COPY

LEGACY PARKWAY

Project Number SP-0067(1)0

DRAFT

SEGMENT 4

GEOTECHNICAL INVESTIGATION REPORT

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.

For

Fluor Ames Kraemer, LLC

September, 2004

Fluor Ames Kraemer LLC

LEGACY

PB 100 YEARS

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Parsons Brinckerhoff Quade & Douglas, Inc.
Legacy Parkway Project
360 North 700 West, Suite F
North Salt Lake, Utah 84054
(801) 951-1900
Fax (801) 951-1840

September 30, 2004

COPY

Utah Department of Transportation
Legacy Parkway Office
360 North 700 West, Suite F
North Salt Lake, Utah 84054

Attention: Mr. Jim Higbee, P.E.
UDOT Geotechnical Oversight Engineer

Subject: Geotechnical Investigation Report
Segment 4 – Legacy Parkway Project
UDOT Project Number *SP-0067(1)0

Dear Mr. Higbee:

Attached herewith is a report of geotechnical investigation for construction of Segment 4 of the Legacy Parkway Project. Segment 4 generally encompasses the portion of the Legacy Parkway extending from north of the 1250 West interchange in Centerville, Utah to north of 250 South Street in Farmington, Utah, and includes a new interchange at Glovers Lane.

The accompanying report describes the field exploration and laboratory testing; summarizes our findings; and presents geotechnical recommendations for design and construction of a bridge, an MSE wall, embankments, and other structures. If you have any questions or comments concerning this report, please contact us.

Sincerely,

Parsons Brinckerhoff Quade & Douglas, Inc.

Michelle D. Cline, P.E.
Geotechnical Engineer

Fluor Ames Kraemer, LLC

K.N. Gunalan, Ph.D., P.E.
Design Manager

LEGACY PARKWAY

Project Number SP-0067(1)0

SEGMENT 3

GEOTECHNICAL INVESTIGATION REPORT

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.

For

Fluor Ames Kraemer, LLC

September, 2004

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1.0 INTRODUCTION

This report presents the results of the geotechnical field and laboratory investigations conducted for Segment 4 of the Legacy Parkway Design-Build Project (hereinafter, the Legacy Parkway Project) along with the analysis, evaluations, and recommendations for the construction of one bridge, one mechanically stabilized earth (MSE) wall, roadway embankments, and other structures. The information obtained during the design-build phase of the project was used to supplement the information provided in the Request for Proposals, Legacy Parkway Design-Build Project, 2000 (RFP) issued by the Utah Department of Transportation (UDOT).

1.1 General Project Description

The Preferred Alignment of the Legacy Parkway Project includes a new limited access parkway in south Davis County, located in north central Utah, along the Wasatch Front just north and west of the state's capitol, Salt Lake City. The location and vicinity of the Preferred Alignment with respect to the existing site features are shown on the Project Location Map and Project Vicinity Map in Appendix A. The project, which includes twenty-five bridges and four interchanges, stems between two existing facilities. The southern terminus is in North Salt Lake at I-215 and Redwood Road and the northern boundary meets U.S. 89 at I-15 in the city of Farmington. Within the 14-mile, four-lane divided parkway's right-of-way, there will be a multi-use/equestrian trail. Additionally, the Legacy Parkway Project includes a 2,098-acre nature preserve.

For ease of management, the Legacy Parkway roadway alignment is divided into five segments. Segment 4 extends northward from north of the 1250 West interchange in Centerville, Utah to just north of 250 South Street in Farmington, Utah, and includes a new interchange at Glovers Lane. Pertinent Segment 4 corridor lines included in this investigation are summarized in Table 1.

Table 1 Segment 4 Stationing

Line	Station
Legacy Parkway (LP)	6016+800 to 6019+995
Glovers Lane (G)	50+100 to 50+688

1.2 Proposed Improvements

In brief, Segment 4 includes construction along approximately 3.2 kilometers (km) of the Legacy Parkway alignment, including a bridge, an MSE wall, embankments, and other

structures such as signs and utilities. Additional details related to these features are provided in later sections of this report. The proposed Segment 4 roadway alignments and other site improvements are described below.

The new Legacy Parkway mainline, extending in a generally south-north direction, will be constructed between approximately LP 6016+800 (northern terminus of Segment 3) and LP 6019+995 (southern terminus of Segment 5), with provision for a utility corridor parallel to the west side of the mainline alignment between approximately LP 6016+800 (continuing from Segment 3) and 6018+600. A new Glovers Lane overpass will be constructed at approximately LP 6018+650, from the existing Glovers Lane roadway on the west side of the Legacy Parkway (G 50+100) and tying into the existing Glovers Lane at the Frontage Road intersection on the east side of I-15 (G 50+688). The existing overpass at Glovers Lane will be removed; the proposed new overpass will cross Legacy Parkway and the multi-use trail, the Union Pacific Railroad (UPRR), and I-15 by way of UDOT Bridge No. F-712 (G 50+352 to 50+588).

An earth berm, up to approximately 4 meters in height, will extend in a south-north direction parallel to the Legacy Parkway mainline (on the west side) between approximately LP 6018+800 and 6019+995 (continuing on into Segment 5). A new aluminum arch culvert (UDOT Structure No. V-2033) at approximately LP 6018+470 will convey the existing Steed-Davis Creek in an east-west direction beneath the Legacy Parkway mainline. Between approximately LP 6017+830 and 6018+500, the existing Steed Creek and Steed-Davis Creek will be relocated to run along the west and east sides, respectively, of the proposed roadway. Additionally, new pipe culverts and ditches will be constructed along the Legacy Parkway mainline and Glovers Lane.

Existing roadway pavements, parking lots, and buildings at 250 South Street will be removed from within the proposed Legacy Parkway right-of-way between approximately LP 6019+890 and 6019+980. A new cul-de-sac will be constructed at 250 South west of the mainline.

2.0 PREVIOUS INVESTIGATIONS

A geotechnical study was performed by Dames and Moore for UDOT to evaluate the general subsurface and groundwater conditions along the proposed preliminary corridor. The details of the study are included in a report dated 1998 and is available with the UDOT Legacy Parkway Management Team.

Subsequently, Kleinfelder, Inc. conducted a geotechnical field and laboratory investigation along the Preferred Alternative Alignment for the Legacy Parkway Project for UDOT. The details of the investigation are contained in a report dated June 2, 2000, also available with the UDOT Legacy Parkway Management Team. Some of the information presented in the 2000 report is repeated here for completeness.

3.0 EXISTING FACILITIES

Existing facilities in this segment of the Legacy Parkway Project include the existing 250 South roadway and adjacent properties; the existing Glovers Lane bridge (UDOT Bridge No. C-448) over UPRR and I-15; pipe culverts; ditches; and utilities.

Steed Creek and Davis Creek (south of Steed Creek) generally flow in a westward direction (with local deviations) from the Wasatch Mountains east of the project. Pipe culverts near the existing Glovers Lane overpass divert the creeks in an east-west direction beneath I-15 and UPRR. Immediately west of UPRR (and east of the proposed mainline), Steed Creek continues in a southwest direction, crossing the site of the proposed alignment between approximately LP 6018+470 and 6018+560. The east-west trending Davis Creek merges with Steed Creek at approximately LP 6018+470; from this point, the Steed-Davis Creek then continues southward in the vicinity of the southbound lane of the proposed mainline until veering to the southwest at approximately LP 6017+830.

4.0 FINDINGS

4.1 Site Conditions

Segment 4 consists primarily of undeveloped land and wetland areas, as well as other facilities previously described. Topography in the area slopes gently to the south, with ground surface elevations ranging from approximately 1287 to 1298 meters.

4.2 Surface Drainage

Surface drainage in the vicinity of Segment 4 is generally to the southwest towards the Great Salt Lake. As indicated in the Kleinfelder (2000) report, there is a potential for local areas of flooding where streams cross the Legacy Parkway alignment.

4.3 Geology

The Legacy Parkway Preferred Alignment is located within the heart of the Salt Lake Valley on the eastern edge of the Basin and Range physiographic province. The Basin and Range province, extending from western Utah to the west through most of Nevada, consists of linear valley basins divided by several north-south trending mountain ranges. Salt Lake Valley is bounded by the Wasatch Mountain Range to the east and by the Oquirrh Mountain Range to the west. The valley is located within the Lake Bonneville Basin, a sediment-filled structural basin bounded by faults and formed over the past 20 million years.

Tectonic activity in the region has helped shape the existing topography. The Salt Lake Valley lies within the Intermountain Seismic Belt, a delineated zone of numerous fault traces and historical earthquakes in the Intermountain West.

Paleolakes have inundated the project vicinity at least four times during the late Pleistocene. During the Bonneville Lake Cycle which occurred between about 27,000 and 12,000 years ago, the area was inundated to an elevation of about 1585 meters. This represented the highest elevation of the Late-Pleistocene Lake Cycles. The historic average surface elevation (between the years 1847 and 1986) of the Great Salt Lake located just west of the project alignment is about 1280 meters (U.S. Geological Survey, 2001). The elevation of today's Great Salt Lake is approximately the same as the elevation approximately 11,000 years ago.

Surficial geology in the area consists of unconsolidated Quaternary sediments with Precambrian- to Tertiary-aged rock outcrops on Wasatch Mountain slopes east of the project site. Near-surface soils consist predominantly of fine-grained materials related to regressive lake cycles. These sediments include stream alluvium (upper Holocene),

lateral-spread deposits (Holocene to middle Pleistocene), lacustrine silt and clay undivided (uppermost Pleistocene), and young lacustrine and marsh deposits (upper Holocene). Bedrock is estimated to be located at a depth of about 180 to 770 meters below the ground surface.

4.4 Climatic Conditions

Climatic data for the proposed project were extrapolated from data collected at the Salt Lake City International Airport (SLCIA) Weather Station, located approximately 20 km southwest of Segment 4. Climatological normal (30-year average recorded during the period 1961 to 1990) daily mean temperature is 11.1 degrees Celsius (°C) (annual mean), with a maximum value of 25.0 °C in July and a minimum value of -1.6 °C in January. Normal annual precipitation is approximately 42 centimeters (cm), with a maximum value of 5 cm in May and a minimum of 2 cm in July. Average annual cumulative snowfall over a 74-year monitoring period is about 149 cm, with recorded average snowfalls of about 18 cm or more recorded during the months of November through March. Based on data collected over a 69-year time period, conditions at SLCIA are clear for 125 days per year, partly cloudy for 101 days per year, and cloudy for 139 days per year (National Oceanic and Atmospheric Association, 2003).

4.5 Faulting and Seismicity

In the Basin and Range physiographic province, extensional tectonics has created a series of normal faults, particularly along the bases of mountain ranges. One of these faults is the Wasatch Fault, which extends along the base of the Wasatch Mountains that define the eastern boundary of Salt Lake Valley. The Wasatch Fault is one of the longest and most active faults in the world, and is considered capable of producing earthquakes as large as magnitude 7.3. The combined average repeat time for earthquakes greater than magnitude 7.0 on the five central segments (Brigham City, Weber, Salt Lake City, Provo, Nephi segments) of the Wasatch Fault is approximately 350 years. On any one segment, the average repeat time ranges from about 1,200 to 2,600 years (Utah Geological Survey, 2004).

The north end of the proposed Legacy Parkway alignment is located approximately 0.9 kilometers west of the Weber segment of the Wasatch Fault Zone. The south end of the proposed alignment is located approximately 4.0 km north of the end of an inferred trace of the Taylorsville Fault of the West Valley Fault Zone. The seismically active West Valley Fault Zone is located within the Salt Lake Valley west of the Wasatch Fault and is considered capable of generating earthquakes as large as magnitude 7.0. Based on proximity to the proposed project, the Weber segment of the Wasatch Fault Zone is considered to be the primary seismic source.

4.6 Soil Materials

Based upon materials encountered in explorations performed by Kleinfelder (2000) and supplemental explorations performed by Fluor Ames Kraemer, LLC (FAK), the native soil profile along the proposed Segment 4 alignment consists of clay and silt layers with interbedded sand and gravel layers. Additional information regarding subsurface materials beneath the proposed bridge structure is presented later in this report.

4.7 Geohydrologic Conditions

The Quaternary basin-fill material in the Salt Lake Valley is characterized geologically into a shallow unconfined aquifer overlying a deep confined aquifer, with locally unconfined perched aquifers. The uppermost confining layer in the basin, which defines the top of the confined aquifer, is generally located within about 15 meters of the ground surface. The deep confined aquifer consists of interbedded clay, silt, sand, and gravel. The primary recharge area for this aquifer is near the Wasatch Mountain Front, where there is relatively little fine-grained material to impede infiltration into the ground.

In the vicinity of the Legacy Parkway Project, groundwater is typically located at depths of about 2 to 5 meters below the natural ground surface, and the gradient is generally toward the west. Reported data in the literature that indicate the potentiometric surface is above the ground surface in localized areas along the project alignment; artesian conditions may be present in these areas.

4.8 Potentially Hazardous Materials

Potentially hazardous materials were not observed by field personnel during subsurface explorations. Further assessment of potentially hazardous materials was not within the scope of work for this geotechnical study.

5.0 EARTHQUAKE CONSIDERATIONS

5.1 Seismic Hazards

Seismic hazards considered in analysis and designs include surface fault rupture, ground shaking, and liquefaction. No active faults are known to cross the project alignment and therefore surface fault rupture hazards are not expected to impact the project. However, ground shaking associated with an event along the Wasatch Fault should be anticipated. The Wasatch Fault Zone is considered capable of generating earthquakes as large as magnitude 7.3.

The primary factors affecting the potential of a soil deposit to liquefy include level and duration of seismic ground motion, depth to groundwater, soil type, and soil density. Liquefaction potential of the site soils in the vicinity of Bridge No. F-712 was evaluated in general accordance with the methods presented in Youd and Idriss (1997) using data obtained from Borings SB-19-274, SB-19-276, SB-19-279, LSB-19-473, SB-19-281, and RB-370, and Cone Penetrometer Test (CPT) Soundings SC-19-275, SC-19-277, SC-19-278, and SC-19-280. Results of our analysis indicate that should an earthquake of sufficient magnitude occur, localized zones within the site soils above an elevation of approximately 1275 meters may experience liquefaction when subjected to strong ground motions for a sufficient duration. Liquefaction-induced settlement at the bridge site was evaluated in general accordance with the procedures presented in Tokimatsu and Seed (1987). The analysis methodology is explained in detail in a design memorandum included in Appendix G. Based on the results of the analysis, liquefaction-induced settlements at the bridge site were estimated to range from about 16 to 170 millimeters (mm).

Based on evidence of historical liquefaction-induced horizontal displacements within the Segment 4 project limits, liquefaction-induced lateral spread was considered for potential impacts to the proposed construction. The northern portion of Segment 4 is located within the Farmington Siding Landslide Complex, which consists of liquefaction-induced landslides that date back to latest Pleistocene and Holocene time. Based on review of maps presented in Hylland and Lowe (1998), the proposed Bridge No. F-712 site is located near the southern mapped boundary of the complex. The site lies within the older mapped portion of the complex, approximately 2¼ km east of the younger mapped portion. The Hylland and Lowe (1998) study indicated that susceptibility to liquefaction-induced landslides may be less than in earlier due to lower average lake and associated groundwater levels. The study also indicated that above-average precipitation could create locally perched conditions which could liquefy and slide when subject to strong ground motions.

Liquefaction-induced lateral spreading was assessed for the Bridge No. F-712 site using data obtained from the exploratory borings (SB-19-274, SB-19-279, LSB-19-473, and SB-19-281) and the revised multilinear regression equations by Youd, Hansen, and Bartlett (2002). Based on the results of the analysis, horizontal displacement due to liquefaction-induced lateral spreading in localized soil layers was estimated to range from about 0.3 to 3.1 meters. No horizontal displacement was estimated in Boring SB-19-276, located near the center of the proposed bridge. The potentially liquefiable layers contributing to the lateral spread hazard at this bridge site do not appear to be continuous; therefore, no mitigation measures are recommended. It should be noted that the proposed installation of wick drains and the use of surcharge to preload the soils will reduce the liquefaction and lateral spread potential by allowing rapid dissipation of seismically-induced pore pressures and densification of the native soils.

5.2 Design Criteria

In accordance with the RFP for the Legacy Parkway Project and communication with UDOT, bridges and embankments/retaining walls located within 15 meters of bridge supports were designed to meet a seismic hazard level of 10% exceedence in 250 years, which was selected for the project as a peak ground surface acceleration (PGA) of 0.6*g*. Embankments and walls not supporting abutments were designed to meet a seismic hazard level of 10% exceedence in 50 years, which was selected for the project as a PGA of 0.29*g*. Liquefaction and stability analyses were conducted on the basis of these seismic design criteria.

6.0 FIELD AND LABORATORY TEST DATA

6.1 Field Exploration

Field exploration for Segment 4 included eleven borings and four CPT soundings that were carried out as part of the Kleinfelder's (2000) study. Subsequent to this initial investigation, three additional borings were drilled in the vicinity of the proposed bridge. The locations of explorations completed during the original and supplemental investigations are listed in the Exploration Information Table in Appendix A. The approximate locations of explorations conducted during Kleinfelder's study (2000) are indicated on the Exploration Location Drawings in Appendix A. The locations of explorations completed at the bridge site during both the initial and supplemental investigations are shown on the Soil Data Exploration Location Plan in Appendix A. The locations represented on the figures in Appendix A are based on the coordinates shown in the Soil Exploration Information Tables; the station and offset shown in the table (and on the exploration logs) may not reflect final alignment stationing.

Logs of subsurface conditions encountered in the borings and CPT soundings are presented in Appendix B. Included with the logs in Appendix B are a Key to Boring Log Soil Symbols and Terms and a CPT Classification Chart.

In general, the locations and planned depths of the explorations were determined based on the preliminary height and location of the bridge and roadway embankments. Borings for the bridge structure were usually drilled until Standard Penetration Test (SPT) blowcounts of about 30 blows per 0.3 meters were observed for three consecutive 1.5-meter intervals. CPT soundings were continued until refusal of the cone was reached. The number and depths of explorations corresponding to each feature are summarized in Table 2.

Table 2 Number and Depths of Explorations for Segment 4

	Borings		CPT Soundings	
Feature	**No.**	**Depth, m**	**No.**	**Depth, m**
Bridge	7	33.5-46.3	4	20.3-55.1
Roadway Embankments	7	8.8-22.6	0	--

Each exploration was assigned an alphanumeric identification according to:

(SB, RB, LSB, SC)-XX-XXX

where,

SB = structure (bridge) boring
RB = roadway boring
LSB = additional structure (bridge) boring
SC = structure CPT sounding
XX = two-digit number corresponding to the assigned FAK structure number; blank for roadway borings
XXX = three-digit number representing a sequential numbering system for borings and soundings

6.1.1 Borings

Borings were accomplished using truck-, track-, or ATV-mounted drills equipped for soil sampling. Hollow-stem auger or mud rotary drilling method was used. Drilling fluid was used as necessary during drilling to equalize hydrostatic pressures in order to reduce the potential for heave and help control artesian water pressures. Typically, soil sampling was attempted at 0- (i.e., continuous sampling) to 3-meter intervals. Disturbed soil samples were collected using a SPT or modified California split-barrel sampler driven by a 63.5 kg hammer free-falling from a height of 762 millimeters (mm). The sampler driving resistance, expressed as "blows per 0.15 m" on the boring logs, was recorded for each sampling depth by the field engineer during drilling.

These field-determined blowcounts were corrected for hammer energy, overburden pressure, rod length, and sampler diameter (as applicable for the modified California sampler) to obtain the $(N_1)_{60}$ values shown on the boring logs. To determine energy correction factors, UDOT performed a hammer efficiency test on each hammer. The SPT hammer calibration records are included in Appendix C. Corrections for sampler diameter were made with the following equation:

$$N_{correct} = N_{measured} * \frac{(2)^2 - (1.375)^2}{D_o^2 - D_i^2}$$

where,

D_o= outside diameter of modified California sampler (63.5 mm for this study)
D_i= inside diameter of modified California sampler (50.8 mm for this study)

Relatively undisturbed soil samples were collected with 76.2 mm outer-diameter by 762 mm long Shelby tubes pushed hydraulically or with a mechanically operated piston sampler. After visual classification in the field, the samples were packaged to prevent

moisture loss and transported to the laboratory for testing. Upon completion, borings were backfilled with a 30 percent solid bentonite grout placed by tremie methods.

6.1.2 CPT Soundings

CPT soundings were performed using a truck- or track-mounted rig designed and equipped to conduct the tests. A calibrated piezocone was used to measure tip resistance (Q_T), sleeve friction (F_s), and pore pressure at nearly continuous depth intervals. The piezocone calibration reports are included in Appendix C. Once collected, the data were processed with a specialized software program to produce the CPT sounding logs. The soil profile shown on each of the sounding logs was determined based on the Robertson and Campanella (1990) classification system, whereby a "Soil Behavior Type" (SBT) is assigned to soils based on measured Q_T and F_s values. A CPT Classification Chart is included with the CPT sounding logs in Appendix B. It should be noted that the cone penetrometer SBT classifications do not necessarily correlate with the soil descriptions given on the boring logs.

The shear strength parameters, $(N_1)_{60}$, relative density, and overconsolidation ratio (OCR) were estimated for each depth interval based on standard published correlations as described in Appendix D. These data are summarized on the CPT Output Tables, also included in Appendix D.

Two dynamic pore pressure dissipation tests were performed in each of Soundings SC-19-275, SC-19-277, SC-19-278, and SC-19-280. This test consisted of collecting pore pressure measurements while keeping the piezocone stationary for a period of time. Results of the dynamic pore pressure dissipation tests, in the form of plots of pore pressure versus time, are included in Appendix E. Upon completion of testing, CPT sounding holes were filled with a bentonite grout using tremie methods.

6.2 Laboratory Testing

Recovered soil samples were visually classified in the field and again in the laboratory by a second engineer or geologist. As part of the laboratory classification process, Shelby tube samples were extruded for assessment of stratigraphic variations (such as sand and silt layers) and to conduct torvane shear tests. Based upon the visual classifications and laboratory test results, soils were classified in general accordance with the Unified Soil Classification System (USCS). The USCS is described on the Key to Boring Log in Appendix B.

Laboratory tests were conducted on selected soil samples for classification purposes and to estimate pertinent physical and engineering properties. These tests include: natural dry unit weight and moisture content; Atterberg Limits (ASTM D 4318); particle size distribution including percent passing the No. 200 sieve (percent fines; ASTM D 422); one-dimensional consolidation (ASTM D 2435); direct shear (ASTM D 3080); unconfined compressive strength (ASTM D 2166); specific gravity (ASTM D 854); and corrosion resistance analyses including resistivity, pH, and water soluble sulfates (performed in general accordance with standard test methods). Results of laboratory tests are presented on the Summary of Laboratory Test Data Table and test reports in Appendix F, as well as on the boring logs in Appendix B.

7.0 GEOTECHNICAL ANALYSIS AND RECOMMENDATIONS

7.1 Bridge

Bridge No. F-712 (FAK No. 19) will be constructed along Glovers Lane (between G 50+352 and 50+588) over the Legacy Parkway mainline, UPRR, and I-15 at approximately LP 6018+650. This six-span, precast concrete bridge will be 20.6 meters wide with span lengths ranging between 31 and 45 meters.

7.1.1 Subsurface Conditions

7.1.1.1 Soils

Native soils within Segment 4 of the Legacy Parkway Project may generally be described clay and silt layers with interbedded sand and gravel layers. A more detailed discussion of materials encountered at the Bridge No. F-712 site is presented below. The soil descriptions are based on review of logs of 9 explorations completed at the site (LSB-19-473, SB-19-274, SB-19-276, SB-19-279, SB-19-281, SC-19-275, SC-19-277, SC-19-278, and SC-19-280). Additional information is presented on the logs provided in Appendix B. It is noted that stratification boundaries shown on the boring logs represent the approximate location of changes in material types; in situ, the transitions may be gradual.

Existing embankment fill in the vicinity of Bridge F-712 extends to depths ranging between about 1 and 11.5 meters below the ground surface. The subsurface profile beneath the fill consists of interlayered clays (CL, CL-ML) and silts (ML, MH) with interbedded layers of sand (SP, SP-SM, SM, SC) and gravel (GP, GM, GC). The near-surface native soils are predominantly fine-grained to an elevation of about 1268 meters; below, the soils are predominantly granular. In general, the consistency/relative density of the site soils increases with depth; an exception is noted in Boring SB-19-281, where a zone of generally dense sand is underlain by a layer of medium dense sand (to the maximum depth explored).

Above an elevation of approximately 1268 meters, the clay/silt layers are very soft to medium stiff with some stiff zones, and the sand/gravel layers are loose to dense. Typical $(N_1)_{60}$ values in these upper clays/silts range from 0 to 8 (with higher values in the stiffer zones), and those in the upper sands/gravels range from 4 to 38. At lower elevations, the clay/silt layers are stiff to very stiff with $(N_1)_{60}$ values ranging from 12 to 16, and the sand/gravel layers are generally medium dense to very dense with typical $(N_1)_{60}$ values ranging from 15 to greater than 50. A relatively thin zone of loose sand, with a measured $(N_1)_{60}$ value of 9, was encountered near the bottom of Boring SB-19-274.

Average tip resistances measured during CPT soundings in the upper 20 to 55 meters of the profile range from about 0.5 to 3 MPa in the clay/silt layers and from approximately 12.5 MPa to greater than 25 MPa in the sand/gravel layers.

7.1.1.2 Groundwater

Based on available historical information and our experience with site conditions in this general location, groundwater is estimated to be located at depths of about 2 to 5 meters below natural grade. Drilling fluid was used as needed during drilling operations; for this reason, groundwater elevations were not typically measured and therefore are not indicated on the majority of the boring logs in Appendix B.

7.1.2 Analysis and Design Recommendations

Capacity, settlement and drivability analyses of piles were conducted based on anticipated service loads (provided by the structural engineers) and subsurface conditions in the relevant borings and CPT soundings. The software program Unipile® was used to estimate capacity and settlement. The program GRLWEAP® was used for evaluation of pile drivability. Piles were designed to develop axial capacity using a combination of end-bearing and side friction. A factor of safety (FS) of 2.25 was used to compute the estimated target ultimate resistance as recommended by AASHTO (1996). The Design Protocol for Evaluation of Axial Pile Capacity analysis is explained in detail in a memorandum included in Appendix G. The analysis was conducted assuming that piles would be driven prior to construction of embankments.

For the Legacy Parkway Project, proposed bridge foundations for the bents and the abutments will consist of 406-mm diameter concrete-filled pipe piles. Pipe piles will consist of Grade 3 steel, with a minimum yield strength of 448 MPa and a shell thickness of 9.5 mm.

Summary design data for the Segment 4 bridge structure are presented in Table 3 on the following page. Additional design data, including reference to explorations used in analyses, are included with the Geotechnical Recommendations for Bridge 19 memorandum in Appendix G. Maximum pile settlements, estimated as described in the pile capacity protocol in Appendix G, were determined to be within the limits specified by the contract documents.

Table 3 General Pile Design Data

Bridge No.	Support No.	Minimum Pile Tip Elevation, m	Estimated Pile Length, m	Service Load, kN	Required Driving Resistance, kN
F-712 (FAK No. 19)	Abut 1	1266.8	31	912	2,052
	Bent 2	1267.0	26	467	1,953
	Bent 3	1267.0	25	467	1,997
	Bent 4	1269.0	22	467	2,260
	Bent 5	1263.0	29	467	1,978
	Bent 6	1268.0	25	467	2,105
	Abut 7	1260.5	38	912	2,052

Based on the subsurface conditions encountered in the borings and CPT soundings, standard correlations were used to develop soil parameters for lateral pile analysis. These soil parameters are summarized in the Soil Parameters for LPILE or GROUP (Structures) Table in Appendix G.

7.1.3 Pile Capacity Field Verification

The design loads must be field-verified using Pile Driving Analyzer (PDA) equipment in accordance with the requirements of the contract during the driving of the initial pile at each abutment and bent location. After initial penetration into the bearing strata, the piles shall be retapped after a period of 24 hours to confirm the required capacity has been achieved. Driving criteria shall be established at each abutment/bent location based on review of the PDA data and in consultation with the geotechnical engineer.

7.1.4 Construction Considerations

Temporary shoring of earth slopes will be required; excavations for pile caps shall be conducted in accordance with applicable safety regulations and UDOT specifications. Based on anticipated groundwater conditions, groundwater may be encountered in excavations and should be removed by pumping or other appropriate means. It is recommended that excavations be dewatered a minimum of 1 meter below bottom of footing at all times during pile driving.

Pile driving shall be accomplished in accordance with applicable UDOT specifications and contract requirements using approved, standard diesel or hydraulic pile hammers. Provisions shall be made to avoid damage to existing utilities, adjacent foundations, and other potential conflicts. The geotechnical engineer shall be contacted if the minimum

pile tip elevation is not achieved. Upon approval of pile driving activities by the geotechnical engineer, placement of the pile cap concrete and filling of pipe piles with concrete shall be performed in accordance with UDOT specifications.

7.2 Embankments

At Glovers Lane, maximum embankment heights (without surcharge) at the Bridge No. F-712 abutments are approximately 7 meters. Along the Legacy Parkway mainline, embankment heights are approximately 3 meters or less.

7.2.1 Analysis and Design Recommendations

Settlement analysis was conducted in general accordance with the Protocol for Estimating Primary and Secondary Settlement Magnitude, Surcharge Height, and Wick Drain Spacing, included in Appendix G. Estimated settlement magnitudes (primary plus four cycles of secondary) for the Glovers Lane embankments are given in Table 4.

Table 4 Estimated Settlements, Surcharge Heights, and Wick Drains

Approx. Station	Embank Sttlmnt[1], mm	Surcharge Height[2], m	Wick Spacing/ Time[3]	Wick Length, m[4]	Notes
G 50+310 to 50+940[5]	100-1025	0-2.5	3 m/105 days	25	N/R[6] for 50+310 to 50+460, 50+920 to 50+940
			2 m/45 days		

[1] Range of settlement (100% primary plus 4 cycles of secondary) estimates for all cross-sections evaluated.
[2] Surcharge height required to reduce the amount of time to remove 100% primary plus 4 cycles of secondary consolidation in the native soils beneath the proposed embankment to meet the construction schedule settlement time.
[3] Preliminary wick drain spacing (meters) and estimated time (days) to remove settlement in the native soils beneath the proposed embankment with surcharge and wick drains; use 3-meter spacing for one-stage construction and 2-meter spacing for two or more stages of construction.
[4] Estimated wick drain length; to be field-verified.
[5] Beginning and end stations of the Glovers Lane alignment at the time the settlement analysis was completed.
[6] N/R = Surcharges/wicks are not required (NR).

The time for completion of primary and secondary (four cycles) settlement for embankments with surcharge and without wick drains was estimated to be about 1000 days for the Glovers Lane embankments. To reduce the amount of time for completion and thereby minimize post-construction consolidation settlement, surcharges with prefabricated vertical drains at triangular spacings of 2 or 3 meters are recommended for embankment fills greater than 3 meters in height. General recommendations for surcharge and vertical (wick) drains for the Glovers Lane alignment are included in Table

4; additional details are provided in the Embankment and Grading Summary Table in Appendix G. Our analysis was based on the assumption that wick drains with a width of 100 mm, a thickness of 2 mm, and a length of 25 meters will be installed in a triangular spacing pattern. The amount of time necessary to achieve the required amount of settlement is dependent upon the wick drain spacing, and must be field-verified by settlement monitoring during construction. The geotechnical engineer shall be consulted prior to placement of subsequent stages or surcharge removal to verify that the required degree of settlement has occurred.

Global stability of slopes with and without surcharge was evaluated using a limit equilibrium software program, GSTABL7, with Bishop's modified method of slices to estimate the minimum factor of safety along the critical failure surface. Soil strength parameters input into the slope stability model were estimated by the SHANSEP method. Based on communication with personnel from UDOT, global stability was evaluated using the design Factors of Safety (FS) shown in Table 5.

Table 5 Minimum Factors of Safety for Global Stability of Embankments

Condition	Abutment Embankments[1]	General Embankments
Staged Construction, Static, Adjacent Impact	1.3	1.3
Staged Construction, Static, Non-Impact	1.1	1.1
Long-Term, Static	1.3	1.25
Long Term Dynamic, PGA = 0.6g (10% PE in 250 years)	1	1

[1] Within 15 meters of the abutment.

Results of the stability analyses, presented in the Summary of Global Stability Calculations Table in Appendix G, indicate that high-strength geotextile (HSG) reinforcement will be required for embankments at Glovers Lane to achieve the required FS under seismic conditions. Approximate locations where HSG is required are identified in the High Strength Geotextile and Staging Options Memorandum in Appendix G. Geotextile reinforcement with strength parameters meeting or exceeding that of Comtrac 1000 geotextile shall be used. Three options for HSG placement, including location, number of layers, elevation, length, and warp direction orientation, are presented in tabular form in the HSG and Staging Options Memorandum.

Results of the short-term stability analysis indicate that staging of some embankment fills (including surcharge) is required to achieve a gain in undrained shear strength and reduce

the potential for foundation instability. Staging options for the Glovers Lane embankment fills are included with the HSG information in Appendix G.

7.2.2 Instrumentation

Instrumentation installation and monitoring, performed in accordance with the requirements of the contract, will be required to assess design assumptions; evaluate percent consolidation prior to surcharge removal; monitor stability during construction; and assess long-term performance. Instrumentation will include traditional survey settlement plates and vibrating wire settlement sensors to monitor embankment/wall settlements; vibrating wire pore pressure transducers to monitor induced pore pressures; and slope inclinometers for monitoring lateral deflections at the toe of an embankment/wall. An Instrumentation Plan for the Legacy Parkway Project has been developed in accordance with RFP requirements and is included in Appendix G. The Instrumentation Plan shall be re-evaluated during construction and in consultation with the geotechnical engineer to verify that the specified instrumentation is adequate for evaluation of embankment/wall performance.

7.2.3 Construction Considerations

It is recommended that water encountered in embankment excavations be removed promptly. If soft, wet, pumping, or otherwise unsuitable soils are exposed at subgrade elevation, the recommendations provided in the Subgrade Preparation Guidelines Memorandum in Appendix G should be followed.

Embankment construction shall be accomplished using approved materials in accordance with applicable contract requirements. Consideration must be given to avoid damage to existing utilities, adjacent facilities, and geotechnical instrumentation during and after construction.

In general, permanent fill slopes shall be constructed with slopes no steeper than 2H (horizontal): 1V (vertical). Where permanent fill slopes no steeper than 1½:1 (H:V) are required, slope paving shall be used. Temporary construction excavations should be properly sloped or shored. All excavations shall be accomplished in accordance with applicable federal, state, and local standards.

7.3 Retaining Wall

Roadway design for Segment 4 has identified the need to construct one MSE wall (UDOT Wall No. R-392-01) for support of the west abutment of Bridge No. F-712. The wall will be located at approximately LP 50+350, and will be about 40 meters in length and 4 meters (maximum) in height.

7.3.1 Analysis and Design Recommendations

Analysis of global stability, bearing capacity and settlements are discussed in this section. Per general industry practice for design/construction of MSE walls, internal stability analysis is the responsibility of the proprietary wall designer. Wall design shall include consideration for applicable static and seismic loadings, adjacent structures, supported signs and light poles, etc. Ranges of magnitudes for the various geotechnical parameters for the MSE wall design are provided in Table 6 below.

Table 6 Geotechnical Parameters for MSE Wall

Parameter	Units	Material Type	Value
Unit Weight	kN/m^3	Select Backfill	20.5
		Random Backfill	19.7
Poisson's Ratio	-	All	0.4
Young's Modulus	MPa	Clay	2-50
		Silt	2-20
		Loose Sand/Gravel	50-150
		Dense Sand/Gravel	100-200
Friction Angle	degrees	Clay	0
		Sand	22-36
Cohesion	kPa	Clay	50-100
		Sand	10

Analysis of wall stability was performed in conjunction with the embankment stability analysis; a more thorough discussion of the analysis methodology is provided in the "Embankments" section of this report. Based on the analysis results, HSG fabric is recommended for the embankments and supporting wall along Glovers Lane to mitigate long-term stability under seismic conditions; recommendations for HSG were discussed in the "Embankments" section of this report.

Native subgrade materials beneath walls consist of clays and silts with an allowable bearing capacity on the order of 60 kPa. It is recommended to overexcavate to 1 meter below the bottom of the footing and backfill using select material in accordance with project specifications. Overexcavation and replacement should extend at least 1 meter beyond each edge of the footing. Footings established on a minimum of 1 meter of properly placed and compacted select backfill may be proportioned for a maximum allowable bearing pressure of 120 kPa.

Estimated wall settlements were computed in conjunction with the embankment settlement analyses. Prefabricated vertical wick drains are recommended for high walls and embankments as required to achieve the required degree of consolidation prior to pavement construction.

7.3.2 Construction Considerations

Wall construction shall be accomplished using approved materials in accordance with applicable contract requirements and manufacturer's guidelines. The MSE wall shall be constructed with facing panels founded on a concrete leveling pad, and should be embedded (to top of leveling pad) at least 750 mm below lowest adjacent grade for frost protection. In accordance with AASHTO requirements, a minimum of 1.2-meter wide horizontal bench shall be provided in front of retaining walls founded on slopes. However, no bench is required where the slope in front of an abutment wall consists of concrete slope paving; a minimum of 0.6 meters of embedment in front of such walls shall be provided. Drainage behind walls shall be considered in design and construction.

It is recommended that water be promptly removed when encountered in foundation excavations. If soft, wet, pumping, or otherwise unsuitable soils are exposed at subgrade elevation, the recommendations provided in the Subgrade Preparation Guidelines Memorandum in Appendix G shall be followed. As discussed in the "Embankments" section earlier in this report, instrumentation shall be installed and monitored to evaluate settlements and lateral deflection. Consideration must be given to avoid damage to existing utilities, adjacent facilities, and instrumentation during and after construction.

7.4 Arch Culvert

Segment 4 includes construction of a new arch culvert (UDOT No. V-2033) for the Steed-Davis Creek beneath the Legacy Parkway mainline at approximately LP 6018+470. The new culvert will be approximately 7.56 meters wide and 70 meters long. Recommendations for allowable bearing pressures and embedment depths are summarized in the Bearing Capacity Recommendation – Steed Creek Structure Memorandum and Summary Sheets in Appendix G.

Groundwater will likely be encountered during excavation and if so, dewatering is recommended. Foundations shall bear on properly prepared subgrade soils as described in the "Earthwork" section later in this report.

7.5 Sign Structures

Overhead and cantilever sign structures will be supported on drilled caissons in natural soils and/or engineered fill. Information obtained from nearby borings and/or CPT

soundings was used for geotechnical analyses as needed. Recommended soil parameters for design of sign foundations were developed using standard correlations and are summarized in a memorandum included in Appendix G.

Casings for drilled shafts will likely be required where groundwater is encountered. Foundations shall bear on properly prepared subgrade soils as described in the "Earthwork" section later in this report.

7.6 Utilities

Settlement analysis was conducted for utilities in accordance with the protocol in Appendix G. Results of settlement analyses for utilities at some Segment 4 locations are presented in Table 7.

Table 7 Estimated Maximum Settlements for Utilities at Selected Locations

Approximate Station	Embankment Height, m	Est. Maximum Settlement, mm
LP 6018+620	1.8	100
LP 6019+100	1.8	100
LP 6019+468	1.8	100
LP 6019+900	0.3	25

Anticipated settlements shall be taken into consideration in design of new utilities and installation/relocation of existing utilities. Ground improvement techniques such as use of lightweight fills or surcharge with wick drains may be employed as a technique for settlement mitigation. The geotechnical engineer shall be consulted if evaluation of settlement impacts for underground utilities is required during construction.

Groundwater may be encountered during excavation and if so, dewatering is recommended.

7.7 Earthwork

All earthwork operations, including stripping, subgrade preparation, excavation, fill placement and compaction, dewatering, etc., shall be conducted in accordance with the requirements of the contract and applicable UDOT specifications. All soil materials used on the project, including but not limited to, embankment fill, select wall backfill, random wall backfill, ground improvement soils, and drainage materials, shall conform to applicable specifications. Excavated soil materials may be suitable for re-use provided that they meet specification requirements and are approved by the geotechnical engineer.

In general, permanent fill slopes shall be constructed with slopes no steeper than 2:1 (H:V). Where permanent fill slopes no steeper than 1½:1 (H:V) are required, slope paving shall be used. Temporary construction excavations should be properly sloped or shored. All excavations shall be accomplished in accordance with applicable federal, state, and local standards.

8.0 CLOSURE AND LIMITATIONS

This report summarizes the geotechnical field explorations, laboratory testing, analysis approach, and recommendations for design and construction of structures and embankments in Segment 4 of the Legacy Parkway Design-Build Project. This report does not reflect any variations that may occur between data points such as borings and CPT soundings performed for the subject project. If variations in soil conditions are encountered during construction, it may be necessary to re-evaluate the recommendations of this report. Parsons Brinckerhoff, Inc. should be consulted if additional information or design changes are required during construction.

Parsons Brinckerhoff, Inc. has prepared this report for Segment 4 of the Legacy Parkway Project in accordance with the terms and conditions of its agreement with, and for the exclusive use and benefit of, Fluor Ames Kramer LLC, the Design-Build Contractor. Parsons Brinckerhoff, Inc. does not offer any other warranties, express or implied.

9.0 REFERENCES

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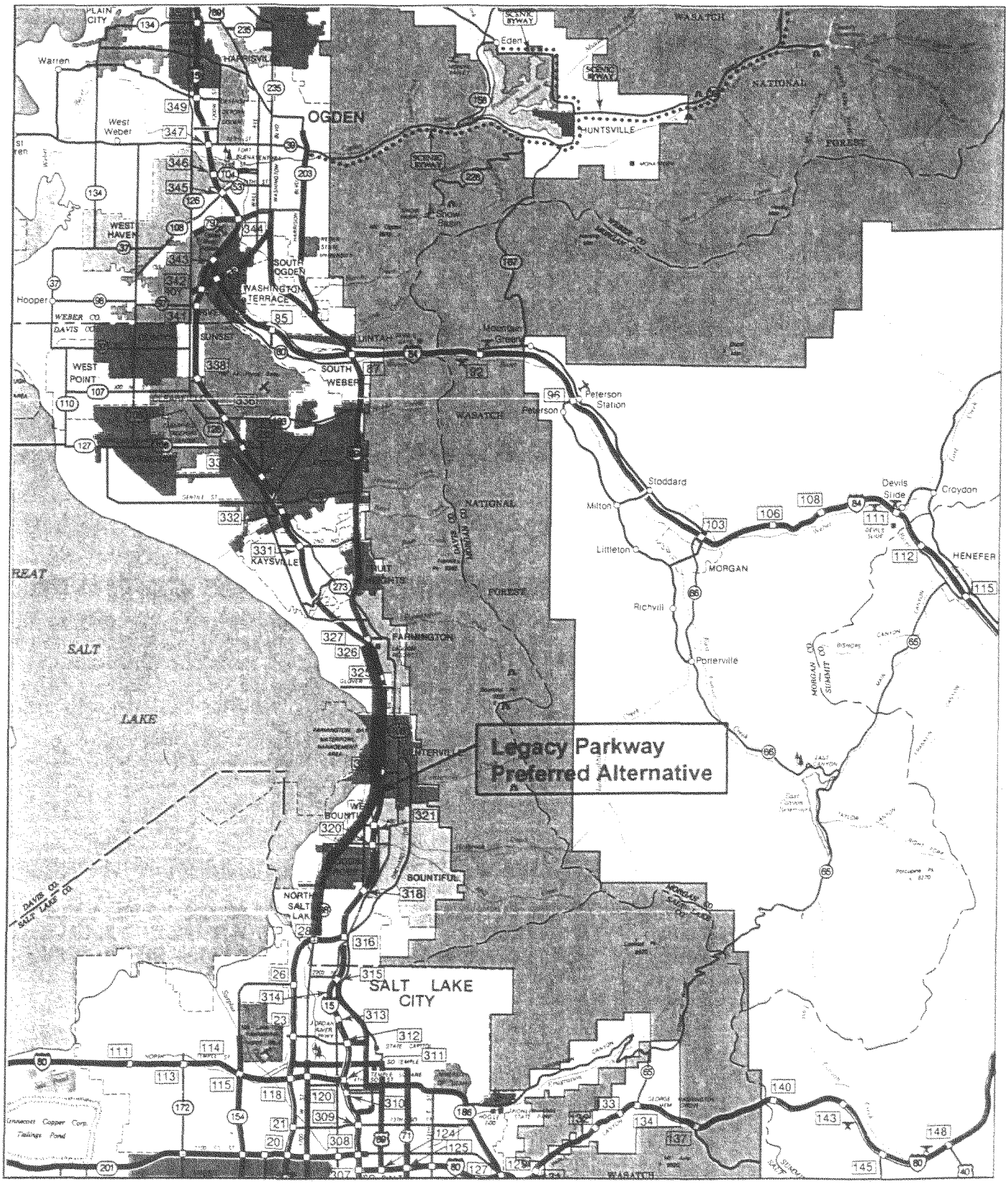


Source:
Official Highway Map
Utah Department of Transportation
1995

0 1 2 4 8
MILES

3510Q134.ppt

KLEINFELDER

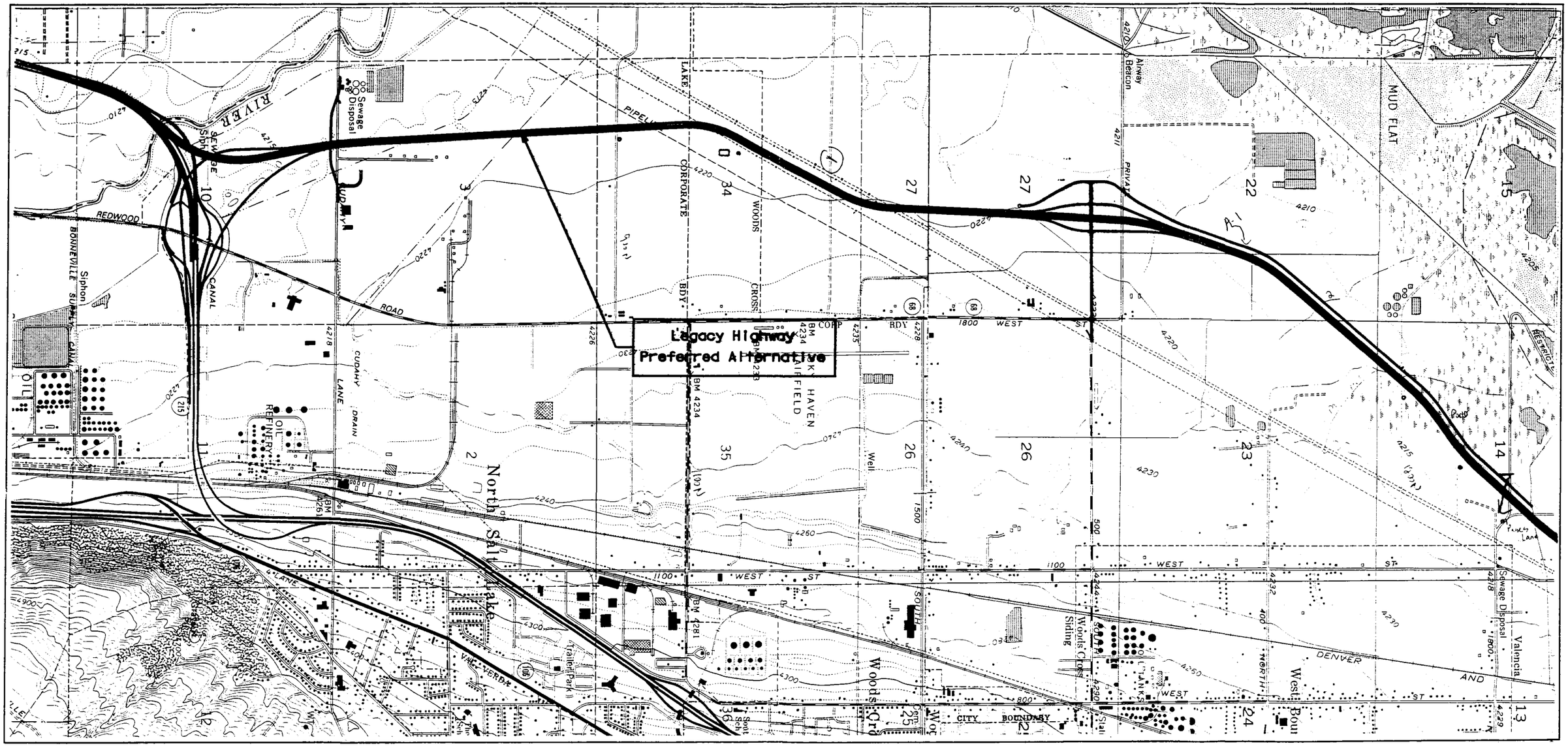
Project Number 35-8163-05

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PROJECT LOCATION MAP

PLATE

A-1



BASE MAPS:
SALT LAKE CITY NORTH AND FARMINGTION, UTAH
U.S.G.S. 7.5 MINUTE QUADRANGLE
1963 AND 1952
Photorevised 1969 and 1975
Project Number - 35-8163-05

SCALE 1:24,000

0 1000 2000 FEET

1" = 2000'

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTAH

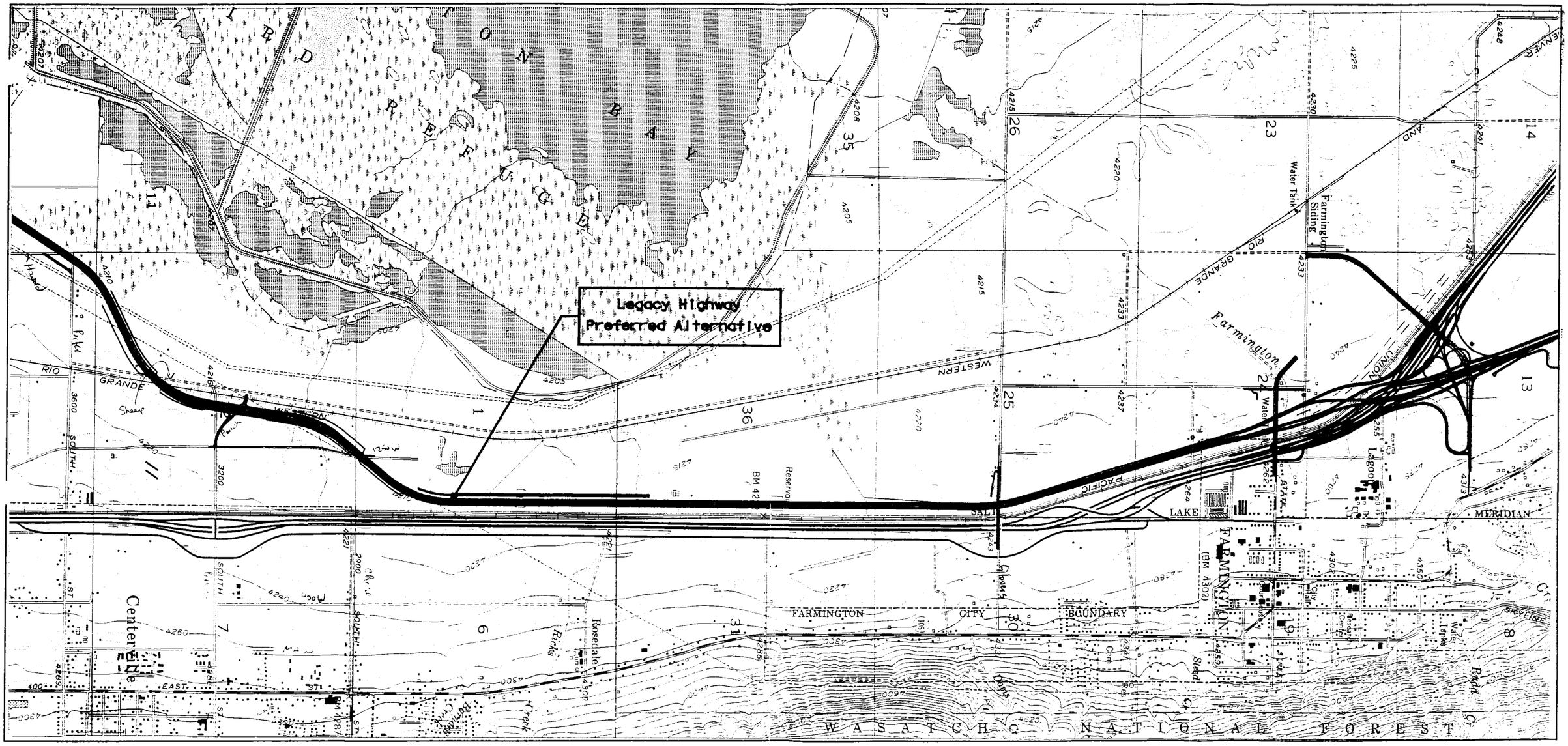
QUADRANGLE LOCATION

KLEINFELDER, INC.

Legacy Parkway - Preferred Alternative
I-215 Interchange to I-15/U.S. 89 Interchange

PROJECT VICINITY MAP

PLATE
A-2



BASE MAP:
FARMINGTION, UTAH
U.S.G.S. 7.5 MINUTE QUADRANGLE
1952
Photorevised 1969 and 1975
Project Number - 35-8163-05

SCALE 1:24,000

0 1000 2000 FEET

1" = 2000'

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

QUADRANGLE LOCATION

KLEINFELDER, INC.

Legacy Parkway - Preferred Alternative
I-215 Interchange to I-15/U.S. 89 Interchange

PROJECT VICINITY MAP

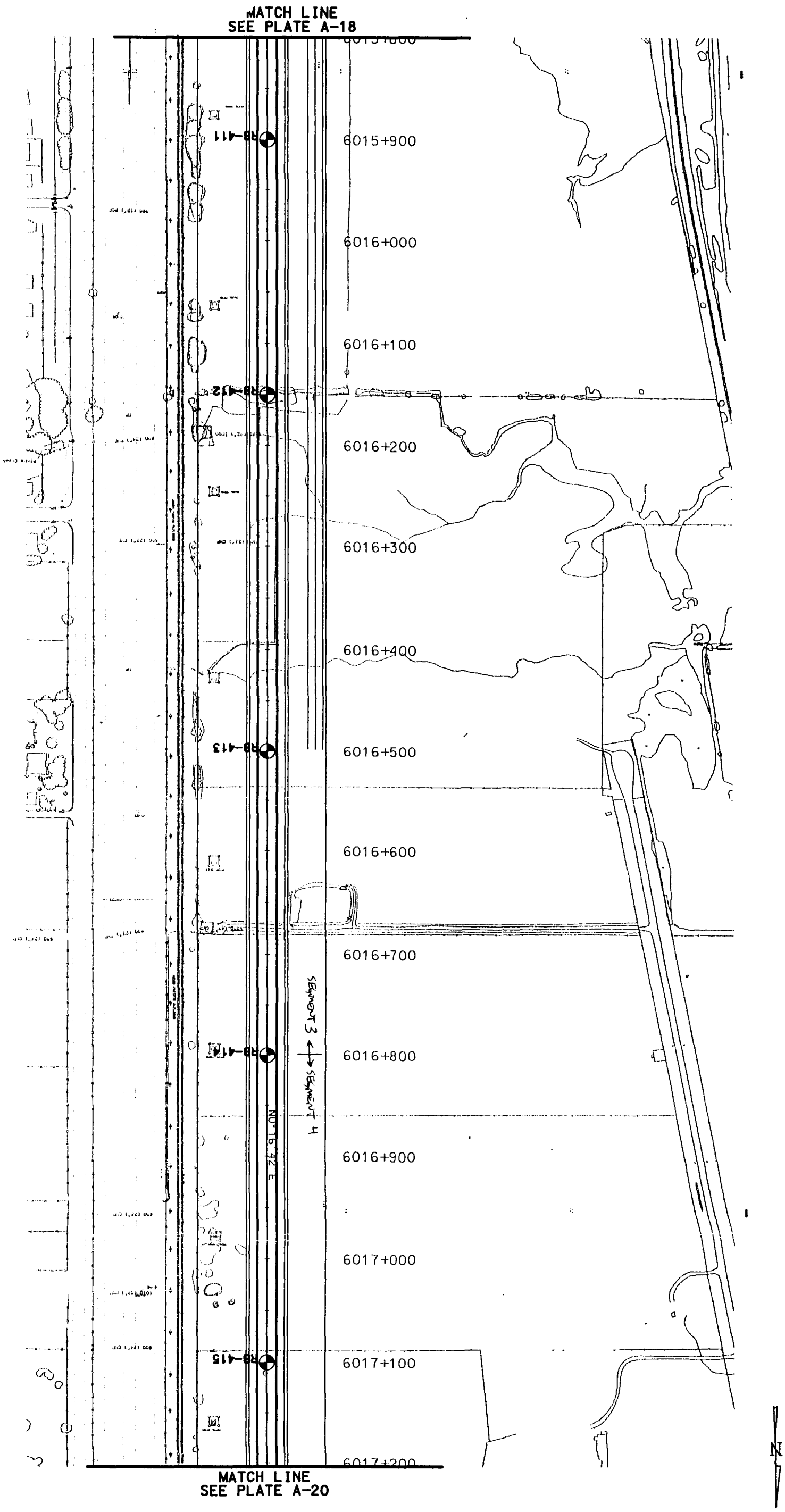
PLATE
A-3

Legacy Parkway
Segment 4
Soil Exploration Information

(according to structure number)

POINT	LINE	STATION	OFFSET	NORTHING (m)	EASTING (m)	ELEVATION (m)
SB-19-274	GLOVERS LANE	50+645 384	0 04 RT	121,728 818	19,846 262	1,299 095
SC-19-275	GLOVERS LANE	50+676 025	2 45 LT	121,731 185	19,876 913	1,300 597
SB-19-276	GLOVERS LANE	50+705 923	0.19 LT	121,728 795	19,906 801	1,302 008
SC-19-277	GLOVERS LANE	50+734 701	0 00 LT	121,728 480	19,935 578	1,290 960
SC-19-278	GLOVERS LANE	50+775 871	5 71 RT	121,722 593	19,976 723	1,291 890
SB-19-279	GLOVERS LANE	50+775 871	5 71 RT	121,722 593	19,976 723	1,291 890
SC-19-280	GLOVERS LANE	50+809 297	1 40 RT	121,726 760	20,010 168	1,292 810
SB-19-281	GLOVERS LANE	50+840 936	7 44 RT	121,720 587	20,041 780	1,291 920
LSB-19-470	GLOVERS LANE	50+667 77	0 00 RT	121,728 766	19,868 648	1,300 033
LSB-19-471	GLOVERS LANE	50+702 77	0 00 RT	121,728 617	19,903 647	1,301 740
LSB-19-473	GLOVERS LANE	50+814 377	0 00 RT	121,728 740	20,015 253	1,295 248
RB-370	GLOVERS LANE	50+571 675	7 54 RT	121,721 642	19,772 521	1,294 969
RB-415	D MAINLINE	6017+100 000	0 00 LT	120,175 489	19,873 302	1,287 442
RB-417	D MAINLINE	6017+700 000	0 00 LT	120,775 482	19,876 216	1,284 832
RB-418	D MAINLINE	6017+960 001	0 19 RT	121,035 479	19,877 674	1,285 296
RB-419	D MAINLINE	6018+299 985	3 00 LT	121,375 475	19,876 131	1,288 020
RB-420	D MAINLINE	6019+470 000	0 00 LT	122,513 204	19,644 905	1,297 222
RB-421	D MAINLINE	6019+900 000	0 00 LT	122,925 217	19,521 837	1,297 852

NOTES: Locations of explorations shown on the figures in this report are based on the coordinates shown in the above table. Station and offset listed above and on the exploration logs may not reflect final alignment stationing.



LEGEND

SC-31-356 CPT Location

SB-31-356 Boring Location

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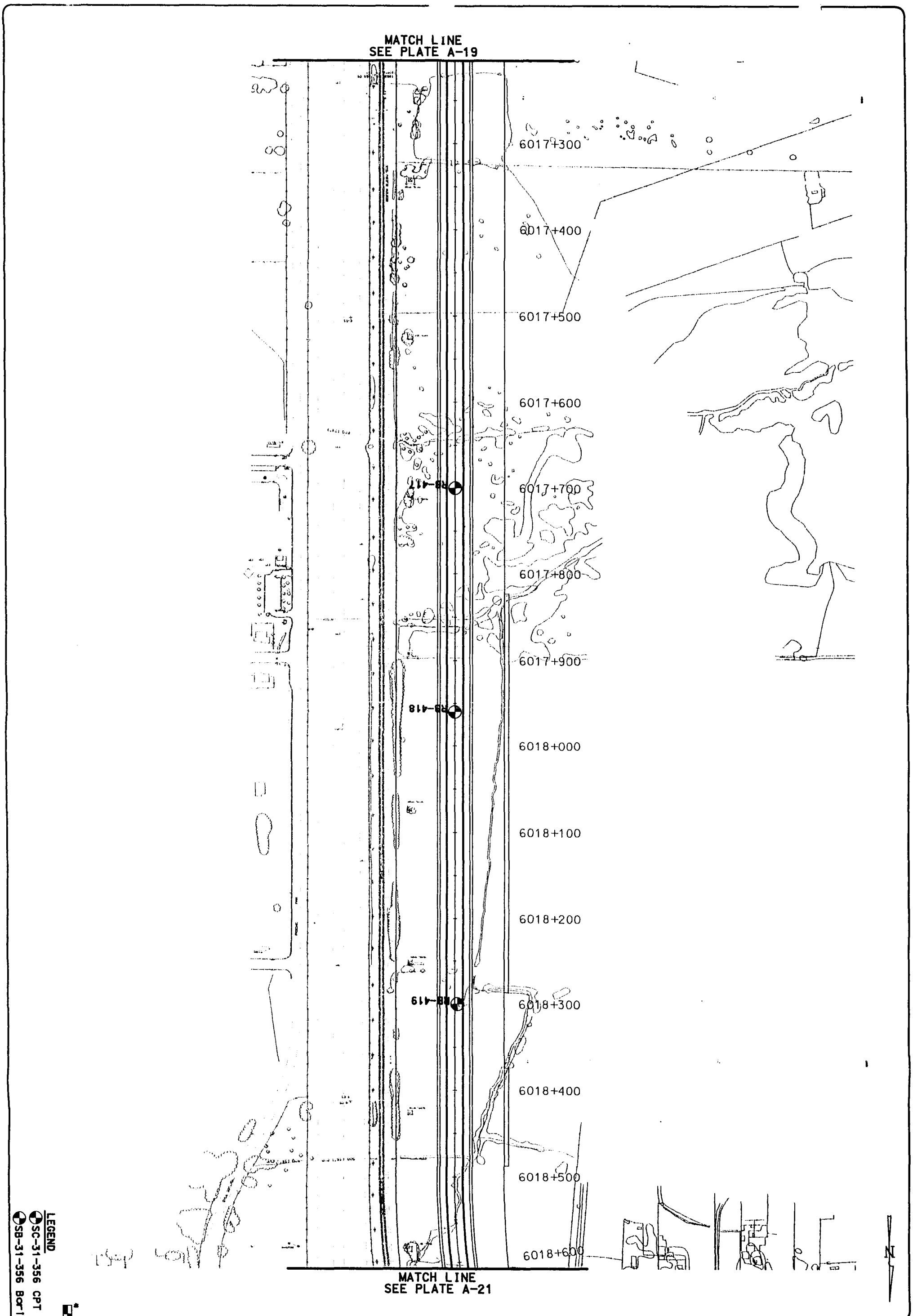
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

EXPLORATION LOCATION DRAWING

PLATE

A-19



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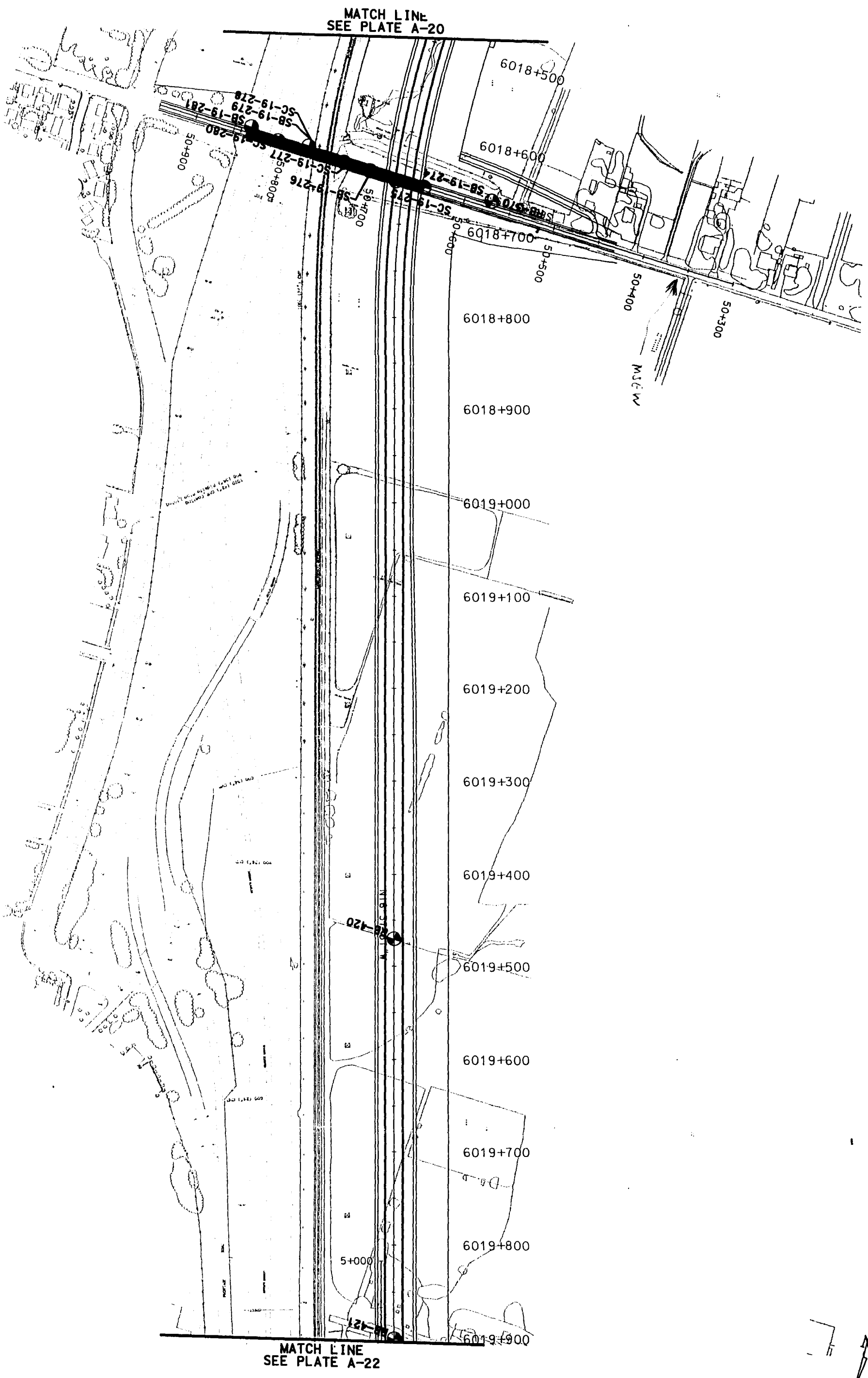
Project No. 35-8163-05

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

EXPLORATION LOCATION DRAWING

PLATE
A-20



LEGEND
SC-31-356 CPT Location
SB-31-356 Boring Location

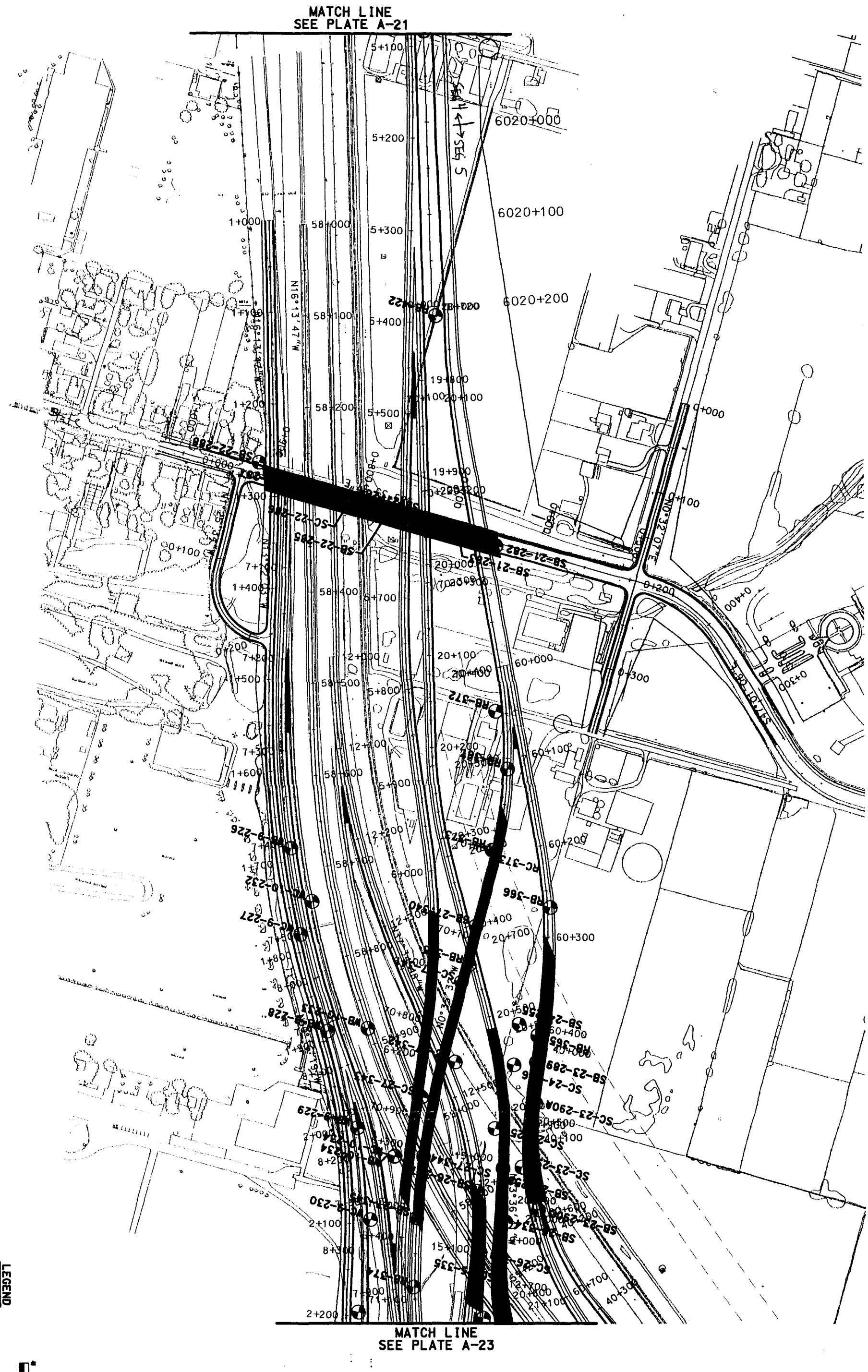
KLEINFELDER

Project No. 35-8163-05

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

EXPLORATION LOCATION DRAWING

PLATE
A-21



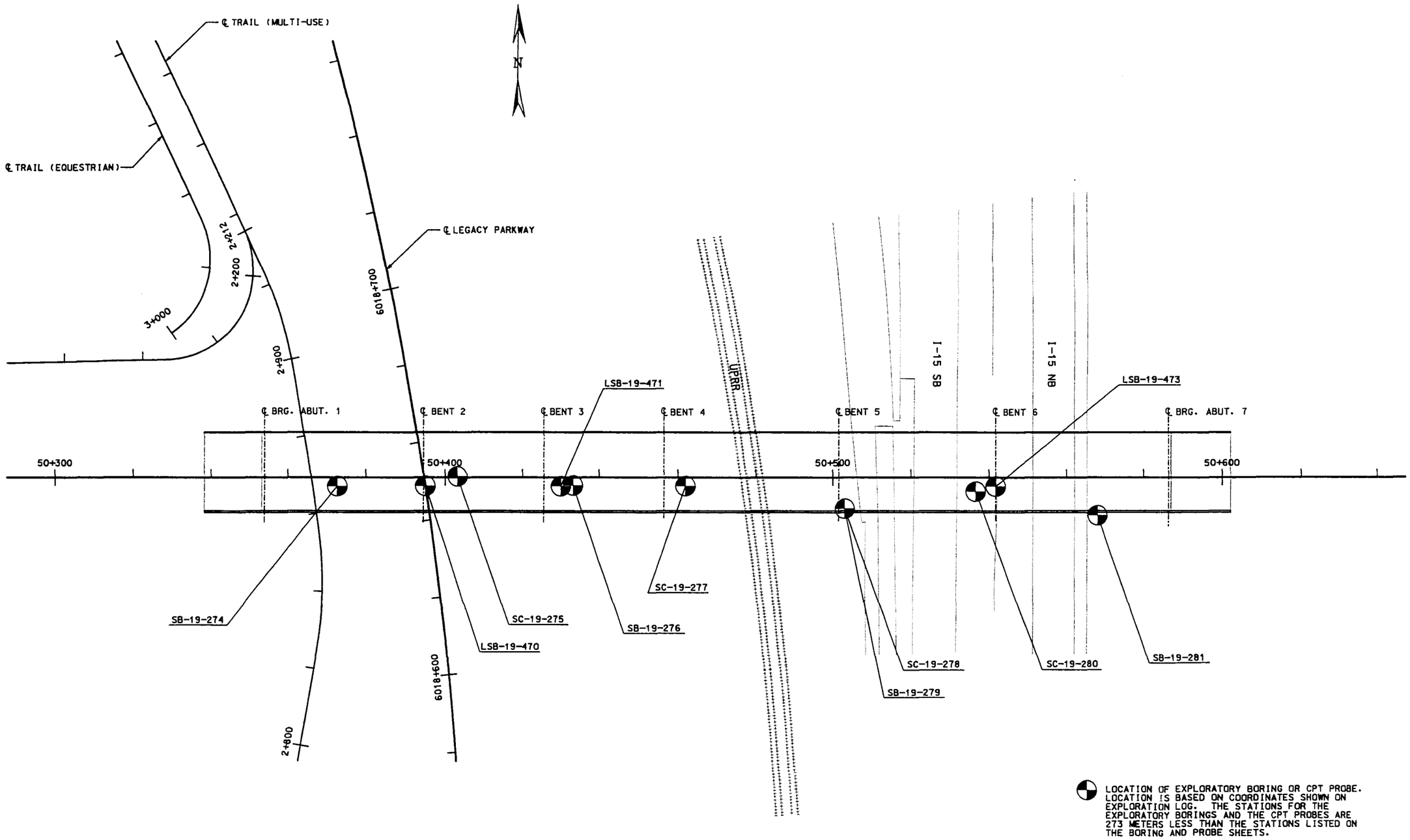
KLEINFELDER

Project No. 35-8163-05

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

EXPLORATION LOCATION DRAWING

PLATE
A-22



LOCATION OF EXPLORATORY BORING OR CPT PROBE. LOCATION IS BASED ON COORDINATES SHOWN ON EXPLORATION LOG. THE STATIONS FOR THE EXPLORATORY BORINGS AND THE CPT PROBES ARE 273 METERS LESS THAN THE STATIONS LISTED ON THE BORING AND PROBE SHEETS.

EXPLORATION LOCATION PLAN

BRIDGE 19
LEVEL 3 SUBMITTAL

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
PARSONS BRINCKERHOFF QUADE & DOUGLAS INC.
STRUCTURE DESIGN

DESIGN STB 03/04 CHECK DJC 03/04
DRAWN RDB 03/04 CHECK DJC 03/04
QUANT. CHECK

APPROVAL RECOMM. 03/04 DATE — DAN CHURCH PROJECT DESIGN ENGINEER
APPROVED 03/04 DATE — K.N. GUNALAN PROJECT DESIGN MANAGER

LEGACY PARKWAY
GLOVERS LANE OVER I-15 & LP
SOIL DATA

PROJECT NUMBER **SP-0067 (11)0**

REFER TO ALIGNMENT & LAYOUT FOR LIMITATION OF LIABILITY STATEMENT

SL / DAVIS
COUNTY

F-712
ORG. NO.

SHT. 5 of 89

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9/28/2004

B

FIELD SOIL CLASSIFICATION

PENETRATION RESISTENCE

STANDARD PENETRATION TEST (ASTMD-1586)
NUMBERS OF BLOWS REQUIRED TO DRIVE A STANDARD 50.8 mm OUTSIDE DIAMETER SPLIT BARREL SAMPLER 304.8 mm USING A 63.5 kg WEIGHT

COHESIONLESS SOIL

RELATIVE DENSITY	$SPT(N_1)_{60}$ - VALUE BLOWS PER 0.3m	RELATIVE DENSITY, %
VERY LOOSE	<4	0 - 15
LOOSE	4 - 10	15 - 35
MEDIUM DENSE	10 - 30	35 - 65
DENSE	30 - 50	65 - 85
VERY DENSE	>50	85 - 100

COHESIVE SOILS

CONSISTENCY	$SPT(N_1)_{60}$ - VALUE BLOWS PER 0.3m	THUMB PENETRATION
VERY SOFT	<2	EASILY PENETRATED MORE THAN 25 mm
SOFT	2 - 4	EASILY PENETRATED 25 mm
MEDIUM STIFF	4 - 8	CAN BE PENETRATED OVER 6 mm WITH MODERATE EFFORT
STIFF	8 - 15	INDENTED ABOUT 6 mm, PENETRATED WITH GREAT EFFORT
VERY STIFF	15 - 30	READILY INDENTED BY THUMBNAIL
HARD	30 - 60	INDENTED WITH DIFFICULTY BY THUMBNAIL
VERY HARD	>60	THUMBNAIL WILL NOT INDENT SOIL

GRADATION

MATERIAL	FRACTION	SEIVE SIZE	GRAIN SIZE
BOULDERS		>304.8 mm	>304.8 mm
COBBLES		75 mm to 304.8 mm	75 mm to 304.8 mm
GRAVEL	COARSE	19 mm to 75 mm	19 mm to 75 mm
	FINE	No. 4 to 19 mm	2 mm to 4.74 mm
SAND	COARSE	No. 10 to No. 4	85 - 100
	MEDIUM	No. 40 to No. 10	430µm to 2 mm
	FINE	No. 200 to No. 40	75µm to 430µm
FINES	(SILT AND CLAY)	PASSING No. 200	<75µm

CRITERIA FOR DESCRIBING MOISTURE CONTENT

SLIGHTLY MOIST	ABSENCE OF MOISTURE, DUSTY, DRY TO TOUCH
MOIST	MOIST BUT NOT VISIBLE WATER
WET	VISIBLE FREE WATER, USUALLY SOIL IS BELOW WATER TABLE

VARIATIONS IN SOIL STRATIGRAPHY

TRACE	<5%
FEW	5 to 10%
LITTLE	15 to 25%
SOME	30 to 45%
MOSTLY	50 to 100%

CRITERIA FOR CLAY PLATICITY AND DRY STRENGTH

PLASTICITY	PLASTICITY INDEX	DRY STRENGTH
NON-PLASTIC	0 - 3	VERY LOW
LOW	3 - 15	LOW
MEDIUM	15 - 30	MEDIUM
HIGH	>30	HIGH

THE TORVANE IS AN INDICATOR OF THE UNCONFINED COMPRESSIVE STRENGTH OF FINE-GRAINED SOILS. THE TORVANE IS MANUALLY ROTATED UNTIL THE SOIL SHEARS. THE TEST IS A VERY CRUDE ESTIMATE OF THE COMPRESSIVE STRENGTH. HENCE, IT SHOULD BE COMPARED WITH OTHERS FOR A RELIABLE ESTIMATE OF THE UNCONFINED COMPRESSIVE STRENGTH. RESULTS SHOWN ON PLOTS IN GDR.

UNIFIED SOIL CLASSIFICATION (USCS) IDENTIFICATION AND DESCRIPTION

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

ABBREVIATIONS

NA - NOT APPLICABLE
GDR - GEOTECHNICAL DATA REPORT

SOIL LABORATORY TEST DESCRIPTIONS

Water Content and Unit Weight

Measures water (moisture) content of soils by drying with direct heat.
Results reported in percent on field test boring logs.
Dry density determines dry unit weight of soils.
Results reported in kN/m^3 on field test boring logs.

Liquid Limit, Plastic Limit, and Plasticity Index - ASTM D 4318

Measures liquid limit, plastic limit, and plasticity index of soils.
Results reported in liquid limit (LL) and plasticity index (PI) or non plastic (NP) on field test boring logs.

Grain Size Distribution Tests - ASTM D 422

Quantitatively measures distribution of particle sizes in soils.
Results shown on a plot in the geotechnical data report (GDR)
SV = Grain size distribution test was run
% Passing No. 200 = Amount of fines passing No. 200 sieve in percent.

Specific Gravity - ASTM D 854

Measures specific gravity of soils by means of a pycnometer.
Results reported in specific gravity (SG) on field test boring log.
SG = Specific gravity test was run.

Consolidation Test - ASTM D 2435

Measures rate and magnitude of consolidation of soil when it is restrained laterally and loaded and drained axially.
Results shown on plot in GRD.
C = Consolidation test was run.

Direct Shear Test - ASTM D 3080

Measures the shear strength of a soil in direct shear.
DS = Direct shear test was run for multi-point test.

Unconfined Compressive Strength - ASTM D 2166

Measures unconfined compressive strength, q_u, of cohesive soil in undisturbed condition using a strain-controlled application of the axial load.
Results shown as undrained shear strength, $s_u = (q_u/2)$, kPa on field boring log and summary of laboratory test data.

Corrosion Resistence Tests

Measures key parameters including pH, electrical resistivity (ohm-cm) and water soluble sulfates (ppm) for use in the evaluation of the corrosion potential of the existing soils.

