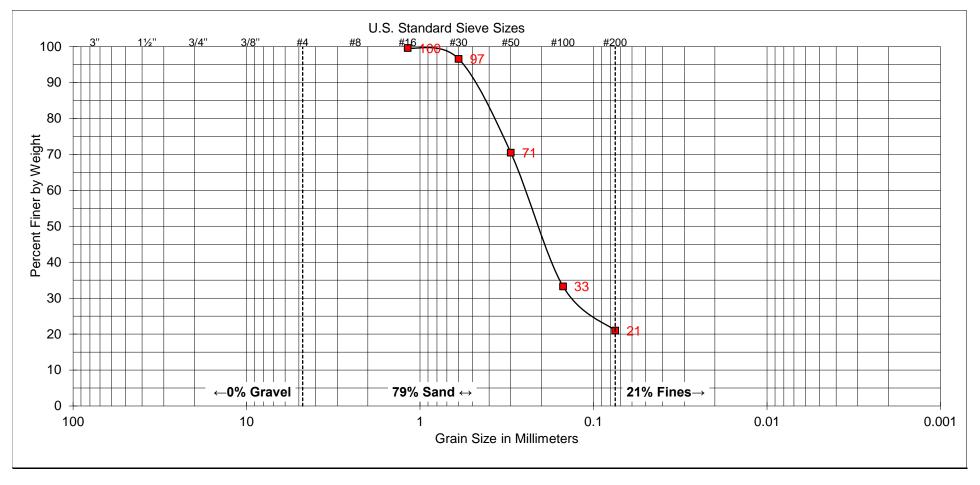
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-14
SAMPLE DEPTH:	2.5' - 4'

UNIFIED SOIL CLASSIFICATION:	sc
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMIT	rs
LIQUID LIMIT: -	:=
PLASTIC LIMIT: -	-
PLASTICITY INDEX: -	





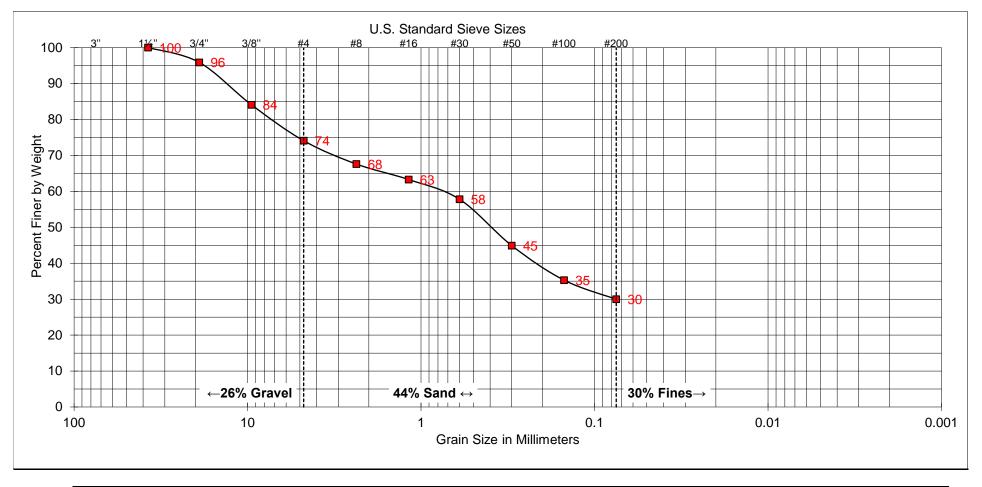
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-14
SAMPLE DEPTH:	25' - 26.5'

INIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS					
LIQUID LIMIT: -	-				
PLASTIC LIMIT: -					
PLASTICITY INDEX: -					





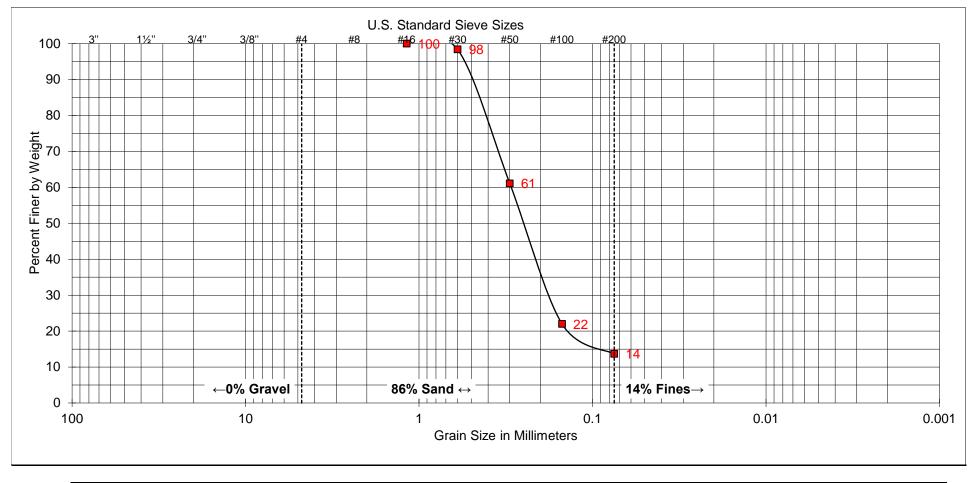
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-15
SAMPLE DEPTH:	0.5' - 5'

INIFIED SOIL CLASSIFICATION:	SC
PESCRIPTION: CLAYEY SAND WITH	H GRAVEL

ATTERBERG LIMITS					
LIQUID LIMIT:					
PLASTIC LIMIT:					
PLASTICITY INDEX:					





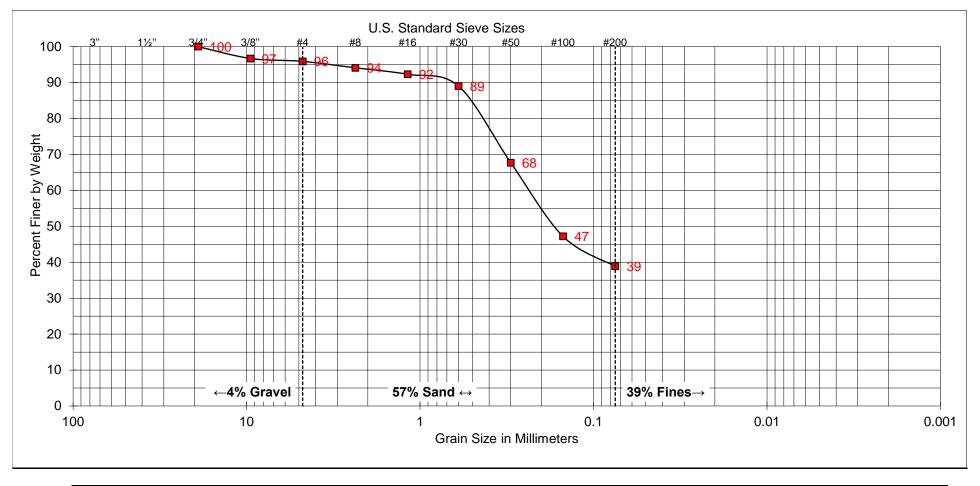
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-15
SAMPLE DEPTH:	35.5' - 36'

JNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS					
LIQUID LIMIT:					
PLASTIC LIMIT:					
PLASTICITY INDEX:					

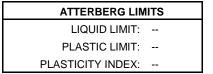




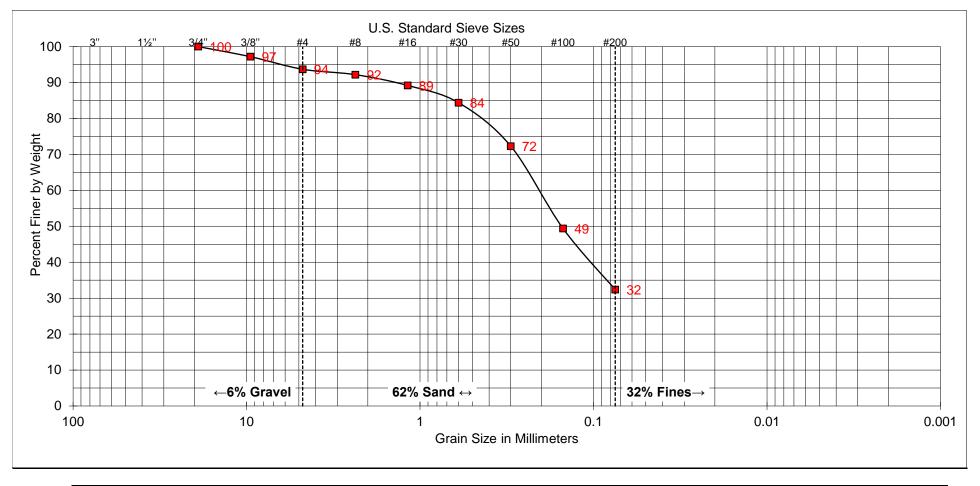
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-16
SAMPLE DEPTH:	2.5' - 5'

UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION: CLAYEY SAND	







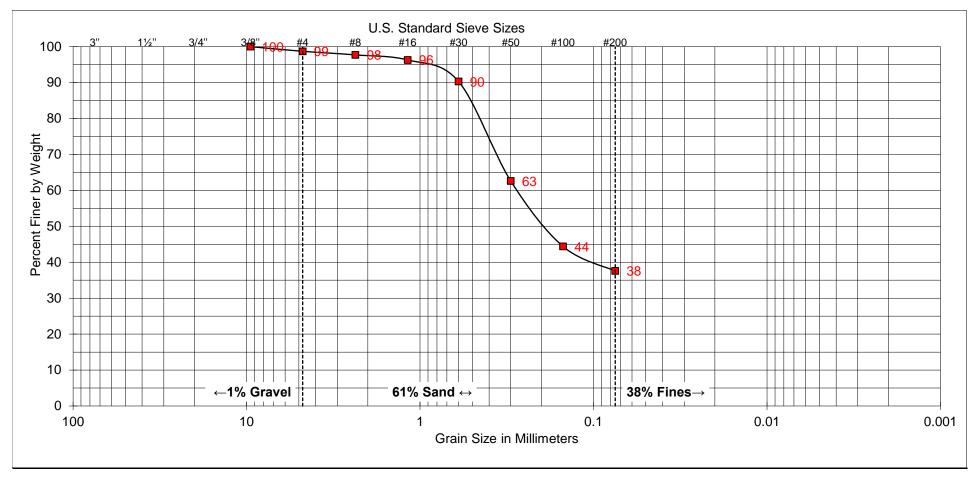
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-16
SAMPLE DEPTH:	30' - 31.5'

JNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS			
LIQUID LIMIT:			
PLASTIC LIMIT:			
PLASTICITY INDEX:			





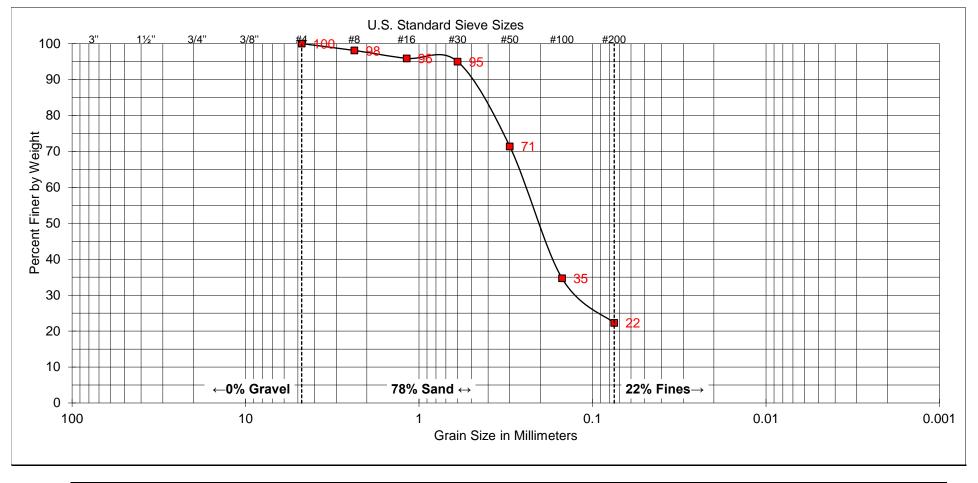
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	B-17
SAMPLE DEPTH:	0.5' - 5'

JNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





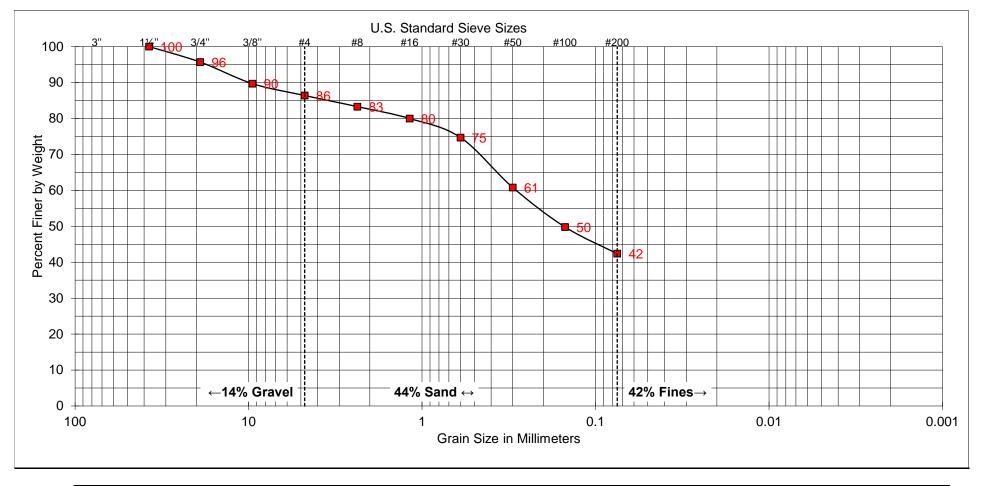
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	B-17
SAMPLE DEPTH:	50' - 51'

INIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





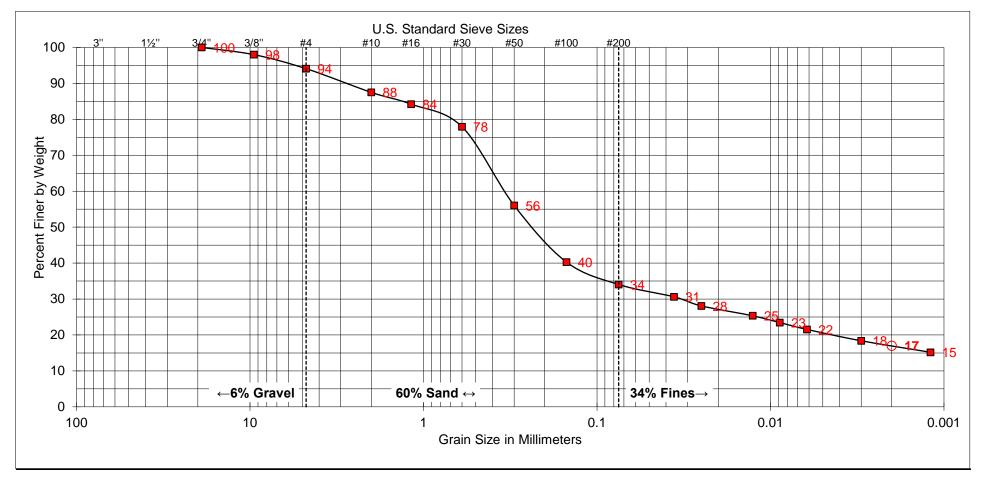
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	B-18
SAMPLE DEPTH:	0.5' - 5'

