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LEGACY PARKWAY

Project Number SP-0067(1)0

DRAFT

SEGMENT 5

GEOTECHNICAL INVESTIGATION REPORT

VOLUME 1 OF 3

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.

For

Fluor Ames Kraemer, LLC

September, 2004

8096

LEGACY

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August 5, 2004

COPY

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

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

Subject: **Geotechnical Investigation Report**
Segment 5 – Legacy Parkway Project
UDOT Project Number *SP-0067(1)0

Dear Mr. Higbee:

Attached herewith is a report of geotechnical investigations for construction of Segment 5 of the Legacy Parkway Project. Segment 5 generally encompasses the northern portion of the Legacy Parkway, extending from about halfway between Glovers Lane and State Street to north of the I-15 / US-89 interchange Farmington, Utah.

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

Sincerely,

Parsons Brinckerhoff Quade & Douglas, Inc.

Michelle D. Cline

Michelle D. Cline, P.E.
Geotechnical Engineer

Fluor Ames Kraemer, LLC

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

LEGACY

LEGACY PARKWAY PROJECT

Project Number *SP-0067(1)0

GEOTECHNICAL INVESTIGATION REPORT

SEGMENT 5

SUBMITTED BY

PB 100 YEARS

Fluor Ames Kraemer LLC

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1.0 INTRODUCTION

This report presents the results of the geotechnical field and laboratory investigations conducted for the North Interchange (Segment 5) of the Legacy Parkway Design-Build Project along with the analysis, evaluations and recommendations for the construction of embankments, mechanically stabilized earth (MSE) walls, bridges, 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 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. The North Interchange is included in Segment 5, which extends northward from the I-15 centerline station 58+000 to I-15 station 60+725 and US-89 station 71+800 (DC3 line). Pertinent Segment 5 corridor lines included in this investigation are summarized in Table 1.

Table 1: Segment 5 (North Interchange) Stationing

Line	Station
I-15 Northbound (15N)	58+000 to 60+732
I-15 Southbound (15S)	58+000 to 60+717
Ramp A, I-15 SB to Burke Lane (RA)	1+000 to 1+334
Ramp B, Burke Lane to I-15 NB (RB)	2+000 to 2+428
Ramp C, Burke Lane to Legacy Parkway SB (RC)	40+148 to 40+516
Ramp D, LP NB to Burke Lane (RD)	15+207 to 15+458
Ramp G, Burke Lane to I-15 SB (RG)	9+153 to 9+452
Ramp H, I-15 NB to Burke Lane (RH)	8+158 to 8+434
I-15 SB to LP SB (DC1)	60+062 to 60+990
LP NB to I-15 NB (DC2)	20+134 to 21+575
US-89 SB to LP SB (DC3)	70+000 to 71+800
LP NB to US-89 NB (DC4)	80+000 to 81+799
US-89 SB to I-15 SB (DC5)	12+157 to 12+955
I-15 NB to US-89 NB (DC6)	7+150 to 7+579
Burke Lane (BL)	4+020 to 5+730
Lagoon Drive Frontage Road (LF)	1+000 to 1+232
Lagoon Drive (LD)	1+100 to 2+685
State Street (SS)	3+450 to 3+996
650 West (65W)	4+075 to 4+240
Whitaker Lane	1+000 to 1+104

1.2 Proposed Improvements

In summary, Segment 5 includes construction along approximately 2.7 kilometers of the I-15 alignment, including new connector ramps for the Legacy Parkway mainline, US-89, and Burke Lane, and improvements to adjacent surface streets. Construction will include 10 new bridges, 31 MSE walls, and embankments up to 17 meters in height. Additionally, some existing utilities will be re-located; new culverts, sign structures, and utilities will be constructed. The new Segment 5 roadway alignments are described briefly below.

Near the north end of Segment 5, an existing section of Burke Lane will be reconstructed between the east project terminus near the Lagoon Drive intersection (BL 5+730) and US-89 (BL 5+380). Between US-89 (BL 5+380) and Clark Lane (BL 4+020), a new

section of Burke Lane will be constructed and will include a new overpass over US-89, I-15, and the Union Pacific Railroad. The overpass will comprise three new bridges, designated as UDOT Bridge Nos. F-714, F-715, and F-716.

Three new ramps provide a connection from Burke Lane to I-15 northbound (Ramp B), I-15 southbound (Ramp G), and Legacy Parkway southbound (Ramp C). Additionally, three new ramps provide a connection to Burke Lane from I-15 southbound (Ramp A), Legacy Parkway northbound (Ramp D), and I-15 northbound (Ramp H).

Near the south end of Segment 5, an existing section of State Street will be reconstructed to include a larger overpass over I-15, the new Legacy Parkway connector ramps, and the Union Pacific Railroad. The reconstructed portion of State Street will extend from the east project terminus (SS 3+996) to the west project terminus near the 650 West Street intersection (SS 3+450), where a new roundabout will be constructed. The State Street overpass will consist of a new bridge, UDOT Bridge No. F-713.

Just north of the Burke Lane overpass, US-89 will be reconstructed to create new connector ramps to Legacy Parkway southbound (DC3) and I-15 southbound (DC5), and from Legacy Parkway northbound (DC4) and I-15 northbound (DC6). The DC3 ramp begins at US-89 (DC3 71+800); crosses I-15, a connector ramp, and the Union Pacific Railroad via Bridge No. C-863; and connects to Legacy Parkway south of the State Street overpass. The DC4 ramp is located immediately east of the DC3 ramp, following the same path (DC4 80+000 to 81+800) and permitting access in the opposite direction. The DC5 connector extends from US-89 just south of the Burke Lane interchange (DC5 13+000) on the east side of I-15; crosses I-15 by means of Bridge No. C-869; and connects to the west side of I-15 about 300 meters north of the State Street overpass (DC5 12+157). The DC6 ramp leads from the east side of I-15 (DC6 7+150) near Lagoon Park to US-89 near the Burke Lane interchange (DC6 7+579).

The existing I-15 will be reconstructed between the southern terminus of Segment 5 (I-15CL 58+000) and the northern terminus (I-15CL 60+725). A new ramp connecting I-15 southbound to Legacy Parkway southbound (DC1) will begin on the west side of I-15 near the Burke Lane overpass (DC1 61+000); cross over the Union Pacific Railroad by way of UDOT Bridge No. C-864; and connect to the Legacy Parkway north of the State Street overpass (DC1 60+034). A new ramp connecting Legacy Parkway northbound to I-15 northbound (DC2) will extend from the Legacy Parkway south of the State Street overpass (DC2 20+134); cross the US-89 connector ramps by way of Bridge No. C-865; cross the Union Pacific Railroad and I-15 by Bridge No. C-866; and merge on the east side of I-15 just north of the Burke Lane overpass (DC2 21+575).

The existing Lagoon Drive Frontage Road (LF 1+000 to 1+232) and Whitaker Lane (WL 1+000 to 1+104) will be reconstructed, as will portions of the existing Lagoon Drive (LD 1+100 to 2+685) and 650 West Street (65W 4+075 to 4+240).

Demolition of existing site features will be required prior to construction of many of the proposed improvements. Existing features are described in a later section of this report.

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 I-15, US-89, Burke Lane, State Street, Lagoon Drive, Lagoon Drive Frontage Road, Whitaker Lane, 650 West Street, and Clark Lane. Additionally, the Union Pacific Railroad is located immediately west of I-15, trending in the same general direction as the interstate.

The existing I-15 roadway is constructed of Portland cement concrete pavement; other roadways are constructed of asphaltic concrete pavements. Interstate-15 generally trends in a north-northwest direction along the proposed alignment from about station I15CL 58+000 to about I15CL 60+725. Three bridge overpasses cross the I-15 corridor – at State Street (I15 58+290); at a location just north of the existing I-15 northbound to US-89 northbound exit ramp (I15 59+090); and just south of the existing Burke Lane (I-15 59+550).

At the existing North Interchange, existing ramps connect I-15 southbound to Burke Lane and Lagoon Park; US-89 southbound to I-15 southbound; I-15 northbound to US-89 northbound; Burke Lane to US-89 northbound and I-15 northbound; Burke Lane to US-89 southbound; and US-89 southbound to Burke Lane. A bridge crosses US-89 near the location of the existing US-89/Burke Lane connector ramps (DC4 84+570).

Based on conditions encountered during field explorations conducted for this study, fills for embankments abutting existing structures are about 12 meters or less in height. Embankment fills for existing roadways and ramps in other areas of Segment 5 are estimated to be about 5 meters or less in height.

4.0 FINDINGS

4.1 Site Conditions

Segment 5 is developed with the existing I-15 alignment and other facilities previously described. Additionally, some residential, commercial, and light industrial properties are located along State Street, Lagoon Drive, and Lagoon Drive Frontage Road. A relatively large area on the east side of Lagoon Drive north of State Street is occupied by Lagoon Park. A few relatively small areas in Segment 5 are designated wetlands or archeological sites. Other existing site features include underground and overhead utilities, culverts, drainage ditches, light poles, and signs. A registered historic building, which will remain in place, is located near the east abutment of the existing State Street Bridge.

Farmington Creek trends from the Wasatch Mountains to the east toward the Great Salt Lake to west. The creek traverses the project site north of the State Street interchange in a generally east-west direction. The creek is channeled below existing roadways via a box culvert beneath Lagoon Drive Frontage Road (LF 1+135) and a larger box culvert beneath Lagoon Drive and I-15 (I15 58+480).

Shepard Creek traverses in a generally northeast to southwest direction across I-15 in the northern portion of Segment 5. An existing reinforced concrete pipe is used to channel the creek below the roadway (I15CL 60+040).

Topography west of US-89 in the northern half of Segment 5 and I-15 in the southern half is relatively level, with ground surface elevations ranging from approximately 1294 to 1297 meters. Immediately east of US-89/I-15, the ground surface slopes upward to the east and ground surface elevations range from approximately 1297 to 1305 meters.

4.2 Surface Drainage

Segment 5 is located in a low-lying area; surface drainage is to the west-southwest towards the Great Salt Lake. As indicated in the Kleinfelder (2000) report, there is a potential for local areas of flooding where streams cross the Legacy Parkway alignment.

4.3 Geology

The Legacy Parkway Preferred Alignment is located within the heart of the Salt Lake Valley on the eastern edge of the Basin and Range physiographic province. The Basin and Range province, extending from western Utah to the west through most of Nevada, consists of linear valley basins divided by several north-south trending mountain ranges. Salt Lake Valley is bounded by the Wasatch Mountain Range to the east and by the

Oquirrh Mountain Range to the west. The valley is located within the Lake Bonneville Basin, a sediment-filled structural basin bounded by faults and formed over the past 20 million years.

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

Paleolakes have inundated the project vicinity at least four times during the late Pleistocene. During the Bonneville lake cycle which occurred between about 27,000 and 12,000 years ago, the area was inundated to an elevation of about 1585 meters. This represented the highest elevation of the late-Pleistocene lake cycles. The historic average surface elevation (1847-1986) 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 Kleinfelder's previous investigations and a supplemental exploration conducted by Fluor Ames Kraemer (FAK), the native soil profile along the proposed alignment predominantly consists of interlayered clay, silt, sand, and gravel. A distinct sand/gravel layer about 5 to 15 meters thick was encountered in many of the explorations below elevations ranging between about 1280 to 1287 meters. Additional information regarding subsurface materials beneath proposed bridge structures is presented later in this report.

4.7 Geohydrologic Conditions

The Quaternary basin-fill material in the Salt Lake Valley is characterized geologically in to a shallow unconfined aquifer underlain by a deep confined aquifer, with locally unconfined perched aquifers. The upper-most 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 of groundwater.

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

No active faults are known to cross the 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 or West Valley Fault should be anticipated. The Wasatch and West Valley Fault Zones are considered capable of generating earthquakes as large as magnitude 7.3 and 7.0 respectively.

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 Segment 5 was evaluated in general accordance with the methods presented in Youd and Idriss (1997) using data obtained from the borings and Cone Penetrometer Test (CPT) soundings. Should an earthquake of sufficient magnitude occur, localized zones within the soils beneath the alignment 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 H. Results of site-specific liquefaction evaluations conducted for each bridge site are summarized in Table 2 on the following page.

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 within the Northern Interchange project limits, liquefaction-induced lateral spread was considered for potential impacts to the proposed construction. The north end of the Legacy Parkway Preferred Alignment is located within the Farmington Siding Landslide Complex, which consists of liquefaction-induced landslides that date back to latest Pleistocene and Holocene time. As mapped in Hylland and Lowe (1998), the northwestern half of the complex consists of younger landslide materials, and the southeastern half consists of older landslide materials. The section of the alignment that extends between Glover Lane and the Burke Lane/US 89 interchange lies within the older mapped portion of the complex; and between the Burke Lane/US 89 interchange and the northern project limits, the alignment lies within the younger portion. The Hylland and Lowe (1998) study indicates that susceptibility to liquefaction-induced landslides may be less than in earlier times due to lower average lake and associated groundwater levels. The study also indicated that above-average precipitation could create locally perched conditions which could liquefy and slide when subject to strong ground motions.

Liquefaction-induced lateral spreading was assessed for each Segment 5 bridge location using data obtained from the exploratory borings and the revised multilinear regression equations by Youd, Hansen, and Bartlett. Results of the analyses are presented in Table 2. For the ten bridges in Segment 5, localized layers of potential lateral spreading were generally thin and/or discontinuous between boring locations. Also, 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. Thus, remediation for liquefaction and lateral spread potential is not recommended for the Segment 5 bridge sites.

Table 2: Results of Evaluations of Liquefaction Potential and Lateral Spread for Segment 5

UDOT (FAK) Bridge No.	No. Bor./ CPT[1]	Est. Sttlmt[2], mm	Est. Hor. Disp.[3], m	Remarks
F-713 (21)	5 / 3	0-116	0-4.5	Several liq. layers 0.5-4.5m thick at elev. 1279-1292m; lat. spread in 1 boring only
C-863 (22), C-867 (25)	9 / 4	73-210	0.0-2.8	A liq. layer >10m in thickness in SB-27-340; other relatively thin liq. layers in upper 20m
C-864 (23)	6 / 2	18-92	0.0-0.6	Several liq. layers 0.2-2m thick in upper 15m; lat. spread in 1 boring only
C-865 (24A)	4 / 0	12-95	0.0-1.2	Several liq. layers 0.5 to 5m thick in upper 16m
C-866 (24B)	5 / 2	17-194	0.0-1.1	Several liq. layers 0.5-5.5m thick at elev. 1280-1295m
C-869 (26)	4 / 1	10-223	0.0-8.8	Several liq. layers 0.5-8m thick in upper 16m; lat. spread in 1 boring only
F-714 (28)	3 / 0	0-39	0.0-3.5	One liq. layer 1.5m thick in upper 13m of one boring; lat spd in this layer only
F-715 (29)	5 / 0	0-73	0-0.9	Several liq. layers 0.5-5m thick in upper 24m
F-716 (30)	3 / 0	0-23	0-1.9	One liq. layer 1.5m thick in upper 15m of two borings

[1] No. Bor./CPT – Number of borings and CPT soundings considered in evaluation.
[2] Est. Sttlmt – Estimated liquefaction-induced settlement in potentially liquefiable layers within the upper 15 - 24 meters of the soil profile.
[3] Est. Hor. Disp. – Estimated horizontal displacement due to lateral spread in potentially liquefiable layers.

5.2 Design Criteria

In accordance with the RFP and communication with UDOT, all bridges and permanent retaining walls adjacent to 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*. Retaining walls and embankments not supporting abutments shall be 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 for walls and embankments supporting bridge abutments (up to 15 meters from the abutment) were conducted on the basis of these seismic design criteria.

6.0 FIELD AND LABORATORY TEST DATA

6.1 Field Exploration

Field exploration for Segment 5 included 46 borings and 21 CPT soundings that were carried out as part of Kleinfelder's (2000) study. Subsequent to this initial investigation, 40 additional borings were drilled in the vicinity of the proposed bridges. The locations of explorations completed during the original and supplemental investigations are listed in the Summary of Exploration Information Tables in Appendix A.

The approximate locations of explorations conducted during Kleinfelder's study (2000) are indicated on the Exploration Location Drawings in Appendix A. It should be noted that the Exploration Location Drawings were obtained from Kleinfelder's (2000) report, and some of the Segment 5 alignments have since been re-configured. The locations of explorations completed at each bridge site during both the initial and supplemental investigations are shown on the Soil Data Sheet Exploration Location Plans in Appendix A. The locations represented on the figures in Appendix A are based on the coordinates shown in the Soil Exploration Information Tables; the station and offset shown in the table (and on the exploration logs) may not reflect final alignment stationing.

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

The borings were drilled to depths ranging from about 5.2 to 53.9 meters below the ground surface. The CPT soundings extended to depths ranging from about 11.7 to 24.1 meters. In general, the locations and planned depths of the explorations were determined based on the preliminary size and location of primary bridges, roadway embankments, and MSE walls. The number and depth of explorations corresponding to each feature is summarized in Table 3.

Table 3: Number and Depths of Explorations for Segment 5

	Borings		CPT Soundings	
Feature	**No.**	**Depth, m**	**No.**	**Depth, m**
Bridges	61	5.2-53.9	14	12.0-24.1
Roadway Embankments	13	8.8-31.1	1	15.9
Walls	12	7.3-15.2	6	11.7-15.3

In general, borings for bridge structures 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, WB, SC)-XX-XXX

where,

SB = structure (bridge) boring
RB = roadway boring
WB = wall 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

It is noted that, with the project alignment modifications that occurred since Kleinfelder's 2000 investigation, some of the bridges have been re-configured, re-located, and/or re-numbered. Thus, the exploration numbers may not represent the current bridge number. The Soil Data Sheets in Appendix A should be referenced to view the approximate locations of explorations relative to the current proposed bridge locations.

6.1.1 Borings

Borings were accomplished using truck-, track-, and ATV-mounted drills equipped for soil sampling. Hollow-stem auger or rotary wash 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 G. Corrections for sampler diameter were made with the following equation:

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

where,

D_o= outside diameter of modified California sampler (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. 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. In one of the

CPT soundings (SC-33-358), shear wave velocity measurements were collected at one-meter intervals. Tabulated and plotted results are presented in Appendix F. 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 boring log key 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 Segment 5 structure borings are summarized in Table 4. 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 in general accordance with standard test methods, are summarized in Table 5. Other laboratory test results are presented on the boring logs in Appendix B and on the figures in Appendix C.

Table 4: Selected Laboratory Test Results for Segment 5 Structure Borings

FAK No.[1]	USCS	γ_d[2], kN/m^3	ω[2], %	LL	PI	% Fines	q_u[3] kPa
21	CH, CL, CL-ML, ML	13.6 – 16.9	22 – 38	NP – 54	NP – 26	63 – 97	63 – 102
	GW-GM, SM	--	--	--	--	11 – 28	--
22	CL, CL-ML, ML	15.5	28	NP – 42	NP – 21	51 – 97	89
	GP-SM, SW, SP, SP-SM, SM, SC	--	--	NP – 38	NP – 15	1 – 48	--
23	CL, ML	14.7 – 15.1	30 – 34	NP – 50	NP – 23	93 – 95	--
	GP-SM, SP, SP-SM, SM	--	--	NP – 26	NP – 2	4 – 41	--
24	CL, CL-ML, ML	14.7 – 15.8	27 – 32	NP – 49	NP – 24	50 – 94	19 – 85
	SP-SM, SM	--	--	NP – 34	NP – 11	5 – 47	--
25	CL, CL-ML, ML, MH	12.8 – 15.3	28 – 41	NP – 56	NP – 24	52 – 97	35 – 109
	GP-GM, GM, SW-SM, SP-SM, SM, SC	--	--	NP – 31	NP – 10	8 – 49	--
26	CH, CL, ML	15.0 – 16.5	25 – 30	NP – 63	NP – 37	67 – 99	67 – 101
	GP-GM, SP-SM, SM	--	--	NP – 33	NP – 3	4 – 20	--
28	CL, CL-ML, ML	15.2 – 17.0	23 – 30	NP – 35	NP – 12	82 – 99	74 – 216
	SC	--	--	--	--	37	--
29	CH, CL, ML	15.9 – 16.5	23 – 24	NP – 50	NP – 30	52 – 95	73 – 77
	GP-GM, GM, SP-SM, SM	16.2	24	NP	NP	9 – 40	--
30	CL, ML	14.7 – 18.2	23 – 28	NP – 34	NP – 13	50 – 90	39 – 46
	GP-GM, SP-SM, SM, SC	--	--	NP – 44	NP – 28	10 – 49	--

NP = Non-plastic

[1] FAK structure number as used during Kleinfelder's (2000) study and FAK's supplemental investigation.

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

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

Table 5: Soil Chemical Analysis Results for Segment 5 Borings

Boring No.	Sample Depth, m	USCS	pH	Resistivity, ohm-cm	Water Soluble Sulfate, ppm
SB-22-288	2.44	SM	8.4	3,900	23
SB-24-255	1.52	ML	7.8	4,800	<25
SB-24-258	1.52	ML	7.5	6,100	<120
SB-25-334	1.52	CL	7.1	6,100	150
SB-25-336	3.05	ML	7.5	6,100	150
SB-26-337	1.22	SP	8.3	2,800	<120
SB-27-345	2.74	CL	7.4	16,000	35
SB-28-346	1.52	CL	8.7	3,300	<12
SB-28-347	1.52	ML	8.4	3,200	<500
SB-29-348	2.13	ML	8.6	1,900	<5
SB-30-352	1.22	CL	7.6	3,400	120

7.0 GEOTECHNICAL ANALYSIS AND RECOMMENDATIONS

7.1 Bridges

Ten bridges will be constructed as part of Segment 5. One of these will extend along State Street across I-15 and the Union Pacific Railroad; three will extend along Burke Lane across US-89, I-15, and the Union Pacific Railroad; and the remaining six will extend across I-15 and/or the Union Pacific Railroad to connect the Legacy Parkway, US-89, and I-15. The bridges will be of simple span precast concrete (SSP), multiple span precast concrete (MSP), or multiple span welded steel plate girder (MSWS). Additional bridge details are summarized in Table 6.

Table 6: Segment 5 Bridges

UDOT No.	FAK No.	Location	Station	Description[1]	Width, m	Height[2], m
F-713	21	State St. over LP, I-15 & UPRR	SS 3+653 – 3+911	MSP, 6 spans (35 – 48m)	21.6	9.5 – 11.2
C-863	22	US 89 SB to LP SB over I-15 & UPRR	DC3 70+909 – 71+252	MSWS, 6 spans (40 – 65m)	13.0	10.7 – 12.3
C-864	23	I-15 SB to LP SB over UPRR	DC1 60+433 – 60+627	MSWS, 3 spans (55 – 78m)	16.6-25.6	9.8 – 13.0
C-865	24A	LP NB to I-15 NB over US89	DC2 20+430 – 20+642	MSP, 4 spans (42 – 65m)	13.0	8.3 – 10.4
C-866	24B	LP NB to I-15 NB over I-15 & UPRR	DC2 20+844 – 21+236	MSWS, 6 spans (45 – 74m)	13.0 & varies	9.6 – 17.3
C-867	25	LP NB to US89 NB over I-15 & UPRR	DC4 81+249 – 80+875	MSWS, 6 spans (43 – 72m)	13.0	10.2 – 12.0
C-869	26	US89 SB & Burke SB to I-15 SB over I-15	DC5 12+554 – 12+726	MSWS, 3 spans (44 – 58m)	16.6 & varies	6.9 – 8.0
F-714	28	Burke over UPRR	BL 4+883 – 4+932	SSP (49m)	37.1	3.9 – 4.0
F-715	29	Burke over I-15	BL 4+957 – 5+069	MSP, 3 spans (34 – 42m)	25.7	8.7 – 8.8
F-716	30	Burke over US89	BL 5+295 – 5+345	SSP (51m)	26.6	5.3 – 5.4

[1] "Description" includes type of bridge construction and no. of spans. Also, length of bridge is given for SSP bridge types; range in span lengths is given for other bridge types.

[2] "Height" for SSP bridges is the approximate range in abutment heights, and does not include height of underlying MSE walls/embankments. For other bridges, "Height" is the approximate range in bent heights (i.e., distance between top of footing and top of bent cap).

7.1.1 Subsurface Conditions

7.1.1.1 Soils

Native soils within Segment 5 of the Legacy Parkway Project may generally be described as interlayered clay, silt, sand and gravel. A more detailed discussion of materials encountered in the borings and CPT soundings at each bridge site is presented below. The soil descriptions are based on review of the exploration logs identified in Table 7; additional information is provided on the boring and CPT sounding logs. 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.