3510d192

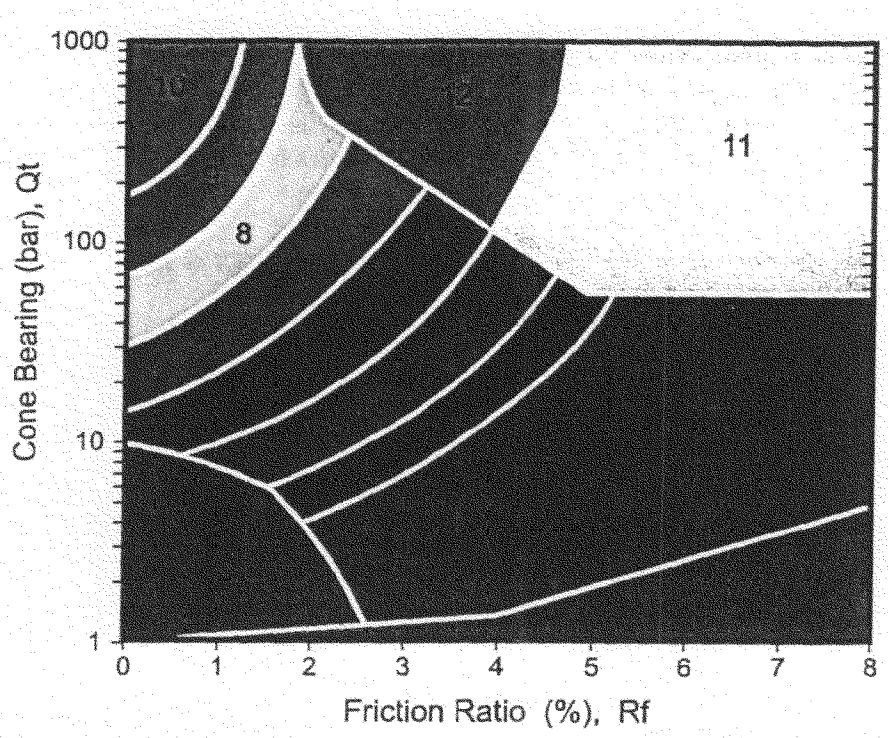
KLEINFELDER

Project Number 35-8163-05

Legacy Parkway - Preferred Alternative
I-215 to I-15 / US 89 Interchange

KEY TO BORING LOG
SOIL SYMBOLS AND TERMS

PLATE
B-321



Zone	Q_t / N	Soil Behaviour Type
1	2	sensitive fine grained
2	1	organic material
3	1	clay
4	1.5	silty clay to clay
5	2	clayey silt to silty clay
6	2.5	sandy silt to clayey silt
7	3	silty sand to sandy silt
8	4	sand to silty sand
9	5	sand
10	6	gravelly sand to sand
11	1	very stiff fine grained *
12	2	sand to clayey sand *

* overconsolidated or cemented

CPT Classification Chart
(After Robertson & Campanella, 1990)

CONETEC

Boring: SB-19-274
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: SAND and Sandy GRAVEL - very dense, moist, brown																
		5	1		SPT	0			50/100mm								
		10	2		MC	610			18 24 45 50	●45							
1295		15	3		SPT	0			50/ 75mm								
		20	4		SPT	559			24 30 36 36	●42							
		25	5		MC	25			50/125mm								
1290	Lean CLAY - stiff, moist, brown, with gray and wet silt	30	6		MC	152	CL	A-6	6 7 10 10	●8							
	Silty SAND - loose to medium dense, wet, black, frequent clay and silt seams and layers	35	7		SPT	508	SM	A-2-5	4 4 4 2	●4							
		40	8		P	406					43						
1285	Lean CLAY - soft, wet, brown to gray, occasional silt and silty SAND seams - SAND layer, medium grained	45	9		SPT	533	CL	A-6	0 2 4 5	●3							
		50	10		P	610					45 48	14.9	29	36	12	94	C SG
	- very soft, some fine-grained sand seams	55	11		SPT	610			0 0 3 3	●1							
1280		60	12		P	508											
		65	13							●5							

Test Results *

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-274**

Sheet **1** of **3**

Logged by:	M. Ivers
Date Start:	2/3/00
Date Finish:	2/7/00
Station:	50+645.384 0.04 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.818 E 19,846.262
Elevation (m):	1299.158
Total Depth Drilled (m):	40.2
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 6/31/00

Boring: SB-19-274
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (N1)60 ● / SPT (N1)60 (Greater than 50 Blows) ○ (0 – 25 – 50)	Su, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	- Lean CLAY, continued; soft, olive gray, mottled brown - interbedded with SILT and SAND layers 10 to 20 mm thick				SPT	559			1 2 4 8								
		70	21		P						43						
			22														
		75	23		SPT	610			0 1 1 1	0							
	- very soft, olive gray		24														
1275		80	25														
		85	26		P	457					47	17.1	19	68	38	49	C
	Clayey SAND - loose to medium dense, wet, black						SC	A-2-7			53						SG
		90	27														
			28														
		95	29		SPT	610			1 1 3 4	1							
1270	Lean CLAY - very soft, black mottled gray						CL	A-6									
		100	30														
			31														
		105	32		P	279											TV
	Poorly Graded SAND - medium dense, wet, gray, medium to coarse-grained sand, frequent GRAVEL layers						SP	A-3			38						
		110	33														
1265	Poorly Graded GRAVEL with sand - medium dense, wet, gray, clasts up to 20 mm		34				GP	A-2-4									
		115	35		SPT	356			10 23 33 44	26							
	Poorly Graded SAND - loose, wet, gray to black, medium-grained						SP	A-3									
			36														
		120	37		SPT	406			11 20 20 31	16							
	- medium dense, frequent lean CLAY layers 10 to 75 mm thick																
		125	38		SPT	559			8 10 12 17	9							
	- loose, interbedded gravel layers, olive to dark gray		39														
1260		130			SPT												

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-274**

Sheet **2** of **3**

Logged by:	M. Ivers
Date Start:	2/3/00
Date Finish:	2/7/00
Station:	50+645.384 0.04 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.818 E 19,846.262
Elevation (m):	1299.158
Total Depth Drilled (m):	40.2
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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SAMPLE TYPE

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MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z0039B2B.GPJ 6/31/00

Boring: SB-19-274
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0–25–50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	- GRAVEL layer, very dense, clasts up to 20 mm thick					330			39 44 50/100mm								
		135	41														
			42														
		140	43														
1255		145	44														
			45														
		150	46														
		155	47														
			48														
1250		160	49														
		165	50														
			51														
		170	52														
		175	53														
1245			54														
		180	55														
			56														
		185	57														
		190	58														
1240			59														
		195															

UTDOT Z0035B2B.GPJ 8/31/00

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-274**

Sheet **3** of **3**

Logged by:	M. Ivers
Date Start:	2/3/00
Date Finish:	2/7/00
Station:	50+645.384 0.04 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.818 E 19,846.262
Elevation (m):	1299.158
Total Depth Drilled (m):	40.2
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: SC-19-275
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) (0 – 25 – 50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Well-Graded SAND with silt and gravel - moist, brown																
1300			1														
	- very dense	5	2		SPT	305			15 16 19								
		10	3		SPT	356			15 18 21								
			4														
	- medium dense, gravel decreasing to approximately less than 10%	15	5		SPT	254			10 10 10	26							
1295																	
	- dense	20	6		SPT	305			10 14 16	35							SV
			7														
	- poorly graded gravel, black	25	8		SPT	279			12 11 15	28							
		30	9		SPT	381	CL	A-6	12 6 5	11							
	Lean CLAY - stiff, moist, black																
1290		35	11														
		40	12														
			13														
		45	14														
			15														
1285		50	16														
		55	17														
			18														
		60	19														
		65															

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: SC-19-275

Sheet 1 of 1

Logged by:	M. Ivers
Date Start:	1/31/00
Date Finish:	1/31/00
Station:	50+676.025 2.45 LT
Line:	GLOVERS LANE
Coordinates (m):	N 121,731.185 E 19,876.913
Elevation (m):	1300.661
Total Depth Drilled (m):	9.6
Drill Contractor:	Haz-tech
Driller:	R. Knott
Rig Type:	CME-850
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

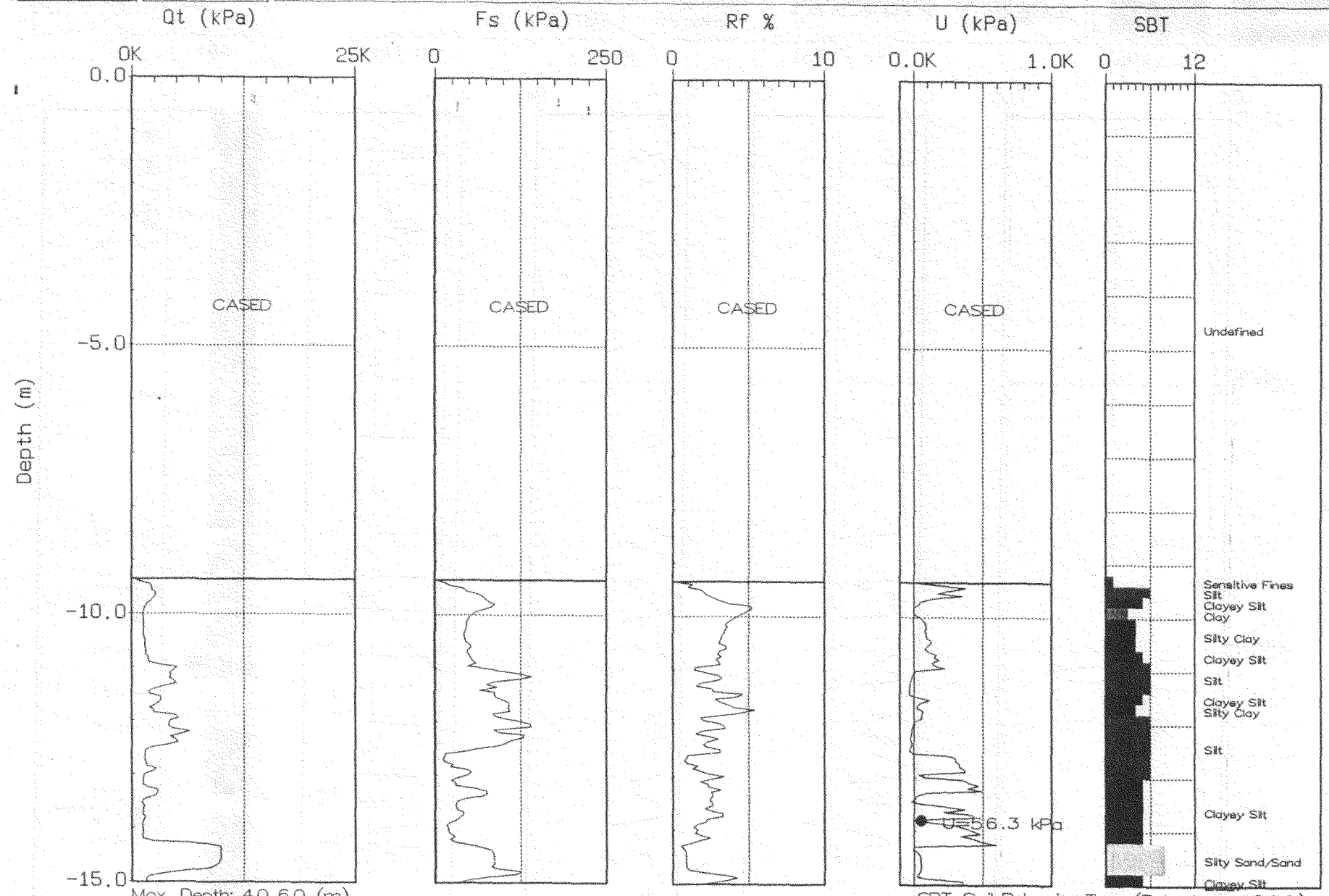
BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 5/31/00

Legacy Parkway

Site: SC-19-275
Station: 50+676.025 2.45 LT
Elevation: 1300.597

Cone: 20 TON A 0
Date: 02:02:00 08:38



Max. Depth: 40.60 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)
● Equilibrium (or near) Pore Pressure from Dissipation

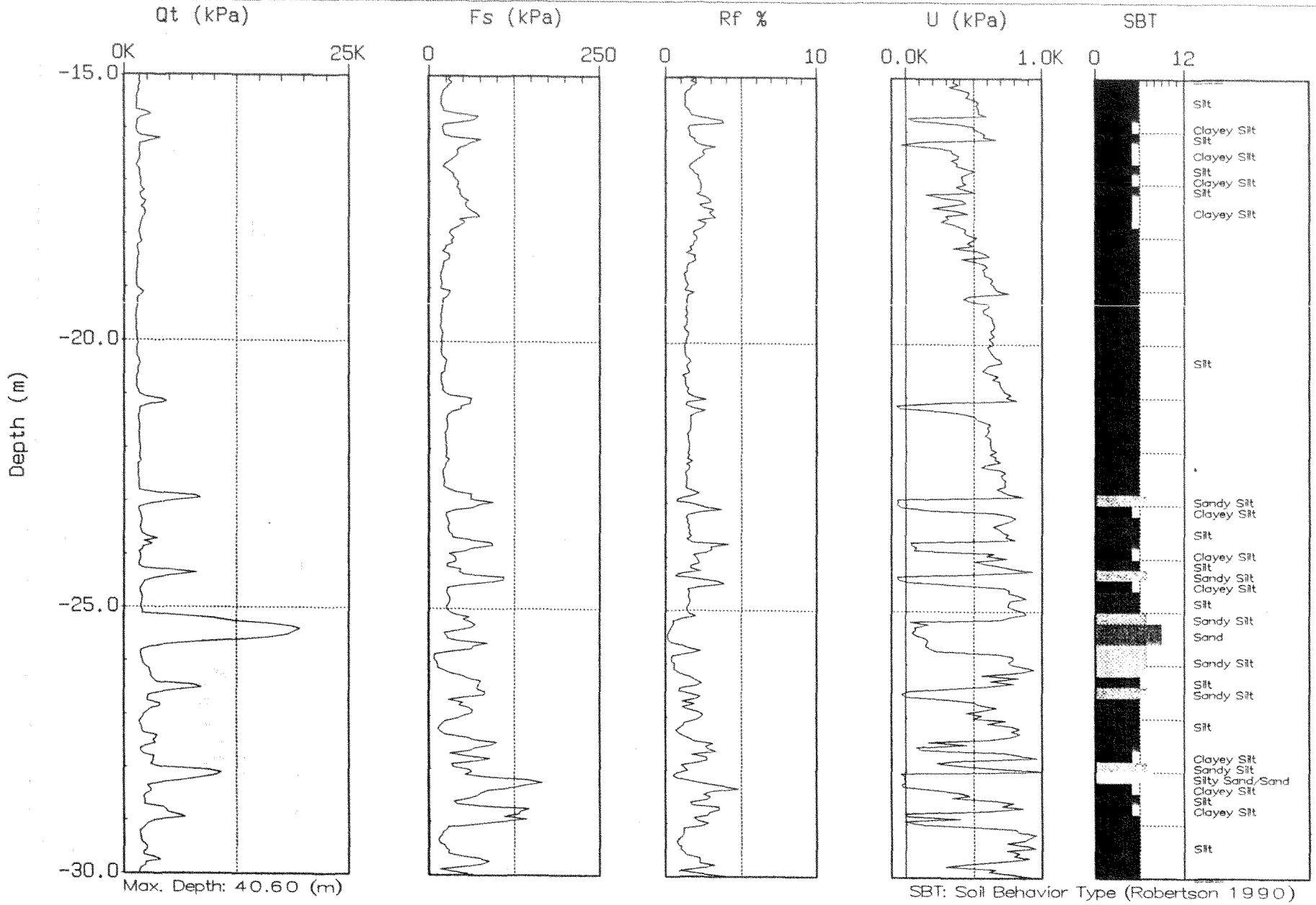
PLATE B-212

CONETEC

Legacy Parkway

Site: SC-19-275
Station: 50+676.025 2.45 LT
Elevation: 1300.597

Cone: 20 TON A 070
Date: 02:02:00 08:38



Max. Depth: 40.60 (m)

Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

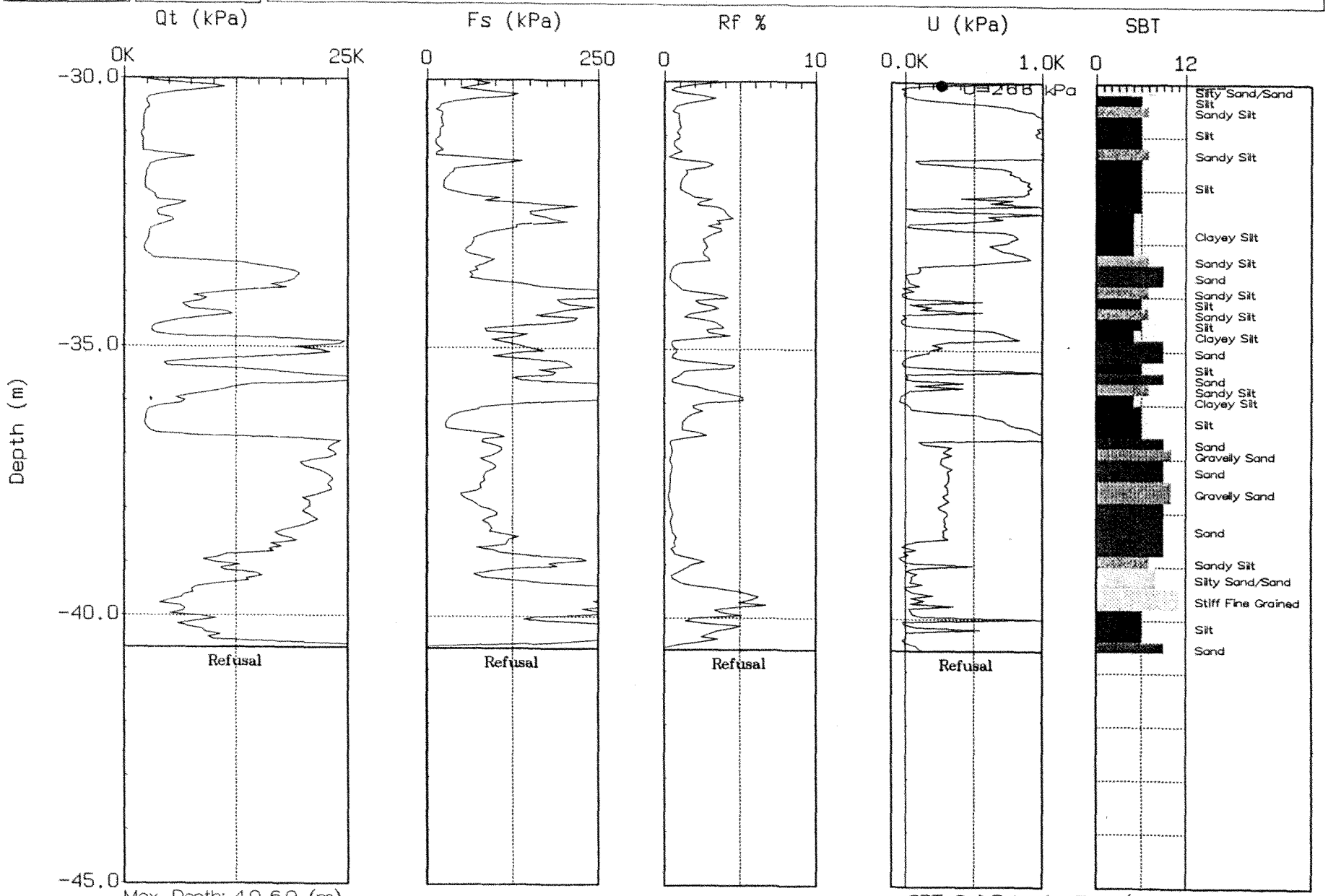
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-213

Legacy Parkway

Site: SC-19-275
Station: 50+676.025 2.45 LT
Elevation: 1300.597

Cone: 20 TON A 70
Date: 02:02:00 08:38



Max. Depth: 40.60 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-214

Boring: SB-19-276
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	ASPHALT - 6"																
	FILL: Poorly Graded SAND and GRAVEL - very dense, moist, brown occasional clay layers 50 mm thick		1														
1300		5	2		MC	305			14 22 27								pH WSS R
		10	3		SPT	406			4 20 35 32								
			4														
	- cobbles	15	5		MC	0			50/100mm								
		20	6		SPT	229			20 27 18 16	40							
1295		25	7		MC	152			8 42 50/75 mm								
		30	9		MC	127			6 10 10 6	12							
		35	10		MC	152			5 6 8 10	9							
1290	Poorly Graded SAND - interbedded with frequent clay layers 3 to 50 mm thick	40	12		SPT	508	SP	A-1-b	2 5 5 7	6							
	Lean CLAY - medium stiff, wet, gray	45	13		SH	610	CL	A-6			48						
	Poorly Graded SAND - medium dense, wet, dark gray	50	15		SPT	610	SP	A-3	8 9 10 6	12							
1285	Lean CLAY - soft, wet, gray-brown, with fine-grained sand seams	55	17		SPT	610	CL	A-6	3 3 3 4	4							
		60	19		SH	610					75 48	17.1	25	35	11	91	C SG
		65															

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-276**

Sheet 1 of 3

Logged by:	M. Ivers
Date Start:	2/1/00
Date Finish:	2/2/00
Station:	50+705.923 0.19 LT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.795 E 19,906.801
Elevation (m):	1302.071
Total Depth Drilled (m):	40.2
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Safety
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003S82B.GPJ 8/31/00

Boring: SB-19-276
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	- Lean CLAY, continued; few sand seams				SPT	610			2 3 4 5								
		70	21														
1280			22		SH	610					53						
		75	23		SPT	610			0 0 2 6	● 1							
			24														
		80	25		SH	610					63 62	14.6	30	36	15		C TR SG
	-medium stiff																
		85	26														
			27														
1275		90			SPT	381			14 14 2 3	● 9							
	- GRAVEL Layer 300 mm thick, with sand		28				CL	A-6									
	Lean CLAY with sand - soft, wet, gray-black																
		95	29														
			30														
		100	31		SH	356	GP	A-2-4			29						
	GRAVEL - dense, wet, gray, fine-grained, with coarse-grained sand																
1270	Lean CLAY - medium stiff, wet, dark olive gray, with trace of coarse-grained sand	105	32				CL	A-6									
			33														
		110	34		SPT		SM	A-2-5	5 4 9 7	● 7							
	Silty SAND with gravel - medium dense, moist, dark olive gray																
		115	35														
			36														
	- Lean CLAY layer 25 mm thick, with interbedded gravel clasts	120	37		SPT	356			3 22 29 10	● 26							
1265	- 40% gravel with clast up to 20 mm Lean CLAY layer 75 mm thick																
	- Poorly Graded SAND layer, fine to medium-grained, very homogeneous	125	38		SPT				18 22 26 29	● 24							
			39														
		130			SPT					● 16							

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-276**

Sheet **2** of **3**

Logged by:	M. Ivers
Date Start:	2/1/00
Date Finish:	2/2/00
Station:	50+705.923 0.19 LT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.795 E 19,906.801
Elevation (m):	1302.071
Total Depth Drilled (m):	40.2
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Safety
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North Amencan Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z0039B2B.GPJ 8/31/00

Boring: SB-19-276
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
						356			17 19 14 22								
		135	41														
1260			42														
		140	43														
		145	44														
			45														
		150	46														
1255		155	47														
			48														
		160	49														
		165	50														
			51														
1250		170	52														
		175	53														
			54														
		180	55														
		185	56														
1245			57														
		190	58														
		195	59														

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-276**

Sheet **3** of **3**

Logged by:	M. Ivers
Date Start:	2/1/00
Date Finish:	2/2/00
Station:	50+705.923 0.19 LT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.795 E 19,906.801
Elevation (m):	1302.071
Total Depth Drilled (m):	40.2
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Safety
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

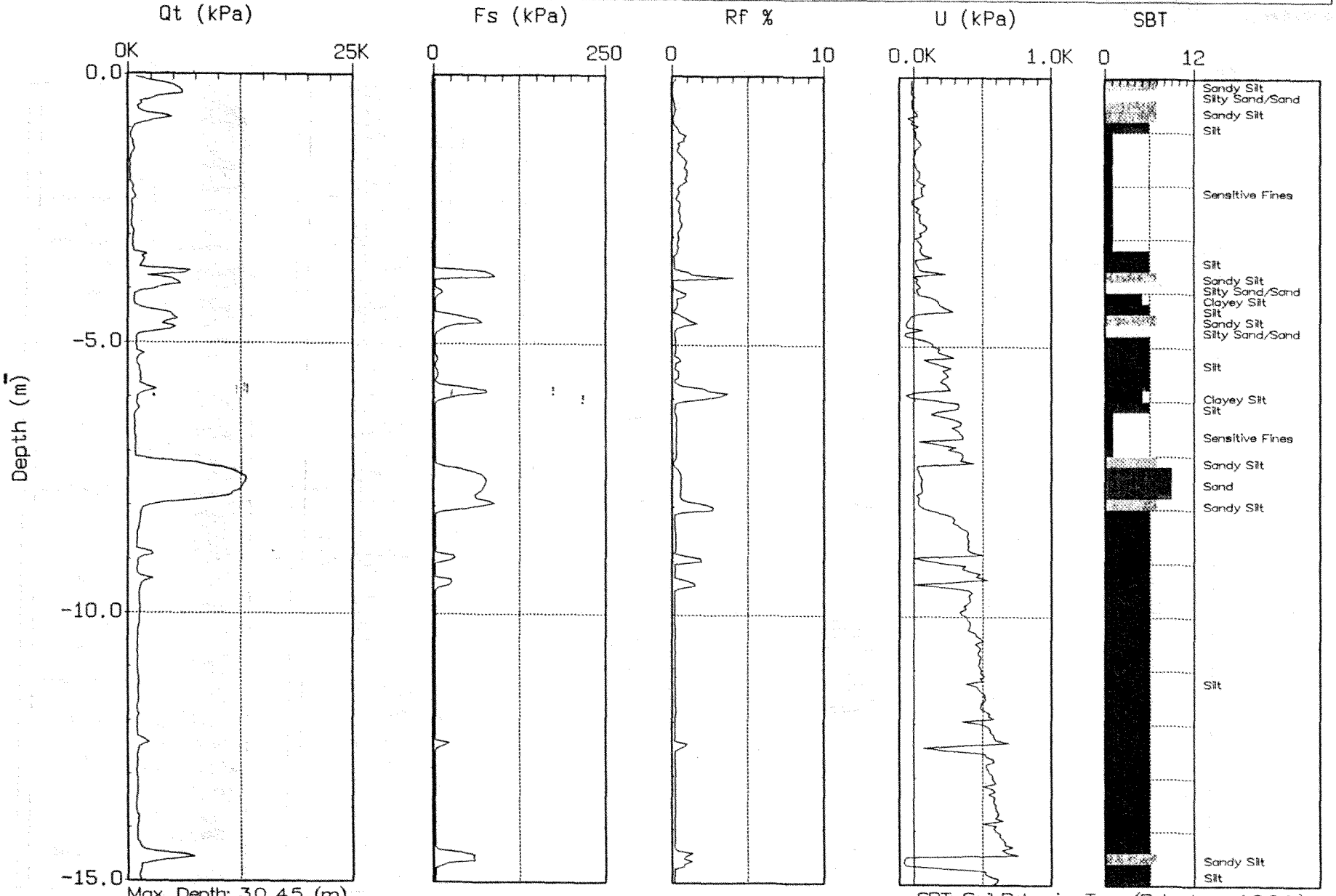
BAG = Bulk Sample

UTDOT Z003B2B GPJ 6/31/00

Legacy Parkway

Site: SC-19-277
Station: 50+734.701 0.00 LT
Elevation: 1290.960

Cone: 20 TON A 07U
Date: 01:31:00 14:01



Max. Depth: 30.45 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

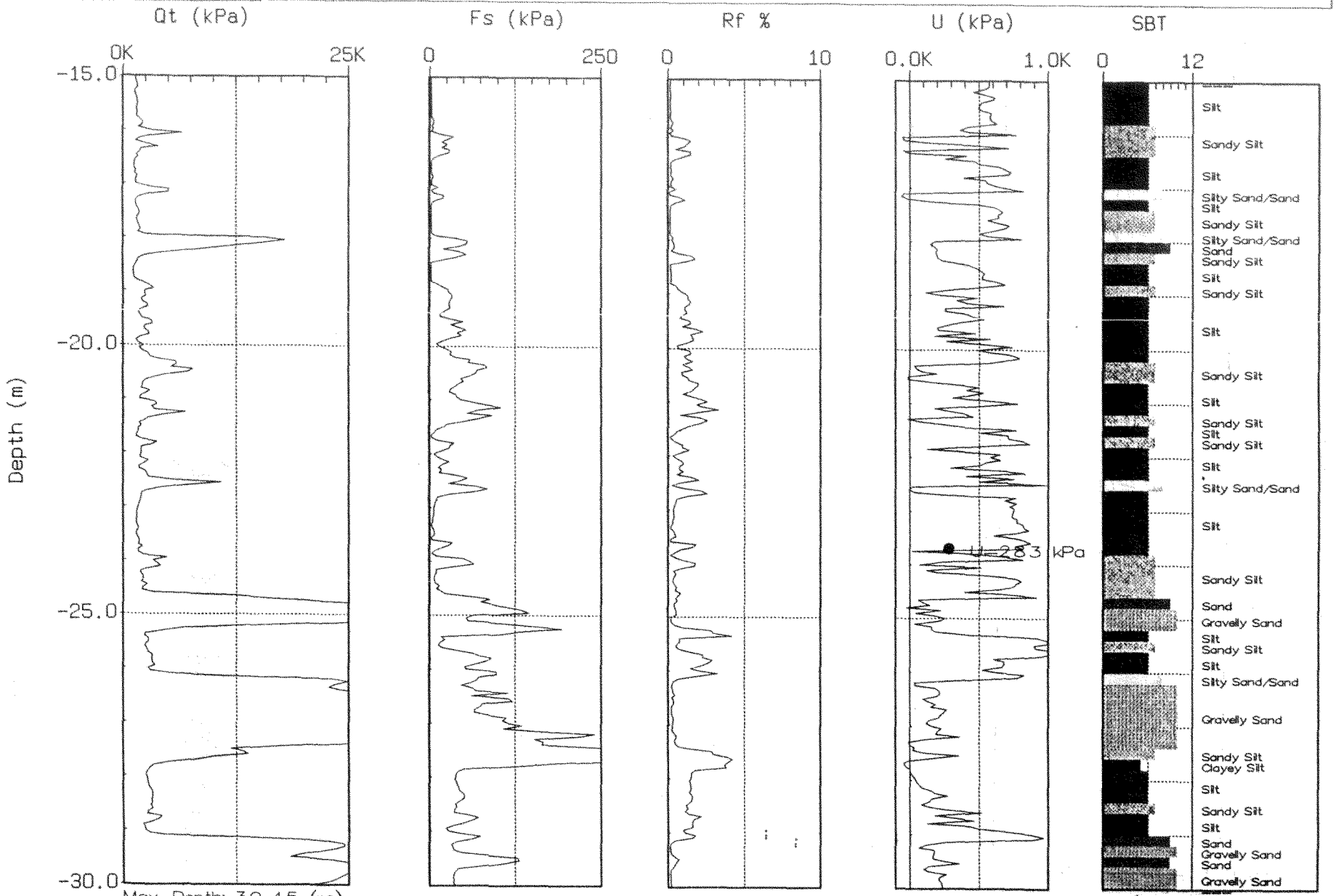
PLATE B-218

CONETEC

Legacy Parkway

Site: SC-19-277
Station: 50+734.701 0.00 LT
Elevation: 1290.960

Cone: 20 TON A 070
Date: 01:31:00 14:01



Max. Depth: 30.45 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

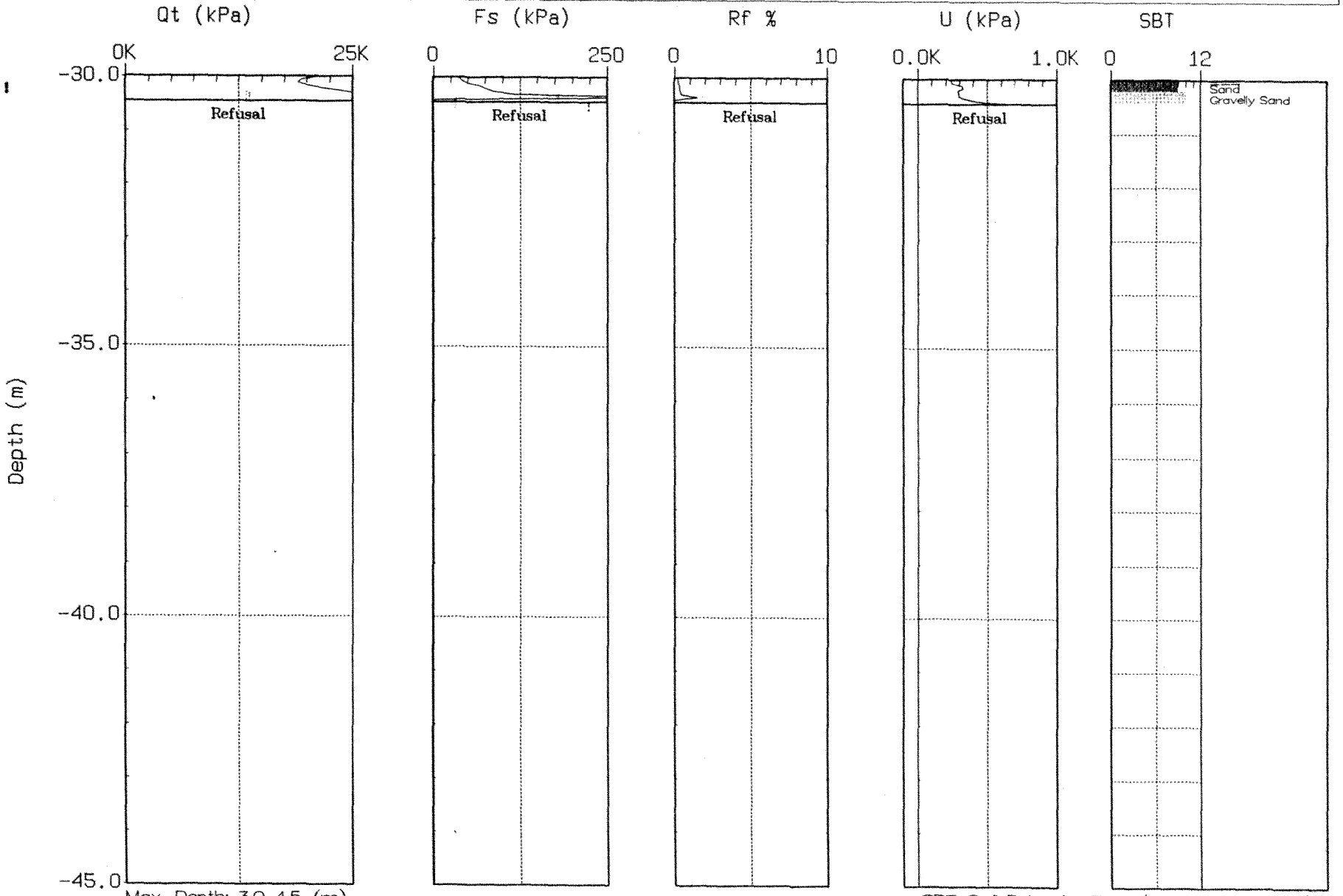
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-219

Legacy Parkway

Site: SC-19-277
Station: 50+734.701 0.00 LT
Elevation: 1290.960

Cone: 20 TON A 070
Date: 01:31:00 14:01



Max. Depth: 30.45 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

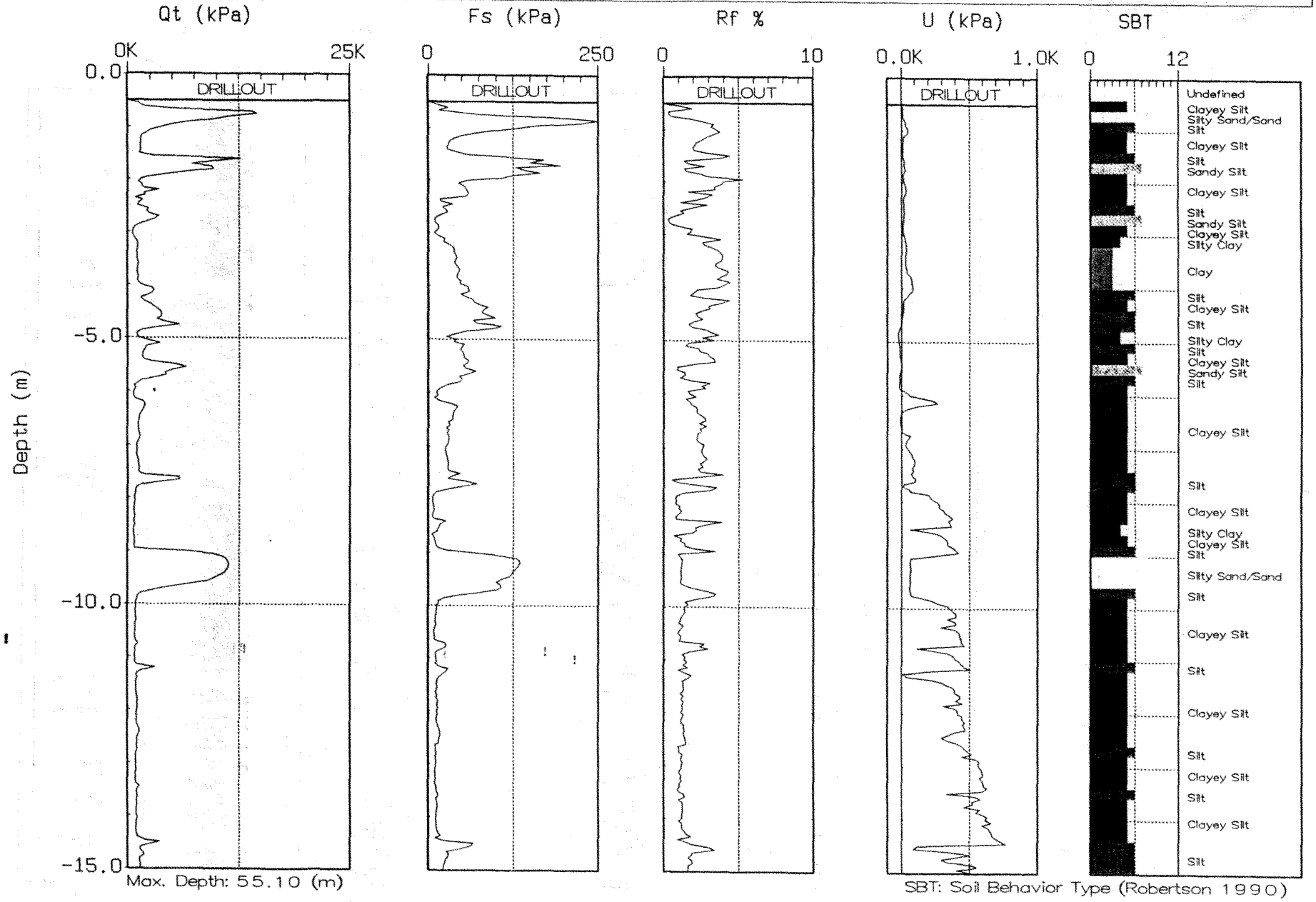
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-220

Legacy Parkway

Site: SC-19-278
Station: 50+775.871 5.71 RT
Elevation: 1291.890

Cone: 20 TON A 092
Date: 02:14:00 11:39



Max. Depth: 55.10 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

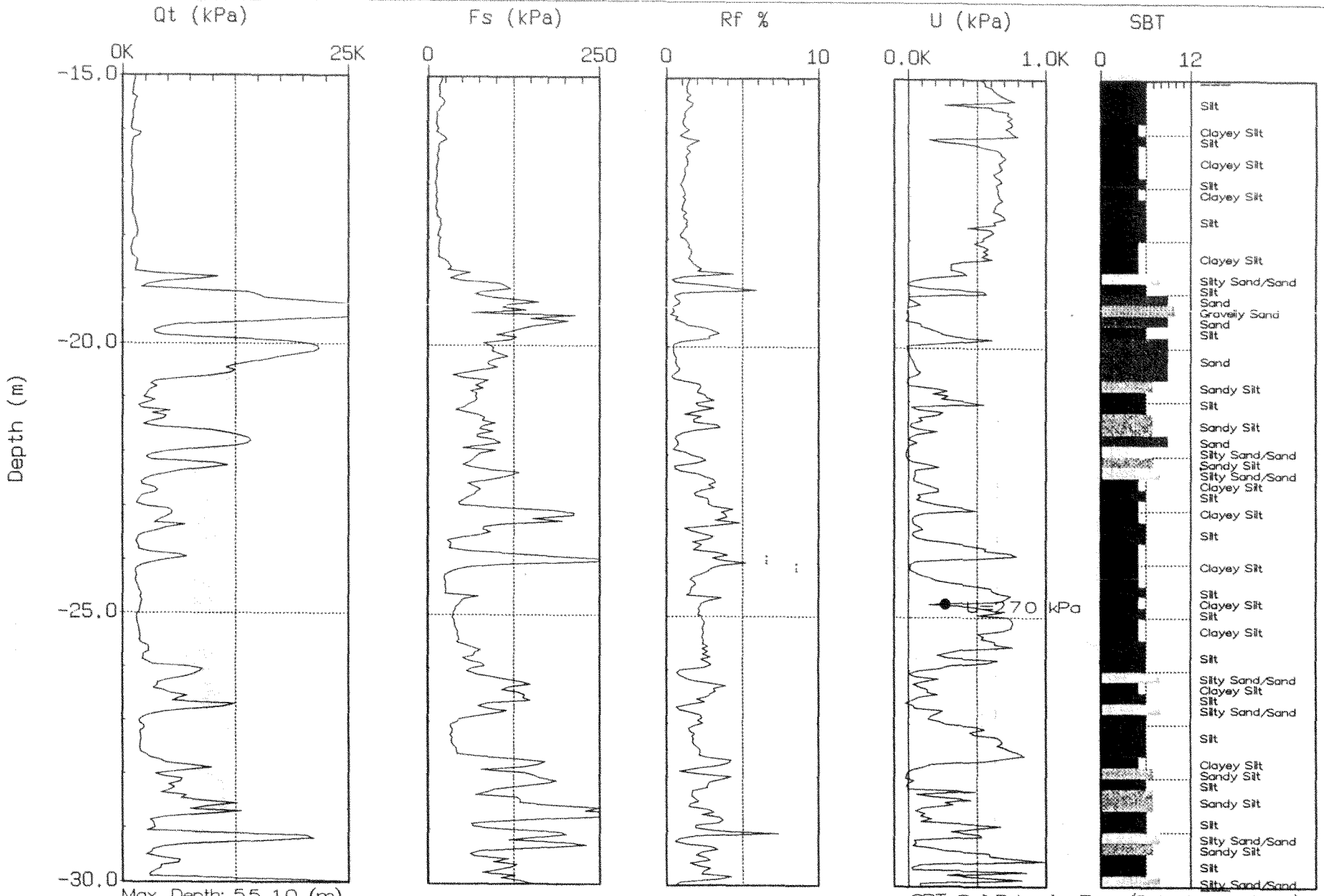
PLATE B-221

CONETEC

Legacy Parkway

Site: SC-19-278
Station: 50+775.871 5.71 RT
Elevation: 1291.890

Cone: 20 TON A 092
Date: 02:14:00 11:39



Max. Depth: 55.10 (m)

Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

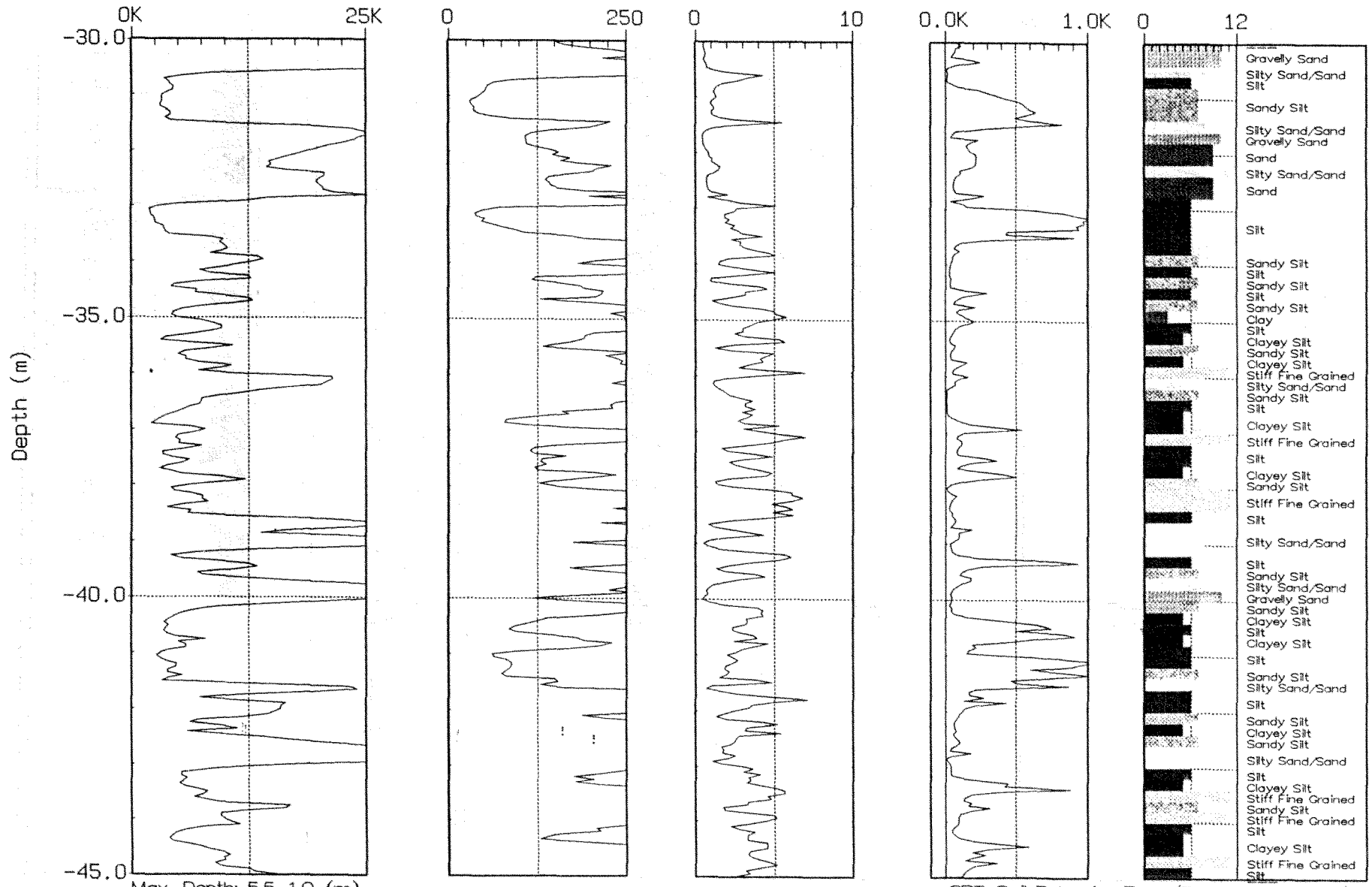
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-222

Legacy Parkway

Site: SC-19-278
Station: 50+775.871 5.71 RT
Elevation: 1291.890

Cone: 20 TON A 092
Date: 02:14:00 11:39



Max. Depth: 55.10 (m)

Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

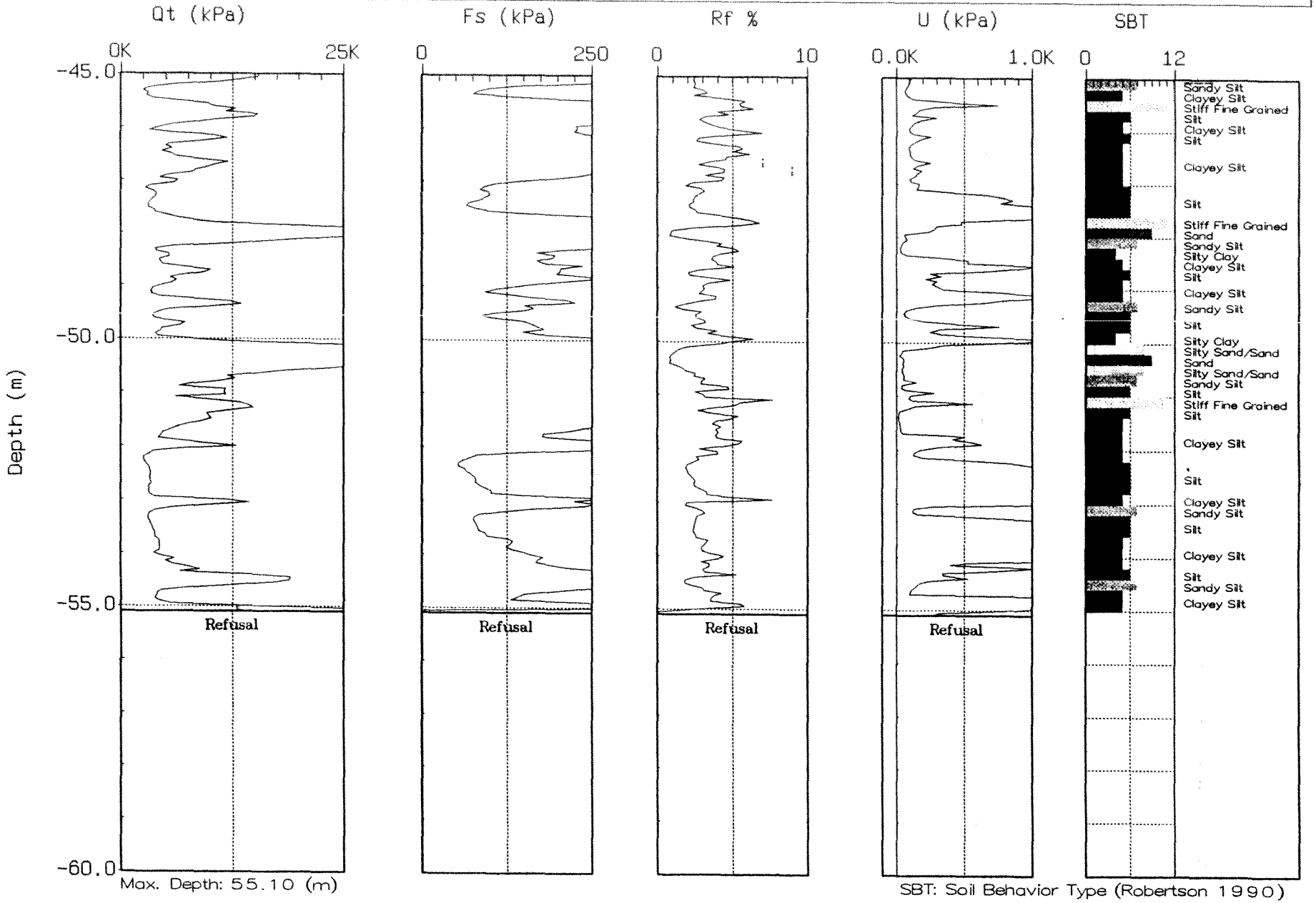
PLATE B-223

CONETEC

Legacy Parkway

Site: SC-19-278
Station: 50+775.871 5.71 RT
Elevation: 1291.890

Cone: 20 TON A 092
Date: 02:14:00 11:39



Max. Depth: 55.10 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-224

Boring: SB-19-279
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: SAND and GRAVEL - medium dense, moist, brownish tan to black, with re-milled asphalt rubble		1													
1290	Lean CLAY - soft to medium stiff, moist, black, with organics	5	2		P	559	CL	A-6		*46*	13.8	31	43	17		C SG
	Poorly Graded SAND - medium dense, moist, gray to black - with GRAVEL	10	3		SPT	305	SP	A-3	4 9 5							
			4													
	- becomes wet - Lean CLAY layer, with organics	15	5		SPT	254			1 2 4							
	Lean CLAY, medium stiff, wet, brown		6				CL	A-6								
	- sand lense	20			SPT	0	CL	A-6	4 1 2							
1285	Lean CLAY - medium stiff, wet, brown		7		P	610				30 *38*	14.4	34	38	13	95	DS
	- Poorly graded SAND layer, loose, wet, gray	25	8		P	610				*43*	14.0	34				C SG
	Poorly Graded SAND with silt- dense, wet, gray, fine-grained	30	9		SPT	381	SP-SM	A-1-b	7 9 8						11	
	Lean CLAY - medium stiff, wet, brown, with silt		10				CL	A-6								
		35	11		P	610				44 *53*	14.8	31	40	19		
1280	- occasional sand seams	40	12		SPT	457			1 2 2							
			13													
		45	14		P	610				*38*						
	- soft	50	15		SPT	25			1 1 1							
			16													
1275		55	17													
			18													
		60			P	610				*48*	14.7	30				C SG
	Poorly Graded SAND - dense, wet, gray, fine to coarse-grained with fine-grained gravel and trace of clay		19				SP	A-1-b								
		65														

Test Results *

● SPT $(N_1)_{60}$
○ SPT $(N_1)_{60}$ (Greater than 50 Blows)

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-279**

Sheet **1** of **3**

Logged by:	C. Wieden
Date Start:	3/3/00
Date Finish:	3/5/00
Station:	50+775.871 5.71 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,722.593 E 19,976.723
Elevation (m):	1291.953
Total Depth Drilled (m):	43.1
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Boring: SB-19-279
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	-Poorly graded SAND, continued				SPT				11 9 10								
	Sandy Lean CLAY - stiff, wet, gray, with frequent clayey sand layers 75 to 100 mm thick	70	21				CL	A-6									
1270			22		P	508					57						
	- occasional sand layers, 75 mm thick	75	23														
			24														
		80			SPT				4 3 4	●12							
			25														
		85	26														
1265			27														
	Silty SAND with gravel - dense, wet, gray, with occasional sandy clay layers 75 mm thick, frequent silt seams	90	28		P SPT	152	SM	A-2-5	2 13 9	●34							
	Lean CLAY, stiff, wet, gray	95	29		SPT		CL	A-6	17 10 10	●30							
			30														
	Silty SAND with GRAVEL - very dense, wet, gray	100	31		P	610	SM	A-2-4							6		
1260		105	32		SPT				25 33 34								
			33														
	- Lean CLAY layer, very stiff, wet, olive gray, with silt and sand	110	34		SPT				13 9 12	●25							
	- Sandy CLAY/Silty SAND layer 300 mm thick																
	- Sandy CLAY layer 300 mm thick, stiff, wet, olive gray	115	35		SPT				7 28 50								
			36														
	- dense	120	37		SPT				17 21 19	●42							SV
1255																	
	- gravel layer																
	- medium dense	125	38		SPT				10 13 15	●28							
			39														
		130			SPT												

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-279**

Sheet **2** of **3**

Logged by:	C. Wieden
Date Start:	3/3/00
Date Finish:	3/5/00
Station:	50+775.871 5.71 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,722.593 E 19,976.723
Elevation (m):	1291.953
Total Depth Drilled (m):	43.1
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

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SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

B = BAG = Bulk Sample

UTDOT Z003S92B.GPJ 6/31/00

Boring: SB-19-279
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	- very dense								40 50/100mm								
		135	41		SPT				16 14 23	●34							
1250			42														
	- Lean CLAY layer 600 mm thick, stiff, wet, gray, with silt	140	43		SPT				6 16 16	●30							
	- medium dense																
		145	44														
			45														
		150	46														
1245		155	47														
			48														
		160	49														
		165	50														
			51														
1240		170	52														
		175	53														
			54														
		180	55														
			56														
1235		185	57														
		190	58														
			59														
		195															

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-279**

Sheet 3 of 3

Logged by:	C. Wieden
Date Start:	3/3/00
Date Finish:	3/5/00
Station:	50+775.871 5.71 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,722.593 E 19,976.723
Elevation (m):	1291.953
Total Depth Drilled (m):	43.1
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

• = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

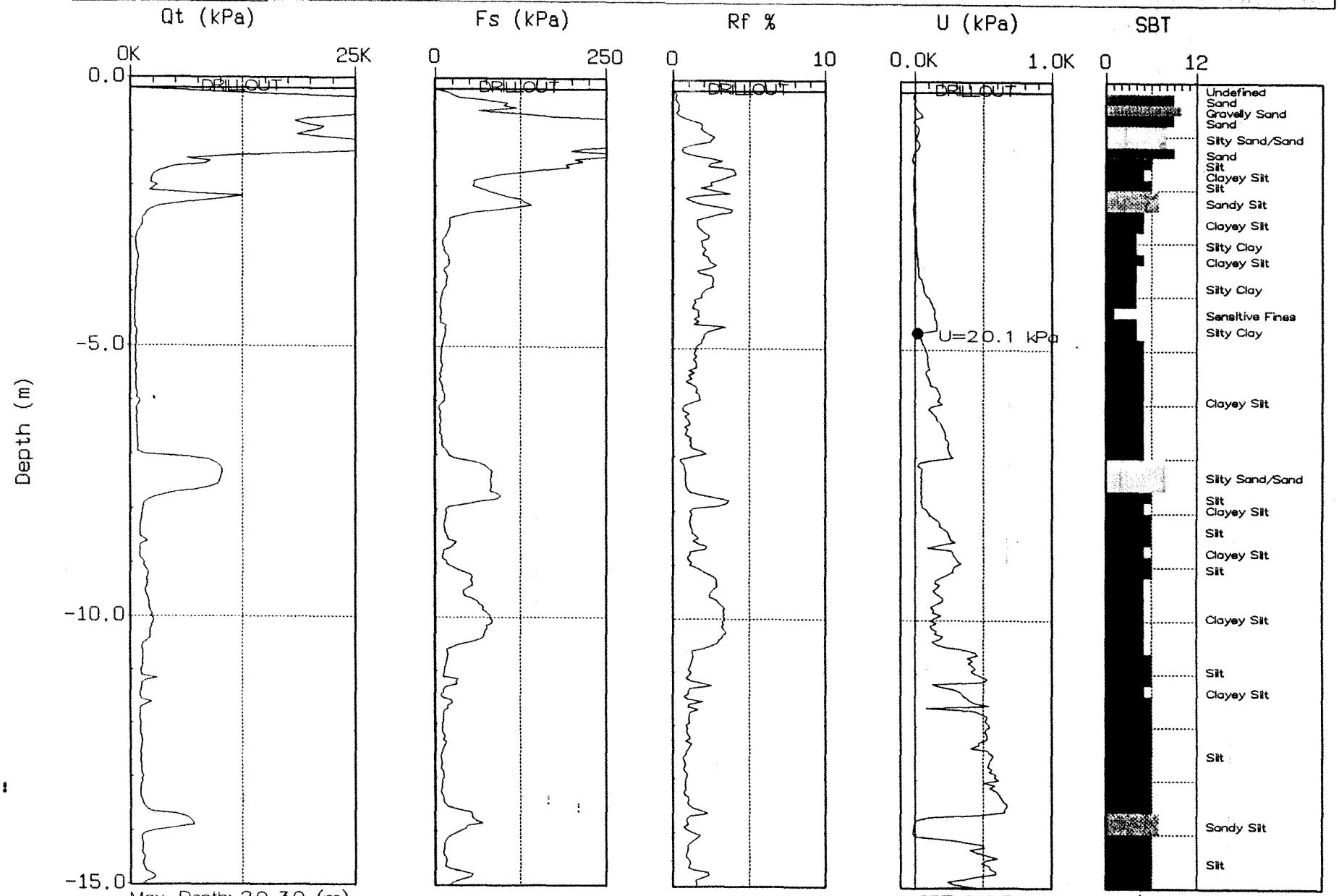
BAG = Bulk Sample

UTDOT Z0035B2B.GPJ 5/31/00

Legacy Parkway

Site: SC-19-280
Station: 50+809.297 1.40 RT
Elevation: 1292.810

Cone: 20 TON A 70
Date: 03:02:00 10:15



Max. Depth: 20.30 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

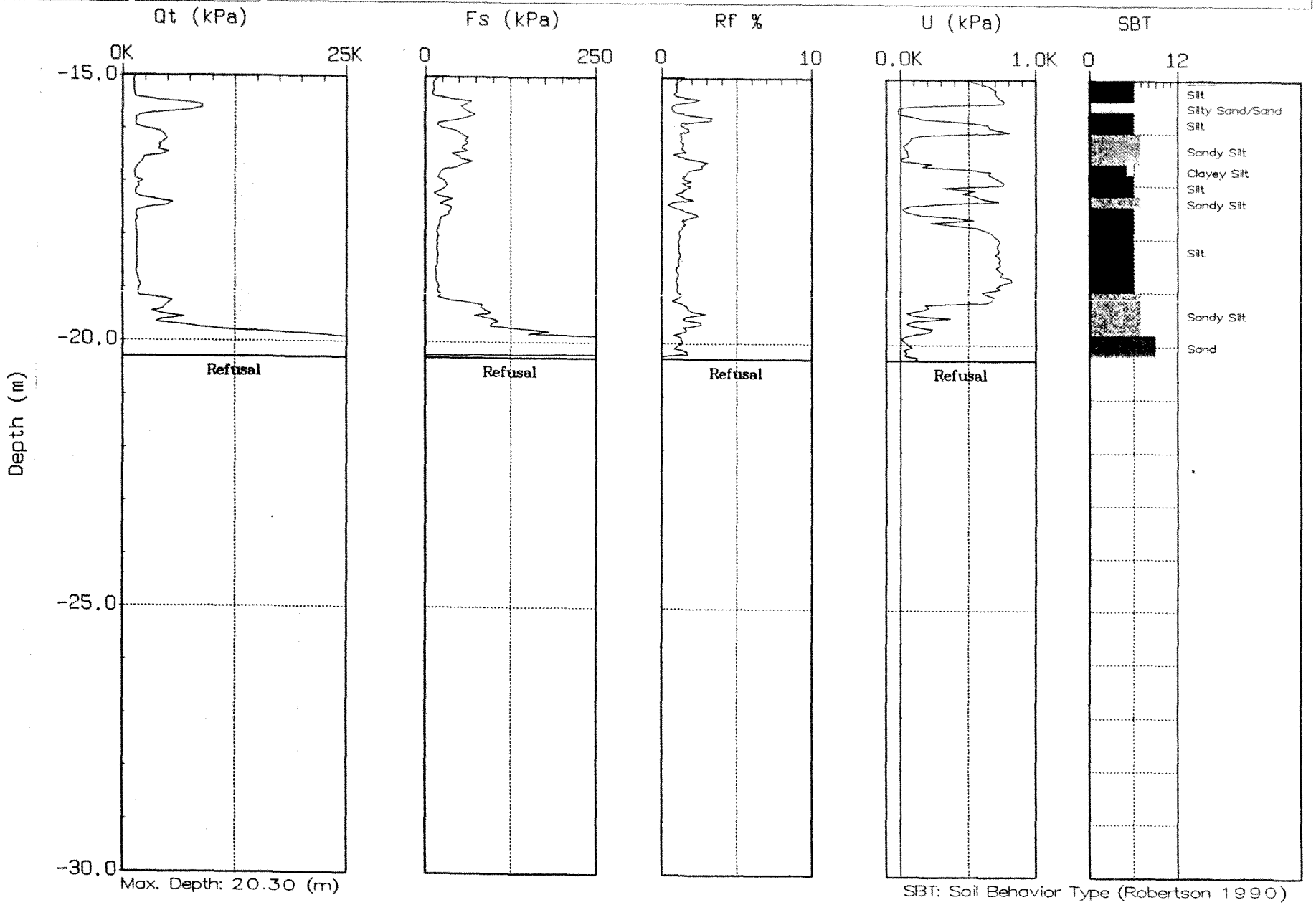
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-228

Legacy Parkway

Site: SC-19-280
Station: 50+809.297 1.40 RT
Elevation: 1292.810

Cone: 20 TON A 070
Date: 03:02:00 10:15



Max. Depth: 20.30 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-229

Boring: SB-19-281
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) (0 – 25 – 50)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: SAND and GRAVEL - medium dense to dense, moist, brownish gray		1														
	Lean CLAY - soft, very moist, black, with organics	5			SPT	457	CL	A-6	9 3 1	8							
1290		10	2		P	508					43						
	SILT - stiff, wet, dark gray, with fine-grained sand	15	3				ML	A-4									
			4		SPT	203			3 5 4	14							
		20	5		P	610											
	Silty SAND - medium dense, wet, brown, with silt		6				SM	A-2-5			38						
1285	Elastic SILT - medium stiff, wet, gray	25	7		SPT		MH	A-7-5	0 2 2	6							
	- very soft	30	8		P	610					30 48	15.4	31			96	C SG
		35	9		SPT				0 0 0	0							
1280		40	10		P	508					48						
		45	11		SPT				0 2 2	4							
		50	12		P	0											
			13		P	610					46 29	11.8	50	50	16	96	C SG
1275	Poorly Graded SAND with silt - dense, wet, fine-grained	55	14				SP-SM	A-1-b									
		60	15		SPT	457			6 12 17	31							
		65	16							10							

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-281**

Sheet 1 of 3

Logged by:	C. Wieden
Date Start:	2/2/00
Date Finish:	2/5/00
Station:	50+840.936 7.44 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,720.587 E 20,041.780
Elevation (m):	1291.983
Total Depth Drilled (m):	44.7
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 2003SB2B.GPJ 6/31/00

Boring: SB-19-281
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (N1)60 ● / (N1)60 (Greater than 50 Blows) ○ (0 25 50)	Su, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	- Poorly Graded SAND with silt, continued; medium dense, wet, gray, fine to medium-grained, with some gravel				SPT	457			6 7 9		48						
	SILT - stiff, moist, gray , frequent sand and clay seams and layers	70	21		SPT	457	ML	A-4	3 7 7	14							
1270			22														
		75	23														
	- no visible sand or clay layers		24														
		80	25		P	610					34						
		85	26														
1265	Silty SAND - dense, wet, gray, frequent silt seams and layers, trace gravel	90	27		SPT	457	SM	A-2-5	7 14 14	24							
	SILT - very stiff, moist, gray, with trace of sand and occasional lean clay seams	95	28		SPT	457	ML	A-4	5 8 11	16							
	Silty SAND with GRAVEL - dense, wet, olive gray	100	29		SPT	254	SM	A-2-5	19 23 19	34							
1260	SILT - stiff, wet, interbedded with frequent silty sand layers	105	30		SPT	305	ML	A-4	9 7 10	14							
	Silty SAND with gravel - medium dense, very moist to wet, olive gray, with occasional silt and clay seams and layers	110	31		SPT	356	SM	A-2-5	11 10 9	15							
	- very dense	115	32		SPT	254			21 33 36								
1255	- medium dense	120	33		SPT	102			19 15 20	26							
		125	34		SPT				18 32 25	41							
	SILT - stiff, wet, olive gray, frequent clay layers up to 300 mm thick,	130	35		SPT		ML	A-4		14							

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-281**

Sheet 2 of 3

Logged by:	C. Wieden
Date Start:	2/2/00
Date Finish:	2/5/00
Station:	50+840.936 7.44 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,720.587 E 20,041.780
Elevation (m):	1291.983
Total Depth Drilled (m):	44.7
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 8/31/00

Boring: SB-19-281
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	some fine-grained gravel					457	SM	A-2-4	4 10 10								
	Silty SAND - medium dense, wet, olive gray, frequent silt and clay layers, some gravel	135	41		SPT	305			10 8 13	● 15							
1250	- GRAVEL with cobbles	140	42		SPT	457			53 11 12	● 16							
	Lean CLAY layer		43														
		145	44		SPT				5 16 15	● 21							
			45														
		150	46														
1245		155	47														
			48														
		160	49														
			50														
		165	51														
1240		170	52														
			53														
		175	54														
		180	55														
			56														
		185	57														
1235		190	58														
			59														
		195															

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-19-281**

Sheet 3 of 3

Logged by:	C. Wieden
Date Start:	2/2/00
Date Finish:	2/5/00
Station:	50+840.936 7.44 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,720.587 E 20,041.780
Elevation (m):	1291.983
Total Depth Drilled (m):	44.7
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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SAMPLE TYPE

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MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003S82B.GPJ 5/31/00

Boring: LSB-19-470
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-19-274 for additional lithology above 30.2 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1295		5	1														
		10	2														
		15	3														
		20	4														
		25	5														
		30	6														
		35	7														
		40	8														
		45	9														
1290	Lean CLAY - medium stiff, moist, brown to grey Silty SAND - stiff, moist, grey, micaceous, fine-grained	50	10		SPT	559			3 4 9 7	●13							
		55	11														
		60	12														
		65	13														
1285			14														
			15														
			16														
			17														
			18														
			19														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-08

FIELD TEST BORING LOG

Boring: **LSB-19-470**

Sheet 1 of 3

Logged by:	M. Ivers
Date Start:	7/10/01
Date Finish:	7/11/02
Station:	50+667.77 0.0 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.766 E 19,868.648
Elevation (m):	1300.033
Total Depth Drilled (m):	45.1
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

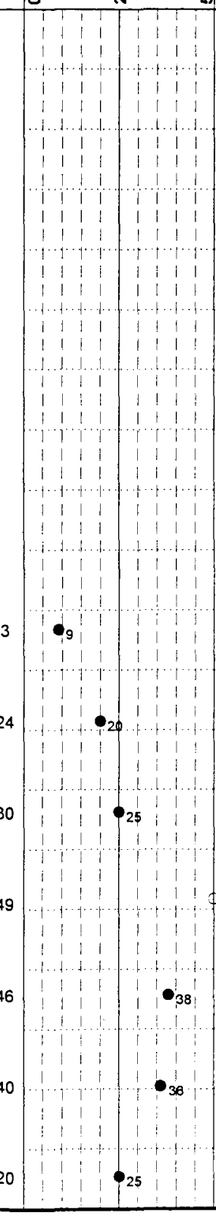
UTDOT 3511ZLNI.GPJ 12/30/02

PLATE A-1
STRUCTURE 19

Boring: LSB-19-470
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-19-274 for additional lithology above 30.2 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.															
1275		70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130	21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39													
1270	Lean CLAY - stiff to very stiff, wet, grey				SPT	381	CL	A-6	2 8 6 3							
					SPT	508			0 11 19 24							
	Poorly Graded SAND - dense, wet, grey, fine-grained sand, trace silt				SPT		SP	A-3	13 12 27 30							
1265	Silty CLAY with sand - hard, wet, olive grey				SPT	610	CL-ML	A-6	6 36 50 49							
	SILT with gravel - hard, moist, olive grey, fine-grained gravel				SPT	483	ML	A-4	50 28 32 46							
					SPT	406			19 26 33 40							
					SPT	457			26 25 17 20							

● SPT $(N_1)_{60}$
○ SPT $(N_1)_{60}$ (Greater than 50 Blows)



Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-08

FIELD TEST BORING LOG

Boring: **LSB-19-470**

Sheet **2** of **3**

Logged by:	M. Ivers
Date Start:	7/10/01
Date Finish:	7/11/02
Station:	50+667.77 0.0 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.766 E 19,868.648
Elevation (m):	1300.033
Total Depth Drilled (m):	45.1
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 35112LNI.GPJ 12/30/02

PLATE A-2
STRUCTURE 19

Boring: LSB-19-470
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows) 0–25–50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT with gravel (continued) - hard, moist, olive grey, fine-grained gravel	135	41		SPT				48 50/ 140mm								
			42														
	Silty SAND with gravel - dense to very dense, wet, olive grey, fine-grained gravel	140	43		SPT	610	SM	A-2-4	18 14 22 15	● 21							
		145	44		MC				70/ 100mm								
1255			45		SPT	127			61/ 150mm								
		150	46														
		155	47														
			48														
		160	49														
1250		165	50														
			51														
		170	52														
			53														
		175	54														
1245		180	55														
			56														
		185	57														
		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-08

FIELD TEST BORING LOG

Boring: **LSB-19-470**

Sheet **3** of **3**

Logged by:	M. Ivers
Date Start:	7/10/01
Date Finish:	7/11/02
Station:	50+667.77 0.0 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.766 E 19,868.648
Elevation (m):	1300.033
Total Depth Drilled (m):	45.1
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3611ZLNI.GPJ 12/30/02

Boring: LSB-19-471
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-19-276 for additional lithology above 30.5 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1300		5	1														
			2														
		10	3														
			4														
		15	5														
		20	6														
1295			7														
		25	8														
▽		30	9														
			10														
		35	11														
1290		40	12														
	Lean CLAY with sand - medium stiff, wet, grey and tan				SPT	432			2 3 3 3	●5				42	20	83	
	Poorly Graded SAND - loose, wet, grey		13														
		45	14														
		50	15														
			16														
1285		55	17														
		60	18														
			19														
		65															

UTDOT 3611ZLNI.GPJ 12/30/02

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-08

FIELD TEST BORING LOG

Boring: **LSB-19-471**

Sheet **1** of **3**

Logged by:	M. Ivers
Date Start:	7/12/01
Date Finish:	7/17/01
Station:	50+702.77 0.0 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.617 E 19,903.647
Elevation (m):	1301.740
Total Depth Drilled (m):	46.3
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: LSB-19-471
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)				SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows) 0–25–50	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-19-276 for additional lithology above 30.5 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																			
1280		70	21																	
		75	22																	
		80	23																	
		85	24																	
1275		90	25																	
		95	26																	
		100	27																	
	Poorly Graded SAND - dense, wet, grey, trace fine-grained gravel, occasional clay seams		28		SPT	457	SP	A-3	8	16	16	14	●21							
1270		105	29																	
	Lean CLAY - very stiff to hard, wet, grey		30		SPT	483	CL	A-6	8	10	6	4	●10			35	11			
		110	31																	
	- occasional medium grained sand layers		32		SPT	533			20	16	14	13	●19							
		115	33																	
	- color change to olive		34		SPT	610			6	16	38	33	●34							
	Silty SAND - very dense, wet, grey, some fine-grained gravel		35				SM	A-2-4										30		
1265	Poorly Graded SAND - medium dense to very dense, wet, grey, medium grained sand	120	36		SPT	356	SP	A-3	3	12	16	22	●17							
	- occasional lean clay layers	125	37		SPT	559			4	6	8	32	●8							
		130	38		SPT								●29							

Test Results *

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8440-08

FIELD TEST BORING LOG

Boring: **LSB-19-471**

Sheet **2** of **3**

Logged by:	M. Ivers
Date Start:	7/12/01
Date Finish:	7/17/01
Station:	50+702.77 0.0 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.617 E 19,903.647
Elevation (m):	1301.740
Total Depth Drilled (m):	46.3
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 12/30/02

PLATE A-5
STRUCTURE 19

Boring: LSB-19-471
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly Graded SAND (continued) - medium dense to very dense, wet, grey, medium grained sand					483			5 18 30 33								
	- with fine-grained gravel	135	41		SPT				34 40 29 15	●40							
1260			42														
	- occasional poorly graded sand layers	140	43		SPT	533			6 8 15 25	●13							
			44														
	- occasional brown clay seams	145	45		SPT	254			20 17 12 11	●16							
		150	46		SPT												
1255		155	47														
			48														
		160	49														
			50														
		165	51														
1250		170	52														
			53														
		175	54														
		180	55														
			56														
		185	57														
1245		190	58														
			59														
		195															

UTDOT 3511ZLNI.GPJ 12/30/02

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-08

FIELD TEST BORING LOG

Boring: **LSB-19-471**

Sheet **3** of **3**

Logged by:	**M. Ivers**
Date Start:	**7/12/01**
Date Finish:	**7/17/01**
Station:	**50+702.77 0.0 RT**
Line:	**GLOVERS LANE**
Coordinates (m):	**N 121,728.617 E 19,903.647**
Elevation (m):	**1301.740**
Total Depth Drilled (m):	**46.3**
Drill Contractor:	**RC Exploration**
Driller:	**M. Labenski**
Rig Type:	**Diedrich D-120 ATV**
Rig Serial Number:	**D-120009**
Drilling Method:	**Hollow-Stem Auger**
Hammer Type:	**Automatic**
Rod Type:	**AW**
Boring Diameter:	**133 mm**

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: LSB-19-473
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1295	FILL: Poorly Graded SAND with gravel - medium dense, slightly moist, reddish brown, fine-grained sand				A-3								
		G											
		SPT	254			6 8 9 10							
	Lean CLAY with sand - soft to medium stiff, moist to wet, grey	SPT	203	CL	A-4	3 2 3 3							
		SPT	457			2 2 2 2				32	10	80	
	- wet, increasing sand content	SPT	508			2 6 7 5							
		SPT	330			2 2 1 1						67	
1290	- occasional brown clay layers	SPT	432			2 4 2 3							
		SPT	508			2 1 2 1						87	
		SPT	229			1 5 7 8							
	Poorly Graded SAND with silt - loose to medium dense, wet, yellow brown, fine-grained sand	SPT	610	SP-SM	A-3	4 2 6 3						8	
		SPT	508			3 2 2 2							
	Lean CLAY - soft, wet, grey	SPT	533	CL	A-6	0 2 1 1				30	9	94	
		SPT	432			1 2 2 2							
1285	SILT - soft to medium stiff, wet, gray, occasional sand seams and layers	SPT	610	ML	A-4	4 3 3 4				36	10	94	
		SPT	610			4 3 4 4							
		SPT	610			1 2 2 1				35	11	96	
		SPT	559			2 2 1 3							
	Lean CLAY - soft to medium stiff, wet, gray	SPT	610	CL	A-6	2 3 3 4				36	14	95	
		SPT	610			3 1 2 3							
1280	- mottled brown and grey Refer to SB-19-279 for additional lithologybetween 15.2 and 19.8 meters.												

Depth: ft 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65; m 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

Graphic Log

● SPT $(N_1)_{60}$
○ SPT $(N_1)_{60}$ (Greater than 50 Blows)
0 25 50

Test Results *

UTDOT 3512LNI.GPJ 12/30/02

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-08

FIELD TEST BORING LOG

Boring: **LSB-19-473**

Sheet **1** of **2**

Logged by:	M. Ivers
Date Start:	8/14/01
Date Finish:	8/17/01
Station:	50+814.377 0.0 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.140 E 20,015.253
Elevation (m):	1295.248
Total Depth Drilled (m):	33.5
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

PLATE A-7
STRUCTURE 19

Boring: LSB-19-473
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1275	Silty GRAVEL with sand - loose, wet, fine to coarse grained sand				SPT	610	GM	A-2-4	4 4 5 6							24	
		70	21														
	Clayey GRAVEL with sand - medium dense, wet, grey, frequent clay layers				SPT	584	GC	A-2-6	8 9 7 7	11							
		75	22														
			23		SPT												
			24														
		80															
	Lean CLAY with gravel - stiff, wet, grey, with frequent silt layers				SPT	559	CL	A-6	2 3 7 9	7						72	
			25														
1270																	
		85	26		SPT	457			4 4 4 8	5				42	18		
			27														
	Silty SAND - medium dense to dense, wet, grey, frequent silt layers	90			SPT	406	SM	A-2-4	9 10 10 10	12						44	
			28														
		95	29		SPT	559			12 21 19 21	25							
			30														
1265		100															
	Lean CLAY - very stiff to hard, wet, grey, occasional clayey gravel layers		31		SPT	483	CL	A-6	5 8 12 11	12							
		105	32		SPT	152	GC	A-2-6	48 50/125 mm								
	Clayey GRAVEL - very dense, wet, grey																
			33		SPT	203			18 35 18 17	31							
		110															
			34														
1260		115	35														
			36														
		120															
			37														
		125	38														
			39														
		130															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-08

FIELD TEST BORING LOG

Boring: **LSB-19-473**

Sheet **2** of **2**

Logged by:	M. Ivers
Date Start:	8/14/01
Date Finish:	8/17/01
Station:	50+814.377 0.0 RT
Line:	GLOVERS LANE
Coordinates (m):	N 121,728.140 E 20,015.253
Elevation (m):	1295.248
Total Depth Drilled (m):	33.5
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3611ZLNI.GPJ 12/30/02

PLATE A-8
STRUCTURE 19

Boring: RB-370
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / $(N_1)_{60}$ ○ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND - medium dense to dense, moist, brown to dark brown, trace gravel				MC	381			10 9 10 12	34							
			1		SPT	203			9 8 5 4	29							
		5			MC	152			5 4 3 3	10							
			2		SPT	432			4 7 10 10	27							
		10	3		MC	610			4 3 4 5	9							
	Sandy Lean CLAY - stiff to very stiff, wet, gray		4		SPT	152	CL	A-6	5 6 5 4	17							
		15			MC	457			4 4 5 6	11							
1290			5		SPT	0			3 7 5 3	19							
	- gravel lense	20	6		SH	610					43						
			7		SPT	508	SM	A-2-4	7 4 2 3	9							
	Silty SAND - loose, wet, gray, fine to medium-grained																
	Clayey SILT - medium stiff, wet, gray	25					CL-ML	A-4									
	- silty sand lenses		8		MC	229			3 2 4 3	7							
					SPT	610			2 2 3 3	7							
	Lean CLAY - medium stiff, wet, brown, with occasional layers fine-grained sand		9				CL	A-6									
	SILT - medium stiff to stiff, wet, gray, with clay seams	30			MC	305	ML	A-4	2 3 5 7	8							
1285	Lean CLAY - stiff, wet, brown		10		SPT	610	CL	A-6	5 6 9 6	20							
		35	11		MC	610	SP	A-2-4	4 4 6 8	11							SV
	Poorly graded SAND with silt - medium dense to dense, wet, brownish-gray, with lean clay lenses				SPT	610			10 10 15 10	35							
		40	12		MC	610			7 4 4 4	8							
			13		SPT	610			4 3 4 2	7							
		45	14		MC	559			2 3 3 3	6							
	Sandy SILT - medium stiff, wet, gray, with lean clay lenses		15		SPT	610	ML	A-7-6	2 2 3 6	5							
1280		50			MC	610			3 3 3 6	6							
			16														
		55	17		SPT	610			6 4 6 5	12							
	- stiff		18														
		60			SH	610					64 *53*	12.7	43	44	16		C TR SG
			19														
		65								3							

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-370**

Sheet **1** of **2**

Logged by:	M. Bostrom
Date Start:	3/14/00
Date Finish:	3/14/00
Station:	50+571.674 7.54 RT
Line:	Glovers Lane
Coordinates (m):	N 121,721.642 E 19,772.521
Elevation (m):	1295.032
Total Depth Drilled (m):	22.6
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 6/30/00

Boring: RB-370
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy SILT - stiff, wet, gray, with lean clay lenses (continued)		21		SPT	610			3 4 3 8								
		70			SH	610					57						
			22		SPT	610			2 3 2 3	●6							
		75	23														
			24														
		80															
1270			25														
		85	26														
			27														
		90															
			28														
		95	29														
1265			30														
		100															
			31														
		105	32														
			33														
		110															
			34														
1260		115	35														
			36														
		120															
			37														
		125	38														
			39														
		130															

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-370**

Sheet 2 of 2

Logged by:	M. Bostrom
Date Start:	3/14/00
Date Finish:	3/14/00
Station:	50+571.674 7.54 RT
Line:	Glovers Lane
Coordinates (m):	N 121,721.642 E 19,772.521
Elevation (m):	1295.032
Total Depth Drilled (m):	22.6
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 5/10/00

Boring: RB-415
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)				SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT - stiff to very stiff, moist, dark brown				MC		ML	A-4	4	10	8	7	●18							
	Lean CLAY - stiff, moist, light gray, medium plasticity		1		SPT		CL	A-6	3	4	3	5	●7							
	SILT - medium stiff, moist, olive-brown, no to low plasticity, with medium to coarse-grained sand	5	2		SH		ML	A-4						67					92	C SG TV
1285	Sandy Lean CLAY - medium stiff, wet, brown to gray to dark gray				SPT		CL	A-6	2	2	2	3	●4							
		10	3		MC				2	1	1	1	●2							
	- sand lense		4		SPT				3	2	1	2	●3		12.9	37				
		15	5		SH				1	2	2	2	●4							
		20	6		MC				2	1	1	2	●2							
	- very soft		7		SPT				5	4	3	4	●7							
1280	- medium stiff	25	8		SH									17 *34*	13.2	38			90	UC TV
		30	9		SPT				2	1	2	3	●3							
		35	10																	
			11																	
		40	12																	
1275			13																	
		45	14																	
		50	15																	
			16																	
		55	17																	
1270			18																	
		60	19																	
		65																		

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-415**

Sheet **1** of **1**

Logged by:	R. Davis
Date Start:	5/19/00
Date Finish:	5/19/00
Station:	6017+100.000 0.00 RT
Line:	D Mainline
Coordinates (m):	N 120,175.489 E 19,873.302
Elevation (m):	1287.505
Total Depth Drilled (m):	9.1
Drill Contractor:	RC Exploration
Driller:	M. Burns
Rig Type:	CME-750 Track
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SUP.GPJ 5/31/00

Boring: RB-417
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows) (0 – 25 – 50)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT - very stiff to hard, moist, dark brown				MC	457	ML	A-4	8 14 20 17	42							
			1		SPT	610			3 2 3 4	8							
		5			SH	406										78	
			2								53						
					SPT	610			2 4 4 5	12							
		10	3		MC	610			1 3 3 4	6							
	Lean CLAY - medium stiff, wet, gray						CL	A-6									
	- grades to soft		4		SPT	610			2 2 1 2	4							
		15			SH	457											
	- with sand seams													33	12		
1280	SILT - medium stiff, moist to wet, gray, dilatant		5				ML	A-4			24						
					SPT	610			2 2 4 3	8							
	Poorly Graded SAND - loose, wet, dark gray to black, with few clay interbeds	20	6		MC	610	SP	A-3	2 3 2 4	5						70	
			7		SPT	610			2 1 1 2	2							
	Lean CLAY - soft, wet, olive-gray						CL	A-6									
	Poorly Graded SAND - loose, wet, dark gray to black, fine-grained	25	8		SH	457	SP	A-3			17 24	13.3	38			97	C SG
					SPT	610			0 0 0 0	0							
	Lean CLAY - very soft, wet, gray		9				CL	A-6									
1275		30	10														
		35	11														
		40	12														
			13														
		45	14														
1270		50	15														
			16														
		55	17														
		60	18														
			19														
1265		65															

UTDOT Z003SUP.GPJ 6/31/00

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-417**

Sheet **1** of **1**

Logged by:	R. Davis
Date Start:	5/19/00
Date Finish:	5/19/00
Station:	6017+700.000 0.00 RT
Line:	D Mainline
Coordinates (m):	N 120,775.482 E 19,876.216
Elevation (m):	1284.895
Total Depth Drilled (m):	9.1
Drill Contractor:	RC Exploration
Driller:	M. Burns
Rig Type:	CME-750 Track
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: RB-418
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)				SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows) 0 25 50	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT with sand - soft, moist, dark gray				MC	457	ML	A-4	1	2	2	1	●4							
	Silty SAND - soft, moist, light gray, micaceous		1		SPT	457	SM	A-2-4	1	1	2	3	●5							
▽	Sandy SILT - soft to medium stiff, moist, dark gray						ML	A-4												
	Lean CLAY - soft, moist to wet, light gray, plastic	5	2		SH	457	CL	A-7-6						42 77	14.7	29	43	21		C SG
	Sandy Lean CLAY - medium stiff, moist, gray, plastic, sand is fragment				MC	457	CL	A-6	2	2	3	4	●8							
	- black organics fragments	10	3		SPT	457	CL-ML	A-6	2	1	0	1	●1							
	Silty CLAY - soft, moist, gray, plastic																			
	Silty SAND - very loose, wet, olive-brown clayey silt, gray fine-grained sand, black organics		4		SPT	457	SM	A-2-4	0	0	1	2	●1							
	Poorly Graded SAND - soft, wet, gray, fine to medium-grained	15	5		SH	610	SP	A-3							13.5	36			93	C SG
1280	- grades to interbedded silt, olive-brown, very soft, moist				SPT	610			2	1	1	2	●2	19						
		20	6		MC	610	CL-ML	A-6	0	0	1	4	●1							
	Silty CLAY - very soft, wet, light gray, plastic																			
	- grades to interbeds of sandy silt, very soft, moist, black sand, gray silty clay, plastic		7		SPT	610			0	0	1	2	●1							
	Poorly Graded SAND - soft, wet, black to gray	25	8		SH	610	SP	A-3												
					MC	610			0	1	1	2	●2							
	Lean CLAY - very soft, wet, light gray						CL	A-6												
	SILT - medium stiff, wet, black	30	9		SPT	610	ML	A-4	3	5	7	9	●12							
	Silty SAND - medium dense, wet, gray to black						SM	A-2-4												
1275		35	10 11																	
		40	12																	
		45	13 14																	
1270		50	15																	
		55	16 17																	
		60	18																	
			19																	
1265		65																		

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-418**

Sheet **1** of **1**

Logged by:	R. Davis
Date Start:	5/10/00
Date Finish:	5/10/00
Station:	6017+960.001 0.19 RT
Line:	D Mainline
Coordinates (m):	N 121,035.479 E 19,877.674
Elevation (m):	1284.895
Total Depth Drilled (m):	9.4
Drill Contractor:	RC Exploration
Driller:	M. Burns
Rig Type:	CME-750 Track
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SUP.GPJ 6/3100

Boring: RB-419
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND - medium stiff, dry to moist, brown to light brown, fine-grained				MC	610	SM	A-2-4	4 4 3 6	9							
	SILT with sand - soft, wet, olive-brown with reddish-brown mottles, fine-grained sand		1		SPT	457	ML	A-4	1 2 2 1	6							
		5			SH	0											
▽			2		SPT	457	CL-ML	A-6	1 1 2 4	5							
	Silty CLAY - soft, moist, olive-gray, plastic																
1285	Sandy SILT - medium stiff, wet, dark gray to black	10	3		SH	0	A-4	A-4									
			4		SPT	203			3 3 4 4	10						53	
	- stiff	15	5		MC	610			4 5 5 6	10		12.7	42				
					SPT	610			0 1 2 1	4							
	- soft	20	6		MC	610			7 8 10 12	18							
	Lean CLAY - stiff, wet, olive-gray silt, with black fine-grained sand		7		SPT	610	CL	A-6	7 5 7 10	14				35	13		
		25			MC	457			0 1 2 1	3		13.3	37				
1280			8		SPT	457			1 1 1 2	3							
		30	9		SPT	457			4 2 2 8	4							
			10														
		35	11														
			12														
		40															
1275			13														
		45	14														
			15														
		50															
			16														
		55	17														
1270			18														
		60															
			19														
		65															

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-419**

Sheet **1** of **1**

Logged by:	R. Davis
Date Start:	5/10/00
Date Finish:	5/10/00
Station:	6018+299.985 3.00 LT
Line:	D Mainline
Coordinates (m):	N 121,375.475 E 19,876.131
Elevation (m):	1288.083
Total Depth Drilled (m):	9.4
Drill Contractor:	RC Exploration
Driller:	M. Burns
Rig Type:	CME-750 Track
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SUP.GPJ 5/31/00

Boring: RB-420
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (N1)60 ● / (N1)60 (Greater than 50 Blows) ○ (0 25 50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT - medium stiff, moist, brown, with trace sand				MC	457	ML	A-4	2 3 5 4	10							
			1		SPT	610			2 3 4 5	11							
	Silty CLAY - medium stiff, moist, light olive-brown, plastic	5			SH	432	CL-ML	A-6									
			2								*41*						
1295					SPT	610			1 2 3 3	8							
	Lean CLAY - medium stiff to stiff, wet, light reddish-brown	10	3		MC	0	CL	A-6	3 4 5 5	11							
			4		SPT	610			2 2 2 3	6							
		15			SH	508					25	16.6	28	39	18	84	C
	- grades gray		5								*43*						SG
					SPT	610			2 3 6 4	12							
		20	6		MC	457			2 3 3 4	6							
	- grades to medium stiff																
	Silty SAND - medium dense, wet, gray to black, fine to medium grained sand		7		SPT	610	SM	A-2-4	2 2 3 2	5							
1290	SILT - medium stiff, moist, gray, slightly dilatant	25					ML	A-4									
			8		SH	356											
	- grades to gray silt				SPT	610	CL	A-6	2 2 4 3	6	*43*			39	18		
	Lean CLAY - medium stiff, wet, gray		9		SPT	610			2 2 2 2	4							
		30															
			10														
		35															
			11														
			12														
1285		40															
			13														
		45															
			14														
			15														
		50															
			16														
		55															
			17														
1280																	
			18														
		60															
			19														
		65															

UTDOT Z003SUP.GPJ 5/31/00

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-420**

Sheet 1 of 1

Logged by:	R. Davis
Date Start:	5/11/00
Date Finish:	5/11/00
Station:	6019+470.000 0.00 RT
Line:	D Mainline
Coordinates (m):	N 122,513.204 E 19,644.905
Elevation (m):	1297.285
Total Depth Drilled (m):	9.4
Drill Contractor:	RC Exploration
Driller:	M. Burns
Rig Type:	CME-750 Track
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: RB-421
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel - medium dense, moist, gray to brown				MC	508	SM	A-2-4	5 6 9 7	24							
			1		SPT	330			3 3 3	14							
		5			SH	457					51	16.9	20	36	14	75	C
			2								*62*						SG
					SPT	457			2 4 3	16							
	Lean CLAY with sand - very stiff, wet, tan						CL	A-6									
1295		10	3		MC	127			4 5 6 10	19							
	Silty SAND with gravel - loose, wet, dark gray to brown and tan, fine-grained		4		SPT	406	SM	A-2-4	3 5 5	20				34	13		
	Lean CLAY - stiff, wet, brown, medium plasticity						CL	A-6									
		15			SH	610											
			5		SPT	457			3 4 4	16	*53*						
		20	6		MC	483			4 11 7 7	26							
			7		SPT	457			1 2 2	6			23			18	
	- loose silty sand layer																
		25			SH	610											
1290			8		SPT	610			2 3 2 2	8	*48*						
		30	9														
			10														
		35	11														
			12														
		40															
1285			13														
		45	14														
			15														
		50															
			16														
		55	17														
1280			18														
		60															
			19														
		65															

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-421**

Sheet **1** of **1**

Logged by:	R. Khandokar
Date Start:	5/17/00
Date Finish:	5/17/00
Station:	6019+900.000 0.00 RT
Line:	D Mainline
Coordinates (m):	N 122,925.217 E 19,521.837
Elevation (m):	1297.915
Total Depth Drilled (m):	8.8
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	203 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SUP.GPJ 6/31/00

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Utah Department of Transportation

Geotechnical Division-SPT Hammer Calibration

Calibration Set Up Data:

Drilling Company: Haz-Tech Date: 2-9-2000

Drilling Company Address: 3131 Lanark suite B; Meridian, ID 83607 Phone: 800-359-1502

Drill Rig Make and Model: Kilman Brainer (BK)-81 Equipment No. BK-81-0192-105 (1992 Model)

Driller: Mike Corn SPT Hammer Type: Automatic

Condition of Hammer: _____ Weather: P.C. Temp: 45

Drill Rod Size: NWJ OD(in) ____ ID(in) ____ Sampler Size: SPT OD(in) 2 ID(in) 1 3/8

PDA Operators: Sjoblom, Bischoff

Location of Boring: I-15 / US-89, Lagoon Int. Drilling Method: Mud Rotary

PDA Equipment Used: PAC S.N.1247K Strain Transducers: F1 30NWJ1 F2 30NWJ2

Accel. Transducers: A1 340 A2 353

Monitored Data:

Recommend monitoring at 3 depths between 15 and 50 feet, 2 foot interval each.

First Depth

PDA xFile Name (*.*X01*) LEGACY1

PDA qFile Name (*.*Q01*) LEGACY1 PDA Blow Numbers: From 71 To 90

Depth from 30' to 31.5' **SPT Blow Counts** 21 total blows in 18"

BPF(2nd + 3rd 6 inches) ____

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

_____

EMX/.35

Low 77.1 Comments: 20 total good blows

High 91.4 _____

Avg. 84.4 _____

Std. 3.9

PLATE I-1

Second Depth

PDA xFile Name (*.*X01*) LEGACY1

PDA qFile Name (*.*Q01*) LEGACY1 PDA Blow Numbers: From 91 To 99

Depth from 35' to 37.5' **SPT Blow Counts** (each 6 inches) 5 3

BPF(2nd + 3rd 6 inches) 8

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 80 Comments: 9 total good blows

High 105.7

Avg. 88.9

Std. 8.2

Third Depth

PDA xFile Name (*.*X01*) LEGACY1

PDA qFile Name (*.*Q01*) LEGACY1 PDA Blow Numbers: From 100 To 156

Depth from 40' to 42.5' **SPT Blow Counts** (each 6 inches) 16 20 20

BPF(2nd + 3rd 6 inches) 40

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM,*):

EMX/.35

Low 68.5 Comments: 57 total good blows

High 94.3

Avg. 82.6

Std. 5.2

Averge EMX/0.35 (All Depths): 83.7 %

Standard Deviation (All Depths): 5.7 %

Utah Department of Transportation

Geotechnical Division-SPT Hammer Calibration

Calibration Set Up Data:

Drilling Company: Haz-Tech Date: 2-9-2000

Drilling Company Address: 3131 Lanark suite B; Meridian, ID 83607 Phone: 800-359-1502

Drill Rig Make and Model: CME-75 Equipment No. SN 227807

Driller: Chris Peterson SPT Hammer Type: Auto-Hydraulic

Condition of Hammer: Fair Weather: P.C. Temp: 50

Drill Rod Size: NWJ OD(in)____ ID(in)____ Sampler Size: SPT OD(in) 2 ID(in) 1 3/8

PDA Operators: Sjoblom, Bischoff

Location of Boring: I-15 / US-89 Drilling Method: Mud Rotary

PDA Equipment Used: PAC S.N.1247K Strain Transducers: F1 30NWJ1 F2 30NWJ2

Accel. Transducers: A1 340 A2 353

Monitored Data:

Recommend monitoring at 3 depths between 15 and 50 feet, 2 foot interval each.

First Depth

PDA xFile Name (*.*X01*) LEGACY2

PDA qFile Name (*.*Q01*) LEGACY2 PDA Blow Numbers: From 1 To 68

Depth from 61' to 62.5' **SPT Blow Counts** (each 6 inches) 20 30 19

BPF(2nd + 3rd 6 inches) 49

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 77 Comments: 68 total good blows

High 82.9

Avg. 80

Std. 1.3

Second Depth

PDA xFile Name (*.*X01*) LEGACY2

PDA qFile Name (*.*Q01*) LEGACY2 PDA Blow Numbers: From 69 To 113

Depth from 71' to 72.5' **SPT Blow Counts** (each 6 inches) 13 19 12

BPF(2nd + 3rd 6 inches) 31

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 74.3 Comments: Blow 69, bad; 44 total good blows

High 80

Avg. 78.2

Std. 1.5

Third Depth

PDA xFile Name (*.*X01*) LEGACY2

PDA qFile Name (* *Q01*) LEGACY2 PDA Blow Numbers: From 114 To 161

Depth from 76' to 77.5' **SPT Blow Counts** (each 6 inches) 17 20 20

BPF(2nd + 3rd 6 inches) 40

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM,*):

EMX/.35

Low 74.3 Comments: Blow 114, bad; 47 total good blows

High 80

Avg. 77.4

Std. 1.3

Averge EMX/0.35 (All Depths): 78.7 %

Standard Deviation (All Depths): 1.8 %

Utah Department of Transportation

Geotechnical Division-SPT Hammer Calibration

Calibration Set Up Data:

Drilling Company: Layne Christensen Date: 2-23-2000

Drilling Company Address: 1707 S. 4490 W., SLC Phone: (801)972-3333

Drill Rig Make and Model: Mobile B-53 Equipment No. 5908

Driller: Christian Davis SPT Hammer Type: Automatic-Hydraulic

Condition of Hammer: Fair Weather: Cloudy Temp: 40

Drill Rod Size: AWJ OD(in)____ ID(in)____ Sampler Size: SPT OD(in) 2 ID(in) 1 3/8

PDA Operators: Sjoblom, Graham California OD(in) 2.5 ID(in) 2

Location of Boring: I-215 / Redwood Rd. Int. Drilling Method: Rotary Wash

PDA Equipment Used: PAC S.N.1247K Strain Transducers: F1 30NWJ1 F2 30NWJ2

Accel. Transducers: A1 340 A2 353

Monitored Data:

Recommend monitoring at 3 depths between 15 and 50 feet, 2 foot interval each.

First Depth

PDA xFile Name (*.*X01*) LEGACY3

PDA qFile Name (*.*Q01*) LEGACY3 PDA Blow Numbers: From 1 To 6

Depth from 35' to 37' **SPT Blow Counts** 2 3 1

BPF(2nd + 3rd 6 inches) 4

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 42.9 Comments: 6 total good blows

High 57.1

Avg. 51.4

Std. 5.2

Second Depth

PDA xFile Name (*.*X01*) LEGACY3

PDA qFile Name (*.*Q01*) LEGACY3 PDA Blow Numbers: From 7 To 24

Depth from 35' to 37.5' **SPT Blow Counts** (each 6 inches) 5 3 3 6

BPF(2nd + 3rd 6 inches) 6

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 34.3 Comments: 17 total good blows, blow #7 bad

High 74.3

Avg. 51.4

Std. 9.3

Third Depth

PDA xFile Name (*.*X01*) LEGACY3

PDA qFile Name (*.*Q01*) LEGACY3 PDA Blow Numbers: From 25 To 56

Depth from 42' to 44' **SPT Blow Counts** (each 6 inches) 7 13 11

BPF(2nd + 3rd 6 inches) 24

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM,*):

EMX/.35

Low 34.3 Comments: 31 total good blows, blow #56 bad

High 71.4

Avg. 58.3

Std. 8.7

Averge EMX/0.35 (All Depths): 55.4 %

Standard Deviation (All Depths): 8.8 %

Utah Department of Transportation

Geotechnical Division-SPT Hammer Calibration

Calibration Set Up Data:

Drilling Company: R C Exploration Date: 2-28-2000

Drilling Company Address: Gusher Utah Phone: 801-722-3307

Drill Rig Make and Model: Diedrich D-120 Equipment No. 072009

Driller: Mike Labenski SPT Hammer Type: Automatic

Condition of Hammer: Good Weather: Cloudy Temp: 40

Drill Rod Size: AWJ OD(in)____ ID(in)____ Sampler Size: SPT OD(in) 2.0" ID(in) 1 3/8"

PDA Operators: Sjoblom, Bischoff

Location of Boring: Legacy, Farmington (23-289) Drilling Method: HSA

PDA Equipment Used: PAC S.N.1247K Strain Transducers: F1 30NWJ1 F2 30NWJ2

Accel. Transducers: A1 340 A2 353

Monitored Data:

Recommend monitoring at 3 depths between 15 and 50 feet, 2 foot interval each.

First Depth

PDA xFile Name (*.*X01*) Legacy4

PDA qFile Name (*.*Q01*) " PDA Blow Numbers: From 1 To 45

Depth from 19' to 21' **SPT Blow Counts** (each 6 inches) 8 8 18 11

BPF(2nd + 3rd 6 inches) 26

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 34.3 Comments: 45 good blows recorded

High 65.7

Avg. 44.3

Std. 7.5

Second Depth

PDA xFile Name (*.*X01*) Legacy4

PDA qFile Name (*.*Q01*) " PDA Blow Numbers: From 46 To 209

Depth from 24' to 26' **SPT Blow Counts** (each 6 inches) 24 54 49 57

BPF(2nd + 3rd 6 inches) 103

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 31.4 Comments: 163 good blows recorded; Blow #46 bad

High 65.7

Avg. 43.6

Std. 8.5

Third Depth

PDA xFile Name (*.*X01*) Legacy4

PDA qFile Name (*.*Q01*) " PDA Blow Numbers: From 210 To 346

Depth from 28' to 30' **SPT Blow Counts** (each 6 inches) 13 26 48 50

BPF(2nd + 3rd 6 inches) 74

PDA Parameters Monitored (*Recommend EMX. ETR set ER to 0.35, EF2, FMX, DFN, BPM,*):

EMX/.35

Low 34.3 Comments: 137 good blows recorded

High 71.4

Avg. 49.2

Std. 8.2

Averge EMX/0.35 (All Depths): 46.0 %

Standard Deviation (All Depths): 8.7 %

Utah Department of Transportation

Geotechnical Division-SPT Hammer Calibration

Calibration Set Up Data:

Drilling Company: Haz-Tech Date: 3-1 & 3-2-2000

Drilling Company Address: 3131 Lanark suite B; Meridian, ID 83607 Phone: 800-359-1502

Drill Rig Make and Model: CME 850 Equipment No. 267652 (1995 Model)

Driller: Rick Knott SPT Hammer Type: Automatic

Condition of Hammer: Good Weather: Cloudy Temp: 45

Drill Rod Size: NWJ OD(in)____ ID(in)____ Sampler Size: SPT OD(in) 2 ID(in) 1 3/8

PDA Operators: Sjoblom, Graham

Location of Boring: I-215 / South side of Jordan River Drilling Method: Mud Rotary

PDA Equipment Used: PAC S.N.1247K Strain Transducers: F1 30NWJ1 F2 30NWJ2

Accel. Transducers: A1 340 A2 353

Monitored Data:

Recommend monitoring at 3 depths between 15 and 50 feet, 2 foot interval each.

