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Legacy
PARKWAY
Davis County

LEGACY PARKWAY

Project Number SP-0067(1)0

SEGMENT 2

GEOTECHNICAL INVESTIGATION REPORT

Prepared by
Parsons Brinckerhoff Quade & Douglas, Inc.
For
Fluor Ames Kraemer, LLC

August, 2004

Fluor Ames Kraemer LLC
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LEGACY

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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 2 – 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 2 of the Legacy Parkway Project. Segment 2 generally encompasses the portion of the Legacy Parkway extending from north of the Center Street interchange (in North Salt Lake) to north of the 500 South Street interchange (just west of the Woods Cross city boundary) in Davis County, Utah.

The accompanying report describes the field exploration and laboratory testing; summarizes our findings; and presents geotechnical recommendations for design and construction of one bridge, one 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.	Fluor Ames Kraemer, LLC
Michelle D. Cline	KN Gunalan
Michelle D. Cline, P.E.	K.N. Gunalan, Ph.D., P.E.
Geotechnical Engineer	Design Manager

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1.0 INTRODUCTION

This report presents the results of the geotechnical field and laboratory investigations conducted for Segment 2 of the Legacy Parkway Design-Build 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 (RFP, 2000) 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 existing site features are shown on the Project Location Map and Project Vicinity Map in Appendix A. The project, which includes 25 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 2 extends northward from north of the Center Street interchange at Legacy Parkway (LP) centerline station 6003+700 (northern terminus of Segment 1) to north of the 500 South Street interchange at LP centerline station 6011+800 (southern terminus of Segment 3). Pertinent Segment 2 corridor lines included in this investigation are summarized in Table 1.

Table 1: Segment 2 Stationing

Line	Station
Legacy Parkway (LP)	6003+696 to 6011+800
500 South (5S)	70+000 to 71+040
LP Northbound (NB) to 500 South (5S1)	4+800 to 5+392
LP Southbound (SB) to 500 South (5S2)	1+000 to 1+681
500 South to LP NB (5S3)	4+000 to 4+600
500 South to LP SB (5S4)	2+940 to 3+473
Redwood Road (R)	2+035 to 2+234
Frontage Road West (FW)	8+700 to 12+215

1.2 Proposed Improvements

In summary, Segment 2 includes construction along approximately 8.1 kilometers of the Legacy Parkway alignment, including a new interchange at 500 South Street. Construction will include a new bridge, one MSE wall, and embankments up to approximately 12.5 meters in height, as well as new signs and light pole structures. One new concrete box culvert will be constructed across the Dual Stone and Barton Channel at approximately LP 6011+460. Several new pipe culverts (corrugated aluminum, smooth lined pipe culvert, or reinforced concrete pipe) will be constructed at various locations along the proposed alignment, and some of the existing drainage channels or ditches which cross the alignment will be removed, abandoned, or re-routed. Additional details related to the bridge, MSE wall, and embankment fills are provided in later sections of this report. The new Segment 2 roadway alignments are described briefly below.

The new Legacy Parkway mainline, extending in a generally south-north direction, will be constructed between approximately LP 6003+700 (beginning of Segment 2) and LP 6011+800 (end of Segment 2), with provision for a new parallel utility corridor on the east side of the mainline alignment. Beginning due north of the 500 South interchange, a north-south trending berm will be constructed between the utility corridor and Legacy Parkway roadway. The berm will have a maximum height on the order of 4 meters.

A new section of 500 South Street will be constructed between Redwood Road and a new 500 South interchange at Legacy Parkway (between 5S 70+000 and 70+830). The interchange will include a new bridge - UDOT Bridge No. F-710 (also identified as FAK Bridge No. 12) - which will cross over Legacy Parkway at approximately LP 6008+830: four new ramps will also be constructed (two on the north side of Bridge No. F-710 and two on the south side). The existing section of 500 South Street extending from Redwood Road to about 200 meters to the east will be reconstructed (between 5S 70+830 and 71+040). A small portion of Redwood Road (between R 2+035 and 2+234) will be reconstructed near the 500 South Street intersection.

A new Frontage Road West will be constructed parallel to Legacy Parkway mainline west side between the new 500 South interchange and the Dual Stone and Barton Channel at approximately LP 6011+500 (between FW 8+700 and 12+215). A new MSE wall will be constructed along a portion of the Frontage Road West roadway (between FW 11+509 and 11+581) to support the roadway embankment on the east side of Bountiful Pond.

Four new cul de sacs will be constructed due east of the utility corridor at 900 North, 2425 South, 1200 North and Pages Lane. Existing pavements for these roadways will be removed in the area of the proposed mainline. A new Woods Cross Detention Basin will be constructed immediately south of the 2425 South cul de sac.

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 roadways which cross the proposed Legacy Parkway mainline at 900 North Street, 2425 South Street, 400 South Street, 1200 North Street and Pages Lane. The proposed alignment crosses areas of designated wetlands near the north end of Segment 2, particularly in the area north of 1200 North Street at about LP 6010+300. Several drainage channels and irrigation ditches traverse the alignment. The A-1 and A-2 Canals intersect the mainline alignment near LP 6009+300; Mill Creek crosses the alignment near 1200 North Street at approximately LP 6010+460; and the Dual Stone and Barton Channel crosses the alignment near LP 6011+460. The Bountiful Pond is located west of the proposed alignment near LP 6010+900. Other existing site features include utilities, culverts, and small ponds.

4.0 FINDINGS

4.1 Site Conditions

Segment 2 consists primarily of undeveloped land and wetland areas, as well as other facilities previously described. Topography in the area is relatively level, with ground surface elevations ranging from approximately 1283 to 1287 meters.

4.2 Surface Drainage

Segment 2 is located in a low-lying area; surface drainage is generally to the west 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 4 km southwest of the project. 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 alignment is located approximately 0.9 km 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 during explorations conducted by Kleinfelder, the native soil profile along the proposed Segment 2 alignment predominantly consists of interlayered clay and silt with intermittent sand 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 located generally 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 design 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-710 was evaluated in general accordance with the methods presented in Youd and Idriss (1997) using data obtained from borings SB-12-263, SB-12-265, and RB-371, and Cone Penetrometer Test (CPT) sounding SC-12-264. Results of our analysis indicate that should an earthquake of sufficient magnitude occur, localized zones within the site soils may experience liquefaction. Liquefaction-induced settlement 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 in the upper 16 meters of the soil profile were estimated to range from about 0 to 10 centimeters.

Given the relatively level terrain of the project alignment, landslide potential related to deep-seated mass slope stability and/or earthworks is considered to be relatively low. However, based on evidence of historical liquefaction-induced horizontal displacements near the north end of the Legacy Parkway Preferred Alignment (Hylland and Lowe, 1998), liquefaction-induced lateral spread was considered for potential impacts to the proposed construction. Liquefaction-induced lateral spreading was assessed for Bridge No. F-710 using data obtained from borings SB-12-263, SB-12-265, and RB-371, and the revised multilinear regression equations by Youd, Hansen, and Bartlett. Lateral spread displacement was estimated to be about 0.6 meters based on data obtained from boring RB-371; no horizontal displacement was estimated in the other two borings. Given the lack of continuity of the potentially liquefiable layers contributing to the lateral spread hazard, no mitigation measures are recommended for this bridge site. 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, the bridge and associated walls (slope terracing units) located within 15 meters of bridge supports were designed to meet a seismic hazard level of 10% exceedence in 250 years, which corresponds to a peak ground surface acceleration of 0.6*g*. For the remaining portions of the alignment, embankments were designed to meet a seismic hazard level of 10% exceedence in 50 years, corresponding to a peak ground surface acceleration of 0.29*g*. Liquefaction and stability analyses were also conducted on the basis of these seismic design criteria.

6.0 FIELD AND LABORATORY TEST DATA

6.1 Field Exploration

Field exploration for Segment 2 included 19 borings and 3 CPT soundings that were carried out as part of Kleinfelder's (2000) study. The locations of the explorations are listed in the Summary of Exploration Information Table in Appendix A. Also, the approximate locations are shown on the Exploration Location Drawings in Appendix A. The locations represented on the figures in Appendix A are based on the coordinates shown in the Soil Exploration Information Table; 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.

The borings drilled in the vicinity of Bridge No. F-710 were drilled to depths ranging from about 61.6 to 77.1 meters below the ground surface; other borings in Segment 2 were drilled to depths of about 8.7 to 63.1 meters. The CPT soundings extended to depths ranging from about 33.7 to 47.6 meters. In general, the locations and planned depths of the explorations were determined based on the preliminary height and location of primary bridges and roadway embankments. At the time of Kleinfelder's field investigation, a bridge over the pedestrian/equestrian was planned along the Segment 2 mainline at approximately LP 6011+400; four borings and two CPT soundings were located in this general area. Later, this bridge (FAK Bridge No. 31) was deleted from the design package.

In general, borings for the bridge structure were drilled until SPT blowcounts of about 30 blows per 0.3 meters were observed for three consecutive 1.5-meter intervals. CPT soundings for bridge structures were continued until refusal of the cone was reached.

As a general criterion, borings were drilled to depths of about 30 meters in locations where proposed embankment heights were in the range of 10 to 16 meters. Shallower borings were drilled where embankment heights were less than about 10 meters. Each exploration was assigned an alphanumeric identification according to

(SB, RB, SC)-XX-XXX

where,

SB = structure (bridge) boring
RB = roadway boring
SC = structure CPT sounding
XX = two-digit number corresponding to the assigned FAK structure or wall 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-, and ATV-mounted drills equipped for soil sampling. Hollow-stem auger or mud rotary methods were 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 1.5- to 3-meter intervals. Disturbed soil samples were collected using a Standard Penetration Test (SPT) or modified California split-barrel sampler driven by a 63.5 kg hammer free-falling from a height of 762 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:

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

where,

D_o= outside diameter of modified California sampler (2.5 inches for this study)
D_o= inside diameter of modified California sampler (2.0 inches for this study)

Relatively undisturbed soil samples were collected with 76.2 mm diameter by 762 mm long Shelby tubes pushed hydraulically or using 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 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. These data are summarized on the Interpretation Tables in Appendix D.

Typically, one dynamic pore pressure dissipation test was performed in each sounding. 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. Ranges of selected laboratory test results for soil samples collected from borings in the vicinity of Bridge No. F-710 are summarized in Table 2. These include dry unit weight (γ_d), moisture content (ω), liquid limit (LL), plasticity index (PI), percent fines, and unconfined compressive strength (q_u). Results of chemical tests, performed on selected samples from the Segment 2 borings in general accordance with standard test methods, are summarized in Table 3. Other laboratory test results are presented on the boring logs in Appendix B and on the figures in Appendix F. It is noted that results of some Atterberg limits and particle size distribution tests on soil samples from borings SB-12-263 and SB-12-265 are not included on the boring logs because these tests were conducted subsequent to log preparation. However, these data are included on the Summary of Laboratory Test Data Table and reports in Appendix F.

Table 2: Selected Laboratory Test Results for Bridge No. F-710 Borings

USCS	γ_d[1], kN/m^3	ω[1], %	LL	PI	% Fines	q_u[2] kPa
CL, ML	13.1 - 16.5	22 - 38	NP - 44	NP - 23	70 - 100	74 - 272
SM	--	--	--	--	18	--

NP = Non-plastic

[1] Consolidation test values of γ_d and ω are not included; refer to test reports in App. F for these data.

[2] Values of q_u estimated by the torvane shear tests are not included; refer to boring logs for these data.

Table 3: Soil Chemical Analysis Results for Segment 2 Borings

Boring No.	Sample Depth, m	USCS	pH	Resistivity, ohm-cm	Water Soluble Sulfate, ppm
SB-12-263	1.52	CL	8.5	4,900	8
SB-12-265	1.52	CL	9.0	2,600	25
SB-31-353	1.22	CL	9.4	1,400	<250
SB-31-354	0.00	CL	8.7	260	320
SB-31-356	3.05	CL	9.0	810	90

7.0 GEOTECHNICAL ANALYSIS AND RECOMMENDATIONS

7.1 Bridge

Bridge No. F-710 (FAK Bridge No. 12) will be constructed along 500 South Street (between 5S 70+174 and 70+260) over the Legacy Parkway mainline at approximately LP 6008+230. The bridge is a two-span, precast concrete girder bridge with a span length of 42 meters and a width of approximately 17 meters.

7.1.1 Subsurface Conditions

7.1.1.1 Soils

Native soils within Segment 2 of the Legacy Parkway Project may generally be described as interlayered clay, silt, and sand. Fill materials extending to depths of about 0.3 to 2.5 meters were encountered in three of the borings drilled in Segment 2. A more detailed discussion of materials encountered at the bridge site is presented below. The soil descriptions are based on review of logs of borings SB-12-263 and SB-12-265 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.

<u>Bridge F-710 (FAK #12) over Legacy Parkway at 500 South Street</u>

The subsurface profile at this bridge site predominantly consists of interlayered clays (CL, CL-ML) and silts (ML) with intermittent layers of sand (SP, SP-SM, SM, SC). In general, the clay and silt layers are about 0.5 to 15 meters thick, and contain frequent seams of sand. The sand layers are about 0.8 to 2.5 meters thick and contain seams of silt and clay. The sand layers were encountered below elevations of about 1251 meters in boring SB-12-265 and 1274 meters in boring SB-12-263. The sand layers are generally discontinuous between the two borings, except for a distinct, relatively thin sand layer at an elevation of about 1242 meters.

The consistency/relative density of the subsurface materials is somewhat variable with depth. Above an elevation of approximately 1247 meters, the clays and silts are soft to stiff, based on average $(N_1)_{60}$ values ranging from 2 to 13. Below this elevation, the clays and silts are generally medium stiff to very stiff with average $(N_1)_{60}$ values ranging from 8 to 16. Based on average $(N_1)_{60}$ values ranging from 13 to 28, the intermittent sand layers are medium dense; a couple isolated loose or dense zones of sand were encountered in boring SB-12-263. Average tip resistances measured in the upper 34 meters of the soil profile ranged from about 0.7 to 4 MPa in the clay and silt layers, and from about 10 to greater than 25 MPa in the sand 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 using during drilling operations; for this reason, groundwater elevations were not measured during drilling and therefore are not indicated on the boring logs in Appendix B.

7.1.2 Analysis and Design Recommendations

Capacity, settlement and driveability 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 driveability. Piles were designed to develop axial capacity using a combination of end-bearing and side friction. A factor of safety of 2.25 was used to compute the estimated target ultimate resistance as recommended by AASHTO (1996). The design protocol for analysis 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 bents and abutments 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 2 bridge structure are presented in Table 4 on the following page. Additional design data, including reference to explorations used in analyses, are included with the Geotechnical Recommendations 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 4: General Pile Design Data

Bridge No.	Support No.	Min. Tip Elevation, m	Estimated Length, m	Service Load, kN	Req'd Driving Resist., Kn
F-710 (FAK #12)	Abut 1	1250.5	48	900	2,025
	Bent 2	1247.5	42	500	2,120
	Abut 3	1255.0	52	900	2,025

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 pile cap concrete and filling of pipe piles with concrete shall be performed in accordance with UDOT specifications.

7.2 Embankments

At the 500 South interchange, maximum embankment heights (without surcharge) at the bridge abutments and on- and off-ramps are generally on the order of 12.5 meters. Along the other Segment 2 roadways, embankments are generally on the order of 3 meters or less, except in some locations along the Legacy Parkway mainline and Frontage Road West where embankments will be about 5 meters in height. Embankment heights for the primary Segment 2 alignments (500 South interchange and portions of the Legacy Parkway mainline) are summarized on the Embankment and Grading Summary Tables in Appendix G.

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. Ranges of estimated settlement magnitudes (primary plus four cycles of secondary) for roadway sections along the Legacy Parkway mainline and 500 South interchange roadway and ramps are given in Table 5.

Table 5: Settlement Estimates, Surcharge Heights, and Wick Drains for Segment 2

Approx Station	Embank Sttlmnt[1] mm	Sur-charge Ht, m	Wick Spacing/ Time[2]	Wick Length[3], m	Notes[4]
5S 70+000 to 71+040	250-1725	1.4-5.2	1.75m/ 90days	29	NR for 70+740 to 71+040
5S2 1+000 to 1+440 (Ramp A)	375-925	1.2-2.9	1.75m/ 90days	29	--
5S3 4+000 to 4+570[5] (Ramp B)	150-1600	1.5-3.5	1.75m/ 90days	29	NR for 4+300 to 4+570
5S4 2+940 to 3+473 (Ramp C)	250-950	1.2-2.9	1.75m/ 90days	29	NR for 3+200 to 3+473
5S1 5+000 to 5+392 (Ramp D)	275-1575	1.5-4.5	1.75m/ 90days	29	NR for 5+000 to 5+140
LP 6005+550 to 6005+940	350	0.7	1.75m/ 90days	19	--
LP 6010+290 to 6011+130	475-750	0.8-1.5	1.75m/ 90days	19	--

[1] Range of settlement (100% primary plus 4 cycles of secondary) estimates for all cross-sections evaluated.

[2] 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.

[3] Estimated wick drain length; to be field-verified.

[4] NR = Not Required (applies for surcharge and wicks)

[5] Stationing shown as 0+000 to 0+570 on Embankment and Grading Summary Table in Appendix G.

The time for completion of primary and secondary (four cycles) settlement for embankments with surcharge and without wick drains was estimated to range between approximately 690 and 4425 days for the Segment 2 embankments. To reduce the amount of time for completion and thereby minimize post-construction consolidation settlement, surcharges with prefabricated vertical drains at a spacing of 1.75 meters are recommended for embankment fills greater than 3 meters in height. General recommendations for surcharge and vertical (wick) drains for the primary Segment 2 alignments are included in Table 5; additional details are provided in the Embankment and Grading Summary Tables in Appendix G.

With consideration for the recommended surcharge heights, wick drain spacing, and total estimated settlements, it is predicted that each stage of embankment fill will require approximately 90 days to achieve the required degree of consolidation prior to placing the next stage or removing the surcharge. It is noted that our analysis was based on the assumption that wick drains with a width of 100 mm, a thickness of 2 mm, and a length ranging between 19 and 29 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 UDOT, global stability was evaluated using the design factors of safety (FOS) shown in Table 6.

Table 6: 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 (10% in 50 yr = 0 6g)	1 0	1.0

[1] Within 15 meters of the abutment.

Results of the stability analyses, included in the Summary of Global Stability Calculations Table in Appendix G, indicate that high-strength geotextile (HSG) reinforcement will be required for embankments at the 500 South interchange to achieve the required FOS 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. Various options for HSG placement, including number of layers, elevation, length, and warp direction orientation, have been developed for the 500 South interchange. These options 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 500 South 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 1½H:1V 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 Walls

Roadway design for Segment 2 has identified the need to construct one MSE wall (UDOT Wall No. R-390-03) for support of the Frontage Road West roadway embankment adjacent to the east side of Bountiful Pond. The wall will be located between approximately FW 11+509 and 11+581, and will be approximately 75 meters in length. The maximum wall height will be about 4.3 meters from the top of the leveling pad to the top of the coping. Additionally, walls constructed of slope terracing units (STUs) will be located at the abutments on either side of Bridge F-710.

7.3.1 Analysis and Design Recommendations

Global stability, bearing capacity and settlement of Legacy Parkway MSE walls were conducted in general accordance with the requirements of the contract. Per general industry practice for design/construction of MSE walls, internal stability analysis is the responsibility of the proprietary wall designer. This 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 MSE wall design are provided in Table 7 on the following page. Recommended soil parameters for STU wall design are included in the Geotechnical Information for STUs Memorandum in Appendix G.

Table 7: Geotechnical Parameters for MSE Wall

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

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.

7.3.2 Construction Considerations

Wall construction shall be accomplished using approved materials in accordance with applicable contract requirements and manufacturer's guidelines. MSE walls shall be constructed with facing panels founded on a concrete leveling pad. The walls 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 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 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. Bearing capacity analysis was performed as required in general accordance with the protocol in Appendix G. 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.

7.5 Utilities

Settlement analysis was conducted for utilities in accordance with the protocol in Appendix G. Results of settlement analyses for utilities at some Segment 2 locations are presented in Table 8.

Table 8: Estimated Maximum Settlements for Utilities at Selected Locations

Approximate Station	Embankment Height, m	Est. Maximum Settlement, mm
LP 6007+780	4.6	575
LP 6008+700	6.8	975
LP 6008+900	6.5	925
LP 6009+885 / UT-7	4.4	400

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. Recommendations for the South Davis sewer crossings at LP 6009+885 and 6010+477 are included in a memorandum in Appendix G.

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

7.6 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 2H:1V. Where permanent fill slopes no steeper than 1½H:1V 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 2 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 2 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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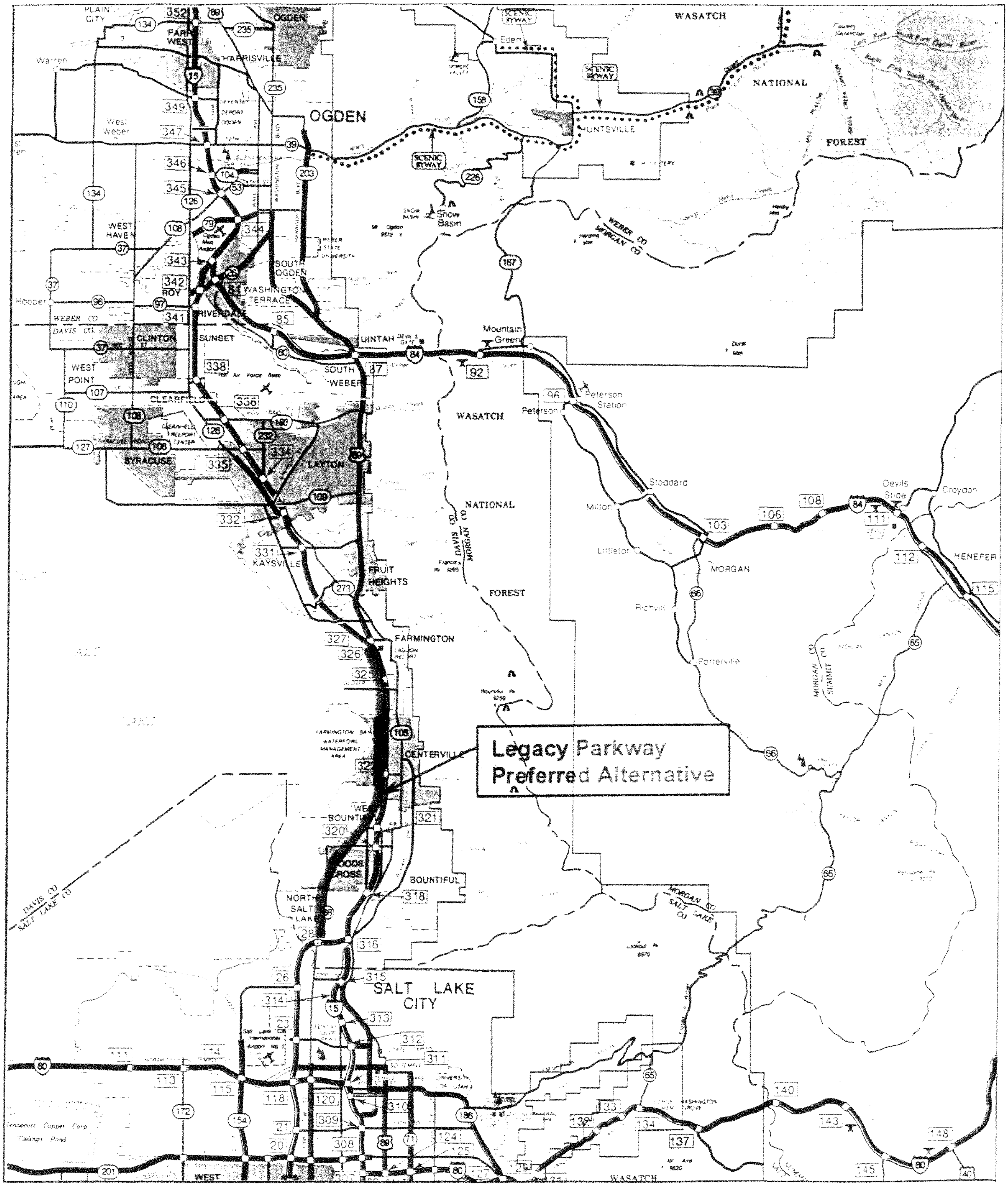


Source:
Official Highway Map
Utah Department of Transportation
1995

0 1 2 4 8

MILES

3510Q134.ppt

N

KLEINFELDER

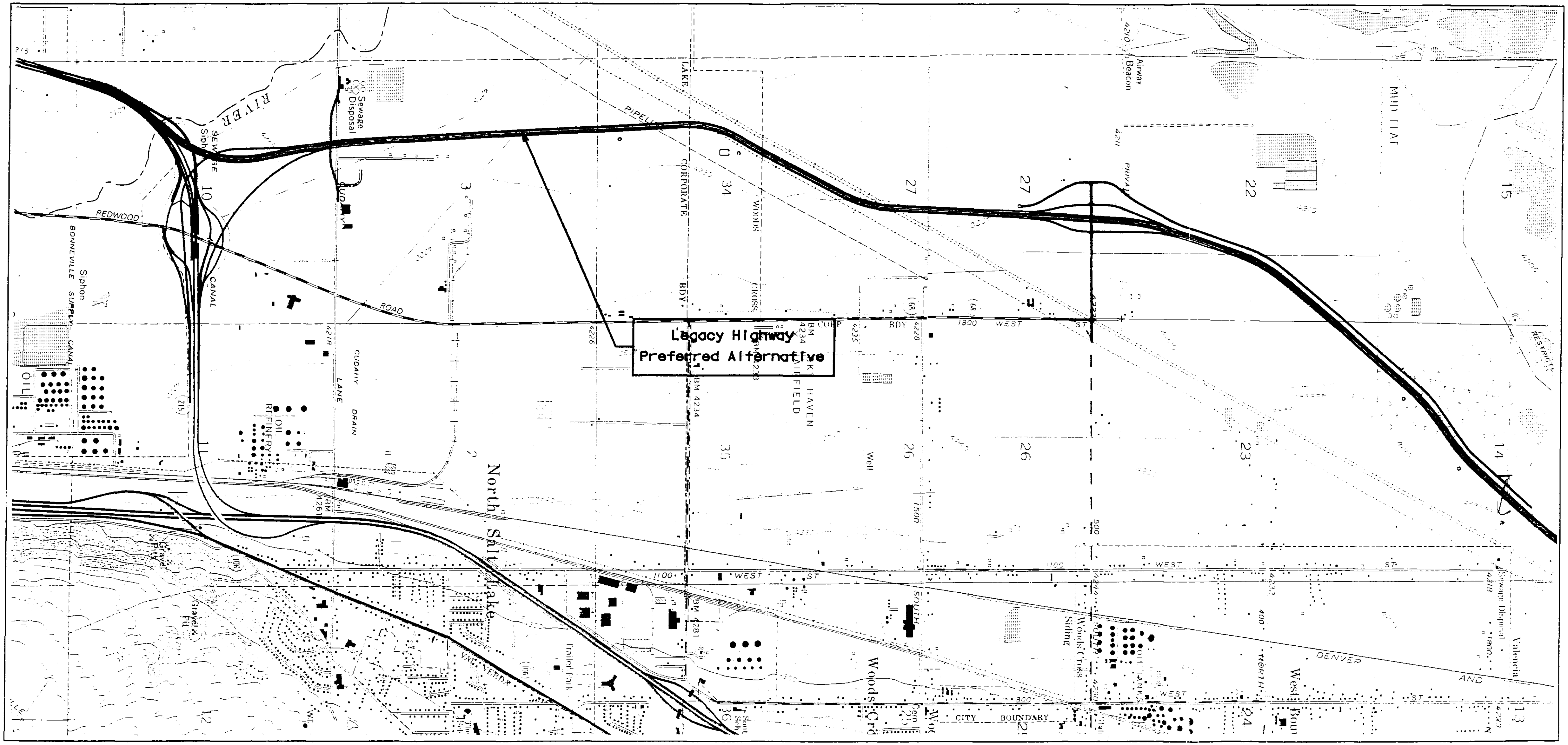
Project Number 35-8163-05

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

PROJECT LOCATION MAP

PLATE

A-1



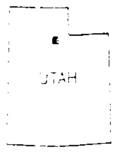
BASE MAPS:
SALT LAKE CITY NORTH AND FARMINGTION, UTAH
U.S.G.S. 7.5 MINUTE QUADRANGLE
1963 AND 1952
Photorevised 1969 and 1975
Project Number - 35-8163-05

SCALE 1:24,000

0 1000 2000 FEET

1" = 2000'

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



QUADRANGLE LOCATION

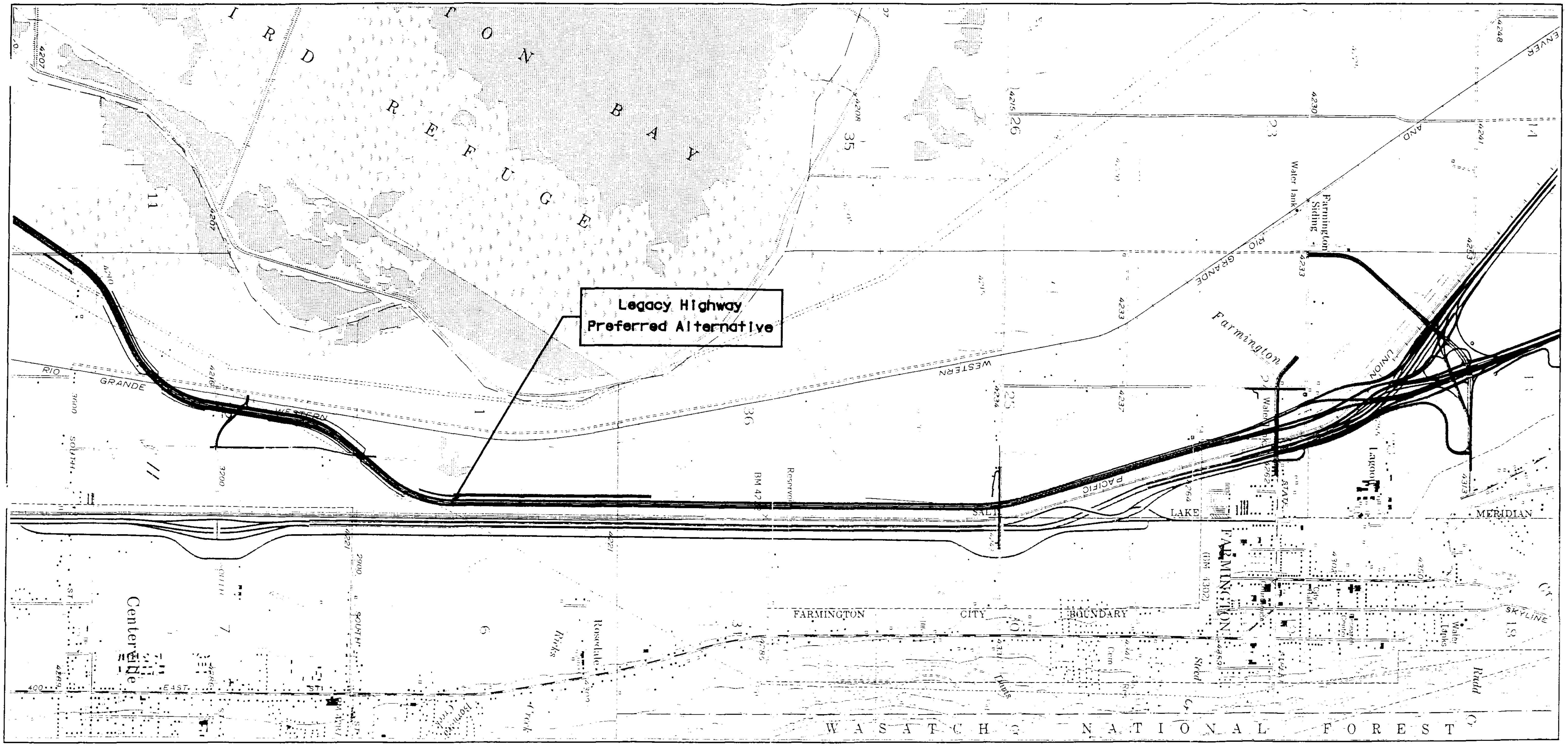
N

KLEINFELDER, INC.

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

PROJECT VICINITY MAP

PLATE
A-2



SCALE 1:24,000

0 1000 2000 FEET

1" = 2000'

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

QUADRANGLE LOCATION

BASE MAP:
FARMINGTION, UTAH
U.S.G.S. 7.5 MINUTE QUADRANGLE
1952
Photorevised 1969 and 1975

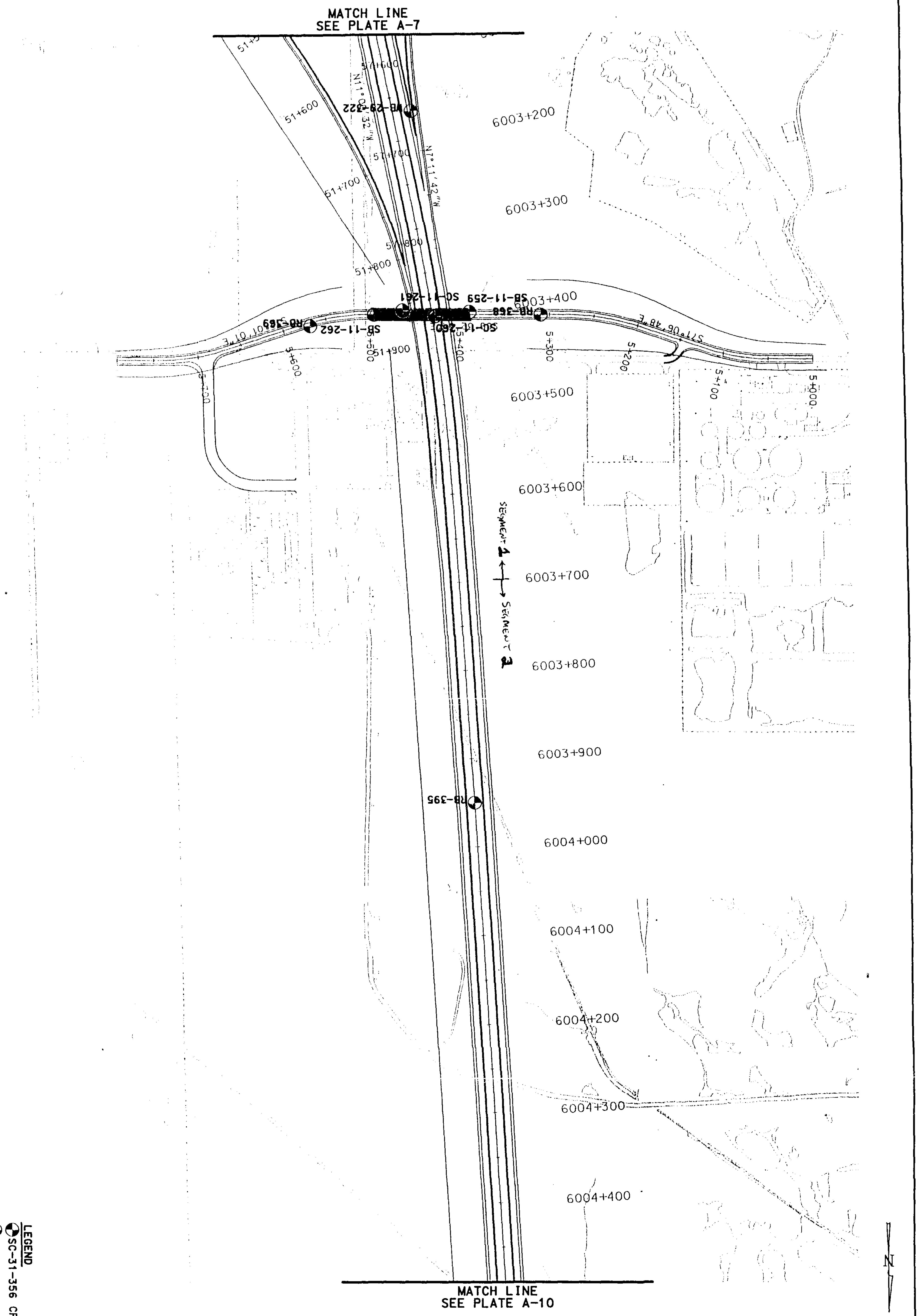
Project Number - 35-8163-05

KLEINFELDER, INC.

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

PROJECT VICINITY MAP

PLATE
A-3



LEGEND
● SC-31-356 CPT Location
● SB-31-355 Boring Location

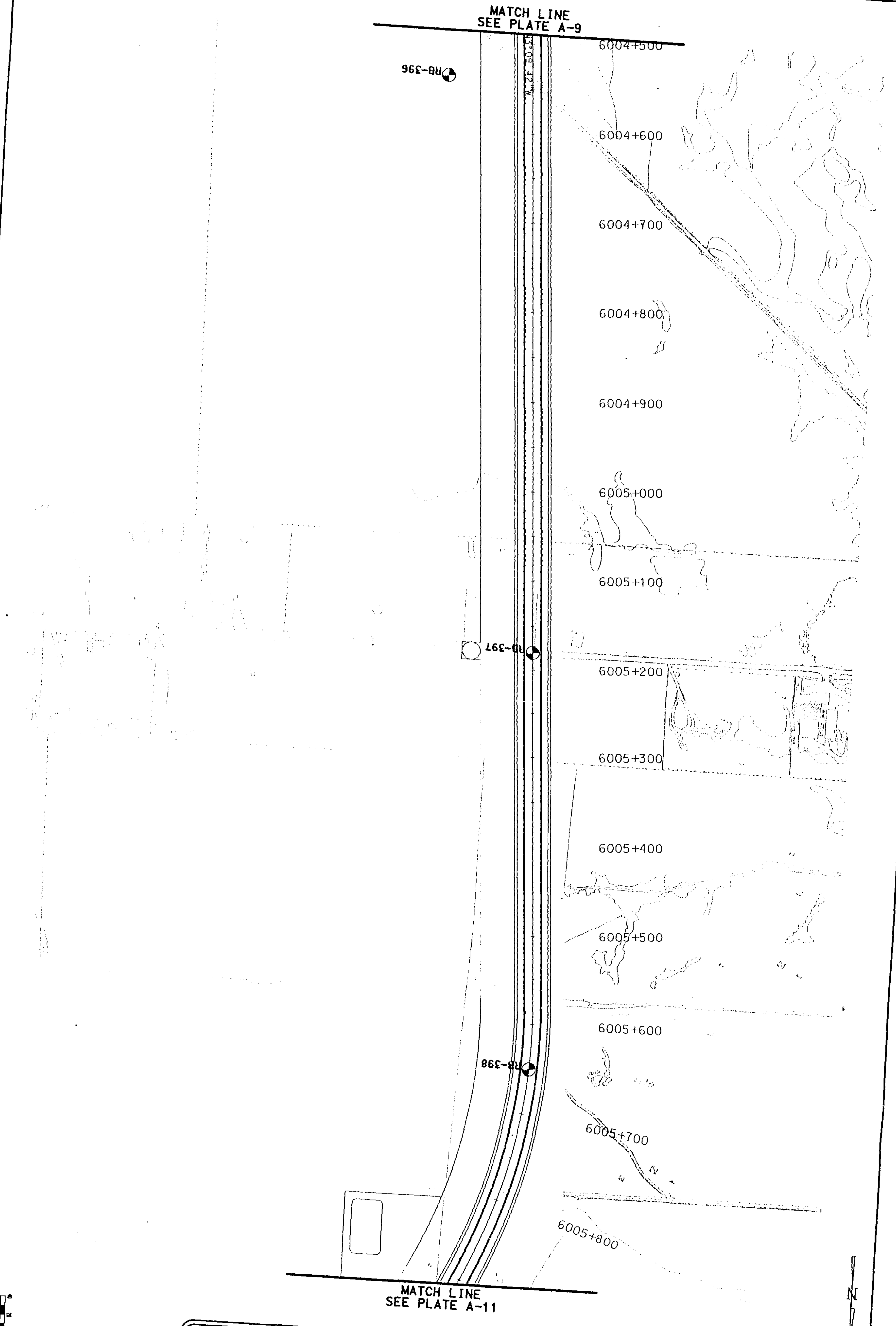
KLEINFELDER

Project No. 35-8163-05

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

EXPLORATION LOCATION DRAWING

PLATE
A-9



LEGEND

- SC-31-356 CPT Location
- SB-31-355 Boring Location

KLEINFELDER

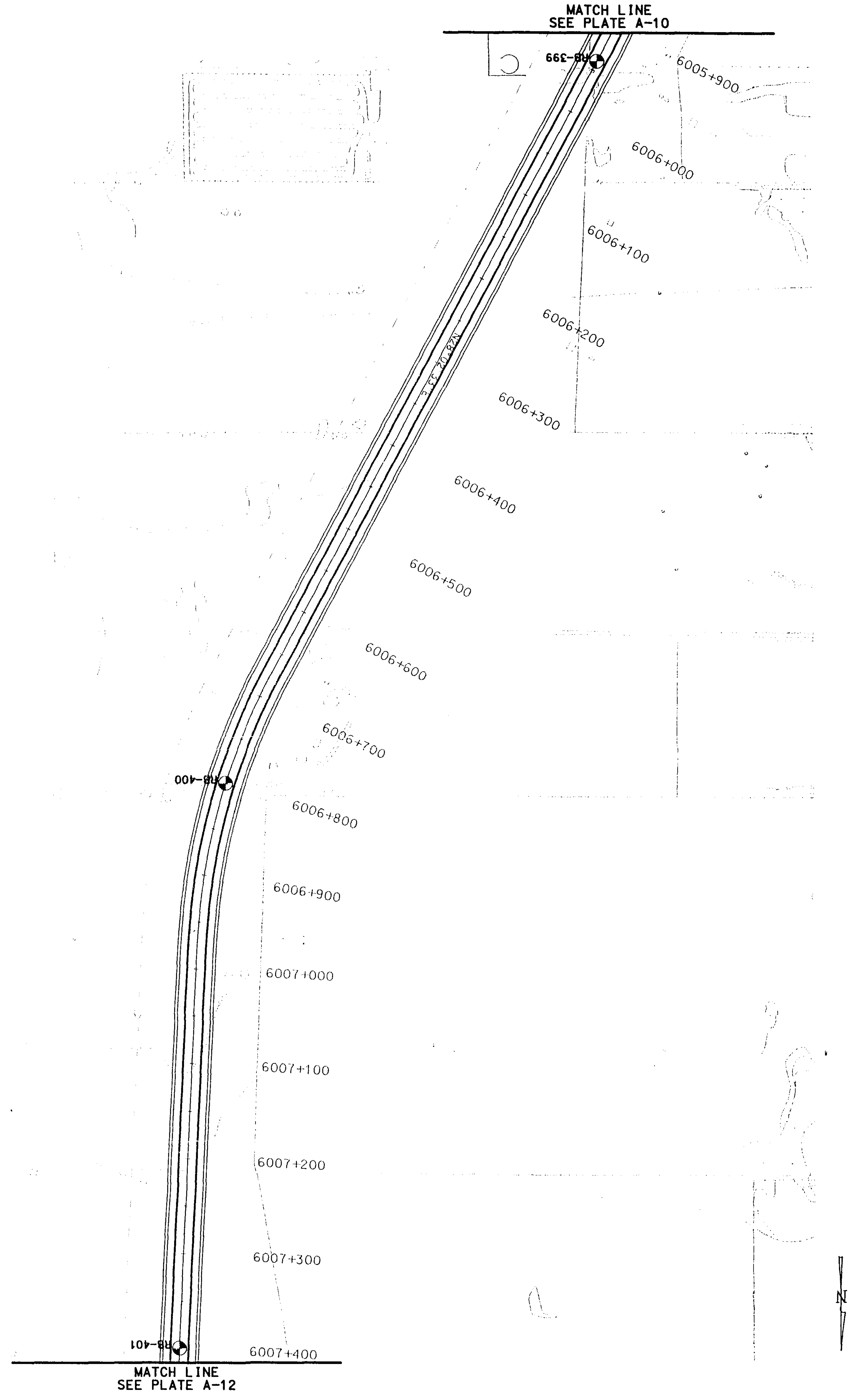
Project No. 35-8163-05

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

EXPLORATION LOCATION DRAWING

PLATE

A-10



LEGEND
- SC-31-356 CPT Location
- SB-31-355 Boring Location

KLEINFELDER

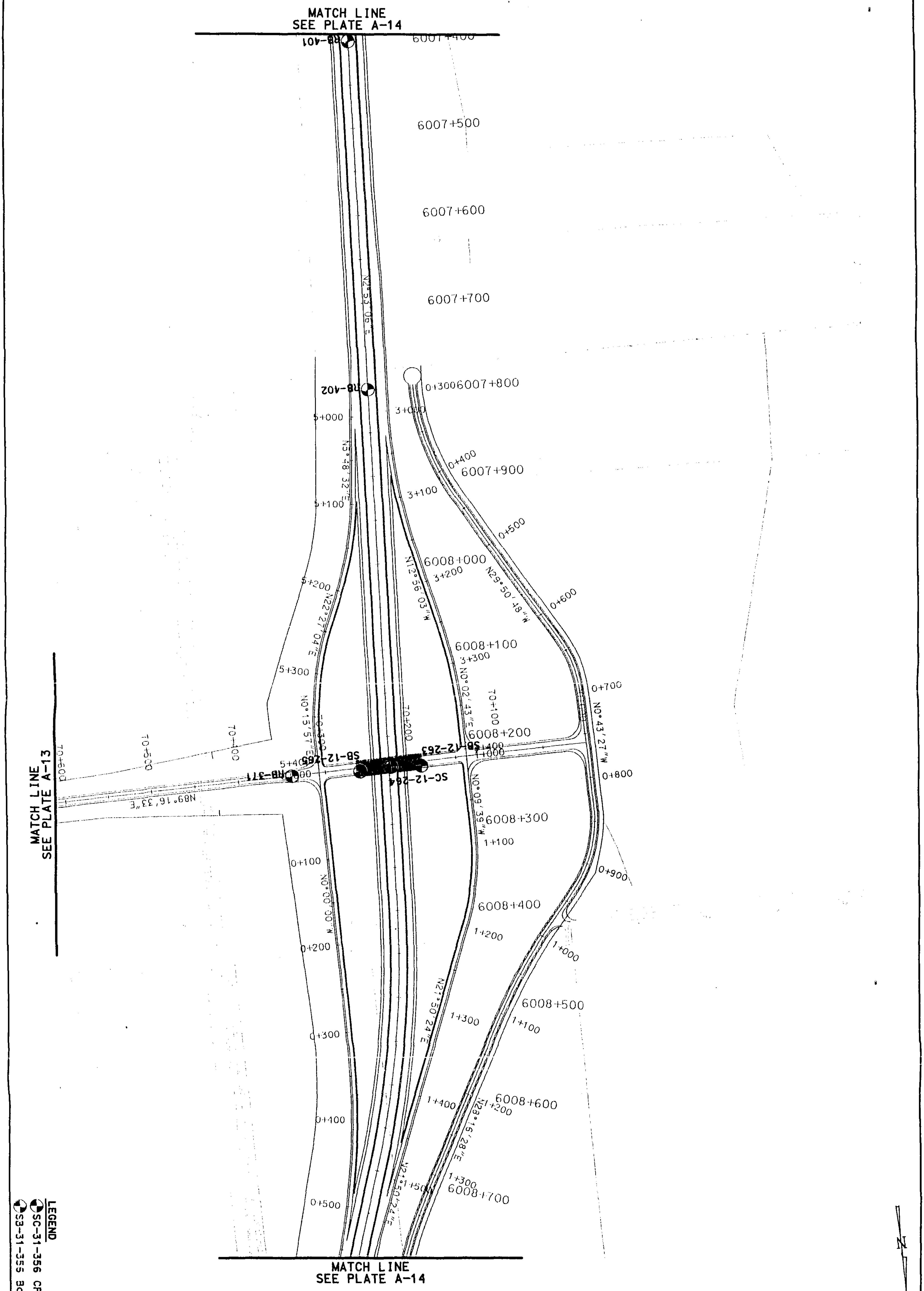
Project No. 35-8163-05

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

EXPLORATION LOCATION DRAWING

PLATE

A-11

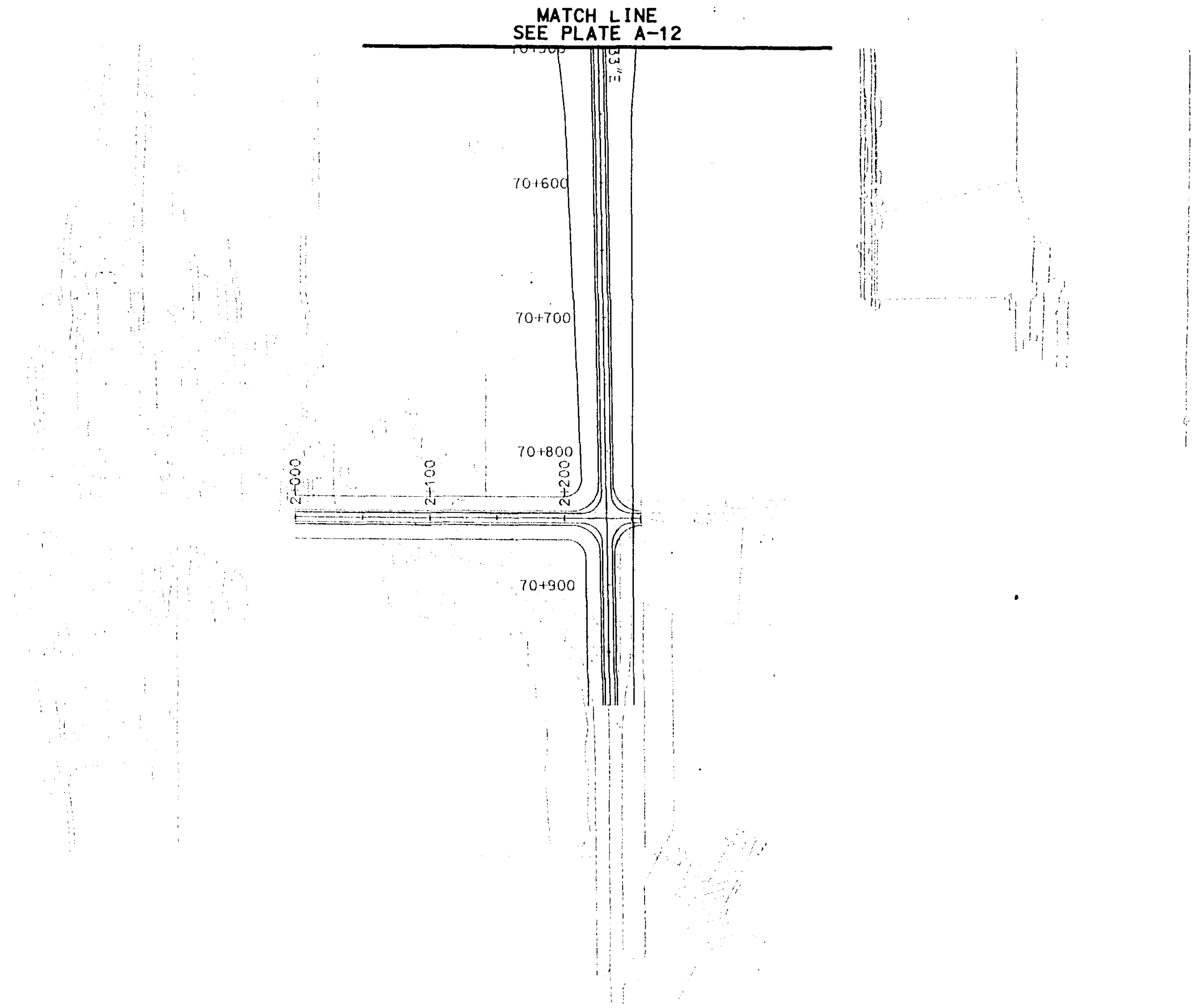


LEGEND
SC-31-356 CPT Location
SB-31-355 Boring Location

KLEINFELDER
Project No. 35-8163-05

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

PLATE
A-12



LEGEND

◐ SC-31-356 CPT Location

◐ SB-31-356 Boring Location

KLEINFELDER

Project No. 35-8163-05

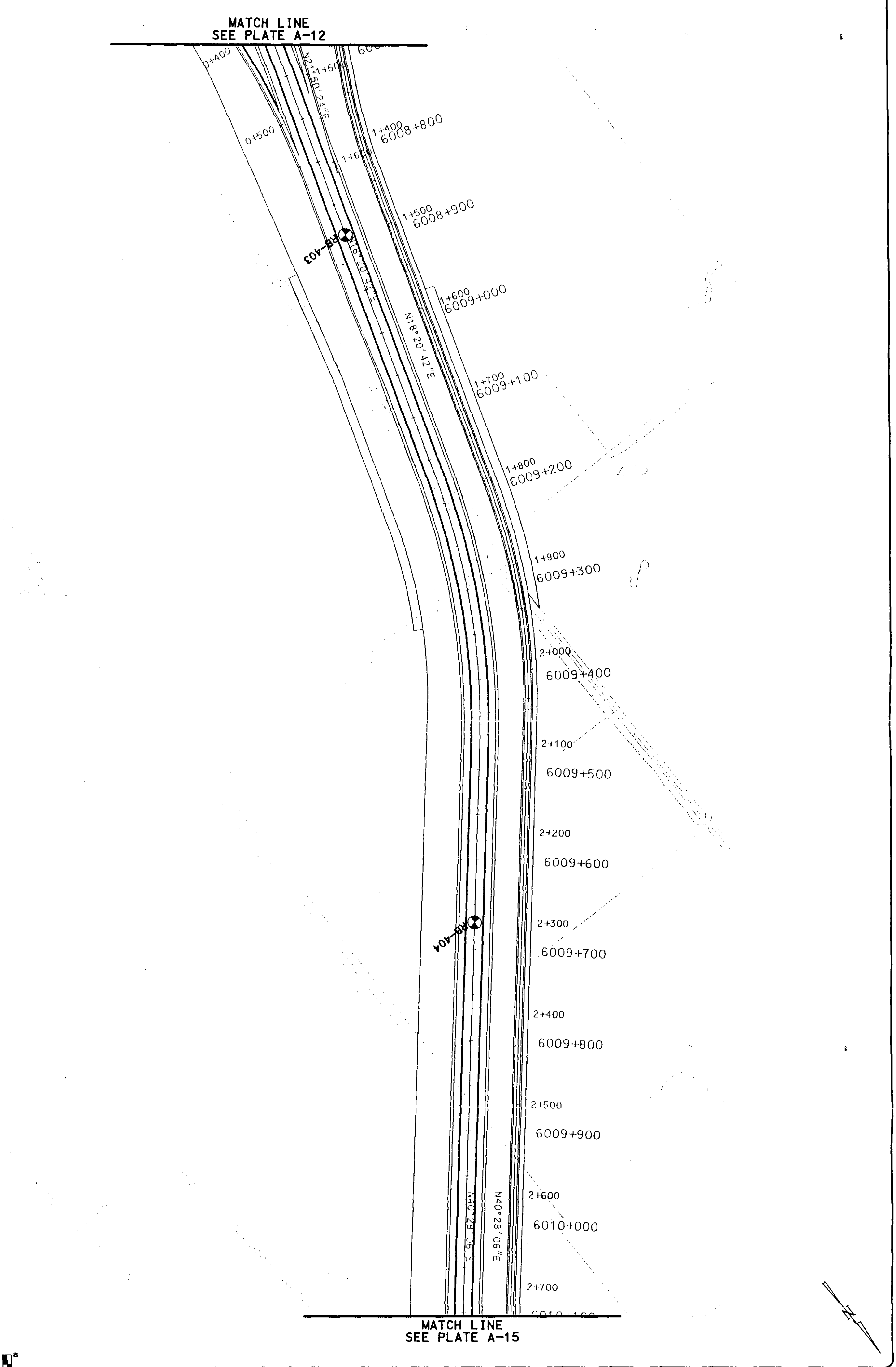
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

EXPLORATION LOCATION DRAWING

PLATE

A-13

MATCH LINE
SEE PLATE A-12



MATCH LINE
SEE PLATE A-15

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

KLEINFELDER

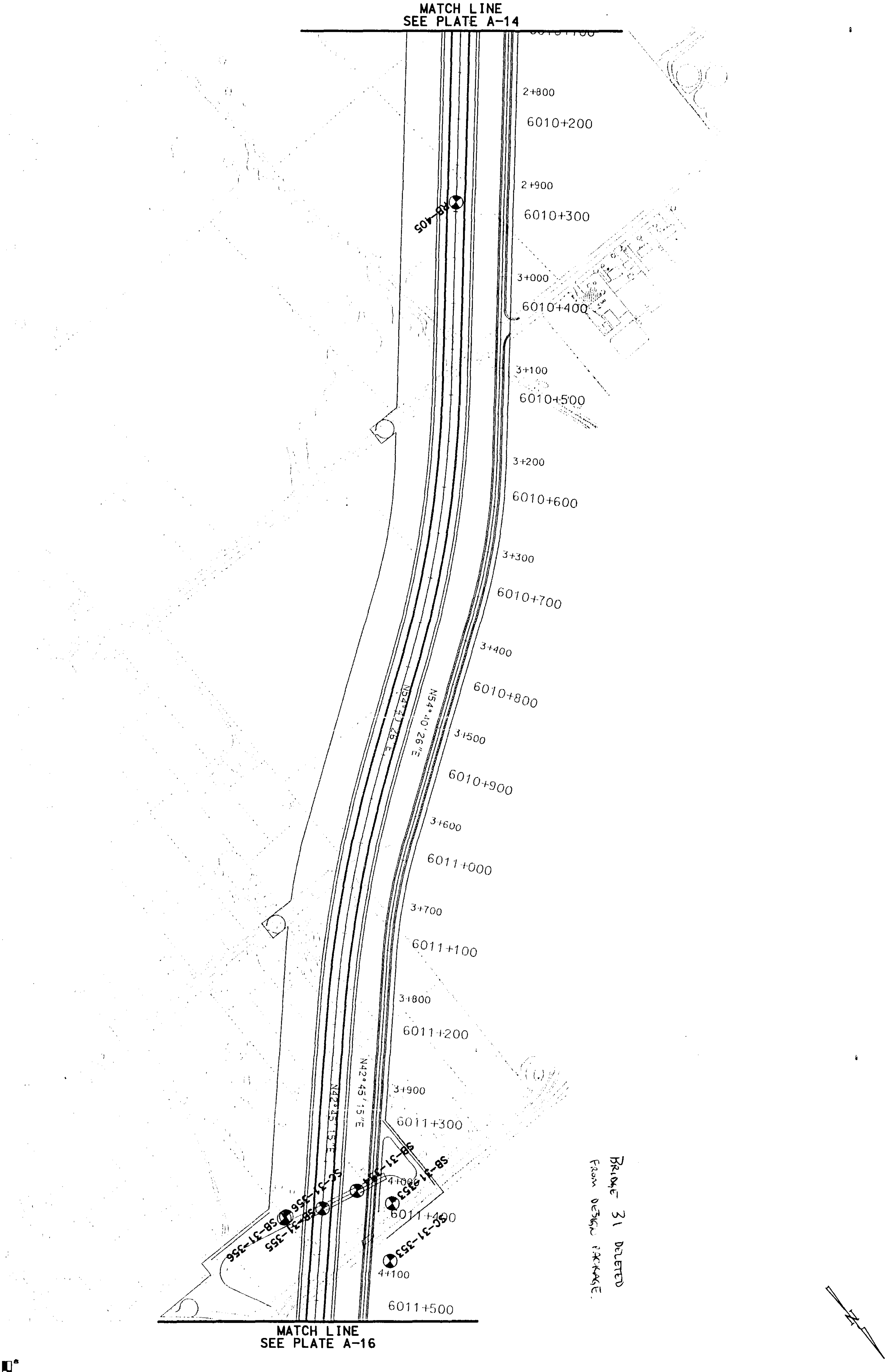
Project No. 35-8163-05

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

EXPLORATION LOCATION DRAWING

PLATE

A-14



Bridge 31 deleted from design package.

LEGEND

● SC-31-356 CPT Location

● SB-31-355 Boring Location

KLEINFELDER

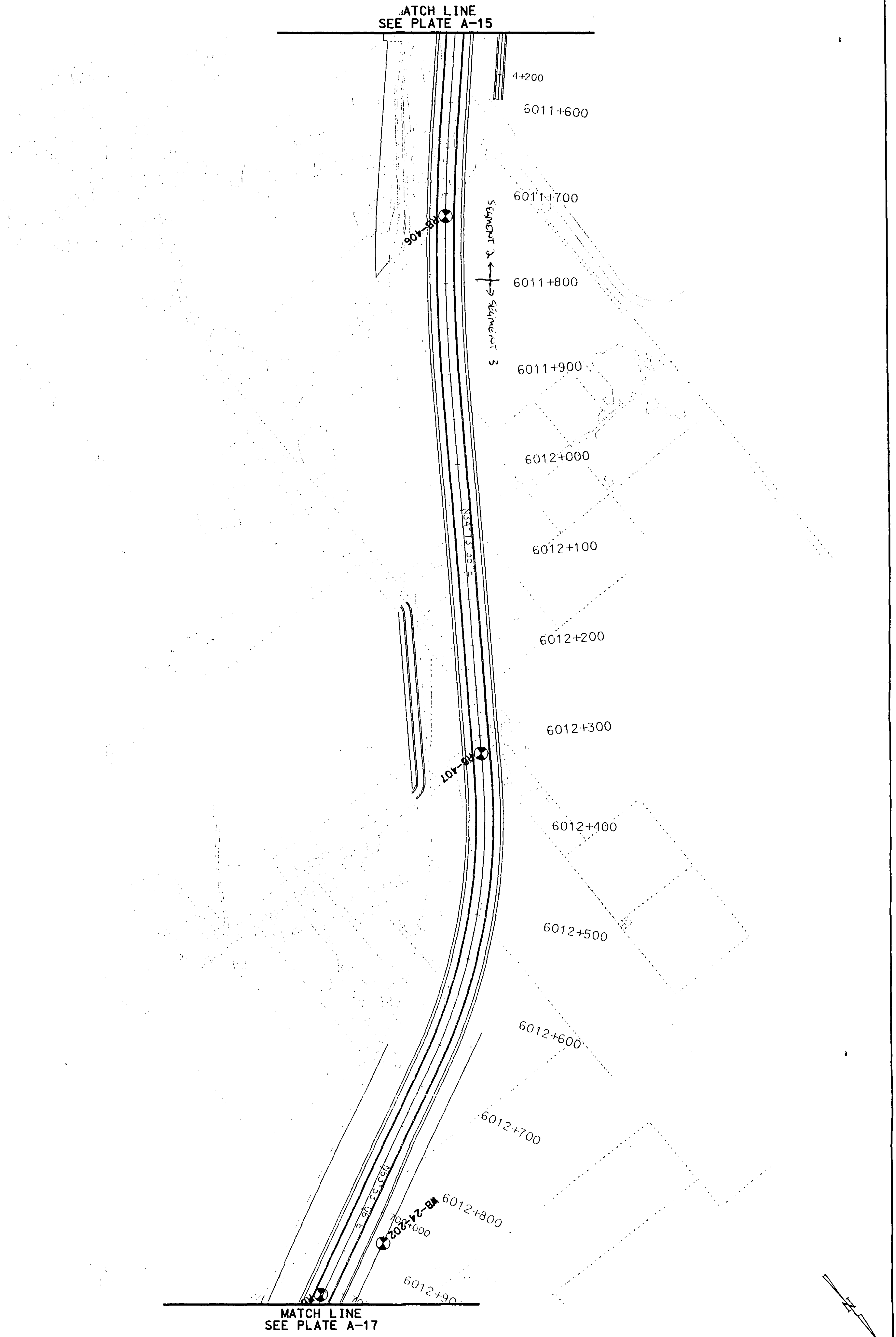
Project No. 35-8163-05

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

EXPLORATION LOCATION DRAWING

PLATE

A-15



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-16

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

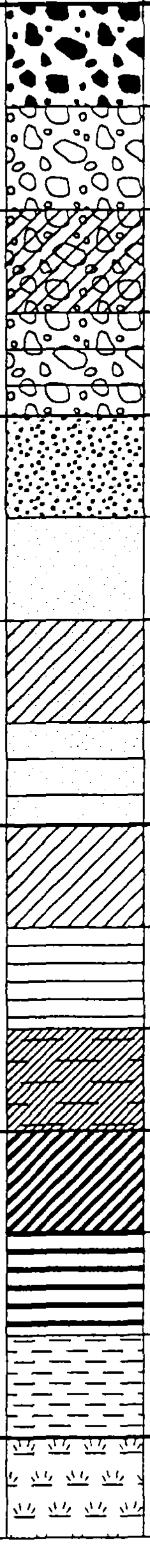
TRACE	<5%
FEW	5 to 10%
LITTLE	15 to 25%
SOME	30 to 45%
MOSTLY	50 to 100%

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

Corrcsion 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

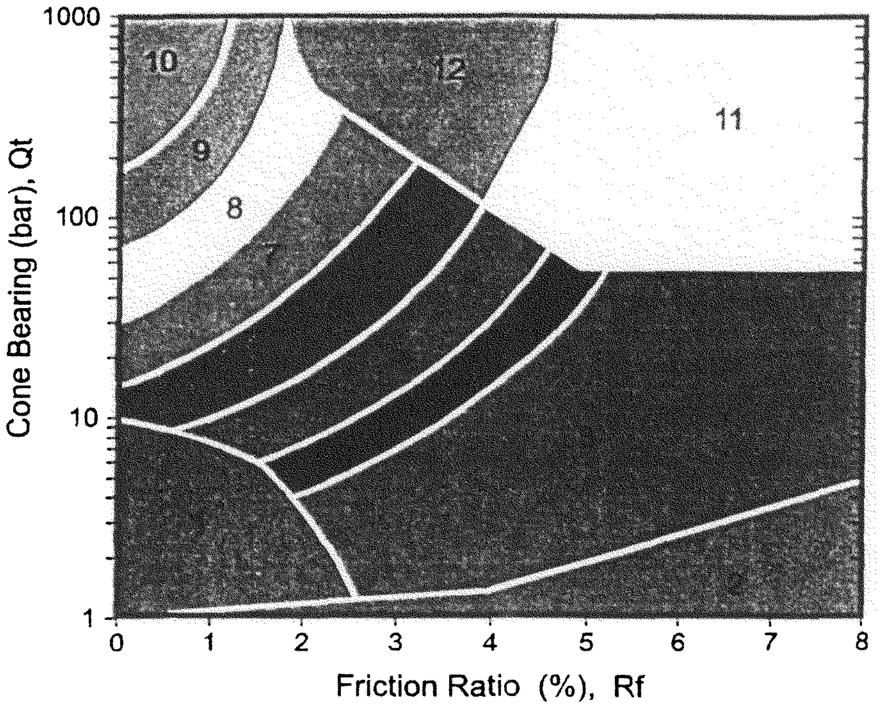
KLEINFELDER

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
C-68



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)

Legacy Parkway
Segment 2
Soil Exploration Information
(according to structure number)

POINT	LINE	STATION	OFFSET	NORTHING (m)	EASTING (m)	ELEVATION (m)
SB-12-263	500 SOUTH	70+189.825	4 65 LT	112,713 423	16,081 296	1,286 454
SC-12-264	500 SOUTH	70+224 505	2.59 LT	112,711 797	16,115 999	1,286 546
SB-12-265	500 SOUTH	70+260 053	3.46 LT	112,713 116	16,151 533	1,286 577
SB-31-353	PEDESTRIAN BR	99+835 873	14 26 RT	115,305 881	17,747 055	1,284 513
SC-31-353	PEDESTRIAN BR	100+036 369	83 64 LT	115,352 857	17,787 830	1,284 513
SB-31-354	PEDESTRIAN BR	100+033 967	0 00 LT	115,271 520	17,768 174	1,284 345
SB-31-355	PEDESTRIAN BR	100+075 967	0 00 LT	115,262 830	17,809 265	1,284 263
SB-31-356	PEDESTRIAN BR	100+118 329	8 80 RT	115,245 451	17,848 889	1,284 932
SC-31-356	PEDESTRIAN BR	100+115 395	9 43 RT	115,245 451	17,845 890	1,284 932
RB-371	500 SOUTH	70+338 171	0 29 RT	112,710 357	16,229 692	1,286 763
RB-395	D MAINLINE	6003+950.000	0.00 LT	108,545 276	15,635 838	1,286 199
RB-396	D MAINLINE	6004+534 815	93 86 RT	109,134 378	15,697 296	1,286 923
RB-397	D MAINLINE	6005+180 000	0 00 LT	109,773 404	15,567 997	1,286 833
RB-398	D MAINLINE	6005+650 000	0 00 LT	110,242.756	15,546.896	1,286 465
RB-399	D MAINLINE	6005+940 000	0 00 LT	110,517 894	15,630 526	1,286 404
RB-400	D MAINLINE	6006+800 000	0 00 LT	111,281 939	16,023 839	1,287 180
RB-401	D MAINLINE	6007+400 000	0 00 LT	111,878 170	16,076 232	1,287 011
RB-402	D MAINLINE	6007+800 000	0 00 LT	112,277 663	16,096 364	1,286 950
RB-403	D MAINLINE	6008+885 000	0 00 LT	113,346 442	16,240 119	1,285 277
RB-404	D MAINLINE	6009+670 000	0 00 LT	114,028 968	16,606 006	1,284 548
RB-405	D MAINLINE	6010+290 000	0 00 LT	114,500 642	17,008 403	1,284 282
RB-406	D MAINLINE	6011+725 000	0 00 LT	115,503 490	18,027 912	1,285 707

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
Structure 31, a pedestrian bridge, was deleted from the Preferred Alignment plans at some time following completion of the field explorations

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-12-263**

Sheet **1** of **4**

Logged by:	**S. Lewis**
Date Start:	**1/31/00**
Date Finish:	**2/4/00**
Station:	**70+189.825 4.65 LT**
Line:	**500 SOUTH**
Coordinates (m):	**N 112,713.423 E 16,081.296**
Elevation (m):	**1286.517**
Total Depth Drilled (m):	**61.6**
Drill Contractor:	**Layne Christensen**
Driller:	**C. Davis**
Rig Type:	**Mobile B-59**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Rope and Cat Head**
Rod Type:	**AW**
Boring Diameter:	**133 mm**

Boring: SB-12-263
Sheet 1 of 4

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	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
	Lean CLAY - stiff, moist, light gray, with light brown mottling, trace silt			SPT	254	CL	A-6	4 3 4 7	● 11							
			1													
1285	- wet	5	2	SH	610					*62*						pH WSS R
	- very soft, wet, light grayish-brown, with 6 mm seams of olive-gray silty sand	10	3	SPT	610			1 1 1 1	● 2							
			4													
	SILT - medium stiff, wet, dark olive-gray, with fine-grained sand, trace clay	15	5	SPT	508	ML	A-4	4 5 2 2	● 8							
	Lean CLAY - medium stiff, wet, dark gray, with trace of organics			SH	610	CL	A-6			37 *48*	13.1	38	41	22		C SG
		20	6	SPT	457			1 1 2 3	● 3							
1280			7													
	SILT - soft, wet, dark olive-gray, with mica flakes, trace clay	25	8	SH	610	ML	A-4			*48*						
	- stiff	30	9	SPT	559			2 6 7 7	● 13							
			10													
	Silty SAND - medium dense, wet, olive-gray, fine-grained	35	11	SH	610	SM	A-2-4									
1275			12													
	Sandy SILT - soft, wet, olive-gray, fine-grained sand	40	13	SPT	584	ML	A-4	3 2 2 3	● 4							
		45	14	SH	610											
	Silty SAND - medium dense, wet, light brownish-gray, fine-grained sand		15			SM	A-2-4									
	Lean CLAY - medium stiff, wet, dark gray, with fine-grained sand, with mica flakes	50	16	SPT	610	CL	A-6	2 3 4 6	● 5							
1270		55	17													
			18													
		60	19	SH	381					52 *57*	16.5	22	42	23	94	
		65														

Test Results *

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-12-263**

Sheet **2** of **4**

Logged by:	S. Lewis
Date Start:	1/31/00
Date Finish:	2/4/00
Station:	70+189.825 4.65 LT
Line:	500 SOUTH
Coordinates (m):	N 112,713.423 E 16,081.296
Elevation (m):	1286.517
Total Depth Drilled (m):	61.6
Drill Contractor:	Layne Christensen
Driller:	C. Davis
Rig Type:	Mobile B-59
Drilling Method:	Mud Rotary
Hammer Type:	Rope and Cat Head
Rod Type:	AW
Boring Diameter:	133 mm

Boring: SB-12-263
Sheet 2 of 4

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	SAMPLE Type	SAMPLE 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/m^3	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Lean CLAY - medium stiff, wet, dark gray, with fine-grained sand, with mica flakes (continued)		21														
1265	- olive-gray to light brown, mottled, 25 mm seam of light brown lean clay	70	22		SPT	483			3 5 6 8	8							
		75	23														
			24														
	- light gray	80	25		SH	610					*38*						
		85	26														
1260			27														
	- light olive-gray	90	28		SPT	508			4 4 8 10	8							
		95	29														
			30														
	Poorly Graded SAND with silt - medium dense, wet, gray, fine to coarse-grained, with layers of fine to medium-grained, with mica flakes, shell fragments	100	31		SPT	559	SP-SM	A-3	4 14 24 25	24							
1255	SILT - medium stiff, wet, gray, with light brown mottling, with trace organics	105	32		SPT	610	ML	A-4	2 5 7 10	7							
			33														
		110	34														
	Sandy SILT - wet, gray, fine-grained sand	115	35		SH	330	ML	A-4			*57*						
			36														
1250		120	37														
	SILT - medium stiff, wet, dark gray, with mica flakes, fine-grained	125	38		SPT	610	ML	A-4	3 6 7 6	7							
			39														
		130															

Test Results *

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
B BAG	= Bulk Sample

UTDOT Z003SB1.GPJ 5/30/00

Boring: SB-12-263
Sheet 3 of 4

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	SAMPLE 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	S_u, kPa (*torvane in italics*)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT - medium stiff, wet, dark gray, with mica flakes, fine-grained (continued)															
1245	- stiff, wet, dark olive-gray	135	41 42	SH	610					131 *67*	15.1	28			99	C SG
		140	43 44													
	Poorly Graded SAND with silt - medium dense, wet, light gray, fine to medium-grained sand, with gray silt at top	145	45	SPT	610	SP-SM	A-3	13 23 33 35	27							
1240	Lean CLAY - very stiff, wet, light olive-gray, with white mottling	150 155	46 47 48	SPT	610	CL	A-6	5 8 13 17	10							
1235	- chalky light gray	160 165	49 50 51	SH	457											
	Silty SAND - loose, wet, olive-gray, fine to medium-grained sand, with mica flakes, with silt layers	170	52	SPT		SM	A-2-4	4 5 7 10	5							
	SILT - very stiff, wet, olive-gray, with fine-grained sand, mica flakes, shell fragments	175 180	53 54 55 56	SPT	610	ML	A-4	8 18 23 35	16							
1230		185		SH	610											
	Silty SAND - wet, dark gray, fine-grained, with mica flakes		57			SM	A-2-4									
	Poorly Graded SAND with silt - medium dense, wet, brown-gray, fine to medium-grained	190	58	SPT	457	SP-SM	A-3	16 35 50	32							
	SILT - very stiff, wet, mottled grayish-brown and light olive-gray, with mica flakes	195	59	SPT	610	ML	A-4	10 18 23 26	16							

Test Results *

UTDOT Z0035811.GPJ 5/30/00

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

FIELD TEST BORING LOG

Boring: **SB-12-263**
Sheet **3** of **4**

Logged by:	S. Lewis
Date Start:	1/31/00
Date Finish:	2/4/00
Station:	70+189.825 4.65 LT
Line:	500 SOUTH
Coordinates (m):	N 112,713.423 E 16,081.296
Elevation (m):	1286.517
Total Depth Drilled (m):	61.6
Drill Contractor:	Layne Christensen
Driller:	C. Davis
Rig Type:	Mobile B-59
Drilling Method:	Mud Rotary
Hammer Type:	Rope and Cat Head
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

Elevation (m)	Boring: SB-12-263 Sheet 4 of 4 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 - very stiff, wet, mottled grayish-brown and light olive-gray, with mica flakes (continued) - medium stiff, gray, with fine-grained sand	200	61	▨	SPT	610			5 6 15 18	●8							
1225																	
			62														
		205															
			63														
		210	64														
			65														
		215															
			66														
1220																	
		220	67														
			68														
		225															
			69														
		230	70														
			71														
1215		235															
			72														
		240	73														
			74														
		245															
			75														
			76														
		250															
1210																	
			77														
		255															
			78														
			79														
		260															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-12-263**

Sheet **4** of **4**

Logged by:	**S. Lewis**
Date Start:	**1/31/00**
Date Finish:	**2/4/00**
Station:	**70+189.825 4.65 LT**
Line:	**500 SOUTH**
Coordinates (m):	**N 112,713.423 E 16,081.296**
Elevation (m):	**1286.517**
Total Depth Drilled (m):	**61.6**
Drill Contractor:	**Layne Christensen**
Driller:	**C. Davis**
Rig Type:	**Mobile B-59**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Rope and Cat Head**
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

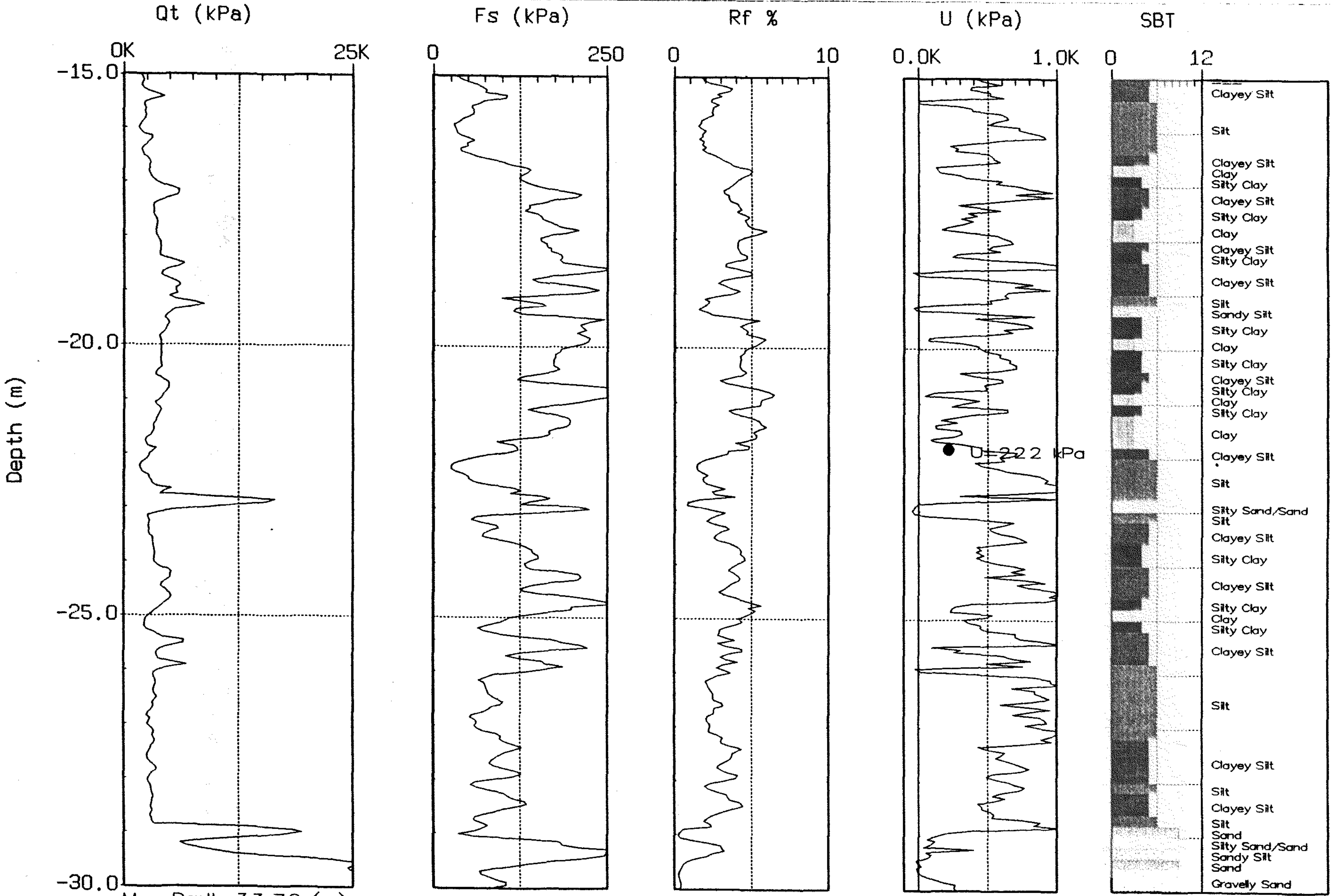
UTDOT Z003SB1.GPJ 5/30/00

CONETEC

Legacy Parkway

Site: SC-12-264
Station: 70+224.505 2.59 LT
Elevation: 1286.546

Cone: 20 TON A 058
Date: 01:26:00 09:47



Max. Depth: 33.70 (m)

Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

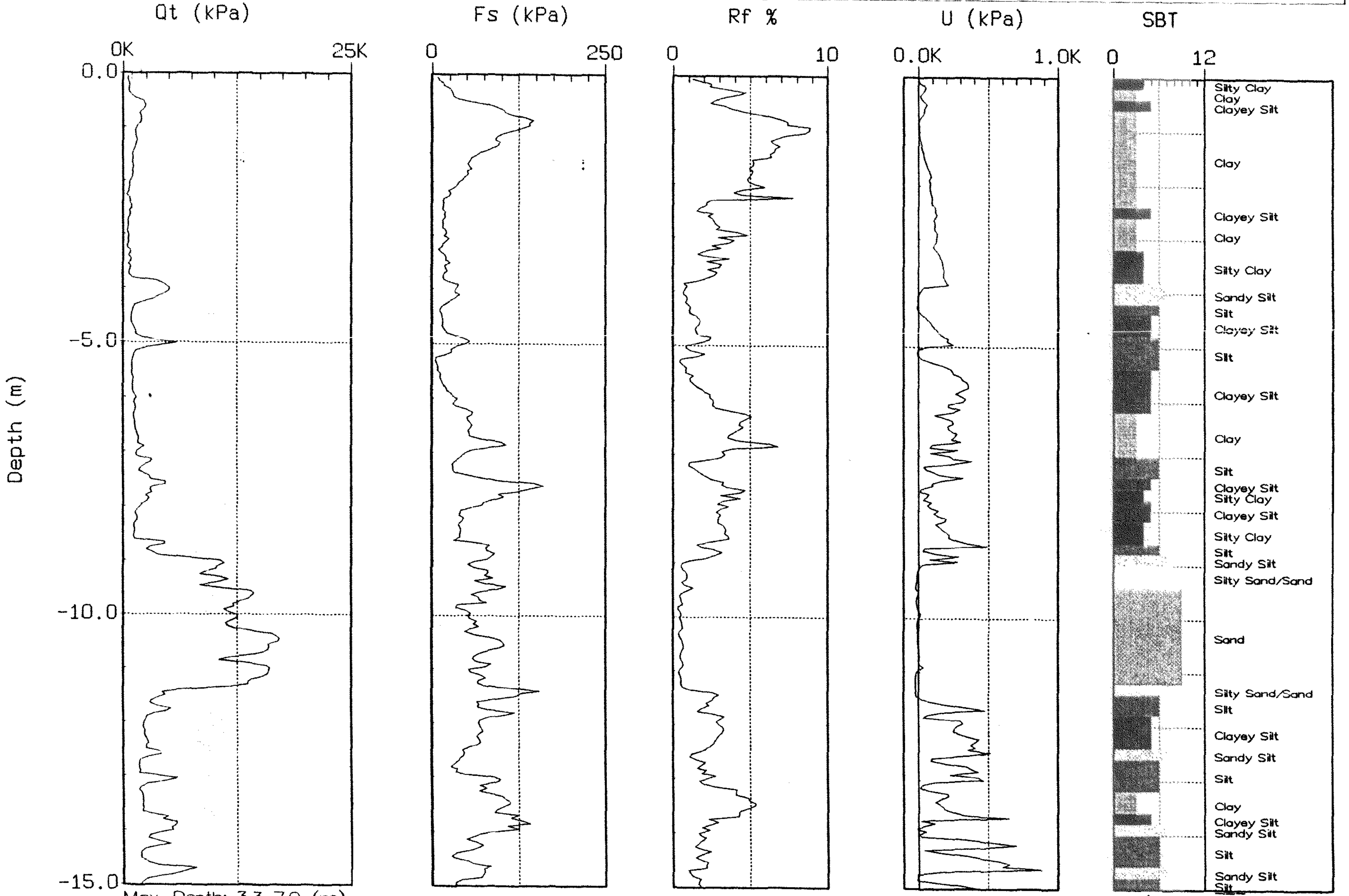
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-113

Legacy Parkway

Site: SC-12-264
Station: 70+224.505 2.59 LT
Elevation: 1286.546

Cone: 20 TON A 058
Date: 01:26:00 09:47



Max. Depth: 33.70 (m)

Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

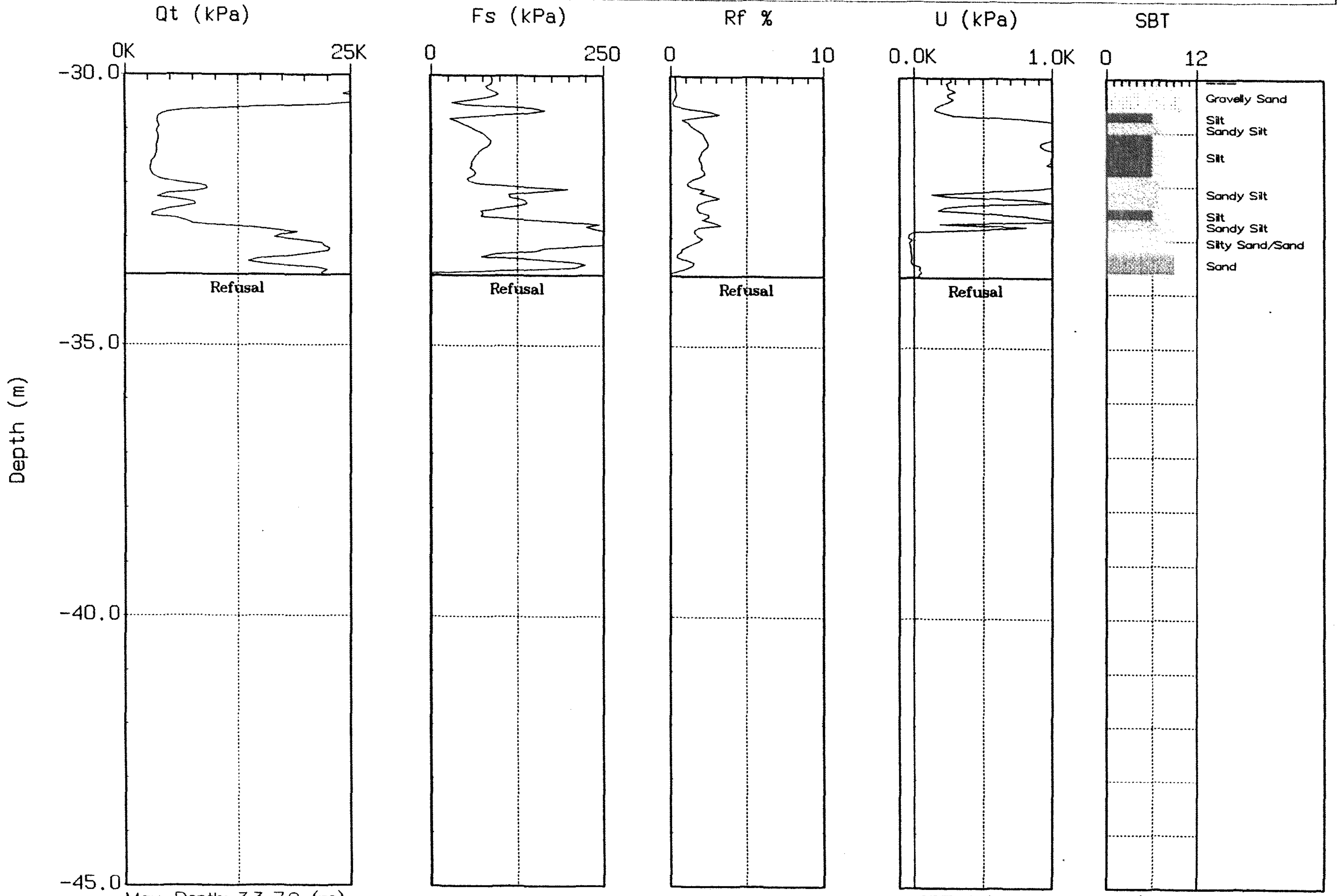
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-112