Table 7: Explorations Referenced for Soil Descriptions

Bridge No.	Exploration Nos.
F-713 (FAK #21)	LSB-21-475, SB-21-282, SB-21-283, LSB-21-477, SB-21-284, SB-22-285, SB-22-288, SC-22-286, SC-22-287
C-863, C-867 (FAK #22, #25)	LSB-22-435, RB-385, LSB-22-436, LSB-22-437, LSB-22-490, SC-27-341, SC-27-344
C-864 (FAK #23)	RB-365, LSB-23-443, SB-23-289, LSB-23-244, SB-23-290C, SC-23-290A
C-865 (FAK #24A)	LSB-24-498, RB-372, RB-367, LSB-22-432, LSB-22-433, RB-373, RC-373
C-866 (FAK #24B)	LSB-24-450, LSB-24-449, SB-25-336, LSB-24-448, SB-25-334, LSB-24-486, SB-24-258, LSB-24-447, RB-365, SC-25-335, SC-24-256
C-869 (FAK #26)	LSB-26-489, LSB-26-456, SB-26-337, LSB-26-487, SB-26-339, SC-26-338
F-714 (FAK #28)	LSB-28-457, SB-28-346, SB-28-347
F-715 (FAK #29)	LSB-29-458, SB-29-348, LSB-29-488, LSB-29-459, LSB-29-350, LSB-29-501, SC-29-349
F-715 (FAK #30)	LSB-30-460, SB-30-351, LSB-30-461, SB-30-352

Bridge F-713 (FAK #21) over I-15 at State Street

Existing embankment fill, extending to depths of about 4.5 to 12 meters below the ground surface, was encountered in each of the borings drilled in the vicinity of Bridge F-713. The subsurface profile beneath the fill consists of interlayered clays (CH, CL, CL-ML), silts (MH, ML), sands (SP, SP-SM, SM, SC), and gravels (GW-GM, GP, GM), with the materials becoming increasingly granular with depth. The profile beneath the western half of the bridge site generally contains fewer coarse-grained soils than that on the eastern half.

On the western side, soils above an elevation of approximately 1281 to 1283 meters predominantly consist of clay and silt layers with a few interbedded sand layers. The

clay and silt soils are generally soft to stiff, with $(N_1)_{60}$ values ranging between about 4 and 14. The interbedded sand layers are typically medium dense to dense based on $(N_1)_{60}$ values ranging from 15 to 43. Below an elevation of about 1281 to 1283 meters, soils predominantly consist of sand and gravel with occasional clay and silt layers. The sand and gravel layers are generally dense to very dense, with $(N_1)_{60}$ values ranging from 33 to greater than 50. The interbedded fine-grained soils are stiff to hard, based on $(N_1)_{60}$ values ranging from 13 to greater than 50.

On the eastern portion of the bridge site, native soils above an elevation of approximately 1291 to 1295 meters consist of medium stiff silt. The silt is underlain by medium dense to very dense sand and gravel. Measured $(N_1)_{60}$ values of the silt ranged between 5 and 8, and those of the underlying granular materials ranged from 19 to greater than 50.

At this bridge site, the clay and silt layers are about 1.5 to 9 meters thick, and contain frequent seams of sand. Based on CPT data collected in the upper 25 meters of the soil profile, average tip resistances in the fine-grained soils range between about 1 and 2.5 MPa. The sand and gravel layers are about 1 to 10 meters thick, and average tip resistances range from about 15 MPa to greater than 25 MPa.

Bridges C-863, C-867 (FAK #22, 25) over I-15 connecting Legacy Parkway and US-89

Existing embankment fill in the vicinity of Bridges C-863 and C-867 extends to depths ranging between about 1.5 to 5.5 meters below the ground surface. The subsurface profile beneath the fill predominantly consists of sand (SP-SM, SP, SM, SC) and gravel (GP-GM, GP, GM) with intermittent clay (CH, CL) and silt (ML) layers.

Above an elevation of approximately 1286 meters, medium dense sand layers with occasional loose and dense zones were encountered. Typical $(N_1)_{60}$ values of the sand range from about 10 to 27. The interbedded clay/silt layers are generally soft to stiff, with typical N-values ranging between 2 and 15. Below about 1286 meters, the sand and gravel layers are medium dense to very dense, based on $(N_1)_{60}$ values ranging from 17 to greater than 50. The interbedded clay/silt layers are medium stiff to very stiff with $(N_1)_{60}$ values ranging between 5 and 24.

The sand and gravel layers at this site are about 0.5 to 15 meters thick and contain occasional seams of silt and clay. The clay and silt layers are approximately 1.5 to 11 meters thick and contain frequent seams of sand and gravel. Average tip resistances measured during CPT soundings in the upper 15 meters of the profile range from about 10 MPa to greater than 25 MPa in the sand and gravel layers, and from approximately 0.5 to 6 MPa in the clay and silt layers.

Bridge C-864 (FAK #23) over UPRR connecting Legacy Parkway and I-15

Fill extending to a depth of about 5 meters was encountered in one of the borings (SB-23-290C) drilled north of the existing UPRR tracks. Native site soils consist of interlayered clays (CL), silts (ML), sands (SP, SP-SM, SM, SC), and gravels (GP, GM). Above an elevation of about 1277 meters, the soils are predominantly granular; below, the soils are more interlayered and fairly discontinuous. The consistency/relative density of the subsurface materials varies substantially with depth and lateral extent.

The silt and clay layers are about 1 to 6.5 meters thick, and contain occasional sand seams. With the exception of a few soft zones, these soils are generally stiff to hard, with $(N_1)_{60}$ values ranging between 9 and 36. The sand and gravel layers range in thickness between about 1 and 10 meters, and based on $(N_1)_{60}$ values ranging from 10 to greater than 50, they are generally medium dense to very dense. Based on CPT data collected in the upper 15 meters of the profile, average tip resistances of the clay/silt layers are on the order of 5 MPa or less, and those for the sand/gravel layers range from about 10 MPa to greater than 25 MPa.

Bridge C-865 (FAK #24A) over US-89 connecting Legacy Parkway and I-15

Fill extending to a depth of about 1 to 1.5 meters was encountered in two of the borings (RB-373, LSB-24-498) drilled in the vicinity of Bridge C-865. The native soils predominantly consist of sand (SP, SM, SC) with intermittent clay (CH, CL, CL-ML) and silt (ML) layers. Frequent gravel (GW-GM, GP, GM) layers were encountered in one of the borings (RB-373) drilled near the north end of the bridge. In general, the soils become increasingly granular with depth.

Above an elevation of approximately 1282 meters, the sands and gravels are loose to medium dense with occasional dense zones, and the clays and silts are soft to stiff with occasional very stiff zones. Average $(N_1)_{60}$ values of the sands and gravels generally range from 6 to 29, and those of the clays and silts range from 4 to 15. Below about 1282 meters, the sands and gravels are medium dense to very dense, with an apparently continuous layer of very dense granular soil encountered between elevations of about 1255 and 1265 meters. Average $(N_1)_{60}$ values of these soils range from 17 to greater than 50. The occasional interbedded clay/silt layers below 1282 meters are stiff to hard based on $(N_1)_{60}$ values ranging between 11 and 36.

The sand and gravel layers at this bridge site are about 1 to 10 meters thick and contain frequent seams of silt and clay. The clay and silt layers are approximately 0.5 to 5 meters

thick and contain frequent seams of sand. Average tip resistances measured in the upper 16 meters of the soil profile ranged from about 15 MPa to greater than 25 MPa in the sand and gravel layers, and from less than 0.5 to about 3 MPa in the clay and silt layers.

Bridge C-866 (FAK #24B) over I-15 and UPRR connecting Legacy Parkway and I-15

Site soils consist of interlayered clays (CL, CL-ML), silts (ML), sands (SP, SP-SM, SM), and gravels (GP, GM). In general, the soils in the upper 15 meters of a boring (RB-365) drilled near the south side of the bridge were denser/stiffer than in the other borings.

Above an elevation of approximately 1285 meters, the subsurface profile predominantly consists of soft to stiff clays and silts with occasional very stiff zones. Typical $(N_1)_{60}$ values of these clays and silts range from about 4 to 11. The interbedded sand and gravel layers in this depth range are generally medium dense with some dense to very dense zones. Average $(N_1)_{60}$ values of these granular soils range between 10 and 26. Between elevations of about 1274 and 1285 meters, a fairly continuous layer of sand and gravel was encountered. This sand/gravel layer is generally medium dense to very dense, based on $(N_1)_{60}$ values ranging from 15 to greater than 50. Below an elevation of about 1274 meters, the soils appear to be more interlayered. The clay/silt layers are typically medium stiff to very stiff with some hard zones, and the sand/gravel layers are medium dense to very dense with some loose zones. Average $(N_1)_{60}$ values range from 8 to 25 in the clays/silts and from 12 to greater than 50 in the sands/gravels.

The sand and gravel layers are on the order of 1 to 10 meters thick, and contain occasional silt seams. The clay and silt layers are also about 1 to 10 meters thick, with occasional sand seams. Based on CPT data collected in the upper 12 to 16 meters of the profile, average tip resistances in the sand/gravel layers range from about 13 to 25 MPa, and those in the clay/silt layers are on the order of 1.5 to 5 MPa.

Bridge C-869 (FAK #26) over I-15 connecting US-89 and Burke Lane to I-15

Existing embankment fill in the vicinity of Bridge C-869 extends to depths ranging between about 1.5 to 4 meters below the ground surface. In general, the native soils beneath the fill (where encountered) predominantly consist of sand (SP-SM, SP, SM) and gravel (GP-GM, GP, GM) with frequent clay (CH, CL) and silt (ML) layers.

Above an elevation of approximately 1286 meters, the clays and silts are generally soft to stiff with occasional very stiff zones, and the sands and gravels are generally medium dense to dense with some loose zones. Within this depth range, typical $(N_1)_{60}$ values in the clay/silt layers range from 2 to 10, and those in sand/gravel layers range from 12 to

37. Between elevations of about 1273 and 1286 meters, a generally continuous layer of medium dense to very dense sand/gravel was encountered. Measured $(N_1)_{60}$ values range from 11 to greater than 50, with lower values in occasional loose zones. The soils are more interlayered below about 1273 meters. The clay and silt layers are medium stiff to hard with $(N_1)_{60}$ values ranging from 7 to greater than 50. The sand and gravel layers are medium dense to very dense based on $(N_1)_{60}$ values ranging from 11 to greater than 50.

The thickness of the clay/silt layers at this site ranges from about 0.5 to 10.5 meters, and the thickness of the sand/gravel layers ranges from about 0.5 to 13 meters. Frequent seams and thin layers of sand and silt were encountered within the subsurface profile. Based on CPT data collected in the upper 16 meters, CPT tip resistances in the clay/silt layers range between about 1 and 5 MPa. In the sand/gravel layers, average tip resistances range from about 12 MPa to greater than 25 MPa.

Bridge F-714 (FAK #28) over UPRR at Burke Lane

Fill extending to a depth of about 1.5 meters was encountered in one of the borings (SB-28-347) drilled on the east side of the proposed bridge. Above an elevation of about 1280 to 1282 meters, the subsurface profile predominantly consists of clay (CL, CL-ML) and silt (ML) layers. At deeper elevations, site soils are primarily comprised of sands (SP, SP-SM, SM, SC) and gravels (GP, GM) with intermittent layers of silt and clay.

The clay/silt layers have thicknesses ranging from about 1.5 to 10.5 meters, and are generally medium stiff to very stiff based on average $(N_1)_{60}$ values ranging from 5 to 27. The sand/gravel layers range in thickness from about 1.5 to 12 meters, and are medium dense to very dense with $(N_1)_{60}$ values ranging from 10 to greater than 50.

Bridge F-715 (FAK #29) over I-15 at Burke Lane

Existing embankment fill, extending to depths of about 1.5 to 10 meters below the ground surface, was encountered in several of the borings (SB-29-348, SB-29-350, LSB-29-348, LSB-29-501) drilled in the vicinity of Bridge F-715. Site soils consist of interlayered clays (CL, CH), silts (ML), sands (SP, SP-SM, SM, SC), and gravels (GP, GP-GM, GM).

Soils above an elevation of approximately 1283 meters generally consist of medium dense sand and medium stiff to very stiff clay/silt with a few soft zones. Within this depth range, average $(N_1)_{60}$ values of the clay/silt layers vary from 5 to 17, and those for the sand layers vary from 15 to 24. Between elevations of about 1268 and 1283 meters, a relatively continuous layer of sand and gravel was encountered. This sand/gravel layer is medium dense to very dense with $(N_1)_{60}$ values ranging from 12 to greater than 50.

Below this sand/gravel layer, the soils are interlayered and fairly discontinuous. The clays/silts are typically soft to stiff with occasional very stiff to hard zones, and the sands/gravels are generally medium dense to very dense. Typical $(N_1)_{60}$ values range from 3 to 14 in the clay/silt layers, and from 11 to greater than 50 in the sand/gravel layers.

At this bridge site, the clay and silt layers are about 0.5 to 12 meters thick and contain frequent sand seams. Based on CPT data collected in the upper 17 meters of the soil profile, average tip resistances in the fine-grained soils range between about 1.5 and 7 MPa. The sand and gravel layers are about 0.3 to 13 meters thick, and average tip resistances range from about 15 MPa to greater than 25 MPa.

Bridge F-716 (FAK #30) over US-89 at Burke Lane

Fill extending to a depth of about 2 meters was encountered in one of the borings (SB-30-351) drilled on the west side of the proposed bridge. Site soils consist of interlayered clays (CL), silts (ML), sands (SP, SP-SM, SM, SC), and gravels (GP, GP-GM, GM).

Above an elevation of approximately 1287 meters, the subsurface profile generally consists of stiff clay/silt layers and loose to medium dense sand layers. Average $(N_1)_{60}$ values of the clay/silt layers range from 8 to 13, and average $(N_1)_{60}$ values of the sand layers range from 9 to 21. Between elevations of about 1273 and 1287 meters, a fairly continuous sand/gravel layer was encountered. This sand/gravel layer is medium dense to very dense with $(N_1)_{60}$ values ranging from 13 to greater than 50. Below an elevation of about 1273 meters, the interlayered soil profile generally consists of stiff to very stiff clay/silt layers and loose to medium dense sand/gravel layers with occasional very dense zones. Average $(N_1)_{60}$ values range from 9 to 15 in the clay/silt layers, and from 7 to 29 in the sand/gravel layers. In the vicinity of Bridge F-716, the clay/silt layers are on the order of 0.5 to 5.5 meters thick, and the sand/gravel layers are about 1 to 11.5 meters thick.

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 (i.e., below existing fill, where encountered). Drilling fluid was using during drilling operations; for this reason, groundwater elevations were not measured during drilling 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 H. 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 bridge structures are presented in Table 8. Additional design data, including reference to explorations used in analyses, are included with the Geotechnical Recommendations Memoranda in Appendix H. Maximum pile settlements, estimated as described in the pile capacity protocol in Appendix H, were determined to be within the limits specified by the contract documents.

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) Tables in Appendix H.

Table 8: Segment 5 Bridges – General Pile Design Data

(continued on following page)

Bridge No.	Support No.	Min. Tip Elevation, m	Estimated Length, m	Service Load, kN	Req'd Driving Resist., Kn
F-713 (FAK #21)	Abut 1	1272.3	26	934	2,102
	Bent 2	1274.0	17	668	2,184
	Bent 3	1272.0	20	668	2,069
	Bent 4	1263.3	31	668	2,630
	Bent 5	1266.5	27	668	2,894
	Bent 6	1267.5	26	668	2,961
	Abut 7	1283.9	18	934	2,102

Table 8, continued: Segment 5 Bridges – General Pile Design Data

Bridge No.	Support No.	Min. Tip Elevation, m	Estimated Length, m	Service Load, kN	Req'd Driving Resist., kN
C-863 (FAK# 22)	Abut 1	1282.5	21	1,005	2,261
	Bent 2	1266.0	26	618	3,379
	Bent 3	1271.8	21	701	3,240
	Bent 4	1276.0	17	658	3,360
	Bent 5	1267.9	27	457	3,665
	Bent 6	1271.0	24	750	3,368
	Abut 7	1286.1	21	1,472	3,312
C-864 (FAK #23)	Abut 1	1281.7	23	1,557	3,503
	Bent 2	1273.5	20	658	2,058
	Bent 3	1279.4	15	489	1,748
	Abut 4	1283.0	20	1,557	3,503
C-865 (FAK #24A)	Abut 1	1280.0	18	1,557	3,503
	Bent 2	1265.5	27	561	2,556
	Bent 3	1272.9	22	556	2,507
	Bent 4	1274.7	21	516	2,708
	Abut 5	1279.6	26	1,557	3,503
C-866 (FAK #24B)	Abut 1	1281.7	23	1,557	3,503
	Bent 2	1277.0	16	436	1,600
	Bent 3	1278.4	17	414	1,718
	Bent 4	1275.4	15	356	1,911
	Bent 5	1272.8	19	787	2,535
	Bent 6	1278.2	15	463	2,335
	Abut 7	1270.1	32	1,557	3,503
C-867 (FAK #25)	Abut 1	1283.3	18	1,420	3,195
	Bent 2	1269.5	23	824	3,567
	Bent 3	1272.0	20	903	3,475
	Bent 4	1273.0	20	863	3,583
	Bent 5	1269.4	25	565	4,135
	Bent 6	1271.3	24	968	3,350
	Abut 7	1286.1	19	1,676	3,771
C-869 (FAK# 26)	Abut 1	1283.0	16	783	1,762
	Bent 2	1279.0	15	952	2,142
	Bent 3	1279.0	15	756	2,053
	Abut 4	1280.2	23	663	1,492
F-714 (FAK #28)	Abut 1	1279.5	22	866	1,950
	Abut 2	1282.6	20	700	1,575
F-715 (FAK #29)	Abut 1	1280.6	22	760	1,710
	Bent 2	1278.5	15	471	1,555
	Bent 3	1278.5	15	441	1,688
	Abut 4	1279.9	22	689	1,550
F-716 (#30)	Abut 1, 2	1285.0	19	1,268	2,853

7.1.3 Pile Capacity Field Verification

The design loads must be field-verified using Pile Driving Analyzer (PDA) equipment in accordance with the contract documents 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 documents 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

Maximum embankment heights in Segment 5 are generally on the order of 7 to 12 meters, except along lines DC1 and DC2, where maximum embankment heights ranging between about 16 and 17 meters are required for bridge abutments. Approximate maximum embankment heights are summarized in Table 9.

Table 9: Segment 5 Embankments

Line	Approximate Station	Approx Max Ht[1], m
Ramp A	RA 1+000 to 1+340	10
Ramp B	RB 2+000 to 2+590	9.3
Ramp C	RC 40+130 to 40+545	10
Ramp D	RD 15+210 to 15+410	6.7
Ramp G	RG 9+080 to 9+450	11.7
Ramp H	RH 8+000 to 8+440	10.1
I-15 SB to LP SB	DC1 59+815 to 61+000	16.0
LP NB to I-15 NB	DC2 20+260 to 21+640	17.0
US-89 SB to LP SB	DC3 70+100 to 70+900, DC3 71+250 to 71+700	12.2
LP NB to US-89 NB	DC4 80+400 to 80+876, DC4 81+250 to 81+700	12.2
US-89 SB to I-15 SB	DC5 11+928 to 13+000	9.7
I-15 NB to US-89 NB	DC6 7+000 to 7+730	8.1
Burke Lane	BL 4+021 to 4+480, BL 5+069 to 5+560	11.5
State Street	SS 3+450 to 3+940	7.8

[1] Maximum height generally corresponds to embankment heights without surcharge for new bridge abutments.

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 H. Ranges of estimated settlement magnitudes (primary plus four cycles of secondary) for representative cross-sections along the Segment 1 alignments are given in Table 10.

Table 10: Settlement Estimates, Surcharge Heights, and Wick Drains for Segment 5

Approx Station	Embank Sttlmnt[1] mm	Sur-charge Ht, m	Wick Spacing/ Time[2]	Wick Length[3], m	Notes[4]
RA 1+000 - 1+340	25-400	0.0-3.0	3.0m/ 90days	14	NR for 1+060 to 1+340
RB 2+000 - 2+590	100-550	0.0-3.0	4.0m / 45d	16	NR for 2+220 to 2+590
RC 40+130 - 40+410	450-650	0.0-3.0	4.0m / ≥60d	12	Wicks NR for 40+260 to 40+320
RC 40+420 - 40+583	175-450	2.5-3.0	3.0m / 90d	14	Wicks NR for 40+420 to 40+545
RD 15+210 - 15+410	100-575	0.0-3.5	4.0m / 90d	12	NR for 15+320 to 15+410
RG 9+080 - 9+450	300-375	2.0-2.5	3.5m / 120d	12	--
RH 8+000 - 8+440	150-525	0.0-3.0	4.0m / 135d	9	NR for 8+310 to 8+360
DC1 60+625 - 61+000	450-650	0.0-3.0	4.0m / ≥60d	12	NR for 60+830-61+000; wicks NR for 60+750 to 60+830
DC1 59+815 - 60+420	50-900	0.0-3.3	4.0m / 60d	13	NR for 59+815 to 60+020
DC2 20+260 - 20+846	50-900	0.0-3.7	4.0m / 60d	13	NR for 20+260 to 20+280
DC2 21+210 - 21+640	100-575	0.0-3.0	4.0m / 90d	12	NR for 21+270 to 21+640
DC3 70+100 - 70+900	50-875	0.0-2.8	4.0m / 60d	13	NR for 70+100 to 70+660
DC3 71+251 - 71+800	175-600	0.0-4.0	4.0m /135d	9	NR for 71+580 to 71+800
DC4 80+400 - 80+876	50-875	0.0-2.7	4.0m / 60d	13	NR for 80+400 to 80+660
DC4 81+247 - 81+800	175-600	0.0-4.0	4.0m /135d	9	NR for 81+580 to 81+800
DC5 11+928 - 12+560	25-400	0.0-2.0	NR	NR	NR for 59+815 to 60+020
DC5 12+724 - 13+000	125	2.0	3.5m / 120d	12	--
DC6 7+000 - 7+730	175-500	0.0-2.7	4.0m / 135d	9	NR for 7+000 to 7+210 & 7+670 - 7+730
BL 4+021 - 4+884	150-575	0.0-2.5	2.0-3.0m / 45-75d	11.5	NR for 4+021 to 4+480
BL 5+069 - 5+560	50-525	1.0-3.0	4.0m / 45-105 d	8 – 10	--
SS 3+450 - 3+940	25-250	0.0-2.2	2.0m / 45d	15	NR for 3+450 to 3+560 & 3+900 - 3+940

[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, unless otherwise stated)

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 45 and 650 days for the Segment 5 embankments. To reduce the amount of time for completion and thereby minimize post-construction consolidation settlement,

surcharges with prefabricated vertical drains are recommended for embankment fills greater than 3 meters in height. Specific recommendations for surcharge heights, wick drain spacings, and wick drain tip elevations for each Segment 1 alignment are provided in the Embankment and Grading Summary Tables in Appendix H.

With consideration for the recommended surcharge heights, wick drain spacings, and total estimated settlements, it is predicted that each stage of embankment fill will require approximately 45 to 150 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 8 and 16 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 11.

Table 11: 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 summary tables in Appendix H, indicate that high-strength geotextile (HSG) reinforcement will be required for many of the Segment 5 embankments to achieve the required FOS under seismic conditions. Approximate locations where HSG is required are identified in Table 12.

Table 12: Segment 5 Embankments Where HSG Required

Line	Approximate Station[1]
Ramp A (RA)	1+015 to 1+040
Ramp B (RB)	2+115 to 2+180
Ramp C (RC)	40+135 to 40+175
	40+400 to 40+515
Ramp G (RG)	9+080 to 9+440
Ramp H (RH)	8+000 to 8+140
I-15 SB to LP SB (DC1)	60+120 to 60+436
	60+625 to 61+020
LP NB to I-15 NB (DC2)	20+340 to 20+846
	21+240 to 21+255
US-89 SB to LP SB (DC3)	70+840 to 70+910
	71+250 to 71+300
LP NB to US-89 NB (DC4)	80+740 to 80+877
	81+250 to 81+300
US-89 SB to I-15 SB (DC5)	12+500 to 12+740
I-15 NB to US-89 NB (DC6)	7+325 to 7+480
State Street (SS)	3+570 to 3+639
Burke Lane (BL)	4+640 to 4+884
	5+068 to 5+360

[1] Greatest station ranges are shown where various options are available. Station ranges are approximate; geotextile should extend to bridge abutments as applicable. Also, HSG from adjacent alignments may extend under footprint of embankment in areas where HSG not required.

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 project alignments. These options are presented in tabular form in the High Strength Geotextile and Staging Options Memoranda in Appendix H.

Results of the short-term stability analysis indicate that staging of embankment fills (including surcharge) greater than 5 meters in height is required to achieve a gain in undrained shear strength and reduce the potential for foundation instability. Staging options for Segment 5 embankment fills are included with the HSG information in Appendix H.

7.2.2 Instrumentation

Instrumentation installation and monitoring, performed in accordance with the contract documents, 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 H. 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 H should be followed.

Embankment construction shall be accomplished using approved materials in accordance with applicable contract documents. 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 5 has identified the need to construct 31 MSE walls for support of roadway embankments. Based on the results of settlement analyses, one of these (R-393-01) will be a two-stage wall; the others will be one-stage walls. Wall details are summarized in Table 13.