UNIFIED SOIL CLASSIFICATION:	sc
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS			
LIQUID LIMIT: 38			
PLASTIC LIMIT: 15			
PLASTICITY INDEX: 23			





COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAV			SAND		CLAY

SAMPLE
SAMPLE NUMBER: B-19
SAMPLE DEPTH: 0.5' - 4.4'

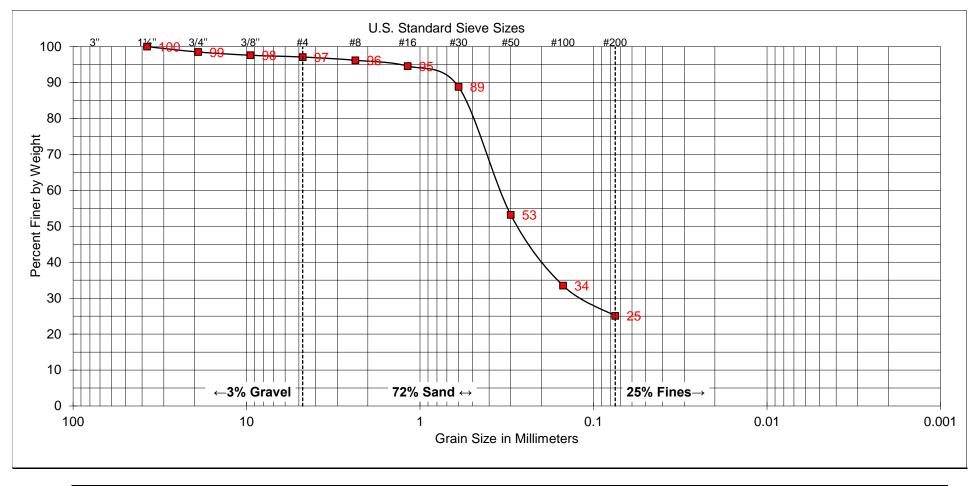
	22
UNIFIED SOIL CLASSIFICATION:	SC
1	
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS
LIQUID LIMIT:
PLASTIC LIMIT:
PLASTICITY INDEX:



Project No. SD605

FIGURE C-1.39



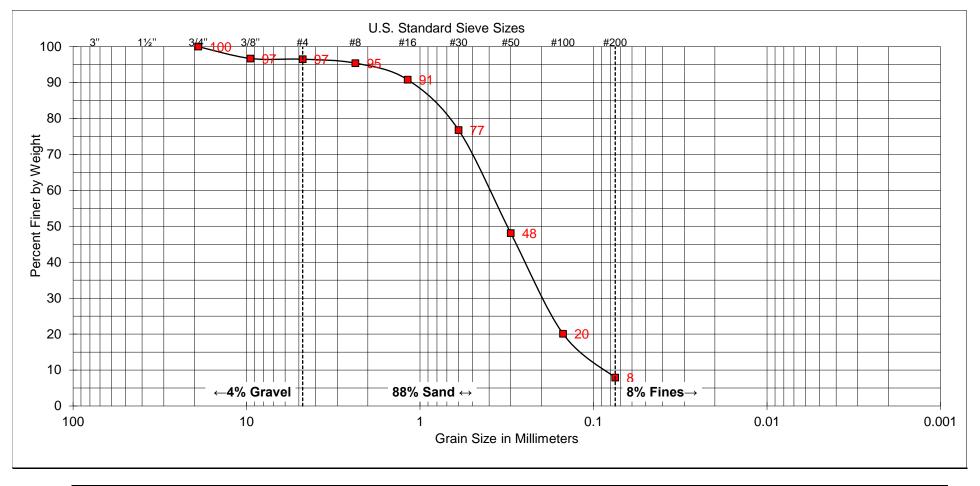
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-20
SAMPLE DEPTH:	0.5' - 2.5'

UNIFIED SOIL CLASSIFICATION:	sc
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS			
LIQUID LIMIT:	-		
PLASTIC LIMIT:			
PLASTICITY INDEX:			





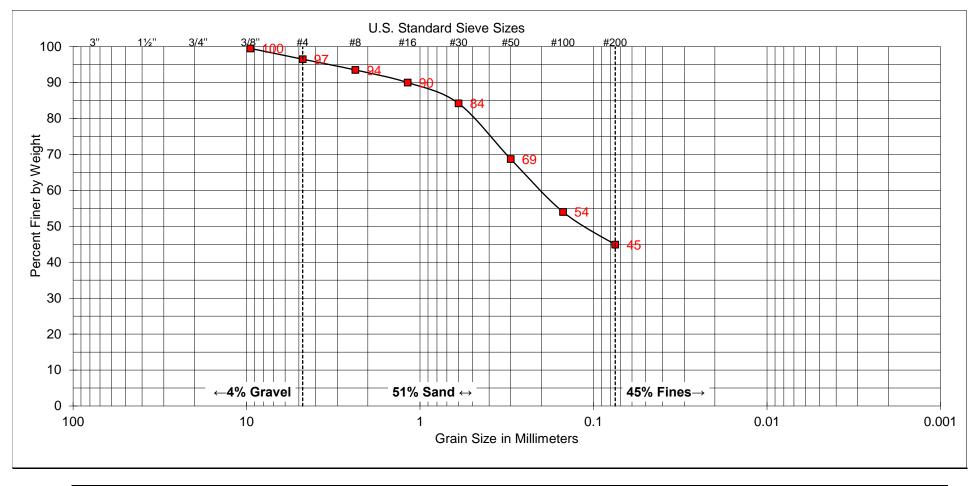
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-20
SAMPLE DEPTH:	35' - 36.5'

JNIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED S	SAND WITH SILT

ATTERBERG LIMITS		
LIQUID LIMIT:		
PLASTIC LIMIT:		
PLASTICITY INDEX:		





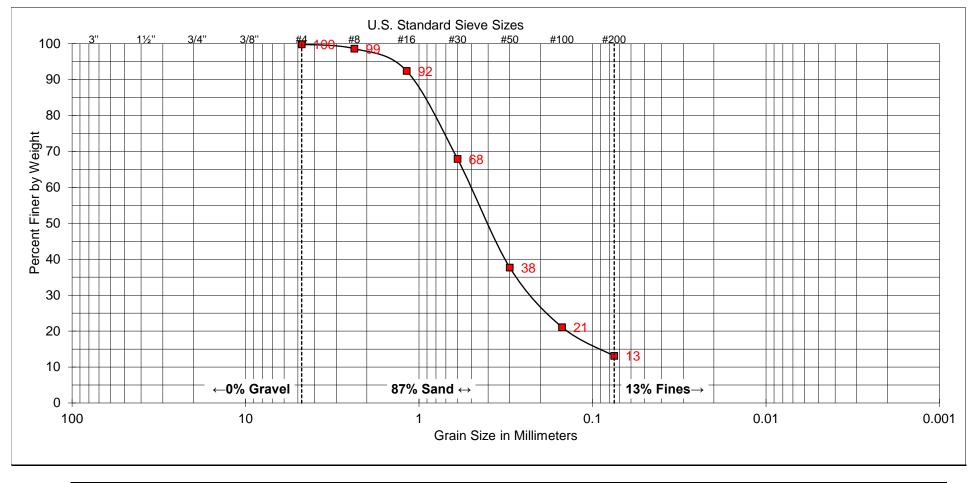
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-21
SAMPLE DEPTH:	0.5' - 5'

UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS		
LIQUID LIMIT:		
PLASTIC LIMIT:		
PLASTICITY INDEX:		





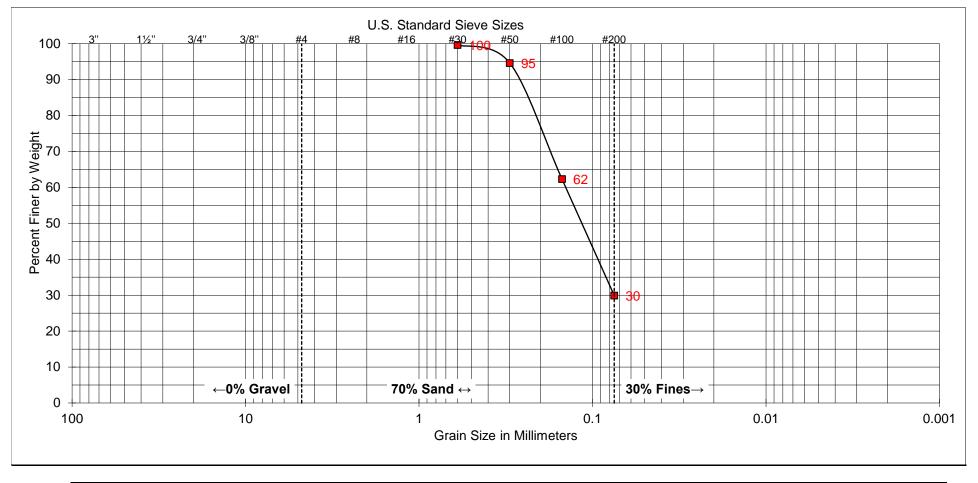
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-21
SAMPLE DEPTH:	15' - 16.5'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIM	ITS
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





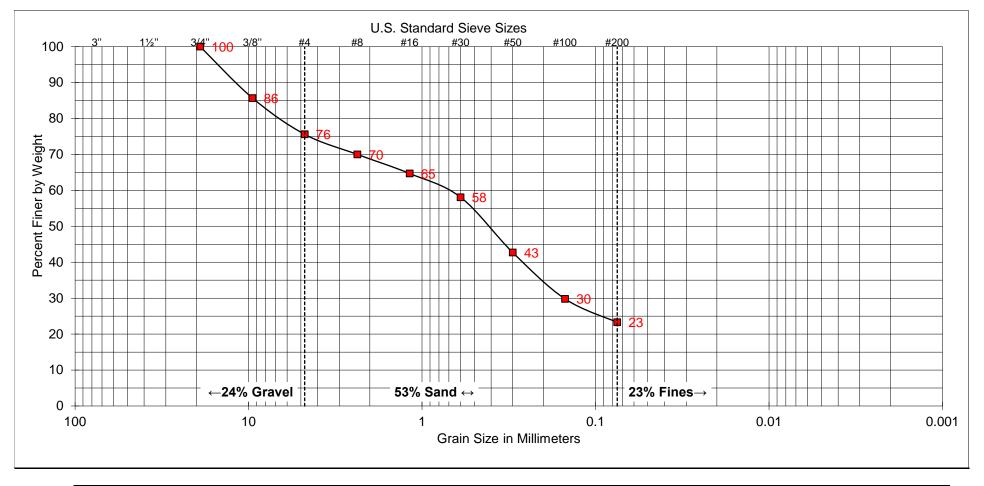
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-21
SAMPLE DEPTH:	40' - 41.5'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIM	ITS
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





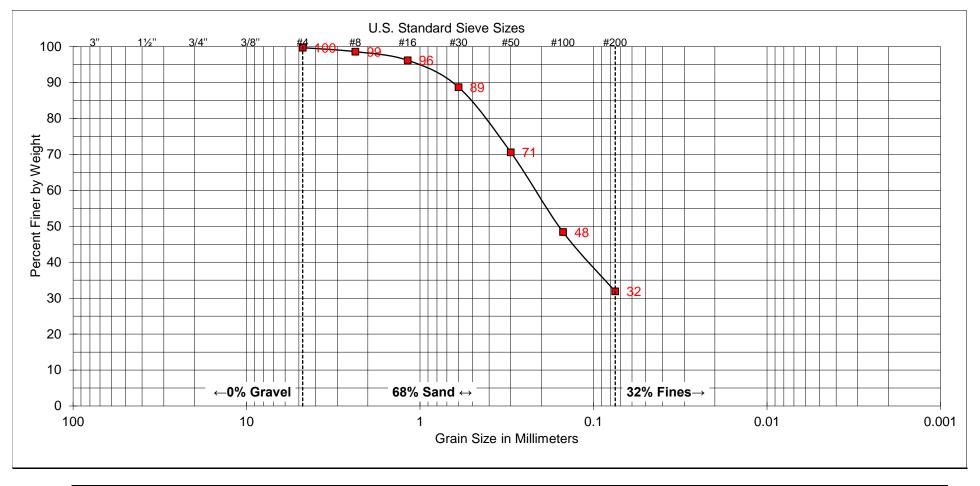
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-22
SAMPLE DEPTH:	1' - 3'

INIFIED SOIL CLASSIFICATION:	SC
PESCRIPTION: CLAYEY SAND WITH	H GRAVEL

ATTERBERG LIMITS	
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





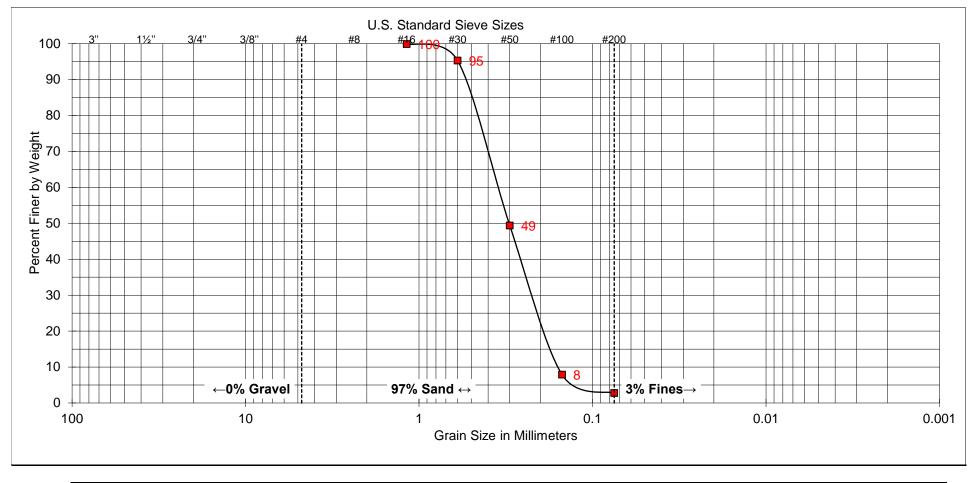
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-23
SAMPLE DEPTH:	0.5' - 5'

INIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMIT	ΓS
LIQUID LIMIT: -	-
PLASTIC LIMIT: -	
PLASTICITY INDEX: -	





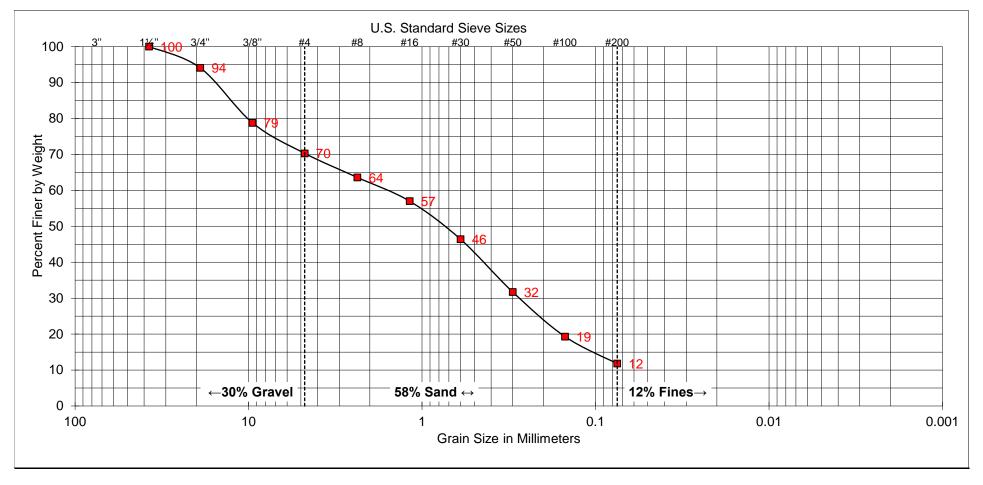
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-23
SAMPLE DEPTH:	10.5' - 11'