Legacy Parkway

Site: SC-12-264
Station: 70+224.505 2.59 LT
Elevation: 1286.546

Cone: 20 TON A 058
Date: 01:26:00 09:47



Max. Depth: 33.70 (m)

Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-114

Boring: SB-12-265
Sheet 1 of 4

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 - stiff, moist, dark brown, with organics				SPT	457	ML	A-4	2 3 3 5	● 10							
			1														
1285	Lean CLAY - stiff, wet, light gray to light brown, mottled, occasional fine-grained sand	5	2		SH	610	CL	A-6			*67*						pH WSS R
	- soft, with trace organics	10	3		SPT	584			1 2 2 2	● 4							
			4														
	- stiff	15	5		SH	610					83 *4*	15.7	27	39	17	97	C SG
	SILT - medium stiff, wet, olive-gray	20	6		SPT	559	ML	A-4	1 3 3 4	● 8							
1280			7														
	- with sand	25	8		SH	610											
	- light brown to olive-gray	30	9		SPT	584			2 3 3 6	● 6							
			10														
		35	11		SH	483											
1275			12														
		40			SPT	610			2 3 2 4	● 5							
			13														
	- grayish-brown	45	14		SH	610					*62*						
			15														
	- soft, 10 mm seam of fine sand	50			SPT	610			2 2 3 4	● 4							
			16														
1270		55	17														
	Lean CLAY - wet, light grayish-brown		18				CL	A-6									
		60			SH	508											
	SILT - wet, olive-gray, with occasional fine-grained sand and trace of clay		19				ML	A-4									
		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-12-265**
Sheet 1 of 4

Logged by:	**W. Lewis**
Date Start:	**1/22/00**
Date Finish:	**1/26/00**
Station:	**70+260.053 3.46 LT**
Line:	**500 SOUTH**
Coordinates (m):	**N 112,713.116 E 16,151.533**
Elevation (m):	**1286.640**
Total Depth Drilled (m):	**77.1**
Drill Contractor:	**Layne Christensen**
Driller:	**C. Davis**
Rig Type:	**Mobile B-59**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Rope and Cathead**
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: SB-12-265
Sheet 2 of 4

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	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
	Lean CLAY - soft, wet, light brown with trace organics and light gray mottling		21			CL	A-6									
1265		70	22	SPT	610			4 3 3 3	●4							
		75	23													
		80	24 25	SH	533					57						
		85	26													
1260			27													
	- stiff	90	28	SPT	610			4 6 9 11	●10							
		95	29 30													
	Silty CLAY - stiff, wet, gray, trace of organics	100	31	SH	610	CL-ML	A-7-6			136 *43*	16.1	26	43	17	99	C SG
1255		105	32 33													
	SILT - medium stiff, wet, light olive-gray with white chalky mottling	110	34	SPT	610	ML	A-4	3 4 5 7	●5							
		115	35													
	Poorly Graded SAND - medium dense, wet, gray		36			SP	A-3									
1250		120	37	SH	508											
	Lean CLAY - stiff, wet, mottled light brown to light gray	125	38	SPT	610	CL	A-6	3 4 16 16	●10							
	Poorly Graded SAND - medium dense, wet, dark gray					SP	A-3									
			39													
		130		SPT					●15							

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-12-265**

Sheet **2** of **4**

Logged by:	**W. Lewis**
Date Start:	**1/22/00**
Date Finish:	**1/26/00**
Station:	**70+260.053 3.46 LT**
Line:	**500 SOUTH**
Coordinates (m):	**N 112,713.116 E 16,151.533**
Elevation (m):	**1286.640**
Total Depth Drilled (m):	**77.1**
Drill Contractor:	**Layne Christensen**
Driller:	**C. Davis**
Rig Type:	**Mobile B-59**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Rope and Cathead**
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 P = Piston Sampler, 76.2 mm OD

▯ SH = Shelby Tube, 76.2mm OD, pushed

B BAG = Bulk Sample

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

FIELD TEST BORING LOG

Boring: **SB-12-265**
Sheet **3** of **4**

Logged by:	**W. Lewis**
Date Start:	**1/22/00**
Date Finish:	**1/26/00**
Station:	**70+260.053 3.46 LT**
Line:	**500 SOUTH**
Coordinates (m):	**N 112,713.116 E 16,151.533**
Elevation (m):	**1286.640**
Total Depth Drilled (m):	**77.1**
Drill Contractor:	**Layne Christensen**
Driller:	**C. Davis**
Rig Type:	**Mobile B-59**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Rope and Cathead**
Rod Type:	**AW**
Boring Diameter:	**133 mm**

Boring: SB-12-265
Sheet 3 of 4

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	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/m^3	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT with sand - very stiff, wet, dark gray-brown				610	ML	A-4	8 12 18 25								
		135	41													
1245	Lean CLAY - wet, gray		42			CL	A-6									
		140	43	SH	356											
	Silty SAND - medium dense, wet, light gray, occasional poorly graded sand layers					SM	A-2-4									
	- 25 mm clay layer	145	44	SPT	533			11 34 25 26	28							
	SILT - stiff, wet, olive-gray, with minor chalky white mottling	150	46	SPT	508	ML	A-7-6	4 8 13 26	10							
1240		155	47													
	- gray	160	49	SH	381					110 *62*	15.1	27	44	17	100	C SG
		165	50													
1235	- medium stiff, with occasional silty sand layers	170	52	SPT	610			4 5 15 14	8							
		175	53													
		180	55	SH	508											
1230		185	57													
	Lean CLAY - stiff, wet, light brown, 0.3 m poorly graded sand layer	190	58	SPT	584	CL	A-6	8 17 16 15	12							
		195	59													

Test Results *

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 P	=	Piston Sampler, 76.2 mm OD
▯ SH	=	Shelby Tube, 76.2mm OD, pushed
B BAG	=	Bulk Sample

Boring: SB-12-265
Sheet 4 of 4

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

FIELD TEST BORING LOG

Boring: **SB-12-265**
Sheet **4** of **4**

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Type	Recovery (mm)	USCS	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/m^3	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1225	Lean CLAY - stiff, wet, light brown (continued)	200	61	SH	457											
	Silty SAND - dense, wet, light grayish-brown	210	64	SPT	610	SM	A-2-4	15 27 12 16	●13							
	Lean CLAY - stiff, wet, dark gray, with fine-grained sand seams					CL	A-6									
1220		220	67	SH	356											
	- medium stiff, light grayish-brown with occasional olive-gray coloring	230	70	SPT	610			6 10 14 20	●8							
1215		240	73	SH	381					99 *120*	16.4	26	39	16	96	C SG
1210	- very stiff, light olive gray	250	76	SPT	432			11 22 50/ 125mm	○							

Depth (ft): 200, 205, 210, 215, 220, 225, 230, 235, 240, 245, 250, 255, 260
Depth (m): 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79
Elevation (m): 1225, 1220, 1215, 1210

Logged by:	**W. Lewis**
Date Start:	**1/22/00**
Date Finish:	**1/26/00**
Station:	**70+260.053 3.46 LT**
Line:	**500 SOUTH**
Coordinates (m):	**N 112,713.116 E 16,151.533**
Elevation (m):	**1286.640**
Total Depth Drilled (m):	**77.1**
Drill Contractor:	**Layne Christensen**
Driller:	**C. Davis**
Rig Type:	**Mobile B-59**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Rope and Cathead**
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: SB-31-353
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	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
	FILL: Silty SAND with gravel - medium dense, moist, red-brown		1													
	Lean CLAY - hard, moist, light gray, with organics and staining	5		SPT	610	CL	A-6	12 14 20 23	○							pH WSS R
∇			2													
		10	3	SH	0											
1280		15	4	SPT	0			43 43 43 32	○							
		20	6	SPT	356			1 2 2 1	● 6							
	Silty SAND - wet, gray	25	7	SH	508	SM	A-2-5			*14*						SV
1275	Sandy SILT - soft, wet, gray	30	9	SPT	610	ML	A-4	1 2 2 2	● 4							
	- stiff	35		SPT	610			3 4 5 6	● 11							
	Silty SAND - wet, gray	40	12	SH	508	SM	A-2-5			45 *72*	17.2	21			62	C SG
	Sandy SILT - hard, wet, gray	45	13	SPT	610	ML	A-4	7 11 22 28	● 33							SV
	Poorly Graded SAND - dense, wet, gray		14			SP	A-3									
1270	SILT - very stiff, wet, gray	50	15	SPT	457	ML	A-4	8 10 15 19	● 23							
		55	16 17													
		60	18	SPT				9 8 12 13	● 17							
1265		65	19													

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-31-353**

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

Logged by:	**N. Miller**
Date Start:	**4/3/00**
Date Finish:	**4/8/00**
Station:	**99+835.873 14.26 RT**
Line:	**PEDESTRIAN BR.**
Coordinates (m):	**N 115,305.881 E 17,747.055**
Elevation (m):	**1284.576**
Total Depth Drilled (m):	**52.4**
Drill Contractor:	**RC Exploration**
Driller:	**R. Ibarra**
Rig Type:	**Longyear BK-66**
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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-31-353**

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

Boring: SB-31-353
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Type	Recovery (mm)	USCS	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
	SILT - very stiff, wet, gray (continued)													
	- stiff, with frequent seams of medium-grained sand	SPT	457			5 6 8 11	11							
	Silty CLAY - very stiff, wet, gray			CL-ML	A-6									
1260	SILT - medium stiff, wet, dark gray	SH	660	ML	A-4			*27*						
	- very stiff, gray mottled white, trace nautilus shell and shell fragments	SPT	508			10 16 22 12	26						53	
	- medium stiff, bluish-green to gray	SH	610					103 *67*	12.8	38				C TR SG
	Lean CLAY - stiff, wet, dark brown, trace woody materials			CL	A-6									
	- medium stiff, gray	SPT	610			4 4 8 12	8							
	- hard, mottled white, occasional seams of fine-grained sands	MC	559			16 34 47 52	50				39	21		
		SPT					15							

Test Results *

Logged by:	N. Miller
Date Start:	4/3/00
Date Finish:	4/8/00
Station:	99+835.873 14.26 RT
Line:	PEDESTRIAN BR.
Coordinates (m):	N 115,305.881 E 17,747.055
Elevation (m):	1284.576
Total Depth Drilled (m):	52.4
Drill Contractor:	RC Exploration
Driller:	R. Ibarra
Rig Type:	Longyear BK-66
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

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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: SB-31-353
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	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
	- stiff, gray with trace shell fragment - light brown to brown, mottled tan	135	41 42		610			6 10 15 18								
	SILT - very stiff, wet, gray	140	43	MC	610	ML	A-4	16 26 26 24	● 24				23	4		
1240	Silty CLAY - very stiff, wet, gray	145	44 45			CL-ML	A-6									
	- occasional seams of medium-grained silty sands	150	46	SPT	457			7 15 18 24	● 18							
	Silty CLAY - very stiff, wet, gray, intermixed with trace to some fine-grained sand	155	47 48			CL-ML	A-6									
1235	- hard, occasional 6 to 20 mm, brownish-gray clay layers and some dark green fine-grained sand seams	160	49 50	MC	457			24 32 48 47	● 35							
	Silty SAND - wet, olive-gray, with fine-grained gravel, sand is fine to coarse-grained, gravel is subrounded and fine-grained (10% gravel)	165 170	51 52	SPT	254	SM	A-2-5	49 70/100mm	○							
1230		175 180	53 54 55													
1225		185 190 195	56 57 58 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-31-353**

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

Logged by:	**N. Miller**
Date Start:	**4/3/00**
Date Finish:	**4/8/00**
Station:	**99+835.873 14.26 RT**
Line:	**PEDESTRIAN BR.**
Coordinates (m):	**N 115,305.881 E 17,747.055**
Elevation (m):	**1284.576**
Total Depth Drilled (m):	**52.4**
Drill Contractor:	**RC Exploration**
Driller:	**R. Ibarra**
Rig Type:	**Longyear BK-66**
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

$\underline{\nabla}$ = 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

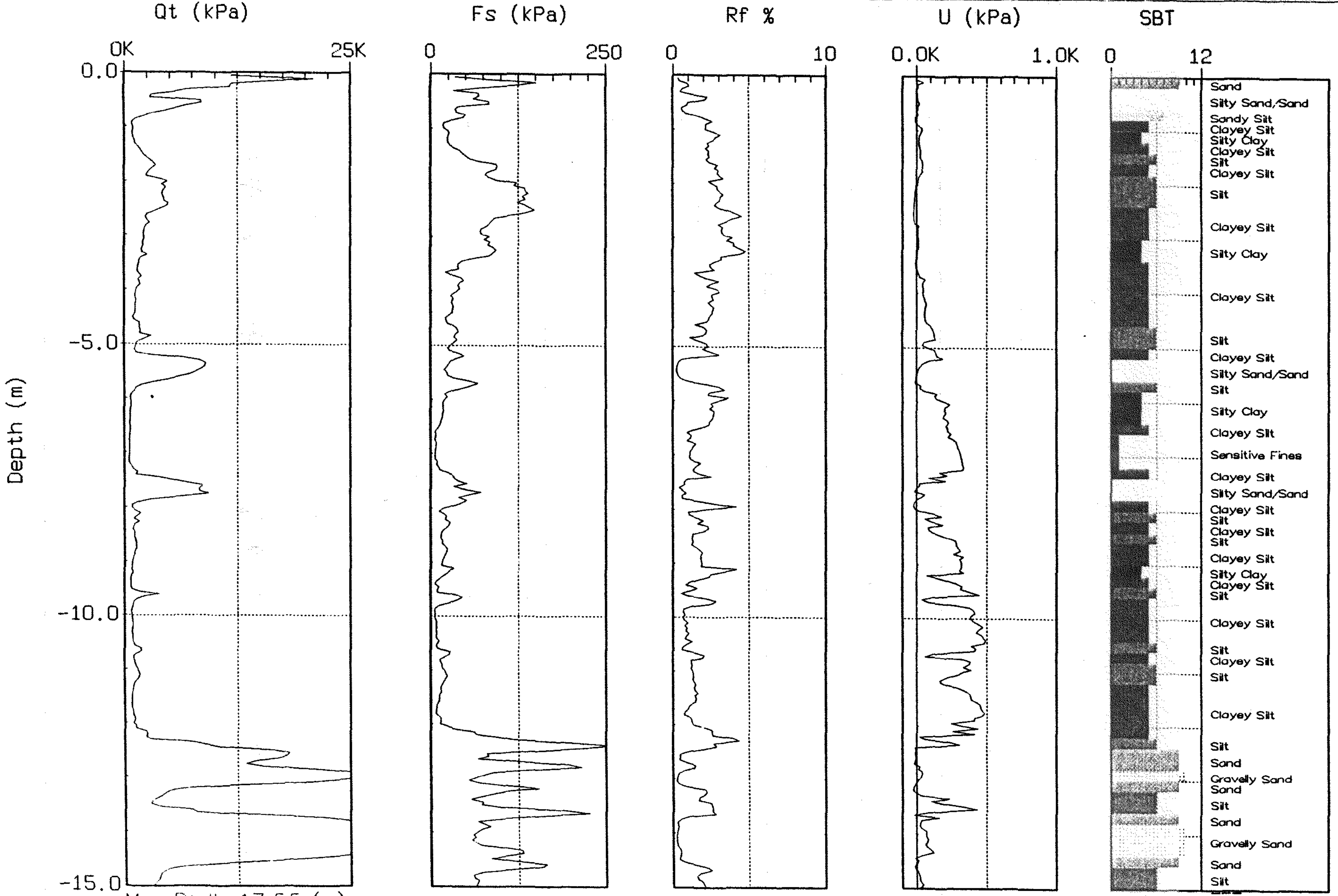
▯ SH = Shelby Tube, 76.2mm OD, pushed

▯ BAG = Bulk Sample

Legacy Parkway

Site: SC–31–353
Station: 100+036.369 83.64 LT
Elevation: 1284.513

Cone: 20 TON A 070
Date: 05:03:00 08:09



Max. Depth: 47.55 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

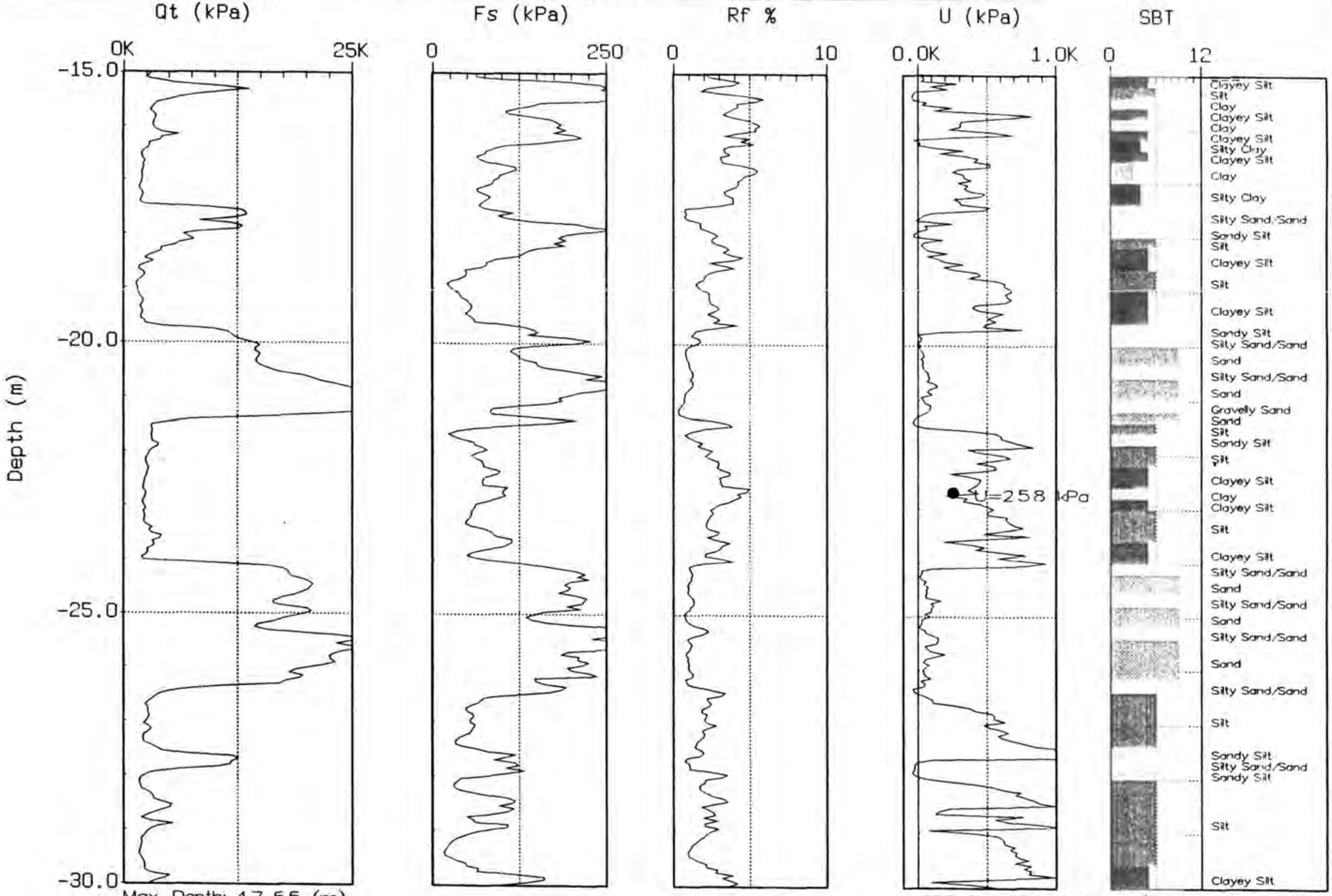
PLATE B-296

CONETEC

Legacy Parkway

Site: SC-31-353
Station: 100+036.369 83.64 LT
Elevation: 1284.513

Cone: 20 TON A 070
Date: 05:03:00 08:09



Max. Depth: 47.55 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

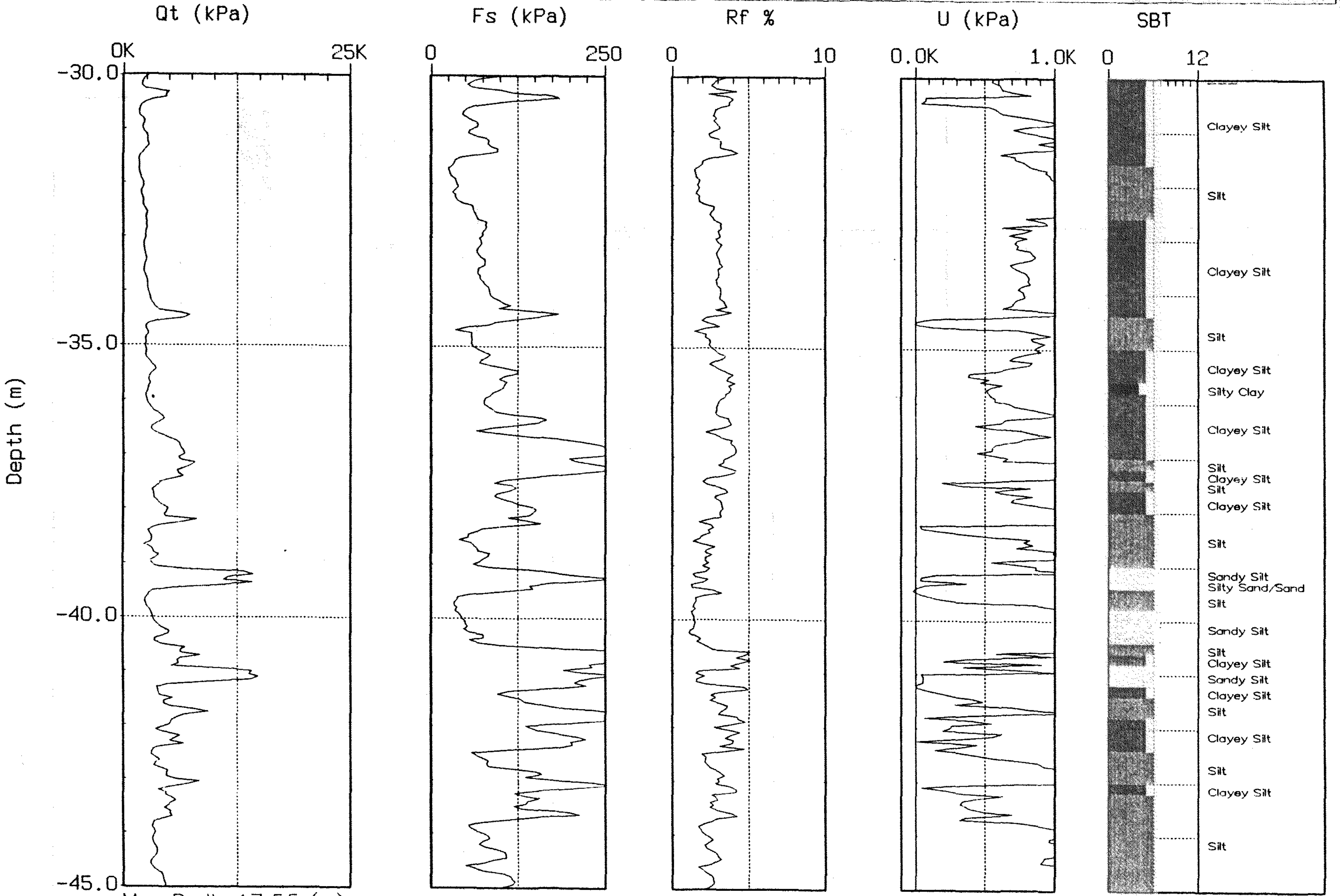
PLATE B-297

CONETEC

Legacy Parkway

Site: SC-31-353
Station: 100+036.369 83.64 LT
Elevation: 1284.513

Cone: 20 TON A 070
Date: 05:03:00 08:09



Max. Depth: 47.55 (m)

Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

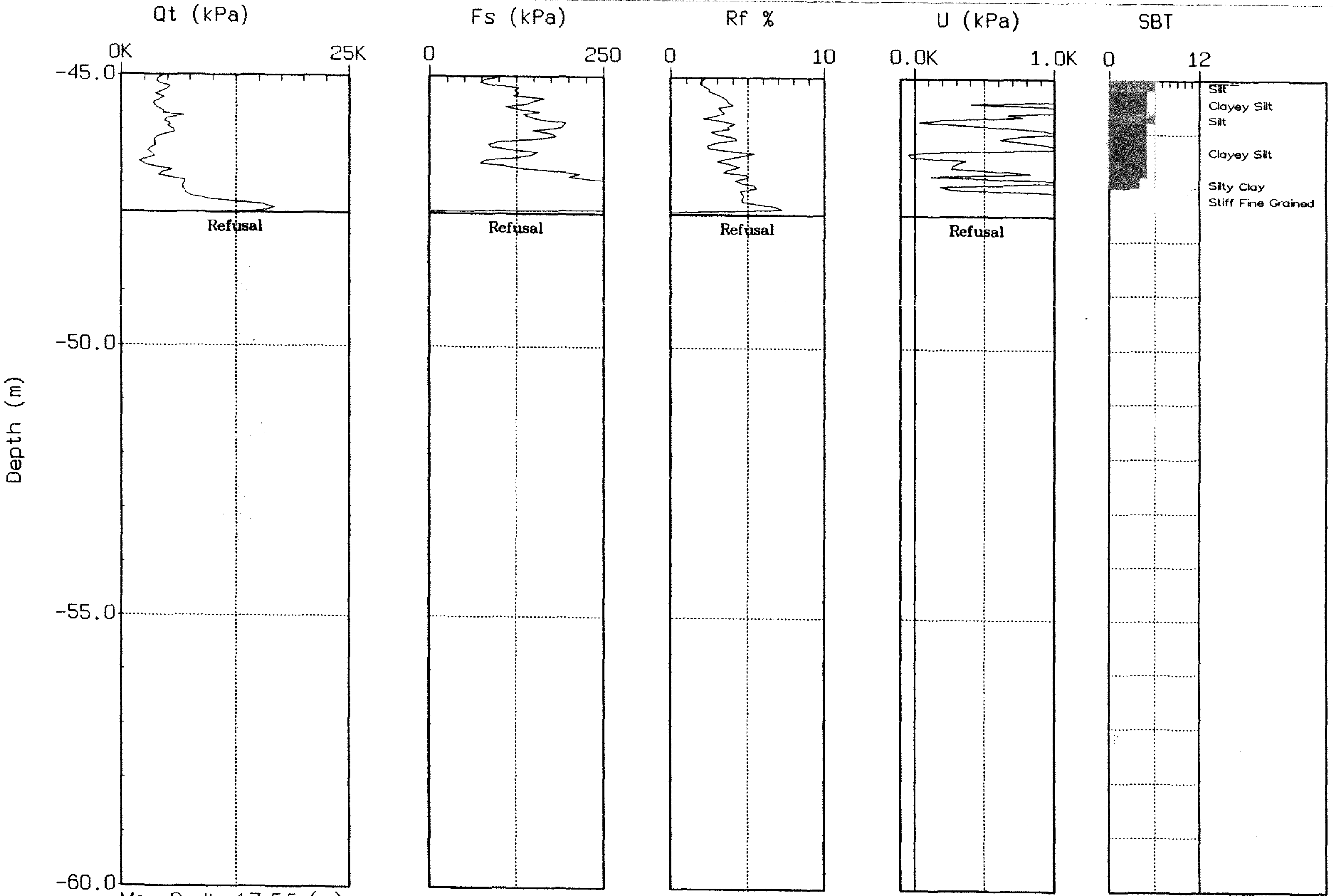
PLATE B-298

CONETEC KA

Legacy Parkway

Site: SC-31-353
Station: 100+036.369 83.64 LT
Elevation: 1284.513

Cone: 20 TON A 070
Date: 05:03:00 08:09



Max. Depth: 47.55 (m)

Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-299

Boring: SB-31-354
Sheet 1 of 4

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
	Lean CLAY - very stiff, moist to wet, dark brown mottled tan-colored - becomes light brown mottled tan, trace medium-grained sands, with thin (grass-roots) extending down to 0.6 meters		1		SPT	610	CL	A-6	2 5 8 6	21							pH WSS R
		5	2		P	610					*19*						
	- stiff, soft mottled rust and gray, frequent seams of silt	10	3 4		SPT	508			0 3 5 4	9							
1280	SILT - wet, gray	15	5		P	610	ML	A-7-6			53 *77*	14.0	35	47	26		C SG DS
	Lean CLAY - medium stiff, wet, gray, with frequent seams of silt	20	6 7		SPT	610	CL	A-6	0 2 3 4	5							
		25	8		P	610					*62*						
		30	9		SPT	610			0 0 0 4	0							
1275	- very soft, frequent seams to 50 mm layers of micaceous fine-grained sand		10														
		35	11		P	610					*57*						
	- medium stiff, with fine-grained sand	40	12 13		SPT	76			6 4 6 11	8							
		45	14		P	508					52 *38*	17.1	22	31	13	79	C TR SG
1270																	
	SILT - stiff, wet, gray, frequent seams of fine-grained sand, micaceous	50 55	15 16 17		SPT	610	ML	A-4	5 7 11 15	15							
	Silty CLAY - stiff, wet, gray	60	18 19		P	610	CL-ML	A-6			*86*						
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: **SB-31-354**
Sheet **1** of **4**

Logged by:	**M. Bostrom**
Date Start:	**4/21/00**
Date Finish:	**4/25/00**
Station:	**100+033.967 0.00 LT**
Line:	**PEDESTRIAN BR.**
Coordinates (m):	**N 115,271.520 E 17,768.174**
Elevation (m):	**1284.408**
Total Depth Drilled (m):	**61.3**
Drill Contractor:	**Layne Christensen**
Driller:	**J. Hulse**
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

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

FIELD TEST BORING LOG

Boring: **SB-31-354**
Sheet **2** of **4**

Boring: SB-31-354
Sheet 2 of 4

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	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
	Silty CLAY - stiff, wet, gray (continued)															
	Silty SAND with silt - medium dense, wet, gray, with trace coarse-grained sand, with medium-grained sand	70	21	SPT	610	SM	A-2-5	5 7 19 25	●18							SV
	- fine-grained sand	75	22 23													
1260	SILT - wet, gray, occasional clay layers 0.3 m thick	80	24 25	P	610	ML	A-4			*134*						
		85	26 27													
	- stiff	90	28	SPT	559			6 9 10 18	●12							
1255		95	29 30													
	Lean CLAY - wet, gray, with trace shell remnants	100	31	P	610	CL	A-6			*134*						
		105	32 33													
	- olive-gray, mottled tan-colored	110		SPT	559			4 6 16 14	●12				26	9		
	SILT - stiff, wet, olive-gray, occasional very fine-grained sand layer		34			ML	A-4									
1250	Lean CLAY - stiff, wet, olive-gray					CL	A-6									
		115	35 36													
		120	37	P	610					*153*						
		125	38 39													
1245		130		SPT					●23							

Test Results *

Logged by: **M. Bostrom**
Date Start: **4/21/00**
Date Finish: **4/25/00**
Station: **100+033.967 0.00 LT**
Line: **PEDESTRIAN BR.**
Coordinates (m): **N 115,271.520 E 17,768.174**
Elevation (m): **1284.408**
Total Depth Drilled (m): **61.3**
Drill Contractor: **Layne Christensen**
Driller: **J. Hulse**
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

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

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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

Boring: SB-31-354
Sheet 3 of 4

SAMPLE DESCRIPTION
(ASTM D 2488/D 2487)

Elevation (m)	Sample Description	Depth ft	Depth m	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	S_U, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	- very stiff, occasional silt layers 0.3 to 0.6 meters thick Silty CLAY - very stiff, wet, olive-brown				508	CL-ML	A-6	7 19 25 17								
		135	41													
			42													
		140	43	P	457					*144*						
1240		145	44													
			45													
	Silty SAND - medium dense, wet, gray, with fine-grained to medium-grained sand	150	46	SPT	559	SM	A-2-5	7 21 20 31	● 20							
		155	47													
	Lean CLAY - wet, gray		48			CL	A-6									
1235		160	49	P	610					*144*						
		165	50													
			51													
	Silty SAND - very dense, wet, gray, medium to coarse-grained	170	52	SPT	483	SM	A-2-5	40 86 31 17	○							
	SILT - hard, wet, gray					ML	A-4									
		175	53													
1230			54													
	Silty CLAY - wet, gray	180	55	P	559	CL-ML	A-6			*21*						
		185	56													
	- frequent seams of micaceous silt to fine-grained sands		57													
	Silty SAND - dense, wet, gray, occasional silt layers	190	58	SPT	508	SM	A-2-5	32 60 46 21	● 48							
1225		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-31-354**

Sheet **3** of **4**

Logged by:	**M. Bostrom**
Date Start:	**4/21/00**
Date Finish:	**4/25/00**
Station:	**100+033.967 0.00 LT**
Line:	**PEDESTRIAN BR.**
Coordinates (m):	**N 115,271.520 E 17,768.174**
Elevation (m):	**1284.408**
Total Depth Drilled (m):	**61.3**
Drill Contractor:	**Layne Christensen**
Driller:	**J. Hulse**
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

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

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▯ SH = Shelby Tube, 76.2mm OD, pushed

▯ BAG = Bulk Sample

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

FIELD TEST BORING LOG

Boring: **SB-31-354**

Sheet 4 of 4

Boring: SB-31-354
Sheet 4 of 4

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	SAMPLE Type	SAMPLE 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 - dense, wet, gray, occasional silt layers (continued)	200	61	▨	SPT	610			5 10 23 50	● 14							
			62														
		205															
			63														
		210	64														
1220																	
			65														
		215															
			66														
		220	67														
			68														
		225															
			69														
1215																	
		230	70														
			71														
		235															
			72														
			73														
		240															
			74														
1210																	
		245															
			75														
			76														
		250															
			77														
		255															
			78														
			79														
		260															
1205																	

Logged by:	**M. Bostrom**
Date Start:	**4/21/00**
Date Finish:	**4/25/00**
Station:	**100+033.967 0.00 LT**
Line:	**PEDESTRIAN BR.**
Coordinates (m):	**N 115,271.520 E 17,768.174**
Elevation (m):	**1284.408**
Total Depth Drilled (m):	**61.3**
Drill Contractor:	**Layne Christensen**
Driller:	**J. Hulse**
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

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SAMPLE TYPE

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▯ P = Piston Sampler, 76.2 mm OD

▯ SH = Shelby Tube, 76.2mm OD, pushed

▯ BAG = Bulk Sample

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-31-355**

Sheet **1** of **4**

Logged by:	**C. Hansen**
Date Start:	**4/17/00**
Date Finish:	**4/19/00**
Station:	**100+075.967 0.00 LT**
Line:	**PEDESTRIAN BR.**
Coordinates (m):	**N 115,262.830 E 17,809.265**
Elevation (m):	**1284.326**
Total Depth Drilled (m):	**63.1**
Drill Contractor:	**Layne Christensen**
Driller:	**J. Hulse**
Rig Type:	**CME-750**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Automatic**
Rod Type:	**AW**
Boring Diameter:	**133 mm**

Boring: SB-31-355
Sheet 1 of 4

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	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
	Lean CLAY with sand - soft, moist, gray, occasional sand seams			SPT	686	CL	A-6	0 0 2 3	●3							
		5		P	559					*37*						
	- stiff	10	3	SPT	635			3 4 6 6	●13							
1280	Fat CLAY - wet, dark gray, with silt and very fine-grained sands lenses	15		P	610	CH	A-7-6			*36*						
	- very soft	20	6	SPT	610			0 0 0 0	●0				59	33		
		25		P	610					*31*						
1275	Lean CLAY - very soft, wet, gray, occasional sand seams	30	9	SPT	610	CL	A-6	1 0 1 1	●2							
		35		P	559					*62*						
	- stiff, with sand	40	12	SPT	610			7 7 8 10	●13				32	16	59	
		45	14	P	356					*48*						
1270																
	SILT - stiff, wet, gray, with sand lenses	50	15	SPT	686	ML	A-4	3 4 7 10	●9							
		55	17													
		60	18	P	559					89 *72*	14.7	31				
1265		65	19													

LEGEND/NOTES

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

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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
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P	=	Piston Sampler, 76.2 mm OD
SH	=	Shelby Tube, 76.2mm OD, pushed
BAG	=	Bulk Sample

Boring: SB-31-355
Sheet 2 of 4

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	SAMPLE 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
	SILT - stiff, wet, gray, with sand lenses (continued)														
	Poorly Graded SAND - dense, wet, gray	70	SPT	610	SP	A-3	11 20 24 18	●31							
		75													
1260	Lean CLAY - stiff, wet, gray	80	P	508	CL	A-6			*56*	15.8	26	30	10	94	C TR SG
		85													
	Silty SAND - medium dense, wet, gray, with interbedded layers of clay and silt 50 to 75 mm thick	90	SPT	610	SM	A-2-4	8 20 23 37	●28							
1255		95													
	Lean CLAY - medium stiff, wet, gray	100	P	610	CL	A-6			*38*						
		105													
	- very stiff	110	SPT	584			3 12 15 13	●16							
1250		115													
		120	P	610					*57*						
		125													
1245		130	SPT	533		A-7-6	6 13 12 18	●14				45	23	81	

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

FIELD TEST BORING LOG

Boring: **SB-31-355**

Sheet **2** of **4**

Logged by:	**C. Hansen**
Date Start:	**4/17/00**
Date Finish:	**4/19/00**
Station:	**100+075.967 0.00 LT**
Line:	**PEDESTRIAN BR.**
Coordinates (m):	**N 115,262.830 E 17,809.265**
Elevation (m):	**1284.326**
Total Depth Drilled (m):	**63.1**
Drill Contractor:	**Layne Christensen**
Driller:	**J. Hulse**
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

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

FIELD TEST BORING LOG

Boring: **SB-31-355**
Sheet **3** of **4**

Logged by:	**C. Hansen**
Date Start:	**4/17/00**
Date Finish:	**4/19/00**
Station:	**100+075.967 0.00 LT**
Line:	**PEDESTRIAN BR.**
Coordinates (m):	**N 115,262.830 E 17,809.265**
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Driller:	**J. Hulse**
Rig Type:	**CME-750**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Automatic**
Rod Type:	**AW**
Boring Diameter:	**133 mm**

Boring: SB-31-355
Sheet 3 of 4

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	SAMPLE Type	SAMPLE 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 - very stiff, wet, gray (continued)																
			41														
		135															
			42														
	- medium stiff	140	43		P	559					55 38	15.9	26	47	27		C SG
			44														
1240		145															
			45														
	- medium stiff, with sand seams	150	46		SPT	635			5 7 8 8	● 8							
		155	47														
			48														
		160	49		P	279					*40*						
1235																	
		165	50														
			51														
	- stiff	170	52		SPT	610			11 11 10 10	● 10							
		175	53														
			54														
1230																	
	- with sand and silt layers	180	55		SPT	660			20 13 14 18	● 13							
		185	56														
			57														
		190	58		P	0											
			59														
1225		195															
	Sandy SILT - hard, wet, gray, frequent silt and sand layers				SPT	610	ML	A-4	6 7 17 35	● 11							

Test Results *

LEGEND/NOTES

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

Coordinates are NAD '83

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Blows	=	Number of blows required to drive split spoon sampler 150 mm or interval shown
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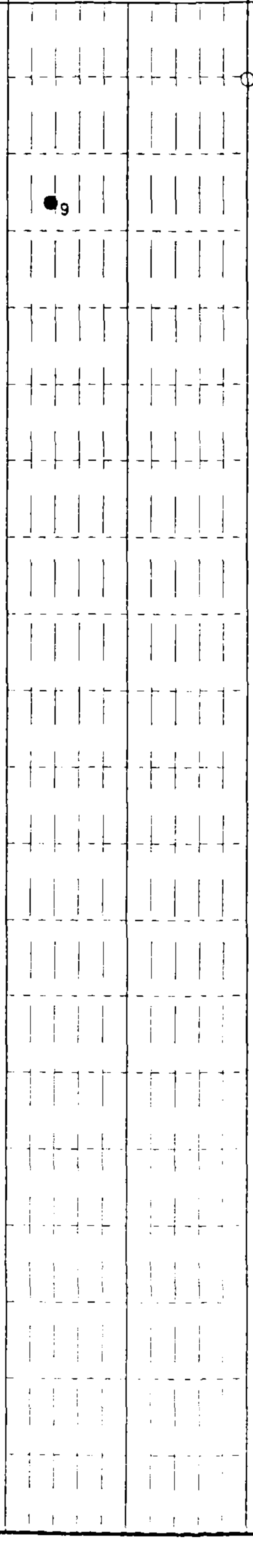
▯ P	=	Piston Sampler, 76.2 mm OD
▯ SH	=	Shelby Tube, 76.2mm OD, pushed
▯ BAG	=	Bulk Sample

Boring: SB-31-355
Sheet 4 of 4

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 (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
	Sandy SILT - hard, wet, gray, frequent silt and sand layers (continued)																
	- hard, coarse-grained sand layers	200	61		SPT	305			25 75	○						30	
			62														
	- stiff	205	63		SPT	610			12 8 11 14	●9							
		210	64														
1220			65														
		215	66														
		220	67														
			68														
		225	69														
1215		230	70														
			71														
		235	72														
		240	73														
1210			74														
		245	75														
		250	76														
			77														
		255	78														
1205		260	79														



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-31-355**

Sheet **4** of **4**

Logged by:	C. Hansen
Date Start:	4/17/00
Date Finish:	4/19/00
Station:	100+075.967 0.00 LT
Line:	PEDESTRIAN BR.
Coordinates (m):	N 115,262.830 E 17,809.265
Elevation (m):	1284.326
Total Depth Drilled (m):	63.1
Drill Contractor:	Layne Christensen
Driller:	J. Hulse
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

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

FIELD TEST BORING LOG

Boring: **SB-31-356**
Sheet **2** of **3**

Logged by:	M. Bostrom
Date Start:	3/30/00
Date Finish:	4/4/00
Station:	100+118.329 8.80 RT
Line:	PEDESTRIAN BR.
Coordinates (m):	N 115,245.451 E 17,848.889
Elevation (m):	1284.995
Total Depth Drilled (m):	44.8
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

Boring: SB-31-356
Sheet 2 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
	Silty SAND - dense, wet, gray				SPT	508	SM	A-2-5	11 23 28 32								
			21														
		70			SPT	610			4 5 10 11	●11							
	- medium dense		22														
		75	23														
			24														
		80			SPT				4 6 8 9	●9							
1260	Lean CLAY - stiff, wet, dark gray, contains frequent silty sand and silt seams and layers		25				CL	A-6									
		85	26														
			27														
		90			SH	508											
	SILT - wet, gray, contains frequent seams of silty sands		28				ML	A-4			*67*						
		95	29														
1255			30														
	- stiff	100			SPT	610			7 12 11 13	●14							
			31														
		105	32														
			33														
		110			SH	0											
			34														
	- very stiff, becomes interbedded with frequent seams and layers of clay and silty sand				MC	559			15 19 32 31	●24							
1250		115	35														
			36														
	- very stiff, brown	120			SPT	610			2 4 7 11	●6							
			37														
		125	38														
			39														
		130			SPT					●25							

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-31-356**

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

Logged by:	**M. Bostrom**
Date Start:	**3/30/00**
Date Finish:	**4/4/00**
Station:	**100+118.329 8.80 RT**
Line:	**PEDESTRIAN BR.**
Coordinates (m):	**N 115,245.451 E 17,848.889**
Elevation (m):	**1284.995**
Total Depth Drilled (m):	**44.8**
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**

Boring: SB-31-356
Sheet 1 of 3

SAMPLE DESCRIPTION (ASTM D 2488/D 2487)

Elevation (m)	Sample Description	Depth ft	Depth m	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)	S_U, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Lean CLAY with concrete debris - moist, brown															
	- very stiff	5		SPT	51			4 7 11 8	23							
	Lean CLAY - wet, light brown to brown	10	3	SH	610	CL	A-6			*120*						pH WSS R
1280	- stiff, interbedded with frequent silt and sand seams and layers	15	5	SPT	610			3 3 5 9	10							
		20	6	SH	610					37 *48*	13.7	37	38	16	89	C TR SG
	- soft	25	8	SPT	610			2 2 1 3	3							
		30	9	SH	610					*43*						
1275	- medium stiff	35	11	SPT	610			3 3 4 3	7							
		40	12	SH	508					*53*						
	Silty SAND - wet, dark olive-gray		13			SM	A-2-4									
		45	14	SPT	457			4 7 11 14	16							
	SILT - very stiff, wet, gray, contains frequent seams and layers of lean clay and silty sand					ML	A-4									
1270		50	15	SH	610					*53*						
		55	17	SPT	610			5 6 14 20	16							
	Fat CLAY - hard, wet, olive-gray	60	18	SH	610	CH	A-7-6			32 *43*	14.6	30	66	37	97	C SG
		65	19													

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: SB-31-356
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	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
	SILT - very stiff, brown, contains frequent seams of silty sands (continued)				610			11 21 26 34								
		135	41	SPT	508			11 15 19 16	●18							
	- stiff	140	43	MC				9 9 11 10	●9							
		145	44	SPT	25			1 3 18 19	●11							
1240			45													

Test Results *

Elevation (m): 1240, 1235, 1230

Depth ft: 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195

Depth m: 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 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-31-356**
Sheet **3** of **3**

Logged by:	**M. Bostrom**
Date Start:	**3/30/00**
Date Finish:	**4/4/00**
Station:	**100+118.329 8.80 RT**
Line:	**PEDESTRIAN BR.**
Coordinates (m):	**N 115,245.451 E 17,848.889**
Elevation (m):	**1284.995**
Total Depth Drilled (m):	**44.8**
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

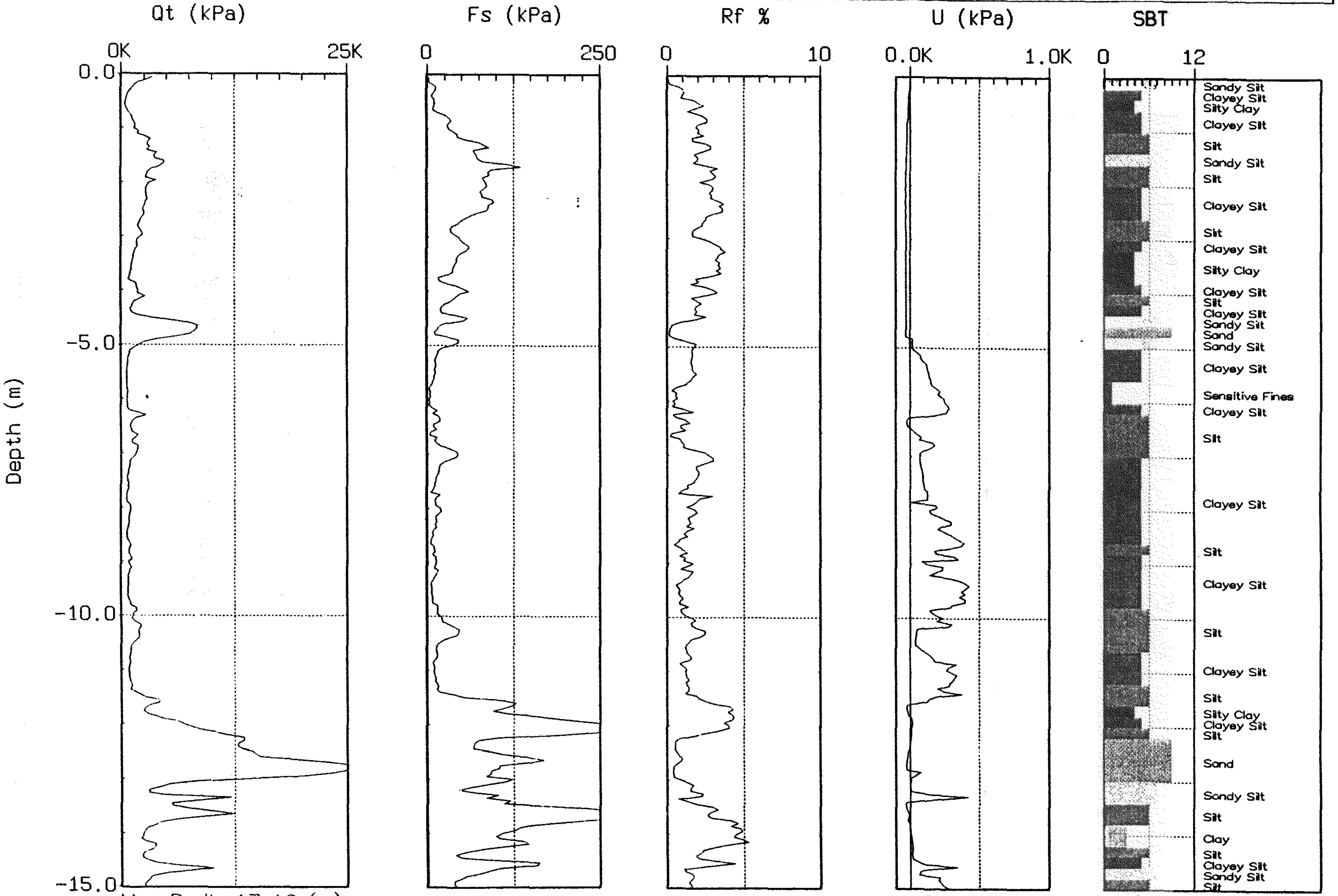
▯ SH = Shelby Tube, 76.2mm OD, pushed

▯ BAG = Bulk Sample

Legacy Parkway

Site: SC-31-356
Station: 100+115.395 9.43 RT
Elevation: 1284.932

Cone: 20 TON A 0/0
Date: 05:02:00 08:54



Max. Depth: 47.40 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

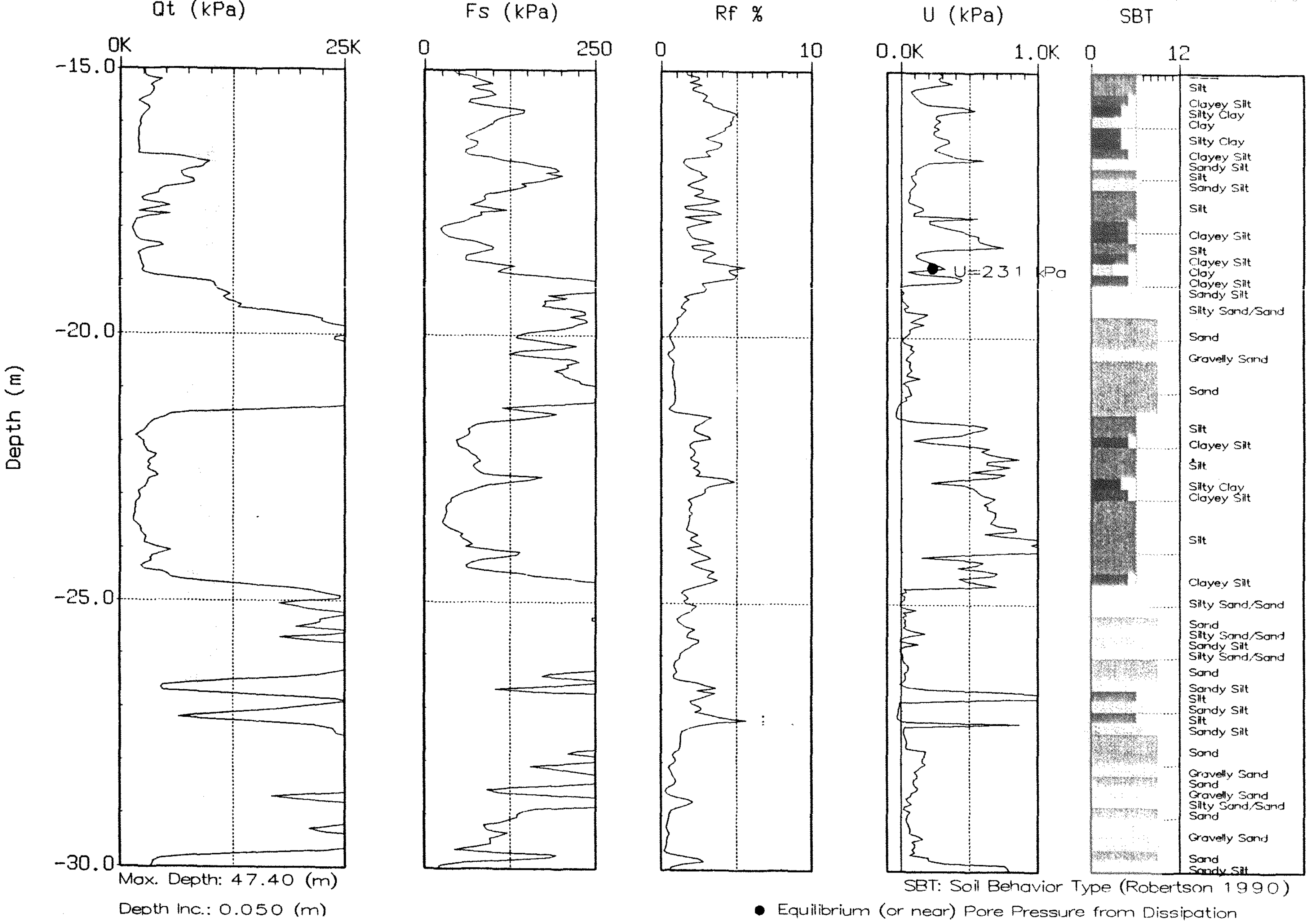
PLATE B-311

CONETEC

Legacy Parkway

Site: SC-31-356
Station: 100+115.395 9.43 RT
Elevation: 1284.932

Cone: 20 TON A 070
Date: 05:02:00 08:54



Max. Depth: 47.40 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

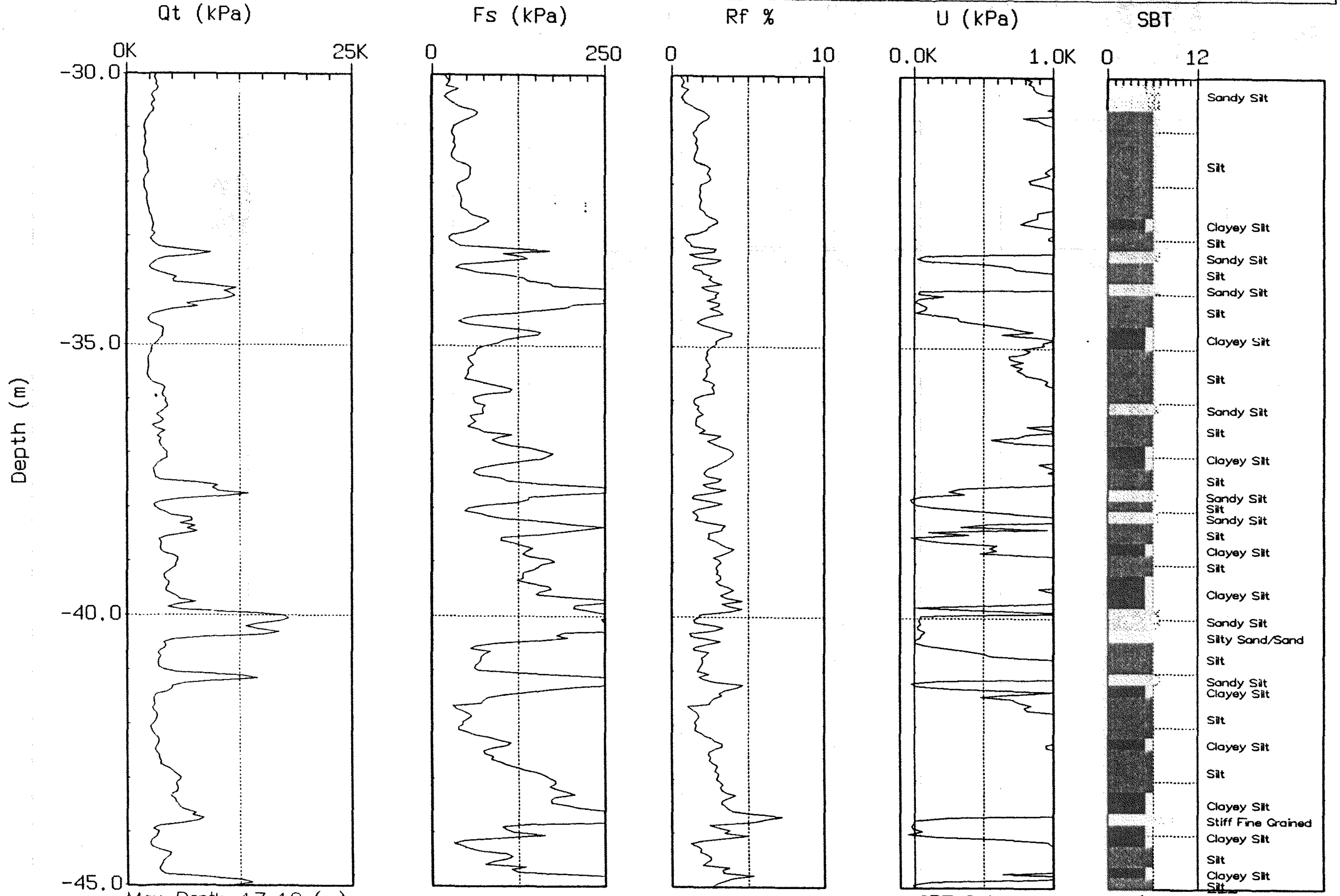
PLATE B-312

CONETEC

Legacy Parkway

Site: SC-31-356
Station: 100+115.395 9.43 RT
Elevation: 1284.932

Cone: 20 TON A 079
Date: 05:02:00 08:54



Max. Depth: 47.40 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

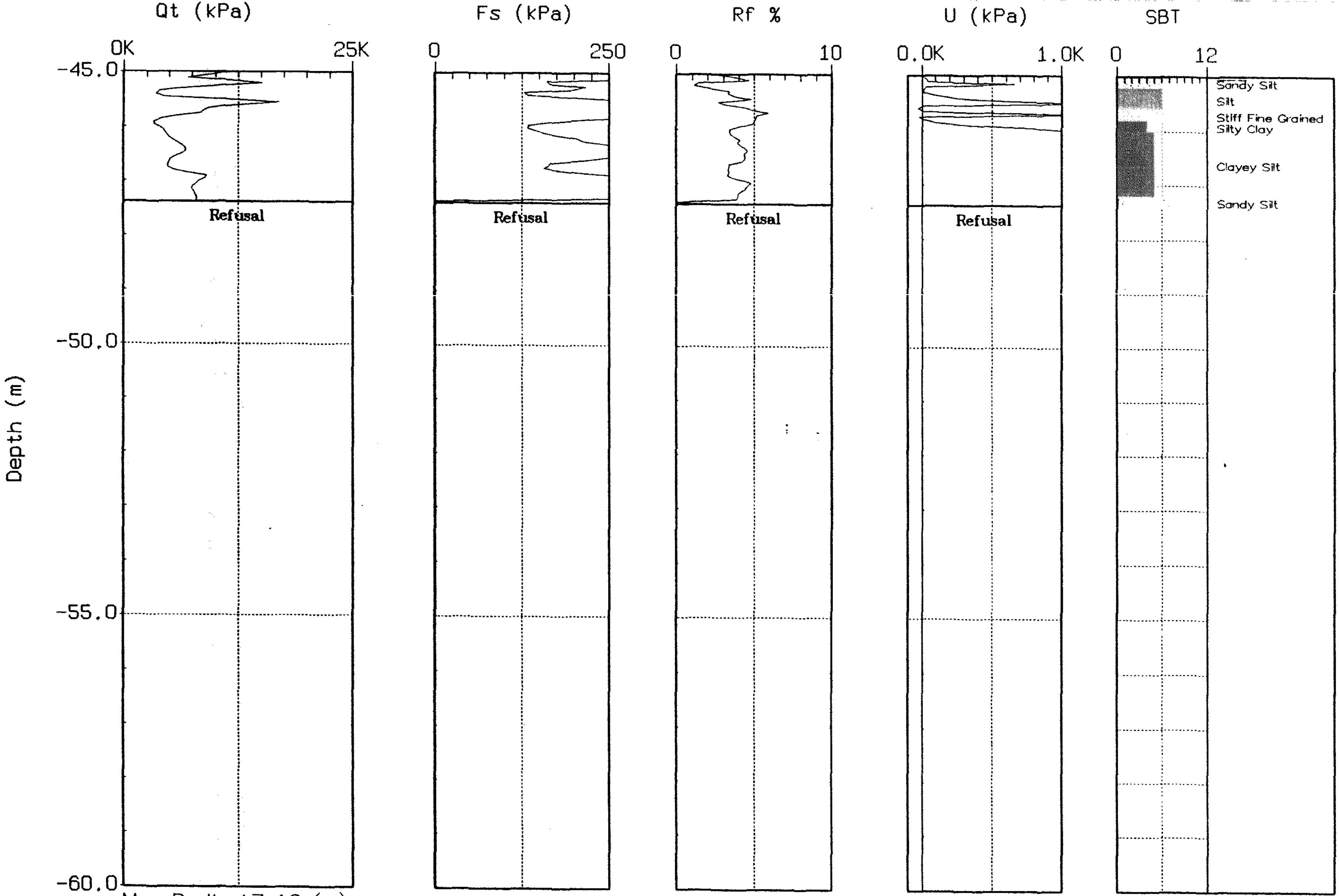
PLATE B-313

CONETEC

Legacy Parkway

Site: SC-31-356
Station: 100+115.395 9.43 RT
Elevation: 1284.932

Cone: 20 TON A 070
Date: 05:02:00 08:54



Max. Depth: 47.40 (m)

Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-371**

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

Logged by:	**A. Waldman**
Date Start:	**2/28/00**
Date Finish:	**2/29/00**
Station:	**70+338.171 0.29 RT**
Line:	**500 South**
Coordinates (m):	**N 112,710.357 E 16,229.692**
Elevation (m):	**1286.826**
Total Depth Drilled (m):	**31.1**
Drill Contractor:	**Layne Christensen**
Driller:	**C. Davis**
Rig Type:	**Mobile B-53**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Safety**
Rod Type:	**AW**
Boring Diameter:	**133 mm**

Boring: RB-371
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	SAMPLE Type	SAMPLE 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
	Lean CLAY - stiff, wet, dark brown			P	610	CL	A-7-6									
	light reddish-brown		1	SPT	305			4 5 8 10	●18	*29*						
1285		5	2	MC	508			1 2 2 2	●4							
				SPT	610			1 2 3 3	●7							
		10	3	P	533					22 *38*	14.3	34	42	22	97	C SG DS
	SILT - medium stiff, gray					ML	A-4									
	Silty SAND - dense, wet, gray, fine-grained		4	SPT	610	SM	A-2-4	0 2 6 5	●8							
		15	5	MC	356			5 19 20 20	●35							
				SPT	305			4 3 4 3	●7							
	Fat CLAY - medium stiff, wet, olive, frequent fine-grained sand and silt lenses					CH	A-7-6									
		20	6	P	610					*62*						
1280			7	SPT	432			2 3 5 6	●8							
	- very stiff	25	8	MC	610			9 7 15 23	●18							
	Silty SAND - medium dense, wet, gray, with trace gravel			SPT	305	SM	A-2-4	3 4 10 17	●14							
		30	9	P	610											
	Lean CLAY - very stiff, wet, reddish-brown					CL	A-6			*86*						
			10	SPT	508			3 7 9 13	●14							
		35	11	MC	508			4 6 11 16	●12							
1275	Sandy Lean CLAY - stiff, wet, reddish-brown			SPT	508	CL	A-6	7 8 9 11	●15							
		40	12	P	610					*38*						
			13	SPT	610			2 1 4 5	●4							
	Silty SAND - dense, wet, gray	45	14	MC	406	SM	A-2-4	5 15 38 40	●35							
				SPT	508			5 7 10 14	●14							
	Lean CLAY - very stiff, wet, olive-gray		15			CL	A-6									
		50		P	610					*48*						
			16	SPT	508			6 9 12 18	●16							
1270		55	17	P	102					*96*						
	Sandy Lean CLAY - stiff, wet, grayish-brown			P	610	CL	A-6			*96*						
	Lean CLAY - very stiff, olive-gray, caliche rich	60	18	SPT	457	CL	A-6	4 8 10 15	●14							
		65	19													

Test Results *

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 P = Piston Sampler, 76.2 mm OD

▯ SH = Shelby Tube, 76.2mm OD, pushed

B BAG = Bulk Sample

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-371**

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

Logged by:	**A. Waldman**
Date Start:	**2/28/00**
Date Finish:	**2/29/00**
Station:	**70+338.171 0.29 RT**
Line:	**500 South**
Coordinates (m):	**N 112,710.357 E 16,229.692**
Elevation (m):	**1286.826**
Total Depth Drilled (m):	**31.1**
Drill Contractor:	**Layne Christensen**
Driller:	**C. Davis**
Rig Type:	**Mobile B-53**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Safety**
Rod Type:	**AW**
Boring Diameter:	**133 mm**

Boring: RB-371
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	SAMPLE Type	SAMPLE 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
	Lean CLAY - very stiff, olive-gray, caliche rich (continued)			P	330					32 *86*	18.5	17	29	13	86	C TR SG
	Sandy CLAY - medium stiff to stiff, wet, grayish-brown	70	21			CL	A-6									
1265			22	SPT	610			2 4 4 7	● 6							
		75	23	P	610											
	- olive gray	80	24 25	SPT	508			7 9 12 20	● 15							
		85	26	P	406					*86*						
1260		90	27 28	SPT	610			3 5 8 10	● 8							
		95	29	P	483											
	Clayey SAND - medium dense, wet, olive, fine-grained					SC	A-2-6									
	Lean CLAY - stiff, wet, olive		30			CL	A-6									
		100	31	SPT	508			3 8 11 15	● 12							
1255		105	32													
		110	33 34													
		115	35													
1250		120	36 37													
		125	38													
		130	39													

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 P	= Piston Sampler, 76.2 mm OD
▯ SH	= Shelby Tube, 76.2mm OD, pushed
B BAG	= Bulk Sample

Boring: RB-395
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	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/m^3	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Lean CLAY - very stiff, moist, brown, grass roots			MC	457	CL	A-6	7 7 6 5	●18							
	- medium stiff, frequent silt seams, reddish-brown		1	SPT	610			2 2 1 1	●5							
1285		5		SH	610						12.8	41	40	19		C SG
			2							*34*						
	- with fine sand lenses			SPT	610			0 0 3 2	●5							
	SILT- soft, wet, gray					ML	A-4									
		10	3													
	Lean CLAY - very soft, wet, brown, with frequent seams of silt			MC	559	CL	A-6	0 0 2 4	●2							
	Sandy SILT - medium stiff to stiff, wet, gray to black		4	SPT	610	ML	A-4	8 6 2 4	●11						55	
	Lean CLAY - very soft, wet, gray	15				CL	A-6									
			5	SH	610					16 *24*	16.7	22	40	17		C SG
				SPT	610			1 1 1	●2							
		20	6													
1280				MC	406			4 3 2 3	●5							
	SILT - medium stiff, wet, gray		7	SPT	610	ML	A-4	0 3 7 12	●12							
	- becomes stiff															
		25	8	SH	559					*48*						
	Silty CLAY - medium stiff, wet, gray					CL-ML	A-6									
				SPT	610			3 5 5 4	●12							
		30	9													
			10													
		35	11													
1275																
		40	12													
			13													
		45	14													
		50	15													
			16													
1270		55	17													
		60	18													
			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-395**

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

Logged by:	**M. Bostrom**
Date Start:	**5/10/00**
Date Finish:	**5/10/00**
Station:	**6003+950.000 0.00 RT**
Line:	**D Mainline**
Coordinates (m):	**N 108,545.276 E 15,635.838**
Elevation (m):	**1286.262**
Total Depth Drilled (m):	**9.1**
Drill Contractor:	**Layne Christensen**
Driller:	**J. Hulse**
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

$\underline{\nabla}$ = 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-396
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	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	S_U, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Lean CLAY - soft, wet, brown			SH	584	CL	A-6									
	- frequent silt seams		1	SPT	610			1 1 1 3	4							
	Silty CLAY - soft, wet, olive, mottled rust-colored	5				CL-ML	A-6									
1285	CLAY - soft, wet, light reddish-brown		2	MC	457	CL	A-6	3 2 1 3	4							
				SPT	457			2 1 1	4							
	- occasional silt seams	10	3	SH	457					*38*	13.9	42	39	19	92	C SG
			4	SPT	457			0 0 0 0	0							
	- light gray, very soft	15														
			5	MC	610			0 0 3 2	4							
				SPT	610			2 1 1 2	2							
	SILT - medium stiff, wet, gray	20	6	SH	610	ML				*29*					50	
1280			7	SPT	610			2 2 2 2	6							
	- lean clay layer	25	8	MC	610			5 5 17 20	22							
	- very stiff			SPT	610			4 5 16 20	25							
		30	9													
			10													
		35	11													
1275		40	12													
			13													
		45	14													
			15													
		50	16													
1270		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: **RB-396**
Sheet **1** of **1**

Logged by:	**M. Bostrom**
Date Start:	**5/11/00**
Date Finish:	**5/11/00**
Station:	**6004+534.815 93.86 RT**
Line:	**D Mainline**
Coordinates (m):	**N 109,134.378 E 15,697.296**
Elevation (m):	**1286.986**
Total Depth Drilled (m):	**8.8**
Drill Contractor:	**Layne Christensen**
Driller:	**J. Hulse**
Rig Type:	**CME-750**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Automatic**
Rod Type:	**AW**
Boring Diameter:	**135255 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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-397**

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

Logged by:	**R. Khandokar**
Date Start:	**5/17/00**
Date Finish:	**5/17/00**
Station:	**6005+180.000 0.00 RT**
Line:	**D Mainline**
Coordinates (m):	**N 109,773.404 E 15,567.997**
Elevation (m):	**1286.896**
Total Depth Drilled (m):	**8.7**
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**

Boring: RB-397
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	SAMPLE Type	SAMPLE 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 - very stiff, moist, gray			MC	559	ML	A-4	14 10 6 6	●29							
	- medium stiff, wet, olive-gray		1	SPT	432			2 1 2	●6							
	Lean CLAY - medium stiff, wet, gray					CL	A-6									
	SILT - medium stiff, light yellow-brown, wet	5		SH	610	ML	A-4									
▽ 1285			2							*53*						
	Lean CLAY - soft, wet, gray			SPT	279	CL	A-6	1 1 2	●7							
		10	3	MC	508			1 2 4 2	●10							
	Silty SAND - loose, wet, gray to light yellow, very fine-grained					ML	A-2-4									
	Lean CLAY - soft, wet, gray		4	SPT	305	CL	A-6	1 1 1	●4							
	- becomes grayish-blue	15		SH	610											
			5							*43*						
	- stiff			SPT	457			2 3 2	●10							
		20	6	MC	610			3 3 5 5	●11							
1280			7	SPT	457			3 4 5	●15							
	Sandy SILT - stiff, wet, gray					ML	A-4									
		25		SH	610					12 *53*	16.7	23	NP	NP	60	C SG
	Silty SAND - loose to medium dense, wet, gray, with very fine to fine-grained sand		8			SM	A-2-4									
				SPT	457			6 3 7	●16							
		30	9													
			10													
		35	11													
1275			12													
		40														
			13													
		45	14													
			15													
		50														
			16													
1270		55	17													
			18													
		60														
			19													
		65														

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 = Sheiby Tube, 76.2mm OD, pushed

▯ BAG = Bulk Sample

Boring: RB-398
Sheet 1 of 1

SAMPLE DESCRIPTION
(ASTM D 2488/D 2487)

Sample Description	Type	Recovery (mm)	USCS	AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
Lean CLAY - stiff, moist, gray, some organics	MC	152	CL	A-7-6	6 8 5 5	21							
- medium stiff	SPT	51			3 2 2 2	8							
	SH	508					*38*	13.4	35				
	SPT	254			1 2 1 3	6							
SILT - medium stiff, wet, gray to tan			ML	A-4									
Lean CLAY - very soft, wet, dark gray	MC	584	CL	A-7-6	0 0 1 1	2							
	SPT	610			1 2 1 1	5							
	SH	610					24 *48*	14.8	28	44	26		C TR SG
- olive-gray	SPT	457			3 3 5	13							
	MC	610			2 5 7 7	15		15.1	26				
SILT - stiff, wet, gray			ML	A-4									
	SPT	457			4 4 4	12						99	
Silty SAND - medium dense, wet, gray, fine-grained	SH		SM	A-2-4									
	MC	610			0 6 12 16	21							SV
- dense	SPT	457			4 9 16	36							

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

0 25 50

Elevation (m): 1285, 1280, 1275, 1270

Depth ft: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

Depth m: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

Graphic Log

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: **RB-398**

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

Logged by:	**R. Khandokar**
Date Start:	**5/10/00**
Date Finish:	**5/10/00**
Station:	**6005+650.000 0.00 RT**
Line:	**D Mainline**
Coordinates (m):	**N 110,242.756 E 15,546.896**
Elevation (m):	**1286.528**
Total Depth Drilled (m):	**9.3**
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

PLATE D-78

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-399**

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

Logged by:	R. Khandokar
Date Start:	5/15/00
Date Finish:	5/15/00
Station:	6005+940.000 0.00 RT
Line:	D Mainline
Coordinates (m):	N 110,517.894 E 15,630.526
Elevation (m):	1286.467
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

Boring: RB-399
Sheet 1 of 1

SAMPLE DESCRIPTION
(ASTM D 2488/D 2487)

Elevation (m)	Sample Description	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: Silty GRAVEL - medium dense, moist, gray to tan	MC	508			6 8 7 7	28							
	Lean CLAY - stiff, wet, tan	SPT	356	CL	A-7-6	7 3 2	11							
1285	SILT - stiff, wet, gray to tan	SH	406	ML	A-4			*57*					95	
		SPT	254			2 2 2	10							
	Lean CLAY - stiff, wet, gray			CL	A-7-6									
	SILT - medium stiff, wet, gray to tan	MC	559	ML	A-4	4 2 2 6	6		14.4	31			96	
		SPT	457			2 1 2	6							
	Lean CLAY - medium stiff, wet, gray	SH	610	CL	A-7-6			16 *67*	14.2	38	46	26	100	C SG
	SILT - very stiff, wet, gray, low to medium plasticity	SPT	457	ML	A-4	2 6 8	26							
1280		MC	610			4 7 8 8	22							
	- occasional sandy silt lenses	SPT	457			4 5 7	20							
		SH	610										63	
	Silty SAND - dense, wet, gray	SPT	610	SM	A-2-4	5 9 12 18	33						39	

Elevation (m): 1285, 1280, 1275, 1270

Depth ft: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

Depth m: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

Test Results *

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 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-400**

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

Logged by:	**R. Khandokar**
Date Start:	**5/15/00**
Date Finish:	**5/15/00**
Station:	**6006+800.000 0.00 RT**
Line:	**D Mainline**
Coordinates (m):	**N 111,281.939 E 16,023.839**
Elevation (m):	**1287.243**
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**

Boring: RB-400
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	SAMPLE 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	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Lean CLAY - stiff, slightly moist, yellow-gray, with a trace of fine sand and organics			MC	305	CL	A-7-6	4 5 2 9	●13							
	- very stiff, wet, with silt		1	SPT	203			3 4 4	●18							
		5	2	SH	610					*38*	13.1	38				C SG
1285	- soft, with occasional silt layers			SPT	457			1 1 1	●4				41	16		
	- medium stiff, gray, with fine sand layers	10	3	MC	610			2 3 1 1	●7							
	- soft		4	SPT	457			0 1 1	●4							
		15	5	SH	610		A-6			32 *67*	15.6	27	35	16		
	Fat CLAY - stiff, wet, grayish-green			SPT	457	CH	A-7-6	3 2 3	●10							
	SILT - medium stiff, wet, gray, with organics	20	6	MC	610	ML	A-4	6 9 11 14	●29							
	Poorly Graded SAND with silt - medium dense, wet, gray		7	SPT	457	SP-SM	A-3	6 8 8	●26						10	
1280	Lean CLAY - medium stiff, wet, olive-gray, with sand seams	25	8	SH	610	CL	A-6			*57*						
				SPT	610			1 2 2 2	●6							
		30	9													
			10													
		35	11													
1275		40	12													
			13													
		45	14													
		50	15													
			16													
1270		55	17													
		60	18													
			19													
		65														

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-401
Sheet 1 of 1

SAMPLE DESCRIPTION
(ASTM D 2488/D 2487)

Sample Description	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT (N₁)₆₀	S_U, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
Sandy SILT - hard, slightly moist, dark brown, with roots	MC	305	ML	A-4	4 8 22 13	49							
	SPT	457			3 3 3 4	12							
Poorly Graded SAND - medium dense, moist, olive-brown, with some silt	SH	610	SP	A-3			*67*	15.0	27			94	
Lean CLAY - medium stiff, wet, reddish-brown	SPT	610	CH	A-7-6	1 1 2 1	6							
SILT - soft, wet, gray, with occasional clay layers	MC	457	ML	A-4	2 2 1 2	4							
- medium stiff	SPT	610			2 2 3 4	8							
Lean CLAY with sand - medium stiff, wet, reddish-brown	SH	610					37 *38*	14.3	27			79	C SG
	SPT	610			2 1 2 3	5							
	MC	610			4 5 6 7	14							
- stiff	SPT	610			3 4 5 5	13							
	SH	610											
Silty SAND - medium dense, wet, olive-brown			SM	A-2-4			*77*						
Poorly Graded SAND - medium dense, wet, gray	SPT	610	SP	A-3	0 4 8 6	17							

Elevation (m): 1285, 1280, 1275, 1270

Depth (ft): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

Depth (m): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

SPT (N₁)₆₀ scale: 0, 25, 50

○ SPT (N₁)₆₀ (Greater than 50 Blows)

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: **RB-401**

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

Logged by:	**R. Davis**
Date Start:	**5/18/00**
Date Finish:	**5/18/00**
Station:	**6007+400.000 0.00 RT**
Line:	**D Mainline**
Coordinates (m):	**N 111,878.170 E 16,076.232**
Elevation (m):	**1287.074**
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

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-402
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Type	Recovery (mm)	USCS	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
	SILT - very stiff, slightly moist, light brown, with roots	MC	457	ML	A-4	5 6 7 8	21							
	Lean CLAY - very stiff, wet, reddish-brown, with occasional silt lenses	SPT	457	CL	A-7-6	5 6 5 8	22							
		SH	457					*81*			47	23	98	
1285	Fat CLAY - stiff, wet, gray	SPT	457	CH	A-7-6	2 2 3 3	10							
		MC	356			0 0 2 3	3							
	SILT - very stiff, wet, brown, with clay lenses	SPT	610	ML	A-4	5 5 6 8	20							
	Lean CLAY - medium stiff, moist, gray	SH	610	CL	A-6			12 *45*	12.6	40			99	C TR SG
	SILT - soft, wet, dark gray, with frequent layers of clay	SPT	610	ML	A-4	1 1 1 4	4							
		MC	610			2 3 5 5	10			27	40	18		
1280	- stiff, wet Fat CLAY - very stiff, wet, gray, with occasional silt lenses	SPT	610	CH	A-7-6	4 5 5 6	16							
		SH	610					*67*						
	Silty SAND - medium dense, wet, dark gray, with occasional clay seams	SPT	610	SM	A-2-4	3 4 6 7	15							

Elevation (m): 1285, 1280, 1275, 1270

Depth ft: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

Depth m: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

SPT scale: 0, 25, 50

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-402**

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

Logged by:	**R. Davis**
Date Start:	**5/15/00**
Date Finish:	**5/15/00**
Station:	**6007+800.000 0.00 RT**
Line:	**D Mainline**
Coordinates (m):	**N 112,277.663 E 16,096.364**
Elevation (m):	**1287.013**
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

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-403**

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

Logged by:	R. Davis
Date Start:	5/15/00
Date Finish:	5/15/00
Station:	6008+885.000 0.00 RT
Line:	D Mainline
Coordinates (m):	N 113,346.442 E 16,240.119
Elevation (m):	1285.340
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

Boring: RB-403
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	SAMPLE 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	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1285	SILT - stiff, moist, dark brown, low plasticity, roots			MC	508	ML	A-4	3 3 5 6	10							
	Silty CLAY - medium stiff, wet, light gray to white, low to medium plasticity, trace and fine-grained sand		1	SPT	610	CL-ML	A-6	3 5 6 6	17							
	Lean CLAY - stiff, wet, light reddish-brown	5				CL	A-7-6									
			2	SH	406					147 *81*	16.7	22	42	21	99	C SG
				SPT	610			2 3 4 6	11							
		10	3	MC	559			3 3 3 4	6							
			4	SPT	610			2 3 4 5	9				36	12		
	- with sand seams	15		SH	610										96	
			5							*72*						
1280	SILT - stiff, wet, gray			SPT	457	ML	A-4	5 5 9 8	17							
	Lean CLAY - soft, wet, gray	20	6	MC	406	CL	A-6	2 2 1 2	3							
	- medium stiff to stiff		7	SPT	406			2 2 3 6	5							
		25	8	SH	610					*67*	13.7	32			91	
	SILT - medium stiff to stiff, wet, gray	30	9	SPT	610	ML	A-4	3 4 6 8	10							
			10													
1275		35	11													
			12													
		40	13													
		45	14													
			15													
1270		50	16													
		55	17													
			18													
		60	19													
		65														

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

B BAG = Bulk Sample

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

FIELD TEST BORING LOG

Boring: **RB-404**
Sheet **1** of **1**

Logged by: **R. Khandokar**
Date Start: **5/12/00**
Date Finish: **5/12/00**
Station: **6009+670.000 0.00 RT**
Line: **D Mainline**
Coordinates (m): **N 114,028.968 E 16,606.006**
Elevation (m): **1284.611**
Total Depth Drilled (m): **9.4**
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**

Boring: RB-404
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	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
	Lean CLAY - medium stiff, moist, dark gray, contains organics			MC	610	CL	A-7-6	2 2 5 11	11							
	SILT - stiff, wet, light gray - occasional silty sand lense		1	SPT	457	ML	A-4	3 3 4	14							
	Lean CLAY - stiff, wet, gray-brown	5	2	SH	610	CL	A-7-6			*72*			41	18		
	- hard			SPT	406			8 13 21	45							
		10	3	MC	610			4 6 6 7	18							
	SILT - very stiff, wet, gray					ML	A-4									
	Lean CLAY - stiff, moist, gray		4	SPT	457	CL	A-7-6	3 3 4	12							
1280		15	5	SH	559					*67*			45 38	23 16	96	C SG
				SPT	432			3 4 3	12							
	- medium stiff, grayish-blue	20	6	MC	610			3 2 4 5	8							
			7	SPT	457			3 3 4	11							
	- stiff	25	8	SH	559					51 *53*	11.9	47				
				SPT	457			2 3 5	11							
		30	9	MC	610			2 2 2 4	4							
1275			10													
		35	11													
		40	12													
			13													
		45	14													
1270		50	15													
			16													
		55	17													
		60	18													
			19													
1265		65														

Test Results *

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-405**

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

Logged by:	R. Davis
Date Start:	5/16/00
Date Finish:	5/16/00
Station:	6010+290.000 0.00 RT
Line:	D Mainline
Coordinates (m):	N 114,500.642 E 17,008.403
Elevation (m):	1284.345
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

Boring: RB-405
Sheet 1 of 1

SAMPLE DESCRIPTION
(ASTM D 2488/D 2487)

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

Sample Description	Type	Recovery (mm)	USCS	AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ (0–25–50)	S_u, kPa (torvane in italics)	Dry Density, kN/m^3	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
SILT - stiff, moist, brown, roots	MC	305	ML	A-4	3 4 4 6	10							
Lean CLAY - very stiff, wet, gray - with occasional silty sand lenses	SPT	610	CL	A-7-6	6 6 7 7	20						56	
	SH	152					*72*						
SILT - medium stiff, wet, olive-brown	SPT	610	ML	A-4	2 1 3 2	7							
Lean CLAY - stiff, wet, dark gray to black	MC	406	CL	A-7-6	1 3 3 4	6							
	SPT	610			2 3 4 5	9							
	SH	559					*124*						
	SPT	610			3 4 4 6	10							
- brown	MC	610			2 3 3 4	6							
- occasional silt lenses	SPT	610			3 2 3 3	5							
	SH	610					33 *29*	11.9	47			99	C SG
	SPT	610			2 2 3 4	5							

Elevation (m): 1280, 1275, 1270, 1265

Depth (ft): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

Depth (m): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

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-406
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	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)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Lean CLAY - very stiff, moist, dark gray	MC	254	CL	A-6	6 12 11 6	29							
1285		SPT	610			3 3 5 7	13							
	Silty SAND - medium dense, wet, tan	SH	508	SM	A-2-4			*57*						
	SILT with sand - stiff, wet, gray	SPT	457	ML	A-4	3 4 5	14						79	
	Lean CLAY - very stiff, wet, gray to tan	MC	584	CL	A-6	6 10 12 14	26							
	- grades to stiff, occasional very thin lenses of fine-grained sand	SPT	406			4 4 7	14							
		SH	610					64 *77*	14.5	31	38	19		C SG
		SPT	457			2 2 2	6							
1280	SILT - medium stiff, wet, gray			ML	A-4									
	Lean CLAY - medium stiff, wet, gray	MC	610	CL	A-6	4 3 3 3	6							
	Silty SAND - medium dense, wet, gray			SM	A-2-4									
	Lean CLAY - medium stiff, wet, gray, - grades to soft	SPT	457	CL	A-6	0 2 2	4							
		SH	584					*43*						
	- grades to medium stiff	SPT	457			4 3 3	6							
		MC	610			1 3 3 3	6							

Elevation (m): 1285, 1280, 1275, 1270

Depth ft: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

Depth m: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

SPT $(N_1)_{60}$ scale: 0, 25, 50

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: **RB-406**

Sheet 1 of 1

Logged by:	**R. Khandokar**
Date Start:	**5/11/00**
Date Finish:	**5/11/00**
Station:	**6011+725.000 0.00 RT**
Line:	**D Mainline**
Coordinates (m):	**N 115,503.490 E 18,027.912**
Elevation (m):	**1285.770**
Total Depth Drilled (m):	**9.4**
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

c

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

High 57.1

Avg. 51.4

Std. 5.2

Comments: 6 total good blows

PLATE I- 5

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 %

PLATE I-6

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

PLATE I- 9

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

High 65.7

Avg. 61.4

Std. 2.5

Comments: 4 total good blows

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

High 71.4

Avg. 65.5

Std. 4.4

Comments: 12 total good blows

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 Comments: 8 total good blows; Readings taken on

High 60.0 3-2-00

Avg. 59.3

Std. 1.2

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 Comments: 1 total good blow; Reading taken on

High 62.9 3-2-00

Avg 62.9

Std. 0.0

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 Comments: 47 total good blows

High 77.1

Avg. 64.5

Std. 7.4

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 Comments: 75 total good blows

High 68.6

Avg. 61.2

Std. 4.9

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 Comments: 16 good blows recorded; California Sampler

High 105.7 used

Avg. 91.3

Std. 6.7

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 Comments: 54 total good blows

High 74.3

Avg 69 3

Std. 3 2

PLATE I- 21

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 Comments: 43 total good blows

High 80.0

Avg. 67.7

Std. 5.0

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 %

Fifteen Square cm Cone Calibration Sheet

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

PLATE J-2

Fifteen Square cm Cone Calibration Sheet

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.: OC-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.

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 D
Operator: RET

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. GLC-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): 5003 (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 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.