Table 13: Segment 5 MSE Walls

(continued on following page)

Wall No.	Approx. Station	Approx. Height[1], m	Approx. Length, m	Remarks
R-393-01	BL 4+862 – 4+863	9.7	84	Provides support to west abutment of Br F-714
R-393-02	RC 40+480 – RA 1+125	11.1	169	Provides support to west side of Ramp A & east abutment of Br F-714
R-393-03	RC 40+493 – RA 1+243	9.5	270	Provides support to east side of Ramp A & west abutment of Br F-715
R-393-04	RA 1+290 – 1+440	1.6	150	Provides support to west side of Ramp A
R-393-05	RC 40+335 – 40+480	10.2	145	Provides support to west side of Ramp C; abuts south side of Wall R-393-02
R-393-06	RC 40+340 – 40+493	8.1	153	Provides support to east side of Ramp C; abuts south side of Wall R-393-03
R-393-07	RB 2+115 – 2+456	6.9	340	Provides support to east side of Ramp B
R-393-07A	RB 2+456 – 15N 60+444	3.6	435	Provides support to east side of Ramp B, abuts north side of Wall R-393-07
R-393-09	BL 5+090 – 5+078	9.2	82	Provides support to east abutment of Br F-715; permits access over I-15 along Burke Lane
R-393-10	BL 5+278 – 5+279	9.0	86	Provides support to west abutment of Br F-716; permits access over US89 ramps along Burke
R-393-11	BL 5+367 – 5+358	4.1	90	Provides support to east abutment of Br F-716; permits access over US89 ramps along Burke
R-393-12	BL 5+436 – 5+553	4.2	119	Provides support on north side of Burke Lane
R-393-13	DC5 12+390 – 12+500	8.6	111	Provides support on west side of US89 SB/I-15 SB ramp
R-393-15	DC5 12+733 – 12+752	8.3	66	Provides support to north abutment of Br C-869
R-393-16	DC5 11+939 – 12+390	2.5	449	Provides support on west side of US89 SB/I-15 SB ramp; abuts south side of wall R-393-13
R-393-17	DC2 20+070 – 20+205	2.9	135	Provides support on east side of LPNB/I-15NB ramp
R-393-18	DC2 20+398 – 20+433	5.8	35	Provides support to south abutment of Br C-865 on west side of LPNB/I-15NB ramp
R-393-19	DC2 20+646 – 20+827	5.0	183	Provides support to north abutment of Br C-865 on west side of LPNB/I-15 NB ramp
R-393-20	DC1 60+614 – 60+673	6.5	55	Provides support to north abutment of Br C-864 on west side of I-15SB/LPSB ramp

[1] Approx. Height corresponds to the approximate maximum height from bottom of leveling pad to top of coping.

Table 13, continued: Segment 5 MSE Walls

Wall No.	Approx. Station	Approx. Height[1], m	Approx. Length, m	Remarks
R-393-21	DC4 81+253 – 81+340	5.2	89	Provides support to north abutment of Br C-867 on east side of LPNB/US89NB ramp
R-393-22	SS 3+624 – 3+636	8.2	87	Provides support to west abutment of Br F-713
R-393-23	DC3 70+881 – 70+893	6.5	70	Provides support to south abutment of Br C-863
R-393-24	DC2 20+767 – 20+825	12.8	57	Provides support on east side of LPNB/I-15NB ramp
R-393-25	DC4 80+770 – 80+798	5.2	28	Provides support on east side of LPNB/US89NB ramp
R-393-26	DC1 60+409 – 60+420	7.5	67	Provides support to south abutment of Br C-864
R-393-27	DC2 21+226 – 21+274	10.3	47	Provides support to north abutment of Br C-866 on west side of LPNB/I-15NB
R-393-28	DC1 60+647 – 60+867	5.3	222	Provides support to east side of I-15SB/LPSB; provides support to north abutment of Br C-864
R-393-29	DC6 7+250 – 7+443	6.3	192	Provides support to east side of I-15NB/US89 NB & Ramp H
R-393-30	LD 1+280 – 1+145	7.5	135	Provides support to east side of Lagoon Drive and east abutment of Br F-713
R-393-31	SS 3+520 – 3+624	5.3	104	Provides support to west abutment of Br F-713; abuts wall R-393-22 on south side of State St
R-393-32	I15S 58+440 – 58+880	3.6	444	Provides support to east side of I-15SB; located between I-15NB and I-15SB

[1] Approx. Height corresponds to the approximate maximum height from bottom of leveling pad to top of coping.

7.3.1 Analysis and Design Recommendations

Analysis of global stability, bearing capacity and settlements of MSE walls are discussed in this section. Per general industry practice for design/construction of MSE walls, internal stability analysis is the responsibility of the proprietary wall designer. Wall design shall include consideration for applicable static and seismic loadings, adjacent structures, supported signs and light poles, etc. Ranges of magnitudes for the various geotechnical parameters for MSE wall design are provided in Table 14.

Table 14: Geotechnical Parameters for Segment 5 MSE Walls

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

Analysis of global stability was conducted for the MSE walls using the FOS values given in Table 15. The wall stability analysis was performed in conjunction with the embankment stability analysis; a more thorough discussion of the analysis methodology is provided in the "Embankments" section of this report. Based on the analysis results, staging and geotextile fabric are recommended for many embankments and the supporting walls in Segment 5. Fill placement for walls 5 meters or more in height shall be staged to mitigate static, short-term stability concerns. High-strength geotextile fabric shall be used where deemed appropriate to mitigate long-term stability under seismic conditions. Recommendations regarding these improvement techniques were discussed in the "Embankments" section of this report.

Table 15: Minimum Factors of Safety For Global Stability of MSE Walls

Condition	Abutment Walls[1]	General Walls
Staged Construction, Static, Adjacent Impact	1.3	1.3
Staged Construction, Static, Non-Impact	--	1.1
Long-Term, Static	1.4	1.3
Long-Term, Dynamic (10% in 50 yr = 0.6g)	1.1	1.1

[1] Within 15 meters of the abutment.

Analysis of bearing capacity was conducted in general accordance with AASHTO specifications to achieve an FOS of 2.5. Native subgrade materials beneath walls consist of clays and silts with an allowable bearing capacity on the order of 60 kPa. It is

recommended to overexcavate to 1 meter below the bottom of the footing and backfill using select material in accordance with project specifications. Overexcavation and replacement should extend at least 1 meter beyond each edge of the footing. Footings established on a minimum of 1 meter of properly placed and compacted select backfill may be proportioned for a maximum allowable bearing pressure of 120 kPa.

Estimated settlements for the Segment 5 MSE walls were computed following the same methodology as for embankments. Estimated maximum settlements at the wall face and beneath the supported embankment (with surcharge), as well as differential settlement per length of wall, are summarized in Table 16, which begins on the following page. Prefabricated vertical wick drains with surcharges shall be used for high walls and embankments as required to achieve the required degree of consolidation prior to pavement construction.

7.3.2 Construction Considerations

Wall construction shall be accomplished using approved materials in accordance with applicable contract documents 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 MSE 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 H 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.

Table 16: Estimated Settlement of Segment 5 MSE Walls

Wall No.	Approximate Station[1]	Max Settlement[2] mm	Max Surch. Ht, m	Differential Settlement
R-393-01	BL 4+880	575	2.5	<2000mm/1000m of wall[3]
R-393-02	BL 4+932, RC 40+500 to 40+583	150 – 475	3.0	<1000mm/1000m of wall[3]
R-393-03	RA 1+000 to 1+243	25 – 400	3.0	<1000mm/1000m of wall[3]
R-393-04	RA 1+290 to 1+340	25	0	<1000mm/1000m of wall[3]
R-393-05	RC 40+335 to 40+480	175 – 500[4]	2.5	<1000mm/1000m of wall[3]
R-393-06	RC 40+340 to 40+493	175 – 500[4]	2.5	<1000mm/1000m of wall[3]
R-393-07	RB 2+120	75 – 375	3.0	<1000mm/1000m of wall[3]
R-393-07A	RB 2+456 to RB 2+590	100[5]	1.0	<1000mm/1000m of wall[3]
R-393-09	BL 5+065	150	3.0	<1000mm/1000m of wall[3]
R-393-10	BL 5+295	275 – 400	3.0	<1000mm/1000m of wall[3]
R-393-11	BL 5+342	200 – 325	2.0	<1000mm/1000m of wall[3]
R-393-12	BL 5+500	75 – 100	1.0	<1000mm/1000m of wall[3]
R-393-13	DC5 12+390 to 12+500	25 – 225	1.0	100mm/100m of wall
R-393-15	DC5 12+724 to 12+752	100 – 150	2.0	25mm/100m of wall
R-393-16	DC5 11+929 to 12+380	25	0	25mm/100m of wall
R-393-17	DC2 20+070 to 20+200	25 – 50	0	25mm/100m of wall
R-393-18	DC2 20+398 to 20+433	300 – 500	3.0	50mm/35m of wall
R-393-19	DC2 20+636 to 20+827	500 – 900	3.7	75mm/100m of wall
R-393-20	DC1 60+614 to 60+673	400 – 650	2.5	100mm/100m of wall
R-393-21	DC4 81+247 to 81+285	425 – 625	3.0	50mm/39m of wall
R-393-22	SS 3+540 to 3+655	100 – 200	2.2	25mm/115m of wall
R-393-23	DC3 70+881 to 70+913	400 – 875	3.7	50mm/70m of wall
R-393-24	DC2 20+769 to 20+823	625 – 1025	3.7	50mm/100m of wall
R-393-25	DC4 80+770 to 80+798	325 – 525	2.3	50mm/28m of wall
R-393-26	DC1 60+415 to 60+437	450 – 775	4.2	50mm/47m of wall
R-393-27	DC2 21+229 to 21+266	325 – 575	3.0	175mm/36m of wall
R-393-28	DC1 60+636 to 60+820	325 – 600	3.0	200mm/100m of wall
R-393-28, cont'd	DC1 60+820 to 60+880	150 – 325	1.5	75mm/100m of wall
R-393-29	DC6 7+250 to 7+461	225 – 450	2.7	75mm/100m of wall
R-393-30	SS 3+900	250[4]	0.0	<1000mm/1000m of wall[3]
R-393-31	SS 3+540 to 3+655	100 – 200	2.2	25mm/115m of wall
R-393-32	I15S 58+440 to 58+880	Minimal	0.0	<1000mm/1000m of wall[3]

[1] Station ranges are approximate. In some cases, the station of the analysis cross-section is given.

[2] Estimated settlement is that induced by the MSE wall-supported embankment (near the embankment center) and underlying embankment, where applicable. For staged construction, where MSE embankments & surcharge are placed some time after the base embankment, settlement should be re-evaluated.

[3] Differential settlement is anticipated to be < 1% for 1-stage walls and < 2% for 2-stage walls.

[4] Reported settlement corresponds to maximum settlement estimated during embankment analysis.

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. Bearing capacity analysis was performed as required in general accordance with the protocol in Appendix H. 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 (Signs) Tables in Appendix H.

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 H. Selected results of analyses are summarized in Table 17.

Table 17: Estimated Maximum Settlement for Utilities

Description/ Approximate Station	Embankment Height, m	Est. Settlement Below Embankment, mm
Utilities along Clark / DC3 70+660	3.9	225 – 300
Utilities near Burke / RA 1+360	1.6	25
Utilities near Burke / RB 2+380, 2+540	0.6 – 0.9	25
Burke Lane Water Line Relocation/ RG 9+150	2.0	300
Burke Lane Water Line Relocation / BL 5+440	2.0	225
Burke Lane Water Line Relocation / DC1 60+760, 60+820	7.0 – 7.1	325 – 475
Sanitary Sewer Line Relocation near Br 30 (ID 8:16-18:5)	13.2 – 13.4	275 – 475
BOR Line / Ramp H	5.1	75 – 125
BOR Line / LPNB to I-15NB	7.6	400 – 575
Power Pole 221, with and without retaining wall, at ground surface	--	125 – 675
Power Pole 222, with and without retaining wall, at ground surface	--	100 – 175
Power Pole 225, without retaining wall, at ground surface	--	< 25

Anticipated settlements shall be taken into consideration in design of new utilities and

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

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

7.6 Earthwork

All earthwork operations, including stripping, subgrade preparation, excavation, fill placement and compaction, dewatering, etc., shall be conducted in accordance with the contract documents 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 bridges, embankments, MSE walls, and other structures in Segment 5 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 5 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

Abramson, L.W., Lee, T.S., Sarma, S., and Boyce, G.M., 1995. Slope Stability and Stabilization Methods, Wiley & Sons, Inc., New York.

AASHTO, 1996. Standard Specifications for Highway Bridges, 16th ed., Washington, D.C.

Hylland, M.D., and Lowe, M., 1998. Characteristics, Timing, and Hazard Potential of Liquefaction-Induced Landsliding in the Farmington Siding Landslide Complex, Davis County, Utah, Special Study 95, Utah Geological Survey.

Kleinfelder, Inc., 2000. Report of Geotechnical Field and Laboratory Investigations, Legacy Parkway – Preferred Alternative, I-215 Interchange to I-15/U.S. 89 Interchange.

National Oceanic and Atmospheric Association. (Updated December 10, 2003). Comparative Climatic Data Publication. [online]. Available: http://www.noaa.gov/climate.html. (June 2, 2004).

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. (Modified May 3, 2001). Great Salt Lake, Utah. [online]. Available: http://ut.water.usgs.gov/greatsaltlake/. (June 9, 2004).

U.S. Geological Survey. (Updated May 27, 2004). National seismic hazard mapping project – Interpolated Probabilistic Ground Motion for the Conterminous 48 States by Latitude Longitude, 1996 Data. [online]. Available: http://eqint.cr.usgs.gov/eq/html/lookup-interp.html. (June 4, 2004).

Utah Department of Transportation, October, 2000. Request for Proposals, Legacy Parkway Design-Build Project.

Utah Geological Survey. (Copyright 2004). Large earthquakes on the Wasatch Fault. [online]. Available: http://geology.utah.gov/utahgeo/hazards/eqfault/eqfact.htm (June 8, 2004).

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.

Youd, T.L., Hansen, C.M., and Bartlett, S.F., 2002. Revised Multilinear Regression Equations for Prediction of Lateral Spread Displacement, Journal of Geotechnical and Geo-Environmental Engineering, ASCE, Vol. 128, No. 12, pp. 1007-1017.

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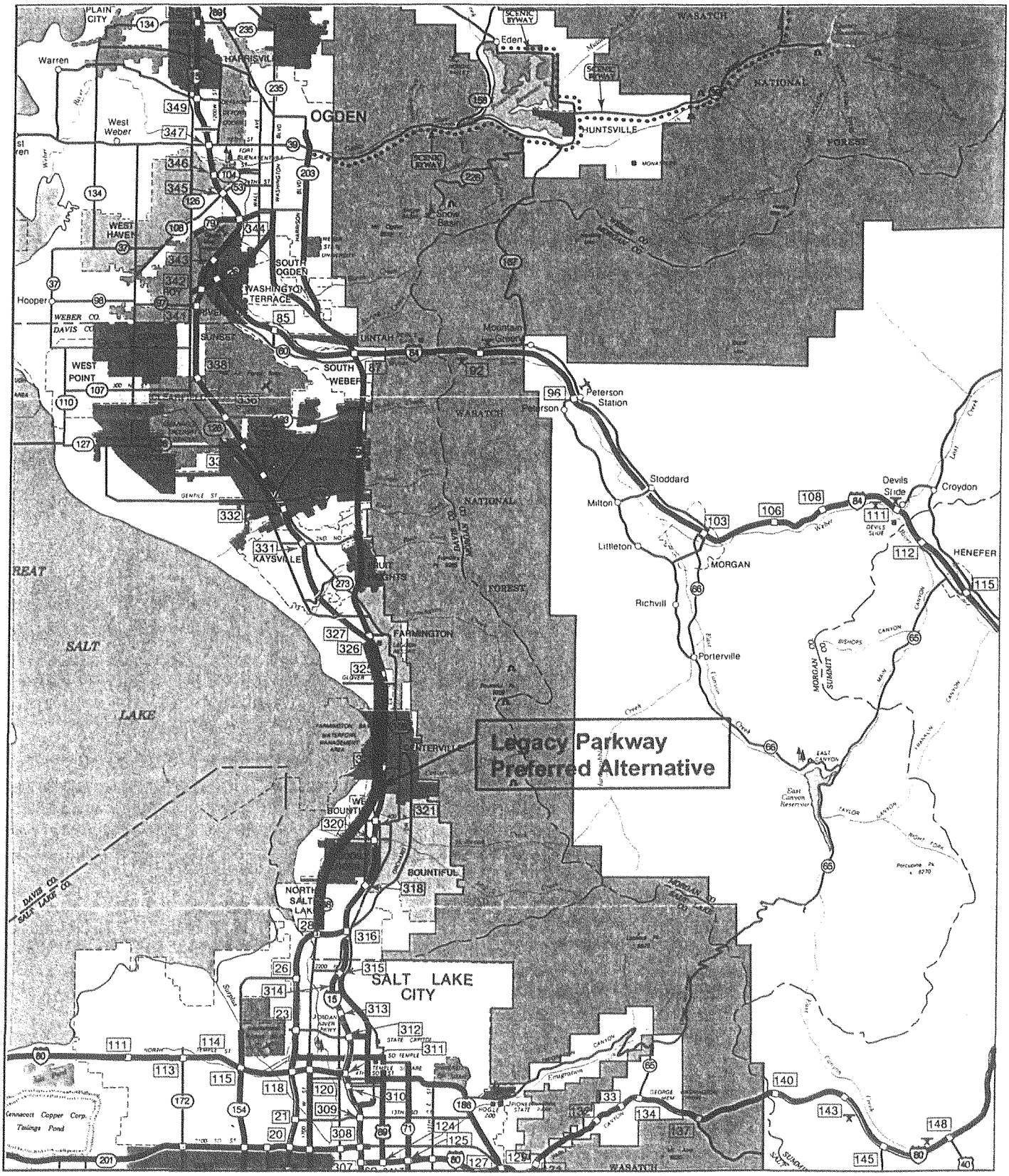


Source:
Official Highway Map
Utah Department of Transportation
1995

0 1 2 4 8
MILES

3510Q134.ppt

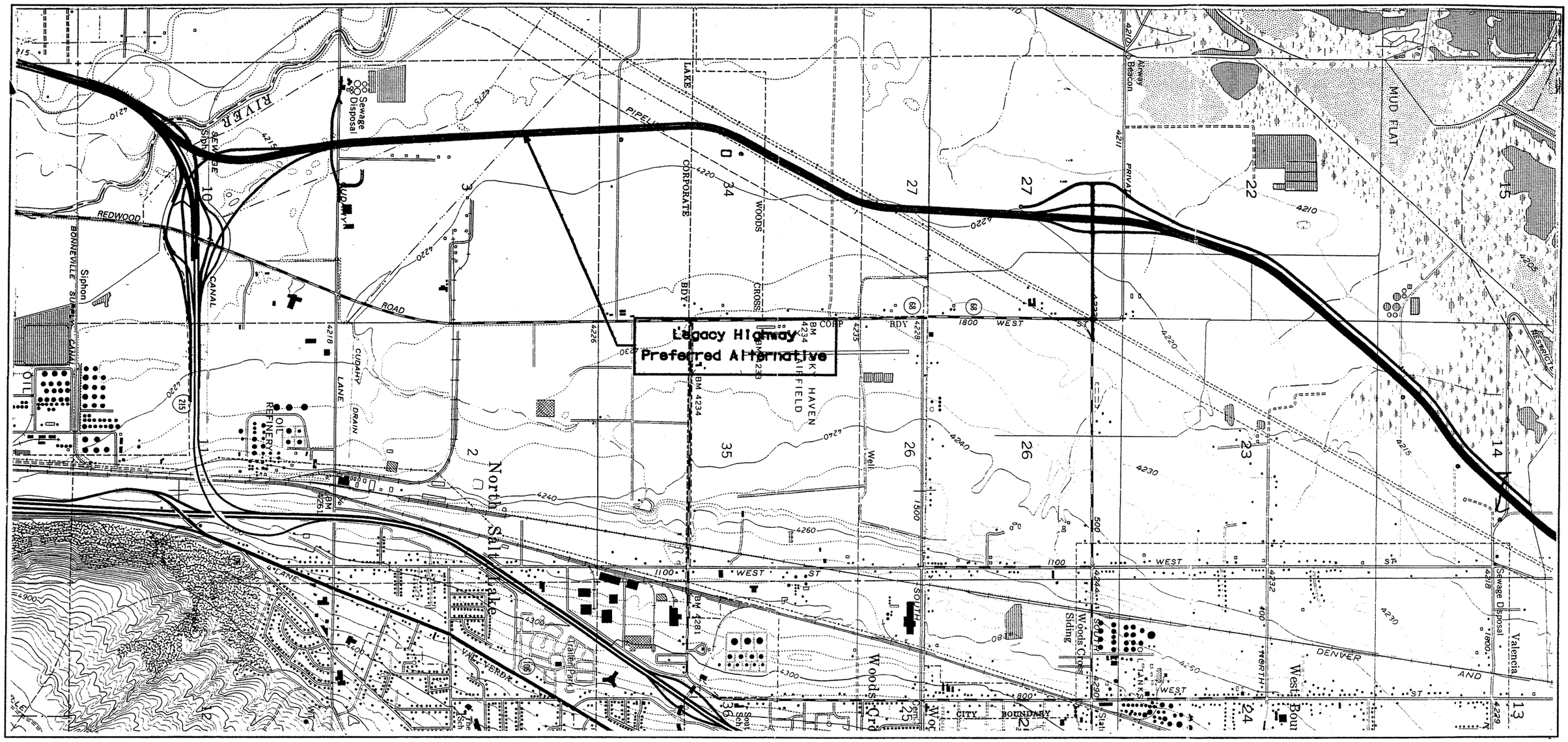
KLEINFELDER

Project Number 35-8163-05

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

PROJECT LOCATION MAP

PLATE
A-1



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

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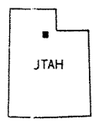
0 1000 2000 FEET

1" = 2000'

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



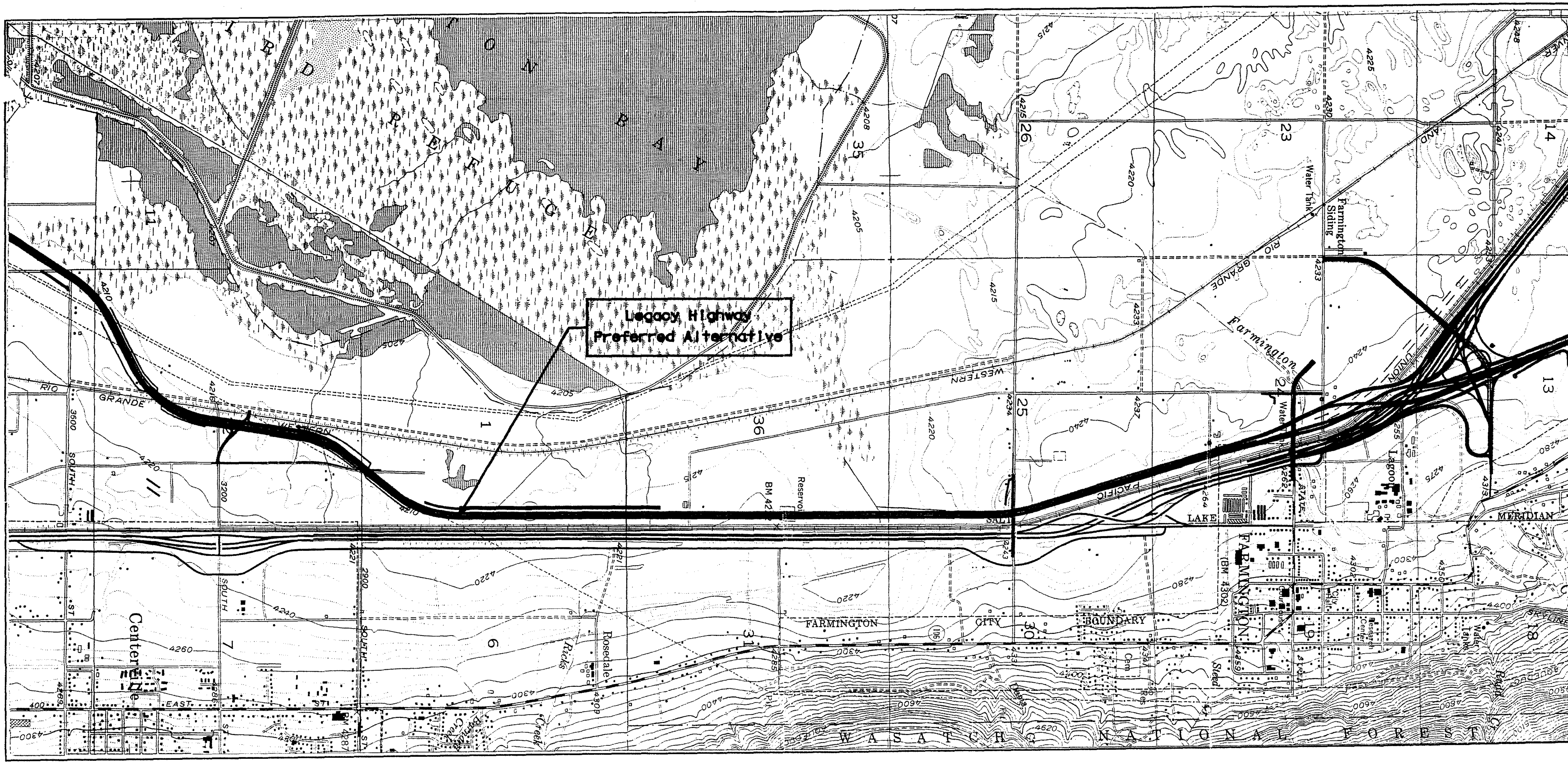
QUADRANGLE LOCATION

KLEINFELDER, INC.