INIFIED SOIL CLASSIFICATION:	SP
PESCRIPTION: POORLY GRADED	SAND

ATTERBERG LIMITS			
LIQUID LIMIT:			
PLASTIC LIMIT:			
PLASTICITY INDEX:			





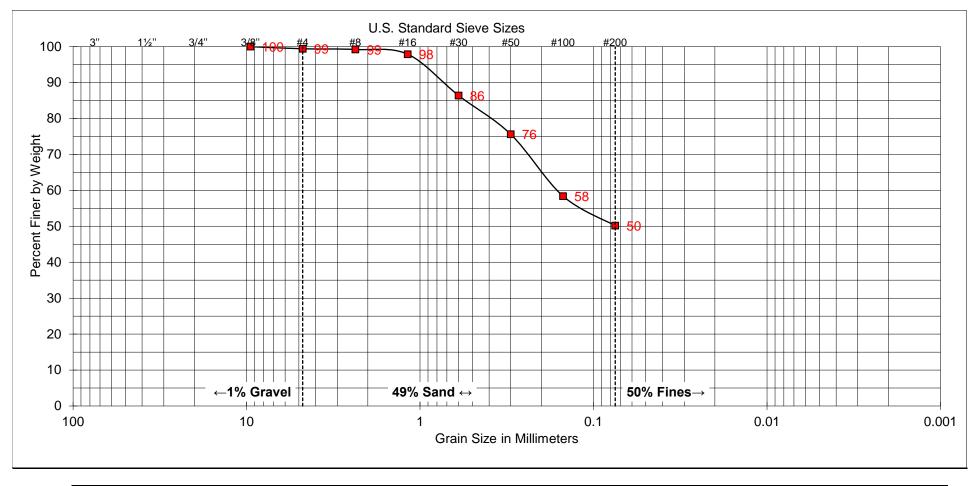
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	B-23
SAMPLE DEPTH:	25' - 25.9'

JNIFIED SOIL CLASSIFICATION:	SP-SM
DESCRIPTION: POORLY GRADED S	SAND WITH SILT AND GRAVEL

ATTERBERG LIMITS			
LIQUID LIMIT:			
PLASTIC LIMIT:			
PLASTICITY INDEX:			





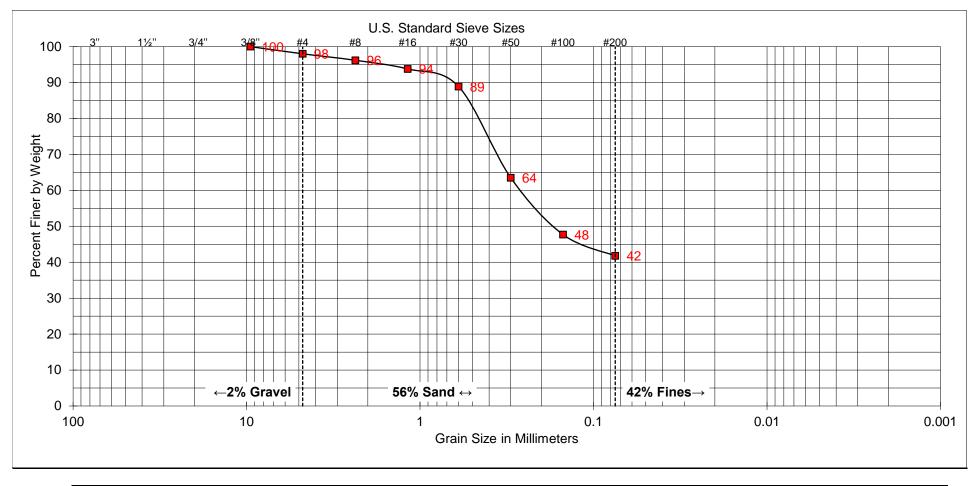
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-23
SAMPLE DEPTH:	40 - 41.5'

UNIFIED SOIL CLASSIFICATION:	SM / ML
DESCRIPTION OF TV OAND / OAN	IDV OH T
DESCRIPTION: SILTY SAND / SAN	NDY SILT

ATTERBERG LIMIT	ΓS
LIQUID LIMIT: -	-
PLASTIC LIMIT: -	
PLASTICITY INDEX: -	





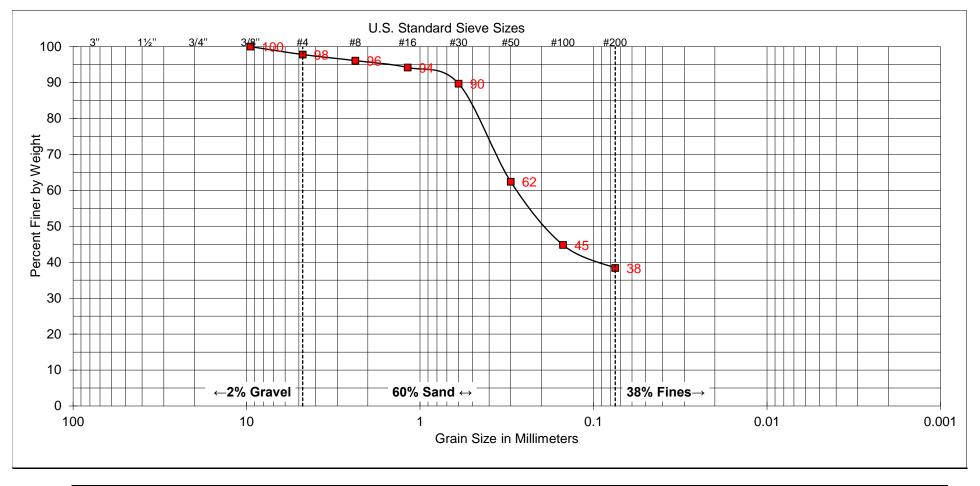
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-24
SAMPLE DEPTH:	0.5' - 5'

UNIFIED SOIL CLASSIFICATION:	sc
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS			
LIQUID LIMIT:			
PLASTIC LIMIT:			
PLASTICITY INDEX:			

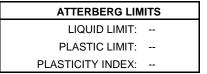




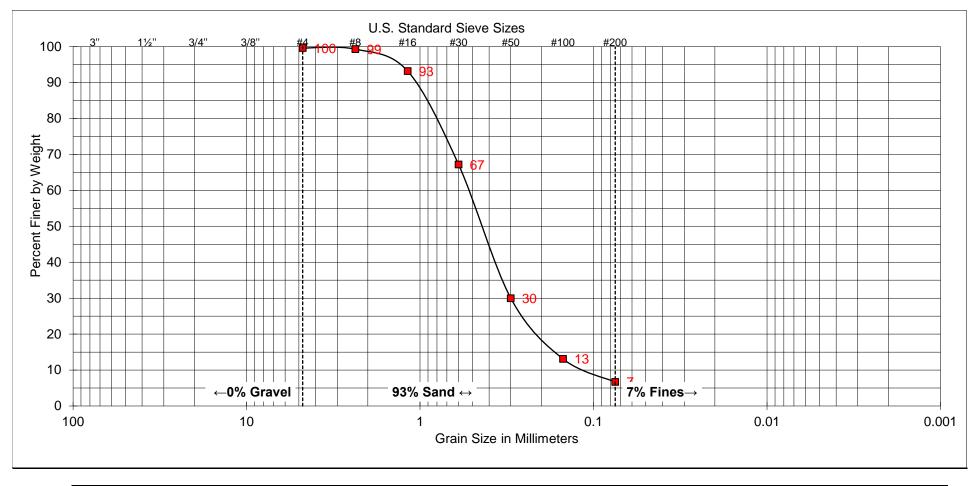
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	B-24
SAMPLE DEPTH:	10' - 11.5'

UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION: CLAYEY SAND	







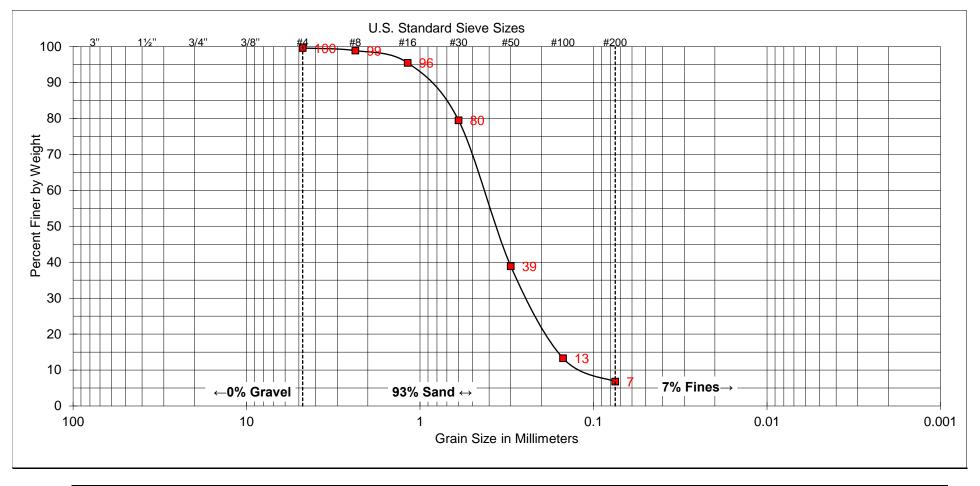
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	B-24
SAMPLE DEPTH:	25' - 26.5'

JNIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED S	SAND WITH SILT

ATTERBERG LIMITS		
LIQUID LIMIT:	-	
PLASTIC LIMIT:		
PLASTICITY INDEX:		





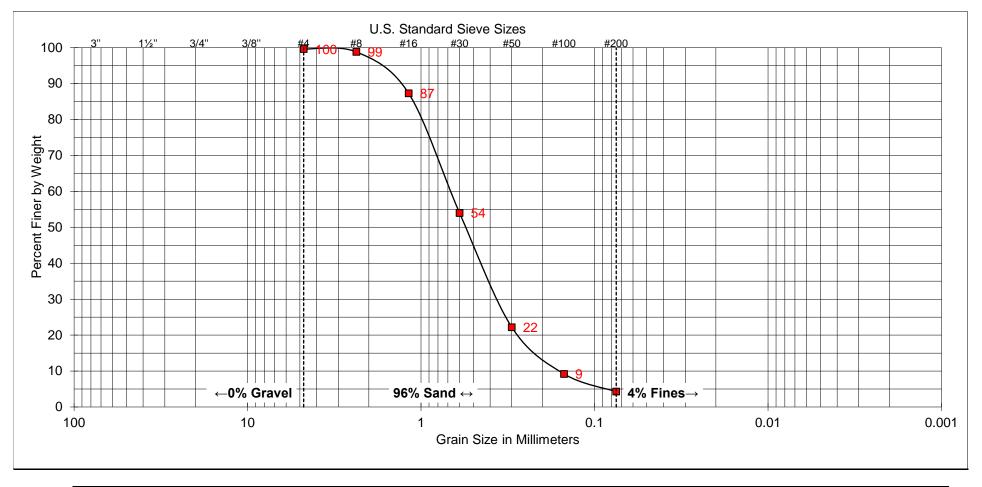
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-24
SAMPLE DEPTH:	35' - 36.5'

UNIFIED SOIL CLASSIFICATION:	SP-SM
DESCRIPTION: POORLY GRADED	SAND WITH SILT

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





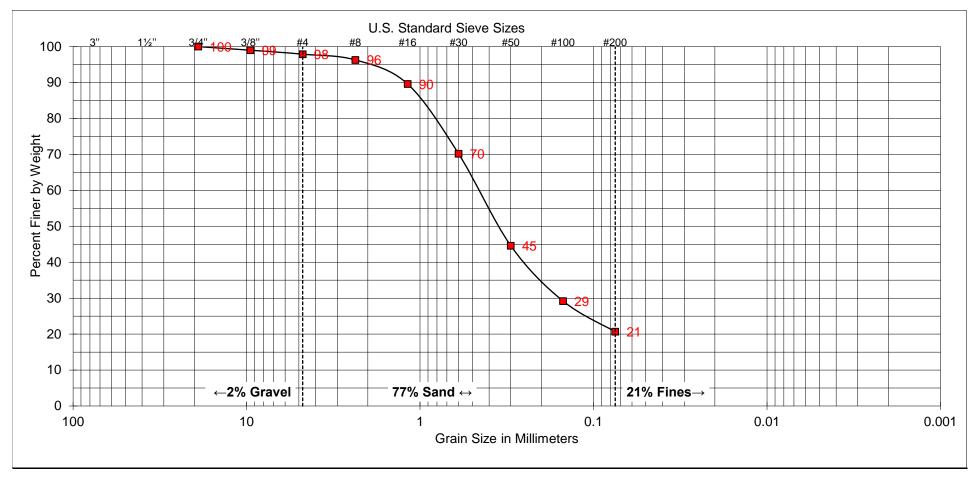
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-24
SAMPLE DEPTH:	55' - 56.5'

INIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED	SAND

ATTERBERG LIMITS				
LIQUID LIMIT:	=			
PLASTIC LIMIT:	=			
PLASTICITY INDEX:	-			





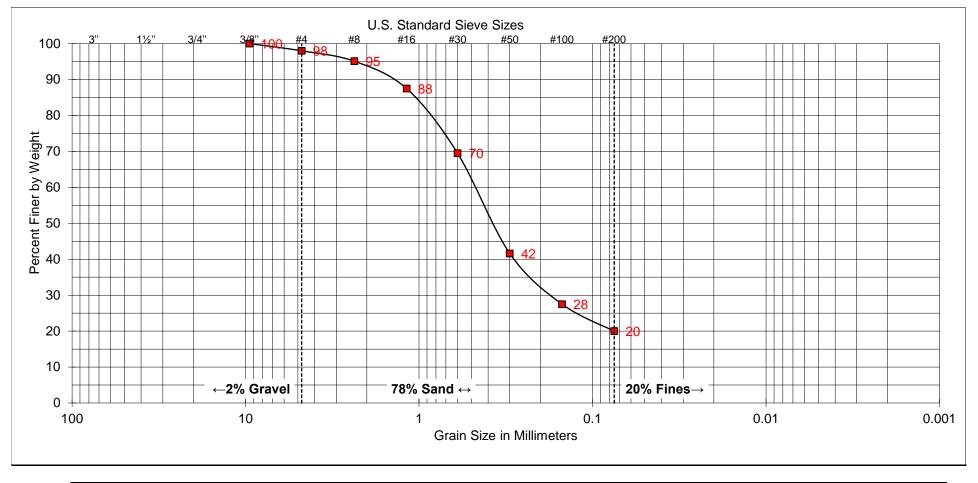
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-25
SAMPLE DEPTH:	0' - 5'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS					
LIQUID LIMIT:					
PLASTIC LIMIT:					
PLASTICITY INDEX:					