PLATE J-8

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300
Project Location: LEGACY HIGHWAY - PARISH 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)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Made (-± 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 (15.25 m) | Water Table (ft): | CPT File: 300CP05.DAT

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Made (-± 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)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Made (-± 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.

PLATE J-9

GREGG

CONETEC

Daily Baseline Summary

Project No.: CO-300
Project Location: LEGACY HIGHWAY/HWY 89
Client/Rep: KLEINFELDER/MARK

Date: 01-07-00
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)	Volt End-Start	Eng. Value (Volt X Calib)	Correction Made (-- 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)	Volt End-Start	Eng. Value (Volt X Calib)	Correction Made (-- 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 (15.25m) Water Table (ft): CPT File: 300CP09.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Volt End-Start	Eng. Value (Volt X Calib)	Correction Made (-- 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): 27.24 (8.3 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	Date: 01-10-00
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 056 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-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): CASED	Start Depth: (ft) 0	Final Depth (ft): 50.03 (15.25m)	Water Table (ft):	CPT File: 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): CASED	Start Depth: (ft) 0	Final Depth (ft): 50.03 (15.25m)	Water Table (ft):	CPT File: 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): CASED	Start Depth: (ft) 0	Final Depth (ft): 48.23 (14.7m)	Water Table (ft):	CPT File: 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.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300
Project Location: LEGACY HIGHWAY - PARISH LANE
Client/Rep: KLEINFELDER / MARTIN

Date: 01-12-00
Rig TRUCK
Operator: REP/JOSH

Calibrations @ 7.5Volts	Standard 10 cm² cone	Standard 15 cm² cone
Tip Friction	1000 bar–139.2 tsf/volt–133.3 bar/volt 10 bar–1.392 tsf/volt–1.333 bar/volt	1500 bar 208.8 tsf/volt–200 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 (55.35 m)　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 M. (-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 (15.25 m)　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: KLEINFELDER / MARTIN

Date: 01-13-00
Rig TRECK
Operator: RED/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)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Made (+- 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)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Made (+- 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	± Eng. Value (± Volt X Calib)	Correction Made (+- 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.

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): 176.34 (53.75 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 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.

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER / MARTIN

Date: 01-17-00
Rig TRACK RIG
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): 0 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.: 00-300
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER / MARTIN
Date: 01-18-00
Rig: TRACK RIG
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)	– Volt End-Start	– Eng. Value (– Volt X Calib)	Correction Made (– 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): 0 Final Depth (ft): 150.26 (45.8m) Water Table (ft): CPT File: 300CP19.DAT

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Volt End-Start	Eng. Value (– Volt X Calib)	Correction Made (– 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): 0 Final Depth (ft): 160.43 (48.9m) Water Table (ft): CPT File: 300CP20.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Volt End-Start	– Eng. Value (– Volt X Calib)	Correction Made (– 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: 01-19-00
Rig TRACK
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): 0 Final Depth (ft): 50.03 (15.25m) Water Table (ft): CPT File: 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): 0 Final Depth (ft): 50.03 (15.25m) Water Table (ft): CPT File: 300CP22.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-17

GREGG **CONETEC**

Daily Baseline Summary

Project No.: CO-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)	-- Volt End-Start	-- Eng. Value (-- Volt X Calib)	Correction Made (-- 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): 0 Final Depth (ft): 135.5 (41.3m) Water Table (ft): CPT File: 300CP23.DAT

Sounding Info 058 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	Volt End-Start	-- Eng. Value (-- Volt X Calib)	Correction Ma (-- 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): 0 Final Depth (ft): 142.88 (43.55 m) Water Table (ft): CPT File: 300C.P24.DAT

Sounding Info Cone Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Volt End-Start	Eng. Value Volt X Calib	Correction Made (-- 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-18

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 058 Cone/Size 015	Channel	Start Baseline (Volts)	End Baseline (Volts)	- Volt End-Start	- Eng. Value (- Volt X Calib)	Correction Made (-- 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: 300CP25.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	- Volt End-Start	- Eng. Value (- Volt X Calib)	Correction Made (-- 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	Eng. Value (- Volt X Calib)	Correction Made (-- 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-19

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER/ MARTIN

Date: 01-26-00
Rig TRACK RIG
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)	– Volt End-Start	– Eng. Value (– Volt X Calib)	Correction Made (–– 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): 110.56 (33.7m)
Water Table (ft):
CPT File: 300CP26.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Volt End-Start	– Eng. Value (– Volt X Calib)	Correction M (–– 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	Eng. Value (– Volt X Calib)	Correction Made (–– 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): 0	Final Depth (ft): 30.02 (9.15m)	Water Table (ft):	CPT File: 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): 0	Final Depth (ft): 172.36 (52.55m)	Water Table (ft):	CPT File: 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.

PLATE J-21

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER / MARTIN

Date: 01-28-00
Rig TRUCK RIG
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)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Made (-± 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): 17.06 (5.12m) Water Table (ft): CPT File: 300CP29.DAT

Sounding Info 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction (-± 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): 146.0 (44.5m) Water Table (ft): CPT File: 300CP29A.DAT

Sounding Info Cone Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Made (-± 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: 1 m=3.28 ft — Pressure Stress: 1 bar=100 kPa = 1.044 tsf = 14.50 psi = 10.19m = 33.4 ft.

GREGG

CONETE

Daily Baseline Summary

Project No.: CO-300	Date: 01-31-00
Project Location: LEGACY HIGHWAY	Rig TRACK RIG
Client/Rep: KLEINFELDER/	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 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
Project Location: GROVERS LANE
Client/Rep: KLEINFELDER / JEFF

Date: 1/31/00
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 070	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Made (+/- Eng.)
Hole No. SC-19-277	Tip	-.023	-.030			—
Elevation (ft)	Sleeve	.080	.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: 300CP27

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	Δ Volt End-Start	Δ Eng. Value (Δ Volt X Calib)	Correction Ma. (+/- 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 (+/- 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: 02-01-00
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
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER/GREG
Date: 02-02-00
Rig TRACK RIG
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): 0 | 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): 0 | 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

PLATE J-

GREGG **CONET**

Daily Baseline Summary

Project No.: 00-300 Project Location: LEGACY (GLOVERS LANE) Client/Rep: KLEINFELDER / NIGEL	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 C10	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): 0 | Final Depth (ft): 133.37 (40.65 m) | 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
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER/ GREG
Date: 02-03-00
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 092 Cone/Size .015	Channel	Start Baseline (Volts)	End Baseline (Volts)	∆ Volt End-Start	∆ Eng. Value (∆ Volt X Calib)	Correction Made (-∆ 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): 0 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)	∆ Volt End-Start	∆ Eng. Value (∆ Volt X Calib)	Correction Made (-∆ 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): 0 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)	∆ Volt End-Start	∆ Eng. Value (∆ Volt X Calib)	Correction Made (-∆ 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-28

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER/MARTIN

Date: 02-04-00
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 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: 300CP40.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:

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: 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	.025	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 Ma (-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 35.75 m	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
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER/ MARTIN

Date: 02-08-00
Rig TRACK
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)	– Volt End-Start	– Eng. Value (– Volt X Calib)	Correction Made (-– 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): 0 | 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)	– Volt End-Start	– Eng. Value (– Volt X Calib)	Correction Made (-– 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	– Eng. Value (– Volt X Calib)	Correction Made (-– 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
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER /
Date: 02-09-00
Rig: TRACK
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)	- Volt End-Start	- Eng. Value (- Volt X Calib)	Correction Made (-- 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): 0	Final Depth (ft): 142.06 43.3	Water Table (ft):	CPT File: 300CP44.DAT

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	- Volt End-Start	- Eng. Value (- Volt X Calib)	Correction Made (-- 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): 0	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)	Volt End-Start	Eng. Value Volt X Calib	Correction Made (-- 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: 0210-00
Project Location: LEGACY HIGHWAY	Rig TRUCK
Client/Rep: KLEINFELDER/MARTIN	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)	Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Mac (-± 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.DA 300CP46.DFT

Sounding Info Cone/Size 090	Channel	Start Baseline (Volts)	End Baseline (Volts)	Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Mac. (-± 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)	Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Mac. (-± 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-33

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER / MARTIN

Date: 02-14-00
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-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 (55.15m) 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.

PLATE J-34

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER / MARTIN

Date: 02-15-00
Rig TRACK
Operator: RED/SGS

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): 0 | Final Depth (ft): 45.28 (13.8 m) | Water Table (ft): | CPT File: 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): 0 | Final Depth (ft): 39.53 (12.05m) | Water Table (ft): | CPT File: 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): 0 | Final Depth (ft): 77.26 (23.55m) | Water Table (ft): | CPT File: 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: LEGACY HIGHWAY
Client/Rep: KLEINFELDER/MARTIN
Date: 2/14/02
Rig TRUCK
Operator: REP/BDS

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	.099	.078	.019	3.8	-3.8
Northing or Latitude	PP	-.099	-.036			—
Easting or Latitude	Temp	.005	.025			

Pre-bore (ft): ~ 3' OF CASING | Start Depth: (ft): 0 | Final Depth (ft): 79.07 (24.10 m) | Water Table (ft): | CPT File: 300CP52

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-27-341	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: 300CP53

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

CONETE

Daily Baseline Summary

Project No.: 00-300	Date: 2/22/00
Project Location: Legacy Hwy	Rig TRUCK
Client/Rep: KLEINFELDER /GREG	Operator: SDO/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 208.3 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 Ma (-Δ Eng.)
Hole No. SC-24-256	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): 0 | Start Depth: (ft): 0 | Final Depth (ft): 39.37 (12.0 m) | Water Table (ft): | CPT File: 300CP54

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 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): 0 | Final Depth (ft): 42.98' 13.10m | Water Table (ft): | CPT File: 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.: CC-300
Project Location: LEGACY HIGHWAY
Client/Rep: KLEINFELDER/GREG

Date: 02-23-00
Rig TRACK
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)	– Volt End-Start	– Eng. Value (– Volt X Calib)	Correction Made (–– Eng.)
Hole No. SC-1-344	Tip	-.099	-.090			—
Elevation (ft)	Sleeve	.040	.060	.020	4.0	-4.0
Northing or Latitude	PP	.145	.197	.052	239	-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)	– Volt End-Start	– Eng. Value (– Volt X Calib)	Correction Ma (–– 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	– Eng. Value Volt X Calib)	Correction Made (–– 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/BRYANT

Date: 02-28-00
Rig TRUCK
Operator: REP/TONL

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)	– Volt End-Start	– Eng. Value (– Volt X Calib)	Correction Made (-– Eng.)
Hole No. 9C-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):	Start Depth: (ft):	Final Depth (ft):	Water Table (ft):	CPT File:
~ 2.0'	0	55.94 (17.05m)		300CP57.D17

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	– Volt End-Start	– Eng. Value (– Volt X Calib)	Correction Made (-– 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	– Eng. Value (– Volt X Calib)	Correction Made (-– 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/ TIM
Date: 02-29-00
Rig: TRUCK
Operator: REP/ TOM

Calibrations @ 7.5Volts	Standard 10 cm^2 cone	Standard 15 cm^2 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)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Made (-± 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)	± Volt End-Start	Eng. Value (± Volt X Calib)	Correction M (-± 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)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Made (-± Eng.)
Hole No. SC-27-344	Tip	-.017	-.017			—
Elevation (ft)	Sleeve	.085	.056			—
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.

PLATE J-40

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300
Project Location: Legacy Highway
Client/Rep: Kleinfelder /NIGILE

Date: 03-01-00
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. SC-22-287	Tip	-.019	-.022			/
Elevation (ft)	Sleeve	.076	.084	-0		/
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)~~: 76.1' | Water Table (ft): | CPT File: 300CP61.DAT

23.2m

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: 03-02-00
Project Location: LEGACY HIGHWAY	Rig TRUCK
Client/Rep: KLEINFELDER / NIHIL	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: 300CP02.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 (-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: 300CP03.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-6-320	Tip	-.024	-.022			/
Elevation (ft)	Sleeve	.083	-.0934			/
Northing or Latitude	PP	-.161	-.122	.039	17.9	-17.9
Easting or Latitude	Temp	1.900	2.237			

Pre-bore (ft): 0 Start Depth: (ft): 0 Final Depth (ft): 139.11 (42.4m) Water Table (ft): CPT File: 300CP[illegible]

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-42

GREGG

CONETEC

Daily Baseline Summary

Project No.: 00-300
Project Location: Leroy Highway
Client/Rep: KLEINFELDER / MICHELLE

Date: 5/1/02
Rig TRUCK
Operator: PEP/DF

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	

SEISMIC

Sounding Info 070 Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Made (-± 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): 122.05 (37.2 m)	Water Table (ft):	CPT File: 300C705

Sounding Info Cone/Size	Channel	Start Baseline (Volts)	End Baseline (Volts)	± Volt End-Start	± Eng. Value (± Volt X Calib)	Correction Made (-± 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	± Eng. Value (± Volt X Calib)	Correction Made (-± 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: 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 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-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: 3007a

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.: 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 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-31-353	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: 300CP07

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-45

GREGG

CONETEC

Daily Baseline Summary

Project No.: CC-300
Project Location: Celery Highway
Client/Rep: KLEINFELDER / NIGEL

Date: 5/4/00
Rig TRUCK
Operator: RFP / 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-33-35B	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: 300P

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

D

References

American Society for Testing and Materials (1996) ASTM D 5778-95 "Performing electronic Friction Cone and Piezocone Penetration Testing of Soils, "Annual Book of ASTM Standards, Vol. 4.08, Philadelphia, PA, pp. 576-593.

Lunne, T., Robertson, P.K. and Powell, J.M.M. (1997) "Cone Penetration Testing in Geotechnical Practice", Blackie Publications, London.

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

ConeTec

Geotechnical and Environmental In Situ Testing Contractors

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

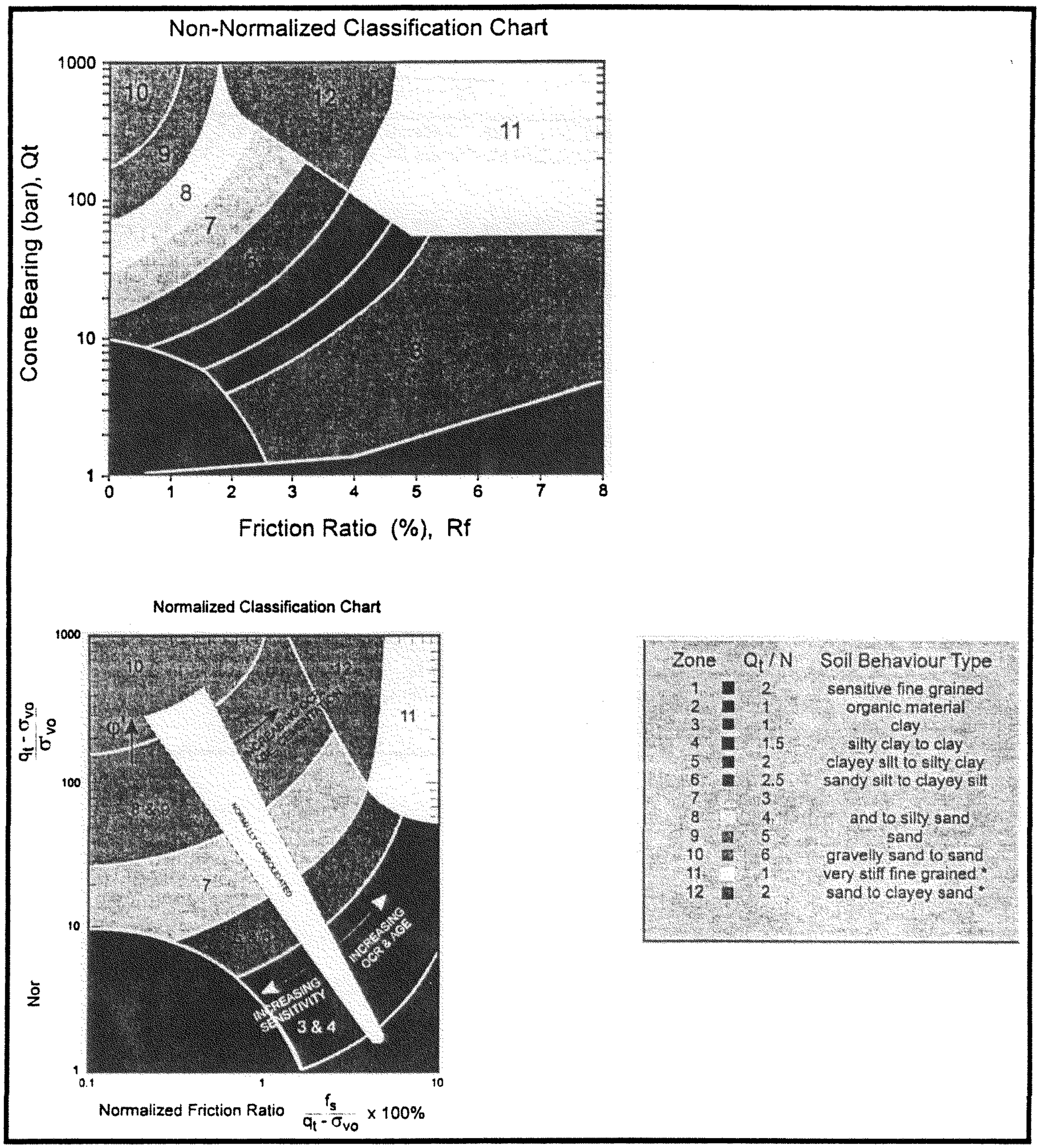
U.Wt.	Unit Weight of soil determined from: 1) uniform value or 2) value assigned to each SBT zone 3) user supplied unit weight profile		
TStress	Total vertical overburden stress at mid layer depth	$TStress = \sum_{i=1}^{n} \gamma_i h_i$ where γ_i is layer unit weight h_i is layer thickness	
EStress	Effective 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	

CONETEC

CPT Interpretations

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	$qc1Ncs = qc1N + \Delta qc1N$	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



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	
8	□	4	and to silty sand
9	■	5	sand
10	■	6	gravelly sand to sand
11	□	1	very stiff fine grained *
12	■	2	sand to clayey sand *

Figure 1 Non-Normalized and Normalized Soil Behaviour Type Classification Charts

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.

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ConeTec Inc. - CPT Interpretation                                         Page:   1
Interpretation Output - Release 1.00.19c
Run No:    00-0518-1635-3652
Job No:    00-300
Client:    Kleinfelder
Project:   Legacy Parkway Project
Site:      SC-12-264
Location: STRUCTURE 12
Cone:      20  TON A 058
CPT Date: 00/26/01
CPT Time: 09:47
CPT File: 300SC264.COR
-------------------------------------------------------------------------------------------
 Water Table (m):               1.00      (ft):    3.3
 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    Depth    AvgQt     AvgFs    AvgRf   E.Stress   Hyd. Pr.  N60   (N1)60     Su     Dr    Phi     OCR
(ft)      (m)     (kPa)     (kPa)     (%)     (kPa)     (kPa)     (blows/ft)     (kPa)   (%)   (deg.) (ratio)
-------------------------------------------------------------------------------------------
  0.25    0.08    568.5      11.0     1.9       1.4       0.0      3.8     7.6    37.8    0.0    0.0    10.0
  0.74    0.23    665.3      23.1     3.5       4.0       0.0      6.7    13.3    44.1    0.0    0.0    10.0
  1.23    0.38    992.7      32.3     3.3       6.7       0.0      6.6    13.2    65.7    0.0    0.0    10.0
  1.72    0.52   2365.6      74.8     3.2       9.4       0.0     11.8    23.7   157.1    0.0    0.0    10.0
  2.21    0.68   2002.0     106.8     5.3      12.0       0.0     20.0    40.0   132.7    0.0    0.0    10.0
  2.71    0.82   1933.3     139.2     7.2      14.7       0.0     19.3    38.7   127.9    0.0    0.0    10.0
  3.20    0.97   1451.4     127.0     8.8      17.3       0.0     14.5    29.0    95.6    0.0    0.0    10.0
  3.61    1.10   1356.4      94.9     7.0      18.5       1.0     13.6    27.1    89.1    0.0    0.0    10.0
  4.02    1.22   1427.4      93.5     6.6      19.5       2.2     14.3    28.5    93.7    0.0    0.0    10.0
  4.51    1.38   1227.8      79.7     6.5      20.6       3.7     12.3    24.6    80.2    0.0    0.0     6.0
  5.00    1.53   1038.7      57.5     5.5      21.8       5.2     10.4    20.8    67.4    0.0    0.0     6.0
  5.50    1.67   1053.9      53.5     5.1      22.9       6.6     10.5    21.1    68.3    0.0    0.0     6.0
  5.99    1.83    998.7      49.5     5.0      24.1       8.1     10.0    19.9    64.4    0.0    0.0     6.0
  6.56    2.00    727.7      37.0     5.1      25.4       9.8      7.3    14.1    46.2    0.0    0.0     6.0
  7.14    2.17    479.4      23.6     4.9      26.8      11.5      4.8     9.1    29.4    0.0    0.0     6.0
  7.63    2.33    681.9      15.2     2.2      28.0      13.0      4.5     8.4    42.7    0.0    0.0     6.0
  8.12    2.47    848.3      15.9     1.9      29.2      14.5      4.2     7.7    53.6    0.0    0.0     6.0
  8.61    2.62    675.8      16.6     2.5      30.4      15.9      4.5     8.0    42.0    0.0    0.0     6.0
  9.10    2.78    511.4      14.6     2.8      31.6      17.4      5.1     8.9    30.8    0.0    0.0     3.0
  9.60    2.92    466.7      18.0     3.9      32.8      18.9      4.7     8.0    27.7    0.0    0.0     3.0
 10.09    3.08    566.0      18.9     3.3      33.9      20.4      5.7     9.5    34.1    0.0    0.0     6.0
 10.58    3.22    544.4      11.3     2.1      35.1      21.8      3.6     6.0    32.5    0.0    0.0     3.0
 11.07    3.38    703.2      17.9     2.5      36.3      23.3      4.7     7.6    42.9    0.0    0.0     6.0
 11.56    3.53    736.2      20.2     2.7      37.6      24.8      4.9     7.8    44.9    0.0    0.0     6.0
 12.06    3.67    683.8      17.5     2.6      38.8      26.2      4.6     7.2    41.3    0.0    0.0     6.0
 12.55    3.83   3002.8      26.2     0.9      40.0      27.7     10.0    15.5     0.0   45.9   40.0     1.0
 13.04    3.98   4961.9      33.9     0.7      41.4      29.2     12.4    18.9     0.0   59.8   42.0     1.0
 13.53    4.12   3861.1      32.3     0.8      42.7      30.7     12.9    19.3     0.0   52.2   42.0     1.0
 14.03    4.27   1511.1      15.3     1.0      44.0      32.1      6.0     8.9    95.7   30.0   36.0     6.0
 14.52    4.43    911.5      12.1     1.3      45.2      33.6      4.6     6.6    55.5    0.0    0.0     6.0
 15.01    4.57    841.9      13.7     1.6      46.5      35.1      4.2     6.0    50.7    0.0    0.0     6.0
 15.50    4.73   1175.8      17.7     1.5      47.7      36.5      5.9     8.3    72.8    0.0    0.0     6.0
 15.99    4.88   2210.0      44.1     2.0      48.9      38.0      8.8    12.4   141.5   34.3   38.0     6.0
 16.49    5.02   4236.8      36.7     0.9      50.2      39.5     14.1    19.5     0.0   52.5   42.0     1.0
 16.98    5.18   1199.6      16.8     1.4      51.4      41.0      6.0     8.2    73.8    0.0    0.0     6.0
 17.47    5.32    965.8       5.7     0.6      52.7      42.4      3.9     5.2    58.0   30.0   32.0     6.0
 17.96    5.48    916.1       8.7     0.9      53.9      43.9      4.6     6.1    54.6    0.0    0.0     6.0
 18.45    5.62   1007.9      11.3     1.1      55.1      45.4      5.0     6.6    60.5    0.0    0.0     6.0
 18.95    5.77   1005.9      18.3     1.8      56.4      46.8      5.0     6.6    60.2    0.0    0.0     6.0
 19.44    5.93   1239.3      30.4     2.5      57.6      48.3      6.2     8.0    75.6    0.0    0.0     6.0
 19.93    6.07   1220.0      32.3     2.6      58.8      49.8      6.1     7.8    74.1    0.0    0.0     6.0
 20.42    6.23   1232.9      54.5     4.4      60.0      51.3     12.3    15.6    74.8    0.0    0.0     6.0
 20.92    6.38   1167.6      51.6     4.4      61.2      52.7     11.7    14.6    70.2    0.0    0.0     6.0
 21.41    6.52   1278.5      54.0     4.2      62.3      54.2     12.8    15.9    77.5    0.0    0.0     6.0
 21.90    6.68   1548.4      58.3     3.8      63.5      55.7     10.3    12.7    95.3    0.0    0.0     6.0
 22.39    6.82   1810.7      96.3     5.3      64.7      57.1     18.1    22.0   112.6    0.0    0.0     6.0
 22.88    6.98   1537.4      49.0     3.2      65.9      58.6      7.7     9.3    94.2    0.0    0.0     6.0
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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	2566.3	33.6	1.3	67.1	60.1	10.3	12.3	162.6	34.0	38.0	6.0
23.87	7.27	1935.1	29.3	1.5	68.3	61.6	7.7	9.2	120.3	30.0	36.0	6.0
24.36	7.43	2687.1	70.4	2.6	69.6	63.0	10.7	12.6	170.3	34.8	38.0	6.0
24.85	7.57	4105.8	149.4	3.6	70.8	64.5	20.5	23.9	264.7	0.0	0.0	6.0
25.34	7.73	2791.1	106.8	3.8	72.0	66.0	14.0	16.1	176.9	0.0	0.0	6.0
25.84	7.88	2438.4	77.0	3.2	73.3	67.4	12.2	13.9	153.2	0.0	0.0	6.0
26.33	8.02	1534.8	45.6	3.0	74.5	68.9	7.7	8.7	92.8	0.0	0.0	6.0
26.82	8.18	1459.4	42.4	2.9	75.7	70.4	7.3	8.2	87.6	0.0	0.0	6.0
27.31	8.32	1178.3	39.2	3.3	76.9	71.9	7.9	8.8	68.6	0.0	0.0	3.0
27.80	8.48	1147.3	39.9	3.5	78.2	73.3	7.6	8.5	66.4	0.0	0.0	3.0
28.30	8.62	3425.8	60.1	1.8	79.4	74.8	13.7	15.1	218.1	39.9	38.0	6.0
28.79	8.77	2894.0	81.0	2.8	80.6	76.3	14.5	15.8	182.5	0.0	0.0	6.0
29.28	8.93	7194.5	73.9	1.0	81.9	77.7	18.0	19.4	0.0	60.7	42.0	1.0
29.77	9.07	10495.9	63.3	0.6	83.3	79.2	21.0	22.5	0.0	71.3	42.0	1.0
30.27	9.23	9343.1	80.3	0.9	84.8	80.7	23.4	24.8	0.0	67.7	42.0	1.0
30.76	9.38	10088.4	80.2	0.8	86.1	82.2	25.2	26.6	0.0	69.7	42.0	1.0
31.17	9.50	12194.6	79.7	0.7	87.3	83.4	24.4	25.5	0.0	74.9	44.0	1.0
31.58	9.62	14005.5	63.4	0.5	88.5	84.6	28.0	29.1	0.0	78.7	44.0	1.0
32.07	9.77	12313.7	48.9	0.4	90.0	86.1	24.6	25.4	0.0	74.8	44.0	1.0
32.56	9.93	11656.6	51.2	0.4	91.4	87.6	23.3	23.9	0.0	73.0	44.0	1.0
33.05	10.07	11890.0	58.0	0.5	92.9	89.0	23.8	24.1	0.0	73.3	44.0	1.0
33.55	10.23	12346.7	55.7	0.5	94.3	90.5	24.7	24.9	0.0	74.2	44.0	1.0
34.04	10.38	16690.2	78.4	0.5	95.8	92.0	33.4	33.4	0.0	82.6	44.0	1.0
34.53	10.52	16286.3	99.6	0.6	97.2	93.4	32.6	32.3	0.0	81.7	44.0	1.0
35.02	10.68	14960.5	68.3	0.5	98.7	94.9	29.9	29.5	0.0	79.0	44.0	1.0
35.51	10.82	11865.0	67.8	0.6	100.2	96.4	23.7	23.2	0.0	72.2	42.0	1.0
36.01	10.98	15892.0	60.5	0.4	101.6	97.9	31.8	30.9	0.0	80.3	44.0	1.0
36.50	11.12	15041.7	70.5	0.5	103.1	99.3	30.1	29.0	0.0	78.5	44.0	1.0
36.99	11.27	12759.3	85.4	0.7	104.5	100.8	25.5	24.4	0.0	73.6	42.0	1.0
37.48	11.43	5010.3	133.6	2.7	105.9	102.3	20.0	19.1	320.1	46.7	38.0	6.0
37.98	11.57	3201.1	74.0	2.3	107.1	103.7	12.8	12.1	199.4	33.6	36.0	6.0
38.47	11.73	4489.8	88.3	2.0	108.3	105.2	18.0	16.9	285.1	43.2	38.0	6.0
38.96	11.88	2731.9	83.4	3.1	109.5	106.7	13.7	12.8	167.7	0.0	0.0	6.0
39.45	12.02	2174.7	67.8	3.1	110.8	108.2	10.9	10.1	130.4	0.0	0.0	6.0
39.94	12.18	2270.3	67.6	3.0	112.0	109.6	11.4	10.5	136.6	0.0	0.0	6.0
40.44	12.32	2594.9	66.2	2.6	113.2	111.1	10.4	9.5	158.0	30.0	34.0	6.0
40.93	12.48	2985.4	48.0	1.6	114.5	112.6	11.9	10.9	183.9	30.7	34.0	6.0
41.42	12.62	2938.1	41.2	1.4	115.7	114.0	11.8	10.7	180.6	30.1	34.0	6.0
41.91	12.77	1729.3	31.7	1.8	116.9	115.5	6.9	6.3	99.8	30.0	32.0	3.0
42.40	12.93	2490.0	56.3	2.3	118.1	117.0	10.0	9.0	150.3	30.0	34.0	6.0
42.90	13.07	4398.3	85.7	1.9	119.4	118.5	17.6	15.8	277.4	41.2	38.0	6.0
43.39	13.23	1843.3	75.1	4.1	120.6	119.9	18.4	16.4	106.9	0.0	0.0	3.0
43.88	13.38	2096.2	105.8	5.0	121.7	121.4	21.0	18.6	123.5	0.0	0.0	6.0
44.37	13.52	2109.9	101.6	4.8	122.9	122.9	21.1	18.6	124.3	0.0	0.0	6.0
44.86	13.68	3302.3	109.1	3.3	124.1	124.3	16.5	14.5	203.6	0.0	0.0	6.0
45.36	13.82	5331.2	125.5	2.4	125.3	125.8	21.3	18.6	338.7	46.0	38.0	6.0
45.85	13.98	4864.6	94.6	1.9	126.6	127.3	16.2	14.1	0.0	43.2	38.0	1.0
46.34	14.12	3119.4	57.3	1.8	127.8	128.8	12.5	10.8	190.9	30.4	34.0	6.0
46.83	14.27	3680.8	64.2	1.7	129.0	130.2	14.7	12.7	228.1	35.0	36.0	6.0
47.33	14.43	1874.7	31.2	1.7	130.3	131.7	7.5	6.4	107.5	30.0	32.0	3.0
47.82	14.57	2924.5	63.5	2.2	131.5	133.2	11.7	10.0	177.3	30.0	34.0	6.0
48.31	14.73	6926.9	73.3	1.1	132.8	134.6	17.3	14.7	0.0	52.7	38.0	1.0
48.80	14.88	2847.6	48.6	1.7	134.1	136.1	11.4	9.6	171.8	30.0	34.0	6.0
49.29	15.02	2020.6	41.3	2.0	135.3	137.6	8.1	6.8	116.5	30.0	32.0	3.0
49.79	15.18	2007.8	69.9	3.5	136.6	139.1	10.0	8.4	115.5	0.0	0.0	3.0
50.28	15.32	3532.8	95.3	2.7	137.8	140.5	14.1	11.8	217.0	32.9	34.0	6.0
50.77	15.48	2535.1	65.0	2.6	139.0	142.0	10.1	8.4	150.3	30.0	32.0	6.0
51.26	15.62	2307.4	56.7	2.5	140.3	143.5	9.2	7.6	134.9	30.0	32.0	3.0
51.75	15.77	2307.8	43.0	1.9	141.5	144.9	9.2	7.6	134.8	30.0	32.0	3.0
52.25	15.93	1753.0	30.7	1.8	142.7	146.4	7.0	5.7	97.6	30.0	30.0	3.0
52.74	16.08	2343.8	40.3	1.7	143.9	147.9	9.4	7.6	136.8	30.0	32.0	3.0
53.23	16.22	2723.9	51.5	1.9	145.2	149.4	10.9	8.9	162.0	30.0	32.0	6.0
53.72	16.38	2002.5	42.6	2.1	146.4	150.8	8.0	6.5	113.7	30.0	30.0	3.0
54.22	16.53	2464.5	80.5	3.3	147.6	152.3	12.3	9.9	144.3	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	2814.0	127.5	4.5	148.8	153.8	28.1	22.6	167.4	0.0	0.0	6.0
55.20	16.83	2854.4	128.4	4.5	150.0	155.2	28.5	22.8	169.9	0.0	0.0	6.0
55.69	16.97	3704.9	139.4	3.8	151.2	156.7	18.5	14.7	226.5	0.0	0.0	6.0
56.18	17.12	5783.7	191.8	3.3	152.4	158.2	28.9	22.9	364.9	0.0	0.0	6.0
56.68	17.28	4811.7	178.2	3.7	153.6	159.7	24.1	19.0	299.9	0.0	0.0	6.0
57.17	17.42	3243.9	135.6	4.2	154.8	161.1	21.6	17.0	195.2	0.0	0.0	6.0
57.66	17.58	3296.0	153.3	4.7	156.0	162.6	33.0	25.8	198.5	0.0	0.0	6.0
58.15	17.72	3594.9	174.5	4.9	157.2	164.1	35.9	28.1	218.2	0.0	0.0	6.0
58.64	17.88	3523.4	188.5	5.3	158.3	165.5	35.2	27.4	213.3	0.0	0.0	6.0
59.14	18.03	3772.6	156.9	4.2	159.5	167.0	25.2	19.5	229.7	0.0	0.0	6.0
59.63	18.17	4002.3	167.0	4.2	160.8	168.5	20.0	15.4	244.9	0.0	0.0	6.0
60.12	18.33	4123.1	183.3	4.4	162.0	170.0	27.5	21.1	252.7	0.0	0.0	6.0
60.61	18.47	6047.8	220.5	3.6	163.2	171.4	30.2	23.2	380.9	0.0	0.0	6.0
61.10	18.62	4387.1	206.6	4.7	164.4	172.9	29.2	22.3	270.0	0.0	0.0	6.0
61.60	18.78	5249.9	161.1	3.1	165.7	174.4	21.0	16.0	327.3	41.6	36.0	6.0
62.09	18.92	5807.2	225.0	3.9	166.9	175.8	29.0	22.0	364.3	0.0	0.0	6.0
62.58	19.08	5506.9	130.3	2.4	168.1	177.3	22.0	16.6	344.1	42.7	36.0	6.0
63.07	19.22	7986.8	145.6	1.8	169.4	178.8	26.6	20.0	0.0	53.3	38.0	1.0
63.57	19.38	5116.6	142.7	2.8	170.7	180.3	20.5	15.3	317.7	40.4	36.0	6.0
64.06	19.53	4717.5	226.6	4.8	171.9	181.7	31.5	23.5	290.9	0.0	0.0	6.0
64.55	19.67	4619.7	213.3	4.6	173.1	183.2	30.8	22.9	284.2	0.0	0.0	6.0
65.04	19.83	3935.1	221.5	5.6	174.3	184.7	39.4	29.2	238.4	0.0	0.0	6.0
65.53	19.97	4038.1	198.0	4.9	175.5	186.1	40.4	29.8	245.1	0.0	0.0	6.0
66.03	20.12	4076.1	177.7	4.4	176.7	187.6	27.2	20.0	247.5	0.0	0.0	6.0
66.52	20.28	4050.7	172.7	4.3	177.9	189.1	27.0	19.8	245.6	0.0	0.0	6.0
67.01	20.42	3795.5	169.9	4.5	179.1	190.6	25.3	18.5	228.4	0.0	0.0	6.0
67.50	20.58	4003.4	133.8	3.3	180.3	192.0	20.0	14.6	242.1	0.0	0.0	6.0
67.99	20.72	4872.9	255.6	5.2	181.5	193.5	48.7	35.4	299.9	0.0	0.0	6.0
68.49	20.88	4350.9	266.8	6.1	182.7	195.0	43.5	31.5	264.9	0.0	0.0	6.0
68.98	21.03	3574.9	186.1	5.2	183.8	196.4	35.7	25.8	213.0	0.0	0.0	6.0
69.47	21.17	3915.7	156.6	4.0	185.0	197.9	19.6	14.1	235.5	0.0	0.0	6.0
69.96	21.33	3584.8	195.2	5.4	186.2	199.4	35.8	25.7	213.3	0.0	0.0	6.0
70.46	21.47	3227.0	177.8	5.5	187.4	200.9	32.3	23.1	189.3	0.0	0.0	6.0
70.95	21.62	2835.1	145.8	5.1	188.5	202.3	28.4	20.2	162.9	0.0	0.0	3.0
71.44	21.78	2395.7	108.7	4.5	189.7	203.8	24.0	17.0	133.5	0.0	0.0	3.0
71.93	21.92	3096.7	100.4	3.2	190.9	205.3	15.5	11.0	180.0	0.0	0.0	3.0
72.42	22.08	2339.0	41.1	1.8	192.1	206.7	9.4	6.6	129.3	30.0	30.0	3.0
72.92	22.22	1700.9	26.2	1.5	193.3	208.2	6.8	4.8	86.6	30.0	30.0	1.5
73.41	22.38	2478.3	47.7	1.9	194.6	209.7	9.9	7.0	138.3	30.0	30.0	3.0
73.90	22.53	3171.0	84.0	2.6	195.8	211.2	12.7	8.9	184.3	30.0	32.0	3.0
74.39	22.67	4461.9	130.1	2.9	197.0	212.6	17.8	12.4	270.2	34.4	34.0	6.0
74.88	22.83	14149.5	144.2	1.0	198.4	214.1	28.3	19.7	0.0	67.4	40.0	1.0
75.38	22.97	8977.1	201.2	2.2	199.7	215.6	29.9	20.7	0.0	54.3	38.0	1.0
75.87	23.12	2903.4	69.2	2.4	201.0	217.0	11.6	8.0	165.7	30.0	32.0	3.0
76.36	23.28	2704.8	84.0	3.1	202.2	218.5	13.5	9.3	152.3	0.0	0.0	3.0
76.85	23.42	2720.4	74.2	2.7	203.5	220.0	13.6	9.3	153.1	0.0	0.0	3.0
77.34	23.58	3141.4	106.8	3.4	204.7	221.5	15.7	10.7	181.0	0.0	0.0	3.0
77.84	23.72	3257.8	139.1	4.3	205.9	222.9	21.7	14.8	188.6	0.0	0.0	3.0
78.33	23.88	3290.2	146.6	4.5	207.1	224.4	21.9	14.9	190.6	0.0	0.0	3.0
78.82	24.03	3601.4	134.1	3.7	208.4	225.9	18.0	12.2	211.1	0.0	0.0	6.0
79.31	24.17	4994.6	200.6	4.0	209.6	227.3	25.0	16.9	303.8	0.0	0.0	6.0
79.81	24.33	4560.0	173.0	3.8	210.8	228.8	22.8	15.4	274.7	0.0	0.0	6.0
80.30	24.47	4355.6	134.9	3.1	212.1	230.3	21.8	14.6	260.9	0.0	0.0	6.0
80.79	24.62	5032.1	221.9	4.4	213.3	231.8	25.2	16.9	305.8	0.0	0.0	6.0
81.28	24.78	4133.8	216.1	5.2	214.5	233.2	41.3	27.6	245.7	0.0	0.0	6.0
81.77	24.92	2977.4	134.9	4.5	215.6	234.7	29.8	19.8	168.5	0.0	0.0	3.0
82.27	25.08	2277.0	89.7	3.9	216.8	236.2	15.2	10.1	121.6	0.0	0.0	3.0
82.76	25.22	2656.7	76.0	2.9	218.1	237.6	13.3	8.8	146.7	0.0	0.0	3.0
83.25	25.38	4841.4	157.9	3.3	219.3	239.1	24.2	16.0	292.2	0.0	0.0	6.0
83.74	25.53	5163.1	200.8	3.9	220.5	240.6	25.8	17.0	313.5	0.0	0.0	6.0
84.23	25.67	3573.2	117.2	3.3	221.7	242.1	17.9	11.7	207.3	0.0	0.0	3.0
84.73	25.83	5264.5	167.3	3.2	223.0	243.5	21.1	13.8	319.9	37.4	34.0	6.0
85.22	25.97	3853.1	125.0	3.2	224.2	245.0	19.3	12.6	225.6	0.0	0.0	6.0
85.71	26.12	3322.1	71.0	2.1	225.4	246.5	13.3	8.7	190.0	30.0	32.0	3.0

ConeTec Inc. - CPT Interpretation

Run No: 00-0518-1635-3652

CPT File: 300SC264.COR

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	3323.8	75.5	2.3	226.7	247.9	13.3	8.6	189.9	30.0	32.0	3.0
86.70	26.42	3364.7	83.6	2.5	227.9	249.4	13.5	8.7	192.5	30.0	32.0	3.0
87.19	26.58	3188.5	93.0	2.9	229.1	250.9	15.9	10.3	180.6	0.0	0.0	3.0
87.68	26.72	2832.4	68.4	2.4	230.3	252.4	11.3	7.3	156.6	30.0	30.0	3.0
88.17	26.88	2701.9	57.9	2.1	231.6	253.8	10.8	7.0	147.8	30.0	30.0	3.0
88.66	27.03	2830.0	63.4	2.2	232.8	255.3	11.3	7.3	156.1	30.0	30.0	3.0
89.16	27.17	3157.0	93.5	3.0	234.0	256.8	15.8	10.1	177.7	0.0	0.0	3.0
89.65	27.33	3190.6	114.5	3.6	235.3	258.2	16.0	10.2	179.8	0.0	0.0	3.0
90.14	27.47	2709.5	103.9	3.8	236.5	259.7	18.1	11.5	147.6	0.0	0.0	3.0
90.63	27.62	2599.2	83.5	3.2	237.7	261.2	13.0	8.2	140.0	0.0	0.0	3.0
91.12	27.78	3362.4	103.5	3.1	238.9	262.7	16.8	10.6	190.7	0.0	0.0	3.0
91.62	27.92	2850.4	107.3	3.8	240.2	264.1	14.3	9.0	156.4	0.0	0.0	3.0
92.11	28.08	2744.4	58.5	2.1	241.4	265.6	11.0	6.9	149.2	30.0	30.0	3.0
92.60	28.22	3021.7	95.9	3.2	242.6	267.1	15.1	9.5	167.5	0.0	0.0	3.0
93.09	28.38	3099.4	125.4	4.0	243.9	268.5	20.7	13.0	172.5	0.0	0.0	3.0
93.58	28.53	2979.9	102.3	3.4	245.1	270.0	14.9	9.3	164.3	0.0	0.0	3.0
94.08	28.67	2915.3	61.3	2.1	246.3	271.5	11.7	7.3	159.8	30.0	30.0	3.0
94.57	28.83	6465.1	71.9	1.1	247.6	273.0	21.6	13.4	0.0	41.8	34.0	1.0
95.06	28.97	18150.1	51.4	0.3	249.0	274.4	36.3	22.5	0.0	71.3	40.0	1.0
95.55	29.12	9332.4	167.7	1.8	250.3	275.9	31.1	19.2	0.0	52.1	38.0	1.0
96.05	29.28	8488.2	242.1	2.9	251.6	277.4	34.0	20.9	530.6	49.4	36.0	6.0
96.54	29.42	17634.7	213.1	1.2	252.9	278.8	44.1	27.1	0.0	70.2	40.0	1.0
97.03	29.58	24985.8	113.7	0.5	254.4	280.3	41.6	25.6	0.0	80.1	42.0	1.0
97.52	29.72	26280.1	71.3	0.3	255.9	281.8	43.8	26.8	0.0	81.5	42.0	1.0
98.01	29.88	26643.4	99.0	0.4	257.4	283.3	44.4	27.1	0.0	81.8	42.0	1.0
98.51	30.03	28140.4	87.6	0.3	258.9	284.7	46.9	28.5	0.0	83.3	42.0	1.0
99.00	30.17	26198.9	82.8	0.3	260.5	286.2	43.7	26.5	0.0	81.2	42.0	1.0
99.49	30.33	25274.1	91.3	0.4	262.0	287.7	42.1	25.5	0.0	80.0	42.0	1.0
99.98	30.47	25346.6	46.4	0.2	263.5	289.1	42.2	25.5	0.0	80.0	42.0	1.0
100.47	30.62	7979.2	148.2	1.9	264.9	290.6	26.6	16.0	0.0	46.8	36.0	1.0
100.97	30.78	3607.6	46.4	1.3	266.2	292.1	12.0	7.2	0.0	30.0	30.0	1.0
101.46	30.92	3646.3	54.1	1.5	267.5	293.6	12.2	7.3	0.0	30.0	30.0	1.0
101.95	31.08	3582.1	76.8	2.1	268.8	295.0	14.3	8.6	201.2	30.0	30.0	3.0
102.44	31.22	3518.9	83.6	2.4	270.0	296.5	14.1	8.4	196.8	30.0	30.0	3.0
102.94	31.38	3427.7	69.2	2.0	271.3	298.0	13.7	8.1	190.6	30.0	30.0	3.0
103.43	31.53	3157.5	60.1	1.9	272.5	299.5	12.6	7.5	172.4	30.0	30.0	3.0
103.92	31.67	2825.1	58.1	2.1	273.7	300.9	11.3	6.7	150.0	30.0	30.0	3.0
104.41	31.83	3234.2	58.3	1.8	275.0	302.4	12.9	7.6	177.1	30.0	30.0	3.0
104.90	31.97	6633.4	77.7	1.2	276.2	303.9	22.1	13.0	0.0	40.9	34.0	1.0
105.40	32.12	7190.3	152.9	2.1	277.5	305.3	24.0	14.1	0.0	43.2	34.0	1.0
105.89	32.28	5687.8	128.6	2.3	278.8	306.8	22.8	13.3	340.1	36.4	32.0	6.0
106.38	32.42	5944.8	101.4	1.7	280.1	308.3	19.8	11.6	0.0	37.6	34.0	1.0
106.87	32.58	3882.3	86.8	2.2	281.3	309.8	15.5	9.1	219.4	30.0	30.0	3.0
107.36	32.72	8967.6	219.1	2.4	282.6	311.2	29.9	17.4	0.0	49.3	36.0	1.0
107.86	32.88	17415.3	279.3	1.6	283.9	312.7	43.5	25.3	0.0	68.2	40.0	1.0
108.35	33.03	19306.0	334.5	1.7	285.3	314.2	48.3	28.0	0.0	71.1	40.0	1.0
108.84	33.17	22451.6	180.0	0.8	286.7	315.6	44.9	26.0	0.0	75.4	40.0	1.0
109.33	33.33	17697.5	101.8	0.6	288.2	317.1	35.4	20.4	0.0	68.5	40.0	1.0
109.82	33.47	16900.3	212.4	1.3	289.6	318.6	42.3	24.3	0.0	67.1	40.0	1.0

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ConeTec Inc. - CPT Interpretation                                      Page:   1
Interpretation Output - Release 1.00.19c
Run No:   00-0524-0019-4161
Job No:   00-300
Client:   Kleinfelder
Project:  Legacy Parkway Project
Site:     SC-31-353
Location: STRUCTURE 31
Cone:      20  TON A 070
CPT Date: 00/03/05
CPT Time: 08:09
CPT File: 300SC353.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    Depth    AvgQt     AvgFs    AvgRf   E.Stress   Hyd. Pr.   N60   (N1)60     Su     Dr    Phi     OCR
 (ft)     (m)     (kPa)     (kPa)     (%)     (kPa)      (kPa)      (blows/ft)     (kPa)   (%)   (deg.)  (ratio)
-------------------------------------------------------------------------------------------
  0.25    0.08   16257.2     92.2     0.6       1.5        0.0     32.5    65.0      0.0   95.0   50.0     1.0
  0.74    0.23   10096.6     75.7     0.7       4.4        0.0     25.2    50.5      0.0   95.0   50.0     1.0
  1.23    0.38    3903.0     65.4     1.7       7.2        0.0     13.0    26.0      0.0   78.1   50.0     1.0
  1.72    0.52    7992.3     67.7     0.8       9.7        0.2     20.0    40.0      0.0   94.2   50.0     1.0
  2.21    0.68    4347.2     40.2     0.9      11.1        1.7     14.5    29.0      0.0   74.9   48.0     1.0
  2.71    0.82    1427.5     31.6     2.2      12.3        3.2      7.1    14.3     94.1    0.0    0.0    10.0
  3.20    0.97     879.6     20.4     2.3      13.6        4.7      4.4     8.8     57.4    0.0    0.0    10.0
  3.61    1.10     856.9     24.9     2.9      14.6        5.9      5.7    11.4     55.8    0.0    0.0     6.0
  4.02    1.22    1043.9     24.9     2.4      15.6        7.1      5.2    10.4     68.1    0.0    0.0    10.0
  4.51    1.38    1698.4     38.3     2.3      16.8        8.6      8.5    17.0    111.5    0.0    0.0    10.0
  5.00    1.53    2468.4     56.2     2.3      18.1       10.1      9.9    19.7    162.7   51.7   44.0    10.0
  5.50    1.67    3254.7     92.9     2.9      19.3       11.5     16.3    32.5    214.9    0.0    0.0    10.0
  5.99    1.83    2600.0     80.1     3.1      20.5       13.0     13.0    26.0    171.1    0.0    0.0    10.0
  6.56    2.00    4380.0    117.3     2.7      22.0       14.7     17.5    35.0    289.6   65.3   46.0    10.0
  7.14    2.17    4239.3    134.7     3.2      23.4       16.4     21.2    42.4    280.0    0.0    0.0    10.0
  7.63    2.33    4542.0    130.2     2.9      24.6       17.9     18.2    35.8    300.0   64.7   44.0    10.0
  8.12    2.47    3934.9    141.1     3.6      25.9       19.4     19.7    37.9    259.3    0.0    0.0    10.0
  8.61    2.62    2440.6     96.4     3.9      27.1       20.8     16.3    30.6    159.5    0.0    0.0    10.0
  9.10    2.78    2483.5     77.6     3.1      28.3       22.3     12.4    22.8    162.2    0.0    0.0    10.0
  9.60    2.92    2129.2     74.7     3.5      29.5       23.8     10.6    19.2    138.4    0.0    0.0    10.0
 10.09    3.08    2082.6     79.8     3.8      30.8       25.3     13.9    24.5    135.1    0.0    0.0    10.0
 10.58    3.22    1984.1     90.0     4.5      32.0       26.7     19.8    34.4    128.4    0.0    0.0    10.0
 11.07    3.38    2066.5     63.2     3.1      33.1       28.2     10.3    17.6    133.7    0.0    0.0    10.0
 11.56    3.53    1554.0     39.3     2.5      34.4       29.7      7.8    13.0     99.3    0.0    0.0     6.0
 12.06    3.67    1662.9     30.6     1.8      35.6       31.1      6.7    10.9    106.4   30.7   38.0     6.0
 12.55    3.83    1639.9     42.1     2.6      36.8       32.6      8.2    13.2    104.7    0.0    0.0     6.0
 13.04    3.98    1296.8     36.7     2.8      38.1       34.1      6.5    10.3     81.6    0.0    0.0     6.0
 13.53    4.12    1205.4     30.0     2.5      39.3       35.6      6.0     9.4     75.4    0.0    0.0     6.0
 14.03    4.27    1193.0     30.6     2.6      40.5       37.0      6.0     9.2     74.4    0.0    0.0     6.0
 14.52    4.43    1047.7     25.5     2.4      41.7       38.5      5.2     7.9     64.5    0.0    0.0     6.0
 15.01    4.57    1421.1     25.9     1.8      43.0       40.0      7.1    10.6     89.2    0.0    0.0     6.0
 15.50    4.73    1745.1     37.0     2.1      44.2       41.4      7.0    10.3    110.6   30.0   38.0     6.0
 15.99    4.88    2216.5     34.5     1.6      45.4       42.9      8.9    12.9    141.9   35.4   38.0     6.0
 16.49    5.02    1188.7     26.2     2.2      46.7       44.4      5.9     8.5     73.2    0.0    0.0     6.0
 16.98    5.18    3608.9     41.5     1.1      47.9       45.9     12.0    17.0      0.0   48.6   40.0     1.0
 17.47    5.32    8728.6     24.9     0.3      49.3       47.3     17.5    24.3      0.0   73.5   44.0     1.0
 17.96    5.48    7937.6     22.0     0.3      50.7       48.8     19.8    27.3      0.0   70.4   44.0     1.0
 18.45    5.62    4557.5     50.8     1.1      52.1       50.3     15.2    20.6      0.0   54.1   42.0     1.0
 18.95    5.77    1412.5     41.8     3.0      53.3       51.7      7.1     9.5     87.2    0.0    0.0     6.0
 19.44    5.93     703.0     20.4     2.9      54.6       53.2      4.7     6.2     39.7    0.0    0.0     3.0
 19.93    6.07     667.8     16.6     2.5      55.8       54.7      4.5     5.8     37.2    0.0    0.0     3.0
 20.42    6.23     643.7     17.2     2.7      57.0       56.2      4.3     5.6     35.4    0.0    0.0     3.0
 20.92    6.38     600.1     14.7     2.4      58.2       57.6      4.0     5.1     32.3    0.0    0.0     3.0
 21.41    6.52     605.3      8.6     1.4      59.5       59.1      3.0     3.8     32.5    0.0    0.0     3.0
 21.90    6.68     551.6      6.1     1.1      60.3       60.6      2.8     3.5     28.7    0.0    0.0     1.5
 22.39    6.82     519.2      7.0     1.4      60.7       62.0      2.6     3.3     26.4    0.0    0.0     1.5
 22.88    6.98     529.9      5.7     1.1      61.1       63.5      2.6     3.3     27.0    0.0    0.0     1.5
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ConeTec Inc. - CPT Interpretation

Run No: 00-0524-0019-4161
CPT File: 300SC353.COR

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	487.3	7.3	1.5	61.9	65.0	3.2	4.0	24.0	0.0	0.0	1.5
23.87	7.27	1057.8	16.0	1.5	63.1	66.5	5.3	6.5	61.9	0.0	0.0	3.0
24.36	7.43	3461.1	34.2	1.0	64.4	67.9	11.5	14.1	0.0	43.2	38.0	1.0
24.85	7.57	7892.1	43.4	0.6	65.7	69.4	19.7	23.8	0.0	66.5	42.0	1.0
25.34	7.73	8039.9	55.5	0.7	67.1	70.9	20.1	24.0	0.0	66.7	42.0	1.0
25.84	7.88	1793.7	43.1	2.4	68.4	72.3	9.0	10.6	110.2	0.0	0.0	6.0
26.33	8.02	1249.6	16.0	1.3	69.7	73.8	5.0	5.9	73.7	30.0	32.0	6.0
26.82	8.18	1384.1	23.0	1.7	70.9	75.3	5.5	6.4	82.5	30.0	32.0	6.0
27.31	8.32	985.9	21.7	2.2	72.1	76.8	4.9	5.7	55.8	0.0	0.0	3.0
27.80	8.48	1104.7	14.0	1.3	73.3	78.2	5.5	6.3	63.5	0.0	0.0	3.0
28.30	8.62	1278.8	17.2	1.3	74.6	79.7	5.1	5.8	75.0	30.0	32.0	6.0
28.79	8.77	1203.6	21.7	1.8	75.8	81.2	6.0	6.8	69.8	0.0	0.0	3.0
29.28	8.93	904.4	16.6	1.8	77.0	82.6	4.5	5.0	49.6	0.0	0.0	3.0
29.77	9.07	771.0	24.3	3.1	78.2	84.1	7.7	8.5	40.6	0.0	0.0	3.0
30.27	9.23	787.4	17.2	2.2	79.4	85.6	3.9	4.3	41.5	0.0	0.0	3.0
30.76	9.38	681.4	8.0	1.2	80.6	87.1	3.4	3.7	34.2	0.0	0.0	1.5
31.17	9.50	1201.5	8.6	0.7	81.7	88.3	4.8	5.2	68.8	30.0	32.0	3.0
31.58	9.62	2404.7	38.9	1.6	82.7	89.5	9.6	10.4	148.8	30.0	36.0	6.0
32.07	9.77	920.3	14.0	1.5	83.9	91.0	4.6	4.9	49.7	0.0	0.0	3.0
32.56	9.93	751.6	5.1	0.7	85.1	92.5	3.8	4.0	38.3	0.0	0.0	1.5
33.05	10.07	851.4	6.7	0.8	86.4	93.9	4.3	4.5	44.7	0.0	0.0	3.0
33.55	10.23	811.4	7.3	0.9	87.6	95.4	4.1	4.2	41.9	0.0	0.0	1.5
34.04	10.38	854.1	8.0	0.9	88.8	96.9	4.3	4.4	44.6	0.0	0.0	3.0
34.53	10.52	1284.1	8.0	0.6	90.1	98.3	5.1	5.3	73.0	30.0	30.0	3.0
35.02	10.68	1397.8	23.9	1.7	91.3	99.8	7.0	7.2	80.4	0.0	0.0	3.0
35.51	10.82	1129.2	13.7	1.2	92.5	101.3	4.5	4.6	62.4	30.0	30.0	3.0
36.01	10.98	1444.4	18.2	1.3	93.7	102.8	5.8	5.8	83.2	30.0	32.0	3.0
36.50	11.12	1537.6	20.4	1.3	95.0	104.2	6.2	6.2	89.2	30.0	32.0	3.0
36.99	11.27	996.7	14.4	1.4	96.2	105.7	5.0	5.0	53.0	0.0	0.0	3.0
37.48	11.43	821.2	12.4	1.5	97.4	107.2	4.1	4.1	41.1	0.0	0.0	1.5
37.98	11.57	761.4	9.6	1.3	98.7	108.6	3.8	3.8	36.9	0.0	0.0	1.5
38.47	11.73	860.5	7.0	0.8	99.9	110.1	4.3	4.2	43.4	0.0	0.0	1.5
38.96	11.88	1063.0	12.1	1.1	101.1	111.6	4.3	4.1	56.7	30.0	30.0	3.0
39.45	12.02	1142.1	22.7	2.0	102.3	113.1	5.7	5.5	61.8	0.0	0.0	3.0
39.94	12.18	2428.7	73.1	3.0	103.6	114.5	12.1	11.7	147.4	0.0	0.0	6.0
40.44	12.32	6461.5	192.5	3.0	104.8	116.0	25.8	24.7	416.0	54.1	40.0	6.0
40.93	12.48	15078.6	153.5	1.0	106.1	117.5	30.2	28.6	0.0	78.2	44.0	1.0
41.42	12.62	16458.8	91.3	0.6	107.6	118.9	32.9	31.1	0.0	80.5	44.0	1.0
41.91	12.77	16572.2	187.7	1.1	109.0	120.4	41.4	38.8	0.0	80.5	44.0	1.0
42.40	12.93	26832.5	75.3	0.3	110.5	121.9	44.7	41.6	0.0	94.1	46.0	1.0
42.90	13.07	19280.1	75.3	0.4	112.0	123.4	38.6	35.7	0.0	84.5	44.0	1.0
43.39	13.23	5598.6	117.5	2.1	113.3	124.8	18.7	17.2	0.0	48.9	38.0	1.0
43.88	13.38	3495.2	67.0	1.9	114.6	126.3	14.0	12.8	217.0	35.2	36.0	6.0
44.37	13.52	4709.6	120.0	2.5	115.8	127.8	18.8	17.1	297.7	43.6	38.0	6.0
44.86	13.68	15521.3	168.9	1.1	117.1	129.2	38.8	35.1	0.0	77.6	44.0	1.0
45.36	13.82	25323.6	75.3	0.3	118.6	130.7	42.2	37.9	0.0	91.5	46.0	1.0
45.85	13.98	27552.6	65.1	0.2	120.1	132.2	45.9	41.0	0.0	93.7	46.0	1.0
46.34	14.12	27884.8	61.3	0.2	121.6	133.7	46.5	41.2	0.0	93.9	46.0	1.0
46.83	14.27	26204.4	101.2	0.4	123.2	135.1	43.7	38.5	0.0	91.9	46.0	1.0
47.33	14.43	24176.4	107.6	0.4	124.7	136.6	40.3	35.3	0.0	89.4	44.0	1.0
47.82	14.57	11293.1	147.5	1.3	126.1	138.1	28.2	24.6	0.0	67.4	42.0	1.0
48.31	14.73	4282.3	83.9	2.0	127.5	139.5	17.1	14.8	267.7	39.5	36.0	6.0
48.80	14.88	3568.6	64.5	1.8	128.7	141.0	14.3	12.3	219.9	34.1	36.0	6.0
49.29	15.02	2819.7	74.7	2.6	129.9	142.5	11.3	9.7	169.8	30.0	34.0	6.0
49.79	15.18	7193.2	227.9	3.2	131.1	144.0	28.8	24.6	461.2	53.9	40.0	6.0
50.28	15.32	10887.8	313.8	2.9	132.4	145.4	43.6	37.0	707.3	65.7	42.0	10.0
50.77	15.48	4917.6	259.5	5.3	133.6	146.9	49.2	41.6	309.1	0.0	0.0	6.0
51.26	15.62	3207.1	123.5	3.9	134.7	148.4	16.0	13.5	194.9	0.0	0.0	6.0
51.75	15.77	3481.5	139.8	4.0	136.0	149.8	17.4	14.6	213.0	0.0	0.0	6.0
52.25	15.93	3316.2	180.3	5.4	137.2	151.3	33.2	27.7	201.8	0.0	0.0	6.0
52.74	16.08	4630.5	189.9	4.1	138.4	152.8	23.2	19.3	289.3	0.0	0.0	6.0
53.23	16.22	3762.7	182.3	4.8	139.6	154.3	37.6	31.2	231.3	0.0	0.0	6.0
53.72	16.38	2625.4	89.7	3.4	140.7	155.7	13.1	10.8	155.3	0.0	0.0	6.0
54.22	16.53	2064.2	68.0	3.3	142.0	157.2	10.3	8.5	117.7	0.0	0.0	3.0

Depth	Depth	AvgQt	AvgFs	AvgRf	E.Stress	Hyd. Pr.	N60	(N1)60	Su	Dr	Phi	OCR
(ft)	(m)	(kPa)	(kPa)	(%)	(kPa)	(kPa)	(blows/ft)		(kPa)	(%)	(deg.)	(ratio)
54.71	16.67	2289.0	98.0	4.3	143.2	158.7	22.9	18.7	132.5	0.0	0.0	3.0
55.20	16.83	2105.4	108.8	5.2	144.3	160.1	21.1	17.2	120.1	0.0	0.0	3.0
55.69	16.97	2067.0	89.4	4.3	145.5	161.6	20.7	16.8	117.3	0.0	0.0	3.0
56.18	17.12	1850.4	67.4	3.6	146.7	163.1	12.3	10.0	102.7	0.0	0.0	3.0
56.68	17.28	2082.1	77.6	3.7	147.9	164.6	13.9	11.2	118.0	0.0	0.0	3.0
57.17	17.42	4388.8	69.6	1.6	149.2	166.0	14.6	11.7	0.0	37.9	36.0	1.0
57.66	17.58	13244.6	100.2	0.8	150.5	167.5	26.5	21.1	0.0	69.5	42.0	1.0
58.15	17.72	10762.4	152.6	1.4	151.9	169.0	26.9	21.4	0.0	63.4	40.0	1.0
58.64	17.88	11242.7	236.8	2.1	153.3	170.4	37.5	29.6	0.0	64.5	40.0	1.0
59.14	18.03	7131.2	188.0	2.6	154.6	171.9	28.5	22.5	453.6	51.3	38.0	6.0
59.63	18.17	5338.6	171.7	3.2	155.8	173.4	21.4	16.7	334.0	42.9	36.0	6.0
60.12	18.33	3452.6	129.3	3.7	157.0	174.9	17.3	13.5	208.1	0.0	0.0	6.0
60.61	18.47	2636.5	82.0	3.1	158.2	176.3	13.2	10.3	153.5	0.0	0.0	3.0
61.10	18.62	1857.7	54.6	2.9	159.5	177.8	9.3	7.2	101.4	0.0	0.0	3.0
61.60	18.78	1999.9	37.7	1.9	160.7	179.3	8.0	6.2	110.7	30.0	30.0	3.0
62.09	18.92	1467.7	24.3	1.7	161.9	180.7	5.9	4.5	75.0	30.0	30.0	1.5
62.58	19.08	1667.0	38.3	2.3	163.2	182.2	8.3	6.4	88.1	0.0	0.0	3.0
63.07	19.22	2076.4	52.3	2.5	164.4	183.7	10.4	7.9	115.2	0.0	0.0	3.0
63.57	19.38	1989.9	51.4	2.6	165.6	185.2	9.9	7.6	109.3	0.0	0.0	3.0
64.06	19.53	2061.8	57.5	2.8	166.8	186.6	10.3	7.8	113.9	0.0	0.0	3.0
64.55	19.67	5570.2	124.5	2.2	168.1	188.1	22.3	16.8	347.6	43.1	36.0	6.0
65.04	19.83	11804.5	161.2	1.4	169.4	189.6	29.5	22.2	0.0	64.5	40.0	1.0
65.53	19.97	14045.2	193.4	1.4	170.8	191.0	35.1	26.3	0.0	69.3	42.0	1.0
66.03	20.12	14594.1	115.9	0.8	172.2	192.5	29.2	21.8	0.0	70.3	42.0	1.0
66.52	20.28	14636.3	133.7	0.9	173.6	194.0	29.3	21.7	0.0	70.3	42.0	1.0
67.01	20.42	15530.2	167.9	1.1	175.0	195.5	38.8	28.7	0.0	71.9	42.0	1.0
67.50	20.58	19343.6	228.2	1.2	176.4	196.9	48.4	35.6	0.0	78.1	42.0	1.0
67.99	20.72	22988.6	273.9	1.2	177.8	198.4	46.0	33.7	0.0	82.9	44.0	1.0
68.49	20.88	26780.7	218.0	0.8	179.3	199.9	53.6	39.1	0.0	87.1	44.0	1.0
68.98	21.03	27283.1	178.4	0.7	180.7	201.4	54.6	39.7	0.0	87.6	44.0	1.0
69.47	21.17	27589.0	95.8	0.3	182.2	202.8	46.0	33.3	0.0	87.8	44.0	1.0
69.96	21.33	15149.3	146.2	1.0	183.7	204.3	30.3	21.9	0.0	70.5	42.0	1.0
70.46	21.47	3620.6	116.2	3.2	185.1	205.8	18.1	13.0	215.3	0.0	0.0	6.0
70.95	21.62	3085.7	28.4	0.9	186.3	207.2	10.3	7.4	0.0	30.0	32.0	1.0
71.44	21.78	3341.8	53.3	1.6	187.6	208.7	13.4	9.6	196.4	30.0	32.0	6.0
71.93	21.92	3208.3	70.5	2.2	188.8	210.2	12.8	9.1	187.3	30.0	32.0	3.0
72.42	22.08	2522.6	61.6	2.4	190.0	211.7	10.1	7.2	141.4	30.0	30.0	3.0
72.92	22.22	2556.0	76.0	3.0	191.3	213.1	12.8	9.0	143.4	0.0	0.0	3.0
73.41	22.38	2550.0	88.1	3.5	192.5	214.6	12.8	9.0	142.9	0.0	0.0	3.0
73.90	22.53	2275.3	71.2	3.1	193.7	216.1	11.4	8.0	124.4	0.0	0.0	3.0
74.39	22.67	2223.7	103.1	4.6	194.9	217.5	22.2	15.6	120.8	0.0	0.0	3.0
74.88	22.83	2270.5	90.7	4.0	196.1	219.0	15.1	10.6	123.7	0.0	0.0	3.0
75.38	22.97	2239.7	60.0	2.7	197.3	220.5	11.2	7.8	121.5	0.0	0.0	3.0
75.87	23.12	2225.8	54.3	2.4	198.6	222.0	8.9	6.2	120.4	30.0	30.0	3.0
76.36	23.28	2304.1	49.5	2.1	199.8	223.4	9.2	6.4	125.4	30.0	30.0	3.0
76.85	23.42	2959.8	80.1	2.7	201.0	224.9	11.8	8.2	168.9	30.0	32.0	3.0
77.34	23.58	3756.0	106.0	2.8	202.3	226.4	15.0	10.3	221.8	30.0	32.0	6.0
77.84	23.72	3018.1	92.2	3.1	203.5	227.8	15.1	10.4	172.5	0.0	0.0	3.0
78.33	23.88	2343.7	55.2	2.4	204.7	229.3	9.4	6.4	127.3	30.0	30.0	3.0
78.82	24.03	8829.1	123.2	1.4	206.0	230.8	22.1	15.1	0.0	53.3	38.0	1.0
79.31	24.17	17785.6	203.3	1.1	207.4	232.3	44.5	30.2	0.0	73.3	42.0	1.0
79.81	24.33	19346.7	210.0	1.1	208.8	233.7	38.7	26.2	0.0	75.6	42.0	1.0
80.30	24.47	20426.7	193.4	0.9	210.3	235.2	40.9	27.6	0.0	77.1	42.0	1.0
80.79	24.62	18457.4	203.0	1.1	211.7	236.7	36.9	24.8	0.0	74.1	42.0	1.0
81.28	24.78	16770.0	208.8	1.2	213.1	238.1	41.9	28.1	0.0	71.2	40.0	1.0
81.77	24.92	20159.9	173.3	0.9	214.6	239.6	40.3	26.9	0.0	76.4	42.0	1.0
82.27	25.08	17163.7	145.9	0.8	216.0	241.1	34.3	22.9	0.0	71.7	42.0	1.0
82.76	25.22	14905.3	279.3	1.9	217.4	242.6	49.7	33.0	0.0	67.6	40.0	1.0
83.25	25.38	22847.2	300.0	1.3	218.7	244.0	57.1	37.8	0.0	79.7	42.0	1.0
83.74	25.53	24430.2	270.7	1.1	220.1	245.5	48.9	32.2	0.0	81.6	42.0	1.0
84.23	25.67	24213.8	216.1	0.9	221.6	247.0	48.4	31.8	0.0	81.2	42.0	1.0
84.73	25.83	22723.8	214.5	0.9	223.0	248.4	45.4	29.8	0.0	79.3	42.0	1.0
85.22	25.97	20313.4	202.7	1.0	224.5	249.9	40.6	26.5	0.0	76.0	42.0	1.0
85.71	26.12	18996.3	203.0	1.1	226.0	251.4	38.0	24.7	0.0	74.0	42.0	1.0

Depth	Depth	AvgQt	AvgFs	AvgRf	E.Stress	Hyd. Pr.	N60	(N1)60	Su	Dr	Phi	OCR
(ft)	(m)	(kPa)	(kPa)	(%)	(kPa)	(kPa)	(blows/ft)		(kPa)	(%)	(deg.)	(ratio)
86.20	26.28	15238.6	166.9	1.1	227.4	252.9	38.1	24.7	0.0	67.6	40.0	1.0
86.70	26.42	5329.8	158.6	3.0	228.7	254.3	21.3	13.8	323.1	37.4	34.0	6.0
87.19	26.58	3025.5	68.9	2.3	229.9	255.8	12.1	7.8	169.3	30.0	30.0	3.0
87.68	26.72	2530.6	49.8	2.0	231.1	257.3	10.1	6.5	136.1	30.0	30.0	3.0
88.17	26.88	2691.1	56.2	2.1	232.4	258.7	10.8	6.9	146.7	30.0	30.0	3.0
88.66	27.03	2439.1	57.5	2.4	233.6	260.2	9.8	6.2	129.7	30.0	30.0	3.0
89.16	27.17	2627.4	50.8	1.9	234.8	261.7	10.5	6.7	142.1	30.0	30.0	3.0
89.65	27.33	2146.6	33.2	1.5	236.0	263.2	8.6	5.5	109.8	30.0	30.0	1.5
90.14	27.47	3593.7	61.9	1.7	237.3	264.6	14.4	9.1	206.1	30.0	32.0	3.0
90.63	27.62	10434.5	104.4	1.0	238.6	266.1	26.1	16.5	0.0	56.0	38.0	1.0
91.12	27.78	11202.5	115.6	1.0	240.0	267.6	28.0	17.7	0.0	58.0	38.0	1.0
91.62	27.92	3661.8	104.1	2.8	241.3	269.0	14.6	9.2	210.1	30.0	32.0	3.0
92.11	28.08	1783.6	34.5	1.9	242.5	270.5	7.1	4.5	84.7	30.0	30.0	1.5
92.60	28.22	2072.9	39.6	1.9	243.7	272.0	8.3	5.2	103.8	30.0	30.0	1.5
93.09	28.38	3179.9	100.2	3.2	244.9	273.5	15.9	9.9	177.4	0.0	0.0	3.0
93.58	28.53	4880.0	109.2	2.2	246.2	274.9	19.5	12.2	290.6	33.8	32.0	6.0
94.08	28.67	3281.1	81.7	2.5	247.4	276.4	13.1	8.2	183.8	30.0	30.0	3.0
94.57	28.83	3472.2	75.3	2.2	248.6	277.9	13.9	8.6	196.4	30.0	30.0	3.0
95.06	28.97	3017.7	76.6	2.5	249.9	279.3	12.1	7.5	165.9	30.0	30.0	3.0
95.55	29.12	2091.2	35.1	1.7	251.1	280.8	8.4	5.2	104.0	30.0	30.0	1.5
96.05	29.28	1923.4	21.1	1.1	252.3	282.3	7.7	4.7	92.6	30.0	30.0	1.5
96.54	29.42	1745.1	18.5	1.1	253.5	283.8	7.0	4.3	80.5	30.0	30.0	1.5
97.03	29.58	2168.6	42.8	2.0	254.8	285.2	8.7	5.3	108.6	30.0	30.0	1.5
97.52	29.72	2506.5	81.1	3.2	256.0	286.7	12.5	7.7	130.9	0.0	0.0	3.0
98.01	29.88	4242.1	152.3	3.6	257.2	288.2	21.2	12.9	246.4	0.0	0.0	3.0
98.51	30.03	2391.5	74.4	3.1	258.5	289.6	12.0	7.3	122.9	0.0	0.0	1.5
99.00	30.17	2150.7	70.5	3.3	259.7	291.1	10.8	6.5	106.7	0.0	0.0	1.5
99.49	30.33	4741.4	158.6	3.3	260.9	292.6	23.7	14.4	279.2	0.0	0.0	6.0
99.98	30.47	2467.1	88.1	3.6	262.1	294.1	12.3	7.5	127.4	0.0	0.0	1.5
100.47	30.62	1721.9	47.6	2.8	263.4	295.5	8.6	5.2	77.5	0.0	0.0	1.5
100.97	30.78	2038.1	57.8	2.8	264.6	297.0	10.2	6.1	98.4	0.0	0.0	1.5
101.46	30.92	2106.7	62.2	3.0	265.8	298.5	10.5	6.3	102.8	0.0	0.0	1.5
101.95	31.08	2439.2	64.5	2.6	267.1	299.9	12.2	7.3	124.8	0.0	0.0	1.5
102.44	31.22	2626.9	83.0	3.2	268.3	301.4	13.1	7.8	137.1	0.0	0.0	3.0
102.94	31.38	2247.4	86.5	3.8	269.5	302.9	15.0	8.9	111.7	0.0	0.0	1.5
103.43	31.53	1734.5	36.7	2.1	270.7	304.4	6.9	4.1	77.3	30.0	30.0	1.5
103.92	31.67	1726.7	26.8	1.6	272.0	305.8	6.9	4.1	76.6	30.0	30.0	1.5
104.41	31.83	1847.6	30.0	1.6	273.2	307.3	7.4	4.4	84.5	30.0	30.0	1.5
104.90	31.97	2157.8	36.7	1.7	274.4	308.8	8.6	5.1	105.0	30.0	30.0	1.5
105.40	32.12	2019.1	33.2	1.6	275.7	310.2	8.1	4.8	95.5	30.0	30.0	1.5
105.89	32.28	2098.5	38.9	1.9	276.9	311.7	8.4	4.9	100.7	30.0	30.0	1.5
106.38	32.42	2251.9	59.4	2.6	278.1	313.2	11.3	6.6	110.7	0.0	0.0	1.5
106.87	32.58	2489.0	64.5	2.6	279.3	314.7	12.4	7.3	126.3	0.0	0.0	1.5
107.36	32.72	2475.7	78.5	3.2	280.6	316.1	12.4	7.2	125.3	0.0	0.0	1.5
107.86	32.88	2431.5	74.1	3.0	281.8	317.6	12.2	7.1	122.1	0.0	0.0	1.5
108.35	33.03	2337.2	70.9	3.0	283.0	319.1	11.7	6.8	115.7	0.0	0.0	1.5
108.84	33.17	2224.9	66.7	3.0	284.3	320.5	11.1	6.5	108.0	0.0	0.0	1.5
109.33	33.33	2389.5	71.8	3.0	285.5	322.0	11.9	6.9	118.8	0.0	0.0	1.5
109.82	33.47	2358.4	73.7	3.1	286.7	323.5	11.8	6.8	116.5	0.0	0.0	1.5
110.32	33.62	2242.4	67.7	3.0	287.9	325.0	11.2	6.5	108.6	0.0	0.0	1.5
110.81	33.78	2520.0	73.1	2.9	289.2	326.4	12.6	7.3	127.0	0.0	0.0	1.5
111.30	33.92	2609.0	82.4	3.2	290.4	327.9	13.0	7.5	132.7	0.0	0.0	1.5
111.79	34.08	2818.4	90.0	3.2	291.6	329.4	14.1	8.1	146.5	0.0	0.0	3.0
112.29	34.22	3215.6	104.7	3.3	292.9	330.8	16.1	9.2	172.8	0.0	0.0	3.0
112.78	34.38	5779.1	163.8	2.8	294.1	332.3	23.1	13.2	343.5	36.1	32.0	6.0
113.27	34.53	4348.0	100.9	2.3	295.3	333.8	17.4	9.9	247.9	30.0	32.0	3.0
113.76	34.67	2506.3	48.2	1.9	296.5	335.3	10.0	5.7	125.0	30.0	30.0	1.5
114.25	34.83	2492.0	58.1	2.3	297.8	336.7	10.0	5.7	123.8	30.0	30.0	1.5
114.75	34.97	2371.5	61.0	2.6	299.0	338.2	11.9	6.7	115.6	0.0	0.0	1.5
115.24	35.12	2436.1	79.5	3.3	300.2	339.7	12.2	6.9	119.7	0.0	0.0	1.5
115.73	35.28	2811.7	75.0	2.7	301.5	341.1	11.2	6.3	144.6	30.0	30.0	1.5
116.22	35.42	3347.9	118.4	3.5	302.7	342.6	16.7	9.4	180.2	0.0	0.0	3.0
116.71	35.58	2758.5	103.4	3.7	303.9	344.1	13.8	7.7	140.7	0.0	0.0	1.5
117.21	35.72	2731.9	102.1	3.7	305.1	345.6	13.7	7.7	138.7	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)
117.70	35.88	2464.4	83.3	3.4	306.4	347.0	12.3	6.9	120.7	0.0	0.0	1.5
118.19	36.03	2632.0	77.2	2.9	307.6	348.5	13.2	7.3	131.7	0.0	0.0	1.5
118.68	36.17	3358.3	98.0	2.9	308.8	350.0	16.8	9.4	180.0	0.0	0.0	3.0
119.18	36.33	4204.8	157.4	3.7	310.1	351.4	21.0	11.7	236.2	0.0	0.0	3.0
119.67	36.47	3169.3	91.0	2.9	311.3	352.9	15.8	8.8	167.0	0.0	0.0	3.0
120.16	36.62	4188.6	142.4	3.4	312.5	354.4	20.9	11.6	234.8	0.0	0.0	3.0
120.65	36.78	5963.1	238.1	4.0	313.7	355.9	29.8	16.5	352.9	0.0	0.0	6.0
121.14	36.92	6498.1	258.2	4.0	315.0	357.3	32.5	17.9	388.4	0.0	0.0	6.0
121.64	37.08	6609.4	212.3	3.2	316.2	358.8	26.4	14.6	395.6	38.9	34.0	6.0
122.21	37.25	6381.6	240.4	3.8	317.6	360.5	31.9	17.5	380.2	0.0	0.0	6.0
122.78	37.42	5264.5	114.3	2.2	319.1	362.2	21.1	11.5	305.5	32.3	32.0	3.0
123.28	37.58	3503.0	116.8	3.3	320.3	363.7	17.5	9.6	187.9	0.0	0.0	3.0
123.77	37.72	3285.3	95.4	2.9	321.5	365.2	16.4	9.0	173.2	0.0	0.0	3.0
124.26	37.88	3984.1	129.6	3.3	322.8	366.6	19.9	10.9	219.6	0.0	0.0	3.0
124.75	38.03	4663.2	146.2	3.1	324.0	368.1	23.3	12.7	264.7	0.0	0.0	3.0
125.24	38.17	6245.9	135.0	2.2	325.2	369.6	20.8	11.3	0.0	36.9	32.0	1.0
125.74	38.33	3211.4	80.4	2.5	326.5	371.1	12.8	7.0	167.6	30.0	30.0	3.0
126.23	38.47	2941.6	48.5	1.6	327.7	372.5	11.8	6.4	149.4	30.0	30.0	1.5
126.72	38.62	2674.7	60.6	2.3	329.0	374.0	10.7	5.8	131.5	30.0	30.0	1.5
127.21	38.78	3413.1	76.9	2.3	330.2	375.5	13.7	7.4	180.5	30.0	30.0	3.0
127.71	38.92	3128.2	67.4	2.2	331.4	376.9	12.5	6.7	161.3	30.0	30.0	1.5
128.20	39.08	7791.6	135.0	1.7	332.7	378.4	26.0	13.9	0.0	42.9	34.0	1.0
128.69	39.22	12253.2	231.7	1.9	334.0	379.9	40.8	21.9	0.0	55.8	38.0	1.0
129.18	39.38	10205.8	153.2	1.5	335.3	381.4	25.5	13.6	0.0	50.5	36.0	1.0
129.67	39.53	2847.0	65.1	2.3	336.6	382.8	11.4	6.1	141.8	30.0	30.0	1.5
130.17	39.67	2377.2	33.8	1.4	337.9	384.3	9.5	5.1	110.3	30.0	30.0	1.5
130.66	39.83	2746.5	36.1	1.3	339.1	385.8	11.0	5.8	134.8	30.0	30.0	1.5
131.15	39.97	3166.0	44.4	1.4	340.4	387.2	10.6	5.6	0.0	30.0	30.0	1.0
131.64	40.12	3872.5	49.2	1.3	341.7	388.7	12.9	6.8	0.0	30.0	30.0	1.0
132.13	40.28	4631.5	67.4	1.5	343.0	390.2	15.4	8.2	0.0	30.0	30.0	1.0
132.63	40.42	3736.1	74.7	2.0	344.2	391.7	14.9	7.9	200.0	30.0	30.0	3.0
133.12	40.58	6402.4	264.3	4.1	345.5	393.1	32.0	16.9	377.6	0.0	0.0	6.0
133.61	40.72	6802.0	308.7	4.5	346.7	394.6	34.0	17.9	404.0	0.0	0.0	6.0
134.10	40.88	7507.7	215.8	2.9	347.9	396.1	30.0	15.8	450.9	41.2	34.0	6.0
134.59	41.03	14167.0	242.6	1.7	349.2	397.6	35.4	18.5	0.0	59.3	38.0	1.0
135.09	41.17	9358.1	213.5	2.3	350.6	399.0	31.2	16.3	0.0	47.4	34.0	1.0
135.58	41.33	3711.4	128.6	3.5	351.8	400.5	18.6	9.7	197.3	0.0	0.0	3.0
136.07	41.47	4494.2	123.2	2.7	353.1	402.0	18.0	9.4	249.3	30.0	30.0	3.0
136.56	41.62	5629.5	189.3	3.4	354.3	403.4	28.1	14.6	324.8	0.0	0.0	3.0
137.06	41.78	7317.0	272.0	3.7	355.5	404.9	36.6	19.0	437.1	0.0	0.0	6.0
137.55	41.92	5141.7	196.3	3.8	356.7	406.4	25.7	13.3	291.9	0.0	0.0	3.0
138.04	42.08	4121.3	161.5	3.9	358.0	407.9	20.6	10.7	223.7	0.0	0.0	3.0
138.53	42.22	5603.4	211.0	3.8	359.2	409.3	28.0	14.5	322.3	0.0	0.0	3.0
139.02	42.38	4583.7	166.0	3.6	360.4	410.8	22.9	11.8	254.2	0.0	0.0	3.0
139.52	42.53	3164.2	65.8	2.1	361.7	412.3	12.7	6.5	159.3	30.0	30.0	1.5
140.01	42.67	3552.1	80.4	2.3	362.9	413.7	14.2	7.3	185.0	30.0	30.0	3.0
140.50	42.83	4547.6	143.6	3.2	364.1	415.2	22.7	11.7	251.2	0.0	0.0	3.0
140.99	42.97	6170.4	178.8	2.9	365.3	416.7	24.7	12.6	359.2	34.9	32.0	3.0
141.48	43.12	5238.3	208.4	4.0	366.6	418.2	26.2	13.4	296.9	0.0	0.0	3.0
141.98	43.28	4850.1	135.3	2.8	367.8	419.6	19.4	9.9	270.8	30.0	30.0	3.0
142.47	43.42	5233.8	131.2	2.5	369.0	421.1	20.9	10.7	296.2	30.0	30.0	3.0
142.96	43.58	4884.6	181.0	3.7	370.3	422.6	24.4	12.4	272.8	0.0	0.0	3.0
143.45	43.72	4274.5	110.1	2.6	371.5	424.0	17.1	8.7	231.9	30.0	30.0	3.0
143.95	43.88	3194.7	57.1	1.8	372.7	425.5	12.8	6.5	159.8	30.0	30.0	1.5
144.44	44.03	3312.7	79.8	2.4	373.9	427.0	13.3	6.7	167.5	30.0	30.0	1.5
144.93	44.17	3289.5	72.8	2.2	375.2	428.5	13.2	6.6	165.7	30.0	30.0	1.5
145.42	44.33	3638.8	101.8	2.8	376.4	429.9	14.6	7.3	188.8	30.0	30.0	3.0
145.91	44.47	3133.2	89.4	2.9	377.6	431.4	15.7	7.9	154.9	0.0	0.0	1.5
146.41	44.62	3211.8	62.2	1.9	378.9	432.9	12.8	6.5	160.0	30.0	30.0	1.5
146.90	44.78	4250.8	111.4	2.6	380.1	434.3	17.0	8.5	229.1	30.0	30.0	3.0
147.39	44.92	4503.9	113.0	2.5	381.3	435.8	18.0	9.0	245.8	30.0	30.0	3.0
147.88	45.08	3947.6	78.8	2.0	382.5	437.3	15.8	7.9	208.5	30.0	30.0	3.0
148.37	45.22	4813.8	126.1	2.6	383.8	438.8	19.3	9.6	266.1	30.0	30.0	3.0
148.87	45.38	4073.9	144.0	3.5	385.0	440.2	20.4	10.2	216.6	0.0	0.0	3.0