First Depth

PDA xFile Name (*.*X01*) LEGACY5

PDA qFile Name (*.*Q01*) LEGACY5 PDA Blow Numbers: From 1 To 4

Depth from 20' to 22' **SPT Blow Counts** 2 2 1 1

BPF(2nd + 3rd 6 inches) 3

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 60.0 Comments: 4 total good blows

High 62.8

Avg. 62.1

Std. 1.2

Second Depth

PDA xFile Name (*.*X01*) LEGACY5

PDA qFile Name (*.*Q01*) LEGACY5 PDA Blow Numbers: From 7 To 14

Depth from 25' to 27' **SPT Blow Counts** (each 6 inches) 2 1 1

BPF(2nd + 3rd 6 inches) 2

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 60.0 Comments: 4 total good blows

High 65.7

Avg. 61.4

Std. 2.5

Third Depth

PDA xFile Name (*.*X01*) LEGACY5

PDA qFile Name (* *Q01*) LEGACY5 PDA Blow Numbers: From 12 To 23

Depth from 30' to 32' **SPT Blow Counts** (each 6 inches) 1 2 3 6

BPF(2nd + 3rd 6 inches) 5

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM,*):

EMX/.35

Low 60.0 Comments: 12 total good blows

High 71.4

Avg. 65.5

Std. 4.4

Fourth Depth

PDA xFile Name (*.*X01*) LEGACY5A

PDA qFile Name (*.*Q01*) LEGACY5A PDA Blow Numbers: From 7 To 14

Depth from 50' to 52' **SPT Blow Counts** (each 6 inches) 4 4

BPF(2nd + 3rd 6 inches) 8

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 57.1

High 60.0

Avg. 59.3

Std. 1.2

Comments: 8 total good blows; Readings taken on 3-2-00

Third Depth

PDA xFile Name (*.*X01*) LEGACY5A

PDA qFile Name (* *Q01*) LEGACY5A PDA Blow Numbers: From 16 To 16

Depth from 70' to 72' **SPT Blow Counts** (each 6 inches) 1 blow in 18"

BPF(2nd + 3rd 6 inches)

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM,*):

EMX/.35

Low 62.9

High 62.9

Avg. 62.9

Std. 0.0

Comments: 1 total good blow; Reading taken on 3-2-00

Averge EMX/0.35 (All Depths): 62.7 %

Standard Deviation (All Depths): 4.0 %

Utah Department of Transportation

Geotechnical Division-SPT Hammer Calibration

Calibration Set Up Data:

Drilling Company: Layne Christiansen Date: 3-7-2000

Drilling Company Address: 1707 S. 4490 W., SLC Phone: (801)972-3333

Drill Rig Make and Model: CME 750 Equipment No. 5908

Driller: Christian Davis SPT Hammer Type: Automatic

Condition of Hammer: Fair Weather: Cloudy Temp: 40

Drill Rod Size: AWJ OD(in)____ ID(in)____ Sampler Size: SPT OD(in) 2 ID(in) 1 3/8

PDA Operators: Sjoblom, Graham SPT OD(in) 2.5 ID(in) 2

Location of Boring: I-15 / US-89 Drilling Method: Rotary Wash

PDA Equipment Used: PAC S.N.1247K Strain Transducers: F1 30NWJ1 F2 30NWJ2

Accel. Transducers: A1 340 A2 353

Monitored Data:

Recommend monitoring at 3 depths between 15 and 50 feet, 2 foot interval each.

First Depth

PDA xFile Name (*.*X01*) LEGACY6

PDA qFile Name (*.*Q01*) LEGACY6 PDA Blow Numbers: From 1 To 7

Depth from 22' to 24' **SPT Blow Counts** 1 3 1 2

BPF(2nd + 3rd 6 inches) 4

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 60.0 Comments: 7 total good blows; California Sampler Used

High 62.9

Avg. 60 4

Std. 1.0

Second Depth

PDA xFile Name (*.*X01*) LEGACY6

PDA qFile Name (*.*Q01*) LEGACY6 PDA Blow Numbers: From 9 To 16

Depth from 25' to 27' **SPT Blow Counts** (each 6 inches) 0 1 3 4

BPF(2nd + 3rd 6 inches) 4

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 60.0 Comments: 8 total good blows; California Sampler Used

High 65.7

Avg. 63.9

Std. 2.0

Third Depth

PDA xFile Name (*.*X01*) LEGACY6

PDA qFile Name (*.*Q01*) LEGACY6 PDA Blow Numbers: From 18 To 31

Depth from 27' to 29' **SPT Blow Counts** (each 6 inches) 0 0 7 7

BPF(2nd + 3rd 6 inches) 7

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM,*):

EMX/.35

Low 62.9 Comments: 14 total good blows; SPT Sampler Used

High 68.6

Avg. 66.9

Std. 1.8

Fourth Depth

PDA xFile Name (*.*X01*) LEGACY6

PDA qFile Name (*.*Q01*) LEGACY6 PDA Blow Numbers: From 57 To 105

Depth from 32' to 34' **SPT Blow Counts** (each 6 inches)__ __ __ __

BPF(2nd + 3rd 6 inches)____

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

_____

EMX/.35

Low 65.7 Comments: 49 total good blows

High 71.4

Avg. 67.9

Std. 1.6

Averge EMX/0.35 (All Depths): 66.6 %

Standard Deviation (All Depths): 2.8 %

Utah Department of Transportation

Geotechnical Division-SPT Hammer Calibration

Calibration Set Up Data:

Drilling Company: Layne Christensen Date: 3-7-2000

Drilling Company Address: 1707 S. 4490 W., SLC Phone: (801)972-3333

Drill Rig Make and Model: Terramec 1000 Equipment No. 5708

Driller: Jay Hulse SPT Hammer Type: Rope and Cathead

Condition of Hammer: Fair Weather: P. Cloudy Temp: 40

Drill Rod Size: AWJ OD(in) ___ ID(in) ___ Sampler Size: SPT OD(in) 2 ID(in) 1 3/8

PDA Operators: Sjoblom, Graham

Location of Boring: Layne Christensen's Yard Drilling Method: HSA

PDA Equipment Used: PAC S.N.1247K Strain Transducers: F1 30NWJ1 F2 30NWJ2

Accel. Transducers: A1 340 A2 353

Monitored Data:

Recommend monitoring at 3 depths between 15 and 50 feet, 2 foot interval each.

First Depth

PDA xFile Name (*.*X01*) LEGACY7

PDA qFile Name (*.*Q01*) LEGACY7 PDA Blow Numbers: From 2 To 67

Depth from 20' to 22' **SPT Blow Counts** 7 15 22 22

BPF(2nd + 3rd 6 inches) 37

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 45.7

High 74.3

High 74.3

Avg. 63.2

Std. 6.1

Comments: 66 total good blows; Used Mobile B-53 to auger down to 20' depth, then tested Terramec 1000 hammer in hole; Scott Church actually operated hammer on the Legacy project, but was unable to be there for energy test

Second Depth

PDA xFile Name (*.*X01*) LEGACY7

PDA qFile Name (*.*Q01*) LEGACY7 PDA Blow Numbers: From 69 To 115

Depth from 22' to 24' **SPT Blow Counts** (each 6 inches) 9 16 12 9

BPF(2nd + 3rd 6 inches) 28

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 48.6

High 77.1

Avg. 64.5

Std. 7.4

Comments: 47 total good blows

Averge EMX/0.35 (All Depths): 63.7 %

Standard Deviation (All Depths): 6.7 %

Utah Department of Transportation

Geotechnical Division-SPT Hammer Calibration

Calibration Set Up Data:

Drilling Company: Layne Christensen Date: 3-7-2000

Drilling Company Address: 1707 S. 4490 W., SLC Phone: (801)972-3333

Drill Rig Make and Model: Mobile B-80 Equipment No. 6164

Driller: Jay Hulse SPT Hammer Type: Rope and Cathead

Condition of Hammer: Fair (Rusty- small 6" diam. cathead) Weather: P. Cloudy Temp: 40

Drill Rod Size: AWJ OD(in) ____ ID(in) ____ Sampler Size: SPT OD(in) 2 ID(in) 1 3/8

PDA Operators: Sjoblom, Graham

Location of Boring: Layne Christensen's Yard Drilling Method: HSA

PDA Equipment Used: PAC S.N.1247K Strain Transducers: F1 30NWJ1 F2 30NWJ2

Accel. Transducers: A1 340 A2 353

Monitored Data:

Recommend monitoring at 3 depths between 15 and 50 feet, 2 foot interval each.

First Depth

PDA xFile Name (*.*X01*) LEGACY8

PDA qFile Name (*.*Q01*) LEGACY8 PDA Blow Numbers: From 2 To 45

Depth from 25' to 27' **SPT Blow Counts** 6 16 11 12

BPF(2nd + 3rd 6 inches) 27

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 48.6

High 68.6

Avg. 61.3

Std. 4.6

Comments: 43 total good blows; Used Mobile B-53 to auger down to 25' depth, then tested Mobile B-80 hammer in hole; not sure who actually operated hammer on the Legacy project

Second Depth

PDA xFile Name (*.*X01*) LEGACY8

PDA qFile Name (*.*Q01*) LEGACY8 PDA Blow Numbers: From 46 To 120

Depth from 27' to 29' **SPT Blow Counts** (each 6 inches) 7 6 25 36

BPF(2nd + 3rd 6 inches) 31

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 48.6

High 68.6

Avg. 61.2

Std. 4.9

Comments: 75 total good blows

Averge EMX/0.35 (All Depths): 61.2 %

Standard Deviation (All Depths): 4.8 %

Utah Department of Transportation

Geotechnical Division-SPT Hammer Calibration

Calibration Set Up Data:

Drilling Company: R C Exploration Date: 3-14-2000

Drilling Company Address: Gusher Utah Phone: 801-722-3307

Drill Rig Make and Model: Diedrich D-120 Equipment No. LX1366 (licence plate#)

Driller: Nathan Young SPT Hammer Type: Automatic

Condition of Hammer: Fair Weather: Cloudy Temp: 45

Drill Rod Size: AWJ OD(in)____ ID(in)____ Sampler Size: SPT OD(in) 2.0" ID(in) 1 3/8"

PDA Operators: Sjoblom, Bischoff, Ryan CAL OD(in) 2.5" ID(in) 2"

Location of Boring: Glover's Layne, West of I-15 Structure Drilling Method: HSA

PDA Equipment Used: PAC S.N.1247K Strain Transducers: F1 30NWJ1 F2 30NWJ2

Accel. Transducers: A1 340 A2 353

Monitored Data:

Recommend monitoring at 3 depths between 15 and 50 feet, 2 foot interval each.

First Depth

PDA xFile Name (*.*X01*) Legacy9

PDA qFile Name (*.*Q01*) " PDA Blow Numbers: From 2 To 17

Depth from 30' to 32' **SPT Blow Counts** (each 6 inches) 2 3 5 7

BPF(2nd + 3rd 6 inches) 8

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 82.9

High 105.7

Avg. 91.3

Std. 6.7

Comments: 16 good blows recorded; California Sampler used

Second Depth

PDA xFile Name (*.*X01*) Legacy9

PDA qFile Name (*.*Q01*) " PDA Blow Numbers: From 18 To 43

Depth from 32' to 34' **SPT Blow Counts** (each 6 inches) 5 6 9 6

BPF(2nd + 3rd 6 inches) 15

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 68.6

High 102.9

Avg. 85.4

Std. 8.2

Comments: 26 good blows recorded; Standard SPT Sampler used

Third Depth

PDA xFile Name (*.*X01*) Legacy9

PDA qFile Name (*.*Q01*) " PDA Blow Numbers: From 45 To 65

Depth from 35' to 37' **SPT Blow Counts** (each 6 inches) 4 4 6 8

BPF(2nd + 3rd 6 inches) 10

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM,*):

EMX/.35

Low 80.0

High 100.0

Avg. 91.0

Std. 5.9

Comments: 21 good blows recorded

Averge EMX/0.35 (All Depths): 88.8 %

Standard Deviation (All Depths): 8.0 %

Utah Department of Transportation

Geotechnical Division-SPT Hammer Calibration

Calibration Set Up Data:

Drilling Company: R C Exploration Date: 4-3-2000

Drilling Company Address: Gusher Utah Phone: 801-722-3307

Drill Rig Make and Model: Kilman Brainer (BK)-66 Equipment No. BK-660693-108

Driller: Rich Ibarra SPT Hammer Type: Automatic

Condition of Hammer: Fair Weather: Sunny Temp: 50

Drill Rod Size: AWJ OD(in)____ ID(in)____ Sampler Size: SPT OD(in) 2 ID(in) 1 3/8

PDA Operators: Sjoblom, Bischoff

Location of Boring: Pages Ln. South of BARD Landfill Drilling Method: HSA-8"

PDA Equipment Used: PAC S.N.1247K Strain Transducers: F1 30NWJ1 F2 30NWJ2

Accel. Transducers: A1 340 A2 353

Monitored Data:

Recommend monitoring at 3 depths between 15 and 80 feet, 2 foot interval each.

First Depth

PDA xFile Name (*.*X01*) LEGACY10

PDA qFile Name (*.*Q01*) LEGACY10 PDA Blow Numbers: From 36 To 89

Depth from 50' to 52' **SPT Blow Counts** 8 10 15 19

BPF(2nd + 3rd 6 inches) 25

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 60.0

High 74.3

Avg. 69.3

Std. 3.2

Comments: 54 total good blows

Second Depth

PDA xFile Name (*.*X01*) LEGACY10

PDA qFile Name (*.*Q01*) LEGACY10 PDA Blow Numbers: From 91 To 133

Depth from 60' to 62' **SPT Blow Counts** (each 6 inches) 9 8 12 13

BPF(2nd + 3rd 6 inches) 20

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 54.3

High 80.0

Avg. 67.7

Std. 5.0

Comments: 43 total good blows

Averge EMX/0.35 (All Depths): 68.6 %

Standard Deviation (All Depths): 4.2 %

Utah Department of Transportation

Geotechnical Division-SPT Hammer Calibration

Calibration Set Up Data:

Drilling Company: R C Exploration Date: 4-11-2000

Drilling Company Address: Gusher Utah Phone: 801-722-3307

Drill Rig Make and Model: Diedrich D-120 Equipment No. 072009

Driller: Mike Labenski SPT Hammer Type: Automatic

Condition of Hammer: Good-Cleaned since 2-28-00 test Weather: Sunny Temp: 55

Drill Rod Size: AWJ OD(in)____ ID(in)____ Sampler Size:___ OD(in)___ ID(in)___

PDA Operators: Sjoblom, Graham

Location of Boring: 4100 S. 4800 W. - West Valley Drilling Method: HSA

PDA Equipment Used: PAC S.N.1247K Strain Transducers: F1 30NWJ1 F2 30NWJ2

Accel. Transducers: A1 340 A2 353

Monitored Data:

Recommend monitoring at 3 depths between 15 and 50 feet, 2 foot interval each.

First Depth

PDA xFile Name (*.*X01*) Legacy4a

PDA qFile Name (*.*Q01*) " PDA Blow Numbers: From 79 To 141

Depth from 15' to 17' **SPT Blow Counts** (each 6 inches) 6 16 21 20

BPF(2nd + 3rd 6 inches) 37

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 71.4

High 91.4

Avg. 81.3

Std. 6.3

Comments: Retest of hammer which was cleaned and lubricated since test performed on 2-28-00; 63 blows recorded

Second Depth

PDA xFile Name (*.*X01*) Legacy4a

PDA qFile Name (*.*Q01*) " PDA Blow Numbers: From 143 To 210

Depth from 25' to 27' **SPT Blow Counts** (each 6 inches) 5 9 25 28

BPF(2nd + 3rd 6 inches) 34

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM*):

EMX/.35

Low 68.6 Comments: 68 blows recorded

High 94.3

Avg. 78.7

Std. 5.0

Third Depth

PDA xFile Name (*.*X01*) Legacy4a

PDA qFile Name (*.*Q01*) " PDA Blow Numbers: From 212 To 273

Depth from 35' to 37' **SPT Blow Counts** (each 6 inches) 4 9 23 26

BPF(2nd + 3rd 6 inches) 32

PDA Parameters Monitored (*Recommend EMX, ETR set ER to 0.35, EF2, FMX, DFN, BPM,*):

EMX/.35

Low 71.4 Comments: 62 blows recorded

High 85.7

Avg. 79.8

Std. 4.4

Averge EMX/0.35 (All Depths): 79.9 %

Standard Deviation (All Depths): 5.4 %

Cone Info:

Serial #:	**AD058**		
Date:	**12-Oct-99**		
Tip Load Capacity:	1500	bar @	7.5 volts
Tip End Area	15	cm2	
Fric. Load Capacity:	15	bar @	7.5 volts
Friction Area	225	cm2	
Pressure Capacity:	500	psi @	7.5 volts
x accelerometer:	none	g	
y accelerometer:	none	g	
RTD Location:	load cell		
Geophone:	installed		

Calibrator Info:

Sensitivity:	0.000313	volt/lb.
Area Conversion:	6.4516	cm2/in2
Pressure Conversion	14.5038	psi/bar

Tip Calibration:

Baseline: -0.039 volts 301.2 ohms

Stress (bar)	Cal. Output (volts)	Desired Output (volts)	Actual Output (volts)	Error (%)
0	0.0000	0.000	0.000	
100	1.0555	0.500	0.500	0.00%
200	2.1110	1.000	1.000	0.00%
300	3.1664	1.500	1.500	0.00%
400	4.2219	2.000	2.001	0.05%

Sleeve Calibration:

Baseline: 0.035 volts 201.7 ohms

Stress (bar)	Cal. Output (volts)	Desired Output (volts)	Actual Output (volts)	Error (%)
0.00	0.0000	0.000	0.000	
3.00	0.4750	1.500	1.501	0.07%
6.00	0.9499	3.000	2.999	-0.03%
9.00	1.4249	4.500	4.503	0.07%
12.00	1.8999	6.000	6.001	0.02%
15.00	2.3748	7.500	7.503	0.04%

Fifteen Square cm Cone Calibration Sheet

Pressure Calibration: Kulite S/N 6177-4-95 Alpha Code 046-72

Baseline: 0.111 volts 972 ohms

Pressure (psi)	Desired Output (volts)	Actual Output (volts)	Error (%)
0	0.000	0.000	
100	1.500	1.497	-0.20%
200	3.000	3.003	0.10%
300	4.500	4.515	0.33%
400	6.000	6.030	0.50%
500	7.500	7.545	0.60%

X Accelerometer Calibration:

Baseline: 0 volts not installed on creation

Acceleration (g)	Desired Output (volts)	Actual Output (volts)	Error (%)
-1	-3.530	0.000	-100.00%
1	3.530	0.000	-100.00%

Y Accelerometer Calibration:

Baseline: 0 volts not installed on creation

Acceleration (g)	Desired Output (volts)	Actual Output	Error (%)
-1	-3.530	0.000	-100.00%
1	3.530	0.000	-100.00%

Temperature Calibration:

Baseline 3.104 volts installed in load cell

Cone Info:

Serial #:	**AD070**			
Date:	**04-May-99**			
Tip Load Capacity:	1500	bar @	7.5	volts
Tip End Area	15	cm2		
Fric. Load Capacity:	15	bar @	7.5	volts
Friction Area	225	cm2		
Pressure Capacity:	500	psi @	7.5	volts
x accelerometer:	none	g		
y accelerometer:	none	g		
RTD Location:	load cell			
Geophone:	installed			

Calibrator Info:

Sensitivity:	0.000315	volt/lb.
Area Conversion:	6.4516	cm2/in2
Pressure Conversion	14.5038	psi/bar

Tip Calibration:

Baseline: -0.225 volts 303.1 ohms

Stress (bar)	Cal. Output (volts)	Desired Output (volts)	Actual Output (volts)	Error (%)
0	0.0000	0.000	0.000	
100	1.0622	0.500	0.501	0.20%
200	2.1244	1.000	1.002	0.20%
300	3.1867	1.500	1.504	0.27%
400	4.2489	2.000	2.007	0.35%

Sleeve Calibration:

Baseline: 0.086 volts 935.4 ohms

Stress (bar)	Cal. Output (volts)	Desired Output (volts)	Actual Output (volts)	Error (%)
0.00	0.0000	0.000	0.000	
3.00	0.4780	1.500	1.494	-0.40%
6.00	0.9560	3.000	2.998	-0.07%
9.00	1.4340	4.500	4.509	0.20%
12.00	1.9120	6.000	6.022	0.37%
15.00	2.3900	7.500	7.531	0.41%

Pressure Calibration:

Transducer: Kulite S/N 5853-2-127 Alpha Code R37-68

Baseline: -0.294 volts 935.4 ohms

Pressure (psi)	Desired Output (volts)	Actual Output (volts)	Error (%)
0	0.000	0.000	
100	1.500	1.497	-0.20%
200	3.000	2.998	-0.07%
300	4.500	4.503	0.07%
400	6.000	6.011	0.18%
500	7.500	7.520	0.27%

X Accelerometer Calibration:

Baseline: 0 volts not installed on creation

Acceleration (g)	Desired Output (volts)	Actual Output (volts)	Error (%)
-1	-3.530	0.000	-100.00%
1	3.530	0.000	-100.00%

Y Accelerometer Calibration:

Baseline: 0 volts not installed on creation

Acceleration (g)	Desired Output (volts)	Actual Output	Error (%)
-1	-3.530	0.000	-100.00%
1	3.530	0.000	-100.00%

Temperature Calibration:

Baseline 3.221 volts installed in load cell

Fifteen Square cm Cone Calibration Sheet

Deep Cone Calibration
Adara Systems Ltd.

Cone Info:

Serial #:	**AD092**		
Date:	**01-Nov-99**		
Tip Load Capacity:	1500	bar @	7.5 volts
Tip End Area	15	cm2	
Fric. Load Capacity:	15	bar @	7.5 volts
Friction Area	225	cm2	
Pressure Capacity:	500	psi @	7.5 volts
x accelerometer:	none	g	
y accelerometer:	none	g	
RTD Location:	Geophone carrier		
Geophone:	installed		
Tilt Sensor	Adara		

Calibrator Info:

Sensitivity:	0.000313	volt/lb.
Area Conversion:	6.4516	cm2/in2
Pressure Conversion	14.5038	psi/bar

Tip Calibration:

Baseline: -0.033 volts 295.4 ohms

Stress (bar)	Cal. Output (volts)	Desired Output (volts)	Actual Output (volts)	Error (%)
0	0.0000	0.000	0.000	
100	1.0555	0.500	0.499	-0.20%
200	2.1110	1.000	0.999	-0.10%
300	3.1664	1.500	1.499	-0.07%
400	4.2219	2.000	2.001	0.05%

Sleeve Calibration:

Baseline: 0.056 volts 199.3 ohms

Stress (bar)	Cal. Output (volts)	Desired Output (volts)	Actual Output (volts)	Error (%)
0.00	0.0000	0.000	0.000	
3.00	0.4750	1.500	1.500	0.00%
6.00	0.9499	3.000	3.001	0.03%
9.00	1.4249	4.500	4.503	0.07%
12.00	1.8999	6.000	6.000	0.00%
15.00	2.3748	7.500	7.492	-0.11%

Fifteen Square cm Cone Calibration Sheet

Pressure Calibration:

Transducer: Kulite S/N Q46-44

Baseline: 0.155 volts 1004.5 ohms

Pressure (psi)	Desired Output (volts)	Actual Output (volts)	Error (%)
0	0.000	0.000	
100	1.500	1.496	-0.27%
200	3.000	3.000	0.00%
300	4.500	4.506	0.13%
400	6.000	6.015	0.25%
500	7.500	7.525	0.33%

X Accelerometer Calibration:

Baseline: -0.817 volts not installed on creation

Acceleration (g)	Desired Output (volts)	Actual Output (volts)	Error (%)
-15 degrees	-1.500	-1.511	0.73%
+15 degrees	1.500	1.511	0.73%

Y Accelerometer Calibration:

Baseline: -0.03 volts not installed on creation

Acceleration (g)	Desired Output (volts)	Actual Output	Error (%)
-15 degrees	-1.500	-1.538	2.53%
+15 degrees	1.500	1.538	2.53%

Temperature Calibration:

Baseline 3.413 volts installed in geophone carr

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 12/20/99
Project Location: LEGACY - PARISH LANE	Rig TRUCK
Client/Rep: KLEINFELDER/GREG	Operator: REP/JOSH

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1:392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size 058/.015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-24-203	Tip	-.107	-.096	.011	220.0	-220.0
Elevation (ft)	Sleeve	.040	.036			—
Northing or Latitude	PP	.149	.116	-.033	-15.2	+15.2
Easting or Latitude	Temp	1.200	2.359			

Pre-bore (ft):	Start Depth: (ft) 0	Final Depth (ft): 50.03 (15.25m)	Water Table (ft):	CPT File: 300CP01.DAT

Sounding Info Cone/Size 058/.015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC 17-214	Tip	-.101	-.101			—
Elevation (ft)	Sleeve	.038	.042			—
Northing or Latitude	PP	.124	.148	.024	11.0	-11.0
Easting or Latitude	Temp	2.138	1.933			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 50.03 (15.25m)	Water Table (ft):	CPT File: 300CP02.DAT

Sounding Info Cone/Size 058/.015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC 15-220	Tip	-.106	-.100			—
Elevation (ft)	Sleeve	.030	.043	.013	2.6	-2.6
Northing or Latitude	PP	.126	.130			—
Easting or Latitude	Temp	2.102	2.009			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 50.03 (15.25m)	Water Table (ft):	CPT File: 300CP03.DAT

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

PLATE J-7

GREGG

CONETEC

Daily Baseline Summary

Project No.: CC-300 Project Location: Legacy Highway Parish Lane Client/Rep: Kleinfelder / Greg	Date: 12/21/99 Rig Truck Operator: RSP

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size 055/.015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. CC-15-221	Tip	-.113	-.100	.013	260.0	-260.0
Elevation (ft)	Sleeve	.028	.041	.013	2.6	-2.6
Northing or Latitude	PP	.157	.130	-.027	-12.4	+12.4
Easting or Latitude	Temp	.619	1.917			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 50.03 (15.25m)	Water Table (ft):	CPT File: 300CP04.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Ma (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: OC-300 Project Location: LEGACY HIGHWAY - PARSH LANE Client/Rep: KLEINFELDER / JEFF	Date: 01-06-00 Rig TRUCK Operator: REP/JOSH

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-15-220B	Tip	-.107	-.104			—
Elevation (ft)	Sleeve	.028	.034			—
Northing or Latitude	PP	.145	.125	-.020	-9.2	+9.2
Easting or Latitude	Temp	1.234	2.032			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 50.03 (15.25m)	Water Table (ft):	CPT File: 300CP05.DAT

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-17-214B	Tip	-.102	-.103			—
Elevation (ft)	Sleeve	.031	.033			—
Northing or Latitude	PP	.127	.138	.011	5.1	-5.1
Easting or Latitude	Temp	2.107	2.312			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 50.03 (15.25m)	Water Table (ft):	CPT File: 300CP06.DAT

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-16-223B	Tip	-.099	-.104			—
Elevation (ft)	Sleeve	.029	.037			—
Northing or Latitude	PP	.118	.147	.029	13.3	-13.3
Easting or Latitude	Temp	2.547	1.678			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 50.03 (15.25 m)	Water Table (ft):	CPT File: 300CP07.DAT

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 01-07-00
Project Location: LEGACY HIGHWAY/HWY 89	Rig TRUCK
Client/Rep: KLEINFELDER/MARK	Operator: REP/JOSH

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 058/.015 Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-13-235	Tip	-.106	-.101			—
Elevation (ft)	Sleeve	.023	.032			—
Northing or Latitude	PP	.121	.118			—
Easting or Latitude	Temp	1.689	2.103			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 46.75 (14.25m)	Water Table (ft):	CPT File: 300CP08.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Mac (-Δ Eng.)
Hole No. WC-10-232	Tip	-.099	-.107			—
Elevation (ft)	Sleeve	.040	.050			—
Northing or Latitude	PP	.113	.129	.016	7.4	-7.4
Easting or Latitude	Temp	2.219	2.403			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 50.03 (15.25 m)	Water Table (ft):	CPT File: 300CP09.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-9-227	Tip	-.097	-.101			—
Elevation (ft)	Sleeve	.041	.051			—
Northing or Latitude	PP	.108	.126	.018	8.3	-8.3
Easting or Latitude	Temp	2.700	2.271			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 47.24 (14.4 m)	Water Table (ft):	CPT File: 300CP10.DAT

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

PLATE J-10

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300 Project Location: LEGACY HIGHWAY- PARISH LANE Client/Rep: KLEINFELDER / MARTIN	Date: 01-10-00 Rig TRUCK Operator: REP / JOSH

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size .058 .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-22-207	Tip	-.107	-.100			—
Elevation (ft)	Sleeve	.032	.037			—
Northing or Latitude	PP	.132	.122			—
Easting or Latitude	Temp	1.241	1.806			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
CASED	0	50.03 (15.25m)		300CP11.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-16-269	Tip	-.099	-.100			—
Elevation (ft)	Sleeve	.038	.040			—
Northing or Latitude	PP	.120	.116			—
Easting or Latitude	Temp	1.891	2.165			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
CASED	0	50.03 (15.25m)		300CP12.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-15-267	Tip	-.099	-.103			—
Elevation (ft)	Sleeve	.040	.053	.013	2.6	-2.6
Northing or Latitude	PP	.119	.114			—
Easting or Latitude	Temp	2.036	2.567			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
CASED	0	48.23 (14.7m)		300CP13.DAT

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

PLATE J-11

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 01-12-00
Project Location: LEGACY HIGHWAY - PARISH LANE	Rig TRUCK
Client/Rep: KLEINFELDER / MARTIN	Operator: REP/JOSH

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-16-269A	Tip	-.101	-.097			—
Elevation (ft)	Sleeve	.032	.053	.021	4.2	-4.2
Northing or Latitude	PP	.117	.145	.028	12.9	-12.9
Easting or Latitude	Temp	1.915	2.441			

Pre-bore (ft): CASED	Start Depth (ft): 0	Final Depth (ft): 181.59 (55.35m)	Water Table (ft):	CPT File: 300CP12A.DAT

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-10-234	Tip	-.094	-.106	-.012	-240.0	+240.0
Elevation (ft)	Sleeve	.046	.054			—
Northing or Latitude	PP	.114	.124			—
Easting or Latitude	Temp	2.258	2.273			

Pre-bore (ft):	Start Depth (ft): 0	Final Depth (ft): 50.03 (15.25m)	Water Table (ft):	CPT File: 300CP14.DAT

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-14-237	Tip	-.098	-.096			—
Elevation (ft)	Sleeve	.045	.048			—
Northing or Latitude	PP	.109	.112			—
Easting or Latitude	Temp	2.365	2.416			

Pre-bore (ft): 42.0'	Start Depth (ft): 0	Final Depth (ft): 48.23 14.7m	Water Table (ft):	CPT File: 300CP15.DAT

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

PLATE J-12

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300 Project Location: LEGACY HIGHWAY Client/Rep: KLENFELDER / MARTIN	Date: 01-13-00 Rig TRUCK Operator: REP/JOSH

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-15-266	Tip	-.106	-.108			
Elevation (ft)	Sleeve	.034	.036			
Northing or Latitude	PP	.106	.112			
Easting or Latitude	Temp	2.023	2.345			

Pre-bore (ft): CASED	Start Depth: (ft): 0	Final Depth (ft): 170.11 (51.85 m)	Water Table (ft):	CPT File: 300CP16.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 01-14-00
Project Location: LEGACY HIGHWAY	Rig TRUCK
Client/Rep: KLEINFELDER / MARTIN	Operator: REP / JOSH

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-13-307	Tip	-.112	-.099	.013	260.0	-260.0
Elevation (ft)	Sleeve	.029	.052	.023	4.6	-4.6
Northing or Latitude	PP	.149	.201	.052	23.9	-23.9
Easting or Latitude	Temp	.674	2.026			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 196.34 (63.75 m)	Water Table (ft):	CPT File: 300CP17.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Mar (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 01-17-00
Project Location: LEGACY HIGHWAY	Rig TRACK RIG
Client/Rep: KLEINFELDER / MARTIN	Operator: REP/JOSH

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-14-311	Tip	-.100	-.092			
Elevation (ft)	Sleeve	.044	.053			
Northing or Latitude	PP	.142	.131	-.011	-5.1	+5.1
Easting or Latitude	Temp	1.918	1.818			

Pre-bore (ft):	Start Depth: (ft): Ø	Final Depth (ft): 133.04 (40.55m)	Water Table (ft):	CPT File: 300CP18.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: CO-300	Date: 01-18-00
Project Location: LEGACY HIGHWAY	Rig TRACK RIG
Client/Rep: KLEINFELDER / MARTIN	Operator: REP/JOSH

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-13-306	Tip	-.101	-.093			—
Elevation (ft)	Sleeve	.043	.054	.011	2.2	-2.2
Northing or Latitude	PP	.152	.168	.016	7.4	-7.4
Easting or Latitude	Temp	.964	1.787			

Pre-bore (ft):	Start Depth (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	150.26 (45.8m)		300CP19.DAT

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Ma (-Δ Eng.)
Hole No. SC-14-310	Tip	-.094	-.092			—
Elevation (ft)	Sleeve	.040	.054	.014	2.8	-2.8
Northing or Latitude	PP	.125	.139	.014	6.4	-6.4
Easting or Latitude	Temp	1.951	1.810			

Pre-bore (ft):	Start Depth (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	160.43 (48.9m)		300CP20.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

PLATE J-16

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 01-19-00
Project Location: LEGACY HIGHWAY	Rig TRACK
Client/Rep: KLEINFELDER / MARTIN	Operator: REP/JOSH

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-24-203B	Tip	-.102	-.092	.010	200	-200
Elevation (ft)	Sleeve	.040	.048			—
Northing or Latitude	PP	.145	.124	-.021	-9.7	+9.7
Easting or Latitude	Temp	1.048	1.819			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	50.03 (15.25m)		300CP21.DAT

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-18-217	Tip	-.090	-.094			—
Elevation (ft)	Sleeve	.049	.049			—
Northing or Latitude	PP	.117	.148	.031	14.3	-14.3
Easting or Latitude	Temp	2.513	1.515			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	50.03 (15.25m)		300CP22.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

PLATE J-17

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300 Project Location: LEGACY HIGHWAY Client/Rep: KLEINFELDER	Date: 01-20-00 Rig TRACK Operator: REP/JBS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-17-207	Tip	-.100	-.092			—
Elevation (ft)	Sleeve	.043	.055	.012	2.4	-2.4
Northing or Latitude	PP	.157	.165			—
Easting or Latitude	Temp	.644	1.815			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	135.5 (41.3m)		300CP23.DAT

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-18-273	Tip	-.093	-.091			—
Elevation (ft)	Sleeve	.049	.056			—
Northing or Latitude	PP	.124	.197 ?			
Easting or Latitude	Temp	2.083	1.944			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	142.88 (43.55 m)		300CP24.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300 Project Location: LEGACY HIGHWAY Client/Rep: KLEINFELDER / MARTIN	Date: 01-21-00 Rig TRUCK Operator: REP/JBS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size 058 .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-28-318	Tip	-.104	-.099			—
Elevation (ft)	Sleeve	.035	.046	.011	2.2	-2.2
Northing or Latitude	PP	.127	.127			—
Easting or Latitude	Temp	1.626	2.096			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 50.03 15.25m	Water Table (ft):	CPT File: 300CPZ5.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 01-26-00
Project Location: LEGACY HIGHWAY	Rig TRACK RIG
Client/Rep: KLEINFELDER/ MARTIN	Operator: REP/GBS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-12-264	Tip	-.097	-.094			—
Elevation (ft)	Sleeve	.044	.064	.02	4.0	-4.0
Northing or Latitude	PP	.131	.204 ?			
Easting or Latitude	Temp	2.388	1.890			

Pre-bore (ft):	Start Depth: (ft): Ø	Final Depth (ft): 113.56 (33.7m)	Water Table (ft):	CPT File: 300CP26.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 01-27-00
Project Location: LEGACY HIGHWAY	Rig TRACK
Client/Rep: KLEINFELDER / MARTIN	Operator: REP/JBS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-27-316	Tip	-.102	-.095			—
Elevation (ft)	Sleeve	.042	.052	.010	2.0	-2.0
Northing or Latitude	PP	.172	.133	-.039	-17.9	+17.9
Easting or Latitude	Temp	.540	1.590			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	30.02 (9.15m)		300CP27.DAT

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-10-301	Tip	-.045	-.037			—
Elevation (ft)	Sleeve	.049	.062	.013	2.6	-2.6
Northing or Latitude	PP	.006	.018	.012	5.5	-5.5
Easting or Latitude	Temp	.017	.027			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	172.36 (52.55m)		300CP28.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 01-28-00
Project Location: LEGACY HIGHWAY	Rig TRACK RIG
Client/Rep: KLEINFELDER / MARTIN	Operator: REP

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-10-302	Tip	-.047	-.067	-.02	-400	+400
Elevation (ft)	Sleeve	.045	.056	.011	2.2	-2.2
Northing or Latitude	PP	.009	.006			—
Easting or Latitude	Temp	-.009	.022			

Pre-bore (ft):	Start Depth: (ft) 0	Final Depth (ft): 17.86 (5.12m)	Water Table (ft):	CPT File: 300CP29.DAT

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-10-302	Tip	-.067	-.063			—
Elevation (ft)	Sleeve	.056	.064			—
Northing or Latitude	PP	.006	.025	.019	8.74	-8.7
Easting or Latitude	Temp	.022	.025			

Pre-bore (ft): SEE ABOVE	Start Depth: (ft): 0	Final Depth (ft): 14.6 (4.45m)	Water Table (ft):	CPT File: 300CP29A.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: CO-300	Date: 01-31-00
Project Location: LEGACY HIGHWAY	Rig TRACK RIG
Client/Rep: KLEINFELDER/	Operator: REP/JGS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Mac (-Δ Eng.)
Hole No. SC-11-261	Tip	-.067	-.062			—
Elevation (ft)	Sleeve	.048	.058	.010	2.0	-2.0
Northing or Latitude	PP	.004	.008			—
Easting or Latitude	Temp	.005	.020			

Pre-bore (ft):	Start Depth: (ft) 0	Final Depth (ft): 168.96 (51.5 m)	Water Table (ft):	CPT File: 300CP30.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Mac (-Δ Eng.)
Hole No. SC-11-260	Tip	-.062	-.059			—
Elevation (ft)	Sleeve	.058	.063			—
Northing or Latitude	PP	.008	.013			—
Easting or Latitude	Temp	.020	.023			

Pre-bore (ft):	Start Depth: (ft) 0	Final Depth (ft): 169.13 (51.55m)	Water Table (ft):	CPT File: 300CP31.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Mac (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 1/31/00
Project Location: GROVERS LANE	Rig TRUCK
Client/Rep: KLEINFELDER / JEFF	Operator: SDS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size 010	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-19-277	Tip	-.023	-.034			—
Elevation (ft)	Sleeve	.0800	.079			—
Northing or Latitude	PP	-.156	-.124	.032	14.7	-14.7
Easting or Latitude	Temp	2.802	1.825			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 99.90 (30.45m)	Water Table (ft):	CPT File: 300-PZ1

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft

PLATE J-24

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 02-01-00
Project Location: LEGACY HIGHWAY	Rig TRACK RIG
Client/Rep: KLEINFELDER / MARTIN	Operator: REP

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-29-321	Tip	-.066	-.060			—
Elevation (ft)	Sleeve	.048	.062	.014	2.8	-2.8
Northing or Latitude	PP	.009	.012			—
Easting or Latitude	Temp	.000	.024			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	50.03 8.5 m		300CP33.DAT

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-5-296	Tip	-.064	-.061			—
Elevation (ft)	Sleeve	.054	.064	.010	2.0	-2.0
Northing or Latitude	PP	.009	.040	.031	14.3	-14.3
Easting or Latitude	Temp	.014	.026			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	135.83 (41.4m)		300CP34.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 02-02-00
Project Location: LEGACY HIGHWAY	Rig TRACK RIG
Client/Rep: KLEINFELDER/GREG	Operator: REP/JBS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 092 Cone/Size .019	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-5-295	Tip	-.072	-.059	.013	260	-260
Elevation (ft)	Sleeve	.041	.064	.023	4.6	-4.6
Northing or Latitude	PP	.008	.021	.013	6.0	-6.0
Easting or Latitude	Temp	-.001	.025			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft): 135.83 (41.4m)	Water Table (ft):	CPT File: 300CP35.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction (-Δ Eng.)
Hole No. SC-6-329	Tip	-.060	-.058			—
Elevation (ft)	Sleeve	.060	.064			—
Northing or Latitude	PP	.010	.036	.026	12.0	-12.0
Easting or Latitude	Temp	.022	.026			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft): 131.56 (40.1m)	Water Table (ft):	CPT File: 300CP37.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300 Project Location: LEGACY (GLOVERS LANE) Client/Rep: KLEINFELDER/NICKEL	Date: 2/2/00 Rig TRUCK Operator: SDS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size 670	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Ma (-Δ Eng.)
Hole No. SC-19.275	Tip	-.025	-.025			—
Elevation (ft)	Sleeve	0.075	.084			—
Northing or Latitude	PP	-.144	-.141			—
Easting or Latitude	Temp	1.966	2.675			

Pre-bore (ft): CASED	Start Depth: (ft): Ø	Final Depth (ft): 133.37 (40.65m)	Water Table (ft):	CPT File: 300CPT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Ma (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Ma (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 02-03-00
Project Location: LEGACY HIGHWAY	Rig TRACK
Client/Rep: KLEINFELDER/GREG	Operator: REP/JBS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size 092 .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-5-294	Tip	-.070	-.061			—
Elevation (ft)	Sleeve	.047	.063	.016	3.2	-3.2
Northing or Latitude	PP	.011	.014			—
Easting or Latitude	Temp	-.010	.024			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft): 123.03 (37.5m)	Water Table (ft):	CPT File: 300CP38.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Mac (-Δ Eng.)
Hole No. SC-1-245	Tip	-.065	-.060			—
Elevation (ft)	Sleeve	.057	.063			—
Northing or Latitude	PP	.011	.013			—
Easting or Latitude	Temp	.020	.025			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft): 130.58 (39.8m)	Water Table (ft):	CPT File: 300CP39.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 02-04-00
Project Location: LEGACY HIGHWAY	Rig TRUCK
Client/Rep: KLEINFELDER/MARTIN	Operator: REP/JBS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 070 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-13-305	Tip	-.096	-.099			—
Elevation (ft)	Sleeve	.043	.048			—
Northing or Latitude	PP	.133	.145	.012	5.5	-5.5
Easting or Latitude	Temp	1.836	1.985			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 145.01 (44.2m)	Water Table (ft):	CPT File: SCCP40.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft

GREGG

CONETEC

Daily Baseline Summary

Project No.: OC-300	Date: 02-07-00
Project Location: LEGACY HIGHWAY	Rig TRACK
Client/Rep: KLEINFELDER / MARTIN	Operator: REP/JBS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-6-330	Tip	-.077	-.060	.017	340	-340
Elevation (ft)	Sleeve	.038	.063	.075	5.0	-5.0
Northing or Latitude	PP	.003	.013	.010	4.6	-4.6
Easting or Latitude	Temp	.001	.025			

Pre-bore (ft):	Start Depth: (ft) 0	Final Depth (ft): 147.14 (44.85m)	Water Table (ft):	CPT File: 300CP41.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-6-331	Tip	-.061	-.059			—
Elevation (ft)	Sleeve	.061	.063			—
Northing or Latitude	PP	.013	.035	.022	10.1	-10.1
Easting or Latitude	Temp	.024	.026			

Pre-bore (ft):	Start Depth: (ft) 0	Final Depth (ft): 117.29 35.75m	Water Table (ft):	CPT File: 300CP42.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 02-08-00
Project Location: LEGACY HIGHWAY	Rig TRACK
Client/Rep: KLEINFELDER/MARTIN	Operator: RED

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 092 Cone/Size 015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-6-332	Tip	-.065	-.061			—
Elevation (ft)	Sleeve	.054	.060			—
Northing or Latitude	PP	.006	.007			—
Easting or Latitude	Temp	.022	.024			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft): 120.08 36.6m	Water Table (ft):	CPT File: 300CP43.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

re-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 02-09-00
Project Location: LEGACY HIGHWAY	Rig TRACK
Client/Rep: KLEINFELDER /	Operator: REP

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 092 / Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-6-324	Tip	-.060	-.058			—
Elevation (ft)	Sleeve	.058	.063			—
Northing or Latitude	PP	.000	.005			—
Easting or Latitude	Temp	.032	.025			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft): 42.06 43.3	Water Table (ft):	CPT File: 300CP44.DAT

Sounding Info / Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-6-325	Tip	-.062	-.060			—
Elevation (ft)	Sleeve	.060	.061			—
Northing or Latitude	PP	.005	.003			—
Easting or Latitude	Temp	.028	.024			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft): 137.14 (41.8m)	Water Table (ft):	CPT File: 300CP45.DAT

Sounding Info / Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300 Project Location: LEGACY HIGHWAY Client/Rep: KLEINFELDER/MARTIN	Date: 02-10-00 Rig TRUCK Operator: REP/SDS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-23-290B	Tip	-.067	-.120	-.053	-1060	1060
Elevation (ft)	Sleeve	.054	.062			—
Northing or Latitude	PP	-.006	-.002			—
Easting or Latitude	Temp	.043	.025			

Pre-bore (ft):	Start Depth: (ft) ~~0~~	Final Depth (ft): 50.52 (15.4m)	Water Table (ft):	CPT File: ~~300CP46.DAT~~ 300CP46.DFT

Sounding Info Cone/Size 090	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-24-257	Tip	-.129	-.115	.014	280	-280
Elevation (ft)	Sleeve	.042	.067	.025	5.0	-5.0
Northing or Latitude	PP	-.008	-.005			—
Easting or Latitude	Temp	.022	.024			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft): 61.35 (18.7m)	Water Table (ft):	CPT File: ~~300CP47~~

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 02-14-00
Project Location: LEGACY HIGHWAY	Rig TRUCK
Client/Rep: KLEINFELDER / MARTIN	Operator: RED/SDS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-19-278	Tip	-.123				—
Elevation (ft)	Sleeve	.051				—
Northing or Latitude	PP	.009				—
Easting or Latitude	Temp	.008				

Pre-bore (ft):	Start Depth: (ft): ~~0~~	Final Depth (ft): 35m Refusal	Water Table (ft):	CPT File: 300CP48.DAT

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-19-278	Tip	-.113	-.114			—
Elevation (ft)	Sleeve	.059	.067			—
Northing or Latitude	PP	.008	.011			—
Easting or Latitude	Temp	.012	.025			

Pre-bore (ft): 3'	Start Depth: (ft): ~~0~~	Final Depth (ft): 180.94 (55.15 m)	Water Table (ft):	CPT File: 300CP48A.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 02-15-00
Project Location: LEGACY HIGHWAY	Rig TRACK
Client/Rep: KLEINFELDER / MARTIN	Operator: RED/SAS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-27-342	Tip	-.111	-.103			—
Elevation (ft)	Sleeve	.066	.075			—
Northing or Latitude	PP	.002	.005			—
Easting or Latitude	Temp	.031	.027			

Pre-bore (ft):	Start Depth (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	45.28 (13.8 m)		300CP49.DAT

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-27-343	Tip	-.108	-.104			—
Elevation (ft)	Sleeve	.066	.076	.010	2.0	-2.0
Northing or Latitude	PP	.003	.003			—
Easting or Latitude	Temp	.021	.032			

Pre-bore (ft):	Start Depth (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	39.53 (12.05 m)		300CP50.DAT

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-22-286	Tip	-.113	-.104			—
Elevation (ft)	Sleeve	.061	.078	.017	3.4	-3.4
Northing or Latitude	PP	.011	.010			—
Easting or Latitude	Temp	.030	.027			

Pre-bore (ft):	Start Depth (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	77.20 (23.55 m)		300CP51.DAT

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

PLATE J-35

GREGG

CONETEC

Daily Baseline Summary

Project No.: CO-300 Project Location: LECIDOY HIGHWAY Client/Rep: K.LEINFELDER/NOSETIN	Date: 2/10/00 Rig TRUCK Operator: REP/SOS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 092 Cone/Size 15	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-21-283	Tip	-.122	-.113			—
Elevation (ft)	Sleeve	.049	.068	.019	3.8	-3.8
Northing or Latitude	PP	-.099	-.006			—
Easting or Latitude	Temp	.005	.025			

Pre-bore (ft): ~3.5' OF CASING	Start Depth: (ft): 0	Final Depth (ft): 79.07 (24.10 m)	Water Table (ft):	CPT File: 300P52

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-21-341	Tip	-.113	-.118			—
Elevation (ft)	Sleeve	.066	.068			—
Northing or Latitude	PP	-.005	-.004			—
Easting or Latitude	Temp	.010	.022			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 49.05 (14.95m)	Water Table (ft):	CPT File: 300P53

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300 Project Location: Legacy Hwy Client/Rep: KLEINFELDER / GREG	Date: 2/22/00 Rig TRUCK Operator: SDS/TRP

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size 092	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Mac (-Δ Eng.)
Hole No. SC-2A-256	Tip	-.116	-.105	.011	.220	-.220
Elevation (ft)	Sleeve	.108	.121	.013	2.6	-2.6
Northing or Latitude	PP	.004	.003			—
Easting or Latitude	Temp	.020	.025			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
0	0	39.37 (12.0 m)		300CP54

Sounding Info Cone/Size 058 .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Mac (-Δ Eng.)
Hole No. SC-23-290A	Tip	-.095	-.093			—
Elevation (ft)	Sleeve	.040	.056	.016	3.2	-3.2
Northing or Latitude	PP	.120	.132	.012	5.52	-5.5
Easting or Latitude	Temp	2.457	2.051			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
	0	42.98 13.10m		300CP55.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Mac (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 02-23-00
Project Location: LEGACY HIGHWAY	Rig TRACK
Client/Rep: KLEINFELDER/GREG	Operator: REP/SDS

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-1-244	Tip	-.099	-.090			—
Elevation (ft)	Sleeve	.040	.060	.020	A.0	-4.0
Northing or Latitude	PP	.145	.197	.052	2.39	-24.0
Easting or Latitude	Temp	1.324	1.811			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 125.0 (38.1 m)	Water Table (ft):	CPT File: 300CP56.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

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Daily Baseline Summary

Project No.: 00-300 Project Location: LEGACY HIGHWAY Client/Rep: KLEINFELDER/BRYANT	Date: 02-28-00 Rig TRUCK Operator: REP/TOM

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 070 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. 00-29-349	Tip	.018	-.024	-.042	-840	+840
Elevation (ft)	Sleeve	-.005	.083	.088	17.6	-17.6
Northing or Latitude	PP	.026	-.134	-.160	-73.7	+73.7
Easting or Latitude	Temp	.012	2.492			

Pre-bore (ft): ~ 2.0	Start Depth: (ft):	Final Depth (ft): 55.94 (17.05m)	Water Table (ft):	CPT File: 300057.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300	Date: 02-29-00
Project Location: LEGACY HIGHWAY	Rig TRUCK
Client/Rep: KLEINFELDER/ TIM	Operator: REP/TOM

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 070 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-25-335	Tip	-.017	-.017			—
Elevation (ft)	Sleeve	.081	.085			—
Northing or Latitude	PP	-.150	-.155			—
Easting or Latitude	Temp	2.094	2.265			

Pre-bore (ft): ~2.0	Start Depth: (ft): 0	Final Depth (ft): 51.51 (15.7m)	Water Table (ft):	CPT File: 300CP58.DAT

Sounding Info 070 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-26-338	Tip	-.020	-.017			—
Elevation (ft)	Sleeve	.079	.085			—
Northing or Latitude	PP	-.153	-.140	.013	6.0	-6.0
Easting or Latitude	Temp	2.256	2.487			

Pre-bore (ft): ~2.0	Start Depth: (ft): 0	Final Depth (ft): 53.97 (16.45m)	Water Table (ft):	CPT File: 300CP59.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-27-344	Tip	-.017	-.017			—
Elevation (ft)	Sleeve	.085	.086			—
Northing or Latitude	PP	-.160	-.163			—
Easting or Latitude	Temp	2.543	2.412			

Pre-bore (ft): ~2.0	Start Depth: (ft): 0	Final Depth (ft): 48.23 14.7m	Water Table (ft):	CPT File: 300CP60.DAT

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

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CONETEC

Daily Baseline Summary

Project No.: 00-300 Project Location: Legacy Highway Client/Rep: Kleinfelder / NIGILE	Date: 03-01-00 Rig TRUCK Operator: RCP/TOM

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 070 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-22-287	Tip	-.019	-.022			—
Elevation (ft)	Sleeve	.076	.084			—
Northing or Latitude	PP	-.146	-.162	-.016	-7.4	+7.4
Easting or Latitude	Temp	1.604	2.681			

Pre-bore (ft): 2.0	Start Depth (ft): 0	Final Depth (ft): 76.11 23.2m	Water Table (ft):	CPT File: 300CP61.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

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Daily Baseline Summary

Project No.: 00-300	Date: 03-02-00
Project Location: LEGACY HIGHWAY	Rig TRUCK
Client/Rep: KLEINFELDER / NIBIL	Operator: REP/TOM

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info 070 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. WC-9-230	Tip	-.018	-.015			/
Elevation (ft)	Sleeve	.089	.088			/
Northing or Latitude	PP	-.149	-.143			/
Easting or Latitude	Temp	1.568	1.765			

Pre-bore (ft): ≈ 2.0'	Start Depth: (ft): 0	Final Depth (ft): 38.55 (11.75m)	Water Table (ft):	CPT File: 300CPt02.DAT

Sounding Info 070 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction M (-Δ Eng.)
Hole No. SC-19-280	Tip	-.023	-.024			/
Elevation (ft)	Sleeve	.076	.083			/
Northing or Latitude	PP	-.147	-.124	.023	10.6	-10.6
Easting or Latitude	Temp	1.649	2.475			

Pre-bore (ft): ≈ 2.0'	Start Depth: (ft): 0	Final Depth (ft): 66.76' (20.35m)	Water Table (ft):	CPT File: 300CPt03.DAT

Sounding Info Cone/Size 070	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-6-326	Tip	-.024	-.022			/
Elevation (ft)	Sleeve	.083	-.0894			/
Northing or Latitude	PP	-.161	-.122	.039	17.9	-17.9
Easting or Latitude	Temp	1.860	2.237			

Pre-bore (ft): 0	Start Depth: (ft): 0	Final Depth (ft): 139.11 (42.4m)	Water Table (ft):	CPT File: 300CPt

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

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Daily Baseline Summary

Project No.: 00-300 Project Location: LEVEE HOLLOW Client/Rep: KLEINFELDER / MICHELLE	Date: 5/1/00 Rig: TRACK Operator: PEP/DR

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

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Sounding Info 070 Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-14-312	Tip	-.008	-.006			
Elevation (ft)	Sleeve	.090	.092			
Northing or Latitude	PP	-.151	-.117	.034	15.64	-15.64
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 122.5 (37.2m)	Water Table (ft):	CPT File: 300070S

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

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Daily Baseline Summary

Project No.: 00-300	Date: 5/2/00
Project Location: LEGACY HIGHWAY	Rig TRUCK
Client/Rep: KLEINFELDER/MICHELLE	Operator: REP/DB

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size 070	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-31-356	Tip	-.011	-.008			
Elevation (ft)	Sleeve	.088	.090			
Northing or Latitude	PP	-.157	-.124	.033	15.18	-15.18
Easting or Latitude	Temp	2.083	2.533			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 155.51 (47.4m)	Water Table (ft):	CPT File: 300pca-

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Ma (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

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Daily Baseline Summary

Project No.: 00-300 Project Location: LEGACY HIGHWAY Client/Rep: KLEINFELDER	Date: MAY 3, 00 Rig TRUCK Operator: DB, RAY

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size 07C	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. SC-31-353	Tip	-.008	-.007			—
Elevation (ft)	Sleeve	.097	.093			—
Northing or Latitude	PP	-.163	-.139	.024	11.04	-11.0
Easting or Latitude	Temp	3.287	2.697			

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File: 300267

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

re-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

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Daily Baseline Summary

Project No.: 00-300	Date: 5/4/00
Project Location: LEGACY HIGHWAY	Rig TRACE
Client/Rep: KLEINFELDER / NIGEL	Operator: REP / DB

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip	1000 bar–139.2 tsf/volt–133.3 bar/volt	1500 bar 208.8 tsf/volt–200 bar/volt
Friction	10 bar–1.392 tsf/volt–1.333 bar/volt	15 bar 2.088 tsf/volt–2.00 bar/volt
Pore Pressure	Both cones: 500 psi–66.67 psi/volt–4.80 tsf/volt–153.8 ft/volt–46.87 m/volt	

Sounding Info Cone/Size 070	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No. X-33-358	Tip	-.002	-.003			
Elevation (ft)	Sleeve	.093	.094			
Northing or Latitude	PP	-.136	-.111	.025	11.50	-11.50
Easting or Latitude	Temp	3.439	2.275			

Pre-bore (ft):	Start Depth: (ft): 0	Final Depth (ft): 119.91 (36.55m)	Water Table (ft):	CPT File: 300p070

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction M (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (-Δ Eng.)
Hole No.	Tip					
Elevation (ft)	Sleeve					
Northing or Latitude	PP					
Easting or Latitude	Temp					

Pre-bore (ft):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:

Conversion Values: Depth: 1m=3.28 ft — Pressure/Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

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References

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Robertson, P.K. (1990) "Soil classification using the cone penetration test". Canadian Geotechnical Journal, 27(1), pp. 151-158.

Robertson, P.K., and Campenella, R.G. (1988) "Guidelines for geotechnical design using CPT and CPTU", University of British Columbia, Vancouver, Canada, Department of Civil Engineering, Soil Mechanics Series No. 120.

ConeTec CPT Interpretations as of October 16, 1998 (Release 1.00.18)

ConeTec's interpretation routine should be considered a calculator of current published CPT correlations and is subject to change to reflect the current state of practice. The interpreted values are not considered valid for all soil types. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design. Reference to current literature is strongly recommended.

The CPT interpretations are based on values of tip, sleeve friction and pore pressure averaged over a user specified interval (typically 0.25m). Note that Qt is the recorded tip value, Qc, corrected for pore pressure effects. Since all ConeTec cones have equal end area friction sleeves, pore pressure corrections to sleeve friction, Fs, are not required.

The tip correction is: $Qt = Qc + (1-a) \bullet Ud$

where: *Qt* is the corrected tip load
Qc is the recorded tip load
Ud is the recorded dynamic pore pressure
a is the Net Area Ratio for the cone (typically 0.85 for ConeTec cones)

Effective vertical overburden stresses are calculated based on a hydrostatic distribution of equilibrium pore pressures below the water table or from a user defined equilibrium pore pressure profile (this can be obtained from CPT dissipation tests). The stress calculations use unit weights assigned to the Soil Behaviour Type zones or from a user defined unit weight profile.

Details regarding the interpretation methods for all of the interpreted parameters is given in table 1. The appropriate references referred to in table 1 are listed in table 2.

The estimated Soil Behaviour Type is based on the charts developed by Robertson and Campanella shown in figure 1.

Table 1 CPT Interpretation Methods

Interpreted Parameter	Description	Equation	Ref
Depth	mid layer depth		
AvgQt	Averaged corrected tip (Qt)	$AvgQt = \frac{1}{n}\sum_{i=1}^{n} Qt_i$	
AvgFs	Averaged sleeve friction (Fs)	$AvgFs = \frac{1}{n}\sum_{i=1}^{n} Fs_i$	
AvgRf	Averaged friction ratio (Rf)	$AvgRf = 100\% \bullet \frac{AvgFs}{AvgQt}$	
AvgUd	Averaged dynamic pore pressure (Ud)	$AvgUd = \frac{1}{n}\sum_{i=1}^{n} Ud_i$	
SBT	Soil Behavior Type as defined by Robertson and Campanella		1

U.Wt.	Unit Weight of soil determined from: 1) uniform value or 2) value assigned to each SBT zone 3) user supplied unit weight profile		
TStress	Total vertical overburden stress at mid layer depth	$TStress = \sum_{i=1}^{n} \gamma_i h_i$ where γ_i is layer unit weight h_i is layer thickness	
EStress	Effective vertical overburden stress at mid layer depth	$EStress = TStress - Ueq$	
Ueq	Equilibrium pore pressure determined from: 1) hydrostatic from water table depth 2) user supplied profile		
Cn	SPT N_{60} overburden correction factor	$Cn=(\sigma_v')^{-0.5}$ where σ_v' is in tsf $0.5 < C_n < 2.0$	
N_{60}	SPT N value at 60% energy calculated from Qt/N ratios assigned to each SBT zone		3
$(N1)_{60}$	SPT N_{60} value corrected for overburden pressure	$N1_{60} = Cn \bullet N_{60}$	3
$\Delta(N1)_{60}$	Equivalent Clean Sand Correction to $(N1)_{60}$	$\Delta(N1)_{60} = \frac{K_{SPT}}{1 - K_{SPT}} \bullet (N1)_{60}$ Where: K_{SPT} is defined as: 0.0 for FC < 5% 0.0167 • (FC - 5) for 5% < FC < 35% 0.5 for FC > 35% FC - Fines Content in %	7
$(N1)_{60cs}$	Equivalent Clean Sand $(N1)_{60}$	$(N1)_{60cs} = (N1)_{60} + \Delta(N1)_{60}$	7
Su	Undrained shear strength - Nkt is use selectable	$Su = \frac{Qt - \sigma_v}{N_{kt}}$	2
k	Coefficient of permeability (assigned to each SBT zone)		6
Bq	Pore pressure parameter	$Bq = \frac{\Delta u}{Qt - \sigma_v}$	2
Qtn	Normalized Qt for Soil Behavior Type classification as defined by Robertson, 1990	$Qtn = \frac{Qt - \sigma_v}{\sigma'_v}$	4
Rfn	Normalized Rf for Soil Behavior Type classification as defined by Robertson, 1990	$Rfn = 100\% \bullet \frac{f_s}{Qt - \sigma_v}$	4
SBTn	Normalized Soil Behavior Type (slightly modified from that published by Robertson, 1990. This version includes all the soil zones of the original non-normalized SBT chart - see figure 1)		4
Qc1	Normalized Qt for seismic analysis	$qc1 = qc \bullet (Pa/\sigma_v')^{0.5}$ where: Pa = atm. pressure	5
Qc1N	Dimensionless Normalized Qt1	qc1N = qc1 / Pa where: Pa = atm. pressure	

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ΔQc1N1	Equivalent clean sand correction	$\Delta qc1N = \frac{K_{CPT}}{1 - K_{CPT}} \bullet qc1N$ Where: K_{CPT} is defined as: 0.0 for FC < 5% 0.0267 • (FC - 5) for 5% < FC < 35% 0.5 for FC > 35% FC - Fines Content in %	5
Qc1Ncs	Clean Sand equivalent Qc1N	*qc1Ncs = qc1N + Δqc1N*	5
Ic	Soil index for estimating grain characteristics	$Ic = [(3.47 - \log Q)^2 + (\log F + 1.22)^2]^{0.5}$	5
FC	Fines content (%)	*FC=1.75(Ic^3.25) - 3.7* *FC=100 for Ic > 3.5* *FC=0 for Ic < 1.26* *FC = 5% if 1.64 < Ic < 2.6 AND Rfn<0.5*	8
PHI	Friction Angle	Campanella and Robertson Durunoglu and Mitchel Janbu	1
Dr	Relative Density	Ticino Sand Hokksund Sand Schmertmann 1976 Jamiolkowski - All Sands	1
OCR	Over Consolidation Ratio		1
State Parameter	Difference between the current void ratio (e) and the critical void ratio (e_c) at the same stress level	$\Psi = e - e_c$	9
CRR	Cyclic Resistance Ratio		7

CONETEC

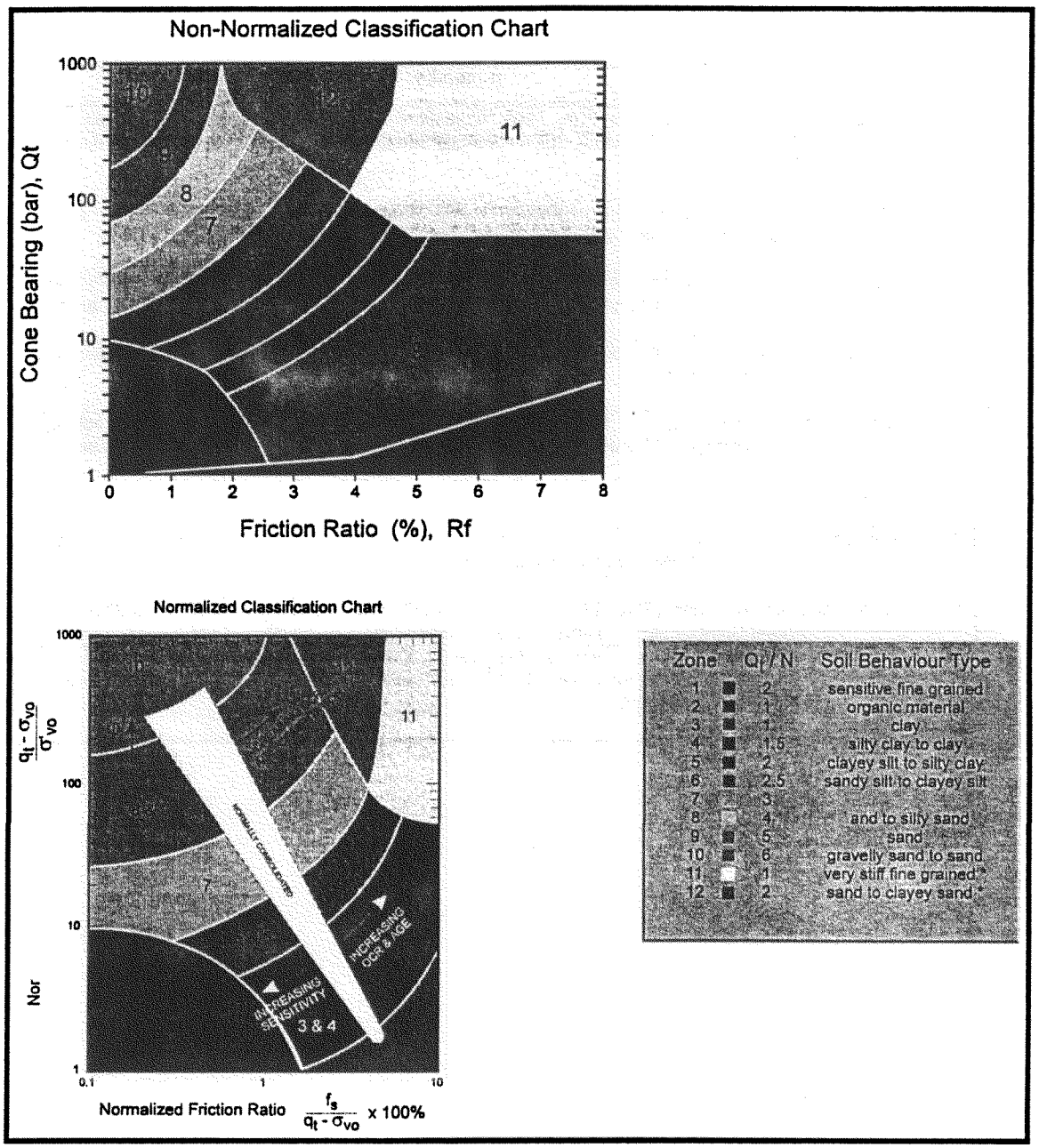


Figure 1 Non-Normalized and Normalized Soil Behaviour Type Classification Charts

CONETEC

Table 2 References

No.	Reference
1	Robertson, P.K. and Campanella, R.G., 1986, "Guidelines for Use, Interpretation and Application of the CPT and CPTU", UBC, Soil Mechanics Series No. 105, Civil Eng. Dept., Vancouver, B.C., Canada
2	Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.
3	Robertson, P.K. and Campanella, R.G., 1989, "Guidelines for Geotechnical Design Using CPT and CPTU", UBC, Soil Mechanics Series No. 120, Civil Eng. Dept., Vancouver, B.C., Canada
4	Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27.
5	Robertson, P.K. and Fear, C.E., 1995, "Liquefaction of Sands and its Evaluation", Keynote Lecture, First International Conference on Earthquake Geotechnical Enginnering, Tokyo, Japan.
6	ConeTec Internal Report
7	Robertson, P.K. and Wride, C.E., 1997, "Cyclic Liquefaction and its Evaluation Based on SPT and CPT", NCEER Workshop Paper, January 22, 1997
8	Wride, C.E. and Robertson, P.K., 1997, "Phase II Data Review Report (Massey and Kidd Sites, Fraser River Delta)", Volume 1 - Data Report (June 1997), University of Alberta.
9	Plewes, H.D., Davies, M.P. and Jefferies, M.G., 1992, "CPT Based Screening Procedure for Evaluating Liquefaction Susceptibility", 45th Canadian Geotechnical Conference, Toronto, Ontario, October 1992.

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
117.70	35.88	4171.5	109.4	2.6	269.4	347.0	16.7	10.0	237.0	30.0	32.0	3.0
118.19	36.03	2247.5	39.2	1.7	270.6	348.5	9.0	5.3	108.6	30.0	30.0	1.5
118.68	36.17	2924.0	59.4	2.0	271.8	350.0	11.7	6.9	153.5	30.0	30.0	3.0
119.18	36.33	2789.3	62.7	2.2	273.1	351.4	11.2	6.6	144.3	30.0	30.0	3.0
119.67	36.47	5939.7	125.4	2.1	274.3	352.9	19.8	11.7	0.0	37.9	34.0	1.0
120.16	36.62	16309.4	324.5	2.0	275.6	354.4	54.4	32.0	0.0	66.8	40.0	1.0
120.65	36.78	20498.0	275.1	1.3	277.0	355.9	51.2	30.1	0.0	73.2	40.0	1.0
121.14	36.92	18883.3	236.0	1.2	278.3	357.3	47.2	27.7	0.0	70.8	40.0	1.0
121.64	37.08	21041.2	255.0	1.2	279.7	358.8	52.6	30.8	0.0	73.9	40.0	1.0
122.21	37.25	10035.3	237.9	2.4	281.3	360.5	33.5	19.5	0.0	52.6	36.0	1.0
122.78	37.42	5386.3	161.4	3.0	282.8	362.2	21.5	12.5	316.1	34.6	32.0	6.0
123.28	37.58	14828.0	276.7	1.9	284.0	363.7	49.4	28.7	0.0	63.6	38.0	1.0
123.77	37.72	14048.0	192.1	1.4	285.4	365.2	35.1	20.3	0.0	62.0	38.0	1.0
124.26	37.88	5312.6	156.3	2.9	286.7	366.6	21.3	12.3	310.6	34.1	32.0	6.0
124.75	38.03	4275.9	104.5	2.4	287.9	368.1	17.1	9.9	241.3	30.0	32.0	3.0
125.24	38.17	4830.3	137.4	2.8	289.1	369.6	19.3	11.1	278.1	31.2	32.0	3.0
125.74	38.33	4683.4	198.6	4.2	290.4	371.1	23.4	13.4	268.1	0.0	0.0	3.0
126.23	38.47	3735.9	136.7	3.7	291.6	372.5	18.7	10.7	204.8	0.0	0.0	3.0
126.72	38.62	3596.2	124.0	3.4	292.8	374.0	18.0	10.3	195.3	0.0	0.0	3.0
127.21	38.78	3369.6	97.2	2.9	294.0	375.5	16.8	9.6	180.0	0.0	0.0	3.0
127.71	38.92	3140.1	90.0	2.9	295.3	376.9	15.7	8.9	164.5	0.0	0.0	3.0
128.20	39.08	2781.0	75.0	2.7	296.5	378.4	13.9	7.9	140.4	0.0	0.0	1.5
128.69	39.22	2632.9	51.4	2.0	297.7	379.9	10.5	6.0	130.4	30.0	30.0	1.5
129.18	39.38	2876.8	49.5	1.7	299.0	381.4	11.5	6.5	146.4	30.0	30.0	1.5
129.67	39.53	2882.6	47.8	1.7	300.2	382.8	11.5	6.5	146.6	30.0	30.0	1.5
130.17	39.67	2900.4	51.5	1.8	301.4	384.3	11.6	6.5	147.6	30.0	30.0	1.5
130.66	39.83	2935.4	64.4	2.2	302.6	385.8	11.7	6.6	149.8	30.0	30.0	1.5
131.15	39.97	2714.2	52.1	1.9	303.9	387.2	10.9	6.1	134.9	30.0	30.0	1.5
131.64	40.12	2445.4	46.6	1.9	305.1	388.7	9.8	5.5	116.8	30.0	30.0	1.5
132.13	40.28	1845.0	35.9	1.9	306.3	390.2	7.4	4.1	76.6	30.0	30.0	1.0
132.63	40.42	2442.2	40.3	1.7	307.6	391.7	9.8	5.5	116.2	30.0	30.0	1.5
133.12	40.58	5028.0	124.3	2.5	308.8	393.1	20.1	11.2	288.4	31.4	32.0	3.0
133.61	40.72	4973.7	148.9	3.0	310.0	394.6	19.9	11.1	284.6	31.0	32.0	3.0
134.10	40.88	3008.6	85.2	2.8	311.2	396.1	15.0	8.3	153.4	0.0	0.0	1.5
134.59	41.03	2792.7	40.0	1.4	312.5	397.6	11.2	6.2	138.8	30.0	30.0	1.5
135.09	41.17	4415.3	87.6	2.0	313.7	399.0	17.7	9.8	246.8	30.0	30.0	3.0
135.58	41.33	11892.7	188.1	1.6	315.0	400.5	29.7	16.4	0.0	55.8	38.0	1.0
136.07	41.47	3266.8	111.6	3.4	316.3	402.0	16.3	9.0	169.9	0.0	0.0	3.0
136.56	41.62	2625.9	37.4	1.4	317.5	403.4	10.5	5.8	127.0	30.0	30.0	1.5
137.06	41.78	2714.0	39.1	1.4	318.8	404.9	10.9	6.0	132.7	30.0	30.0	1.5
137.55	41.92	4844.8	111.2	2.3	320.0	406.4	19.4	10.6	274.6	30.0	32.0	3.0
138.04	42.08	20512.7	269.9	1.3	321.3	407.9	51.3	28.0	0.0	71.1	40.0	1.0
138.53	42.22	12240.6	313.9	2.6	322.6	409.3	40.8	22.2	0.0	56.3	38.0	1.0
139.02	42.38	4340.7	170.6	3.9	323.9	410.8	21.7	11.8	240.4	0.0	0.0	3.0
139.52	42.53	2528.8	38.9	1.5	325.1	412.3	10.1	5.5	119.4	30.0	30.0	1.5
140.01	42.67	2972.6	67.7	2.3	326.4	413.7	11.9	6.4	148.8	30.0	30.0	1.5
140.50	42.83	3971.5	122.2	3.1	327.6	415.2	19.9	10.7	215.2	0.0	0.0	3.0
140.99	42.97	5684.1	148.1	2.6	328.8	416.7	22.7	12.3	329.2	34.0	32.0	6.0
141.48	43.12	3547.6	99.3	2.8	330.0	418.2	14.2	7.6	186.6	30.0	30.0	3.0
141.98	43.28	7781.4	135.6	1.7	331.3	419.6	25.9	13.9	0.0	42.9	34.0	1.0
142.47	43.42	18346.3	203.2	1.1	332.7	421.1	36.7	19.7	0.0	67.4	40.0	1.0

ConeTec Inc. - CPT Interpretation
Interpretation Output - Release 1.00.19c
Run No: 00-0518-1635-4196
Job No: 00-300
Client: Kleinfelder
Project: Legacy Parkway Project
Site: SC-19-275
Location: STRUCTURE 19
Cone: 20 TON A 070
CPT Date: 00/02/02
CPT Time: 08:38
CPT File: 300SC275.COR

Water Table (m): 0.50 (ft): 1.6
Averaging Increment (m): 0.15
Su Nkt used: 15.00
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
Used Unit Weights Assigned to Soil Zones

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
0.25	0.08	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0
0.74	0.23	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	1.0
1.23	0.38	0.0	0.0	0.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0	1.0
1.72	0.52	0.0	0.0	0.0	10.0	0.2	0.0	0.0	0.0	0.0	0.0	1.0
2.21	0.68	0.0	0.0	0.0	11.4	1.7	0.0	0.0	0.0	0.0	0.0	1.0
2.71	0.82	0.0	0.0	0.0	12.9	3.2	0.0	0.0	0.0	0.0	0.0	1.0
3.20	0.97	0.0	0.0	0.0	14.4	4.7	0.0	0.0	0.0	0.0	0.0	1.0
3.61	1.10	0.0	0.0	0.0	15.6	5.9	0.0	0.0	0.0	0.0	0.0	1.0
4.02	1.22	0.0	0.0	0.0	16.8	7.1	0.0	0.0	0.0	0.0	0.0	1.0
4.51	1.38	0.0	0.0	0.0	18.2	8.6	0.0	0.0	0.0	0.0	0.0	1.0
5.00	1.53	0.0	0.0	0.0	19.7	10.1	0.0	0.0	0.0	0.0	0.0	1.0
5.50	1.67	0.0	0.0	0.0	21.1	11.5	0.0	0.0	0.0	0.0	0.0	1.0
5.99	1.83	0.0	0.0	0.0	22.6	13.0	0.0	0.0	0.0	0.0	0.0	1.0
6.56	2.00	0.0	0.0	0.0	24.3	14.7	0.0	0.0	0.0	0.0	0.0	1.0
7.14	2.17	0.0	0.0	0.0	26.0	16.4	0.0	0.0	0.0	0.0	0.0	1.0
7.63	2.33	0.0	0.0	0.0	27.4	17.9	0.0	0.0	0.0	0.0	0.0	1.0
8.12	2.47	0.0	0.0	0.0	28.9	19.4	0.0	0.0	0.0	0.0	0.0	1.0
8.61	2.62	0.0	0.0	0.0	30.3	20.8	0.0	0.0	0.0	0.0	0.0	1.0
9.10	2.78	0.0	0.0	0.0	31.8	22.3	0.0	0.0	0.0	0.0	0.0	1.0
9.60	2.92	0.0	0.0	0.0	33.2	23.8	0.0	0.0	0.0	0.0	0.0	1.0
10.09	3.08	0.0	0.0	0.0	34.7	25.3	0.0	0.0	0.0	0.0	0.0	1.0
10.58	3.22	0.0	0.0	0.0	36.2	26.7	0.0	0.0	0.0	0.0	0.0	1.0
11.07	3.38	0.0	0.0	0.0	37.6	28.2	0.0	0.0	0.0	0.0	0.0	1.0
11.56	3.53	0.0	0.0	0.0	39.1	29.7	0.0	0.0	0.0	0.0	0.0	1.0
12.06	3.67	0.0	0.0	0.0	40.5	31.1	0.0	0.0	0.0	0.0	0.0	1.0
12.55	3.83	0.0	0.0	0.0	42.0	32.6	0.0	0.0	0.0	0.0	0.0	1.0
13.04	3.98	0.0	0.0	0.0	43.4	34.1	0.0	0.0	0.0	0.0	0.0	1.0
13.53	4.12	0.0	0.0	0.0	44.9	35.6	0.0	0.0	0.0	0.0	0.0	1.0
14.03	4.27	0.0	0.0	0.0	46.3	37.0	0.0	0.0	0.0	0.0	0.0	1.0
14.52	4.43	0.0	0.0	0.0	47.8	38.5	0.0	0.0	0.0	0.0	0.0	1.0
15.01	4.57	0.0	0.0	0.0	49.2	40.0	0.0	0.0	0.0	0.0	0.0	1.0
15.50	4.73	0.0	0.0	0.0	50.7	41.4	0.0	0.0	0.0	0.0	0.0	1.0
15.99	4.88	0.0	0.0	0.0	52.1	42.9	0.0	0.0	0.0	0.0	0.0	1.0
16.49	5.02	0.0	0.0	0.0	53.6	44.4	0.0	0.0	0.0	0.0	0.0	1.0
16.98	5.18	0.0	0.0	0.0	55.1	45.9	0.0	0.0	0.0	0.0	0.0	1.0
17.47	5.32	0.0	0.0	0.0	56.5	47.3	0.0	0.0	0.0	0.0	0.0	1.0
17.96	5.48	0.0	0.0	0.0	58.0	48.8	0.0	0.0	0.0	0.0	0.0	1.0
18.45	5.62	0.0	0.0	0.0	59.4	50.3	0.0	0.0	0.0	0.0	0.0	1.0
18.95	5.77	0.0	0.0	0.0	60.9	51.7	0.0	0.0	0.0	0.0	0.0	1.0
19.44	5.93	0.0	0.0	0.0	62.3	53.2	0.0	0.0	0.0	0.0	0.0	1.0
19.93	6.07	0.0	0.0	0.0	63.8	54.7	0.0	0.0	0.0	0.0	0.0	1.0
20.42	6.23	0.0	0.0	0.0	65.2	56.2	0.0	0.0	0.0	0.0	0.0	1.0
20.92	6.38	0.0	0.0	0.0	66.7	57.6	0.0	0.0	0.0	0.0	0.0	1.0
21.41	6.52	0.0	0.0	0.0	68.1	59.1	0.0	0.0	0.0	0.0	0.0	1.0
21.90	6.68	0.0	0.0	0.0	69.6	60.6	0.0	0.0	0.0	0.0	0.0	1.0
22.39	6.82	0.0	0.0	0.0	71.0	62.0	0.0	0.0	0.0	0.0	0.0	1.0
22.88	6.98	0.0	0.0	0.0	72.5	63.5	0.0	0.0	0.0	0.0	0.0	1.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
23.38	7.12	0.0	0.0	0.0	73.9	65.0	0.0	0.0	0.0	0.0	0.0	1.0
23.87	7.27	0.0	0.0	0.0	75.4	66.5	0.0	0.0	0.0	0.0	0.0	1.0
24.36	7.43	0.0	0.0	0.0	76.9	67.9	0.0	0.0	0.0	0.0	0.0	1.0
24.85	7.57	0.0	0.0	0.0	78.3	69.4	0.0	0.0	0.0	0.0	0.0	1.0
25.34	7.73	0.0	0.0	0.0	79.8	70.9	0.0	0.0	0.0	0.0	0.0	1.0
25.84	7.88	0.0	0.0	0.0	81.2	72.3	0.0	0.0	0.0	0.0	0.0	1.0
26.33	8.02	0.0	0.0	0.0	82.7	73.8	0.0	0.0	0.0	0.0	0.0	1.0
26.82	8.18	0.0	0.0	0.0	84.1	75.3	0.0	0.0	0.0	0.0	0.0	1.0
27.31	8.32	0.0	0.0	0.0	85.6	76.8	0.0	0.0	0.0	0.0	0.0	1.0
27.80	8.48	0.0	0.0	0.0	87.0	78.2	0.0	0.0	0.0	0.0	0.0	1.0
28.30	8.62	0.0	0.0	0.0	88.5	79.7	0.0	0.0	0.0	0.0	0.0	1.0
28.79	8.77	0.0	0.0	0.0	89.9	81.2	0.0	0.0	0.0	0.0	0.0	1.0
29.28	8.93	0.0	0.0	0.0	91.4	82.6	0.0	0.0	0.0	0.0	0.0	1.0
29.77	9.07	0.0	0.0	0.0	92.8	84.1	0.0	0.0	0.0	0.0	0.0	1.0
30.27	9.23	0.0	0.0	0.0	94.3	85.6	0.0	0.0	0.0	0.0	0.0	1.0
30.76	9.38	1056.2	11.5	1.1	95.6	87.1	4.2	4.2	58.2	30.0	30.0	3.0
31.17	9.50	2226.4	43.3	1.9	96.7	88.3	8.9	8.9	136.1	30.0	34.0	6.0
31.58	9.62	2543.1	67.3	2.6	97.7	89.5	12.7	12.6	157.1	0.0	0.0	6.0
32.07	9.77	1798.5	81.9	4.6	98.9	91.0	18.0	17.7	107.2	0.0	0.0	6.0
32.56	9.93	1305.1	59.3	4.5	100.0	92.5	13.1	12.8	74.2	0.0	0.0	3.0
33.05	10.07	1297.6	47.2	3.6	101.2	93.9	8.7	8.4	73.5	0.0	0.0	3.0
33.55	10.23	1302.7	45.0	3.5	102.4	95.4	8.7	8.4	73.7	0.0	0.0	3.0
34.04	10.38	1328.0	42.5	3.2	103.7	96.9	8.9	8.5	75.2	0.0	0.0	3.0
34.53	10.52	1472.9	49.3	3.3	104.9	98.3	9.8	9.4	84.6	0.0	0.0	3.0
35.02	10.68	1550.4	47.6	3.1	106.1	99.8	7.8	7.4	89.6	0.0	0.0	3.0
35.51	10.82	1835.6	54.8	3.0	107.4	101.3	9.2	8.7	108.5	0.0	0.0	6.0
36.01	10.98	4300.4	71.8	1.7	108.6	102.8	14.3	13.5	0.0	41.9	38.0	1.0
36.50	11.12	4245.3	129.5	3.0	109.9	104.2	21.2	19.8	268.7	0.0	0.0	6.0
36.99	11.27	4355.3	82.3	1.9	111.2	105.7	14.5	13.5	0.0	41.9	38.0	1.0
37.48	11.43	2134.7	79.4	3.7	112.4	107.2	14.2	13.1	127.7	0.0	0.0	6.0
37.98	11.57	3183.3	99.5	3.1	113.7	108.6	15.9	14.6	197.4	0.0	0.0	6.0
38.47	11.73	2359.0	107.8	4.6	114.8	110.1	23.6	21.5	142.3	0.0	0.0	6.0
38.96	11.88	4144.1	92.3	2.2	116.0	111.6	16.6	15.1	261.1	39.9	36.0	6.0
39.45	12.02	4157.2	135.0	3.2	117.3	113.1	20.8	18.8	261.8	0.0	0.0	6.0
39.94	12.18	5522.8	103.1	1.9	118.5	114.5	18.4	16.5	0.0	47.8	38.0	1.0
40.44	12.32	4774.3	113.9	2.4	119.8	116.0	19.1	17.1	302.6	43.5	38.0	6.0
40.93	12.48	2582.6	67.4	2.6	121.0	117.5	10.3	9.2	156.3	30.0	34.0	6.0
41.42	12.62	1453.4	13.0	0.9	122.3	118.9	5.8	5.1	80.8	30.0	30.0	3.0
41.91	12.77	1574.2	20.2	1.3	123.5	120.4	6.3	5.5	88.7	30.0	30.0	3.0
42.40	12.93	2099.3	48.2	2.3	124.7	121.9	8.4	7.4	123.5	30.0	32.0	3.0
42.90	13.07	1241.9	28.2	2.3	125.9	123.4	6.2	5.4	66.2	0.0	0.0	3.0
43.39	13.23	1984.3	53.1	2.7	127.2	124.8	9.9	8.6	115.5	0.0	0.0	3.0
43.88	13.38	2401.0	61.1	2.5	128.4	126.3	9.6	8.3	143.1	30.0	32.0	6.0
44.37	13.52	1239.2	29.7	2.4	129.6	127.8	6.2	5.3	65.5	0.0	0.0	3.0
44.86	13.68	1214.6	36.9	3.0	130.9	129.2	8.1	6.9	63.6	0.0	0.0	1.5
45.36	13.82	1341.4	27.4	2.0	132.1	130.7	6.7	5.7	71.9	0.0	0.0	3.0
45.85	13.98	1188.0	17.6	1.5	133.3	132.2	5.9	5.0	61.5	0.0	0.0	1.5
46.34	14.12	1187.5	23.2	2.0	134.5	133.7	5.9	5.0	61.3	0.0	0.0	1.5
46.83	14.27	6877.2	46.6	0.7	135.8	135.1	17.2	14.4	0.0	52.2	38.0	1.0
47.33	14.43	9885.2	83.3	0.8	137.2	136.6	24.7	20.6	0.0	62.4	40.0	1.0
47.82	14.57	9795.3	85.5	0.9	138.6	138.1	24.5	20.4	0.0	62.0	40.0	1.0
48.31	14.73	8044.9	98.7	1.2	140.0	139.5	20.1	16.6	0.0	56.2	40.0	1.0
48.80	14.88	2295.0	84.9	3.7	141.3	141.0	15.3	12.6	134.2	0.0	0.0	3.0
49.29	15.02	1639.0	31.1	1.9	142.5	142.5	6.6	5.4	90.3	30.0	30.0	3.0
49.79	15.18	1613.0	25.4	1.6	143.7	144.0	6.5	5.3	88.4	30.0	30.0	3.0
50.28	15.32	1466.7	18.2	1.2	145.0	145.4	5.9	4.8	78.4	30.0	30.0	3.0
50.77	15.48	1352.9	16.9	1.3	146.2	146.9	5.4	4.4	70.7	30.0	30.0	1.5
51.26	15.62	1713.0	27.2	1.6	147.4	148.4	6.9	5.5	94.5	30.0	30.0	3.0
51.75	15.77	2050.5	63.9	3.1	148.7	149.8	10.3	8.2	116.8	0.0	0.0	3.0
52.25	15.93	1338.6	20.0	1.5	149.9	151.3	5.4	4.3	69.2	30.0	30.0	1.5
52.74	16.08	1472.0	24.8	1.7	151.1	152.8	5.9	4.7	77.9	30.0	30.0	3.0
53.23	16.22	2788.6	62.9	2.3	152.3	154.3	11.2	8.8	165.5	30.0	32.0	6.0
53.72	16.38	1675.7	42.1	2.5	153.6	155.7	8.4	6.6	91.1	0.0	0.0	3.0
54.22	16.53	1671.4	34.6	2.1	154.8	157.2	8.4	6.6	90.6	0.0	0.0	3.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
54.71	16.67	1389.4	22.5	1.6	156.0	158.7	5.6	4.4	71.6	30.0	30.0	1.5
55.20	16.83	1651.4	33.7	2.0	157.3	160.1	8.3	6.4	88.9	0.0	0.0	3.0
55.69	16.97	1779.4	40.7	2.3	158.5	161.6	8.9	6.9	97.3	0.0	0.0	3.0
56.18	17.12	1929.2	42.4	2.2	159.7	163.1	7.7	6.0	107.1	30.0	30.0	3.0
56.68	17.28	1767.0	49.8	2.8	160.9	164.6	8.8	6.8	96.1	0.0	0.0	3.0
57.17	17.42	2097.5	53.5	2.5	162.2	166.0	10.5	8.1	118.0	0.0	0.0	3.0
57.66	17.58	2228.8	67.7	3.0	163.4	167.5	11.1	8.5	126.5	0.0	0.0	3.0
58.15	17.72	1945.4	47.3	2.4	164.6	169.0	9.7	7.4	107.5	0.0	0.0	3.0
58.64	17.88	1699.0	34.0	2.0	165.9	170.4	6.8	5.2	90.8	30.0	30.0	3.0
59.14	18.03	1685.3	33.1	2.0	167.1	171.9	6.7	5.1	89.8	30.0	30.0	3.0
59.63	18.17	1613.2	27.7	1.7	168.3	173.4	6.5	4.9	84.8	30.0	30.0	3.0
60.12	18.33	1506.8	25.8	1.7	169.5	174.9	6.0	4.5	77.5	30.0	30.0	1.5
60.61	18.47	1431.5	23.2	1.6	170.8	176.3	5.7	4.3	72.3	30.0	30.0	1.5
61.10	18.62	1382.0	18.2	1.3	172.0	177.8	5.5	4.1	68.8	30.0	30.0	1.5
61.60	18.78	1292.2	16.4	1.3	173.2	179.3	5.2	3.8	62.6	30.0	30.0	1.5
62.09	18.92	1305.4	17.2	1.3	174.5	180.7	5.2	3.9	63.3	30.0	30.0	1.5
62.58	19.08	1826.2	28.0	1.5	175.7	182.2	7.3	5.4	97.9	30.0	30.0	3.0
63.07	19.22	1428.4	19.4	1.4	176.9	183.7	5.7	4.2	71.2	30.0	30.0	1.5
63.57	19.38	1357.0	18.6	1.4	178.1	185.2	5.4	4.0	66.2	30.0	30.0	1.5
64.06	19.53	1259.4	17.0	1.3	179.4	186.6	5.0	3.7	59.6	30.0	30.0	1.5
64.55	19.67	1278.4	16.4	1.3	180.6	188.1	5.1	3.7	60.6	30.0	30.0	1.5
65.04	19.83	1301.3	18.6	1.4	181.8	189.6	5.2	3.8	62.0	30.0	30.0	1.5
65.53	19.97	1396.1	17.8	1.3	183.0	191.0	5.6	4.0	68.1	30.0	30.0	1.5
66.03	20.12	1363.7	17.0	1.2	184.3	192.5	5.5	3.9	65.8	30.0	30.0	1.5
66.52	20.28	1411.0	20.9	1.5	185.5	194.0	5.6	4.1	68.8	30.0	30.0	1.5
67.01	20.42	1626.1	23.0	1.4	186.7	195.5	6.5	4.7	82.9	30.0	30.0	1.5
67.50	20.58	1431.8	18.9	1.3	188.0	196.9	5.7	4.1	69.8	30.0	30.0	1.5
67.99	20.72	1361.4	17.7	1.3	189.2	198.4	5.4	3.9	64.9	30.0	30.0	1.5
68.49	20.88	1422.8	20.7	1.5	190.4	199.9	5.7	4.0	68.8	30.0	30.0	1.5
68.98	21.03	2714.6	50.7	1.9	191.6	201.4	10.9	7.7	154.8	30.0	30.0	3.0
69.47	21.17	3005.5	50.7	1.7	192.9	202.8	12.0	8.5	174.0	30.0	32.0	3.0
69.96	21.33	1637.9	28.9	1.8	194.1	204.3	6.6	4.6	82.6	30.0	30.0	1.5
70.46	21.47	1581.7	25.6	1.6	195.3	205.8	6.3	4.4	78.7	30.0	30.0	1.5
70.95	21.62	1624.1	24.5	1.5	196.6	207.2	6.5	4.5	81.4	30.0	30.0	1.5
71.44	21.78	1594.7	23.5	1.5	197.8	208.7	6.4	4.4	79.2	30.0	30.0	1.5
71.93	21.92	1644.0	24.9	1.5	199.0	210.2	6.6	4.6	82.3	30.0	30.0	1.5
72.42	22.08	1685.3	24.5	1.5	200.2	211.7	6.7	4.7	84.9	30.0	30.0	1.5
72.92	22.22	1685.1	25.9	1.5	201.5	213.1	6.7	4.6	84.7	30.0	30.0	1.5
73.41	22.38	1512.3	20.9	1.4	202.7	214.6	6.0	4.2	73.0	30.0	30.0	1.5
73.90	22.53	1520.5	20.8	1.4	203.9	216.1	6.1	4.2	73.4	30.0	30.0	1.5
74.39	22.67	1582.8	22.9	1.4	205.2	217.5	6.3	4.3	77.3	30.0	30.0	1.5
74.88	22.83	4393.3	52.6	1.2	206.4	219.0	14.6	10.0	0.0	33.3	34.0	1.0
75.38	22.97	5565.2	75.0	1.3	207.7	220.5	18.6	12.6	0.0	40.0	34.0	1.0
75.87	23.12	1638.9	40.8	2.5	209.0	222.0	8.2	5.5	80.5	0.0	0.0	1.5
76.36	23.28	1869.6	25.4	1.4	210.2	223.4	7.5	5.0	95.7	30.0	30.0	1.5
76.85	23.42	1820.7	27.6	1.5	211.5	224.9	7.3	4.9	92.3	30.0	30.0	1.5
77.34	23.58	2109.7	31.1	1.5	212.7	226.4	8.4	5.7	111.4	30.0	30.0	3.0
77.84	23.72	2972.5	81.4	2.7	213.9	227.8	11.9	8.0	168.7	30.0	30.0	3.0
78.33	23.88	1860.6	47.3	2.5	215.1	229.3	9.3	6.2	94.4	0.0	0.0	1.5
78.82	24.03	1783.0	37.6	2.1	216.4	230.8	7.1	4.7	89.1	30.0	30.0	1.5
79.31	24.17	1715.7	32.5	1.9	217.6	232.3	6.9	4.6	84.4	30.0	30.0	1.5
79.81	24.33	6249.1	67.4	1.1	218.9	233.7	20.8	13.8	0.0	42.6	36.0	1.0
80.30	24.47	2485.5	78.9	3.2	220.1	235.2	12.4	8.2	135.3	0.0	0.0	3.0
80.79	24.62	1748.4	25.7	1.5	221.4	236.7	7.0	4.6	86.0	30.0	30.0	1.5
81.28	24.78	1906.1	29.1	1.5	222.6	238.1	7.6	5.0	96.4	30.0	30.0	1.5
81.77	24.92	1814.6	25.2	1.4	223.8	239.6	7.3	4.7	90.1	30.0	30.0	1.5
82.27	25.08	3303.0	41.0	1.2	225.1	241.1	11.0	7.2	0.0	30.0	32.0	1.0
82.76	25.22	12651.5	57.7	0.5	226.5	242.6	25.3	16.5	0.0	62.3	40.0	1.0
83.25	25.38	19105.5	41.3	0.2	227.9	244.0	38.2	24.8	0.0	74.0	42.0	1.0
83.74	25.53	16009.6	30.8	0.2	229.4	245.5	32.0	20.7	0.0	68.9	40.0	1.0
84.23	25.67	5044.1	70.1	1.4	230.7	247.0	16.8	10.8	0.0	35.7	34.0	1.0
84.73	25.83	1822.9	15.2	0.8	232.0	248.4	7.3	4.7	89.5	30.0	30.0	1.5
85.22	25.97	1946.6	9.6	0.5	233.3	249.9	6.5	4.2	0.0	30.0	30.0	1.0
85.71	26.12	2584.1	20.8	0.8	234.6	251.4	8.6	5.5	0.0	30.0	30.0	1.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
86.20	26.28	2988.6	59.4	2.0	235.8	252.9	12.0	7.6	166.7	30.0	30.0	3.0
86.70	26.42	6582.4	70.0	1.1	237.2	254.3	16.5	10.5	0.0	42.9	36.0	1.0
87.19	26.58	3930.5	71.8	1.8	238.5	255.8	15.7	10.0	229.1	30.0	32.0	3.0
87.68	26.72	3003.1	39.5	1.3	239.7	257.3	12.0	7.6	167.1	30.0	30.0	3.0
88.17	26.88	3111.2	60.4	1.9	240.9	258.7	12.4	7.8	174.1	30.0	30.0	3.0
88.66	27.03	1987.7	36.7	1.8	242.1	260.2	8.0	5.0	99.0	30.0	30.0	1.5
89.16	27.17	1744.5	15.0	0.9	243.4	261.7	7.0	4.4	82.6	30.0	30.0	1.5
89.65	27.33	2503.3	31.7	1.3	244.6	263.2	10.0	6.3	133.0	30.0	30.0	3.0
90.14	27.47	3348.4	83.2	2.5	245.8	264.6	13.4	8.4	189.2	30.0	30.0	3.0
90.63	27.62	1969.9	51.3	2.6	247.1	266.1	9.8	6.1	97.1	0.0	0.0	1.5
91.12	27.78	2816.6	70.0	2.5	248.3	267.6	11.3	7.0	153.4	30.0	30.0	3.0
91.62	27.92	3338.3	40.7	1.2	249.5	269.0	11.1	6.9	0.0	30.0	30.0	1.0
92.11	28.08	10054.1	65.2	0.6	250.9	270.5	25.1	15.5	0.0	54.2	38.0	1.0
92.60	28.22	6130.1	150.7	2.5	252.2	272.0	24.5	15.1	373.7	40.0	34.0	6.0
93.09	28.38	2788.4	93.9	3.4	253.4	273.5	13.9	8.6	150.8	0.0	0.0	3.0
93.58	28.53	2228.4	54.2	2.4	254.6	274.9	8.9	5.5	113.3	30.0	30.0	1.5
94.08	28.67	2854.7	86.8	3.0	255.9	276.4	14.3	8.7	154.8	0.0	0.0	3.0
94.57	28.83	5088.2	124.4	2.4	257.1	277.9	20.4	12.4	303.5	34.4	32.0	6.0
95.06	28.97	4290.3	101.2	2.4	258.3	279.3	17.2	10.4	250.2	30.0	32.0	3.0
95.55	29.12	2047.7	24.0	1.2	259.6	280.8	8.2	5.0	100.5	30.0	30.0	1.5
96.05	29.28	1769.6	15.3	0.9	260.8	282.3	7.1	4.3	81.8	30.0	30.0	1.5
96.54	29.42	2193.5	20.2	0.9	262.0	283.8	8.8	5.3	109.8	30.0	30.0	1.5
97.03	29.58	2214.0	34.3	1.6	263.2	285.2	8.9	5.3	111.0	30.0	30.0	1.5
97.52	29.72	3179.5	78.4	2.5	264.5	286.7	12.7	7.7	175.2	30.0	30.0	3.0
98.01	29.88	1946.1	34.2	1.8	265.7	288.2	7.8	4.7	92.8	30.0	30.0	1.5
98.51	30.03	5367.4	75.6	1.4	267.0	289.6	17.9	10.7	0.0	35.4	32.0	1.0
99.00	30.17	8303.9	89.3	1.1	268.3	291.1	20.8	12.4	0.0	47.8	36.0	1.0
99.49	30.33	2907.5	76.7	2.6	269.6	292.6	11.6	6.9	156.4	30.0	30.0	3.0
99.98	30.47	2681.0	17.3	0.6	270.9	294.1	8.9	5.3	0.0	30.0	30.0	1.0
100.47	30.62	2246.4	21.3	0.9	272.1	295.5	9.0	5.3	111.9	30.0	30.0	1.5
100.97	30.78	2103.0	21.4	1.0	273.4	297.0	8.4	5.0	102.2	30.0	30.0	1.5
101.46	30.92	2033.8	18.1	0.9	274.6	298.5	8.1	4.8	97.4	30.0	30.0	1.5
101.95	31.08	1942.0	13.8	0.7	275.8	299.9	7.8	4.6	91.1	30.0	30.0	1.5
102.44	31.22	1998.9	17.2	0.9	277.1	301.4	8.0	4.7	94.7	30.0	30.0	1.5
102.94	31.38	5008.0	32.6	0.7	278.4	302.9	12.5	7.3	0.0	32.8	32.0	1.0
103.43	31.53	3760.9	110.3	2.9	279.7	304.4	15.0	8.8	211.8	30.0	30.0	3.0
103.92	31.67	2555.3	36.9	1.4	280.9	305.8	10.2	6.0	131.2	30.0	30.0	1.5
104.41	31.83	2348.5	26.1	1.1	282.1	307.3	9.4	5.5	117.3	30.0	30.0	1.5
104.90	31.97	2275.2	25.0	1.1	283.4	308.8	9.1	5.3	112.2	30.0	30.0	1.5
105.40	32.12	3188.6	72.1	2.3	284.6	310.2	12.8	7.4	172.9	30.0	30.0	3.0
105.89	32.28	5491.4	149.4	2.7	285.8	311.7	22.0	12.7	326.3	35.0	32.0	6.0
106.38	32.42	3975.0	160.7	4.0	287.0	313.2	19.9	11.5	225.0	0.0	0.0	3.0
106.87	32.58	4858.1	186.1	3.8	288.3	314.7	24.3	14.0	283.7	0.0	0.0	3.0
107.36	32.72	3649.4	124.0	3.4	289.5	316.1	18.2	10.5	202.9	0.0	0.0	3.0
107.86	32.88	2723.5	78.2	2.9	290.7	317.6	13.6	7.8	141.0	0.0	0.0	1.5
108.35	33.03	2439.5	66.4	2.7	292.0	319.1	12.2	7.0	121.9	0.0	0.0	1.5
108.84	33.17	2222.7	57.7	2.6	293.2	320.5	11.1	6.4	107.3	0.0	0.0	1.5
109.33	33.33	5005.7	89.1	1.8	294.4	322.0	16.7	9.5	0.0	32.0	32.0	1.0
109.82	33.47	15619.4	74.5	0.5	295.8	323.5	31.2	17.8	0.0	64.5	38.0	1.0
110.32	33.62	19284.7	63.6	0.3	297.3	325.0	38.6	21.9	0.0	70.5	40.0	1.0
110.81	33.78	17760.8	129.6	0.7	298.7	326.4	35.5	20.1	0.0	68.1	40.0	1.0
111.30	33.92	14136.8	315.3	2.2	300.1	327.9	47.1	26.6	0.0	61.4	38.0	1.0
111.79	34.08	8546.8	237.8	2.8	301.4	329.4	34.2	19.3	527.7	47.0	36.0	6.0
112.29	34.22	6918.9	219.9	3.2	302.6	330.8	27.7	15.6	419.0	40.8	34.0	6.0
112.78	34.38	10843.7	187.3	1.7	303.9	332.3	36.1	20.3	0.0	53.7	36.0	1.0
113.27	34.53	4898.9	174.3	3.6	305.1	333.8	24.5	13.7	284.0	0.0	0.0	3.0
113.76	34.67	3138.7	105.9	3.4	306.4	335.3	15.7	8.8	166.5	0.0	0.0	3.0
114.25	34.83	16208.2	112.2	0.7	307.7	336.7	32.4	18.1	0.0	65.0	38.0	1.0
114.75	34.97	21559.4	151.5	0.7	309.2	338.2	43.1	24.0	0.0	73.1	40.0	1.0
115.24	35.12	18441.3	120.4	0.7	310.6	339.7	36.9	20.5	0.0	68.6	40.0	1.0
115.73	35.28	5636.4	205.3	3.6	312.0	341.1	28.2	15.6	332.2	0.0	0.0	6.0
116.22	35.42	16222.4	177.9	1.1	313.3	342.6	40.6	22.4	0.0	64.8	38.0	1.0
116.71	35.58	25504.8	176.6	0.7	314.7	344.1	51.0	28.1	0.0	77.7	42.0	1.0
117.21	35.72	12557.1	355.0	2.8	316.1	345.6	41.9	23.0	0.0	57.3	38.0	1.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
117.70	35.88	7292.6	364.5	5.0	317.5	347.0	72.9	40.1	0.0	41.7	34.0	1.0
118.19	36.03	5723.7	125.1	2.2	318.9	348.5	22.9	12.5	337.1	34.7	32.0	6.0
118.68	36.17	2611.2	53.0	2.0	320.2	350.0	10.4	5.7	129.4	30.0	30.0	1.5
119.18	36.33	2309.9	29.3	1.3	321.4	351.4	9.2	5.0	109.1	30.0	30.0	1.5
119.67	36.47	2472.8	38.7	1.6	322.6	352.9	9.9	5.4	119.8	30.0	30.0	1.5
120.16	36.62	10622.0	98.1	0.9	323.9	354.4	26.6	14.4	0.0	52.2	36.0	1.0
120.65	36.78	23533.8	95.5	0.4	325.4	355.9	39.2	21.3	0.0	74.9	40.0	1.0
121.14	36.92	23289.1	101.4	0.4	326.9	357.3	38.8	21.0	0.0	74.5	40.0	1.0
121.64	37.08	21186.3	86.8	0.4	328.4	358.8	42.4	22.9	0.0	71.8	40.0	1.0
122.21	37.25	21448.9	91.8	0.4	330.1	360.5	42.9	23.1	0.0	72.0	40.0	1.0
122.78	37.42	23127.9	81.5	0.4	331.8	362.2	38.5	20.7	0.0	74.1	40.0	1.0
123.28	37.58	22986.2	76.1	0.3	333.3	363.7	38.3	20.5	0.0	73.9	40.0	1.0
123.77	37.72	21122.2	52.0	0.2	334.9	365.2	35.2	18.8	0.0	71.4	40.0	1.0
124.26	37.88	20722.3	72.9	0.4	336.4	366.6	41.4	22.1	0.0	70.8	40.0	1.0
124.75	38.03	20282.8	99.2	0.5	337.8	368.1	40.6	21.6	0.0	70.1	40.0	1.0
125.24	38.17	21184.8	86.4	0.4	339.3	369.6	42.4	22.5	0.0	71.3	40.0	1.0
125.74	38.33	18985.4	92.7	0.5	340.7	371.1	38.0	20.1	0.0	68.1	40.0	1.0
126.23	38.47	17657.4	121.7	0.7	342.2	372.5	35.3	18.7	0.0	65.9	38.0	1.0
126.72	38.62	17770.0	101.1	0.6	343.6	374.0	35.5	18.8	0.0	66.1	38.0	1.0
127.21	38.78	14748.4	116.7	0.8	345.1	375.5	29.5	15.5	0.0	60.7	38.0	1.0
127.71	38.92	9815.7	210.9	2.1	346.5	376.9	32.7	17.2	0.0	48.9	36.0	1.0
128.20	39.08	11582.9	131.7	1.1	347.8	378.4	29.0	15.2	0.0	53.6	36.0	1.0
128.69	39.22	14622.0	87.8	0.6	349.2	379.9	29.2	15.3	0.0	60.2	38.0	1.0
129.18	39.38	10763.0	228.4	2.1	350.6	381.4	35.9	18.8	0.0	51.4	36.0	1.0
129.67	39.53	7292.5	406.5	5.6	352.1	382.8	72.9	38.0	0.0	40.2	32.0	1.0
130.17	39.67	5089.4	292.3	5.7	353.7	384.3	50.9	26.5	0.0	30.0	32.0	1.0
130.66	39.83	6544.3	252.6	3.9	355.1	385.8	32.7	17.0	386.9	0.0	0.0	6.0
131.15	39.97	7872.1	185.6	2.4	356.3	387.2	26.2	13.6	0.0	42.2	34.0	1.0
131.64	40.12	6953.6	278.1	4.0	357.6	388.7	34.8	18.0	413.8	0.0	0.0	6.0
132.13	40.28	9516.2	272.5	2.9	358.8	390.2	38.1	19.7	584.5	47.5	34.0	6.0
132.63	40.42	13003.1	248.6	1.9	360.1	391.7	43.3	22.4	0.0	56.4	38.0	1.0