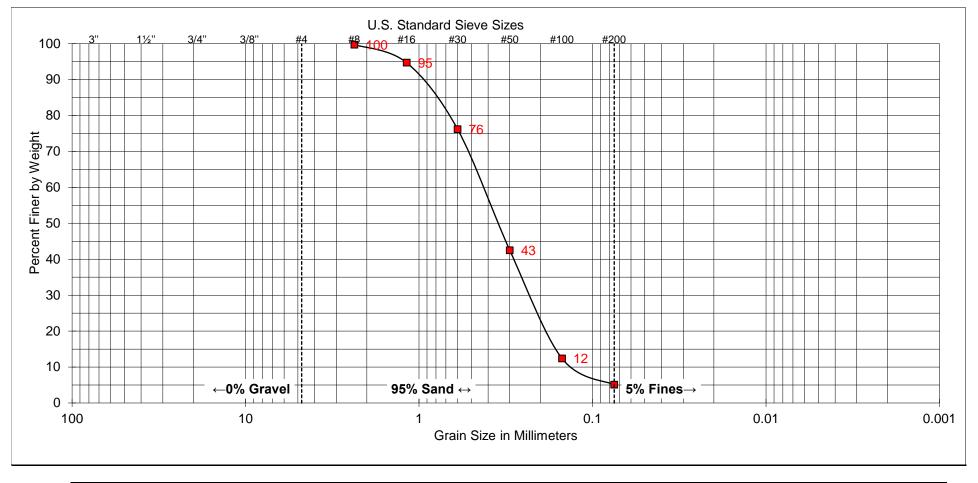
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
BORING NUMBER:	B-25
SAMPLE DEPTH:	10' - 11.5'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS					
LIQUID LIMIT:					
PLASTIC LIMIT:					
PLASTICITY INDEX:					





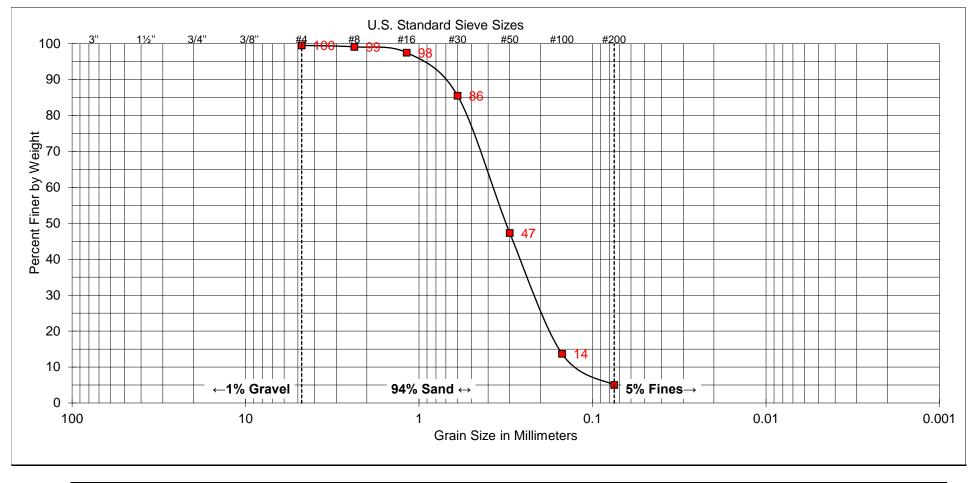
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
BORING NUMBER:	B-26
SAMPLE DEPTH:	5.5' - 6'

JNIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED	SAND

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





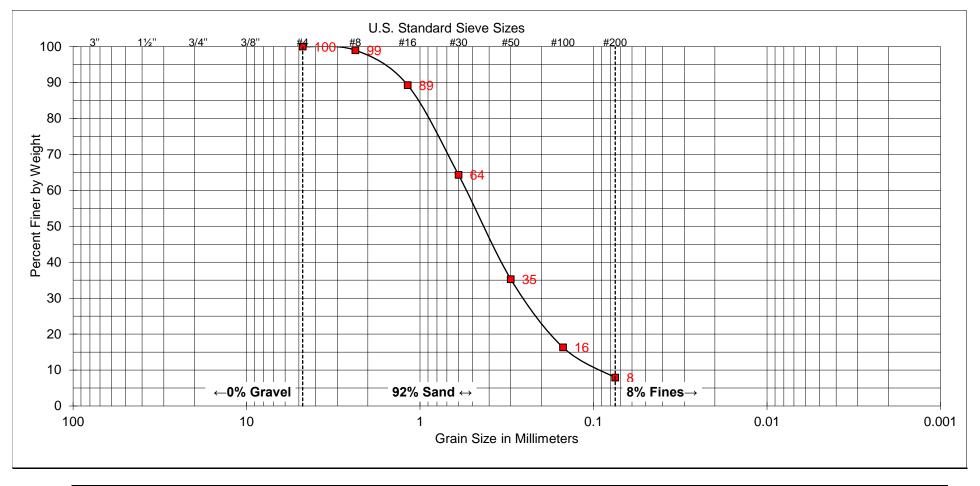
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
BORING NUMBER:	B-26
SAMPLE DEPTH:	15' - 16.5'

INIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED	SAND

ATTERBERG LIMITS				
LIQUID LIMIT:				
PLASTIC LIMIT:				
PLASTICITY INDEX:				





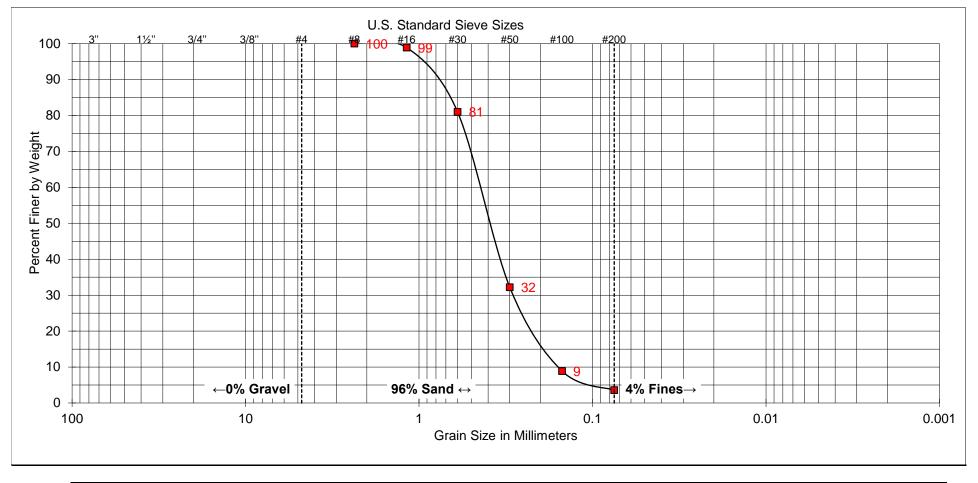
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL SAND			CLAY		

SAMPLE	
BORING NUMBER:	B-26
SAMPLE DEPTH:	25' - 26'

INIFIED SOIL CLASSIFICATION:	SP
ESCRIPTION: POORLY GRADED S	SAND WITH SILT

ATTERBERG LIMIT	S
LIQUID LIMIT: -	=
PLASTIC LIMIT: -	-
PLASTICITY INDEX: -	-





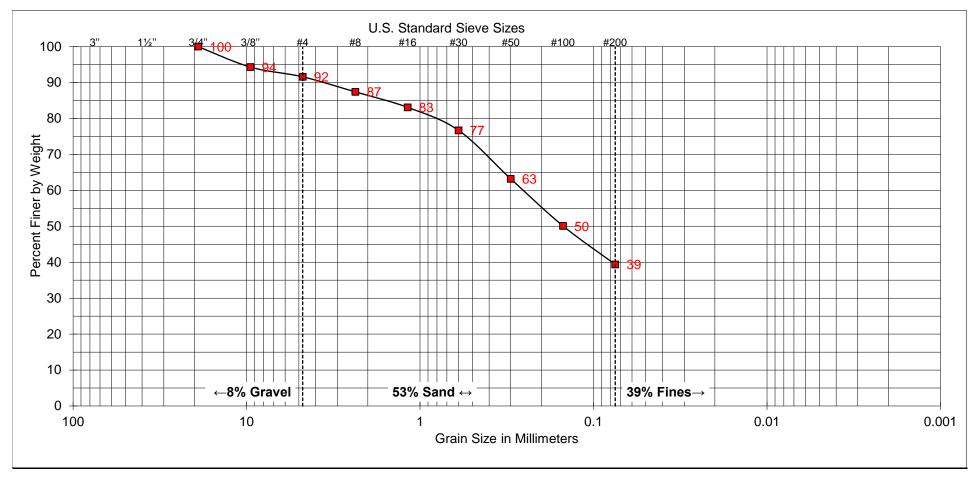
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL SAND			CLAY		

SAMPLE	
BORING NUMBER:	B-26
SAMPLE DEPTH:	35' - 36.5'

INIFIED SOIL CLASSIFICATION:	SP
PESCRIPTION: POORLY GRADED	SAND

ATTERBERG LIMIT	S
LIQUID LIMIT: -	=
PLASTIC LIMIT: -	-
PLASTICITY INDEX: -	-





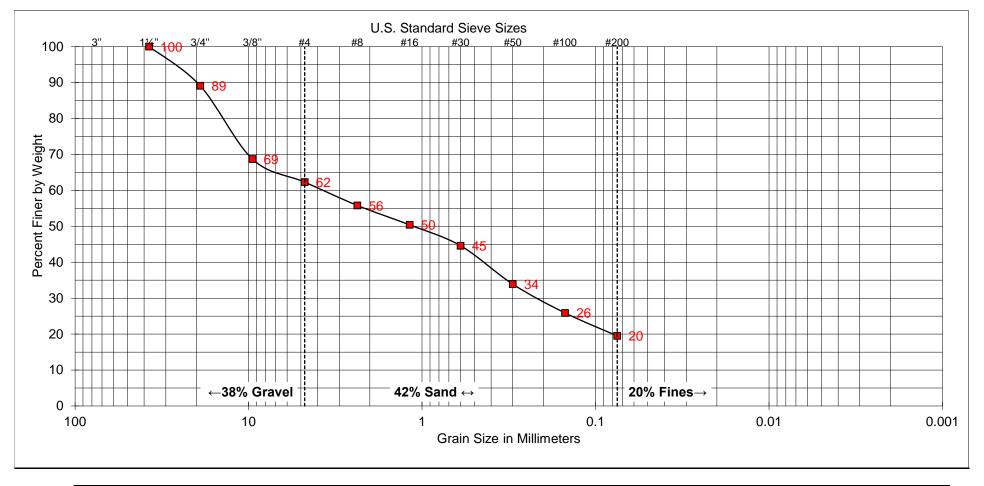
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-27
SAMPLE DEPTH:	0.5' - 5'

INIFIED SOIL CLASSIFICATION:	sc
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS
LIQUID LIMIT: 36
PLASTIC LIMIT: 15
PLASTICITY INDEX: 21





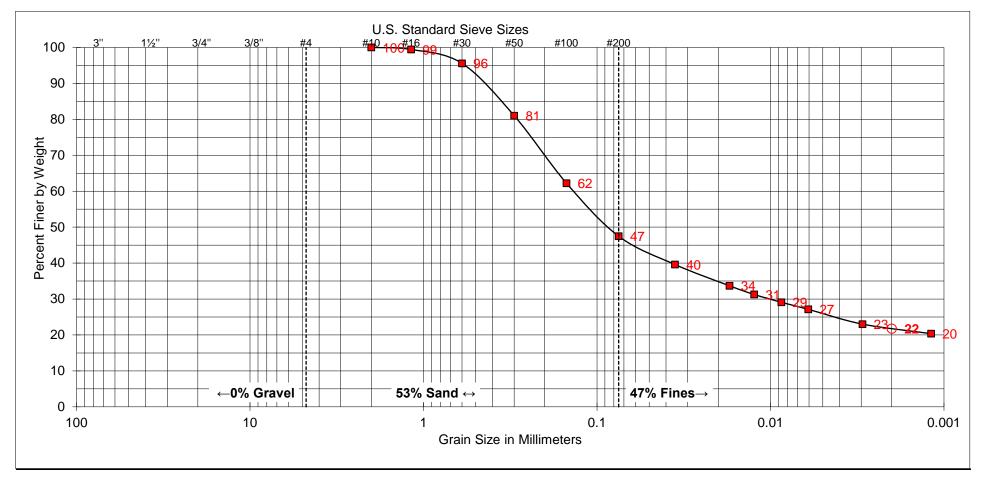
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-27
SAMPLE DEPTH:	15.5' - 16'

INIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION: CLAYEY SAND WIT	H GRAVEL

ATTERBERG LIMIT	гѕ
LIQUID LIMIT: -	-
PLASTIC LIMIT: -	
PLASTICITY INDEX: -	





COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND		CLAY	

SAMPLE
SAMPLE NUMBER: B-27
SAMPLE DEPTH: 30' - 31.5'

UNIFIED SOIL CLASSIFICATION: SC

DESCRIPTION: CLAYEY SAND

ATTERBERG LIMITS

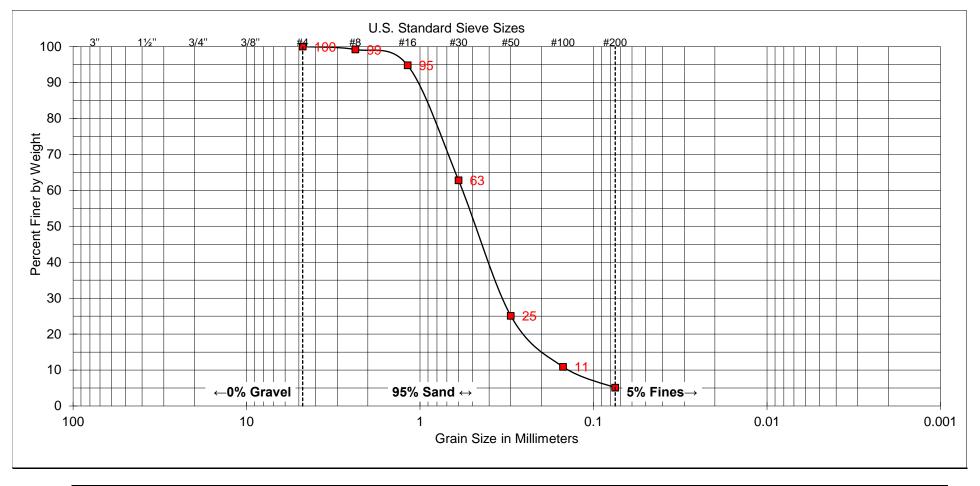
LIQUID LIMIT: -
PLASTIC LIMIT: -
PLASTICITY INDEX: --