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Depth    Depth     AvgQt      AvgFs    AvgRf   E.Stress   Hyd. Pr.   N60   (N1)60     Su      Dr     Phi     OCR
(ft)      (m)      (kPa)      (kPa)     (%)     (kPa)      (kPa)     (blows/ft)     (kPa)    (%)   (deg.)  (ratio)
------------------------------------------------------------------------------------------------------------
149.36   45.53    3650.7     125.1     3.4     386.2      441.7     18.3     9.1    188.2    0.0     0.0     1.5
149.85   45.67    5297.6     144.9     2.7     387.5      443.2     21.2    10.6    297.8   30.0    30.0     3.0
150.34   45.83    4953.9     181.9     3.7     388.7      444.6     24.8    12.4    274.7    0.0     0.0     3.0
150.83   45.97    5448.5     170.1     3.1     389.9      446.1     21.8    10.9    307.5   30.4    30.0     3.0
151.33   46.12    3925.1     148.7     3.8     391.1      447.6     19.6     9.8    205.8    0.0     0.0     3.0
151.82   46.28    3448.5      93.8     2.7     392.4      449.1     13.8     6.9    173.8   30.0    30.0     1.5
152.31   46.42    3191.8     140.8     4.4     393.6      450.5     21.3    10.6    156.5    0.0     0.0     1.5
152.80   46.58    2329.5      86.8     3.7     394.8      452.0     15.5     7.8     98.8    0.0     0.0     1.5
153.30   46.72    4511.4     177.8     3.9     396.1      453.5     22.6    11.3    244.1    0.0     0.0     3.0
153.79   46.88    5503.6     249.0     4.5     397.3      454.9     27.5    13.8    310.1    0.0     0.0     3.0
154.28   47.03    6690.4     345.7     5.2     398.7      456.4     66.9    33.5      0.0   35.9    32.0     1.0
154.77   47.17    7222.2     336.1     4.7     400.3      457.9     72.2    36.1      0.0   38.1    32.0     1.0
155.26   47.33   12682.4     754.6     5.9     401.9      459.4    126.8    63.4      0.0   54.2    36.0     1.0
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ConeTec Inc. - CPT Interpretation                                        Page:   1
Interpretation Output - Release 1.00.19c
Run No:    00-0519-1709-1877
Job No:    97-100
Client:    Kleinfelder
Project:   Legacy Parkway Project
Site:      SC-31-356
Location:  STRUCTURE 31
Cone:       20  TON A 070
CPT Date:  10/02/05
CPT Time:  08:54
CPT File:  300SC356.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   Depth    AvgQt    AvgFs   AvgRf  E.Stress  Hyd. Pr.   N60   (N1)60     Su     Dr    Phi     OCR
(ft)     (m)     (kPa)    (kPa)    (%)    (kPa)     (kPa)    (blows/ft)     (kPa)   (%)  (deg.)  (ratio)
-------------------------------------------------------------------------------------------------
  0.25   0.08   2648.9      2.3    0.1      1.4       0.0     8.8    17.7      0.0   90.5   50.0    1.0
  0.74   0.23   1179.3     11.1    0.9      4.1       0.0     4.7     9.4     78.3   51.7   46.0   10.0
  1.23   0.38    666.0      7.8    1.2      6.8       0.0     3.3     6.7     43.9    0.0    0.0   10.0
  1.72   0.52    464.3      9.5    2.1      9.3       0.2     3.1     6.2     30.3    0.0    0.0    6.0
  2.21   0.68    814.1     15.9    2.0     10.5       1.7     4.1     8.1     53.5    0.0    0.0   10.0
  2.71   0.82   1327.8     31.4    2.4     11.7       3.2     6.6    13.3     87.5    0.0    0.0   10.0
  3.20   0.97   1636.6     32.0    2.0     13.0       4.7     6.5    13.1    107.9   44.7   44.0   10.0
  3.61   1.10   2236.6     42.8    1.9     14.0       5.9     8.9    17.9    147.8   52.5   44.0   10.0
  4.02   1.22   3029.8     69.4    2.3     15.0       7.1    12.1    24.2    200.5   60.2   46.0   10.0
  4.51   1.38   3310.3     74.0    2.2     16.2       8.6    13.2    26.5    219.0   61.6   46.0   10.0
  5.00   1.53   4034.4     74.2    1.8     17.5      10.1    13.4    26.9      0.0   66.2   46.0    1.0
  5.50   1.67   4034.2    114.8    2.8     18.8      11.5    16.1    32.3    266.9   65.2   46.0   10.0
  5.99   1.83   2827.6     85.3    3.0     20.0      13.0    14.1    28.3    186.3    0.0    0.0   10.0
  6.56   2.00   3160.1     83.6    2.6     21.4      14.7    12.6    25.3    208.3   56.3   44.0   10.0
  7.14   2.17   2750.2     77.6    2.8     22.9      16.4    13.8    27.5    180.7    0.0    0.0   10.0
  7.63   2.33   2707.4     92.6    3.4     24.1      17.9    13.5    27.0    177.7    0.0    0.0   10.0
  8.12   2.47   2457.2     81.4    3.3     25.3      19.4    12.3    23.9    160.8    0.0    0.0   10.0
  8.61   2.62   2237.3     54.6    2.4     26.6      20.8     8.9    17.0    146.0   43.4   42.0   10.0
  9.10   2.78   1901.7     36.9    1.9     27.8      22.3     7.6    14.1    123.4   38.1   40.0   10.0
  9.60   2.92   2203.1     39.3    1.8     29.0      23.8     8.8    16.0    143.4   41.7   40.0   10.0
 10.09   3.08   1698.5     52.0    3.1     30.2      25.3     8.5    15.1    109.5    0.0    0.0    6.0
 10.58   3.22   1556.1     54.8    3.5     31.5      26.7    10.4    18.1     99.9    0.0    0.0    6.0
 11.07   3.38   1309.9     42.8    3.3     32.7      28.2     8.7    14.9     83.3    0.0    0.0    6.0
 11.56   3.53   1151.1     38.2    3.3     33.9      29.7     7.7    12.9     72.5    0.0    0.0    6.0
 12.06   3.67    961.9     26.8    2.8     35.2      31.1     6.4    10.6     59.7    0.0    0.0    6.0
 12.55   3.83   1354.6     27.4    2.0     36.4      32.6     6.8    11.0     85.7    0.0    0.0    6.0
 13.04   3.98   1777.7     52.5    3.0     37.6      34.1     8.9    14.2    113.7    0.0    0.0    6.0
 13.53   4.12   1999.6     36.2    1.8     38.8      35.6     8.0    12.6    128.3   34.7   38.0    6.0
 14.03   4.27   1106.4     20.5    1.9     40.1      37.0     5.5     8.6     68.6    0.0    0.0    6.0
 14.52   4.43   2066.8     40.2    1.9     41.3      38.5     8.3    12.6    132.5   34.8   38.0    6.0
 15.01   4.57   7305.7     30.2    0.4     42.6      40.0    18.3    27.4      0.0   70.5   44.0    1.0
 15.50   4.73   8042.0     12.3    0.2     44.0      41.4    16.1    23.7      0.0   72.8   44.0    1.0
 15.99   4.88   4130.8     40.1    1.0     45.4      42.9    13.8    20.0      0.0   53.3   42.0    1.0
 16.49   5.02   1447.6     23.9    1.7     46.7      44.4     5.8     8.3     90.4   30.0   36.0    6.0
 16.98   5.18    824.0     13.1    1.6     47.9      45.9     4.1     5.8     48.7    0.0    0.0    6.0
 17.47   5.32    713.7     11.3    1.6     49.1      47.3     3.6     5.0     41.2    0.0    0.0    3.0
 17.96   5.48    609.9     10.5    1.7     50.3      48.8     4.1     5.6     34.0    0.0    0.0    3.0
 18.45   5.62    600.4      7.9    1.3     51.6      50.3     3.0     4.1     33.2    0.0    0.0    3.0
 18.95   5.77    660.0      3.3    0.5     52.4      51.7     3.3     4.5     37.1    0.0    0.0    3.0
 19.44   5.93    653.3      3.3    0.5     52.8      53.2     3.3     4.4     36.5    0.0    0.0    3.0
 19.93   6.07    652.4      3.9    0.6     53.2      54.7     3.3     4.4     36.3    0.0    0.0    3.0
 20.42   6.23   1869.7     12.3    0.7     54.0      56.2     7.5    10.0    117.3   30.0   36.0    6.0
 20.92   6.38   1295.1     15.1    1.2     55.2      57.6     5.2     6.8     78.8   30.0   34.0    6.0
 21.41   6.52   1086.7      8.4    0.8     56.5      59.1     4.3     5.7     64.7   30.0   32.0    6.0
 21.90   6.68   1526.8      9.1    0.6     57.7      60.6     6.1     7.9     93.9   30.0   34.0    6.0
 22.39   6.82   1607.6     20.7    1.3     58.9      62.0     6.4     8.2     99.1   30.0   34.0    6.0
 22.88   6.98   1571.0     42.1    2.7     60.2      63.5     7.9     9.9     96.5    0.0    0.0    6.0
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PLATE E-214

Depth	Depth	AvgQt	AvgFs	AvgRf	E.Stress	Hyd. Pr.	N60	(N1)60	Su	Dr	Phi	OCR
(ft)	(m)	(kPa)	(kPa)	(%)	(kPa)	(kPa)	(blows/ft)		(kPa)	(%)	(deg.)	(ratio)
23.38	7.12	987.7	24.3	2.5	61.4	65.0	4.9	6.2	57.4	0.0	0.0	3.0
23.87	7.27	808.6	15.9	2.0	62.6	66.5	4.0	5.0	45.3	0.0	0.0	3.0
24.36	7.43	668.8	11.9	1.8	63.8	67.9	3.3	4.1	35.8	0.0	0.0	3.0
24.85	7.57	789.1	9.3	1.2	65.1	69.4	3.9	4.8	43.6	0.0	0.0	3.0
25.34	7.73	622.8	11.8	1.9	66.3	70.9	4.2	5.0	32.4	0.0	0.0	1.5
25.84	7.88	745.2	11.5	1.5	67.5	72.3	3.7	4.4	40.4	0.0	0.0	3.0
26.33	8.02	1004.6	17.8	1.8	68.8	73.8	5.0	5.9	57.5	0.0	0.0	3.0
26.82	8.18	868.7	12.3	1,4	70.0	75.3	4.3	5.1	48.2	0.0	0.0	3.0
27.31	8.32	739.0	10.4	1.4	71.2	76.8	3.7	4.3	39.4	0.0	0.0	3.0
27.80	8.48	629.2	6.6	1.1	72.4	78.2	3.1	3.6	31.9	0.0	0.0	1.5
28.30	8.62	894.7	5.8	0.7	73.7	79.7	3.6	4.1	49.4	30.0	30.0	3.0
28.79	8.77	850.9	8.6	1.0	74.9	81.2	4.3	4.8	46.3	0.0	0.0	3.0
29.28	8.93	963.0	11.8	1.2	76.1	82.6	4.8	5.4	53.6	0.0	0.0	3.0
29.77	9.07	974.4	12.0	1.2	77.4	84.1	4.9	5.4	54.2	0.0	0.0	3.0
30.27	9.23	827.6	11.0	1.3	78.6	85.6	4.1	4.6	44.2	0.0	0.0	3.0
30.76	9.38	772.1	5.7	0.7	79.8	87.1	3.9	4.2	40.3	0.0	0.0	3.0
31.17	9.50	736.7	5.7	0.8	80.8	88.3	3.7	4.0	37.8	0.0	0.0	1.5
31.58	9.62	768.4	6.8	0.9	81.9	89.5	3.8	4.2	39.8	0.0	0.0	1.5
32.07	9.77	1191.3	11.9	1.0	83.1	91.0	4.8	5.1	67.8	30.0	32.0	3.0
32.56	9.93	1379.3	15.5	1.1	84.3	92.5	5.5	5.9	80.2	30.0	32.0	3.0
33.05	10.07	1530.8	24.4	1.6	85.5	93.9	6.1	6.5	90.1	30.0	32.0	6.0
33.55	10.23	1935.9	43.0	2.2	86.8	95.4	7.7	8.1	116.9	30.0	34.0	6.0
34.04	10.38	1784.0	30.6	1.7	88.0	96.9	7.1	7.4	106.6	30.0	32.0	6.0
34.53	10.52	1108.2	13.3	1.2	89.2	98.3	4.4	4.6	61.4	30.0	30.0	3.0
35.02	10.68	959.5	13.5	1.4	90.5	99.8	4.8	4.9	51.3	0.0	0.0	3.0
35.51	10.82	907.3	9.3	1.0	91.7	101.3	4.5	4.6	47.6	0.0	0.0	3.0
36.01	10.98	790.2	9.4	1.2	92.9	102.8	4.0	4.0	39.6	0.0	0.0	1.5
36.50	11.12	886.9	11.2	1.3	94.1	104.2	4.4	4.5	45.9	0.0	0.0	1.5
36.99	11.27	1050.8	14.1	1.3	95.4	105.7	5.3	5.3	56.6	0.0	0.0	3.0
37.48	11.43	2031.8	35.7	1.8	96.6	107.2	8.1	8.1	121.9	30.0	34.0	6.0
37.98	11.57	3810.3	118.9	3.1	97.8	108.6	19.1	18.9	240.3	0.0	0.0	6.0
38.47	11.73	2585.3	106.9	4.1	99.1	110.1	17.2	16.9	158.4	0.0	0.0	6.0
38.96	11.88	4809.4	191.2	4.0	100.3	111.6	24.0	23.5	306.5	0.0	0.0	6.0
39.45	12.02	7704.4	289.3	3.8	101.5	113.1	38.5	37.4	499.3	0.0	0.0	10.0
39.94	12.18	11848.2	177.2	1.5	102.8	114.5	29.6	28.6	0.0	71.7	42.0	1.0
40.44	12.32	13094.2	68.7	0.5	104.2	116.0	26.2	25.1	0.0	74.4	42.0	1.0
40.93	12.48	14135.9	89.3	0.6	105.7	117.5	28.3	26.9	0.0	76.4	44.0	1.0
41.42	12.62	19139.2	154.7	0.8	107.1	118.9	38.3	36.2	0.0	84.9	44.0	1.0
41.91	12.77	25617.7	100.2	0.4	108.6	120.4	42.7	40.1	0.0	93.1	46.0	1.0
42.40	12.93	19047.5	99.5	0.5	110.1	121.9	38.1	35.5	0.0	84.4	44.0	1.0
42.90	13.07	6081.3	88.5	1.5	111.5	123.4	20.3	18.8	0.0	51.5	40.0	1.0
43.39	13.23	3565.9	71.7	2.0	112.8	124.8	14.3	13.1	221.9	36.0	36.0	6.0
43.88	13.38	8769.9	104.6	1.2	114.1	126.3	21.9	20.1	0.0	61.6	40.0	1.0
44.37	13.52	7720.2	228.7	3.0	115.4	127.8	30.9	28.1	498.5	57.8	40.0	10.0
44.86	13.68	9346.9	281.0	3.0	116.6	129.2	37.4	33.9	606.7	63.1	42.0	10.0
45.36	13.82	3597.3	161.3	4.5	117.8	130.7	24.0	21.6	223.2	0.0	0.0	6.0
45.85	13.98	2417.9	110.4	4.6	119.0	132.2	24.2	21.7	144.4	0.0	0.0	6.0
46.34	14.12	2848.5	129.7	4.6	120.2	133.7	28.5	25.4	173.0	0.0	0.0	6.0
46.83	14.27	3206.7	81.7	2.5	121.4	135.1	12.8	11.4	196.7	31.9	34.0	6.0
47.33	14.43	2498.8	58.8	2.4	122.6	136.6	10.0	8.8	149.3	30.0	32.0	6.0
47.82	14.57	6626.1	141.9	2.1	123.9	138.1	22.1	19.4	0.0	52.4	38.0	1.0
48.31	14.73	5349.7	74.3	1.4	125.2	139.5	17.8	15.6	0.0	46.1	38.0	1.0
48.80	14.88	2801.2	40.8	1.5	126.4	141.0	11.2	9.8	168.9	30.0	34.0	6.0
49.29	15.02	2652.3	51.8	2.0	127.7	142.5	10.6	9.2	158.8	30.0	32.0	6.0
49.79	15.18	3762.8	86.6	2.3	128.9	144.0	15.1	13.0	232.7	35.6	36.0	6.0
50.28	15.32	3512.3	79.8	2.3	130.1	145.4	14.0	12.1	215.8	33.5	34.0	6.0
50.77	15.48	3023.0	86.7	2.9	131.3	146.9	15.1	12.9	183.0	0.0	0.0	6.0
51.26	15.62	2524.9	89.9	3.6	132.6	148.4	12.6	10.7	149.6	0.0	0.0	6.0
51.75	15.77	2907.8	137.7	4.7	133.8	149.8	29.1	24.6	174.9	0.0	0.0	6.0
52.25	15.93	2223.9	103.4	4.6	134.9	151.3	22.2	18.7	129.2	0.0	0.0	3.0
52.74	16.08	2069.7	84.6	4.1	136.1	152.8	13.8	11.6	118.7	0.0	0.0	3.0
53.23	16.22	1969.6	63.6	3.2	137.3	154.3	9.8	8.2	111.9	0.0	0.0	3.0
53.72	16.38	1942.2	75.0	3.9	138.6	155.7	12.9	10.8	109.9	0.0	0.0	3.0
54.22	16.53	1990.0	60.5	3.0	139.8	157.2	9.9	8.2	112.9	0.0	0.0	3.0

Depth	Depth	AvgQt	AvgFs	AvgRf	E.Stress	Hyd. Pr.	N60	(N1)60	Su	Dr	Phi	OCR
(ft)	(m)	(kPa)	(kPa)	(%)	(kPa)	(kPa)	(blows/ft)		(kPa)	(%)	(deg.)	(ratio)
54.71	16.67	8109.9	120.5	1.5	141.1	158.7	27.0	22.3	0.0	56.3	40.0	1.0
55.20	16.83	8632.7	183.9	2.1	142.4	160.1	28.8	23.6	0.0	58.0	40.0	1.0
55.69	16.97	6809.4	188.4	2.8	143.6	161.6	27.2	22.2	433.6	51.1	38.0	6.0
56.18	17.12	7791.5	153.4	2.0	144.9	163.1	26.0	21.1	0.0	54.8	38.0	1.0
56.68	17.28	4426.2	112.7	2.5	146.2	164.6	17.7	14.3	274.4	38.5	36.0	6.0
57.17	17.42	2630.7	84.6	3.2	147.4	166.0	13.2	10.6	154.5	0.0	0.0	6.0
57.66	17.58	4424.6	90.7	2.0	148.6	167.5	17.7	14.2	273.9	38.2	36.0	6.0
58.15	17.72	3484.1	76.9	2.2	149.8	169.0	13.9	11.1	211.0	31.3	34.0	6.0
58.64	17.88	1710.1	42.6	2.5	151.1	170.4	8.6	6.8	92.6	0.0	0.0	3.0
59.14	18.03	1406.9	25.4	1.8	152.3	171.9	7.0	5.6	72.2	0.0	0.0	1.5
59.63	18.17	1885.8	54.0	2.9	153.5	173.4	9.4	7.4	103.9	0.0	0.0	3.0
60.12	18.33	4003.1	94.4	2.4	154.8	174.9	16.0	12.6	244.9	34.8	34.0	6.0
60.61	18.47	2109.1	66.5	3.2	156.0	176.3	10.5	8.3	118.4	0.0	0.0	3.0
61.10	18.62	2280.2	95.2	4.2	157.2	177.8	15.2	11.9	129.7	0.0	0.0	3.0
61.60	18.78	2506.3	116.9	4.7	158.4	179.3	25.1	19.5	144.6	0.0	0.0	3.0
62.09	18.92	6699.3	229.5	3.4	159.6	180.7	26.8	20.8	423.9	49.1	38.0	6.0
62.58	19.08	10537.5	302.2	2.9	160.8	182.2	42.2	32.5	679.6	62.0	40.0	10.0
63.07	19.22	11678.8	204.8	1.8	162.1	183.7	38.9	29.9	0.0	64.8	40.0	1.0
63.57	19.38	12647.8	174.9	1.4	163.4	185.2	31.6	24.2	0.0	67.0	40.0	1.0
64.06	19.53	16174.1	227.4	1.4	164.8	186.6	40.4	30.8	0.0	73.9	42.0	1.0
64.55	19.67	21982.9	228.1	1.0	166.2	188.1	44.0	33.4	0.0	82.6	44.0	1.0
65.04	19.83	25096.0	208.3	0.8	167.7	189.6	50.2	37.9	0.0	86.2	44.0	1.0
65.53	19.97	25774.5	139.4	0.5	169.1	191.0	51.5	38.8	0.0	86.9	44.0	1.0
66.03	20.12	25203.9	194.1	0.8	170.6	192.5	50.4	37.8	0.0	86.1	44.0	1.0
66.52	20.28	27771.7	153.3	0.6	172.1	194.0	46.3	34.5	0.0	88.8	44.0	1.0
67.01	20.42	27183.0	199.5	0.7	173.6	195.5	54.4	40.4	0.0	88.0	44.0	1.0
67.50	20.58	26997.1	202.5	0.8	175.0	196.9	54.0	39.9	0.0	87.7	44.0	1.0
67.99	20.72	27600.5	205.7	0.7	176.5	198.4	55.2	40.7	0.0	88.2	44.0	1.0
68.49	20.88	27732.3	236.3	0.9	177.9	199.9	55.5	40.7	0.0	88.3	44.0	1.0
68.98	21.03	31638.6	276.8	0.9	179.4	201.4	63.3	46.2	0.0	91.9	44.0	1.0
69.47	21.17	31385.4	272.7	0.9	180.8	202.8	62.8	45.7	0.0	91.6	44.0	1.0
69.96	21.33	21927.3	143.2	0.7	182.3	204.3	43.9	31.8	0.0	81.2	42.0	1.0
70.46	21.47	6087.9	172.1	2.8	183.6	205.8	24.4	17.6	379.9	44.3	36.0	6.0
70.95	21.62	3387.8	81.1	2.4	184.9	207.2	13.6	9.8	199.7	30.0	32.0	6.0
71.44	21.78	2504.9	63.9	2.5	186.1	208.7	10.0	7.2	140.7	30.0	30.0	3.0
71.93	21.92	2149.2	49.4	2.3	187.3	210.2	8.6	6.1	116.8	30.0	30.0	3.0
72.42	22.08	2681.3	55.6	2.1	188.5	211.7	10.7	7.6	152.1	30.0	30.0	3.0
72.92	22.22	3610.4	72.8	2.0	189.8	213.1	14.4	10.3	213.8	30.0	32.0	6.0
73.41	22.38	3233.6	74.6	2.3	191.0	214.6	12.9	9.2	188.5	30.0	32.0	3.0
73.90	22.53	3317.4	80.0	2.4	192.2	216.1	13.3	9.4	193.9	30.0	32.0	6.0
74.39	22.67	3427.8	148.3	4.3	193.5	217.5	22.9	16.1	201.1	0.0	0.0	6.0
74.88	22.83	2677.1	79.1	3.0	194.7	219.0	13.4	9.4	150.9	0.0	0.0	3.0
75.38	22.97	2077.2	45.2	2.2	195.9	220.5	8.3	5.8	110.7	30.0	30.0	3.0
75.87	23.12	1753.7	33.9	1.9	197.1	222.0	7.0	4.9	89.0	30.0	30.0	1.5
76.36	23.28	1598.5	30.5	1.9	198.4	223.4	6.4	4.4	78.4	30.0	30.0	1.5
76.85	23.42	1479.2	27.4	1.9	199.6	224.9	7.4	5.1	70.3	0.0	0.0	1.5
77.34	23.58	2047.4	37.3	1.8	200.8	226.4	8.2	5.7	108.0	30.0	30.0	3.0
77.84	23.72	2552.3	53.9	2.1	202.1	227.8	10.2	7.0	141.5	30.0	30.0	3.0
78.33	23.88	2899.1	63.7	2.2	203.3	229.3	11.6	8.0	164.4	30.0	30.0	3.0
78.82	24.03	4722.4	120.4	2.6	204.5	230.8	18.9	12.9	285.8	35.5	34.0	6.0
79.31	24.17	3366.5	86.3	2.6	205.7	232.3	13.5	9.2	195.2	30.0	32.0	3.0
79.81	24.33	2449.5	69.5	2.8	207.0	233.7	12.2	8.3	133.9	0.0	0.0	3.0
80.30	24.47	5076.3	168.1	3.3	208.2	235.2	25.4	17.2	308.9	0.0	0.0	6.0
80.79	24.62	11045.4	277.4	2.5	209.5	236.7	36.8	24.9	0.0	59.5	38.0	1.0
81.28	24.78	21080.5	310.1	1.5	210.8	238.1	52.7	35.5	0.0	78.0	42.0	1.0
81.77	24.92	23163.4	381.4	1.6	212.2	239.6	57.9	38.9	0.0	80.6	42.0	1.0
82.27	25.08	19332.0	408.1	2.1	213.5	241.1	64.4	43.2	0.0	75.3	42.0	1.0
82.76	25.22	24731.3	310.8	1.3	214.9	242.6	49.5	33.0	0.0	82.3	42.0	1.0
83.25	25.38	21964.1	289.4	1.3	216.3	244.0	54.9	36.5	0.0	78.8	42.0	1.0
83.74	25.53	23365.3	443.1	1.9	217.7	245.5	58.4	38.7	0.0	80.5	42.0	1.0
84.23	25.67	20568.7	448.5	2.2	219.0	247.0	68.6	45.3	0.0	76.7	42.0	1.0
84.73	25.83	26939.7	482.4	1.8	220.4	248.4	67.3	44.4	0.0	84.4	42.0	1.0
85.22	25.97	27337.4	336.1	1.2	221.8	249.9	54.7	35.9	0.0	84.7	42.0	1.0
85.71	26.12	29248.1	254.5	0.9	223.3	251.4	58.5	38.3	0.0	86.5	44.0	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	26130.2	238.4	0.9	224.7	252.9	52.3	34.1	0.0	83.2	42.0	1.0
86.70	26.42	17795.7	222.9	1.3	226.1	254.3	44.5	29.0	0.0	72.1	40.0	1.0
87.19	26.58	5696.6	167.2	2.9	227.4	255.8	22.8	14.8	347.6	39.4	34.0	6.0
87.68	26.72	11353.0	315.2	2.8	228.7	257.3	45.4	29.4	724.5	59.1	38.0	6.0
88.17	26.88	23936.3	517.6	2.2	229.9	258.7	79.8	51.5	0.0	80.4	42.0	1.0
88.66	27.03	17015.4	447.3	2.6	231.2	260.2	56.7	36.5	0.0	70.5	40.0	1.0
89.16	27.17	8767.8	369.7	4.2	232.5	261.7	43.8	28.1	551.6	0.0	0.0	6.0
89.65	27.33	20993.2	389.7	1.9	233.8	263.2	52.5	33.6	0.0	76.4	42.0	1.0
90.14	27.47	24538.3	309.4	1.3	235.2	264.6	49.1	31.3	0.0	80.7	42.0	1.0
90.63	27.62	26875.2	331.8	1.2	236.7	266.1	53.8	34.2	0.0	83.3	42.0	1.0
91.12	27.78	26724.2	240.3	0.9	238.1	267.6	53.4	33.9	0.0	83.0	42.0	1.0
91.62	27.92	30329.7	268.8	0.9	239.6	269.0	60.7	38.4	0.0	86.6	44.0	1.0
92.11	28.08	33354.9	185.9	0.6	241.1	270.5	55.6	35.0	0.0	89.2	44.0	1.0
92.60	28.22	33957.4	254.9	0.8	242.6	272.0	67.9	42.7	0.0	89.6	44.0	1.0
93.09	28.38	34320.6	266.3	0.8	244.0	273.5	68.6	43.0	0.0	89.8	44.0	1.0
93.58	28.53	33773.0	109.8	0.3	245.5	274.9	56.3	35.2	0.0	89.3	44.0	1.0
94.08	28.67	19146.4	303.8	1.6	247.0	276.4	47.9	29.8	0.0	72.9	40.0	1.0
94.57	28.83	26378.4	287.1	1.1	248.4	277.9	52.8	32.8	0.0	82.0	42.0	1.0
95.06	28.97	26253.7	137.7	0.5	249.9	279.3	43.8	27.1	0.0	81.8	42.0	1.0
95.55	29.12	26452.7	106.5	0.4	251.4	280.8	44.1	27.2	0.0	81.9	42.0	1.0
96.05	29.28	22200.5	100.1	0.5	252.9	282.3	44.4	27.3	0.0	76.8	42.0	1.0
96.54	29.42	26153.8	99.4	0.4	254.4	283.8	43.6	26.7	0.0	81.5	42.0	1.0
97.03	29.58	27165.9	70.6	0.3	255.9	285.2	45.3	27.7	0.0	82.5	42.0	1.0
97.52	29.72	14559.0	152.7	1.0	257.4	286.7	29.1	17.8	0.0	64.5	40.0	1.0
98.01	29.88	3739.7	62.3	1.7	258.8	288.2	12.5	7.6	0.0	30.0	32.0	1.0
98.51	30.03	3141.6	21.1	0.7	260.1	289.6	10.5	6.4	0.0	30.0	30.0	1.0
99.00	30.17	3331.2	26.6	0.8	261.4	291.1	11.1	6.7	0.0	30.0	30.0	1.0
99.49	30.33	2978.0	22.2	0.7	262.7	292.6	9.9	6.0	0.0	30.0	30.0	1.0
99.98	30.47	2948.3	27.9	0.9	264.0	294.1	9.8	5.9	0.0	30.0	30.0	1.0
100.47	30.62	2872.3	56.0	1.9	265.2	295.5	11.5	6.9	154.1	30.0	30.0	3.0
100.97	30.78	2361.5	53.6	2.3	266.5	297.0	9.4	5.7	119.9	30.0	30.0	1.5
101.46	30.92	1956.6	32.5	1.7	267.7	298.5	7.8	4.7	92.7	30.0	30.0	1.5
101.95	31.08	2011.2	29.4	1.5	268.9	299.9	8.0	4.8	96.2	30.0	30.0	1.5
102.44	31.22	1999.1	31.9	1.6	270.2	301.4	8.0	4.8	95.2	30.0	30.0	1.5
102.94	31.38	1874.8	29.7	1.6	271.4	302.9	7.5	4.5	86.7	30.0	30.0	1.5
103.43	31.53	2062.3	30.5	1.5	272.6	304.4	8.2	4.9	99.0	30.0	30.0	1.5
103.92	31.67	2235.1	52.8	2.4	273.8	305.8	8.9	5.3	110.4	30.0	30.0	1.5
104.41	31.83	2191.2	53.2	2.4	275.1	307.3	8.8	5.2	107.3	30.0	30.0	1.5
104.90	31.97	1903.6	38.7	2.0	276.3	308.8	7.6	4.5	87.9	30.0	30.0	1.5
105.40	32.12	2064.8	37.9	1.8	277.5	310.2	8.3	4.9	98.5	30.0	30.0	1.5
105.89	32.28	2216.2	41.5	1.9	278.8	311.7	8.9	5.2	108.4	30.0	30.0	1.5
106.38	32.42	2322.8	44.3	1.9	280.0	313.2	9.3	5.4	115.3	30.0	30.0	1.5
106.87	32.58	2554.1	63.2	2.5	281.2	314.7	10.2	6.0	130.5	30.0	30.0	1.5
107.36	32.72	2806.9	74.7	2.7	282.4	316.1	11.2	6.5	147.2	30.0	30.0	3.0
107.86	32.88	2835.3	46.4	1.6	283.7	317.6	11.3	6.6	148.9	30.0	30.0	3.0
108.35	33.03	2726.2	27.1	1.0	284.9	319.1	9.1	5.3	0.0	30.0	30.0	1.0
108.84	33.17	4309.0	103.5	2.4	286.2	320.5	17.2	10.0	246.8	30.0	32.0	3.0
109.33	33.33	6963.1	123.4	1.8	287.5	322.0	23.2	13.4	0.0	41.8	34.0	1.0
109.82	33.47	2857.7	56.4	2.0	288.7	323.5	11.4	6.6	149.7	30.0	30.0	3.0
110.32	33.62	3395.8	76.2	2.2	290.0	325.0	13.6	7.8	185.4	30.0	30.0	3.0
110.81	33.78	5257.7	147.2	2.8	291.2	326.4	21.0	12.1	309.3	33.5	32.0	6.0
111.30	33.92	10666.5	259.9	2.4	292.5	327.9	35.6	20.3	0.0	53.7	38.0	1.0
111.79	34.08	11458.2	307.0	2.7	293.8	329.4	38.2	21.8	0.0	55.7	38.0	1.0
112.29	34.22	7673.0	221.8	2.9	295.0	330.8	30.7	17.5	469.8	44.2	34.0	6.0
112.78	34.38	3786.3	114.2	3.0	296.3	332.3	18.9	10.8	210.5	0.0	0.0	3.0
113.27	34.53	2438.7	44.7	1.8	297.5	333.8	9.8	5.5	120.5	30.0	30.0	1.5
113.76	34.67	3742.0	121.8	3.3	298.7	335.3	18.7	10.6	207.2	0.0	0.0	3.0
114.25	34.83	3788.0	127.1	3.4	299.9	336.7	18.9	10.7	210.1	0.0	0.0	3.0
114.75	34.97	2987.8	79.1	2.6	301.2	338.2	12.0	6.7	156.6	30.0	30.0	3.0
115.24	35.12	2600.4	58.7	2.3	302.4	339.7	10.4	5.9	130.6	30.0	30.0	1.5
115.73	35.28	2334.6	55.8	2.4	303.6	341.1	9.3	5.2	112.7	30.0	30.0	1.5
116.22	35.42	2309.0	52.4	2.3	304.9	342.6	9.2	5.2	110.8	30.0	30.0	1.5
116.71	35.58	2398.2	54.5	2.3	306.1	344.1	9.6	5.4	116.5	30.0	30.0	1.5
117.21	35.72	3632.9	98.1	2.7	307.3	345.6	14.5	8.1	198.7	30.0	30.0	3.0

Depth	Depth	AvgQt	AvgFs	AvgRf	E.Stress	Hyd. Pr.	N60	(N1)60	Su	Dr	Phi	OCR
(ft)	(m)	(kPa)	(kPa)	(%)	(kPa)	(kPa)	(blows/ft)		(kPa)	(%)	(deg.)	(ratio)
117.70	35.88	3935.0	81.8	2.1	308.5	347.0	15.7	8.8	218.6	30.0	30.0	3.0
118.19	36.03	4286.1	65.9	1.5	309.8	348.5	14.3	7.9	0.0	30.0	30.0	1.0
118.68	36.17	4052.7	72.9	1.8	311.1	350.0	13.5	7.5	0.0	30.0	30.0	1.0
119.18	36.33	3655.5	58.5	1.6	312.4	351.4	12.2	6.7	0.0	30.0	30.0	1.0
119.67	36.47	3194.2	58.6	1.8	313.7	352.9	12.8	7.1	168.5	30.0	30.0	3.0
120.16	36.62	3684.0	95.8	2.6	314.9	354.4	14.7	8.1	201.0	30.0	30.0	3.0
120.65	36.78	3615.1	98.2	2.7	316.1	355.9	14.5	8.0	196.2	30.0	30.0	3.0
121.14	36.92	4063.7	157.8	3.9	317.4	357.3	20.3	11.2	225.9	0.0	0.0	3.0
121.64	37.08	4175.6	150.6	3.6	318.6	358.8	20.9	11.4	233.2	0.0	0.0	3.0
122.21	37.25	3043.5	73.1	2.4	320.0	360.5	12.2	6.7	157.5	30.0	30.0	1.5
122.78	37.42	3251.4	91.2	2.8	321.5	362.2	13.0	7.1	171.2	30.0	30.0	3.0
123.28	37.58	8901.6	235.5	2.6	322.7	363.7	35.6	19.4	547.7	47.2	36.0	6.0
123.77	37.72	11420.3	200.1	1.8	324.0	365.2	38.1	20.7	0.0	54.2	36.0	1.0
124.26	37.88	4153.6	112.4	2.7	325.2	366.6	16.6	9.0	230.8	30.0	30.0	3.0
124.75	38.03	3632.3	56.4	1.6	326.5	368.1	12.1	6.6	0.0	30.0	30.0	1.0
125.24	38.17	6336.4	118.4	1.9	327.8	369.6	21.1	11.4	0.0	37.2	32.0	1.0
125.74	38.33	6664.4	223.2	3.3	329.1	371.1	26.7	14.4	397.6	38.6	32.0	6.0
126.23	38.47	6040.7	143.6	2.4	330.3	372.5	24.2	13.0	355.9	35.7	32.0	6.0
126.72	38.62	3645.5	115.9	3.2	331.5	374.0	18.2	9.8	196.0	0.0	0.0	3.0
127.21	38.78	3743.9	137.6	3.7	332.7	375.5	18.7	10.0	202.4	0.0	0.0	3.0
127.71	38.92	5422.0	161.4	3.0	334.0	376.9	21.7	11.6	314.1	32.4	32.0	3.0
128.20	39.08	5185.7	151.9	2.9	335.2	378.4	20.7	11.1	298.1	31.1	32.0	3.0
128.69	39.22	4229.2	131.2	3.1	336.4	379.9	21.1	11.3	234.2	0.0	0.0	3.0
129.18	39.38	4478.6	144.5	3.2	337.7	381.4	22.4	11.9	250.6	0.0	0.0	3.0
129.67	39.53	4442.1	159.0	3.6	338.9	382.8	22.2	11.8	248.0	0.0	0.0	3.0
130.17	39.67	6278.2	236.2	3.8	340.1	384.3	31.4	16.7	370.2	0.0	0.0	6.0
130.66	39.83	5443.4	213.4	3.9	341.3	385.8	27.2	14.4	314.4	0.0	0.0	3.0
131.15	39.97	16446.6	265.6	1.6	342.6	387.2	41.1	21.7	0.0	63.9	38.0	1.0
131.64	40.12	14825.9	358.7	2.4	344.0	388.7	49.4	26.1	0.0	60.9	38.0	1.0
132.13	40.28	15433.6	254.6	1.6	345.3	390.2	38.6	20.3	0.0	62.0	38.0	1.0
132.63	40.42	5947.0	147.0	2.5	346.6	391.7	23.8	12.5	347.2	34.6	32.0	6.0
133.12	40.58	3965.7	66.4	1.7	347.9	393.1	13.2	6.9	0.0	30.0	30.0	1.0
133.61	40.72	3550.5	71.9	2.0	349.2	394.6	14.2	7.4	187.1	30.0	30.0	3.0
134.10	40.88	3431.8	63.7	1.9	350.4	396.1	13.7	7.2	179.0	30.0	30.0	3.0
134.59	41.03	7406.7	139.6	1.9	351.7	397.6	24.7	12.9	0.0	40.6	34.0	1.0
135.09	41.17	10339.3	296.6	2.9	352.9	399.0	41.4	21.5	639.2	50.2	36.0	6.0
135.58	41.33	4762.0	171.4	3.6	354.2	400.5	23.8	12.4	267.2	0.0	0.0	3.0
136.07	41.47	3020.8	85.7	2.8	355.4	402.0	15.1	7.8	150.9	0.0	0.0	1.5
136.56	41.62	2888.3	44.3	1.5	356.6	403.4	11.6	6.0	141.9	30.0	30.0	1.5
137.06	41.78	3092.9	51.2	1.7	357.8	404.9	12.4	6.4	155.3	30.0	30.0	1.5
137.55	41.92	3017.1	45.6	1.5	359.1	406.4	12.1	6.2	150.1	30.0	30.0	1.5
138.04	42.08	2590.7	42.1	1.6	360.3	407.9	10.4	5.3	121.5	30.0	30.0	1.5
138.53	42.22	3196.3	79.8	2.5	361.5	409.3	12.8	6.6	161.7	30.0	30.0	1.5
139.02	42.38	3284.7	102.7	3.1	362.8	410.8	16.4	8.4	167.4	0.0	0.0	1.5
139.52	42.53	3263.7	79.2	2.4	364.0	412.3	13.1	6.7	165.8	30.0	30.0	1.5
140.01	42.67	3636.4	96.9	2.7	365.2	413.7	14.5	7.4	190.5	30.0	30.0	3.0
140.50	42.83	4734.9	137.3	2.9	366.4	415.2	18.9	9.7	263.5	30.0	30.0	3.0
140.99	42.97	5720.6	170.8	3.0	367.7	416.7	22.9	11.7	329.1	32.6	32.0	3.0
141.48	43.12	5454.8	175.7	3.2	368.9	418.2	21.8	11.1	311.2	31.2	32.0	3.0
141.98	43.28	5077.5	192.0	3.8	370.1	419.6	25.4	12.9	285.8	0.0	0.0	3.0
142.47	43.42	5397.8	179.2	3.3	371.4	421.1	27.0	13.7	307.0	0.0	0.0	3.0
142.96	43.58	6594.2	295.1	4.5	372.6	422.6	33.0	16.7	386.6	0.0	0.0	6.0
143.45	43.72	7812.5	487.9	6.2	374.0	424.0	78.1	39.5	0.0	41.3	34.0	1.0
143.95	43.88	4048.0	117.7	2.9	375.4	425.5	16.2	8.2	216.5	30.0	30.0	3.0
144.44	44.03	3288.4	131.9	4.0	376.6	427.0	21.9	11.1	165.7	0.0	0.0	1.5
144.93	44.17	2581.5	40.4	1.6	377.9	428.5	10.3	5.2	118.3	30.0	30.0	1.5
145.42	44.33	3787.5	75.9	2.0	379.1	429.9	15.1	7.6	198.6	30.0	30.0	3.0
145.91	44.47	4268.7	103.5	2.4	380.3	431.4	17.1	8.6	230.5	30.0	30.0	3.0
146.41	44.62	3625.8	107.9	3.0	381.6	432.9	18.1	9.1	187.4	0.0	0.0	1.5
146.90	44.78	5627.6	232.1	4.1	382.8	434.3	28.1	14.1	320.7	0.0	0.0	3.0
147.39	44.92	12722.7	382.2	3.0	384.0	435.8	50.9	25.4	793.5	54.9	36.0	6.0
147.88	45.08	9203.1	280.1	3.0	385.2	437.3	36.8	18.4	558.7	45.6	34.0	6.0
148.37	45.22	10335.4	192.4	1.9	386.5	438.8	34.5	17.2	0.0	48.8	34.0	1.0
148.87	45.38	3926.3	156.9	4.0	387.8	440.2	19.6	9.8	206.6	0.0	0.0	3.0

ConeTec Inc. - CPT Interpretation
Run No: 00-0519-1709-1877
CPT File: 300SC356.COR

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	13912.1	464.6	3.3	389.0	441.7	55.6	27.8	872.1	57.3	36.0	6.0
149.85	45.67	8764.7	463.0	5.3	390.4	443.2	87.6	43.8	0.0	44.0	34.0	1.0
150.34	45.83	4400.1	220.6	5.0	391.8	444.6	44.0	22.0	237.6	0.0	0.0	3.0
150.83	45.97	3878.0	138.0	3.6	393.0	446.1	19.4	9.7	202.6	0.0	0.0	3.0
151.33	46.12	4760.0	179.4	3.8	394.2	447.6	23.8	11.9	261.2	0.0	0.0	3.0
151.82	46.28	5954.8	247.0	4.1	395.4	449.1	29.8	14.9	340.7	0.0	0.0	3.0
152.31	46.42	6646.1	295.1	4.4	396.7	450.5	33.2	16.6	386.6	0.0	0.0	3.0
152.80	46.58	5281.9	210.6	4.0	397.9	452.0	26.4	13.2	295.5	0.0	0.0	3.0
153.30	46.72	5029.6	166.5	3.3	399.1	453.5	25.1	12.6	278.5	0.0	0.0	3.0
153.79	46.88	8269.5	311.7	3.8	400.4	454.9	41.3	20.7	494.3	0.0	0.0	6.0
154.28	47.03	7881.9	361.4	4.6	401.8	456.4	78.8	39.4	0.0	40.5	32.0	1.0
154.77	47.17	7602.7	301.8	4.0	403.2	457.9	38.0	19.0	449.4	0.0	0.0	6.0

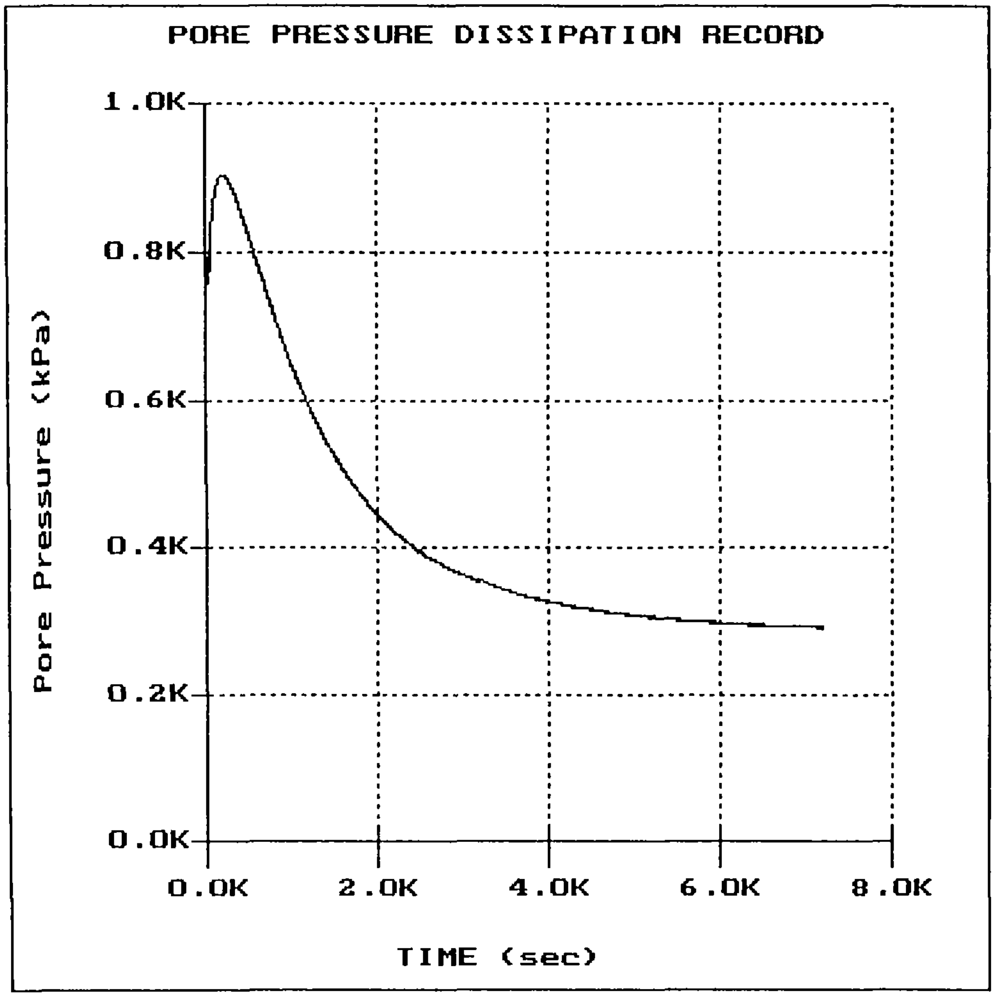
E

Legacy Parkway

SC-11-261
Location:STRUCTURE 11

Cone:20 TON A 092
Date:01:31:00 07:47

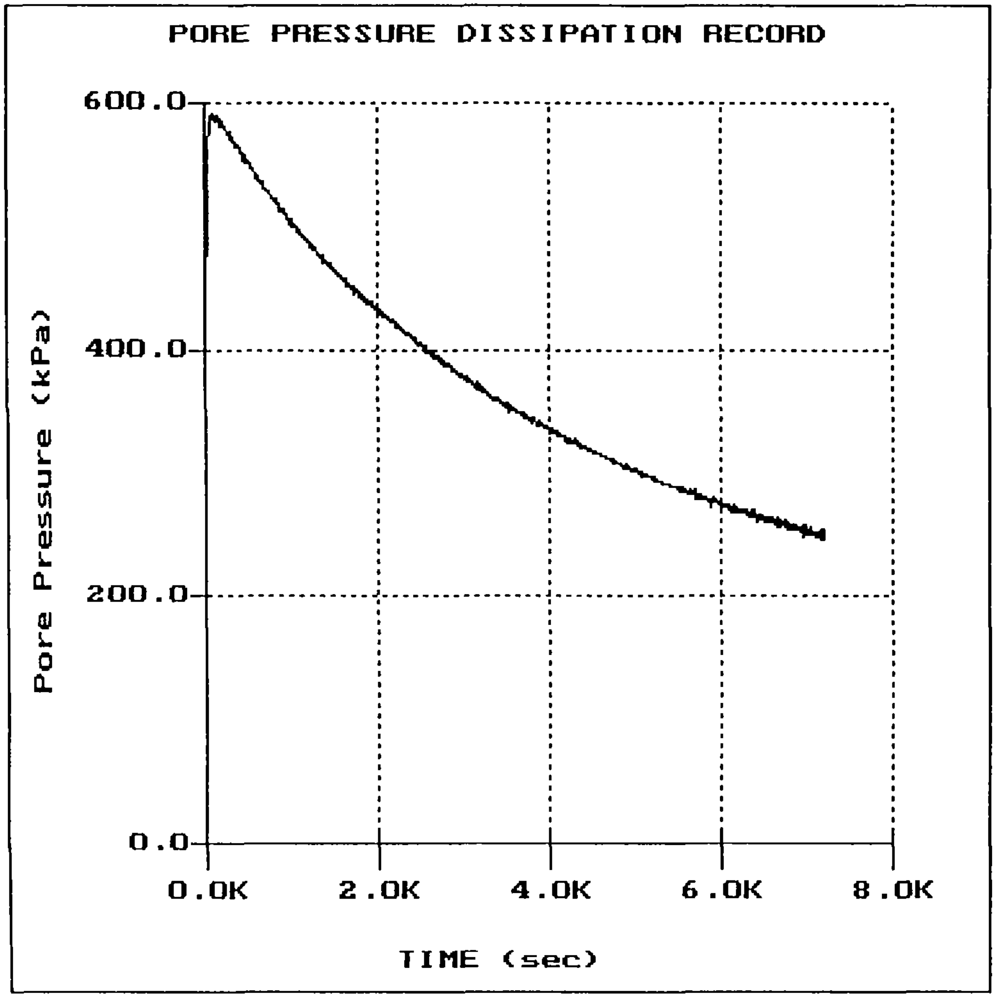
File: 300SC261.PPR
Depth (m): 26.25
(ft): 86.12
Duration : 7200.0s
U-min: 289.40 7170.0s
U-max: 904.10 195.0s



Legacy Parkway

SC-12-264
Location:STRUCTURE 12

Cone:20 TON A 058
Date:01:26:00 09:47

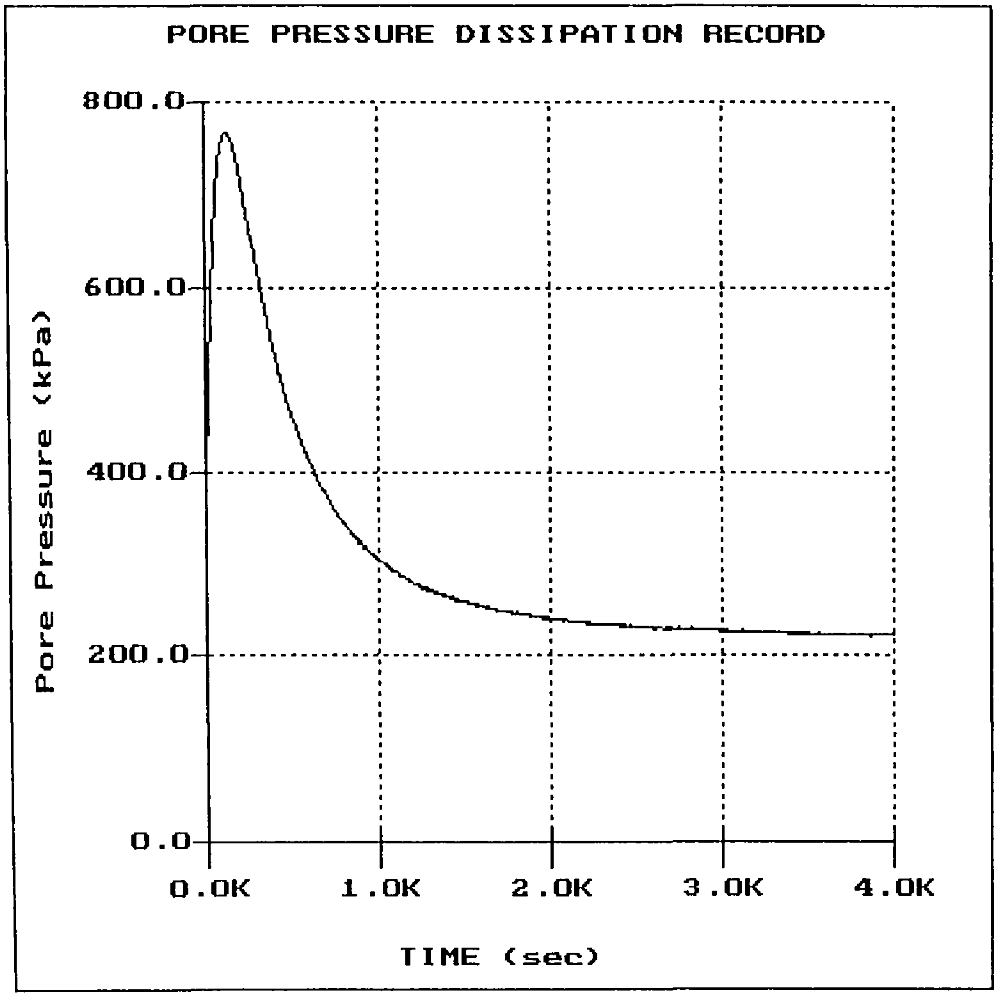


File: 300SC264.PPR
Depth (m): 13.25
(ft): 43.47
Duration : 7200.0s
U-min: 245.70 7185.0s
U-max: 590.80 95.0s

Legacy Parkway

SC-12-264
Location:STRUCTURE 12

Cone:20 TON A 058
Date:01:26:00 09:47



PORE PRESSURE DISSIPATION RECORD

File: 300SC264.PPR
Depth (m): 21.85
(ft): 71.69
Duration : 4000.0s
U-min: 220.80 3860.0s
U-max: 767.40 120.0s

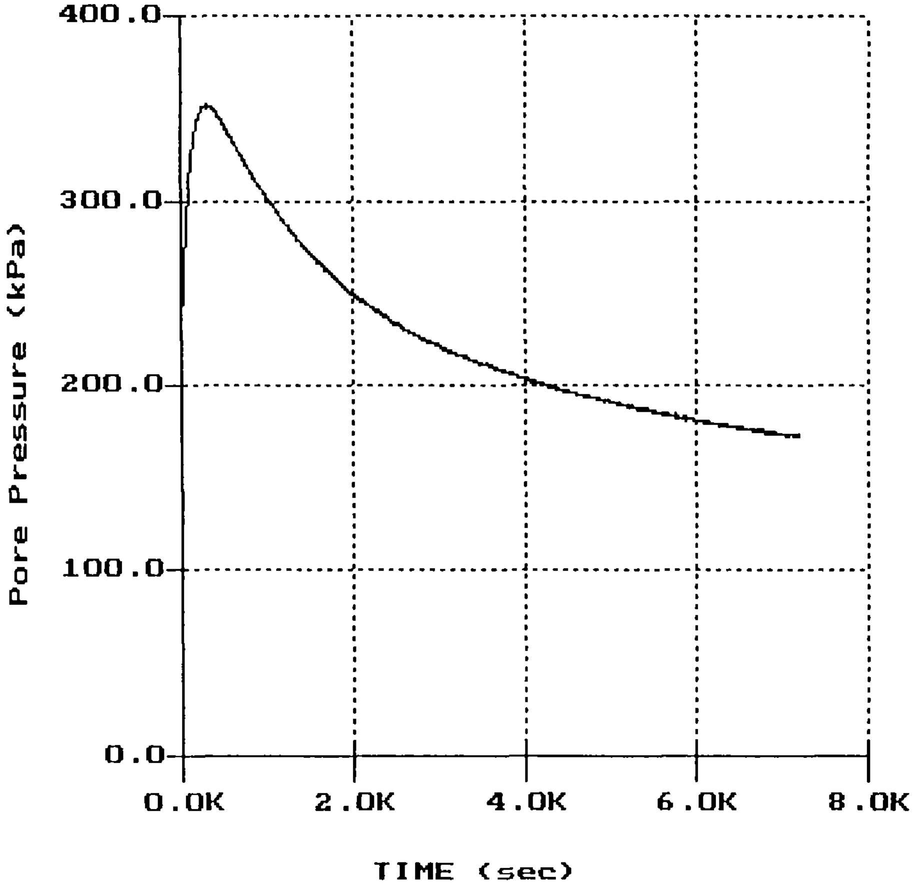
Legacy Parkway

SC-13-305
Location:STRUCTURE 13

Cone: 20 TON A 070
Date:02:04:00 08:11

File: 300SC305.PPR
Depth (m): 11.75
(ft): 38.55
Duration : 7200.0s
U-min: 171.97 7175.0s
U-max: 352.11 305.0s

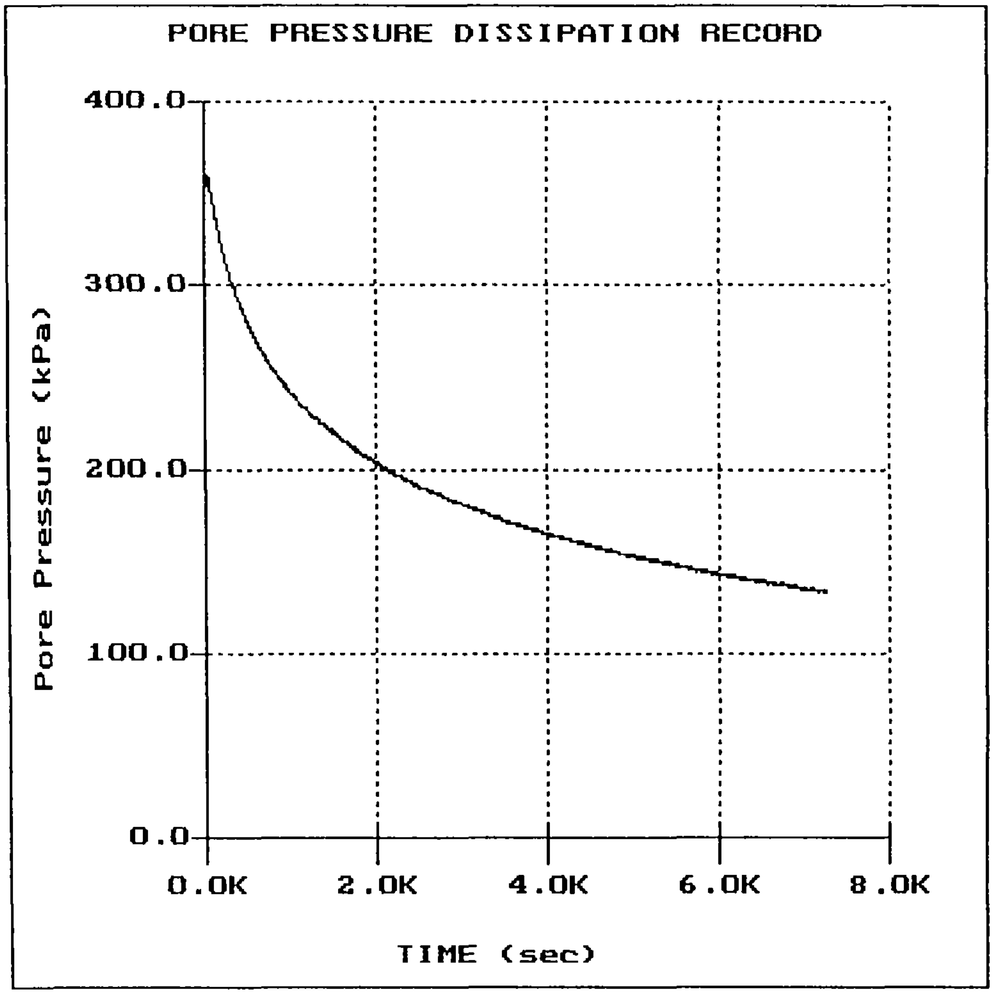
PORE PRESSURE DISSIPATION RECORD



Legacy Parkway

SC-31-353
Location:STRUCTURE 31

Cone: 20 TON A 070
Date:05:03:00 08:09



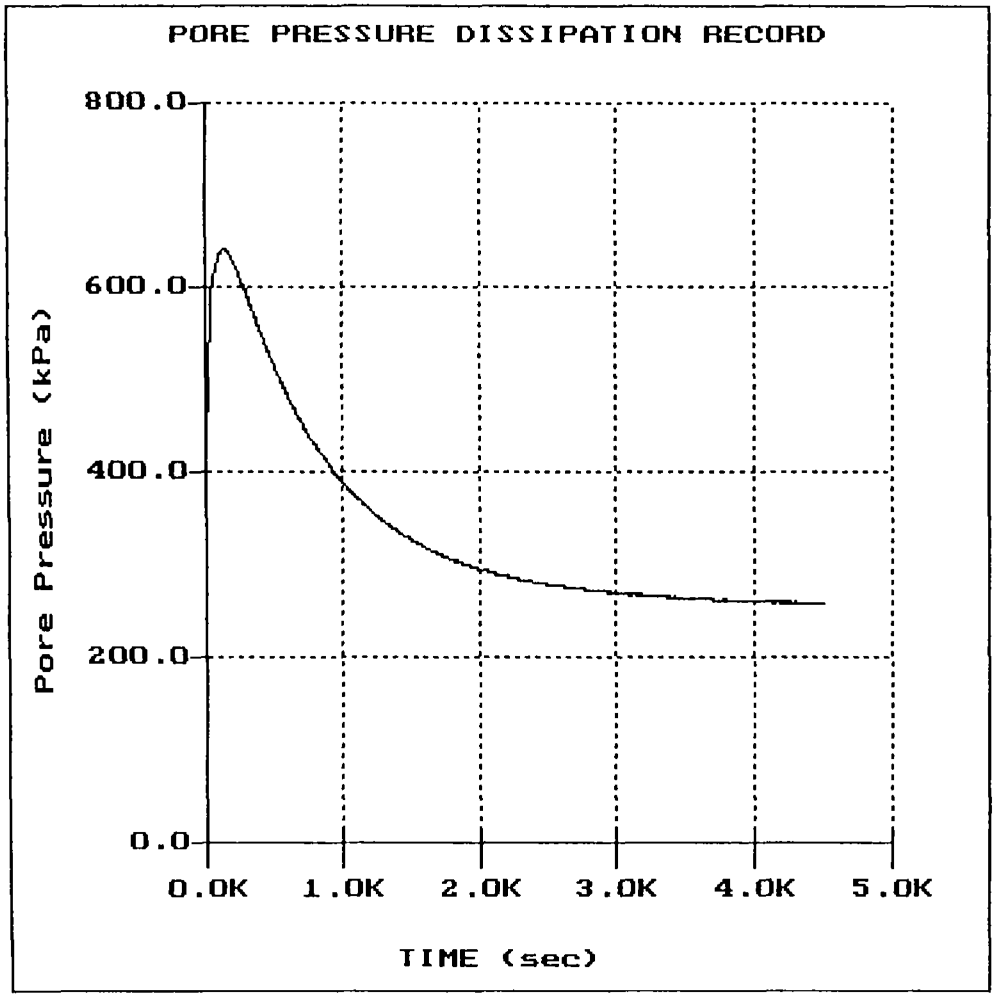
File: 300SC353.PPR
Depth (m): 9.15
(ft): 30.02
Duration : 7260.0s
U-min: 133.36 7230.0s
U-max: 359.82 40.0s

Legacy Parkway

SC-31-353
Location:STRUCTURE 31

Cone: 20 TON A 070
Date:05:03:00 08:09

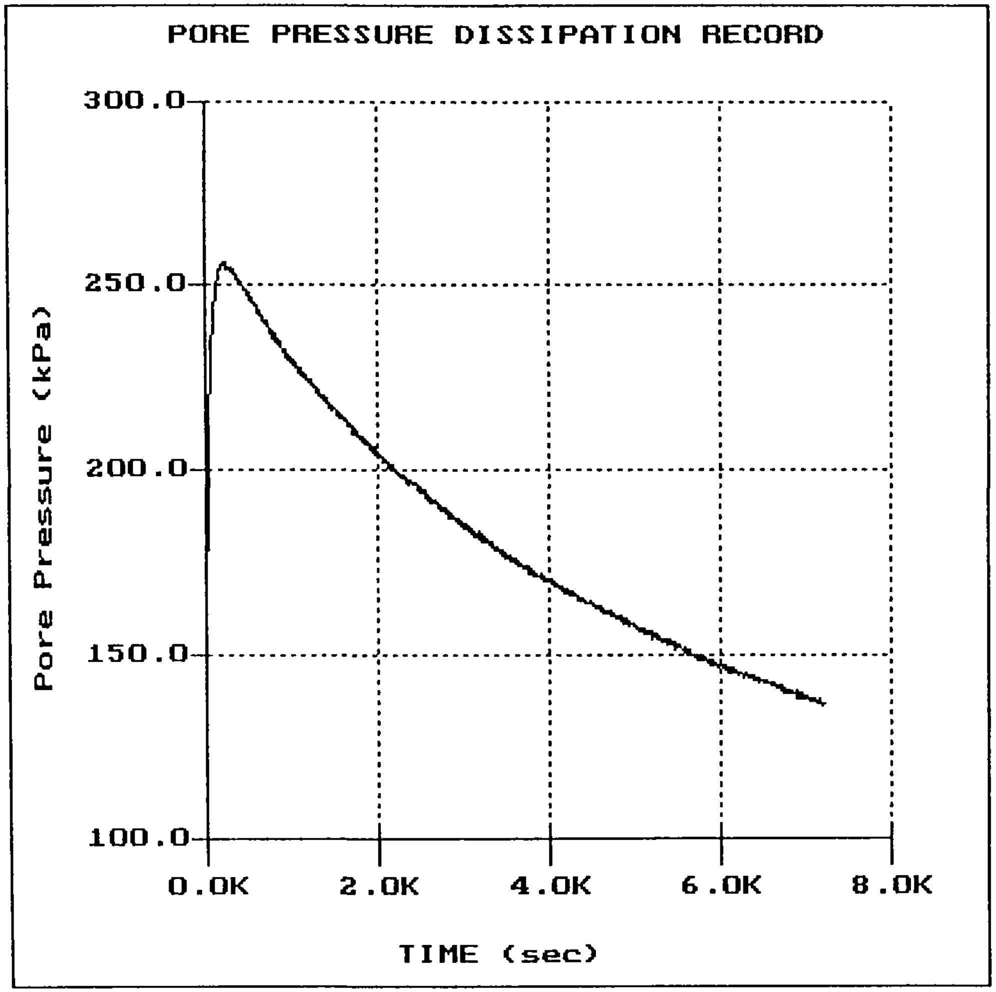
File: 300SC353.PPR
Depth (m): 22.70
(ft): 74.48
Duration : 4500.0s
U-min: 258.10 4445.0s
U-max: 641.30 130.0s



Legacy Parkway

SC-31-356
Location:STRUCTURE 31

Cone: 20 TON A 070
Date:05:02:00 08:54

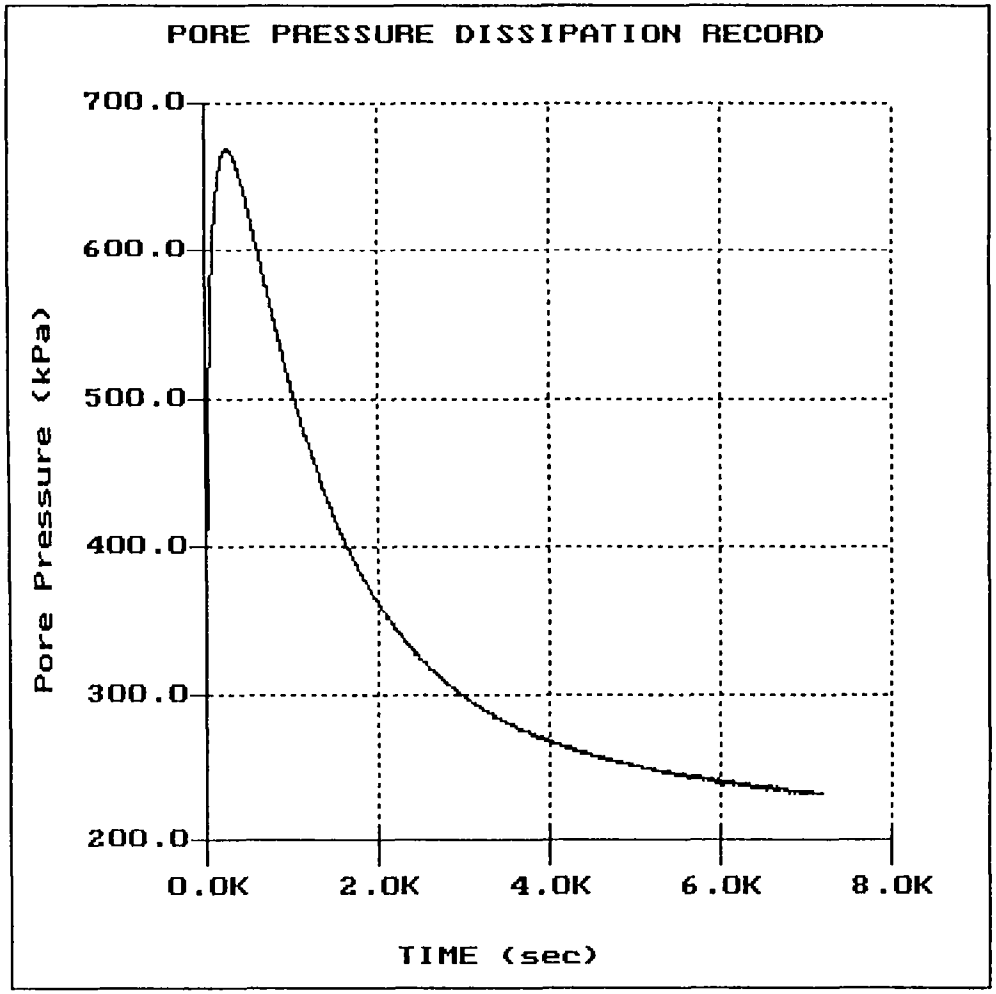


File: 300SC356.PPR
Depth (m): 7.80
(ft): 25.59
Duration : 7215.0s
U-min: 129.68 0.0s
U-max: 256.33 230.0s

Legacy Parkway

SC-31-356
Location:STRUCTURE 31

Cone: 20 TON A 070
Date:05:02:00 08:54



File: 300SC356.PPR
Depth (m): 18.70
(ft): 61.35
Duration : 7205.0s
U-min: 230.53 7195.0s
U-max: 668.64 260.0s

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION	LATER TESTS:									
BORING NO.	SB-11-262	SB-12-263								
SAMPLE DEPTH (m)	16.76	4.6	7.6	9.1	10.7	12.2	15.2			
LINE	CENTER ST	500 SOUTH								
STATION	5+495.950									
OFFSET (RT or LT)	0.22 LT									
ELEVATION (m)	1286.12									
SAMPLE TYPE	SH									
DATE SAMPLED	1/26/2000									
SOIL CLASSIFICATION (USCS)	CH	CL	CL	ML	SM	CL	CL			
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)		100	100	100	100	100	100			
NO. 100 (147 microns)										
NO. 200 (74 microns)	99	77	91	73	18	87	86			
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)	33									
WET UNIT WEIGHT (kN/m^3)	18.1									
DRY UNIT WEIGHT (kN/m^3)	13.6									
SPECIFIC GRAVITY	2.72									
ATTERBERG LIMITS										
LIQUID LIMIT, LL	61	30	27	NP		35	40			
PLASTICITY INDEX, PI	35	12	9	NP		17	21			
SHEAR STRENGTH										
~~UNDRAINED SHEAR STRENGTH, Su, (kPa)~~ qu, kPa	123									
TORVANE (kPa)	67									
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
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE

K-1110

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	SB 12-263	SB-12-263	SB-12-263	SB 12-263	SB-12-263	SB-12-263	SB-12-263	SB 12-265	SB 12-265	SB 12-265
SAMPLE DEPTH (m)	1.52	5.18	7.62	18.29	24.38	35.05	41.15	1.52	4.57	13.72
LINE	500 SOUTH	500 SOUTH	500 SOUTH	500 SOUTH	500 SOUTH	500 SOUTH	500 SOUTH	500 SOUTH	500 SOUTH	500 SOUTH
STATION	70+189.825	70+189.825	70+189.825	70+189.825	70+189.825	70+189.825	70+189.825	70+260.053	70+260.053	70+260.053
OFFSET (RT or LT)	4.65 LT	4.65 LT	4.65 LT	4.65 LT	4.65 LT	4.65 LT	4.65 LT	3.46 LT	3.46 LT	3.46 LT
ELEVATION (m)	1286.52	1286.52	1286.52	1286.52	1286.52	1286.52	1286.52	1286.64	1286.64	1286.64
SAMPLE TYPE	SH	SH	SH	SH	SH	SH	SH	SH	SH	SH
DATE SAMPLED	1/31/2000	1/31/2000	1/31/2000	1/31/2000	1/31/2000	1/31/2000	1/31/2000	1/22/2000	1/22/2000	1/22/2000
SOIL CLASSIFICATION (USCS)	CL	CL	ML	CL		ML	ML	CL	CL	
GROUP CLASSIFICATION (AASHTO)			A-4			A-4				
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)				94			99		97	
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)		38		22			26		27	
WET UNIT WEIGHT (kN/m^3)		18.1		20.1			19.8		19.9	
DRY UNIT WEIGHT (kN/m^3)		13.1		16.5			15.7		15.7	
SPECIFIC GRAVITY		2.75					2.70		2.77	
ATTERBERG LIMITS										
LIQUID LIMIT, LL		41		42					39	
PLASTICITY INDEX, PI		22		23					17	
SHEAR STRENGTH										
~~UNDRAINED SHEAR STRENGTH, Su~~ quc; (kPa)		74		103			262		167	
TORVANE (kPa)	62	48	48	57	38	57	67	67	4	62
CORROSION										
pH	8.5							9.0		
RESISTIVITY (ohm cm)	4900							2600		
WATER SOLUBLE SULFATE (ppm)	8							25		

UDOTSUM (LEGACY 2) 35-8163-05 P.D. 6/2/00

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-1111

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION					LATER TESTS:						
BORING NO.	SB-12-265	SB-12-265	SB-12-265	SB-12-265							
SAMPLE DEPTH (m)	24.38	30.48	48.77	73.15	6.1	7.6	9.1	10.7	12.2	13.7	15.2
LINE	500 SOUTH	500 SOUTH	500 SOUTH	500 SOUTH							
STATION	70+260.053	70+260.053	70+260.053	70+260.053							
OFFSET (RT or LT)	3.46 LT	3.46 LT	3.46 LT	3.46 LT							
ELEVATION (m)	1286.64	1286.64	1286.64	1286.64							
SAMPLE TYPE	SH	SH	SH	SH							
DATE SAMPLED	1/22/2000	1/22/2000	1/22/2000	1/22/2000							
SOIL CLASSIFICATION (USCS)		CL	ML	CL	CL	CL	CL	CL	CL	CL	CL
GROUP CLASSIFICATION (AASHTO)		A-7-6									
SIEVE ANALYSIS (percent passing)											
9.5mm SQUARE OPENING											
NO. 4 (4760 microns)					100	100	100	100	100	100	100
NO. 100 (147 microns)											
NO. 200 (74 microns)		99	100	96	86	72	88	95	89	93	70
CLAY FRACTION (2 microns)											
MOISTURE CONTENT & UNIT WEIGHT											
MOISTURE CONTENT (%)		26	27	26							
WET UNIT WEIGHT (kN/m^3)		20.3	19.1	20.6							
DRY UNIT WEIGHT (kN/m^3)		16.1	15.1	16.4							
SPECIFIC GRAVITY		2.80	2.77	2.84							
ATTERBERG LIMITS											
LIQUID LIMIT, LL		43	44	39	34	36	35	36	34	30	30
PLASTICITY INDEX, PI		17	17	16	15	18	17	15	15	13	10
SHEAR STRENGTH qu, kPa											
~~UNDRAINED SHEAR STRENGTH~~, Su, (kPa)		272	220	197							
TORVANE (kPa)	57	43	62	120							
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
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE
K-1112

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	SB-31-353	SB-31-353	SB-31-353	SB-31-353	SB-31-353	SB-31-353	SB-31-353	SB-31-354	SB-31-354	SB-31-354
SAMPLE DEPTH (m)	1 22	7 32	11 89	13 41	24 38	27 43	30 48	0 00	1 52	4 57
LINE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE
STATION	99+835 873	99+835 873	99+835 873	99+835 873	99+835 873	99+835 873	99+835 873	100+033 967	100+033 967	100+033 967
OFFSET (RT or LT)	14 26 RT	14 26 RT	14 26 RT	14 26 RT	14 26 RT	14 26 RT	14 26 RT	0 00 LT	0 00 LT	0 00 LT
ELEVATION (m)	1284 58	1284 58	1284 58	1284 58	1284 58	1284 58	1284 58	1284 41	1284 41	1284 41
SAMPLE TYPE	SPT	SH	SH	SPT	SH	SPT	SH	SPT	P	P
DATE SAMPLED	4/3/2000	4/3/2000	4/3/2000	4/3/2000	4/3/2000	4/3/2000	4/3/2000	4/21/2000	4/21/2000	4/21/2000
SOIL CLASSIFICATION (USCS)	CL	SM	SM	SP	ML		CL	CL		CL
GROUP CLASSIFICATION (AASHTO)					A-4			A-6		
SIEVE ANALYSIS (percent passing)										
9 5mm SQUARE OPENING		100		100						
NO 4 (4760 microns)		100		99						
NO 100 (147 microns)		29		9						
NO 200 (74 microns)		17	62	5		53				
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)			21				38			35
WET UNIT WEIGHT (kN/m^3)			20 9				17 7			19 0
DRY UNIT WEIGHT (kN/m^3)			17 2				12 8			14 0
SPECIFIC GRAVITY			2 73				2 69			2 73
ATTERBERG LIMITS										
LIQUID LIMIT, LL										47
PLASTICITY INDEX, PI										26
SHEAR STRENGTH										
UNDRAINED SHEAR STRENGTH, Su, (kPa)			89				206			106
TORVANE (kPa)		14	72		27		67		19	77
CORROSION										
pH	9 4							8 7		
RESISTIVITY (ohm cm)	1400							260		
WATER SOLUBLE SULFATE (ppm)	<250							320		

KLEINFELDER

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SUMMARY OF LABORATORY TEST DATA

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

PLATE

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LDDTSUM (LEGACY2 35-8163-05 [illegible] 6/2/05

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO.	SB-31-354	SB-31-354	SB-31-354	SB-31-354	SB-31-354	SB-31-354	SB-31-354	SB-31-354	SB-31-354	SB-31-354
SAMPLE DEPTH (m)	7.32	10.36	13.41	17.98	21.03	24.08	30.48	36.58	42.67	48.77
LINE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE
STATION	100+033.967	100+033.967	100+033.967	100+033.967	100+033.967	100+033.967	100+033.967	100+033.967	100+033.967	100+033.967
OFFSET (RT or LT)	0.00 LT	0.00 LT	0.00 LT	0.00 LT	0.00 LT	0.00 LT	0.00 LT	0.00 LT	0.00 LT	0.00 LT
ELEVATION (m)	1284.41	1284.41	1284.41	1284.41	1284.41	1284.41	1284.41	1284.41	1284.41	1284.41
SAMPLE TYPE	P	P	P	P	SPT	P	P	P	P	P
DATE SAMPLED	4/21/2000	4/21/2000	4/21/2000	4/21/2000	4/21/2000	4/21/2000	4/21/2000	4/21/2000	4/21/2000	4/21/2000
SOIL CLASSIFICATION (USCS)			CL	CL-ML	SP-SM	ML	CL			
GROUP CLASSIFICATION (AASHTO)				A-6	A-2-5	A-4	A-6			
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING					100					
NO. 4 (4760 microns)					99					
NO. 100 (147 microns)					10					
NO. 200 (74 microns)			79		5					
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)			22							
WET UNIT WEIGHT (kN/m^3)			20.9							
DRY UNIT WEIGHT (kN/m^3)			17.1							
SPECIFIC GRAVITY			2.70							
ATTERBERG LIMITS										
LIQUID LIMIT, LL			31							
PLASTICITY INDEX, PI			13							
SHEAR STRENGTH										
~~UNDRAINED SHEAR STRENGTH, Su,~~ qu (kPa)			103							
TORVANE (kPa)	62	57	38	86		134	134	153	144	144
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
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

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SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	SB-31-354	SB-31-355	SB-31-355	SB-31-355	SB-31-355	SB-31-355	SB-31-355	SB-31-355	SB-31-355	SB-31-355
SAMPLE DEPTH (m)	54 86	1 37	4 42	7.47	10 52	12 04	13 56	18 14	24 23	30 33
LINE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE
STATION	100+033 967	100+075 967	100+075 967	100+075 967	100+075 967	100+075 967	100+075 967	100+075 967	100+075 967	100+075 967
OFFSET (RT or LT)	0.00 LT	0.00 LT	0.00 LT	0 00 LT	0 00 LT	0 00 LT	0.00 LT	0.00 LT	0 00 LT	0.00 LT
ELEVATION (m)	1284 41	1284.33	1284 33	1284 33	1284.33	1284.33	1284.33	1284 33	1284 33	1284.33
SAMPLE TYPE	P	P	P	P	P	SPT	P	P	P	P
DATE SAMPLED	4/21/2000	4/17/2000	4/17/2000	4/17/2000	4/17/2000	4/17/2000	4/17/2000	4/17/2000	4/17/2000	4/17/2000
SOIL CLASSIFICATION (USCS)	CL ML		CH			CL		CL	CL	CL
GROUP CLASSIFICATION (AASHTO)	A 6		A-7-6						A 6	A 6
SIEVE ANALYSIS (percent passing)										
9 5mm SQUARE OPENING										
NO 4 (4760 microns)										
NO 100 (147 microns)										
NO 200 (74 microns)						59			94	
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)								31	26	
WET UNIT WEIGHT (kN/m^3)								19 3	19 9	
DRY UNIT WEIGHT (kN/m^3)								14 7	15 8	
SPECIFIC GRAVITY									2 73	
ATTERBERG LIMITS										
LIQUID LIMIT, LL						32			30	
PLASTICITY INDEX, PI						16			10	
SHEAR STRENGTH										
qu ~~UNDRAINED SHEAR~~ STRENGTH, ~~Su~~, (kPa)								178		
TORVANE (kPa)	21	37	36	31	62		48	72	56	38
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

UDC TSUM LEGACY 2 35-8163-05 P.C 6/2/00

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-1140

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	SB-31-355	SB-31-355	SB-31-355	SB-31-355	SB-31-355	SB-31-356	SB-31-356	SB-31-356	SB-31-356	SB-31-356
SAMPLE DEPTH (m)	36.42	39.47	42.52	48.62	60.96	3.05	6.10	9.14	12.19	15.24
LINE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE	PED BRIDGE
STATION	100+075.967	100+075.967	100+075.967	100+075.967	100+075.967	100+118.329	100+118.329	100+118.329	100+118.329	100+118.329
OFFSET (RT or LT)	0.00 LT	0.00 LT	0.00 LT	0.00 LT	0.00 LT	8.80 RT	8.80 RT	8.80 RT	8.80 RT	8.80 RT
ELEVATION (m)	1284.33	1284.33	1284.33	1284.33	1284.33	1284.99	1284.99	1284.99	1284.99	1284.99
SAMPLE TYPE	P	SPT	P	P	SPT	SH	SH	SH	SH	SH
DATE SAMPLED	4/17/2000	4/17/2000	4/17/2000	4/17/2000	4/17/2000	3/30/2000	3/30/2000	3/30/2000	3/30/2000	3/30/2000
SOIL CLASSIFICATION (USCS)		CL	CL			CL	CL			
GROUP CLASSIFICATION (AASHTO)		A-7-6								
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)		81			30		89			
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)			26				37			
WET UNIT WEIGHT (kN/m^3)			20.1				18.7			
DRY UNIT WEIGHT (kN/m^3)			15.9				13.7			
SPECIFIC GRAVITY			2.77				2.73			
ATTERBERG LIMITS										
LIQUID LIMIT, LL		45	47				38			
PLASTICITY INDEX, PI		23	27				16			
SHEAR STRENGTH										
~~UNDRAINED SHEAR STRENGTH~~, Su, (kPa)			110				73			
TORVANE (kPa)	57		38	40		120	48	43	53	53
CORROSION										
pH						9.0				
RESISTIVITY (ohm cm)						810				
WATER SOLUBLE SULFATE (ppm)						90				

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SUMMARY OF LABORATORY TEST DATA
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

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UDOTSUM (LEGACY 2) 35-8163-05 P.D. 6/2/00

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	SB 31-356	SB-31-356								
SAMPLE DEPTH (m)	18 29	27 43								
LINE	PED BRIDGE	PED BRIDGE								
STATION	100+118 329	100+118 329								
OFFSET (RT or LT)	8 80 RT	8 80 RT								
ELEVATION (m)	1284 99	1284 99								
SAMPLE TYPE	SH	SH								
DATE SAMPLED	3/30/2000	3/30/2000								
SOIL CLASSIFICATION (USCS)	CH									
GROUP CLASSIFICATION (AASHTO)	A-7 6									
SIEVE ANALYSIS (percent passing)										
9 5mm SQUARE OPENING										
NO 4 (4760 microns)										
NO 100 (147 microns)										
NO 200 (74 microns)	97									
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)	30									
WET UNIT WEIGHT (kN/m^3)	18 9									
DRY UNIT WEIGHT (kN/m^3)	14 6									
SPECIFIC GRAVITY	2 74									
ATTERBERG LIMITS										
LIQUID LIMIT, LL	66									
PLASTICITY INDEX, PI	37									
SHEAR STRENGTH										
UNDRAINED SHEAR STRENGTH, Su, (kPa)	64									
TORVANE (kPa)	43	67								
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

KLEINFELDER

Project No. 35-8163 05

SUMMARY OF LABORATORY TEST DATA
Legacy Parkway - Preferred Alternative
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K-1142

SUMMARY OF LABO TORY 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										
qu ~~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)										

UDOTSUM (LEGACY 2) 35-8163-05 P D 6/2/00

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

SUMMARY OF LAB⌄RATORY TEST DATA

DESCRIPTION										
BORING NO	RB-395	RB-395	RB-395	RB-395						
SAMPLE DEPTH (m)	1 52	3 66	4 57	7.62						
LINE	D Mainline	D Mainline	D Mainline	D Mainline						
STATION	6003+950 000	6003+950 000	6003+950 000	6003+950 000						
OFFSET (RT or LT)	0 00 RT	0 00 RT	0.00 RT	0.00 RT						
ELEVATION (m)	1286 26	1286.26	1286.26	1286.26						
SAMPLE TYPE	SH	SPT	SH	SH						
DATE SAMPLED	5/10/2000	5/10/2000	5/10/2000	5/10/2000						
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)		55								
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)	41		22							
WET UNIT WEIGHT (kN/m^3)	18 1		20 3							
DRY UNIT WEIGHT (kN/m^3)	12 8		16 7							
SPECIFIC GRAVITY	2 75		2.71							
ATTERBERG LIMITS										
LIQUID LIMIT, LL	40		40							
PLASTICITY INDEX, PI	19		17							
SHEAR STRENGTH										
UNDRAINED ~~SHEAR STRENGTH, Su,~~ (kPa)			33							
TORVANE (kPa)	34		24	48						
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

KLEINFELDER

SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

PLATE

K-1212

Project No.. 35 8163-05

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	RB-396	RB-396								
SAMPLE DEPTH (m)	3.05	6.10								
LINE	D Mainline	D Mainline								
STATION	6004+534.815	6004+534.815								
OFFSET (RT or LT)	93.86 RT	93.86 RT								
ELEVATION (m)	1286.99	1286.99								
SAMPLE TYPE	SH	SH								
DATE SAMPLED	5/11/2000	5/11/2000								
SOIL CLASSIFICATION (USCS)	CL	ML								
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)	92	50								
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)	42									
WET UNIT WEIGHT (kN/m^3)	19.7									
DRY UNIT WEIGHT (kN/m^3)	13.9									
SPECIFIC GRAVITY	2.74									
ATTERBERG LIMITS										
LIQUID LIMIT, LL	39									
PLASTICITY INDEX, PI	19									
SHEAR STRENGTH τ_u										
~~UNDRAINED SHEAR STRENGTH, Su~~, (kPa)										
TORVANE (kPa)	38	29								
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