ConeTec Inc. - CPT Interpretation
Interpretation Output - Release 1.00.19c
Run No: 00-0518-1635-4234
Job No: 00-300
Client: Kleinfelder
Project: Legacy Parkway Project
Site: SC-19-277
Location: STRUCTURE 19
Cone: 20 TON A 070
CPT Date: 00/31/01
CPT Time: 14:01
CPT File: 300SC277.COR

Water Table (m): 0.50 (ft): 1.6
Averaging Increment (m): 0.15
Su Nkt used: 15.00
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
Used Unit Weights Assigned to Soil Zones

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
0.25	0.08	2388.8	2.0	0.1	1.4	0.0	8.0	15.9	0.0	87.5	50.0	1.0
0.74	0.23	5639.9	2.0	0.0	4.2	0.0	14.1	28.2	0.0	95.0	50.0	1.0
1.23	0.38	3950.4	2.0	0.1	7.0	0.0	9.9	19.8	0.0	78.7	50.0	1.0
1.72	0.52	1274.6	2.0	0.2	9.6	0.2	5.1	10.2	84.3	41.8	44.0	10.0
2.21	0.68	2234.1	2.0	0.1	10.8	1.7	7.4	14.9	0.0	56.2	46.0	1.0
2.71	0.82	3082.8	2.0	0.1	12.1	3.2	10.3	20.6	0.0	63.8	46.0	1.0
3.20	0.97	558.6	2.0	0.4	13.0	4.7	2.8	5.6	36.1	0.0	0.0	6.0
3.61	1.10	237.5	2.0	0.8	13.3	5.9	1.2	2.4	14.6	0.0	0.0	6.0
4.02	1.22	415.0	2.0	0.5	13.7	7.1	2.1	4.2	26.3	0.0	0.0	6.0
4.51	1.38	566.9	2.0	0.4	14.1	8.6	2.8	5.7	36.3	0.0	0.0	6.0
5.00	1.53	247.6	2.0	0.8	14.5	10.1	1.2	2.5	14.9	0.0	0.0	6.0
5.50	1.67	229.0	2.0	0.9	14.9	11.5	1.1	2.3	13.5	0.0	0.0	3.0
5.99	1.83	218.1	2.0	0.9	15.3	13.0	1.1	2.2	12.7	0.0	0.0	3.0
6.56	2.00	379.3	2.0	0.5	15.8	14.7	1.9	3.8	23.3	0.0	0.0	6.0
7.14	2.17	554.3	2.0	0.4	16.2	16.4	2.8	5.5	34.8	0.0	0.0	6.0
7.63	2.33	544.5	2.0	0.4	16.6	17.9	2.7	5.4	34.0	0.0	0.0	6.0
8.12	2.47	460.8	2.0	0.4	17.0	19.4	2.3	4.6	28.3	0.0	0.0	6.0
8.61	2.62	405.0	2.0	0.5	17.4	20.8	2.0	4.1	24.4	0.0	0.0	6.0
9.10	2.78	346.1	2.0	0.6	17.8	22.3	1.7	3.5	20.4	0.0	0.0	6.0
9.60	2.92	557.0	2.0	0.4	18.2	23.8	2.8	5.6	34.3	0.0	0.0	6.0
10.09	3.08	529.9	2.0	0.4	18.7	25.3	2.6	5.3	32.4	0.0	0.0	6.0
10.58	3.22	565.4	2.0	0.4	19.1	26.7	2.8	5.7	34.6	0.0	0.0	6.0
11.07	3.38	1820.6	2.0	0.1	19.9	28.2	6.1	12.1	0.0	41.6	42.0	1.0
11.56	3.53	1446.3	2.0	0.1	21.2	29.7	5.8	11.6	93.0	34.1	40.0	10.0
12.06	3.67	5111.1	81.5	1.6	22.4	31.1	17.0	34.1	0.0	69.5	46.0	1.0
12.55	3.83	5302.3	2.0	0.0	23.8	32.6	13.3	26.5	0.0	69.7	46.0	1.0
13.04	3.98	2585.8	8.4	0.3	25.1	34.1	8.6	16.8	0.0	48.3	42.0	1.0
13.53	4.12	658.2	3.2	0.5	26.0	35.6	3.3	6.3	39.8	0.0	0.0	6.0
14.03	4.27	902.2	2.0	0.2	26.8	37.0	3.6	6.8	55.9	30.0	36.0	6.0
14.52	4.43	4293.8	21.8	0.5	28.1	38.5	10.7	19.8	0.0	61.2	44.0	1.0
15.01	4.57	4479.1	54.5	1.2	29.4	40.0	14.9	26.9	0.0	61.8	44.0	1.0
15.50	4.73	4117.5	9.3	0.2	30.8	41.4	10.3	18.2	0.0	58.7	44.0	1.0
15.99	4.88	979.7	2.0	0.2	32.1	42.9	3.9	6.8	60.3	30.0	36.0	6.0
16.49	5.02	911.6	2.0	0.2	33.3	44.4	3.6	6.2	55.6	30.0	34.0	6.0
16.98	5.18	1319.3	3.0	0.2	34.5	45.9	5.3	8.8	82.6	30.0	38.0	6.0
17.47	5.32	965.3	3.2	0.3	35.8	47.3	3.9	6.3	58.8	30.0	34.0	6.0
17.96	5.48	1258.8	4.2	0.3	37.0	48.8	5.0	8.1	78.2	30.0	36.0	6.0
18.45	5.62	1392.5	3.2	0.2	38.2	50.3	5.6	8.8	86.9	30.0	38.0	6.0
18.95	5.77	2141.7	41.8	2.0	39.5	51.7	8.6	13.3	136.7	36.4	40.0	6.0
19.44	5.93	1442.8	45.9	3.2	40.7	53.2	9.6	14.8	89.9	0.0	0.0	6.0
19.93	6.07	993.9	3.2	0.3	41.9	54.7	4.0	6.0	59.8	30.0	34.0	6.0
20.42	6.23	1041.4	2.0	0.2	43.1	56.2	4.2	6.2	62.8	30.0	34.0	6.0
20.92	6.38	732.1	2.0	0.3	44.0	57.6	3.7	5.4	42.0	0.0	0.0	3.0
21.41	6.52	729.5	2.0	0.3	44.4	59.1	3.6	5.4	41.7	0.0	0.0	3.0
21.90	6.68	749.1	2.0	0.3	44.8	60.6	3.7	5.5	42.9	0.0	0.0	3.0
22.39	6.82	788.6	2.0	0.3	45.2	62.0	3.9	5.7	45.4	0.0	0.0	6.0
22.88	6.98	772.1	2.0	0.3	45.6	63.5	3.9	5.6	44.2	0.0	0.0	3.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
23.38	7.12	3756.5	2.0	0.1	46.5	65.0	9.4	13.5	0.0	50.2	42.0	1.0
23.87	7.27	10299.0	34.6	0.3	47.9	66.5	20.6	29.1	0.0	78.7	46.0	1.0
24.36	7.43	12750.0	71.9	0.6	49.3	67.9	25.5	35.5	0.0	84.4	46.0	1.0
24.85	7.57	12795.2	74.1	0.6	50.8	69.4	25.6	35.1	0.0	84.1	46.0	1.0
25.34	7.73	11816.0	63.7	0.5	52.2	70.9	23.6	32.0	0.0	81.4	46.0	1.0
25.84	7.88	7101.5	76.0	1.1	53.7	72.3	17.8	23.7	0.0	66.4	44.0	1.0
26.33	8.02	1843.0	38.7	2.1	55.0	73.8	7.4	9.7	114.3	30.0	36.0	6.0
26.82	8.18	1360.5	2.0	0.1	56.2	75.3	5.4	7.1	81.9	30.0	34.0	6.0
27.31	8.32	1247.4	2.0	0.2	57.4	76.8	5.0	6.4	74.2	30.0	34.0	6.0
27.80	8.48	1040.5	2.0	0.2	58.6	78.2	4.2	5.3	60.2	30.0	32.0	6.0
28.30	8.62	969.9	2.0	0.2	59.9	79.7	3.9	4.9	55.4	30.0	32.0	3.0
28.79	8.77	1427.1	2.0	0.1	61.1	81.2	5.7	7.1	85.7	30.0	34.0	6.0
29.28	8.93	1840.0	26.9	1.5	62.3	82.6	7.4	9.1	113.0	30.0	36.0	6.0
29.77	9.07	1072.9	2.0	0.2	63.6	84.1	4.3	5.3	61.7	30.0	32.0	3.0
30.27	9.23	1123.8	2.0	0.2	64.8	85.6	4.5	5.5	64.9	30.0	32.0	6.0
30.76	9.38	2037.8	24.4	1.2	66.0	87.1	8.2	9.8	125.7	30.0	36.0	6.0
31.17	9.50	1348.5	3.9	0.3	67.0	88.3	5.4	6.4	79.5	30.0	32.0	6.0
31.58	9.62	1235.9	2.0	0.2	68.1	89.5	4.9	5.9	71.9	30.0	32.0	6.0
32.07	9.77	1248.2	2.0	0.2	69.3	91.0	5.0	5.9	72.5	30.0	32.0	6.0
32.56	9.93	1293.5	2.0	0.2	70.5	92.5	5.2	6.0	75.4	30.0	32.0	6.0
33.05	10.07	1221.0	2.0	0.2	71.7	93.9	4.9	5.6	70.4	30.0	32.0	3.0
33.55	10.23	1147.6	2.0	0.2	73.0	95.4	4.6	5.3	65.3	30.0	32.0	3.0
34.04	10.38	1051.7	2.0	0.2	74.2	96.9	4.2	4.8	58.7	30.0	30.0	3.0
34.53	10.52	1063.7	2.0	0.2	75.4	98.3	4.3	4.8	59.3	30.0	30.0	3.0
35.02	10.68	1046.6	2.0	0.2	76.7	99.8	4.2	4.7	58.0	30.0	30.0	3.0
35.51	10.82	1064.7	2.0	0.2	77.9	101.3	4.3	4.7	59.0	30.0	30.0	3.0
36.01	10.98	1035.8	2.0	0.2	79.1	102.8	4.1	4.6	56.9	30.0	30.0	3.0
36.50	11.12	1097.0	2.0	0.2	80.3	104.2	4.4	4.8	60.8	30.0	30.0	3.0
36.99	11.27	1156.6	2.0	0.2	81.6	105.7	4.6	5.0	64.6	30.0	30.0	3.0
37.48	11.43	1087.7	2.0	0.2	82.8	107.2	4.4	4.7	59.8	30.0	30.0	3.0
37.98	11.57	1125.4	2.0	0.2	84.0	108.6	4.5	4.8	62.2	30.0	30.0	3.0
38.47	11.73	997.7	2.0	0.2	85.3	110.1	4.0	4.2	53.5	30.0	30.0	3.0
38.96	11.88	1071.4	2.0	0.2	86.5	111.6	4.3	4.5	58.2	30.0	30.0	3.0
39.45	12.02	1051.3	2.0	0.2	87.7	113.1	4.2	4.4	56.7	30.0	30.0	3.0
39.94	12.18	1022.4	2.0	0.2	88.9	114.5	4.1	4.2	54.6	30.0	30.0	3.0
40.44	12.32	1729.9	8.8	0.5	90.2	116.0	6.9	7.1	101.6	30.0	32.0	6.0
40.93	12.48	1378.2	7.2	0.5	91.4	117.5	5.5	5.6	78.0	30.0	32.0	3.0
41.42	12.62	1053.3	2.0	0.2	92.6	118.9	4.2	4.3	56.1	30.0	30.0	3.0
41.91	12.77	1036.6	2.0	0.2	93.9	120.4	4.1	4.2	54.8	30.0	30.0	3.0
42.40	12.93	963.9	2.0	0.2	95.1	121.9	3.9	3.9	49.8	30.0	30.0	3.0
42.90	13.07	1049.0	2.0	0.2	96.3	123.4	4.2	4.2	55.3	30.0	30.0	3.0
43.39	13.23	1045.8	2.0	0.2	97.5	124.8	4.2	4.1	54.9	30.0	30.0	3.0
43.88	13.38	1011.7	2.0	0.2	98.8	126.3	4.0	4.0	52.4	30.0	30.0	3.0
44.37	13.52	948.3	2.0	0.2	100.0	127.8	3.8	3.7	48.0	30.0	30.0	1.5
44.86	13.68	954.2	2.0	0.2	101.2	129.2	3.8	3.7	48.2	30.0	30.0	1.5
45.36	13.82	1186.4	2.0	0.2	102.5	130.7	4.7	4.6	63.5	30.0	30.0	3.0
45.85	13.98	1069.3	2.0	0.2	103.7	132.2	4.3	4.1	55.6	30.0	30.0	3.0
46.34	14.12	1022.5	2.0	0.2	104.9	133.7	4.1	3.9	52.3	30.0	30.0	1.5
46.83	14.27	1220.5	2.0	0.2	106.1	135.1	4.9	4.6	65.3	30.0	30.0	3.0
47.33	14.43	3637.9	35.2	1.0	107.4	136.6	12.1	11.5	0.0	37.3	36.0	1.0
47.82	14.57	4808.2	45.7	1.0	108.7	138.1	16.0	15.0	0.0	45.1	38.0	1.0
48.31	14.73	1459.0	5.3	0.4	110.0	139.5	5.8	5.4	80.6	30.0	30.0	3.0
48.80	14.88	1291.8	2.0	0.2	111.2	141.0	5.2	4.8	69.3	30.0	30.0	3.0
49.29	15.02	1421.0	2.0	0.1	112.4	142.5	5.7	5.2	77.7	30.0	30.0	3.0
49.79	15.18	1491.8	2.0	0.1	113.7	144.0	6.0	5.5	82.3	30.0	30.0	3.0
50.28	15.32	1385.1	2.0	0.1	114.9	145.4	5.5	5.1	75.0	30.0	30.0	3.0
50.77	15.48	1551.3	2.0	0.1	116.1	146.9	6.2	5.6	85.9	30.0	30.0	3.0
51.26	15.62	1475.2	2.0	0.1	117.3	148.4	5.9	5.3	80.6	30.0	30.0	3.0
51.75	15.77	1824.0	3.9	0.2	118.6	149.8	6.1	5.5	0.0	30.0	32.0	1.0
52.25	15.93	2196.1	3.3	0.1	119.9	151.3	7.3	6.5	0.0	30.0	32.0	1.0
52.74	16.08	3864.5	25.3	0.7	121.2	152.8	12.9	11.5	0.0	37.3	36.0	1.0
53.23	16.22	2550.2	20.3	0.8	122.5	154.3	8.5	7.5	0.0	30.0	34.0	1.0
53.72	16.38	1772.3	23.1	1.3	123.8	155.7	7.1	6.2	99.5	30.0	32.0	3.0
54.22	16.53	1383.2	2.9	0.2	125.0	157.2	5.5	4.8	73.4	30.0	30.0	3.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
54.71	16.67	1263.9	2.0	0.2	126.2	158.7	5.1	4.4	65.3	30.0	30.0	3.0
55.20	16.83	1403.7	3.0	0.2	127.5	160.1	5.6	4.9	74.4	30.0	30.0	3.0
55.69	16.97	1749.6	5.1	0.3	128.7	161.6	5.8	5.0	0.0	30.0	30.0	1.0
56.18	17.12	4264.8	9.2	0.2	130.1	163.1	10.7	9.1	0.0	39.1	36.0	1.0
56.68	17.28	1495.9	8.8	0.6	131.4	164.6	6.0	5.1	80.0	30.0	30.0	3.0
57.17	17.42	1566.5	2.0	0.1	132.7	166.0	5.2	4.4	0.0	30.0	30.0	1.0
57.66	17.58	1642.4	2.0	0.1	134.0	167.5	5.5	4.6	0.0	30.0	30.0	1.0
58.15	17.72	1650.8	2.0	0.1	135.3	169.0	5.5	4.6	0.0	30.0	30.0	1.0
58.64	17.88	2023.0	3.7	0.2	136.6	170.4	6.7	5.6	0.0	30.0	32.0	1.0
59.14	18.03	16206.9	47.9	0.3	137.9	171.9	32.4	27.0	0.0	76.5	42.0	1.0
59.63	18.17	9674.3	35.3	0.4	139.4	173.4	19.3	16.0	0.0	61.6	40.0	1.0
60.12	18.33	2440.1	37.8	1.5	140.7	174.9	9.8	8.1	141.6	30.0	32.0	6.0
60.61	18.47	1360.3	2.0	0.1	142.0	176.3	5.4	4.5	69.5	30.0	30.0	1.5
61.10	18.62	1123.4	2.0	0.2	143.2	177.8	4.5	3.7	53.5	30.0	30.0	1.5
61.60	18.78	1670.9	5.0	0.3	144.4	179.3	6.7	5.4	89.8	30.0	30.0	3.0
62.09	18.92	2859.8	23.4	0.8	145.7	180.7	9.5	7.7	0.0	30.0	32.0	1.0
62.58	19.08	2282.7	30.8	1.3	147.0	182.2	9.1	7.4	130.2	30.0	32.0	3.0
63.07	19.22	2471.3	28.3	1.1	148.2	183.7	9.9	7.9	142.6	30.0	32.0	3.0
63.57	19.38	1803.0	17.3	1.0	149.4	185.2	7.2	5.8	97.9	30.0	30.0	3.0
64.06	19.53	2836.4	36.1	1.3	150.6	186.6	11.3	9.0	166.6	30.0	32.0	6.0
64.55	19.67	2467.5	44.5	1.8	151.9	188.1	9.9	7.8	141.8	30.0	32.0	3.0
65.04	19.83	2053.1	32.0	1.6	153.1	189.6	8.2	6.5	114.0	30.0	30.0	3.0
65.53	19.97	1890.8	16.2	0.9	154.3	191.0	7.6	6.0	103.0	30.0	30.0	3.0
66.03	20.12	2572.7	32.0	1.2	155.6	192.5	10.3	8.1	148.3	30.0	32.0	3.0
66.52	20.28	5093.5	65.0	1.3	156.8	194.0	17.0	13.3	0.0	41.5	36.0	1.0
67.01	20.42	6713.0	73.5	1.1	158.2	195.5	16.8	13.1	0.0	49.3	38.0	1.0
67.50	20.58	3442.3	51.0	1.5	159.5	196.9	11.5	8.9	0.0	30.0	34.0	1.0
67.99	20.72	2090.7	36.1	1.7	160.8	198.4	8.4	6.5	115.4	30.0	30.0	3.0
68.49	20.88	2439.9	35.0	1.4	162.0	199.9	9.8	7.5	138.5	30.0	32.0	3.0
68.98	21.03	2983.7	63.7	2.1	163.2	201.4	11.9	9.1	174.6	30.0	32.0	6.0
69.47	21.17	4496.9	75.6	1.7	164.5	202.8	15.0	11.4	0.0	37.2	34.0	1.0
69.96	21.33	3282.8	71.2	2.2	165.8	204.3	13.1	10.0	194.2	30.0	32.0	6.0
70.46	21.47	1812.3	18.4	1.0	167.0	205.8	7.2	5.5	96.0	30.0	30.0	3.0
70.95	21.62	1558.2	3.9	0.2	168.2	207.2	6.2	4.7	78.8	30.0	30.0	1.5
71.44	21.78	2945.1	24.6	0.8	169.5	208.7	9.8	7.4	0.0	30.0	32.0	1.0
71.93	21.92	2013.7	16.4	0.8	170.7	210.2	8.1	6.0	108.9	30.0	30.0	3.0
72.42	22.08	2197.6	18.1	0.8	172.0	211.7	8.8	6.6	120.9	30.0	30.0	3.0
72.92	22.22	1952.0	15.6	0.8	173.2	213.1	7.8	5.8	104.4	30.0	30.0	3.0
73.41	22.38	2589.8	35.5	1.4	174.4	214.6	10.4	7.7	146.7	30.0	32.0	3.0
73.90	22.53	7862.5	45.7	0.6	175.7	216.1	19.7	14.5	0.0	52.3	38.0	1.0
74.39	22.67	2816.5	58.4	2.1	177.0	217.5	11.3	8.3	161.5	30.0	32.0	3.0
74.88	22.83	1935.9	9.4	0.5	178.3	219.0	6.5	4.7	0.0	30.0	30.0	1.0
75.38	22.97	1650.2	5.8	0.4	179.6	220.5	6.6	4.8	83.3	30.0	30.0	1.5
75.87	23.12	1497.5	4.7	0.3	180.8	222.0	6.0	4.4	73.0	30.0	30.0	1.5
76.36	23.28	1469.4	2.6	0.2	182.0	223.4	5.9	4.3	70.9	30.0	30.0	1.5
76.85	23.42	1527.7	5.8	0.4	183.3	224.9	6.1	4.4	74.6	30.0	30.0	1.5
77.34	23.58	1640.7	11.9	0.7	184.5	226.4	6.6	4.7	82.0	30.0	30.0	1.5
77.84	23.72	1786.0	16.8	0.9	185.7	227.8	7.1	5.1	91.5	30.0	30.0	1.5
78.33	23.88	2893.5	20.5	0.7	187.0	229.3	9.6	6.9	0.0	30.0	32.0	1.0
78.82	24.03	3715.1	51.7	1.4	188.3	230.8	12.4	8.8	0.0	30.0	32.0	1.0
79.31	24.17	2233.6	8.3	0.4	189.6	232.3	7.4	5.3	0.0	30.0	30.0	1.0
79.81	24.33	2144.5	6.4	0.3	190.9	233.7	7.1	5.1	0.0	30.0	30.0	1.0
80.30	24.47	2291.1	13.1	0.6	192.2	235.2	7.6	5.4	0.0	30.0	30.0	1.0
80.79	24.62	10564.5	55.5	0.5	193.6	236.7	21.1	14.9	0.0	59.4	40.0	1.0
81.28	24.78	25586.5	94.0	0.4	195.1	238.1	42.6	29.9	0.0	84.6	44.0	1.0
81.77	24.92	29288.1	115.0	0.4	196.6	239.6	48.8	34.1	0.0	88.4	44.0	1.0
82.27	25.08	29371.7	73.1	0.2	198.1	241.1	49.0	34.0	0.0	88.4	44.0	1.0
82.76	25.22	9005.8	157.2	1.7	199.5	242.6	30.0	20.8	0.0	54.4	38.0	1.0
83.25	25.38	2528.1	46.7	1.8	200.8	244.0	10.1	7.0	138.9	30.0	30.0	3.0
83.74	25.53	2532.2	14.6	0.6	202.1	245.5	8.4	5.8	0.0	30.0	30.0	1.0
84.23	25.67	2869.7	57.1	2.0	203.3	247.0	11.5	7.9	161.3	30.0	30.0	3.0
84.73	25.83	3171.2	80.3	2.5	204.6	248.4	12.7	8.7	181.2	30.0	32.0	3.0
85.22	25.97	3062.9	67.1	2.2	205.8	249.9	12.3	8.4	173.8	30.0	32.0	3.0
85.71	26.12	13280.8	79.3	0.6	207.1	251.4	26.6	18.1	0.0	65.0	40.0	1.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
86.20	26.28	23812.9	56.8	0.2	208.6	252.9	39.7	26.9	0.0	81.6	42.0	1.0
86.70	26.42	27429.5	80.9	0.3	210.2	254.3	45.7	30.9	0.0	85.6	44.0	1.0
87.19	26.58	35862.6	103.8	0.3	211.7	255.8	59.8	40.2	0.0	93.1	44.0	1.0
87.68	26.72	37850.8	68.0	0.2	213.2	257.3	63.1	42.3	0.0	94.6	44.0	1.0
88.17	26.88	36254.9	99.4	0.3	214.7	258.7	60.4	40.4	0.0	93.2	44.0	1.0
88.66	27.03	47861.8	119.3	0.2	216.3	260.2	79.8	53.1	0.0	95.0	46.0	1.0
89.16	27.17	44567.4	205.8	0.5	217.8	261.7	74.3	49.3	0.0	95.0	46.0	1.0
89.65	27.33	34257.9	160.8	0.5	219.3	263.2	57.1	37.7	0.0	91.3	44.0	1.0
90.14	27.47	14287.2	322.9	2.3	220.7	264.6	47.6	31.4	0.0	66.2	40.0	1.0
90.63	27.62	10661.5	421.3	4.0	222.0	266.1	53.3	35.0	678.2	0.0	0.0	6.0
91.12	27.78	3805.2	122.2	3.2	223.2	267.6	19.0	12.5	221.0	0.0	0.0	3.0
91.62	27.92	2593.8	39.7	1.5	224.5	269.0	10.4	6.8	140.0	30.0	30.0	3.0
92.11	28.08	2695.7	39.0	1.4	225.7	270.5	10.8	7.0	146.6	30.0	30.0	3.0
92.60	28.22	3065.7	44.6	1.5	226.9	272.0	12.3	8.0	171.1	30.0	30.0	3.0
93.09	28.38	3208.9	47.6	1.5	228.1	273.5	12.8	8.3	180.5	30.0	30.0	3.0
93.58	28.53	3157.8	37.6	1.2	229.4	274.9	10.5	6.8	0.0	30.0	30.0	1.0
94.08	28.67	3182.4	54.4	1.7	230.7	276.4	12.7	8.2	178.4	30.0	30.0	3.0
94.57	28.83	3040.5	48.0	1.6	231.9	277.9	12.2	7.8	168.7	30.0	30.0	3.0
95.06	28.97	2541.7	32.9	1.3	233.1	279.3	10.2	6.5	135.3	30.0	30.0	3.0
95.55	29.12	14356.4	57.6	0.4	234.5	280.8	28.7	18.4	0.0	65.4	40.0	1.0
96.05	29.28	24214.9	33.2	0.1	236.0	282.3	40.4	25.7	0.0	80.3	42.0	1.0
96.54	29.42	19851.8	87.6	0.4	237.5	283.8	39.7	25.2	0.0	74.5	42.0	1.0
97.03	29.58	24516.1	104.2	0.4	238.9	285.2	40.9	25.9	0.0	80.5	42.0	1.0
97.52	29.72	25333.2	37.9	0.1	240.5	286.7	42.2	26.6	0.0	81.3	42.0	1.0
98.01	29.88	23647.4	34.2	0.1	242.0	288.2	39.4	24.8	0.0	79.3	42.0	1.0
98.51	30.03	19836.6	42.4	0.2	243.5	289.6	39.7	24.9	0.0	74.2	42.0	1.0
99.00	30.17	21751.1	76.7	0.4	245.0	291.1	43.5	27.2	0.0	76.7	42.0	1.0
99.49	30.33	28889.8	176.0	0.6	246.4	292.6	57.8	36.0	0.0	84.8	42.0	1.0

ConeTec Inc. - CPT Interpretation
Interpretation Output - Release 1.00.19c
Run No: 00-0518-1635-4278
Job No: 00-300
Client: Kleinfelder
Project: Legacy Parkway Project
Site: SC-19-278
Location: STRUCTURE 19
Cone: 20 TON A 092
CPT Date: 00/14/02
CPT Time: 11:39
CPT File: 300SC278.COR

Water Table (m): 0.50 (ft): 1.6
Averaging Increment (m): 0.15
Su Nkt used: 15.00
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
Used Unit Weights Assigned to Soil Zones

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
0.25	0.08	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0
0.74	0.23	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	1.0
1.23	0.38	0.0	0.0	0.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0	1.0
1.72	0.52	920.5	14.3	1.5	9.9	0.2	4.6	9.2	60.7	0.0	0.0	10.0
2.21	0.68	11065.0	46.8	0.4	11.2	1.7	22.1	44.3	0.0	95.0	50.0	1.0
2.71	0.82	9283.3	226.5	2.4	12.6	3.2	30.9	61.9	0.0	94.8	50.0	1.0
3.20	0.97	3839.7	128.8	3.4	13.9	4.7	19.2	38.4	254.7	0.0	0.0	10.0
3.61	1.10	1861.1	56.8	3.1	14.9	5.9	9.3	18.6	122.7	0.0	0.0	10.0
4.02	1.22	1448.4	32.9	2.3	15.9	7.1	7.2	14.5	95.0	0.0	0.0	10.0
4.51	1.38	1423.7	32.6	2.3	17.1	8.6	7.1	14.2	93.2	0.0	0.0	10.0
5.00	1.53	5623.7	112.2	2.0	18.4	10.1	18.7	37.5	0.0	75.0	46.0	1.0
5.50	1.67	8611.5	157.6	1.8	19.7	11.5	28.7	57.4	0.0	86.3	48.0	1.0
5.99	1.83	6836.1	142.5	2.1	21.0	13.0	22.8	45.6	0.0	78.7	48.0	1.0
6.56	2.00	1541.6	64.9	4.2	22.4	14.7	15.4	30.8	100.3	0.0	0.0	10.0
7.14	2.17	2295.0	56.2	2.4	23.8	16.4	9.2	18.4	150.3	45.6	42.0	10.0
7.63	2.33	1481.5	30.8	2.1	25.0	17.9	7.4	14.5	95.9	0.0	0.0	6.0
8.12	2.47	1569.3	27.5	1.8	26.3	19.4	6.3	12.0	101.6	33.3	40.0	6.0
8.61	2.62	2643.7	19.2	0.7	27.5	20.8	8.8	16.4	0.0	47.6	42.0	1.0
9.10	2.78	2233.5	11.0	0.5	28.8	22.3	7.4	13.6	0.0	42.1	40.0	1.0
9.60	2.92	644.7	11.3	1.8	30.1	23.8	3.2	5.7	39.4	0.0	0.0	6.0
10.09	3.08	685.7	20.5	3.0	31.3	25.3	6.9	12.0	41.9	0.0	0.0	6.0
10.58	3.22	1073.3	33.4	3.1	32.5	26.7	7.2	12.3	67.6	0.0	0.0	6.0
11.07	3.38	1027.9	39.7	3.9	33.7	28.2	10.3	17.3	64.4	0.0	0.0	6.0
11.56	3.53	1121.9	40.0	3.6	34.8	29.7	11.2	18.6	70.5	0.0	0.0	6.0
12.06	3.67	1085.7	44.4	4.1	36.0	31.1	10.9	17.7	67.9	0.0	0.0	6.0
12.55	3.83	1124.2	43.7	3.9	37.1	32.6	11.2	18.1	70.3	0.0	0.0	6.0
13.04	3.98	1777.9	53.7	3.0	38.3	34.1	8.9	14.1	113.7	0.0	0.0	6.0
13.53	4.12	2563.3	54.2	2.1	39.6	35.6	10.3	16.0	165.9	41.5	40.0	10.0
14.03	4.27	1900.5	68.4	3.6	40.8	37.0	12.7	19.4	121.5	0.0	0.0	6.0
14.52	4.43	3259.0	81.7	2.5	42.0	38.5	13.0	19.7	211.9	47.6	40.0	10.0
15.01	4.57	3644.6	83.6	2.3	43.2	40.0	14.6	21.7	237.4	50.4	42.0	10.0
15.50	4.73	4425.6	90.7	2.0	44.5	41.4	17.7	26.0	289.3	55.5	42.0	10.0
15.99	4.88	1311.2	40.7	3.1	45.7	42.9	8.7	12.7	81.5	0.0	0.0	6.0
16.49	5.02	2372.0	43.4	1.8	46.9	44.4	9.5	13.6	152.0	36.9	38.0	6.0
16.98	5.18	1949.2	48.4	2.5	48.2	45.9	9.7	13.7	123.7	0.0	0.0	6.0
17.47	5.32	1665.4	53.9	3.2	49.4	47.3	8.3	11.6	104.6	0.0	0.0	6.0
17.96	5.48	4872.5	53.6	1.1	50.7	48.8	16.2	22.3	0.0	56.4	42.0	1.0
18.45	5.62	4496.6	57.6	1.3	52.0	50.3	15.0	20.4	0.0	53.7	42.0	1.0
18.95	5.77	1802.7	40.8	2.3	53.2	51.7	9.0	12.1	113.2	0.0	0.0	6.0
19.44	5.93	755.8	15.2	2.0	54.5	53.2	3.8	5.0	43.2	0.0	0.0	3.0
19.93	6.07	710.0	12.6	1.8	55.7	54.7	3.5	4.7	40.0	0.0	0.0	3.0
20.42	6.23	1855.4	38.5	2.1	56.9	56.2	7.4	9.6	116.2	30.0	36.0	6.0
20.92	6.38	1504.6	36.4	2.4	58.1	57.6	7.5	9.7	92.6	0.0	0.0	6.0
21.41	6.52	1223.9	32.2	2.6	59.4	59.1	6.1	7.8	73.7	0.0	0.0	6.0
21.90	6.68	1202.1	28.4	2.4	60.6	60.6	6.0	7.6	72.1	0.0	0.0	6.0
22.39	6.82	1352.8	30.4	2.2	61.8	62.0	6.8	8.4	81.9	0.0	0.0	6.0
22.88	6.98	1036.8	26.8	2.6	63.1	63.5	5.2	6.4	60.7	0.0	0.0	3.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
23.38	7.12	993.3	26.5	2.7	64.3	65.0	5.0	6.1	57.6	0.0	0.0	3.0
23.87	7.27	1134.5	28.8	2.5	65.5	66.5	5.7	6.9	66.8	0.0	0.0	6.0
24.36	7.43	1216.3	34.7	2.9	66.7	67.9	6.1	7.3	72.1	0.0	0.0	6.0
24.85	7.57	4299.7	39.4	0.9	68.0	69.4	14.3	17.0	0.0	48.6	40.0	1.0
25.34	7.73	1851.7	50.9	2.8	69.3	70.9	9.3	10.9	114.1	0.0	0.0	6.0
25.84	7.88	859.4	8.5	1.0	70.5	72.3	4.3	5.0	47.8	0.0	0.0	3.0
26.33	8.02	766.7	6.7	0.9	71.7	73.8	3.8	4.4	41.4	0.0	0.0	3.0
26.82	8.18	689.1	7.2	1.0	73.0	75.3	3.4	3.9	36.1	0.0	0.0	1.5
27.31	8.32	716.3	12.6	1.8	74.2	76.8	3.6	4.1	37.7	0.0	0.0	3.0
27.80	8.48	681.1	15.7	2.3	75.4	78.2	4.5	5.1	35.2	0.0	0.0	1.5
28.30	8.62	622.6	7.8	1.3	76.6	79.7	3.1	3.5	31.1	0.0	0.0	1.5
28.79	8.77	711.1	9.0	1.3	77.9	81.2	3.6	3.9	36.8	0.0	0.0	1.5
29.28	8.93	2795.7	35.5	1.3	79.1	82.6	11.2	12.3	175.6	34.1	36.0	6.0
29.77	9.07	10445.0	122.7	1.2	80.4	84.1	26.1	28.5	0.0	71.6	44.0	1.0
30.27	9.23	11244.7	131.3	1.2	81.8	85.6	28.1	30.4	0.0	73.5	44.0	1.0
30.76	9.38	10717.1	121.8	1.1	83.2	87.1	26.8	28.8	0.0	71.9	44.0	1.0
31.17	9.50	9308.1	102.8	1.1	84.3	88.3	23.3	24.8	0.0	67.7	42.0	1.0
31.58	9.62	5508.3	103.4	1.9	85.4	89.5	18.4	19.4	0.0	52.4	40.0	1.0
32.07	9.77	1506.8	46.4	3.1	86.7	91.0	7.5	7.9	88.6	0.0	0.0	6.0
32.56	9.93	938.2	13.6	1.4	87.9	92.5	4.7	4.9	50.5	0.0	0.0	3.0
33.05	10.07	873.9	11.7	1.3	89.1	93.9	4.4	4.5	46.1	0.0	0.0	3.0
33.55	10.23	916.4	9.8	1.1	90.4	95.4	4.6	4.7	48.7	0.0	0.0	3.0
34.04	10.38	804.7	9.4	1.2	91.6	96.9	4.0	4.1	41.1	0.0	0.0	1.5
34.53	10.52	802.0	8.3	1.0	92.8	98.3	4.0	4.1	40.7	0.0	0.0	1.5
35.02	10.68	930.5	19.3	2.1	94.1	99.8	4.7	4.7	49.1	0.0	0.0	3.0
35.51	10.82	809.0	15.8	1.9	95.3	101.3	4.0	4.1	40.8	0.0	0.0	1.5
36.01	10.98	748.3	10.5	1.4	96.5	102.8	3.7	3.7	36.6	0.0	0.0	1.5
36.50	11.12	1641.4	18.4	1.1	97.7	104.2	6.6	6.5	96.0	30.0	32.0	3.0
36.99	11.27	1306.9	20.5	1.6	99.0	105.7	5.2	5.1	73.5	30.0	30.0	3.0
37.48	11.43	976.3	12.2	1.3	100.2	107.2	4.9	4.8	51.3	0.0	0.0	3.0
37.98	11.57	929.8	11.3	1.2	101.4	108.6	4.6	4.5	48.0	0.0	0.0	1.5
38.47	11.73	1002.7	12.3	1.2	102.7	110.1	5.0	4.8	52.7	0.0	0.0	3.0
38.96	11.88	1071.8	12.9	1.2	103.9	111.6	5.4	5.1	57.1	0.0	0.0	3.0
39.45	12.02	993.0	11.8	1.2	105.1	113.1	5.0	4.7	51.7	0.0	0.0	1.5
39.94	12.18	984.7	11.8	1.2	106.3	114.5	4.9	4.7	50.9	0.0	0.0	1.5
40.44	12.32	1206.1	16.0	1.3	107.6	116.0	4.8	4.6	65.5	30.0	30.0	3.0
40.93	12.48	1157.4	16.1	1.4	108.8	117.5	5.8	5.4	62.1	0.0	0.0	3.0
41.42	12.62	1006.0	11.5	1.1	110.0	118.9	5.0	4.7	51.8	0.0	0.0	1.5
41.91	12.77	956.8	10.5	1.1	111.3	120.4	4.8	4.4	48.3	0.0	0.0	1.5
42.40	12.93	877.5	10.2	1.2	112.5	121.9	4.4	4.0	42.9	0.0	0.0	1.5
42.90	13.07	883.4	9.3	1.1	113.7	123.4	4.4	4.1	43.1	0.0	0.0	1.5
43.39	13.23	833.4	9.3	1.1	114.9	124.8	4.2	3.8	39.6	0.0	0.0	1.5
43.88	13.38	1041.8	10.1	1.0	116.2	126.3	4.2	3.8	53.3	30.0	30.0	1.5
44.37	13.52	1031.7	12.7	1.2	117.4	127.8	5.2	4.7	52.4	0.0	0.0	1.5
44.86	13.68	1015.3	11.5	1.1	118.6	129.2	5.1	4.6	51.2	0.0	0.0	1.5
45.36	13.82	993.6	12.2	1.2	119.9	130.7	5.0	4.4	49.5	0.0	0.0	1.5
45.85	13.98	968.2	10.7	1.1	121.1	132.2	4.8	4.3	47.7	0.0	0.0	1.5
46.34	14.12	926.1	10.8	1.2	122.3	133.7	4.6	4.1	44.7	0.0	0.0	1.5
46.83	14.27	914.7	13.9	1.5	123.5	135.1	4.6	4.0	43.7	0.0	0.0	1.5
47.33	14.43	2111.3	33.5	1.6	124.8	136.6	8.4	7.4	123.3	30.0	32.0	3.0
47.82	14.57	1601.2	44.6	2.8	126.0	138.1	8.0	7.0	89.1	0.0	0.0	3.0
48.31	14.73	1595.7	27.8	1.7	127.2	139.5	6.4	5.5	88.6	30.0	30.0	3.0
48.80	14.88	1368.5	23.1	1.7	128.5	141.0	6.8	5.9	73.3	0.0	0.0	3.0
49.29	15.02	1356.1	19.4	1.4	129.7	142.5	5.4	4.7	72.3	30.0	30.0	3.0
49.79	15.18	1203.0	15.9	1.3	130.9	144.0	4.8	4.1	61.9	30.0	30.0	1.5
50.28	15.32	1262.4	17.6	1.4	132.1	145.4	5.0	4.3	65.7	30.0	30.0	1.5
50.77	15.48	1327.6	21.0	1.6	133.4	146.9	5.3	4.5	69.8	30.0	30.0	3.0
51.26	15.62	1170.4	13.8	1.2	134.6	148.4	4.7	3.9	59.2	30.0	30.0	1.5
51.75	15.77	1131.0	11.9	1.1	135.8	149.8	4.5	3.8	56.4	30.0	30.0	1.5
52.25	15.93	1019.7	13.1	1.3	137.1	151.3	5.1	4.3	48.8	0.0	0.0	1.5
52.74	16.08	1721.0	22.8	1.3	138.3	152.8	6.9	5.7	95.3	30.0	30.0	3.0
53.23	16.22	1084.8	15.7	1.4	139.5	154.3	5.4	4.5	52.7	0.0	0.0	1.5
53.72	16.38	1002.3	13.7	1.4	140.7	155.7	5.0	4.1	47.1	0.0	0.0	1.5
54.22	16.53	1018.4	13.7	1.3	142.0	157.2	5.1	4.2	47.9	0.0	0.0	1.5

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
54.71	16.67	981.0	11.5	1.2	143.2	158.7	4.9	4.0	45.3	0.0	0.0	1.5
55.20	16.83	1086.0	11.7	1.1	144.4	160.1	4.3	3.5	52.1	30.0	30.0	1.5
55.69	16.97	1108.2	10.9	1.0	145.7	161.6	4.4	3.6	53.4	30.0	30.0	1.5
56.18	17.12	1030.4	11.8	1.1	146.9	163.1	5.2	4.2	48.0	0.0	0.0	1.5
56.68	17.28	1077.0	12.1	1.1	148.1	164.6	4.3	3.5	51.0	30.0	30.0	1.5
57.17	17.42	1076.2	11.6	1.1	149.3	166.0	4.3	3.4	50.7	30.0	30.0	1.5
57.66	17.58	1185.0	14.0	1.2	150.6	167.5	4.7	3.8	57.8	30.0	30.0	1.5
58.15	17.72	1436.1	17.4	1.2	151.8	169.0	5.7	4.6	74.4	30.0	30.0	1.5
58.64	17.88	1584.6	14.8	0.9	153.0	170.4	6.3	5.0	84.1	30.0	30.0	3.0
59.14	18.03	1284.9	16.9	1.3	154.3	171.9	5.1	4.0	63.9	30.0	30.0	1.5
59.63	18.17	988.6	15.2	1.5	155.5	173.4	4.9	3.9	44.0	0.0	0.0	1.5
60.12	18.33	1150.8	17.4	1.5	156.7	174.9	5.8	4.5	54.6	0.0	0.0	1.5
60.61	18.47	1571.4	30.9	2.0	157.9	176.3	7.9	6.1	82.5	0.0	0.0	3.0
61.10	18.62	2273.0	44.8	2.0	159.2	177.8	9.1	7.1	129.1	30.0	30.0	3.0
61.60	18.78	7757.7	62.2	0.8	160.5	179.3	19.4	15.0	0.0	53.2	38.0	1.0
62.09	18.92	4230.7	104.1	2.5	161.8	180.7	16.9	13.0	259.2	35.7	34.0	6.0
62.58	19.08	14873.0	92.2	0.6	163.1	182.2	29.7	22.8	0.0	71.6	42.0	1.0
63.07	19.22	23671.4	128.9	0.5	164.6	183.7	47.3	36.1	0.0	84.8	44.0	1.0
63.57	19.38	28674.0	140.0	0.5	166.1	185.2	47.8	36.3	0.0	90.2	44.0	1.0
64.06	19.53	19400.7	176.1	0.9	167.6	186.6	38.8	29.3	0.0	78.9	42.0	1.0
64.55	19.67	4685.3	134.9	2.9	168.9	188.1	18.7	14.1	288.6	38.0	36.0	6.0
65.04	19.83	6662.6	115.6	1.7	170.2	189.6	22.2	16.7	0.0	48.0	38.0	1.0
65.53	19.97	20089.5	89.1	0.4	171.5	191.0	40.2	30.0	0.0	79.5	42.0	1.0
66.03	20.12	20534.0	103.9	0.5	173.0	192.5	41.1	30.6	0.0	80.0	42.0	1.0
66.52	20.28	15710.8	91.3	0.6	174.4	194.0	31.4	23.3	0.0	72.2	42.0	1.0
67.01	20.42	12073.0	81.8	0.7	175.9	195.5	24.1	17.8	0.0	64.6	40.0	1.0
67.50	20.58	9197.8	58.2	0.6	177.3	196.9	23.0	16.9	0.0	56.7	38.0	1.0
67.99	20.72	3528.6	76.0	2.2	178.6	198.4	14.1	10.3	210.1	30.0	32.0	6.0
68.49	20.88	2836.1	66.8	2.4	179.8	199.9	11.3	8.3	163.8	30.0	32.0	3.0
68.98	21.03	2890.7	65.2	2.3	181.1	201.4	11.6	8.4	167.2	30.0	32.0	3.0
69.47	21.17	2965.4	50.9	1.7	182.3	202.8	11.9	8.6	172.0	30.0	32.0	3.0
69.96	21.33	4198.8	78.6	1.9	183.6	204.3	14.0	10.1	0.0	33.7	34.0	1.0
70.46	21.47	3100.8	84.3	2.7	184.8	205.8	12.4	8.9	180.7	30.0	32.0	3.0
70.95	21.62	11321.7	78.8	0.7	186.2	207.2	22.6	16.2	0.0	61.9	40.0	1.0
71.44	21.78	13947.8	92.1	0.7	187.6	208.7	27.9	19.9	0.0	67.8	40.0	1.0
71.93	21.92	8351.6	74.6	0.9	189.0	210.2	20.9	14.9	0.0	53.0	38.0	1.0
72.42	22.08	2931.3	65.1	2.2	190.3	211.7	11.7	8.3	168.6	30.0	32.0	3.0
72.92	22.22	10379.1	67.4	0.6	191.7	213.1	25.9	18.3	0.0	59.0	40.0	1.0
73.41	22.38	4874.7	118.5	2.4	193.0	214.6	19.5	13.7	297.8	37.3	34.0	6.0
73.90	22.53	2217.1	67.6	3.0	194.2	216.1	11.1	7.8	120.5	0.0	0.0	3.0
74.39	22.67	3641.9	71.2	2.0	195.4	217.5	14.6	10.2	215.3	30.0	32.0	6.0
74.88	22.83	1865.0	50.8	2.7	196.6	219.0	9.3	6.5	96.6	0.0	0.0	1.5
75.38	22.97	3012.5	112.1	3.7	197.9	220.5	15.1	10.5	172.9	0.0	0.0	3.0
75.87	23.12	5209.1	191.9	3.7	199.1	222.0	26.0	18.1	319.2	0.0	0.0	6.0
76.36	23.28	4828.9	127.5	2.6	200.3	223.4	19.3	13.4	293.7	36.5	34.0	6.0
76.85	23.42	3700.5	81.5	2.2	201.6	224.9	14.8	10.2	218.3	30.0	32.0	6.0
77.34	23.58	1610.5	36.5	2.3	202.8	226.4	8.1	5.5	78.8	0.0	0.0	1.5
77.84	23.72	1720.6	40.4	2.4	204.0	227.8	8.6	5.9	85.9	0.0	0.0	1.5
78.33	23.88	5476.9	188.5	3.4	205.2	229.3	27.4	18.7	336.2	0.0	0.0	6.0
78.82	24.03	3279.6	136.9	4.2	206.5	230.8	21.9	14.9	189.5	0.0	0.0	3.0
79.31	24.17	1403.9	31.8	2.3	207.7	232.3	7.0	4.8	64.3	0.0	0.0	1.5
79.81	24.33	1389.6	23.7	1.7	208.9	233.7	6.9	4.7	63.1	0.0	0.0	1.5
80.30	24.47	1604.7	24.7	1.5	210.2	235.2	6.4	4.3	77.3	30.0	30.0	1.5
80.79	24.62	1908.9	49.1	2.6	211.4	236.7	9.5	6.4	97.4	0.0	0.0	1.5
81.28	24.78	2019.7	43.8	2.2	212.6	238.1	8.1	5.4	104.6	30.0	30.0	1.5
81.77	24.92	1727.9	37.0	2.1	213.8	239.6	8.6	5.8	85.0	0.0	0.0	1.5
82.27	25.08	1527.2	36.9	2.4	215.1	241.1	7.6	5.1	71.4	0.0	0.0	1.5
82.76	25.22	1692.2	40.1	2.4	216.3	242.6	8.5	5.6	82.2	0.0	0.0	1.5
83.25	25.38	1847.2	43.3	2.3	217.5	244.0	9.2	6.1	92.4	0.0	0.0	1.5
83.74	25.53	2152.9	52.4	2.4	218.8	245.5	8.6	5.7	112.6	30.0	30.0	3.0
84.23	25.67	2674.0	69.6	2.6	220.0	247.0	10.7	7.1	147.1	30.0	30.0	3.0
84.73	25.83	2371.3	62.4	2.6	221.2	248.4	11.9	7.8	126.8	0.0	0.0	3.0
85.22	25.97	6462.0	66.8	1.0	222.5	249.9	16.2	10.6	0.0	43.3	36.0	1.0
85.71	26.12	7631.6	89.5	1.2	223.9	251.4	19.1	12.5	0.0	48.0	36.0	1.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
86.20	26.28	4158.6	133.1	3.2	225.2	252.9	20.8	13.6	245.4	0.0	0.0	6.0
86.70	26.42	4349.9	125.6	2.9	226.4	254.3	17.4	11.3	257.9	31.7	32.0	6.0
87.19	26.58	6206.9	124.2	2.0	227.7	255.8	20.7	13.4	0.0	41.8	34.0	1.0
87.68	26.72	10221.1	91.3	0.9	229.0	257.3	25.6	16.5	0.0	56.0	38.0	1.0
88.17	26.88	3234.5	70.6	2.2	230.3	258.7	12.9	8.3	183.0	30.0	30.0	3.0
88.66	27.03	2003.8	35.9	1.8	231.6	260.2	8.0	5.2	100.8	30.0	30.0	1.5
89.16	27.17	2054.8	33.6	1.6	232.8	261.7	8.2	5.3	104.0	30.0	30.0	1.5
89.65	27.33	1955.9	33.8	1.7	234.0	263.2	7.8	5.0	97.3	30.0	30.0	1.5
90.14	27.47	1872.6	39.4	2.1	235.2	264.6	7.5	4.8	91.5	30.0	30.0	1.5
90.63	27.62	2539.8	80.2	3.2	236.5	266.1	12.7	8.1	135.8	0.0	0.0	3.0
91.12	27.78	5428.4	155.8	2.9	237.7	267.6	21.7	13.8	328.2	37.4	34.0	6.0
91.62	27.92	6687.4	124.0	1.9	239.0	269.0	22.3	14.1	0.0	43.3	36.0	1.0
92.11	28.08	5805.5	173.6	3.0	240.2	270.5	23.2	14.7	353.0	39.1	34.0	6.0
92.60	28.22	5357.7	106.1	2.0	241.5	272.0	17.9	11.2	0.0	36.8	34.0	1.0
93.09	28.38	5910.7	111.0	1.9	242.8	273.5	19.7	12.4	0.0	39.5	34.0	1.0
93.58	28.53	10334.4	190.3	1.8	244.1	274.9	34.4	21.6	0.0	55.4	38.0	1.0
94.08	28.67	9769.9	278.5	2.9	245.4	276.4	39.1	24.4	616.5	53.7	38.0	6.0
94.57	28.83	3690.7	112.8	3.1	246.6	277.9	18.5	11.5	211.1	0.0	0.0	3.0
95.06	28.97	3208.4	122.6	3.8	247.8	279.3	16.0	10.0	178.8	0.0	0.0	3.0
95.55	29.12	17302.2	159.6	0.9	249.2	280.8	34.6	21.5	0.0	69.9	40.0	1.0
96.05	29.28	9286.0	198.2	2.1	250.6	282.3	31.0	19.1	0.0	52.0	38.0	1.0
96.54	29.42	3066.3	68.0	2.2	251.8	283.8	12.3	7.6	168.7	30.0	30.0	3.0
97.03	29.58	5532.0	113.5	2.1	253.1	285.2	18.4	11.3	0.0	37.0	34.0	1.0
97.52	29.72	3961.6	100.7	2.5	254.4	286.7	15.8	9.7	228.0	30.0	32.0	3.0
98.01	29.88	7283.5	121.8	1.7	255.6	288.2	24.3	14.9	0.0	44.7	36.0	1.0
98.51	30.03	32616.4	167.4	0.5	257.0	289.6	54.4	33.2	0.0	87.6	44.0	1.0
99.00	30.17	42065.7	257.9	0.6	258.6	291.1	70.1	42.7	0.0	94.8	44.0	1.0
99.49	30.33	44641.6	266.1	0.6	260.1	292.6	74.4	45.2	0.0	95.0	44.0	1.0
99.98	30.47	29005.9	344.0	1.2	261.6	294.1	58.0	35.1	0.0	84.0	42.0	1.0
100.47	30.62	5822.5	209.8	3.6	262.9	295.5	29.1	17.6	350.9	0.0	0.0	6.0
100.97	30.78	4144.3	57.1	1.4	264.2	297.0	13.8	8.3	0.0	30.0	32.0	1.0
101.46	30.92	3787.4	45.9	1.2	265.5	298.5	12.6	7.6	0.0	30.0	30.0	1.0
101.95	31.08	3135.3	31.2	1.0	266.8	299.9	10.5	6.3	0.0	30.0	30.0	1.0
102.44	31.22	3538.0	37.0	1.0	268.1	301.4	11.8	7.0	0.0	30.0	30.0	1.0
102.94	31.38	3945.0	124.7	3.2	269.4	302.9	19.7	11.8	224.9	0.0	0.0	3.0
103.43	31.53	17822.0	185.4	1.0	270.7	304.4	35.6	21.2	0.0	69.6	40.0	1.0
103.92	31.67	24891.5	111.2	0.4	272.2	305.8	41.5	24.6	0.0	79.1	42.0	1.0
104.41	31.83	22417.0	113.2	0.5	273.7	307.3	44.8	26.5	0.0	76.0	42.0	1.0
104.90	31.97	18844.3	147.7	0.8	275.1	308.8	37.7	22.2	0.0	70.9	40.0	1.0
105.40	32.12	15636.0	170.3	1.1	276.6	310.2	39.1	23.0	0.0	65.5	40.0	1.0
105.89	32.28	15332.8	212.3	1.4	277.9	311.7	38.3	22.5	0.0	64.9	40.0	1.0
106.38	32.42	20373.2	146.8	0.7	279.4	313.2	40.7	23.9	0.0	73.0	40.0	1.0
106.87	32.58	19936.2	145.9	0.7	280.8	314.7	39.9	23.3	0.0	72.3	40.0	1.0
107.36	32.72	23022.0	273.7	1.2	282.3	316.1	46.0	26.8	0.0	76.3	42.0	1.0
107.86	32.88	10660.0	298.2	2.8	283.6	317.6	42.6	24.8	670.6	54.2	38.0	6.0
108.35	33.03	2243.6	52.4	2.3	284.8	319.1	9.0	5.2	109.3	30.0	30.0	1.5
108.84	33.17	2304.3	44.7	1.9	286.1	320.5	9.2	5.3	113.2	30.0	30.0	1.5
109.33	33.33	3136.3	76.6	2.4	287.3	322.0	12.5	7.2	168.5	30.0	30.0	3.0
109.82	33.47	5355.7	155.6	2.9	288.5	323.5	21.4	12.3	316.2	34.2	32.0	6.0
110.32	33.62	9676.4	280.3	2.9	289.7	325.0	38.7	22.3	604.1	51.1	36.0	6.0
110.81	33.78	9426.4	418.5	4.4	291.2	326.4	94.3	54.1	0.0	50.3	36.0	1.0
111.30	33.92	13387.2	221.6	1.7	292.6	327.9	33.5	19.1	0.0	60.2	38.0	1.0
111.79	34.08	9236.8	317.7	3.4	294.0	329.4	36.9	21.1	574.2	49.5	36.0	6.0
112.29	34.22	11176.4	157.6	1.4	295.3	330.8	27.9	15.9	0.0	54.9	38.0	1.0
112.78	34.38	5316.8	176.9	3.3	296.6	332.3	26.6	15.1	312.5	0.0	0.0	6.0
113.27	34.53	7888.0	213.4	2.7	297.8	333.8	31.6	17.9	483.8	44.8	34.0	6.0
113.76	34.67	11932.7	191.6	1.6	299.1	335.3	29.8	16.9	0.0	56.6	38.0	1.0
114.25	34.83	5623.4	263.0	4.7	300.4	336.7	37.5	21.2	332.4	0.0	0.0	6.0
114.75	34.97	5622.6	259.7	4.6	301.6	338.2	37.5	21.1	332.2	0.0	0.0	6.0
115.24	35.12	9284.5	293.1	3.2	302.9	339.7	37.1	20.9	576.1	49.3	36.0	6.0
115.73	35.28	6053.9	196.0	3.2	304.1	341.1	24.2	13.6	360.6	37.0	32.0	6.0
116.22	35.42	6669.3	153.1	2.3	305.3	342.6	26.7	14.9	401.4	39.7	34.0	6.0
116.71	35.58	6412.1	230.9	3.6	306.5	344.1	32.1	17.9	384.1	0.0	0.0	6.0
117.21	35.72	6230.5	239.7	3.8	307.8	345.6	31.2	17.4	371.8	0.0	0.0	6.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
117.70	35.88	9133.3	398.0	4.4	309.2	347.0	91.3	50.8	0.0	48.5	36.0	1.0
118.19	36.03	18002.5	358.6	2.0	310.6	348.5	60.0	33.3	0.0	67.9	40.0	1.0
118.68	36.17	19070.8	254.5	1.3	312.0	350.0	47.7	26.4	0.0	69.5	40.0	1.0
119.18	36.33	11571.6	254.0	2.2	313.3	351.4	38.6	21.3	0.0	55.1	38.0	1.0
119.67	36.47	7407.0	244.0	3.3	314.6	352.9	29.6	16.3	449.3	42.2	34.0	6.0
120.16	36.62	5409.7	186.7	3.5	315.8	354.4	27.0	14.9	316.0	0.0	0.0	6.0
120.65	36.78	3080.4	92.6	3.0	317.0	355.9	15.4	8.5	160.5	0.0	0.0	3.0
121.14	36.92	5389.6	210.9	3.9	318.3	357.3	26.9	14.8	314.3	0.0	0.0	3.0
121.64	37.08	5393.0	320.0	5.9	319.7	358.8	53.9	29.5	0.0	32.9	32.0	1.0
122.21	37.25	5830.4	158.8	2.7	321.3	360.5	23.3	12.7	343.2	35.1	32.0	6.0
122.78	37.42	3705.2	138.6	3.7	322.7	362.2	18.5	10.1	201.4	0.0	0.0	3.0
123.28	37.58	5111.0	128.6	2.5	324.0	363.7	20.4	11.1	294.9	31.2	32.0	3.0
123.77	37.72	4142.1	187.4	4.5	325.2	365.2	27.6	15.0	230.1	0.0	0.0	3.0
124.26	37.88	10438.9	156.0	1.5	326.5	366.6	26.1	14.1	0.0	51.5	36.0	1.0
124.75	38.03	4963.2	210.8	4.2	327.8	368.1	24.8	13.4	284.5	0.0	0.0	3.0
125.24	38.17	7107.1	452.0	6.4	329.2	369.6	71.1	38.3	0.0	40.4	34.0	1.0
125.74	38.33	5741.9	308.1	5.4	330.8	371.1	57.4	30.9	0.0	34.2	32.0	1.0
126.23	38.47	7504.8	384.9	5.1	332.4	372.5	75.0	40.3	0.0	41.8	34.0	1.0
126.72	38.62	24291.7	313.4	1.3	333.9	374.0	60.7	32.5	0.0	75.4	40.0	1.0
127.21	38.78	17942.9	531.5	3.0	335.3	375.5	59.8	32.0	0.0	66.7	38.0	1.0
127.71	38.92	31279.9	303.3	1.0	336.6	376.9	62.6	33.4	0.0	82.6	42.0	1.0
128.20	39.08	21519.4	329.0	1.5	338.1	378.4	53.8	28.6	0.0	71.8	40.0	1.0
128.69	39.22	5461.4	306.0	5.6	339.5	379.9	54.6	29.0	0.0	32.4	32.0	1.0
129.18	39.38	11520.4	243.5	2.1	341.0	381.4	38.4	20.4	0.0	53.8	36.0	1.0
129.67	39.53	8468.9	267.9	3.2	342.3	382.8	33.9	17.9	516.3	44.9	34.0	6.0
130.17	39.67	18184.8	284.4	1.6	343.6	384.3	45.5	24.0	0.0	66.7	38.0	1.0
130.66	39.83	34107.2	247.4	0.7	345.0	385.8	68.2	35.9	0.0	84.7	42.0	1.0
131.15	39.97	27252.0	157.1	0.6	346.4	387.2	54.5	28.7	0.0	78.2	40.0	1.0
131.64	40.12	11478.1	344.3	3.0	347.8	388.7	45.9	24.1	716.1	53.4	36.0	6.0
132.13	40.28	5124.5	199.6	3.9	349.0	390.2	25.6	13.4	292.4	0.0	0.0	3.0
132.63	40.42	3745.4	109.1	2.9	350.2	391.7	15.0	7.8	200.2	30.0	30.0	3.0
133.12	40.58	3578.1	104.8	2.9	351.5	393.1	17.9	9.3	188.9	0.0	0.0	3.0
133.61	40.72	5822.5	199.2	3.4	352.7	394.6	29.1	15.2	338.3	0.0	0.0	3.0
134.10	40.88	5083.4	158.2	3.1	353.9	396.1	20.3	10.6	288.9	30.0	32.0	3.0
134.59	41.03	2900.8	67.6	2.3	355.1	397.6	11.6	6.0	143.2	30.0	30.0	1.5
135.09	41.17	4420.6	86.6	2.0	356.4	399.0	17.7	9.2	244.3	30.0	30.0	3.0
135.58	41.33	4346.1	77.4	1.8	357.6	400.5	14.5	7.5	0.0	30.0	30.0	1.0
136.07	41.47	6602.4	143.2	2.2	358.9	402.0	22.0	11.4	0.0	37.1	32.0	1.0
136.56	41.62	22131.6	341.2	1.5	360.3	403.4	55.3	28.5	0.0	71.7	40.0	1.0
137.06	41.78	9830.6	534.5	5.4	361.8	404.9	98.3	50.6	0.0	48.4	34.0	1.0
137.55	41.92	16048.3	500.1	3.1	363.2	406.4	64.2	33.0	1018.6	62.3	38.0	6.0
138.04	42.08	13864.0	231.3	1.7	364.5	407.9	34.7	17.8	0.0	58.1	38.0	1.0
138.53	42.22	7569.6	307.6	4.1	365.8	409.3	37.8	19.4	453.0	0.0	0.0	6.0
139.02	42.38	8782.4	305.4	3.5	367.0	410.8	35.1	17.9	533.6	44.9	34.0	6.0
139.52	42.53	17206.7	406.8	2.4	368.3	412.3	57.4	29.3	0.0	64.1	38.0	1.0
140.01	42.67	26109.3	435.9	1.7	369.6	413.7	65.3	33.2	0.0	76.0	40.0	1.0
140.50	42.83	27529.5	500.1	1.8	371.0	415.2	68.8	35.0	0.0	77.5	40.0	1.0
140.99	42.97	17894.8	446.4	2.5	372.4	416.7	59.6	30.3	0.0	65.1	38.0	1.0
141.48	43.12	6227.2	212.2	3.4	373.6	418.2	31.1	15.8	362.4	0.0	0.0	3.0
141.98	43.28	5490.7	198.5	3.6	374.9	419.6	27.5	13.9	313.1	0.0	0.0	3.0
142.47	43.42	6876.5	378.9	5.5	376.3	421.1	68.8	34.7	0.0	37.6	32.0	1.0
142.96	43.58	7458.3	312.2	4.2	377.7	422.6	37.3	18.8	443.9	0.0	0.0	6.0
143.45	43.72	14236.4	299.6	2.1	378.9	424.0	47.5	23.9	0.0	58.3	38.0	1.0
143.95	43.88	10246.2	454.9	4.4	380.4	425.5	102.5	51.4	0.0	48.8	34.0	1.0
144.44	44.03	10699.5	351.0	3.3	381.8	427.0	42.8	21.4	659.4	50.0	36.0	6.0
144.93	44.17	6010.1	192.0	3.2	383.0	428.5	24.0	12.0	346.6	33.4	32.0	3.0
145.42	44.33	4206.4	155.2	3.7	384.3	429.9	21.0	10.5	226.1	0.0	0.0	3.0
145.91	44.47	7188.1	294.6	4.1	385.5	431.4	35.9	18.0	424.7	0.0	0.0	6.0
146.41	44.62	9965.9	355.7	3.6	386.7	432.9	39.9	19.9	609.8	47.8	34.0	6.0
146.90	44.78	9412.9	433.5	4.6	388.1	434.3	94.1	47.1	0.0	46.1	34.0	1.0
147.39	44.92	13700.7	409.2	3.0	389.6	435.8	54.8	27.4	858.4	56.8	36.0	6.0
147.88	45.08	13114.0	319.3	2.4	390.8	437.3	43.7	21.9	0.0	55.5	36.0	1.0
148.37	45.22	3816.9	106.3	2.8	392.1	438.8	15.3	7.6	199.1	30.0	30.0	3.0
148.87	45.38	3204.8	136.3	4.3	393.3	440.2	21.4	10.7	158.1	0.0	0.0	1.5

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
149.36	45.53	8824.0	515.5	5.8	394.7	441.7	88.2	44.1	0.0	44.0	34.0	1.0
149.85	45.67	13276.6	513.8	3.9	396.2	443.2	66.4	33.2	0.0	55.7	36.0	1.0
150.34	45.83	11123.0	342.4	3.1	397.5	444.6	44.5	22.2	685.4	50.5	36.0	6.0
150.83	45.97	4326.6	226.1	5.2	398.7	446.1	43.3	21.6	232.1	0.0	0.0	3.0
151.33	46.12	9285.3	276.1	3.0	399.9	447.6	37.1	18.6	562.5	45.3	34.0	6.0
151.82	46.28	6505.0	297.1	4.6	401.1	449.1	32.5	16.3	377.0	0.0	0.0	3.0
152.31	46.42	5297.6	275.0	5.2	402.6	450.5	53.0	26.5	0.0	30.0	30.0	1.0
152.80	46.58	8974.6	303.0	3.4	404.0	452.0	35.9	17.9	541.2	44.2	34.0	6.0
153.30	46.72	9457.0	404.2	4.3	405.4	453.5	94.6	47.3	0.0	45.6	34.0	1.0
153.79	46.88	5827.5	221.3	3.8	406.8	454.9	29.1	14.6	331.0	0.0	0.0	3.0
154.28	47.03	5107.9	112.5	2.2	408.0	456.4	20.4	10.2	282.9	30.0	30.0	3.0
154.77	47.17	3402.1	93.9	2.8	409.3	457.9	13.6	6.8	169.0	30.0	30.0	1.5
155.26	47.33	3540.8	81.1	2.3	410.5	459.4	14.2	7.1	178.1	30.0	30.0	1.5
155.76	47.47	3300.2	80.1	2.4	411.7	460.8	13.2	6.6	161.8	30.0	30.0	1.5
156.25	47.62	5006.1	262.1	5.2	412.9	462.3	50.1	25.0	275.4	0.0	0.0	3.0
156.74	47.78	12879.4	531.5	4.1	414.3	463.8	128.8	64.4	0.0	54.2	36.0	1.0
157.23	47.92	36913.6	312.1	0.8	415.8	465.2	73.8	36.9	0.0	84.3	42.0	1.0
157.72	48.08	21401.0	608.0	2.8	417.2	466.7	71.3	35.7	0.0	68.6	38.0	1.0
158.22	48.22	7416.1	333.7	4.5	418.7	468.2	74.2	37.1	0.0	38.2	32.0	1.0
158.71	48.38	4916.2	185.7	3.8	420.1	469.7	24.6	12.3	268.4	0.0	0.0	3.0
159.20	48.53	4465.8	194.5	4.4	421.3	471.1	29.8	14.9	238.2	0.0	0.0	3.0
159.69	48.67	8843.0	201.6	2.3	422.6	472.6	29.5	14.7	0.0	43.1	34.0	1.0
160.19	48.83	6070.6	237.5	3.9	423.8	474.1	30.4	15.2	344.8	0.0	0.0	3.0
160.68	48.97	4469.8	134.9	3.0	425.1	475.5	17.9	8.9	237.9	30.0	30.0	3.0
161.17	49.12	3696.5	129.6	3.5	426.3	477.0	18.5	9.2	186.2	0.0	0.0	1.5
161.66	49.28	11184.8	195.6	1.7	427.6	478.5	37.3	18.6	0.0	49.7	34.0	1.0
162.15	49.42	6324.7	139.6	2.2	428.9	480.0	21.1	10.5	0.0	33.3	32.0	1.0
162.65	49.58	3959.9	117.4	3.0	430.1	481.4	15.8	7.9	203.2	30.0	30.0	1.5
163.14	49.72	6042.7	169.6	2.8	431.4	482.9	24.2	12.1	341.9	31.9	30.0	3.0
163.63	49.88	4139.0	195.1	4.7	432.6	484.4	27.6	13.8	214.8	0.0	0.0	1.5
164.12	50.03	15218.4	459.3	3.0	433.8	485.8	60.9	30.4	953.3	58.3	36.0	6.0
164.61	50.17	37096.2	406.7	1.1	435.1	487.3	74.2	37.1	0.0	83.8	42.0	1.0
165.11	50.33	39942.7	310.6	0.8	436.6	488.8	79.9	39.9	0.0	85.8	42.0	1.0
165.60	50.47	27305.8	408.6	1.5	438.0	490.3	68.3	34.1	0.0	74.9	40.0	1.0
166.09	50.62	15033.1	398.3	2.6	439.4	491.7	50.1	25.1	0.0	57.7	36.0	1.0
166.58	50.78	10458.7	348.8	3.3	440.6	493.2	41.8	20.9	635.0	47.3	34.0	6.0
167.07	50.92	9842.8	312.6	3.2	441.9	494.7	39.4	19.7	593.7	45.5	34.0	6.0
167.57	51.08	9188.9	458.9	5.0	443.3	496.1	91.9	45.9	0.0	43.5	32.0	1.0
168.06	51.22	14107.1	532.2	3.8	444.8	497.6	70.5	35.3	0.0	55.8	36.0	1.0
168.55	51.38	10447.2	466.2	4.5	446.3	499.1	104.5	52.2	0.0	47.1	34.0	1.0
169.04	51.52	8760.2	339.6	3.9	447.7	500.6	43.8	21.9	520.8	0.0	0.0	6.0
169.53	51.67	5397.7	210.7	3.9	448.9	502.0	27.0	13.5	296.5	0.0	0.0	3.0
170.02	51.82	4969.7	250.4	5.0	450.1	503.5	49.7	24.8	267.7	0.0	0.0	3.0
170.52	51.97	9615.3	344.5	3.6	451.3	505.0	38.5	19.2	577.3	44.6	34.0	6.0
171.01	52.12	3108.2	98.0	3.2	452.5	506.4	15.5	7.8	143.3	0.0	0.0	1.5
171.50	52.27	2693.0	54.1	2.0	453.7	507.9	10.8	5.4	115.4	30.0	30.0	1.5
171.99	52.42	3225.9	64.9	2.0	455.0	509.4	12.9	6.5	150.8	30.0	30.0	1.5
172.48	52.57	3234.6	76.9	2.4	456.2	510.8	12.9	6.5	151.2	30.0	30.0	1.5
172.98	52.72	3210.2	91.0	2.8	457.4	512.3	16.1	8.0	149.4	0.0	0.0	1.5
173.47	52.87	3314.1	177.2	5.3	458.6	513.8	33.1	16.6	156.1	0.0	0.0	1.5
173.96	53.02	11917.3	240.2	2.0	459.8	515.3	39.7	19.9	0.0	50.4	34.0	1.0
174.45	53.17	4127.1	119.5	2.9	461.1	516.7	16.5	8.3	209.9	30.0	30.0	1.5
174.95	53.32	3074.7	76.0	2.5	462.3	518.2	12.3	6.1	139.6	30.0	30.0	1.5
175.44	53.47	3435.3	80.7	2.3	463.6	519.7	13.7	6.9	163.5	30.0	30.0	1.5
175.93	53.62	3755.4	104.2	2.8	464.8	521.1	15.0	7.5	184.6	30.0	30.0	1.5
176.42	53.77	4236.7	128.2	3.0	466.0	522.6	16.9	8.5	216.5	30.0	30.0	1.5
176.91	53.92	4070.0	145.2	3.6	467.2	524.1	20.4	10.2	205.2	0.0	0.0	1.5
177.41	54.07	5051.7	170.9	3.4	468.5	525.6	25.3	12.6	270.5	0.0	0.0	3.0
177.90	54.22	7170.2	225.9	3.2	469.7	527.0	28.7	14.3	411.6	35.6	32.0	3.0
178.39	54.37	13227.8	339.0	2.6	471.0	528.5	44.1	22.0	0.0	53.1	36.0	1.0
178.88	54.52	16325.6	357.6	2.2	472.3	530.0	54.4	27.2	0.0	59.1	36.0	1.0
179.37	54.67	5290.0	187.5	3.5	473.5	531.4	26.4	13.2	285.7	0.0	0.0	3.0
179.87	54.82	3986.7	169.5	4.3	474.8	532.9	26.6	13.3	198.6	0.0	0.0	1.5
180.36	54.97	17194.3	231.0	1.3	476.1	534.4	43.0	21.5	0.0	60.4	38.0	1.0

ConeTec Inc. - CPT Interpretation
Interpretation Output - Release 1.00.19c
Run No: 00-0518-1635-4322
Job No: 00-300
Client: Kleinfelder
Project: Legacy Parkway Project
Site: SC-19-280
Location: STRUCTURE 19
Cone: 20 TON A 070
CPT Date: 00/02/03
CPT Time: 10:15
CPT File: 300SC280.COR

Water Table (m): 0.50 (ft): 1.6
Averaging Increment (m): 0.15
Su Nkt used: 15.00
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
Used Unit Weights Assigned to Soil Zones