SOIL CLASSIFICATION

Project No. SD605

FIGURE C-1.63



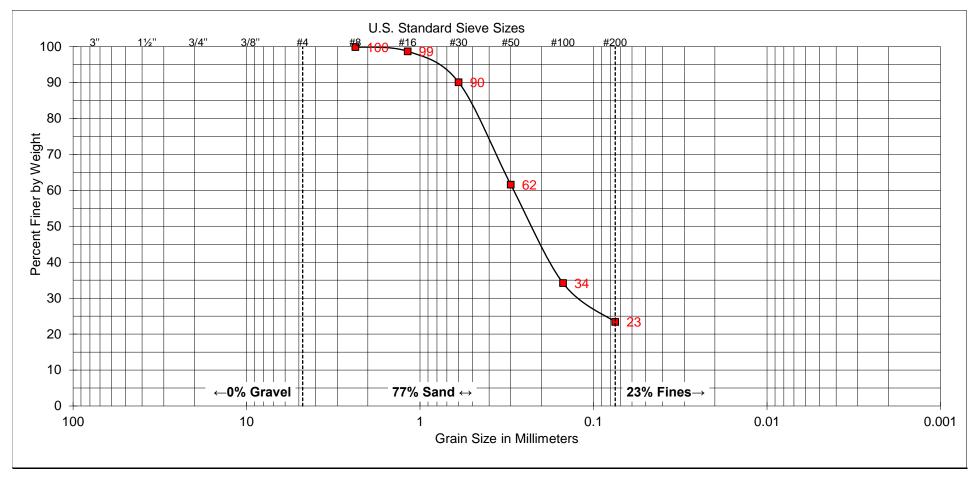
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-27
SAMPLE DEPTH:	35.5' - 36'

INIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED S	SAND

ATTERBERG LIMIT	S
LIQUID LIMIT: -	=
PLASTIC LIMIT: -	-
PLASTICITY INDEX: -	-





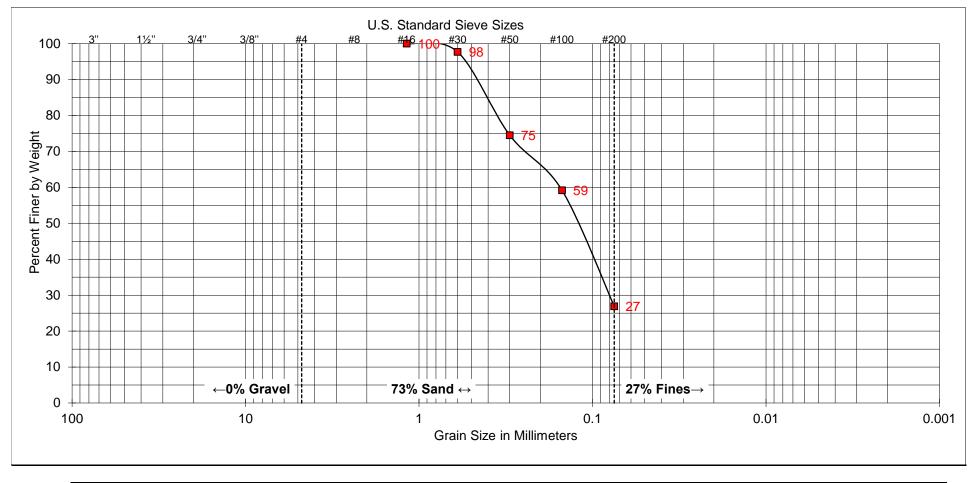
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-27
SAMPLE DEPTH:	40' - 41.5'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMI	TS
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





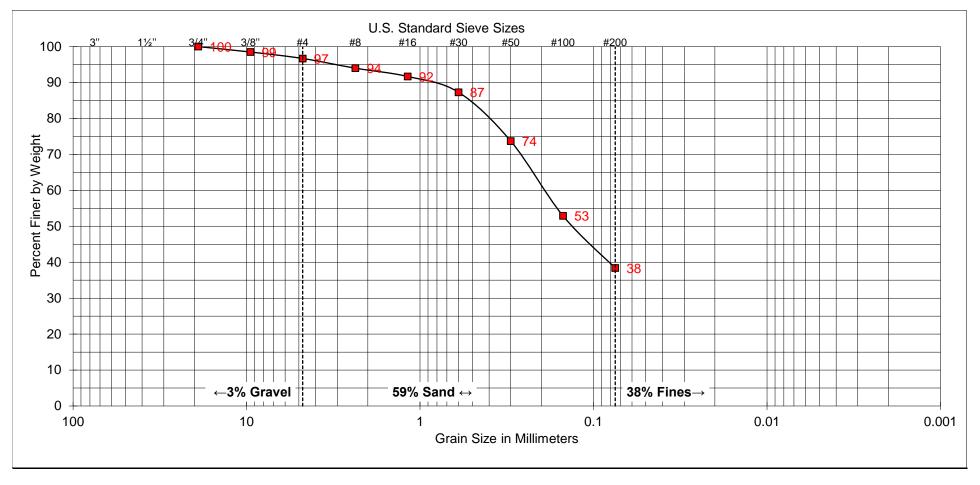
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-27
SAMPLE DEPTH:	70' - 70.6'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMI	TS
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





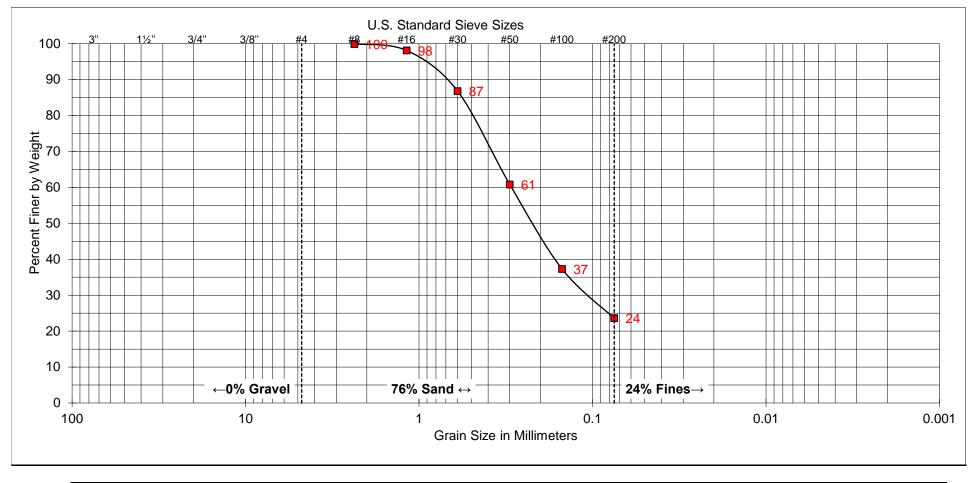
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L	SAND			CLAY

SAMPLE	
BORING NUMBER:	B-28
SAMPLE DEPTH:	0.5' - 5'

UNIFIED SOIL CLASSIFICATION:	sc
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS
LIQUID LIMIT:
PLASTIC LIMIT:
PLASTICITY INDEX:





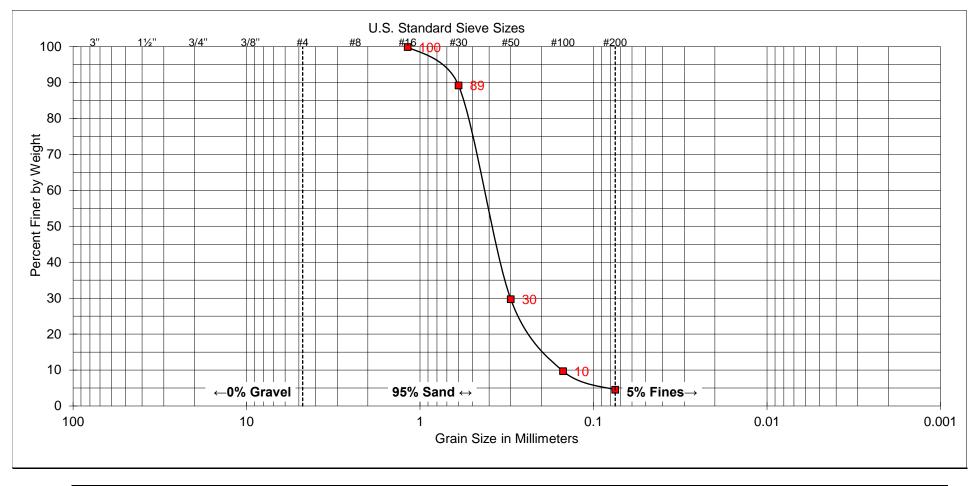
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-28
SAMPLE DEPTH:	25.5' - 26'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS
LIQUID LIMIT:
PLASTIC LIMIT:
PLASTICITY INDEX:





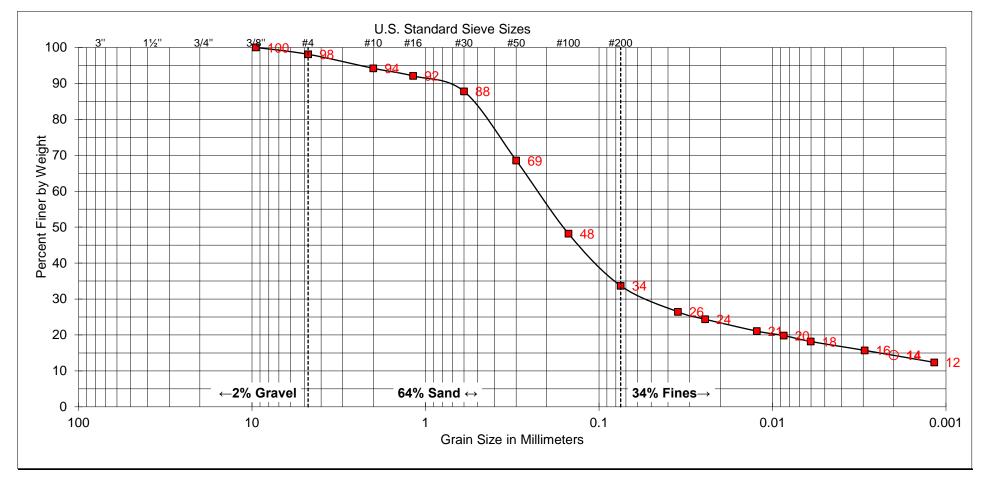
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-28
SAMPLE DEPTH:	35' - 36.5'

INIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED	SAND

ATTERBERG LIMITS
LIQUID LIMIT:
PLASTIC LIMIT:
PLASTICITY INDEX:





COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE
SAMPLE NUMBER: B-29
SAMPLE DEPTH: 0.5 - 4.8'

UNIFIED SOIL CLASSIFICATION: SC

DESCRIPTION: CLAYEY SAND

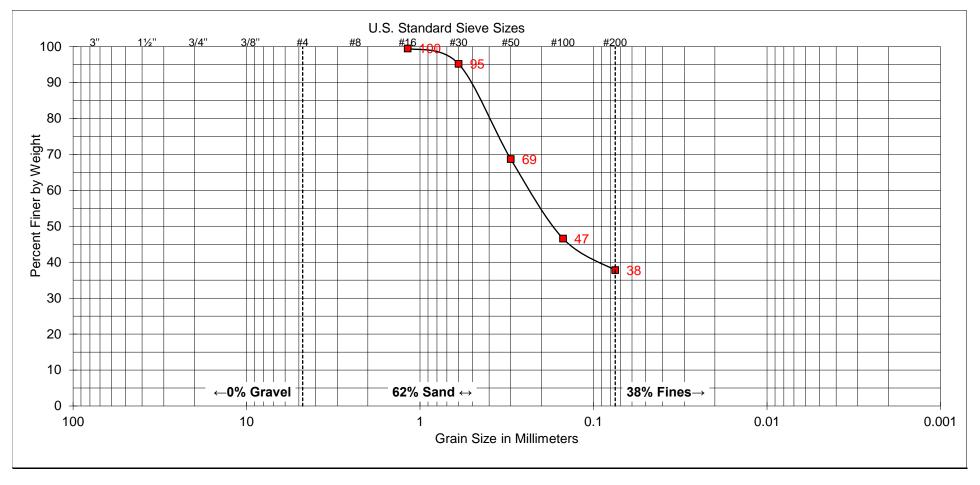
ATTERBERG LIM	IITS
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	



SOIL CLASSIFICATION

Project No. SD605

FIGURE C-1.70



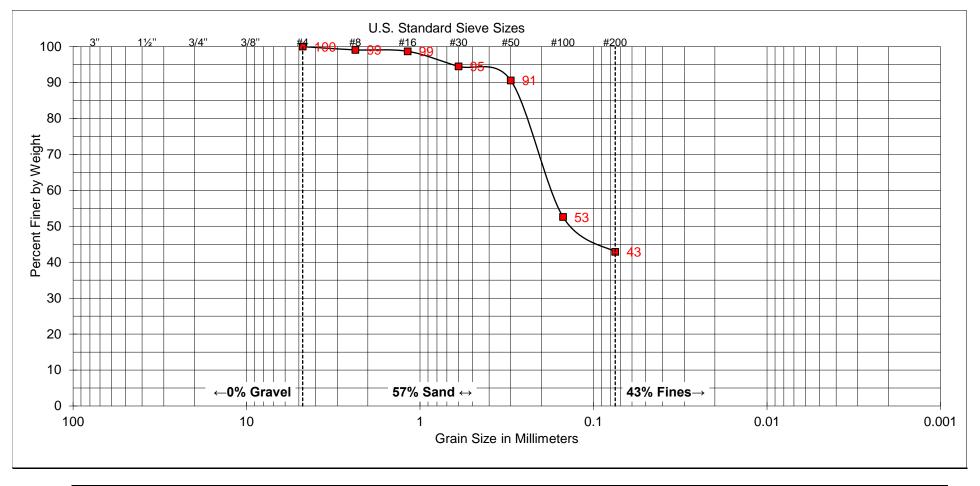
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-30
SAMPLE DEPTH:	0.5' - 5'

JNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS						
LIQUID LIMIT: 29						
PLASTIC LIMIT: 14						
PLASTICITY INDEX: 15						





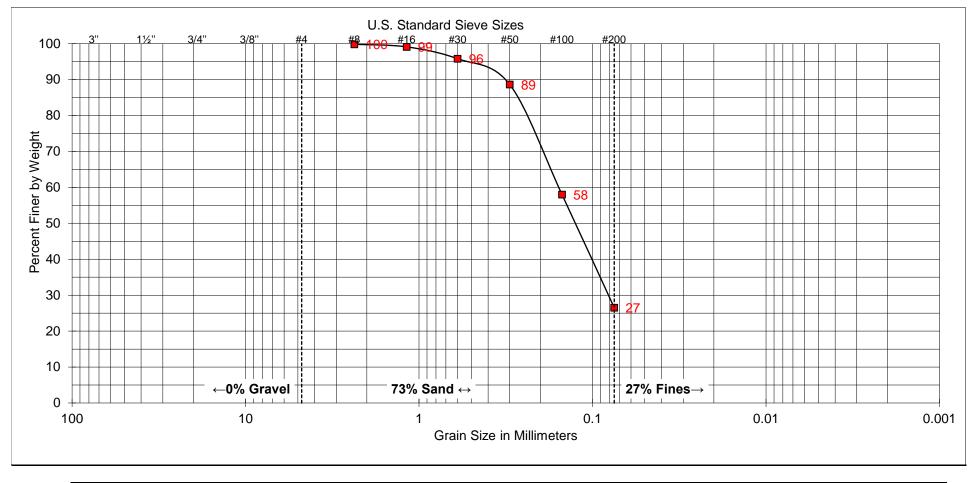
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL			SAND		CLAY

SAMPLE	
BORING NUMBER:	B-30
SAMPLE DEPTH:	10' - 11.5'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS
LIQUID LIMIT:
PLASTIC LIMIT:
PLASTICITY INDEX:





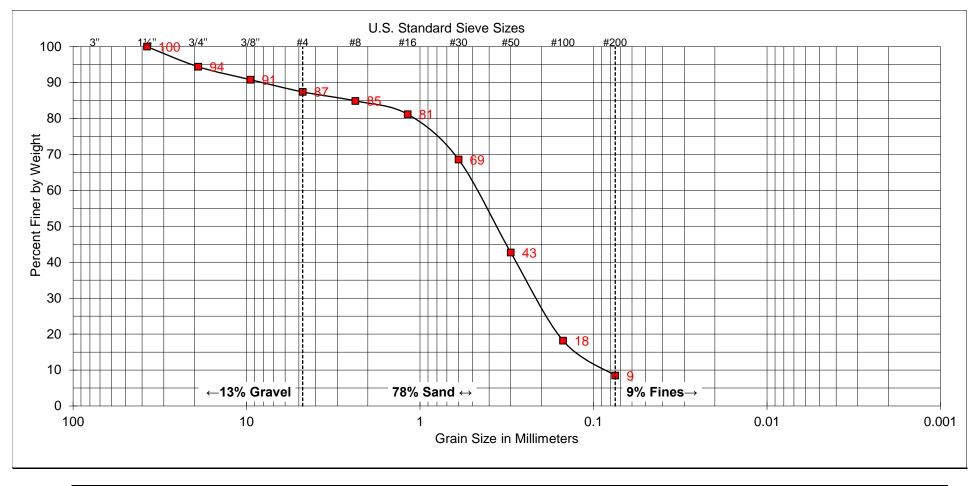
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-30
SAMPLE DEPTH:	25' - 26.5'

INIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMIT	S
LIQUID LIMIT: -	=
PLASTIC LIMIT: -	-
PLASTICITY INDEX: -	-

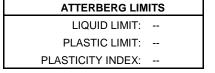




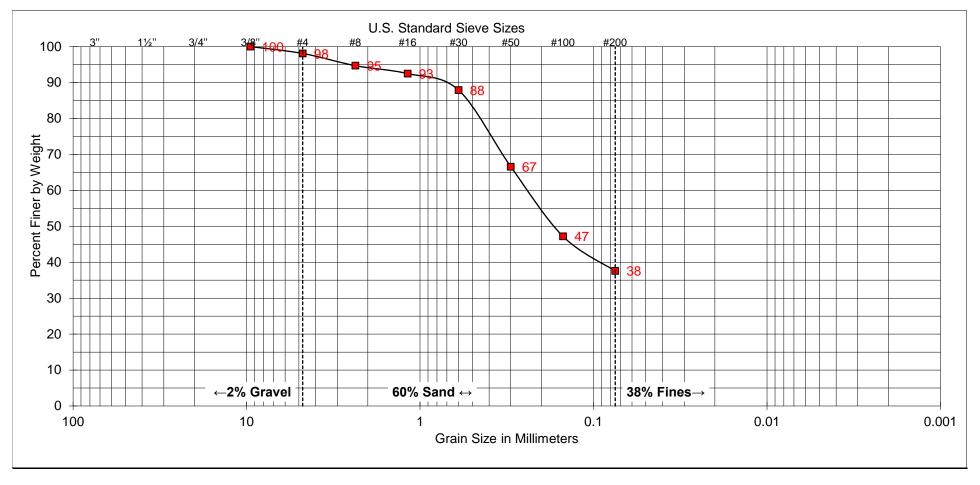
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-30
SAMPLE DEPTH:	40' - 41.5'

UNIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED	SAND WITH SILT







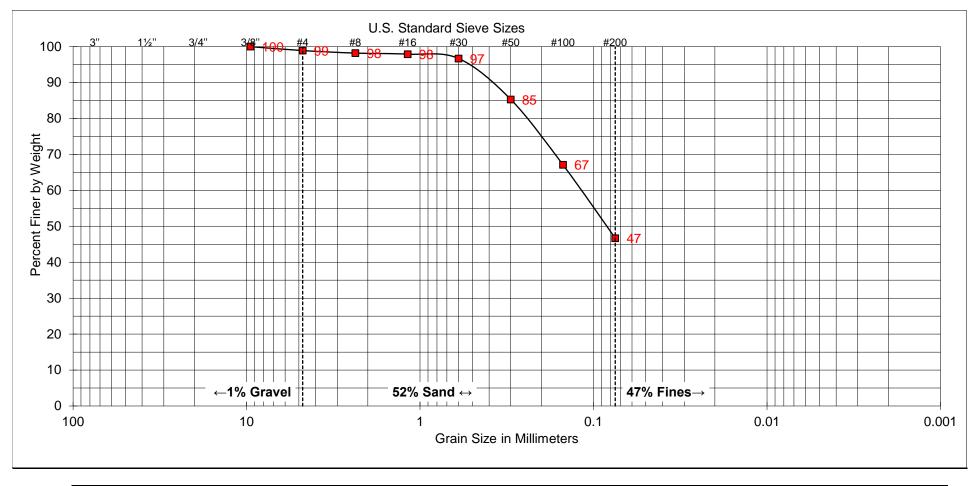
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	iL .		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-31
SAMPLE DEPTH:	2.5' - 5'

UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMIT	гѕ
LIQUID LIMIT: -	-
PLASTIC LIMIT: -	
PLASTICITY INDEX: -	





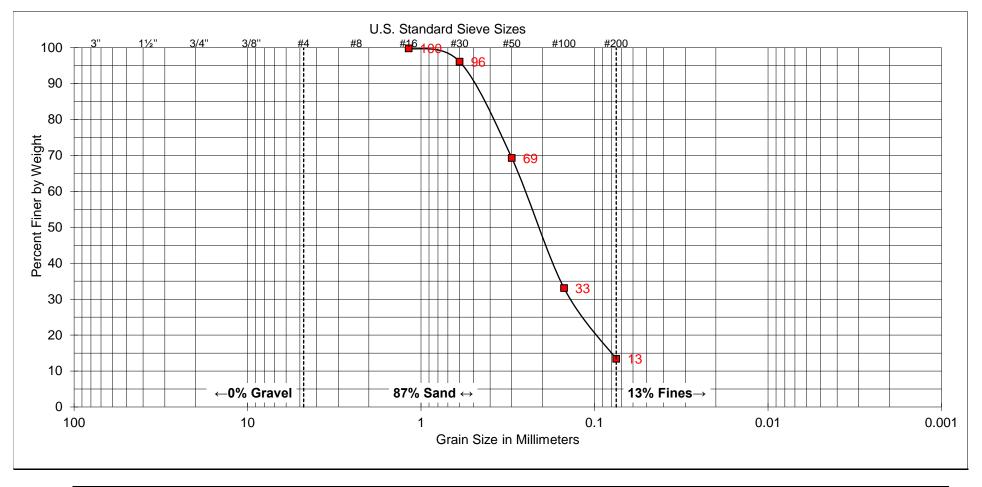
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-31
SAMPLE DEPTH:	15' - 16.5'

UNIFIED SOIL CLASSIFICATION:	SC
oran ieb ddie deaddii idanida.	66
DESCRIPTION: CLAYEY SAND	

ATTERBERG LIMITS	
LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	





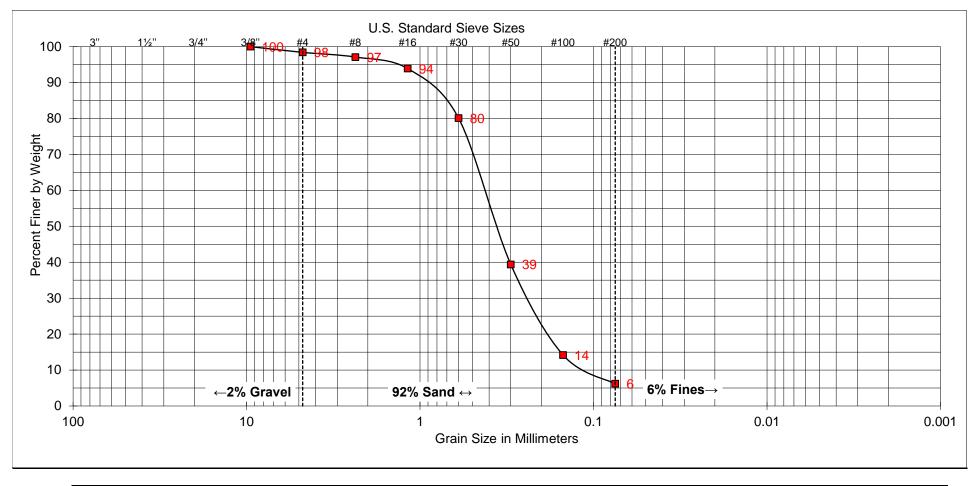
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-31
SAMPLE DEPTH:	25' - 26.5'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMIT	S
LIQUID LIMIT: -	=
PLASTIC LIMIT: -	-
PLASTICITY INDEX: -	-





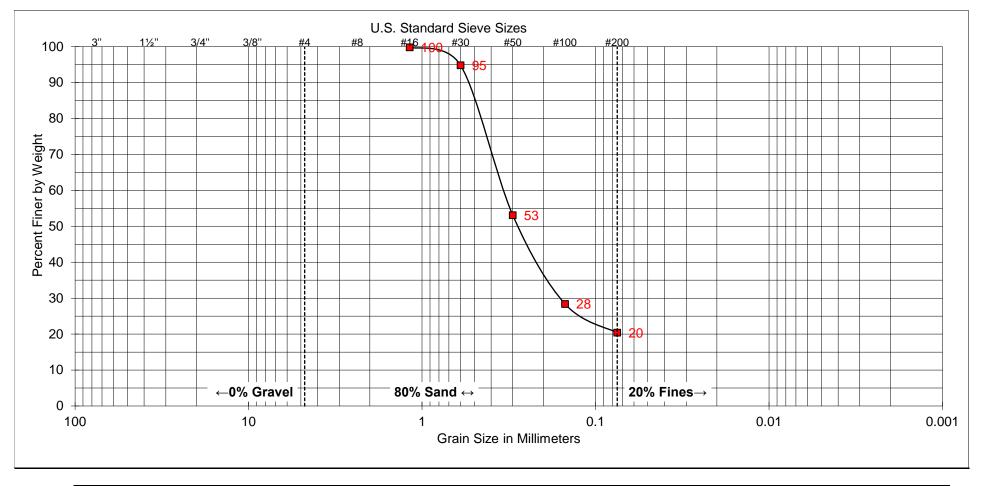
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-31
SAMPLE DEPTH:	40' - 41.5'

JNIFIED SOIL CLASSIFICATION:	SP
DESCRIPTION: POORLY GRADED S	SAND WITH SILT

ATTERBERG LIMITS		
LIQUID LIMIT:		
PLASTIC LIMIT:		
PLASTICITY INDEX:		





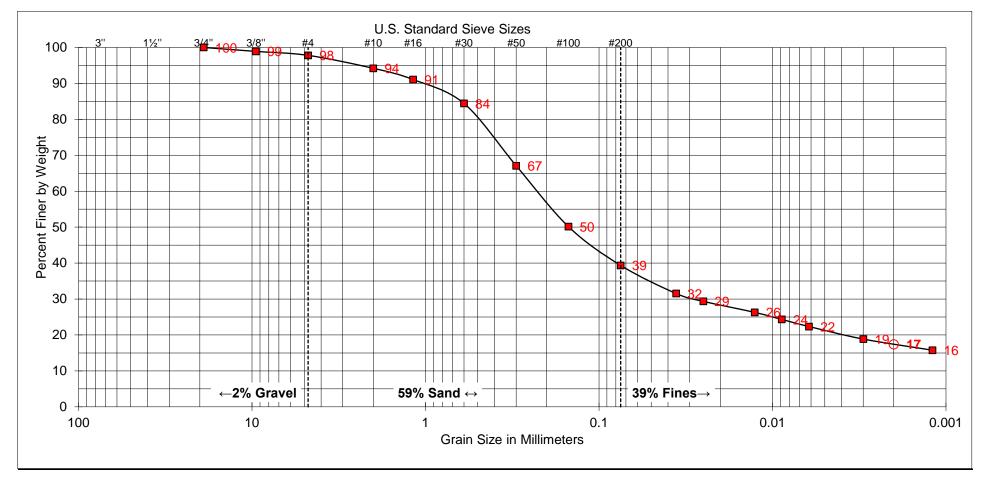
COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVE	L		SAND		CLAY

SAMPLE	
BORING NUMBER:	B-31
SAMPLE DEPTH:	65' - 65.9'

UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION: SILTY SAND	

ATTERBERG LIMITS		
LIQUID LIMIT:		
PLASTIC LIMIT:		
PLASTICITY INDEX:		





COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAV			SAND		CLAY

SAMPLE	
SAMPLE NUMBER: B-32	
SAMPLE DEPTH: 0.5 - 5'	

UNIFIED SOIL CLASSIFICATION: SC

DESCRIPTION: CLAYEY SAND

ATTERBERG LIMITS

LIQUID LIMIT: -
PLASTIC LIMIT: -
PLASTICITY INDEX: --



SOIL CLASSIFICATION

Project No. SD605

FIGURE C-1.80

ATTERBERG LIMITS RESULTS

(ASTM D4318)

SAMPLE	DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
S-2 @ 10′ – 11.5′	Sandy Lean CLAY (CL)	40	18	22
S-2 @ 26' – 26.5'	Sandy Lean CLAY (CL)	39	17	22
S-2 @ 50' – 51'	Fat CLAY with sand (CH)	51	24	27
S-3 @ 10.5' – 11'	Sandy Lean CLAY (CL)	42	18	24
S-3 @ 34' – 36'	Sandy Lean CLAY (CL)	42	14	28
S-4 @ 10′ – 11.5′	Lean CLAY with sand (CL)	48	19	29
S-4 @ 20′ – 21.5′	Lean CLAY with sand (CL)	42	16	26
S-5 @ 0.5' – 5'	Clayey SAND with gravel (SC)	38	15	23
S-5 @ 20.5' – 21'	Lean CLAY with sand (CL)	46	20	26
S-6 @ 20' – 21.5'	Sandy Lean CLAY (CL)	42	16	26
S-7 @ 0.5' – 5'	Sandy Lean CLAY (CL)	39	14	25
S-8 @ 40.5' – 41'	Fat CLAY (CH)	59	21	38
S-9 @ 30' – 31'	Fat CLAY (CH)	66	22	44
S-10 @ 0.5′ – 5′	Clayey SAND with gravel (SC)	39	15	24
S-10 @ 35' – 36.5'	Sandy Lean CLAY (CL)	45	16	29
S-10 @ 45' – 46.5'	Sandy Lean CLAY (CL)	46	17	29
S-11 @ 0.5′ – 5′	Sandy Lean CLAY (CL)	38	13	25
S-11 @ 10' – 11.5'	Sandy Lean CLAY (CL)	38	15	23
S-12 @ 35' – 36'	Sandy fat CLAY (CH)	53	21	32
S-13 @ 0.5′ – 5′	Clayey SAND with gravel (SC)	40	17	23
B-14 @ 5' – 6.5'	Sandy Lean CLAY (CL)	40	17	23
B-15 @ 6' – 6.5'	Clayey SAND with gravel (SC)	36	19	17
B-16 @ 20' – 21.5'	Clayey SAND (SC)	34	17	17
B-16 @ 41' – 41.5'	Sandy Fat CLAY (CH)	55	28	27
B-17 @ 20' – 21.5'	Clayey SAND (SC)	35	16	19
B-18 @ 0.5′ – 5′	Clayey SAND (SC)	38	15	23
B-21 @ 5' – 6.5'	Clayey SAND (SC)	33	18	15