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

PROJECT VICINITY MAP

PLATE
A-2



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

SCALE 1:24,000

0 1000 2000 FEET

1" = 2000'

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTAH

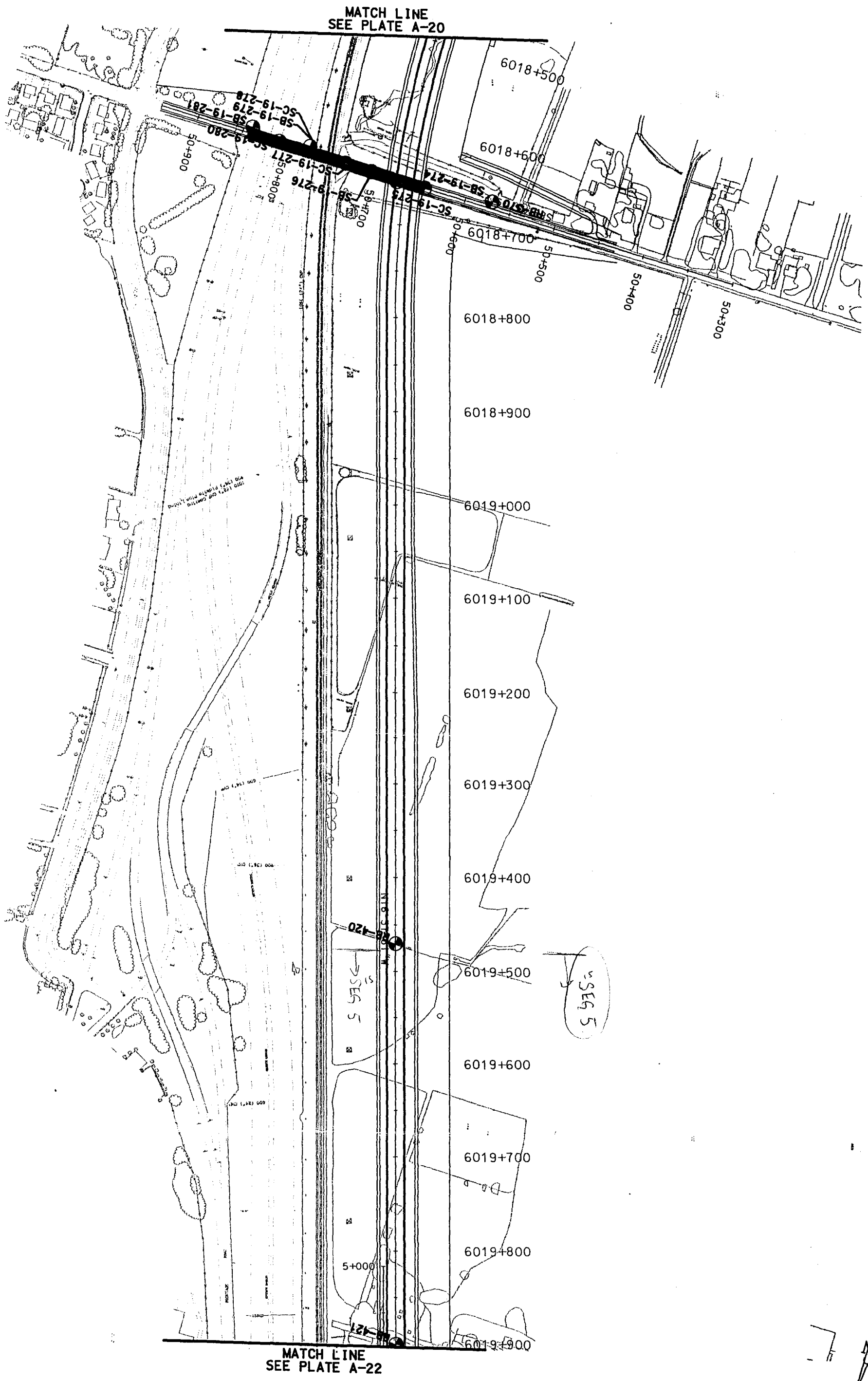
QUADRANGLE LOCATION

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-31-356 Boring Location

KLEINFELDER

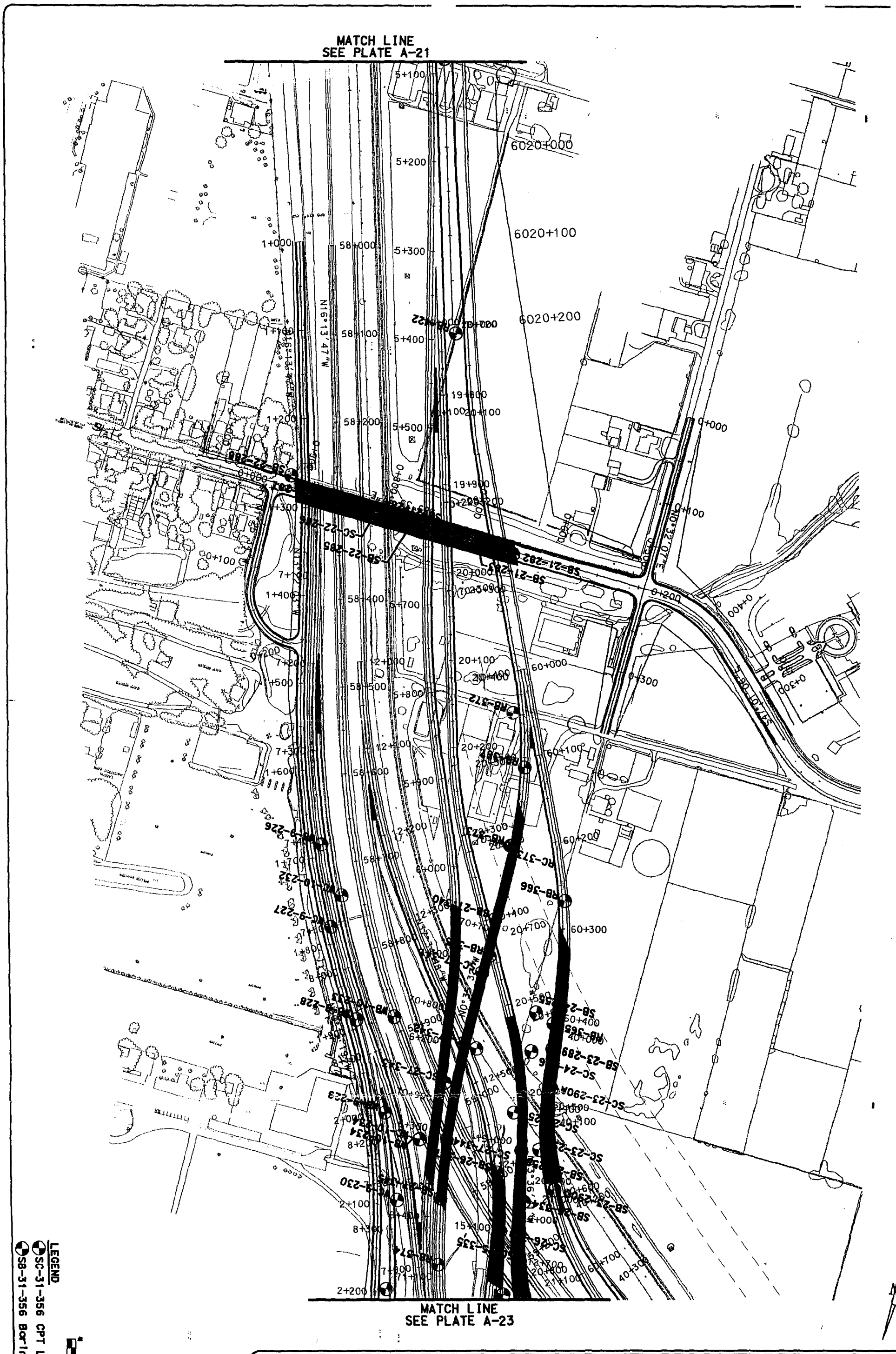
Project No. 35-8163-05

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

EXPLORATION LOCATION DRAWING

PLATE

A-21



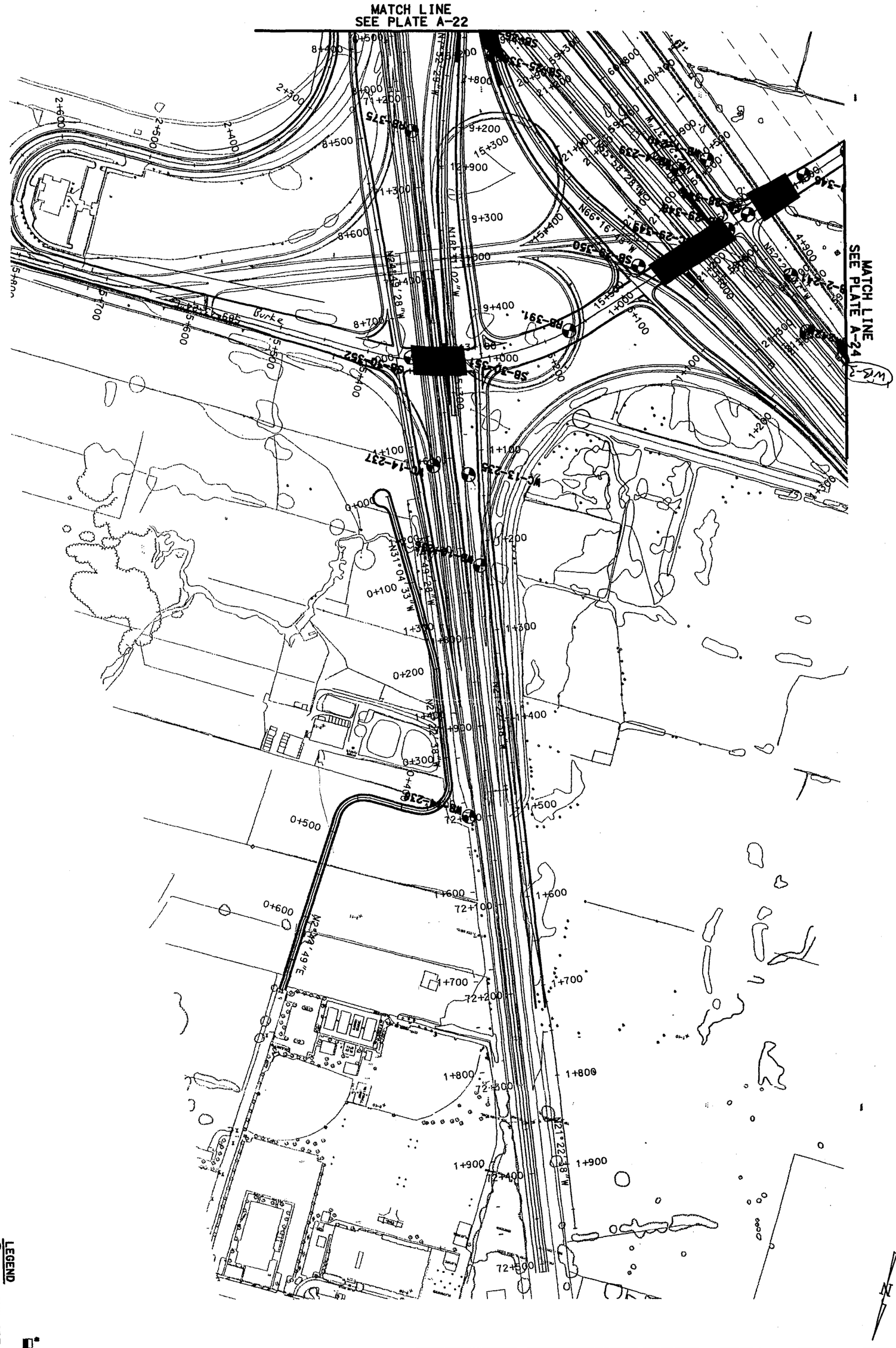
KLEINFELDER

Project No. 35-8163-05

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

EXPLORATION LOCATION DRAWING

PLATE
A-22



KLEINFELDER

Project No. 35-8163-05

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

EXPLORATION LOCATION DRAWING

PLATE
A-23

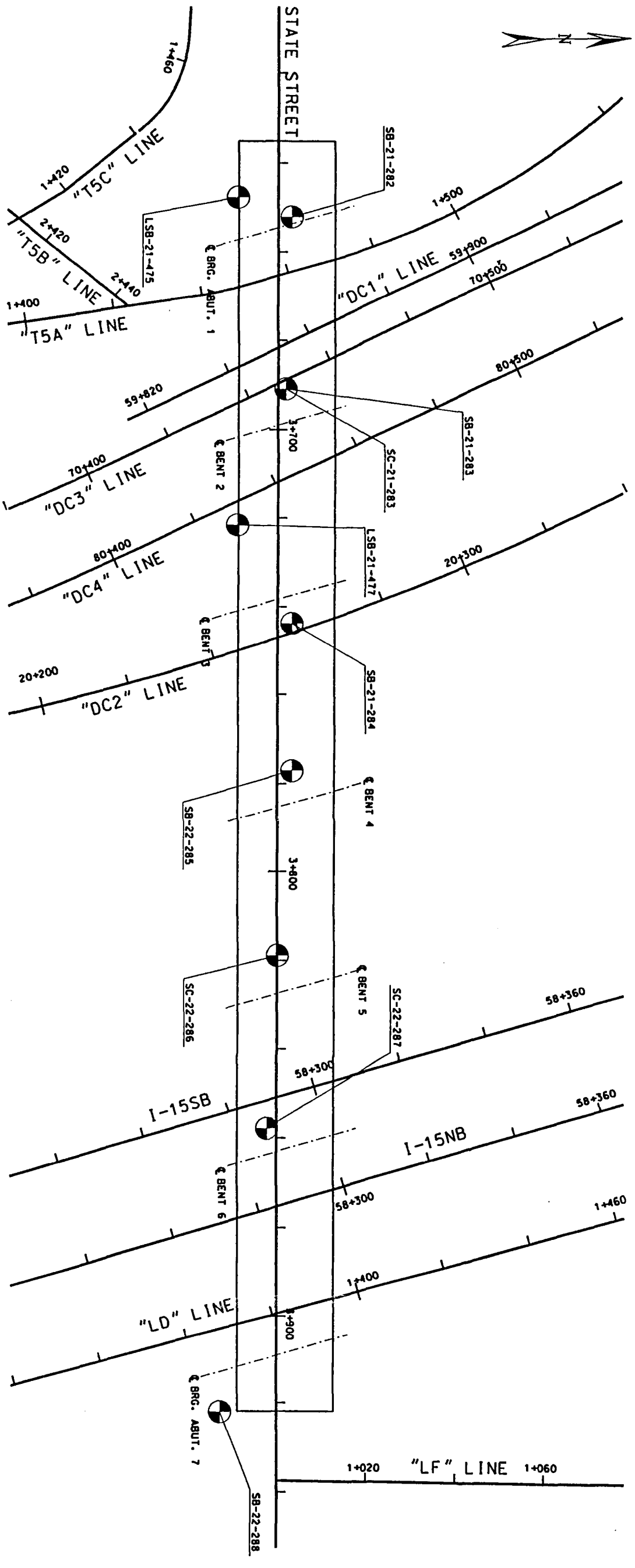
KLEINFELDER

Project No. 35-8163-05

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

EXPLORATION LOCATION DRAWING

PLATE
A-24

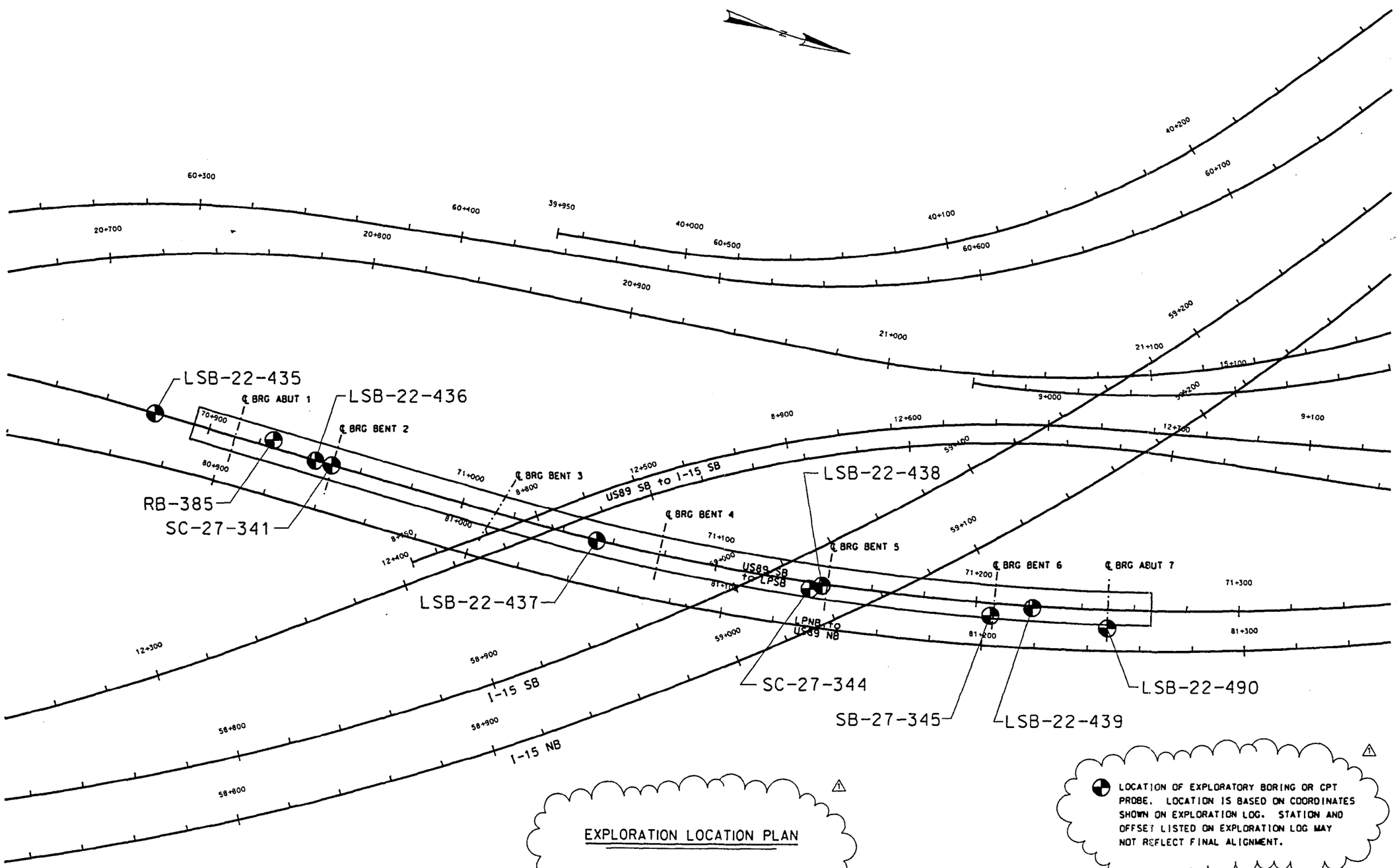


EXPLORATION LOCATION PLAN

LOCATION OF EXPLORATORY BORING OR CPT PROBE. LOCATION IS BASED ON COORDINATES SHOWN ON EXPLORATION LOG. STATION AND OFFSET LISTED ON EXPLORATION LOG MAY NOT REFLECT FINAL ALIGNMENT.

BRIDGE 21
LEVEL 3 SUBMITTAL

SL / DAVIS COUNTY	LEGACY PARKWAY	UTAH DEPARTMENT OF TRANSPORTATION PARSONS BRINCKERHOFF QUADE & DOUGLAS INC. STRUCTURE DESIGN					
	STATE ST. OVER LP, UPRR & I-15						
F-713 DRG. NO.	SOIL DATA	APPROVAL RECOMM. 04/04 DATE — DAN CHURCH PROJECT DESIGN ENGINEER	DESIGN STB 04/04	CHECK DJC 04/04			
	PROJECT NUMBER SP-0067 (1)0		DRAWN STB 04/04	CHECK DJC 04/04	NO.	DATE	BY	REMARKS
SHT. 5 of	REFER TO SITUATION & LAYOUT FOR LIMITATION OF LIABILITY STATEMENT	APPROVED 04/04 DATE — K.N. GUNALAN PROJECT DESIGN MANAGER	QUANT.	CHECK	REVISIONS		



BRIDGE 22
LEVEL 3 SUBMITTAL
ISSUED FOR CONSTRUCTION

NO.	DATE	BY	REMARKS
1	3/18/02	STB	CLARIFIED SOIL EXPLORATION TERMS

REVISIONS

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

DESIGN STB 10/01 CHECK DJC 10/01
DRAWN JAC 10/01 CHECK STB 10/01
QUANT. CHECK

APPROVAL RECOMM. DATE PROJECT DESIGN MANAGER
APPROVED DATE PROJECT DESIGN ENGINEER

LEGACY PARKWAY
US-89 SB TO LPSB OVER I-15
SOIL DATA

PROJECT NUMBER SP-0067 (110

SL / DAVIS
COUNTY

C-863
DRG. NO.

SHT. 5 of 109

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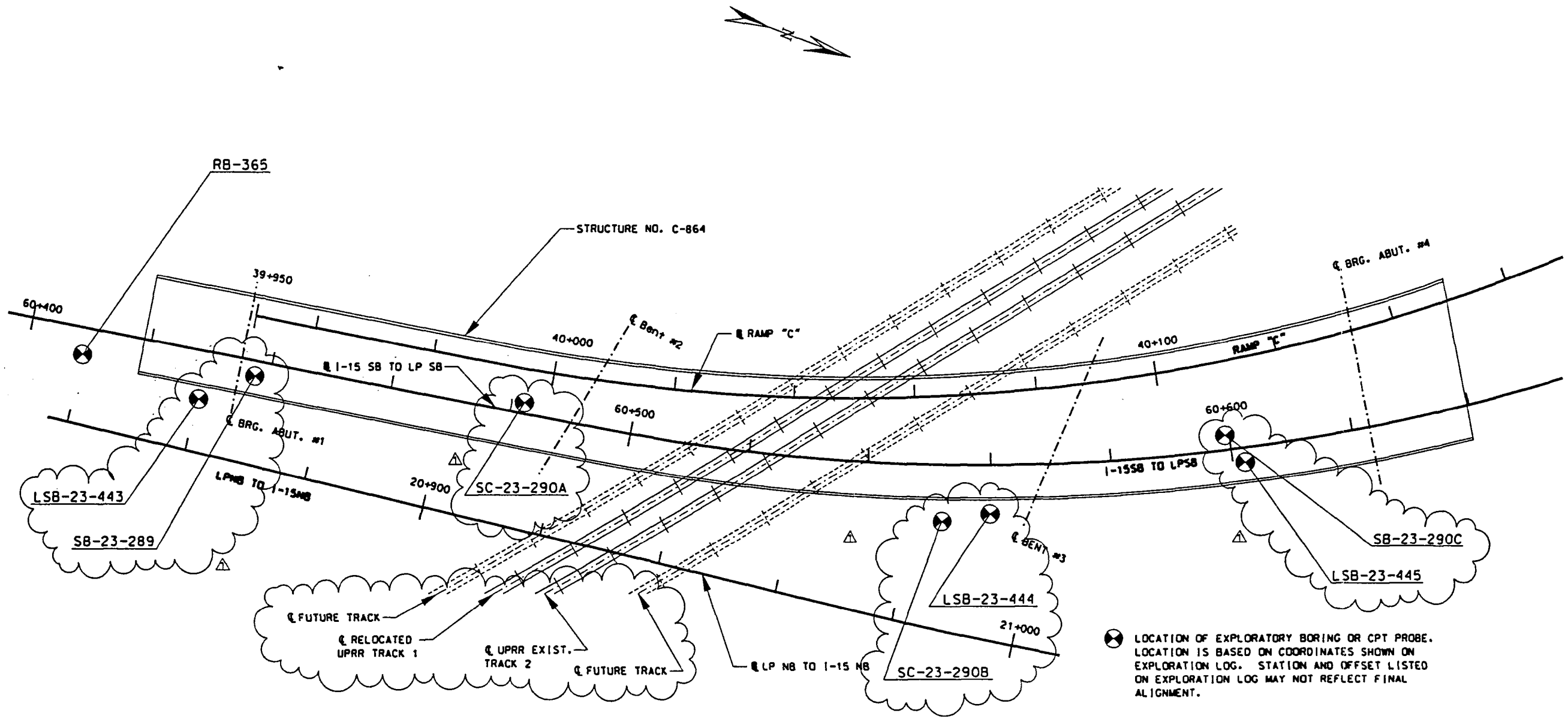
04/25/02



EXPLORATION LOCATION PLAN

BRIDGE 23
LEVEL 3 SUBMITTAL
ISSUED FOR CONSTRUCTION

NO.	DATE	BY	REMARKS
1	06/26/02	STB	ADDED ADDITIONAL EXPLORATORY LOCATIONS

REVISIONS

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

DESIGN STB 06/02 CHECK STB 06/02
DRAWN ROB 06/02 CHECK STB 06/02
QUANT. CHECK

APPROVAL RECOMM. 06/02 DATE — JOSEPH SKOWERS PROJECT DESIGN MANAGER
APPROVED 06/02 DATE — TIM DOUGHERTY PROJECT DESIGN ENGINEER

LEGACY PARKWAY
I-15 SB TO LP SB OVER UPRR
SOIL DATA SHEET
PROJECT NUMBER SP-0067 (110)

SL / DAVIS
COUNTY

C-864
DRG. NO.