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
0.25	0.08	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0
0.74	0.23	8291.6	14.5	0.2	4.4	0.0	16.6	33.2	0.0	95.0	50.0	1.0
1.23	0.38	26568.9	70.7	0.3	7.4	0.0	44.3	88.6	0.0	95.0	50.0	1.0
1.72	0.52	31771.1	94.2	0.3	10.1	0.2	53.0	105.9	0.0	95.0	50.0	1.0
2.21	0.68	24700.9	182.4	0.7	11.6	1.7	49.4	98.8	0.0	95.0	50.0	1.0
2.71	0.82	19682.6	361.2	1.8	13.0	3.2	49.2	98.4	0.0	95.0	50.0	1.0
3.20	0.97	19700.3	454.5	2.3	14.4	4.7	65.7	131.3	0.0	95.0	50.0	1.0
3.61	1.10	23419.7	568.9	2.4	15.4	5.9	78.1	156.1	0.0	95.0	50.0	1.0
4.02	1.22	45604.0	344.4	0.8	16.6	7.1	76.0	152.0	0.0	95.0	50.0	1.0
4.51	1.38	19577.8	245.8	1.3	18.1	8.6	48.9	97.9	0.0	95.0	50.0	1.0
5.00	1.53	7844.5	203.9	2.6	19.4	10.1	31.4	62.8	521.0	83.8	48.0	10.0
5.50	1.67	3970.6	159.8	4.0	20.6	11.5	19.9	39.7	262.6	0.0	0.0	10.0
5.99	1.83	2424.0	73.7	3.0	21.9	13.0	12.1	24.2	159.3	0.0	0.0	10.0
6.56	2.00	2478.6	64.3	2.6	23.3	14.7	12.4	24.8	162.7	0.0	0.0	10.0
7.14	2.17	9899.3	107.6	1.1	24.8	16.4	24.7	48.6	0.0	87.0	48.0	1.0
7.63	2.33	5082.7	130.0	2.6	26.1	17.9	20.3	39.0	335.9	67.1	44.0	10.0
8.12	2.47	1909.2	57.4	3.0	27.3	19.4	9.5	17.9	124.2	0.0	0.0	10.0
8.61	2.62	1357.0	21.3	1.6	28.6	20.8	5.4	9.9	87.2	30.0	38.0	6.0
9.10	2.78	1092.1	20.2	1.9	29.8	22.3	5.5	9.8	69.3	0.0	0.0	6.0
9.60	2.92	638.3	13.9	2.2	31.0	23.8	4.3	7.5	38.9	0.0	0.0	6.0
10.09	3.08	567.3	11.3	2.0	32.2	25.3	3.8	6.5	34.0	0.0	0.0	6.0
10.58	3.22	730.8	15.2	2.1	33.5	26.7	3.7	6.2	44.7	0.0	0.0	6.0
11.07	3.38	794.4	19.8	2.5	34.7	28.2	5.3	8.8	48.8	0.0	0.0	6.0
11.56	3.53	746.2	14.1	1.9	35.9	29.7	3.7	6.1	45.4	0.0	0.0	6.0
12.06	3.67	635.1	16.4	2.6	37.2	31.1	4.2	6.8	37.8	0.0	0.0	6.0
12.55	3.83	609.7	14.9	2.4	38.4	32.6	4.1	6.4	35.9	0.0	0.0	3.0
13.04	3.98	537.6	10.1	1.9	39.6	34.1	3.6	5.6	30.9	0.0	0.0	3.0
13.53	4.12	514.5	7.2	1.4	40.8	35.6	3.4	5.3	29.2	0.0	0.0	3.0
14.03	4.27	470.9	7.2	1.5	41.7	37.0	2.4	3.6	26.1	0.0	0.0	3.0
14.52	4.43	461.9	7.2	1.6	42.1	38.5	2.3	3.5	25.4	0.0	0.0	3.0
15.01	4.57	481.1	12.0	2.5	42.8	40.0	4.8	7.2	26.6	0.0	0.0	3.0
15.50	4.73	681.3	14.0	2.1	44.0	41.4	4.5	6.7	39.7	0.0	0.0	3.0
15.99	4.88	637.5	11.3	1.8	45.3	42.9	3.2	4.6	36.6	0.0	0.0	3.0
16.49	5.02	596.2	8.6	1.4	46.5	44.4	3.0	4.3	33.7	0.0	0.0	3.0
16.98	5.18	544.7	7.9	1.4	47.7	45.9	2.7	3.9	30.1	0.0	0.0	3.0
17.47	5.32	634.3	8.5	1.3	48.9	47.3	3.2	4.4	35.9	0.0	0.0	3.0
17.96	5.48	589.1	7.0	1.2	50.2	48.8	2.9	4.1	32.7	0.0	0.0	3.0
18.45	5.62	606.6	6.9	1.1	51.4	50.3	3.0	4.1	33.7	0.0	0.0	3.0
18.95	5.77	656.5	10.4	1.6	52.6	51.7	3.3	4.4	36.8	0.0	0.0	3.0
19.44	5.93	861.1	13.0	1.5	53.9	53.2	4.3	5.7	50.3	0.0	0.0	3.0
19.93	6.07	857.0	5.9	0.7	55.1	54.7	3.4	4.5	49.8	30.0	32.0	3.0
20.42	6.23	716.5	6.4	0.9	56.3	56.2	3.6	4.7	40.3	0.0	0.0	3.0
20.92	6.38	687.8	6.6	1.0	57.5	57.6	3.4	4.4	38.2	0.0	0.0	3.0
21.41	6.52	732.1	6.3	0.9	58.8	59.1	3.7	4.7	40.9	0.0	0.0	3.0
21.90	6.68	756.8	8.7	1.1	60.0	60.6	3.8	4.8	42.4	0.0	0.0	3.0
22.39	6.82	798.4	11.1	1.4	61.2	62.0	4.0	5.0	45.0	0.0	0.0	3.0
22.88	6.98	2873.4	20.8	0.7	62.5	63.5	9.6	11.9	0.0	38.3	38.0	1.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
23.38	7.12	9363.6	61.1	0.7	63.8	65.0	23.4	28.7	0.0	71.8	44.0	1.0
23.87	7.27	10167.1	80.8	0.8	65.2	66.5	25.4	30.8	0.0	73.9	44.0	1.0
24.36	7.43	9961.6	81.0	0.8	66.6	67.9	24.9	29.9	0.0	73.0	44.0	1.0
24.85	7.57	8555.3	80.6	0.9	68.0	69.4	21.4	25.4	0.0	68.3	42.0	1.0
25.34	7.73	3646.3	91.8	2.5	69.3	70.9	14.6	17.2	233.7	43.6	38.0	6.0
25.84	7.88	1573.3	42.0	2.7	70.5	72.3	7.9	9.2	95.4	0.0	0.0	6.0
26.33	8.02	1306.6	14.8	1.1	71.7	73.8	5.2	6.0	77.4	30.0	32.0	6.0
26.82	8.18	1216.3	13.5	1.1	73.0	75.3	4.9	5.6	71.2	30.0	32.0	3.0
27.31	8.32	1071.2	13.0	1.2	74.2	76.8	5.4	6.1	61.4	0.0	0.0	3.0
27.80	8.48	1187.0	17.1	1.4	75.4	78.2	5.9	6.7	68.9	0.0	0.0	3.0
28.30	8.62	1381.5	26.1	1.9	76.6	79.7	6.9	7.7	81.7	0.0	0.0	6.0
28.79	8.77	1044.9	10.9	1.0	77.9	81.2	4.2	4.6	59.1	30.0	30.0	3.0
29.28	8.93	1284.8	14.0	1.1	79.1	82.6	5.1	5.7	74.9	30.0	32.0	3.0
29.77	9.07	1674.3	30.9	1.8	80.3	84.1	6.7	7.3	100.7	30.0	34.0	6.0
30.27	9.23	1926.9	52.1	2.7	81.6	85.6	9.6	10.4	117.3	0.0	0.0	6.0
30.76	9.38	1872.5	51.6	2.8	82.8	87.1	9.4	10.1	113.5	0.0	0.0	6.0
31.17	9.50	1694.1	40.7	2.4	83.8	88.3	8.5	9.1	101.5	0.0	0.0	6.0
31.58	9.62	1923.4	52.5	2.7	84.8	89.5	9.6	10.2	116.6	0.0	0.0	6.0
32.07	9.77	2073.5	67.2	3.2	86.1	91.0	10.4	10.9	126.4	0.0	0.0	6.0
32.56	9.93	2343.1	77.4	3.3	87.3	92.5	11.7	12.3	144.2	0.0	0.0	6.0
33.05	10.07	2470.8	79.2	3.2	88.5	93.9	12.4	12.9	152.6	0.0	0.0	6.0
33.55	10.23	2199.6	73.0	3.3	89.7	95.4	11.0	11.4	134.3	0.0	0.0	6.0
34.04	10.38	2104.2	63.9	3.0	91.0	96.9	10.5	10.8	127.8	0.0	0.0	6.0
34.53	10.52	1332.9	25.4	1.9	92.2	98.3	6.7	6.8	76.2	0.0	0.0	3.0
35.02	10.68	1403.0	17.7	1.3	93.4	99.8	5.6	5.7	80.7	30.0	32.0	3.0
35.51	10.82	1355.8	15.4	1.1	94.7	101.3	5.4	5.5	77.3	30.0	32.0	3.0
36.01	10.98	1203.3	12.8	1.1	95.9	102.8	4.8	4.8	67.0	30.0	30.0	3.0
36.50	11.12	1956.6	24.3	1.2	97.1	104.2	7.8	7.8	117.0	30.0	32.0	6.0
36.99	11.27	1212.3	18.4	1.5	98.3	105.7	6.1	6.0	67.2	0.0	0.0	3.0
37.48	11.43	1095.4	9.6	0.9	99.6	107.2	4.4	4.3	59.2	30.0	30.0	3.0
37.98	11.57	1791.9	21.8	1.2	100.8	108.6	7.2	7.0	105.5	30.0	32.0	6.0
38.47	11.73	1110.9	14.1	1.3	102.0	110.1	5.6	5.4	59.9	0.0	0.0	3.0
38.96	11.88	1074.1	11.3	1.1	103.3	111.6	4.3	4.1	57.3	30.0	30.0	3.0
39.45	12.02	1105.0	9.8	0.9	104.5	113.1	4.4	4.2	59.2	30.0	30.0	3.0
39.94	12.18	1139.2	11.5	1.0	105.7	114.5	4.6	4.3	61.3	30.0	30.0	3.0
40.44	12.32	1254.1	12.9	1.0	106.9	116.0	5.0	4.7	68.7	30.0	30.0	3.0
40.93	12.48	1159.1	10.2	0.9	108.2	117.5	4.6	4.4	62.2	30.0	30.0	3.0
41.42	12.62	1183.7	8.2	0.7	109.4	118.9	4.7	4.4	63.7	30.0	30.0	3.0
41.91	12.77	1209.8	8.8	0.7	110.6	120.4	4.8	4.5	65.3	30.0	30.0	3.0
42.40	12.93	1304.7	11.6	0.9	111.9	121.9	5.2	4.8	71.4	30.0	30.0	3.0
42.90	13.07	1242.0	9.6	0.8	113.1	123.4	5.0	4.6	67.0	30.0	30.0	3.0
43.39	13.23	1102.6	8.2	0.7	114.3	124.8	4.4	4.0	57.6	30.0	30.0	3.0
43.88	13.38	1160.1	11.2	1.0	115.5	126.3	4.6	4.2	61.2	30.0	30.0	3.0
44.37	13.52	1546.0	21.3	1.4	116.8	127.8	6.2	5.6	86.8	30.0	30.0	3.0
44.86	13.68	4492.2	54.0	1.2	118.0	129.2	15.0	13.5	0.0	42.0	38.0	1.0
45.36	13.82	6889.9	58.3	0.8	119.4	130.7	17.2	15.4	0.0	54.1	40.0	1.0
45.85	13.98	3160.7	35.1	1.1	120.7	132.2	10.5	9.4	0.0	31.6	34.0	1.0
46.34	14.12	1263.6	16.5	1.3	122.0	133.7	5.1	4.5	67.2	30.0	30.0	3.0
46.83	14.27	1357.6	12.8	0.9	123.2	135.1	5.4	4.8	73.3	30.0	30.0	3.0
47.33	14.43	1431.9	12.9	0.9	124.4	136.6	5.7	5.0	78.1	30.0	30.0	3.0
47.82	14.57	1385.7	14.7	1.1	125.7	138.1	5.5	4.8	74.8	30.0	30.0	3.0
48.31	14.73	1876.3	37.8	2.0	126.9	139.5	7.5	6.5	107.3	30.0	32.0	3.0
48.80	14.88	2365.1	38.5	1.6	128.1	141.0	9.5	8.2	139.7	30.0	32.0	6.0
49.29	15.02	1246.3	14.8	1.2	129.4	142.5	5.0	4.3	65.0	30.0	30.0	3.0
49.79	15.18	1214.9	11.7	1.0	130.6	144.0	4.9	4.2	62.7	30.0	30.0	1.5
50.28	15.32	1288.2	18.6	1.4	131.8	145.4	5.2	4.4	67.4	30.0	30.0	3.0
50.77	15.48	6539.1	60.5	0.9	133.1	146.9	16.3	13.9	0.0	51.0	38.0	1.0
51.26	15.62	6627.5	64.5	1.0	134.5	148.4	16.6	14.0	0.0	51.2	38.0	1.0
51.75	15.77	1615.9	43.6	2.7	135.8	149.8	8.1	6.8	88.7	0.0	0.0	3.0
52.25	15.93	1772.7	28.7	1.6	137.0	151.3	7.1	5.9	99.0	30.0	30.0	3.0
52.74	16.08	4486.9	56.3	1.3	138.3	152.8	15.0	12.4	0.0	39.7	36.0	1.0
53.23	16.22	4462.5	58.4	1.3	139.6	154.3	14.9	12.3	0.0	39.4	36.0	1.0
53.72	16.38	4404.5	51.2	1.2	140.9	155.7	14.7	12.1	0.0	38.9	36.0	1.0
54.22	16.53	2949.7	56.8	1.9	142.2	157.2	11.8	9.7	176.7	30.0	32.0	6.0

Depth (ft)	Depth (m)	AvgQt (kPa)	AvgFs (kPa)	AvgRf (%)	E.Stress (kPa)	Hyd. Pr. (kPa)	N60 (blows/ft)	(N1)60	Su (kPa)	Dr (%)	Phi (deg.)	OCR (ratio)
54.71	16.67	1715.0	41.3	2.4	143.4	158.7	8.6	7.0	94.2	0.0	0.0	3.0
55.20	16.83	1344.5	20.2	1.5	144.6	160.1	5.4	4.4	69.3	30.0	30.0	1.5
55.69	16.97	1747.8	29.2	1.7	145.9	161.6	7.0	5.7	96.0	30.0	30.0	3.0
56.18	17.12	1563.3	20.0	1.3	147.1	163.1	6.3	5.0	83.5	30.0	30.0	3.0
56.68	17.28	2450.6	29.1	1.2	148.3	164.6	9.8	7.9	142.5	30.0	32.0	3.0
57.17	17.42	4396.1	31.4	0.7	149.6	166.0	14.7	11.7	0.0	37.9	36.0	1.0
57.66	17.58	1469.1	30.3	2.1	150.8	167.5	7.3	5.9	76.7	0.0	0.0	3.0
58.15	17.72	1439.9	20.1	1.4	152.1	169.0	5.8	4.6	74.6	30.0	30.0	1.5
58.64	17.88	1446.5	17.3	1.2	153.3	170.4	5.8	4.6	74.8	30.0	30.0	1.5
59.14	18.03	1561.0	17.7	1.1	154.5	171.9	6.2	4.9	82.3	30.0	30.0	3.0
59.63	18.17	1544.2	17.1	1.1	155.8	173.4	6.2	4.8	81.0	30.0	30.0	3.0
60.12	18.33	1505.6	17.6	1.2	157.0	174.9	6.0	4.7	78.2	30.0	30.0	1.5
60.61	18.47	1550.6	16.6	1.1	158.2	176.3	6.2	4.8	81.1	30.0	30.0	3.0
61.10	18.62	1488.1	14.4	1.0	159.4	177.8	6.0	4.6	76.7	30.0	30.0	1.5
61.60	18.78	1589.8	14.9	0.9	160.7	179.3	6.4	4.9	83.3	30.0	30.0	3.0
62.09	18.92	1829.4	18.3	1.0	161.9	180.7	7.3	5.6	99.1	30.0	30.0	3.0
62.58	19.08	1707.1	19.5	1.1	163.1	182.2	6.8	5.2	90.8	30.0	30.0	3.0
63.07	19.22	5084.1	59.5	1.2	164.4	183.7	16.9	12.9	0.0	40.8	36.0	1.0
63.57	19.38	4125.7	88.6	2.1	165.7	185.2	16.5	12.5	251.7	34.7	34.0	6.0
64.06	19.53	5199.2	91.7	1.8	166.9	186.6	17.3	13.1	0.0	41.2	36.0	1.0
64.55	19.67	6378.2	110.8	1.7	168.2	188.1	21.3	16.0	0.0	46.9	38.0	1.0
65.04	19.83	18852.5	211.3	1.1	169.6	189.6	37.7	28.3	0.0	77.9	42.0	1.0
65.53	19.97	32206.3	385.4	1.2	171.1	191.0	64.4	48.2	0.0	93.1	44.0	1.0
66.03	20.12	47138.2	657.7	1.4	172.5	192.5	94.3	70.2	0.0	95.0	46.0	1.0

E

CONETEC

ConeTec Inc. • Salt Lake City
Job No: 00-300
Client: Kleinfelder
Project: Legacy Parkway

Pore Pressure Dissipation Summary

Station Identifier	Dissipation File Name	Dissipation Depth (m)	Dissipation Status	Equilibrium* Pressure (kPa)	Dissipation Duration (s)
*Note: Not all dissipation tests went to completion. For those not reaching 100% completion the **final** pore pressure value has been recorded. Incomplete dissipation tests estimated to have reached >95% completion are marked with * Dissipation tests estimated to have not reached 95% completion are marked with ** Equilibrium **and** final values for tests reaching >95% dissipation have been plotted on the CPT plots					
SC-1-244	300SC244.PPR	6.95	Incomplete	79.2**	7200
SC-1-244		18.65	Incomplete	434**	7200
SC-1-245	300SC245.PPR	6.40	>95% Complete	44.8*	4800
SC-1-245		23.45	Incomplete	418**	7200
SC-5-294	300SC294.PPR	8.80	Incomplete	183**	7200
SC-5-294		17.50	>95% Complete	212*	7200
SC-5-295	300SC295.PPR	4.50	>95% Complete	48.0*	7200
SC-5-295		23.35	Incomplete	385**	7200
SC-5-296	300SC296.PPR	8.90	Incomplete	165**	7200
SC-5-296		17.90	Incomplete	405**	7200
SC-6-324	300SC324.PPR	10.85	>95% Complete	140*	6500
SC-6-324		21.55	Incomplete	402**	7200
SC-6-325	300SC325.PPR	14.10	Incomplete	192**	7200
SC-6-325		21.45	Incomplete	457**	7200
SC-6-326	300SC326.PPR	10.40	Complete	70.8	6000
SC-6-326		23.30	Complete	230	7200
SC-6-329	300SC329.PPR	6.70	Incomplete	66.7**	7200
SC-6-329		21.70	>95% Complete	229*	7200
SC-6-330	300SC330.PPR	10.85	Incomplete	163**	7200
SC-6-330		24.50	Complete	252	900
SC-6-331	300SC331.PPR	9.75	>95% Complete	86.1*	4200
SC-6-331		15.75	>95% Complete	175*	7200
SC-6-332	300SC332.PPR	11.85	Incomplete	237**	7200
SC-6-332		22.85	Incomplete	381**	7200
SC-10-301	300SC301.PPR	7.70	Incomplete	80.2**	7200
SC-10-301		17.70	>95% Complete	175*	7200
SC-10-302	300SC302.PPR	6.80	Incomplete	70.0**	7200
SC-10-302		25.00	Incomplete	547**	7200
SC-11-260	300SC260.PPR	12.00	Incomplete	220**	7200
SC-11-260		17.30	>95% Complete	204*	2000
SC-11-261	300SC261.PPR	6.40	Incomplete	76.0**	7200
SC-11-261		26.25	Complete	292	7200
SC-12-264	300SC264.PPR	13.25	Incomplete	248**	7200
SC-12-264		21.85	Complete	222	4000

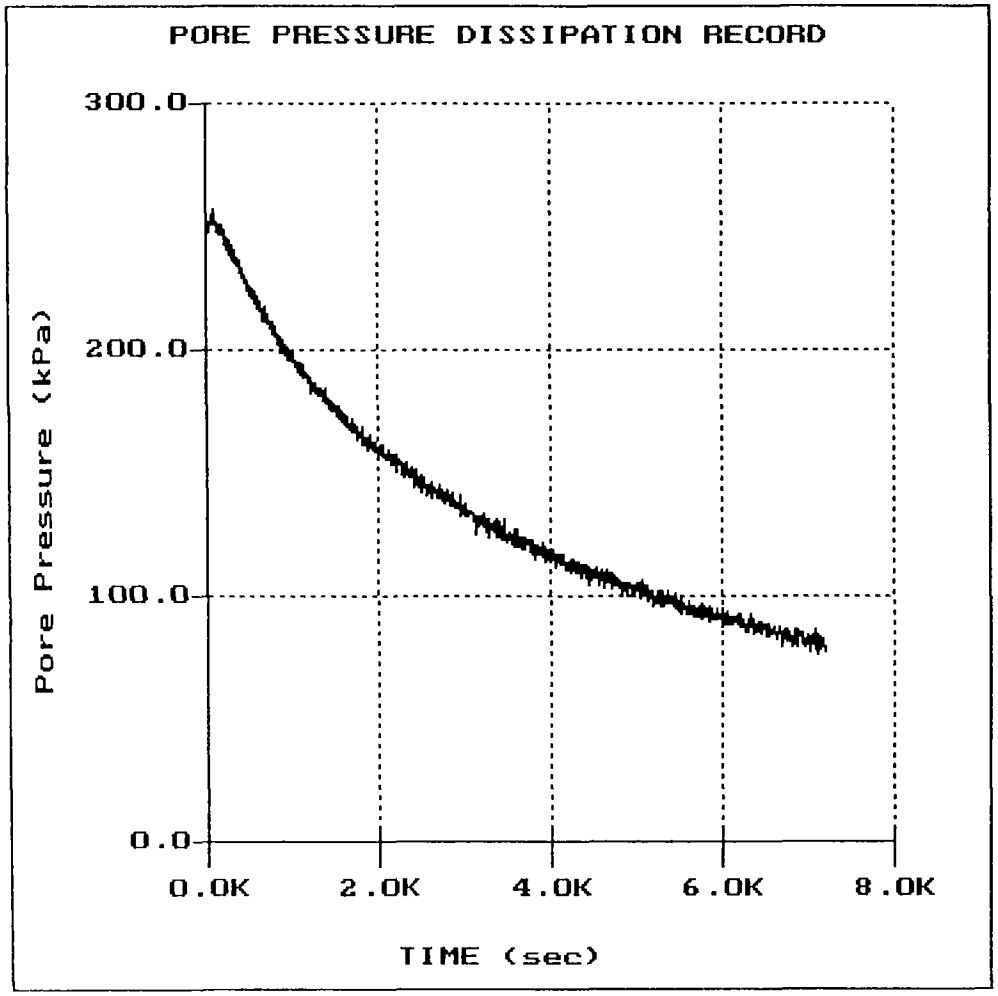
Station Identifier	Dissipation File Name	Dissipation Depth (m)	Dissipation Status	Equilibrium* Pressure (kPa)	Dissipation Duration (s)
SC-13-305	300SC305.PPR	11 75	Incomplete	171**	7200
SC-13-305		28.75	Complete	338	3600
SC-13-306	300SC306.PPR	8.05	Complete	70.8	200
SC-13-306		9.75	Incomplete	220**	7200
SC-13-306		19.35	Complete	218	1800
SC-13-307	300SC307.PPR	7.00	Incomplete	153**	7200
SC-13-307		19.45	Complete	194	1500
SC-14-310	300SC310.PPR	2.70	>95% Complete	20*	2800
SC-14-310		29.40	Complete	336	800
SC-14-311	300SC311 PPR	6.70	Incomplete	243**	7200
SC-14-311		17.95	Complete	215	400
SC-14-311		21 20	>95% Complete	290*	7200
SC-14-312	300SC312.PPR	6.90	Incomplete	98**	7200
SC-14-312		21.05	Complete	233	2500
SC-15-266	300SC266.PPR	16.80	Complete	216	7200
SC-15-266		26.80	Complete	324	1800
SC-15-267	300SC267.PPR	12.30	Incomplete	255**	4635
SC-15-361	300SC361.PPR	none	none	none	none
SC-16-269	300SC269.PPR	6 05	Incomplete	80.5**	7200
SC-16-269A	300S269A.PPR	26.0	Complete	297	1500
SC-1604-360	300SC360	none	none	none	none
SC-17-270	300SC270.PPR	4.10	>95% Complete	34.7*	2000
SC-17-270		28 55	Incomplete	523**	7200
SC-18-273	300SC273.PPR	9.85	Complete	130	7200
SC-18-273		16 55	>95% Complete	250*	7200
SC-19-275	300SC275.PPR	13 8	Complete	56.3	7200
SC-19-275		30.05	Complete	266	7200
SC-19-277	300SC277.PPR	6.70	Incomplete	81.9**	7200
SC-19-277		23.70	Complete	283	3600
SC-19-278	300SC278.PPR	8.50	Incomplete	80.5**	7200
SC-19-278		24 75	Complete	270	3600
SC-19-280	300SC280.PPR	4.70	>95% Complete	20.1*	7200
SC-19-280		17 70	Incomplete	219**	7200
SC-21-283	300SC283 PPR	14 75	Complete	64 2	2500
SC-21-283		21.10	Incomplete	322**	7200
SC-22-286	300SC286.PPR	4 65	Complete	32.3	4500
SC-22-287	300SC287 PPR	13.70	Complete	115	500
SC-22-287		22.80	Complete	227	3600
SC-23-290A	300S290A.PPR	2.30	Complete	27 0	7200
SC-23-290B	300S290B PPR	10.55	Complete	83 0	500
SC-23-290B		11 20	Complete	91.6	1500
SC-24-256	300SC256 PPR	9 50	Incomplete	122**	7200
SC-24-257	300SC257.PPR	4 0	Complete	16 2	300
SC-24-257		4 85	Complete	24 4	600
SC-25-335	300SC335 PPR	7 25	Complete	52 8	400
SC-25-335		7 85	Complete	61 5	1000
SC-26-338	300SC338.PPR	5 85	Complete	35 3	1500
SC-27-341	300SC341 PPR	11 65	Complete	92 7	2500
SC-27-342	300SC342.PPR	6 00	Complete	41 7	1000
SC-27-343	300SC343.PPR	none	none	none	none
SC-27-344	300SC344 PPR	9 60	Incomplete	100**	6000

Station Identifier	Dissipation File Name	Dissipation Depth (m)	Dissipation Status	Equilibrium* Pressure (kPa)	Dissipation Duration (s)
SC-29-349	300SC349.PPR	3.05	Complete	9 6	400
SC-29-349		4 25	Complete	21.0	500
SC-29-349		10 75	Complete	100	5500
SC-31-353	300SC353.PPR	9.15	Incomplete	133**	7260
SC-31-353		22.7	Complete	258	4500
SC-31-356	300SC356.PPR	7 8	Incomplete	136**	7200
SC-31-356		18.7	>95% Complete	231*	7200
SC-33-358	300SC358.PPR	10.85	Complete	107	7200
SC-33-358		17.85	>95% Complete	191*	7200
WC-9-227	300WC227.PPR	3 45	>95% Complete	19 3*	3200
WC-9-230	300WC230.PPR	6.55	Complete	51.4	800
WC-10-232	300WC232.PPR	8.60	Complete	63 5	1505
WC-10-234	300WC234.PPR	9.65	Complete	87.5	2700
WC-13-235	300WC235.PPR	5.80	Complete	27.0	100
WC-13-235		8.65	Complete	60 0	100
WC-14-237	300WC237 PPR	8.80	>95% Complete	73 0*	1500
WC-15-220B	300W220B.PPR	7 05	Complete	68.0	3000
WC-15-221	300WC221 PPR	7.65	>95% Complete	110*	26000
WC-16-223B	300W223B.PPR	4.95	Incomplete	51.0**	7200
WC-17-214B	300W214B.PPR	10.65	Incomplete	144**	7200
WC-18-217	300WC217.PPR	8.90	Incomplete	191**	7200
WC-22-207	300WC207 PPR	7.00	Incomplete	167**	7200
WC-24-203B	300W203B.PPR	6.50	Incomplete	215**	7200
WC-27-316	300WC316 PPR	3 0	Complete	39 0	7200
WC-28-318	300WC318.PPR	4.50	>95% Complete	33.3*	3600
WC-29-321	300WC321.PPR	8.50	>95% Complete	80 2*	1600
RC-373	300RC373.PPR	10 15	Complete	94	4000
RC-373		15.90	Complete	147	1200

Legacy Parkway

SC-1-244
Location:STRUCTURE 1

Cone:20 TON A 058
Date:02:23:00 10:46



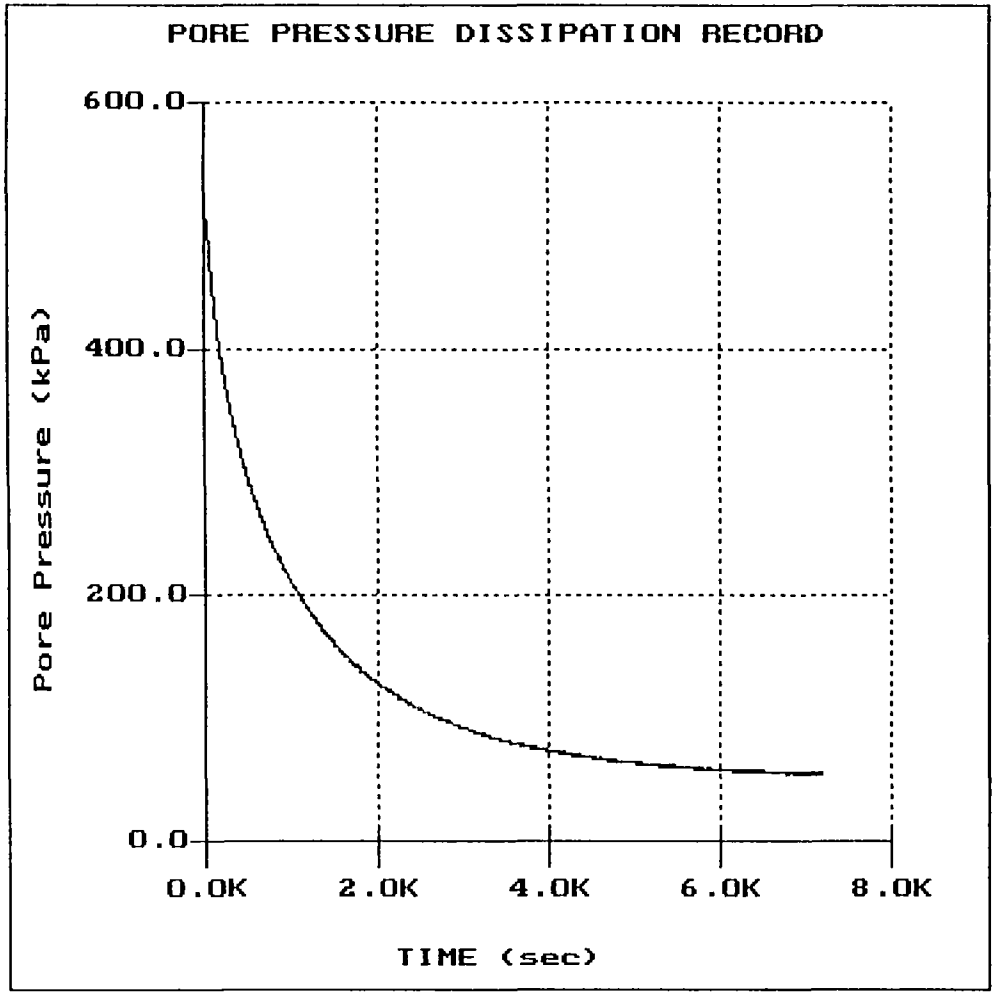
File: 300SC244.PPR
Depth (m): 6.95
(ft): 22.80
Duration : 7200.0s
U-min: 76.20 7090.0s
U-max: 271.60 0.0s

PLATE G-4

Legacy Parkway

SC-19-275
Location:STRUCTURE 19

Cone: 20 TON A 070
Date:02:02:00 08:38

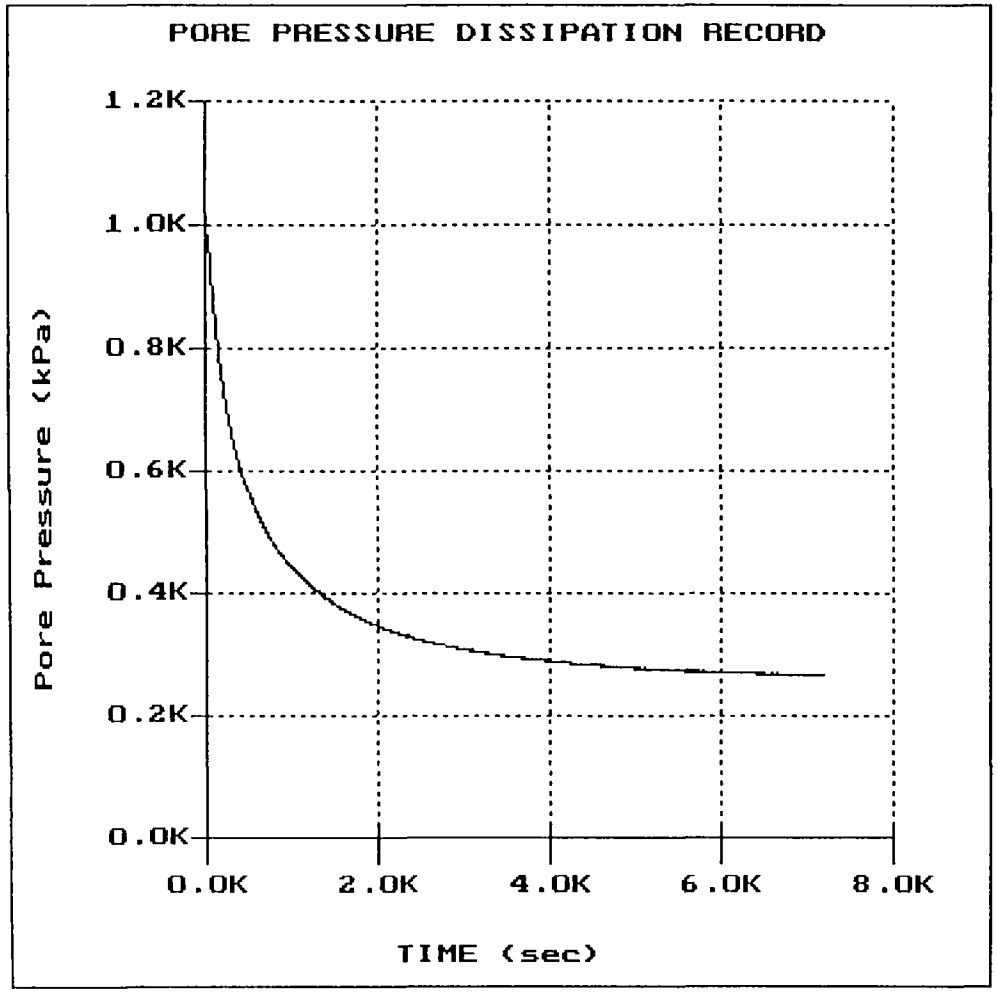


File: 300SC275.PPR
Depth (m): 13.80
(ft): 45.28
Duration : 7200.0s
U-min: 54.15 7080.0s
U-max: 505.06 15.0s

Legacy Parkway

SC-19-275
Location:STRUCTURE 19

Cone: 20 TON A 070
Date:02:02:00 08:38

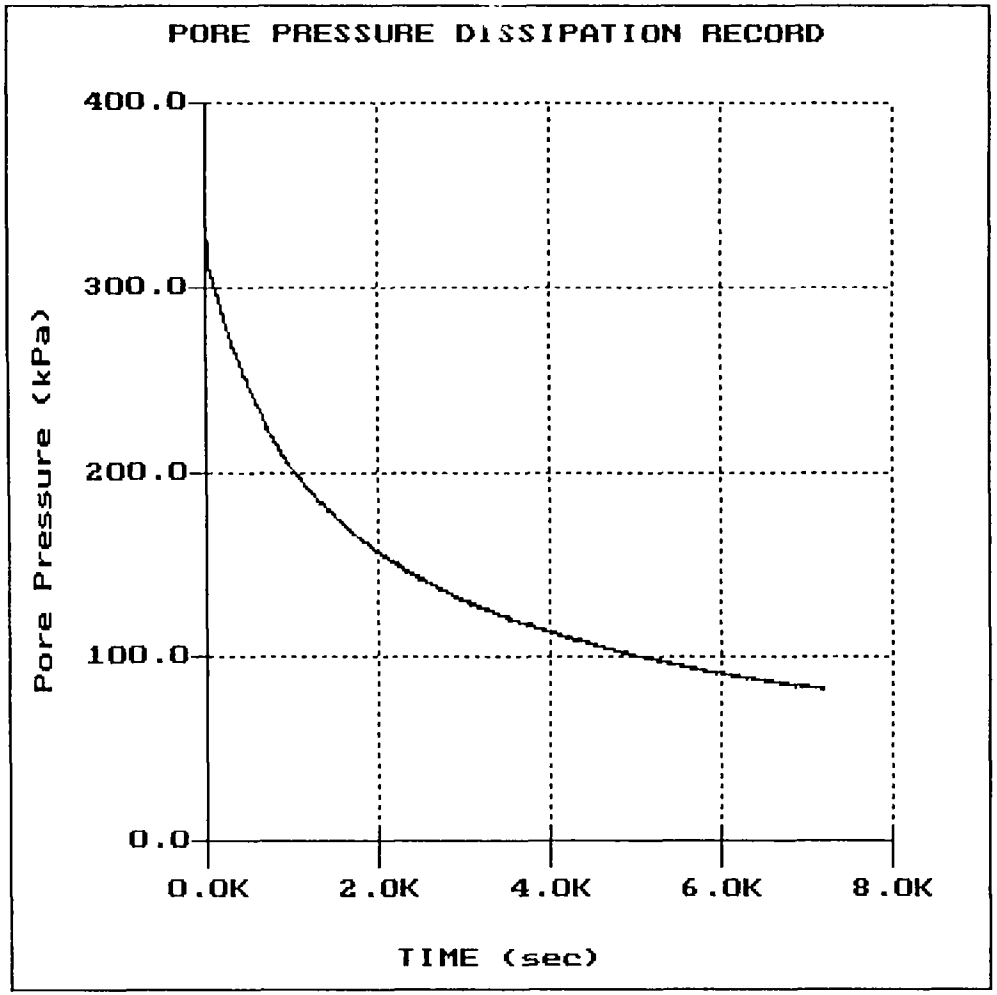


File: 300SC275.PPR
Depth (m): 30.05
(ft): 98.59
Duration : 7200.0s
U-min: 265.72 7150.0s
U-max: 1111.69 0.0s

Legacy Parkway

SC-19-277
Location:STRUCTURE 19

Cone: 20 TON A 070
Date:01:31:00 14:01

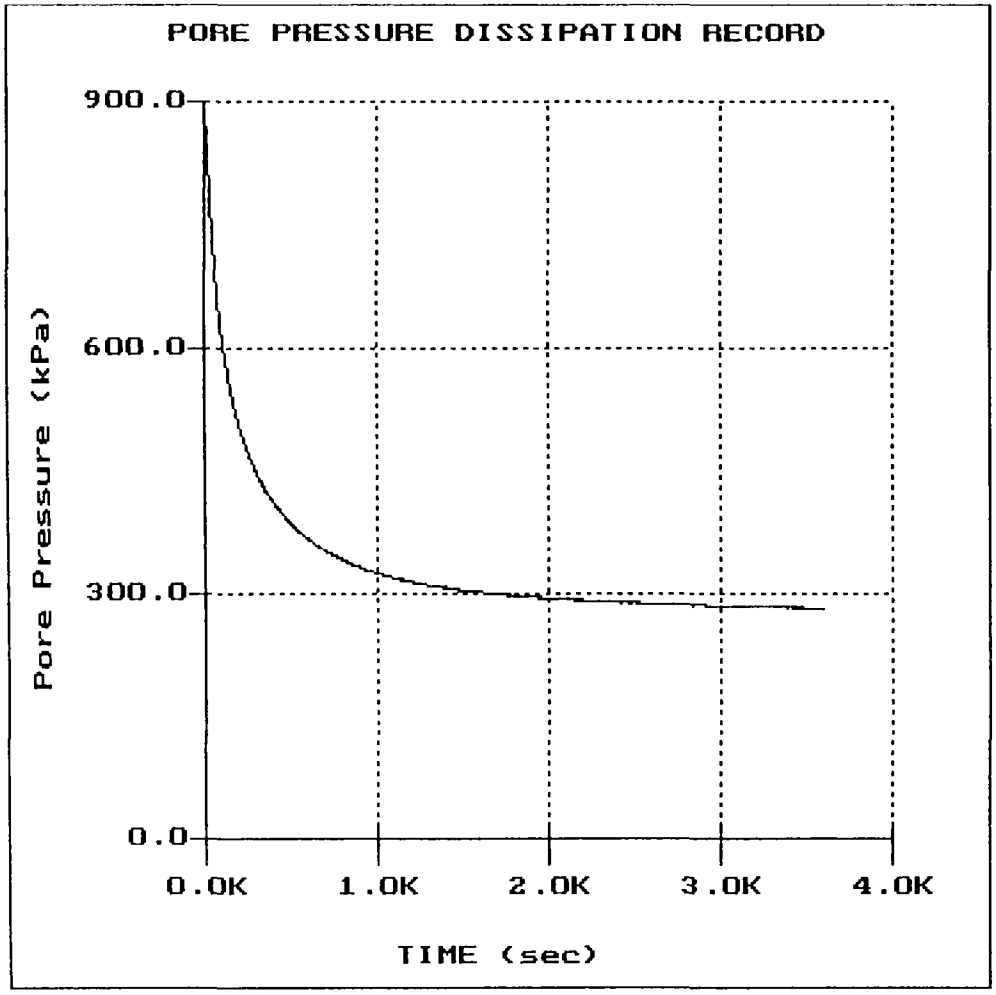


File: 300SC277.PPR
Depth (m): 6.70
(ft): 21.98
Duration : 7200.0s
U-min: 81.96 7190.0s
U-max: 346.56 0.0s

Legacy Parkway

SC-19-277
Location:STRUCTURE 19

Cone: 20 TON A 070
Date:01:31:00 14:01

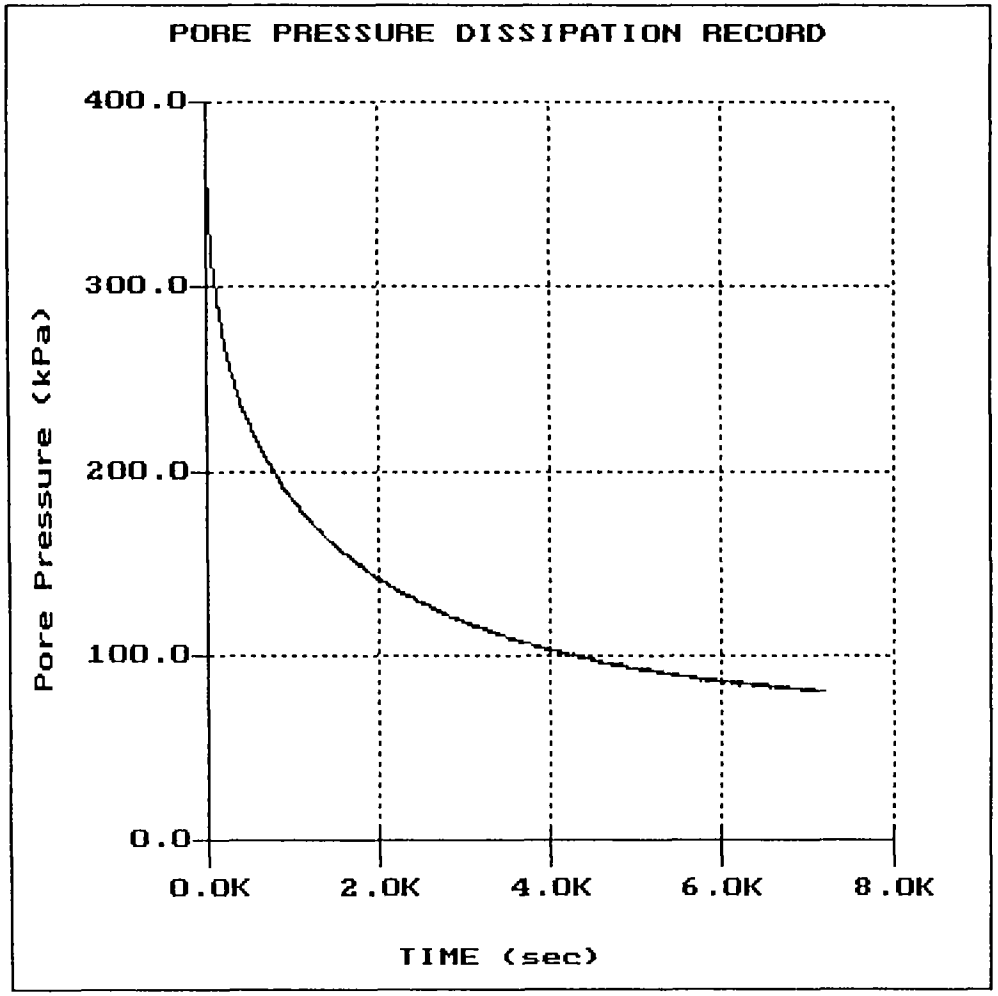


File: 300SC277.PPR
Depth (m): 23.70
(ft): 77.76
Duration : 3600.0s
U-min: 281.74 3575.0s
U-max: 895.67 0.0s

Legacy Parkway

SC-19-278
Location:STRUCTURE 19

Cone: 20 TON A 092
Date:02:14:00 11:39

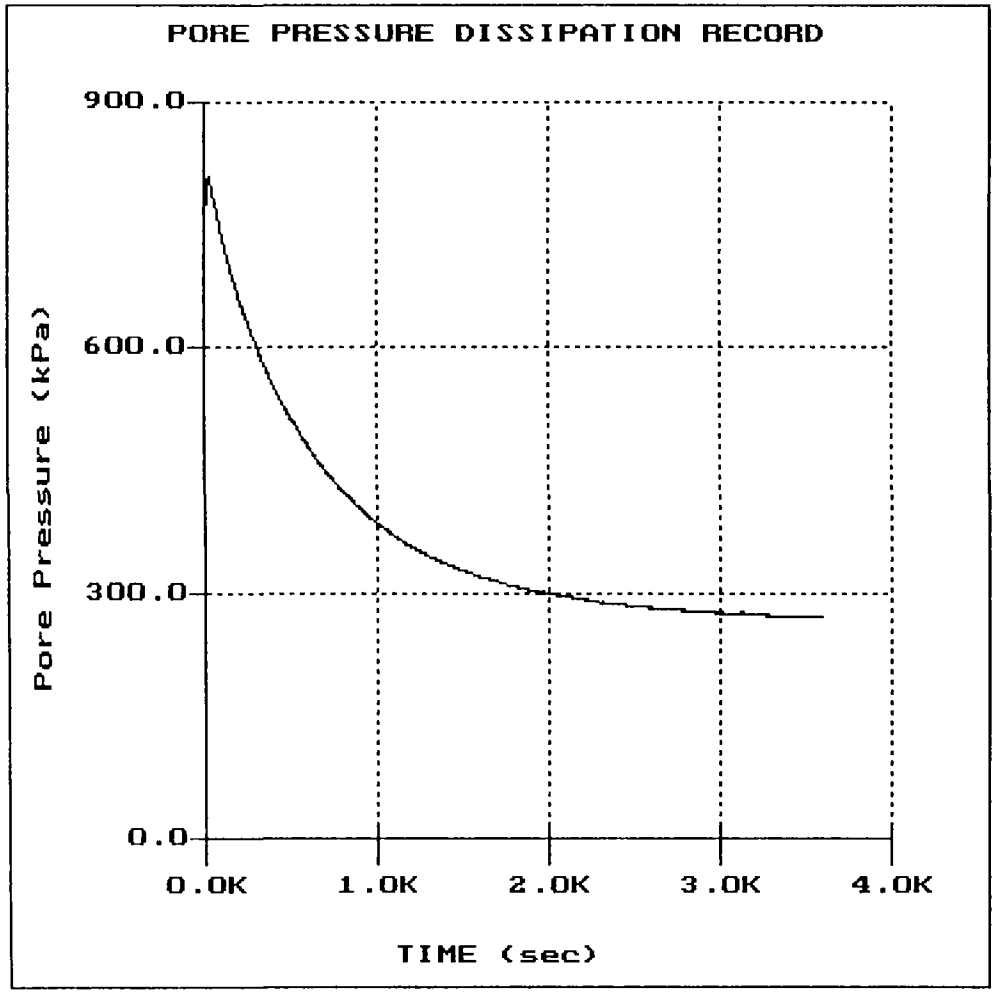


File: 300SC278.PPR
Depth (m): 8.50
(ft): 27.89
Duration : 7200.0s
U-min: 80.25 7165.0s
U-max: 365.89 0.0s

Legacy Parkway

SC-19-278
Location:STRUCTURE 19

Cone: 20 TON A 092
Date:02:14:00 11:39

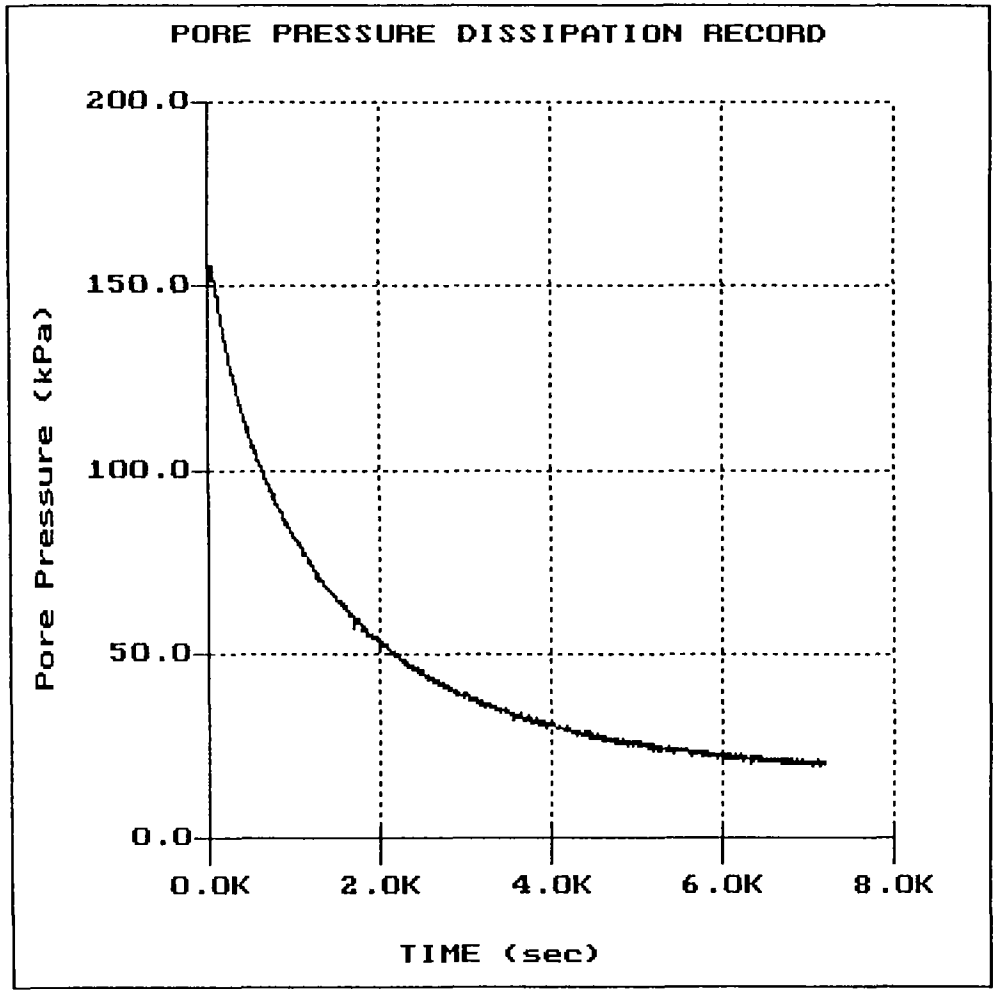


File: 300SC278.PPR
Depth (m): 24.75
(ft): 81.20
Duration : 3600.0s
U-min: 270.91 3590.0s
U-max: 809.78 25.0s

Legacy Parkway

SC-19-280
Location:STRUCTURE 19

Cone: 20 TON A 070
Date:03:02:00 10:15

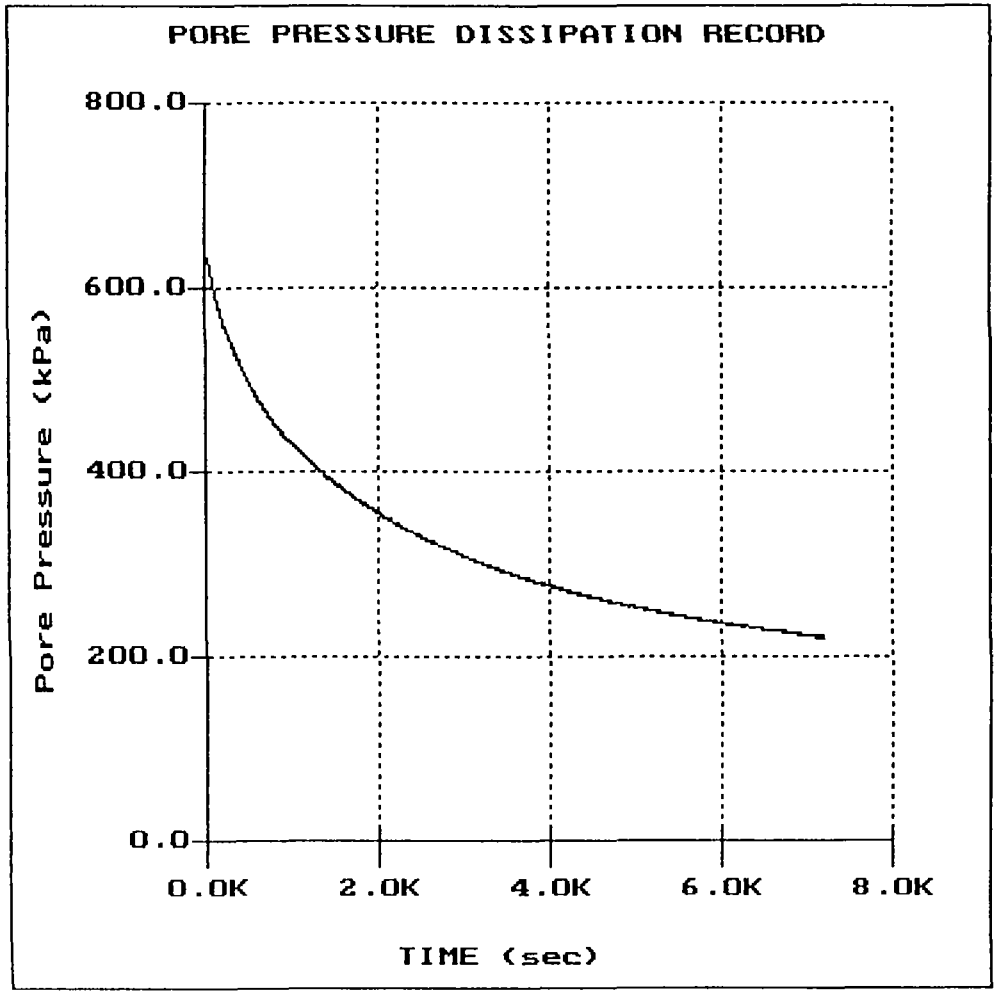


File: 300SC280.PPR
Depth (m): 4.70
(ft): 15.42
Duration : 7200.0s
U-min: 19.70 7130.0s
U-max: 167.85 0.0s

Legacy Parkway

SC-19-280
Location:STRUCTURE 19

Cone: 20 TON A 070
Date:03:02:00 10:15



File: 300SC280.PPR
Depth (m): 17.70
(ft): 58.07
Duration : 7200.0s
U-min: 220.18 7195.0s
U-max: 633.77 25.0s

F

SUMMARY OF L JORATORY TEST DATA

DESCRIPTION											
BORING NO.	LSB 19-471	→	LSB 19-473								→
SAMPLE DEPTH (m)	12.2	32.0	3.0	4.6	6.1	7.6	9.1	10.7	12.2	13.7	25.9
LINE											
STATION											
OFFSET (RT or LT)											
ELEVATION (m)											
SAMPLE TYPE											
DATE SAMPLED											
SOIL CLASSIFICATION (USCS)	CL	CL	CL	CL	CL	SP-SM	CL	ML	ML	CL	CL
GROUP CLASSIFICATION (AASHTO)											
SIEVE ANALYSIS (percent passing)											
9.5mm SQUARE OPENING											
NO. 4 (4760 microns)											
NO. 100 (147 microns)											
NO. 200 (74 microns)	83		81	67	87	8	94	94	97	95	
CLAY FRACTION (2 microns)											
MOISTURE CONTENT & UNIT WEIGHT											
MOISTURE CONTENT (%)											
WET UNIT WEIGHT (kN/m^3)											
DRY UNIT WEIGHT (kN/m^3)											
SPECIFIC GRAVITY											
ATTERBERG LIMITS											
LIQUID LIMIT, LL	42	35	32				30	36	35	36	42
PLASTICITY INDEX, PI	20	11	10				9	10	11	14	18
SHEAR STRENGTH											
UNDRAINED SHEAR STRENGTH, Su, (kPa)											
TORVANE (kPa)											
CORROSION											
pH											
RESISTIVITY (ohm-cm)											
WATER SOLUBLE SULFATE (ppm)											

UDOTSUM (LEGACY 2) 35-8163-05 P.D. 6/2/00

KLEINFELDER

Project No.: 35-8163-05

SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

PLATE

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SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	SB-19-274	SB-19-274	SB-19-274	SB-19-274	SB-19-274	SB-19-276	SB-19-276	SB-19-276	SB-19-276	SB-19-276
SAMPLE DEPTH (m)	12.19	15.24	21.34	25.91	32.00	1.52	13.72	18.29	21.64	24.38
LINE	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN
STATION	50+645.384	50+645.384	50+645.384	50+645.384	50+645.384	50+705.923	50+705.923	50+705.923	50+705.923	50+705.923
OFFSET (RT or LT)	0.04 RT	0.04 RT	0.04 RT	0.04 RT	0.04 RT	0.19 LT	0.19 LT	0.19 LT	0.19 LT	0.19 LT
ELEVATION (m)	1299.16	1299.16	1299.16	1299.16	1299.16	1302.07	1302.07	1302.07	1302.07	1302.07
SAMPLE TYPE	P	P	P	P	P	MC	SH	SH	SH	SH
DATE SAMPLED	2/3/2000	2/3/2000	2/3/2000	2/3/2000	2/3/2000	2/1/2000	2/1/2000	2/1/2000	2/1/2000	2/1/2000
SOIL CLASSIFICATION (USCS)		CL		SC		SP		CL		CL
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)		94		49				91		
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)		29		19				25		30
WET UNIT WEIGHT (kN/m^3)		19.3		20.2				21.3		19.0
DRY UNIT WEIGHT (kN/m^3)		14.9		17.1				17.1		14.6
SPECIFIC GRAVITY		2.75		2.77				2.84		2.83
ATTERBERG LIMITS										
LIQUID LIMIT, LL		36		68				35		36
PLASTICITY INDEX, PI		12		38				11		15
SHEAR STRENGTH										
UNDRAINED SHEAR STRENGTH, Su, (kPa)		90		94				150		127
TORVANE (kPa)	43	48	43	53	38		48	48	53	82
CORROSION										
pH						8.8				
RESISTIVITY (ohm cm)						1400				
WATER SOLUBLE SULFATE (ppm)						180				

KLEINFELDER

Project No.: 35-8163-05

SUMMARY OF LABORATORY TEST DATA
Legacy Parkway - Preferred Alternative
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PLATE
K-1123

UDOTSUM (LEGACY 2 35-8163-05 P.D. 6/20/0

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SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO.	SB-19-276	SB-19-279	SB-19-279	SB-19-279	SB-19-279	SB-19-279	SB-19-279	SB-19-279	SB-19-279	SB-19-279
SAMPLE DEPTH (m)	30.48	1.37	6.71	7.62	9.14	10.67	13.72	18.29	21.34	30.48
LINE	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN
STATION	50+705.923	50+775.871	50+775.871	50+775.871	50+775.871	50+775.871	50+775.871	50+775.871	50+775.871	50+775.871
OFFSET (RT or LT)	0.19 LT	5.71 RT	5.71 RT	5.71 RT	5.71 RT	5.71 RT	5.71 RT	5.71 RT	5.71 RT	5.71 RT
ELEVATION (m)	1302.07	1291.95	1291.95	1291.95	1291.95	1291.95	1291.95	1291.95	1291.95	1291.95
SAMPLE TYPE	SH	P	P	P	SPT	P	P	P	P	P
DATE SAMPLED	2/1/2000	3/3/2000	3/3/2000	3/3/2000	3/3/2000	3/3/2000	3/3/2000	3/3/2000	3/3/2000	3/3/2000
SOIL CLASSIFICATION (USCS)		CL	ML	CL		CL		CL		
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)			95		11					6
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)		31	34	34		31		30		
WET UNIT WEIGHT (kN/m^3)		18.1	19.4	18.7		19.4		19.2		
DRY UNIT WEIGHT (kN/m^3)		13.8	14.4	14.0		14.8		14.7		
SPECIFIC GRAVITY		2.76		2.81				2.70		
ATTERBERG LIMITS										
LIQUID LIMIT, LL		43	38			40				
PLASTICITY INDEX, PI		17	13			19				
SHEAR STRENGTH										
UNDRAINED SHEAR STRENGTH, Su, (kPa)			60			89				
TORVANE (kPa)	29	46	38	43		53	38	48	57	
CORROSION										
pH										
RESISTIVITY (ohm-cm)										
WATER SOLUBLE SULFATE (ppm)										

UDOTSUM (LEGACY 2) 35-8163-05 P.D. 6/2000

KLEINFELDER

Project No.: 35-8163-05

SUMMARY OF LABORATORY TEST DATA
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE
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SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	SB-19-279	SB-19-281	SB-19-281	SB-19-281	SB-19-281	SB-19-281	SB-19-281	SB-19-281		
SAMPLE DEPTH (m)	36.58	2.74	6.10	9.14	12.19	15.85	19.81	24.38		
LINE	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN	GLOVERS LN		
STATION	50+775.871	50+840.936	50+840.936	50+840.936	50+840.936	50+840.936	50+840.936	50+840.936		
OFFSET (RT or LT)	5.71 RT	7.44 RT	7.44 RT	7.44 RT	7.44 RT	7.44 RT	7.44 RT	7.44 RT		
ELEVATION (m)	1291.95	1291.98	1291.98	1291.98	1291.98	1291.98	1291.98	1291.98		
SAMPLE TYPE	SPT	P	P	P	P	P	SPT	P		
DATE SAMPLED	3/3/2000	2/2/2000	2/2/2000	2/2/2000	2/2/2000	2/2/2000	2/2/2000	2/2/2000		
SOIL CLASSIFICATION (USCS)	SM			CL		MH				
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING	100									
NO. 4 (4760 microns)	79									
NO. 100 (147 microns)	35									
NO. 200 (74 microns)	26			96		96				
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)				31		50				
WET UNIT WEIGHT (kN/m^3)				20.2		17.8				
DRY UNIT WEIGHT (kN/m^3)				15.4		11.8				
SPECIFIC GRAVITY				2.80		2.68				
ATTERBERG LIMITS										
LIQUID LIMIT, LL						50				
PLASTICITY INDEX, PI						16				
SHEAR STRENGTH										
UNDRAINED SHEAR STRENGTH, Su, (kPa)				59		93				
TORVANE (kPa)		43	38	48	48	29	48	34		
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

KLEINFELDER

Project No.: 35-8163-05

SUMMARY OF LABORATORY TEST DATA
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE
K-1125

UDOTSUM (LEGACY 2) 35-8163-05 P.D. 6/2/00

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SUMMARY OF L ORATORY TEST DATA

DESCRIPTION										
BORING NO.	RB-372	→	→	→	→	RB-370				
SAMPLE DEPTH (m)	6.7	9.1	12.2	12.8	12.8 (?)	13.7				
LINE										
STATION										
OFFSET (RT or LT)										
ELEVATION (m)										
SAMPLE TYPE										
DATE SAMPLED										
SOIL CLASSIFICATION (USCS)	SM	SM	SM	CL	SM	ML				
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)	27	46	26	89	27	93				
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)										
WET UNIT WEIGHT (kN/m^3)										
DRY UNIT WEIGHT (kN/m^3)										
SPECIFIC GRAVITY										
ATTERBERG LIMITS										
LIQUID LIMIT, LL		NP		35						
PLASTICITY INDEX, PI		NP		14						
SHEAR STRENGTH										
UNDRAINED SHEAR STRENGTH, Su, (kPa)										
TORVANE (kPa)										
CORROSION										
pH										
RESISTIVITY (ohm-cm)										
WATER SOLUBLE SULFATE (ppm)										

UDOTSUM (LEGACY 2) 35-8163-05 P.D. 6/2/00

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Project No.: 35-8163-05

SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

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SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO.	RB-370	RB-370	RB-370	RB-370						
SAMPLE DEPTH (m)	6.10	10.67	18.29	21.34						
LINE	Glovers Lane	Glovers Lane	Glovers Lane	Glovers Lane						
STATION	50+571.674	50+571.674	50+571.674	50+571.674						
OFFSET (RT or LT)	7.54 RT	7.54 RT	7.54 RT	7.54 RT						
ELEVATION (m)	1295.03	1295.03	1295.03	1295.03						
SAMPLE TYPE	SH	MC	SH	SH						
DATE SAMPLED	3/14/2000	3/14/2000	3/14/2000	3/14/2000						
SOIL CLASSIFICATION (USCS)		SP-SM	ML							
GROUP CLASSIFICATION (AASHTO)		A-2-4								
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING		100								
NO. 4 (4760 microns)		100								
NO. 100 (147 microns)		46								
NO. 200 (74 microns)		11								
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)			43							
WET UNIT WEIGHT (kN/m^3)			18.2							
DRY UNIT WEIGHT (kN/m^3)			12.7							
SPECIFIC GRAVITY			2.77							
ATTERBERG LIMITS										
LIQUID LIMIT, LL			44							
PLASTICITY INDEX, PI			16							
SHEAR STRENGTH										
~~UNDRAINED SHEAR STRENGTH, Su~~ Qu (kPa)			127							
TORVANE (kPa)	43		53	57						
CORROSION										
pH										
RESISTIVITY (ohm-cm)										
WATER SOLUBLE SULFATE (ppm)										

KLEINFELDER

Project No.: 35-8163-05

SUMMARY OF LABORATORY TEST DATA
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE
K-1188

UDOTSUM (LEGACY 2) 35-8163-05 P.D. 6/2/00

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SUMMARY OF LABC ATORY TEST DATA

DESCRIPTION										
BORING NO	RB-371	RB-371	RB-371	RB-371	RB-371	RB-371	RB-371	RB-371	RB-371	RB-371
SAMPLE DEPTH (m)	0.61	3.05	6.10	9.14	12.19	15.24	16.76	17.37	19.81	25.91
LINE	500 South	500 South	500 South	500 South	500 South	500 South	500 South	500 South	500 South	500 South
STATION	70+338.171	70+338.171	70+338.171	70+338.171	70+338.171	70+338.171	70+338.171	70+338.171	70+338.171	70+338.171
OFFSET (RT or LT)	0.29 RT	0.29 RT	0.29 RT	0.29 RT	0.29 RT	0.29 RT	0.29 RT	0.29 RT	0.29 RT	0.29 RT
ELEVATION (m)	1286.83	1286.83	1286.83	1286.83	1286.83	1286.83	1286.83	1286.83	1286.83	1286.83
SAMPLE TYPE	SPT	P	P	P	P	P	P	P	P	P
DATE SAMPLED	2/28/2000	2/28/2000	2/28/2000	2/28/2000	2/28/2000	2/28/2000	2/28/2000	2/28/2000	2/28/2000	2/28/2000
SOIL CLASSIFICATION (USCS)		CL							CL	
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)		97							86	
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)		34							17	
WET UNIT WEIGHT (kN/m^3)		19.2							21.7	
DRY UNIT WEIGHT (kN/m^3)		14.3							18.5	
SPECIFIC GRAVITY		2.68							2.81	
ATTERBERG LIMITS										
LIQUID LIMIT, LL		42							29	
PLASTICITY INDEX, PI		22							13	
SHEAR STRENGTH										
~~UNDRAINED SHEAR STRENGTH, Su,~~ (kPa)		43							63	
TORVANE (kPa)	29	38	62	86	38	48	96	96	86	86
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

KLEINFELDER

Project No.: 35-8163-05

SUMMARY OF LABORATORY TEST DATA
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE
K-1189

UDOTSUM/LEGACY 21 35-8163-05 P.D. 6/2/00

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SUMMARY OF LABOR..TORY TEST DATA

DESCRIPTION										
BORING NO.	RB-417	RB-417	RB-417	RB-417	RB-418	RB-418	RB-419	RB-420	RB-420	RB-420
SAMPLE DEPTH (m)	1.52	4.57	6.10	7.62	1.52	4.57	3.66	1.52	4.57	7.62
LINE	D Mainline	D Mainline	D Mainline	D Mainline	D Mainline	D Mainline	D Mainline	D Mainline	D Mainline	D Mainline
STATION	6017+700.000	6017+700.000	6017+700.000	6017+700.000	6017+960.001	6017+960.001	6018+299.985	6019+470.000	6019+470.000	6019+470.000
OFFSET (RT or LT)	0.00 RT	0.00 RT	0.00 RT	0.00 RT	0.19 RT	0.19 RT	3.00 LT	0.00 RT	0.00 RT	0.00 RT
ELEVATION (m)	1284.89	1284.89	1284.89	1284.89	1284.89	1284.89	1288.08	1297.29	1297.29	1297.29
SAMPLE TYPE	SH	SH	MC	SH	SH	SH	SPT	SH	SH	SH
DATE SAMPLED	5/19/2000	5/19/2000	5/19/2000	5/19/2000	5/10/2000	5/10/2000	5/10/2000	5/11/2000	5/11/2000	5/11/2000
SOIL CLASSIFICATION (USCS)		CL		CL	CL	SM			CL	
GROUP CLASSIFICATION (AASHTO)				A-3	A-7-6					
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)	78		70	97		93	53		84	
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)				38	29	36			28	
WET UNIT WEIGHT (kN/m^3)				18.4	19.0	18.3			21.2	
DRY UNIT WEIGHT (kN/m^3)				13.3	14.7	13.5			16.6	
SPECIFIC GRAVITY		2.77			2.78	2.82			2.77	
ATTERBERG LIMITS										
LIQUID LIMIT, LL		33			43				39	
PLASTICITY INDEX, PI		12			21				18	
SHEAR STRENGTH										
UNDRAINED SHEAR STRENGTH, Su, (kPa)				34	84				50	
TORVANE (kPa)	53	24		24	77	19		41	43	43
CORROSION										
pH										
RESISTIVITY (ohm-cm)										
WATER SOLUBLE SULFATE (ppm)										

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SUMMARY OF LABORATORY TEST DATA

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PLATE

K-1228

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SUMMARY OF LAE RATORY TEST DATA

DESCRIPTION										
BORING NO	RB-421	RB-421	RB-421	RB-421	RB-422	RB-422	RB-422	RB-422	RB-423	RB-423
SAMPLE DEPTH (m)	1.52	4.57	6.71	7.62	1.52	3.66	6.10	7.62	2.13	8.53
LINE	D Mainline	D Mainline	D Mainline	D Mainline	D Mainline	D Mainline	D Mainline	D Mainline	Burke Lane	Burke Lane
STATION	6019+900.000	6019+900.000	6019+900.000	6019+900.000	6020+210.000	6020+210.000	6020+210.000	6020+210.000	4+220.000	4+220.000
OFFSET (RT or LT)	0.00 RT	0.00 RT	0.00 RT	0.00 RT	0.00 RT	0.00 RT	0.00 RT	0.00 RT	0.00 RT	0.00 RT
ELEVATION (m)	1297.92	1297.92	1297.92	1297.92	1295.40	1295.40	1295.40	1295.40	1291.57	1291.57
SAMPLE TYPE	SH	SH	SPT	SH	SH	SPT	SH	SH	SPT	SPT
DATE SAMPLED	5/17/2000	5/17/2000	5/17/2000	5/17/2000	5/11/2000	5/11/2000	5/11/2000	5/11/2000	5/12/2000	5/12/2000
SOIL CLASSIFICATION (USCS)	CL		SM				CL			
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)	75		18			21			70	92
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)	20		23				27			
WET UNIT WEIGHT (kN/m^3)	20.3						18.9			
DRY UNIT WEIGHT (kN/m^3)	16.9						14.8			
SPECIFIC GRAVITY	2.71									
ATTERBERG LIMITS										
LIQUID LIMIT, LL	36						36			
PLASTICITY INDEX, PI	14						16			
SHEAR STRENGTH										
UNDRAINED SHEAR STRENGTH, Su, (kPa)	109						149			
TORVANE (kPa)	62	53		48	34		57	48		
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

UDOTSUM (LEGACY 2): 35-8163-05 P.D. 6/2/00

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SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

PLATE

K-1229

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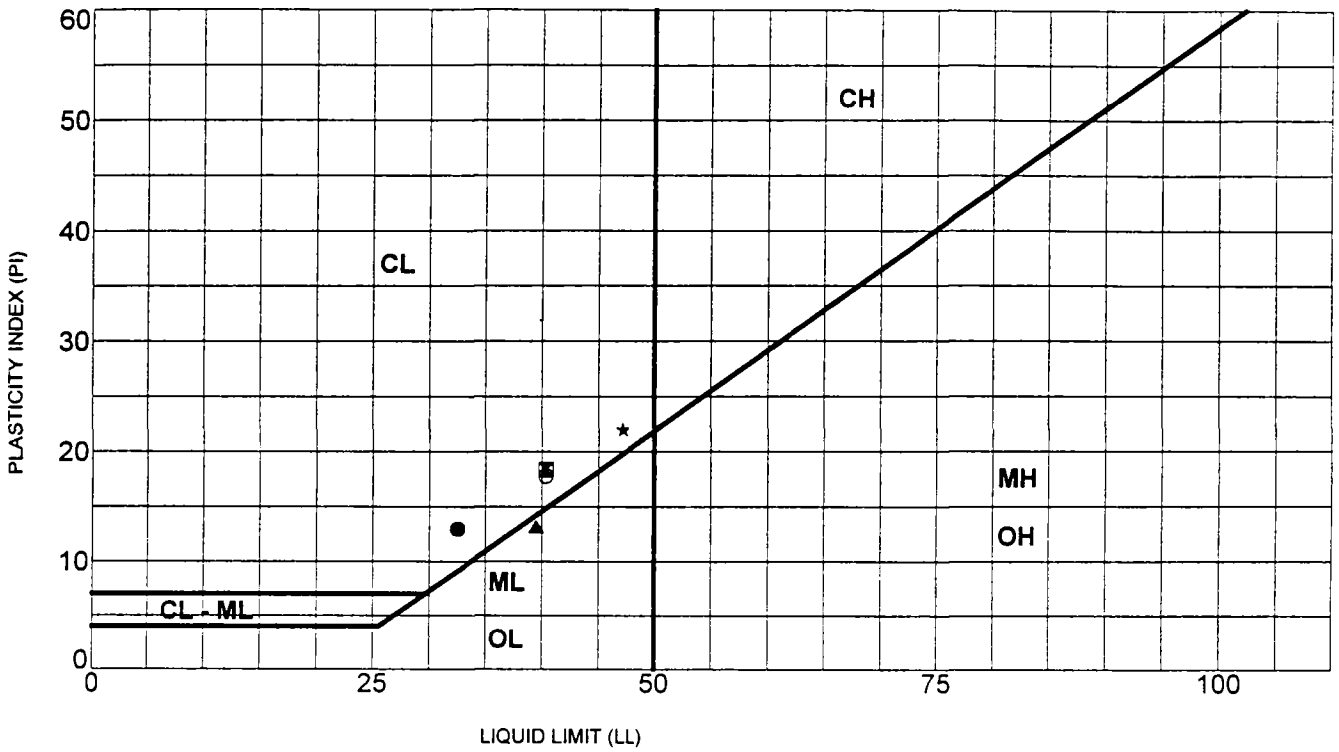

	Sample	Depth (m)	LL	PL	PI	Description
●	SB-18-272	4.6	32	20	13	Lean CLAY (CL)
⧗	SB-18-272	10.7	40	22	18	Lean CLAY (CL)
▲	SB-18-272	13.7	39	26	13	SILT (ML)
★	SB-18-272	36.6	47	25	22	Lean CLAY (CL)
○	SB-18-272	48.8	40	23	18	Lean CLAY (CL)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

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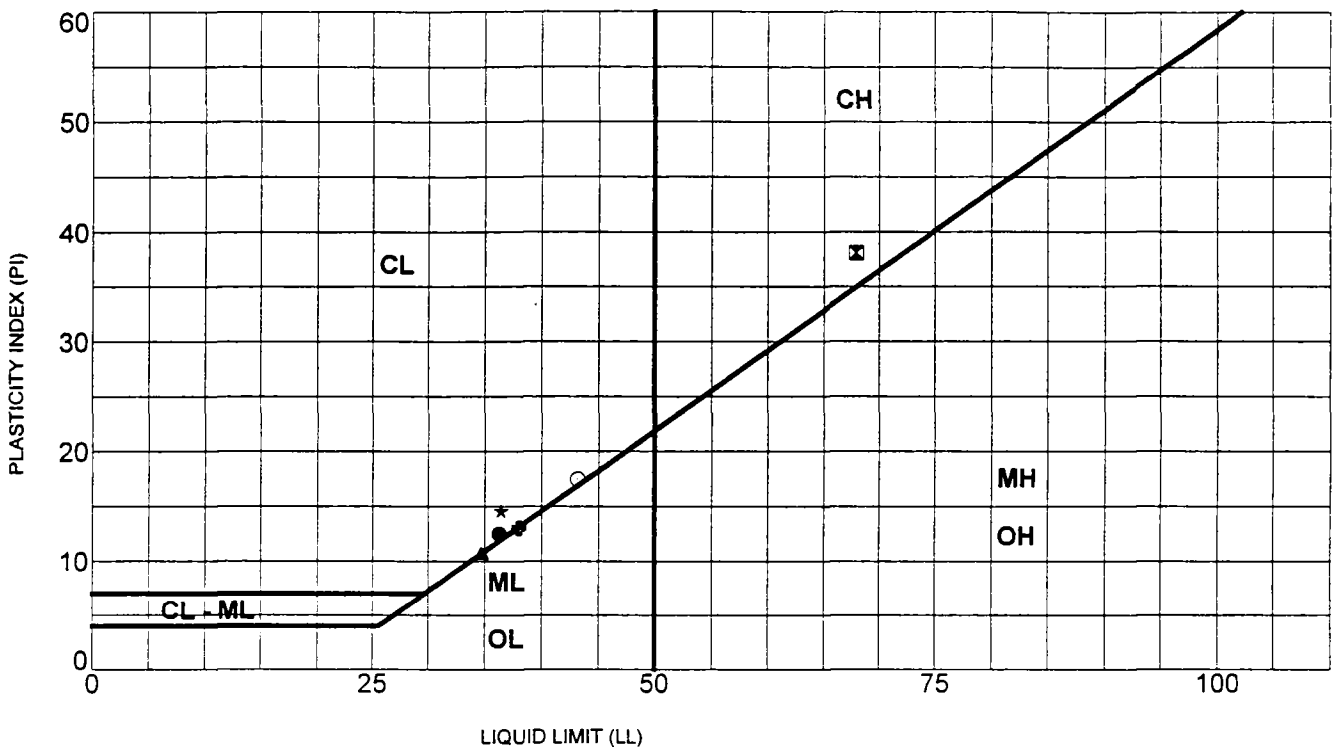
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE
K-17



	Sample	Depth (m)	LL	PL	PI	Description
●	SB-19-274	15.2	36	24	12	Lean CLAY (CL)
⊠	SB-19-274	25.9	68	30	38	Clayey SAND (SC)
▲	SB-19-276	18.3	35	24	11	Lean CLAY (CL)
★	SB-19-276	24.4	36	22	15	Lean CLAY (CL)
○	SB-19-279	1.4	43	26	17	Lean CLAY (CL)
✪	SB-19-279	6.7	38	25	13	SILT (ML)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

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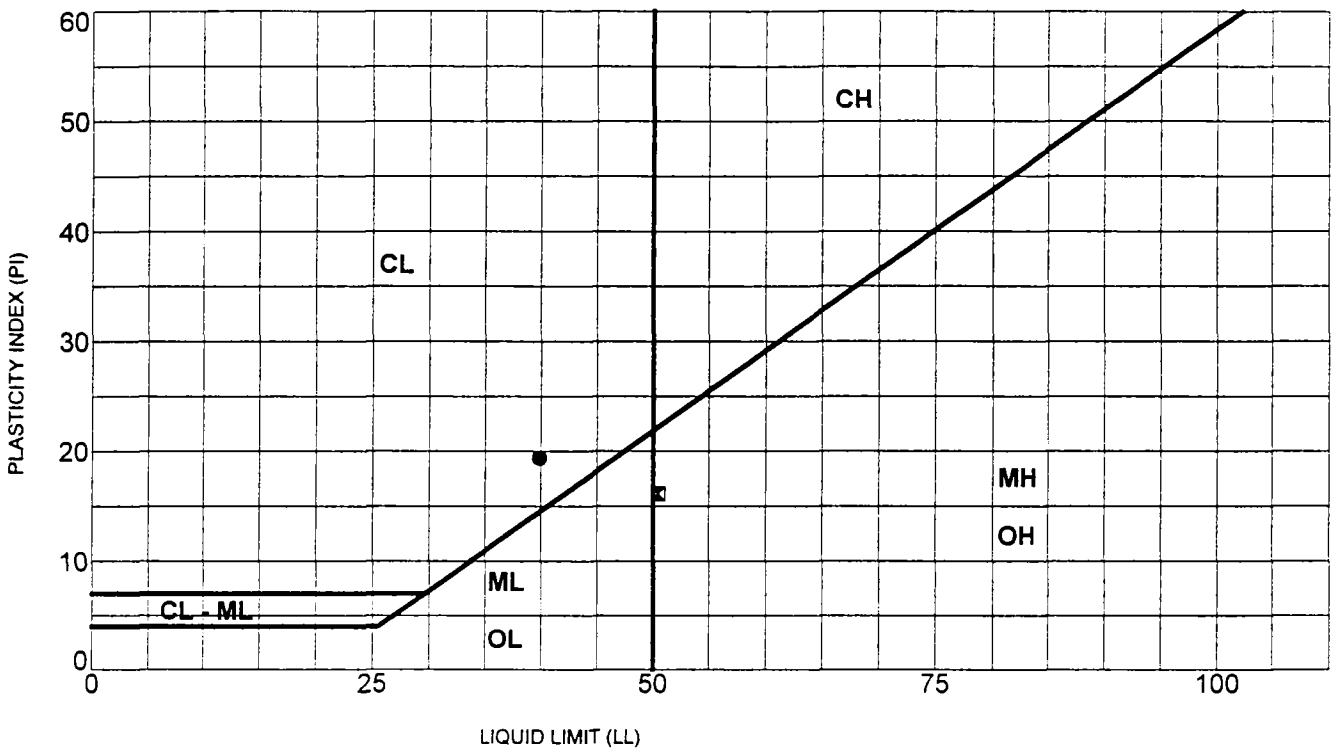
PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE
K-18



	Sample	Depth (m)	LL	PL	PI	Description
●	SB-19-279	10.7	40	20	19	Lean CLAY (CL)
⧗	SB-19-281	15.8	50	34	16	Elastic SILT (MH)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

KLEINFELDER

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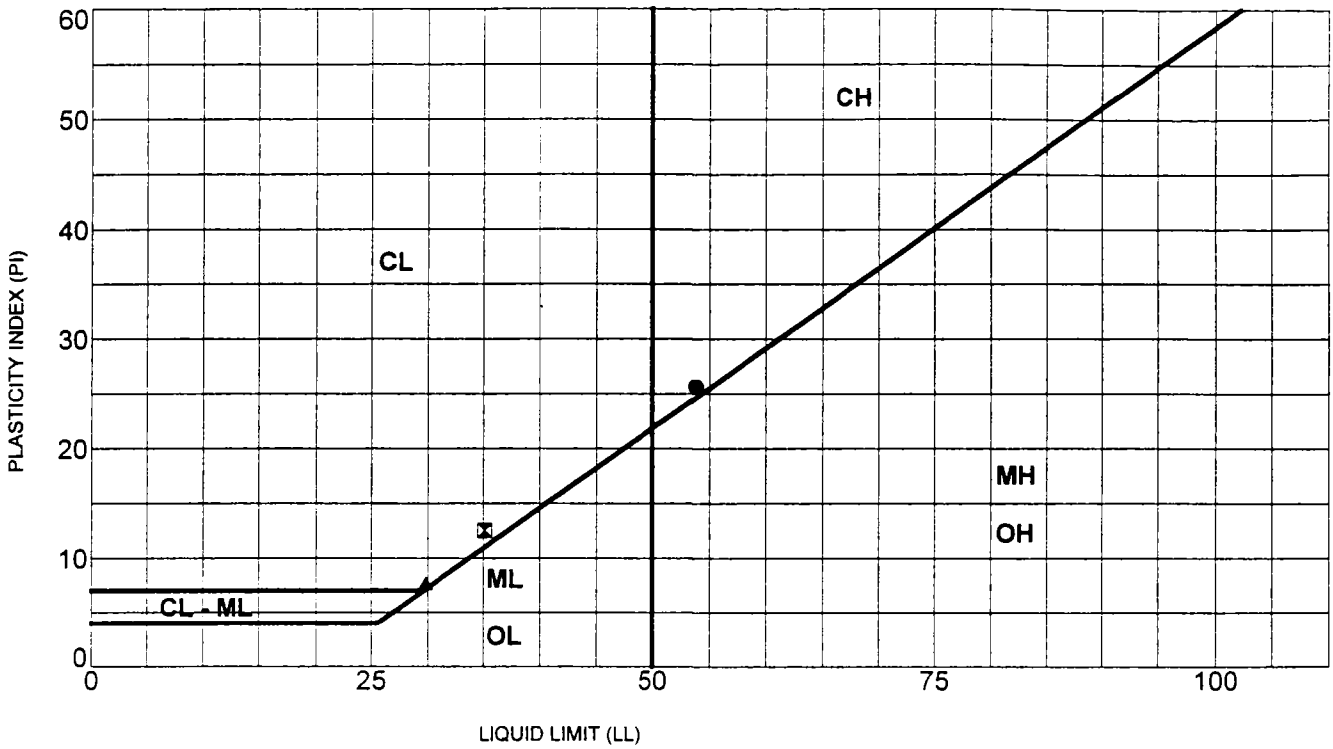
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE
K-19



	Sample	Depth (m)	LL	PL	PI	Description
●	SB-21-282	7.6	54	28	26	Fat CLAY (CH)
⧗	SB-21-282	16.8	35	23	13	Lean CLAY (CL)
▲	SB-21-284	21.3	30	22	8	Lean CLAY (CL)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

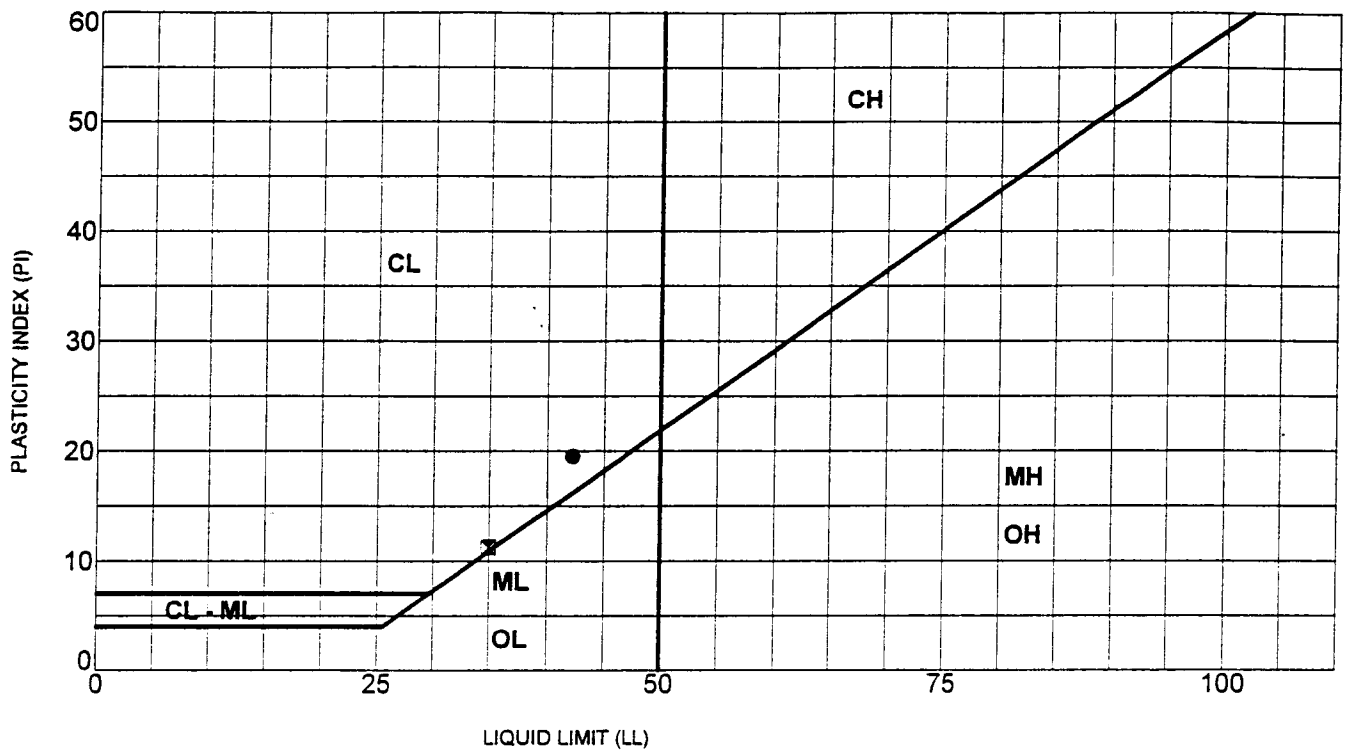
KLEINFELDER

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE
K-20

PROJECT NO. 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	LSB-19-471	12.2	42	23	20	Lean CLAY with sand (CL)
⧗	LSB-19-471	32.0	35	24	11	Lean CLAY (CL)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

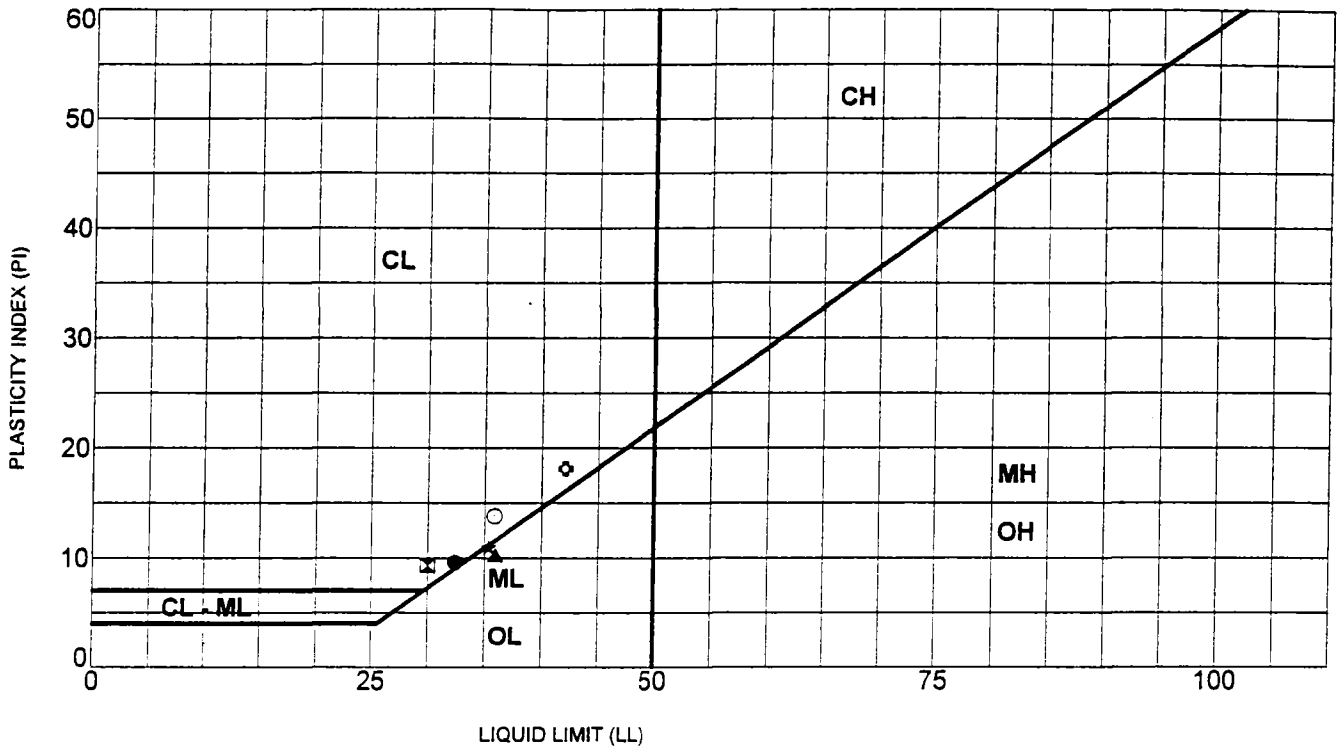
KLEINFELDER

PROJECT NO. 35-8440-08

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE
K-1



	Sample	Depth (m)	LL	PL	PI	Description
●	LSB-19-473	3.0	32	23	10	Lean CLAY with sand (CL)
⧗	LSB-19-473	9.1	30	21	9	Lean CLAY (CL)
▲	LSB-19-473	10.7	36	26	10	SILT (ML)
★	LSB-19-473	12.2	35	24	11	SILT (ML)
○	LSB-19-473	13.7	36	22	14	Lean CLAY (CL)
✿	LSB-19-473	25.9	42	24	18	Lean CLAY (CL)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

KLEINFELDER

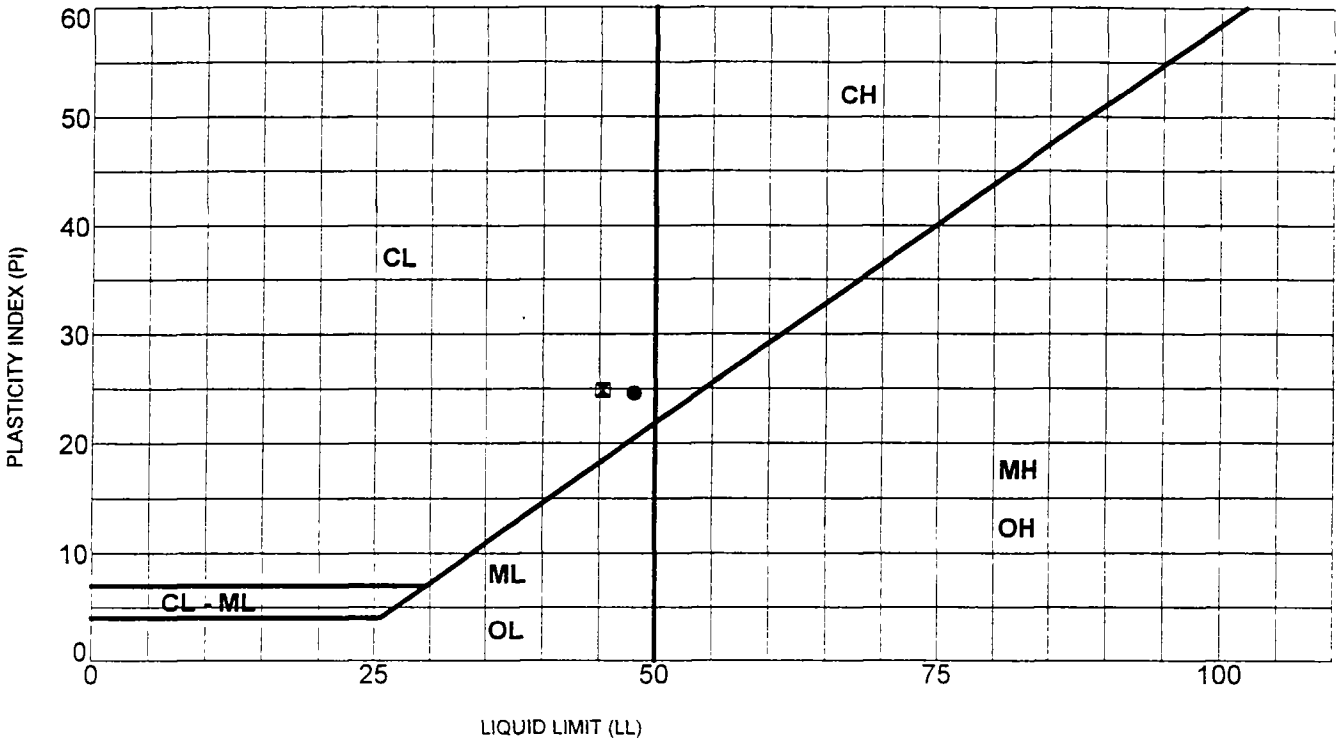
35-8440-08

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-2



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-369	1.5	48	23	25	Lean CLAY (CL)
⧗	RB-369	13.7	45	20	25	Lean CLAY (CL)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50		LL ≥ 50
ML	Inorganic clayey silts to very fine sands of low plasticity	MH	Inorganic silts and clayey silts of high plasticity
CL	Inorganic clays of low to medium plasticity	CH	Inorganic clays of high plasticity
OL	Organic silts and organic silty clays of low plasticity	OH	Organic clays of medium to high plasticity and organic silts