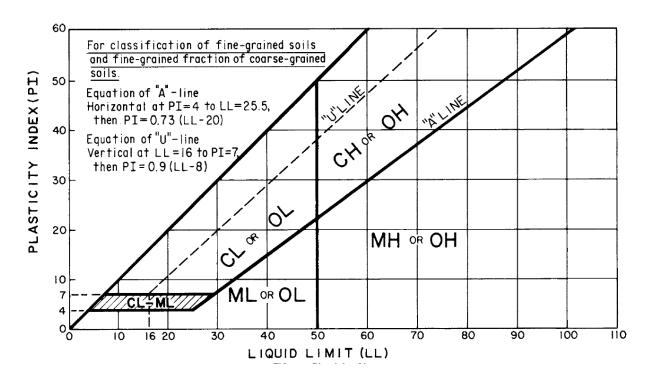


ATTERBERG LIMITS RESULTS (CONTINUED)

(ASTM D4318)

SAMPLE	DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
B-21 @ 25' – 26.5'	Sandy Lean CLAY (CL)	33	18	15
B-22 @ 15' – 16.5'	Clayey SAND (SC)	33	15	18
B-23 @ 60' – 61'	Silty SAND (SM)	NP	NP	NP
B-27 @ 0.5′ – 5′	Clayey SAND (SC)	36	15	21
B-27 @ 25.5' – 26'	Sandy Lean CLAY (CL)	41	21	20
B-27 @ 50' – 51.5'	Lean CLAY (CL)	47	16	31
B-28 @ 15' – 16.5'	Sandy Lean CLAY (CL)	41	18	23
B-30 @ 0.5' – 5'	Clayey SAND (SC)	29	14	15
B-31 @ 30' - 31.5'	Sandy Lean CLAY (CL)	36	20	16

NP = Nonplastic





EXPANSION TEST RESULTS

(ASTM D4829)

SAMPLE	DESCRIPTION	EXPANSION INDEX
S-2 @ 0.5′ – 5′	Clayey SAND (SC)	26
S-6 @ 0.5' – 5'	Lean CLAY with sand (CL)	75
S-7 @ 0.5' – 5'	Sandy Lean CLAY (CL)	50
S-10 @ 0.5' – 5'	Clayey SAND with gravel (SC)	20
S-11 @ 0.5' – 5'	Sandy Lean CLAY (CL)	63
S-12 @ 0.5' – 5'	Clayey SAND (SC)	25
S-13 @ 0.5′ – 5′	Clayey SAND (SC)	70
B-14 @ 0.5' – 2.5'	Clayey SAND (SC)	6
B-16 @ 2.5' – 5'	Clayey SAND (SC)	55
B-19 @ 0.5' – 4.4'	Clayey SAND (SC)	31
B-20 @ 0.5' – 2.5'	Clayey SAND (SC)	36
B-21 @ 0.5' – 5'	Clayey SAND (SC)	52
B-24 @ 0.5' – 5'	Clayey SAND (SC)	55
B-27 @ 0.5' – 5'	Clayey SAND (SC)	36
B-28 @ 0.5' – 5'	Clayey SAND (SC)	32
B-30 @ 0.5' – 5'	Clayey SAND (SC)	18
B-31 @ 2.5' – 5'	Clayey SAND (SC)	34

EXPANSION INDEX	POTENTIAL EXPANSION
0 to 20	Very low
21 to 50	Low
51 to 90	Medium
91 to 130	High
Above 130	Very High



CORROSIVITY TEST RESULTS

(ASTM D516, CTM 643)

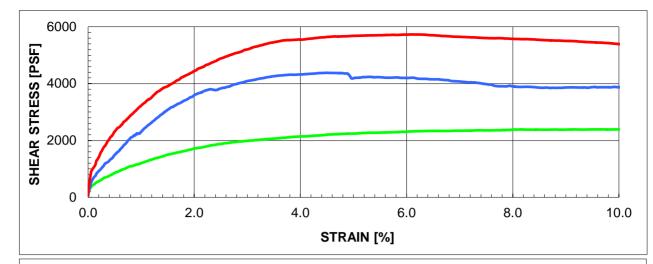
SAMPLE	рН	RESISTIVITY [OHM-CM]	SULFATE CONTENT [%]	CHLORIDE CONTENT [%]
S-2 @ 0.5' – 5'	8.6	1,950	<0.01	<0.01
S-6 @ 0.5' – 5'	7.1	1,135	0.01	0.01
S-7 @ 0.5' – 5'	8.0	600	0.03	0.07
S-10 @ 0.5' – 5'	7.9	980	<0.01	0.06
S-11 @ 0.5′ – 5′	8.2	940	<0.01	0.01
B-16 @ 2.5' – 5'	8.6	970	0.01	0.01
B-17 @ 0.5' – 5'	8.5	1,080	<0.01	<0.01
B-20 @ 0.5' – 2.5'	8.3	1,120	<0.01	0.01
B-21 @ 0.5′ – 5′	8.5	1,960	<0.01	0.01
B-24 @ 0.5' – 5'	8.8	880	<0.01	0.01
B-26 @ 0.5' – 5'	8.4	2,210	<0.01	0.01
B-27 @ 0.5′ – 5′	7.9	720	0.02	0.07
B-30 @ 0.5' – 5'	8.6	1,320	0.01	0.01

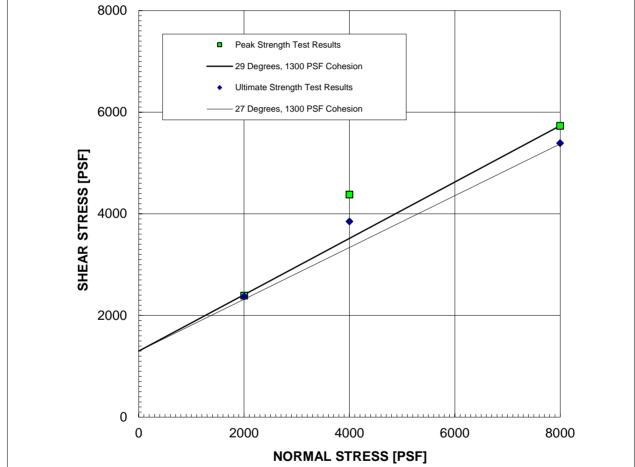
SULFATE CONTENT [%]	SULFATE EXPOSURE	CEMENT TYPE
0.00 to 0.10	Negligible	-
0.10 to 0.20	Moderate	II, IP(MS), IS(MS)
0.20 to 2.00	Severe	V
Above 2.00	Very Severe	V plus pozzolan

SOIL RESISTIVITY [OHM-CM]	GENERAL DEGREE OF CORROSIVITY TO FERROUS METALS
0 to 1,000	Very Corrosive
1,000 to 2,000	Corrosive
2,000 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
Above 10,000	Slightly Corrosive

CHLORIDE (CI) CONTENT [%]	GENERAL DEGREE OF CORROSIVITY TO METALS
0.00 to 0.03	Negligible
0.03 to 0.15	Corrosive
Above 0.15	Severely Corrosive







SAMPLE: S-2 @ 46' - 46.5'

<u>Description</u>: Clayey SAND (SC)

STRAIN RATE: 0.0020 IN/MIN (Sample was consolidated and drained)

PEAK

φ' 29 ° **C'** 1,300 PSF

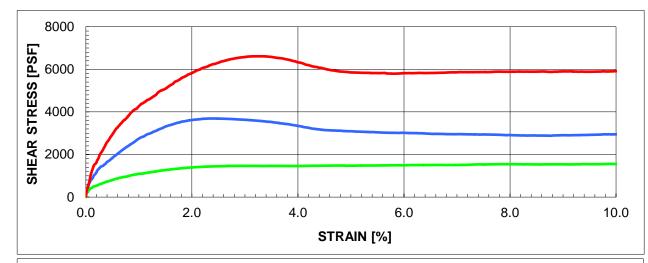
| IN-SITU | 102.3 PCF | w_c | 21.1 %

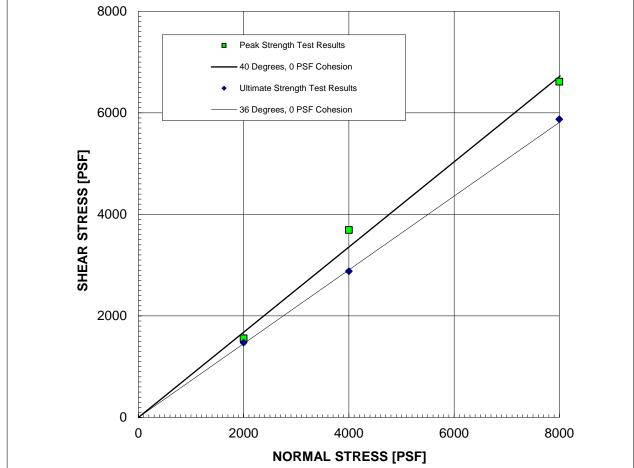
ULTIMATE

27 ° 1,300 PSF

AS-TESTED 102.3 PCF 24.0 %







SAMPLE: S-7 @ 50.4' - 50.9'

<u>Description</u>: Silty SAND (SM)

STRAIN RATE: 0.0030 IN/MIN (Sample was consolidated and drained)

PEAK

φ' 40 ° **C'** 0 PSF

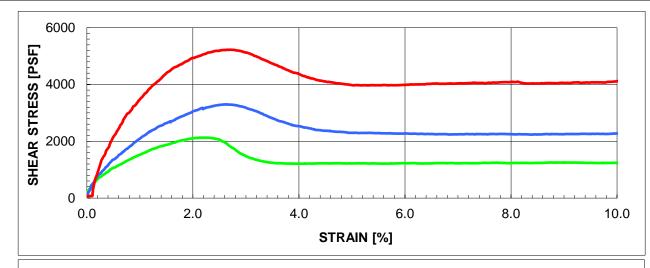
| N-SITU | 103.2 PCF | w_c | 22.0 %

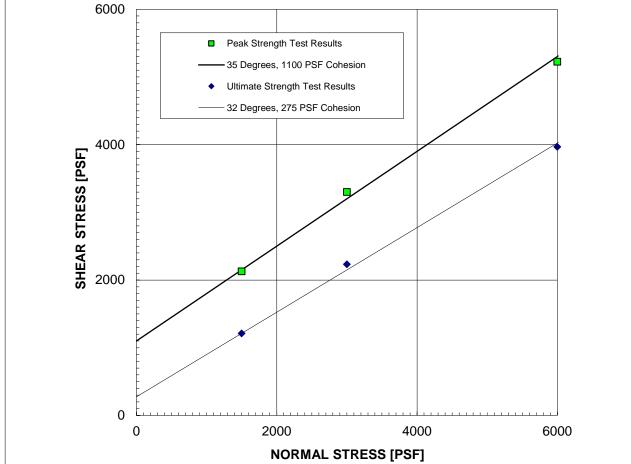
ULTIMATE

36 ° 0 PSF

AS-TESTED 103.2 PCF 23.3 %







SAMPLE: B-15 @ 35.5' - 36'

Description:

Gray silty SAND (SM)

STRAIN RATE: 0.0030 IN/MIN (Sample was consolidated and drained)

PEAK

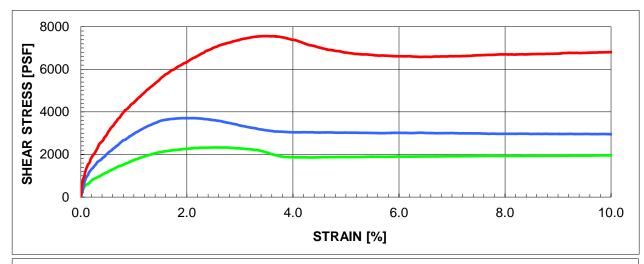
φ' 35 ° **C'** 1,100 PSF

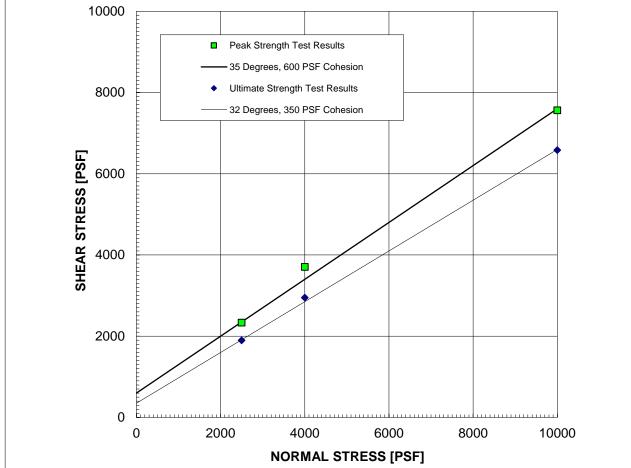
| IN-SITU γ_d | 119.7 PCF **w**_c | 6.1 % ULTIMATE

32 ° 275 PSF

AS-TESTED 119.7 PCF 15.1 %







SAMPLE: B-17 @ 60.5' - 70'

WIN EE. B 17 @ 00.0 7

Description:

Poorly graded SAND with silt (SP-SM)

STRAIN RATE: 0.0030 IN/MIN (Sample was consolidated and drained)

PEAK

φ' 35 ° C' 600 PSF

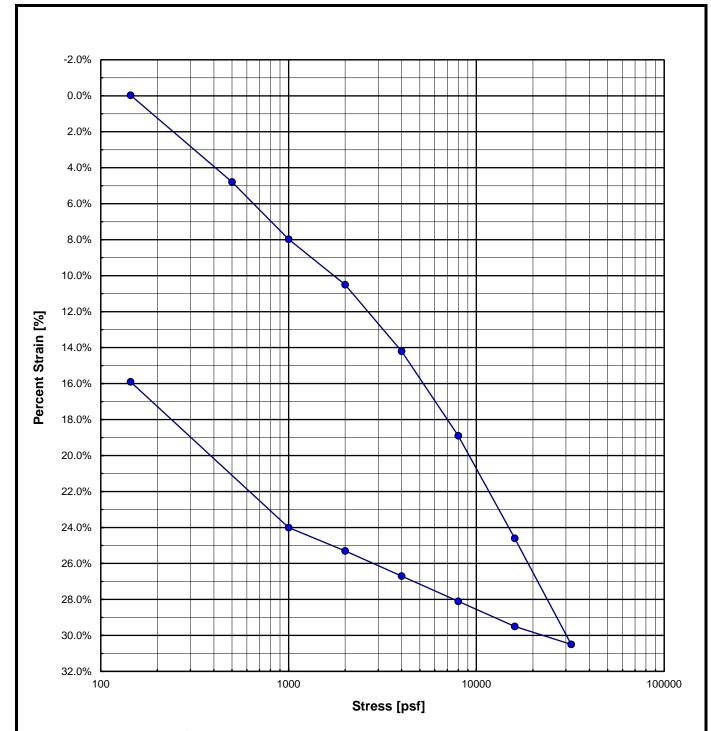
	IN-SITU
γd	105.3 PCF
W _c	19.7 %

ULTIMATE

32 ° 350 PSF

AS-TESTED 105.3 PCF 22.2 %





BORING NUMBER/DEPTH: S-5 @ 21' - 21.5' DESCRIPTION: Lean CLAY with sand (CL)

 INITIAL
 FINAL

 1.0000
 0.8410

 72.2
 85.9

 2.96
 2.96

 1.56
 1.16

 50.1
 39.0

 95.0
 100.0

SAMPLE HEIGHT [IN]
DRY DENSITY [PCF]
SPECIFIC GRAVITY (ASSUMED)
VOID RATIO (e)
WATER CONTENT [%]
DEGREE OF SATURATION [%]

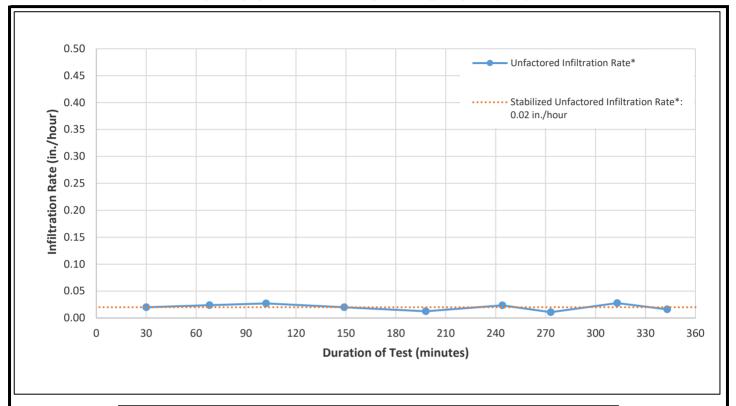


APPENDIX D STORM WATER INFILTRATION TEST RESULTS



Project Name: SDSU	Mission Valley	Date Drilled:	3/12/2019	Borehole Radius (*r):	4 in.
Project Number: SD605	5	Date Tested:	3/13/2019	Casing Diameter:	4 in.
Test Hole Number: -1		Tested By:	TSL	Depth of Hole:	4.4 ft
Drilling Method: Holloy	w-Stem Auger Average	e Temp. of Water:	60 F	Average Test Depth:	2.4' - 4.4'

UNFACTORED INFILTRATION RATES* DURING TEST



Preliminary Factored Infiltration Rate¹: 0.01 in./hr.