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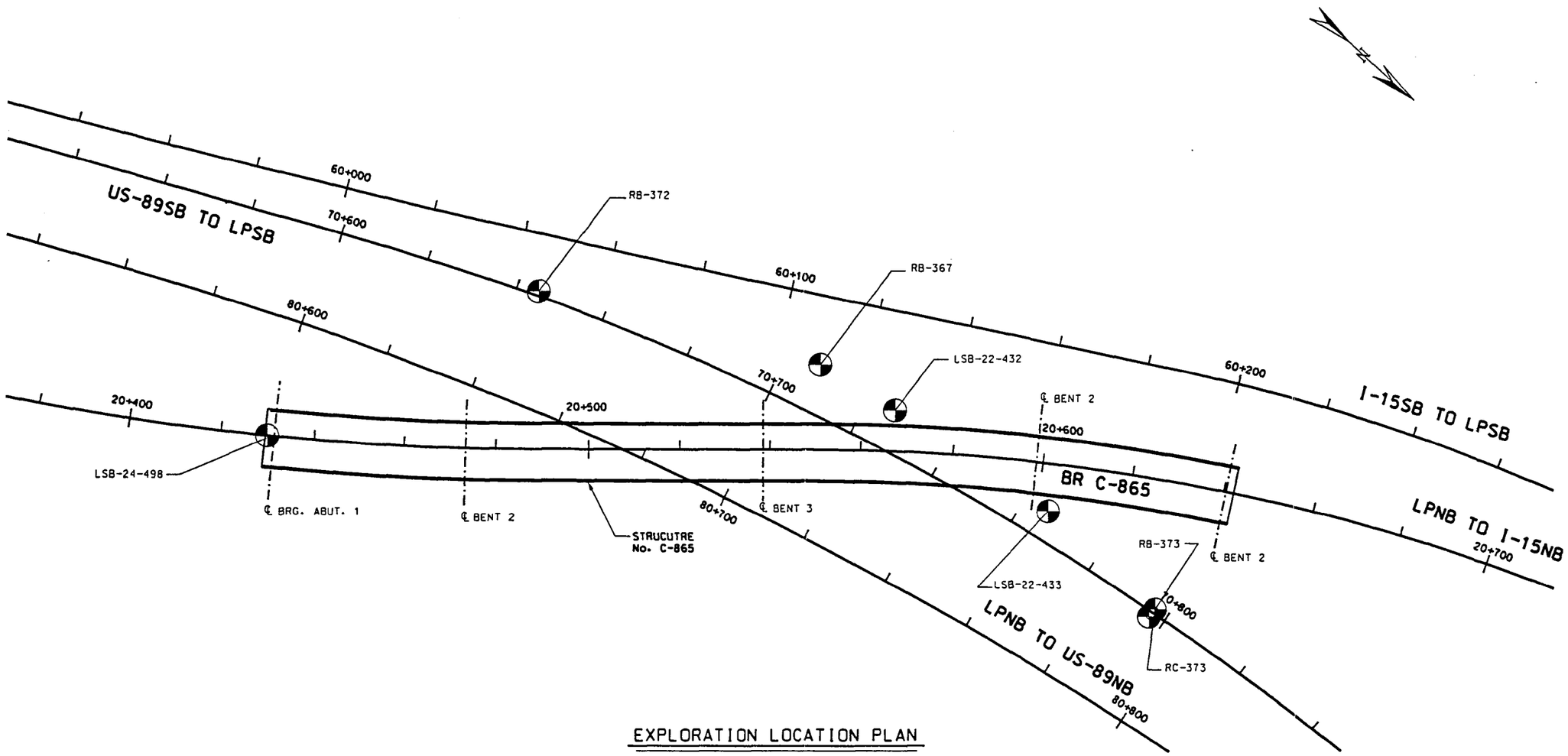

EXPLORATION LOCATION PLAN

LOCATION OF EXPLORATORY BORING OR CPT PROBE. LOCATION IS BASED ON COORDINATES SHOWN ON EXPLORATION LOG. STATION AND OFFSET LISTED ON EXPLORATION LOG MAY NOT REFLECT FINAL ALIGNMENT.

BRIDGE 24A
LEVEL 3 SUBMITTAL
ISSUED FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

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

DESIGN STB 05/02	CHECK DJC 05/02		
DRAWN JAQ 05/02	CHECK STB 05/02		
QUANT.	CHECK		

APPROVAL RECOMM. 6/02 DATE — T. DOUGHERTY, PROJECT DESIGN MANAGER
APPROVED 6/02 DATE — J. SHOWERS, PROJECT DESIGN ENGINEER

LEGACY PARKWAY
LP NB TO I-15 NB
SOIL DATA SHEET
PROJECT NUMBER SP-0067 (110)

SL / DAVIS
COUNTY

C-865
DRG. NO.

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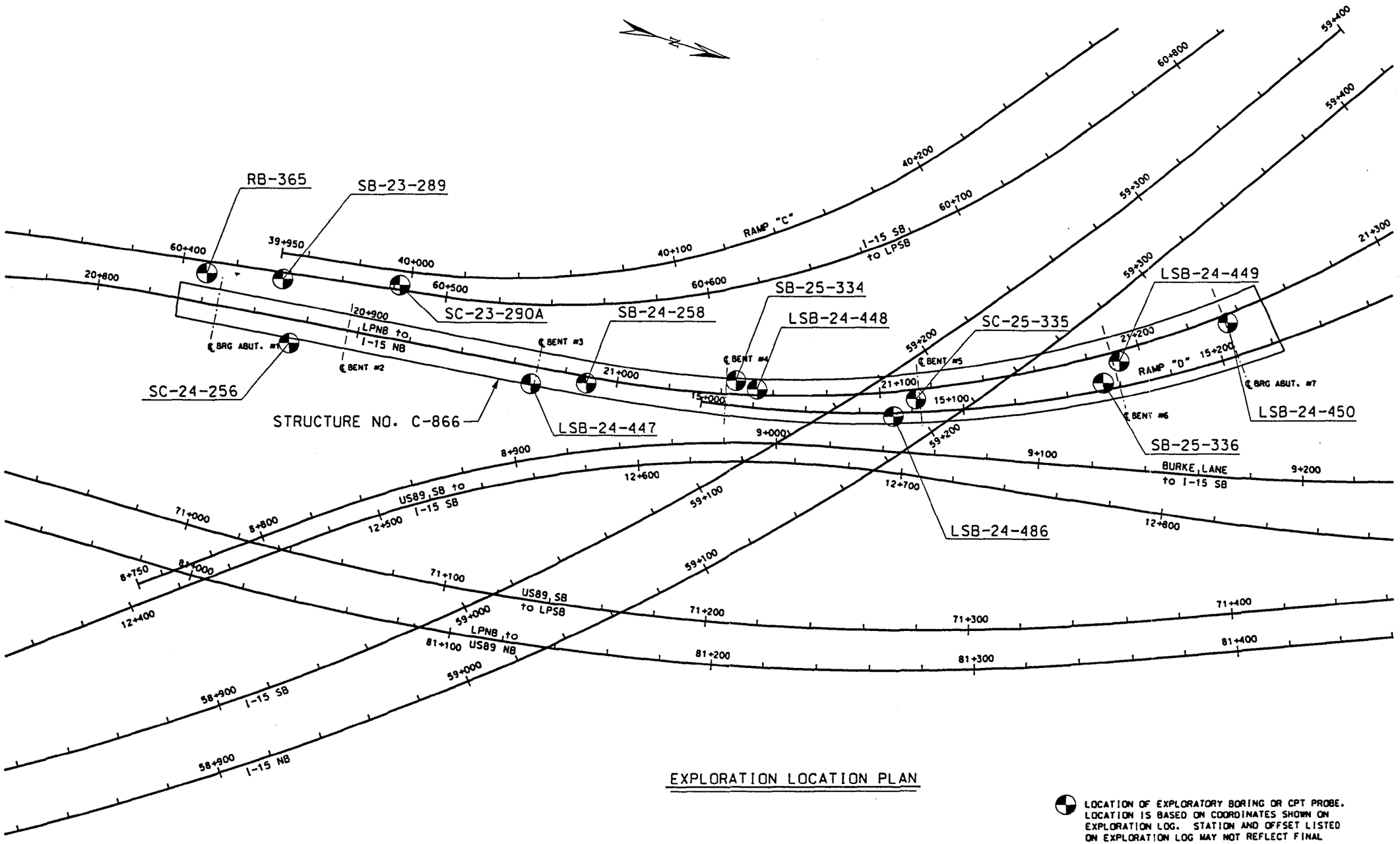

EXPLORATION LOCATION PLAN

LOCATION OF EXPLORATORY BORING OR CPT PROBE. LOCATION IS BASED ON COORDINATES SHOWN ON EXPLORATION LOG. STATION AND OFFSET LISTED ON EXPLORATION LOG MAY NOT REFLECT FINAL ALIGNMENT.

BRIDGE 24B
LEVEL 3 SUBMITTAL

NO.	DATE	BY	REMARKS

REVISIONS

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

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

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

LEGACY PARKWAY
LP NB TO I-15 NB OVER I-15
SOIL DATA
PROJECT NUMBER SP-0067 (110)
REFER TO SITUATION & LAYOUT FOR LIMITATION OF LIABILITY STATEMENT

SL / DAVIS
COUNTY

C-866
ORG. NO.

SHT. 7 of 148

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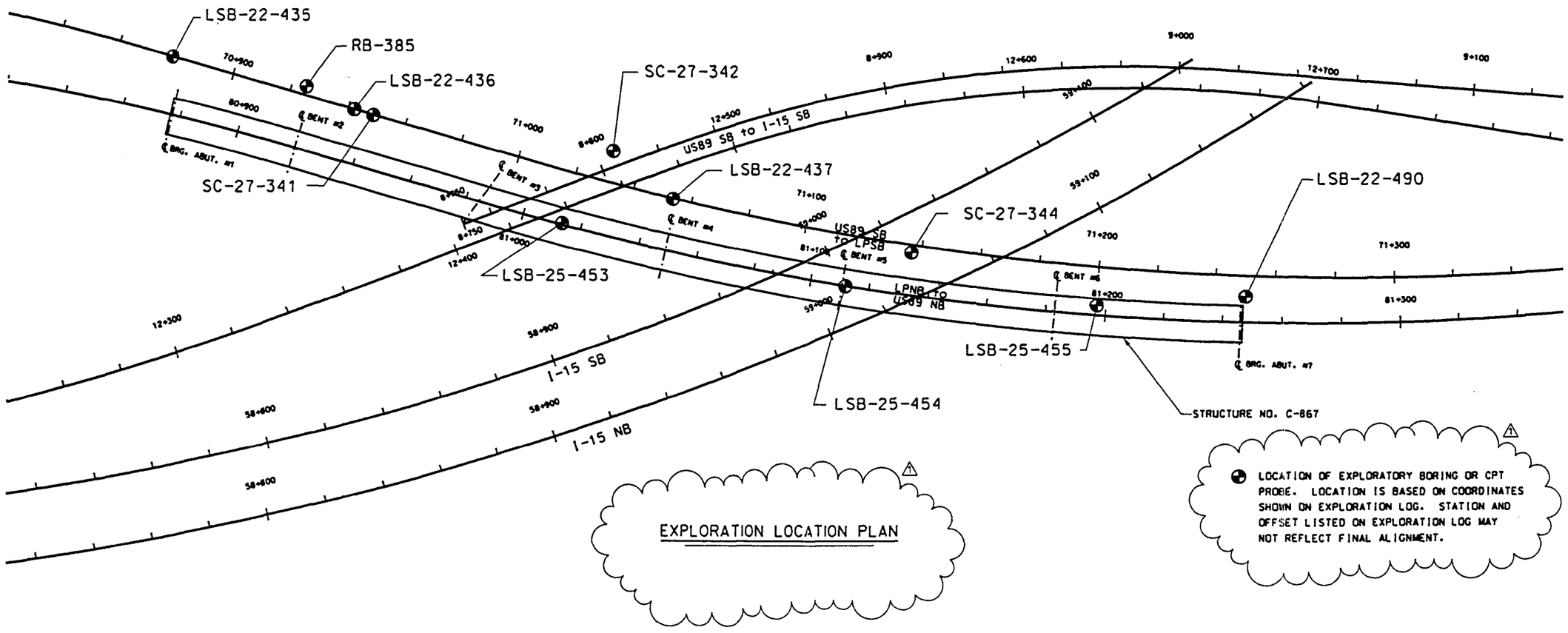
5/24/2004



BRIDGE 25
LEVEL 3 SUBMITTAL
ISSUED FOR CONSTRUCTION

NO.	DATE	BY	REMARKS
1	1/17/02	DJC	CLARIFIED SOIL EXPLORATION TERMS

REVISIONS

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

DESIGN STB 10/01 CHECK DJC 10/01
DRAWN JAG 10/01 CHECK STB 10/01
QUANT. CHECK

APPROVAL RECOMM. 03/02 JOSEPH L. SHOMERS PROJECT DESIGN MANAGER DATE
APPROVED 03/02 TIMOTHY K. DOUGHERTY PROJECT DESIGN ENGINEER DATE

LEGACY PARKWAY
LP NB T O US-89 NB OVER I-15
SOIL DATA

PROJECT NUMBER SP-0067 (110)

SL / DAVIS
COUNTY

C-867
DRG. NO.

SHT. 5 of 68

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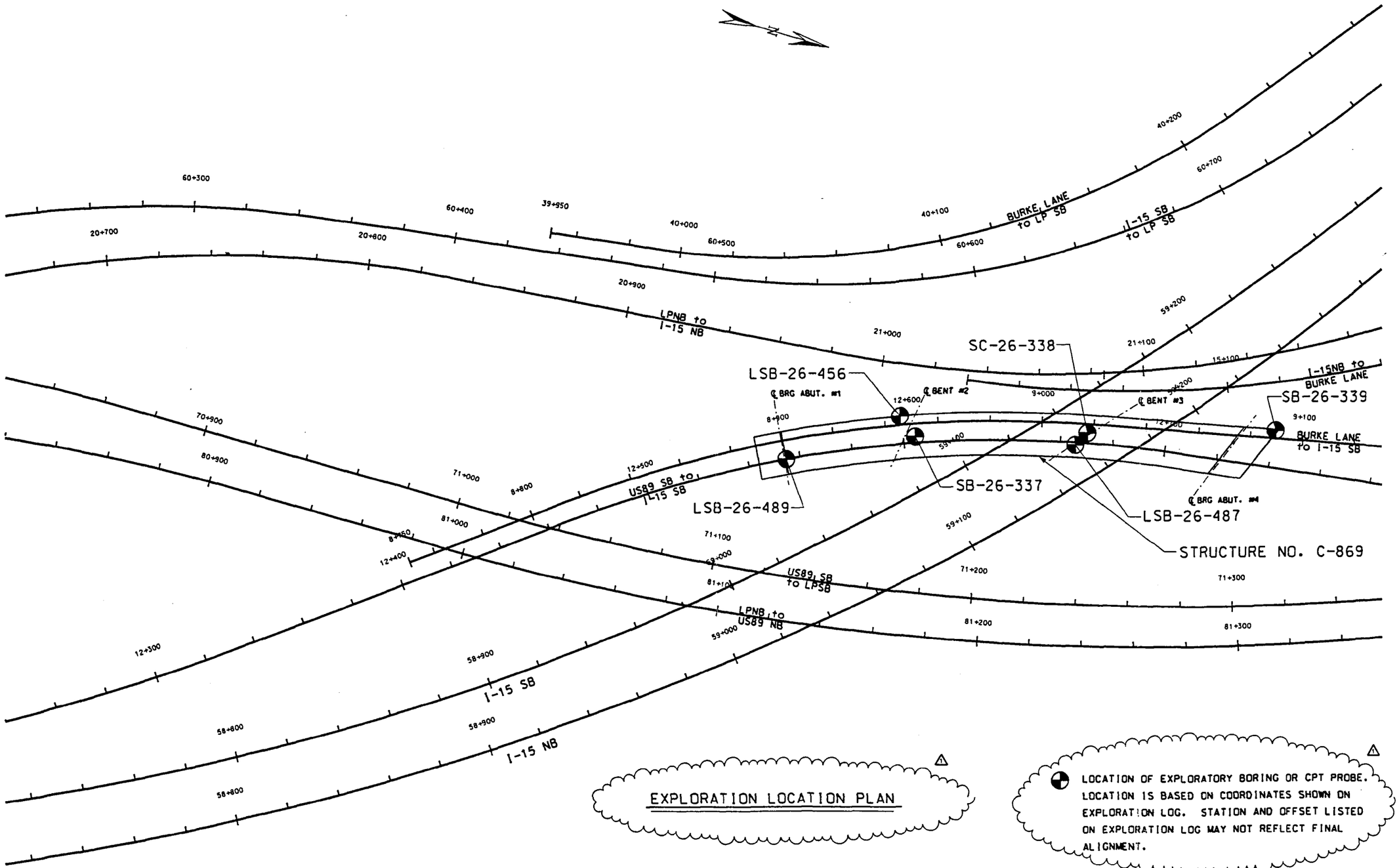

EXPLORATION LOCATION PLAN

LOCATION OF EXPLORATORY BORING OR CPT PROBE. LOCATION IS BASED ON COORDINATES SHOWN ON EXPLORATION LOG. STATION AND OFFSET LISTED ON EXPLORATION LOG MAY NOT REFLECT FINAL ALIGNMENT.

BRIDGE 26
LEVEL 3 SUBMITTAL
ISSUED FOR CONSTRUCTION

NO.	DATE	BY	REMARKS
1	3/5/02	STB	CLARIFIED SOIL EXPLORATION TERMS

REVISIONS

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

DESIGN STB 10/01 CHECK DJC 10/01
DRAWN JAG 10/01 CHECK STB 10/01
QUANT. CHECK

APPROVAL RECOMM. DATE PROJECT DESIGN MANAGER
APPROVED DATE PROJECT DESIGN ENGINEER

LEGACY PARKWAY
US-89 SB TO I-15 SB OVER I-15
SOIL DATA

PROJECT NUMBER SP-0067 (110

SR / DAVIS COUNTY

C-869 DRG. NO.

SHT. 4 of 83

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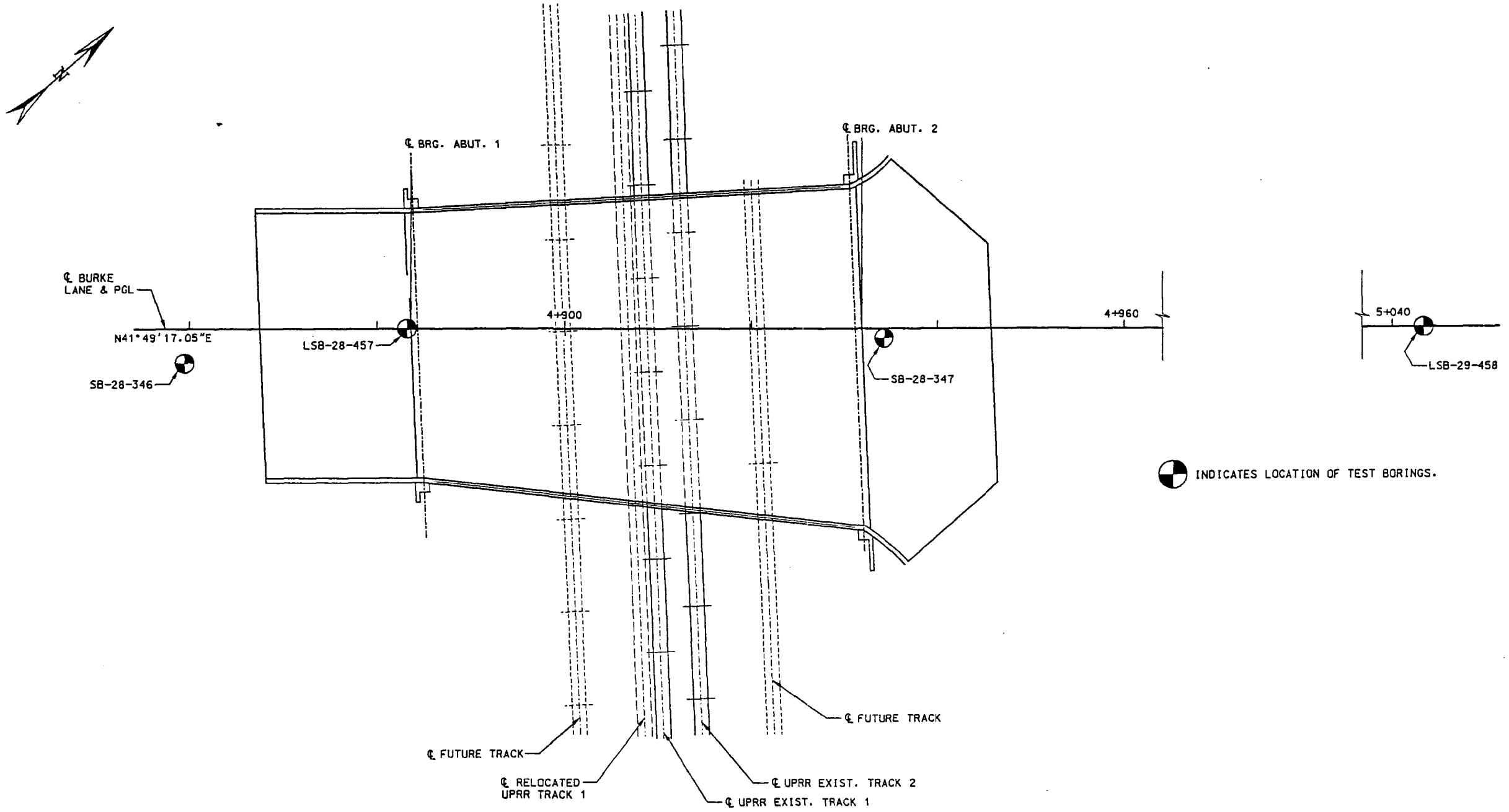

BORING LOCATION PLAN

BRIDGE 28
LEVEL 3 SUBMITTAL

NO.	DATE	BY	REMARKS

REVISIONS

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

DESIGN SB 10/01 CHECK DC 10/01
DRAWN RB 10/01 CHECK DC 10/01
QUANT. CHECK

APPROVAL RECOMM. DATE PROJECT DESIGN ENGINEER
APPROVED DATE PROJECT MANAGER

LEGACY PARKWAY
BURKE LANE OVER UPRR
SOIL DATA

PROJECT NUMBER SP-0067 (1)0

DAVIS COUNTY

F-663
DRG. NO.