KLEINFELDER

Project No.: 35-8163.05

SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

PLATE

K-1213

UDOT SUM (LEGACY 2) 35-8163-05 P.D. 5/2/00

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	RB-397	RB-397	RB-397							
SAMPLE DEPTH (m)	1.52	4.57	7.62							
LINE	D Mainline	D Mainline	D Mainline							
STATION	6005+180.000	6005+180.000	6005+180.000							
OFFSET (RT or LT)	0.00 RT	0.00 RT	0.00 RT							
ELEVATION (m)	1286.90	1286.90	1286.90							
SAMPLE TYPE	SH	SH	SH							
DATE SAMPLED	5/17/2000	5/17/2000	5/17/2000							
SOIL CLASSIFICATION (USCS)			ML							
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)			60							
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)			23							
WET UNIT WEIGHT (kN/m^3)			20.6							
DRY UNIT WEIGHT (kN/m^3)			16.7							
SPECIFIC GRAVITY			2.69							
ATTERBERG LIMITS										
LIQUID LIMIT, LL			NP							
PLASTICITY INDEX, PI			NP							
SHEAR STRENGTH q_u										
~~UNDRAINED SHEAR STRENGTH, Su,~~ (kPa)			24							
TORVANE (kPa)	53	43	53							
CORROSION										
pH										
RESISTIVITY (ohm-cm)										
WATER SOLUBLE SULFATE (ppm)										

KLEINFELDER

Project No.: 35-8163-05

SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

PLATE

K-1214

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	RB-398	RB-398	RB-398	RB-398						
SAMPLE DEPTH (m)	1.52	4.57	6.71	8.23						
LINE	D Mainline	D Mainline	D Mainline	D Mainline						
STATION	6005+650.000	6005+650.000	6005+650.000	6005+650.000						
OFFSET (RT or LT)	0.00 RT	0.00 RT	0.00 RT	0.00 RT						
ELEVATION (m)	1286.53	1286.53	1286.53	1286.53						
SAMPLE TYPE	SH	SH	SPT	MC						
DATE SAMPLED	5/10/2000	5/10/2000	5/10/2000	5/10/2000						
SOIL CLASSIFICATION (USCS)	CL	CL		SM						
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING				100						
NO. 4 (4760 microns)				100						
NO. 100 (147 microns)				43						
NO. 200 (74 microns)			99	13						
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)	35	28								
WET UNIT WEIGHT (kN/m^3)	18.0	18.9								
DRY UNIT WEIGHT (kN/m^3)	13.4	14.8								
SPECIFIC GRAVITY		2.78								
ATTERBERG LIMITS										
LIQUID LIMIT, LL		44								
PLASTICITY INDEX, PI		26								
SHEAR STRENGTH q_u										
UN~~DRAINED SHEAR STRENGTH, Su,~~ (kPa)		47								
TORVANE (kPa)	38	48								
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

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KLEINFELDER

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SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

PLATE

K-1215

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	RB-399	RB-399	RB-399	RB-399	RB-399					
SAMPLE DEPTH (m)	1 52	3 05	4 57	7 62	8 23					
LINE	D Mainline	D Mainline	D Mainline	D Mainline	D Mainline					
STATION	6005+940 000	6005+940 000	6005+940 000	6005+940 000	6005+940 000					
OFFSET (RT or LT)	0 00 RT	0 00 RT	0 00 RT	0 00 RT	0 00 RT					
ELEVATION (m)	1286 47	1286 47	1286 47	1286 47	1286 47					
SAMPLE TYPE	SH	MC	SH	SH	SPT					
DATE SAMPLED	5/15/2000	5/15/2000	5/15/2000	5/15/2000	5/15/2000					
SOIL CLASSIFICATION (USCS)		ML	CL		SM					
GROUP CLASSIFICATION (AASHTO)			A-7-6		A-2-4					
SIEVE ANALYSIS (percent passing)										
9 5mm SQUARE OPENING										
NO 4 (4760 microns)										
NO 100 (147 microns)										
NO 200 (74 microns)	95	96	100	63	39					
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)		31	38							
WET UNIT WEIGHT (kN/m^3)		18 8	19 5							
DRY UNIT WEIGHT (kN/m^3)		14 4	14.2							
SPECIFIC GRAVITY			2.77							
ATTERBERG LIMITS										
LIQUID LIMIT, LL			46							
PLASTICITY INDEX, PI			26							
SHEAR STRENGTH qu										
~~UNDRAINED SHEAR STRENGTH, Su~~, (kPa)			32							
TORVANE (kPa)	57		67							
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

KLEINFELDER

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SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

PLATE

K-1216

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO.	RB-400	RB-400	RB-400	RB-400						
SAMPLE DEPTH (m)	1.52	4.57	6.71	7.62						
LINE	D Mainline	D Mainline	D Mainline	D Mainline						
STATION	6006+800.000	6006+800.000	6006+800.000	6006+800.000						
OFFSET (RT or LT)	0.00 RT	0.00 RT	0.00 RT	0.00 RT						
ELEVATION (m)	1287.24	1287.24	1287.24	1287.24						
SAMPLE TYPE	SH	SH	SPT	SH						
DATE SAMPLED	5/15/2000	5/15/2000	5/15/2000	5/15/2000						
SOIL CLASSIFICATION (USCS)	CL	CL								
GROUP CLASSIFICATION (AASHTO)		A-6								
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)			10							
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)	38	27								
WET UNIT WEIGHT (kN/m^3)	18.2	19.8								
DRY UNIT WEIGHT (kN/m^3)	13.1	15.6								
SPECIFIC GRAVITY	2.77									
ATTERBERG LIMITS										
LIQUID LIMIT, LL		35								
PLASTICITY INDEX, PI		16								
SHEAR STRENGTH										
~~UNDRAINED SHEAR STRENGTH, Su~~ Qu, (kPa)		64								
TORVANE (kPa)	38	67		57						
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

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KLEINFELDER

Project No.: 35-8163-05

SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

PLATE

K-1217

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO	RB-401	RB-401	RB-401							
SAMPLE DEPTH (m)	1.52	4.57	7.62							
LINE	D Mainline	D Mainline	D Mainline							
STATION	6007+400.000	6007+400.000	6007+400.000							
OFFSET (RT or LT)	0.00 RT	0.00 RT	0.00 RT							
ELEVATION (m)	1287.07	1287.07	1287.07							
SAMPLE TYPE	SH	SH	SH							
DATE SAMPLED	5/18/2000	5/18/2000	5/18/2000							
SOIL CLASSIFICATION (USCS)	ML	ML								
GROUP CLASSIFICATION (AASHTO)	A-3									
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)	94	79								
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)	27	27								
WET UNIT WEIGHT (kN/m^3)	19.1	18.1								
DRY UNIT WEIGHT (kN/m^3)	15.0	14.3								
SPECIFIC GRAVITY		2.71								
ATTERBERG LIMITS										
LIQUID LIMIT, LL										
PLASTICITY INDEX, PI										
SHEAR STRENGTH										
~~UNDRAINED SHEAR STRENGTH, Su~~ (kPa)		74								
TORVANE (kPa)	67	38	77							
CORROSION										
pH										
RESISTIVITY (ohm-cm)										
WATER SOLUBLE SULFATE (ppm)										

KLEINFELDER

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SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

PLATE

K-1218

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO.	RB-402	RB 402	RB-402							
SAMPLE DEPTH (m)	1.52	4.57	7.62							
LINE	D Mainline	D Mainline	D Mainline							
STATION	6007+800.000	6007+800.000	6007+800.000							
OFFSET (RT or LT)	0.00 RT	0.00 RT	0.00 RT							
ELEVATION (m)	1287.01	1287.01	1287.01							
SAMPLE TYPE	SH	SH	SH							
DATE SAMPLED	5/15/2000	5/15/2000	5/15/2000							
SOIL CLASSIFICATION (USCS)	CL	CL								
GROUP CLASSIFICATION (AASHTO)		A-6								
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)	98	99								
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)		40								
WET UNIT WEIGHT (kN/m^3)		17.6								
DRY UNIT WEIGHT (kN/m^3)		12.6								
SPECIFIC GRAVITY		2.75								
ATTERBERG LIMITS										
LIQUID LIMIT, LL	47									
PLASTICITY INDEX, PI	23									
SHEAR STRENGTH										
qu ~~UNDRAINED SHEAR STRENGTH, Su~~ (kPa)		25								
TORVANE (kPa)	81	45	67							
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-1219

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION											
BORING NO	RB-403	RB-403	RB-403								
SAMPLE DEPTH (m)	1.52	4.57	7.62								
LINE	D Mainline	D Mainline	D Mainline								
STATION	6008+885.000	6008+885.000	6008+885.000								
OFFSET (RT or LT)	0.00 RT	0.00 RT	0.00 RT								
ELEVATION (m)	1285.34	1285.34	1285.34								
SAMPLE TYPE	SH	SH	SH								
DATE SAMPLED	5/15/2000	5/15/2000	5/15/2000								
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)	99	96	91								
CLAY FRACTION (2 microns)											
MOISTURE CONTENT & UNIT WEIGHT											
MOISTURE CONTENT (%)	22		32								
WET UNIT WEIGHT (kN/m^3)	20.5		18.1								
DRY UNIT WEIGHT (kN/m^3)	16.7		13.7								
SPECIFIC GRAVITY	2.83										
ATTERBERG LIMITS											
LIQUID LIMIT, LL	42										
PLASTICITY INDEX, PI	21										
SHEAR STRENGTH											
qu ~~UNDRAINED SHEAR STRENGTH, Su,~~ (kPa)	293										
TORVANE (kPa)	81	72	67								
CORROSION											
pH											
RESISTIVITY (ohm cm)											
WATER SOLUBLE SULFATE (ppm)											

KLEINFELDER

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SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

PLATE

K-1220

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO.	RB-404	RB-404	RB-404							
SAMPLE DEPTH (m)	1.52	4.57	7.62							
LINE	D Mainline	D Mainline	D Mainline							
STATION	6009+670.000	6009+670.000	6009+670.000							
OFFSET (RT or LT)	0.00 RT	0.00 RT	0.00 RT							
ELEVATION (m)	1284.61	1284.61	1284.61							
SAMPLE TYPE	SH	SH	SH							
DATE SAMPLED	5/12/2000	5/12/2000	5/12/2000							
SOIL CLASSIFICATION (USCS)	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)		96								
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)			47							
WET UNIT WEIGHT (kN/m^3)			17.4							
DRY UNIT WEIGHT (kN/m^3)			11.9							
SPECIFIC GRAVITY		2.79								
ATTERBERG LIMITS										
LIQUID LIMIT, LL	41	45								
PLASTICITY INDEX, PI	18	23								
SHEAR STRENGTH										
qu ~~UNDRAINED SHEAR STRENGTH, Su~~, (kPa)			102							
TORVANE (kPa)	72	67	53							
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

K-1221

SUMMARY OF LABORATORY TEST DATA

DESCRIPTION										
BORING NO.	RB-405	RB-405	RB-405	RB-405						
SAMPLE DEPTH (m)	0.61	1.52	4.57	7.62						
LINE	D Mainline	D Mainline	D Mainline	D Mainline						
STATION	6010+290.000	6010+290.000	6010+290.000	6010+290.000						
OFFSET (RT or LT)	0.00 RT	0.00 RT	0.00 RT	0.00 RT						
ELEVATION (m)	1284.34	1284.34	1284.34	1284.34						
SAMPLE TYPE	SPT	SH	SH	SH						
DATE SAMPLED	5/16/2000	5/16/2000	5/16/2000	5/16/2000						
SOIL CLASSIFICATION (USCS)				CI						
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)	56			99						
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)				47						
WET UNIT WEIGHT (kN/m^3)				17.4						
DRY UNIT WEIGHT (kN/m^3)				11.9						
SPECIFIC GRAVITY				2.71						
ATTERBERG LIMITS										
LIQUID LIMIT, LL										
PLASTICITY INDEX, PI										
SHEAR STRENGTH										
UNDRAINED SHEAR STRENGTH, Su, (kPa)				66						
TORVANE (kPa)		72	124	29						
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

KLEINFELDER

Project No.: 35-8163-05

SUMMARY OF LABORATORY TEST DATA

I-215 to I-15/US 89 Interchange

PLATE

K-1222

SUMMARY OF LABOR TORY TEST DATA

DESCRIPTION										
BORING NO	RB 406	RB 406	RB 406	RB 406						
SAMPLE DEPTH (m)	1.52	2.13	4.57	7.62						
LINE	D Mainline	D Mainline	D Mainline	D Mainline						
STATION	6011+725.000	6011+725.000	6011+725.000	6011+725.000						
OFFSET (RT or LT)	0.00 RT	0.00 RT	0.00 RT	0.00 RT						
ELEVATION (m)	1285.77	1285.77	1285.77	1285.77						
SAMPLE TYPE	SH	SPT	SH	SH						
DATE SAMPLED	05/11/2000	05/11/2000	05/11/2000	05/11/2000						
SOIL CLASSIFICATION (USCS)			CL							
GROUP CLASSIFICATION (AASHTO)										
SIEVE ANALYSIS (percent passing)										
9.5mm SQUARE OPENING										
NO. 4 (4760 microns)										
NO. 100 (147 microns)										
NO. 200 (74 microns)		79								
CLAY FRACTION (2 microns)										
MOISTURE CONTENT & UNIT WEIGHT										
MOISTURE CONTENT (%)			31							
WET UNIT WEIGHT (kN/m^3)			18.9							
DRY UNIT WEIGHT (kN/m^3)			14.5							
SPECIFIC GRAVITY			2.81							
ATTERBERG LIMITS										
LIQUID LIMIT, LL			38							
PLASTICITY INDEX, PI			19							
SHEAR STRENGTH qu										
~~UNDRAINED SHEAR STRENGTH,~~ Su, (kPa)			127							
TORVANE (kPa)	57		77	43						
CORROSION										
pH										
RESISTIVITY (ohm cm)										
WATER SOLUBLE SULFATE (ppm)										

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SUMMARY OF LABORATORY TEST DATA

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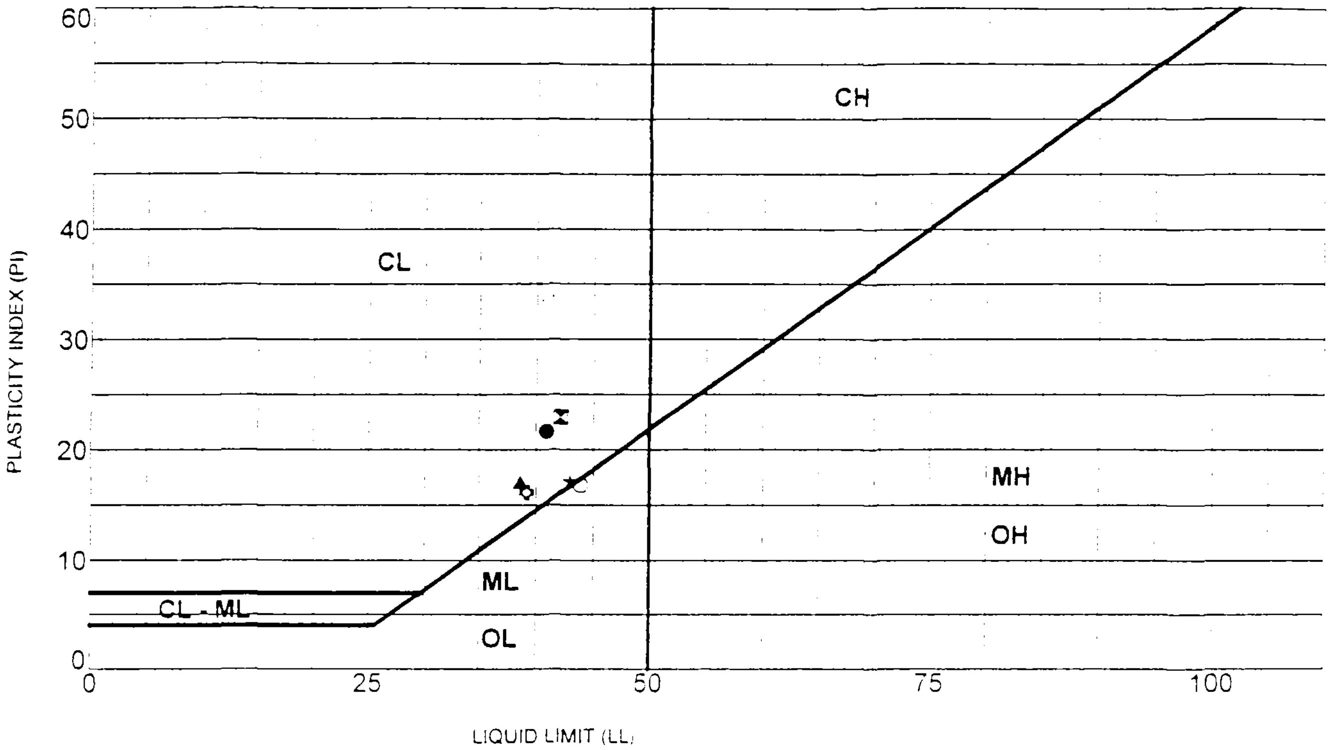
PLATE

K-1223



	Sample	Depth (m)	LL	PL	PI	Description
●	SB-12-263	5.2	41	19	22	Lean CLAY (CL)
⧗	SB-12-263	18.3	42	19	23	Lean CLAY (CL)
▲	SB-12-265	4.6	39	21	17	Lean CLAY (CL)
★	SB-12-265	30.5	43	26	17	Lean CLAY (CL)
○	SB-12-265	48.8	44	27	17	SILT (ML)
✪	SB-12-265	73.2	39	23	16	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

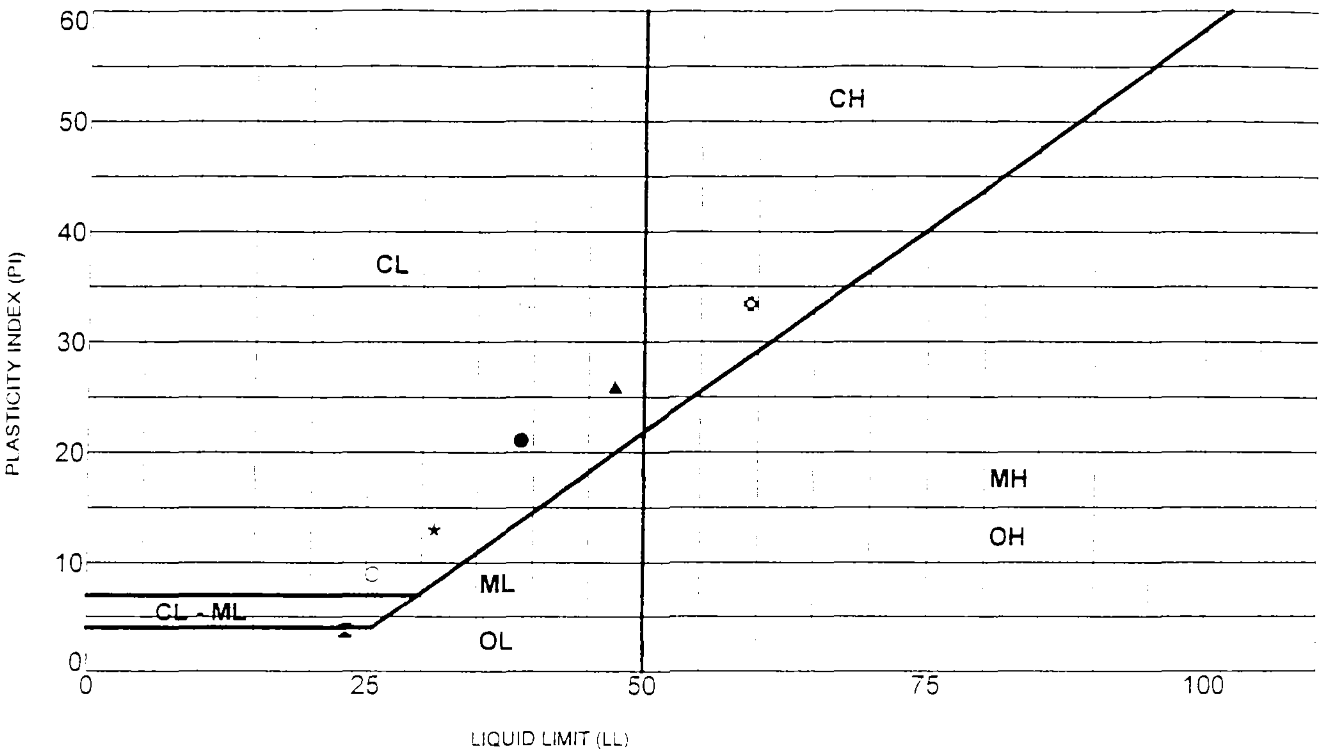
I-215 to I-15/US 89 Interchange

PLATE

K-12

PLASTICITY CHART

PROJECT NO. 35-3163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	SB-31-353	36.6	39	18	21	Lean CLAY (CL)
⧗	SB-31-353	42.7	23	19	4	SILT (ML)
▲	SB-31-354	4.6	47	21	26	Lean CLAY (CL)
★	SB-31-354	13.4	31	18	13	Lean CLAY with sand (CL)
○	SB-31-354	33.5	26	17	9	Lean CLAY (CL)
⊕	SB-31-355	5.9	59	26	33	Fat CLAY (CH)

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

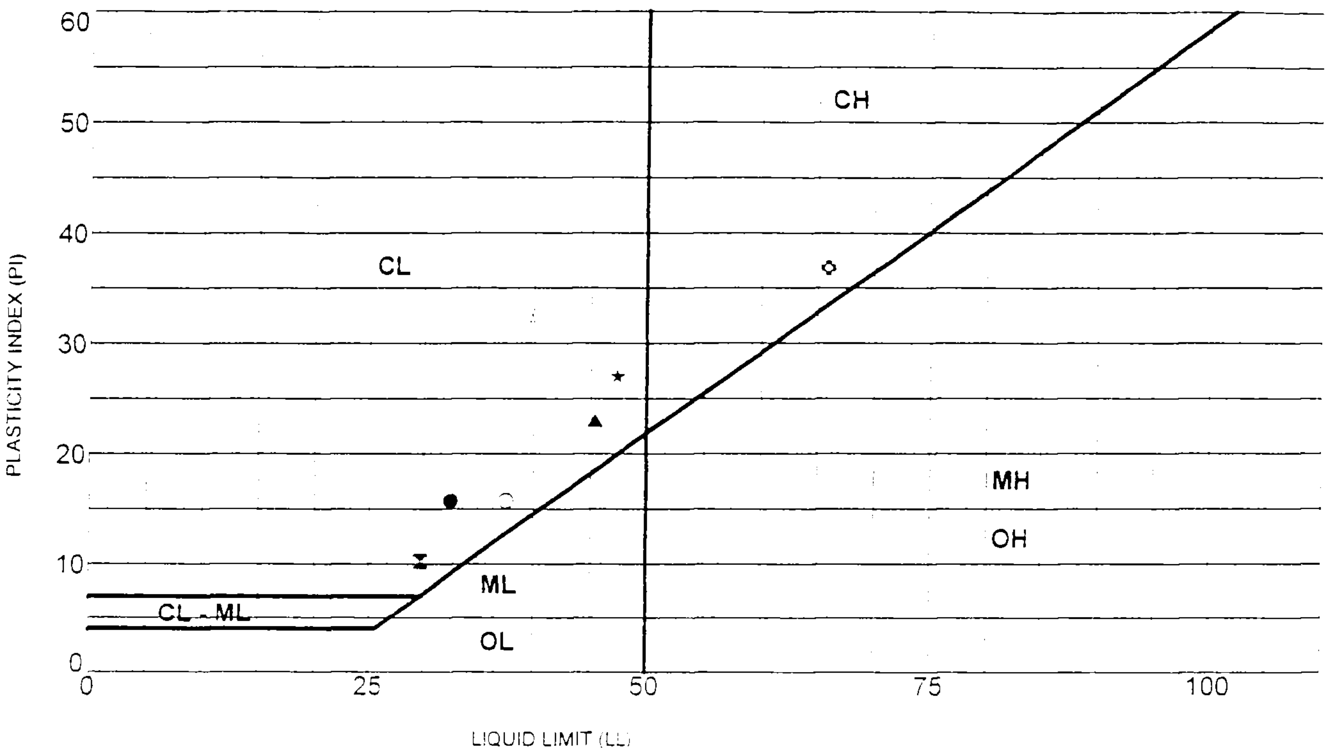
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE

PLASTICITY CHART

K-28

PROJECT NO 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	SB-31-355	12.0	32	17	16	Sandy Lean CLAY (CL)
⧗	SB-31-355	24.2	30	19	10	Lean CLAY (CL)
▲	SB-31-355	39.5	45	22	23	Lean CLAY with sand (CL)
★	SB-31-355	42.5	47	20	27	Lean CLAY (CL)
○	SB-31-356	6.1	38	22	16	Lean CLAY (CL)
✪	SB-31-356	18.3	66	29	37	Fat CLAY (CH)

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

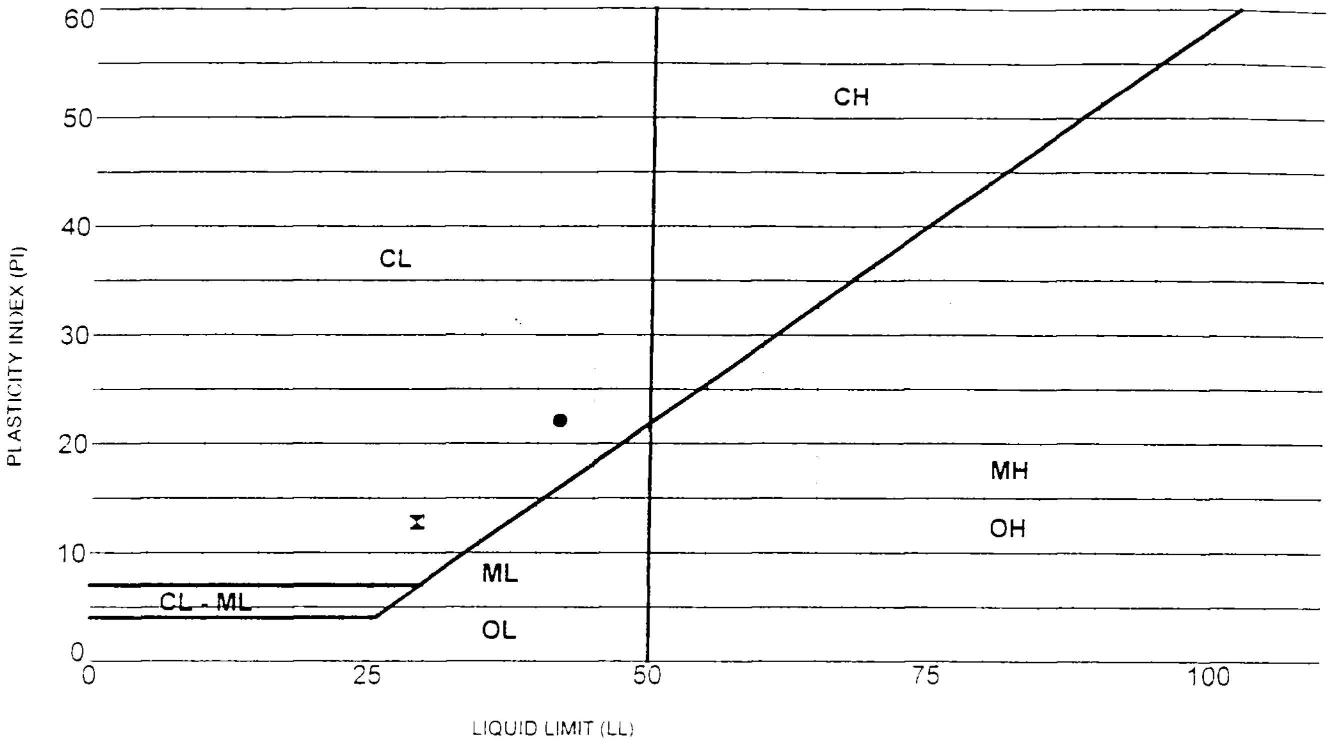
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE

PLASTICITY CHART

K-29

PROJECT NO. 35-3163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-371	3.0	42	20	22	Lean CLAY (CL)
⧗	RB-371	19.8	29	17	13	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

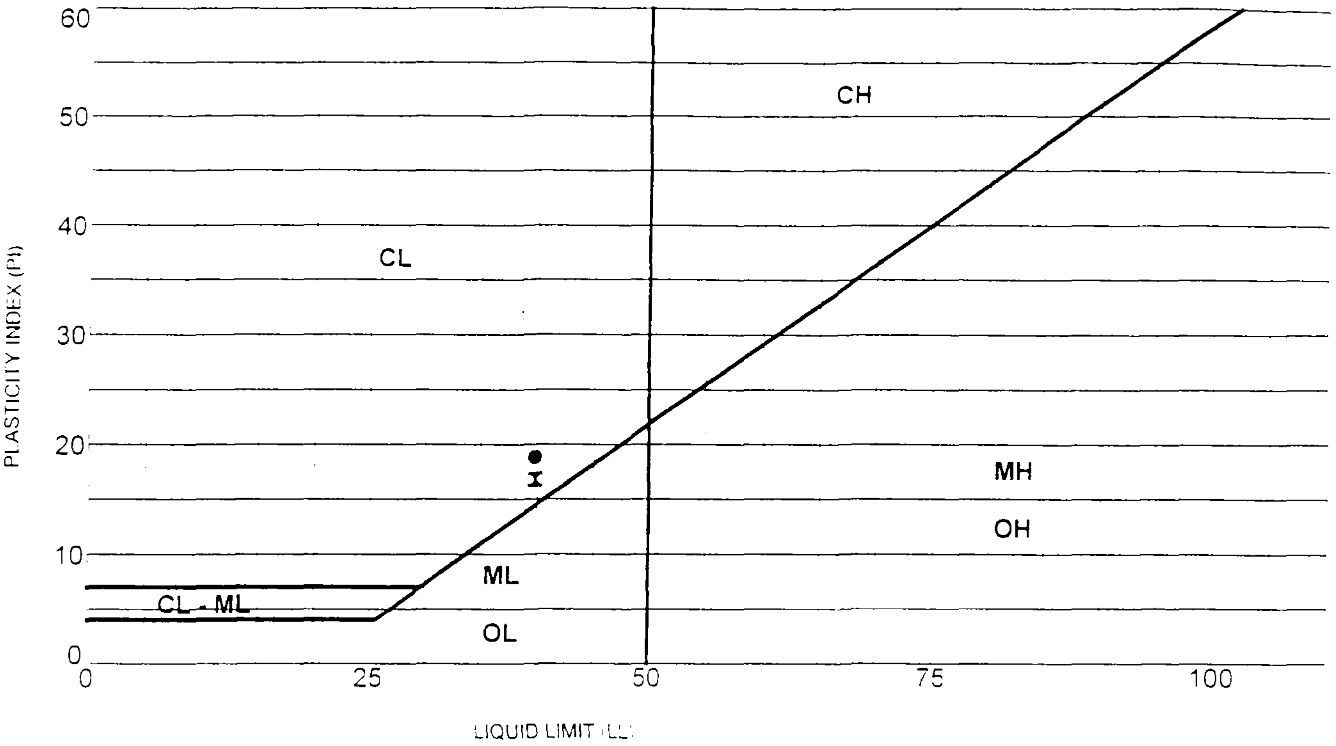
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE

PLASTICITY CHART

K-67

PROJECT NO 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-395	1.5	40	21	19	Lean CLAY (CL)
⧗	RB-395	4.6	40	23	17	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

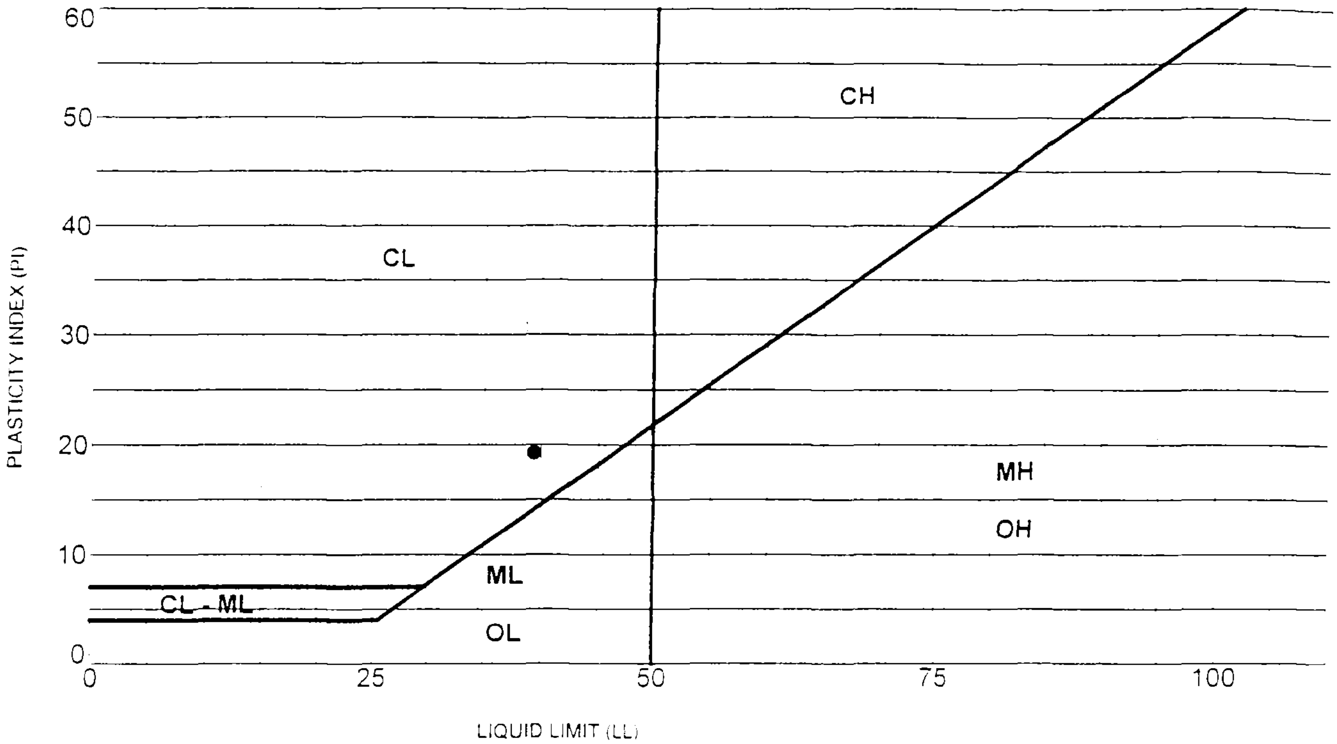
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-88

PROJECT NO. 35-3163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-396	3.0	39	20	19	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

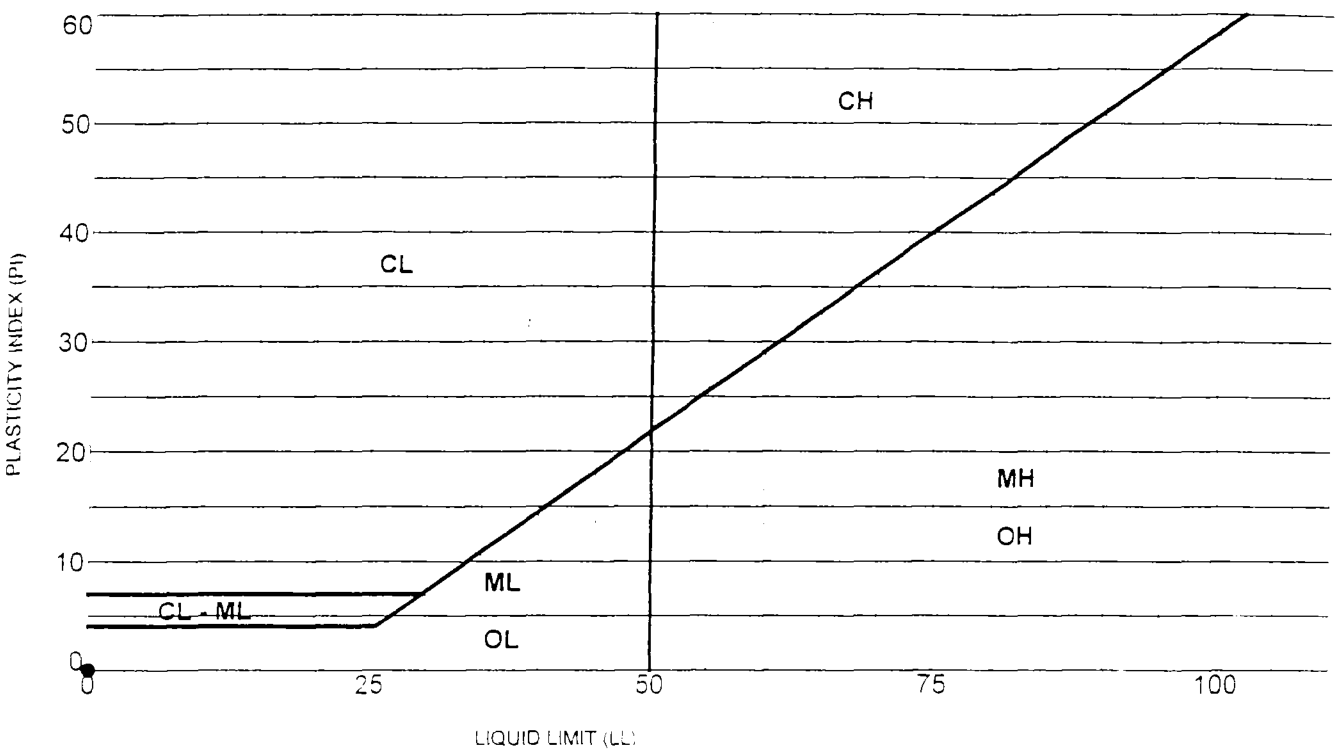
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-89

PROJECT NO. 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-397	7.6	NP	NP	NP	Sandy SILT (ML)

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

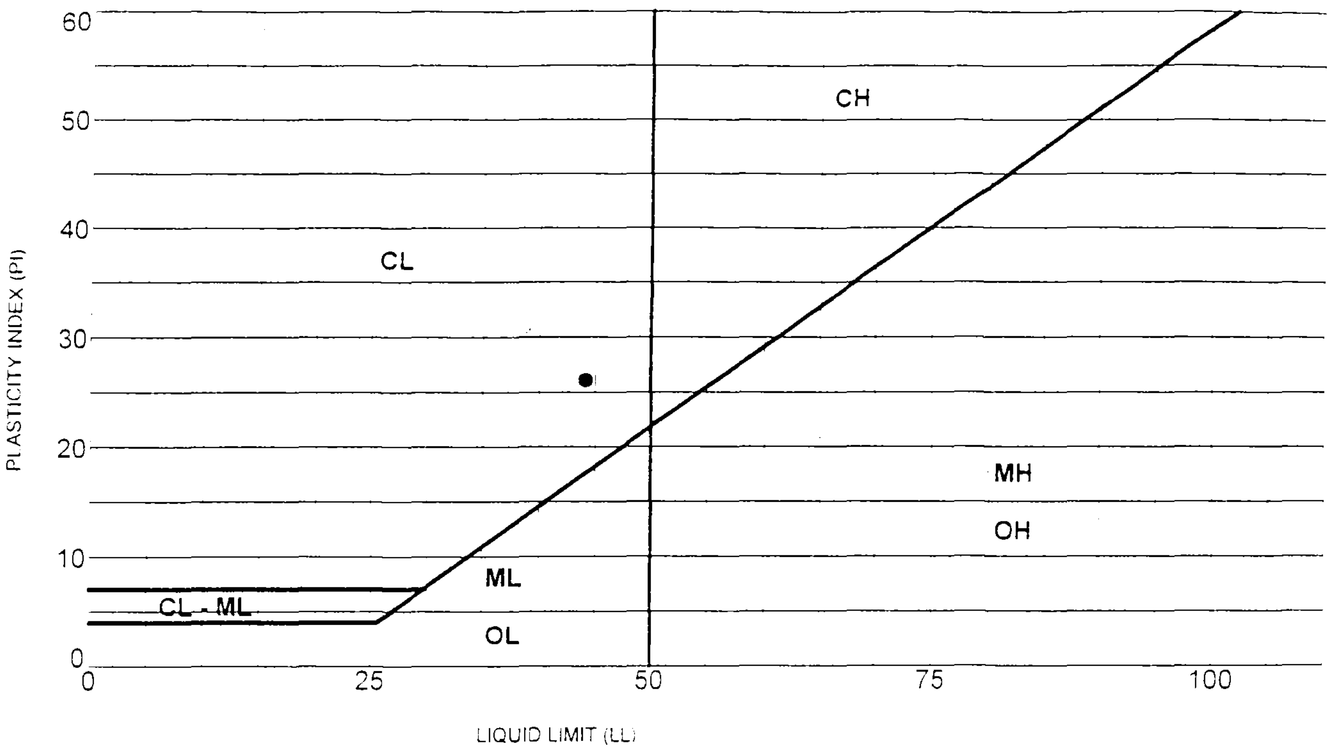
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-9C

PROJECT NO. 35-3163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-398	4.6	44	18	26	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

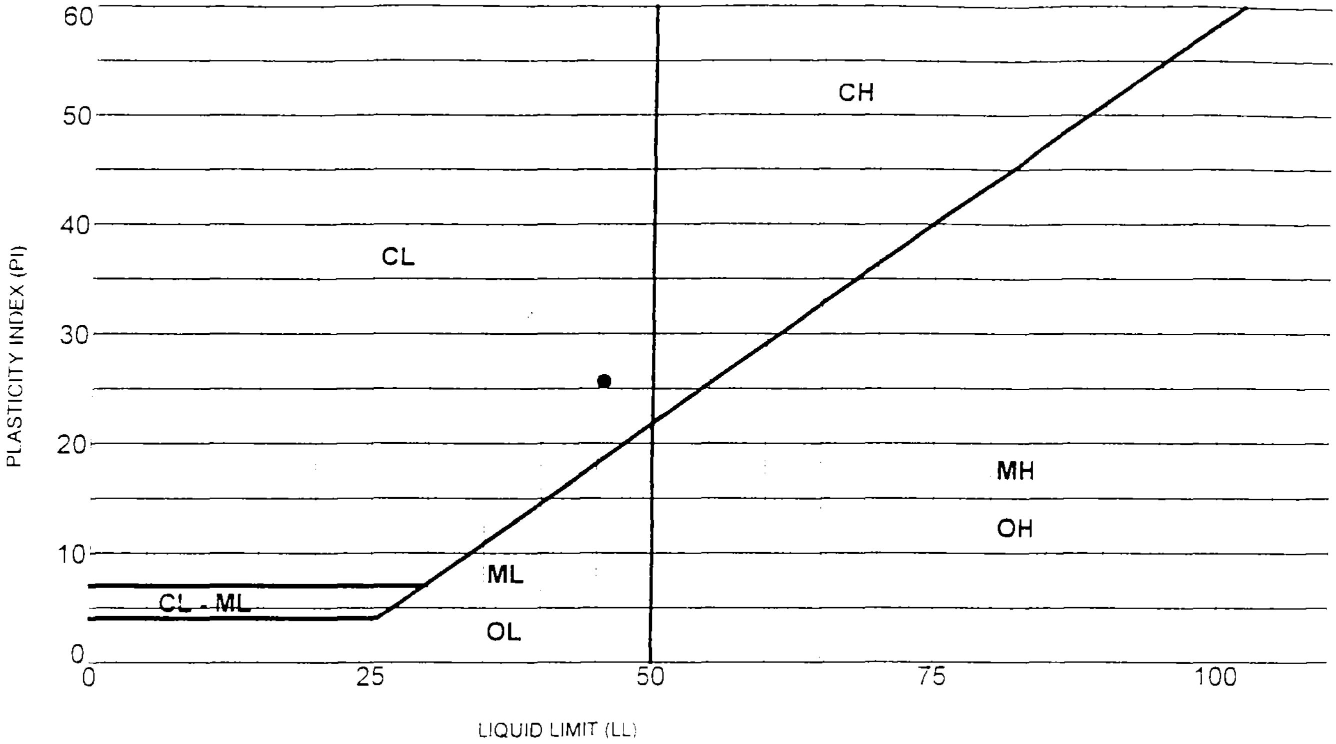
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-91

PROJECT NO. 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-399	4.6	46	20	26	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

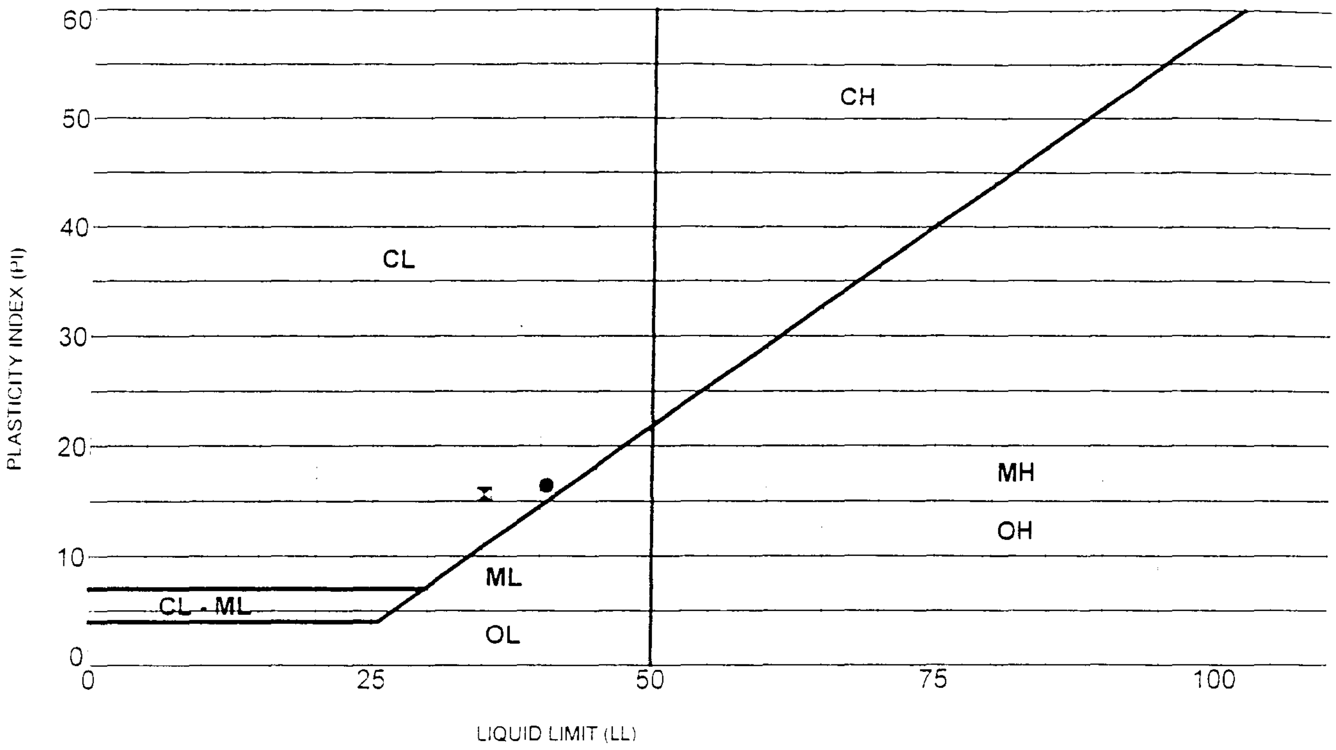
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-92

PROJECT NO. 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-400	2.1	41	24	16	Lean CLAY (CL)
⧗	RB-400	4.6	35	19	16	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

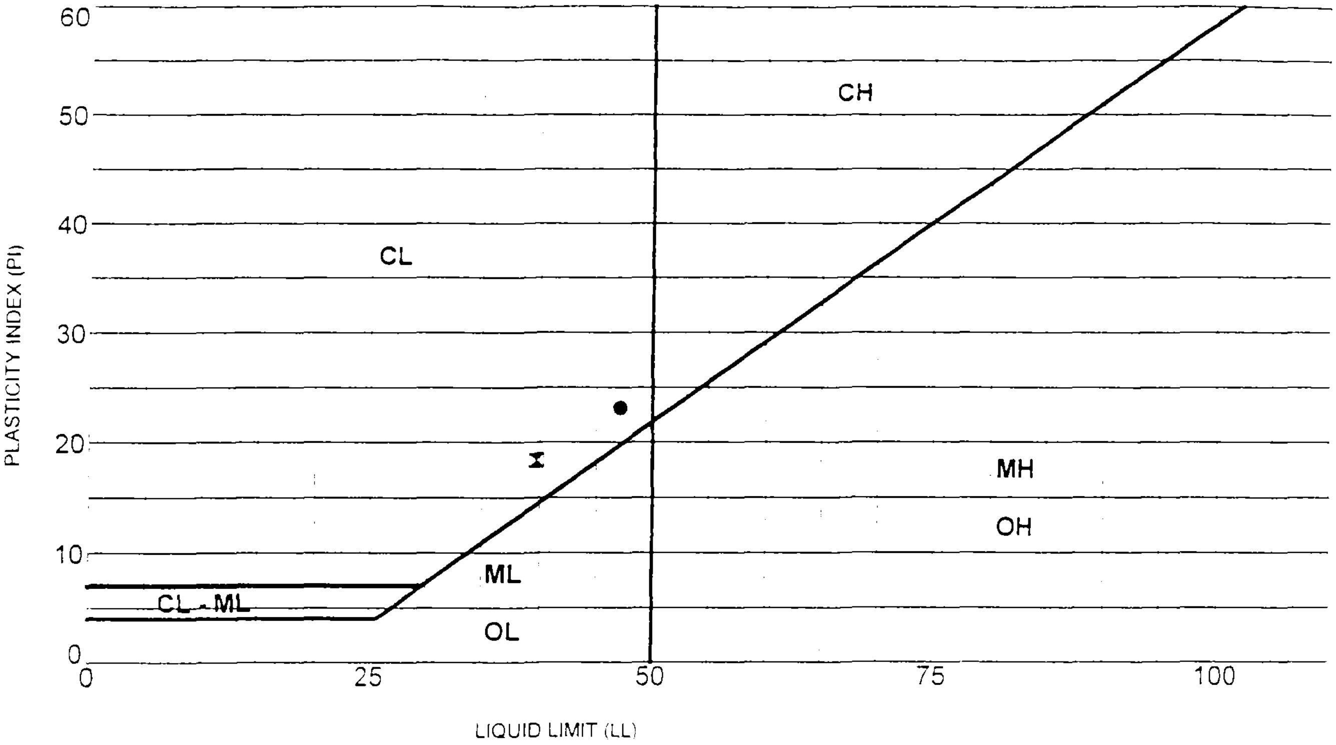
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-93

PROJECT NO 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-402	1.5	47	24	23	Lean CLAY (CL)
⧗	RB-402	6.1	40	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

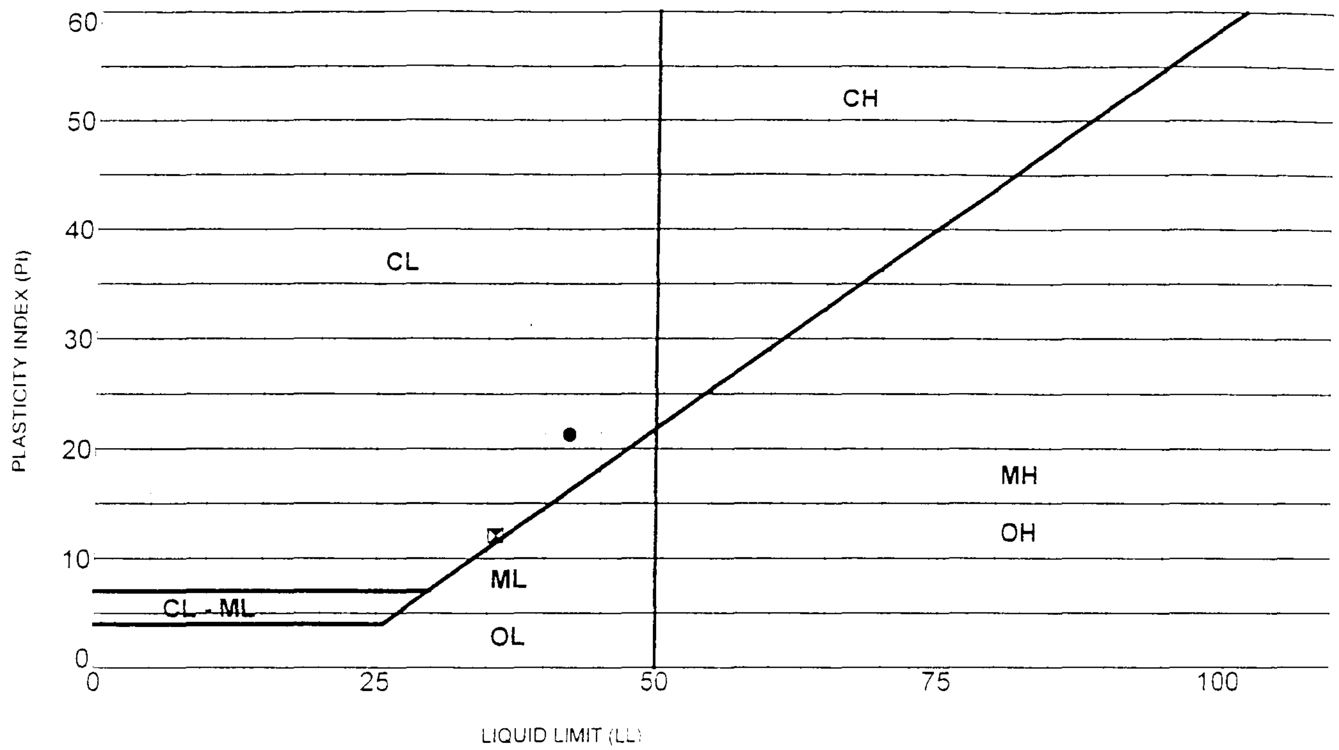
KLEINFELDER

I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE
K-94

PROJECT NO 35-3163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-403	1.5	42	21	21	Lean CLAY (CL)
⧗	RB-403	3.7	36	24	12	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

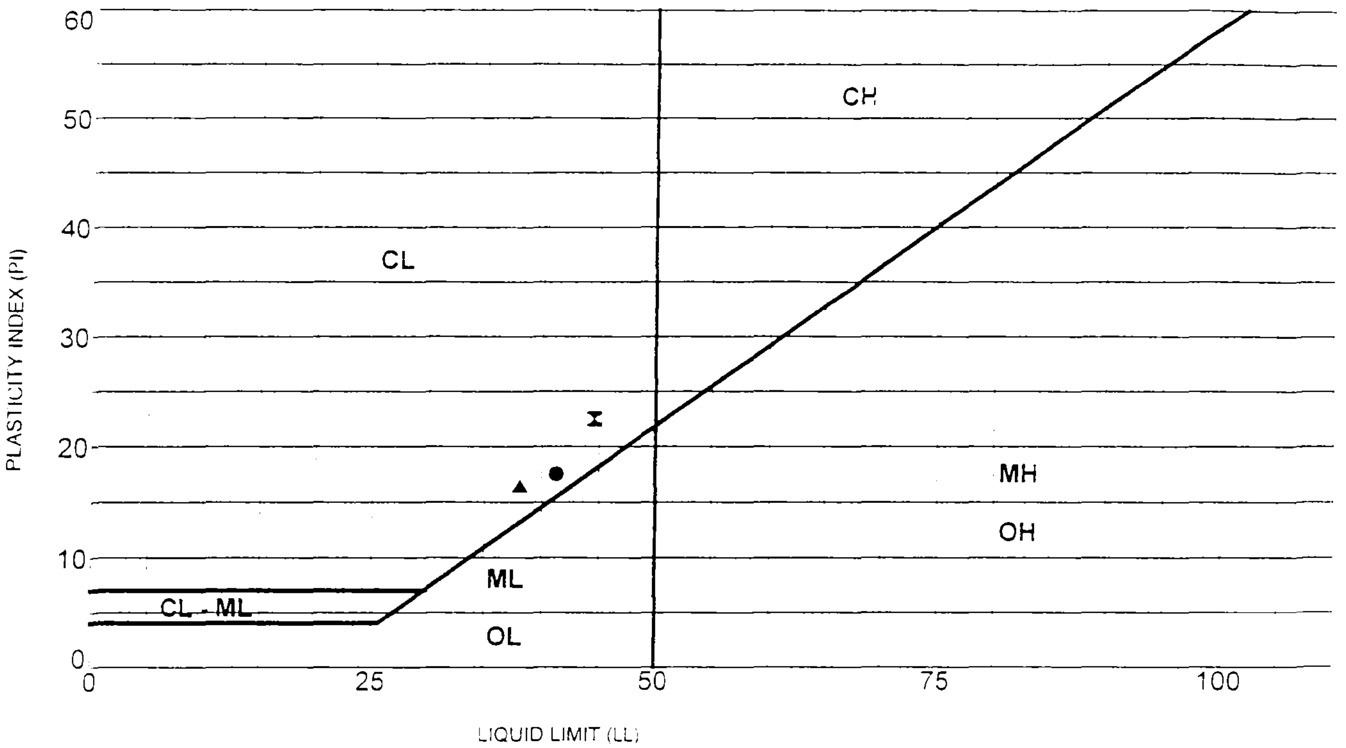
KLEINFELDER

I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE
K-95

PROJECT NO. 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-404	1.5	41	24	18	Lean CLAY (CL)
⧗	RB-404	4.6	45	22	23	Lean CLAY (CL)
▲	RB-404	4.9	38	22	16	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

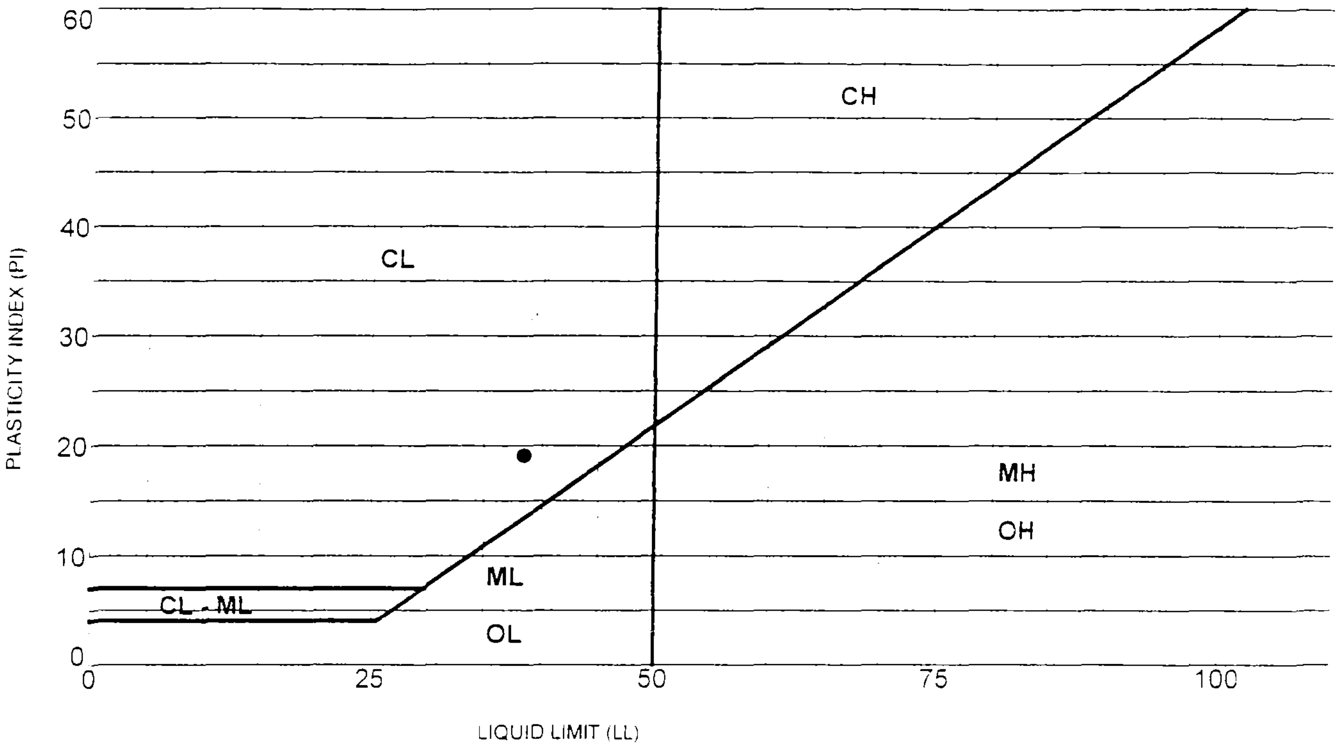
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-96

PROJECT NO. 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	RB-406	4.6	38	19	19	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

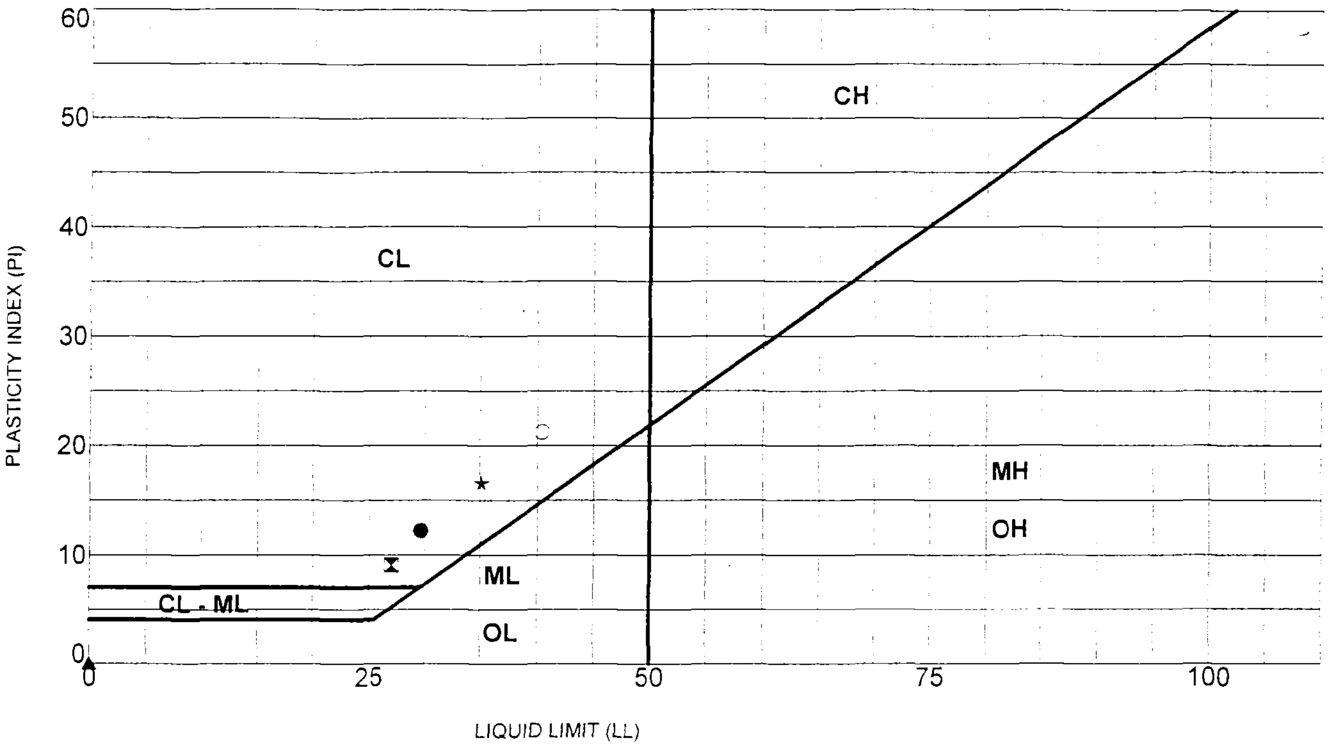
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-98

PROJECT NO. 35-8163-05



	Sample	Depth (m)	LL	PL	PI	Description
●	SB-12-263	4.6	30	17	12	Lean CLAY with sand (CL)
⧗	SB-12-263	7.6	27	18	9	Lean CLAY (CL)
▲	SB-12-263	9.1	NP	NP	NP	SILT with sand (ML)
★	SB-12-263	12.2	35	18	17	Lean CLAY (CL)
○	SB-12-263	15.2	40	19	21	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 Design/Build

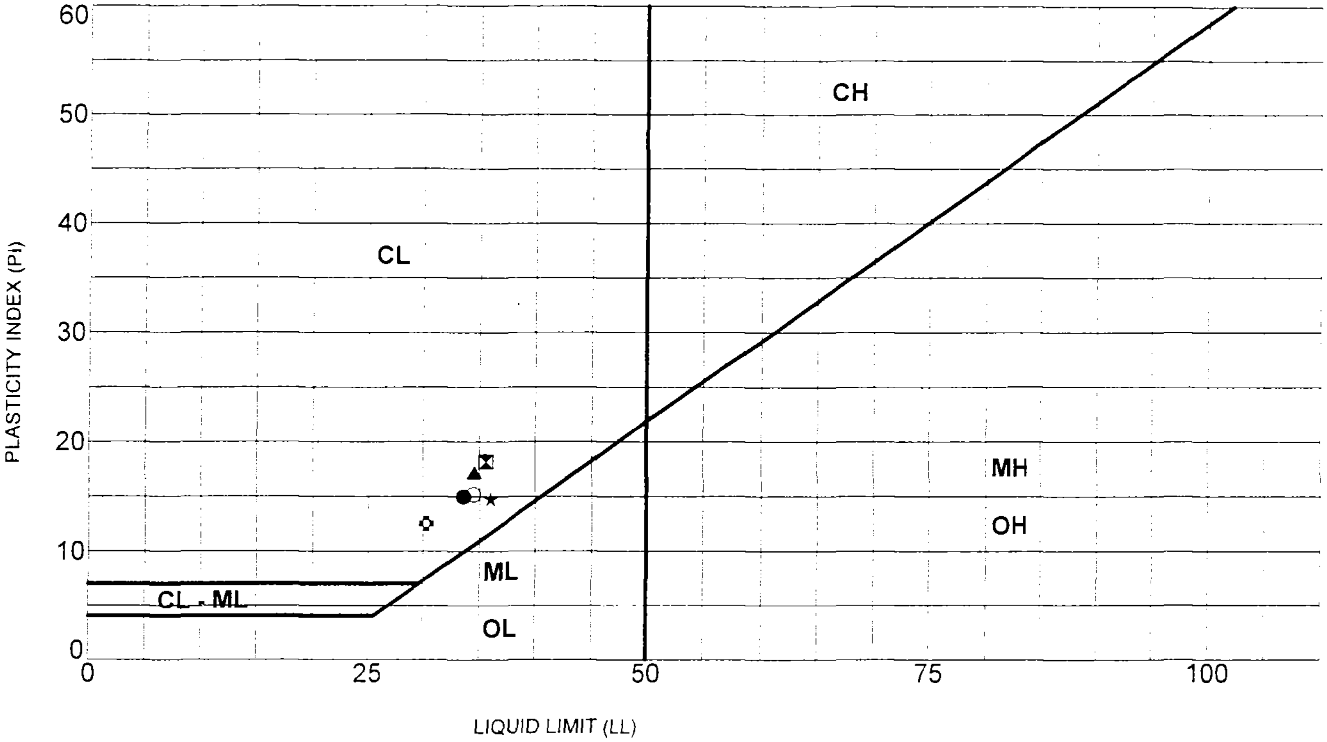
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-1

PROJECT NO. 35-8440-07



	Sample	Depth (m)	LL	PL	PI	Description
●	SB-12-265	6.1	34	19	15	Lean CLAY with sand (CL)
⧗	SB-12-265	7.6	36	17	18	Lean CLAY with sand (CL)
▲	SB-12-265	9.1	35	17	17	Lean CLAY (CL)
★	SB-12-265	10.7	36	21	15	Lean CLAY (CL)
○	SB-12-265	12.2	34	19	15	Lean CLAY (CL)
✤	SB-12-265	13.7	30	18	13	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 Design/Build

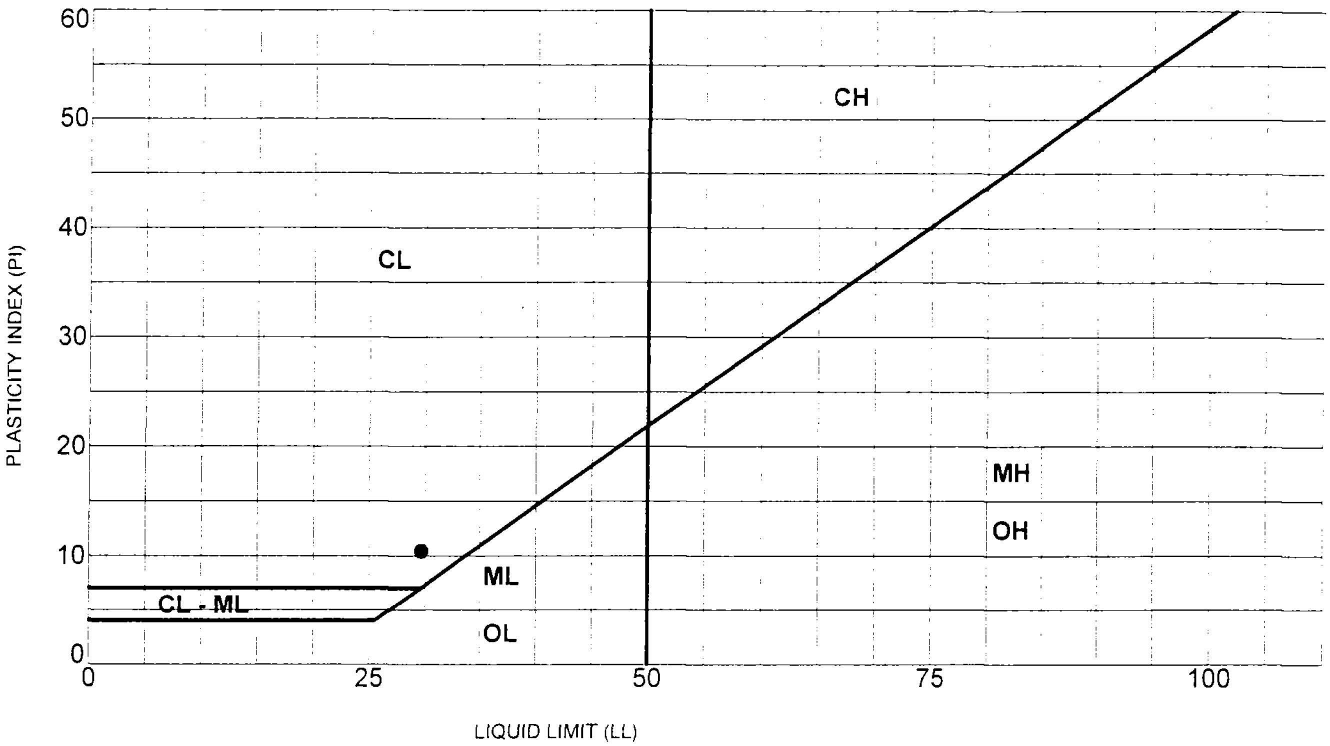
I-215 to I-15/US 89 Interchange

PLATE

PLASTICITY CHART

K-2

PROJECT NO. 35-8440-07



	Sample	Depth (m)	LL	PL	PI	Description
●	SB-12-265	15.2	30	19	10	Sandy 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 Design/Build

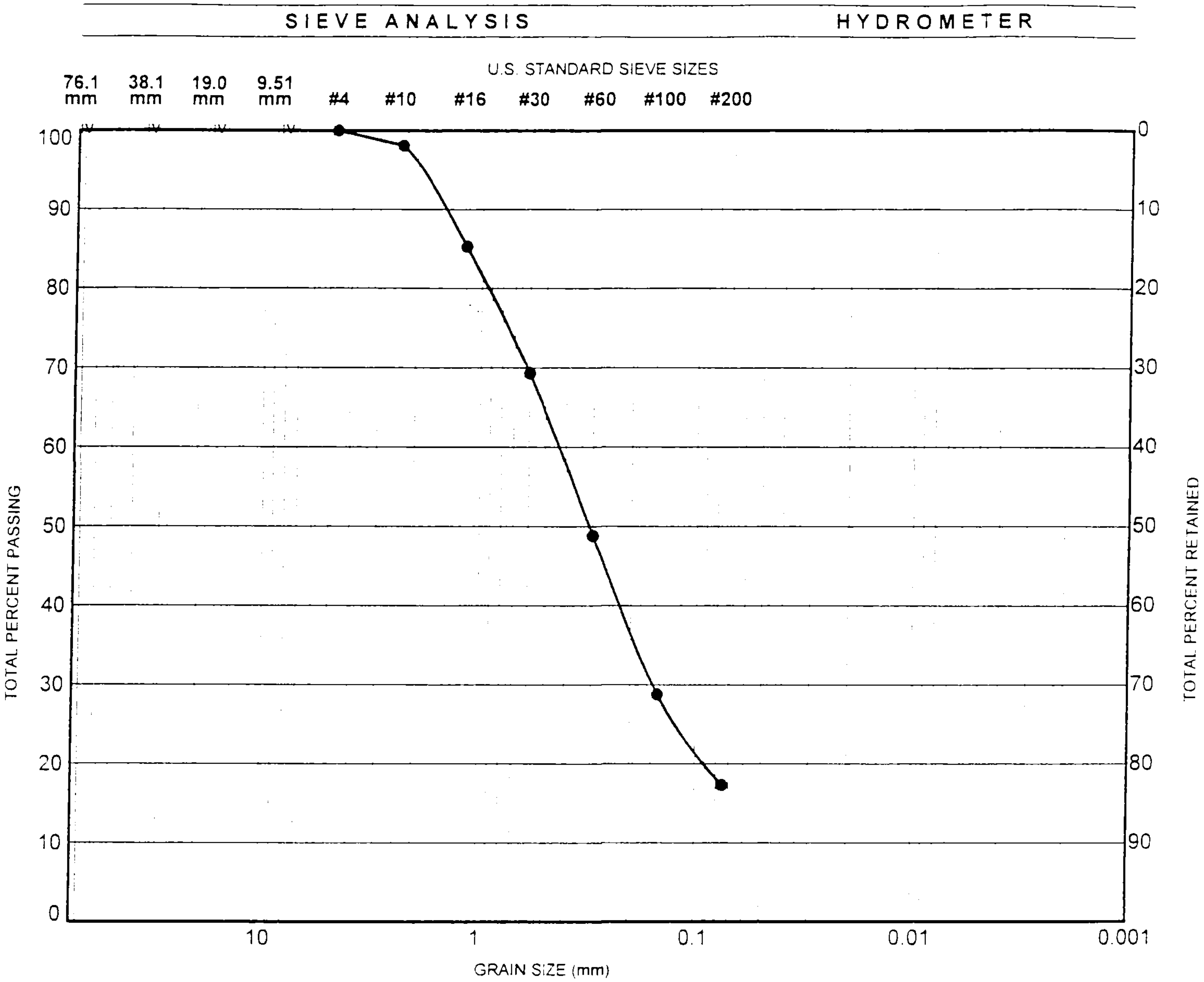
I-215 to I-15/US 89 Interchange

PLASTICITY CHART

PLATE

K-3

PROJECT NO. 35-8440-07



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	SB-31-353	7.3	Silty SAND	SM

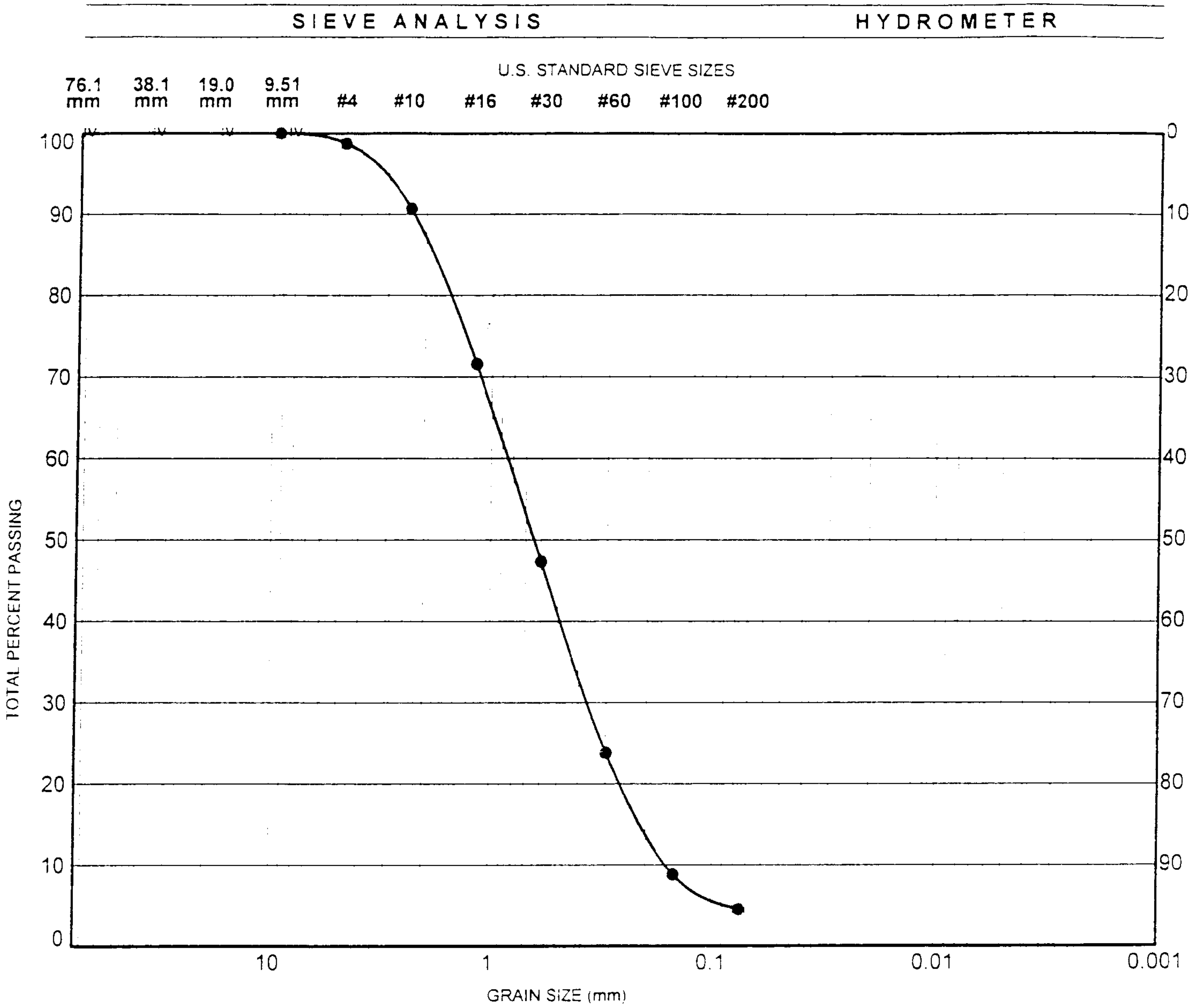
KLEINFELDER

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

GRAIN SIZE DISTRIBUTION

PLATE
K-132

PROJECT NO. 35-8163-05



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	SB-31-353	13.4	Poorly Graded SAND	SP

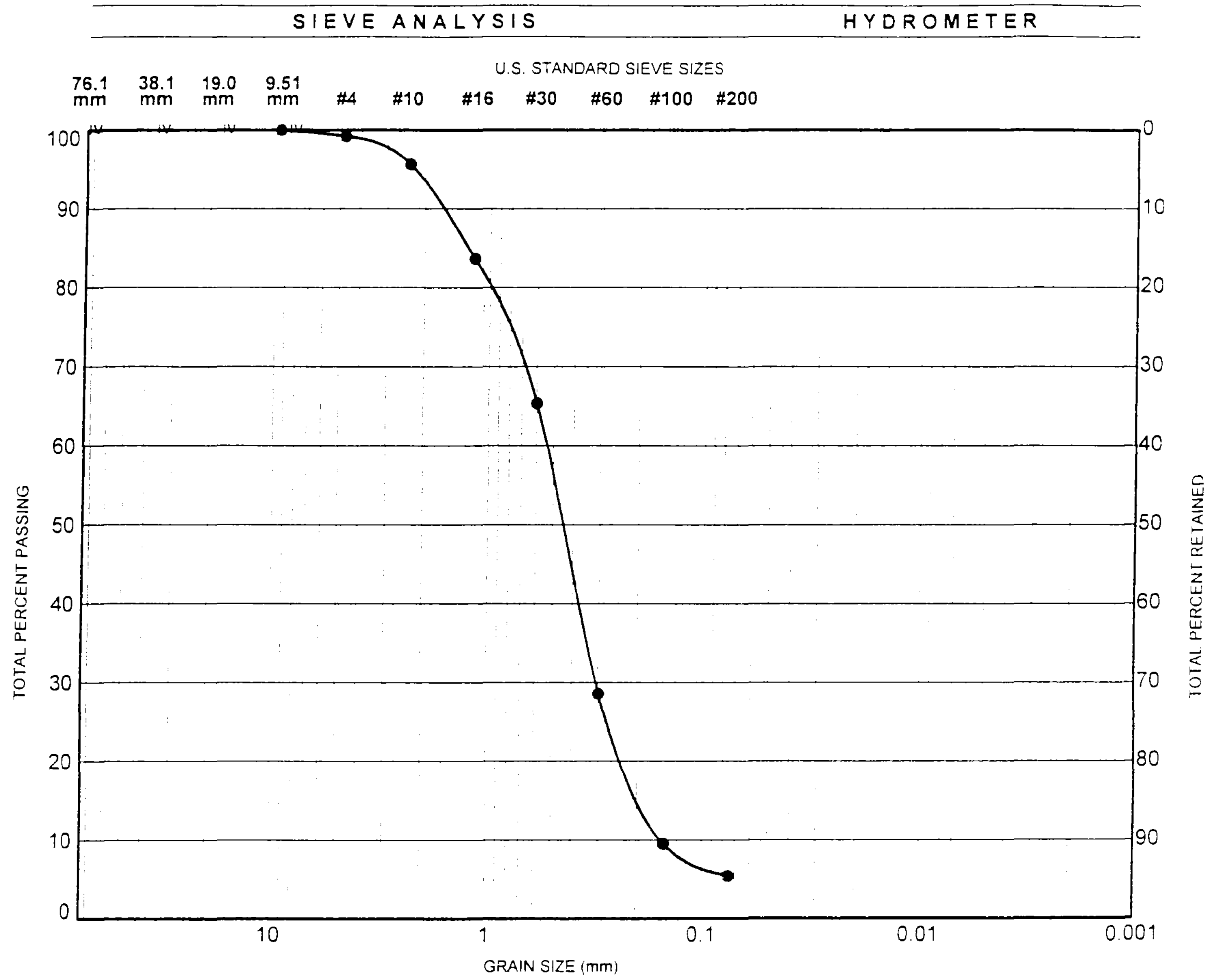
KLEINFELDER

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

GRAIN SIZE DISTRIBUTION

PLATE
K-133

PROJECT NO. 35-8163-05



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	SB-31-354	21.0	Poorly Graded SAND with silt	SP-SM

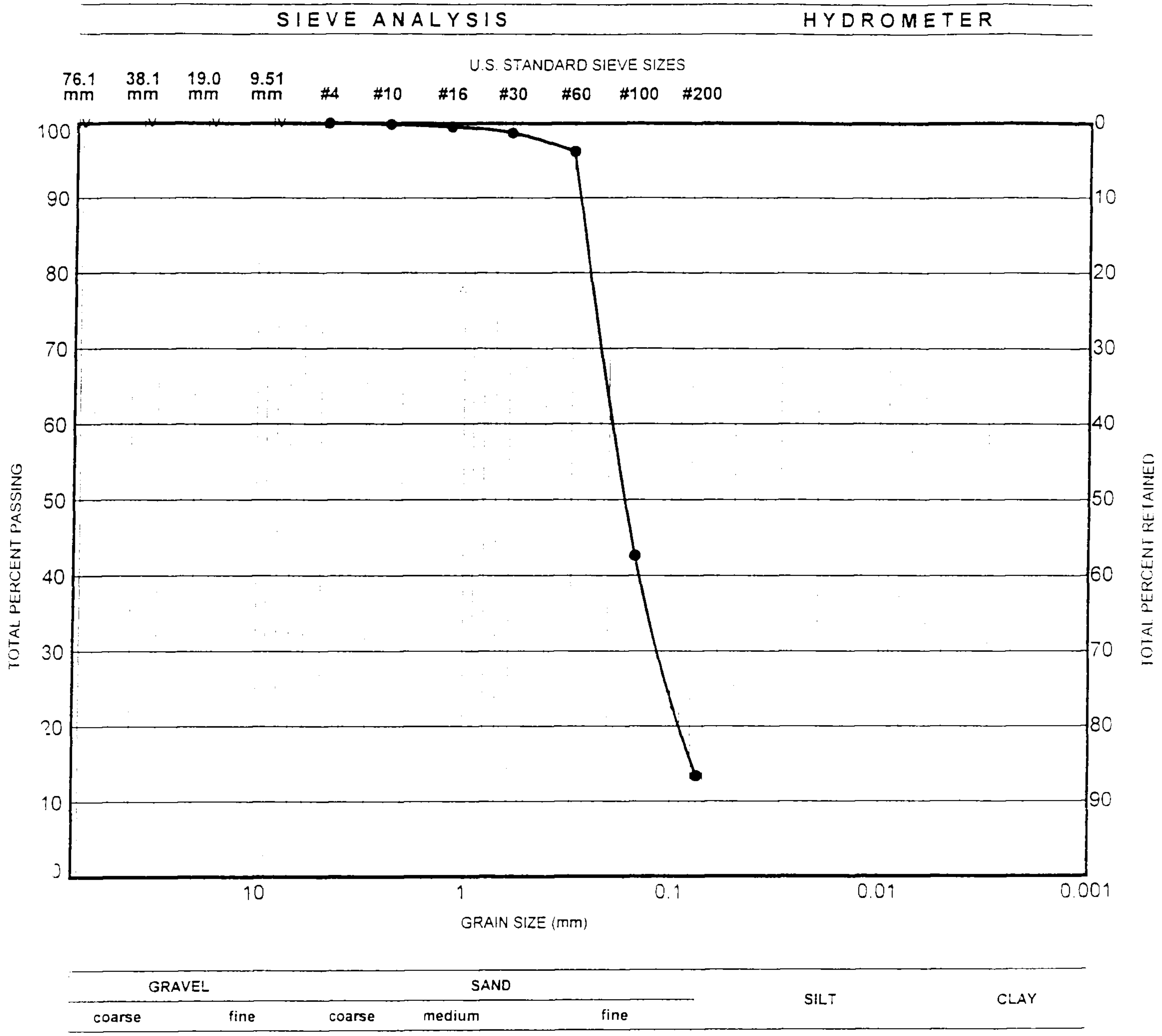
KLEINFELDER

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

GRAIN SIZE DISTRIBUTION

PLATE
K-134

PROJECT NO. 35-8163-05



Symbol	Sample	Depth (m)	Description	Classification
●	RB-398	27.0	Silty SAND	SM

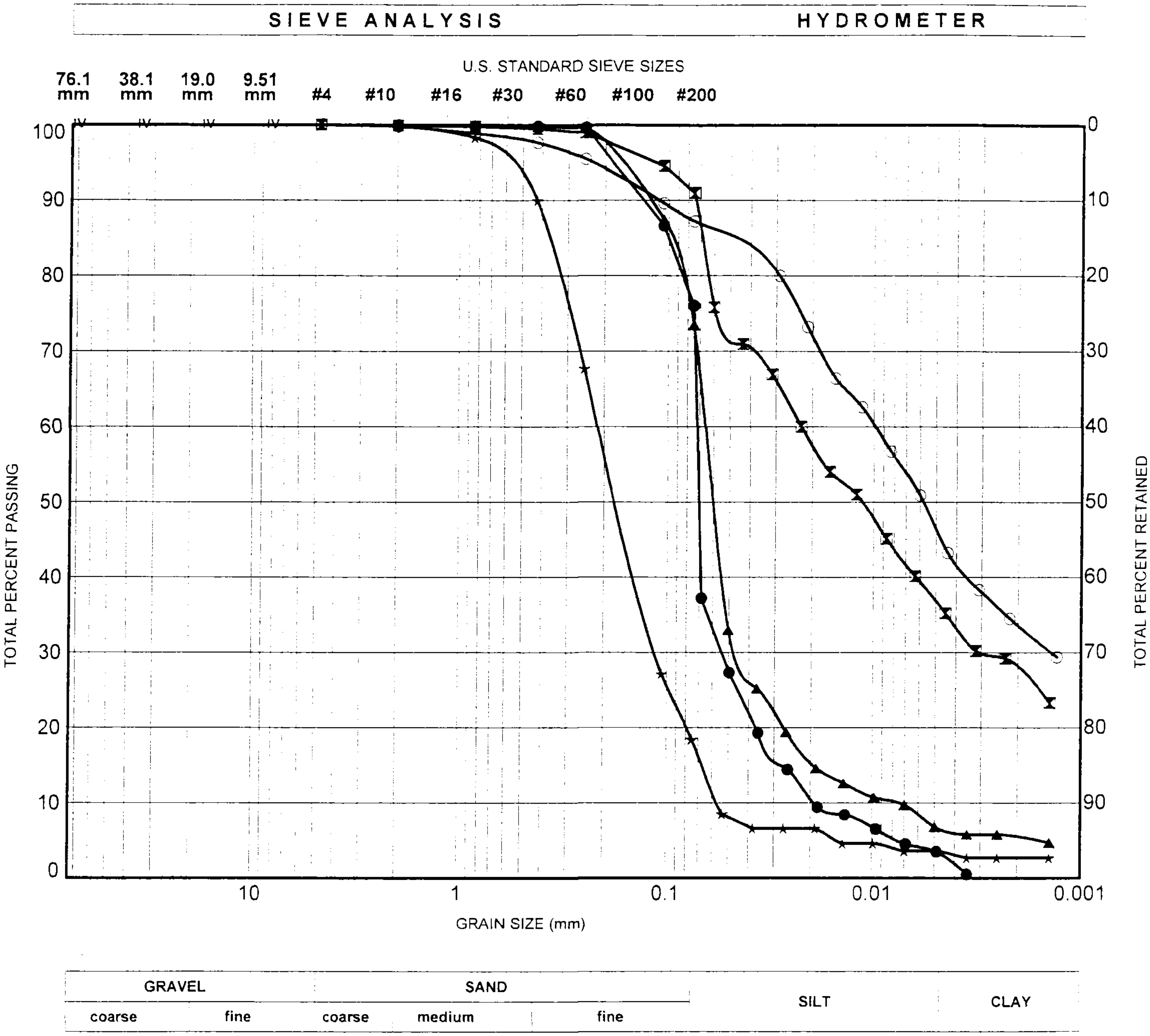
KLEINFELDER

I-215 to I-15/US 89 Interchange

GRAIN SIZE DISTRIBUTION

PLATE
K-159

PROJECT NO. 35-8163-05



Symbol	Sample	Depth (m)	Description	Classification
●	SB-12-263	4.6	CL – ~~Lean CLAY with sand~~ ~~([illegible])~~	(~~CL~~ ~~[illegible]~~) CL
⧗	SB-12-263	7.6	Lean CLAY	CL
▲	SB-12-263	9.1	SILT with sand	ML
★	SB-12-263	10.7	Silty SAND	SM
○	SB-12-263	12.2	Lean CLAY	CL