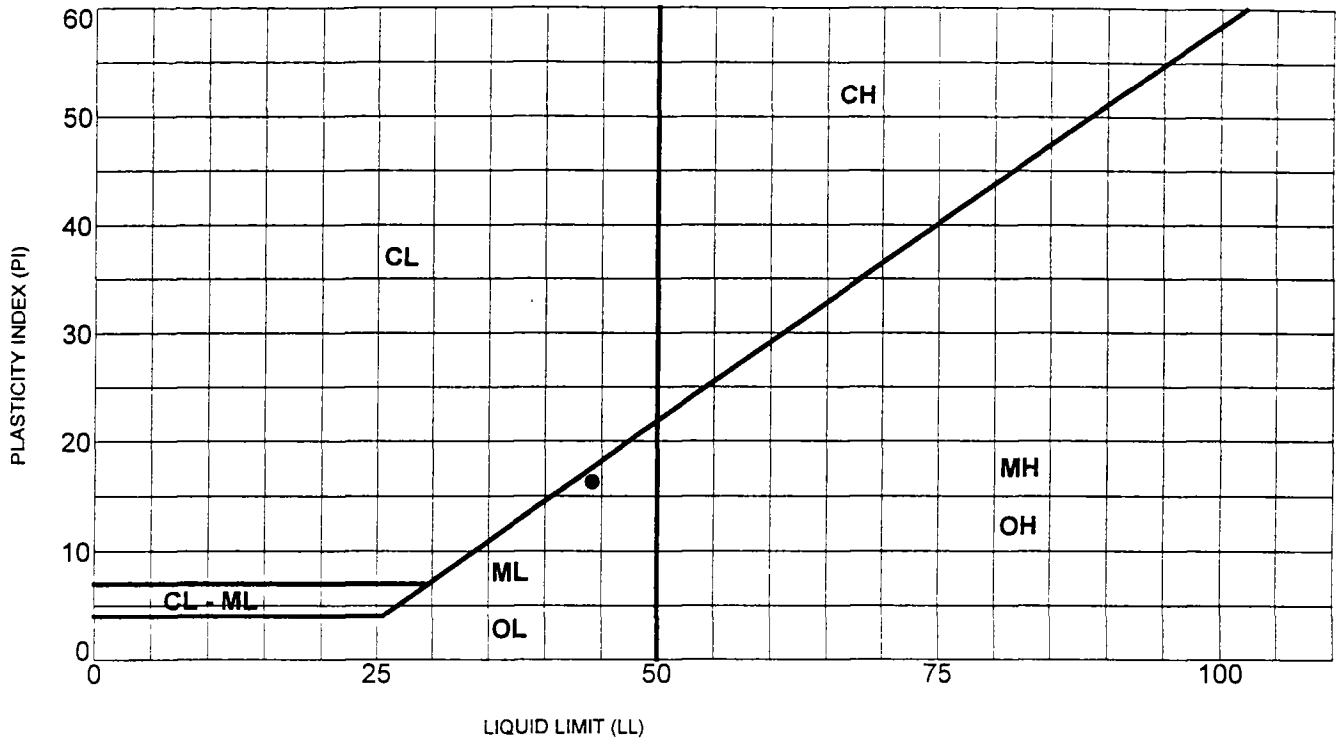
KLEINFELDER

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE
K-65

PROJECT NO. 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-370	18.3	44	28	16	SILT (ML)

LL - Liquid Limit
PL - Plastic Limit

PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

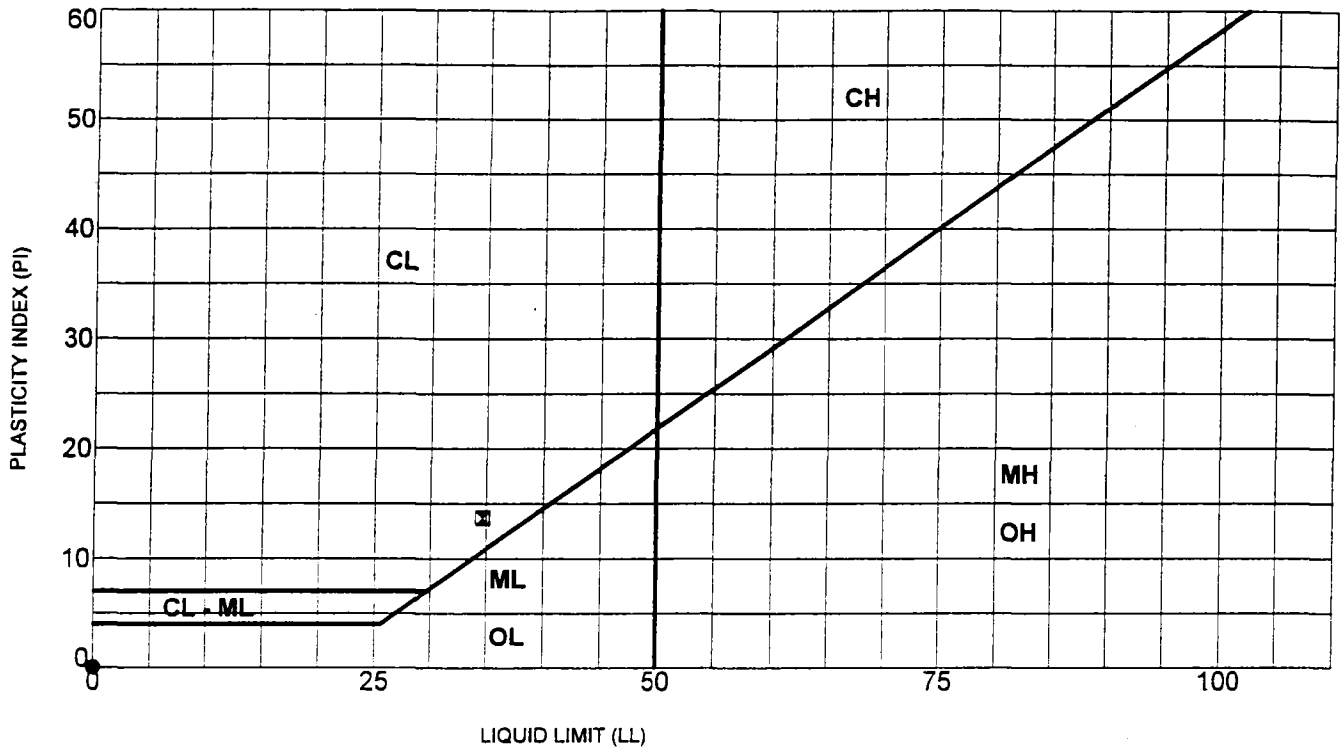
KLEINFELDER

Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE
K-66

PROJECT NO 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-370	9.1	NP	NP	NP	Silty SAND (SM)
⧗	RB-370	12.8	35	21	14	Lean CLAY (CL)

LL - Liquid Limit

PL - Plastic Limit

PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

KLEINFELDER

PROJECT NO. 35-8440-06

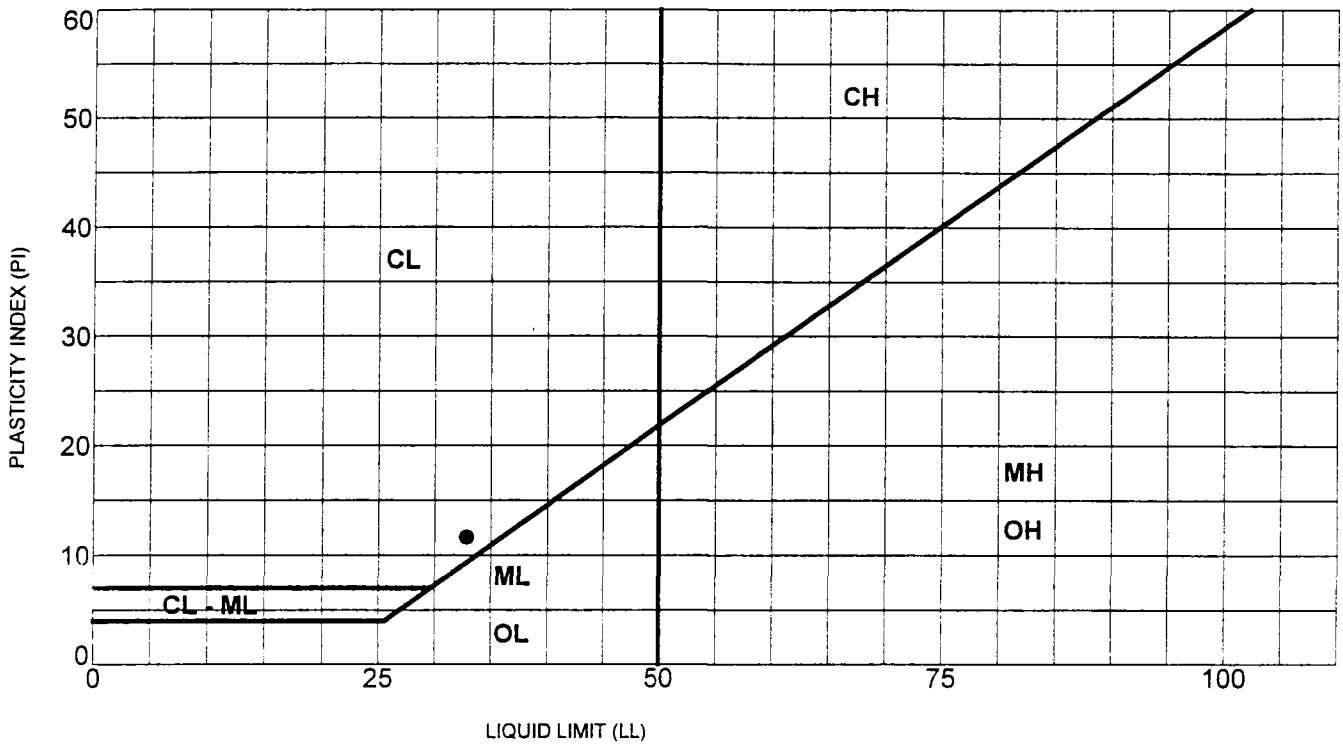
Legacy Parkway Design/Build

I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-1



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-417	4.6	33	21	12	Lean CLAY with sand (CL)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

KLEINFELDER

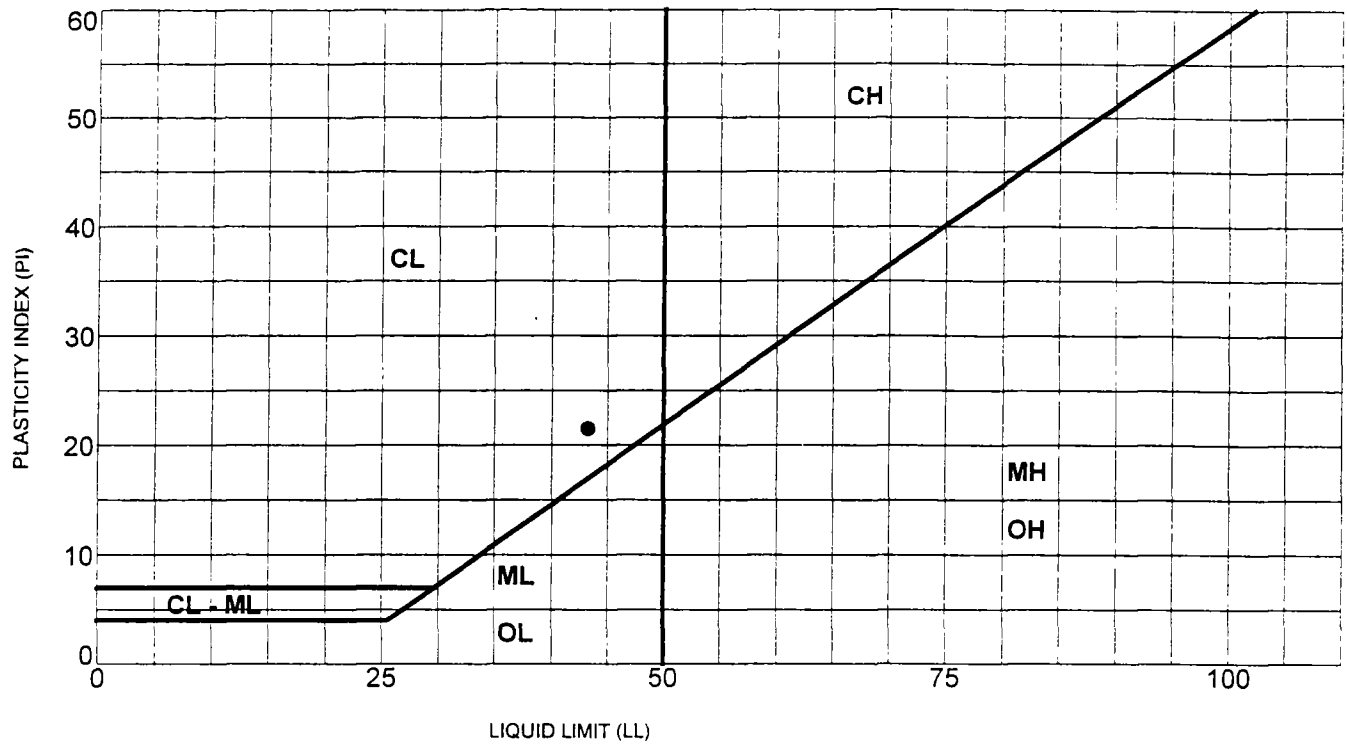
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-107

PROJECT NO. 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-418	1.5	43	22	21	Lean CLAY (CL)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

KLEINFELDER

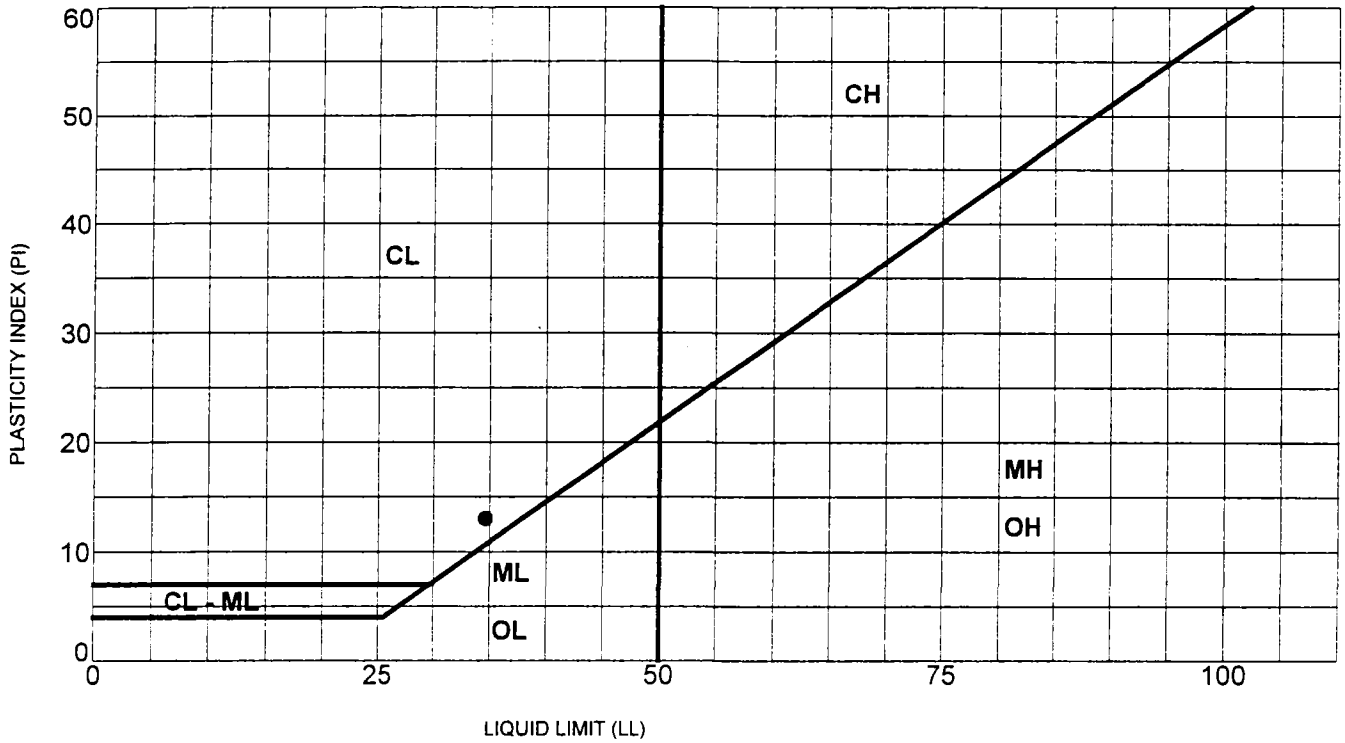
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-108

PROJECT NO 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-419	6.7	35	22	13	()

LL - Liquid Limit
PL - Plastic Limit

PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

KLEINFELDER

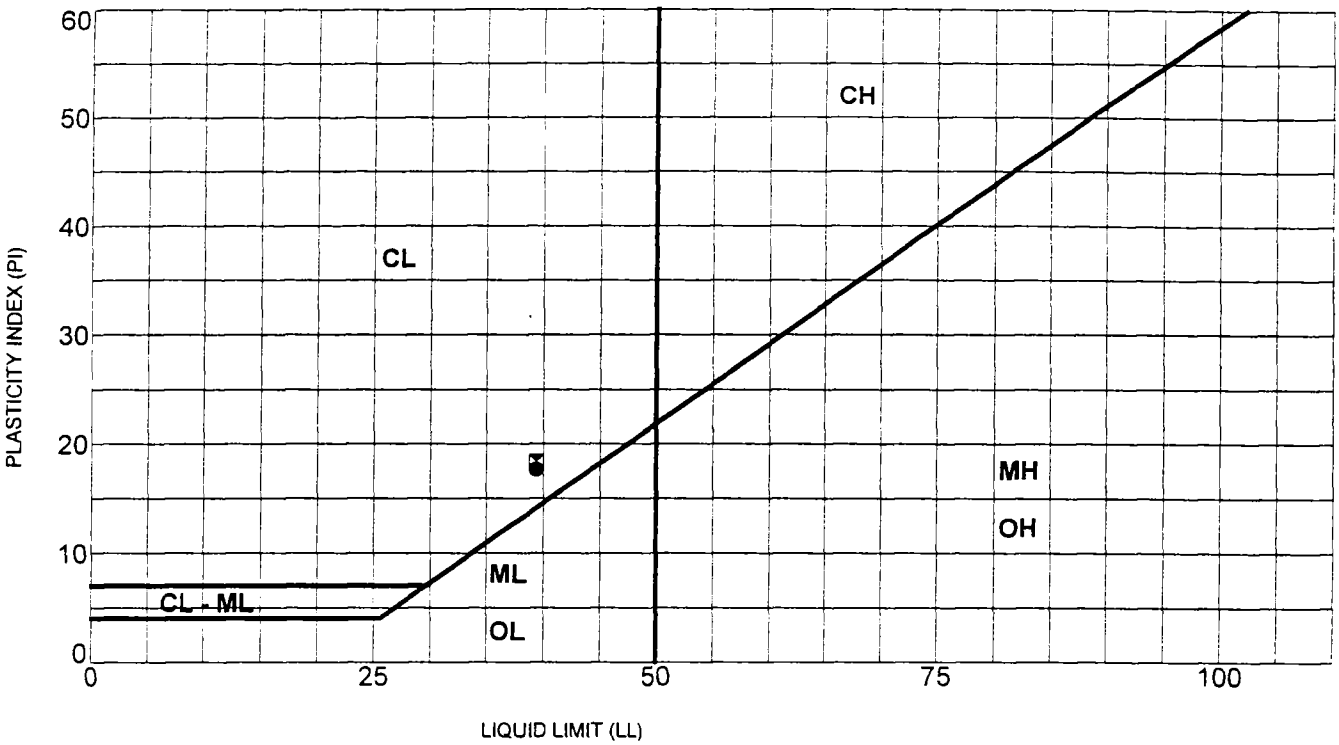
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-109

PROJECT NO. 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-420	4.6	39	22	18	Lean CLAY (CL)
⧗	RB-420	8.2	39	21	18	Lean CLAY (CL)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

KLEINFELDER

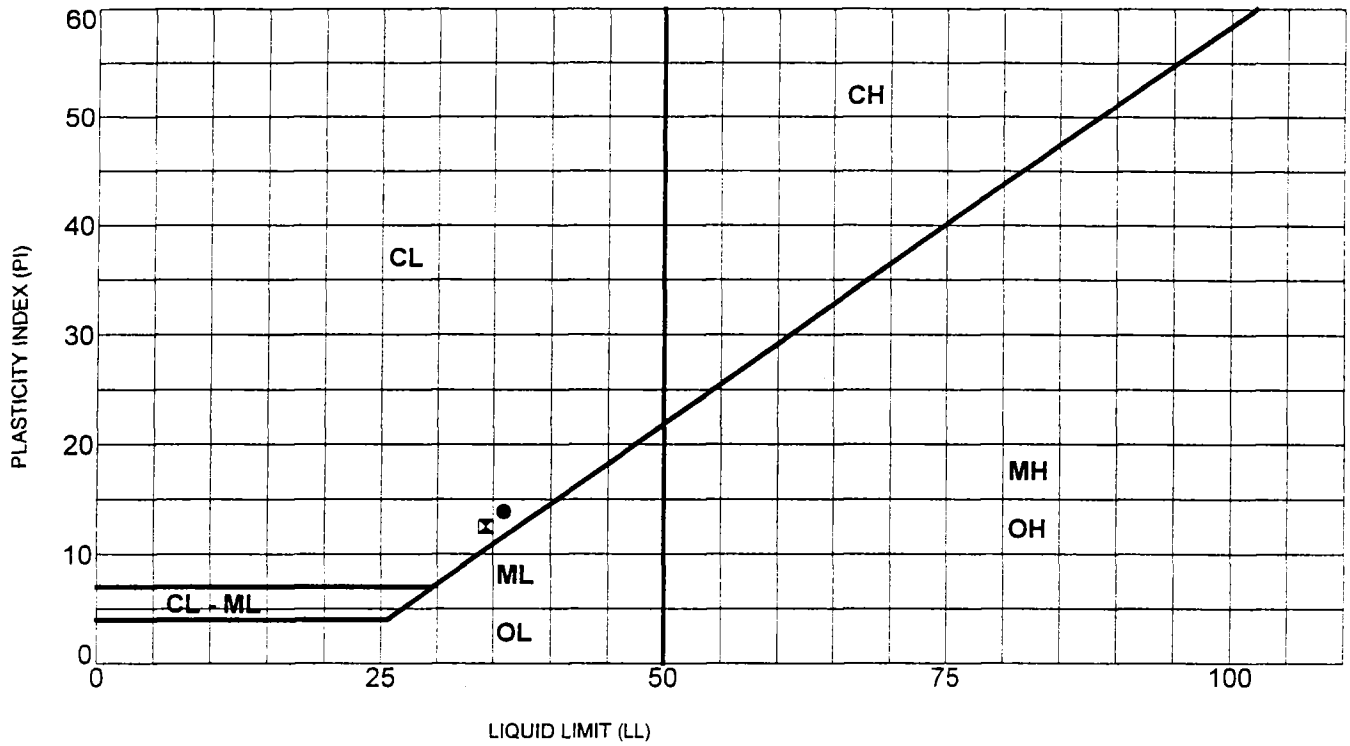
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-110

PROJECT NO. 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-421	1.5	36	22	14	Lean CLAY (CL)
⊠	RB-421	3.7	34	22	13	Lean CLAY (CL)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

KLEINFELDER

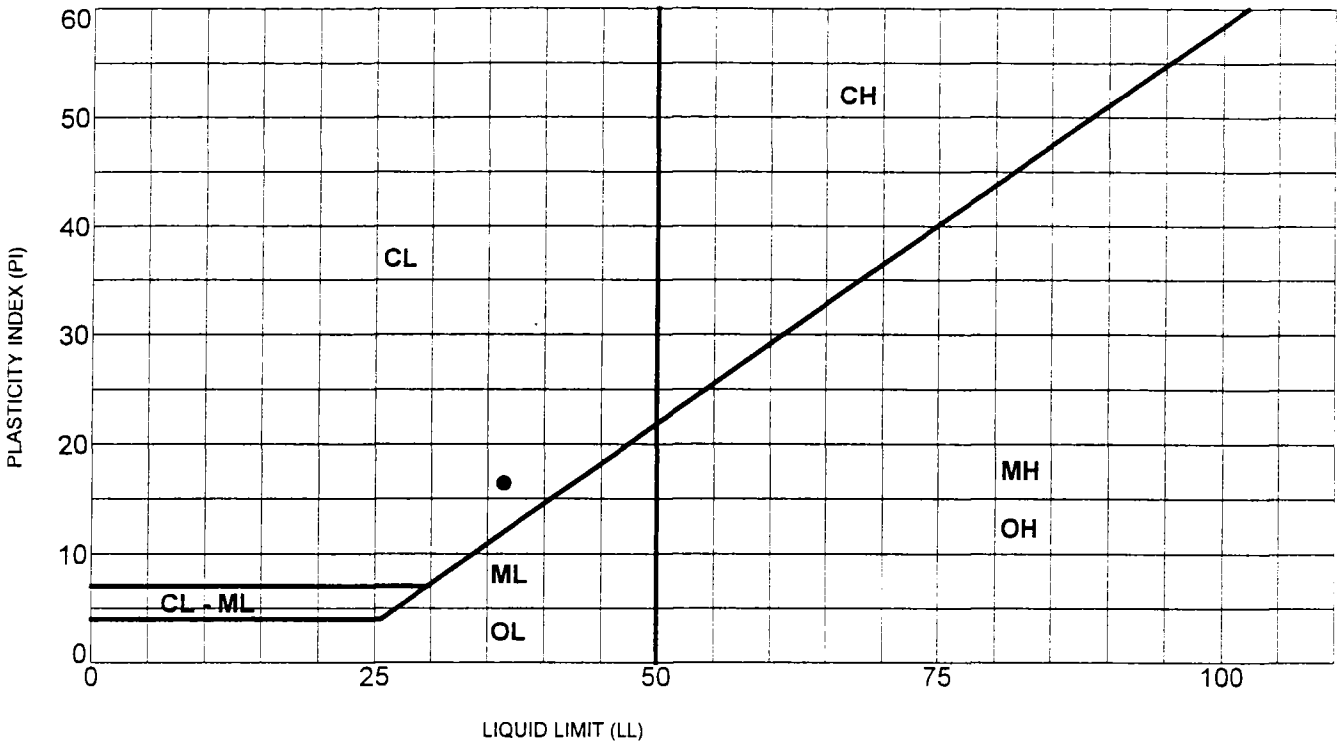
PROJECT NO. 35-8163-05

I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-111



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-422	6.1	36	20	16	Lean CLAY (CL)

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

Unified Soil Classification
Fine Grained Soil Groups

	LL < 50
ML	Inorganic clayey silts to very fine sands of low plasticity
CL	Inorganic clays of low to medium plasticity
OL	Organic silts and organic silty clays of low plasticity

	LL ≥ 50
MH	Inorganic silts and clayey silts of high plasticity
CH	Inorganic clays of high plasticity
OH	Organic clays of medium to high plasticity and organic silts

KLEINFELDER

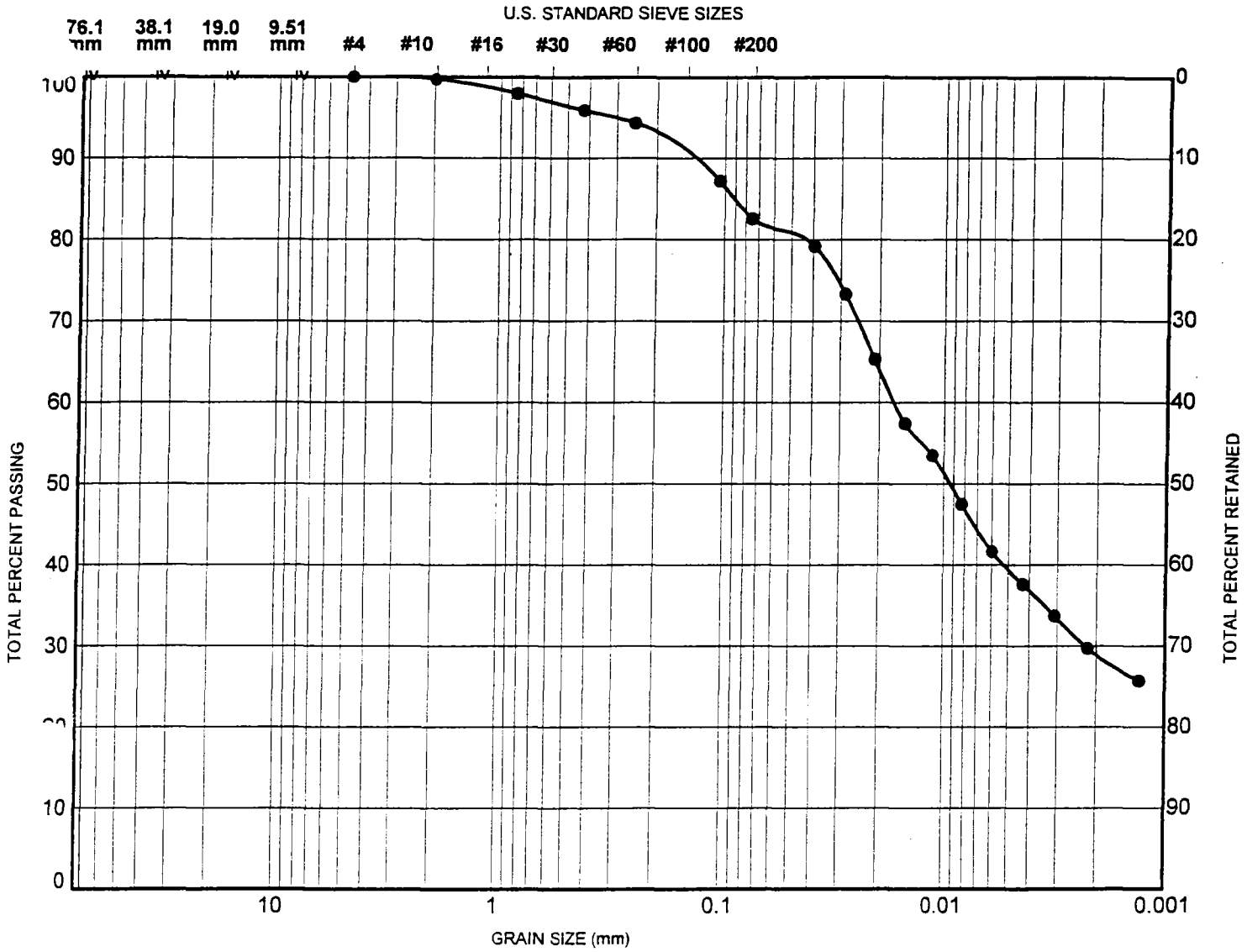
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-112

PROJECT NO. 35-8163-05



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	LSB-19-471	12.2	Lean CLAY with sand	CL

KLEINFELDER

PROJECT NO. 35-8440-08

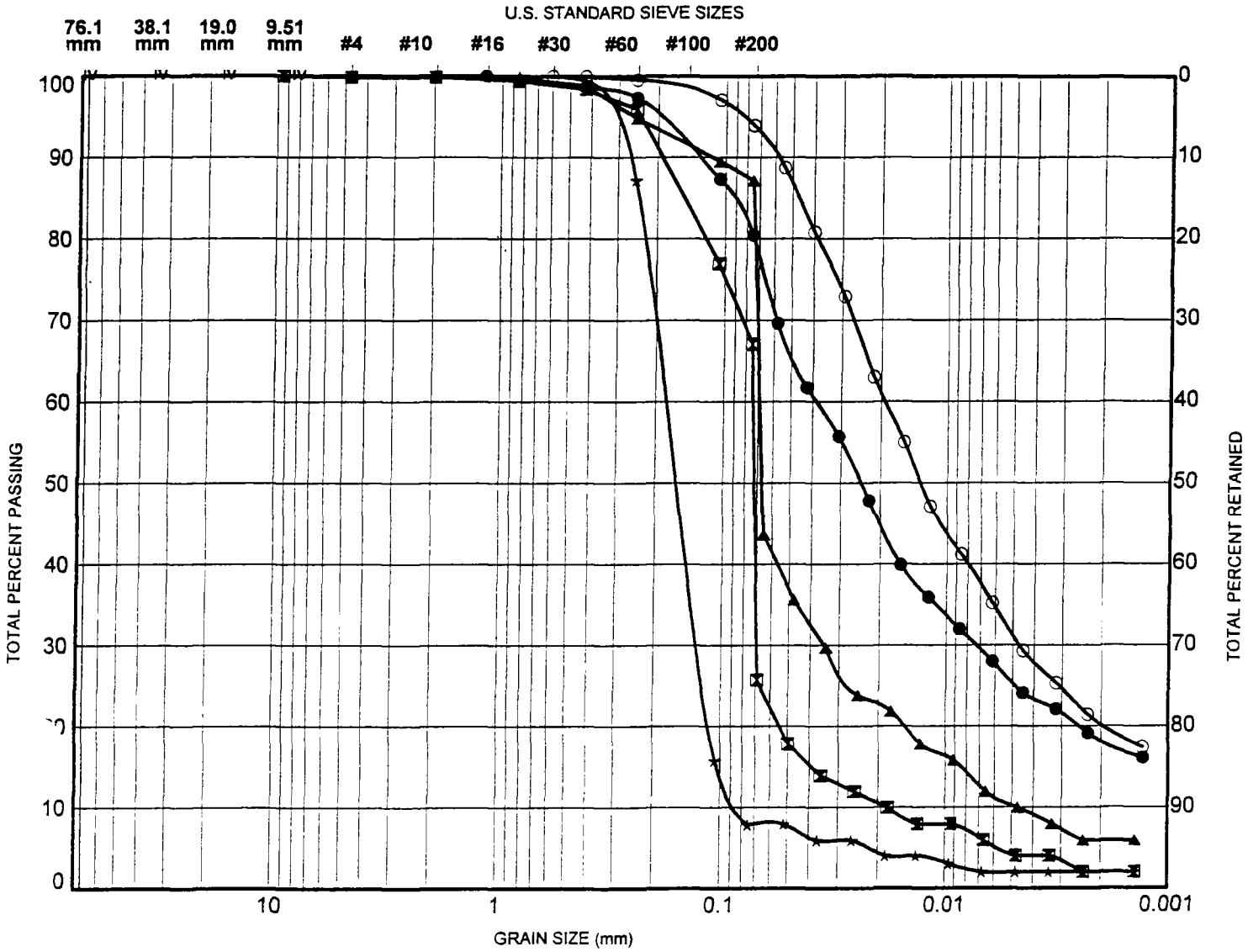
Legacy Parkway Design/Build

I-215 to I-15/US 89 Interchange

GRAIN SIZE DISTRIBUTION

PLATE

K-3



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	LSB-19-473	3.0	Lean CLAY with sand	CL
⧗	LSB-19-473	4.6	Sandy Lean CLAY	CL
▲	LSB-19-473	6.1	Lean CLAY with sand	CL
★	LSB-19-473	7.6	Poorly Graded SAND with silt	SP-SM
○	LSB-19-473	9.1	Lean CLAY	CL

KLEINFELDER

Legacy Parkway Design/Build

I-215 to I-15/US 89 Interchange

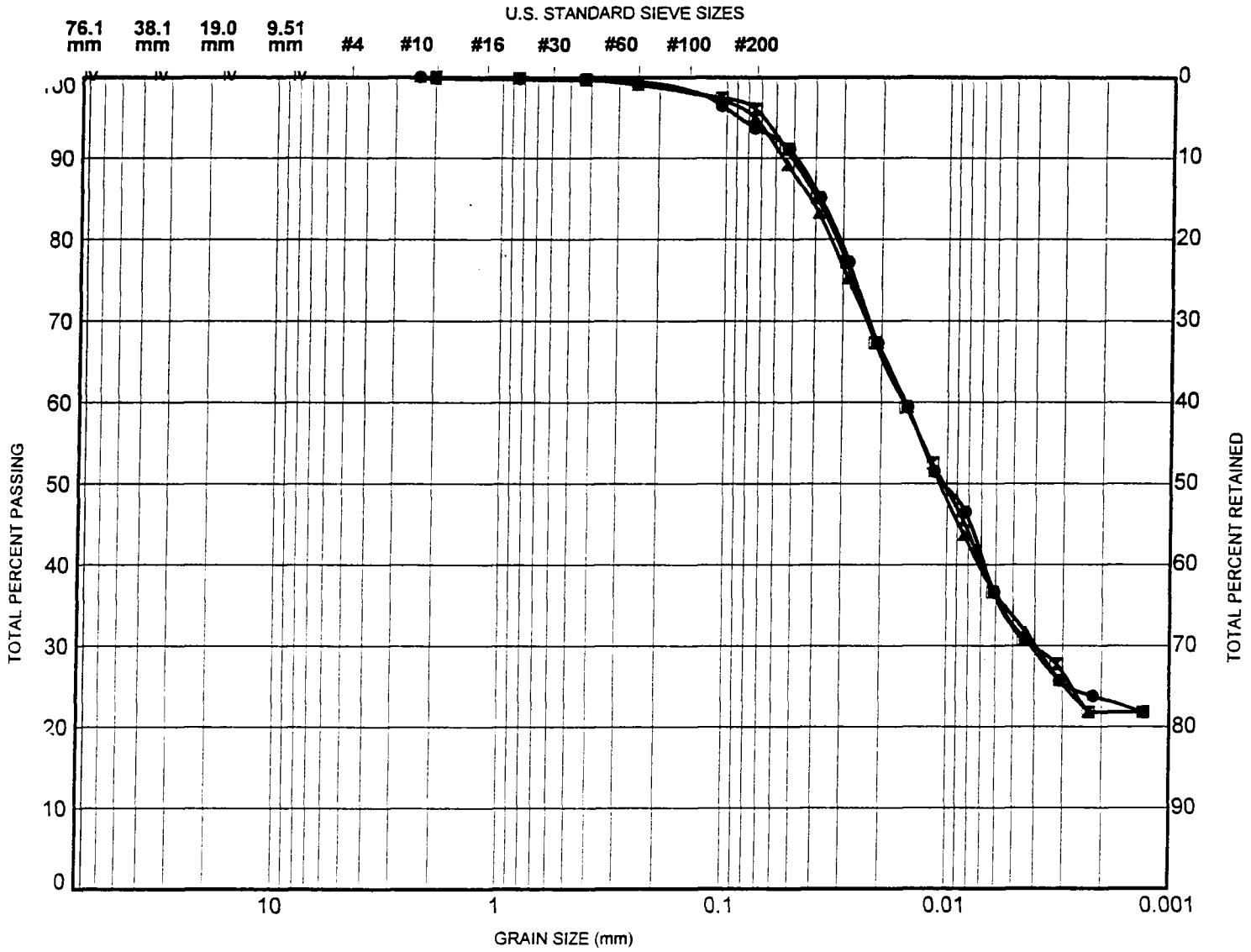
GRAIN SIZE DISTRIBUTION

PLATE

K-4

PROJECT NO. 35-8440-08

SIEVE ANALYSIS	HYDROMETER



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	LSB-19-473	10.7	SILT	ML
⧗	LSB-19-473	12.2	SILT	ML
▲	LSB-19-473	13.7	Lean CLAY	CL

KLEINFELDER

PROJECT NO. 35-8440-08

Legacy Parkway Design/Build

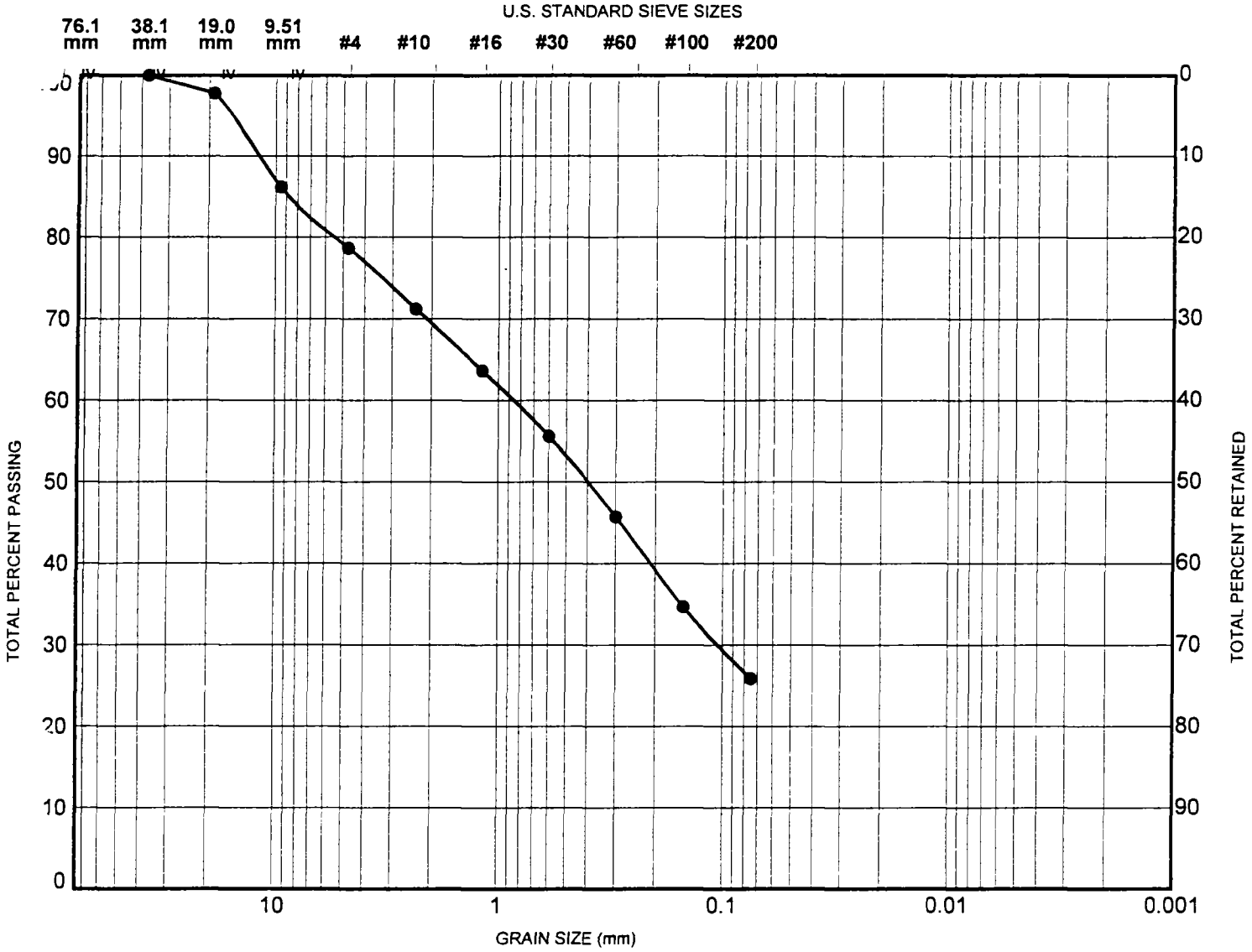
I-215 to I-15/US 89 Interchange

GRAIN SIZE DISTRIBUTION

PLATE

K-5

SIEVE ANALYSIS	HYDROMETER



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	SB-19-279	36.6	Silty SAND with gravel	SM

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

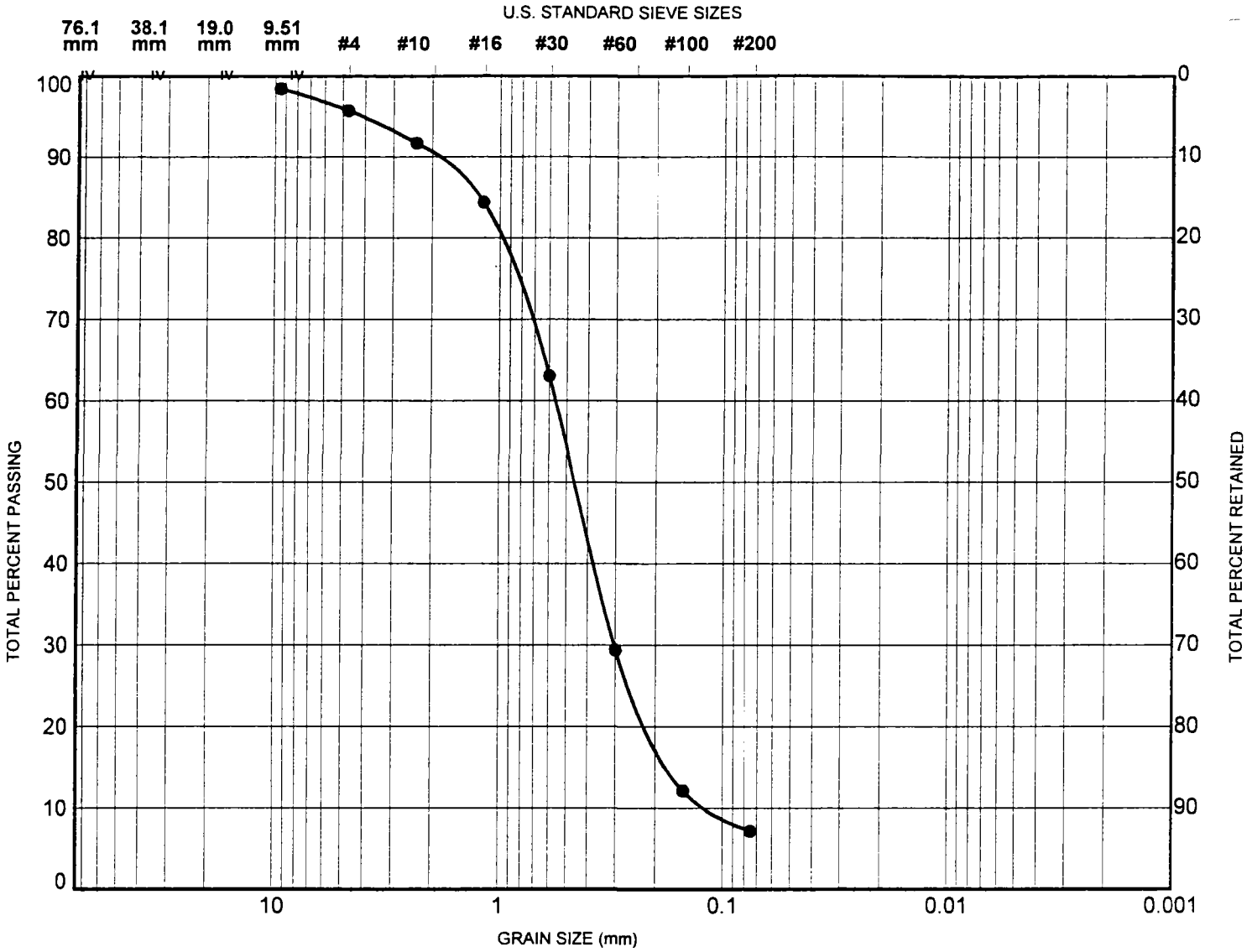
I-215 to I-15/US 89 Interchange

GRAIN SIZE DISTRIBUTION

PLATE

K-125

SIEVE ANALYSIS	HYDROMETER



GRAVEL		SAND			SILT	CLAY
coarse	*fine*	*coarse*	*medium*	*fine*		

Symbol	Sample	Depth (m)	Description	Classification
●	SB-23-289	9.1	Poorly Graded SAND with silt	SP-SM

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

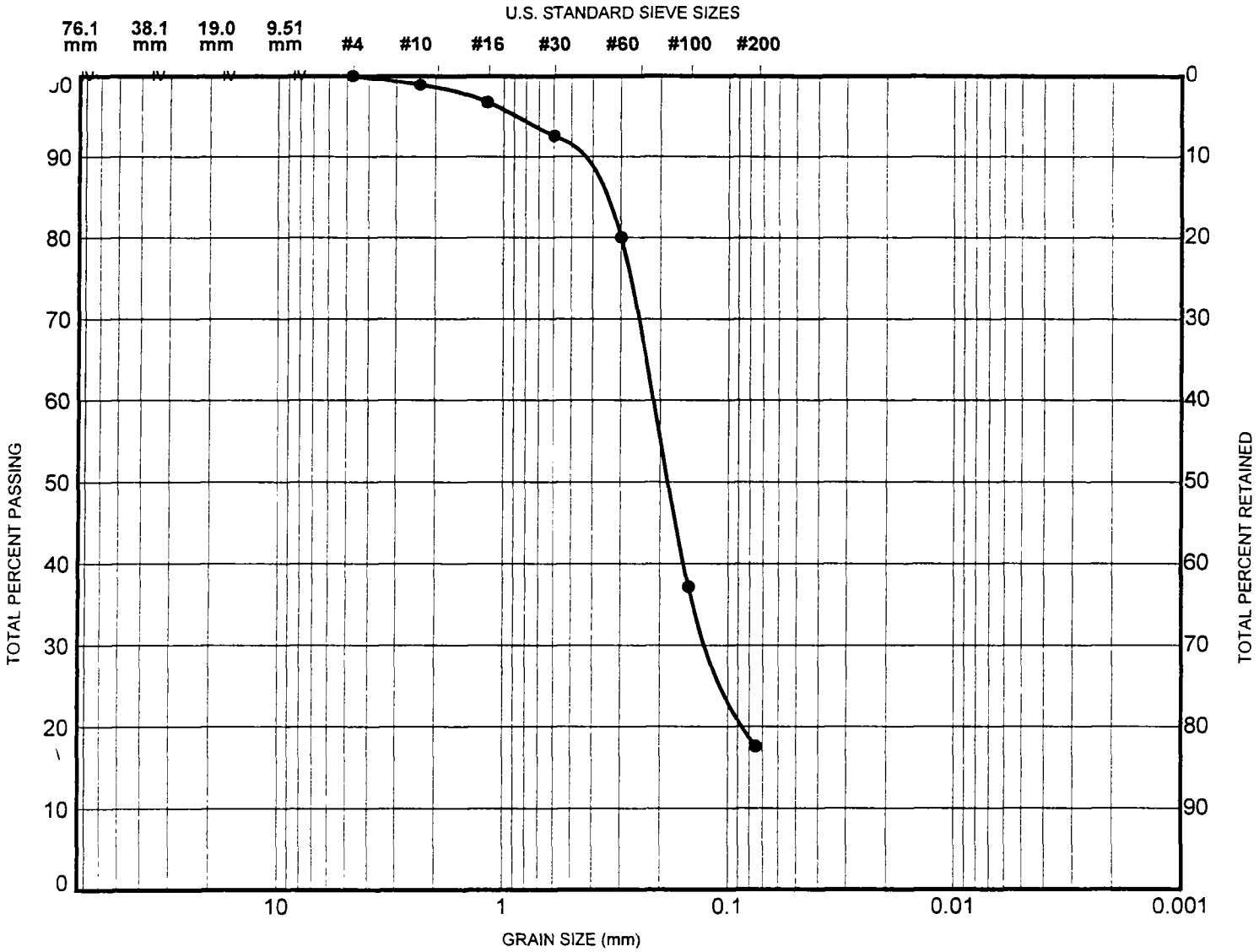
I-215 to I-15/US 89 Interchange

GRAIN SIZE DISTRIBUTION

PLATE

K-126

SIEVE ANALYSIS	HYDROMETER



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	RB-366	7.0	Silty SAND	SM

KLEINFELDER

PROJECT NO. 35-8163-05

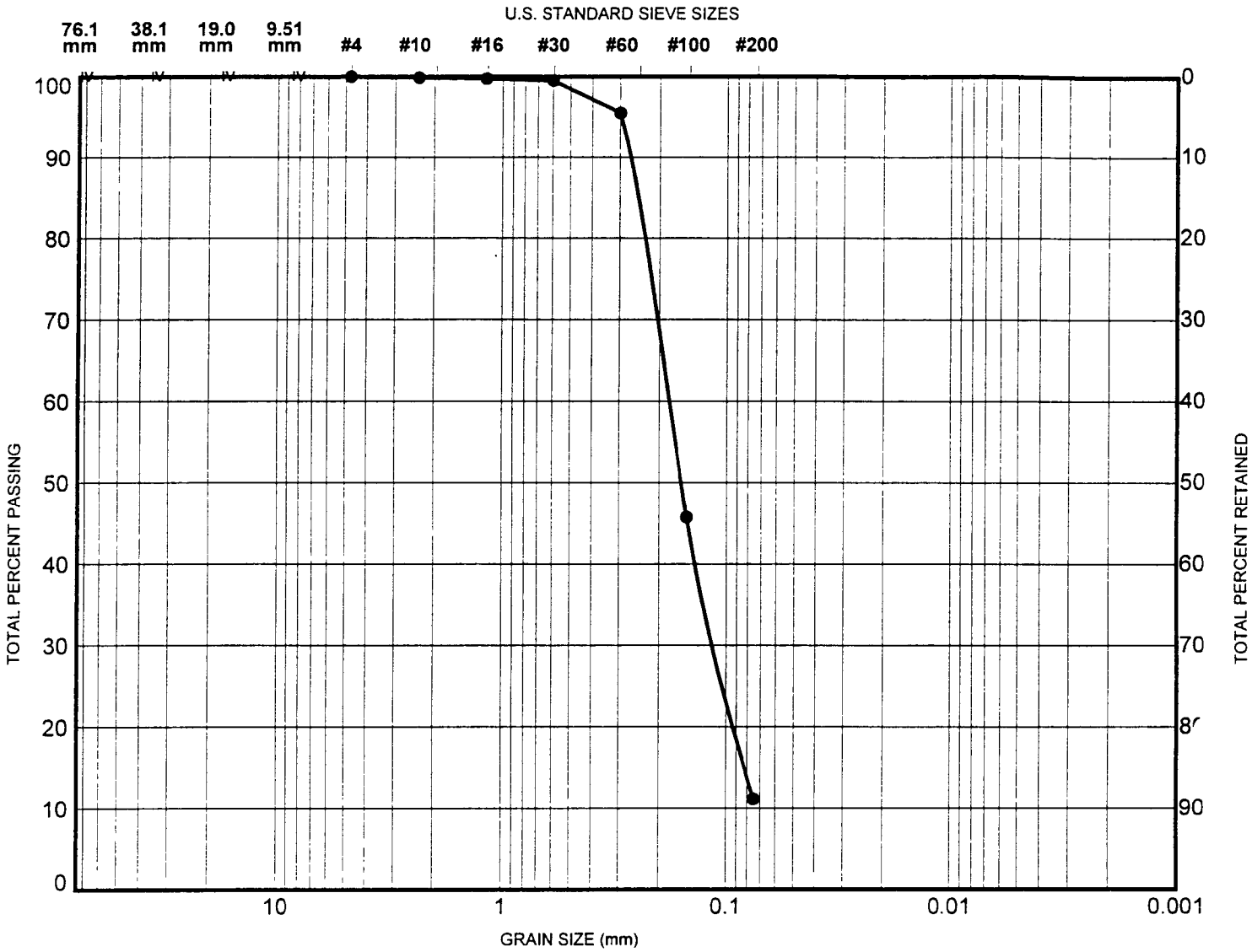
Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

GRAIN SIZE DISTRIBUTION

PLATE

K-152



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	RB-370	35.0	Poorly graded SAND with silt	SP-SM

KLEINFELDER

PROJECT NO. 35-8163-05

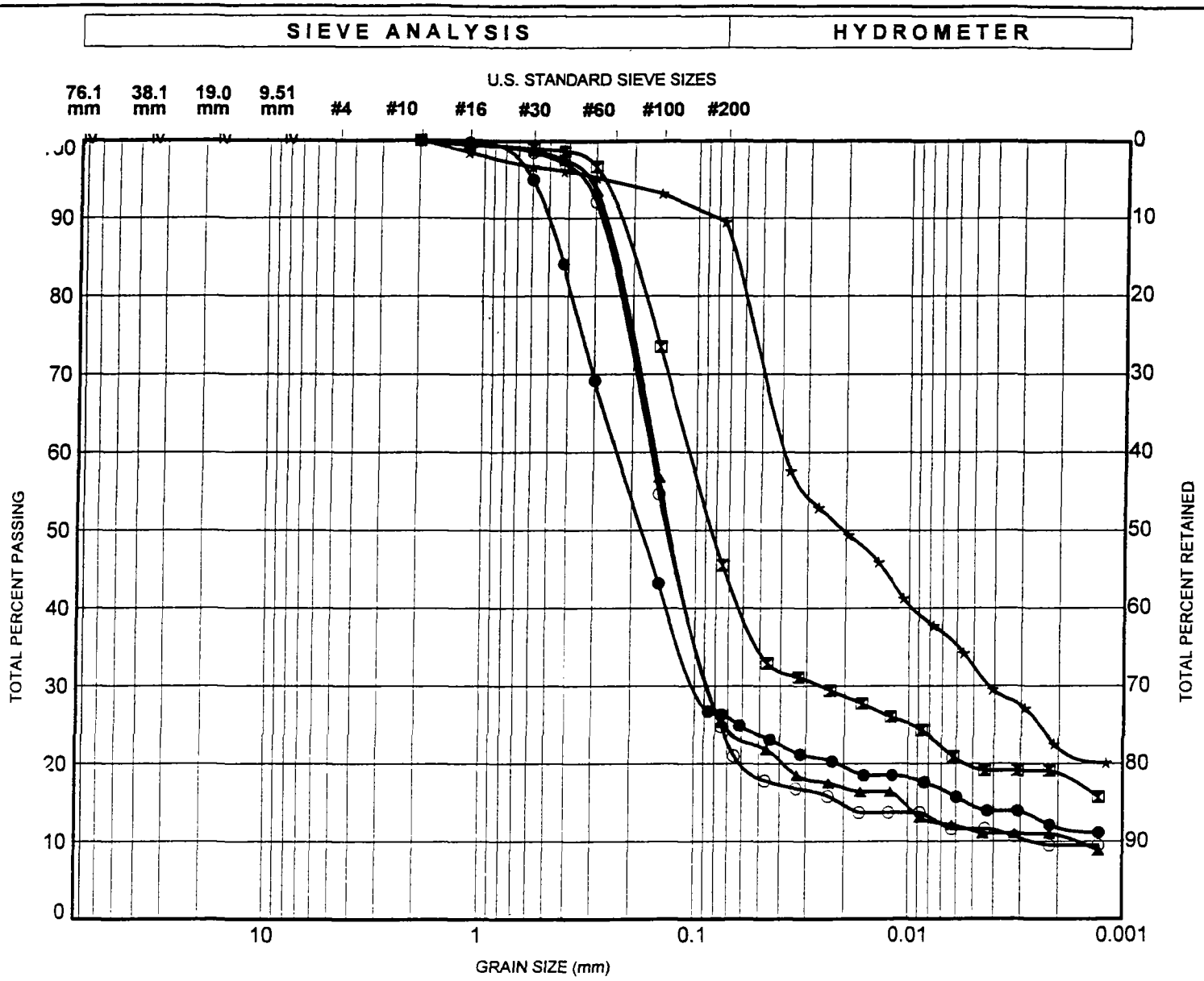
Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

GRAIN SIZE DISTRIBUTION

PLATE

K-153



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	RB-370	6.7	Silty SAND	SM
⊠	RB-370	9.1	Silty SAND	SM
▲	RB-370	12.2	Silty SAND	SM
★	RB-370	12.8	Lean CLAY	CL
○	RB-370	12.8	Silty SAND	SM

KLEINFELDER

Legacy Parkway Design/Build

I-215 to I-15/US 89 Interchange

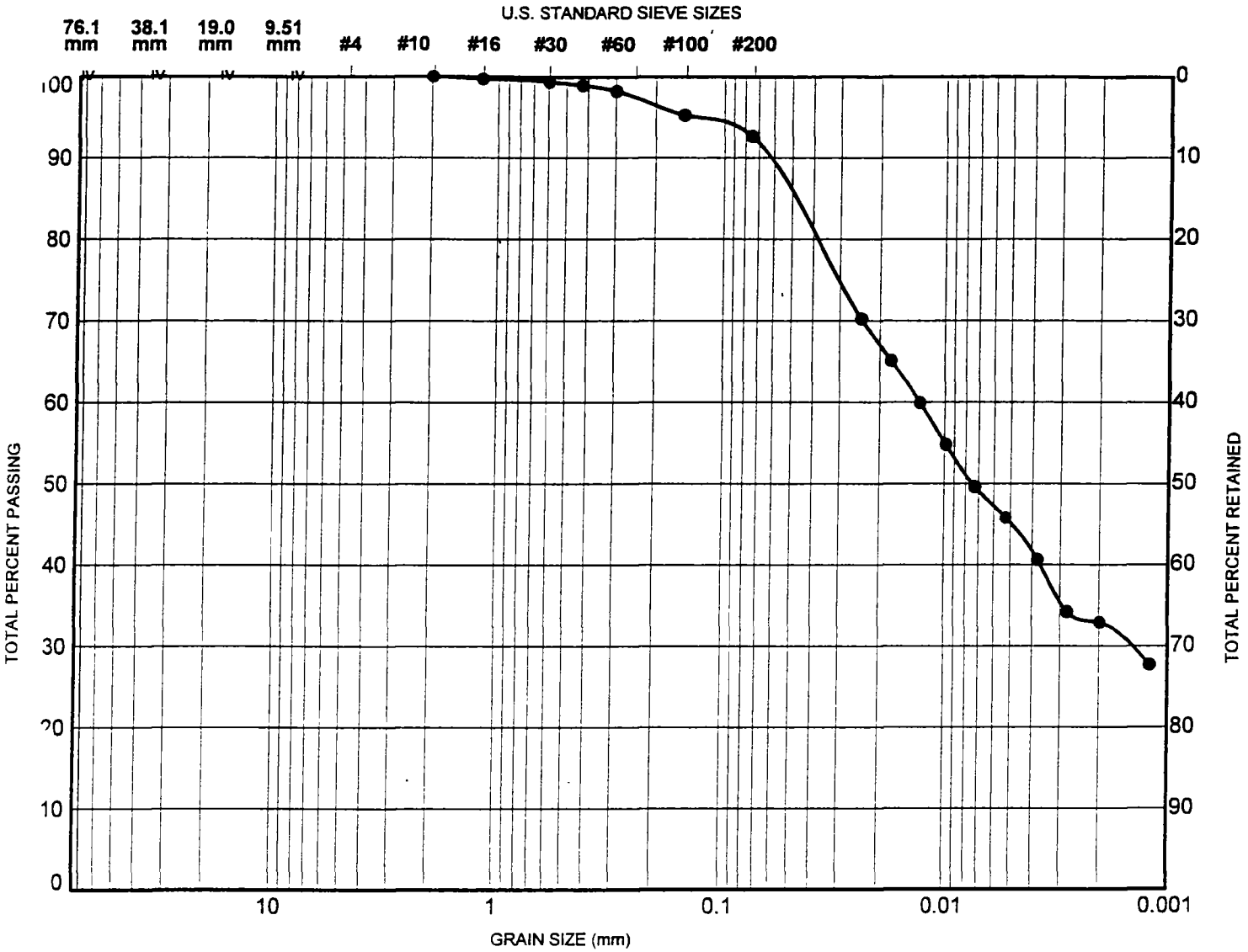
GRAIN SIZE DISTRIBUTION

PLATE

K-1

PROJECT NO. 35-8440-06

SIEVE ANALYSIS	HYDROMETER



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	RB-370	13.7	SILT	ML

KLEINFELDER

Legacy Parkway Design/Build

I-215 to I-15/US 89 Interchange

GRAIN SIZE DISTRIBUTION

PLATE

K-2

PROJECT NO. 35-8440-06

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
01/30/00	9:35:00	72:35:00		0542	
01/31/00	8:50:00	95:55:00		0543	
	16:50:00	103:55:00		0545	
02/01/00	7:45:00	118:50:00		0545	
	11:15:00	122:15:00	383.0	0545	3.52
	11:15:00	0:00:00	766.1	0560	3.67
	11:15:06	0:00:06		0574	
	11:15:15	0:00:15		0579	
	11:15:30	0:00:30		0585	
	11:16:00	0:01:00		0593	
	11:17:00	0:02:00		0605	
	11:19:00	0:04:00		0622	
	11:23:00	0:08:00		0641	
	11:30:00	0:15:00		0661	
	11:45:00	0:30:00		0680	
	12:15:00	1:00:00		0694	
	13:15:00	2:00:00		0703	
	15:15:00	4:00:00		0712	
	19:15:00	8:00:00		0720	
02/02/00	11:15:00	24:00:00		0732	
	14:20:00	27:10:00		0732	
	19:00:00	31:50:00		0734	
02/03/00	8:30:00	45:20:00		0738	
	17:20:00	54:10:00		0740	
02/04/00	7:30:00	68:20:00		0743	
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	17:35:00	78:25:00		0745	
02/06/00	15:45:00	100:35:00		0749	
02/08/00	10:30:00		1532.2	1113	9.20
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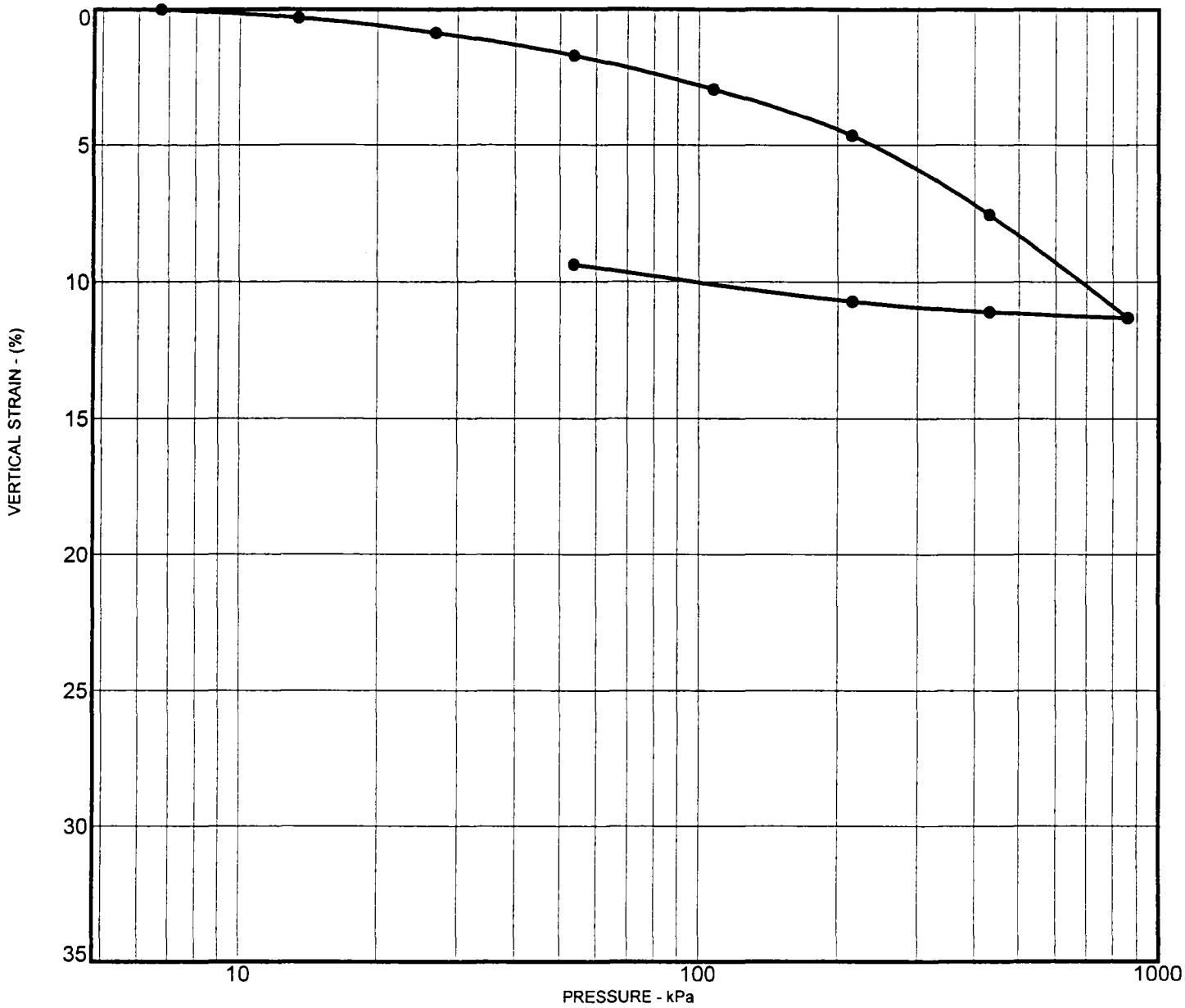
	19:00:00		383.0	0966	7.73
02/09/00	7:35:00		191.5	0848	6.55



Sample	SB-19-274
Depth	15.24 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	14.7	16.3
Water content, %	30.1	25.4
Sample height, mm	25.4	23.1

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-370

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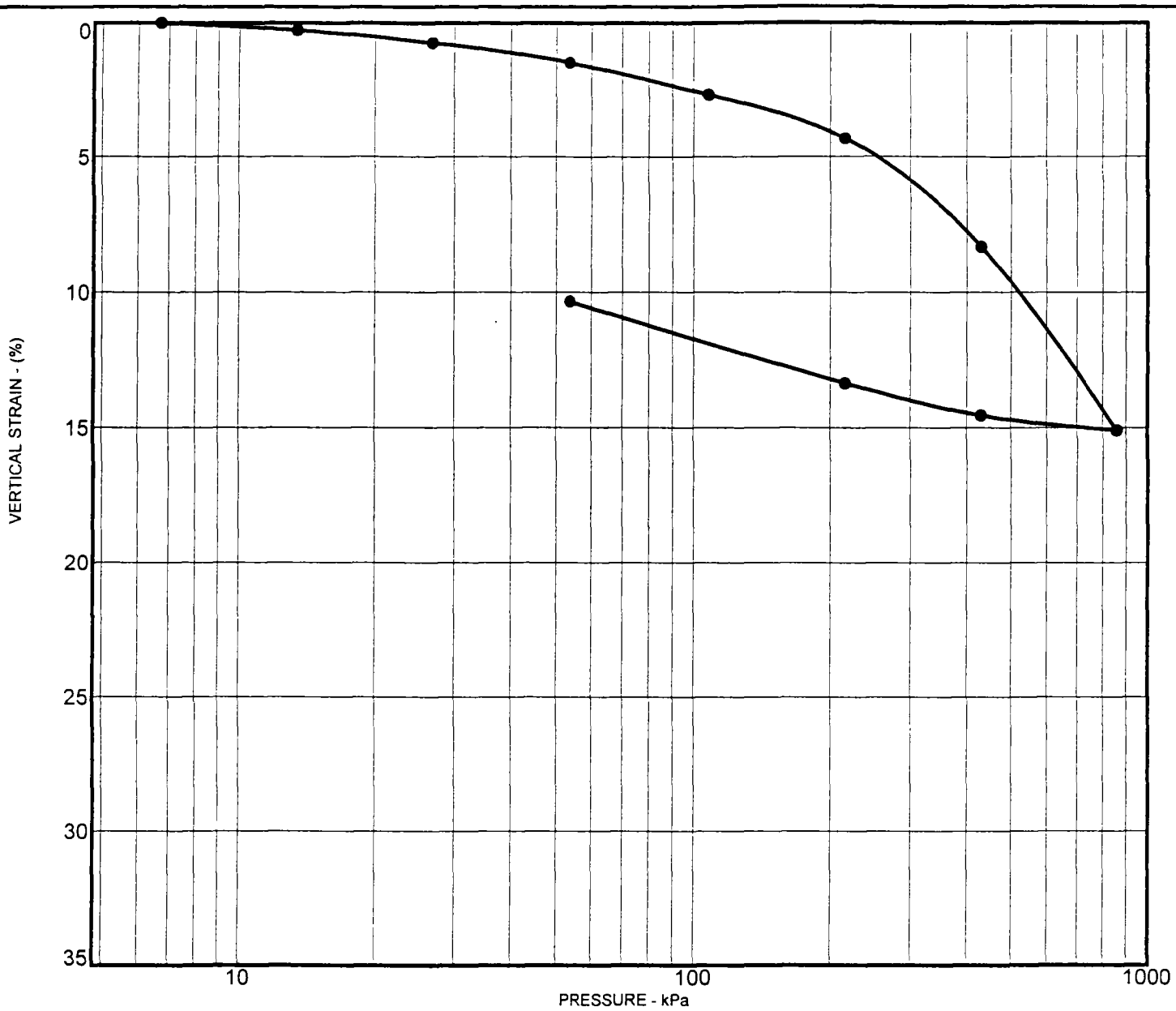

Sample	SB-19-274
Depth	25.91 m
Classification	SC

	Initial	Final
Dry density, kN/m^3	12.1	13.5
Water content, %	45.1	38.6
Sample height, mm	25.4	22.9

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-372

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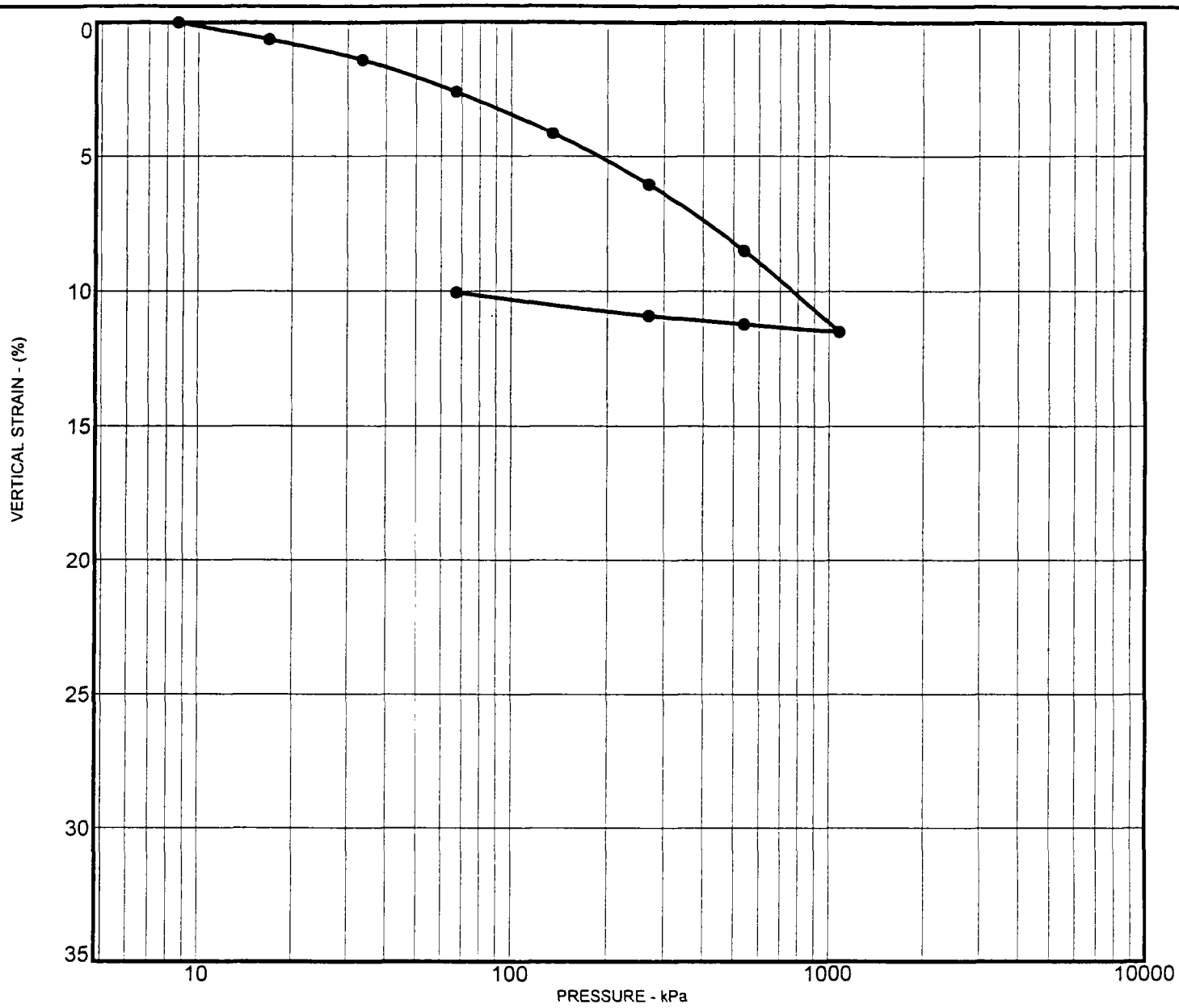


Sample	SB-19-276
Depth	18.29 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	15.9	17.7
Water content, %	26.8	21.3
Sample height, mm	25.4	22.9

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-374

Kleinfelder, Inc.
Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

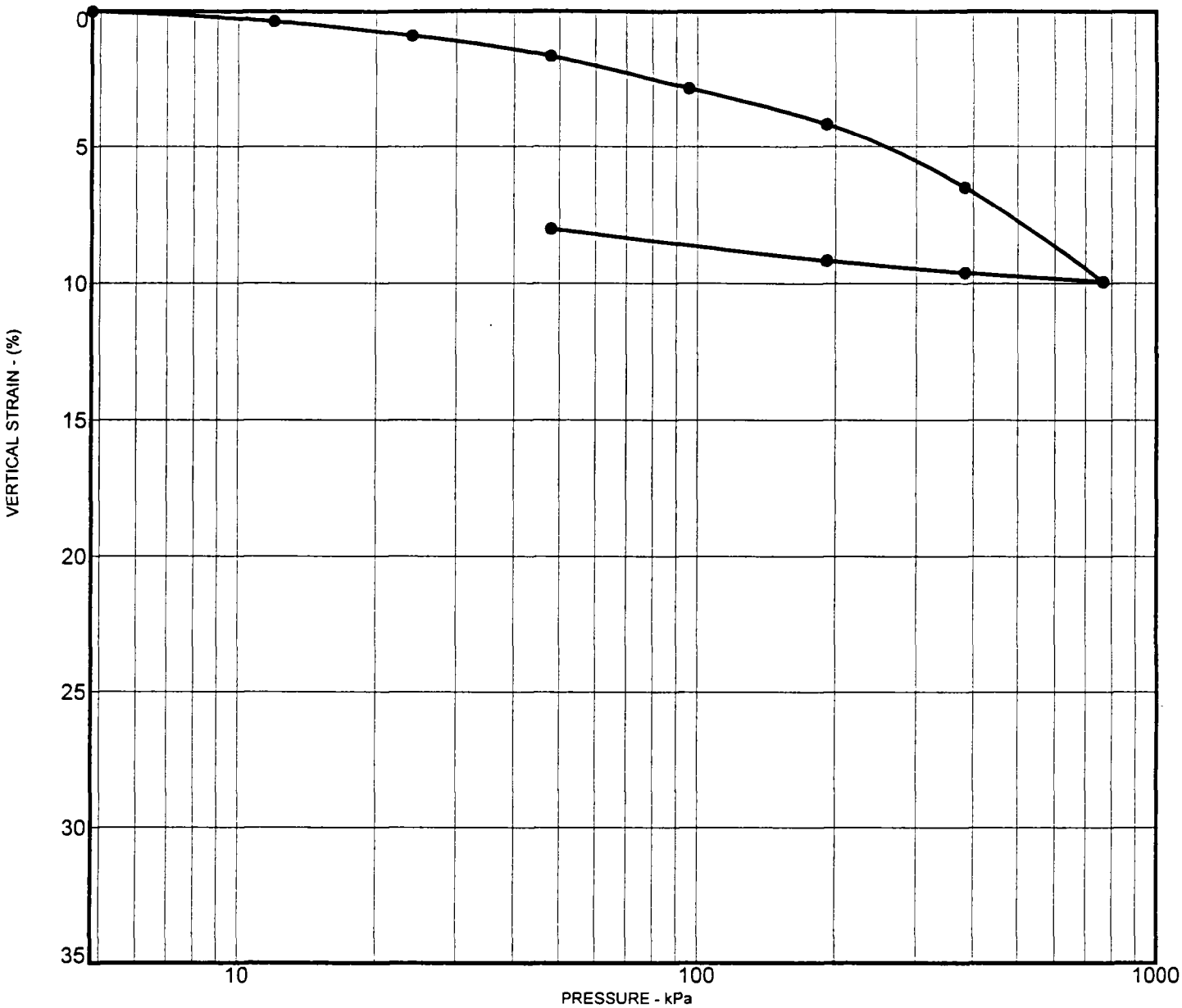
Boring Number:	SB-19-276
Sample Depth:	18.3 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	198.7	
Ring Weight	45.7	
Wet Wt.	153.0	
Wet + Tare		200.5
Dry + Tare		174.8
Tare Wt.		8.4

	Before Test (mm)	After Test (mm)
Sample Height	25.4	25.9
Sample Diameter	49.0	

Water added at 8.6 kPa.
* Elapsed Time shown only for time rates.

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
03/20/00	9:55:00			0200	
	18:30:00		8.6	0267	0.67
03/21/00	7:20:00		16.8	0330	1.30
	12:10:00		33.5	0408	2.08
	17:00:00		67.0	0529	3.29
03/22/00	8:00:00		134.5	0682	4.82
	17:00:00		268.6	0871	6.71
03/23/00	16:50:00		537.7	1117	9.17
03/24/00	17:50:00		1075.4	1417	12.17
03/25/00	8:55:00		537.7	1389	11.89
	11:20:00		268.6	1358	11.58
	13:05:00		67.0	1272	10.72



Sample	SB-19-276
Depth	24.38 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	15.1	16.4
Water content, %	29.4	26.3
Sample height, mm	25.4	23.4

KLEINFELDER

PROJECT NO. 35-8163-05

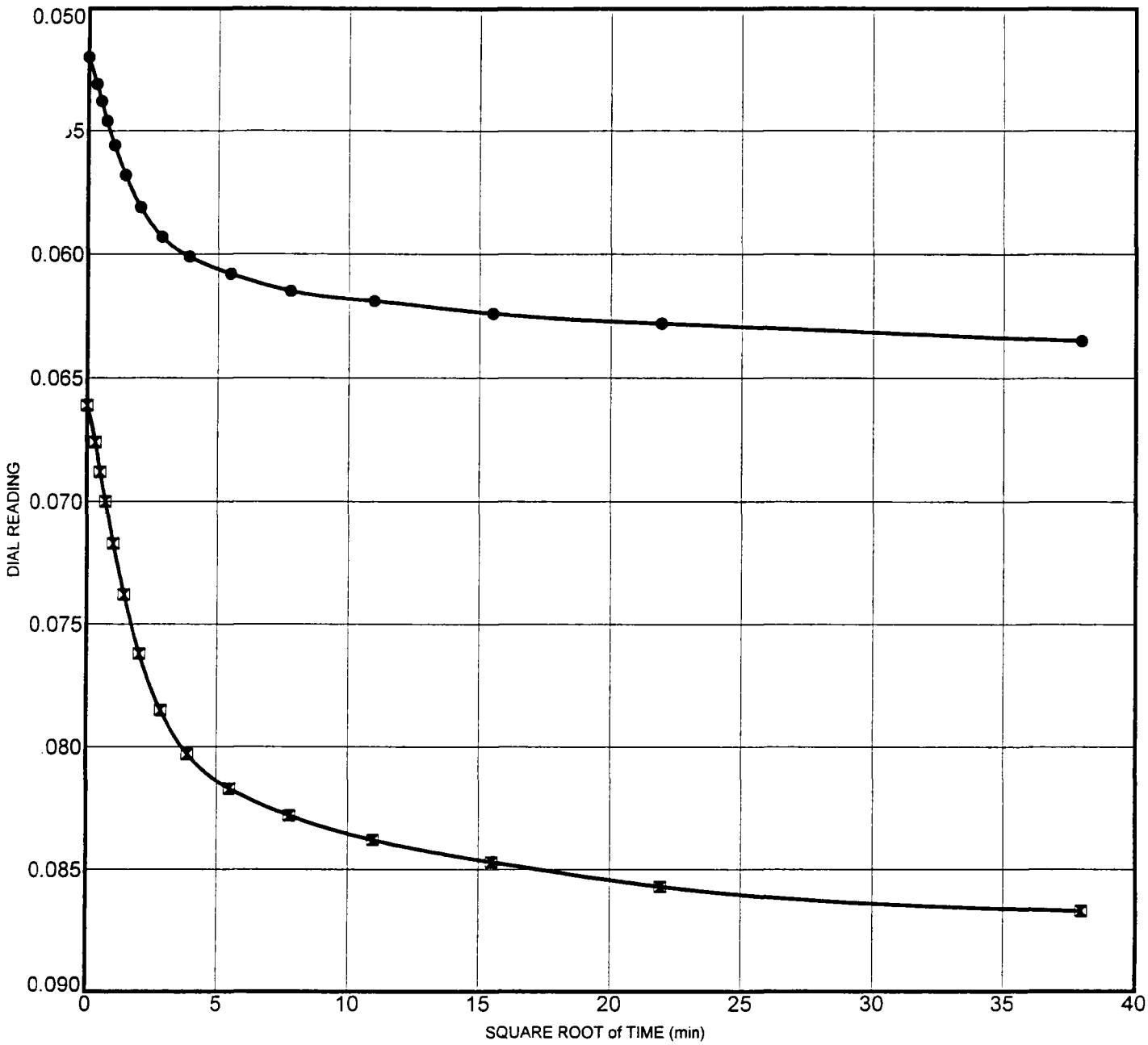
Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-376



Sample	**SB-19-276**	
Depth	**24.4 m**	
Pressure (MPa)	● **0.19**	⧗ **0.38**
Cv (m^2/day)		

KLEINFELDER

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

TIME RATE CONSOLIDATION

PLATE

K-377

PROJECT NO. **35-8163-05**

TIME RATE (RTC) 2-M-B Z003SB2B.GPJ 6/1/00

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

Boring Number:	SB-19-276
Sample Depth:	24.4 m

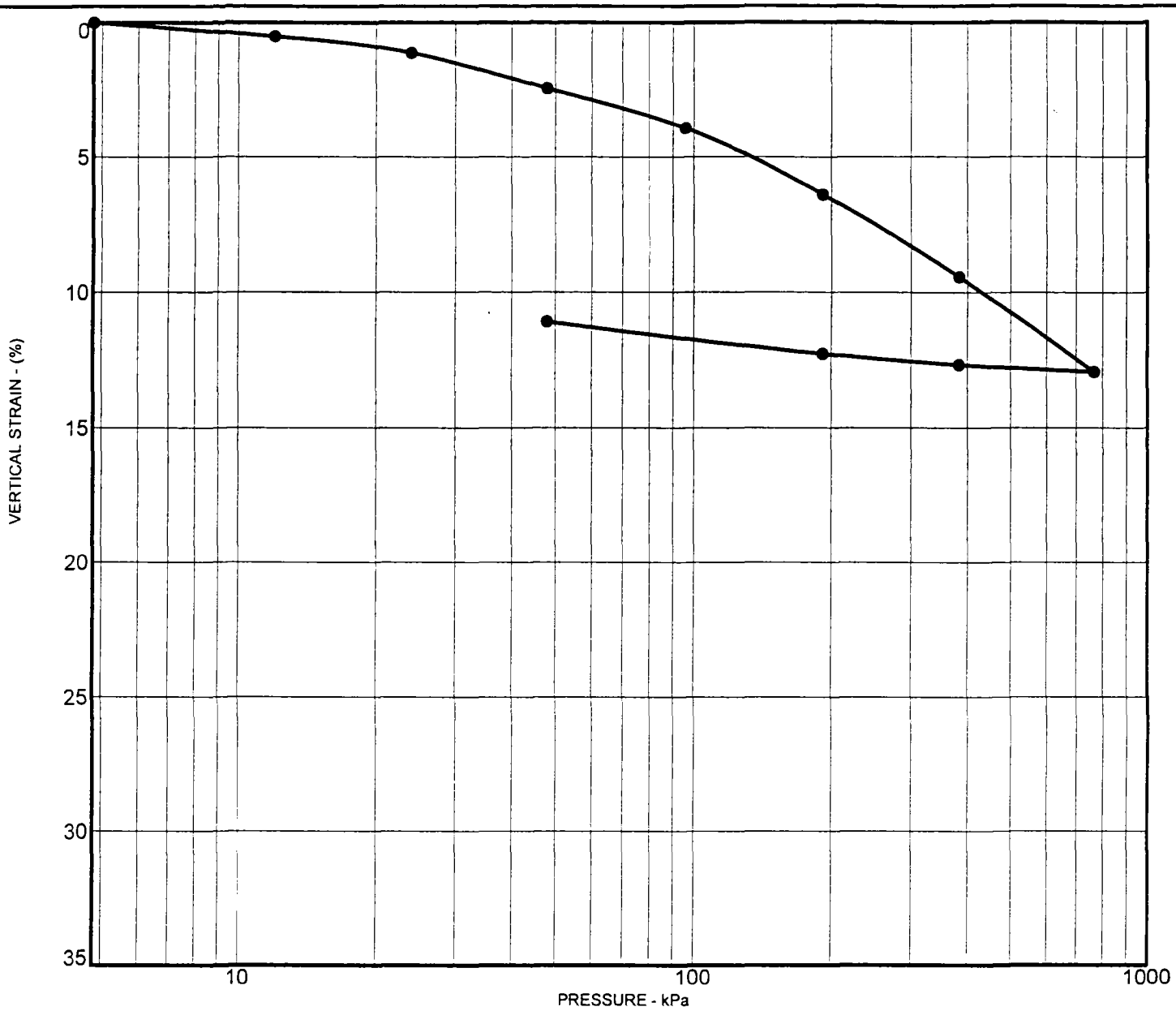
	Before Test (g)	After Test (g)
Wet Wt. + Ring	198.7	
Ring Weight	45.9	
Wet Wt.	152.8	
Wet + Tare		198.5
Dry + Tare		168.5
Tare Wt.		8.4

	Before Test (mm)	After Test (mm)
Sample Height	25.4	22.9
Sample Diameter	49.0	

Water added at 4.8 kPa.
* Elapsed Time shown only for time rates.

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
03/21/00	9:00:00			0207	
	11:00:00		4.8	0217	0.10
	14:30:00		12.0	0254	0.47
	17:20:00		23.9	0307	1.00
	21:00:00		47.9	0384	1.77
03/24/00	7:50:00		95.8	0502	2.95
	7:55:00	0:00:00	191.5	0520	
	7:55:06	0:00:06		0531	
	7:55:15	0:00:15		0538	
	7:55:30	0:00:30		0546	
	7:56:00	0:01:00		0556	
	7:57:00	0:02:00		0568	
	7:59:00	0:04:00		0581	
	8:03:00	0:08:00		0593	
	8:10:00	0:15:00		0601	
	8:25:00	0:30:00		0608	
	8:55:00	1:00:00		0615	
	9:55:00	2:00:00		0619	
	11:55:00	4:00:00		0624	
	15:55:00	8:00:00		0628	
03/25/00	7:55:00	24:00:00	191.5	0635	4.28
	9:22:00	0:00:00	383.0	0661	4.54
	9:22:06	0:00:06		0676	
	9:22:15	0:00:15		0688	

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
	9:22:30	0:00:30		0700	
	9:23:00	0:01:00		0717	
	9:24:00	0:02:00		0738	
	9:26:00	0:04:00		0762	
	9:30:00	0:08:00		0785	
	9:37:00	0:15:00		0803	
	9:52:00	0:30:00		0817	
	10:22:00	1:00:00		0828	
	11:22:00	2:00:00		0838	
	13:22:00	4:00:00		0847	
	17:22:00	8:00:00		0857	
03/26/00	9:22:00	24:00:00	383.0	0867	6.60
03/27/00	14:40:00		766.1	1211	10.04
	19:30:00		383.0	1178	9.71
03/28/00	8:15:00		191.5	1133	9.26
	11:55:00		47.9	1018	8.11



Sample	SB-19-279
Depth	1.37 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	13.8	15.6
Water content, %	30.9	27.8
Sample height, mm	25.4	22.6

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-380

Kleinfelder, Inc.
Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

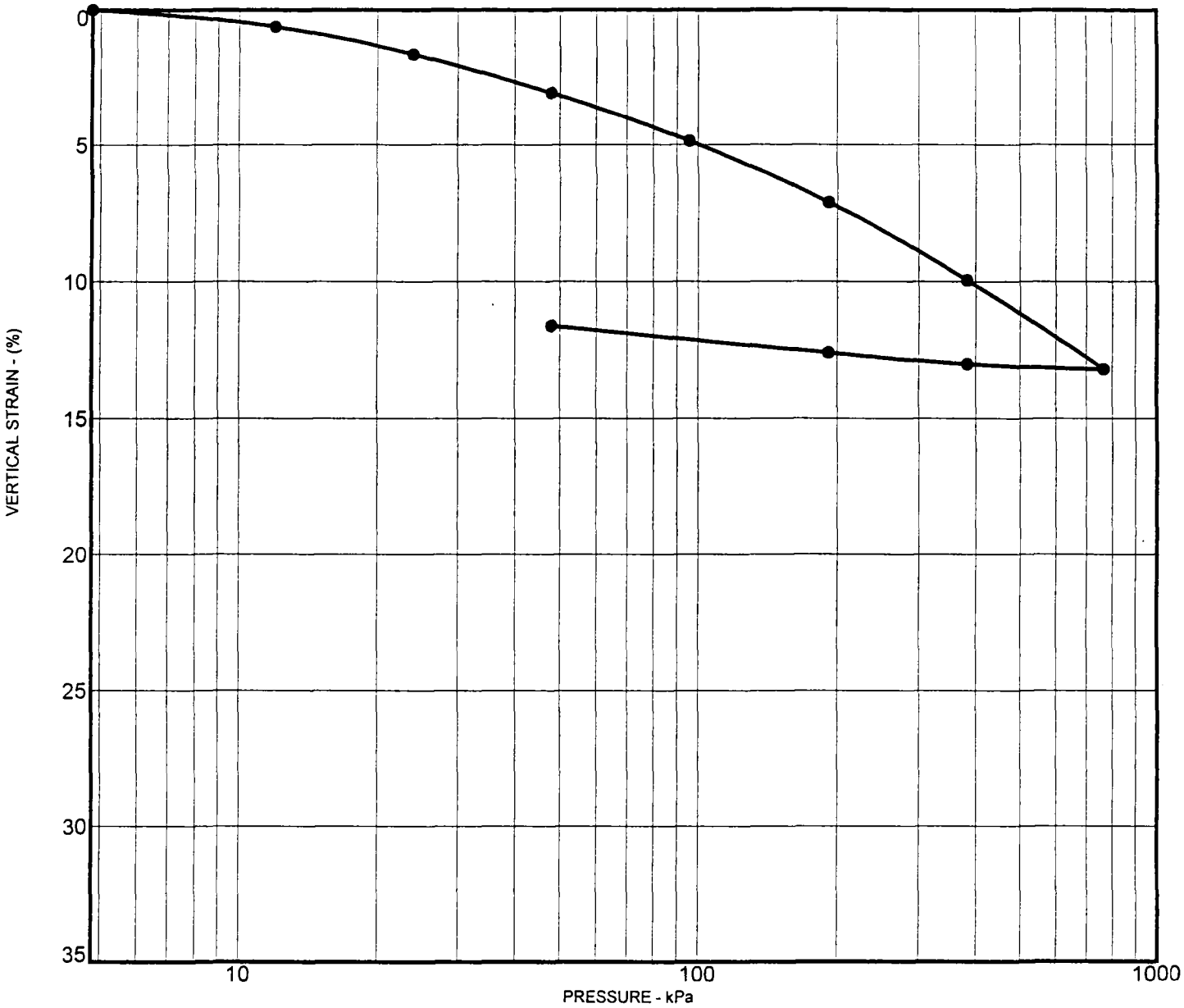
Boring Number:	SB-19-279
Sample Depth:	1.5 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	182.7	
Ring Weight	45.7	
Wet Wt.	137.0	
Wet + Tare		187.9
Dry + Tare		158.8
Tare Wt.		8.4

	Before Test (mm)	After Test (mm)
Sample Height	25.4	26.0
Sample Diameter	49.0	

Water added at 4.8 kPa.
* Elapsed Time shown only for time rates.