SHT. 3 OF 37

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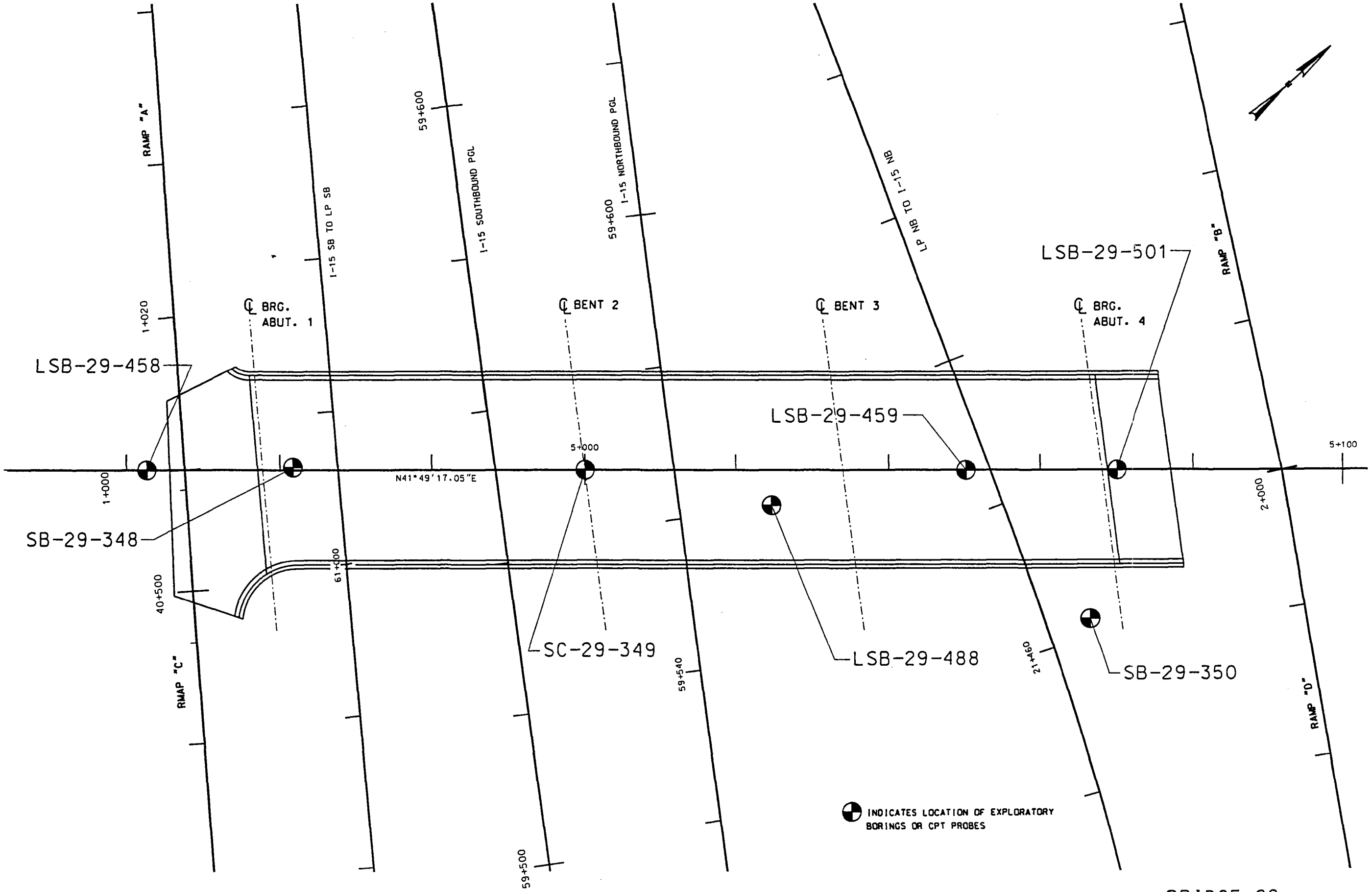

BORING LOCATION PLAN

BRIDGE 29
LEVEL 3 SUBMITTAL
ISSUED FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

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

DESIGN STB 11-01 CHECK DJC 11-01
DRAWN JAG 11-01 CHECK STB 11-01
QUANT. CHECK

APPROVAL RECOMM. 11-01 DATE — Don Church PROJECT DESIGN ENGINEER
APPROVED 11-01 DATE — Tim Dougherty PROJECT MANAGER

LEGACY PARKWAY
BURKE LANE OVER I-15
SOIL DATA

PROJECT NUMBER SP-0067 (110)

SL / DAVIS
COUNTY

F-664
DRG. NO.

SHT. 4 OF 77

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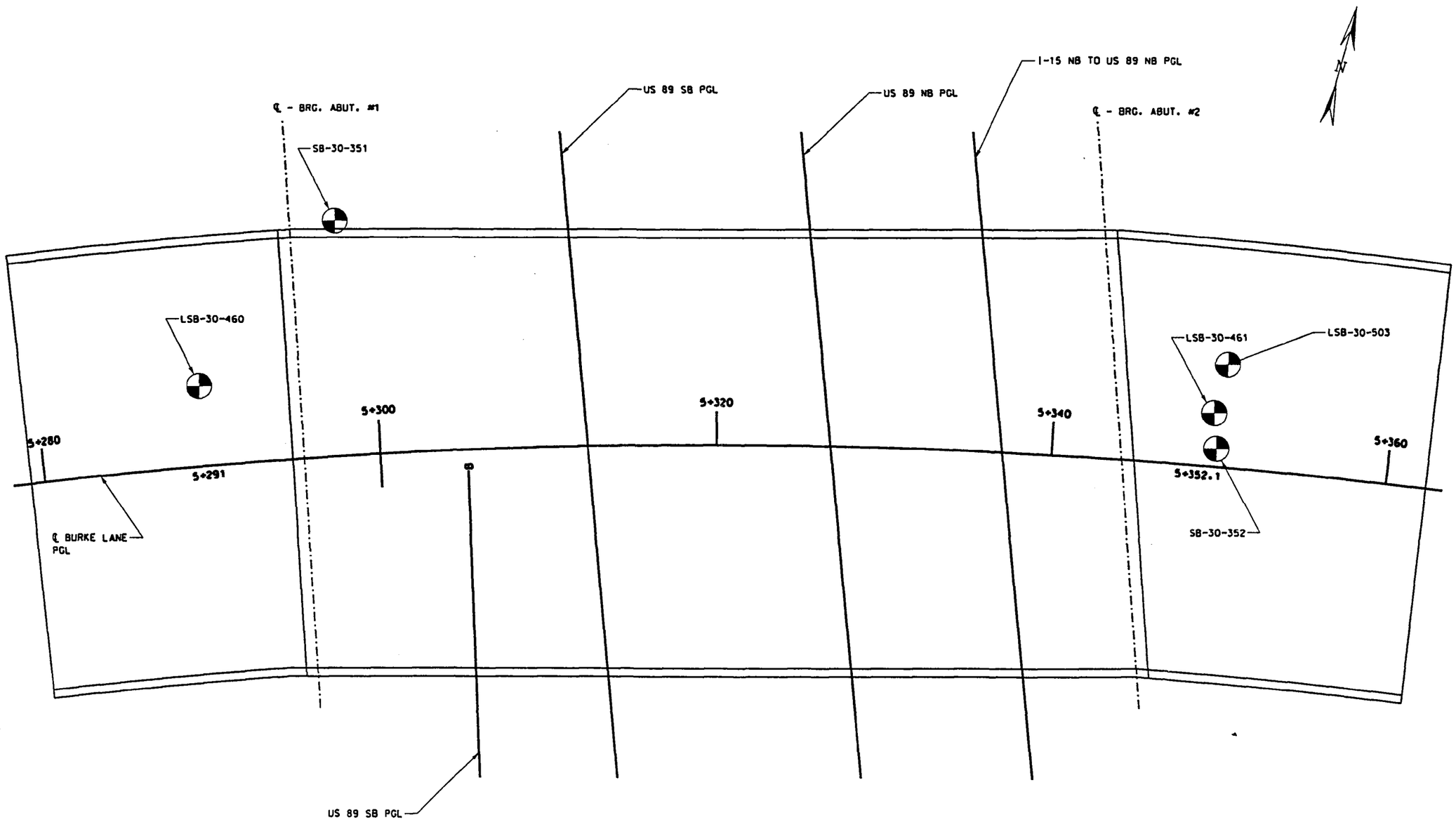
12/17/01



EXPLORATION LOCATION PLAN

LOCATION OF EXPLORATORY BORING OR CPT PROBE. LOCATION IS BASED ON COORDINATES SHOWN ON EXPLORATION LOG. STATION AND OFFSET LISTED ON EXPLORATION LOG MAY NOT REFLECT FINAL ALIGNMENT.

BRIDGE 30
LEVEL 3 SUBMITTAL

NO.	DATE	BY	REMARKS

REVISIONS

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

DESIGN 11-01 STB CHECK 11-01 DJC
DRAWN 11-01 RDB CHECK 11-01 STB
QUANT. CHECK

APPROVAL RECOMM. 11-12-01 DATE Joe Showers PROJECT DESIGN MANAGER
APPROVED 11-12-01 DATE Tim Dougherty PROJECT DESIGN ENGINEER

LEGACY PARKWAY
BURKE LANE OVER US 89
SOIL DATA

PROJECT NUMBER SP-0067 (110)

SL / DAVIS
COUNTY

F-665
DRG. NO.

SHT. 3 of 39

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01/25/02

B

FIELD SOIL CLASSIFICATION

PENETRATION RESISTENCE

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

COHESIONLESS SOIL

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

COHESIVE SOILS

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

GRADATION

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

CRITERIA FOR DESCRIBING MOISTURE CONTENT

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

VARIATIONS IN SOIL STRATIGRAPHY

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

CRITERIA FOR CLAY PLATICITY AND DRY STRENGTH

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

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

UNIFIED SOIL CLASSIFICATION (USCS) IDENTIFICATION AND DESCRIPTION

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

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^3on field test boring logs.

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

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

Grain Size Distribution Tests - ASTM D 422

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

Specific Gravity - ASTM D 854

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

Consolidation Test - ASTM D 2435

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

Direct Shear Test - ASTM D 3080

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

Unconfined Compressive Strength - ASTM D 2166

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

Corrosion Resistence Tests

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

3510d192

ABBREVIATIONS

NA - NOT APPLICABLE
GDR - GEOTECHNICAL DATA REPORT

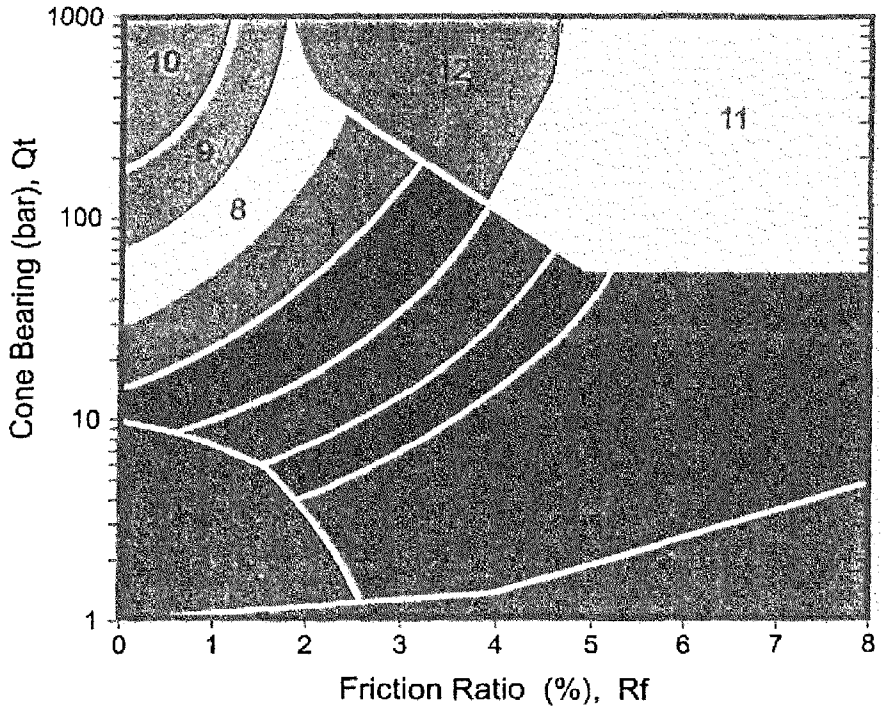
KLEINFELDER

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)

CONETEC

Legacy Parkway
Segment 5 - North Interchange
Soil Exploration Information

ORIGINAL EXPLORATIONS

POINT	LINE	STATION	OFFSET		NORTHING (m)	EASTING (m)	ELEVATION (m)
SB-21-282	STATE ST	0+648 656	3 03	LT	123,444.419	19,302 374	1,300 590
SB-21-283	STATE ST	0+687 382	1 75	LT	123,442 842	19,341 089	1,302 674
SC-21-283	STATE ST	0+687 382	1 75	LT	123,442 842	19,341 089	1,302 674
SB-21-284	STATE ST	0+740 395	3 19	LT	123.443 868	19,394 112	1,305 301
SB-22-285	STATE ST	0+773 642	3 26	LT	123,443 685	19,427 358	1,306 543
SC-22-286	STATE ST	0+815 552	0 00	LT	123,440 104	19,469 242	1,295 750
SC-22-287	STATE ST	0+854.444	2 22	RT	123,437 583	19,508 116	1,296 540
SB-22-288	STATE ST	0+918 648	12 68	RT	123,426 636	19,572 238	1,304 491
SB-23-289	I-15 SB TO LP SB	60+436 602	0 52	LT	123,977 638	19,114 208	1,295.020
SB-23-290C	I-15 SB TO LP SB	60+599 449	4 87	LT	124,132 337	19,070 781	1,297 364
SC-23-290A	I-15 SB TO LP SB	60+480 966	5 61	LT	124,021 035	19,103.686	1,295 394
SC-23-290B	I-15 SB TO LP SB	60+551 904	6 21	RT	124,092 787	19,099.480	1,297 876
SB-24-255	LP NB to I-15 NB (US 89)	20+512 743	20 84	LT	123,943 153	19,142 978	1,295 173
SC-24-256	LP NB to I-15 NB (US 89)	20+554 154	10 26	LT	123,986 818	19,136 718	1,295 320
SC-24-257	LP NB to I-15 NB (US 89)	20+623.800	11 20	RT	124,059 940	19,138 703	1,297.923
SB-24-258	LP NB to I-15 NB (US 89)	20+666 464	1 21	RT	124,099 054	19,118 949	1,297 642
SB-25-334	LP NB to I-15 NB (US 89)	20+723 909	2 88	LT	124,153 922	19,101 451	1,296 674
SC-25-335	LP NB to I-15 NB (US 89)	20+791 718	1 98	RT	124,220 759	19,088 753	1,297 649
SB-25-336	LP NB to I-15 NB (US 89)	20+862 412	6.42	RT	124,287.360	19,062.514	1,297 090
SB-26-337	US 89 SB to 1-15 SB	12+605 204	1 91	LT	124,130 372	19,139 171	1,297 010
SC-26-338	US 89 SB to 1-15 SB	12+670 717	4 98	LT	124,193 322	19,119 094	1,297 766
SB-26-339	US 89 SB to 1-15 SB	12+741 455	16 33	LT	124,261 994	19,097 767	1,297 519
SB-27-340	US 89 SB to LP SB	70+686 974	0 76	RT	123,852 107	19,215 247	1,295 785
SC-27-341	US 89 SB to LP SB	70+750 382	0 47	RT	123,915 509	19,214 299	1,297 574
SC-27-342	US 89 SB to LP SB	70+835 805	14 36	LT	124,000.680	19,198 573	1,297 770
SC-27-343	US 89 SB to LP SB	70+880 983	13 03	RT	124,046.870	19,224 153	1,297 174
SC-27-344	US 89 SB to LP SB	70+944 734	0 00	LT	124,109 520	19,205 164	1,296 850
SB-27-345	US 89 SB to LP SB	71+011 211	0 83	RT	124,175.305	19,195 454	1,298 128
SB-28-346	BURKE LANE	4+859 468	3 67	RT	124,322.805	18,698 933	1,294 258
SB-28-347	BURKE LANE	4+934 261	1 02	RT	124,380.313	18,746 828	1,296 320
SB-29-348	BURKE LANE	4+961 767	0.38	LT	124,401 740	18,764 131	1,296 206
SC-29-349	BURKE LANE	5+000 045	0 01	LT	124,430 020	18,789 930	1,296 024
SB-29-350	BURKE LANE	5+066 599	19 50	RT	124,466 611	18,848 846	1,304 692
SB-30-351	BURKE LANE	5+299 649	9 45	LT	124,631 325	19,011 152	1,298 224
SB-30-352	BURKE LANE	5+352 141	2.08	RT	124,632 729	19,065 430	1,297 372
WB-1-240	I-15	59+493 295	70 03	LT	124,334 943	18,805 525	1,296 584
WB-2-241	I-15	59+647 927	57 07	LT	124,432 213	18,684 621	1,299 469
WB-3-242	I-15	59+705 550	28 93	LT	124,488 338	18,651 781	1,298 160
WB-4-239	I-15	59+480 935	39 09	LT	124,353 670	18,833 082	1,296 272
WB-9-226	I-15 NB to US 89 NB	1+406 133	1 01	RT	123,822 721	19,430 441	1,298 147
WC-9-227	I-15 NB to US 89 NB	1+500 557	8 10	RT	123,911 285	19,395 932	1,301.460
WB-9-228	I-15 NB to US 89 NB	1+608 843	8 56	RT	124,005 160	19,340 414	1,298 732
WB-9-229	I-15 NB to US 89 NB	1+719 031	12 69	RT	124,098 389	19,282 261	1,298 918
WC-9-230	I-15 NB to US 89 NB	1+822 003	19.87	RT	124,190 669	19,242 937	1,299 148
WB-9-231	I-15 NB to US 89 NB	1+920 608	44 42	RT	127,295 100	19,198 787	1,302 280
WC-10-232	I-15	58+734 533	23 51	RT	123,873 306	19,393 068	1,301 210
WB-10-233	I-15	58+881 649	1 16	RT	123,990 684	19,299.166	1,300 973
WB-10-234	I-15	59+019 306	27 99	RT	124,117 524	19,235 458	1,298 457
WC-10-234	I-15	59+019 196	27 36	RT	124,117 024	19,235 058	1,298 457
WC-13-235	US 89 SB to LP SB	71+619 643	18.65	LT	124,739 947	18,971 031	1,298 069
WB-13-236	US 89 SB to LP SB	71+721 381	20 11	LT	124,834 150	18,932 579	1,297 676
WC-14-237	US 89 SB to LP SB	71+606 215	18 72	RT	124,741 062	19,010 718	1,301 664
WB-14-238	US 89 SB to LP SB	71+998 327	23 07	RT	125,107 784	18,871 845	1,298 566
RB-365	I-15 SB to LP SB	60+408 284	1 91	RT	123,949 836	19,120 112	1,295 007
RB-366	I-15 SB to LP SB	60+267 794	3 08	LT	123,811 316	19,143 614	1,294 660
RB-367	I-15 SB to LP SB	60+110 925	19 11	RT	123,676 840	19,226 605	1,294 582
RB-372	US 89 SB to LP SB	70+447 152	11 43	RT	123,619 606	19,255 658	1,294 959
RB-373	US 89 SB to LP SB	70+601 650	4 71	RT	123,766 960	19,220 257	1,295 444
RC-373	US 89 SB to LP SB	70+601 725	2 71	RT	123,766 960	19,218.257	1,295 444
RB-374	US 89 SB to LP SB	71+086 495	1 40	RT	124,248 802	19,178 835	1,298 372
RB-375	US 89 SB to LP SB	71+238.091	0 81	RT	124,391 737	19,128 227	1,299 022
RB-385	LP NB to I-15 NB (US 89)	20+438 886	16 47	RT	123,894 805	19,211 113	1,296 995
RB-390	BURKE LANE	4+804 884	0 88	LT	124,285 160	18,659 148	1,293 901
RB-391	BURKE LANE	5+171 083	0 76	LT	124,557 265	18,904 272	1,302 471
RB-421	D MAINLINE	6019+900 000	0 00	LT	122,925 217	19,521 837	1,297 852
RB-422	D MAINLINE	6020+210 000	0 00	LT	123,221 186	19,429 774	1,295 335
RB-423	BURKE LANE	4+220 000	0 00	LT	123,819 432	18,320 892	1,291 511

NOTE 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

Legacy Parkway
Segment 5 - North Interchange
Soil Exploration Information

SUPPLEMENTAL EXPLORATIONS

POINT	LINE	STATION	OFFSET	NORTHING (m)	EASTING (m)	ELEVATION (m)
LSB-21-475	STATE ST.	0+644.15	0.0 RT	123,432.374	19,297.884	1,300.185
LSB-21-477	STATE ST.	0+718.15	0.0 RT	123,431.795	19,371.787	1,304.087
LSB-22-432	US 89 SB to LP SB	70+530	0.0 RT	123,695.600	19,223.300	1,295.248
LSB-22-433	US 89 SB to LP SB	70+570	0.0 RT	123,735.200	19,217.700	1,295.309
LSB-22-434	US 89 SB to LP SB	70+620	0.0 RT	123,785.112	19,215.213	1,295.430
LSB-22-435	US 89 SB to LP SB	70+879	0.0 RT	123,848.606	19,214.498	1,295.827
LSB-22-436	US 89 SB to LP SB	70+942	0.0 RT	123,912.092	19,213.851	1,297.503
LSB-22-437	US 89 SB to LP SB	71+053	0.3 RT	124,023.461	19,211.742	1,301.344
LSB-22-438	US 89 SB to LP SB	71+141	0.6 RT	124,110.645	19,202.999	1,298.875
LSB-22-439	US 89 SB to LP SB	71+222	0.7 RT	124,189.710	19,188.171	1,298.000
LSB-22-490	US 89 SB to LP SB	71+250	7.0 RT	124,219.100	19,187.400	1,298.143
LSB-23-440	I-15 SB to LP SB	60+273	0.0 RT	123,817.189	19,144.972	1,294.760
LSB-23-441	I-15 SB to LP SB	60+313	0.0 RT	123,855.695	19,134.125	1,294.547
LSB-23-442	I-15 SB to LP SB	60+366	0.0 RT	123,907.661	19,123.702	1,294.699
LSB-23-443	I-15 SB to LP SB	60+428	5.0 RT	123,970.300	19,120.700	1,295.065
LSB-23-444	I-15 SB to LP SB	60+560	5.0 RT	124,099.700	19,095.800	1,297.889
LSB-23-445	I-15 SB to LP SB	60+602	N/A	124,136.847	19,073.937	1,297.412
LSB-24-446	LP NB to I-15 NB	20+796	N/A	124,048.900	19,125.200	1,296.010
LSB-24-447	LP NB to I-15 NB	20+896	5.0 LT	124,078.768	19,125.176	1,296.497
LSB-24-448	LP NB to I-15 NB	21+012	N/A	124,162.458	19,102.330	1,296.680
LSB-24-449	LP NB to I-15 NB	21+150	N/A	124,290.558	19,052.995	1,297.259
LSB-24-450	LP NB to I-15 NB	21+194	N/A	124,326.000	19,027.100	1,298.997
LSB-24-486	LP NB to I-15 NB	21+063	8.3 RT	124,214.527	19,097.454	1,297.625
LSB-24-498	LP NB to I-15 NB	20+430	0.0 RT	123,595.800	19,317.900	1,295.217
LSB-25-451	LP NB to US 89 NB	6+026.5	N/A	123,832.204	19,268.338	1,297.168
LSB-25-452	LP NB to US 89 NB	6+066.5	N/A	123,870.541	19,256.942	1,296.528
LSB-25-453	LP NB to US 89 NB	6+189.0	N/A	123,990.353	19,230.314	1,300.277
LSB-25-454	LP NB to US 89 NB	6+287.5	N/A	124,088.687	19,222.720	1,298.082
LSB-25-455	LP NB to US 89 NB	6+372.5	N/A	124,171.640	19,204.700	1,298.143
LSB-26-456	US 89 TO I-15 SB	12+600	10.0 LT	124,122.631	19,133.384	1,296.954
LSB-26-487	US 89 TO I-15 SB	12+666	0.0 RT	124,190.072	19,124.774	1,297.747
LSB-26-489	US 89 TO I-15 SB	12+555	14.0 LT	124,085.700	19,161.400	1,297.076
LSB-28-457	BURKE LANE	4+883	0.0 LT	124,342.924	18,712.009	1,294.547
LSB-29-458	BURKE LANE	5+043	0.0 RT	124,387.302	18,751.718	1,296.619
LSB-29-459	BURKE LANE	5+050	0.0 RT	124,467.416	18,823.402	1,300.673
LSB-29-488	BURKE LANE	5+025	5.0 RT	124,445.304	18,809.832	1,296.010
LSB-29-501	BURKE LANE	5+070	N/A	124,482.700	18,837.000	1,303.569
LSB-30-460	BURKE LANE	5+289.6 (rev.)	4.8 LT	124,619.567	19,006.245	1,298.539
LSB-30-461	BURKE LANE	5+349.4 (rev.)	3.2 LT	124,634.719	19,064.711	1,297.381
LSB-30-503	BURKE LANE	5+349.9 (rev.)	6.1 LT	124,637.700	19,064.700	1,298.052

NOTE: 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.

N/A: Not Available.