KLEINFELDER

Legacy Parkway Design/Build

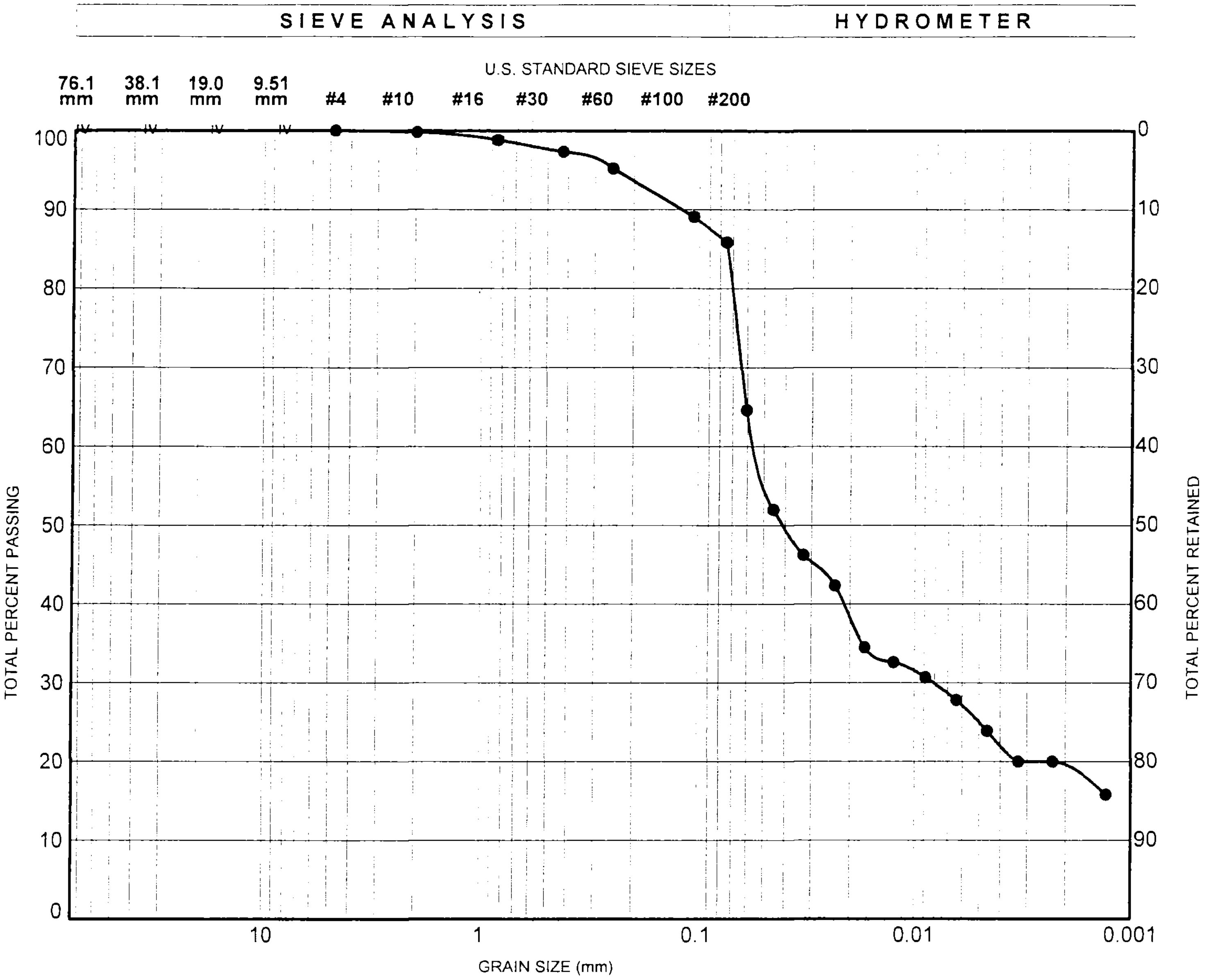
I-215 to I-15/US 89 Interchange

GRAIN SIZE DISTRIBUTION

PLATE

K-4

PROJECT NO. 35-8440-07



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	SB-12-263	15.2	Lean CLAY	CL

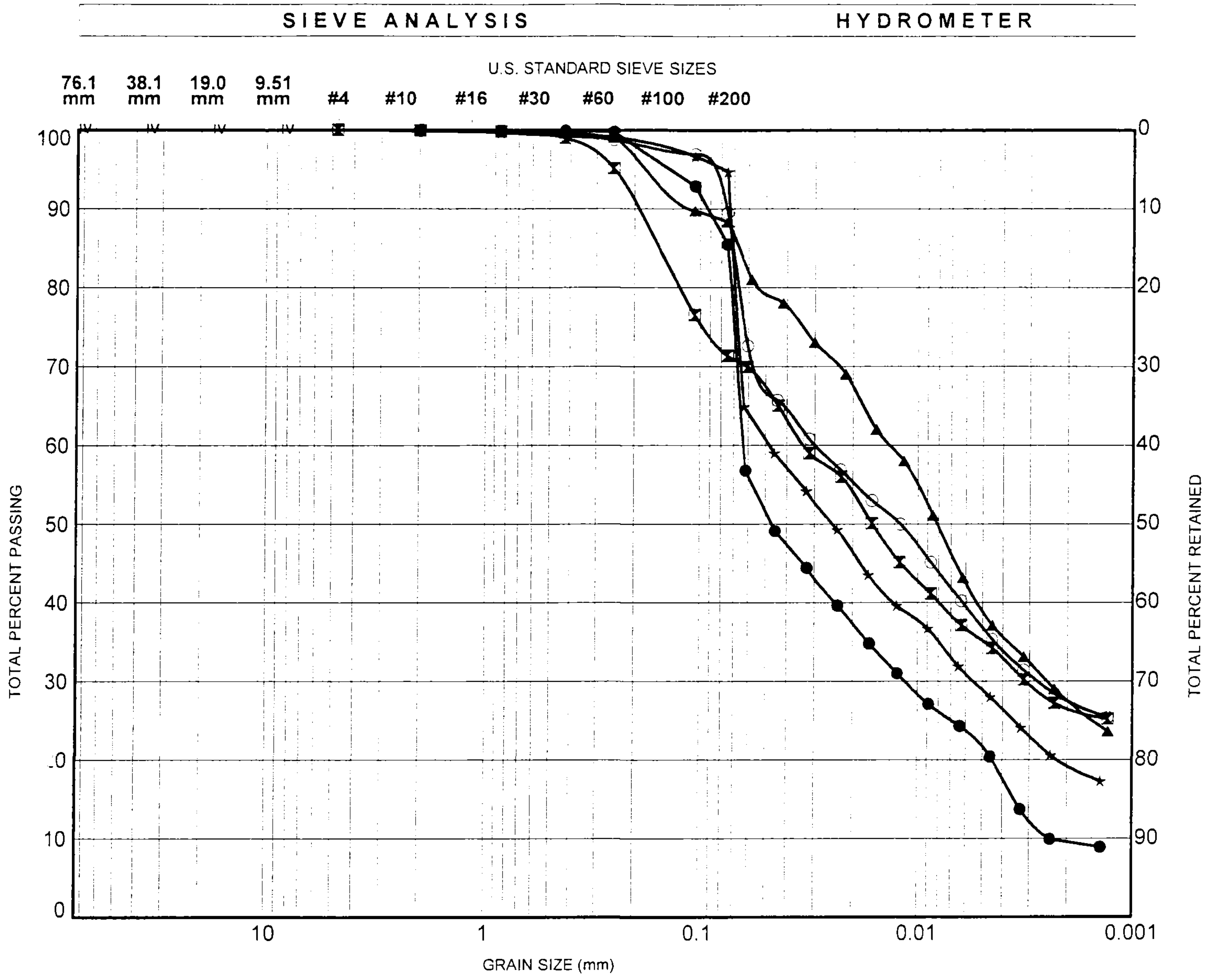
KLEINFELDER

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

GRAIN SIZE DISTRIBUTION

PLATE K-5

PROJECT NO. 35-8440-07



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	SB-12-265	6.1	Lean CLAY with sand	CL
⧗	SB-12-265	7.6	Lean CLAY with sand	CL
▲	SB-12-265	9.1	Lean CLAY	CL
★	SB-12-265	10.7	Lean CLAY	CL
○	SB-12-265	12.2	Lean CLAY	CL

KLEINFELDER

Legacy Parkway Design/Build

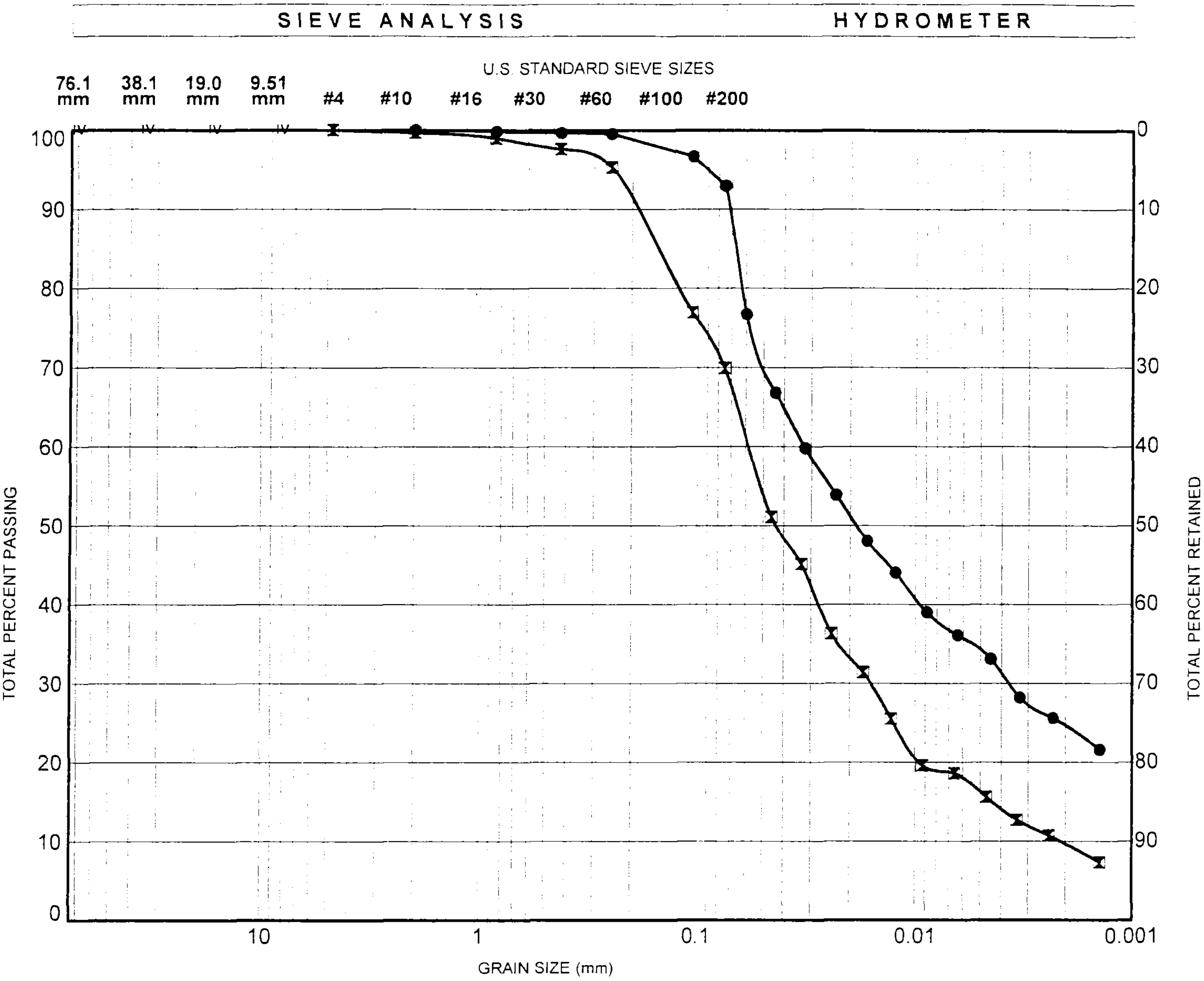
I-215 to I-15/US 89 Interchange

GRAIN SIZE DISTRIBUTION

PLATE

K-6

PROJECT NO. **35-8440-07**



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (m)	Description	Classification
●	SB-12-265	13.7	Lean CLAY	CL
⧗	SB-12-265	15.2	Sandy Lean CLAY	CL

KLEINFELDER

Legacy Parkway Design/Build

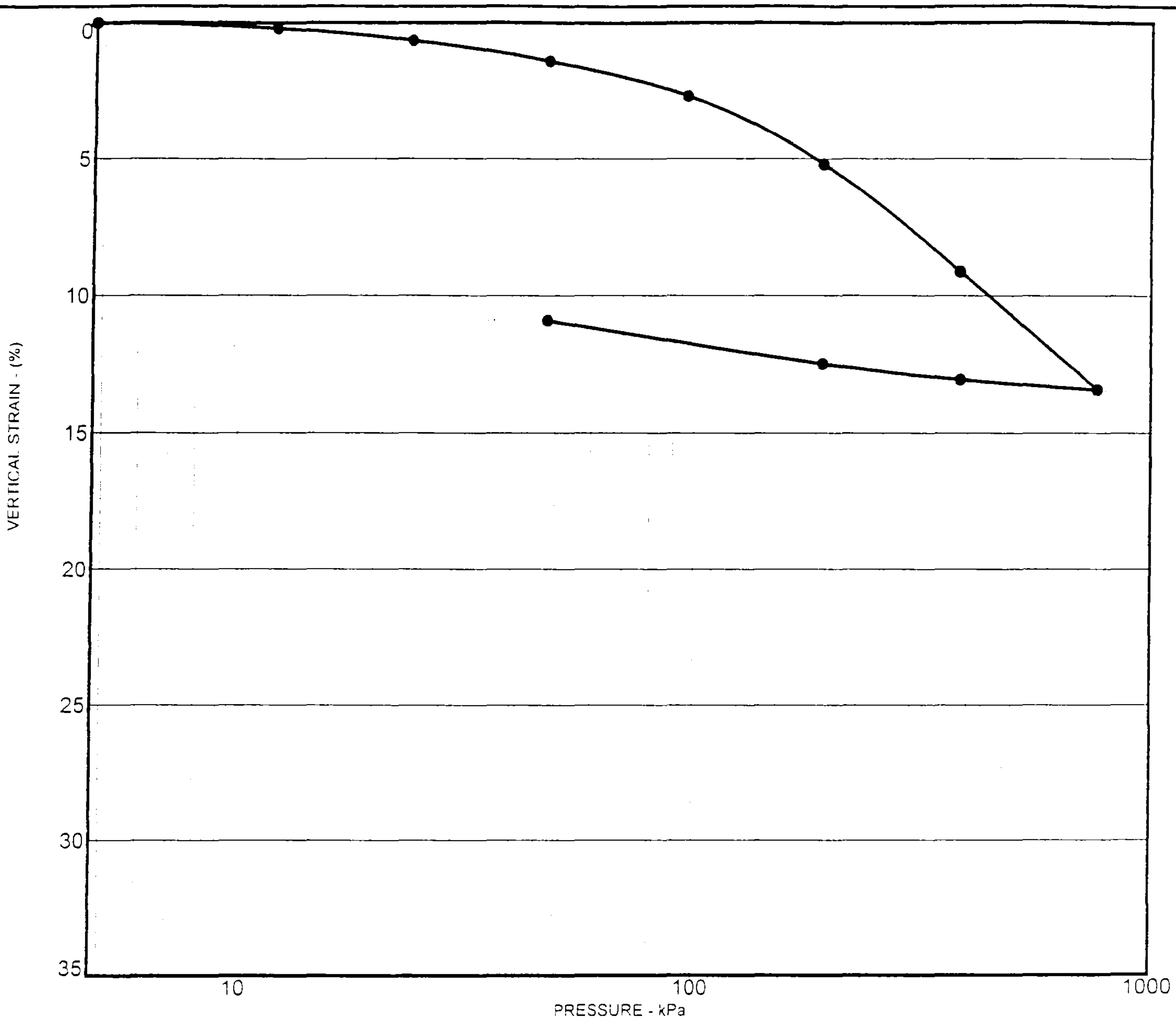
I-215 to I-15/US 89 Interchange

GRAIN SIZE DISTRIBUTION

PLATE

K-7

PROJECT NO. 35-8440-07



Sample	SB-12-263
Depth	5.18 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	13.9	15.6
Water content, %	33.2	27.1
Sample height, mm	25.4	22.6

KLEINFELDER

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

CONSOLIDATION TEST RESULTS

PLATE

K-274

PROJECT NO. 35-8163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

Boring Number:	SB-12-263
Sample Depth:	5.2 m

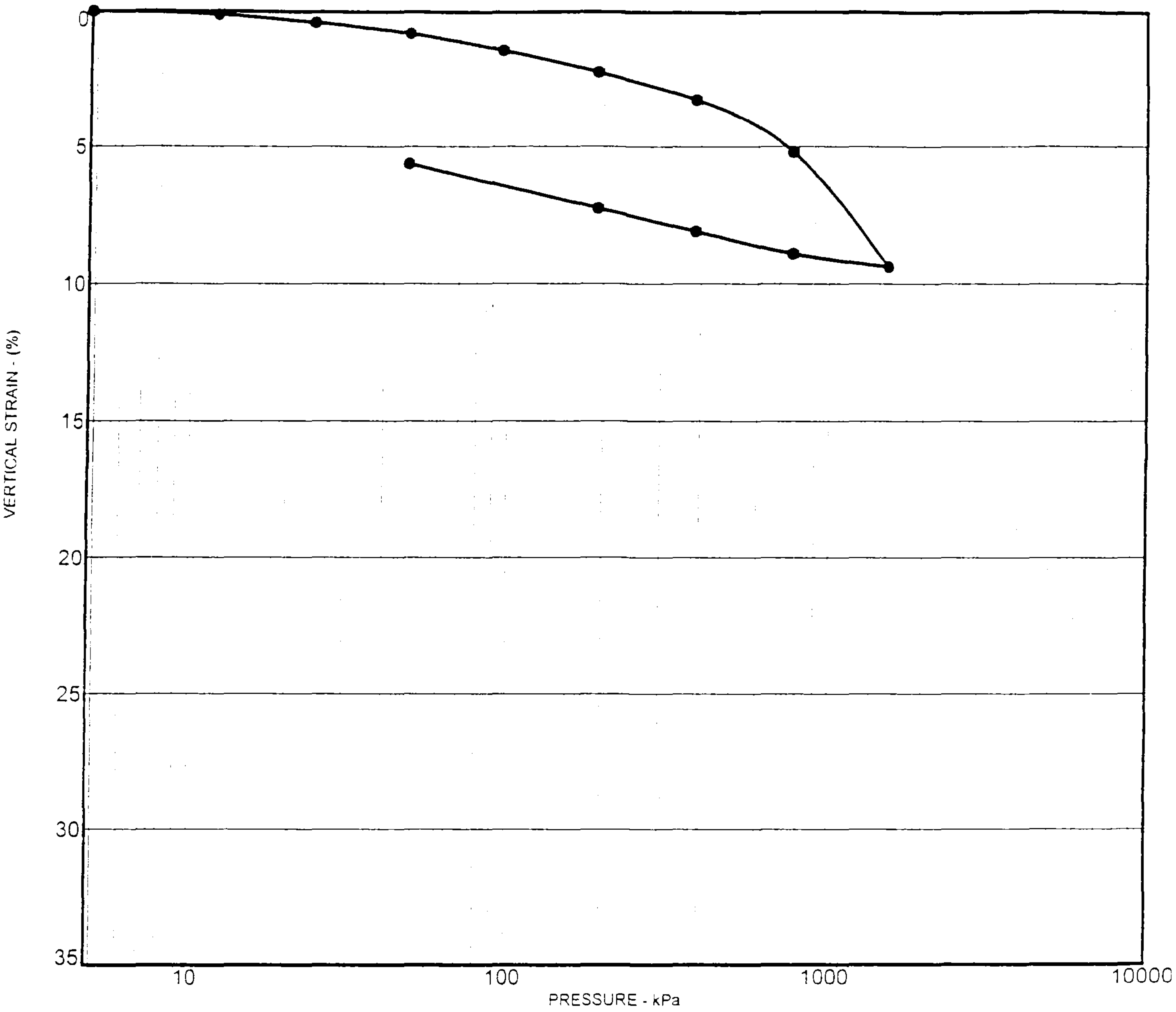
	Before Test (g)	After Test (g)
Wet Wt. + Ring	185.7	
Ring Weight	45.4	
Wet Wt.	140.3	
Wet + Tare		187.7
Dry + Tare		159.2
Tare Wt.		8.5

	Before Test (mm)	After Test (mm)
Sample Height	25.4	25.9
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 (%)
03/15/00	8:25:00			0199	
	15:40:00		4.8	0209	0.10
	19:30:00		12.0	0230	0.31
03/16/00	7:50:00		23.9	0275	0.76
	11:55:00		47.9	0351	1.52
	18:00:00		95.8	0480	2.81
03/18/00	9:30:00		191.5	0730	5.31
03/19/00	10:00:00		383.0	1121	9.22
03/20/00	13:35:00		766.1	1551	13.52
	19:50:00		383.0	1514	13.15
03/21/00	7:40:00		191.5	1457	12.58
	14:00:00		47.9	1300	11.01



Sample	SB-12-263
Depth	41.15 m
Classification	ML

	Initial	Final
Dry density, kN/m^3	15.1	16.4
Water content, %	28.1	26.4
Sample height, mm	25.4	23.4

KLEINFELDER

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-276

PROJECT NO. 35-8163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

Boring Number	SB-12-263
Sample Depth.	41.1 m

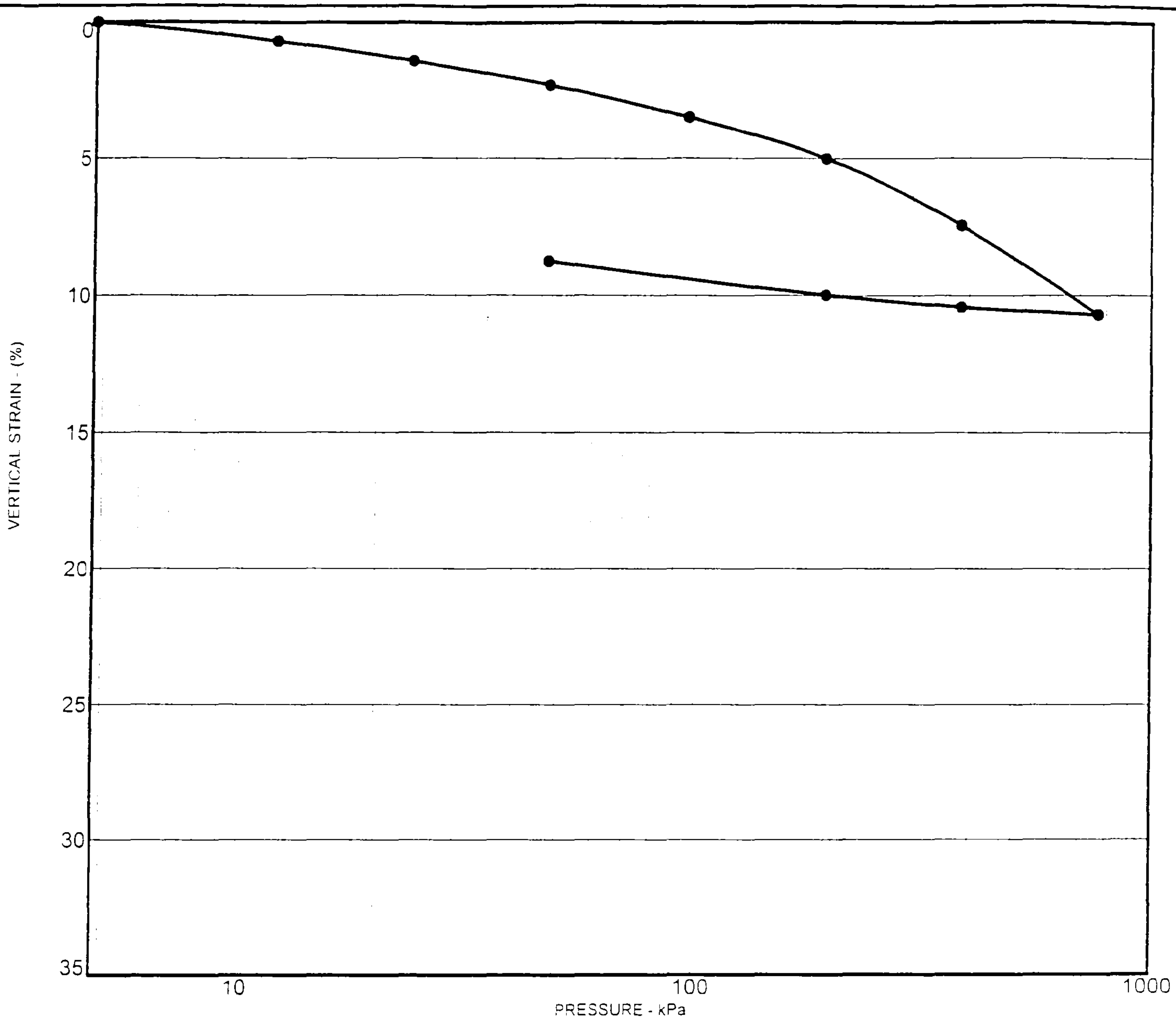
	Before Test (g)	After Test (g)
Wet Wt + Ring	191.8	
Ring Weight	45.1	
Wet Wt	146.7	
Wet + Tare		198.4
Dry + Tare		168.2
Tare Wt.		8.6

	Before Test (mm)	After Test (mm)
Sample Height	25.4	26.2
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 (%)
03/15/00	9:20:00			0305	
	15:40:00		4.8	0252	-0.53
	19:30:00		12.0	0265	-0.40
03/16/00	7:45:00		23.9	0292	-0.13
	11:55:00		47.9	0333	0.28
	18:00:00		95.8	0395	0.90
03/17/00	10:20:00		191.5	0478	1.73
03/18/00	9:30:00		383.0	0579	2.74
03/19/00	10:00:00		766.1	0772	4.67
03/20/00	17:20:00		1532.2	1190	8.85
	19:50:00		766.1	1142	8.37
03/21/00	7:40:00		383.0	1061	7.56
	13:15:00		191.5	0977	6.72
	17:20:00		47.9	0815	5.10



Sample	SB-12-265
Depth	4.57 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	15.0	16.4
Water content, %	28.7	25.3
Sample height, mm	25.4	23.1

KLEINFELDER

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

CONSOLIDATION TEST RESULTS

PLATE K-278

PROJECT NO. 35-8163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

Boring Number:	SB-12-265
Sample Depth:	4.6 m

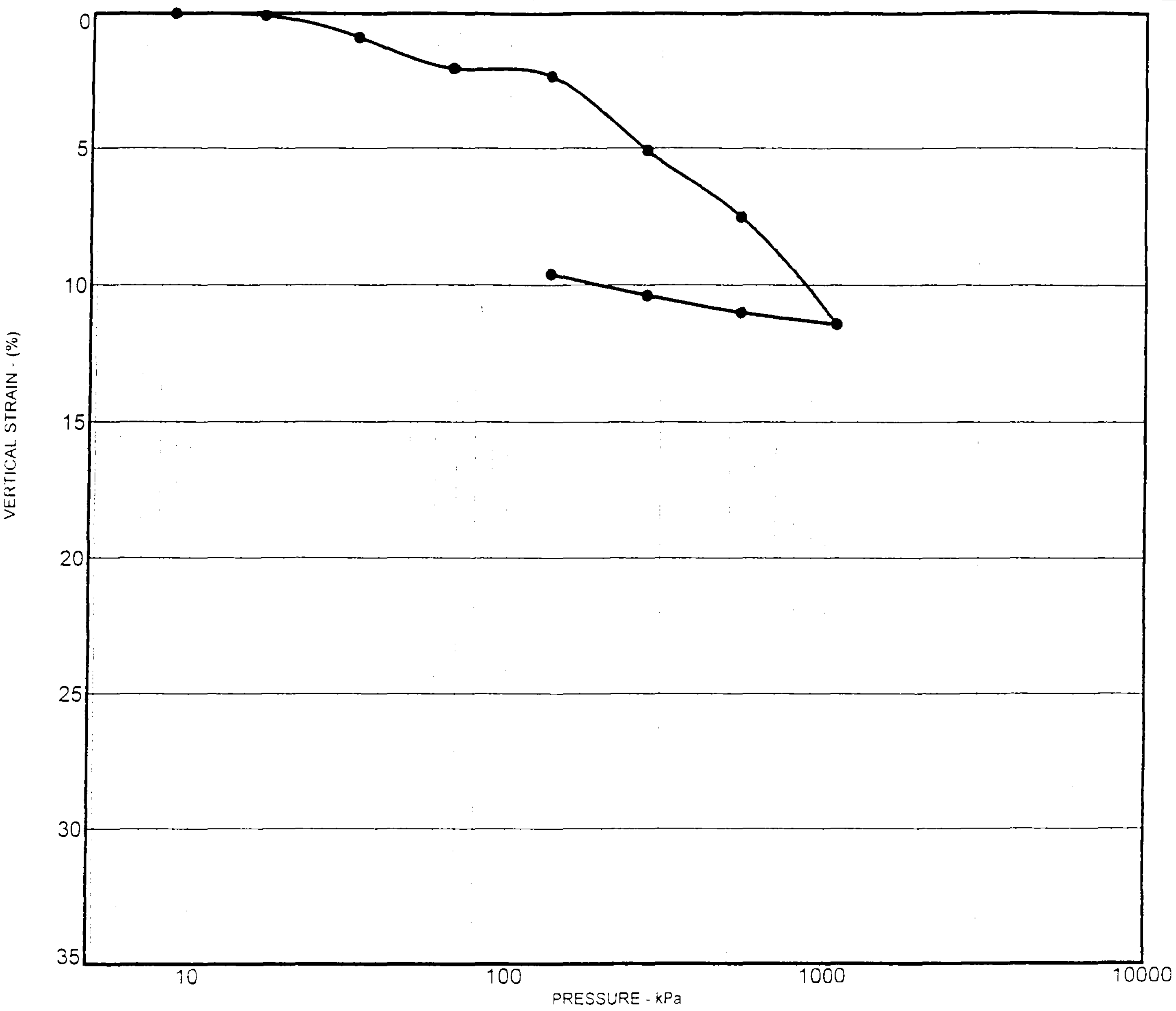
	Before Test (g)	After Test (g)
Wet Wt. + Ring	191.1	
Ring Weight	45	
Wet Wt.	146.1	
Wet + Tare		195.6
Dry + Tare		166.9
Tare Wt.		8.5

	Before Test (mm)	After Test (mm)
Sample Height	25.4	25.9
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 (%)
02/28/00	12:20:00			0193	
	15:30:00		4.8	0206	0.13
	19:00:00		12.0	0276	0.83
02/29/00	1:00:00		23.9	0349	1.56
	15:50:00		47.9	0437	2.44
03/01/00	7:50:00		95.8	0556	3.63
	18:10:00		191.5	0707	5.14
03/02/00	17:25:00		383.0	0951	7.58
03/03/00	13:50:00		766.1	1276	10.83
03/04/00	9:45:00		383.0	1248	10.55
	12:00:00		191.5	1204	10.11
	17:45:00		47.9	1081	8.88



Sample	SB-12-265
Depth	30.48 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	15.5	17.1
Water content, %	27.9	24.1
Sample height, mm	25.4	22.9

KLEINFELDER

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-280

PROJECT NO. 35-8163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

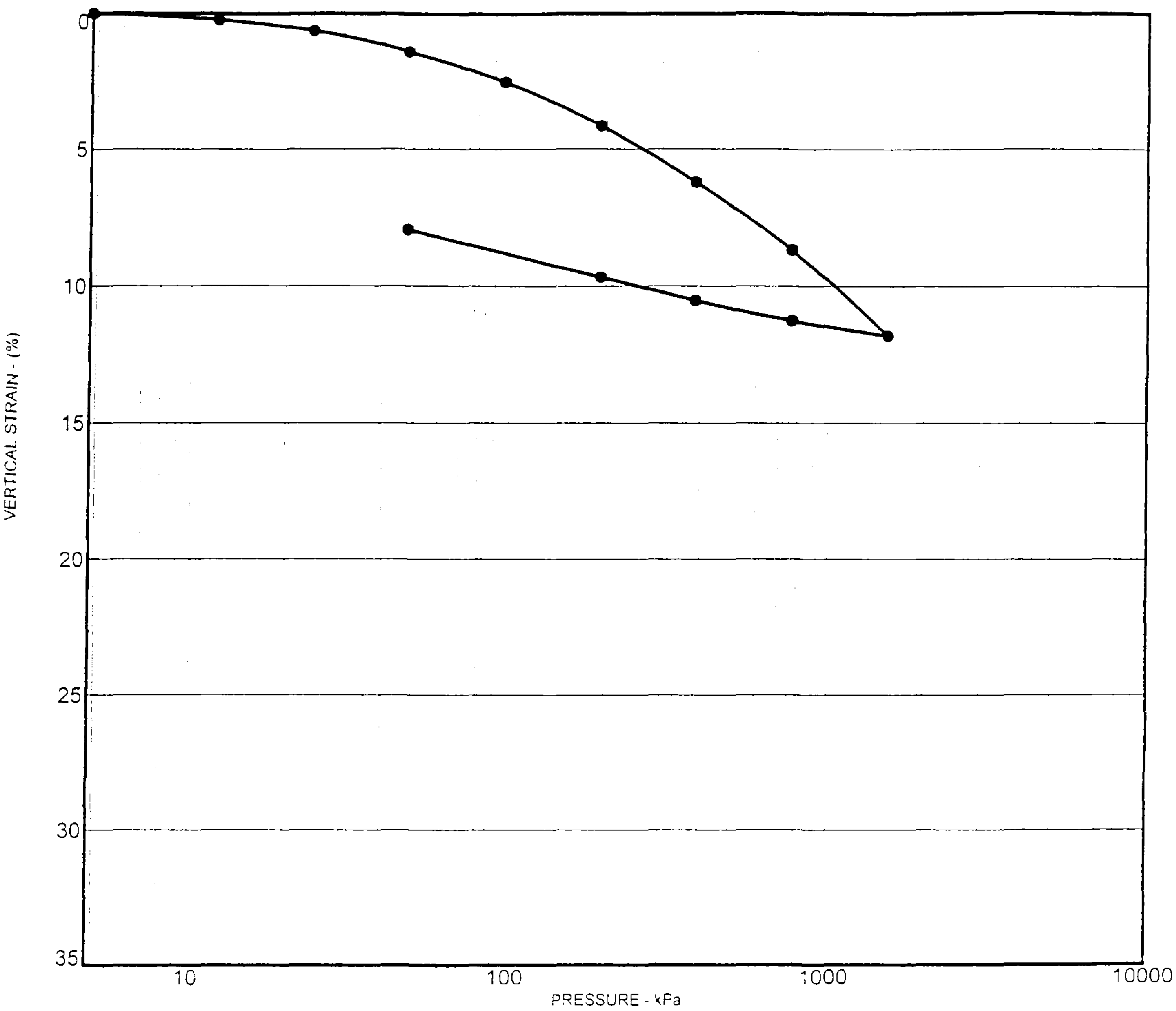
Boring Number:	SB-12-265
Sample Depth:	30.5 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	195.4	
Ring Weight	45.7	
Wet Wt.	149.7	
Wet + Tare		199
Dry + Tare		170.8
Tare Wt.		8.1

	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 (%)
03/03/00	15:00:00			0191	
03/04/00	9:40:00		8.6	0165	-0.26
	12:00:00		16.8	0174	-0.17
	17:45:00		33.5	0254	0.63
03/05/00	17:40:00		67.0	0371	1.80
03/06/00	8:15:00		134.5	0399	2.08
03/07/00	7:50:00		268.6	0674	4.83
	21:00:00		537.7	0916	7.25
03/08/00	19:00:00		1075.4	1308	11.17
03/09/00	17:50:00		537.7	1266	10.75
03/10/00	7:55:00		268.6	1203	10.12
	15:50:00		134.5	1125	9.34



Sample	SB-12-265
Depth	48.77 m
Classification	ML

	Initial	Final
Dry density, kN/m^3	15.6	17.0
Water content, %	26.7	24.3
Sample height, mm	25.4	23.4

KLEINFELDER

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

CONSOLIDATION TEST RESULTS

PLATE K-282

PROJECT NO. 35-3163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway

Project Number: 35-8163-05

Boring Number	SB-12-265
Sample Depth:	48.8 m

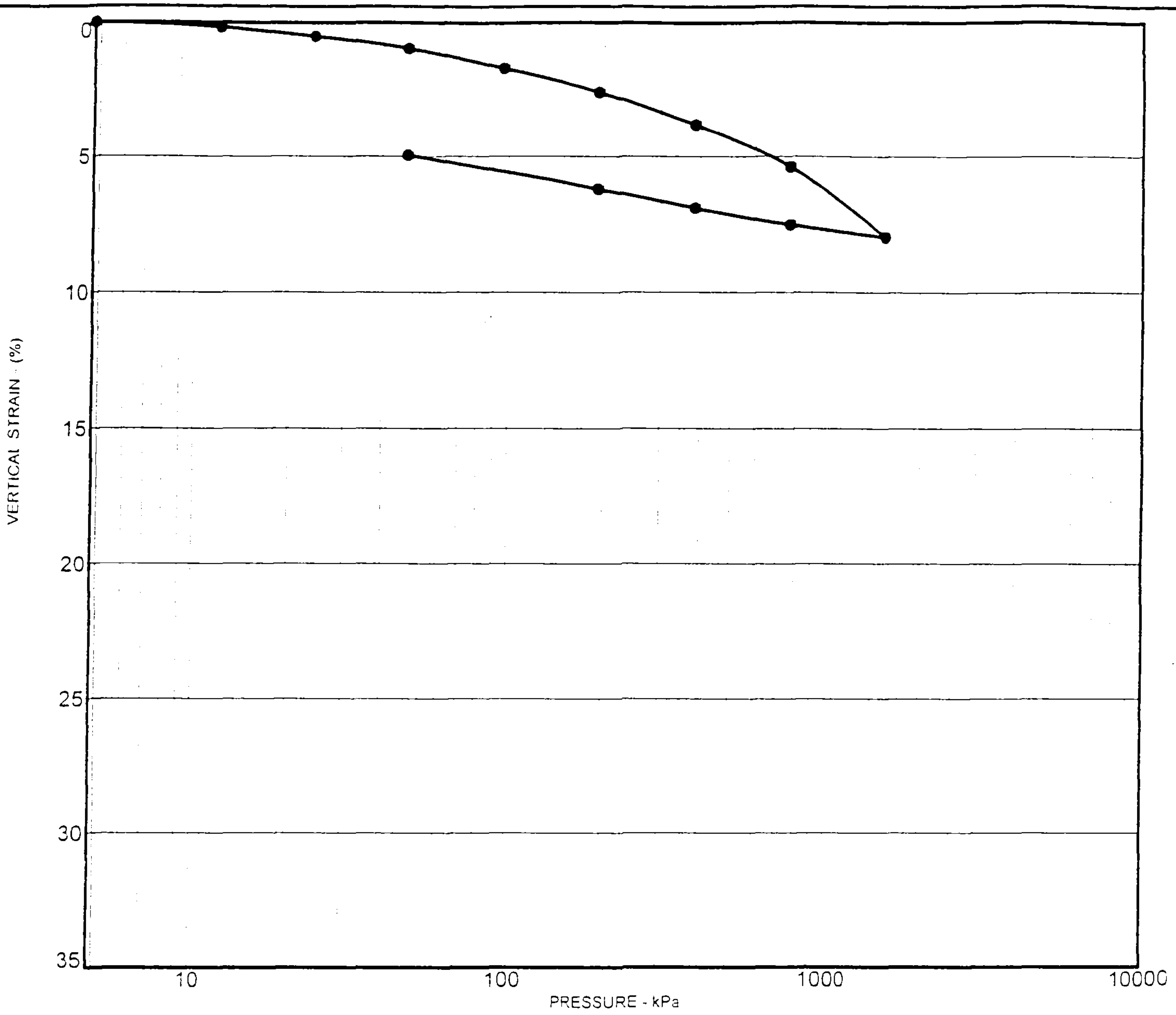
	Before Test (g)	After Test (g)
Wet Wt. + Ring	195 7	
Ring Weight	45.8	
Wet Wt	149.9	
Wet + Tare		201.2
Dry + Tare		172 5
Tare Wt		8 4

	Before Test (mm)	After Test (mm)
Sample Height	25 4	25.9
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 (%)
03/04/00	18 10:00			0201	
03/05/00	17 45 00		4 8	0192	-0.09
03/06/00	8:15:00		12.0	0215	0.14
	19.30:00		23.9	0256	0 55
03/07/00	7:55 00		47 9	0333	1.32
	17 45 00		95.8	0446	2 45
03/08/00	8:50 00		191 5	0607	4 06
03/09/00	17:50:00		383.0	0814	6 13
03/10/00	17:00.00		766.1	1060	8 59
03/11/00	18.00.00		1532.2	1373	11 72
03/12/00	8.45.00		766.1	1318	11 17
	17.00:00		383.0	1244	10 43
03/13/00	7 05 00		191 5	1159	9 58
	14 40 00		47 9	0986	7 85



Sample	SB-12-265
Depth	73.15 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	16.1	17.0
Water content, %	23.5	23.3
Sample height, mm	25.4	24.1

KLEINFELDER

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

PLATE

CONSOLIDATION TEST RESULTS

K-284

PROJECT NO. 35-8163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

Boring Number:	SB-12-265
Sample Depth:	73.1 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	195.9	
Ring Weight	45.1	
Wet Wt.	150.8	
Wet + Tare		204
Dry + Tare		175.6
Tare Wt.		8.4

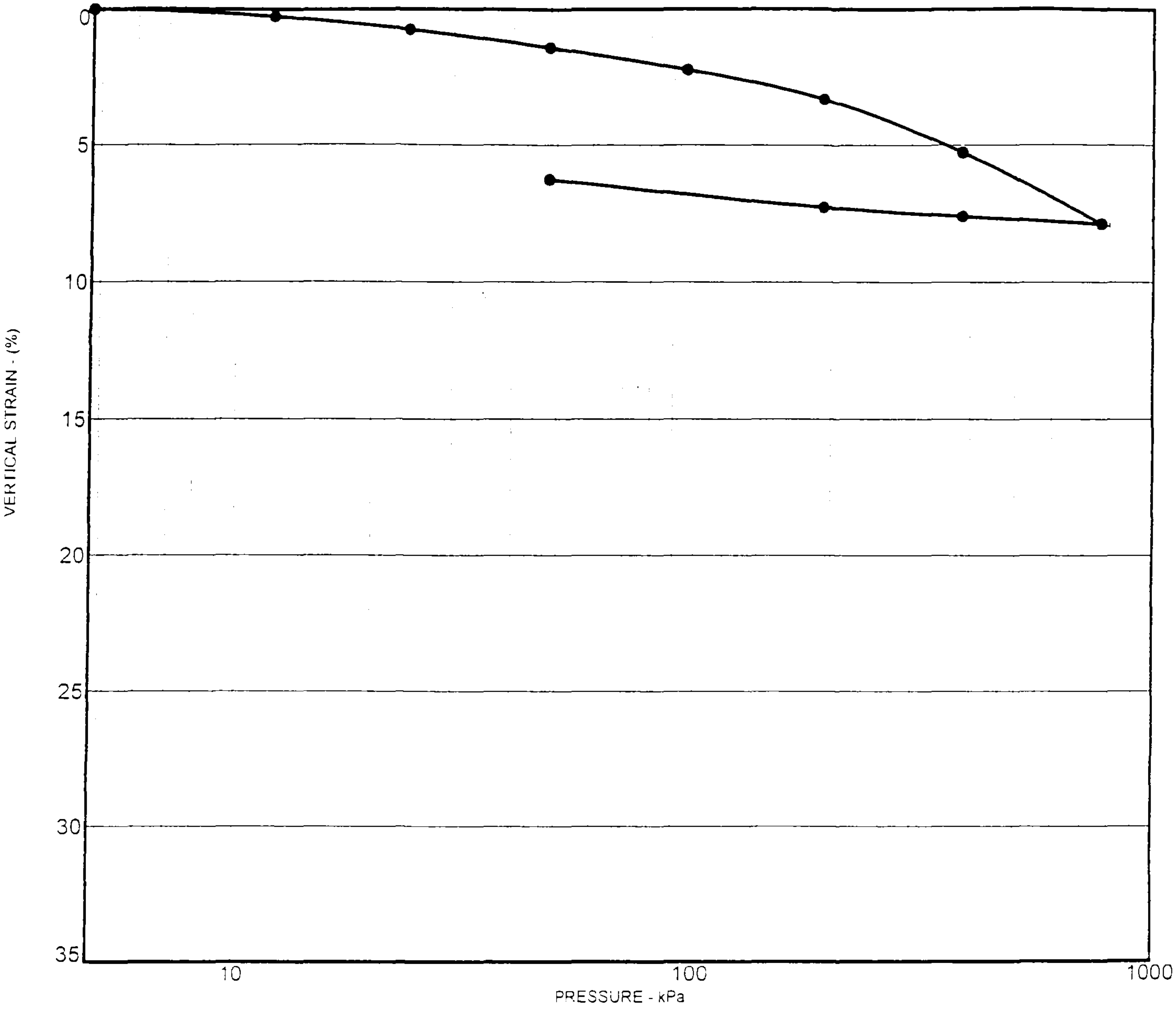
	Before Test (mm)	After Test (mm)
Sample Height	25.4	25.9
Sample Diameter	49.0	

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 (%)
03/04/00	18:40:00			0205	
03/05/00	17:40:00		4.8	0154	-0.51
03/06/00	8:15:00		12.0	0172	-0.33
	19:30:00		23.9	0206	0.01
03/07/00	7:55:00		47.9	0251	0.46
	13:05:00		95.8	0325	1.20
	21:00:00		191.5	0416	2.11
03/08/00	19:20:00		383.0	0537	3.32
03/09/00	17:50:00		766.1	0693	4.88
03/10/00	17:00:00		1532.2	0951	7.46
03/11/00	10:00:00		766.1	0906	7.01
	18:00:00		383.0	0844	6.39
03/12/00	8:45:00		191.5	0774	5.69
	17:00:00		47.9	0650	4.45

Date	Time (HH MM:SS)	Elapsed Time* (HH:MM SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
	8·15:30	0:00:30		0795	
	8·16.00	0:01·00		0802	
	8:17·00	0:02:00		0808	
	8·19:00	0:04·00		0813	
	8:23.00	0·08:00		0819	
	8:30·00	0·15 00		0824	
	8·45:00	0:30:00		0829	
	9·15·00	1:00:00		0834	
	10·15·00	2.00:00		0838	
	12:15·00	4·00:00		0842	
	16.15.00	8:00:00		0848	
03/18/00	8:15.00	24·00:00	383.0	0855	6 48
03/19/00	10:00:00		766.1	1060	8 53
	18:00:00		383.0	1037	8.30
03/20/00	13:35 00		191 5	1010	8.03
03/21/00	7·40.00		47 9	0950	7 43



Sample	SB-31-353
Depth	11.89 m
Classification	SM

	Initial	Final
Dry density, kN/m^3	16.6	17.8
Water content, %	21.8	20.2
Sample height, mm	25.4	23.9

KLEINFELDER

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

CONSOLIDATION TEST RESULTS

PLATE K-481

PROJECT NO. 35-3163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway

Project Number: 35-8163-05

Boring Number:	SB-31-353
Sample Depth:	11.9 m

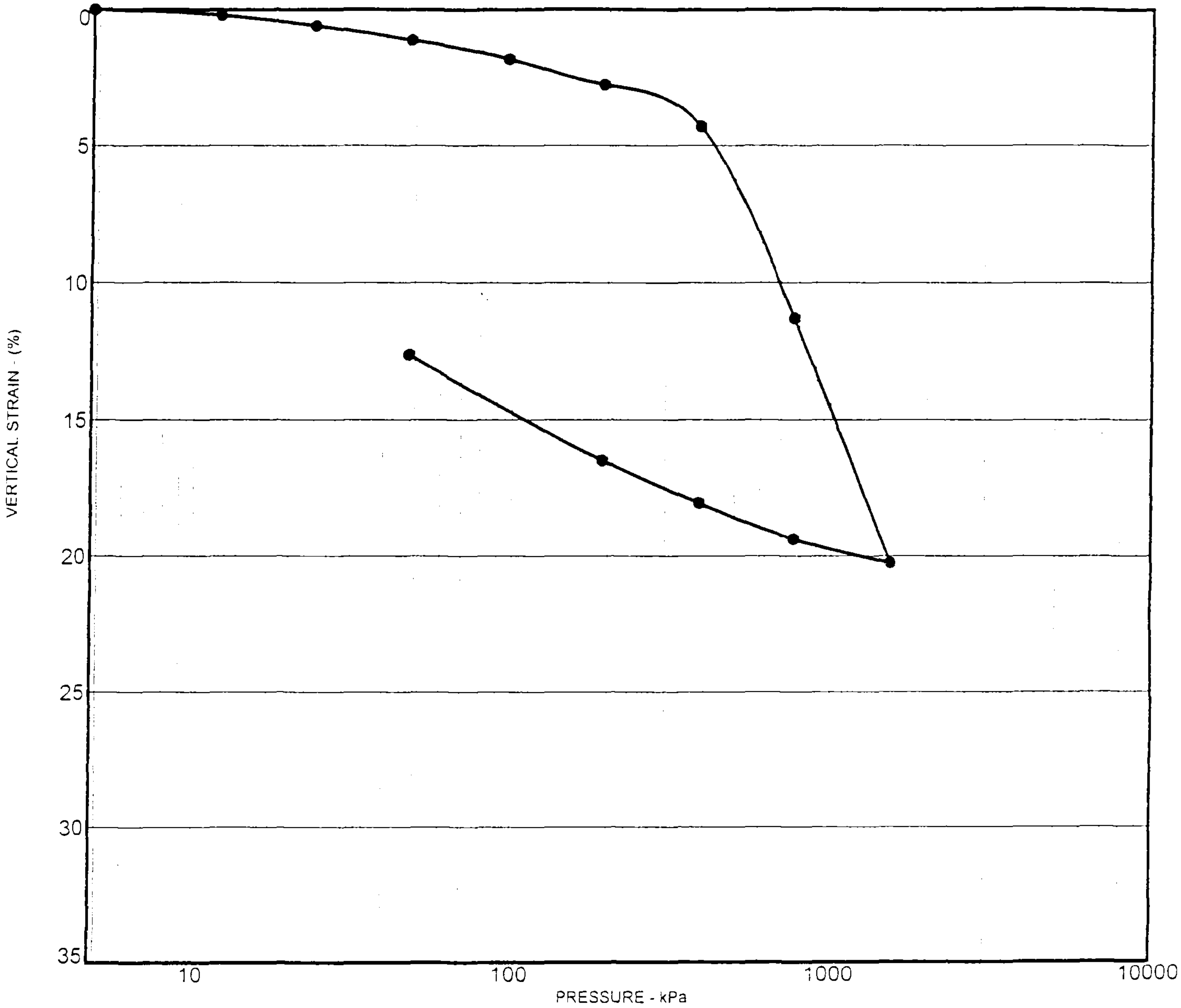
	Before Test (g)	After Test (g)
Wet Wt. + Ring	198.4	
Ring Weight	45.1	
Wet Wt.	153.3	
Wet + Tare		205
Dry + Tare		179.6
Tare Wt.		8.6

	Before Test (mm)	After Test (mm)
Sample Height	25.4	25.9
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 (%)
04/11/00	18:00:00			0180	
	20:30:00		4.8	0230	0.50
04/12/00	7:30:00		12.0	0257	0.77
	16:20:00		23.9	0306	1.26
04/13/00	10:35:00		47.9	0372	1.92
04/14/00	7:50:00		95.8	0454	2.74
	16:05:00		191.5	0563	3.83
04/15/00	18:15:00		383.0	0757	5.77
04/16/00	14:25:00		766.1	1019	8.39
04/17/00	7:30:00		383.0	0990	8.10
	9:00:00		191.5	0956	7.76
	14:00:00		47.9	0856	6.76



Sample	SB-31-353
Depth	30.48 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	10.9	12.5
Water content, %	53.0	44.5
Sample height, mm	25.4	22.1

KLEINFELDER

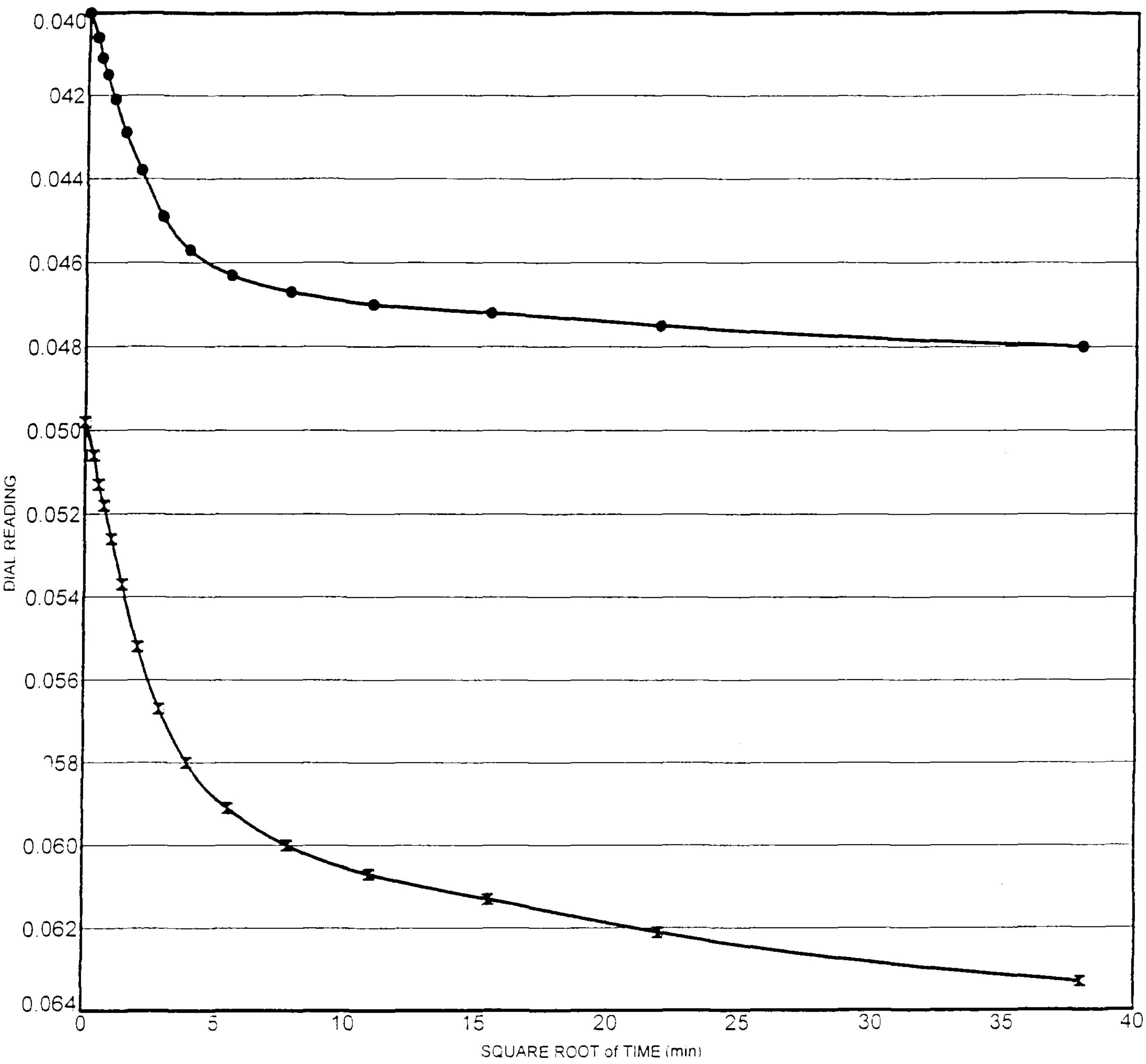
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE

CONSOLIDATION TEST RESULTS

K-483

PROJECT NO. 35-8163-05



Sample	SB-31-353	
Depth	30.5 m	
Pressure (MPa)	● 0.19	⧗ 0.38
Cv (m^2/day)		

KLEINFELDER

PROJECT NO. 35-8163-05

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

TIME RATE CONSOLIDATION

PLATE

K-484

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

Boring Number:	SB-31-353
Sample Depth:	30.5 m

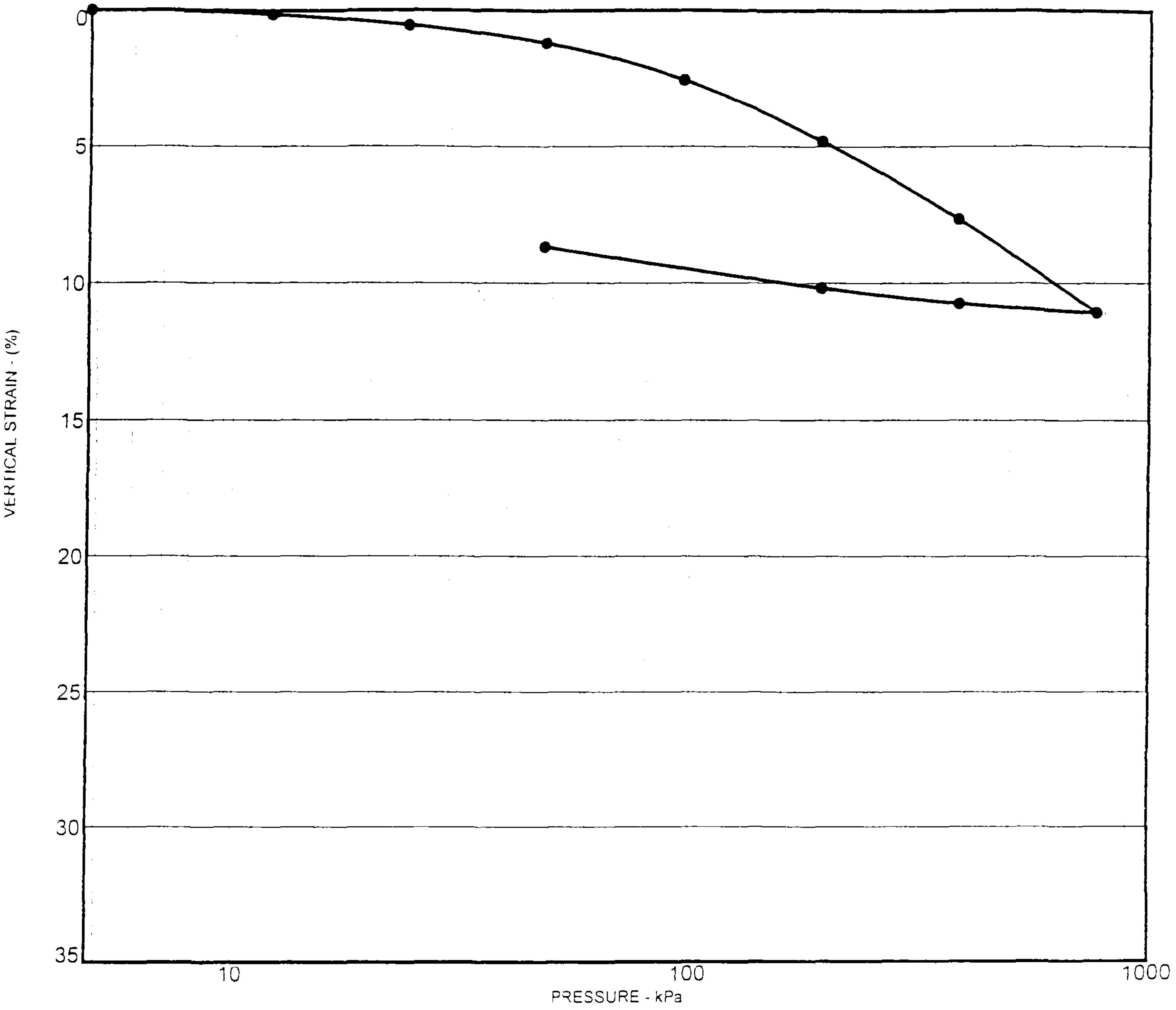
	Before Test (g)	After Test (g)
Wet Wt. + Ring	171.2	
Ring Weight	45.3	
Wet Wt.	125.9	
Wet + Tare		172.6
Dry + Tare		136
Tare Wt.		8.4

	Before Test (mm)	After Test (mm)
Sample Height	25.4	20.3
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 (%)
04/11/00	18:30:00			0228	
	22:00:00		4.8	0202	-0.26
04/12/00	7:30:00		12.0	0223	-0.05
	16:20:00		23.9	0263	0.35
04/13/00	10:35:00		47.9	0315	0.87
04/14/00	19:50:00		95.8	0385	1.57
	8:06:00	0:00:00	191.5	0400	
	8:06:06	0:00:06		0406	
	8:06:15	0:00:15		0411	
	8:06:30	0:00:30		0415	
	8:07:00	0:01:00		0421	
	8:08:00	0:02:00		0429	
	8:10:00	0:04:00		0438	
	8:14:00	0:08:00		0449	
	8:21:00	0:15:00		0457	
	8:36:00	0:30:00		0463	
	9:06:00	1:00:00		0467	
	10:06:00	2:00:00		0470	
	12:06:00	4:00:00		0472	
	16:06:00	8:00:00		0475	
04/15/00	8:06:00	24:00:00	191.5	0480	2.52
04/16/00	9:09:00	0:00:00	383.0	0498	2.70
	9:09:06	0:00:06		0506	
	9:09:15	0:00:15		0513	

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
	9:09:30	0:00:30		0518	
	9:10:00	0:01:00		0526	
	9:11:00	0:02:00		0537	
	9:13:00	0:04:00		0552	
	9:17:00	0:08:00		0567	
	9:24:00	0:15:00		0580	
	9:39:00	0:30:00		0591	
	10:09:00	1:00:00		0600	
	11:09:00	2:00:00		0607	
	13:09:00	4:00:00		0613	
	17:09:00	8:00:00		0621	
04/17/00	9:09:00	24:00:00	383.0	0633	4.05
04/18/00	7:25:00		766.1	1332	11.04
04/19/00	15:45:00		1532.2	2226	19.98
04/20/00	16:40:00		766.1	2139	19.11
04/21/00	7:00:00		383.0	2006	17.78
	14:45:00		191.5	1850	16.22
04/22/00	9:20:00		47.9	1464	12.36



Sample	SB-31-354
Depth	4.57 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	15.2	16.6
Water content, %	28.9	24.5
Sample height, mm	25.4	23.1

KLEINFELDER

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

PLATE

CONSOLIDATION TEST RESULTS

K-487

PROJECT NO. 35-8163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway

Project Number: 35-8163-05

Boring Number:	SB-31-354
Sample Depth:	4.6 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	193.4	
Ring Weight	45.2	
Wet Wt.	148.2	
Wet + Tare		196.5
Dry + Tare		168.3
Tare Wt.		8.1

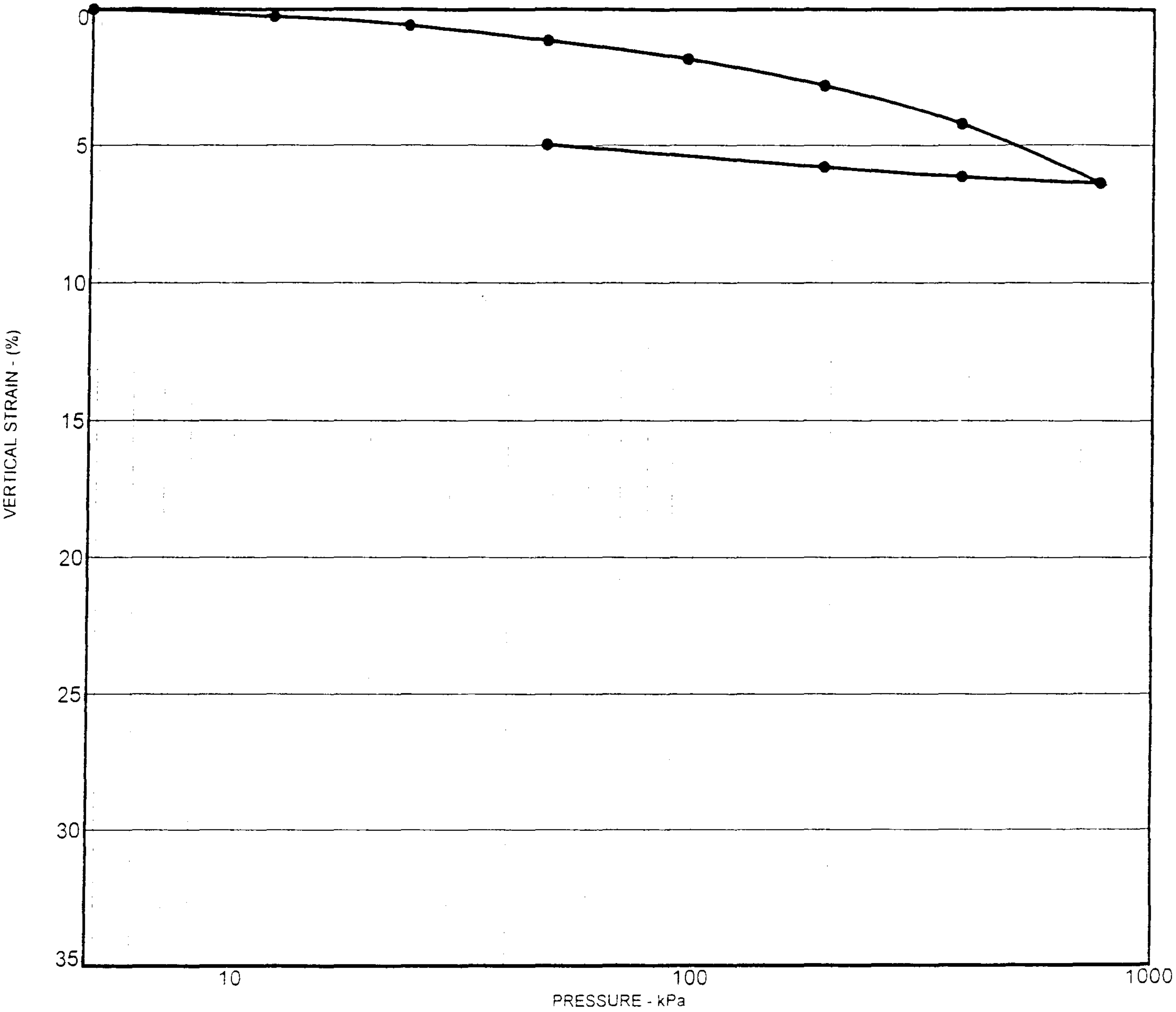
	Before Test (mm)	After Test (mm)
Sample Height	25.4	25.9
Sample Diameter	49.0	

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 (%)
05/06/00	11:10:00			0203	
	11:30:00		4.8	0190	-0.13
	13:05:00		12.0	0204	0.01
05/07/00	11:30:00		23.9	0246	0.43
	16:10:00		47.9	0310	1.07
05/08/00	9:30:00		95.8	0448	2.45
05/09/00	8:50:00		191.5	0671	4.68
05/10/00	5:50:00		383.0	0956	7.53
05/11/00	9:30:00		766.1	1298	10.95
	16:20:00		383.0	1264	10.61
05/12/00	6:50:00		191.5	1208	10.05
	14:30:00		47.9	1057	8.54

PLATE K-488



Sample	SB-31-354
Depth	13.41 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	16.9	17.8
Water content, %	22.0	20.5
Sample height, mm	25.4	24.1

KLEINFELDER

Legacy Parkway - Preferred Alternative

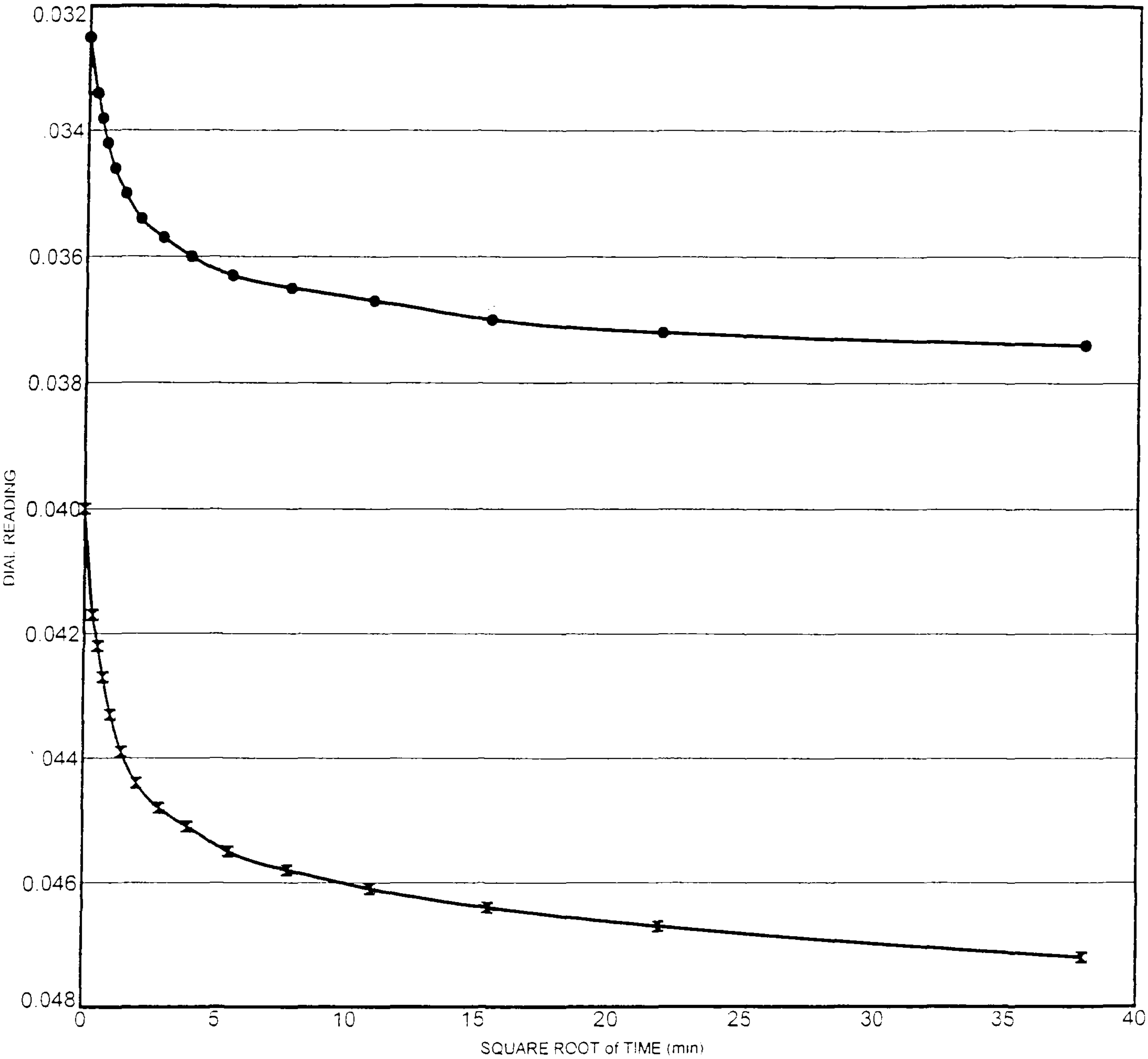
I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-489

PROJECT NO. 35-8163-05



Sample	SB-31-354	
Depth	13.4 m	
Pressure (MPa)	● 0.10	⧗ 0.19
Cv (m²/day)		

KLEINFELDER

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

PLATE

TIME RATE CONSOLIDATION

K-490

PROJECT NO. 35-8163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

Boring Number:	SB-31-354
Sample Depth:	13.4 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	201.1	
Ring Weight	45.4	
Wet Wt.	155.7	
Wet + Tare		207.8
Dry + Tare		181.7
Tare Wt.		8.7

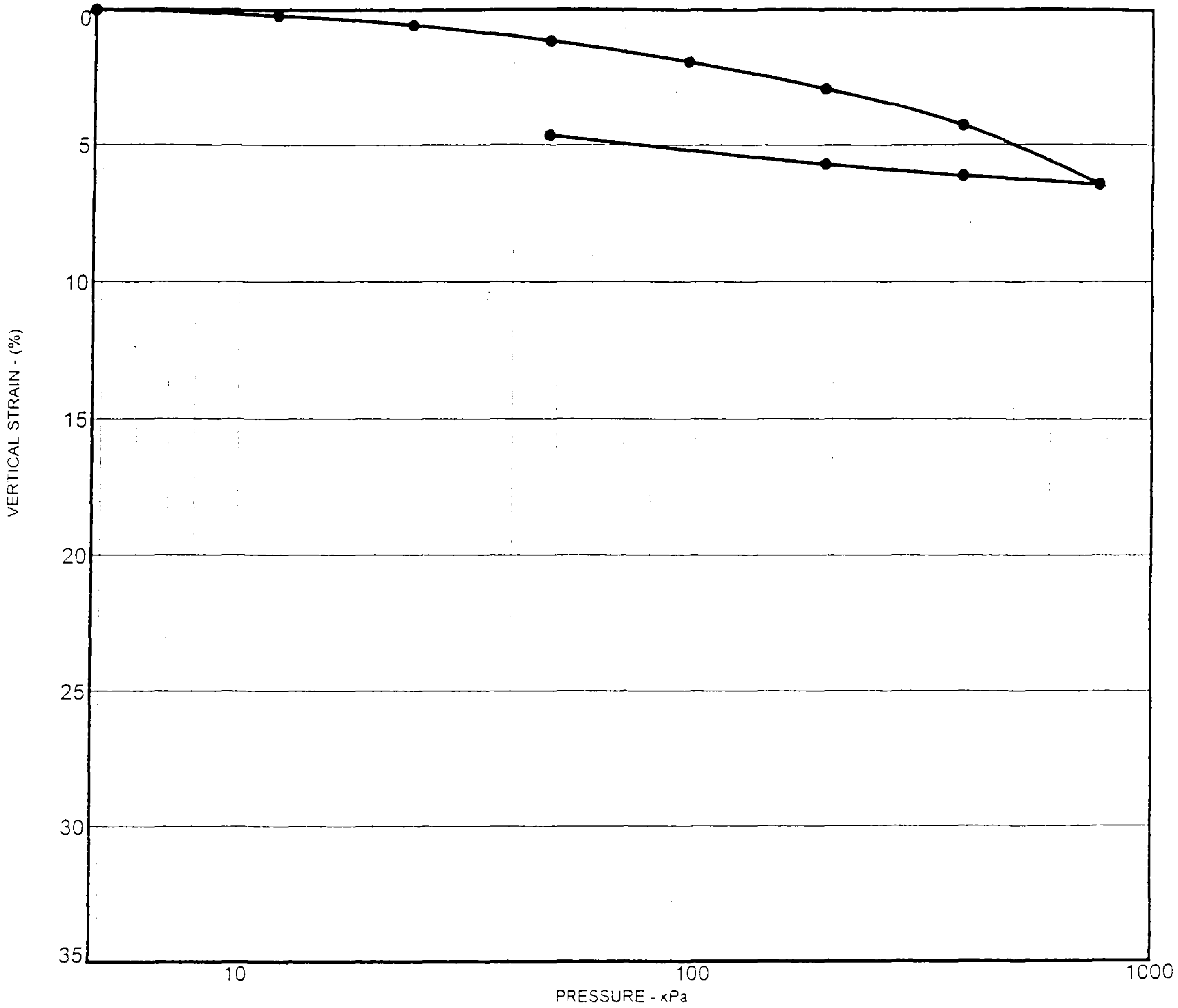
	Before Test (mm)	After Test (mm)
Sample Height	25.4	23.8
Sample Diameter	49.0	

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 (%)
05/06/00	12:05:00			0188	
	13:30:00		4.8	0191	0.03
05/07/00	11:30:00		12.0	0217	0.29
	16:10:00		23.9	0250	0.62
05/08/00	7:55:00		47.9	0306	1.18
	8:00:00	0:00:00	95.8	0325	1.37
	8:00:06	0:00:06		0334	
	8:00:15	0:00:15		0338	
	8:00:30	0:00:30		0342	
	8:01:00	0:01:00		0346	
	8:02:00	0:02:00		0350	
	8:04:00	0:04:00		0354	
	8:08:00	0:08:00		0357	
	8:15:00	0:15:00		0360	
	8:30:00	0:30:00		0363	
	9:00:00	1:00:00		0365	
	10:00:00	2:00:00		0367	
	12:00:00	4:00:00		0370	
	16:00:00	8:00:00		0372	
05/09/00	8:00:00	0:00:00	95.8	0374	1.86
	8:13:00	24:00:00	191.5	0400	2.12
	8:13:06	0:00:06		0417	
	8:13:15	0:00:15		0422	
	8:13:30	0:00:30		0427	

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
	8:14:00	0:01:00		0433	
	8:15:00	0:02:00		0439	
	8:17:00	0:04:00		0444	
	8:21:00	0:08:00		0448	
	8:28:00	0:15:00		0451	
	8:43:00	0:30:00		0455	
	9:13:00	1:00:00		0458	
	10:13:00	2:00:00		0461	
	12:13:00	4:00:00		0464	
	16:13:00	8:00:00		0467	
05/10/00	8:13:00	24:00:00	191.5	0472	2.84
05/11/00	9:30:00		383.0	0613	4.25
05/12/00	6:50:00		766.1	0830	6.42
	14:30:00		383.0	0805	6.17
05/13/00	9:40:00		191.5	0770	5.82
05/15/00	7:30:00		47.9	0685	4.97



Sample	SB-31-355
Depth	24.23 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	15.8	16.6
Water content, %	25.8	24.7
Sample height, mm	25.4	24.1

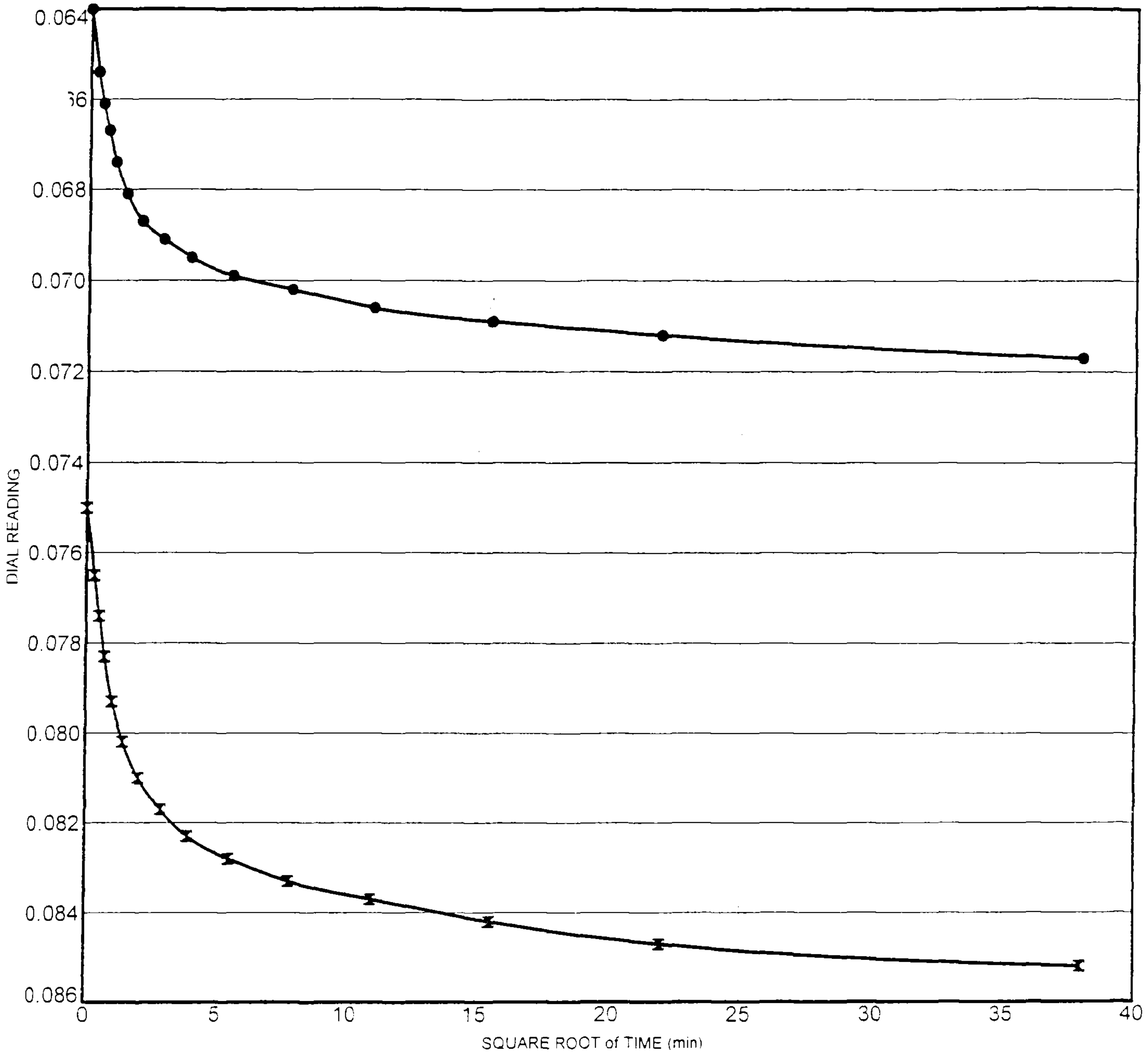
KLEINFELDER

PROJECT NO. 35-8163-05

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

CONSOLIDATION TEST RESULTS

PLATE
K-493



Sample	SB-31-355	
Depth	24.2 m	
Pressure (MPa)	● 0.19	⧗ 0.38
Cv (m^2/day)		

KLEINFELDER

PROJECT NO. 35-8163-05

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

TIME RATE CONSOLIDATION

PLATE
K-494

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

Boring Number:	SB-31-355
Sample Depth:	24.2 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	195.6	
Ring Weight	45.2	
Wet Wt.	150.4	
Wet + Tare		202.7
Dry + Tare		173.1
Tare Wt.		8.3

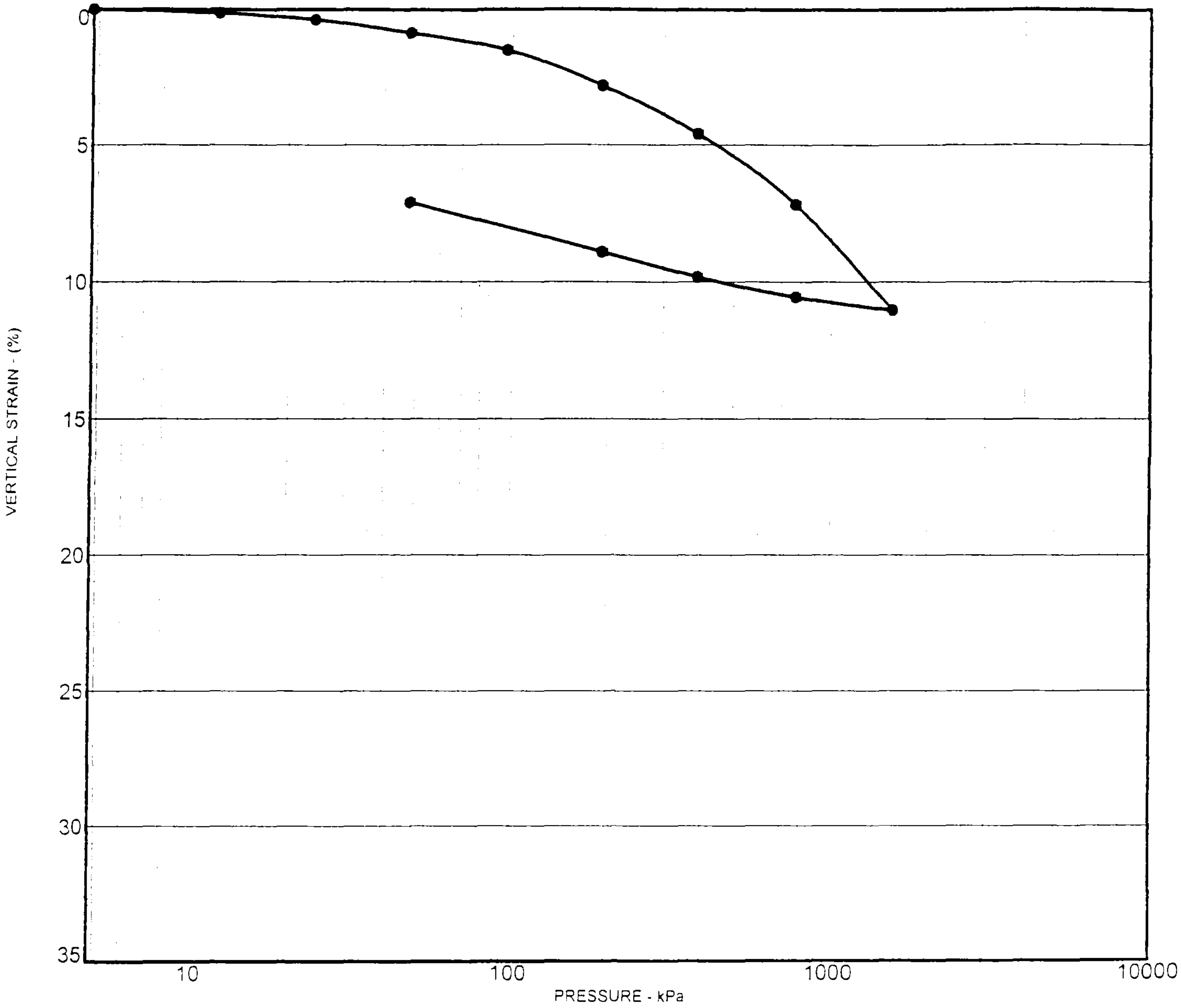
	Before Test (mm)	After Test (mm)
Sample Height	25.4	23.7
Sample Diameter	49.0	