Feasibility Screening Factor of Safety, F.S.²: 2

Temperature Correction Factor^{2,3}: 0.86

Factored Infiltration Rate ²	Design Condition ²
Below 0.05	No Infiltration
0.05 to 0.5	Partial Infiltration
Above 0.50	Full Infiltration

^{*}Porchet method used to convert percolation rate to infiltration rate. See Appendix D for details.

- ${\bf 1: Rate\ Factored\ by\ Factor\ of\ Safety\ and\ Temperature\ Correction\ Factor.}$
- 2: Reference: The City of San Diego, BMP Design Manual (2018).
- 3: Factor based on as-tested water temperature of 60 F and rainfall temperature of 50 F.

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BOREHOLE PERCOLATION TEST - I-1
INFILTRATION RATE

A GROU	IP DELTA
PROJECT NUMBER	FIGURE NUMBER
SD605	D-1.1

Project Name: SDSU Mission Valley	Date Drilled: 3/12/2019	Borehole Radius (*r): 4 in.	
Project Number: SD605	Date Tested: 3/13/2019	Casing Diameter: 4 in.	
Test Hole Number: -1	Tested By: TSL	Depth of Hole: 4.4 ft	
Drilling Method: Hollow-Stem Auger	Average Temp. of Water: 60 F	Average Test Depth: 2.4' - 4.4'	

DATA SHEET

Reading Number	Time Interval (min.)	Cumulative Time (min.)	Initial Depth to Water (ft.)	Final Depth to Water (ft.)	Average Height of Water (Head) (in.)	Measured Drop in Water Level (in.)	Corrected Drop in Water Level ¹ (in.)	Corrected Percolation Rate ¹ (in./hour) ΔΗ _ε /Δt	Unfactored Infiltration Rate* (in./hour)
	Δt	Т	[from grou	nd surface]	H _{avg}	ΔΗ	Δп _с	Δη _c /Δι	I _t
Pre-soak	-	-							
1	30	30	2.35	2.37	24.48	0.24	0.13	0.26	0.02
2	38	68	2.37	2.40	24.18	0.36	0.20	0.31	0.02
3	34	102	2.40	2.43	23.82	0.36	0.20	0.35	0.03
4	47	149	2.43	2.46	23.46	0.36	0.20	0.25	0.02
5	49	198	2.40	2.42	23.88	0.24	0.13	0.16	0.01
6	46	244	2.42	2.46	23.55	0.42	0.23	0.30	0.02
7	29	273	2.46	2.47	23.28	0.12	0.07	0.14	0.01
8	40	313	2.47	2.50	23.01	0.42	0.23	0.35	0.03
9	30	343	2.50	2.52	22.71	0.18	0.10	0.20	0.02

^{1:} Porosity of gravel assumed to be 0.4 to correct drop in water. See Appendix D for details. *Porchet method used to convert percolation rate to infiltration rate. See Appendix D for details.

Stabilized, Unfactored Infiltration Rate*: 0.02 inch/hour

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BOREHOLE PERCOLATION TEST - I-1 INFILTRATION RATE



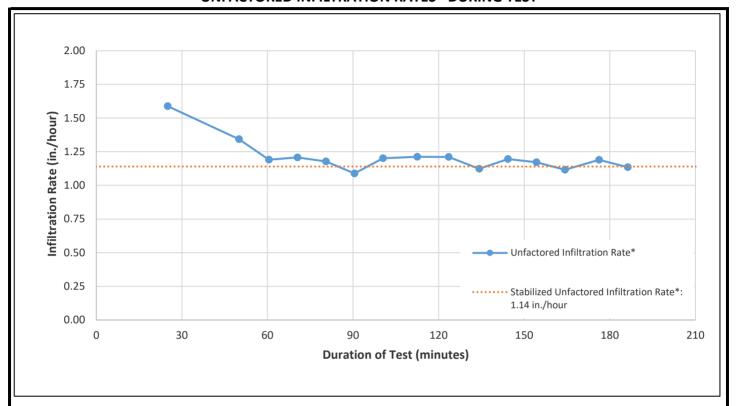
 Project Name:
 SDSU Mission Valley
 Date Drilled:
 3/12/2019
 Borehole Radius (*r):
 4 in.

 Project Number:
 SD605
 Date Tested:
 3/13/2019
 Casing Diameter:
 4 in.

 Test Hole Number:
 I-2
 Tested By:
 TSL
 Depth of Hole:
 5.0 ft

 Drilling Method:
 Hollow-Stem Auger
 Average Temp. of Water:
 60 F
 Average Test Depth:
 2.9' - 5'

UNFACTORED INFILTRATION RATES* DURING TEST



Preliminary Factored Infiltration Rate¹: 0.49 in./hr.

Feasibility Screening Factor of Safety, F.S.²: 2

Temperature Correction Factor^{2,3}: 0.86

Factored Infiltration Rate ²	Design Condition ²
Below 0.05	No Infiltration
0.05 to 0.5	Partial Infiltration
Above 0.50	Full Infiltration

^{*}Porchet method used to convert percolation rate to infiltration rate. See Appendix D for details.

- 1: Rate Factored by Factor of Safety and Temperature Correction Factor.
- 2: Reference: The City of San Diego, BMP Design Manual (2018).
- 3: Factor based on as-tested water temperature of 60 F and rainfall temperature of 50 F.

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BOREHOLE PERCOLATION TEST - 1-2 INFILTRATION RATE

<u></u> ← GROU	P DELTA
PROJECT NUMBER	FIGURE NUMBER
SD605	D-2.1

Project Name: SI	DSU Mission Valley	Date Drilled: 3/12/2019	Borehole Radius (*r): 4 in	
Project Number: SI	D605	Date Tested: 3/13/2019	Casing Diameter: 4 in	
Test Hole Number: 1-2	2	Tested By: TSL	Depth of Hole: 5.0	ft
Drilling Method: Ho	ollow-Stem Auger	Average Temp. of Water: 60 F	Average Test Depth: 2.9	' - 5'

DATA SHEET

Reading Number	Time Interval (min.)	Cumulative Time (min.)	Initial Depth to Water (ft.)	Final Depth to Water (ft.)	Average Height of Water (Head) (in.)	Measured Drop in Water Level (in.)	Corrected Drop in Water Level ¹ (in.)	Corrected Percolation Rate ¹ (in./hour)	Unfactored Infiltration Rate* (in./hour)
	Δt	Т	[from grou	nd surface]	H _{avg}	ΔН	ΔH _c	ΔH _c /Δt	l _t
Pre-soak	-	-							
1	25	25	2.27	3.61	24.72	16.08	8.84	21.23	1.59
2	25	50	2.80	3.76	20.64	11.52	6.34	15.21	1.34
3	11	61	2.97	3.35	22.08	4.56	2.51	14.33	1.19
4	10	71	2.96	3.33	22.26	4.44	2.44	14.65	1.21
5	10	81	2.97	3.33	22.20	4.32	2.38	14.26	1.18
6	10	91	2.87	3.22	23.46	4.20	2.31	13.86	1.09
7	10	101	2.95	3.32	22.38	4.44	2.44	14.65	1.20
8	12	113	2.95	3.39	21.96	5.28	2.90	14.52	1.21
9	11	124	2.93	3.34	22.38	4.92	2.71	14.76	1.21
10	11	134	2.96	3.33	22.26	4.44	2.44	13.63	1.12
11	10	144	3.00	3.36	21.84	4.32	2.38	14.26	1.20
12	10	154	3.02	3.37	21.66	4.20	2.31	13.86	1.17
13	10	164	3.05	3.38	21.42	3.96	2.18	13.07	1.12
14	12	176	2.81	3.27	23.52	5.52	3.04	15.18	1.19
15	10	186	3.02	3.36	21.72	4.08	2.24	13.46	1.14

^{1:} Porosity of gravel assumed to be 0.4 to correct drop in water. See Appendix D for details. *Porchet method used to convert percolation rate to infiltration rate. See Appendix D for details.

Stabilized, Unfactored Infiltration Rate*: 1.14 inch/hour

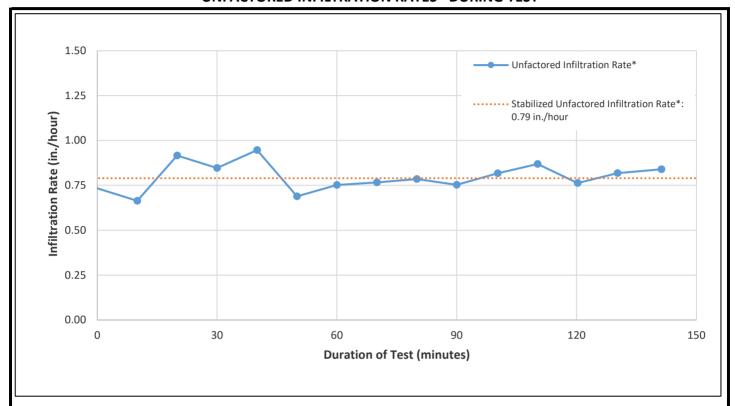
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BOREHOLE PERCOLATION TEST - I-2 INFILTRATION RATE



Project Name: SDSU Mission Valley	Date Drilled: 3/12/2019	Borehole Radius (*r): 4 in.	
Project Number: SD605	Date Tested : 3/13/2019	Casing Diameter: 4 in.	
Test Hole Number: I-3	Tested By: TSL	Depth of Hole: 4.8 ft	
Drilling Method: Hollow-Stem Auger	Average Temp. of Water: 60 F	Average Test Depth: 2.7' - 4.8'	

UNFACTORED INFILTRATION RATES* DURING TEST



Preliminary Factored Infiltration Rate¹: 0.34 in./hr.

Feasibility Screening Factor of Safety, F.S.²: 2

Temperature Correction Factor^{2,3}: 0.86

Factored Infiltration Rate ²	Design Condition ²		
Below 0.05	No Infiltration		
0.05 to 0.5	Partial Infiltration		
Above 0.50	Full Infiltration		

 $^{{\}bf *Porchet\ method\ used\ to\ convert\ percolation\ rate\ to\ infiltration\ rate.\ See\ Appendix\ D\ for\ details.}$

- ${\bf 1: Rate\ Factored\ by\ Factor\ of\ Safety\ and\ Temperature\ Correction\ Factor.}$
- 2: Reference: The City of San Diego, BMP Design Manual (2018).
- 3: Factor based on as-tested water temperature of 60 F and rainfall temperature of 50 F.

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BOREHOLE PERCOLATION TEST - I-3
INFILTRATION RATE

<u></u> GROU	P DELTA
PROJECT NUMBER	FIGURE NUMBER
SD605	D-3.1

Project Name: SDSU Mission Valley	Date Drilled: 3/12/20	19 Borehole Radius (*r): 4 in.	
Project Number: SD605	Date Tested: 3/13/20	19 Casing Diameter: 4 in.	_
Test Hole Number: 1-3	Tested By: TSL	Depth of Hole: 4.8 ft	
Drilling Method: Hollow-Stem Auger	Average Temp. of Water: 60 F	Average Test Depth: 2.7' - 4.8'	

DATA SHEET

Reading Number	Time Interval (min.)	Cumulative Time (min.)	Initial Depth to Water (ft.)	Final Depth to Water (ft.)	Average Height of Water (Head) (in.)	Measured Drop in Water Level (in.)	Corrected Drop in Water Level ¹ (in.)	Corrected Percolation Rate ¹ (in./hour)	Unfactored Infiltration Rate* (in./hour)
	Δt	T	[from grou	nd surface]	H_{avg}	ΔΗ	ΔH_c	ΔH _c /Δt	l _t
Pre-soak	-	-							
Pre-soak	(25)	(25)	2.70	3.55	19.50	10.20	5.61	13.46	1.25
Pre-soak	(25)	(50)	2.74	3.48	19.68	8.88	4.88	11.72	1.08
1	10	10	2.62	2.84	24.24	2.64	1.45	8.71	0.66
2	10	20	2.76	3.04	22.20	3.36	1.85	11.09	0.92
3	10	30	2.76	3.02	22.32	3.12	1.72	10.30	0.85
4	10	40	2.75	3.04	22.26	3.48	1.91	11.48	0.95
5	10	50	2.70	2.92	23.28	2.64	1.45	8.71	0.69
6	10	60	2.69	2.93	23.28	2.88	1.58	9.50	0.75
7	10	70	2.73	2.97	22.80	2.88	1.58	9.50	0.77
8	10	80	2.69	2.94	23.22	3.00	1.65	9.90	0.79
9	10	90	2.60	2.85	24.30	3.00	1.65	9.90	0.75
10	10	100	2.78	3.04	22.11	3.06	1.68	9.85	0.82
11	10	110	2.65	2.93	23.52	3.36	1.85	11.09	0.87
12	10	120	2.72	2.96	22.92	2.88	1.58	9.50	0.76
13	10	130	2.69	2.95	23.16	3.12	1.72	10.30	0.82
14	11	141	2.70	2.99	22.86	3.48	1.91	10.44	0.84

^{1:} Porosity of gravel assumed to be 0.4 to correct drop in water. See Appendix D for details. *Porchet method used to convert percolation rate to infiltration rate. See Appendix D for details.

Stabilized, Unfactored Infiltration Rate*: 0.79 inch/hour

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BOREHOLE PERCOLATION TEST - I-3 INFILTRATION RATE