Boring: SB-21-282
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (N1)60 ● / (N1)60 (Greater than 50 Blows) ○ (0–25–50)	Test Results * S_{u}, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1300	FILL: Poorly Graded GRAVEL with sand - medium dense, wet, gray to brown, frequent clay layers 150 mm thick		1														
		5	2		MC	152			5 8 15 19	24							
		10	3		SPT	254			7 9 10 13	23							
			4														
		15	5		MC	152			7 12 21 24	27							
1295		20	6		SPT	305			12 8 7 6	13							
	Fat CLAY - soft, wet, brown		7				CH	A-7-6									
		25	8		SH	610					35 29	13.6	38	54	26	97	C SG
	Poorly Graded SAND with gravel - medium dense, wet, olive-gray, maximum clast 40 mm in size	30	9		SPT	356	SP	A-3	8 7 8 6	11							
			10														
1290		35	11		MC	25			12 13 10 10	22							
			12														
	Lean CLAY- medium stiff, wet, gray, interbedded, with very fine-grained sands	40			SPT	356	CL	A-6	4 5 4 4	6							
			13														
		45	14		SH	381					24						
			15														
1285	- frequent black sand seams with organic odor	50			SPT	610			6 5 4 6	7							
			16														
		55	17		SH	610					51 38	15.7	27	35	13	96	C SG
	- medium stiff, moist, gray, with clayey fine-grained sand		18														
		60			SPT	610			5 5 6 7	7							
	- frequent sand layers 6 mm		19														
	Poorly Graded GRAVEL with sand - very dense, wet, gray, with 50%	65					GP	A-2-4									

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-21-282**

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

Logged by:	M. Ivers
Date Start:	2/14/00
Date Finish:	2/14/00
Station:	0+648.656 3.03 LT
Line:	STATE ST.
Coordinates (m):	N 123,444.419 E 19,302.374
Elevation (m):	1300.654
Total Depth Drilled (m):	28.0
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Boring: SB-21-282
Sheet 2 of 2

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)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	fine to coarse-grained gravel (maximum clast 25 mm), with 50% medium to coarse-grained sand				SPT	610			17 48 41 39								
1280		70	21														
	- loose, trace of wet sand in tip		22		SPT	0			6 5 3 6	5							
	- dense	75	23		SPT	406			11 38 30 30	43							
		80	24														
			25		SPT	381			10 19 50/ 125mm								
1275	- very dense	85	26		SPT	152			19 47 44 32								
		90	27														
	- medium dense		28		SPT	610			20 18 15 17	20							
		95	29														
			30														
1270		100	31														
		105	32														
			33														
		110	34														
		115	35														
1265			36														
		120	37														
		125	38														
			39														
		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-21-282**

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

Logged by:	M. Ivers
Date Start:	2/14/00
Date Finish:	2/14/00
Station:	0+648.656 3.03 LT
Line:	STATE ST.
Coordinates (m):	N 123,444.419 E 19,302.374
Elevation (m):	1300.654
Total Depth Drilled (m):	28.0
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Boring: SC-21-283
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Sandy Lean Clay - hard, moist, dark brown, with fine-grained gravel				SPT	610			8 8 15 18								
	FILL: Silty SAND - very dense, moist, black to dark brown, coarse-grained, poorly sorted, occasional 0.3 m thick clay layers	5	1														
			2		SPT	610			15 16 14 15								
1300		10	3		SPT	610			5 15 15 12	50							
			4														
	- dense, brown	15	5		SPT	610			5 13 9 11	36							
	- very dense, concrete in end of sampler	20	6		MC	254			50/100mm								
			7														
1295	- dark brown	25	8		SPT	508			15 17 25 20								
	Lean CLAY - medium stiff, moist to wet, dark brown to black, with faint petroleum odor in bottom 3" of sample	30	9		SPT	457	CL	A-7-5	1 2 3 2	7			39	63	29	84	
			10														
		35	11														
			12														
		40															
1290			13														
		45	14														
			15														
		50															
			16														
		55	17														
1285																	
		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: **SC-21-283**

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

Logged by:	M. Bostrom
Date Start:	2/15/00
Date Finish:	2/15/00
Station:	0+687.382 1.75 LT
Line:	STATE ST.
Coordinates (m):	N 123,442.842 E 19,341.089
Elevation (m):	1302.737
Total Depth Drilled (m):	9.8
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	203 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

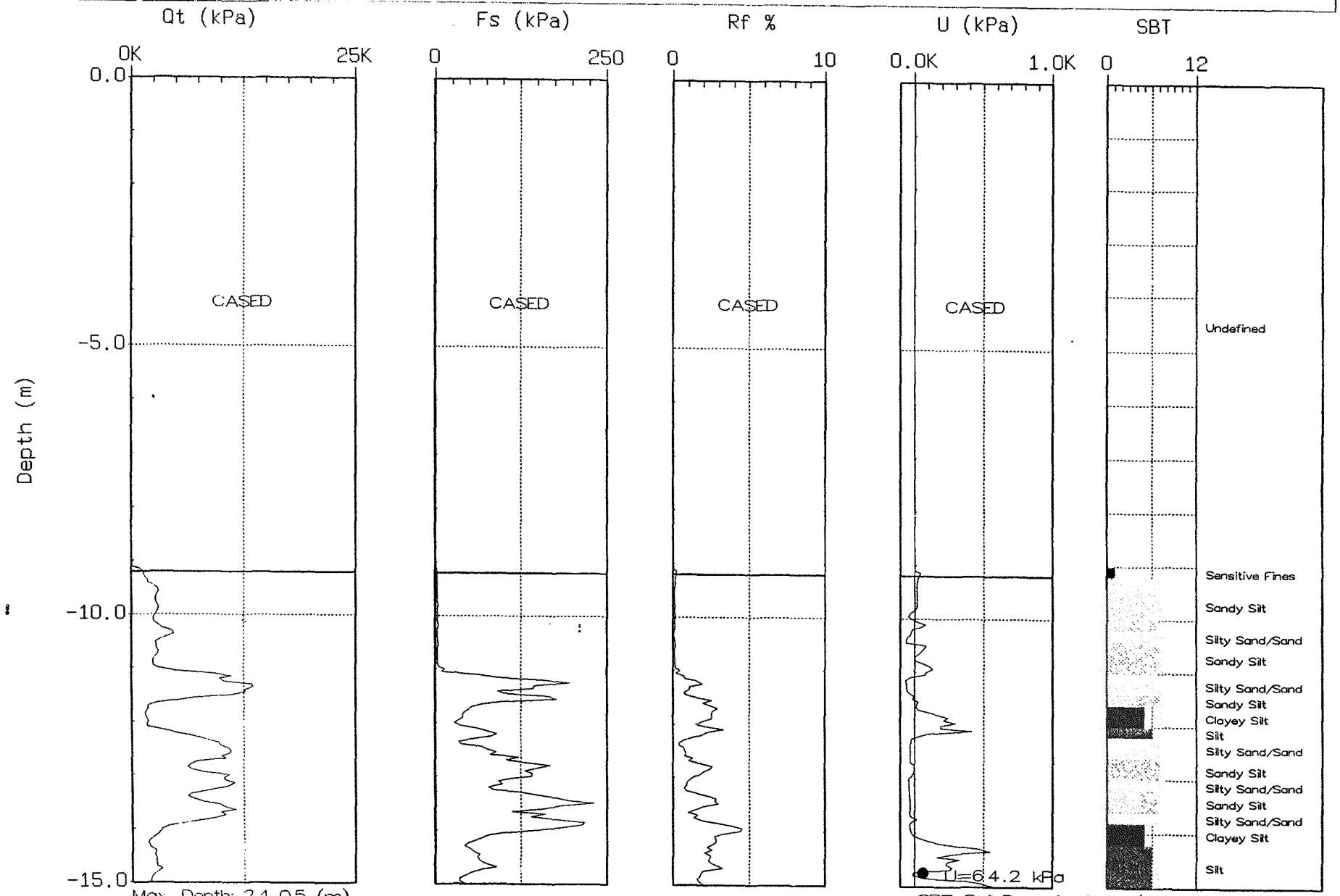
BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 5/31/00

Legacy Parkway

Site: SC-21-283
Station: 0+687.382 1.75 LT
Elevation: 1302.674

Cone: 20 TON . J92
Date: 02:16:00 08:47



Max. Depth: 24.05 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

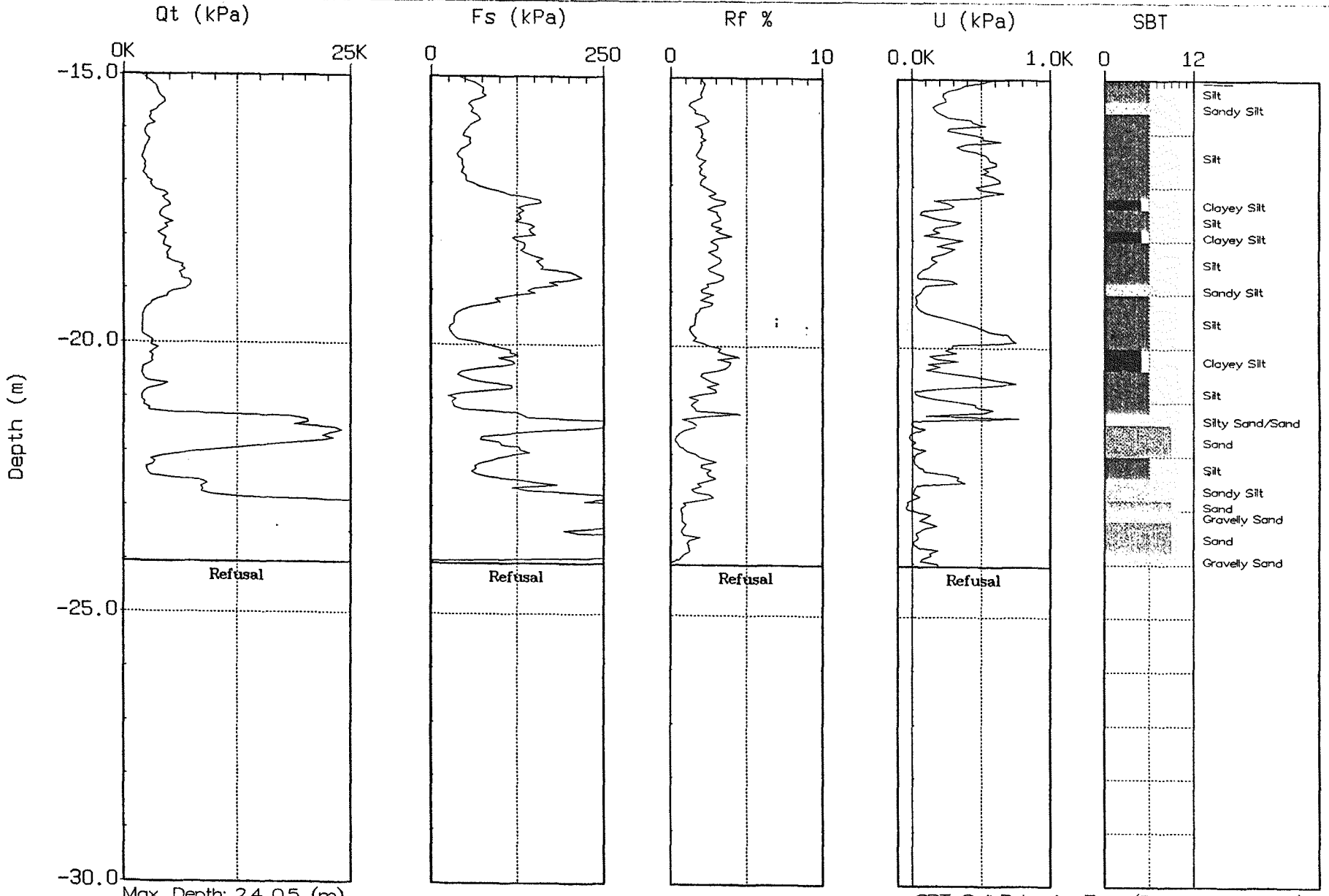
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-236

Legacy Parkway

Site: SC-21-283
Station: 0+687.382 1.75 LT
Elevation: 1302.674

Cone: 20 TON A 092
Date: 02:16:00 08:47



Max. Depth: 24.05 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-237

Boring: SB-21-284
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1305	ASPHALT CONCRETE - 50 mm thick FILL: Silty SAND and GRAVEL, medium dense, moist, brown				SPT	610			8 8 8 8	16							
		5	1		SPT	457			4 6 8 12	30							
	- very dense	10	2		SPT	610			22 24 19 11								
		15	3		SPT	559			5 8 9 12	23							
1300		20	4		SPT	559			3 9 12 12	25							
		25	5		MC	508			19 25 21 43	50							
	ASPHALT CONCRETE - 75 mm thick FILL: Silty SAND - very dense, slightly moist, light brown, some coarse-grained gravel	30	6		SPT	559			19 28 27 38								
1295	Lean CLAY layer, medium stiff, wet, brown Silty SAND - dense, wet, light brown to brown, occasional gravel up to 75 mm in size	35	7		SPT	610	CL SM	A-6 A-2-5	18 24 28 20	48							
	Lean CLAY - medium stiff, wet, dark brown, with frequent sand and silt seams and layers	40	8		SPT	610	CL	A-6	3 3 5 6	8							
		45	9		SPT	610			2 2 3 5	5							
1290	- medium stiff	50	10		SPT	610			3 4 7 11	9							
		55	11														
		60	12		SPT	610			2 2 6 6	7							
		65	13														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-21-284**

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

Logged by:	M. Bostrom
Date Start:	2/14/00
Date Finish:	2/16/00
Station:	0+740.395 3.19 LT
Line:	STATE ST.
Coordinates (m):	N 123,443.868 E 19,394.112
Elevation (m):	1305.365
Total Depth Drilled (m):	29.6
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	203 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Boring: SB-21-284
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 25 50)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1285	Lean CLAY, continued																
		70	21		P	457					32 *48*	16.9	22	30	8	85	C TR SG
		75	22														
			23														
			24														
		80	25		SPT	610	SM	A-2-4	6 16 20 10	●27							
1280	Silty SAND with GRAVEL - medium dense, wet, gray, frequent silt and clay seams and layers																
	- very dense	85	26		SPT	610			21 47 66								
			27														
	- dense	90	28		SPT	559			15 24 27 21	●37							
	-medium dense	95	29		SPT	610			19 14 24 27	●27							
1275		100	30														
			31														
		105	32														
			33														
		110	34														
1270		115	35														
			36														
		120	37														
		125	38														
			39														
		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-21-284**

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

Logged by:	M. Bostrom
Date Start:	2/14/00
Date Finish:	2/16/00
Station:	0+740.395 3.19 LT
Line:	STATE ST.
Coordinates (m):	N 123,443.868 E 19,394.112
Elevation (m):	1305.365
Total Depth Drilled (m):	29.6
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	203 mm

LEGEND/NOTES

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

Coordinates are NAD '83

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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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Boring: SB-22-285
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows)	Su, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Poorly Graded SAND with gravel - dense, moist, gray																
1305		5	1		SPT	152			7 650/75mm								
		10	2		MC	356			7 10 7 10	●15							
		15	3		SPT	51			50/ 75mm								
1300		20	4		SPT	610			6 8 9 10	●15							
		25	5		MC	330			5 10 30 23	●27							
1295		30	6		SPT	279			8 17 19 19	●30							
		35	7		MC	457			18 19 30 27	●31							
	Lean CLAY - stiff, wet, dark brown to black	40	8		SPT	305	CL	A-6	5 5 6 6	●9							
	Sandy Lean CLAY - medium stiff, wet, gray, with fine-grained gravel	45	9		P		CL	A-6			45 43	15.5	28	42	19	58	C SG
	- with some fine-grained gravel	50	10		SPT				3 3 4 5	●5							
1290		55	11		P	0											
		60	12		SPT	508			8 6 8 7	●9							
		65	13														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-22-285**

Sheet 1 of 2

Logged by:	M. Ivers
Date Start:	2/15/00
Date Finish:	2/17/00
Station:	0+773.642 3.26 LT
Line:	STATE ST.
Coordinates (m):	N 123,443.685 E 19,427.358
Elevation (m):	1306.607
Total Depth Drilled (m):	39.3
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Boring: SB-22-285
Sheet 2 of 2

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)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy Lean CLAY - medium stiff, wet, gray (continued)			P	0										
				MC	0										
			21												
		70		MC	0										
1285			22												
	Poorly Graded SAND - medium dense, wet, gray	75	23	P	76	SP	A-2-4								
	Lean CLAY - stiff, wet, brown to gray, with occasional large clast of gravel		24			CL	A-6								
		80		MC	610			8 10 21 23							
			25												
	Poorly Graded SAND - dense, wet, gray	85	26	SPT	406	SP	A-2-4	10 14 19 24							
1280			27												
	Poorly Graded GRAVEL - very dense, wet, gray, with approximately 30% medium to coarse-grained	90	28	SPT	305	GP	A-1-a	29 50 50/100mm							
	Poorly Graded SAND with gravel - very dense, wet, gray, medium to coarse-grained, with 20% fine to coarse-grained gravel	95	29	SPT	356	SP	A-2-4	15 20 38 39							
			30												
	- dense, moist, gray, with approximately 10% fine-grained gravel, medium to coarse-grained sand	100	31	SPT				18 23 12 13							
	SILT - stiff, moist, gray, with 0 to 20% fine-grained gravel					ML	A-4								
1275	Lean CLAY - stiff, wet, gray, grading to brown and moist	105	32	SPT	610	CL	A-6	6 7 6 9							
		110	33												
			34												
	Poorly Graded GRAVEL with sand - very dense, wet, gray, with approximately 40% medium to coarse-grained sand	115	35	SPT		GP	A-1-a	16 50 50/100mm							
			36												
1270		120	37	SPT	610	ML	A-4	15 27 13 11							
	Sandy SILT - very stiff, wet, gray														
		125	38	P	127										
	- grades to gravelly clay, very stiff, wet, gray		39	MC				15 10 11 45							
	Poorly Graded SAND with gravel	130				SP	A-2-4								

Graphic Log

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

UTDOT Z003SB2B.GPJ 8/31/00

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-22-285**

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

Logged by:	M. Ivers
Date Start:	2/15/00
Date Finish:	2/17/00
Station:	0+773.642 3.26 LT
Line:	STATE ST.
Coordinates (m):	N 123,443.685 E 19,427.358
Elevation (m):	1306.607
Total Depth Drilled (m):	39.3
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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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

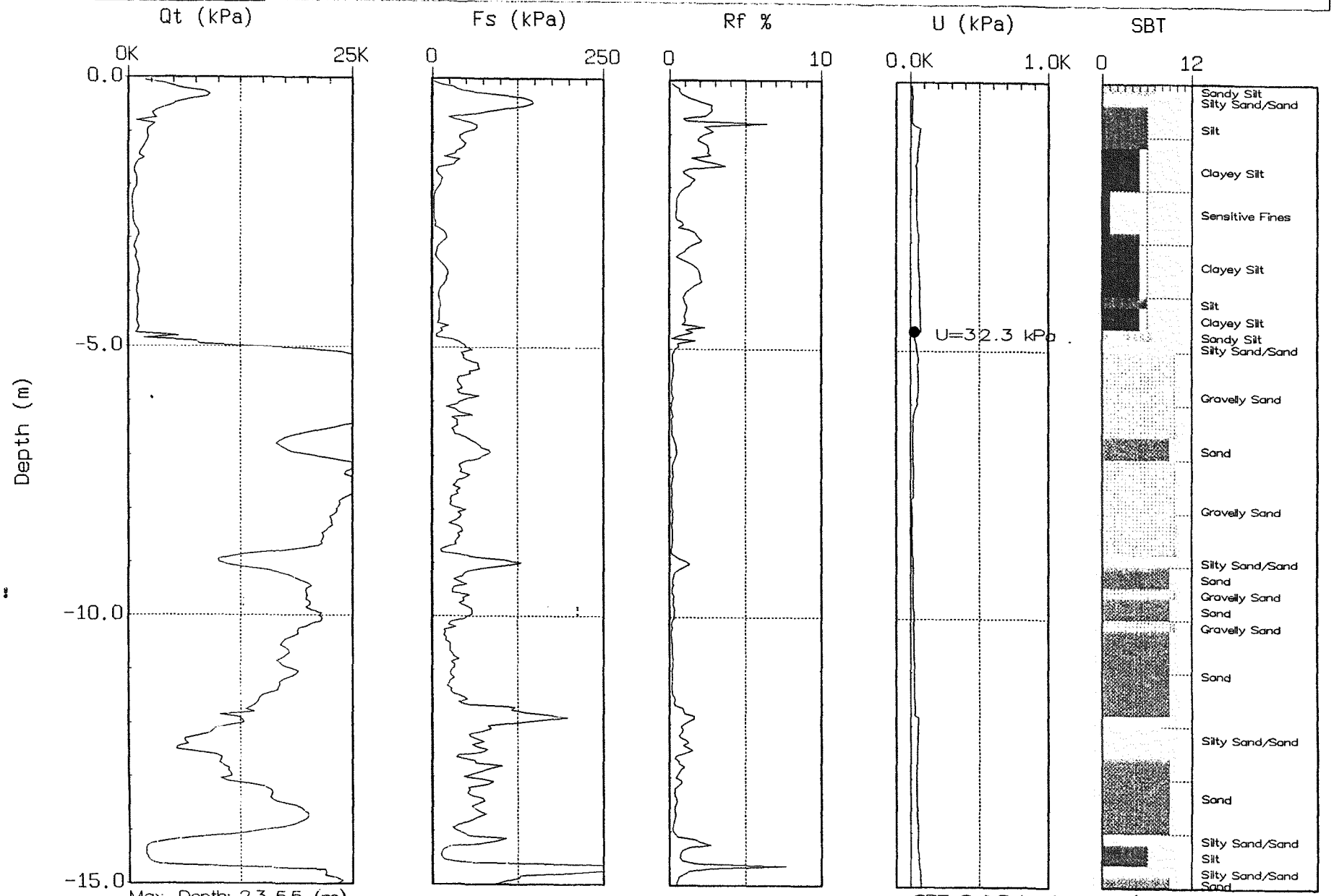
SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Legacy Parkway

Site: SC-22-286
Station: 0+815.552 0.00 LT
Elevation: 1295.750

Cone: 20 TON A 92
Date: 02:15:00 15:39



Max. Depth: 23.55 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

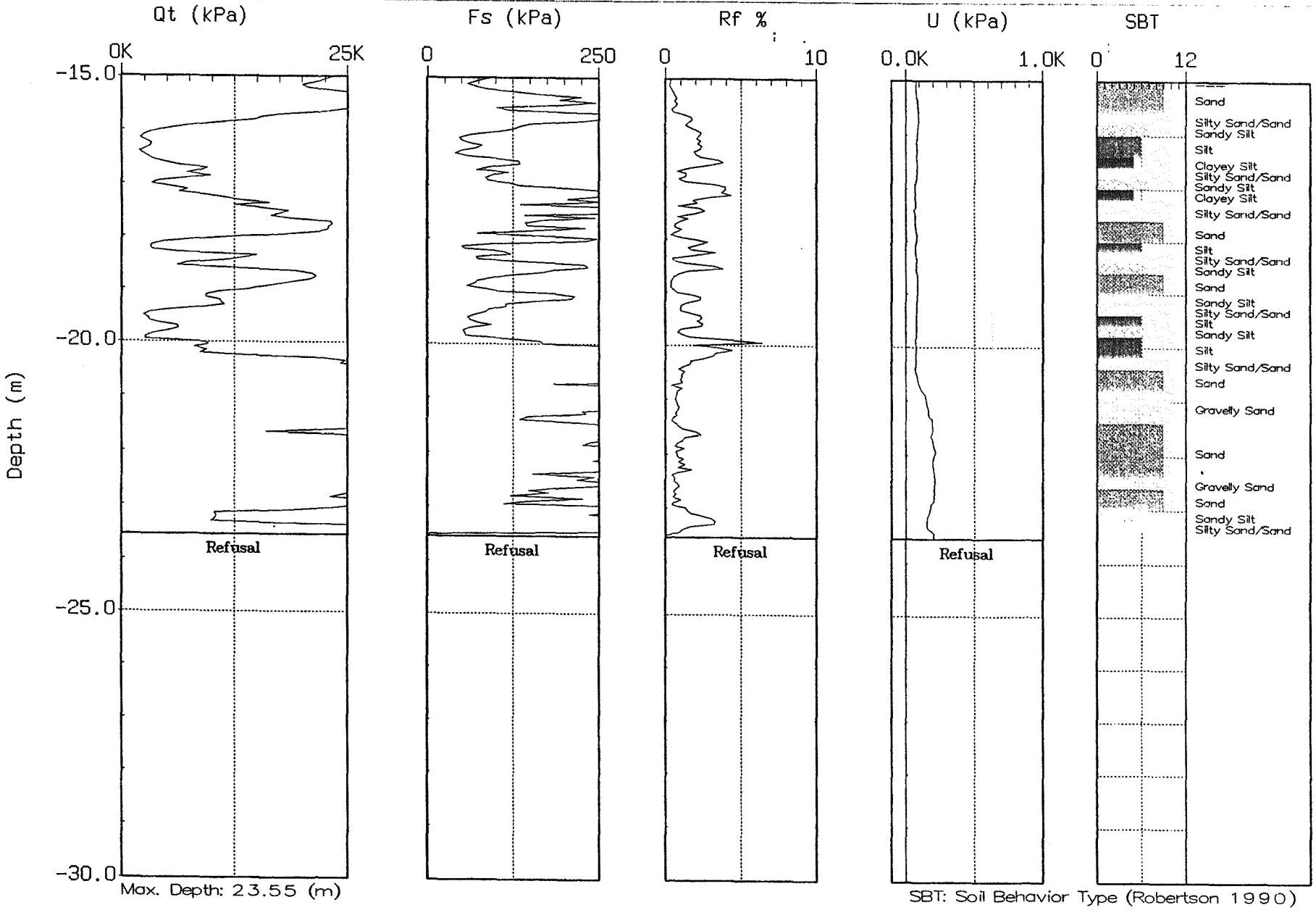
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-242

Legacy Parkway

Site: SC-22-286
Station: 0+815.552 0.00 LT
Elevation: 1295.750

Cone: 20 TON A 092
Date: 02:15:00 15:39



Max. Depth: 23.55 (m)
Depth Inc.: 0.050 (m)