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 (%)
04/21/00	8:40:00			0411	
	10:25:00		4.8	0424	0.13
	13:25:00		12.0	0446	0.35
	16:30:00		23.9	0481	0.70
04/22/00	9:20:00		47.9	0541	1.30
04/23/00	8:00:00		95.8	0617	2.06
	8:09:00	0:00:00	191.5	0640	
	8:09:06	0:00:06		0654	
	8:09:15	0:00:15		0661	
	8:09:30	0:00:30		0667	
	8:10:00	0:01:00		0674	
	8:11:00	0:02:00		0681	
	8:13:00	0:04:00		0687	
	8:17:00	0:08:00		0691	
	8:24:00	0:15:00		0695	
	8:39:00	0:30:00		0699	
	9:09:00	1:00:00		0702	
	10:09:00	2:00:00		0706	
	12:09:00	4:00:00		0709	
	16:09:00	8:00:00		0712	
04/24/00	8:09:00	24:00:00	191.5	0717	3.06
	8:00:00	0:00:00	383.0	0750	3.39
	8:00:06	0:00:06		0765	
	8:00:15	0:00:15		0774	

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
	8:00:30	0:00:30		0783	
	8:01:00	0:01:00		0793	
	8:02:00	0:02:00		0802	
	8:04:00	0:04:00		0810	
	8:08:00	0:08:00		0817	
	8:15:00	0:15:00		0823	
	8:30:00	0:30:00		0828	
	9:00:00	1:00:00		0833	
	10:00:00	2:00:00		0837	
	12:00:00	4:00:00		0842	
	16:00:00	8:00:00		0847	
04/25/00	8:00:00	24:00:00		0852	
04/26/00	11:35:00		766.1	1068	6.57
04/27/00	7:50:00		383.0	1036	6.25
	17:00:00		191.5	0994	5.83
04/28/00	8:15:00		47.9	0889	4.78



Sample	SB-31-355
Depth	42.52 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	15.0	16.1
Water content, %	29.0	25.9
Sample height, mm	25.4	23.6

KLEINFELDER

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-497

PROJECT NO. 35-3163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

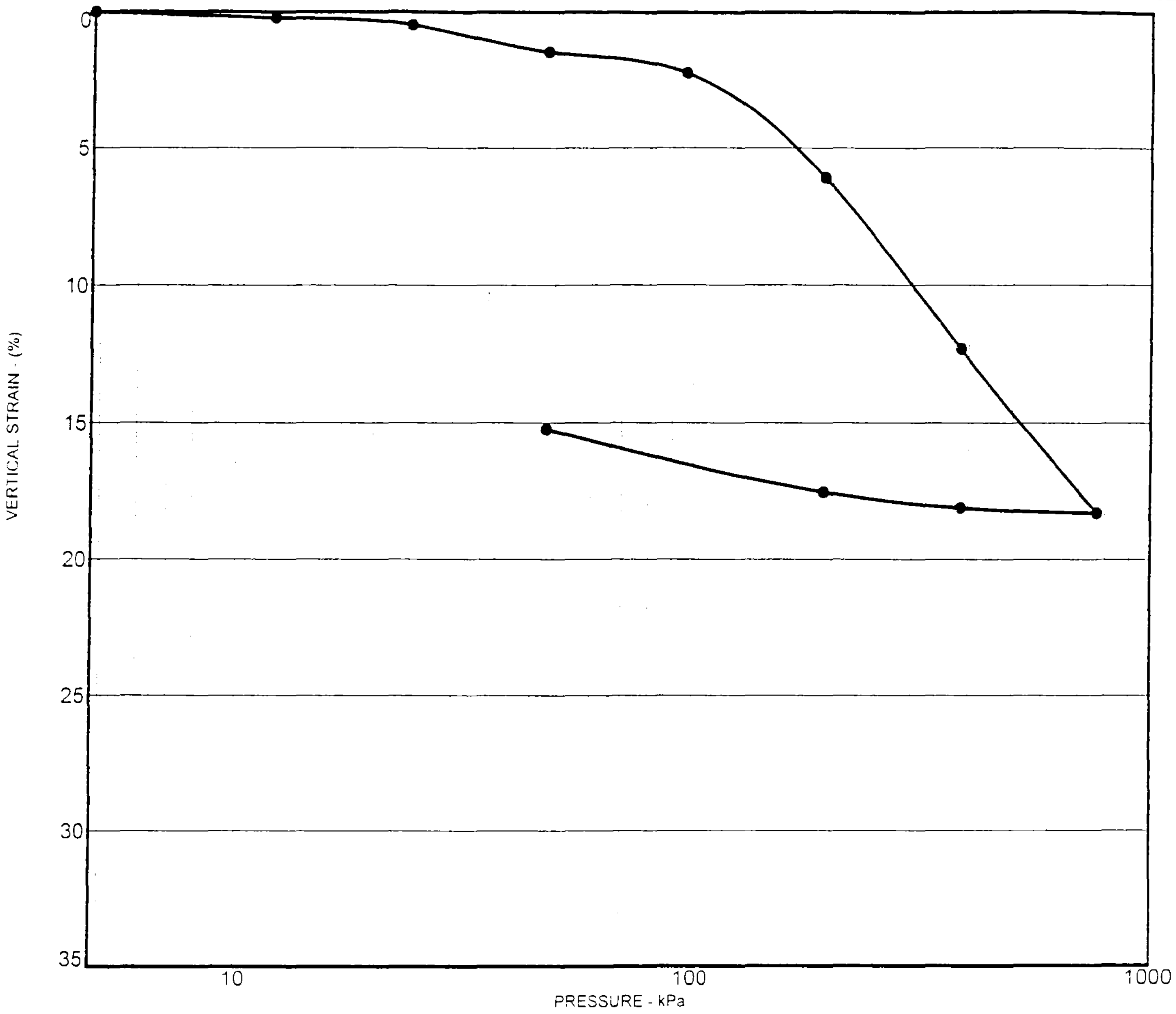
Boring Number:	SB-31-355
Sample Depth:	42.5 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	190.7	
Ring Weight	44.5	
Wet Wt.	146.2	
Wet + Tare		195.3
Dry + Tare		165.9
Tare Wt.		8.1

	Before Test (mm)	After Test (mm)
Sample Height	25.4	25.9
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 (%)
04/21/00	9:10:00			0210	
	10:25:00		4.8	0198	-0.12
	13:25:00		12.0	0212	0.02
	16:30:00		23.9	0236	0.26
04/22/00	9:20:00		47.9	0284	0.74
	13:40:00		95.8	0349	1.39
04/23/00	9:30:00		191.5	0480	2.70
04/24/00	7:50:00		383.0	0658	4.48
	19:00:00		766.1	0916	7.06
04/26/00	11:35:00		1532.2	1301	10.91
04/27/00	7:00:00		766.1	1253	10.43
	17:00:00		383.0	1180	9.70
04/28/00	8:15:00		191.5	1089	8.79
04/29/00	11:00:00		47.9	0908	6.98



				Initial	Final
Sample	SB-31-356		Dry density, kN/m^3	12.0	14.2
Depth	6.10 m		Water content, %	44.2	34.2
Classification	CL		Sample height, mm	25.4	21.6

KLEINFELDER

Legacy Parkway - Preferred Alternative

I-215 to I-15/US 89 Interchange

PLATE

CONSOLIDATION TEST RESULTS

K-499

PROJECT NO. 35-8163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

Boring Number:	SB-31-356
Sample Depth:	6.1 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	176.9	
Ring Weight	45.5	
Wet Wt.	131.4	
Wet + Tare		176.2
Dry + Tare		145
Tare Wt.		8.4

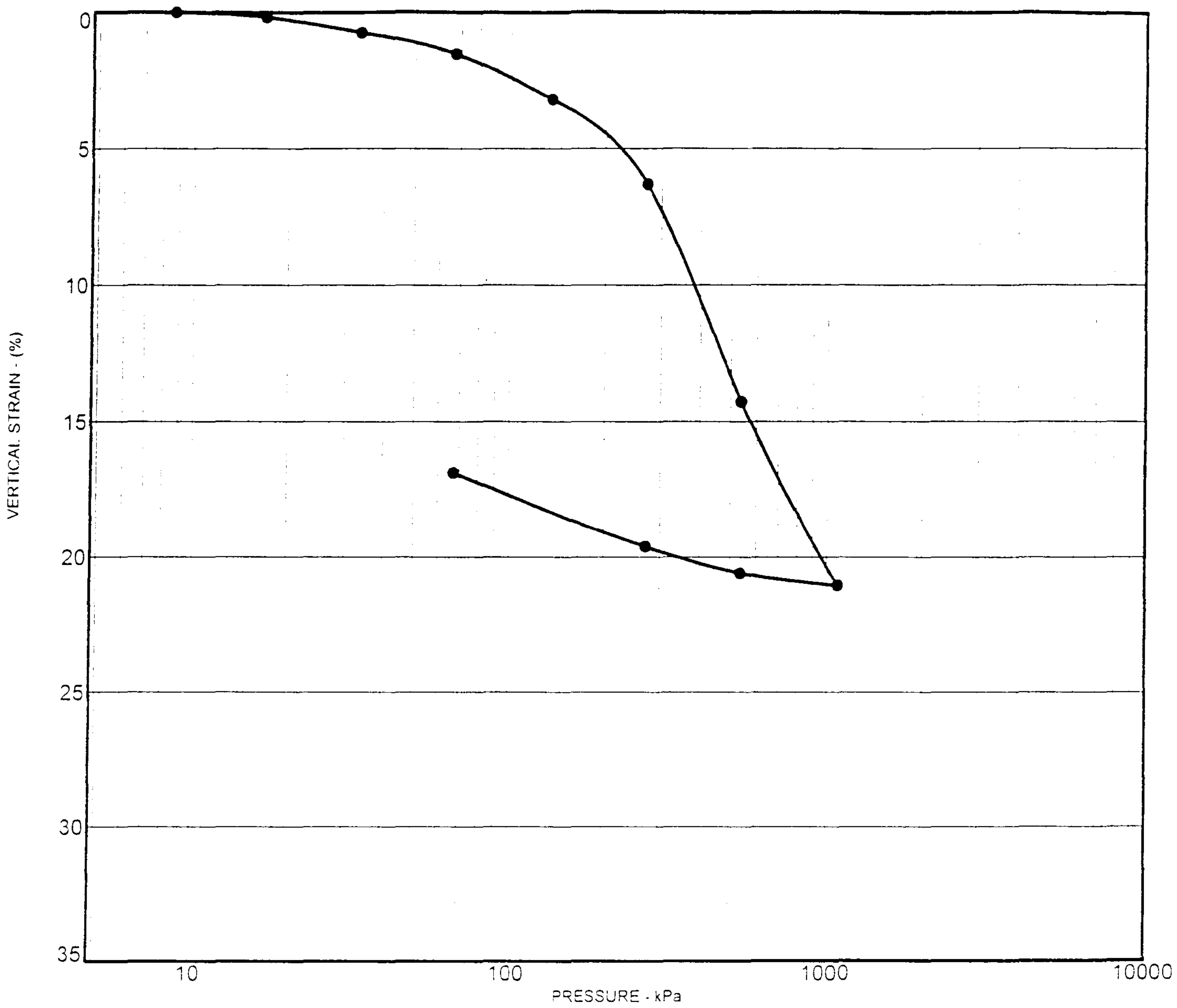
	Before Test (mm)	After Test (mm)
Sample Height	25.4	20.8
Sample Diameter	49.0	

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 (%)
04/07/00	15:50:00			0100	
	19:00:00		4.8	0115	0.15
04/08/00	8:00:00		12.0	0137	0.37
	16:10:00		23.9	0164	0.64
04/09/00	8:45:00		47.9	0263	1.63
04/11/00	14:20:00		95.8	0341	2.41
	14:30:00	0:00:00	191.5	0350	
	14:30:06	0:00:06		0361	
	14:30:15	0:00:15		0372	
	14:30:30	0:00:30		0423	
	14:31:00	0:01:00		0440	
	14:32:00	0:02:00		0465	
	14:34:00	0:04:00		0495	
	14:38:00	0:08:00		0522	
	14:45:00	0:15:00		0527	
	15:00:00	0:30:00		0546	
	15:30:00	1:00:00		0577	
	16:30:00	2:00:00		0646	
	18:30:00	4:00:00		0673	
	22:30:00	8:00:00		0691	
04/12/00	14:30:00	24:00:00	191.5	0723	6.23
04/14/00	8:00:00	0:00:00	383.0	0760	6.60
	8:00:06	0:00:06		0770	
	8:00:15	0:00:15		0779	

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
	8:00:30	0:00:30		0840	
	8:01:00	0:01:00		0863	
	8:02:00	0:02:00		0897	
	8:04:00	0:04:00		0917	
	8:08:00	0:08:00		0974	
	8:15:00	0:15:00		0985	
	8:30:00	0:30:00		1121	
	9:00:00	1:00:00		1182	
	10:00:00	2:00:00		1270	
	12:00:00	4:00:00		1304	
	16:00:00	8:00:00		1312	
04/15/00	8:00:00	24:00:00		1347	
04/17/00	7:00:00		383.0	1943	18.43
	9:00:00		383.0	1925	18.25
	14:00:00		191.5	1867	17.67
04/18/00	7:25:00		47.9	1638	15.38

PLATE K-502



Sample	SB-31-356
Depth	18.29 m
Classification	CH

	Initial	Final
Dry density, kN/m^3	11.9	14.4
Water content, %	45.6	34.1
Sample height, mm	25.4	21.1

KLEINFELDER

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

CONSOLIDATION TEST RESULTS

PLATE
K-503

PROJECT NO 35-8163-05

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway **Project Number: 35-8163-05**

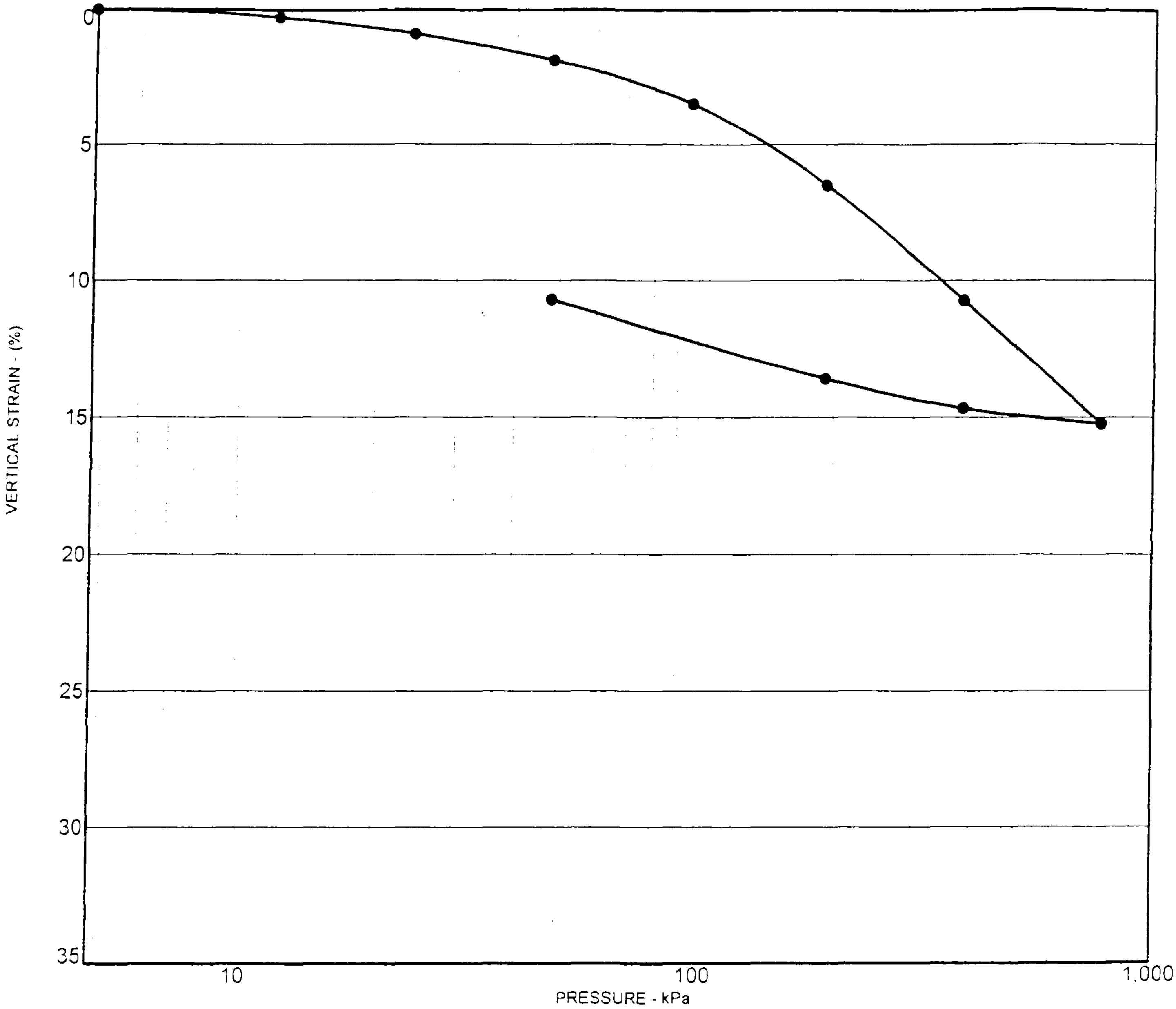
Boring Number:	SB-31-356
Sample Depth:	18.3 m

	Before Test (g)	After Test (g)
Wet Wt. + Ring	176.8	
Ring Weight	45.3	
Wet Wt.	131.5	
Wet + Tare		174
Dry + Tare		144
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 (%)
04/07/00	11:50:00			0214	
	13:30:00		8.6	0156	-0.58
	15:45:00		16.8	0174	-0.40
04/08/00	8:30:00		33.5	0231	0.17
	16:15:00		67.0	0310	0.96
04/09/00	8:40:00		134.5	0476	2.62
04/10/00	8:40:00		268.6	0787	5.73
04/11/00	14:20:00		537.7	1583	13.69
04/12/00	8:30:00		1075.4	2260	20.46
	14:30:00		537.7	2215	20.01
04/13/00	12:15:00		268.6	2116	19.02
04/14/00	8:30:00		67.0	1843	16.29



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

Kleinfelder, Inc.

Consolidation Test Data

Legacy Parkway

Project Number: 35-8163-05

Boring Number:	RB-371
Sample Depth:	3.0 m

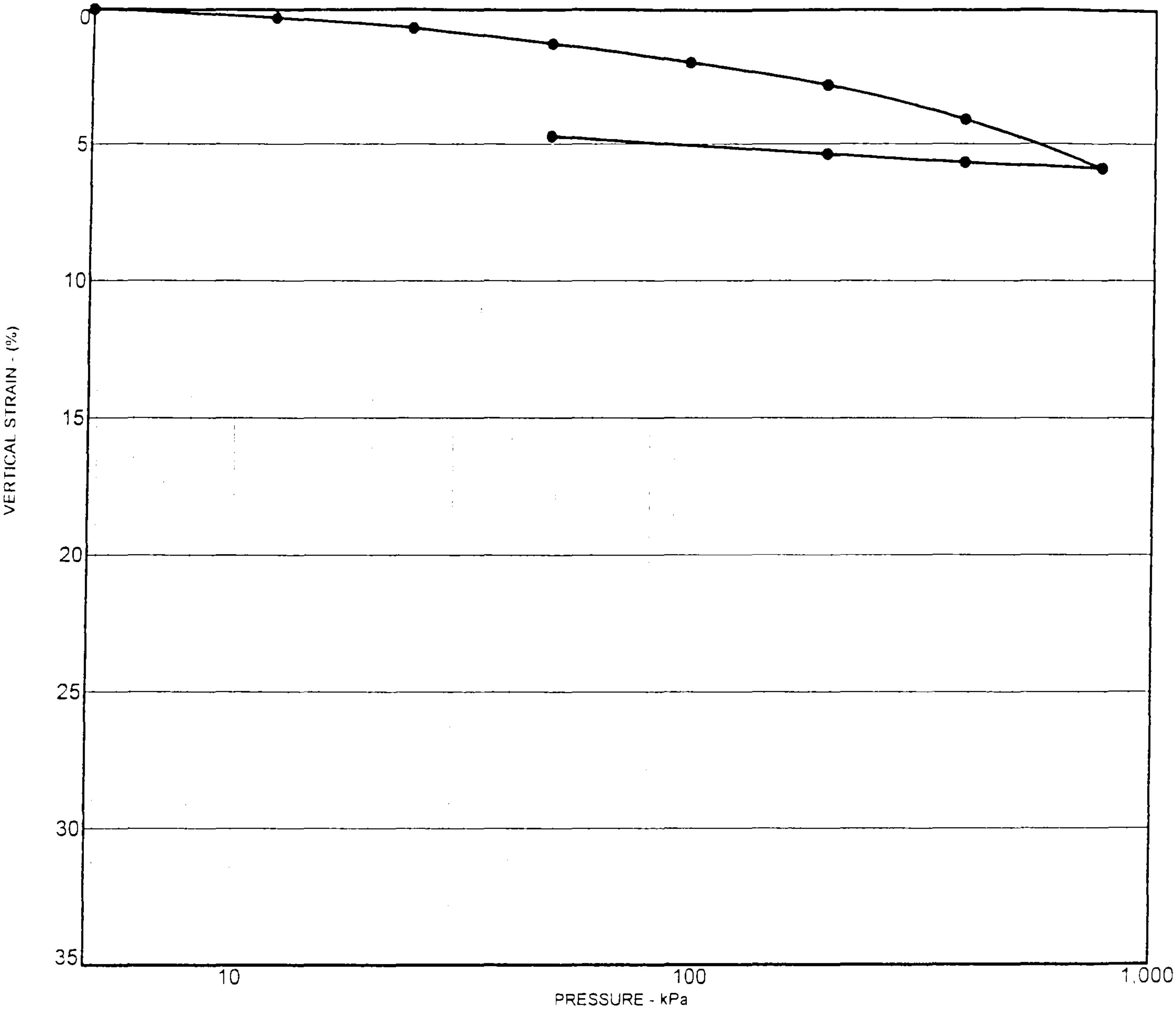
	Before Test (g)	After Test (g)
Wet Wt. + Ring	186.4	
Ring Weight	46.4	
Wet Wt.	140.0	
Wet + Tare		189.2
Dry + Tare		156.3
Tare Wt.		8.6

	Before Test (mm)	After Test (mm)
Sample Height	25.4	25.9
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 (%)
04/25/00	10:50:00			0188	
	11:30:00		4.8	0176	-0.12
	13:30:00		12.0	0204	0.16
04/26/00	11:35:00		23.9	0266	0.78
04/27/00	7:00:00		47.9	0364	1.76
	17:00:00		95.8	0526	3.38
04/28/00	10:45:00		191.5	0827	6.39
04/29/00	11:00:00		383.0	1249	10.61
04/30/00	10:15:00		766.1	1699	15.11
	12:00:00		383.0	1643	14.55
	18:00:00		191.5	1535	13.47
05/01/00	7:15:00		47.9	1246	10.58



Sample	RB-371
Depth	19.81 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	17.7	18.6
Water content, %	17.6	16.3
Sample height, mm	25.4	24.1

KLEINFELDER

Legacy Parkway - Preferred Alternative

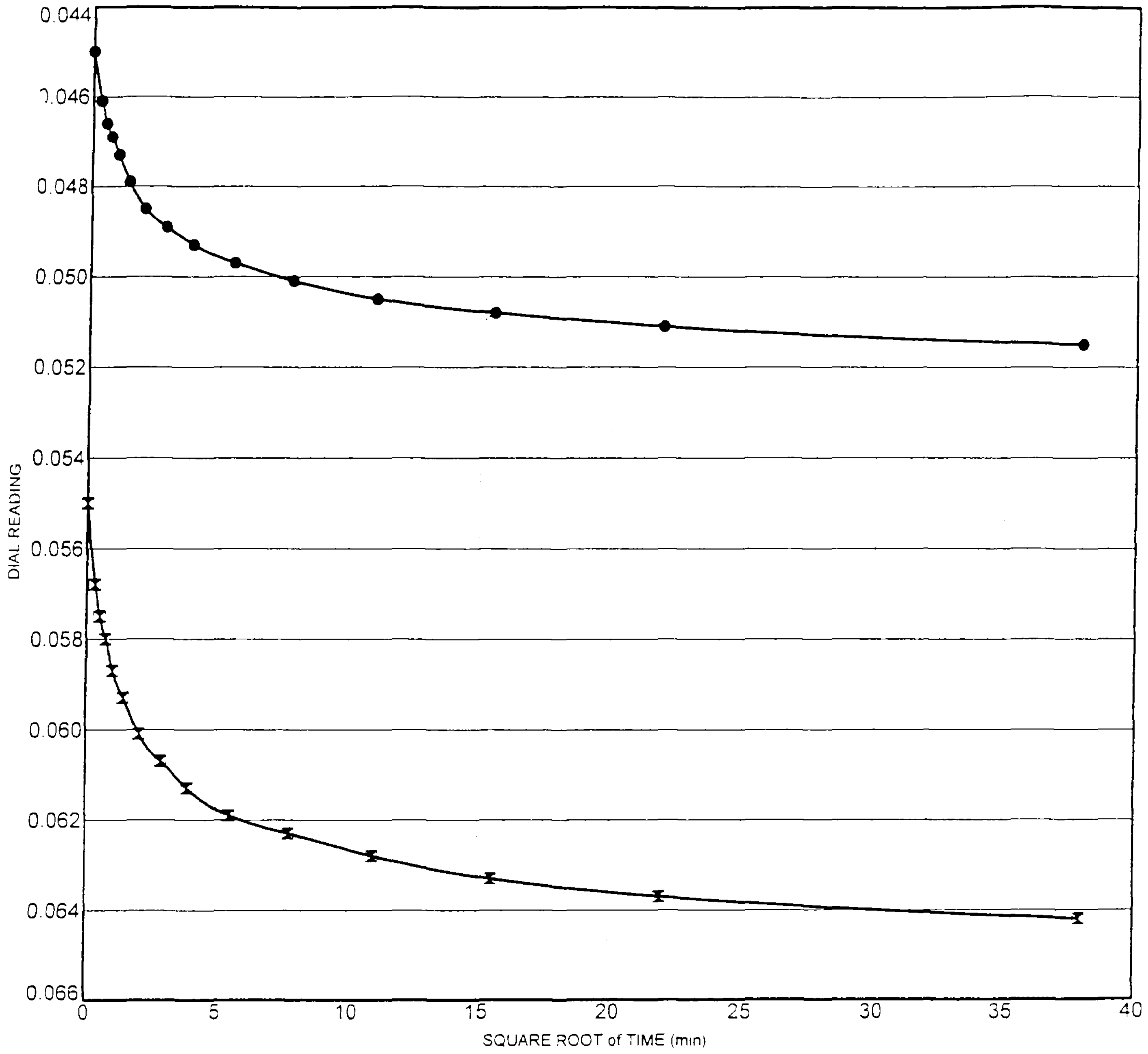
I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

PLATE

K-715

PROJECT NO. 35-8163-05



Sample	RB-371	
Depth	19.8 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-716

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-371
Sample Depth:	19.8 m

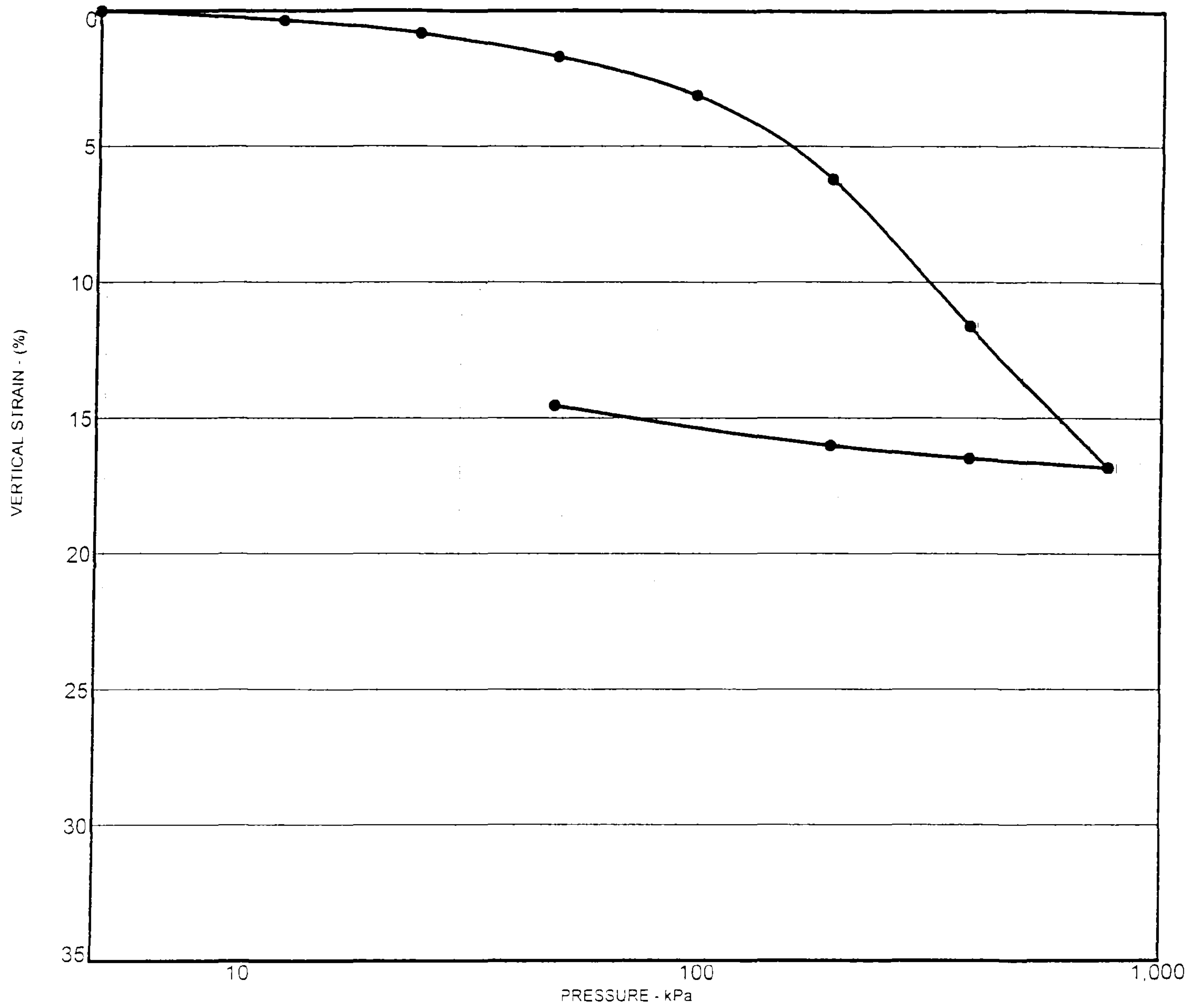
	Before Test (g)	After Test (g)
Wet Wt. + Ring	202.6	
Ring Weight	45.2	
Wet Wt.	157.4	
Wet + Tare		209.5
Dry + Tare		187.7
Tare Wt.		8.6

	Before Test (mm)	After Test (mm)
Sample Height	25.4	23.8
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 (%)
04/25/00	9:20:00			0203	
	10:30:00		4.8	0232	0.29
	12:30:00		12.0	0263	0.60
	15:25:00		23.9	0302	0.99
04/26/00	11:40:00		47.9	0360	1.57
04/28/00	8:00:00		95.8	0429	2.26
	8:03:00	0:00:00	191.5	0450	
	8:03:06	0:00:06		0461	
	8:03:15	0:00:15		0466	
	8:03:30	0:00:30		0469	
	8:04:00	0:01:00		0473	
	8:05:00	0:02:00		0479	
	8:07:00	0:04:00		0485	
	8:11:00	0:08:00		0489	
	8:18:00	0:15:00		0493	
	8:33:00	0:30:00		0497	
	9:03:00	1:00:00		0501	
	10:03:00	2:00:00		0505	
	12:03:00	4:00:00		0508	
	16:03:00	8:00:00		0511	
04/29/00	8:03:00	24:00:00	191.5	0515	3.12
04/30/00	10:09:00	0:00:00	383.0	0550	3.47
	10:09:06	0:00:06		0568	
	10:09:15	0:00:15		0575	

Date	Time (HH:MM:SS)	Elapsed Time* (HH:MM:SS)	Applied Stress (kPa)	Dial Reading	Strain (%)
	10:09:30	0:00:30		0580	
	10:10:00	0:01:00		0587	
	10:11:00	0:02:00		0593	
	10:13:00	0:04:00		0601	
	10:17:00	0:08:00		0607	
	10:24:00	0:15:00		0613	
	10:39:00	0:30:00		0619	
	11:09:00	1:00:00		0623	
	12:09:00	2:00:00		0628	
	14:09:00	4:00:00		0633	
	18:09:00	8:00:00		0637	
05/01/00	10:09:00	24:00:00	383.0	0642	4.39
05/02/00	7:00:00		766.1	0822	6.19
	18:15:00		383.0	0800	5.97
05/03/00	7:50:00		191.5	0770	5.67
	9:45:00		47.9	0705	5.02



Sample	RB-395
Depth	1.52 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	12.8	15.0
Water content, %	40.7	30.9
Sample height. mm	25.4	21.6

PLATE

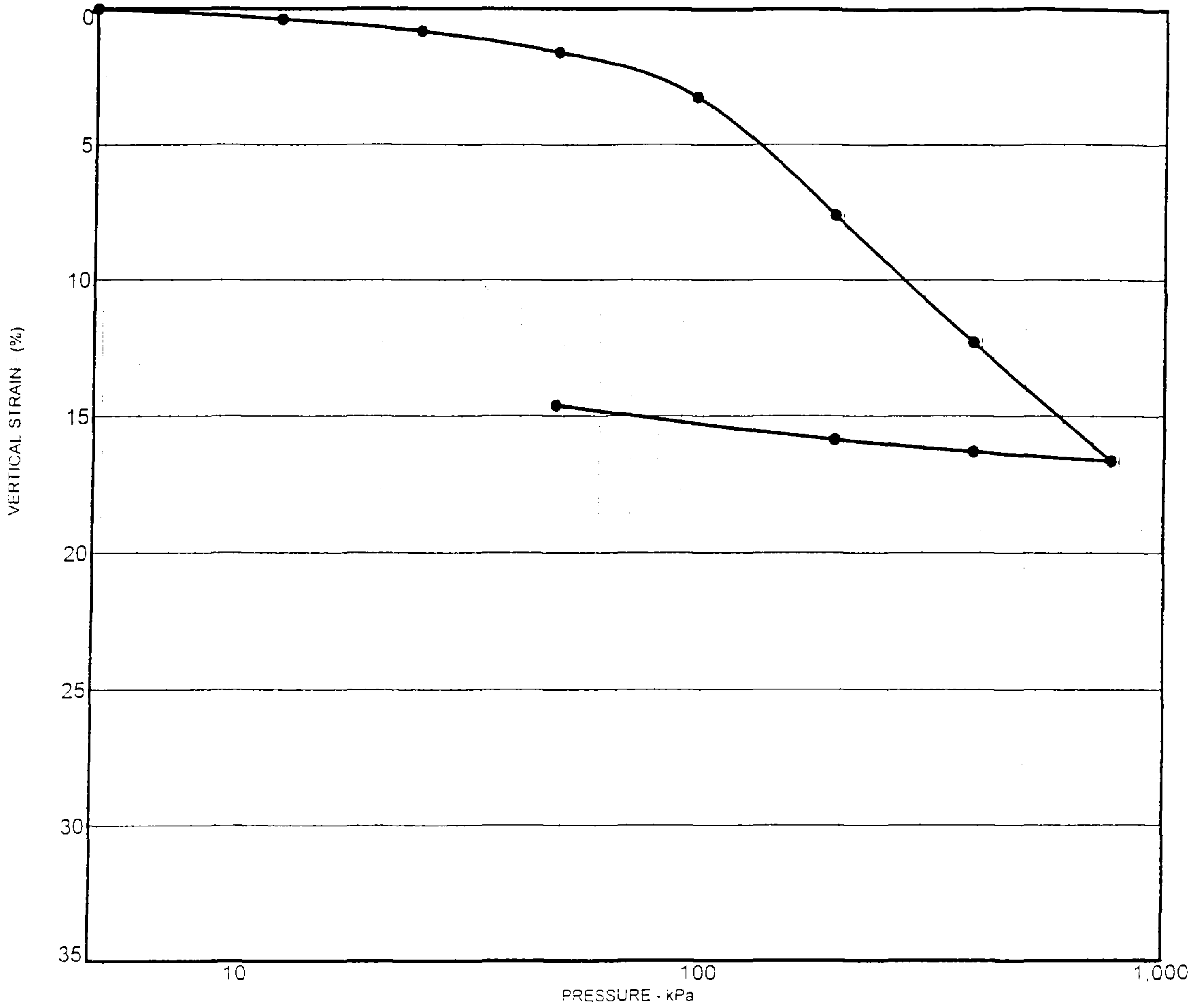
KLEINFELDER

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

K-831

PROJECT NO 35-3163-05



Sample	RB-395
Depth	4.57 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	12.7	14.9
Water content, %	41.4	30.6
Sample height, mm	25.4	21.6

PLATE

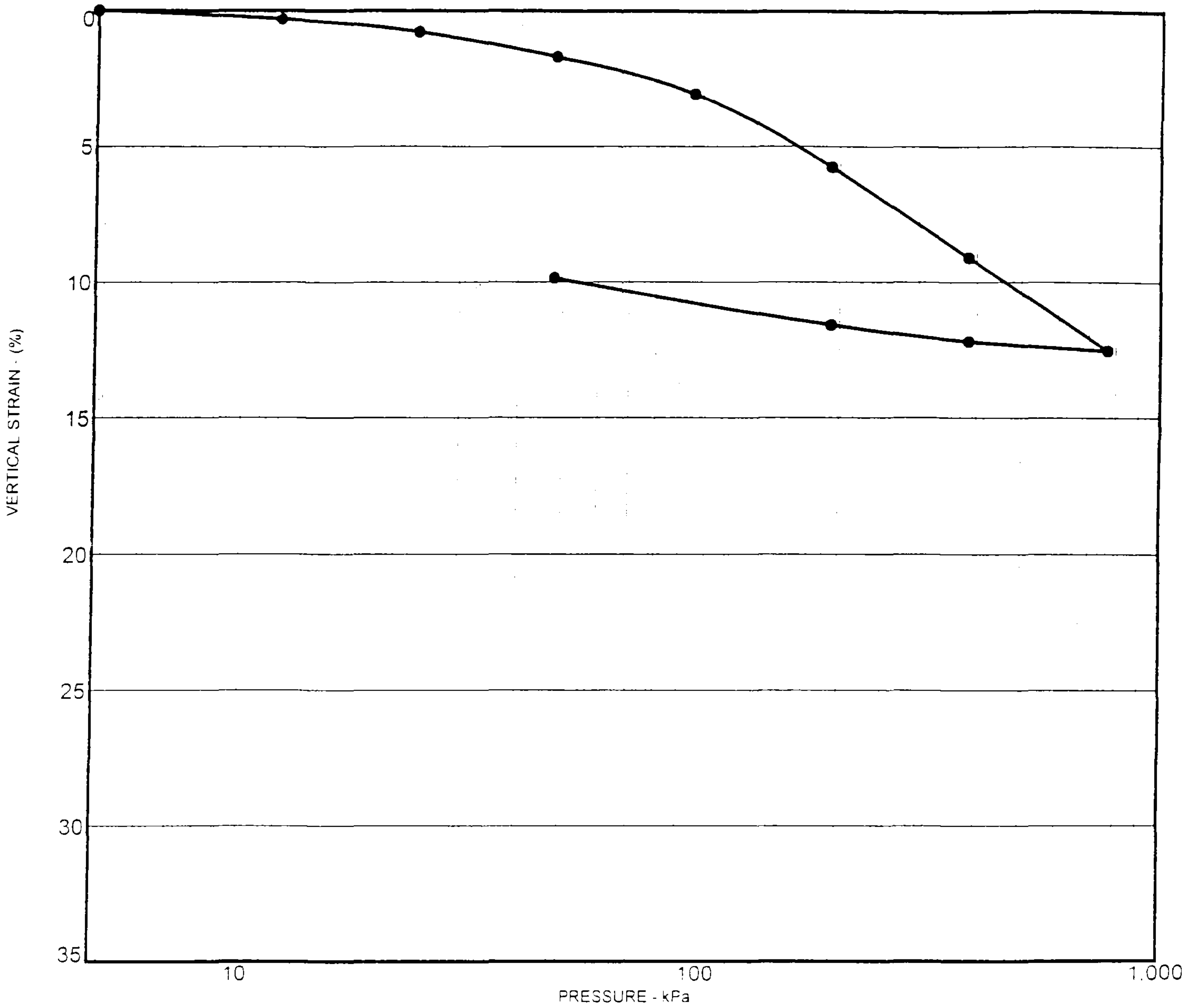
KLEINFELDER

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

K-833

PROJECT NO 35-8163-05



Sample	RB-398
Depth	4.57 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	14.2	15.8
Water content, %	32.1	25.7
Sample height, mm	25.4	22.9

PLATE

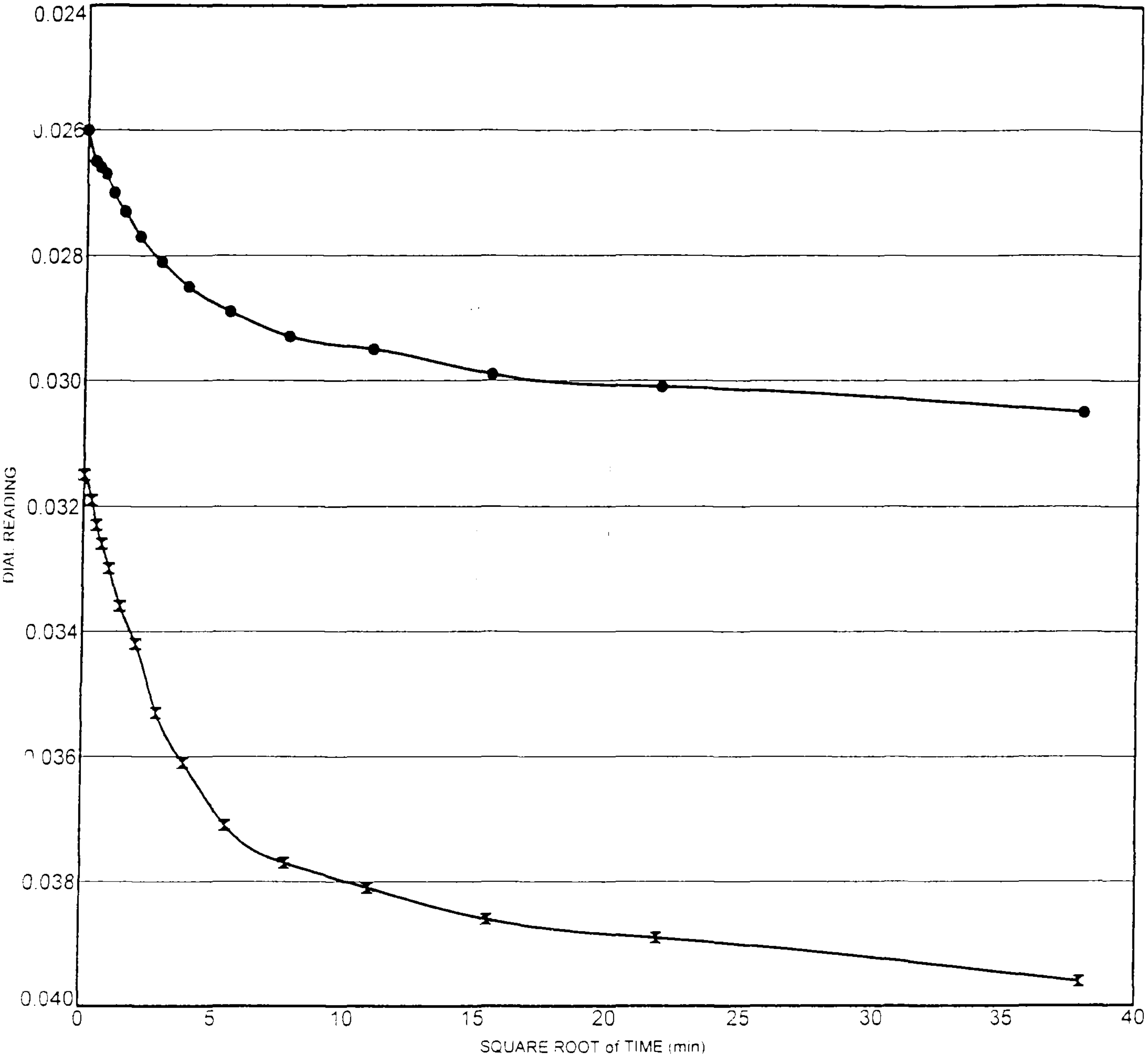
KLEINFELDER

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

K-839

PROJECT NO 35-8163-05



Sample	RB-398		
Depth	4.6 m		
Pressure (MPa)	● 0.02		⧗ 0.05
Cv (m^2/day)			

KLEINFELDER

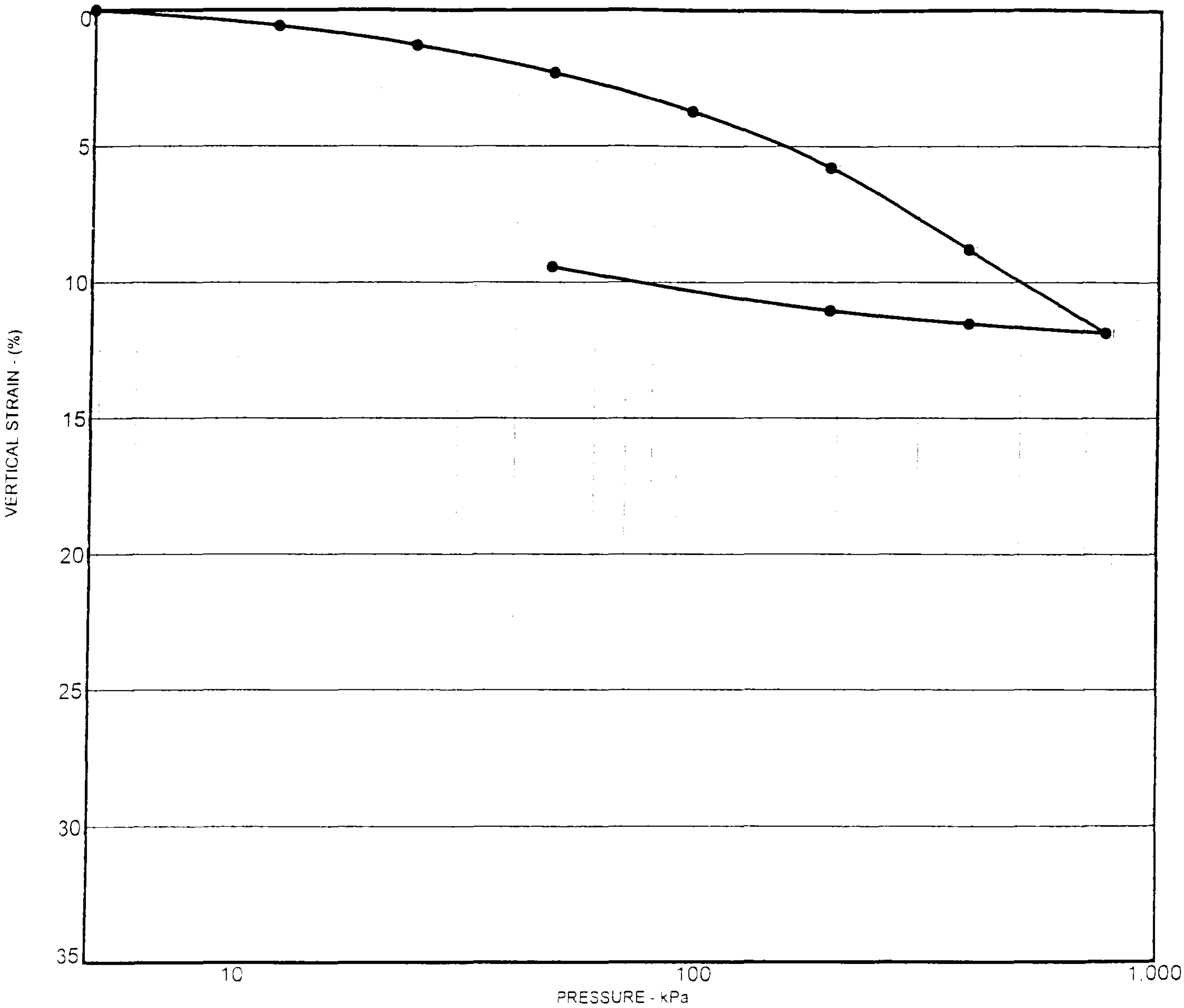
PROJECT NO. 35-8163-05

I-215 to I-15/US 89 Interchange

TIME RATE CONSOLIDATION

PLATE

K-840



Sample	RB-399
Depth	4.57 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	15.5	17.1
Water content, %	25.4	22.5
Sample height, mm	25.4	23.1

PLATE

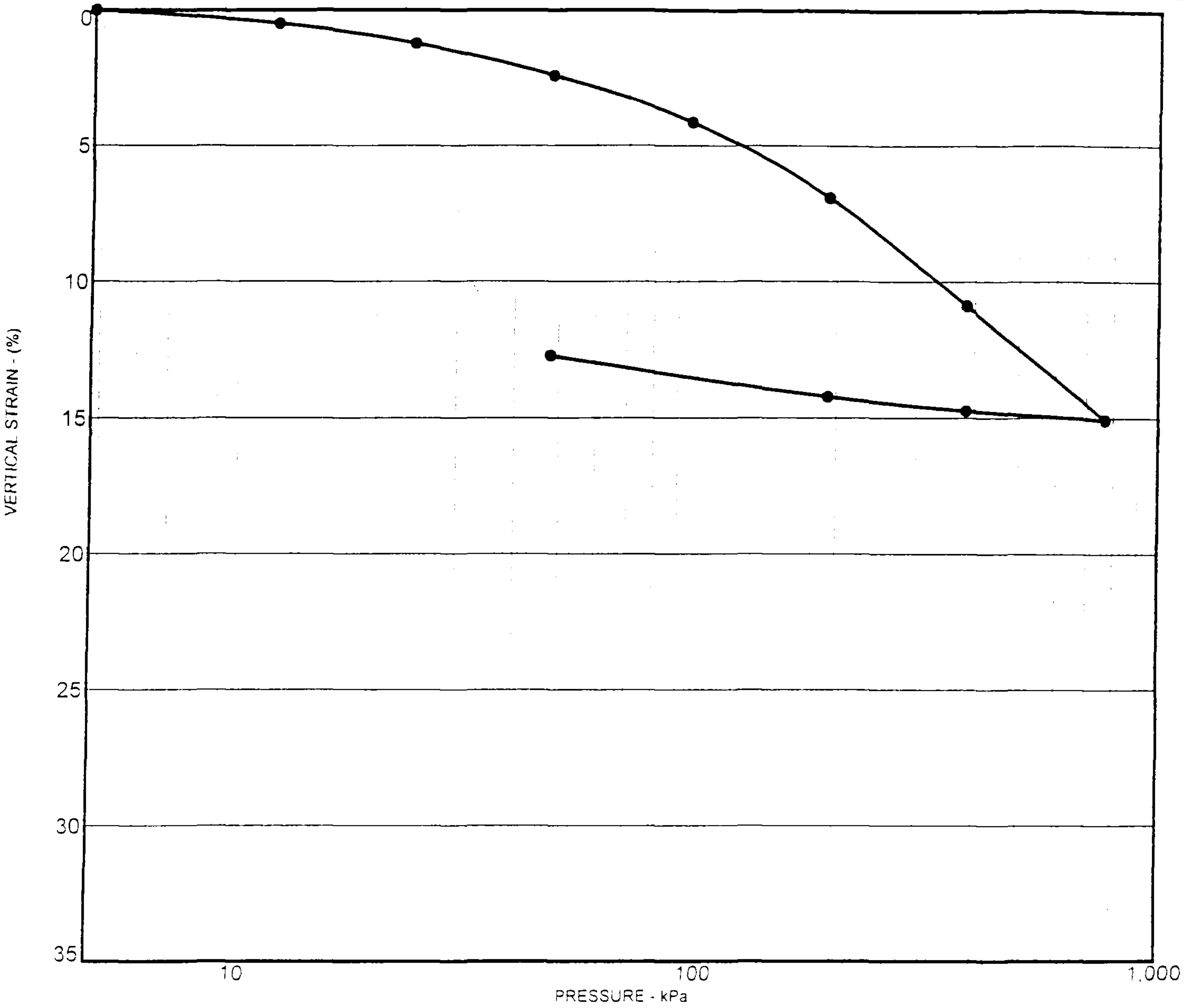
KLEINFELDER

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

K-843

PROJECT NO 35-8163-05



Sample	RB-400
Depth	1.52 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	13.1	15.1
Water content, %	38.4	30.2
Sample height, mm	25.4	22.1

PLATE

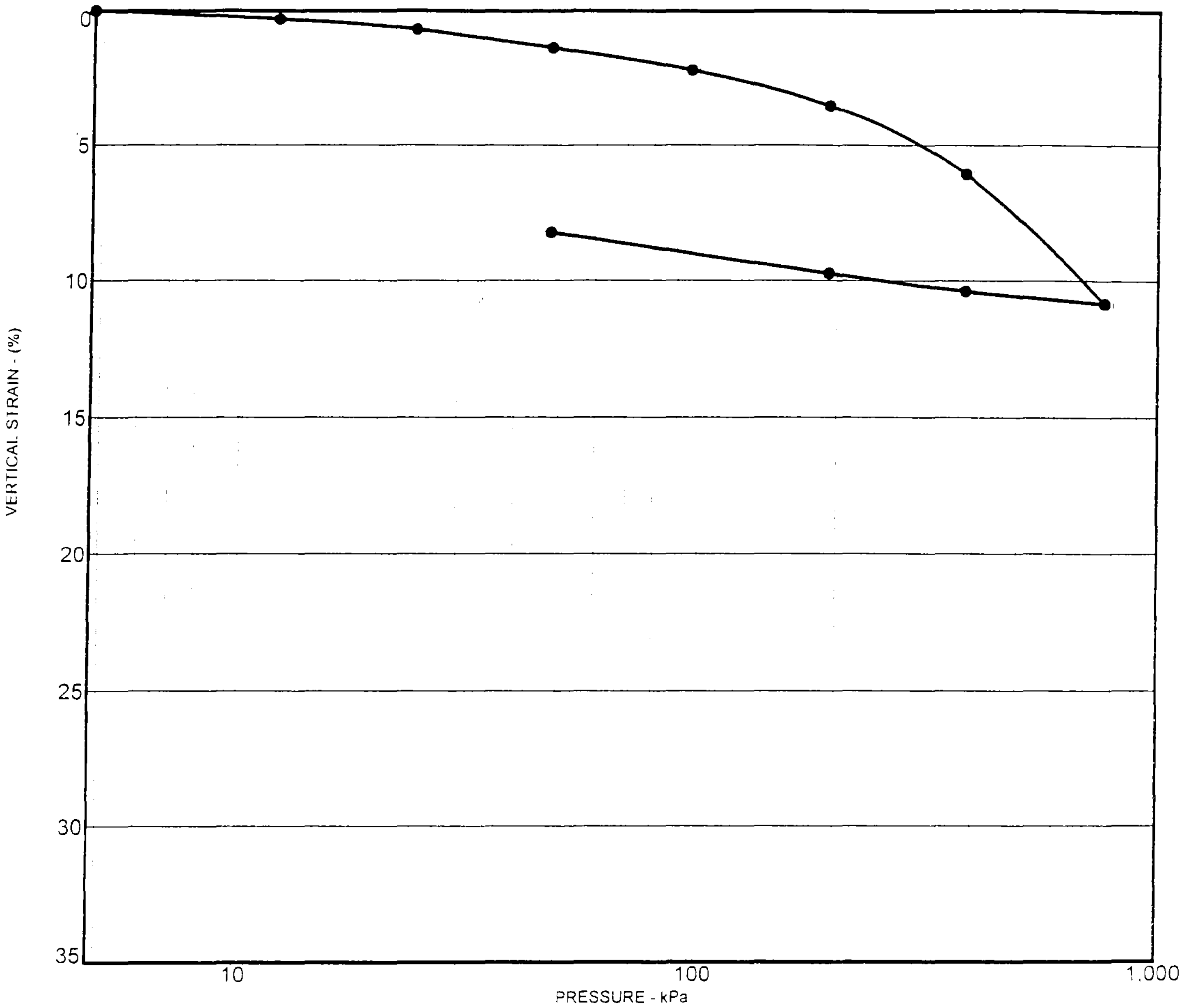
KLEINFELDER

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

K-845

PROJECT NO 35-8163-05



Sample	RB-406
Depth	4.57 m
Classification	CL

	Initial	Final
Dry density, kN/m^3	13.4	14.7
Water content, %	35.2	31.9
Sample height, mm	25.4	23.4

PLATE

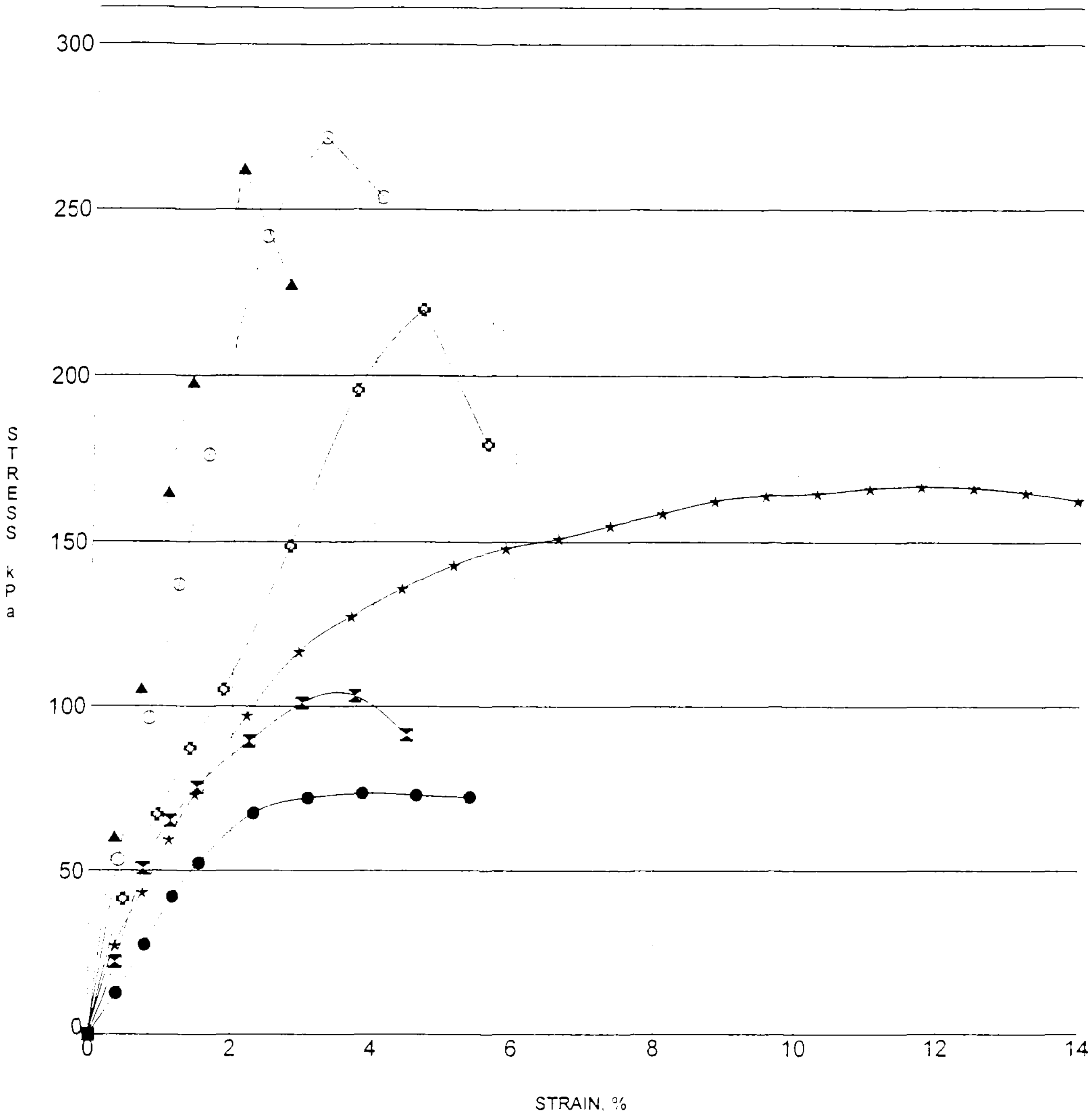
KLEINFELDER

I-215 to I-15/US 89 Interchange

CONSOLIDATION TEST RESULTS

K-859

PROJECT NO. 35-8163-05



Specimen Identification			USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	SB-12-263	5.2	Lean CLAY (CL)	74		
⧗	SB-12-263	18.3	Lean CLAY (CL)	103		
▲	SB-12-263	41.1	SILT (ML)	262		
★	SB-12-265	4.6	Lean CLAY (CL)	167	15.7	27
○	SB-12-265	30.5	Lean CLAY (CL)	272	16.1	26
✧	SB-12-265	48.8	SILT (ML)	220	15.1	27

KLEINFELDER

Legacy Parkway - Preferred Alternative

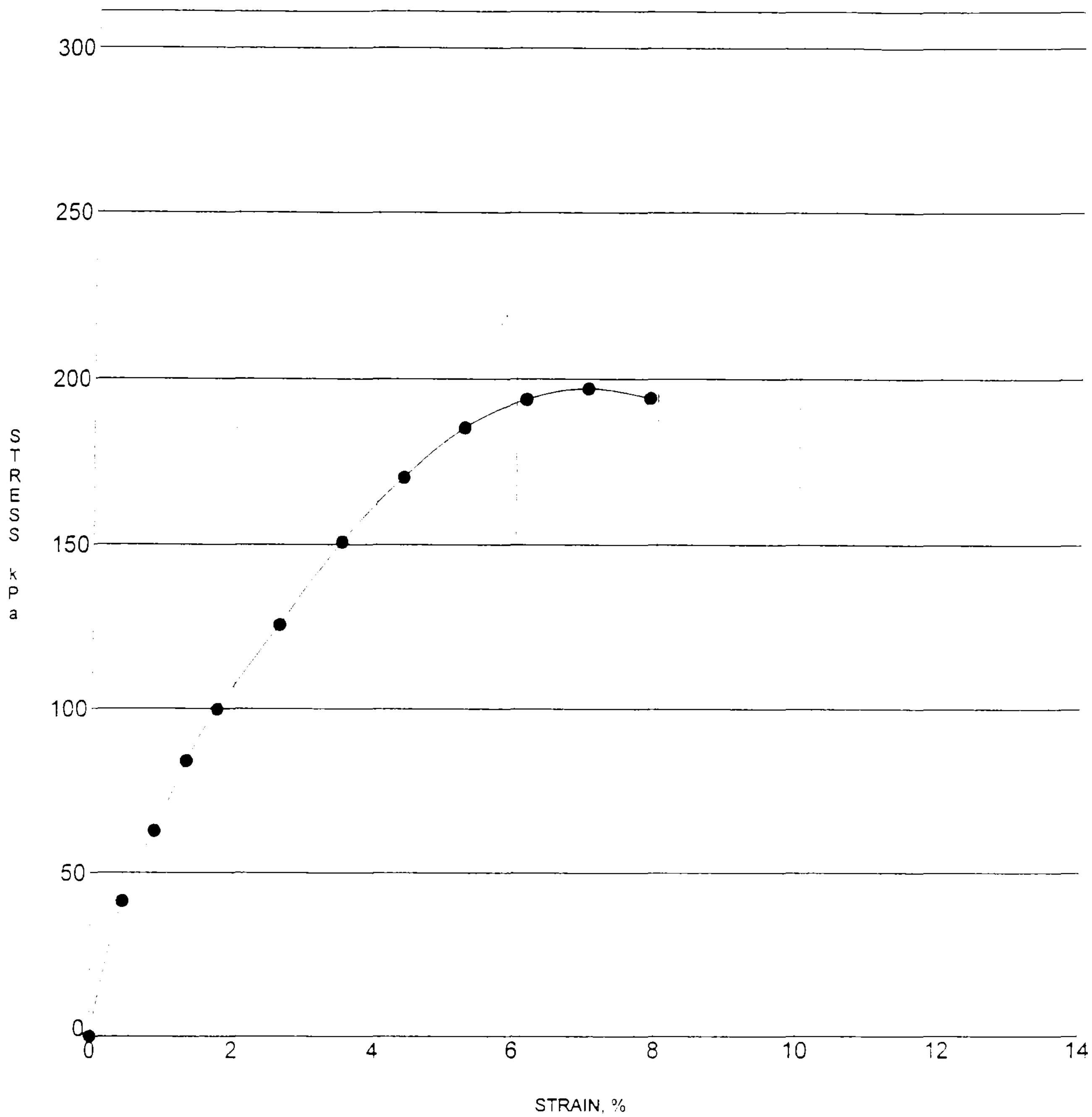
I-215 to I-15/US 89 Interchange

PLATE

UNCONFINED COMPRESSION TEST

K-914

PROJECT NO. 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	SB-12-265	73.2	Lean CLAY (CL)	197	16.4	26

KLEINFELDER

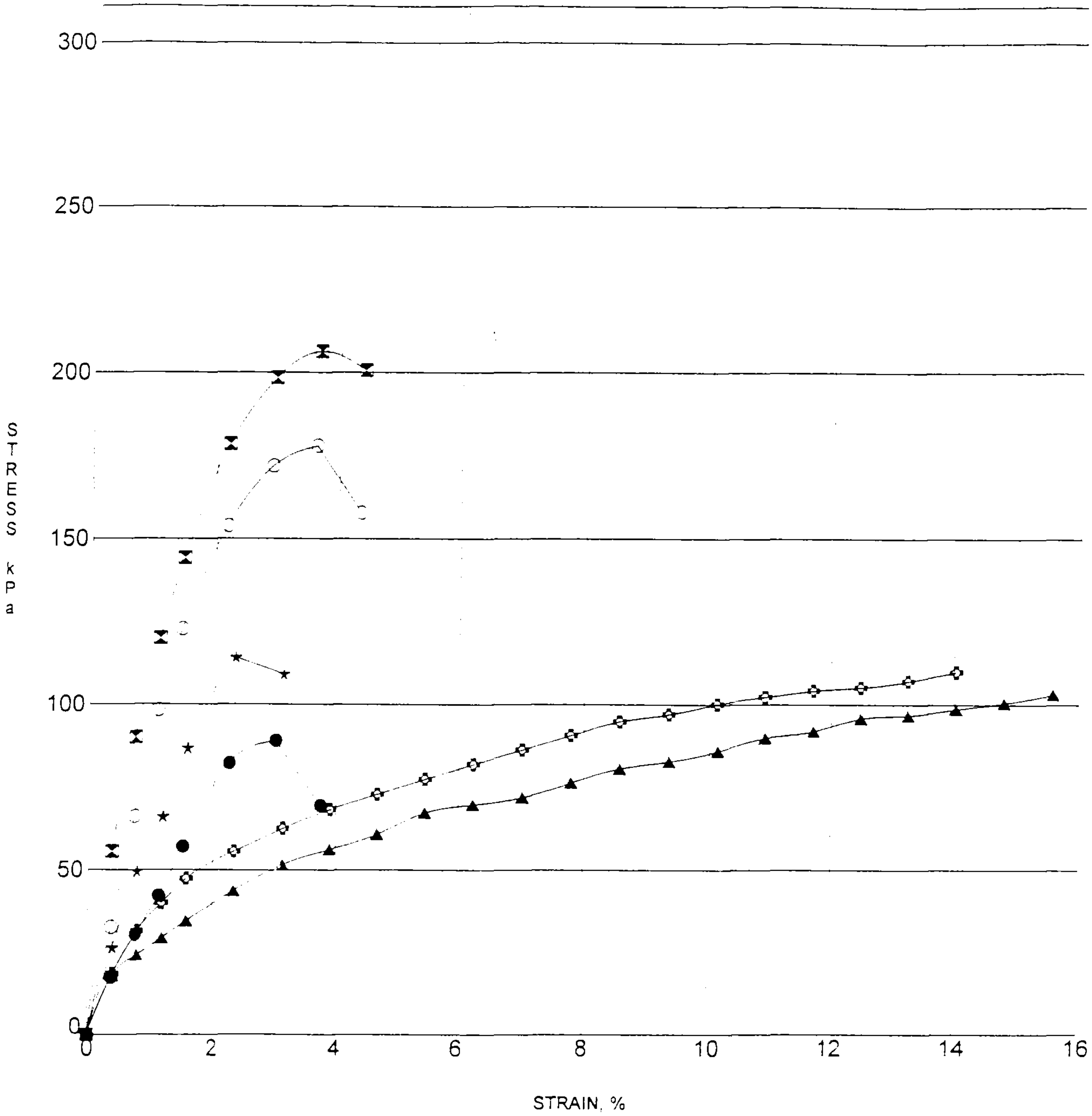
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE

UNCONFINED COMPRESSION TEST

K-915

PROJECT NO. 35-8163-05



Specimen Identification			USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	SB-31-353	11.9	Silty SAND (SM)	89	17.2	21
⧗	SB-31-353	30.5	Lean CLAY (CL)	206	12.8	38
▲	SB-31-354	4.6	Lean CLAY (CL)	106	14.0	35
★	SB-31-354	13.4	Lean CLAY with sand (CL)	103	17.1	22
○	SB-31-355	18.1	Lean CLAY (CL)	178	14.7	31
⊕	SB-31-355	42.5	Lean CLAY (CL)	110	15.9	26

KLEINFELDER

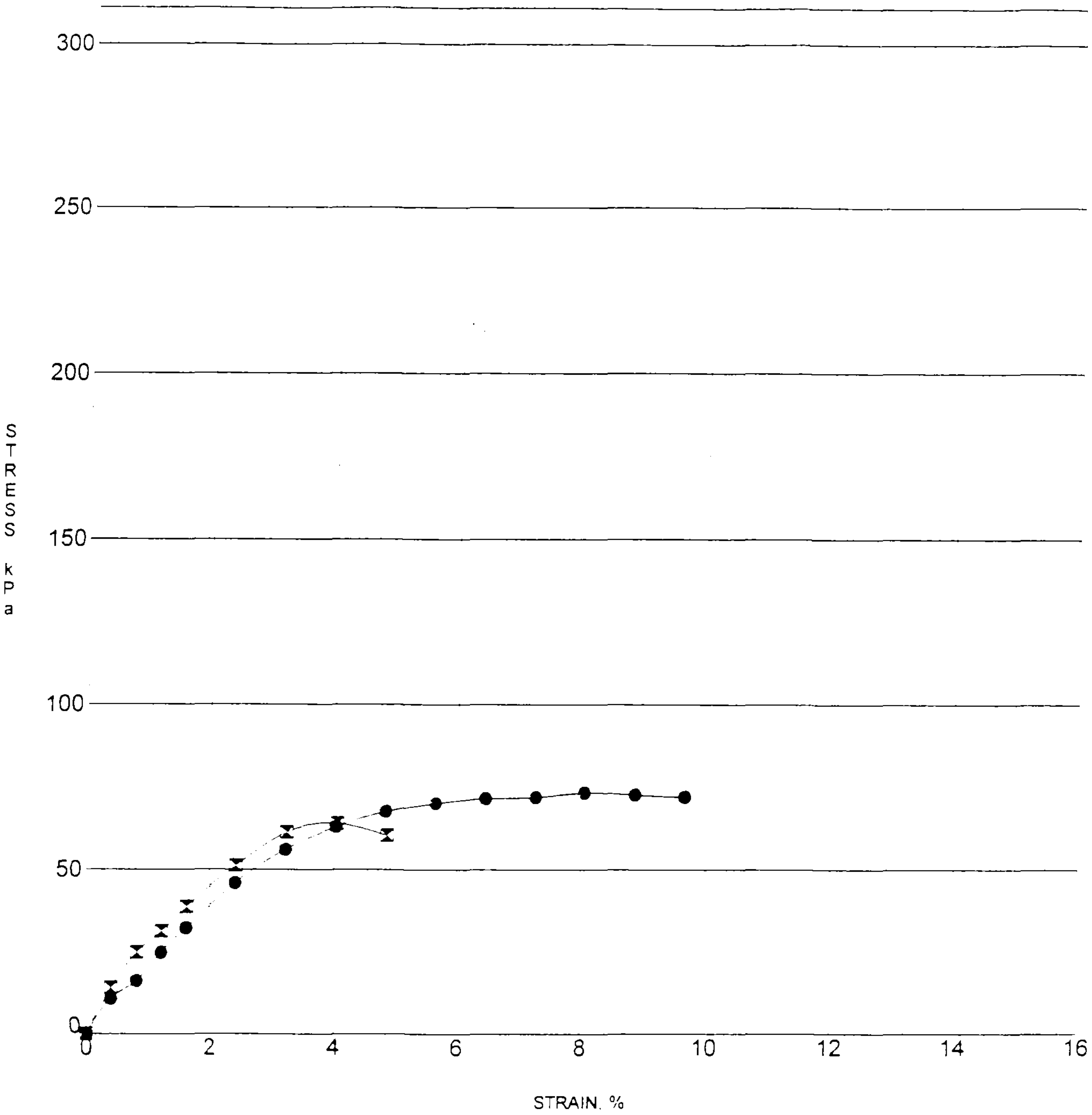
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE

UNCONFINED COMPRESSION TEST

K-934

PROJECT NO. 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	SB-31-356	6.1	Lean CLAY (CL)	73	13.7	37
⧗	SB-31-356	18.3	Fat CLAY (CH)	64	14.6	30

KLEINFELDER

Legacy Parkway - Preferred Alternative

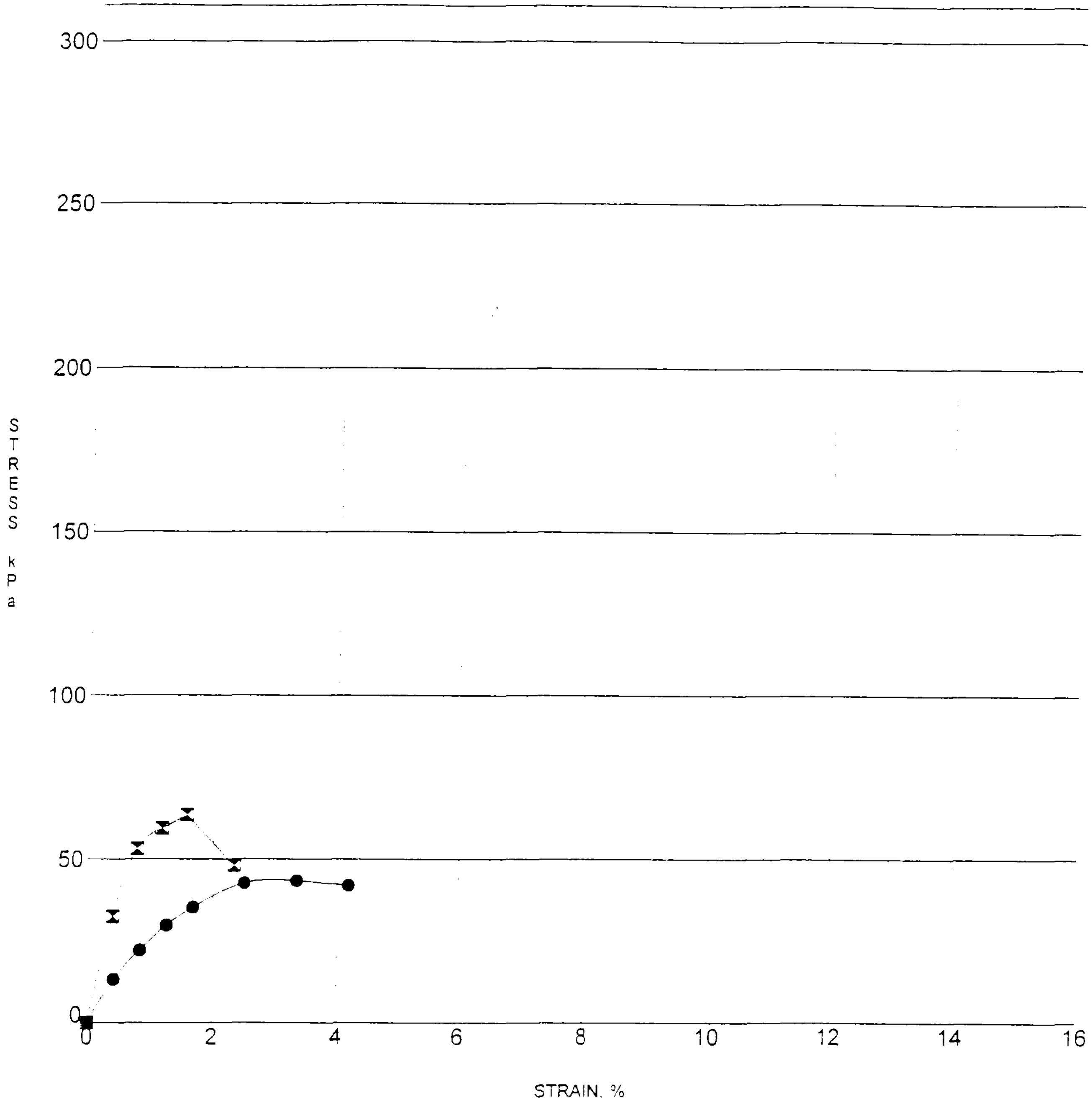
I-215 to I-15/US 89 Interchange

PLATE

UNCONFINED COMPRESSION TEST

K-935

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

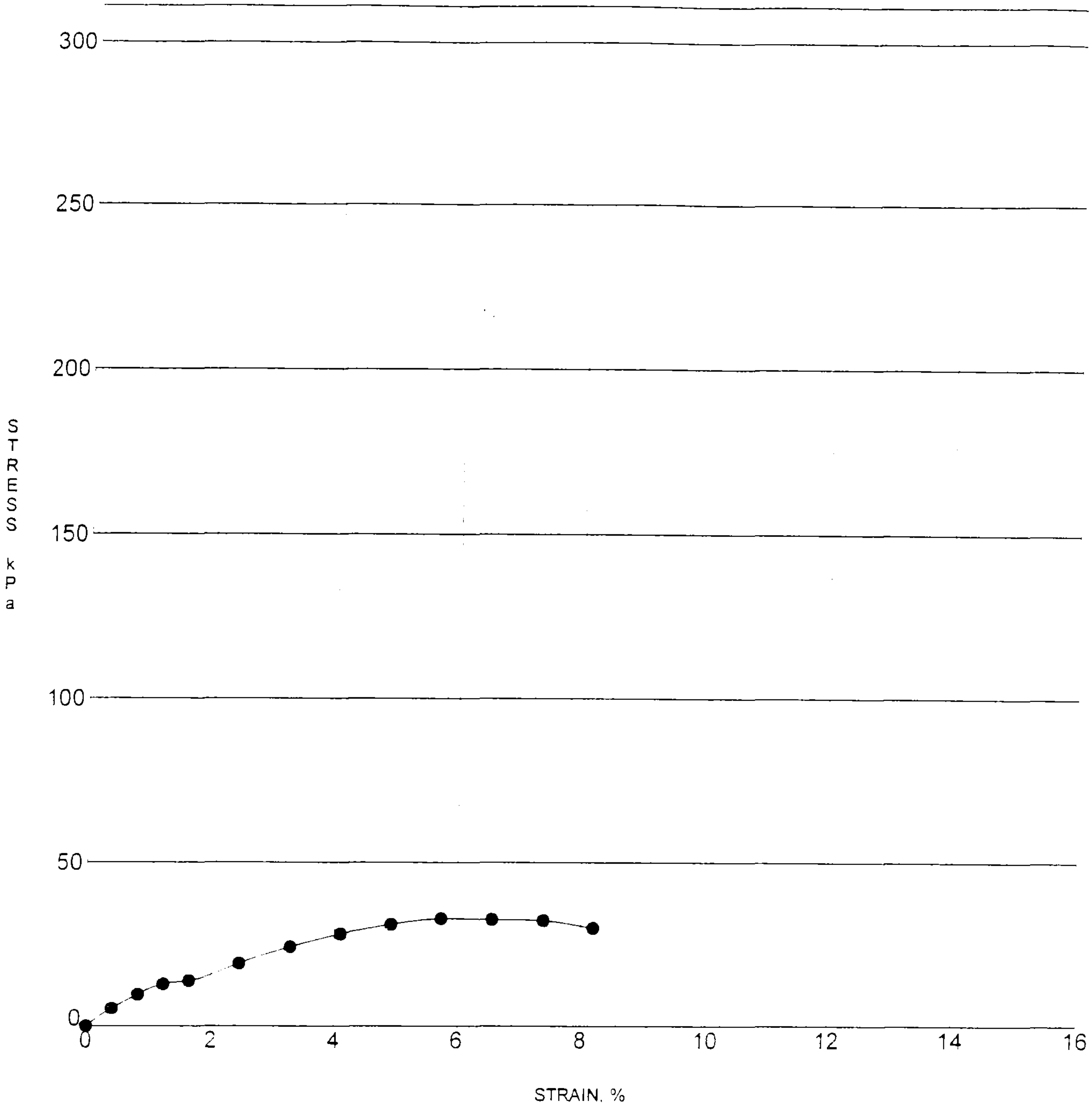
Legacy Parkway - Preferred Alternative
I-215 to I-15/US 89 Interchange

PLATE

UNCONFINED COMPRESSION TEST

K-967

PROJECT NO. 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	RB-395	4.6	Lean CLAY (CL)	33	16.7	22

KLEINFELDER

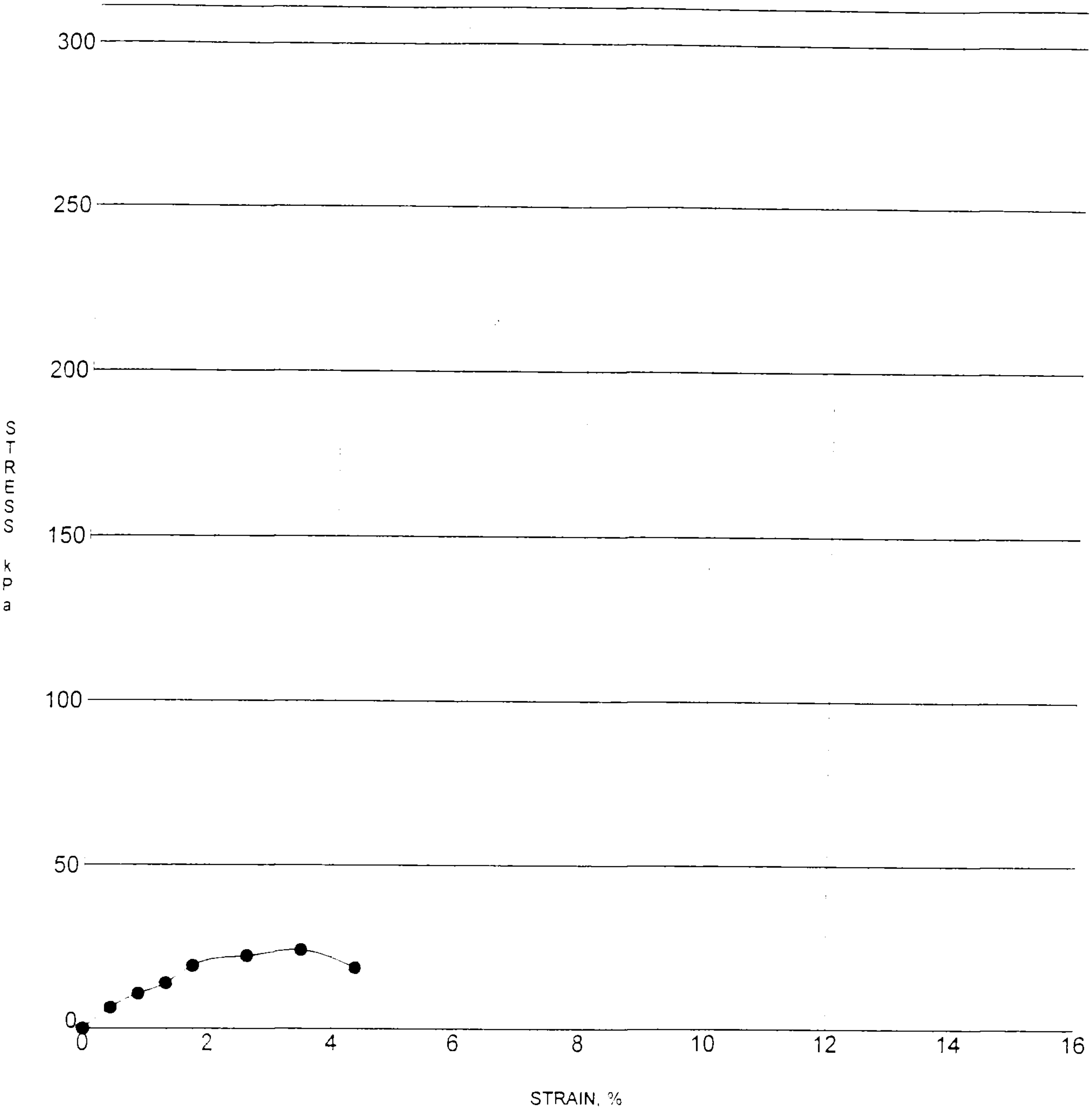
I-215 to I-15/US 89 Interchange

PLATE

UNCONFINED COMPRESSION TEST

K-989

PROJECT NO. 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	RB-397	7.6	Sandy SILT (ML)	24	16.7	28