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
04/21/00	15:40:00			0228	
	15:50:00		4.8	0237	0.09
04/22/00	9:20:00		12.0	0289	0.61
	13:40:00		23.9	0351	1.23
04/23/00	9:30:00		47.9	0483	2.55
	17:10:00		95.8	0631	4.03
04/24/00	11:00:00		191.5	0875	6.47
04/25/00	8:15:00		383.0	1180	9.52
04/26/00	11:35:00		766.1	1533	13.05
04/27/00	7:00:00		383.0	1504	12.76
	17:00:00		191.5	1464	12.36
04/28/00	8:20:00		47.9	1346	11.18



Sample	SB-19-279
Depth	6.71 m
Classification	ML

	Initial	Final
Dry density, kN/m^3	14.1	16.0
Water content, %	33.1	26.8
Sample height, mm	25.4	22.4

KLEINFELDER

PROJECT NO. 35-8163-05

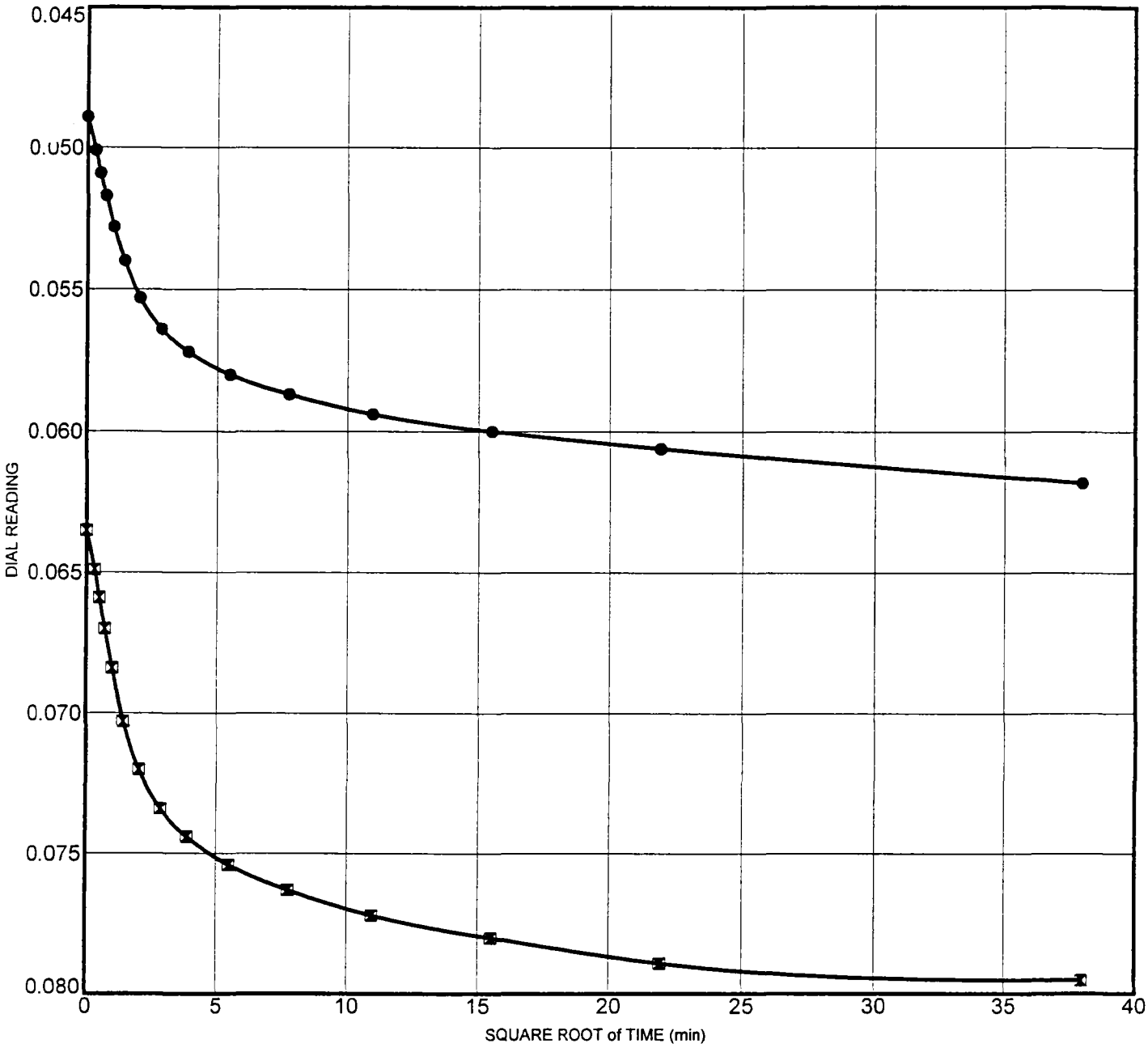
Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-382



Sample	**SB-19-279**	
Depth	**6.7 m**	
Pressure (MPa)	● **0.05**	⊠ **0.10**
Cv (m^2/day)		

KLEINFELDER

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

TIME RATE CONSOLIDATION

PLATE

K-383

PROJECT NO. **35-8163-05**

TIME RATE (RTC) 2-M-B Z003SB2B.GPJ 6/1/00

Kleinfelder, Inc.
Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

Boring Number:	SB-19-279
Sample Depth:	6.7 m

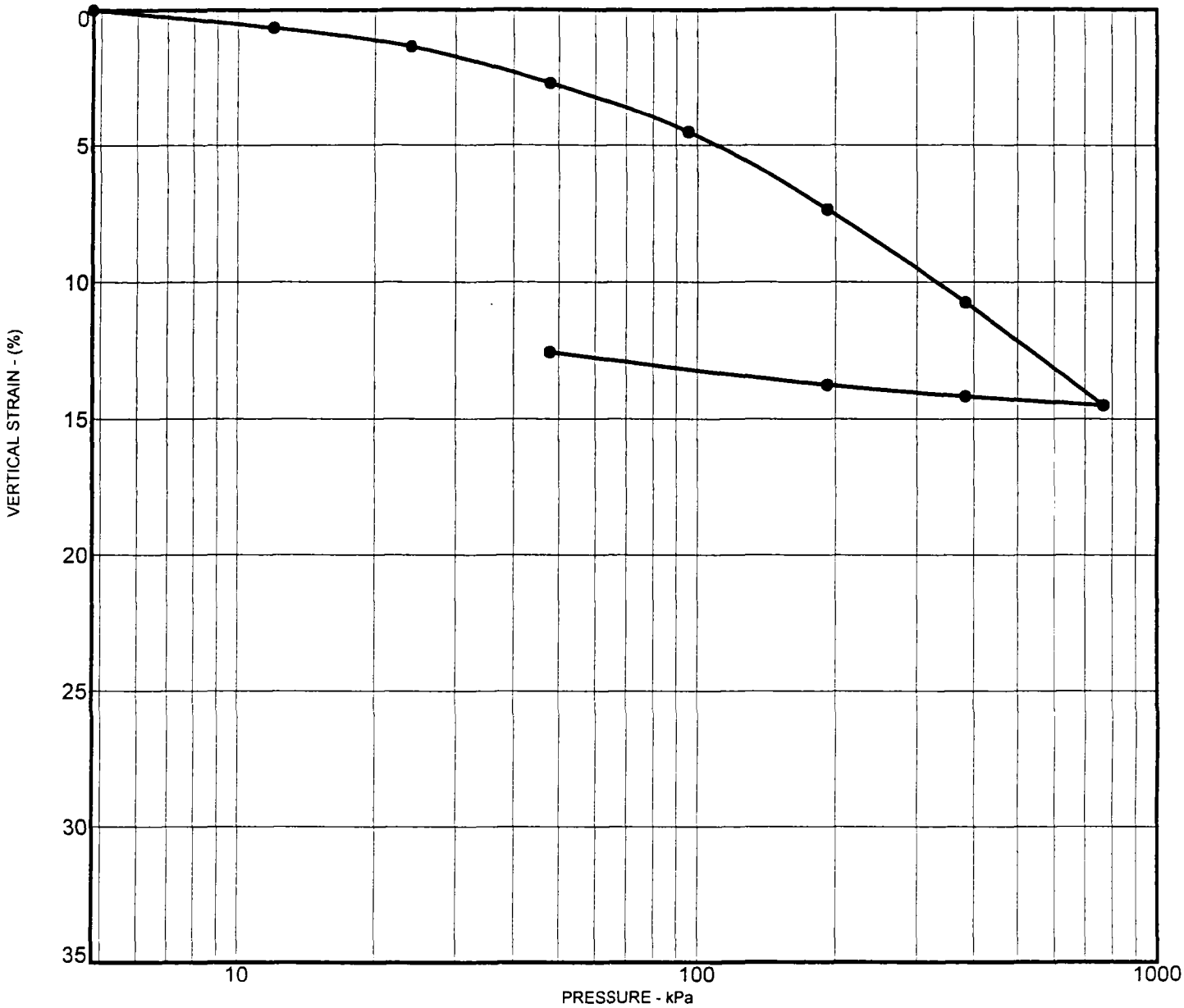
	Before Test (g)	After Test (g)
Wet Wt. + Ring	187.9	
Ring Weight	45.7	
Wet Wt.	142.2	
Wet + Tare		189
Dry + Tare		160.4
Tare Wt.		7.9

	Before Test (mm)	After Test (mm)
Sample Height	25.4	22.0
Sample Diameter	49.0	

Water added at 4.8 kPa.
* Elapsed Time shown only for time rates.

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
04/21/00	15:45:00			0270	
	9:20:00		4.8	0309	0.39
	12:55:00		12.0	0372	1.02
04/23/00	8:00:00		23.9	0475	2.05
	8:06:00	0:00:00	47.9	0489	2.19
	8:06:06	0:00:06		0501	
	8:06:15	0:00:15		0509	
	8:06:30	0:00:30		0517	
	8:07:00	0:01:00		0528	
	8:08:00	0:02:00		0540	
	8:10:00	0:04:00		0553	
	8:14:00	0:08:00		0564	
	8:21:00	0:15:00		0572	
	8:36:00	0:30:00		0580	
	9:06:00	1:00:00		0587	
	10:06:00	2:00:00		0594	
	12:06:00	4:00:00		0600	
	16:06:00	8:00:00		0606	
04/24/00	8:06.00	24:00:00	47 9	0618	3.48
	8:03:00	0:00:00	95.8	0635	3.65
	8:03:06	0:00:06		0649	
	8:03:15	0:00:15		0659	
	8:03:30	0:00 30		0670	
	8:04:00	0:01:00		0684	

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
	8:05:00	0:02:00		0703	
	8:07:00	0:04:00		0720	
	8:11:00	0:08:00		0734	
	8:18:00	0:15:00		0744	
	8:33:00	0:30:00		0754	
	9:03:00	1:00:00		0763	
	10:03:00	2:00:00		0772	
	12:03:00	4:00:00		0780	
	16:03:00	8:00:00		0789	
04/25/00	8:03:00	24:00:00	95.8	0795	5.25
	15:20:00		191.5	1020	7.50
04/26/00	11:35:00		383.0	1304	10.34
04/27/00	7:00:00		766.1	1628	13.58
	10:00:00		383.0	1610	13.40
	17:00:00		191.5	1569	12.99
04/28/00	8:15:00		47.9	1471	12.01



Sample	SB-19-279
Depth	7.62 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	14.0	16.0
Water content, %	33.9	27.5
Sample height, mm	25.4	22.1

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-386

Kleinfelder, Inc.
Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

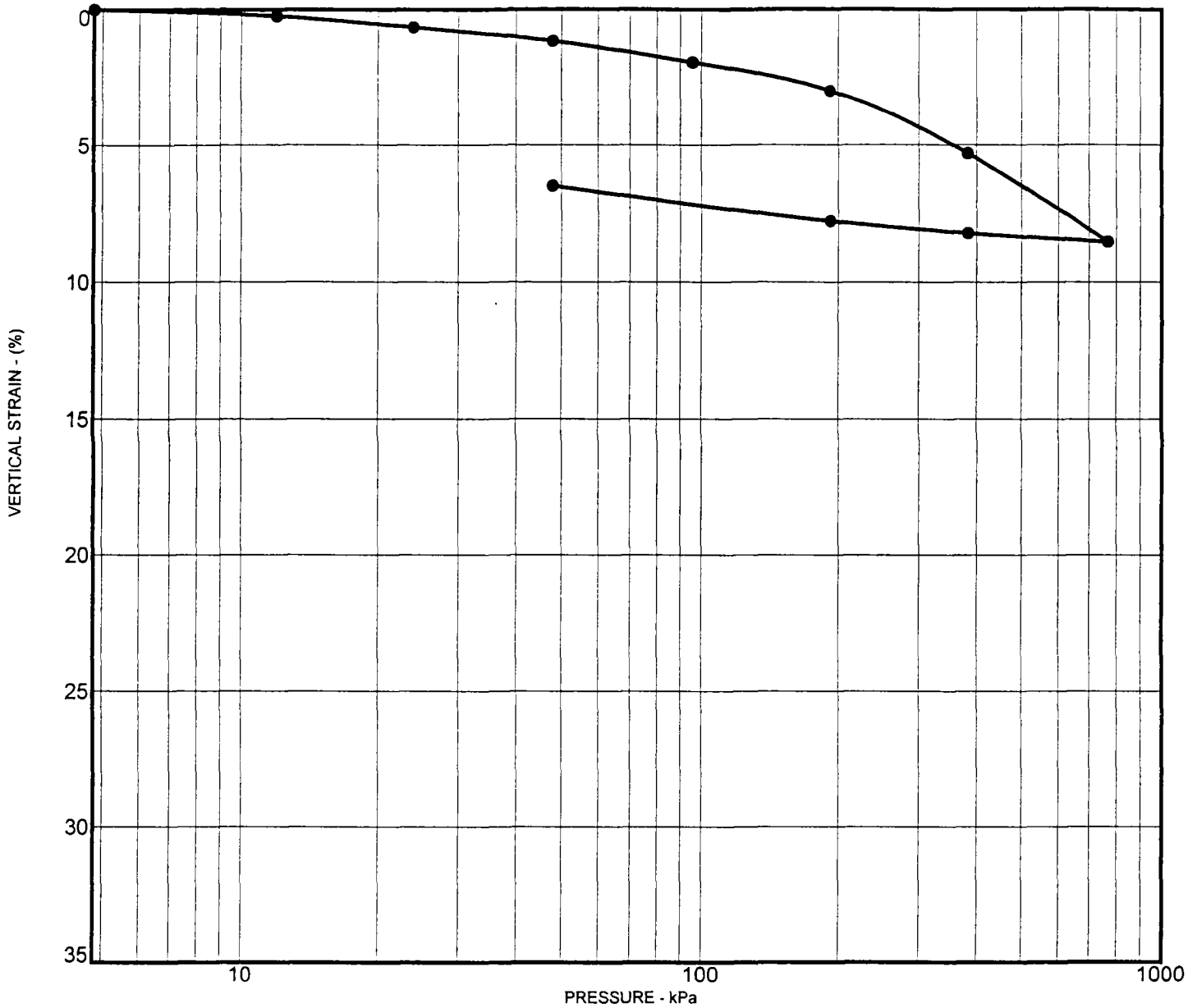
Boring Number:	SB-19-279
Sample Depth:	7.6 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	186.5	
Ring Weight	45.1	
Wet Wt.	141.4	
Wet + Tare		188
Dry + Tare		159
Tare Wt.		8.3

	Before Test (mm)	After Test (mm)
Sample Height	25.4	26.0
Sample Diameter	49.0	

Water added at 4.8 kPa.
* Elapsed Time shown only for time rates.

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
04/21/00	15:55:00			0227	
	17:30:00		4.8	0250	0.23
04/22/00	9:20:00		12.0	0316	0.89
	13:40:00		23.9	0387	1.60
04/23/00	9:30:00		47.9	0522	2.95
	17:10:00		95.8	0702	4.75
04/24/00	11:00:00		191.5	0984	7.57
04/25/00	8:10:00		383.0	1324	10.97
04/26/00	11:35:00		766.1	1700	14.73
04/27/00	7:00:00		383.0	1667	14.40
	17:00:00		191.5	1625	13.98
04/28/00	8:00:00		47.9	1506	12.79



Sample	SB-19-279
Depth	18.29 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	14.7	15.8
Water content, %	30.0	27.1
Sample height, mm	25.4	23.9

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-388

Kleinfelder, Inc.
Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

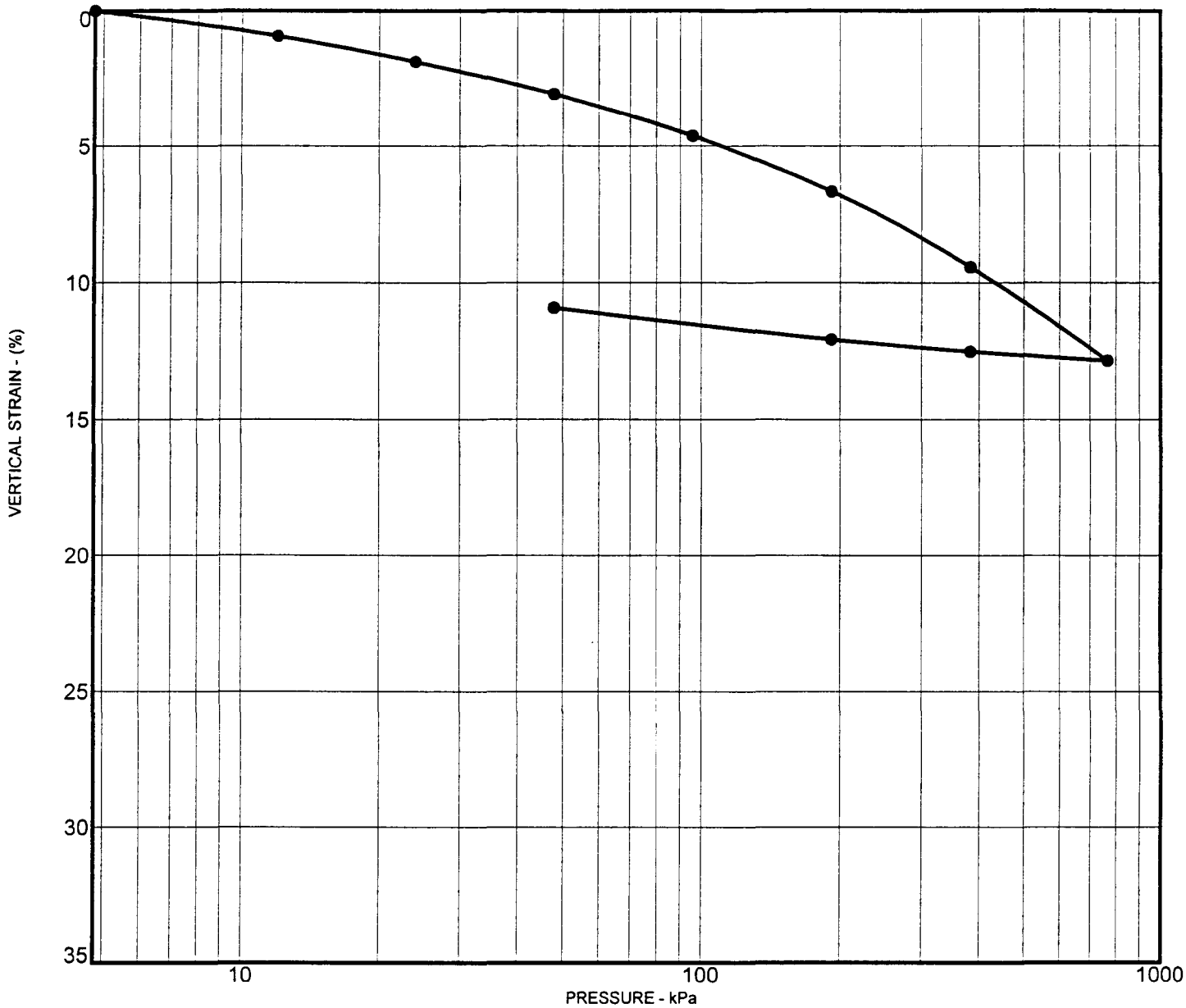
Boring Number:	SB-19-279
Sample Depth:	18.3 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	190.3	
Ring Weight	45.3	
Wet Wt.	145.0	
Wet + Tare		195.3
Dry + Tare		165.1
Tare Wt.		8.3

	Before Test (mm)	After Test (mm)
Sample Height	25.4	26.1
Sample Diameter	49.0	

Water added at 4.8 kPa.
* Elapsed Time shown only for time rates.

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
04/21/00	16:05:00			0256	
	19:40:00		4.8	0289	0.33
04/22/00	9:20:00		12.0	0319	0.63
	13:40:00		23.9	0355	0.99
	16:05:00		47.9	0407	1.51
04/23/00	9:30:00		95.8	0486	2.30
	17:10:00		191.5	0592	3.36
04/24/00	13:00:00		383.0	0826	5.70
04/25/00	9:30:00		766.1	1142	8.86
	11:30:00		383.0	1110	8.54
	13:30:00		191.5	1066	8.10
04/26/00	11:35:00		47.9	0938	6.82



Sample	SB-19-281
Depth	9.14 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	14.7	16.5
Water content, %	30.0	25.5
Sample height, mm	25.4	22.6

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-390

Kleinfelder, Inc.
Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

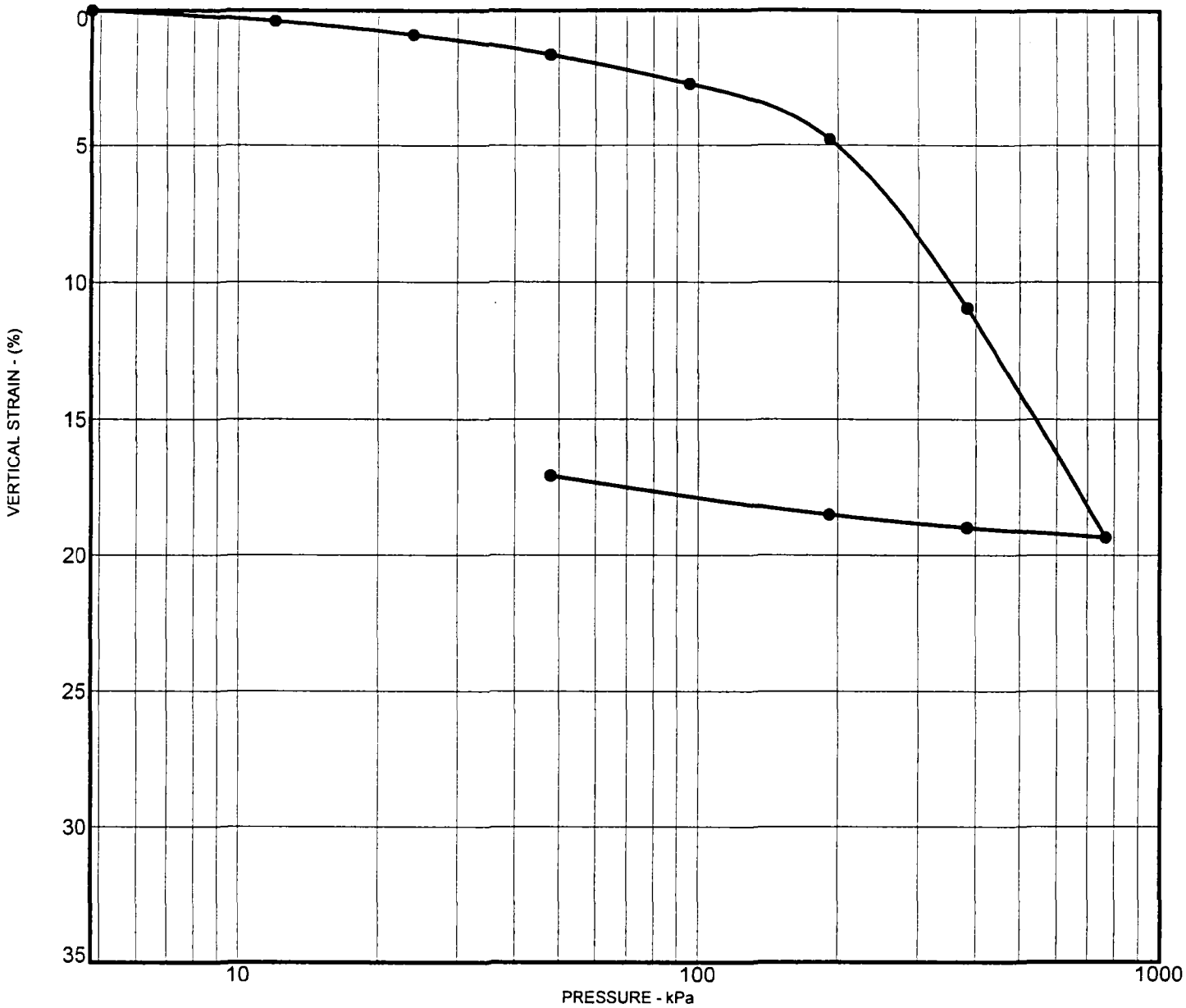
Boring Number:	SB-19-281
Sample Depth:	9.1 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	189.7	
Ring Weight	45.3	
Wet Wt.	144.4	
Wet + Tare		193.2
Dry + Tare		164.9
Tare Wt.		8.5

	Before Test (mm)	After Test (mm)
Sample Height	25.4	25.7
Sample Diameter	49.0	

Water added at 4.8 kPa.
* Elapsed Time shown only for time rates.

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
03/28/00	17:30:00			0127	
	18:40:00		4.8	0183	0.56
03/29/00	7:15:00		12.0	0277	1.50
	13:50:00		23.9	0373	2.46
	19:30:00		47.9	0492	3.65
03/30/00	10:05:00		95.8	0646	5.19
03/31/00	7:20:00		191.5	0849	7.22
04/01/00	9:00:00		383.0	1126	9.99
04/02/00	10:30:00		766.1	1467	13.40
	18:00:00		383.0	1434	13.07
04/03/00	8:50:00		191.5	1390	12.63
04/04/00	7:10:00		47.9	1275	11.48



Sample	SB-19-281
Depth	15.85 m
Classification	MH

	Initial	Final
Dry density, kN/m^3	10.8	13.1
Water content, %	53.0	40.9
Sample height, mm	25.4	21.1

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-392

Kleinfelder, Inc.
Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

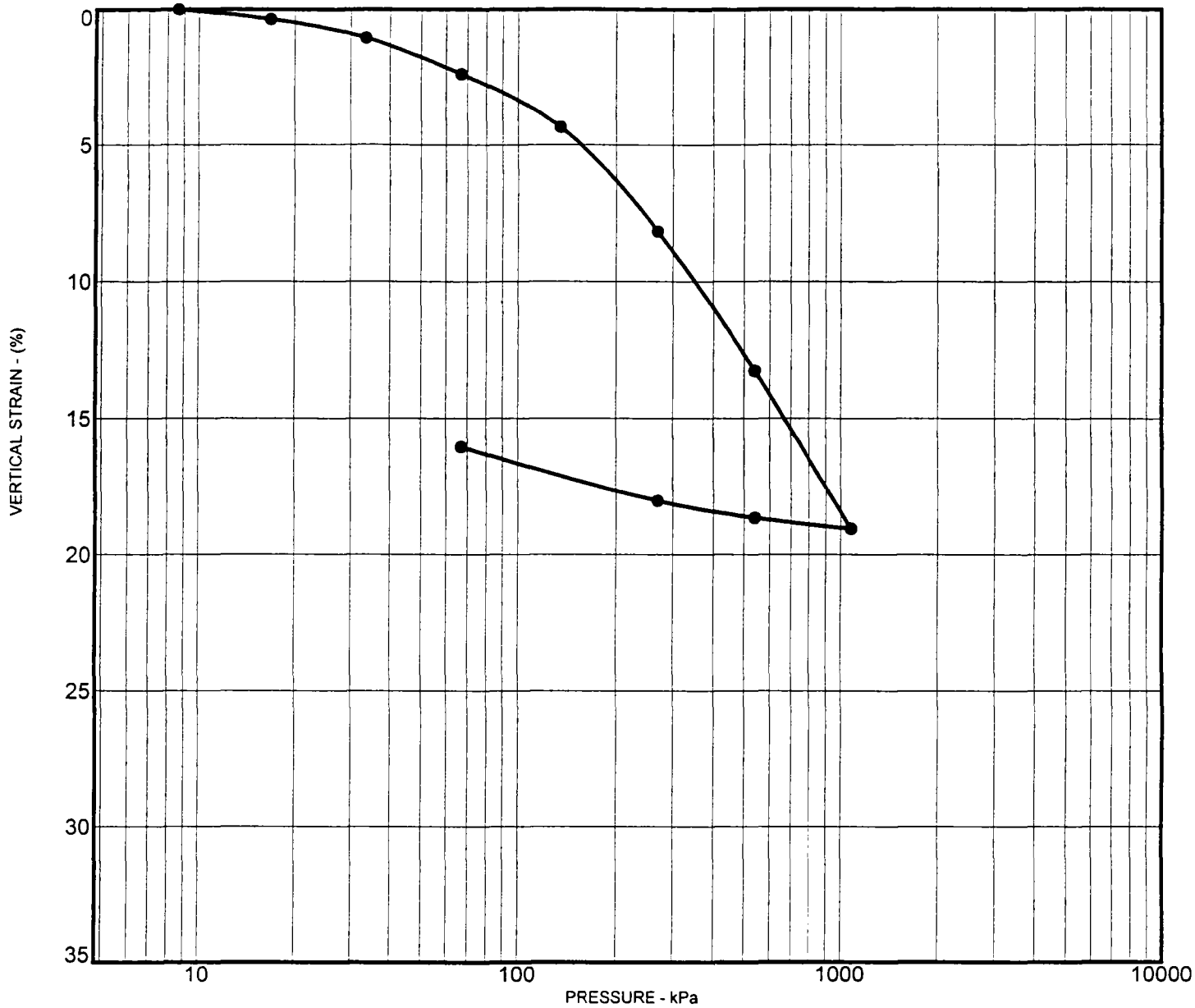
Boring Number:	SB-19-281
Sample Depth:	15.8 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	171.0	
Ring Weight	45.5	
Wet Wt.	125.5	
Wet + Tare		169.4
Dry + Tare		135.9
Tare Wt.		8.4

	Before Test (mm)	After Test (mm)
Sample Height	25.4	25.8
Sample Diameter	49.0	

Water added at 4.8 kPa.
* Elapsed Time shown only for time rates.

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
03/28/00	17:50:00			0176	
	18:40:00		4.8	0198	0.22
03/29/00	7:20:00		12.0	0238	0.62
	13:50:00		23.9	0289	1.13
	19:30:00		47.9	0363	1.87
03/30/00	10:05:00		95.8	0473	2.97
03/31/00	7:00:00		191.5	0677	5.01
04/01/00	9:00:00		383.0	1293	11.17
04/02/00	18:00:00		766.1	2130	19.54
04/03/00	8:50:00		383.0	2094	19.18
	15:40:00		191.5	2047	18.71
04/04/00	7:50:00		47.9	1904	17.28



Sample	SB-21-282
Depth	7.62 m
Classification	CH

	Initial	Final
Dry density, kN/m^3	12.7	15.1
Water content, %	40.0	31.4
Sample height, mm	25.4	21.3

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-394

Kleinfelder, Inc.
Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

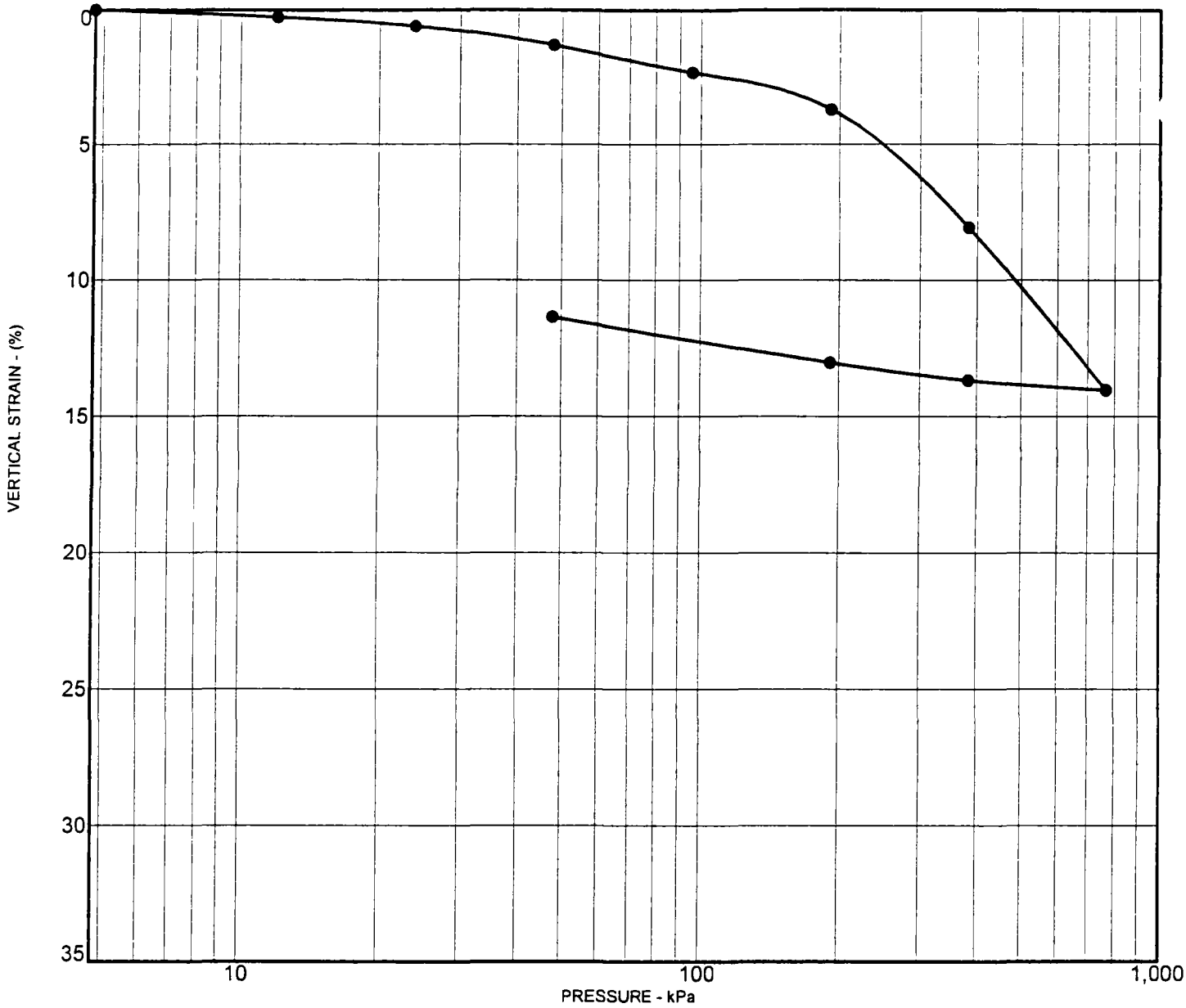
Boring Number:	RB-369
Sample Depth:	16.8 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	192.8	
Ring Weight	45.2	
Wet Wt.	147.6	
Wet + Tare		198.1
Dry + Tare		169.4
Tare Wt.		8.5

	Before Test (mm)	After Test (mm)
Sample Height	25.4	25.8
Sample Diameter	49.0	

Water added at 4.8 kPa.
* Elapsed Time shown only for time rates.

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
04/08/00	9:20:00			0176	
	10:10:00		4.8	0171	-0.05
	16:10:00		12.0	0215	0.39
04/09/00	8:45:00		23.9	0285	1.09
04/10/00	8:50:00		47.9	0377	2.01
	18:35:00		95.8	0489	3.13
04/11/00	12:25:00		191.5	0641	4.65
04/12/00	8:30:00		383.0	0838	6.62
04/13/00	17:45:00		766.1	1089	9.13
04/14/00	14:55:00		383.0	1062	8.86
04/15/00	18:15:00		191.5	1022	8.46
04/17/00	7:00:00		47.9	0920	7.44



Sample	RB-370
Depth	18.29 m
Classification	ML

	Initial	Final
Dry density, kN/m^3	12.4	14.0
Water content, %	43.3	36.1
Sample height, mm	25.4	22.6

KLEINFELDER

PROJECT NO. 35-8163-05

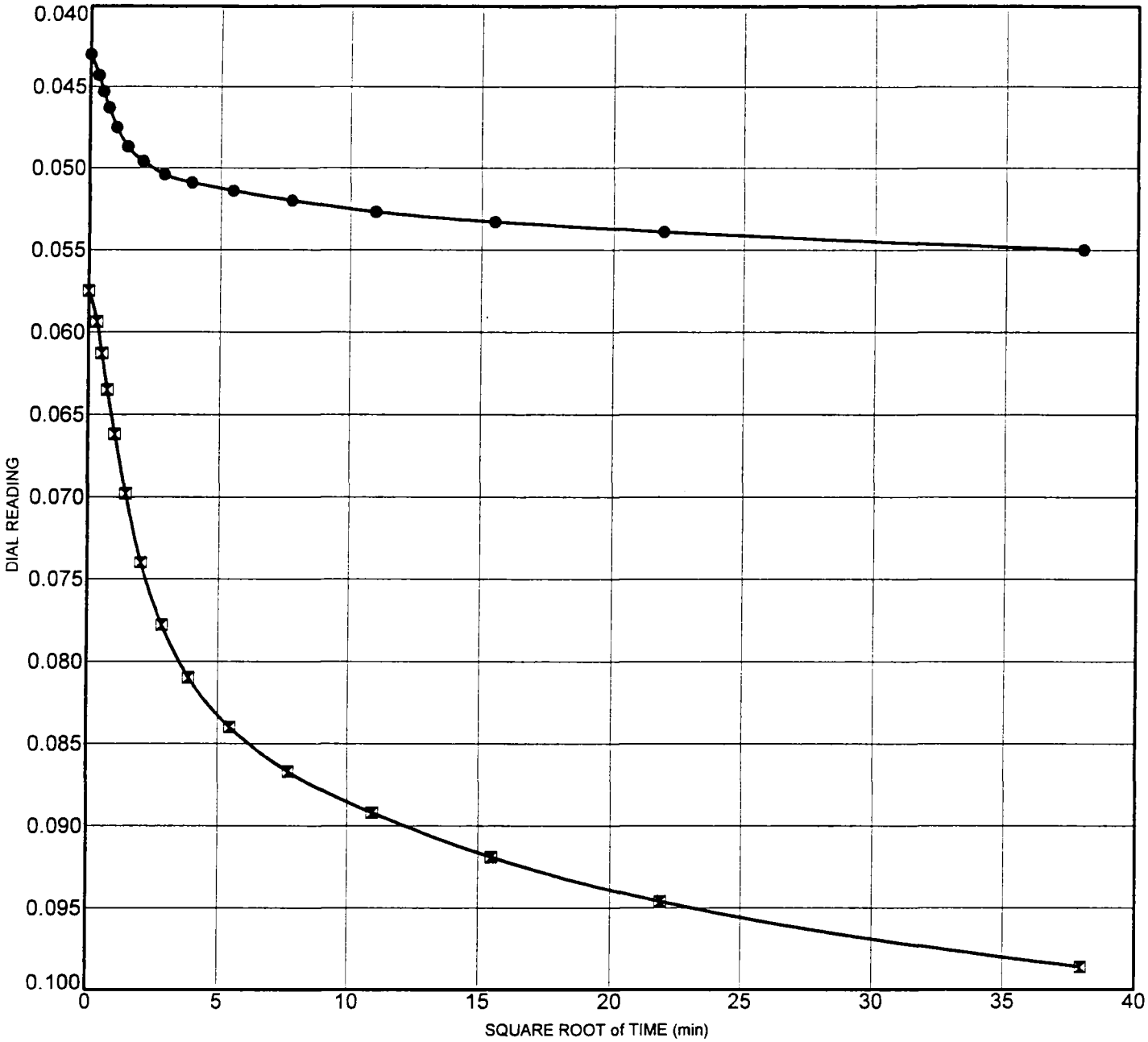
Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-709



Sample	**RB-370**	
Depth	**18.3 m**	
Pressure (MPa)	● **0.19**	⊠ **0.38**
Cv (m^2/day)		

KLEINFELDER

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

TIME RATE CONSOLIDATION

PLATE

K-710

PROJECT NO. **35-8163-05**

TIME RATE (RTC) 2-M-B Z003RB.GPJ 6/1/00

Kleinfelder, Inc.
Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

Boring Number:	RB-370
Sample Depth:	18.3 m

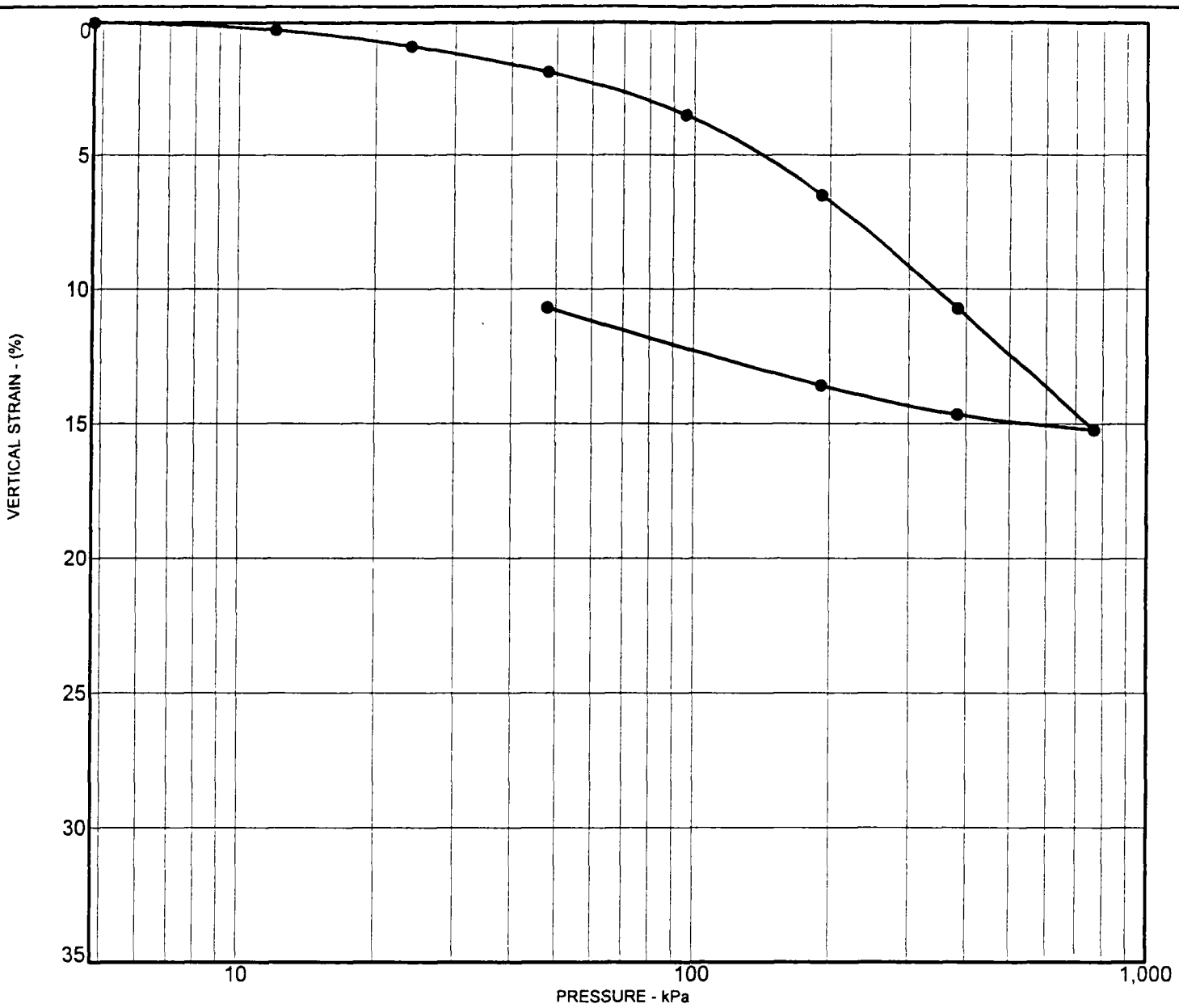
	Before Test (g)	After Test (g)
Wet Wt. + Ring	179.4	
Ring Weight	45	
Wet Wt.	134.4	
Wet + Tare		181.2
Dry + Tare		147.3
Tare Wt.		8.5

	Before Test (mm)	After Test (mm)
Sample Height	25.4	22.0
Sample Diameter	49.0	

Water added at 4.8 kPa.
* Elapsed Time shown only for time rates.

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
04/04/00	11:20:00			0193	
	11:45:00		4.8	0179	-0.14
	15:00:00		12.0	0206	0.13
	17:00:00		23.9	0240	0.47
04/05/00	11:00:00		47.9	0310	1.17
04/07/00	7:00:00		95.8	0412	2.19
	7:57:00	0:00:00	191.5	0430	2.37
	7:57:06	0:00:06		0443	
	7:57:15	0:00:15		0453	
	7:57:30	0:00:30		0463	
	7:58:00	0:01:00		0475	
	7:59:00	0:02:00		0487	
	8:01:00	0:04:00		0496	
	8:05:00	0:08:00		0504	
	8:13:00	0:16:00		0509	
	8:27:00	0:30:00		0514	
	8:57:00	1:00:00		0520	
	9:57:00	2:00:00		0527	
	11:57:00	4:00:00		0533	
	15:57:00	8:00:00		0539	
04/08/00	7:57:00	24:00:00	191.5	0550	3.57
	8:00:00	0:00:00	383.0	0575	3.82
	8:00:06	0:00:06		0594	
	8:00:15	0:00:15		0613	

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
	8:00:30	0:00:30		0635	
	8:01:00	0:01:00		0662	
	8:02:00	0:02:00		0698	
	8:04:00	0:04:00		0740	
	8:08:00	0:08:00		0778	
	8:15:00	0:15:00		0810	
	8:30:00	0:30:00		0840	
	9:00:00	1:00:00		0867	
	10:00:00	2:00:00		0892	
	12:00:00	4:00:00		0919	
	16:00:00	8:00:00		0946	
04/09/00	8:00:00	24:00:00	383.0	0986	7.93
	8:00:00		766.1	1583	13.90
	18:35:00		383.0	1547	13.54
04/11/00	12:25:00		191.5	1485	12.92
	16:50:00		47.9	1315	11.22



Sample	RB-371
Depth	3.05 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	13.4	15.0
Water content, %	38.2	32.5
Sample height, mm	25.4	22.6

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-713

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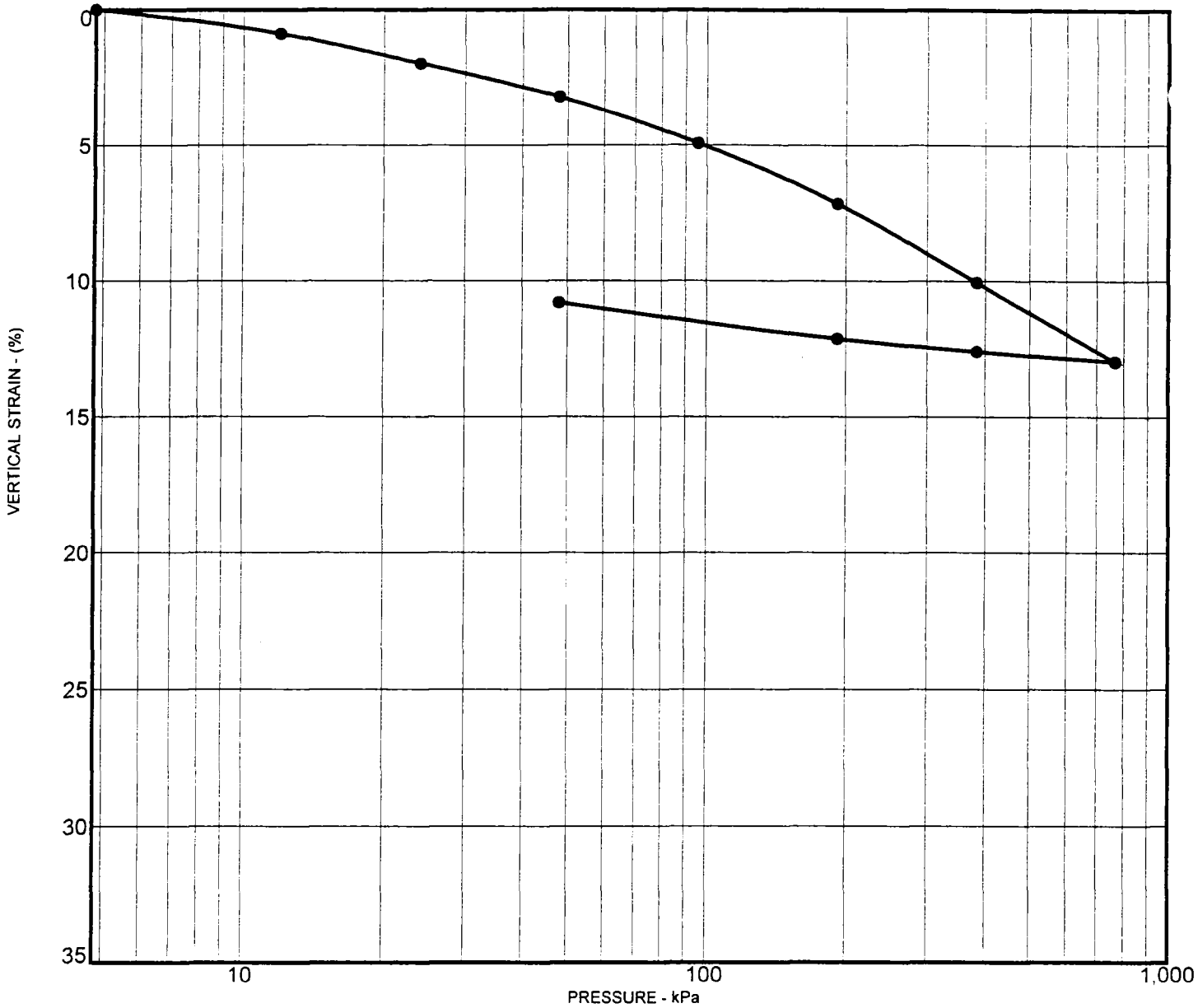

Sample	RB-418
Depth	1.52 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	14.3	16.1
Water content, %	28.4	25.7
Sample height, mm	25.4	22.6

KLEINFELDER

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-890

PROJECT NO. **35-8163-05**

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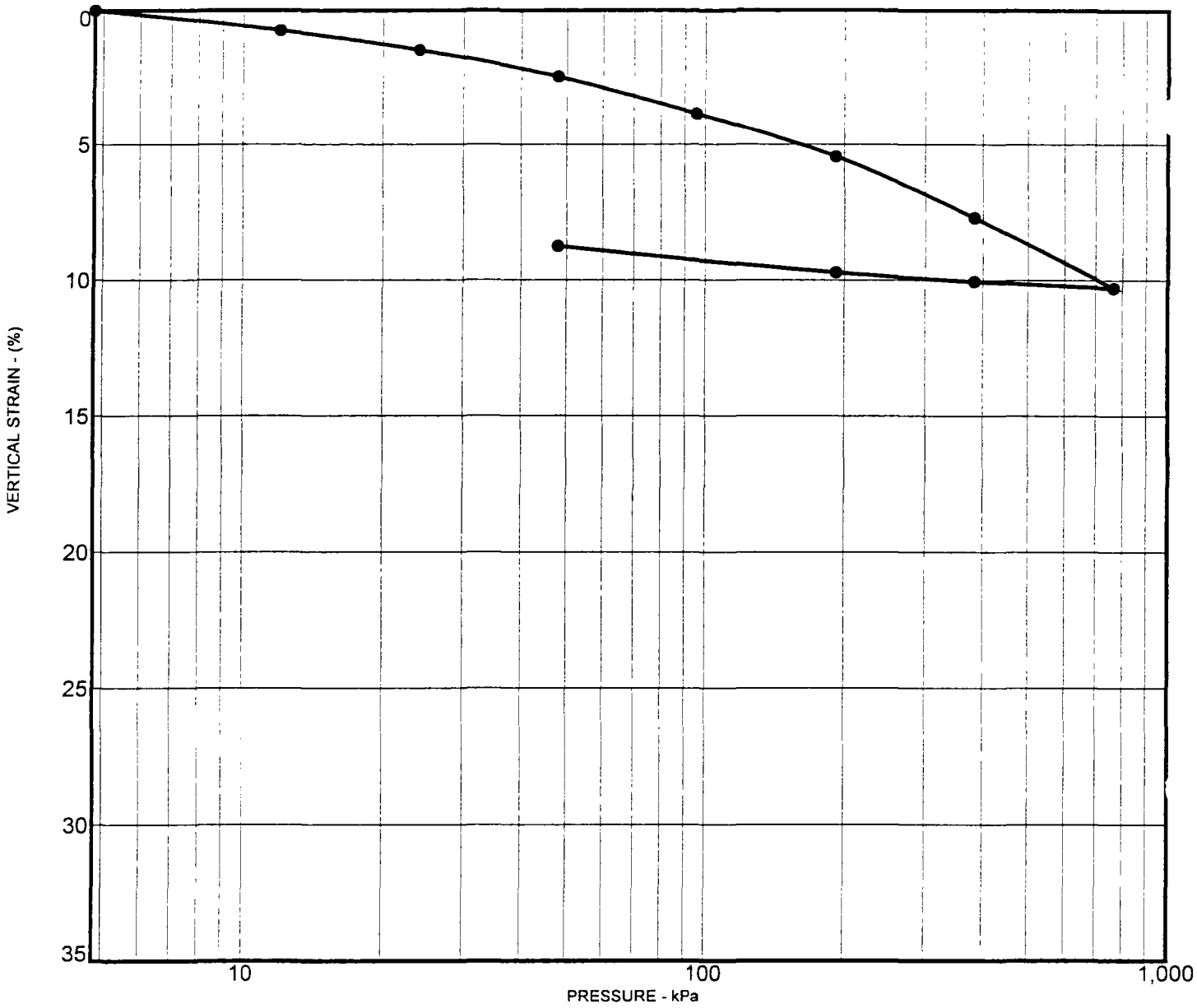

Sample	RB-418
Depth	4.57 m
Classification	SM

	Initial	Final
Dry density, kN/m^3	13.4	14.8
Water content, %	36.0	33.2
Sample height, mm	25.4	23.1

KLEINFELDER

PROJECT NO. 35-8163-05

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-892

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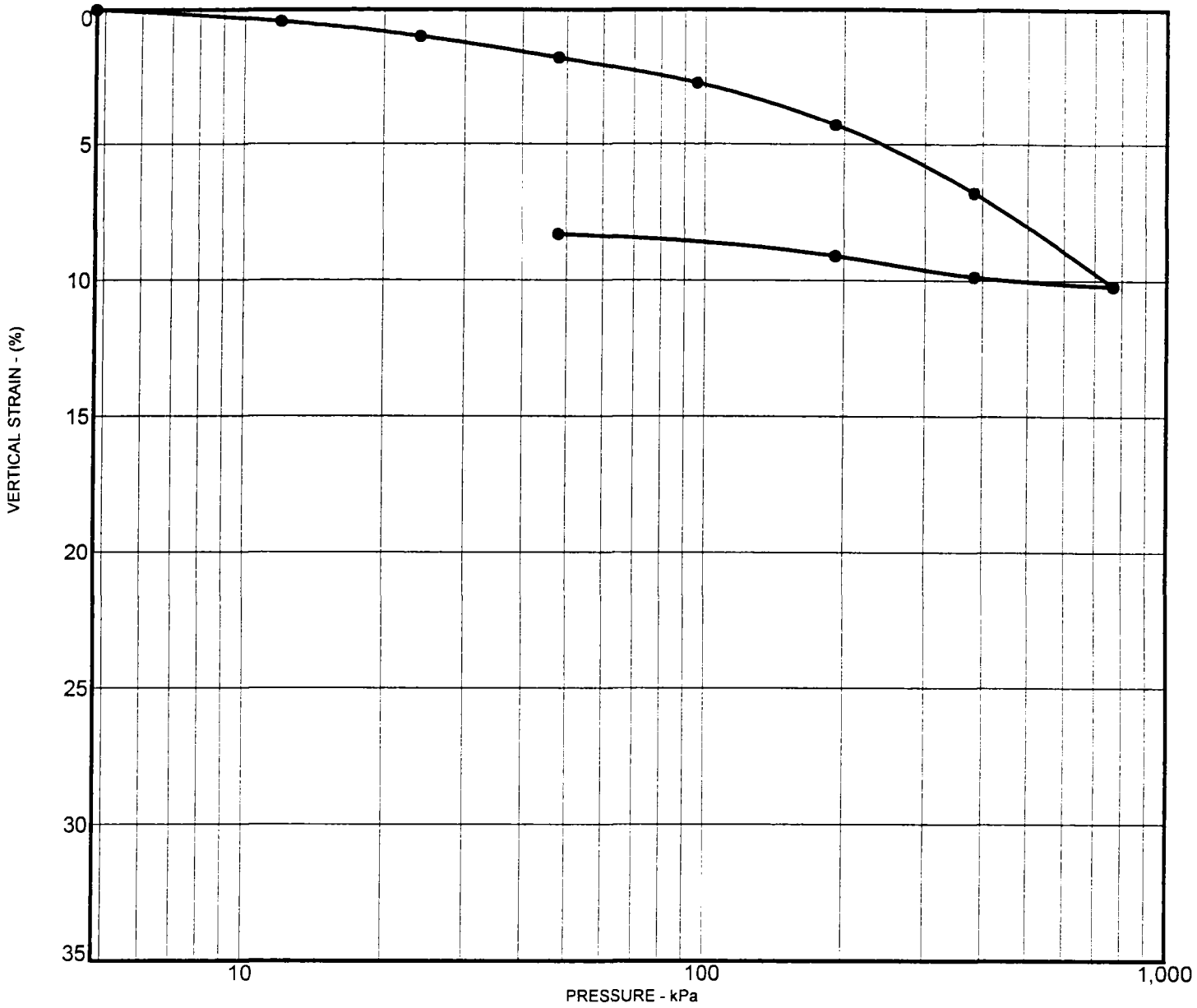


Sample	RB-420
Depth	4.57 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	14.9	16.3
Water content, %	30.3	26.7
Sample height, mm	25.4	23.4

KLEINFELDER

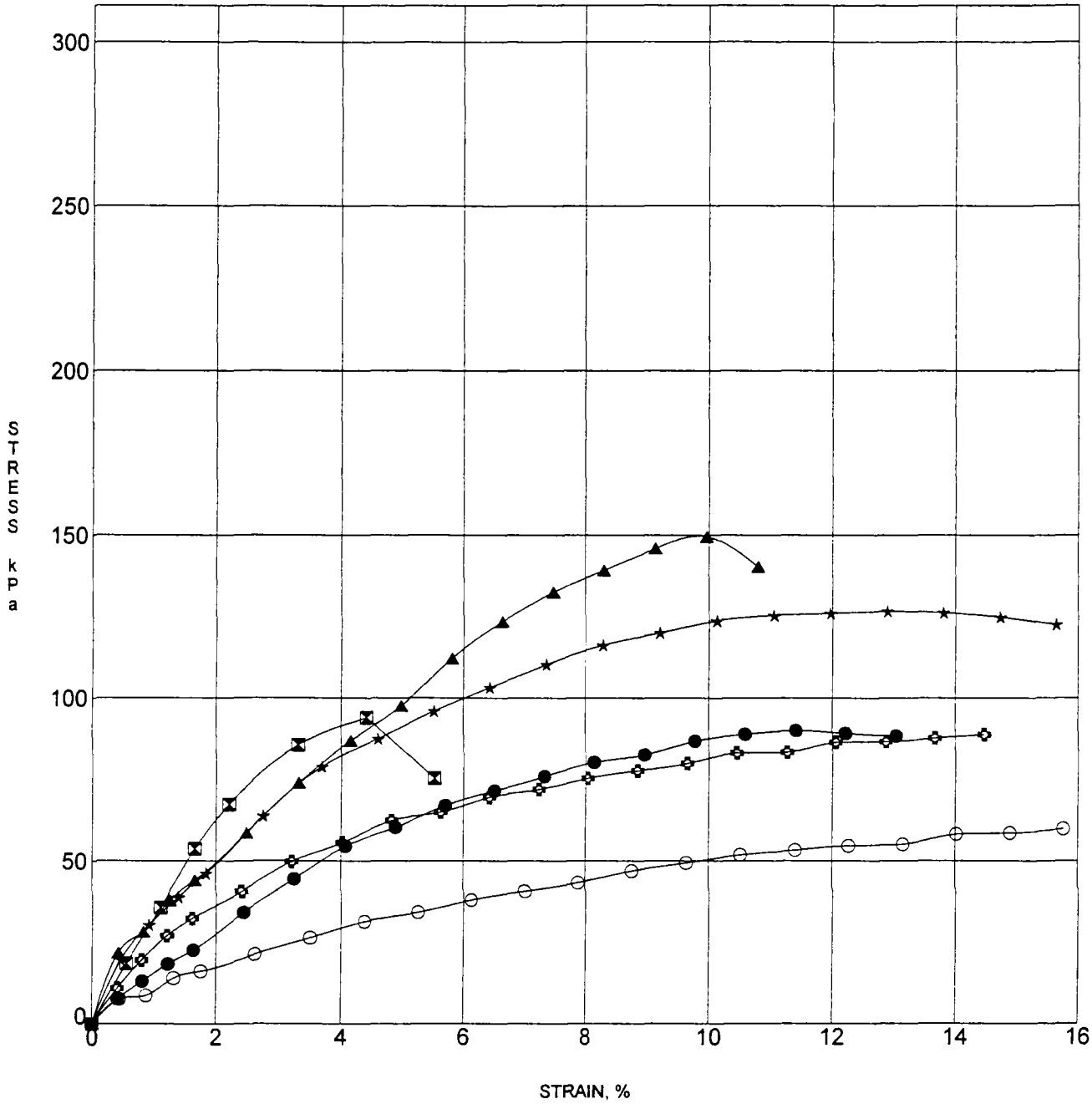
PROJECT NO. 35-8163-05

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-894



Specimen Identification			USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	SB-19-274	15.2	Lean CLAY (CL)	90	14.9	29
⊠	SB-19-274	25.9	Clayey SAND (SC)	94	17.1	19
▲	SB-19-276	18.3	Lean CLAY (CL)	150	17.1	25
★	SB-19-276	24.4	Lean CLAY (CL)	127	14.6	30
○	SB-19-279	6.7	SILT (ML)	60	14.4	34

KLEINFELDER

PROJECT NO. 35-8163-05

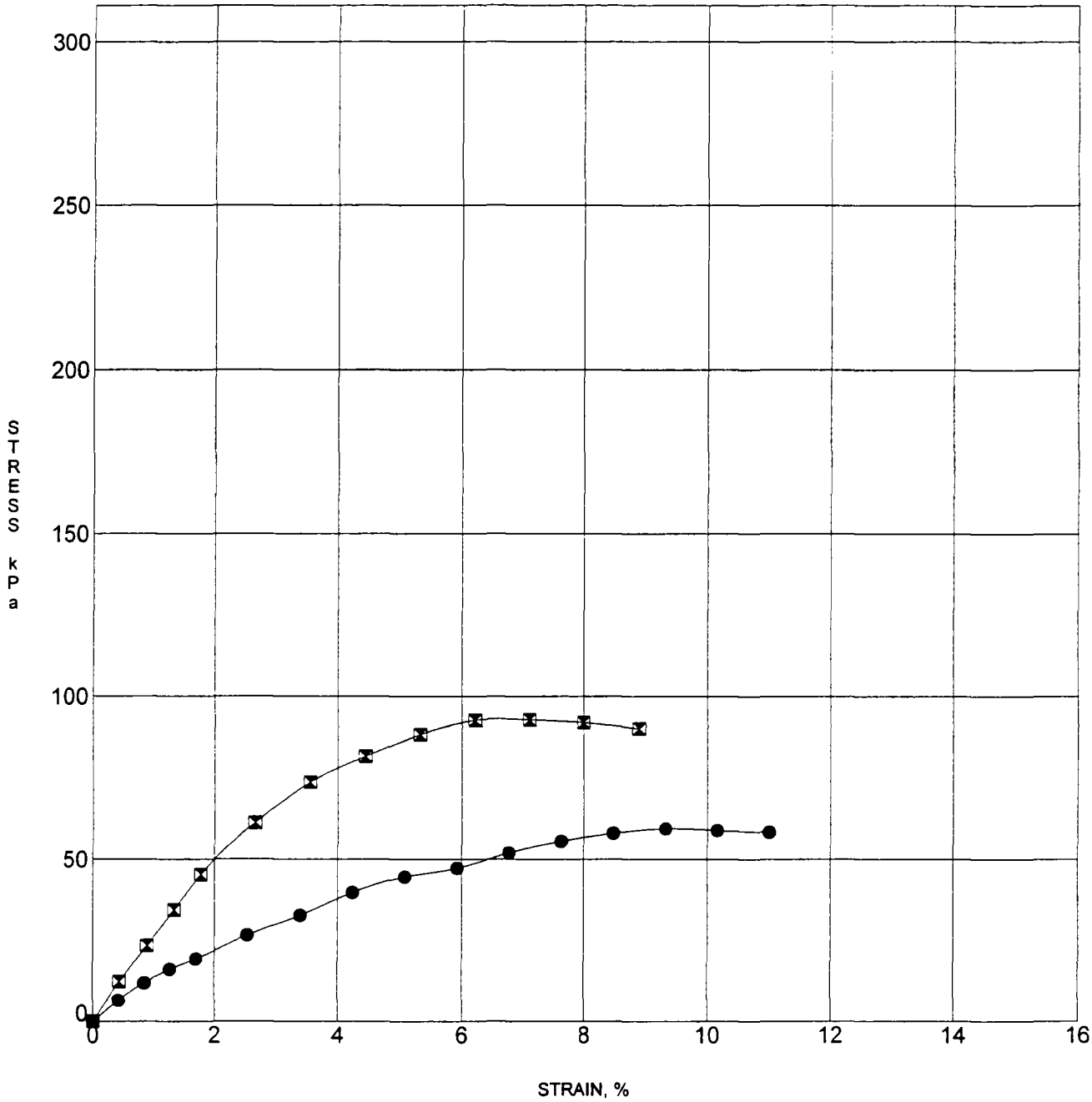
Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE

K-922



Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
● SB-19-281	9.1	Lean CLAY (CL)	59	15.4	31
⊠ SB-19-281	15.8	Elastic SILT (MH)	93	11.8	50

KLEINFELDER

Legacy Parkway - Preferred Alternative

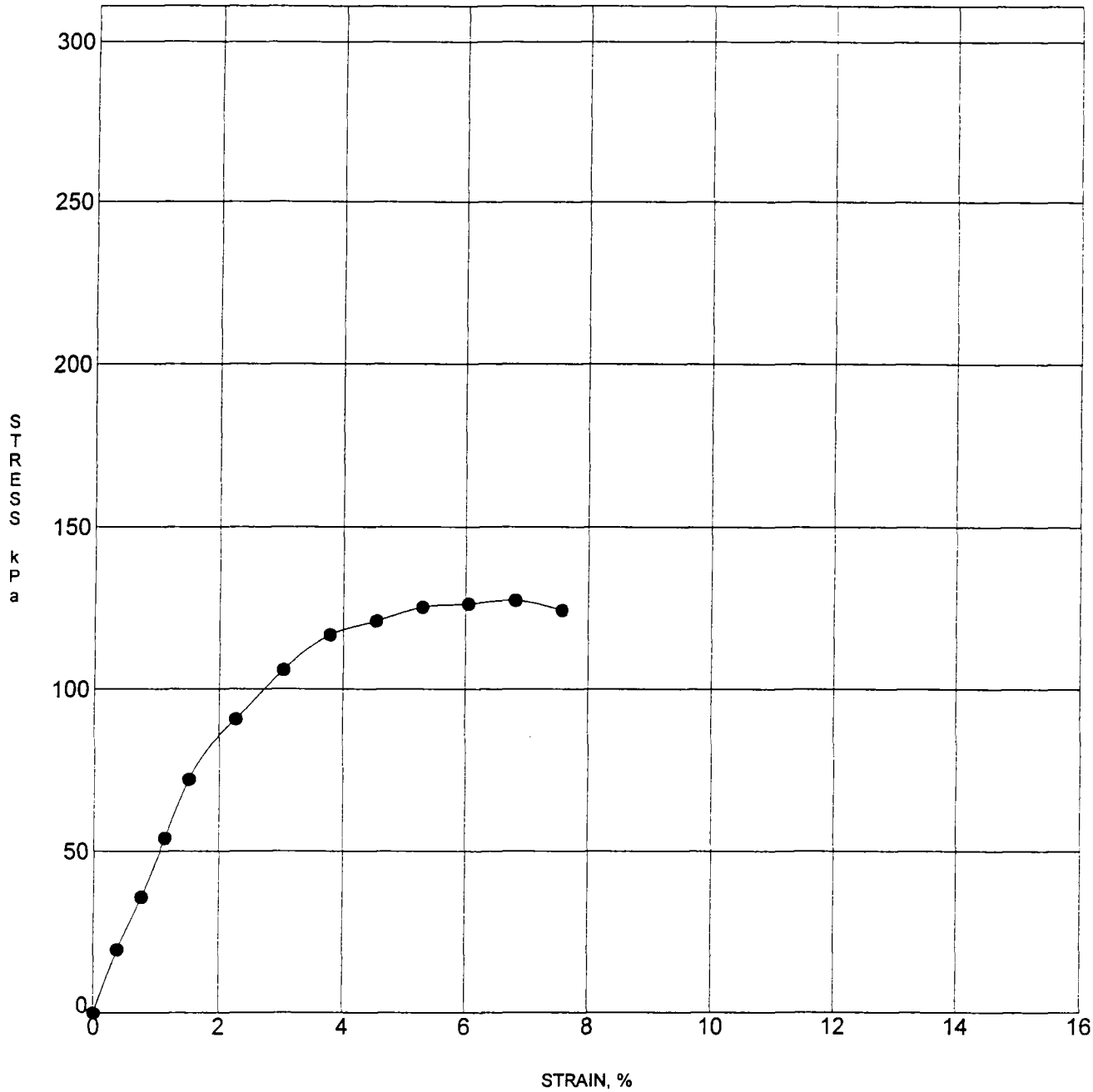
I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE

K-923

PROJECT NO. 35-8163-05



Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
● RB-370	18.3	SILT (ML)	127	12.7	43

KLEINFELDER

Legacy Parkway - Preferred Alternative

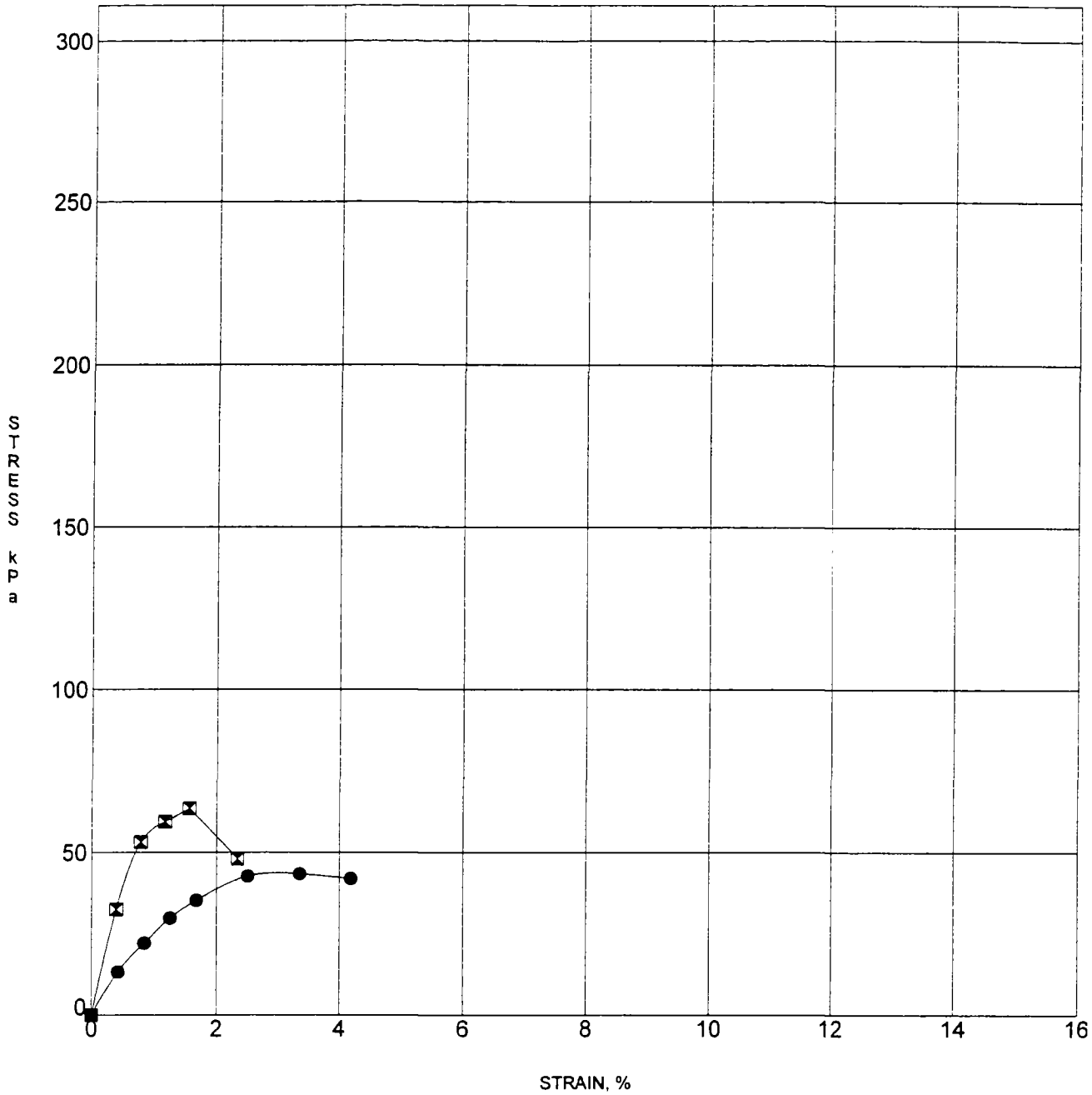
I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE

K-966

PROJECT NO. **35-8163-05**



Specimen Identification			USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	RB-371	3.0	Lean CLAY (CL)	43	14.3	34
⊠	RB-371	19.8	Lean CLAY (CL)	63	18.5	17

KLEINFELDER

Legacy Parkway - Preferred Alternative

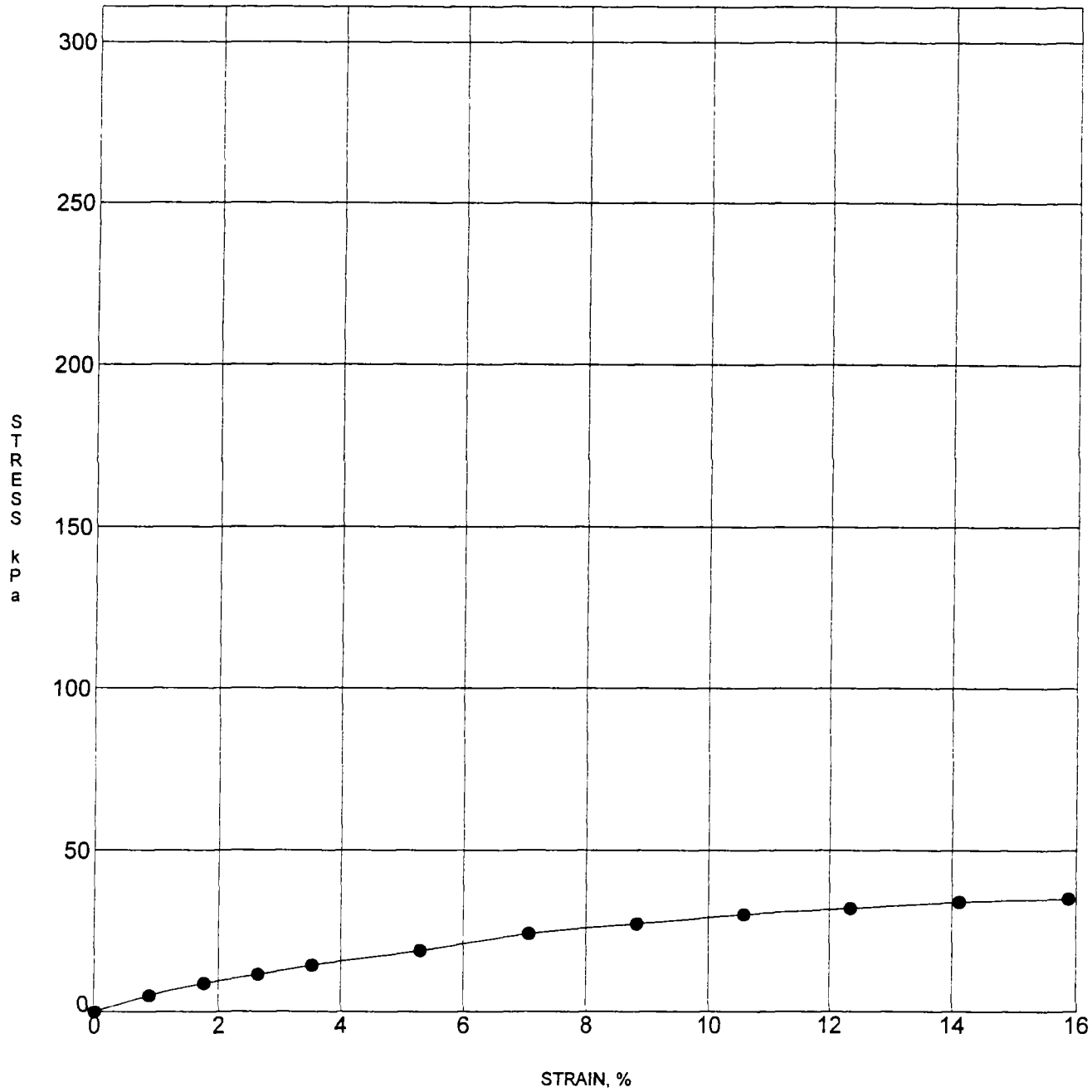
I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE

K-967

PROJECT NO. 35-8163-05



Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
● RB-414	1.5	Lean CLAY (CL)	35	8.0	23

KLEINFELDER

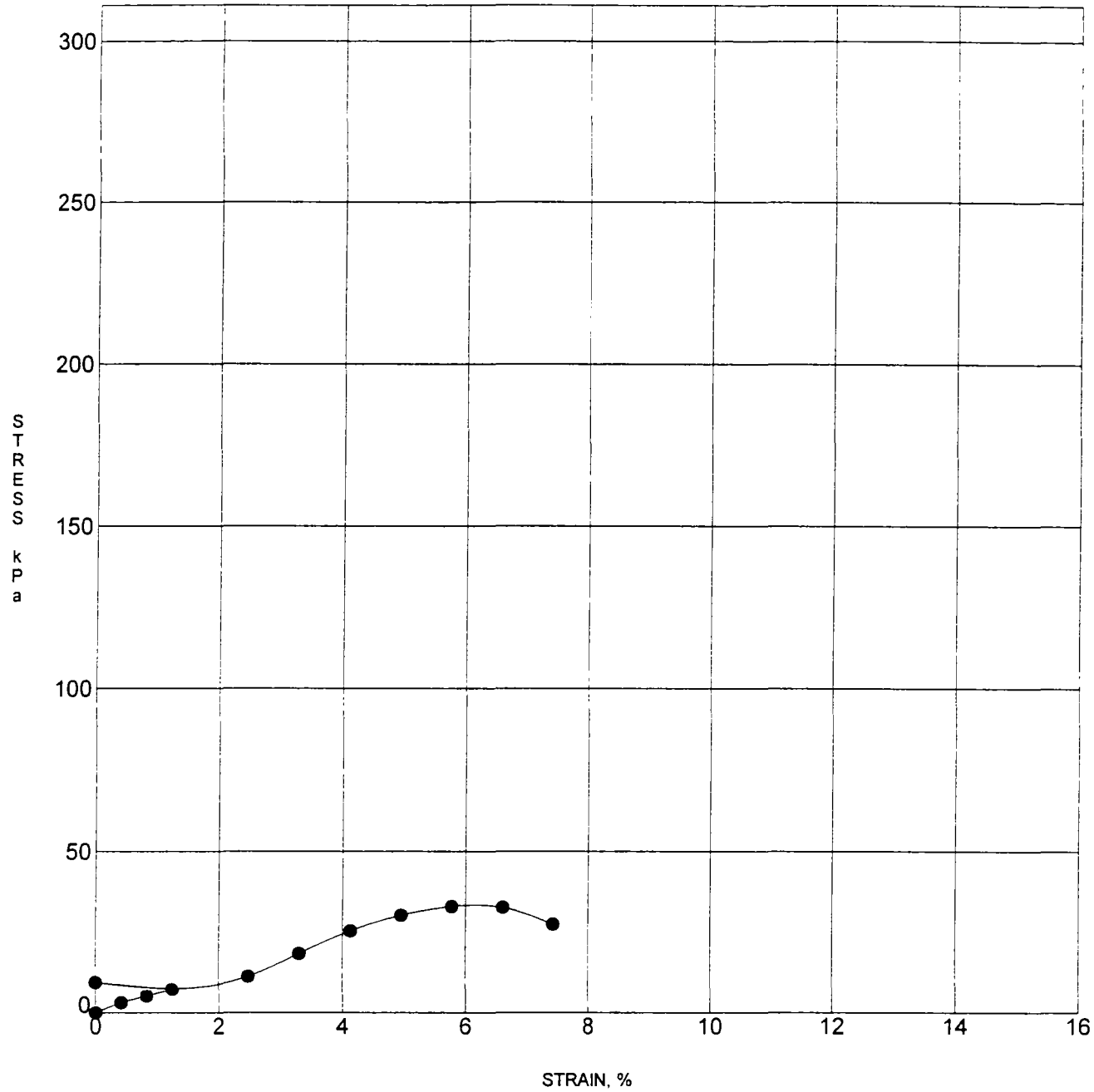
I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE

K-1006

PROJECT NO. 35-8163-05



Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
● RB-415	7.6	Sandy Lean CLAY (CL)	33	13.2	38

KLEINFELDER

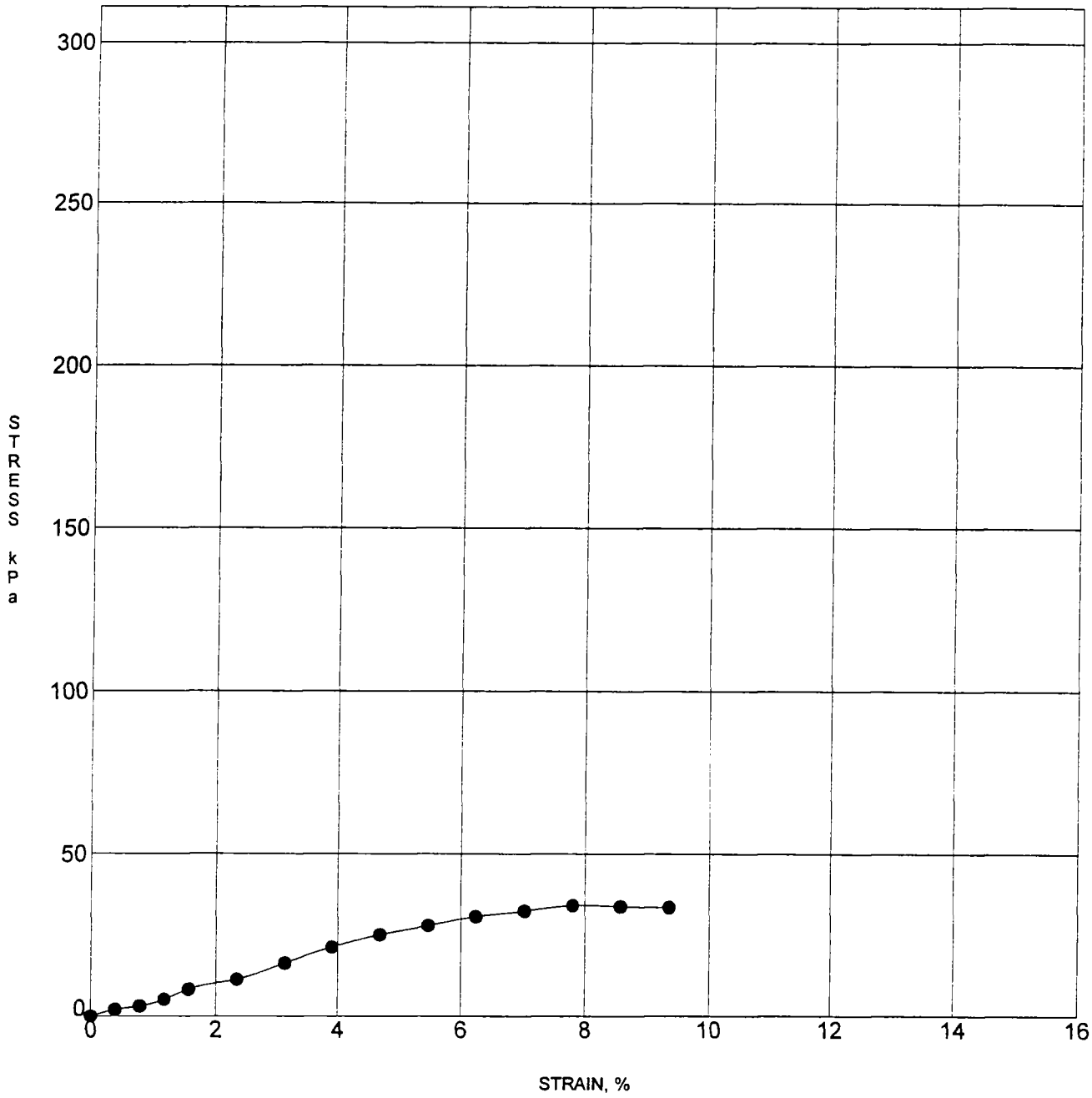
I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE

K-1007

PROJECT NO. 35-8163-05



Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
● RB-417	7.6	Lean CLAY (CL)	34	13.3	38

KLEINFELDER

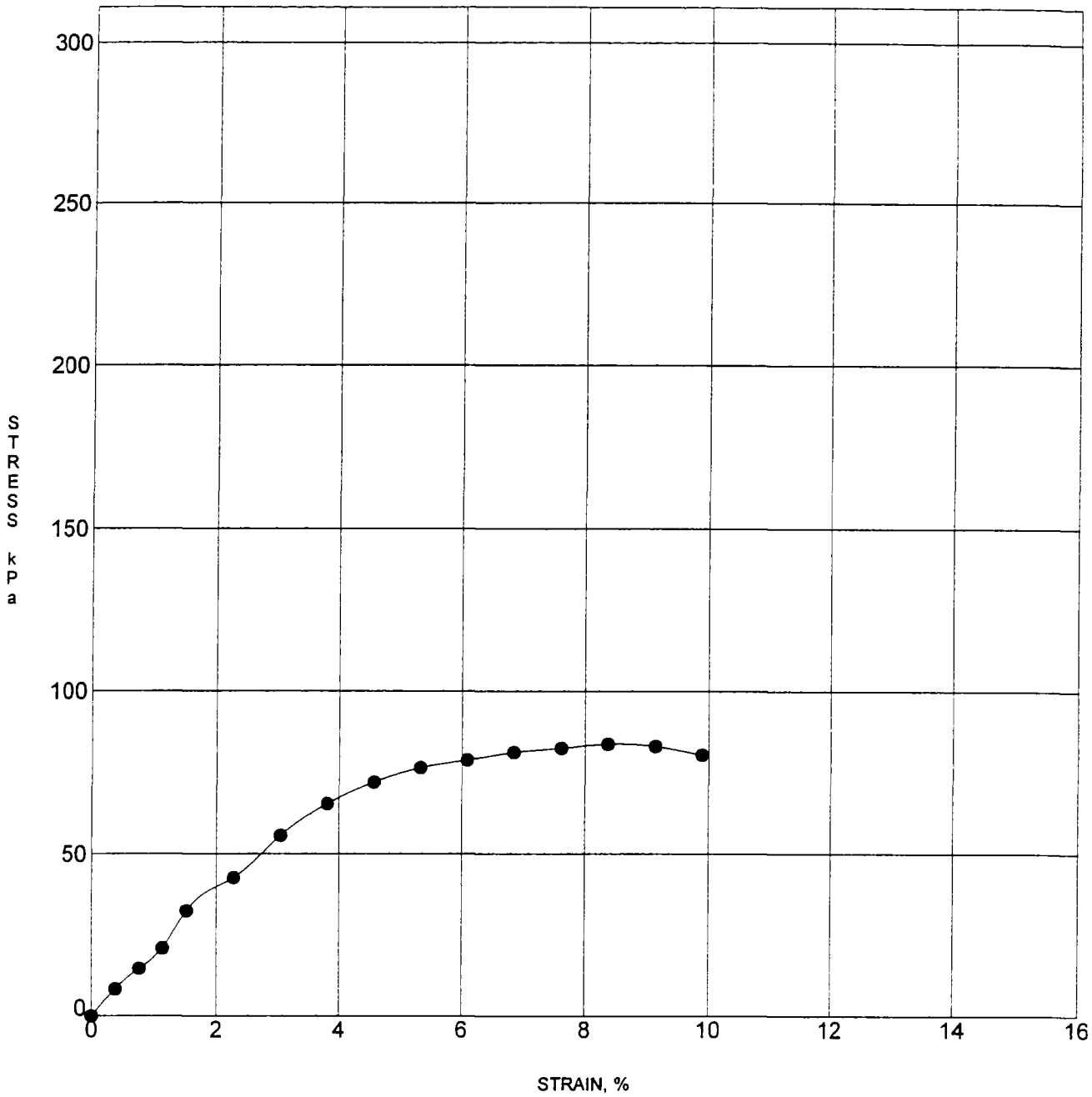
I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE

K-1008

PROJECT NO. 35-8163-05



Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
● RB-418	1.5	Lean CLAY (CL)	84	14.7	29

KLEINFELDER

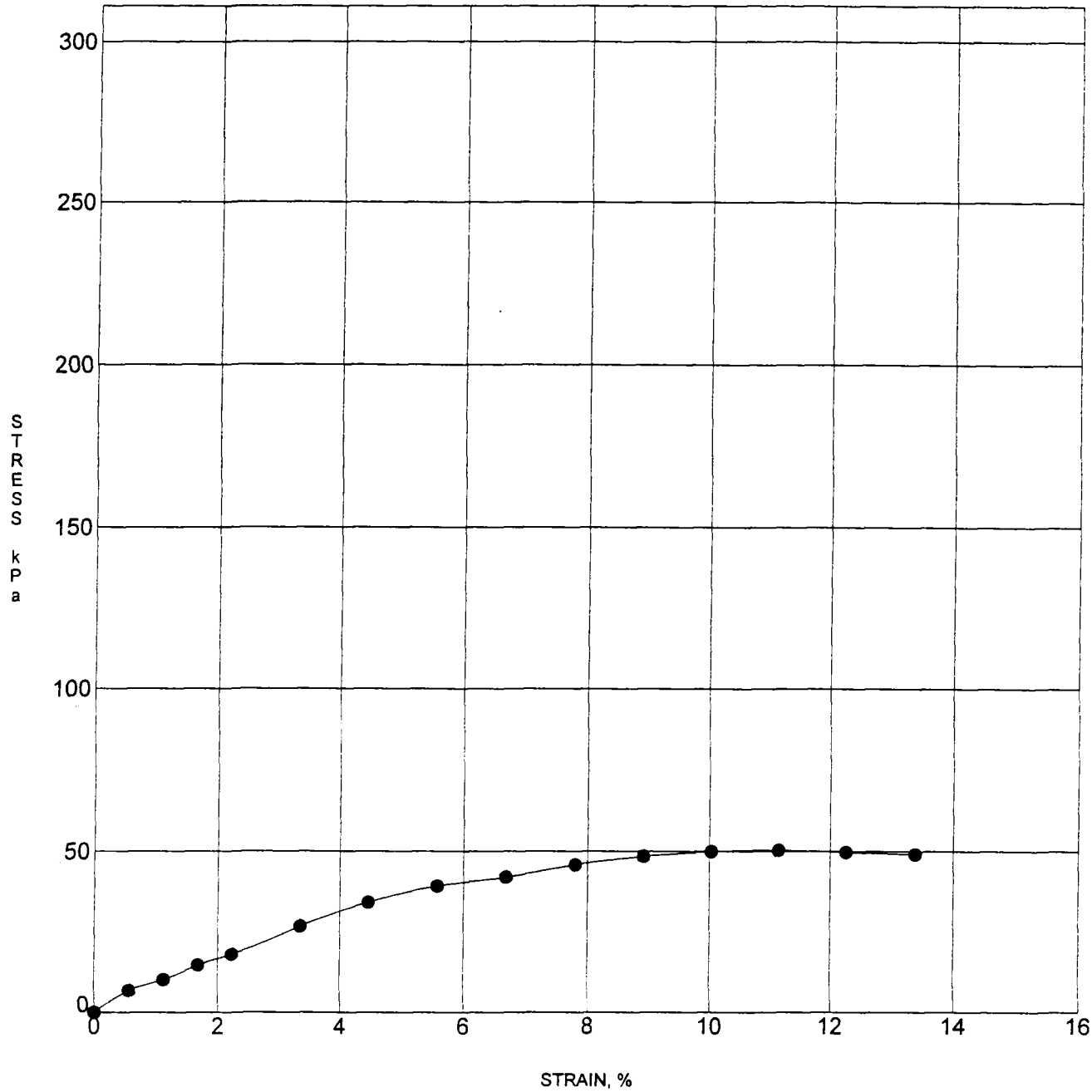
I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE

K-1009

PROJECT NO. **35-8163-05**



Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
● RB-420	4.6	Lean CLAY (CL)	50	16.6	28

KLEINFELDER

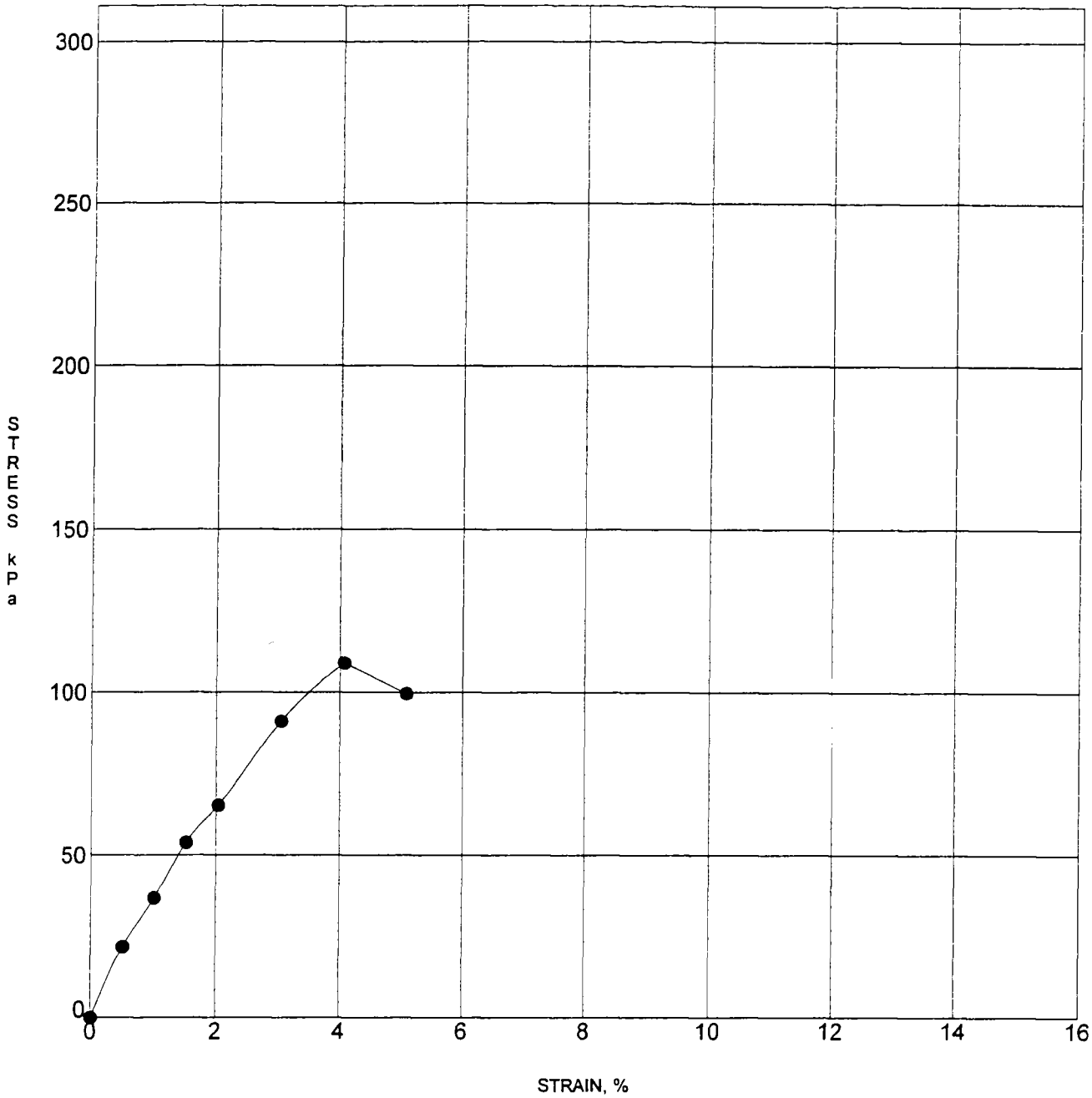
I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE

K-1010

PROJECT NO. **35-8163-05**



Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
● RB-421	1.5	Lean CLAY (CL)	109	16.9	20

KLEINFELDER

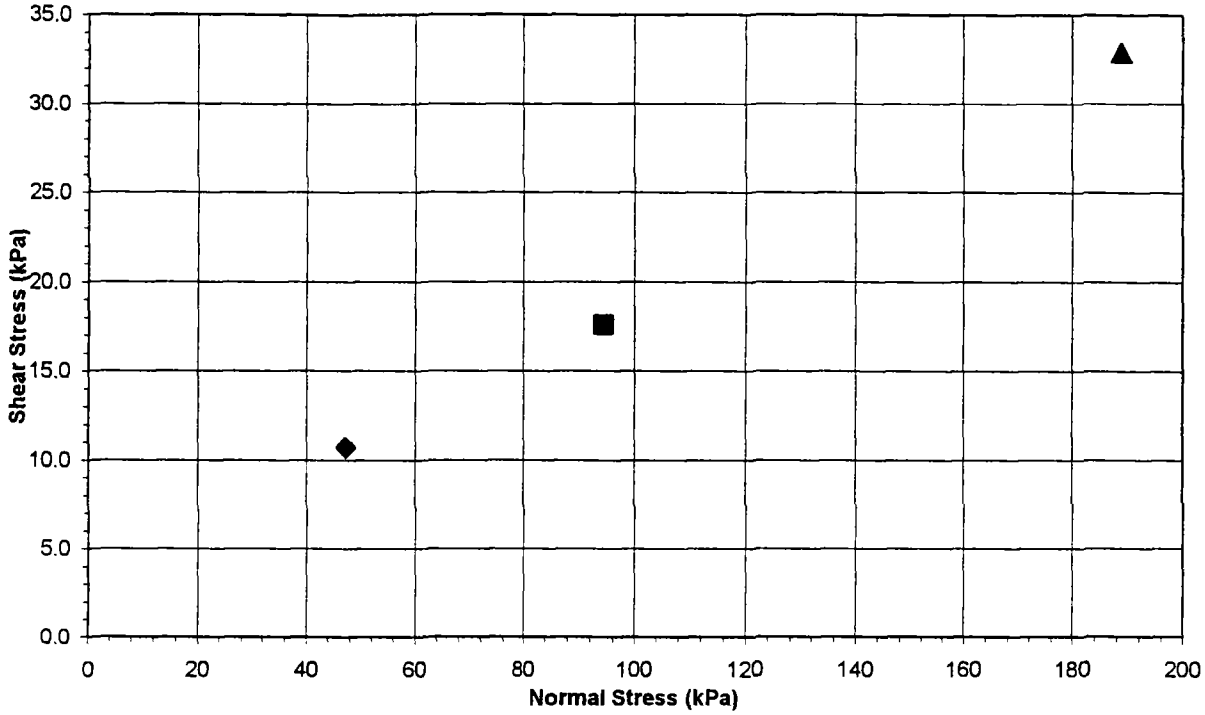
I-215 to I-15/US 89 Interchange

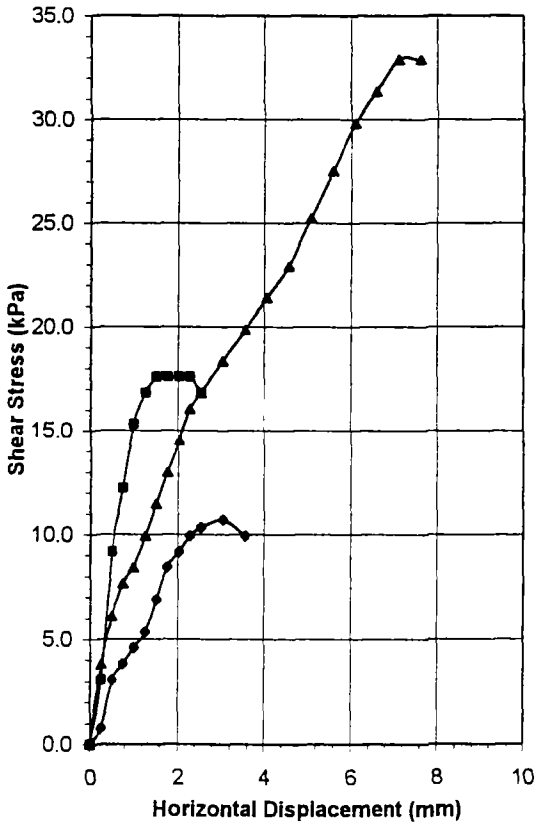
UNCONFINED COMPRESSION TEST

PLATE

K-1011

PROJECT NO. 35-8163-05





Boring: SB-6-333	Depth: 7.6 m
Type of Test::	Unconsolidated-Undrained

Test No. (Symbol)	1	2	3
Sample Type	Undisturbed		
Height, mm	20	20	20
Diameter, mm	63	63	63
Dry Density, KN/m^3	12.9	12.5	13.0
Water Content, %	38.8	41.7	38.1
Normal Stress, kPa	47	94	189
Shear Stress, kPa	11	18	33
Strain Rate	1.25 mm/min		

KLEINFELDER

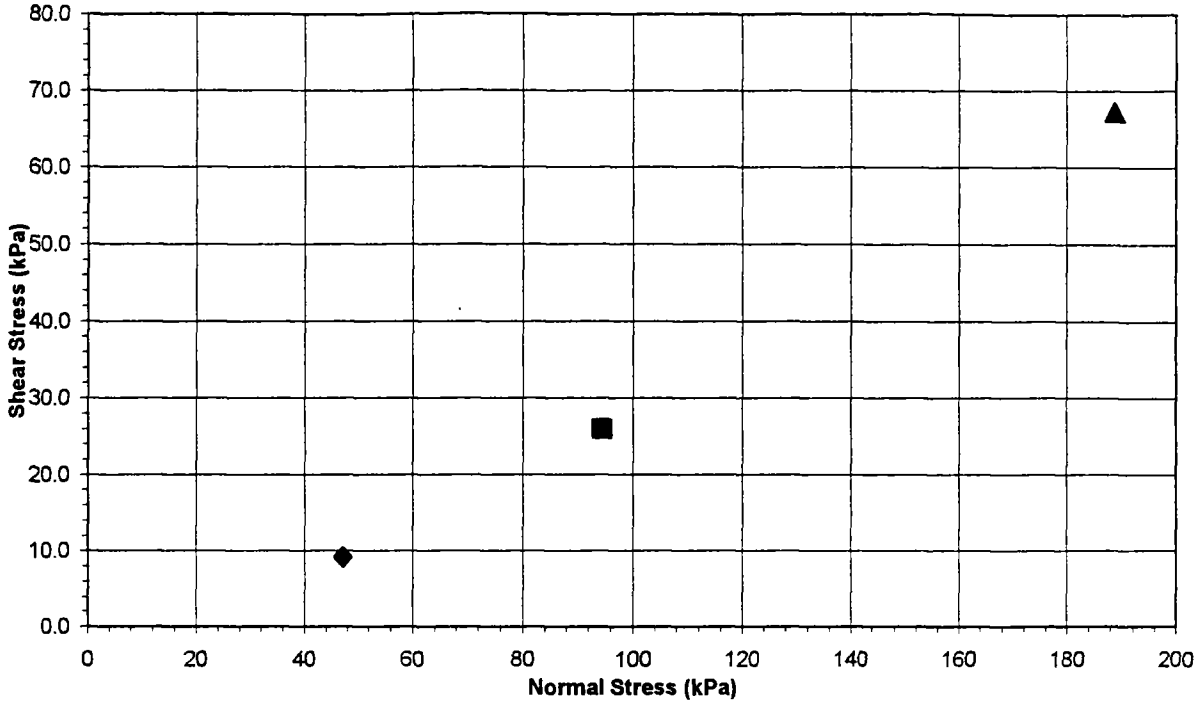
Project No. 35-8163-05

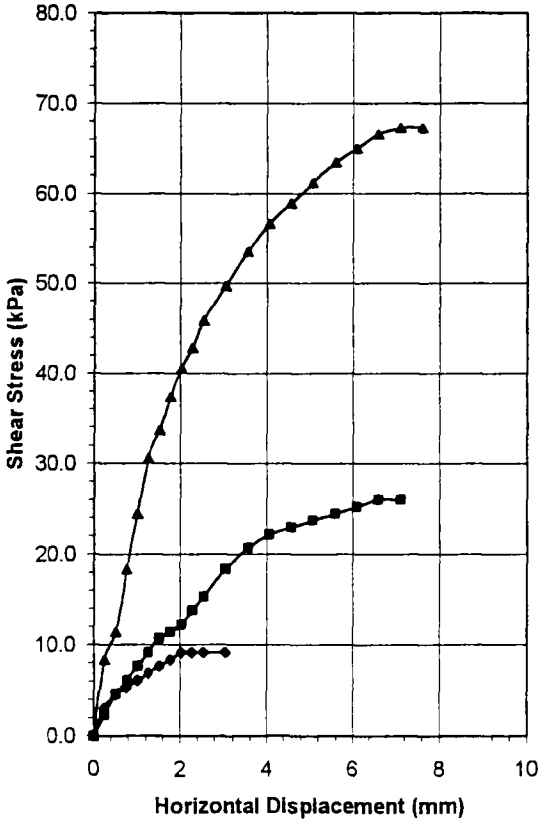
Legacy Highway - Peferred Alternative
I-215 to I-15/US 89 Interchange

DIRECT SHEAR TEST

PLATE

K-1016





Boring: SB-19-279	Depth: 6.7 m
Type of Test:	Unconsolidated-Undrained

Test No. (Symbol)	1	2	3
Sample Type	Undisturbed		
Height, mm	20	20	20
Diameter, mm	63	63	63
Dry Density, KN/m^3	13.3	14.1	14.1
Water Content, %	32.6	31.8	30.8
Normal Stress, kPa	47	94	189
Shear Stress, kPa	9	26	67
Strain Rate	1.25 mm/min		

KLEINFELDER

Project No. 35-8163-05

Legacy Highway - Peferred Alternative
I-215 to I-15/US 89 Interchange

DIRECT SHEAR TEST

PLATE

K-1017

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Toll Free (888) 263-8686
Fax (801) 263-8687

Client: Kleinfelder-SLC
Date Sampled: February 1, 2000
Project: Legacy Parkway/35-8163-05.005

Contact: Chris Garris
Date Received: March 29, 2000

Lab Sample ID:
L40594-04A

Field Sample ID:
SB-19-276 bag 1 @ 5-6'

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Amount Detected	
pH	pH units	3/30/00	9045C	0	**8.80**	
Resistivity	ohm-cm	3/30/00	2510B	0	**1,400**	*
Sulfate	mg/kg	3/30/00	375.4	5.0	**180**	*

* Analysis is performed on a 1:1 DI water extract for soils.

Released by: _____
Laboratory Supervisor

Report Date: April 5, 2000

PLATE K-1060

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INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
1 Free (888) 263-8686
Fax (801) 263-8687

Client: Kleinfelder-SLC
Date Sampled: February 17, 2000
Project: Legacy Parkway/35-8163-05.005

Contact: Chris Garris
Date Received: March 29, 2000

Lab Sample ID:
L40594-15A

Field Sample ID:
SB-22-288 #3A @ 8-10'

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Amount Detected	
pH	pH units	3/30/00	9045C	0	**8.40**	
Resistivity	ohm-cm	3/30/00	2510B	0	**3,900**	*
Sulfate	mg/kg	3/30/00	375.4	5.0	**23**	*

* Analysis is performed on a 1:1 DI water extract for soils.

Released by: SOH
Laboratory Supervisor

Report Date: April 5, 2000

PLATE K-1061

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MEMORANDUM

To: Mr. K.N. Gunalan, P.E.
Parsons, Brinckerhoff

From: Chris T. Garris, P.E.
Corbett M. Hansen, E.I.T.
Curt Christensen, P.E.

Date: May 8, 2001

File # 03CDR	Doc. # 002
Route to:	
Scanned 5.14.01	

Subject: Methodology for Evaluating Liquefaction Potential and Estimating Liquefaction-Induced Settlement

This memorandum describes the methodology proposed for evaluation of the liquefaction potential and estimation of liquefaction-induced settlement for the proposed Legacy Parkway alignment.

BACKGROUND

Liquefaction is a phenomenon whereby loose, saturated, granular soil deposits lose a significant portion of their shear strength due to pore pressure buildup resulting from dynamic loading, such as that caused by an earthquake. Among other effects, liquefaction can result in densification of such deposits causing settlement of overlying layers as excess pore water pressures are dissipated. The primary factors affecting liquefaction of a soil deposit are: (1) level and duration of seismic ground motions; (2) soil type and relative density; and (3) depth to groundwater.

Results of a preliminary investigation of the subsurface soil conditions along the proposed roadway alignment were presented in the Report of Geotechnical Field and Laboratory Investigations, Legacy Parkway Preferred Alternative, Salt Lake and Davis Counties, Utah, dated June 2, 2000. Section 5.2.2 of the above-referenced report, Surficial Geology, indicates the proposed alignment is underlain predominately by unconsolidated Quaternary deposits overlying bedrock at depths ranging from approximately 180 to 770 meters. The Quaternary deposits consist predominately of fine-grained soils related to regressive lake cycles. Lateral-spread deposits derived from older lacustrine deposits, which failed due to liquefaction are located near the northern portion of the proposed alignment. These deposits are reported to have moved on four different occasions in response to prehistoric earthquake loads and/or high water levels on the Great Salt Lake.

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FIELD INVESTIGATION

Available subsurface data from the above-referenced report include soil classification, Standard Penetration Test (SPT) blow count, Cone Penetration Test (CPT) soundings, and laboratory test data.

METHODOLOGY

Liquefaction potential will be calculated using available SPT and CPT data and methods presented in Youd and Idriss, 1997. Peak horizontal ground acceleration (PHA) values for the proposed alignment will be obtained from Frankel et. al. as presented on the U. S. Geologic Survey web site (USGS 2001). The maximum PHA from a large earthquake, having a 10 percent probability of exceedence in a 50 year time period is 0.24g to 0.29g near the north and south ends of the proposed alignment, respectively. A moment magnitude, Mw = 7.1 will be used in the liquefaction analysis considering the location of the proposed alignment with respect to the Weber and Salt Lake segments of the Wasatch Fault (Hecker, 1993).

Liquefaction-induced settlement will be estimated using relationships presented by Tokimatsu and Seed (1987). This method estimates volumetric strain for clean sand based on cyclic stress ratio and SPT blow count or relative density. SPT blow counts obtained in the field will be corrected for overburden pressure, hammer energy, rod length, sampler size, and fines content to obtain $(N_1)_{60\text{-}CS}$ (Seed and Idriss, 1982).

To estimate liquefaction-induced settlement using the CPT data, an equivalent clean-sand SPT blow count, $(N_1)_{60\text{-}CS}$ will be estimated from relationships originally presented by Seed and Idriss (1982) using the cyclic stress ratio and the factor of safety against liquefaction calculated from the CPT data.

The factor of safety against liquefaction is calculated using the following equation:

$$FOS_\lambda = CRR/CSR$$

Where:

FOS_λ = factor of safety against liquefaction (using CPT data and procedure)
CRR = cyclic resistance ratio (obtained from CPT data)
CSR = cyclic stress ratio induced from earthquake motions

The terms may be rearranged as follows to calculate the CRR:

$$CRR = FOS_\lambda * CSR$$

This calculated cyclic resistance ratio will then be used with the Seed and Idriss (1982) relationships to estimate an equivalent SPT blow count for clean sands, or $(N_1)_{60\text{-}CS}$. This estimated blow count and the CSR will then be used with the Tokimatsu and Seed (1987) procedure to evaluate liquefaction-induced settlement.

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Liquefiable layer thicknesses used to calculate liquefaction-induced settlement will be estimated based on available subsurface information for each location. The evaluation of the thickness of potentially liquefiable layers will include "thin layer" effects of potentially liquefiable sand deposits within a soft non-liquefiable clay deposit. We will include in our analysis sand deposits having a marginal liquefaction potential (i.e., a factor of safety against liquefaction between 1.0 and 1.1). The geologic age of sand deposits will be considered in evaluating liquefaction potential and liquefaction-induced settlement at depths greater than approximately 14 meters.

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Seed, H. Bolton, and Idriss, I.M., 1982, Ground Motions and Soil Liquefaction During Earthquakes, Earthquake Engineering Research Institute, Berkeley, California.

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LEGACY PARKWAY

File # 03LOR	Doc. # 155
Route to:	
SCANNED 12/19/01	

December 18, 2001

K.N. Gunalan, FAK Deputy Design Manager
Fluor Ames Kraemer, LLC
360 North 700 West, Suite F
North Salt Lake, UT 84054

Re: Acceptance of Proposed Magnitude/Fault Rupture Methodology
for Liquefaction Evaluation
Legacy Parkway Design-Build Project
PC-DOCS #2605

Gentlemen:

As requested, this letter presents our acceptance of the proposed methodology for determining the mean moment magnitude ("Mw-bar") and fault rupture distance (R) terms for use in the liquefaction and lateral spread evaluation for the project. The methodology outlined by Kleinfelder in their letter to you dated July 30, 2001 appears acceptable to us as proposed for use on the project.

Should any abnormalities be observed using this methodology, we reserve the right to reconsider this approach.

Sincerely,

Jim Higbee

Jim Higbee
Geotechnical Oversight Engineer

cc: Michael Blomquist, Design Oversight Manager
Todd Jensen, Deputy Project Manager

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MEMORANDUM

Date: July 30, 2001

To: K.N. Gunalan, P.E.
Parsons Brinckerhoff

From: Travis Gerber, P.E. TMG
Curt Christensen, P.E. cc

Subject: **Legacy Parkway**
Suggested Mw and R Values for Evaluation of Liquefaction and Lateral Spread Hazards

While UDOT has specified the peak horizontal ground accelerations (PHA) for seismic hazard analyses (e.g., dynamic slope stability and liquefaction) and structure design, earthquake magnitudes have not been specified. Although not necessary for slope stability, earthquake magnitude is one parameter required to assess liquefaction and lateral spread hazards. Kleinfelder has previously used a deterministic magnitude value of 7.3, as presented in the RFP Geotechnical Report, as the largest credible magnitude-event generated by the Wasatch Fault Zone. This value has been used in our analyses to date regardless of whether the associated PHA was based on a 2 or 10 percent probability of exceedance in fifty years (2PE50 & 10PE50).

To be consistent in evaluating these hazards on a probabilistic basis, we propose a weighted mean moment-magnitude ("Mw-bar") be used. Mw-bar will be derived from the de-aggregation of the probabilistic seismic hazard assessment made by the USGS (as shown on the 1996 NEHRP mapping). This is the same source from which the specified values of PHA were interpolated by UDOT. For the 1996 NEHRP maps, the seismic hazard has been evaluated only at specific grid points (spaced at approximately 0.05 degrees for most of Utah and 0.1 degrees for the remainder of the state). We propose to evaluate Mw-bar by interpolation using the four grid points closest to each bridge site. To check the compatibility of the de-aggregated Mw-bar values with the PHA values previously specified, we will use the same interpolation technique to re-estimate PHA values and then compare them with those previously specified.

Another parameter needed in conducting a lateral spread analysis is R, the horizontal distance from the site being analyzed to the closest fault trace or rupture. The R-bar value that accompanies Mw-bar in the seismic hazard de-aggregation cannot be used directly in lateral spread analyses because R-bar appears to represent a weighted mean epicentral distance. To evaluate values of R for use in lateral spread analyses which are consistent with the specified probabilities of exceedance, we propose to use available fault maps and evaluate the distances from each principal seismic source (i.e., those contributing more than 10%, and excluding

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background seismicity) used in estimating the seismic hazard. We will then weight each of those distances according to its source's contribution to the seismic hazard and use the resulting mean value as R. This value is expected to be somewhat conservative in that minor contributors (which typically have large values of R) are neglected.

The effect of this approach can be illustrated with the following values evaluated for Salt Lake City (−111.890 West, 40.761 N) by the USGS, very near the south end of the Legacy Parkway. Note that the peak magnitude for the Salt Lake City Segment of the Wasatch Fault is taken as 7.2 in these particular calculations, but it contributes only 33 and 46 percent to the overall hazard for the 10PE50 and 2PE50, respectively. Other contributing seismic sources include the West Valley Fault (Mw=6.5), Weber Segment of the Wasatch Fault (Mw=7.1), and Western US Background Seismicity (Mw =6.03).

Event	PGA	Mw-bar	R-bar (km)	R (km)
10PE50	0.27	6.69	8.4	3.8
2PE50	0.71	6.80	3.6	2.9

We expect the value of Mw-bar to generally increase (but PHA to decrease) for sites north of Salt Lake for both 10P50 and 2PE50 because of the diminishing contribution of the West Valley Fault to the overall hazard.

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KLEINFELDER

MEMORANDUM

TO: Mr. K. N. Gunalan, P.E.

FROM: Nigel Miller, E.I.T. NLM
Curt Christensen, P.E. CC

DATE: August 3, 2001

RECEIVED
AUG 0 6 2001
Parsons Brinckerhoff
Legacy Parkway Project

SUBJECT: Design Protocol for Evaluation of Axial Pile Capacity

---

The intent of this memorandum is to provide a consistent, documented protocol for the evaluation of axial pile capacity, pile head settlement, and driveability analysis. Pile capacity and settlement will be evaluated using the program Unipile®. The pile driveability will be evaluated using GRLWEAP®. Should you have any questions regarding the procedure, please see Nigel Miller or Curt Christensen.

Pile downdrag and dragload will be evaluated. Downdrag is settlement of the soil below the neutral plane. Downdrag is a settlement problem and will be evaluated using conventional methods of estimating soil consolidation and compression. Downdrag will not be subtracted from the geotechnical capacity of the pile. Dragload will be evaluated and the magnitude compared to the structural capacity of the pile to prevent a structural failure. Although dragload always develops, it is rare for a pile shorter than about 30 m to experience an excessive dragload.

I. Assemble the subsurface soil profile for the area using the appropriate boring and CPT sounding logs. Evaluate the soil profile with the ground surface of each log located at the appropriate elevation. Evaluate the depth to the bottom of each generalized soil layer to the maximum depth explored. If available from field data, evaluate the average uncorrected blow count (N_{ave} value). If there are any changes in soil type, consistency, or density, it will be identified by a new layer. A maximum of **twenty** soil layers may be defined in UniPile.

II. Open the Excel® file LP Pile Design.xls and save the file with the following name:

AAPD XX-Y,Y,Y
AA = project area (NI, GL, PL, VS, SI)
PD = pile design
XX = structure number
Y = support number(s)

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III. Required input cells in the "Input" worksheet tab are shaded yellow. Orange shaded cells contain values that can be changed according to site-specific lab test results or engineering judgement. Beginning at the top left hand side of the Input worksheet, enter the following:

- Structure
- Support (A-1 for Abutment 1, B-2 for Bent 2, etc.)
- Lowest Finished Grade Elevation (of the deck at the abutment or the finished grade at the bent) from current situation and layout sheets.
- Groundwater Table Depth
  This depth is the distance from the lowest finished grade of the bridge deck or the ground adjacent to a bent to the groundwater. It must consider any new embankment or excavation from the existing ground surface.

IV. Enter the depth at the **bottom** of each soil layer, including new fill (embankment) both above and below the pile cap, with a soil type number from the table on the input sheet. For this project, Fill A is new fill **above** the cap and Fill B is new fill **below** the cap, by definition. Since the pile capacity model considers the soil layers to be of semi-infinite extent, the unit weight of the fill material must be reduced. An analysis of the soil stresses due to a semi-infinite embankment versus the vertical or sloped abutments indicates that using one-half of the embankment unit weight provides a reasonably accurate model. This model is somewhat conservative, as the actual soil stresses induced by the fill are greater in the upper portion of the soil profile than predicted using the reduced unit weight value. For our analyses, a unit weight of 2,070 kg/m^3 is used based on the results of laboratory tests of potential fill materials. When Fill A or Fill B is selected as the soil type, the reduced unit weight of the fill is automatically calculated and placed in the correct cell of the spreadsheet. A Beta value is assigned to Fill B **only** since Fill A, above the bottom of the pile cap, does not contribute to the pile shaft resistance.

Enter N_{ave} (uncorrected field blows) value for each layer. This will define the soil consistency or relative density of each layer and assist in evaluating other parameters. If there are any changes in soil consistency or relative density, it will be identified as a new layer. If N_{ave} is not available, use an average correlated N_{60} value from CPT data. Orange cells contain values that can be changed according to site-specific laboratory test results or engineering judgment. The most critical value that should be changed according to site-specific lab test results is the total unit weight.

V. Save the file and print the output sheet for use in UniPile. On the output worksheet, initial and date next to "Prepared By". The input and output worksheets should be checked by someone who is familiar with UniPile.

VI. Open UniPile® and save the file with the following nomenclature:

SXXYZZ.unp

Where: XX = structure number
Y = support type (A = Abutment, B = Bent)

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ZZ = support number

VII. Input the following:

1. Info
   a. Project: Legacy Parkway, Structure XX, Y-ZZ, (and compass direction for abutments)
   b. Project ID: (Kleinfelder's job number)
   c. Engineer: (your initials)
   d. Date: (today's date)

2. Units: Metric

3. Settings
   a. Ground Elevation: (lowest finished grade of the bridge deck at the abutment or the lowest adjacent ground surface elevation at the bent under consideration).
   b. Groundwater Table Depth: (the depth from the lowest finished grade of the bridge deck at the abutment or the lowest adjacent ground surface elevation at the bent under consideration, to the groundwater).

4. Soil Data
   a. Enter the soil data for each layer as shown in the output table from Step V.

5. Pile Data
   a. Description: Driven Steel Pile
   b. Pile Type: Round
   c. Embedment: (start with 30 m and adjust in Step VIII to obtain FS = 2.25)
   d. Diameter: 406 mm
   e. Dead Load: (from structural engineer)
   f. Live Load: (from structural engineer)
   g. Number of Piles: (start with 1)
   h. L group: (for abutments start with L = 0.1295; for bents use the pile group length)
   i. B group: (for abutments start with B = 1; for bents use the pile group length)

VIII. Save the file and execute the program with the "Capacity vs. Embedment" analysis option selected. Print the Capacity vs. Embedment graph. Evaluate an appropriate pile embedment depth that provides a Factor of Safety of 2.25 (AASHTO, 1996, Table 4.5.6.2A with WEAP and PDA). Evaluate that end bearing piles are founded in a layer with sufficient thickness to support the piles. Change the assumed input pile length to the new length, run the "Capacity" analysis, and print the table of results.

IX. Compare the load at the neutral plan (i.e. dragload) to verify it is less than the maximum allowable value, 7,100 kN, provided by the Parsons Brinckerhoff structural engineers. The neutral plane is where there is no relative movement between the pile and soil. The maximum dragload generally occurs at the neutral plane and is of concern only for the

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structural strength of the pile. Dragload does not reduce the geotechnical capacity of the pile.

X. Next evaluate the seismic uplift resistance of a single pile. Subtract the contributing friction resistance of the potentially liquefiable layers (from liquefaction hazard evaluation) from the ultimate shaft resistance (R_s). The "Incremental R_s" column shows the contribution for each layer.

XI. Next evaluate the seismic compressive resistance of a single pile. Subtract the contributing friction resistance of the potentially liquefiable layers (from liquefaction hazard evaluation) from the ultimate resistance (R_u). The "Incremental R_s" column shows the contribution for each layer.

XII. For abutment pile groups in a single row with a minimum three-diameter spacing, execute the settlement analysis for a single pile with the equivalent footing at the pile tip. The settlement analysis is complete if the maximum settlement is less than 25 mm. Since using the equivalent footing is a conservative procedure as it considers a smaller footing area, if the magnitude of settlement is greater than 25 mm, refer to the toe movement vs. tip resistance curve below. Evaluate the maximum tip resistance developed under service load conditions and find the toe movement required to develop the maximum tip resistance. The toe movement plus elastic compression of the pile is the estimated settlement magnitude. The elastic compression of the pile will be evaluated by the structural engineer.

XIII. Next evaluate the capacity of the pile after installation, but prior to embankment construction. This step is required to evaluate the required driving resistance without the embankment in place. Save the file as the same file name with the letter "D" at the end. Change the soil profile by deleting the new fill layers. Change the pile length to reflect the same tip elevation from part VIII. Save the file, run the "Capacity" Analysis, and print the table of results.

XIV. Prepare the GRLWEAP input file.

1. Use the total pile length and embedment depth from the Unipile analyses. Initially, analyses with the IHC Hydrohammer S70 and S90 hammers will be required. As additional hammers are used by the contractor, additional analyses will be required for these hammers also. If the required driving resistance, percent shaft resistance, pile length, and penetration length are similar to previous analyses, these should be considered rather than a new analyses.

2. The cross-sectional area of the PP406 x 9.53 pile is 118.73 cm^2. The circumference of the pile is 1.275 m and the yield strength is 448 MPa. The pile hammer cushion properties, area, elastic modulus, and thickness as well as the pile hammer helmet weight should be obtained from the contractor's pile hammer submittal. The specific weight is calculated by GRLWEAP based on the pile material selected. Use the

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default coefficient of restitution and roundout values unless specific information, such as PDA or CAPWAP data, is available to override the default values.

3. Enter a series of ultimate loads (up to ten), including the required ultimate load, for evaluation.

XIII Perform the GRLWEAP analysis.

1. Required input parameters include:

   a. Pile
      i. Overall pile length (from Unipile Analysis)
      ii. Penetration length (from Unipile Analysis)
      iii. Cross-sectional area (118.73 cm^2 for PP 406 x 9.53)
      iv. Modulus of Elasticity (199,948 Mpa)
      v. Specific Weight (76.98 kN/m^3)
      vi. Circumference (1.275 m for PP 406 x9.53)
      vii. Yield Strength (448 MPa)
      viii. Coefficient of Restitution (0.8 to 1.0, must be less than 1.0)
      ix. Roundout (3 mm unless other, more specific information is available)
   b. Pile Hammer
      At the present time this will be the IHC S70, IHC S90, or Junttan HHK-7A
   c. Pile Cushion (Parameters provided by Contractor)
      i. Thickness
      ii. Modulus of Elasticity
      iii. Area
      iv. Coefficient of Restitution (for steel 0.8 to 1.0, must be less than 1.0)
      v. Weight
      vi. Roundout (3 mm unless other, more specific information is available)

   d. Ultimate Capacities

      Up to ten capacities may be entered. Generally include the required ultimate capacity with two or three capacities below this value and five or six greater than this value. To provide a reasonable graph use increments of about 100 kN. Increment the two or three values greater than the required ultimate value by 25 kN.

   e. Soil Parameters (Use the values shown below unless better information, such as PDA data, is available)
      i. Quake
         Shaft (2.5 mm)
         Toe (D/60 or 406/60 = 6.8 mm)
      ii. Damping
         Shaft (0.16 s/m for non-cohesive soils, 0.65 s/m for cohesive soils)
         Toe (0.5 s/m)

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f. Percentage Shaft Resistance (From Unipile analysis)

1. Analyze the current input. Review the output to assure that the allowable driving stresses are not exceeded. If the stresses are exceeded, depending on the pile-driving hammer, the following methods may be used to evaluate other driving options:

   a. Reduce the hammer energy.

   b. Include the end plate at the tip of the pile in the model by including a second pile segment.

   c. Reduce the ultimate capacity (This will also reduce the allowable capacities, requiring additional Unipile analyses).

2. If the driving stresses in the pile are less than the maximum allowable (90 percent of the yield stress or 403 MPa), print the Bearing Graph sheets (both the graphs and the text table indicating the values used for generation of the graph).

	Name	Date
Prepared By:	NPM	8/3/01
Reviewed By:	[illegible]	3 August 01

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Memorandum

LEGACY

Date: 07/12/2004

To: J. Deschamp

From: M. D. Cline

REGISTERED PROFESSIONAL ENGINEER
No. 388522-2202
MICHELLE D. CLINE
7/12/04
STATE OF UTAH

File Code: GDM-STR-043
(Revised GDM-STR-033)

Subject: Geotechnical Recommendations for Bridge 19 - Revised

Cc: DocC, Kleinfelder, Farid Nobari

SCANNED: 7-15-04

Introduction

This memorandum summarizes our Geotechnical evaluation and recommendations for Bridge 19, developed in accordance with UDOT's Geotechnical MOI. Included herein are a summary of general geotechnical conditions at the bridge location, our evaluation of liquefaction concerns, and a summary of geotechnical parameters for pile design. Detailed descriptions of our understanding of the project, geology, design analysis, and recommendations will be incorporated into the Segment 4 geotechnical report and submitted along with other documents as part of final submittal for the project. This information will be maintained in the project files for reference until being incorporated into the final report.

General Geotechnical Conditions

Geotechnical conditions at the site are defined by previous investigations performed for UDOT and a subsequent investigation undertaken by FAK. Based on the information obtained during those investigations, the subsurface profile at the bridge site above an elevation of about 1268 meters can be defined generally as consisting of very soft to medium stiff clay/silt layers with interbedded layers of loose to dense sand/gravel. Below an elevation of about 1268 meters, the clay/silt layers are typically medium stiff to very stiff, and the interbedded sand/gravel layers are generally medium dense to very dense. Groundwater was not measured during drilling but is anticipated to be at shallow depths. Based upon the site-specific information for this bridge, we recommend that AASHTO Soil Type III be used for design.

Liquefaction Potential

Bridge 19 is located within the Farmington Siding Landslide Complex, which consists of liquefaction-induced landslides that date back to latest Pleistocene and Holocene time. The bridge site is located near the southern mapped boundary of the complex. The site lies within the older mapped portion of the complex, approximately 2¼ km east of the mapped contact with the

mapped portion of the complex, approximately 2¼ km east of the mapped contact with the younger portion. UGS studies indicate that susceptibility to liquefaction-induced landslides may be less than in earlier times due to lower average lake and associated groundwater levels. The study also indicated that above-average precipitation could create locally perched conditions which could liquefy and slide when subject to strong ground motions.

A site-specific evaluation of liquefaction and lateral spread was conducted for Bridge 19. Information obtained from five exploratory borings and four CPT soundings located near the Bridge 19 abutments and bents were used in the evaluation of liquefaction potential and liquefaction-induced settlement. Analysis results indicated that layers of silt and sand may liquefy under an earthquake magnitude of 7.1 with a peak horizontal ground acceleration of 0.61g. Potential liquefaction-induced settlement in these layers has been estimated to range between about 2 to 17 centimeters. Based on data obtained from four of the five the borings, horizontal displacement due to liquefaction-induced lateral spreading in localized soil layers has been estimated to range from about 0.3 to 3.1 meters. It is noted that no horizontal displacement was estimated based on information obtained from Boring SB-19-279, located near the center of the proposed bridge. The potentially liquefiable layers contributing to the lateral spread hazard do not appear to be continuous in the area of Bridge 19. This together with other factors indicates that remediation does not appear to be necessary.

Foundation Recommendations

It is our understanding that 406 mm (16 in.) diameter pipe piles are being proposed for the bridge foundations. The target vertical capacity per pile at the abutments is 2,052 kN and at the bents is 1,051 kN. Required driving resistance for abutment foundations is controlled by the required ultimate service load capacities and that for the bents is controlled by seismic compression plus estimated loss during liquefaction. Recommended pile capacities and Geotechnical parameters required for analysis and design are presented in the attached table.

LEGACY PARKWAY
BRIDGE 19
PILE CAPACITY SUMMARY HP 406x0.53 (16" x 3/8")
YIELD STRENGTH = [illegible]

	Initials	Date
Completed By	[illegible]	6/4/04
Reviewed By	[illegible]	6/4/04

A-1 Target Geotechnical Capacity per Pile (2.25xService Load)	2,052	kN
B-2 Target Geotechnical Capacity per Pile (2.25xService Load)	1,051	kN
B-3 Target Geotechnical Capacity per Pile (2.25xService Load)	1,051	kN
B-4 Target Geotechnical Capacity per Pile (2.25xService Load)	1,051	kN
B-5 Target Geotechnical Capacity per Pile (2.25xService Load)	1,051	kN
B-6 Target Geotechnical Capacity per Pile (2.25xService Load)	1,051	kN
A-7 Target Geotechnical Capacity per Pile (2.25xService Load)	2,052	kN

(Target Service Load Provided by Structural Engineer)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Location	Finished Grade Elevation (m)	Bottom of Pile Cap Elevation (m)	Est. Embankm. Height (m)	Estimated Pile Tip Elevation (m)	Minimum Pile Tip Elevation (m)	Service Uplift Load Resistance (kN)	Required Seismic Compression Resistance (kN)	Required Seismic Uplift Resistance (kN)	Service Load (DL + LL) (kN)	Required Driving Resistance (kN)	Est. Pile Length w/ fill (m)	Estimated Maximum Structural Load in Pile (kN) (Service Load + Drag Load)	Est. Elevation of Neutral Plane (m)	Estimated Pile Tip Settlement (mm)
Bridge 19, Abutment 1	1300.3	1296	10.3	1265.3	1266.8	2,494	N/A	N/A	912	2,052	31	3,081	1265.3	1
Bridge 19, Bent 2	1293.0	1290	N/A	1264.0	1267.0	1,292	1,944	867	467	1,953	26	1,759	1264.0	1
Bridge 19, Bent 3	1294.0	1291.3	N/A	1266.0	1267.0	1,907	1,944	867	467	1,997	25	2,374	1266.0	1
Bridge 19, Bent 4	1293.2	1290.2	N/A	1268.2	1269.0	644	1,944	867	467	2,260	22	1,916	1268.2	1
Bridge 19, Bent 5	1293.0	1290	N/A	1261.5	1263.0	783	1,944	867	467	1,978	29	2,228	1261.5	1
Bridge 19, Bent 6	1295.0	1292.4	N/A	1267.5	1268.0	652	1,944	867	467	2,105	25	1,935	1267.5	1
Bridge 19, Abutment 7	1301.7	1297.4	9.7	1259.7	1260.5	1,556	N/A	N/A	912	2,052	38	2,860	1259.7	1

Location	Borings Used for Soil Profile
Bridge 19, Abutment 1	SB-19-274
Bridge 19, Bent 2	LSB-19-470, SC-19-275
Bridge 19, Bent 3	LSB-19-471, SB-19-276
Bridge 19, Bent 4	LSB-19-471, SB-19-276, SC-19-277
Bridge 19, Bent 5	SC-19-278, SB-19-279
Bridge 19, Bent 6	SC-19-280, LSB-19-473
Bridge 19, Abutment 7	SB-19-281

Description of Information Presented in Each Column:

A: Finished Grade Elevation - Top of approach slab elevation at abutment locations and adjacent ground elevation at bent locations as shown on the structure Plan and Profile drawing provided.

B: Bottom of Pile Cap Elevation - Elevation at the bottom of the pile cap as scaled from the structure Plan and Profile drawing provided

C: Estimated Embankment Height - Elevation difference between the top of the approach slab and the native ground surface at the abutment as scaled from the structure Plan and Profile drawing provided.

D: Estimated Pile Tip Elevation - Estimated elevation to which the bottom of the pile will need to be driven to develop the required capacity and meet the settlement criteria. (Additional depth may be required to reach required resistance during driving.)

E: Minimum Pile Tip Elevation - Estimated minimum elevation to which the bottom of the pile will need to be driven to meet settlement, minimum length, or minimum depth criteria should the required driving resistance be obtained above the Target Pile Tip Elevat

F: Service Uplift Load Resistance = (Ultimate Friction Resistance)/(FS=2.25) Per comment resolution meeting with UDOT (8/15/01)

G: Seismic Compression Resistance = Ultimate Friction and End Bearing Resistance neglecting the contribution of potentially liquefiable zones. (AASHTO allows the use of the ultimate resistance values to resist seismic loads.)

H: Seismic Uplift Resistance = Ultimate Friction Resistance neglecting the contribution of potentially liquefiable zones. (AASHTO allows the use of the ultimate friction resistance value to resist seismic uplift loads.)

I: Service Load (DL + LL) - The maximum load that can be applied at the top of the pile by the structure provided the pile is driven to the assumed capacity.

J: Required Driving Resistance - The minimum load (service load x 2.25 or required seismic resistance plus estimated loss during liquefaction, whichever is greater) that must be verified in the field by PDA.

K: Estimated Pile Length w/ Fill - The estimated length of pile required. Calculated as (Bottom Of Pile Cap - Estimated Tip Elevation) rounded up to the nearest meter. (Actual lengths may vary depending on driving conditions encountered at each pile location.)

L: Estimated Structural Load in the Pile - The largest load that will develop in the pile due to structural service dead loads and drag loads. This load occurs at the neutral plane where equilibrium exists between the sum of the downward acting permanent load (service load) applied at the top of the pile and drag load due to negative skin friction and the sum of upward acting positive shaft resistance and mobilized toe resistance.

M: Estimated Elevation of Neutral Plane - The level in the pile where relative movement between the pile and soil is zero

N: Estimated Pile Tip Settlement - The magnitude of pile tip settlement required to mobilize estimated pile tip loads. This does not include elastic compression of the pile

1 of 122

Legacy Parkway
Lateral Pile Analysis
Soil Parameters for LPILE or GROUP

Structure	19
Support(s)	1, 2, 3, 4
Water Depth (m)	1.0
Finished Grade Elevation (m)	1291.0
Soil Borings Used for Profile	SB-19-274, SC-19-275, SB-19-276, SC-19-277

	Initials	Date
Completed By:	CMH	5/8/02
Checked By:	NM	5/8/02

Layer	Soil Type	Depth to Top of Soil Layer (m)	Depth to Bottom of Soil Layer (m)	Unit Weight of Soil (kN/m^3)	Shear Strength (kN/m^2)	Strain, ε_{50}	Modulus of Subgrade Reaction, k (kPa/m)	Friction Angle, ϕ (degrees)	Maximum Side Friction (kN/m^2)		Maximum Tip Resistance (kN/m^2)	
									Top	Bottom	Top	Bottom
1	Soft Clay	0.0	1.0	19.3	18	0.031	3,500	-	0	4	0	80
2	Soft Clay	1.0	23.5	9.5	18	0.031	3,500	-	4	48	80	1,070
3	Sand	23.5	30.0	10.5	-	-	19,910	36	114	148	24,860	32,140

Press the "Copy" button to copy this tab to a new spreadsheet. The new file should be saved in the same directory with the name "S-XX-Y,Y,Y LPILE Parameters" (XX is the structure number and Y is the support numbers for which this file applies. Complete renaming of the spreadsheet immediately after it is copied by adding the structure and support numbers.

03COR236

Legacy Parkway
Lateral Pile Analysis
Soil Parameters for LPILE or GROUP

Structure	19
Support(s)	5, 6, 7
Water Depth (m)	1.0
Finished Grade Elevation (m)	1291.0
Soil Borings Used for Profile	SC-19-278, SB-19-279, SC-19-280, SB-19-281

	Initials	Date
Completed By:	CMH	5/8/02
Checked By:	NM	5/8/02

Layer	Soil Type	Depth to Top of Soil Layer (m)	Depth to Bottom of Soil Layer (m)	Unit Weight of Soil (kN/m³)	Shear Strength (kN/m²)	Strain, ε_{50}	Modulus of Subgrade Reaction, k (kPa/m)	Friction Angle, ϕ (degrees)	Maximum Side Friction (kN/m²)		Maximum Tip Resistance (kN/m²)	
									Top	Bottom	Top	Bottom
1	Soft Clay	0.0	1.0	19.5	37	0.030	29,165	-	0	4	0	120
2	Soft Clay	1.0	16.9	9.7	37	0.030	29,165	-	4	37	120	1,080
3	Sand	16.9	19.2	10.1	-	-	17,070	35	81	91	16,830	19,080
4	Stiff Clay with Free Water	19.2	25.0	10.0	83	0.020	96,665	-	46	60	1,960	2,550
5	Sand	25.0	30.0	10.1	-	-	18,490	36	122	146	25,970	31,110

Press the "Copy" button to copy this tab to a new spreadsheet. The new file should be saved in the same directory with the name "S-XX-Y,Y,Y LPILE Parameters" (XX is the structure number and Y is the support numbers for which this file applies. Complete renaming of the spreadsheet immediately after it is copied by adding the structure and support numbers.

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RECEIVED
JUL 16 2001
Parsons Brinckerhoff
Legacy Parkway Project

KLEINFELDER MEMORANDUM

To: Mr. K. N. Gunalan, P.E.

From: Corbett M. Hansen, E.I.T. CMH 7/16/01
Curt Christensen, P.E. 7/16/01

File # 03CDR Doc. # 0027
Route to:
SCANNED: 7/18/01 MC

Date: July 16, 2001

Subject: **Protocol for estimating primary and secondary settlement magnitude, surcharge height, and wick drain spacing**

The intent of this protocol is to provide a consistent, documented method for evaluation of primary and secondary settlement magnitude, time rate of settlement, surcharge height, and wick drain spacing using the Excel® spreadsheet "LP Embankment".

Should you have any questions regarding the procedure, please see Corbett Hansen or Curt Christensen.

I. Assemble the subsurface soil profile for the selected embankment alignment using the appropriate boring and CPT logs with the ground surface of each log at the appropriate elevation. Evaluate the depth to the bottom of each generalized soil layer to the maximum depth explored. If available from field or laboratory data, evaluate the average uncorrected blow count (N_{ave} value), average unit weight (γ_{ave}), average over consolidation ratio (OCR_{ave}), compression ratio ($C_{c\tau u}$), recompression ratio ($C_{r\tau u}$), secondary compression ratio ($C_{\alpha\tau u}$), Coefficient of Vertical Consolidation (C_v), Coefficient of Horizontal Consolidation (C_h), and drainage path for each layer. If there are any changes in soil type, consistency, or density, it should be identified by a new layer. A maximum of **twenty** soil layers may be defined.

II. Evaluate coordinates for the existing ground surface, including existing embankments if present, and the proposed embankment from the cross sections provided. A maximum of **eleven** coordinates may be used to define each cross-section. Coordinates are entered from left to right and cannot decrease in absolute value from the previous offset coordinate, however, subsequent coordinates can be equal in value. Vertical coordinates are entered as elevations.

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III. Open the file LP Embankment-p.xls. Select "options" under the Tools" pull-down menu. Under the "Calculations" tab, select "Manual" calculations option. Also, uncheck the box next to "Recalculate before save". Select "OK". Save the working file using the following nomenclature:

AASE_XXXX_Y+YYY_ZZ-ZZ-ZZ

Where: AA = Legacy project segment (NI, GL, PL, 5S, SI)
XXXX = alignment name (do not abbreviate)
Y+YYY = station
ZZ-ZZ-ZZ = cross section print date

IV. Cells requiring input in the "Input" worksheet tab are shaded yellow. Orange cells contain values that can be changed according to site specific information. Beginning at the top left hand side of the Input worksheet, enter the following:

- Alignment Name
- Station
- Cross section drawing date
- Nearest structure number
- Section centerline elevation
- Scheduled settlement time (from FAK construction schedule)
- Soil Profile Identification
- Stage identification (from FAK)
- Fill identification (from FAK)
- Feature (e.g., S-29 Abutment 1, MSE embankment, or Embankment)

Values in the following override cells should be changed according to the accompanying directions:

- METRIC? – The spreadsheet is set to calculate in metric units. Because the project will be completed in metric units, this value will not change.

- Proposed Embankment Fill Unit Weight – The value entered, 20.4 kN/m^3, was obtained from tests performed on soil from the potential borrow areas. This value should be used for most of the embankment fill on the project.

- Increment Width – The spreadsheet calculates settlement at 75 points along the cross section. The increment width is set at 2 meters, which will calculate settlement for 150 meters. This value can be changed to accommodate the overall cross section width.

- Min x-coordinate – This value is the far-left offset point at which settlement is calculated. Because it is set at =75 meters and the increment width is set at 2 meters, settlement will be calculated from –75 meters to 75 meters along the

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cross section. This value can be changed to accommodate the cross section width.

- Water Level – The depth of the ground water surface is evaluated by the spreadsheet based on studies performed by others during preparation of the environmental document. Groundwater observations recorded during the field exploration may be used to override the tabulated spreadsheet values.

- Existing Ground Unit Weight – The set value was obtained through testing. This value can be changed is site specific test results are available.

- Time 1 for secondary – This value will not change for the Legacy Parkway project.

- Time 2 for secondary – This value will not change for the Legacy Parkway project.

- Average Degree of Consolidation – This value will not change for the Legacy Parkway project.

- Number of Construction Stages – This value will vary according to the stability analysis.

- Surcharge Method – This value will not change for the Legacy parkway project.

V. Enter the coordinates for the existing ground, proposed embankment, proposed embankment with surcharge, and proposed embankment with surcharge for time calculations. **X coordinates may not decrease in value from left to right,** although identical, subsequent x-coordinates are allowed.

VI. Enter the depth to the **bottom** of each soil layer with a soil type number from the table on the input sheet. Enter N_{ave} for each layer. This will define the soil consistency or density of each layer and assist in determining other parameters. If there are any changes in soil consistency or density, it must be identified as a new layer. If an N_{ave} value is not available, use an average correlated N_{60} value from CPT data.

VII. Press key F9.

VIII. For each layer the spreadsheet will estimate γ_{ave}, OCR, preconsolidation pressure, $C_{c'}$, $C_{r'}$, $C_{\alpha'}$, C_v, and C_h. If available, use laboratory test results for the layer to overwrite the range of values.

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IX. The spreadsheet is currently set for two-way drainage of each layer. Change the drainage to one-way drainage for the layers that will likely exhibit single drainage.

X. Calculate the settlement by pressing key F9.

XI. Check the "Settlement Chart" worksheet and adjust the "proposed embankment with surcharge coordinates" until the settlement due to the surcharge (green line with plus symbols) matches the upper bound "primary plus secondary settlement estimate" (lowest red line).

XII. Execute the "Find Maximum Offset" macro to find the offset at which maximum settlement occurs. The offset at maximum settlement value will change after striking key F9. Calculations for surcharge height and consolidation time are based on the induced stresses at this offset. If another offset location is preferable, an "o" can be typed in place of the "m" in cell F6 and a location can be entered in the cell F5.

XIII. Execute the "Surcharge Time" (1 and 2) macros (Method 1, 2, and 3). Adjust the "proposed embankment with surcharge coordinates for time calculations" until the Surcharge Time 1 for the preferred method fits the contractor's scheduled settlement time. The surcharge times must be reset (reset macro) and the spreadsheet recalculated (F9) before re-executing the "Surcharge Time" macros.

XIV. Enter the estimated Wick Drain Installation Length. This should be evaluated from the soil profile. When a dense sand or gravel layer is likely to cause refusal, evaluate the need for wick drains below that layer. The wick drain length is always evaluated as the depth below native ground. Wick drain thickness and width dimensions are fixed values that will not change for the Legacy Parkway project.

XV. Execute the "Wick Time" macro and the "Wick Plus Surcharge Time" macro. Default values of 2.0, 2.5, and 3.0 meters are entered into the worksheet for wick drain spacing values. The values can be decreased to meet the contractor's time requirements or increased to maximizing spacing. Before re-running either macro, reset the time using the macro button located beneath.

XVI. On the "Output" worksheet, adjust the scale of the settlement figure as required. The scales should stay consistent for a group of cross sections. Review all values on the "Output" worksheet. Reported settlement magnitudes are rounded up in 25-millimeter increments and time calculations are rounded up in 15-day increments. The time calculations are set at a minimum 45 days. Considering construction staging needs for stability, determine a recommended combination of surcharge height and triangular wick drain spacing to meet the contractor's schedule. Print the input and output worksheets. On the input worksheet, initial and date next to the "Prepared By:" cell in the table

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similar to the one shown below. The input and output worksheets should be checked by someone who is familiar with "LP Embankment".

	Name	Date
Prepared By:		
Checked By:		

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Embankment and Grading Summary

Alignment: Glovers Lane

Station		Embankment Height (m)	Surcharge Height (m)	Compacted Surcharge Height Above Embankment[a] (m)	Wick Drain Spacing (m)	Wick Drain Tip Elevation (m)	Height of First Stage (m)	Height of Second Stage (m)
Beginning	Ending							
50+310[b]	50+460	<3.0	0.0	—	N/R	—	To Be Evaluated	To Be Evaluated
50+460	50+480	3.0 - 3.7	1.0	0.5	2.0 or 3.0[f]	1265.0	To Be Evaluated	To Be Evaluated
50+480	50+520	3.7 - 4.6	1.7	0.6	2.0 or 3.0[f]	1265.0	To Be Evaluated	To Be Evaluated
50+520	50+560	4.6 - 5.7	2.0	0.8	2.0 or 3.0[f]	1265.0	To Be Evaluated	To Be Evaluated
50+560	50+580	5.7 - 6.0	2.4	0.9	2.0 or 3.0[f]	1265.0	To Be Evaluated	To Be Evaluated
50+580	50+640[c]	6.0 - 7.0	2.5	1.1	2.0 or 3.0[f]	1265.0	To Be Evaluated	To Be Evaluated
50+840[d]	50+920	3.0 - 5.6	1.5	0.7	2.0 or 3.0[f]	1265.0	To Be Evaluated	To Be Evaluated
50+920	50+940[e]	<3.0	0.0	—	N/R	—	To Be Evaluated	To Be Evaluated

a. Compact surcharge to embankment standards.

b. Approximate beginning of Glovers Lane reconstruction.

c. Approximate beginning of structure 19.

d. Approximate ending of structure 19.

e. Approximate ending of Glovers Lane reconstruction.

f. Use 3.0 meter wick drain spacing for one-stage construction and 2.0 meter spacing for two or more stages of construction.

N/R - wick drains not required.

	Initials	Date
Completed By:	CMH	1/18/02
Reviewed By:	NM	1/21/02

03COR153

SUMMARY OF GLOBAL STABILITY CALCULATIONS

Glover's Lane

		HSG		Staged Construction			Long Term			Pseudo-Static and Dynamic							
Type	Classification	#	Length	# of Stages	Target F.S.	Max. Stage Height	Target F.S.	Max. Final Height	Height w/ Surcharge	Target F.S.	Seismic Design Criteria (g)		Max. Final Height	Height w/ Surcharge	Post-EQ F.S.	Yield Accel (g)	Deformation (cm)
Sloped Embankment (2H:1V with 1.5H:1V sloped surcharge)	Non-Impact	0	0	1	1.1	= 7.5	1.25	>> 5.8	7.5	1	10PE50	0.29	- - -	- - -	- - -	- - -	- - -
				2	1.1	= 10.5	1.25	>> 7.6	10.5	1	10PE50	0.29	- - -	- - -	- - -	- - -	- - -
				3	1.1	= 12.0	1.25	> 8.5	12.0	1	10PE50	0.29	= 7.3	10.0	0.91	n/a	>270
		1	45	1	1.1	= 12.0	1.25	>> 8.5	12.0	1	10PE50	0.29	- - -	- - -	- - -	- - -	- - -
				2	1.1	> 17.7	1.25	>> 12.0	17.7	1	10PE50	0.29	>> 12.0	17.7	1.03	0.006	>270
		2	55 (-20)	1	1.1	= 14.5	1.25	>> 10.0	14.5	1	10PE50	0.29	>> 10.0	14.5	1.12	- - -	- - -
Sloped Embankment (2H:1V with 1.5H:1V sloped surcharge)	At Bridge	0	0	1	1.1	- - -	1.3	- - -	- - -	1	2PE50	0.60	- - -	- - -	- - -	- - -	- - -
				2	1.1	- - -	1.3	- - -	- - -	1	2PE50	0.60	- - -	- - -	- - -	- - -	- - -
				3	1.1	- - -	1.3	- - -	- - -	1	2PE50	0.60	< 7.3	- - -	- - -	- - -	- - -
		1	45	1	1.1	= 12.0	1.3	>> 8.5	12.0	1	2PE50	0.60	- - -	- - -	- - -	- - -	- - -
				2	1.1	> 17.7	1.3	>> 12.0	17.7	1	2PE50	0.60	> 12.0	17.7	0.97	n/a	>270
		2	55 (-20)	1	1.1	= 14.5	1.3	>> 10.0	14.5	1	2PE50	0.60	>> 10.0	14.5	1.05	0.01	>270
MSE Wall	At Bridge	1	40	1	1.1	= 14.0	1.4	>> 9.7	14.0	1.1	2PE50	0.60	>> 9.7	14.0	1.11	- - -	- - -

Notes and Assumptions:

1. The values presented in this table are in meters unless otherwise indicated.
2. The values presented in this table are calculated values or linearly interpolated from calculated values; Actual heights will be dictated by instrumentation data and field performance.
3. "At Bridge" classification is applicable to fill within 15m from the back of the bridge abutment (i.e., length of the approach slab).
4. Embankment geometry no steeper than 1V:1.5H for temporary conditions (i.e., w/ surcharge) and 1V:2H for permanent slopes, unless otherwise indicated. Fill properties: friction angle = 32°, cohesion = 5 kPa, unit weight = 21.2 kN/m^3
5. MSE wall reinforcement length is equal to the final design height; Gobal stability controlled by failure behind reinforced zone.
6. HSG = High Strength Geotextile, Woven polyester with warp strengths of 730 and 290 kN/m at ultimate and 5% strain, respectively; Allowable static and dynamic strengths = 400 and 690 kN/m, respectively.
7. HSG rotates tangentially to failure surface; HSG placed at the base of the fill; HSG length extends from toe of slope (or face of wall) for the length indicated; HSG lengths include length for anchorage.
8. When calculated HSG length exceeds entire base width of fill, or HSG extending from opposite sides of fill overlap, use HSG length equal to base width of fill.
9. HSG strength is unidirectional; Consequently, at bridge abutments, the number of HSG indicated should be placed with the warp direction oriented both parallel and perpendicular to roadway centerline.
10. Pseudo-static analysis assumes kh = 0.5*pga applied to critical failure surface from static, long-term conditions without HSG; Deformation estimated from simplified Makdisi-Seed procedure.

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MEMORANDUM

Date: April 2, 2002

To: K. N. Gunalan, P.E.
Parsons Brinckerhoff

From: Bill Turner, P.E.
Travis M. Gerber, P.E.

Subject: **High Strength Geotextile and Staging Options**
Glover's Lane Overpass
Legacy Parkway
Kleinfelder Project No. 35-8440-08

At your request we have evaluated the slope stability calculations and requirements for the above referenced embankments. The following tables provide summaries of the high strength geotextile (HSG) and staging options that appear to be suitable for these embankments. Note that the existing embankment material will require removal where HSG will be placed to provide adequate stability for the new embankment. Each stage will require approximately 60 to 105 days, depending on the wick drain spacing selected, to obtain the required degree of consolidation prior to commencing construction of the next stage or surcharge removal. We should be informed of the construction and staging options selected. Instrumentation data and construction notification should be provided in accordance with our memorandum dated October 10, 2001.

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GLOVER'S LANE (STA 50+300 to STA 50+920)

Option	Begin Station	End Station	# of Stages	Previous Stage Height(s)	Number of HSG *	HSG Elevation *	Orientation of Warp Direction	Begin Offset	End Offset
1	50+300	50+530	1	n/a	0	n/a	n/a	n/a	n/a
	50+530	50+600	1	n/a	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	50+600	~50+618	1	n/a	2	Grade + 0.2 m Grade + 0.4 m	Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 20 m from L. toe of slope	0 m from R. toe of slope 20 m from R. toe of slope
	~50+618	W. Abut., Bridge 19 (~50+633)	1	n/a	2+1	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Parallel to CL Perpendicular to CL	0 m from L. toe of slope 0 m from face of wall 20 m from L. toe of slope	0 m from R. toe of slope 40 m from face of wall 20 m from R. toe of slope
	E. Abut., Bridge 19 (~50+859)	~50+874	1	n/a	2+1	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Parallel to CL Perpendicular to CL	0 m from L. toe of slope 0 m from face of wall 20 m from L. toe of slope	0 m from R. toe of slope 40 m from face of wall 20 m from R. toe of slope
	~50+874	50+895	1	n/a	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	50+895	50+920	1	n/a	0	n/a	n/a	n/a	n/a
2	50+300	50+530	1	n/a	0	n/a	n/a	n/a	n/a
	50+530	50+575	2	7.5 m	0	n/a	n/a	n/a	n/a
	50+575	~50+618	2	12.0 m	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	~50+618	W. Abut., Bridge 19 (~50+633)	2	12.0 m	1+1	Grade + 0.2 m Grade + 0.4 m	Perpendicular to CL Parallel to CL	0 m from L. toe of slope 0 m from face of wall	0 m from R. toe of slope 40 m from face of wall
	E. Abut., Bridge 19 (~50+859)	~50+874	2	12.0 m	1+1	Grade + 0.2 m Grade + 0.4 m	Perpendicular to CL Parallel to CL	0 m from L. toe of slope 0 m from face of wall	0 m from R. toe of slope 40 m from face of wall
	~50+874	50+895	2	7.5 m	0	n/a	n/a	n/a	n/a
	50+895	50+920	1	n/a	0	n/a	n/a	n/a	n/a
3	50+300	50+530	1	n/a	0	n/a	n/a	n/a	n/a
	50+530	50+575	2	7.5 m	0	n/a	n/a	n/a	n/a
	50+575	50+600	3	7.5, 10.5 m	0	n/a	n/a	n/a	n/a
	50+600	~50+618	2	12.0 m	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	~50+618	W. Abut., Bridge 19 (~50+633)	2	12.0 m	1+1	Grade + 0.2 m Grade + 0.4 m	Perpendicular to CL Parallel to CL	0 m from L. toe of slope 0 m from face of wall	0 m from R. toe of slope 40 m from face of wall
	E. Abut., Bridge 19 (~50+859)	~50+874	2	12.0 m	1+1	Grade + 0.2 m Grade + 0.4 m	Perpendicular to CL Parallel to CL	0 m from L. toe of slope 0 m from face of wall	0 m from R. toe of slope 40 m from face of wall
	~50+874	50+895	2	7.5 m	0	n/a	n/a	n/a	n/a
	50+895	50+920	1	n/a	0	n/a	n/a	n/a	n/a

* Will require removing existing fill material in order to place HSG at same grade as beyond existing fill.

Geotechnical Instrumentation Plan
Legacy Parkway Project

Submitted to
Utah Department of Transportation

Submitted by
Fluor Ames Kraemer LLC
February 16, 2001

Introduction

The Utah Department of Transportation (UDOT) has contracted with Fluor Daniel, Ames Construction and Ed Kraemer & Sons, LLC (FAK) to construct the Legacy Parkway in Salt Lake/Davis Counties, Utah. As a part of this contract, the FAK team is required to submit a Geotechnical Instrumentation Plan to the UDOT Legacy Team. The FAK team, through the technical proposal, has indicated its overall approach to addressing the geotechnical challenges it anticipates during the design and construction of the parkway. This brief plan presents the details of instrumentation and monitoring to be used by the FAK team to verify design assumptions or assist in making any modifications to the approach to ensure that UDOT is provided with a very functional facility that provides a very pleasant experience for the travelling public.

Purpose

The purpose of geotechnical instrumentation is to monitor induced pore pressures, settlement, peak ground velocities, and horizontal movement of embankment and foundation soils under the given loads during construction. Observed behavior will be compared to predicted behavior and design assumptions to either confirm or form the basis for appropriate design modifications and/or construction procedures. Geotechnical instrumentation will be used to:

a) define existing insitu state prior to any construction,
b) monitor pore pressures of foundation soils during construction of embankments to establish construction staging,
c) evaluate rates of consolidation settlement to determine surcharging magnitude and duration,
d) evaluate lateral displacement of foundation soils due to loading and their implications on the stability of the embankments and adjacent properties and
e) monitor impact of operating heavy construction equipment on adjacent properties.

Organization

Parameters to be monitored, instrumentation needs. location of various instruments. data collection/compilation etc. will be established by FAK's geotechnical team. Installation and monitoring of the instruments will actually be performed by FAK. Data will be reduced and reviewed by the geotechnical team and appropriate conclusions/decisions will be arrived at and any recommendations will be made by the geotechnical group.

QA/QC Plan

All of the equipment used for monitoring will be inspected, calibrated and maintained per manufacturer's recommendations to ensure quality in the data obtained. Accuracy of data will be checked. Some redundancy will be incorporated into the monitoring program to ensure the decision making process is not hampered.

Approach

The FAK team's basic approach is to use the simplest and most reliable instruments that will produce data in the range of values required to make the best engineering decisions for the project.

The preliminary instrumentation layout developed during the proposal phase will be used. Settlement plates will be used to monitor surface settlements, differential settlements, and heave at the toe of walls or embankments. Benchmarks and reference controls will be established for QC. Open standpipe piezometers will be installed where ever possible to monitor pore pressure fluctuations at shallow depths. Isolated tip piezometers will be installed where open standpipe piezometers cannot be used effectively. Vibrating wire piezometers will be used in relatively thick clay layers. Closed tip piezometers will be used where artesian conditions are anticipated. Inclinometers will be installed at the toe of high embankments to monitor lateral movements in conjunction with settlement monitoring. Magnetic extensometers will be used to measure magnitude and rate of settlement at various elevations within the lake bed deposits.

The geotechnical group will develop specifications on required range of measurements and sensitivities. The group will also develop installation details.

It is proposed to take two readings every week initially and based on the observed rate of parameter change, the frequency may be reduced to one reading per week. Data will be collected either using read out units or manually. Data collected will include source; readings; construction features and activities in the area; other pertinent information as it affects data collected: necessary corrective action to be undertaken; QA/QC verification; interpretations etc. Information will then be transferred into spread sheets for generation of plots and reports. This information will be presented on a biweekly basis.

Information obtained will form the basis for assessing behavior of the embankment and foundation soils, including decisions on addition of fills and release of surcharges.

AK

Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	Construction Performance: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m	Long-Term Performance Instrumentation: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m
Structure Approach Embankments																		
South Interchange																		
I-215 to LP SB		1	9	58+224	2	VW		2	30	1	5							
										1	20							
			12	58+300	1	ME	36	2	30	1	5							
					1	VW				1	20							
LP -- Jordan River		2	7	6002+225	2	VW		2	30	1	5							
										1	20							
			7	6002+280	2	VW		2	30	1	5							
										1	20							
LP -- Jordan River		3	7	6002+225	2	VW		2	30	1	5							
										1	20							
			7	6002+280	2	VW		2	30	1	5							
										1	20							
LP NB to I-215 Jordan R.		4	6	54+655	2	VW		2	30	1	5							
										1	20							
			5	54+715	2	VW		2	30	1	5							
										1	20							
I-215 to LP SB		5	16	58+430								2	ME	36	2	30	1	5
																	1	10
																	1	15
			16	58+590	2	VW		2	30	1	5						1	20
										1	20							
LP -- Oil Drain		32	8	6002+490	2	VW		2	30	1	5							

AK

Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	Construction Performance: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m	Long-Term Performance Instrumentation: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m
										1	20							
			7	6002+533	2	VW		2	30	1	5							
										1	20							
LP -- Oil Drain		33	8	6002+490	2	VW		2	30	1	5							
										1	20							
			7	6002+533	2	VW		2	30	1	5							
										1	20							
Center Street		11	11	5+380	2	VW		2	30	1	5							
										1	20							
			9	5+500	2	VW		2	30	1	5							
										1	20							
500 South		12	8	70+180	1	ME	36	2	30	1	5							
					1	VW				1	10							
										1	15							
										1	20							
			10	70+270	1	ME	36	2	30	1								
					1	VW				1								
Parrish Lane Interchange																		
LP -- Sheep Road	W	13	12	6013+170								2	ME	61	2	30	1	10
																	1	20
																	1	30
																	1	40
			12	6013+420	1	ME	61	2	30	1	10							
					1					1	30							
LP -- Sheep Road		14	12	6013+215								2	ME	61	2	30	1	10
																	1	20

AK

Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	Construction Performance: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m	Long-Term Performance Instrumentation: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m
																	1	30
			12	6013+340	1	ME	61	2	30	1	10						1	40
					1	VW				1	30							
LP -- Parrish Lane	W	15	11	6013+730	2	VW		2	30	1								
										1								
			11	6013+845	2	VW		2	30	1								
										1								
LP -- Parrish Lane	W	16	11	6013+730	2	VW		2	30	1								
										1								
			11	6013+845	2	VW		2	30	1								
LP -- 1250 West		17	9	6014+545								2	ME	61	2	30	1	10
																	1	20
																	1	30
			8	6014+680	1	ME	61	2	30	1	10						1	40
					1	VW				1	30							
LP -- 1250 West		18	10	6014+570								2	ME	61	2	30	1	10
																	1	20
																	1	30
			8	6014+675													1	40
												2	ME	60	2	30	1	10
																	1	20
																	1	30
North Interchange																	1	40
Glovers Lane		19	4	50+850	2	VW		2	25	1	5							

AK

Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	Construction Performance: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m	Long-Term Performance Instrumentation: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m
										1	15							
State Street		21	7	+640	2	VW		2	25	1	5							
										1	15							
US 89 SB to LP SB		22	10	70+525	2	VW		2	25	1	5							
										1	15							
			11	71+030	2	VW		2	25	1	5							
										1	15							
I-15 SB to LP SB		23	15	60+265								2	ME	25	2	25	1	5
			10	60+607	1	ME		2	25	1	5						1	15
					1	VW				1	15							
LP NB to I-15 NB		24	10	20+785	2	VW		2	25	1	5							
										1	15							
			7	21+165	2	VW		2	25	1	5							
										1	15							
LP NB to US 89 NB		25	10	6+000	1	ME	30	2	25	1	5							
					1	VW				1	15							
			10	6+380	2	ME		2	25	1	5							
										1	15							
US 89 SB to to I-15 SB		26	10	12+590	2	VW		2	25	1	5							
										1	15							
			4	12+730	2	VW		2	25	1	5							
										1	15							
Burke Lane over UPRR	W	28	11	4+870	2	VW		2	25	1	5							
										1	15							
				4+925	2	VW		2	25	1	5							
										1	15							

AK

Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	Construction Performance: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m	Long-Term Performance Instrumentation: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m
Burke Lane over I-15		29	11	4+955	1	ME	30	2	25	1	5							
					1	VW				1	15							
				5+060	2	ME		2	25	1	5							
										1	15							
Burke Lane over US 89		30	11	5+285	2	VW		2	25	1	5							
										1	15							
				5+355	2	VW		2	25	1	5							
										1	15							
Pedestrian Bridge		31		99+995	2	VW		2	30	1	5							
										1	20							
				100+160	2	VW		2	30	1	5							
										1	20							
Ramp Embankments																		
I-15 to LP NB			11	50+850	2	VW		2	30	1	5							
										1	15							
			10	51+025	2	VW		2	30	1	5							
										1	15							
LP NB to Parrish Lane			12	800+150	1	ME	61	2	30	1	10							
					1	VW				1	20							
										1	30							
										1	40							
Parrish Lane to LP NB			6	500+600	2	VW		2	30	1	10							
										1	30							
LP SB to Parrish Lane			9	600+400	2	VW		2	30	1	10							
										1	30							

AK

Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	Construction Performance: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m	Long-Term Performance Instrumentation: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m
I-15 NB to US 89 NB	W		12	7+650								2	ME	25	2	25	1	5
																	1	15
				7+800	1	ME	25	2	30	1	5							
					1	VW				1	15							
Burke Lane to LP SB	W		9	40+550	2	VW		2	30	1	5							
										1	15							
I-15 SB to Burke Lane			9	1+040	2	VW		2	30	1	5							
										1	15							
Burke Lane to I-15 NB			6	1+090	2	VW		2	30	1	5							
										1	15							
I-15 NB to Burke Lane			7	8+100	2	VW		2	30	1	5							
										1	15							
			10	8+300	2	VW		2	30	1	5							
										1	15							
US 89 SB to Burke Lane	W		11	3+050								2	ME	25	2	25	1	5
																	1	15
Burke Lane to US 89 NB	W		11	+125	2	VW		2	30	1	5							
										1	15							
Parrish Lane to LP SB			11	700+300	2	VW		2	30	1	5							
										1	15							
LP NB to Burke			10	15+225	2	VW		2	30	1	5							
										1	15							

Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	Construction Performance: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m	Long-Term Performance Instrumentation: Settlement Platforms No.	Settlement Platforms Type*	Settlement Platforms Est. Depth, m	Slope Inclinometer No.	Slope Inclinometer Est. Depth, m	Piezometers No.	Piezometers Est. Depth, m
Burke to I-15 SB			9	9+150	2	VW		2	30	1	5							
											15							
Retaining Walls																		
I-15 SB TO LP SB			10	60+900	2	VW		1	30	1	5							
										1	15							
Roadway Embankment																		
LP				6001+700	1	VW												
LP				6004+500	1	VW												
LP				6006+000	1	VW												
LP				6007+500	1	VW												
LP				6009+000	1	VW												
LP				6010+600	1	VW												
LP				6012+500	1	VW												
LP				6016+000	1	VW												
LP				6017+500	1	VW												
LP				6019+125	1	VW												

NOTES:

1. Slope Inclinometer casing is 70 mm outside diameter with telescoping couplings. Casing spiral shall be measured upon completion of installation. The casing installation shall be completed flush with the ground surface with a large diameter monitoring well cover to protect the casing.
2. Settlement platforms for construction performance shall be vibrating wire (VW), or pneumatic (P), magnet extensometer (ME), or reed switch (SW), as indicated.
3. Settlement platforms for long-term performance instrumentation shall be magnet extensometer (ME) or reed switch (SW).

Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	Construction Performance							Long-Term Performance Instrumentation						
					Settlement Platforms			Slope Inclinometer		Piezometers		Settlement Platforms			Slope Inclinometer		Piezometers	
					No.	Type*	Est. Depth, m	No.	Est. Depth, m	No.	Est. Depth, m	No.	Type*	Est. Depth, m	No.	Est. Depth, m	No.	Est. Depth, m

4. Piezometers shall be vibrating wire.

5. Depending on construction sequencing, i.e., if the embankment is initially constructed full width, it may be possible to reduce the number of settlement platforms to 2 and the slope inclinometers to 3 for the Legacy Parkway mainline.

Memorandum

LEGACY

Date: *August 20, 2001* **File Code:** C·D1-1·0033

To: *Ernie Green, Deputy Project Director*

From: *Tim Dougherty, Design Manager*

Subject: *Unsuitable Materials – Subgrade Preparation Guidelines*

Cc: *KN. Gunalan, DocC,*

Attached with this memo is a guideline entitled, "Unsuitable Materials – Subgrade Preparation Guidelines". These guidelines have been developed by design to define a general solution to normally occurring unsuitable materials encountered on the subgrade.

Please note that the guidelines are limited to conditions were surface compaction of the working platform is achieved. When construction forces are unable to achieve compaction after following these guidelines, the guidelines struct that the project Geotechnical Engineer is notified before work continues in that area.

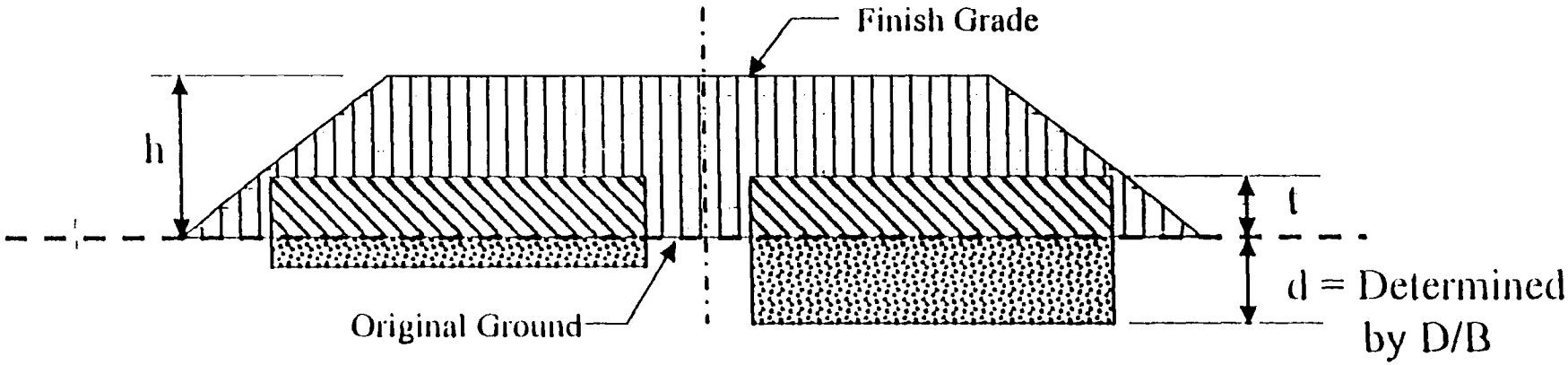
UNSUITABLE MATERIALS – Subgrade Preparation Guidelines

Bridge Lift

- Place and compact material to thickness "t" above O.G.
- If compaction is not achieved, GO TO Sub Excavate

Sub Excavate

- Excavate unsuitable material to a depth determined by the Design Builder
- Backfill with material determined by the D/B
- Obtain compaction per 02330 at surface of working platform
- See note below if compaction is not achieved



NOTE: If compaction of the sub excavation working platform material is not achieved contact the Design Builder Geotechnical Engineer before proceeding with embankment construction.

Working Platform

t = 0.5 m max. for > 3.0 m (h) embankment

t = 0.3 m max. for h < 3.0 m and > 1.0 m (h) embankment

h = < 1.0 m, compaction must be achieved at subgrade below 0.9 m pavement section

Symbol Legend

Unsuitable Material
- May be left in place and bridged with material
- Sub Excavate if working platform does not compact

Working Platform
- Maximum depth "t" above OG
- compaction per Section 02330 at surface
- material determined by D/B

Embankment or Bridge Backfill

Memorandum

LEGACY

Date: 9/30/2002 *File Code: 03COR301*

To: Mike McArthur

From: K. N. Gunalan

Subject: Bearing Capacity Recommendation - Steed Creek Structure

Cc: DocC, Kleinfelder

This is to confirm that the recommended allowable bearing capacity (refer to Kleinfelder's memo dated 12/20/01 – PB Doc 03COR160) of existing soils for a 3 m wide footing at 0.762 m below existing grade is 1250 psf. The allowable bearing capacity can be improved by over excavating to 1 m below the bottom of the footing (and to 1 m beyond the edges of the footing) and backfilling with compacted granular borrow. The allowable bearing capacity of the compacted granular borrow will be 2500 psf.

If you have any further questions, please let me know.

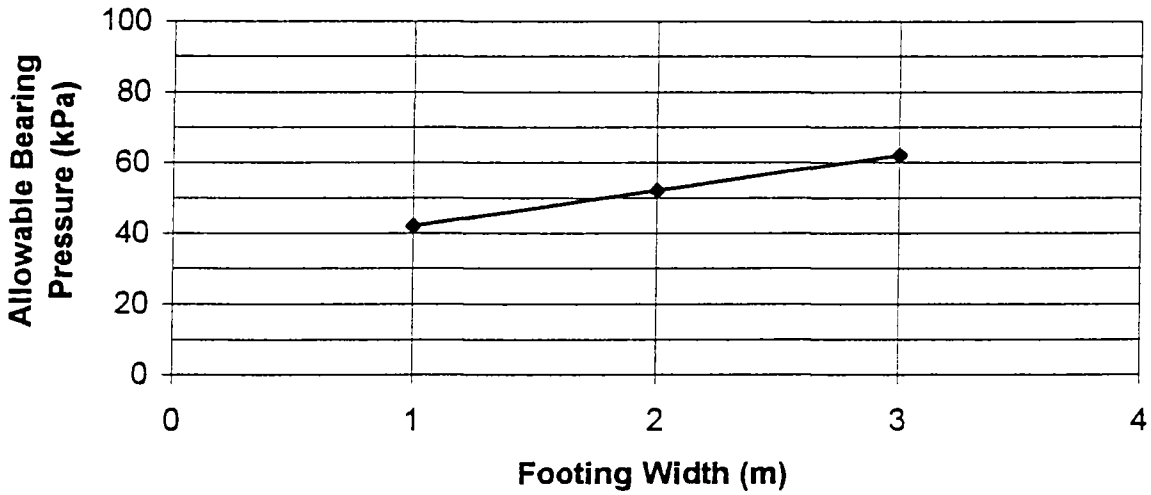
Legacy Parkway
Arch Span Structure
LP Mainline over Steed Creek
6018+470

Footing Width (m)	Allowable Bearing (kPa)
1	42
2	52
3	62

	Initials	Date
Prepared By	CMH	6/18/02
Reviewed By	NM	6/18/02

Note: Allowable bearing pressures based on 0.762 meters minimum embedment below the bottom of the creek invert on native soil.

Arch Span Structure on Native Soil
Mainlline 6018+470



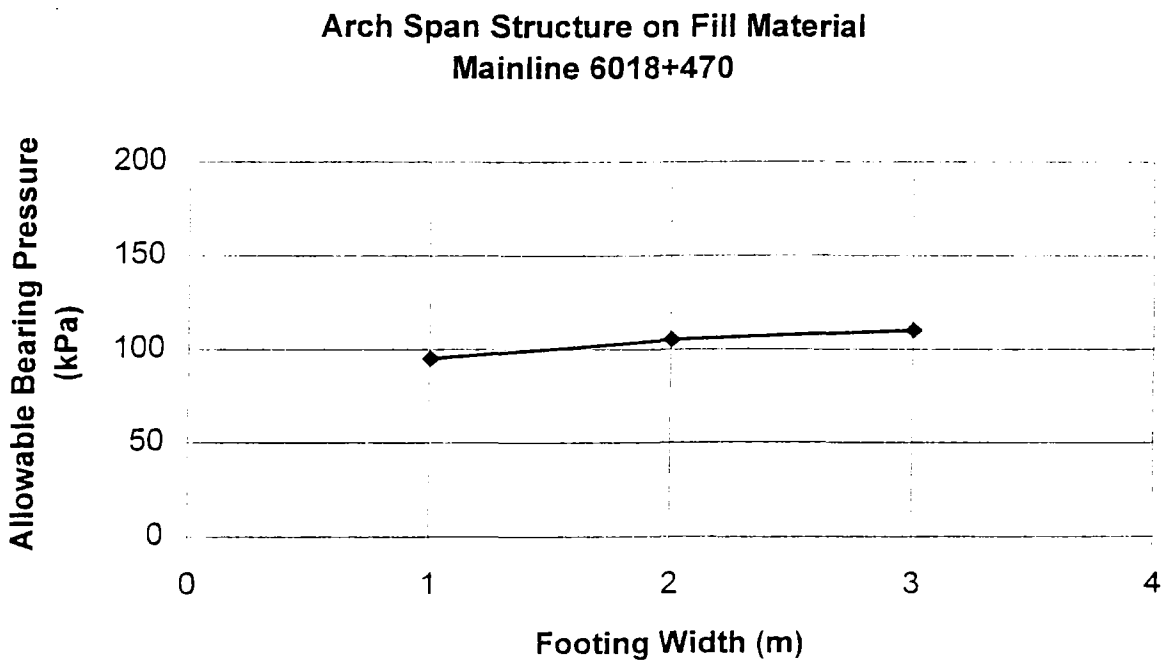
63C0R250

Legacy Parkway
Arch Span Structure
LP Mainline over Steed Creek
6018+470

Footing Width (m)	Allowable Bearing (kPa)
1	95
2	105
3	110

	Initials	Date
Prepared By	CmH	6/28/02
Reviewed By	NM	6/28/02

Note: Allowable bearing pressures based on 0.762 meters minimum embedment below the bottom of the creek invert on 1 meter of compacted fill soil and fill material placed 1 meter beyond the edge of footing in the horizontal direction.



Memorandum

LEGACY

Date: 02/18/2002 *File Code:03COR # 191*

To: Rex Gilley/ Duane Anderson

From: K. N. Gunalan

Subject: Soil parameters for CCTV/ VMS sign foundations

Cc: DocC, *Kleinfelder*

Dear Rex/Duane:

This is in response to your request from last week. CCTV foundations along Legacy Parkway mainline will be embedded in granular material that meets UDOT specifications (unit weight in the range of 15 kN/m3 and angle of internal friction of 28 deg.) for embankment material and therefore use of detail from I-15 will be applicable. For foundations by Cherry Hill (US 89) use similar soil properties. For foundations at the south end of the project on I-215, if the foundations are going to be outside of the embankment zone consider the soils to be cohesive and use a value of 15 kN/m2 for shear strength.

If you have any questions, please do not hesitate to contact me. Thank you.

KLEINFELDER

Transmittal

To	K. N. Gunalan	**Date:**	March 18, 2002
	Parsons Brinckerhoff	**Files:**	35-8440-08.001
	360 North 700 West Suite F	**Copies:**	1
	North Salt Lake City, Utah 84054		

Subject: **Lateral Soil Parameters**

We are sending the following: ☒ Attached ☐ Under separate cover

Lateral soil parameters for sign structures near Glover's Lane.

RECEIVED
MAR 19 2002
Parsons Brinckerhoff
Legacy Parkway Project

Via:
- ☒ Messenger
- ☐ First Class Mail
- ☐ Air
- ☐ Fed Ex
- ☐ United Parcel
- ☐ Air Freight
- ☐ _____

Transmitted:
- ☒ As Requested
- ☐ For Approval
- ☐ For Your Use
- ☐ For Review & Comment

Remarks:

File # C3CCR	Doc. # 199
Route to:	
SCANNED	3/20/02

By Nigel Miller

Nigel Miller

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Legacy Parkway
Lateral Pile Analysis
Soil Parameters for LPILE or GROUP

Line	LP Mainline
Station	6017+750
Water Depth (m)	1.0
Boring Elevation (m)	1284.9
Soil Borings Used for Profile	BB-417

	Initials	Date
Completed By	CMB	3/18/02
Checked By	NM	3/18/02

Layer	Soil Type	Depth to Top of Soil Layer (m)	Depth to Bottom of Soil Layer (m)	Unit Weight of Soil (kN/m³)	Shear Strength (kN/m²)	Strain, ε_{50}	Modulus of Subgrade Reaction, k (kPa/m)	Friction Angle, φ (degrees)	Maximum Side Friction (kN/m²)		Maximum Tip Resistance (kN/m²)	
									Top	Bottom	Top	Bottom
1	Soft Clay	0.0	1.0	20.3	128	0.015	165,665	-	0	5	0	280
2	Soft Clay	1.0	4.9	9.7	31	0.030	18,665	-	4	12	110	330
3	Silt	4.9	5.9	9.7	37	0.030	29,165	29	16	18	1,290	1,510
4	Soft Clay	5.9	9.1	8.6	11	0.030	3,500	-	13	19	270	380

Legacy Parkway
Lateral Pile Analysis
Soil Parameters for LPILE or GROUP

Line	LP Mainline
Station	6018+555
Water Depth (m)	1.0
Boring Elevation (m)	1290.1
Soil Borings Used for Profile	SB-19-274

	Initials	Date
Completed By:	CMH	3/14/02
Checked By:	NM	3/19/02

Layer	Soil Type	Depth to Top of Soil Layer (m)	Depth to Bottom of Soil Layer (m)	Unit Weight of Soil (kN/m^3)	Shear Strength (kN/m^2)	Strain, ε_{50}	Modulus of Subgrade Reaction, k (kPa/m)	Friction Angle, ϕ (degrees)	Maximum Side Friction (kN/m^2)		Maximum Tip Resistance (kN/m^2)	
									Top	Bottom	Top	Bottom
1	Stiff Clay without Free Water	0.0	1.0	19.9	83	0.020	96,665	-	0	4	0	190
2	Stiff Clay with Free Water	1.0	1.9	10.0	83	0.020	96,665	-	4	6	190	280
3	Sand	1.9	4.3	9.7	-	-	2,870	30	10	18	1,420	2,560
4	Soft Clay	4.3	10.0	10.0	45	0.030	41,165	-	11	23	260	560

Legacy Parkway
Lateral Pile Analysis
Soil Parameters for LPILE or GROUP

Line	LP Mainline
Station	6019+360
Water Depth (m)	1.0
Boring Elevation (m)	1297.3
Soil Borings Used for Profile	RB-420

	Initials	Date
Completed By	CMJ	3/18/02
Checked By	NM	3/19/02

Layer	Soil Type	Depth to Top of Soil Layer (m)	Depth to Bottom of Soil Layer (m)	Unit Weight of Soil (kN/m³)	Shear Strength (kPa)	Strain, ε	Modulus of Subgrade Reaction, k (kN/m³)	Friction Angle, φ (degrees)	Maximum Side Friction (kN/m²)		Maximum Tip Resistance (kPa)	
									Top	Bottom	Top	Bottom
1	Silt	0.0	1.0	19.9	63	0.020	68,165	30	0	5	0	470
2	Soft Clay	1.0	7.0	11.4	25	0.030	11,165	-	4	19	120	550
3	Silt	7.0	8.4	9.7	31	0.030	18,665	29	24	27	1,940	2,230
4	Soft Clay	8.4	9.1	9.7	31	0.030	18,665	-	21	23	570	610