KLEINFELDER

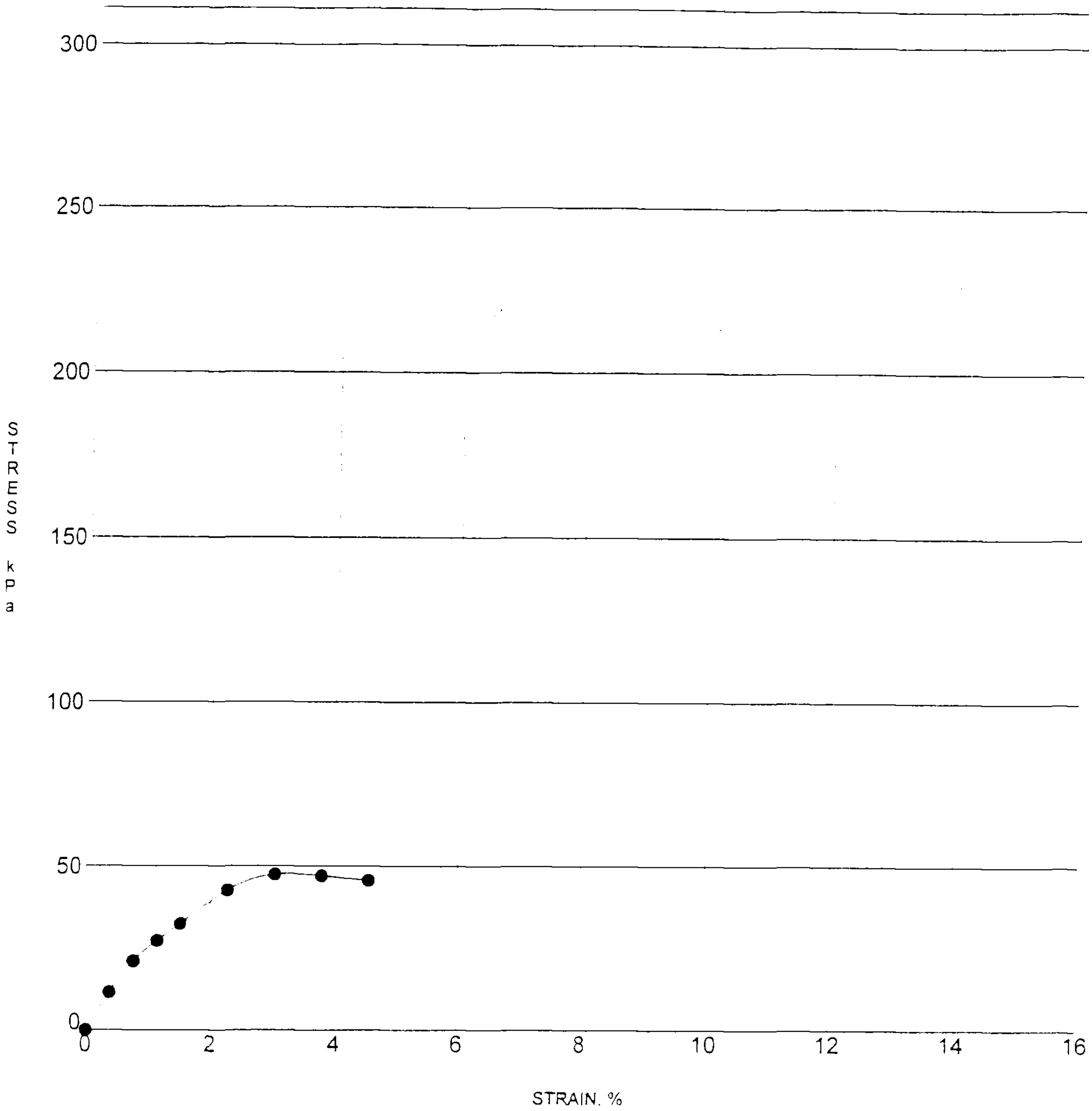
I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE

K-990

PROJECT NO. 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	RB-398	4.6	Lean CLAY (CL)	47	14.8	28

KLEINFELDER

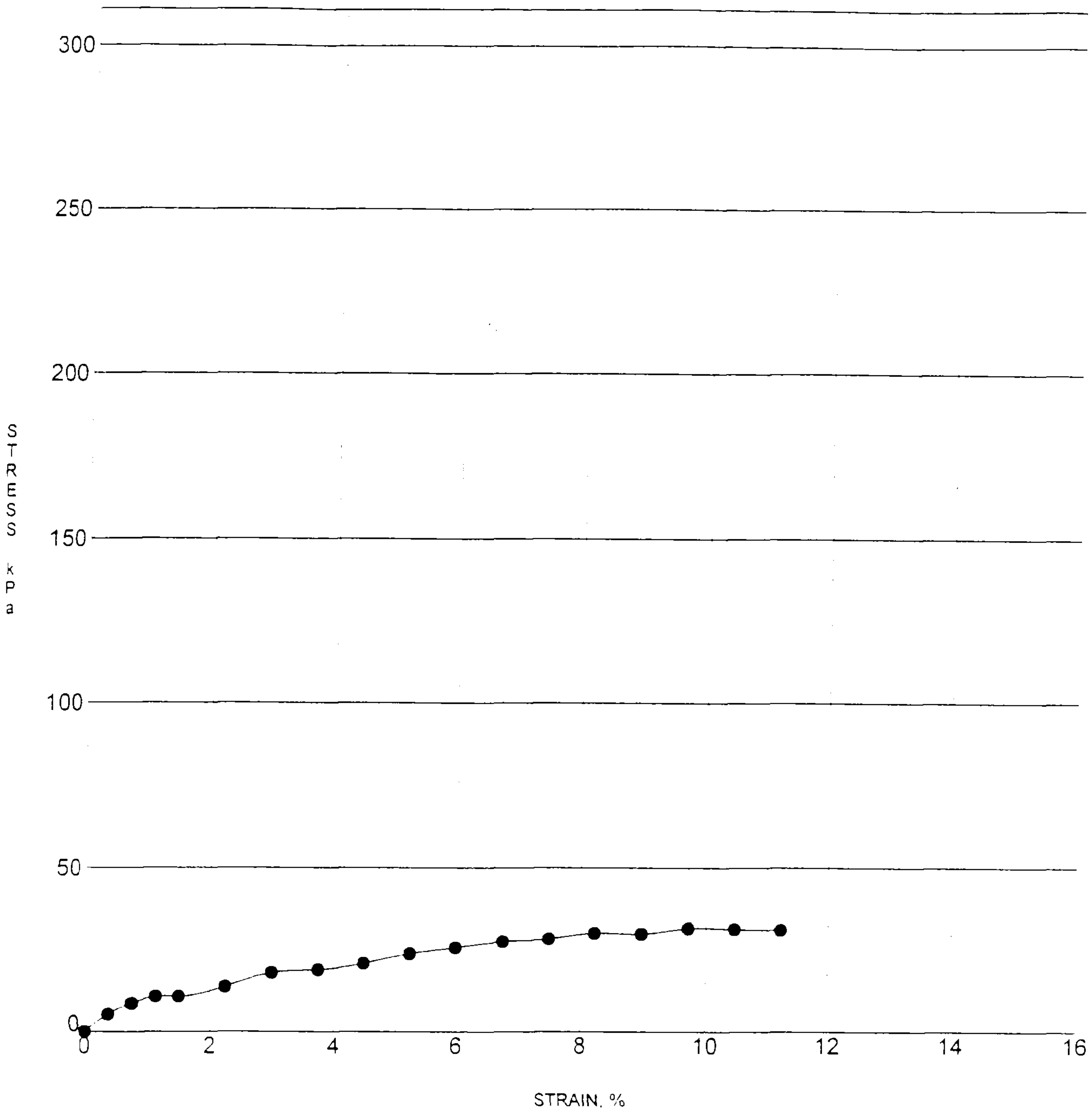
I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE

K-991

PROJECT NO. 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	RB-399	4.6	Lean CLAY (CL)	32	14.2	38

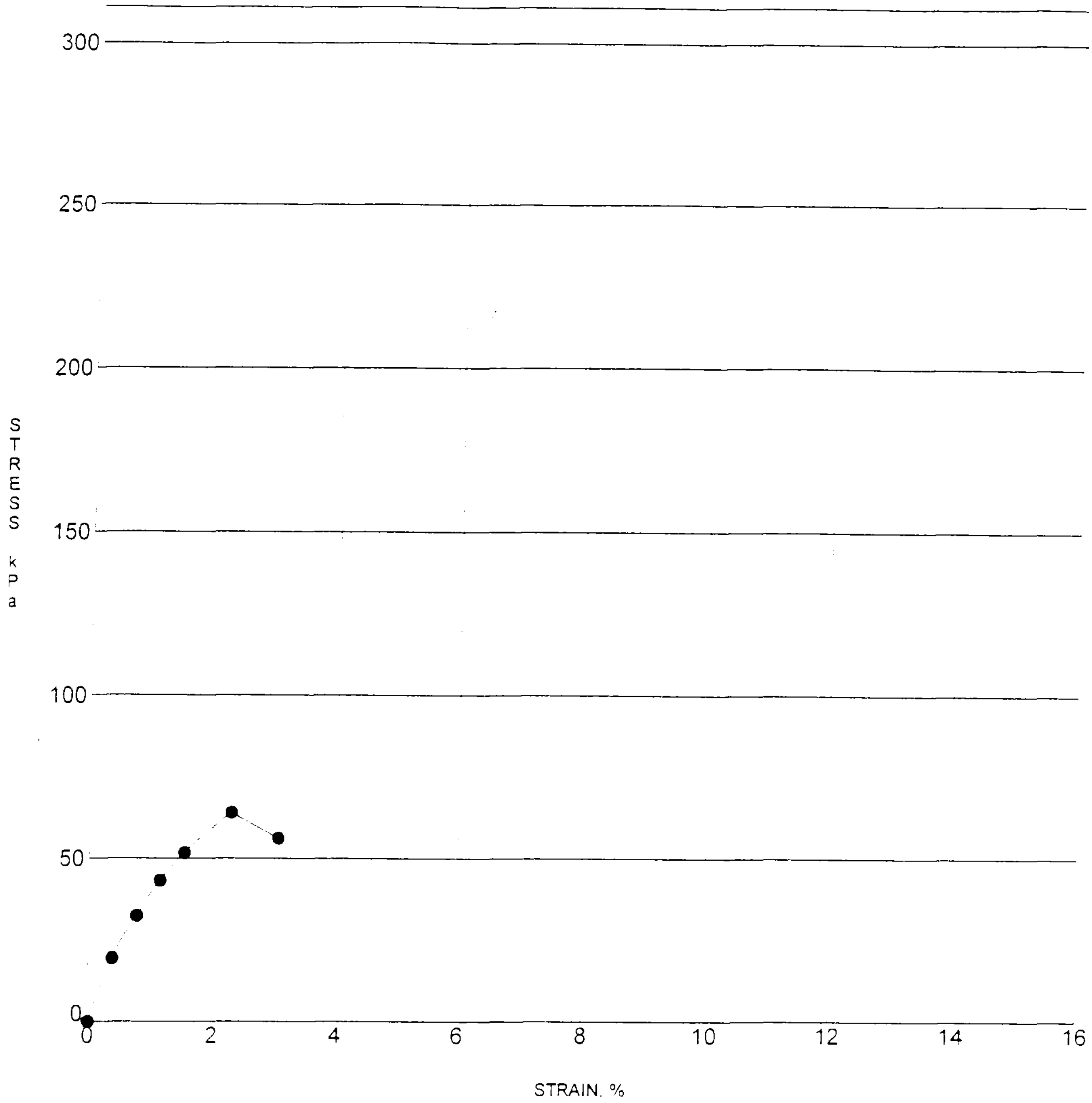
KLEINFELDER

I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE K-992

PROJECT NO. 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	RB-400	4.6	Lean CLAY (CL)	64	15.6	27

KLEINFELDER

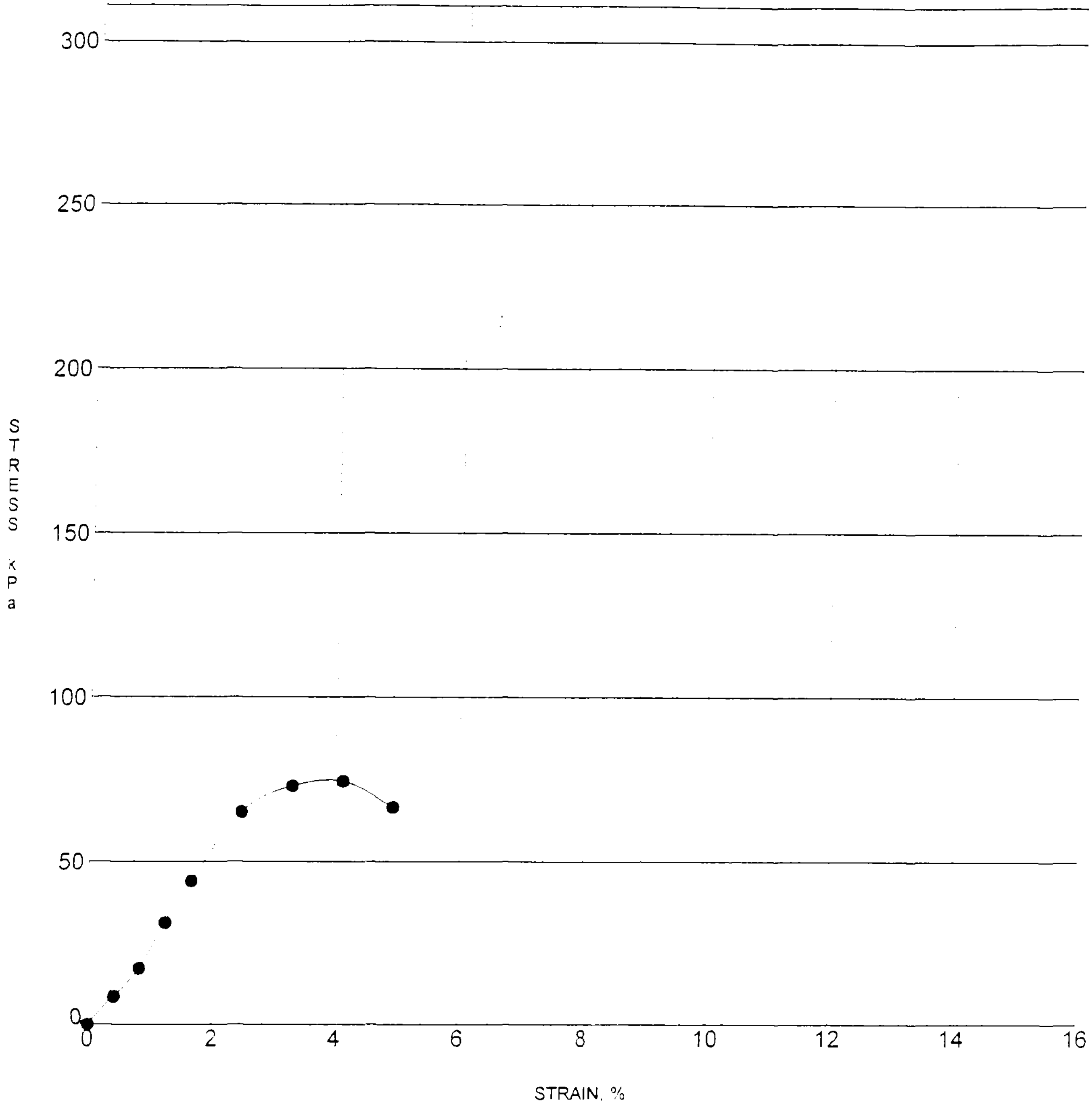
I-215 to I-15/US 89 Interchange

PLATE

UNCONFINED COMPRESSION TEST

K-993

PROJECT NO. 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	RB-401	4.6	SILT with sand (ML)	74	14.3	27

KLEINFELDER

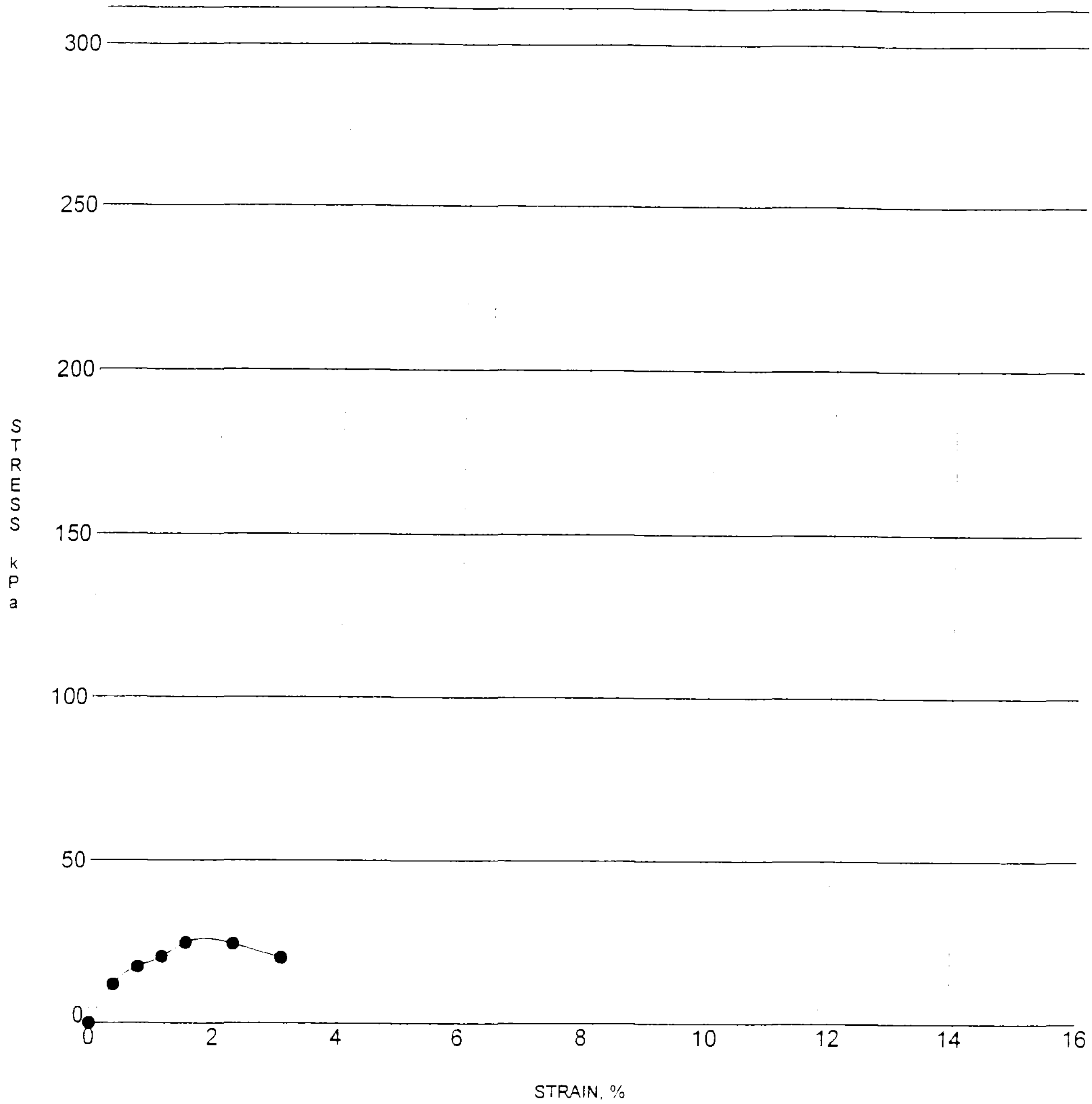
I-215 to I-15/US 89 Interchange

PLATE

UNCONFINED COMPRESSION TEST

K-994

PROJECT NO. 35-8163-05



Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
● RB-402	4.6	Lean CLAY (CL)	25	12.6	40

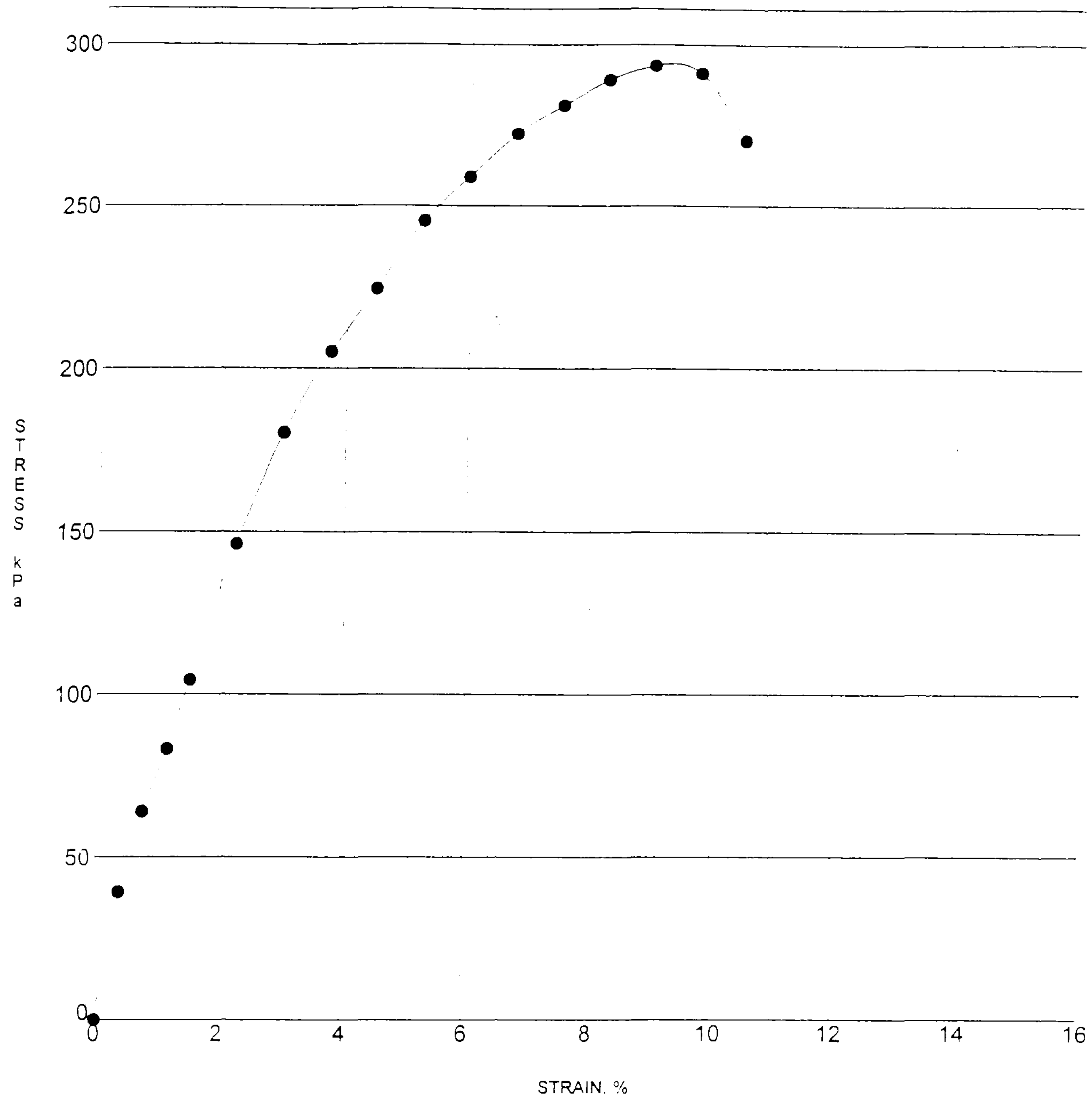
KLEINFELDER

I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

PLATE K-995

PROJECT NO. 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	RB-403	1.5	Lean CLAY (CL)	293	16.7	22

PLATE

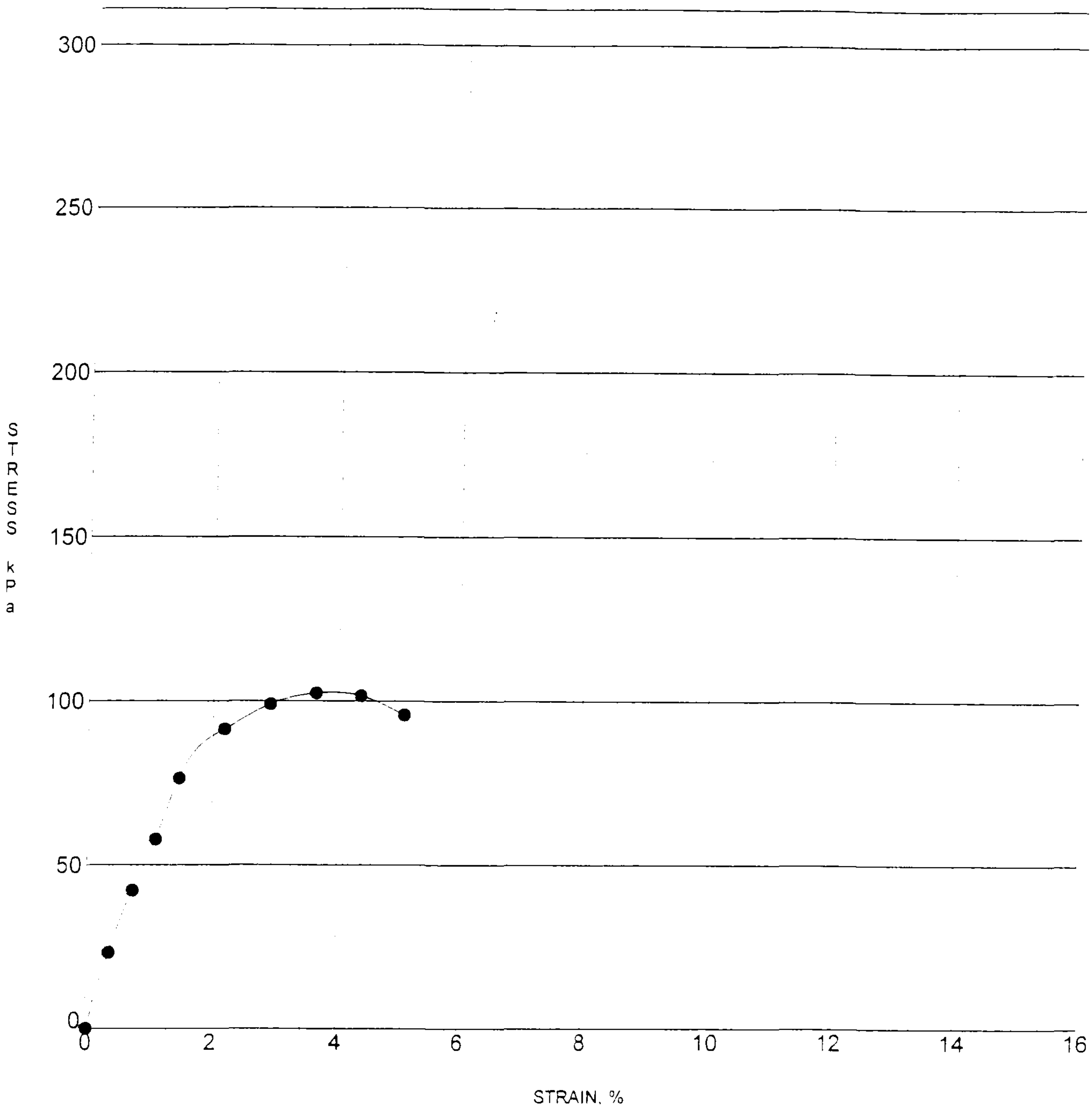
KLEINFELDER

I-215 to I-15/US 89 Interchange

UNCONFINED COMPRESSION TEST

K-996

PROJECT NO. 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	RB-404	7.6	Lean CLAY (CL)	102	11.9	47

KLEINFELDER

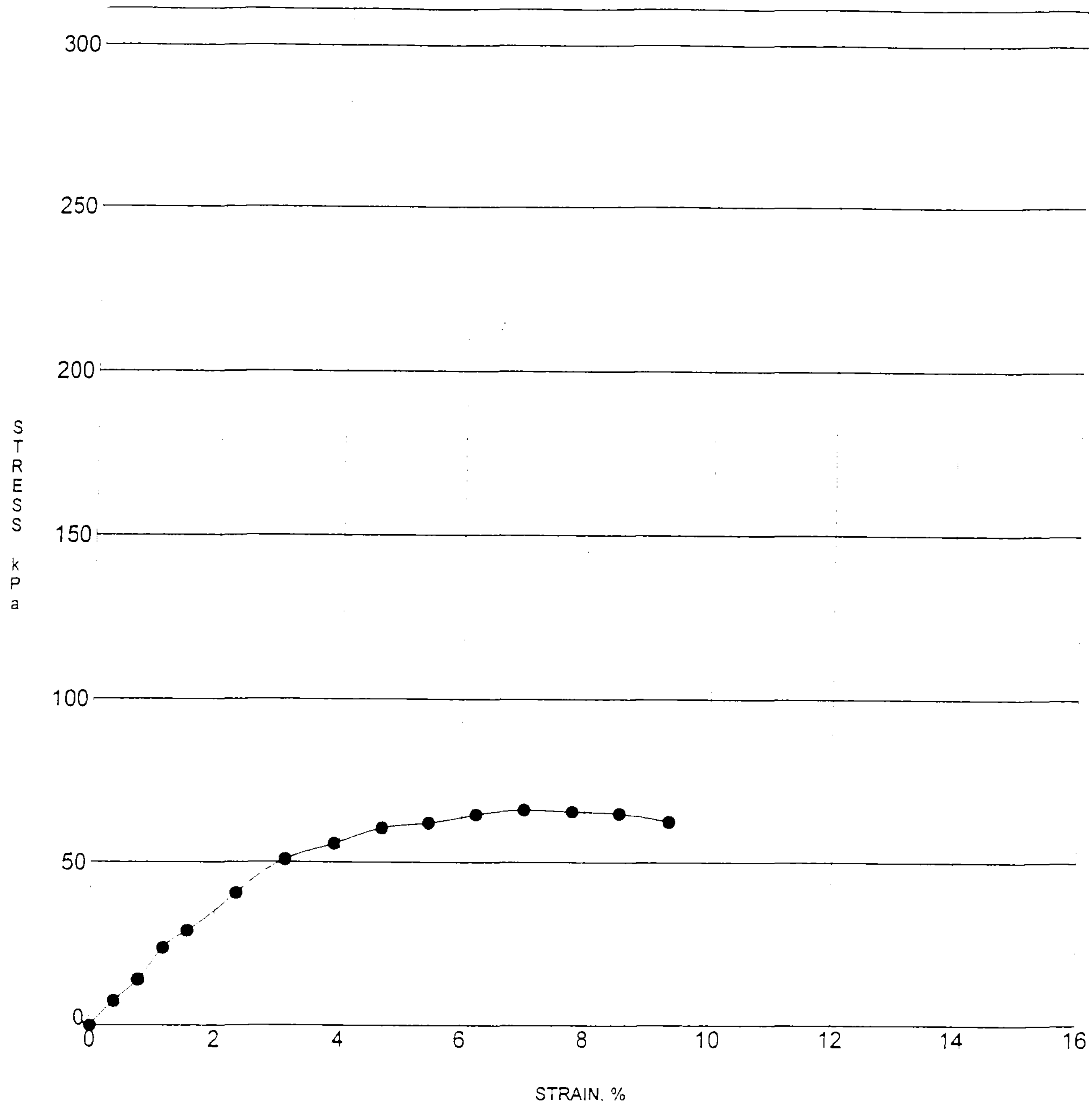
I-215 to I-15/US 89 Interchange

PLATE

UNCONFINED COMPRESSION TEST

K-997

PROJECT NO. 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	RB-405	7.6	Lean CLAY (CL)	66	11.9	47

KLEINFELDER

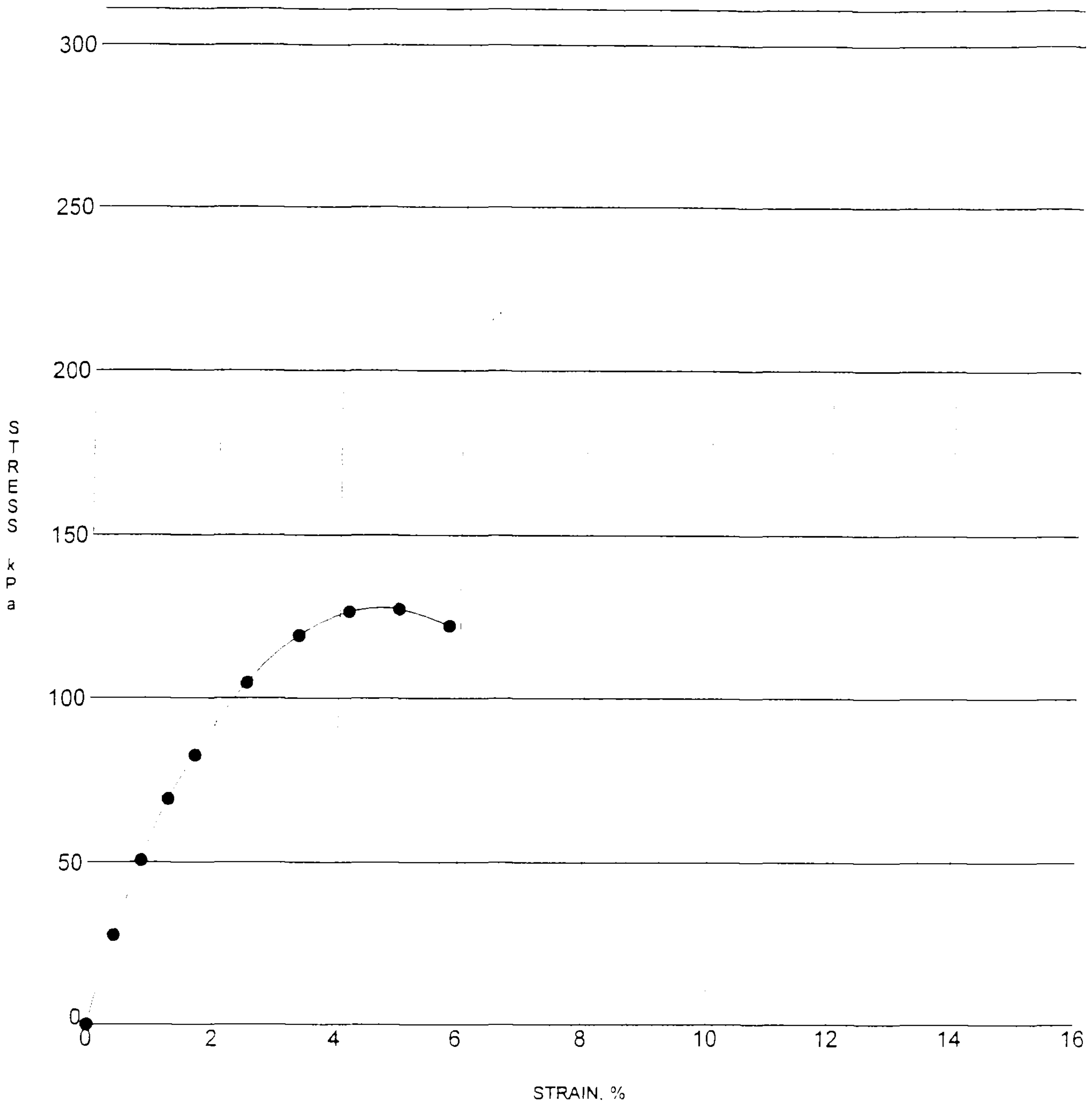
I-215 to I-15/US 89 Interchange

PLATE

UNCONFINED COMPRESSION TEST

K-998

PROJECT NO 35-8163-05



	Specimen Identification		USCS Classification	q_u (kPa)	DD (kN/m^3)	MC%
●	RB-406	4.6	Lean CLAY (CL)	127	14.5	31

KLEINFELDER

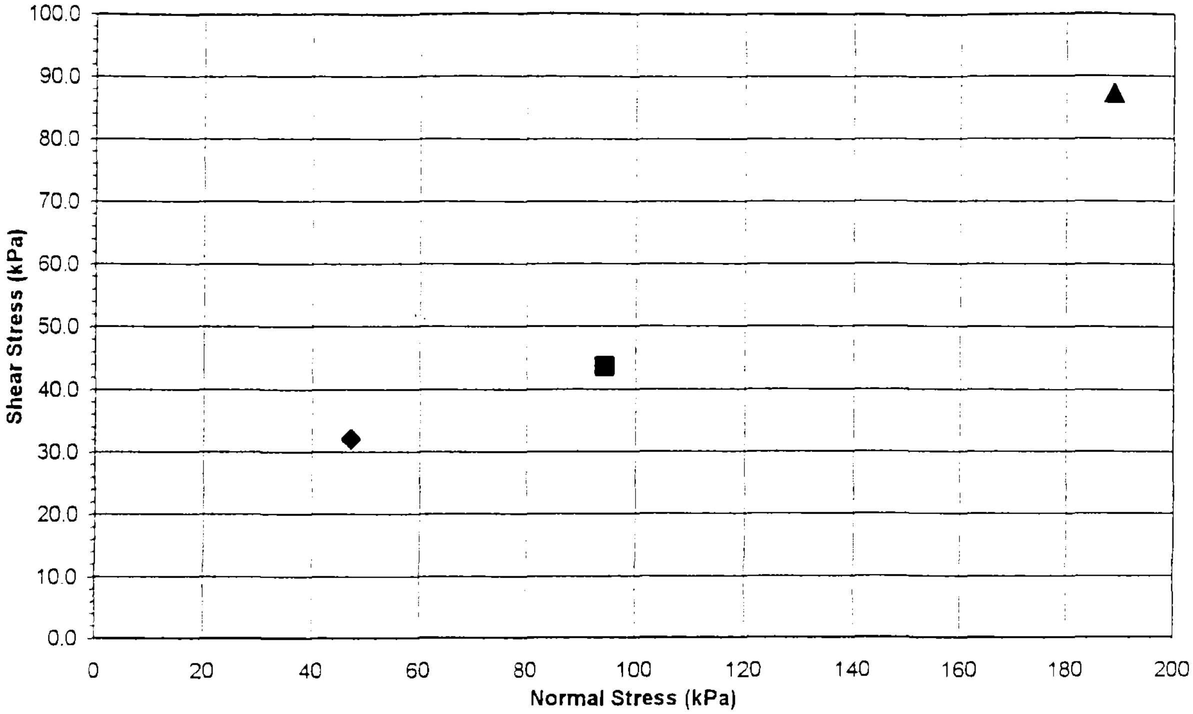
I-215 to I-15/US 89 Interchange

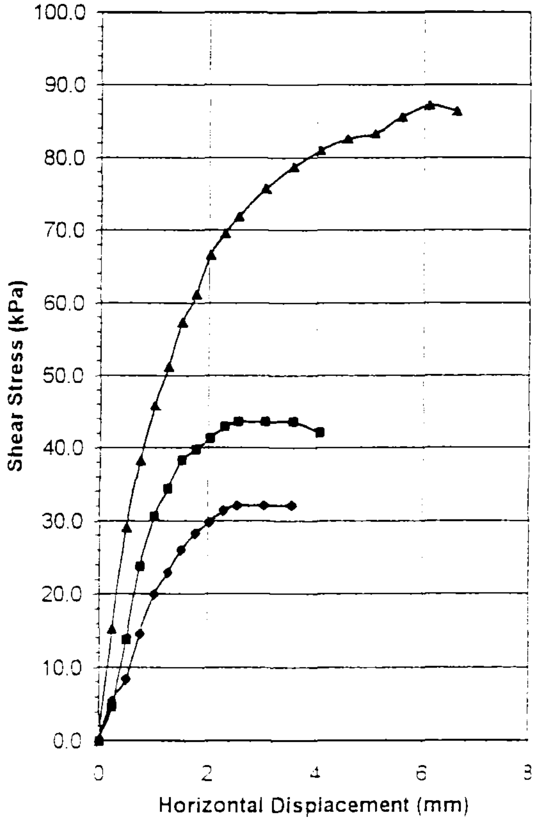
PLATE

UNCONFINED COMPRESSION TEST

K-999

PROJECT NO. 35-8163-05





Boring: SB-31-354	Depth: 4.6 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	15.1	15.0	15.3
Water Content, %	29.9	29.9	26.5
Normal Stress, kPa	47	94	189
Shear Stress, kPa	32	44	87
Strain Rate	1.25 mm/min		

KLEINFELDER

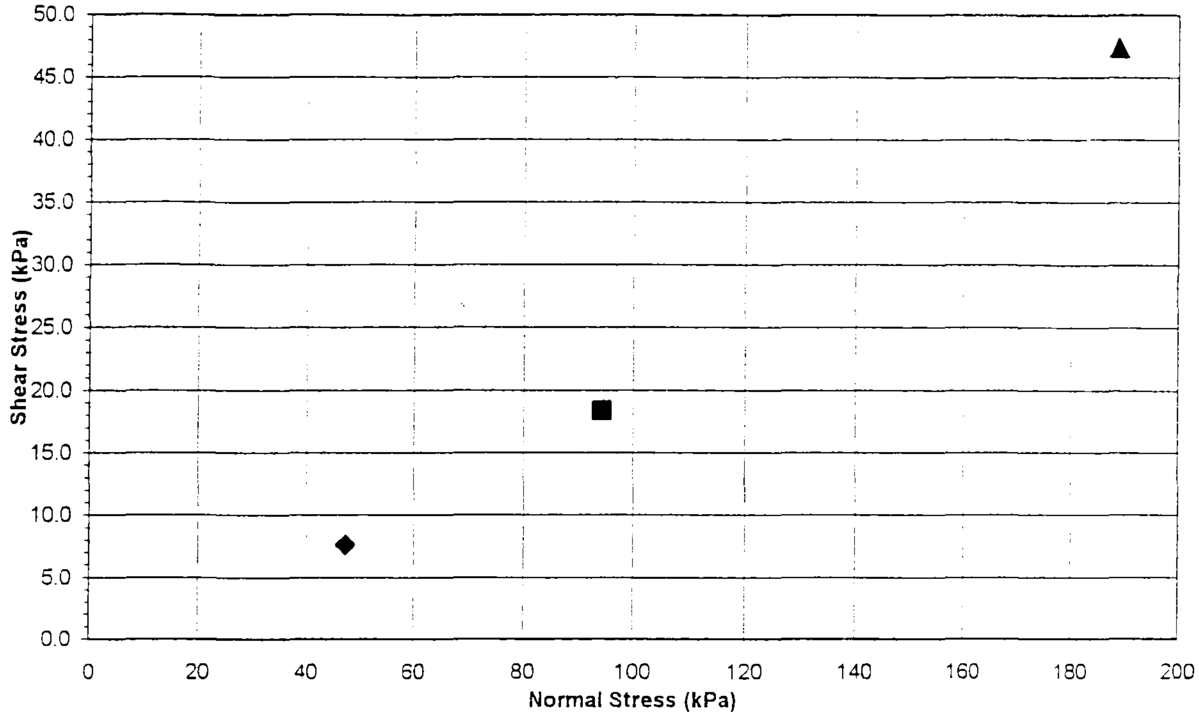
Project No. 35-8163-05

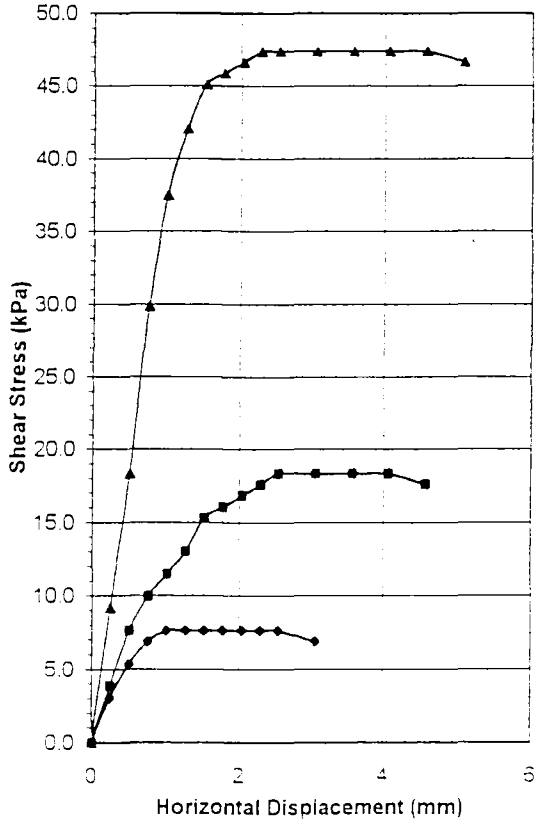
Legacy Highway - Peferred Alternative
I-215 to I-15/US 89 Interchange

DIRECT SHEAR TEST

PLATE

K-1018





Boring: RB-371	Depth: 3.1 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	13.7	13.2	12.8
Water Content, %	35.0	35.7	37.3
Normal Stress, kPa	47	94	189
Shear Stress, kPa	8	18	47
Strain Rate	1.25 mm/min		

KLEINFELDER

Legacy Highway - Peferred Alternative
I-215 to I-15/US 89 Interchange

DIRECT SHEAR TEST

PLATE
K-1023

Project No. 35-8163-05

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder-SLC
Date Sampled: January 31, 2000
Project: Legacy Parkway/35-8163-05.005

Contact: Chris Garris
Date Received: March 29, 2000

Lab Sample ID:
L40594-07A

Field Sample ID:
SB-12-263 @ 5'

63 West 3600 South
Salt Lake City, Utah
84115

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Amount Detected	
pH	pH units	3/30/00	9045C	0	**8.50**	
Resistivity	ohm-cm	3/30/00	2510B	0	**4,900**	*
Sulfate	mg/kg	3/30/00	375.4	5.0	**8.0**	*

(801) 263-8686
l Free (888) 263-8686
Fax (801) 263-8687

* Analysis is performed on a 1:1 DI water extract for soils.

Released by: ______________________
Laboratory Supervisor

Report Date: April 5, 2000

PLATE K-1049

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

INORGANIC ANALYSIS REPORT

Client: Kleinfelder-SLC
Date Sampled: January 22, 2000
Project: Legacy Highway

Contact: Curt Christensen
Date Received: March 2, 2000

Lab Sample ID:
L40295-10A

Field Sample ID:
SB-12-265 @ 5'

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Amount Detected	
pH	pH units	3/3/00	9045C	0	**9.00**	
Resistivity	ohm-cm	3/3/00	2510B	0	**2,600**	*
Sulfate	mg/kg	3/6/00	375.4	5.0	**25**	*

* Analysis is performed on a 1:1 DI water extract for soils.

Released by:

Laboratory Supervisor

Report Date: March 9, 2000

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

INORGANIC ANALYSIS REPORT

Client: Kleinfelder-SLC
Date Sampled: April 3, 2000
Project: Legacy Parkway/35-8163-05.005

Contact: Chris Garris
Date Received: April 14, 2000

Lab Sample ID:
L40795-01A

Field Sample ID:
SB-31-353 @ 4-6'

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Amount Detected	
pH	pH units	4/17/00	9045C	0	**9.40**	
Resistivity	ohm-cm	4/17/00	2510B	0	**1,400**	*
Sulfate	mg/kg	4/18/00	375.4	250	< 250	*+

+ The reporting limits were raised due to sample matrix interference.

* Analysis is performed on a 1:1 DI water extract for soils.

Released by:

Laboratory Supervisor

Report Date: April 21, 2000 Page 1 of 1

PLATE K-1076

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

63 West 3600 South
alt Lake City, Utah
84115

(801) 263-8686
Free (888) 263-8686
Fax (801) 263-8687

Client: Kleinfelder-SLC
Date Sampled: April 21, 2000
Project: Legacy Parkway / 35-8163-05.005

Contact: Chris Garris
Date Received: May 9, 2000

Lab Sample ID:
L41117-01A

Field Sample ID:
SB-31-354 0-2' #1A

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Amount Detected	
pH	pH units	5/10/00	9045C	0	**8.70**	
Resistivity	ohm-cm	5/11/00	2510B	0	**260**	*
Sulfate	mg/kg	5/11/00	375.4	5.0	**320**	*

* Analysis is performed on a 1:1 DI water extract for soils.

Released by: ______________________
Laboratory Supervisor

Report Date: May 15, 2000

PLATE K-1077

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: March 30, 2000
Project: Legacy Parkway/35-8163-05.005

Contact: Chris Garris
Date Received: April 14, 2000

Lab Sample ID:
L40795-02A

Field Sample ID:
SB-31-356 @ 10-12'

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Amount Detected	
pH	pH units	4/17/00	9045C	0	**9.00**	
Resistivity	ohm-cm	4/17/00	2510B	0	**810**	*
Sulfate	mg/kg	4/18/00	375.4	5.0	**90**	*

* Analysis is performed on a 1:1 DI water extract for soils.

Released by:
Laboratory Supervisor

Report Date: April 21, 2000

PLATE K-1078

QC SUMMARY REPORT

CLIENT: Kleinfelder-SLC
Work Order: L40295
Project: Legacy Highway

Sample ID: L40295-01ADUP
Batch ID: R2352
Analysis Date: March 3, 2000

Resistivity in solids

Analyte	Result	Amount Spiked	Original Amount	%REC	Low Limit	Upper Limit	%RPD	RPD Limit	Qualifiers
Units: ohm-cm									
Resistivity	2331	0	2342	0	0	0	0.471	5	*

* Analysis is performed on a 1:1 DI water extract for soils.

Released by:
Laboratory Supervisor

Report Date: March 9, 2000

PLATE K-1079

G

KLEINFELDER
An employee owned company

MEMORANDUM

To: Mr. K.N. Gunalan, P.E.
Parsons, Brinckerhoff

From: Chris T. Garris, P.E.
Corbett M. Hansen, E.I.T. CMH
Curt Christensen, P.E. CC

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.

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.

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.

REFERENCES

AASHTO, 1996, Standard Specifications for Highway Bridges, Sixteenth Edition, American Association of State Highway and Transportation Officials, Inc., Washington, D.C.

Frankel, A., Mueller, C., Perkins, D., Leyendecker, E.V., Dickman, N., Hanson, S., and Hopper, M., 1996, National Seismic Hazard Maps: Documentation June 1996: U.S. Geologic Survey Open File Report 96-532, p. 110.

Hecker, S., 1993 Quaternary Tectonics with Emphasis on Earthquake Hazard Characterization; Utah Geologic Survey Bulletin, 127, 157 p., map scale: 1:500,000.

Seed, H. Bolton, and Idriss, I.M., 1982, Ground Motions and Soil Liquefaction During Earthquakes, Earthquake Engineering Research Institute, Berkeley, California.

Tokimatsu, K., and Seed, H.B., 1987, "Evaluation of Settlements in Sands Due to Earthquake Shaking," Journal of Geotechnical Engineering, ASCE, vol. 113, No. 8, pp, 861-878.

U.S. Geological Survey Web Page, 2001, U.S. Geological Survey National Seismic Hazard Mapping Project, http://geohazards.cr.usgs.gov/eq/

Youd, T. L., and Idriss, I.M., 1997, Proceedings of the NCEER Workshop on the Evaluation of Liquefaction Resistance of Soils. Technical Report NCEER-97-0022, National Center for Earthquake Engineering Research (NCEER), State University of New York at Buffalo, Red Jacket quadrangle, Buffalo, N.Y.

Commission
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DEPARTMENT OF TRANSPORTATION

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Carlos Braceras Deputy Director

LEGACY PARKWAY

[illegible]

File # 0300R	**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.
Curt Christensen, P.E.

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 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.

KLEINFELDER

MEMORANDUM

RECEIVED
AUG 0 6 2001
Parsons Brinckerhoff
Legacy Parkway Project

TO: Mr. K. N. Gunalan, P.E.

FROM: Nigel Miller, E.I.T.
Curt Christensen, P.E.

DATE: August 3, 2001

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)

File # 03C0R	Doc. # ~~Where:~~ CCS8
Route to:	
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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)

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 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

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)

   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:		3 August 01

Memorandum

LEGACY

Date: 07/13/2004

To: J. Deschamp

From: M. D. Cline

Subject: Geotechnical Recommendations for Bridge 12 - Revised

cc: DocC, Kleinfelder, Farid Nobari

File Code: GDM-STR-045
(Revised GDM-STR-035)

REGISTERED PROFESSIONAL ENGINEER
Michelle D Cline
No. 3[illegible]522-2202
MICHELLE D. CLINE
7/13/04
STATE OF UTAH

SCANNED: 2-18-04

Introduction

This memorandum summarizes our Geotechnical evaluation and recommendations developed in accordance with UDOT's Geotechnical MOI for Bridge 12. 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 2 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. Based on the information obtained during those investigations, the subsurface profile at the bridge site can be generally defined as consisting of soft to stiff clay/silt layers with a few layers of medium dense sand about 1- to 3-meters thick. 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

Information obtained from three exploratory borings and one CPT sounding located near the Bridge 12 abutments and bent were used in this evaluation. Evaluations indicated that layers of silt and sand layers may liquefy under an earthquake magnitude of 7.1 with a peak horizontal ground acceleration of 0.6g. Estimated liquefaction-induced settlement in the upper 16 meters of the profile has been estimated to range from about 0 to 10 centimeters. Liquefaction-induced lateral spread displacement in localized soil layers in one of the borings has been estimated to be about 0.6 meters. In the other explorations, no horizontal displacement was estimated. Given the lack of continuity of the potentially liquefiable layers contributing to the lateral spread hazard, no mitigation measures are recommended for the Bridge 12 site.

Foundation Recommendations

It is our understanding that 406 mm (16 in.) diameter pipe piles are being proposed for the bridge foundations and that the target vertical capacity per pile at the abutments and bent is 2,025 kN and 1,125 kN, respectively. Pile design for abutment foundations is controlled by settlement associated with the required service load, and that for the bent is controlled by seismic compression. Recommended pile capacities and Geotechnical parameters required for analysis and design are presented in the attached table.

LEGACY PARKWAY
BRIDGE 12
PILE CAPACITY SU · PP 406x9 53 (16" x 3/8")
YIELD STRENGTH = [illegible] MPa

	Initials	Date
Completed By:	CL	7/13/04
Reviewed By:	CMH	7/13/04

A-1 Target Geotechnical Capacity per Pile (2.25x Service Load). 2,025 kN
B-2 Target Geotechnical Capacity per Pile (2.25x Service Load) 1,125 kN
A-3 Target Geotechnical Capacity per Pile (2.25x Service Load). 2,025 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		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)
							Compression Resistance (kN)	Uplift Resistance (kN)						
Bridge 12, Abutment 1	1294 5	1290.0	8 0	1241 9	1260 5	2,380	N/A	N/A	900	2,025	48	5,886	1243.4	1
Bridge 12, Bent 2	1286.5	1283 5	n/a	1241.9	1247.5	1,708	1,900	750	500	2,120	42	4,344	1241.9	1
Bridge 12, Abutment 3	1299 0	1294.5	12 5	1242.9	1255.0	2,698	N/A	N/A	900	2,025	52	6,554	1244.8	1

Location	Borings Used for Soil Profile		
Bridge 12, Abutment 1	SB-12-263,SC-12-264		
Bridge 12 Bent 2	SB-12-263,SC-12-264		
Bridge 12, Abutment 3	SB-12-265		

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 Elevati
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.

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Legacy Parkway
Lateral Pile Analysis
Soil Parameters for LPILE or GROUP

Structure	12
Support(s)	1,2,3
Water Depth (m)	0.5
Native Elevation (m)	1286.0
Soil Borings Used for Profile	SB-12-263; SC-12-264; SB-12-265

	Initials	Date
Completed By:	NM	1 15 02
Checked By:	CMH	1 15 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, e50	Modulus of Subgrade Reaction, k (kPa/m)	Friction Angle, f (degrees)	Maximum Side Friction (kN/m2)		Maximum Tip Resistance (kN/m2)	
									Top	Bottom	Top	Bottom
1	Soft Clay	0.0	0.5	19.0	50	0.015	48,665	-	0	2	0	60
2	Soft Clay	0.5	4.4	9.2	50	0.015	48,665	-	2	10	60	330
3	Sand	4.4	5.2	10.1	-	-	8,550	32	18	21	3,110	3,660
4	Soft Clay	5.2	12.4	9.2	50	0.015	48,665	-	12	26	390	870
5	Sand	12.4	14.6	10.1	-	-	9,260	32	48	57	8,490	10,070
6	Soft Clay	14.6	18.6	3.6	115	0.015	146,165	-	36	39	1,800	1,990
7	Sand	18.6	21.2	10.1	-	-	17,780	36	74	86	15,590	18,210
8	Silt	21.2	24.0	9.2	89	0.015	107,165	31	58	66	4,680	5,340
9	Sand	24.0	27.8	10.5	-	-	27,720	39	116	138	27,790	33,100

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Parsons Brinckerhoff
Legacy Parkway Project

KLEINFELDER
An employee owned company

KLEINFELDER MEMORANDUM

File # 03CDR | Doc. # 0027
Route to:

SCANNED: 7/18/01 MC

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

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 ($C_{c^{\text{TM}}}$), recompression ratio ($C_{r^{\text{TM}}}$), secondary compression ratio ($C_{\alpha^{\text{TM}}}$), 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.

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 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 $\gamma_{ave,}$ OCR, preconsolidation pressure, C_{c}^{TM}, C_{r}^{TM}, C_{α}^{TM}, $C_{v,}$ and $C_{h.}$ If available, use laboratory test results for the layer to overwrite the range of values.

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 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:		

Embankment and Grading Summary

Alignment: 500 South

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							
70+000	70+060	3.0 - 3.7	1.4	0.6	1.75	1256.0	To Be Evaluated	To Be Evaluated
70+060	70+080	3.7 - 4.6	1.9	0.8	1.75	1256.0	To Be Evaluated	To Be Evaluated
70+080	70+140	4.6 - 7.4	2.9	1.2	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+140	70+160	7.4 - 8.2	3.2	1.3	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+160	70+179.8[b]	8.2 - 9.0	4.2	1.7	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+253.8[c]	70+400	11.3 - 12.6	4.5	1.8	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+400	70+480	11.2 - 12.4	5.2	1.7	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+480	70+520	10.4 - 11.2	4.7	1.5	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+520	70+560	9.1 - 10.4	4.3	1.4	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+560	70+580	8.3 - 9.1	3.9	1.3	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+580	70+600	7.5 - 8.3	3.7	1.2	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+600	70+620	6.7 - 7.5	3.5	1.1	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+620	70+640	5.8 - 6.7	3.3	1	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+640	70+660	5.1 - 5.8	3.0	0.9	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+660	70+680	4.3 - 5.1	2.8	0.8	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+680	70+700	3.6 - 4.3	2.0	0.6	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+700	70+740	3.0 - 3.6	1.5	0.5	1.75	1257.0	To Be Evaluated	To Be Evaluated
70+740	71+040	<3.0	0.0	---	N/R	---	To Be Evaluated	To Be Evaluated

a Compact surcharge to embankment standards

b Approximate beginning of structure 12.

c Approximate ending of structure 12

N/R - wick drains not required

	Initials	Date
Completed By:	CMH	12/19/01
Reviewed By:	NPM	12/21/01

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Embankment and Grading Summary

Alignment: Ramp A - LPSB to 500 South

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							
1+000	1+060	3.0 - 3.5	1.2	0.4	1.75	1257.0	To Be Evaluated	To Be Evaluated
1+060	1+160	3.5 - 4.1	1.8	0.6	1.75	1257.0	To Be Evaluated	To Be Evaluated
1+160	1+300	4.1 - 5.1	2.2	0.8	1.75	1257.0	To Be Evaluated	To Be Evaluated
1+300	1+400	5.1 - 6.0	2.6	1.0	1.75	1257.0	To Be Evaluated	To Be Evaluated
1+400	1+440[b]	6.0 - 7.0	2.9	1.2	1.75	1257.0	To Be Evaluated	To Be Evaluated

a. Compact surcharge to embankment standards.

b. Intersection at 500 South.

	Initials	Date
Completed By:	CMH	12\20\01
Reviewed By:	NM	12\21\01

Embankment and Grading Summary

Alignment: Ramp B - 500 South to LPNB

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							
0+000[b]	0+080	10.4 - 11.4	3.5	1.6	1.75	1257.0	To Be Evaluated	To Be Evaluated
0+080	0+100	9.7 - 10.4	3.2	1.5	1.75	1257.0	To Be Evaluated	To Be Evaluated
0+100	0+120	8.9 - 9.7	3.0	1.5	1.75	1257.0	To Be Evaluated	To Be Evaluated
0+120	0+140	8.1 - 8.9	2.8	1.4	1.75	1257.0	To Be Evaluated	To Be Evaluated
0+140	0+160	7.2 - 8.1	2.5	1.3	1.75	1257.0	To Be Evaluated	To Be Evaluated
0+160	0+180	6.6 - 7.2	2.3	1.1	1.75	1257.0	To Be Evaluated	To Be Evaluated
0+180	0+200	5.4 - 6.6	2.1	1	1.75	1257.0	To Be Evaluated	To Be Evaluated
0+200	0+240	4.1 - 5.4	1.8	0.9	1.75	1257.0	To Be Evaluated	To Be Evaluated
0+240	0+300	3.0 - 4.1	1.5	0.7	1.75	1257.0	To Be Evaluated	To Be Evaluated
0+300	0+569.6	<3.0	0.0	---	N/R	---	To Be Evaluated	To Be Evaluated

a. Compact surcharge to embankment standards.

b. Approximate ending of structure 12.

N/R - wick drains not required.

	Initials	Date		
Completed By:	CMH	12	20	01
Reviewed By:	NM	12	20	01

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Embankment and Grading Summary

Alignment: Ramp C - 500 South to LPSB

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							
3+000	3+020	6 4 - 7 4	2.9	1.2	1.75	1257.0	To Be Evaluated	To Be Evaluated
3+020	3+060	5 6 - 6 4	2.7	1.0	1.75	1257.0	To Be Evaluated	To Be Evaluated
3+060	3+100	4.7 - 5.6	2.4	0.9	1 75	1257.0	To Be Evaluated	To Be Evaluated
3+100	3+140	3 9 - 4.7	2.1	0.7	1.75	1257.0	To Be Evaluated	To Be Evaluated
3+140	3+180	3 1 - 3.9	1 8	0 6	1.75	1257.0	To Be Evaluated	To Be Evaluated
3+180	3+200	3 0 - 3 1	1 2	0.4	1.75	1257.0	To Be Evaluated	To Be Evaluated
3+200	3+473	<3 0	0 0	—	N/R	—	To Be Evaluated	To Be Evaluated

a Compact surcharge to embankment standards

b Intersection at 500 South.

	Initials	Date
Completed By.	CMH	12/20/01
Reviewed By.	NM	12/21/01

1 of 2

Embankment and Grading Summary

Alignment: Ramp D - LPNB to 500 South

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							
5+000	5+140	<3.0	0.0	—	N/R	—	To Be Evaluated	To Be Evaluated
5+140	5+160	3.0 - 3.5	1.5	0.5	1.75	1257.0	To Be Evaluated	To Be Evaluated
5+160	5+180	3.5 - 4.3	2.3	0.7	1.75	1257.0	To Be Evaluated	To Be Evaluated
5+180	5+200	4.3 - 5.3	2.6	0.8	1.75	1257.0	To Be Evaluated	To Be Evaluated
5+200	5+220	5.3 - 6.2	2.8	1.0	1.75	1257.0	To Be Evaluated	To Be Evaluated
5+220	5+240	6.2 - 7.1	3.1	1.1	1.75	1257.0	To Be Evaluated	To Be Evaluated
5+240	5+260	7.1 - 8.1	3.4	1.3	1.75	1257.0	To Be Evaluated	To Be Evaluated
5+260	5+280	8.1 - 9.2	3.8	1.4	1.75	1257.0	To Be Evaluated	To Be Evaluated
5+280	5+300	9.2 - 9.9	4.2	1.5	1.75	1257.0	To Be Evaluated	To Be Evaluated
5+300	5+392[b]	9.9 - 10.9	4.5	1.6	1.75	1257.0	To Be Evaluated	To Be Evaluated

a. Compact surcharge to embankment standards.

b. Intersection at 500 South.

	Initials	Date
Completed By:	CMH	12/21/01
Reviewed By:	NM	12/21/01

Embankment and Grading Summary

Alignment: Mainline

Station		Embankment Height (m)	Surcharge Height (m)	Compacted Surcharge Height Above Embankment[a] (m)	Wick Drain Spacing (m)	Wick Drain Tip Elevation (m)
Beginning	Ending					
6005+550	6005+940	3.3 - 4.1	0.7	0.4	1.75	1266.0

a. Compact surcharge to embankment standards.

	Initials	Date
Completed By:	CMH	11/7/02
Reviewed By:	cc	11/8/02

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Embankment and Grading Summary

Alignment: Mainline

Station		Embankment Height (m)	Surcharge Height (m)	Compacted Surcharge Height Above Embankment[a] (m)	Wick Drain Spacing (m)	Wick Drain Tip Elevation (m)
Beginning	Ending					
6010+290	6010+380	3.3 - 3.9	0.9	0.5	1.75	1265.0
6010+380	6010+830	3.2 - 5.1	1.5	0.8	1.75	1265.0
6010+830	6010+980	3.7 - 5.1	1.1	0.6	1.75	1265.0
6010+980	6011+130	3.3 - 4.0	0.8	0.5	1.75	1265.0

a. Compact surcharge to embankment standards

	Initials	Date
Completed By:	CMH	11/8/02
Reviewed By:		11/8/02

SUMMARY OF GLOBAL STABILITY CALCULATIONS

500 South Area

		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 (1V:4H with 1V:1.5H sloped surcharge)	Non-Impact	0	0	1	1.1	= 5.2	1.25	>> 3.7	5.2	1	10PE50	0.29	> 3.7	5.2	- - -		
				2	1.1	= 8.5	1.25	>> 5.9	8.5	1	10PE50	0.29	- - -	- - -	- - -		
				3	1.1	= 10.5	1.25	> 7.3	10.5	1	10PE50	0.29	= 5.6	8.1	- - -		
Sloped Embankment (1V:3H with 1V:1.5H sloped surcharge)	Non-Impact	0	0	1	1.1	= 4.6	1.25	>> 3.4	4.6	1	10PE50	0.29	- - -	- - -	- - -		
				2	1.1	= 6.1	1.25	>> 4.3	6.1	1	10PE50	0.29	- - -	- - -	- - -		
				3	1.1	= 6.9	1.25	> 4.8	6.9	1	10PE50	0.29	> 4.8	6.9	1.45		
		1	50	1	1.1	= 8.8	1.25	>> 6.1	8.8	1	10PE50	0.29	- - -	- - -	- - -		
				2	1.1	= 13.2	1.25	>> 9.3	13.2	1	10PE50	0.29	- - -	- - -	- - -		
				3	1.1	= 15.5	1.25	> 10.9	15.5	1	10PE50	0.29	> 12.7	18.0	1.42		
		2	55	1	1.1	= 11.4	1.25	>> 8.0	11.4	1	10PE50	0.29	- - -	- - -	- - -		
			(-20)	2	1.1	= 17.8	1.25	> 12.6	17.8	1	10PE50	0.29	>> 12.7	18.0	1.34		
				3	1.1		1.25		0.0	1	10PE50	0.29					
		3	70	1	1.1	= 13.6	1.25	>> 9.6	13.6	1	10PE50	0.29	- - -	- - -	- - -		
			(-20)	2	1.1	>> 17.8	1.25	>> 12.6	17.8	1	10PE50	0.29	>> 12.7	18.0	>1.34		
			(-25)	3	1.1		1.25			1	10PE50	0.29					
Sloped Embankment (1V:1.5H with 1V:1.5H 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	< 6.9	1.3	- - -	- - -	1	2PE50	0.60	- - -	- - -	- - -		
		1	45	1	1.1	= 8.7	1.3	>> 6.1	8.7	1	2PE50	0.60	- - -	- - -	- - -		
				2	1.1	= 12.5	1.3	>> 8.8	12.5	1	2PE50	0.60	- - -	- - -	- - -		
				3	1.1	= 14.2	1.3	> 10.0	14.2	1	2PE50	0.60	> 11.3	16.0	1.47		
		2	55	1	1.1	= 11.0	1.3	>> 7.7	11.0	1	2PE50	0.60	- - -	- - -	- - -		
			(-15)	2	1.1	= 16.5	1.3	>> 11.6	16.5	1	2PE50	0.60	- - -	- - -	- - -		
				3	1.1	= 18.5	1.3	> 13.1	18.5	1	2PE50	0.60	>> 11.3	16.0	1.36		
		3	65	1	1.1	= 13.2	1.3	>> 9.3	13.2	1	2PE50	0.60	- - -	- - -	- - -		
			(-15)	2	1.1	>> 18.0	1.3	>> 12.7	18.0	1	2PE50	0.60	>> 11.3	16.0	>1.36		
			(-20)	3	1.1		1.3			1	2PE50	0.60					
MSE Wall (1V:2H sloped buttress to at least 1/3 final height of wall, vertical surcharge at wall face, < 25m wide top width)	Non-Impact	0	0	1	1.1	- - -	1.4	- - -	- - -	1.1	10PE50	0.29	- - -	- - -	- - -		
				2	1.1	- - -	1.4	- - -	- - -	1.1	10PE50	0.29	- - -	- - -	- - -		
				3	1.1	- - -	1.4	- - -	- - -	1.1	10PE50	0.29	- - -	- - -	- - -		
		1	full	1	1.1	= 8.4	1.4	>> 5.8	8.4	1.1	10PE50	0.29	- - -	- - -	- - -		
				2	1.1	= 11.4	1.4	>> 8.0	11.4	1.1	10PE50	0.29	- - -	- - -	- - -		
				3	1.1	= 12.5	1.4	> 8.8	12.5	1.1	10PE50	0.29	= 12.7	18.0	1.87		
		2	full	1	1.1	= 10.6	1.4	>> 7.4	10.6	1.1	10PE50	0.29	- - -	- - -	- - -		
				2	1.1	= 14.3	1.4	>> 10.1	14.3	1.1	10PE50	0.29	- - -	- - -	- - -		
				3	1.1	= 15.8	1.4	> 11.1	15.8	1.1	10PE50	0.29	>> 12.7	18.0	1.95		
		3	full	1	1.1	= 12.5	1.4	>> 8.8	12.5	1.1	10PE50	0.29	- - -	- - -	- - -		
				2	1.1	= 16.9	1.4	>> 11.9	16.9	1.1	10PE50	0.29	- - -	- - -	- - -		
				3	1.1	> 18.0	1.4	> 12.7	18.0	1.1	10PE50	0.29	>> 12.7	18.0	2.00		

Notes and Assumptions

1. The values presented in this table are in meters unless otherwise indicated.
2. The values presented in thus 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.

1 of 20

Completed by: TMK 3/8/02
Reviewed by: 3/13/02

KLEINFELDER
An employee owned company

MEMORANDUM

Date: March 14, 2002

To: K. N. Gunalan, P.E.
Parsons Brinckerhoff

From: Travis Gerber, P.E.
Bill Turner, P.E.

Subject: **High Strength Geotextile and Staging Options**
500 South
Legacy Parkway
Kleinfelder Project No. 35-8440-07.001

At your request we have evaluated the slope stability requirements for the embankments in the above referenced area. The attached tables provide summaries of the high strength geotextile and staging options that appear to be suitable for these embankments. Each stage will require approximately 90 days 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 observations and reports, as well as construction notification, should be provided in accordance with our memorandum dated October 10, 2001.

- 500 South (STA 70+000 to STA 71+040)
- Legacy Parkway Southbound to 500 South [Ramp A] (STA 1+000 to STA 1+420)
- 500 South to Legacy Parkway Northbound [Ramp B] (STA 0+030 to STA 0+570)
- 500 South to Legacy Parkway Southbound [Ramp C] (STA 3+020 to STA 3+460)
- Legacy Parkway Northbound to 500 South [Ramp D] (STA 5+000 to STA 5+360)

500 SOUTH (STA 70+000 to STA 71+040)

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	70+000	70+055	1	n/a	0	n/a	n/a	n/a	n/a
	70+055	70+100	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
	70+100*	70+140*	1	n/a	0	n/a	n/a	n/a	n/a
	70+140	70+155	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
	70+155	W. Abut., Bridge 12 (~70+180)	1	n/a	3+3	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m Grade + 0.8 m Grade + 1.0 m Grade + 1.2 m	Perpendicular to CL Parallel to CL Perpendicular to CL Parallel to CL Perpendicular to CL Parallel to CL	0 m from L. toe of slope 0 m from toe of spill slope 20 m from L. toe of slope 15 m from toe of spill slope 25 m from L. toe of slope 20 m from toe of spill slope	0 m from R. toe of slope 65 m from toe of spill slope 20 m from R. toe of slope 65 m from toe of spill slope 25 m from R. toe of slope 65 m from toe of spill slope
	E. Abut., Bridge 12 (~70+255)	70+270	2	11.0 m	2+2	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m Grade + 0.8 m	Perpendicular to CL Parallel to CL Perpendicular to CL Parallel to CL	0 m from L. toe of slope 0 m from toe of spill slope 15 m from L. toe of slope 15 m from toe of spill slope	0 m from R. toe of slope 55 m from toe of spill slope 15 m from R. toe of slope 55 m from toe of spill slope
	70+270*	70+330*	1	n/a	0	n/a	n/a	n/a	n/a
	70+330	~70+350	2	11.4 m	2	Grade + 0.2 m Grade + 0.4 m	Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 15 m from L. toe of slope	0 m from R. toe of slope 15 m from R. toe of slope
	~70+350	70+420	3	12.5, 16.9 m	3	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 15 m from L. toe of slope 20 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope 0 m from R. toe of slope
	70+420	70+445	3	12.5, 16.9 m	3	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 0 m from L. toe of slope 0 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope 0 m from R. toe of slope
	70+445	70+565	2	12.5 m	3	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 0 m from L. toe of slope 0 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope 0 m from R. toe of slope
	70+565	70+600	1	n/a	3	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 0 m from L. toe of slope 0 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope 0 m from R. toe of slope
	70+600	70+640	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 0 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope
	70+640	70+710	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
	70+710	71+040	1	n/a	0	n/a	n/a	n/a	n/a
2	70+000	70+055	1	n/a	0	n/a	n/a	n/a	n/a
	70+055	70+075	2	4.6 m	0	n/a	n/a	n/a	n/a
	70+075	70+100	2	8.8 m	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	70+100*	70+140*	1	n/a	0	n/a	n/a	n/a	n/a
	70+140	W. Abut., Bridge 12 (~70+180)	2	8.7 m	1+2	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Parallel to CL Parallel to CL	0 m from L. toe of slope 0 m from toe of spill slope 15 m from toe of spill slope	0 m from R. toe of slope 55 m from toe of spill slope 55 m from toe of spill slope
	E. Abut., Bridge 12 (~70+255)	70+270	2	11.0 m	2+2	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m Grade + 0.8 m	Perpendicular to CL Parallel to CL Perpendicular to CL Parallel to CL	0 m from L. toe of slope 0 m from toe of spill slope 15 m from L. toe of slope 15 m from toe of spill slope	0 m from R. toe of slope 55 m from toe of spill slope 15 m from R. toe of slope 55 m from toe of spill slope
	70+270*	70+330*	1	n/a	0	n/a	n/a	n/a	n/a
	70+330	~70+350	2	11.4 m	2	Grade + 0.2 m Grade + 0.4 m	Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 15 m from L. toe of slope	0 m from R. toe of slope 15 m from R. toe of slope
	~70+350	70+420	3	12.5, 16.9 m	3	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 15 m from L. toe of slope 20 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope 0 m from R. toe of slope
	70+420	70+445	3	12.5, 16.9 m	3	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 0 m from L. toe of slope 0 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope 0 m from R. toe of slope
	70+445	70+525	2	12.5 m	3	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 0 m from L. toe of slope 0 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope 0 m from R. toe of slope
	70+525	70+585	2	10.6 m	2	Grade + 0.2 m Grade + 0.4 m	Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 0 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope
	70+585	70+640	2	8.4 m	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	70+640	70+680	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
	70+680	71+010	2	4.5 m	0	n/a	n/a	n/a	n/a
	70+710	71+040	1	n/a	0	n/a	n/a	n/a	n/a
3	70+000	70+055	1	n/a	0	n/a	n/a	n/a	n/a
	70+055	70+075	2	4.6 m	0	n/a	n/a	n/a	n/a
	70+075	70+085	3	4.6, 6.1 m	0	n/a	n/a	n/a	n/a
	70+085	70+100	2	9.8 m	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	70+100*	70+140*	1	n/a	0	n/a	n/a	n/a	n/a
	70+140	W. Abut., Bridge 12 (~70+180)	3	8.7, 12.5 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 toe of spill slope	0 m from R. toe of slope 45 m from toe of spill slope
	E. Abut., Bridge 12 (~70+255)	70+270	2	11.0 m	2+2	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m Grade + 0.8 m	Perpendicular to CL Parallel to CL Perpendicular to CL Parallel to CL	0 m from L. toe of slope 0 m from toe of spill slope 15 m from L. toe of slope 15 m from toe of spill slope	0 m from R. toe of slope 55 m from toe of spill slope 15 m from R. toe of slope 55 m from toe of spill slope
	70+270*	70+330*	1	n/a	0	n/a	n/a	n/a	n/a
	70+330	~70+350	2	11.4 m	2	Grade + 0.2 m Grade + 0.4 m	Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 15 m from L. toe of slope	0 m from R. toe of slope 15 m from R. toe of slope
	~70+350	70+420	3	12.5, 16.9 m	3	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 15 m from L. toe of slope 20 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope 0 m from R. toe of slope
	70+420	70+480	3	12.5, 16.9 m	3	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 0 m from L. toe of slope 0 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope 0 m from R. toe of slope
	70+480	70+525	3	10.6, 14.3 m	2	Grade + 0.2 m Grade + 0.4 m	Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 0 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope
	70+525	70+565	2	10.6 m	2	Grade + 0.2 m Grade + 0.4 m	Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 0 m from L. toe of slope	0 m from R. toe of slope 0 m from R. toe of slope
	70+565	70+600	3	8.4, 11.4 m	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	70+600	70+640	2	8.4 m	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	70+640	70+660	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
	70+660	70+680	3	4.5, 6.0 m	0	n/a	n/a	n/a	n/a
	70+680	71+010	2	4.5 m	0	n/a	n/a	n/a	n/a
	70+710	71+040	1	n/a	0	n/a	n/a	n/a	n/a

* Area to be buttressed by adjacent fills

LEGACY PARKWAY SOUTHBOUND TO 500 SOUTH [RAMP A] (STA 1+000 to STA 1+420)

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	1+000	1+100	1	n/a	0	n/a	n/a	n/a	n/a
	1+100	1+420	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
2	1+000	1+100	1	n/a	0	n/a	n/a	n/a	n/a
	1+100	1+380	2	5 2 m	0	n/a	n/a	n/a	n/a
	1+380	1+420	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

500 SOUTH TO LEGACY PARKWAY NORTHBOUND [RAMP B] (STA 0+030 to STA 0+570)

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	0+030	0+100	2	11.4 m	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
	0+100	0+140	1	n/a	3	Grade + 0.2 m Grade + 0.4 m Grade + 0.6 m	Perpendicular to CL Perpendicular to CL Perpendicular to CL	0 m from L. toe of slope 20 m from L. toe of slope 25 m from L. toe of slope	0 m from R. toe of slope 20 m from R. toe of slope 25 m from R. toe of slope
	0+140	0+190	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
	0+190	0+250	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
	0+250	0+570	1	n/a	0	n/a	n/a	n/a	n/a
2	0+030	0+110	2	11.4 m	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
	0+110	0+200	2	8.8 m	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	0+200	0+250	2	5.2 m	0	n/a	n/a	n/a	n/a
	0+250	0+570	1	n/a	0	n/a	n/a	n/a	n/a
3	0+030	0+060	2	11.4 m	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
	0+060	0+200	3	8.8. 13.2 m	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	0+200	0+250	2	5.2 m	0	n/a	n/a	n/a	n/a
	0+250	0+570	1	n/a	0	n/a	n/a	n/a	n/a

500 SOUTH TO LEGACY PARKWAY SOUTHBOUND [RAMP C] (STA 3+020 to STA 3+460)

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	3+020	3+145	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
	3+145	3+460	1	n/a	0	n/a	n/a	n/a	n/a
2	3+020	3+060	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
	3+060	3+145	2	5 2 m	0	n/a	n/a	n/a	n/a
	3+145	3+460	1	n/a	0	n/a	n/a	n/a	n/a

LEGACY PARKWAYNORTHBOUND TO 500 SOUTH [RAMP D] (STA 5+000 to STA 5+360)

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	5+000	5+165	1	n/a	0	n/a	n/a	n/a	n/a
	5+165	5+220	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
	5+220	5+260	1	n/a	2	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
						Grade + 0.4 m	Perpendicular to CL	20 m from L. toe of slope	20 m from R. toe of slope
	5+260	5+300	1	n/a	3	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
						Grade + 0.4 m	Perpendicular to CL	20 m from L. toe of slope	20 m from R. toe of slope
						Grade + 0.6 m	Perpendicular to CL	25 m from L. toe of slope	25 m from R. toe of slope
	5+300	5+360	2	11.4 m	2	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
						Grade + 0.4 m	Perpendicular to CL	20 m from L. toe of slope	20 m from R. toe of slope
2	5+000	5+165	1	n/a	0	n/a	n/a	n/a	n/a
	5+165	5+210	2	5.2 m	0	n/a	n/a	n/a	n/a
	5+210	5+280	2	8.8 m	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	5+280	5+360	2	11.4 m	2	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
						Grade + 0.4 m	Perpendicular to CL	20 m from L. toe of slope	20 m from R. toe of slope
3	5+000	5+165	1	n/a	0	n/a	n/a	n/a	n/a
	5+165	5+210	2	5.2 m	0	n/a	n/a	n/a	n/a
	5+210	5+340	3	8.8, 13.2 m	1	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
	5+340	5+360	2	11.4 m	2	Grade + 0.2 m	Perpendicular to CL	0 m from L. toe of slope	0 m from R. toe of slope
						Grade + 0.4 m	Perpendicular to CL	20 m from L. toe of slope	20 m from R. toe of slope

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.

Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	Construction Performance: Settlement Platforms No.	Type*	Est. Depth, m	Slope Inclinometer No.	Est. Depth, m	Piezometers No.	Est. Depth, m	Long-Term Performance Instrumentation: Settlement Platforms No.	Type*	Est. Depth, m	Slope Inclinometer No.	Est. Depth, m	Piezometers No.	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
																	1	20
			16	58+590	2	VW		2	30	1	5							
										1	20							
LP -- Oil Drain		32	8	6002+490	2	VW		2	30	1	5							

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
										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

					Construction Performance								Long-Term Performance Instrumentation						
					Settlement Platforms			Slope Inclinometer		Piezometers		Settlement Platforms			Slope Inclinometer		Piezometers	
Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	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
																	1	30
																	1	40
			12	6013+340	1	ME	61	2	30	1	10							
					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
																	1	40
			8	6014+680	1	ME	61	2	30	1	10							
					1	VW				1	30							
LP -- 1250 West		18	10	6014+570								2	ME	61	2	30	1	10
																	1	20
																	1	30
																	1	40
			8	6014+675								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							

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
										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							

					Construction Performance							Long-Term Performance Instrumentation						
					Settlement Platforms			Slope Inclinometer		Piezometers		Settlement Platforms			Slope Inclinometer		Piezometers	
Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	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
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							

					Construction Performance							Long-Term Performance Instrumentation						
					Settlement Platforms			Slope Inclinometer		Piezometers		Settlement Platforms			Slope Inclinometer		Piezometers	
Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	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
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							

					Construction Performance							Long-Term Performance Instrumentation						
					Settlement Platforms			Slope Inclinometer		Piezometers		Settlement Platforms			Slope Inclinometer		Piezometers	
Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	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
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).

					Construction Performance							Long-Term Performance Instrumentation						
					Settlement Platforms			Slope Inclinometer		Piezometers		Settlement Platforms			Slope Inclinometer		Piezometers	
Alignment	Ret. Wall	Structure No.	Emb. Hgt.	Approx. Station	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 instruct that the project Geotechnical Engineer is notified before work continues in that area.

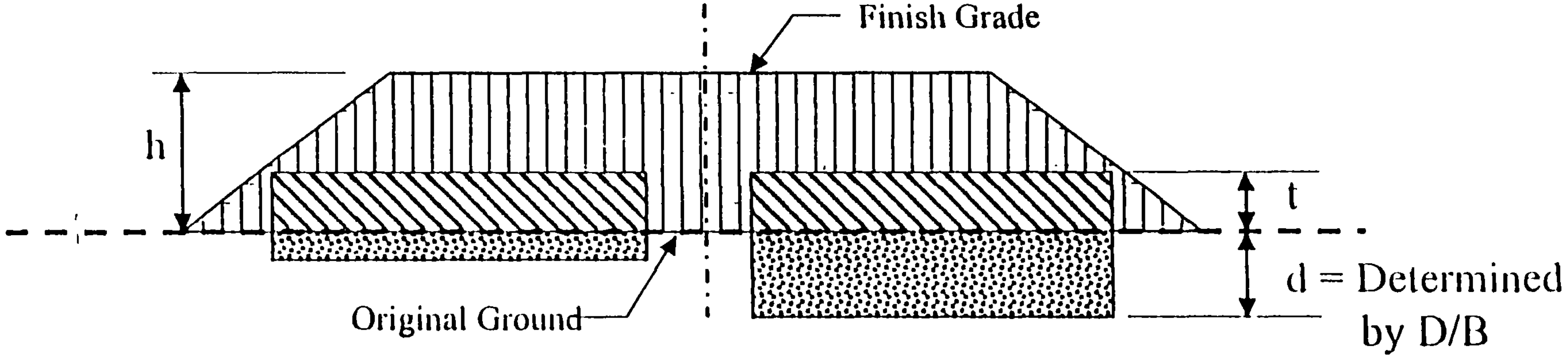
UN UITABLE MATERIALS – ograde Preparation Guidelin

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: 4/29/02 *File Code:* 03COR----

To: JD

From: K. N. Gunalan

Subject: Geotechnical Information for STU's

Cc: DocC, Dan Church, Kleinfelder

JD;

Per your request dated 4/29/02, the recommended ultimate coefficient of sliding friction is 0.67 based on a angle of internal friction of 34 degrees for the select fill beneath the wall; unit weight of backfill material is 21 kN/m3; coefficient of active and at rest earth pressures are 0.4 and 1.0 respectively. Factor of safety against overturning is 2.0 and against sliding is 1.5.

The minimum req'd

If you have any questions, please do not hesitate to contact me.

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.

Memorandum

LEGACY

Date: 7/28/2002 *File Code:* 03COR272

To: Brian Tolbert

From: K. N. Gunalan
Curt Christensen

Subject: Settlement estimates at South Davis Sewer Crossings at 6009+885, 6010+477, 6014+120 and 6015+300

Cc: DocC, CRS, Kleinfelder

Based on discussions with CRS and Kleinfelder on July 22, 2002 pertaining to settlement at the referenced locations, please find our recommendations below.

24 inch RCP Sanitary Sewer Line at 6009+885

The major impact to the line at this location would be due to the proposed berm. Preconstruction phase testing indicated that by keeping the roadway profile below a threshold value of 3.3 m, primary and secondary settlements should not be initiated. Therefore it is proposed to lower the berm to approximately the roadway elevation and mitigate visual impacts through strategically placed landscaping. In spite of the efforts to mitigate the impact, the line will experience settlement due to the construction of the parkway. The anticipated magnitude of settlement due to compression of the soils is in the order of 125 mm.

It is recommended that the embankment be constructed to final grade and settlement monitored using surface settlement plates. Based on measured magnitudes, the need for placing additional surcharge to remove both primary and secondary settlements will be evaluated.

48 inch RCP Sanitary Sewer line at 6010+477

It is our understanding that the line crosses the main line at an angle such that the line under the north bound barrel alone would be impacted by the settlement caused by the embankment. The section of the line under the south bound barrel would be under a structure and therefore would not experience any impacts. This poses an additional problem of differential settlement to deal with. In order to mitigate this, it is proposed to use the zero net loading philosophy for the section under the north bound barrel. Using materials such as geofoam for the embankment, the line would in fact experience zero net additional loading and thereby negligible settlement impact. Analysis has been carried out to evaluate the extent of geofoam over the line so as to not impact the line. It has been evaluated that the geofoam should extend from the north abutment of the north bound bridge over Mill creek to approximately 15 m north of the center line of the pipe. Additionally it is recommended that the existing material to approximately the depth of the pavement section be excavated prior to constructing the embankment with geofoam.

Line at 6014+120

The impact to the line (anticipated magnitude of settlement being 700 mm) at this location is mainly due to the ramp sections. However due to concerns relating to differential settlements, it is proposed to surcharge the entire section just as the ramp sections. However in order to accelerate the impact, it is proposed to install wick drains in the area surrounding the line. Instruments will be strategically located to monitor settlement magnitudes, prior to determining any remedial measures.

Line at 6015+300

The anticipated impact (settlement magnitude of 450 mm) to the line at this location is due to the roadway section itself. Based on the anticipated time rate of settlement, it is recommended that the embankment section be placed without wick drains and settlements monitored.

Should you have any questions regarding this, please contact us at your convenience.