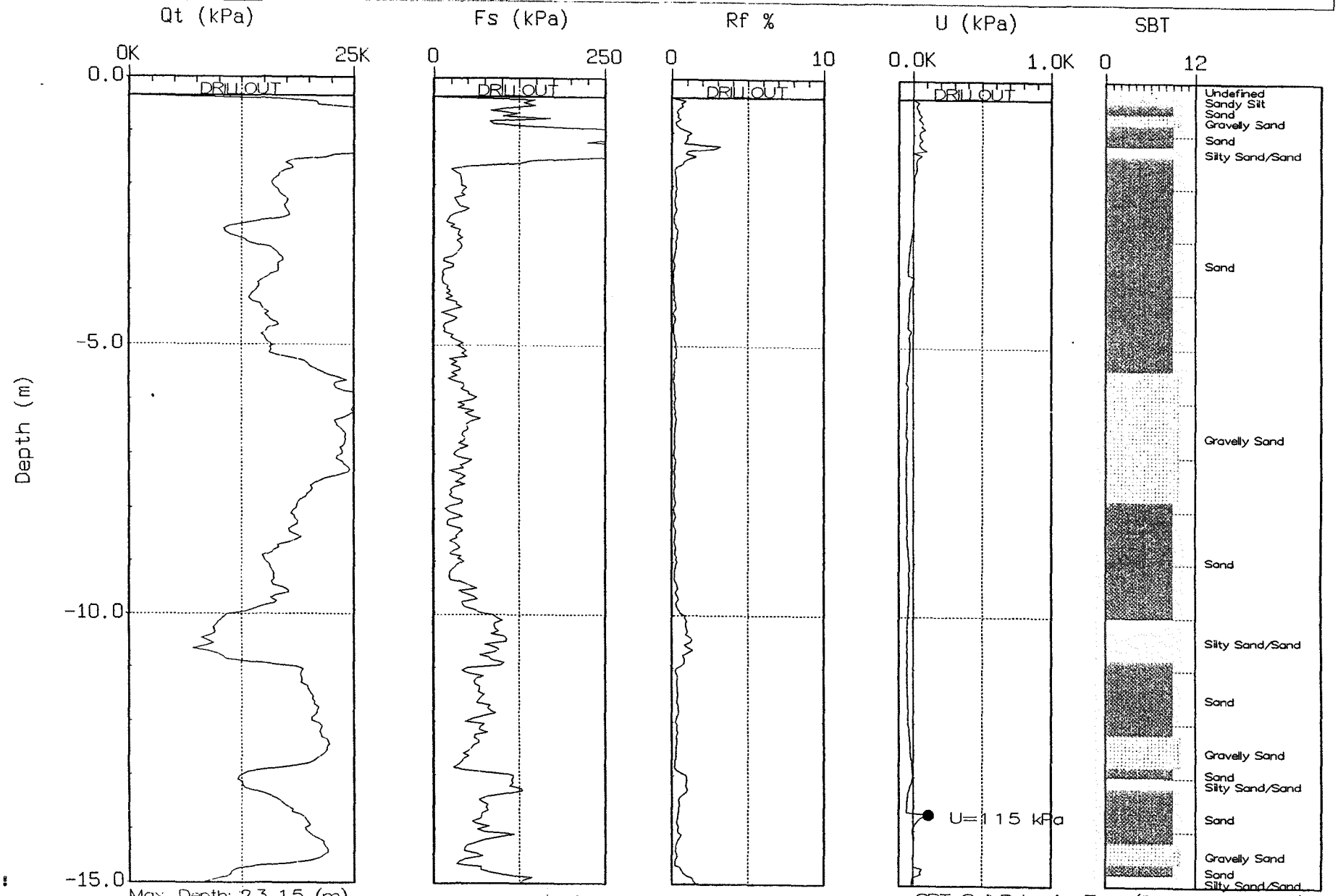
SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

Legacy Parkway

Si. SC-22-287
Station: 0+854.444 2.22 RT
Elevation: 1296.540

Cone: 20 TON
Date: 03:01:00 09:37



Max. Depth: 23.15 (m)
Depth Inc.: 0.050 (m)

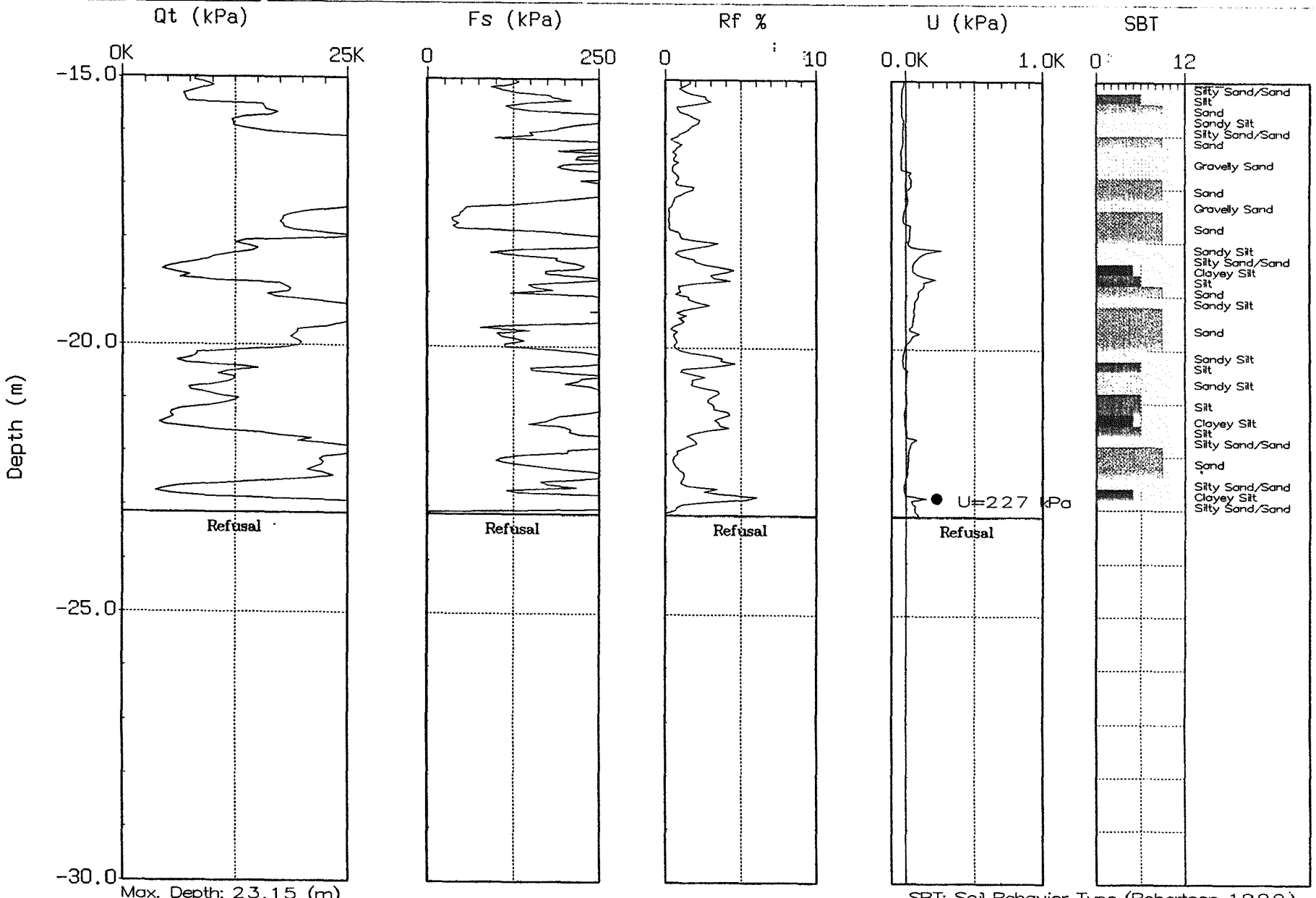
SBT: Soil Behavior Type (Robertson 1990)
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-244

Legacy Parkway

Site: SC-22-287
Station: 0+854.444 2.22 RT
Elevation: 1296.540

Cone: 20 TON A 070
Date: 03:01:00 09:37



Max. Depth: 23.15 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-245

Boring: SB-22-288
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (N₁)₆₀ ● / (N₁)₆₀ (Greater than 50 Blows) ○ (0–25–50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND with gravel - loose, moist, yellow-brown		1		GRAB												
		5	2		GRAB												
		10	3		SPT	610			5 3 2 4	●8							pH WSS R
			4														
1300	SILT - stiff, wet, brown, with frequent seams of very fine-grained sands	15	5		SPT	559	ML	A-4	3 4 4 6	●12							
		20	6		SPT	457			4 2 4 4	●10							
			7														
		25	8		P	457						15.3	30	31	6		C TR SG
1295		30	9		SPT	559			2 3 3 9	●10							
	Poorly Graded SAND - very dense, wet, gray, coarse-grained		10				SP	A-3									
		35	11		SPT	610			11 17 20 30	○							
		40	12		SPT	610			11 15 23 29	○							
			13														
		45	14		SPT	305			15 11 8 12	●26							
1290			15														
	Silty SAND - dense, wet, gray, medium and coarse-grained sand - medium dense	50	16		SPT	457	SM	A-2-4	5 14 17 20	●40							
		55	17														
			18														
	- dense	60	19		SPT	457			5 14 16 18	●37							
1285		65															

UTDOT Z0035B2B.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-22-288**

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

Logged by:	M. Bostrom
Date Start:	2/21/00
Date Finish:	2/21/00
Station:	0+918.648 12.68 RT
Line:	STATE ST.
Coordinates (m):	N 123,426.636 E 19,572.238
Elevation (m):	1304.555
Total Depth Drilled (m):	31.1
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120
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

Boring: SB-22-288
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in tsf/cs)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	- Silty SAND, continued		21														
	- gravelly	70			SPT	305			21 32 22 21								
	Silty GRAVEL - very dense, wet, gray		22				GM	A-2-4									
	Silty SAND - medium dense, wet, gray	75	23		SPT	610	SM	A-2-4	3 10 15 16	● 28							
	SILT - very stiff, wet, dark brown, with some medium-grained sands and organic materials		24				ML	A-4									
1280	Silty SAND - very dense, wet, gray, medium to coarse-grained sand	80	25		SPT	610	SM	A-2-4	20 26 26 31								
	SILT - hard, wet, green to bluish-gray, with fine-grained sand	85	26		SPT	610	ML	A-4	19 27 29 21								
			27														
	Poorly Graded SAND - very dense, wet, gray	90	28		SPT	610	SP	A-3	20 25 25 25								
1275		95	29		SPT	559			20 26 43 47								
			30														
		100	31		SPT	559			47 53 57 57								
		105	32														
			33														
		110	34														
1270		115	35														
			36														
		120	37														
		125	38														
			39														
1265		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-22-288**

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

Logged by:	M. Bostrom
Date Start:	2/21/00
Date Finish:	2/21/00
Station:	0+918.648 12.68 RT
Line:	STATE ST.
Coordinates (m):	N 123,426.636 E 19,572.238
Elevation (m):	1304.555
Total Depth Drilled (m):	31.1
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	203 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Boring: SB-23-289
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy SILT with gravel - very stiff, moist, brown, micaceous				SPT	406	ML	A-4	3 5 7 7	24							
		5	1		MC	457			5 5 5 8	18			28	44	15		
	Lean CLAY - very stiff, wet, gray mottled orange and brown, with trace of mica		2				CL	A-6									
		10	3		SPT	406			3 4 4 5	14							
	Sandy SILT - stiff, wet, gray and brown		4				ML	A-4									
	Silty GRAVEL with sand - dense, wet, gray	15	5		MC	457	GM	A-2-4	10 10 18 20	45							
1290		20	6		SPT	305			8 8 18 11	36							
			7														
	Poorly Graded SAND with silt - very dense, wet, gray	25	8		MC	508	SP-SM	A-2-4	24 54 49 37								
		30	9		SPT	610			13 26 48 50								SV
1285			10														
		35	11		MC	356			12 8 18 34	24							
	Clayey SAND with gravel - medium dense, wet, gray						SC	A-2-6									
	Poorly Graded SAND with gravel - very dense, wet, gray	40	12		SPT	356	SP	A-3	9 54 58 39								
			13														
		45	14		MC	610			15 57 50/ 90mm								
1280		50	15		SPT	457			17 23 35 37								
		55	16														
			17														
	Sandy SILT - hard, wet, gray	60	18		MC	457	ML	A-4	9 17 41 34	41							
		65	19														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-23-289**

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

Logged by:	M. Hislop
Date Start:	2/28/00
Date Finish:	2/29/00
Station:	60+436.602 0.52 LT
Line:	I-15 SB TO LP SB
Coordinates (m):	N 123,977.638 E 19,114.208
Elevation (m):	1295.083
Total Depth Drilled (m):	26.5
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Boring: SB-23-289
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty GRAVEL - very dense, wet, gray						GM	A-2-4									
		70	21		SPT	457			15 50 54 45								
			22														
		75	23		SPT	305			13 28 75/ 125mm								
			24														
	- with sand	80			MC	406			17 68 50/ 100mm								
1270			25														
		85	26		SPT	330			24 75/ 100mm								
			27														
		90															
			28														
		95	29														
1265			30														
		100	31														
		105	32														
			33														
		110	34														
1260		115	35														
			36														
		120	37														
		125	38														
			39														
		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-23-289**

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

Logged by:	M. Hislop
Date Start:	2/28/00
Date Finish:	2/29/00
Station:	60+436.602 0.52 LT
Line:	I-15 SB TO LP SB
Coordinates (m):	N 123,977.638 E 19,114.208
Elevation (m):	1295.083
Total Depth Drilled (m):	26.5
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	*Diedrich D-120 ATV*
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

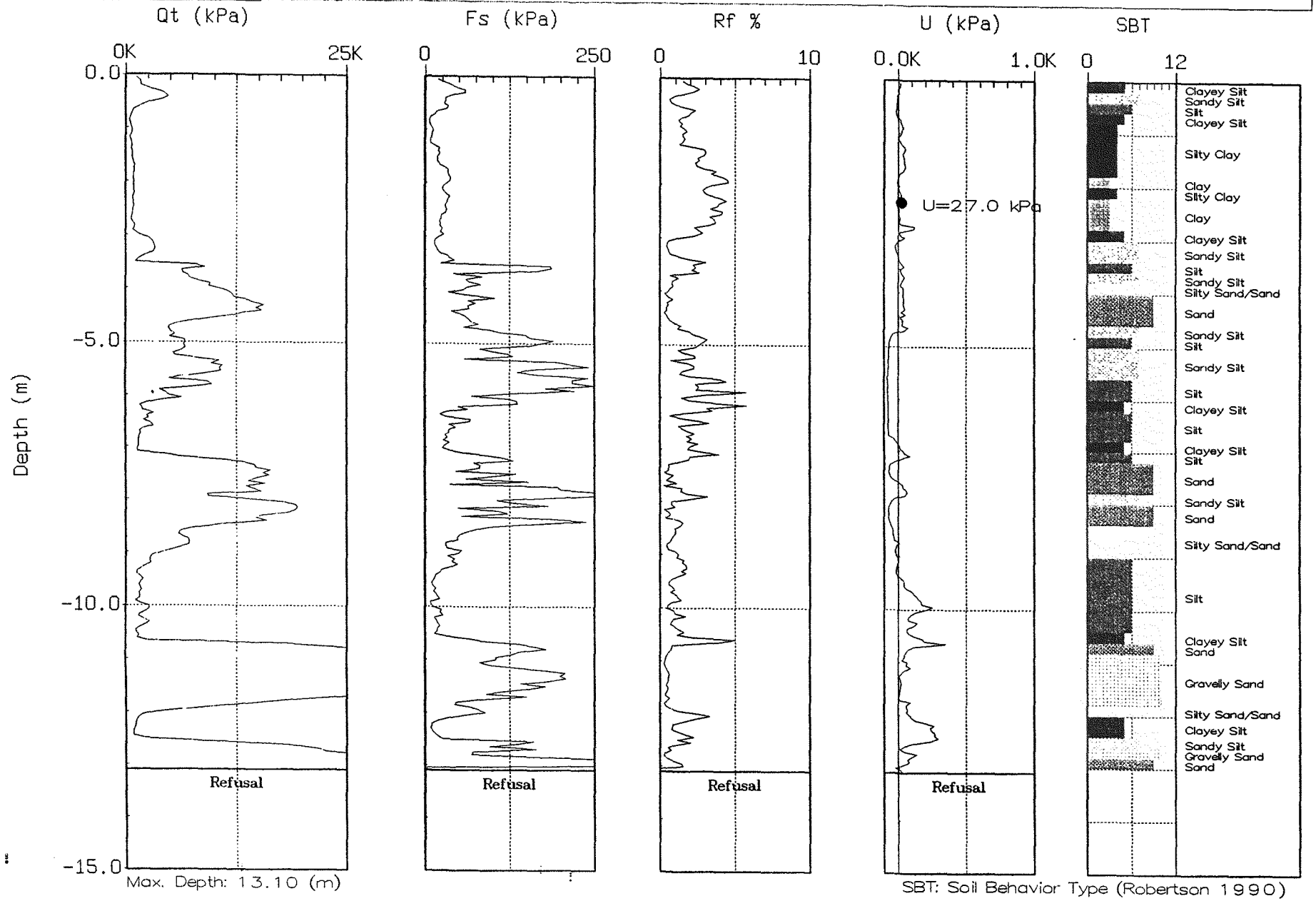
BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Legacy Parkway

Site: -23-290A
Station: 60+480.966 5.61 LT
Elevation: 1295.394

Cone: 20 TON A 0
Date: 02:22:00 14:59



Max. Depth: 13.10 (m)
Depth Inc.: 0.050 (m)

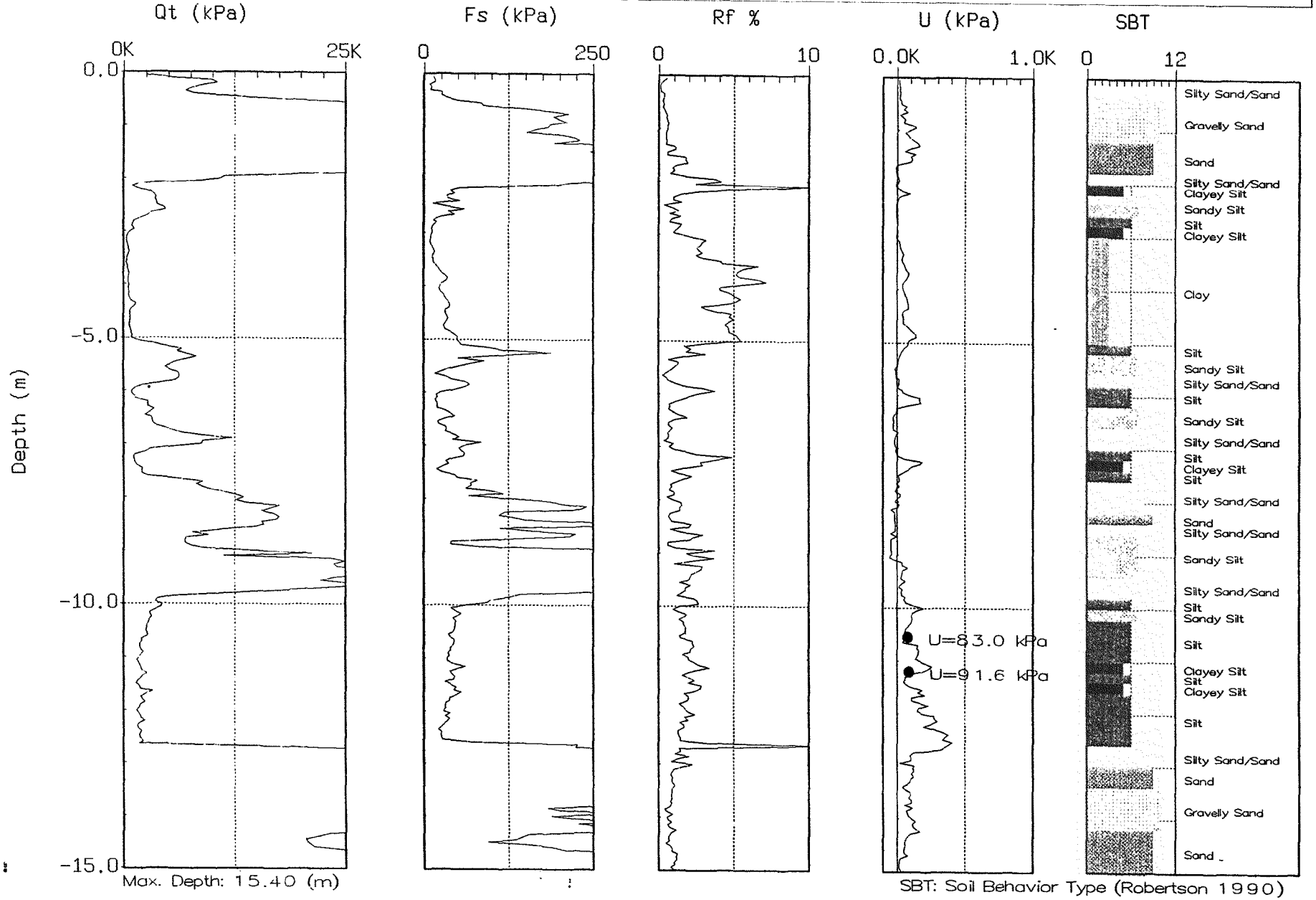
SBT: Soil Behavior Type (Robertson 1990)
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-250

Legacy Parkway

Site: SC-23-290B
Station: 60+551.904 6.21 RT
Elevation: 1297.876

Cone: 20 TON A 092
Date: 02:10:00 11:33



Max. Depth: 15.40 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

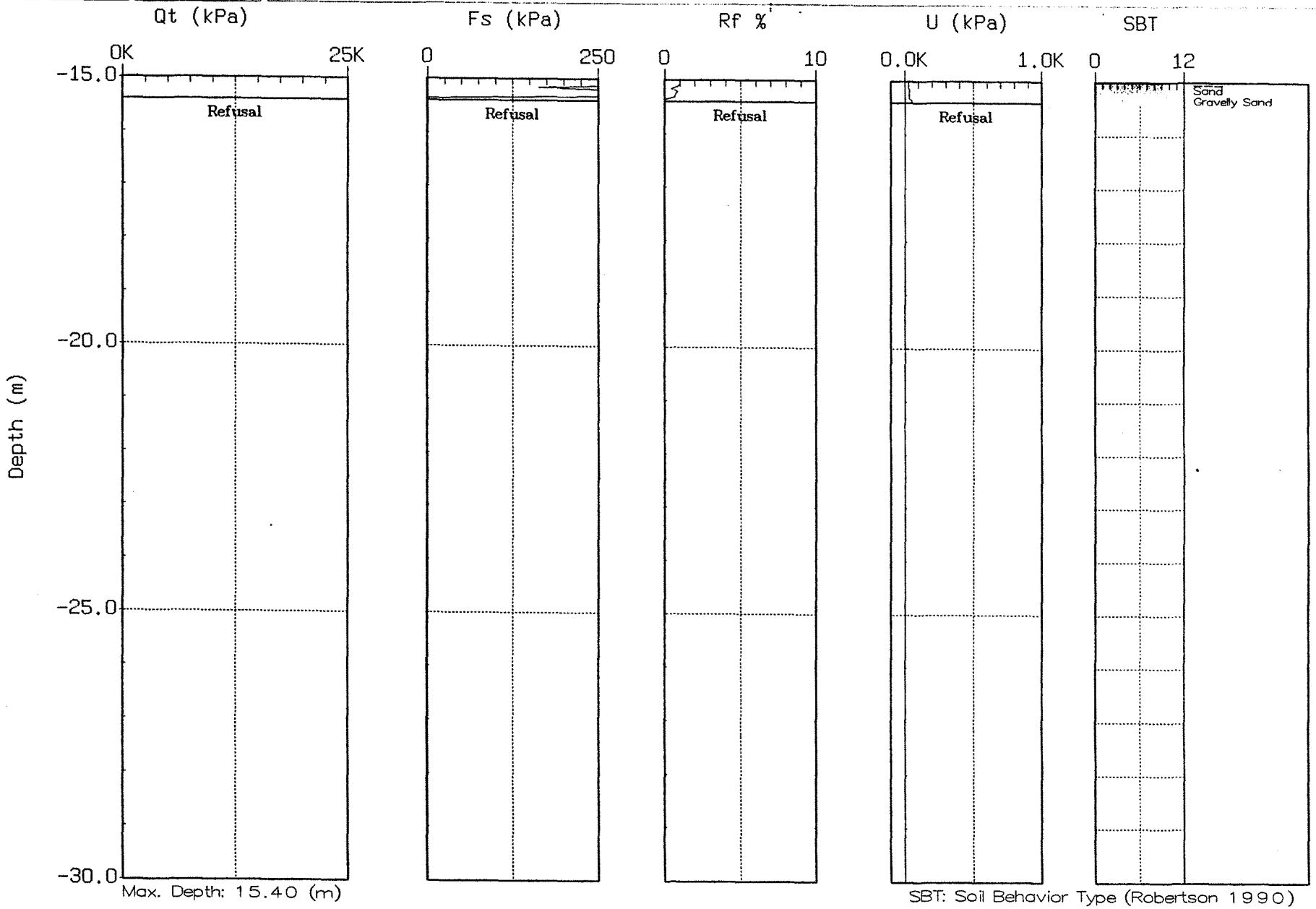
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-251

Legacy Parkway

Site: SC-23-290B
Station: 60+551.904 6.21 RT
Elevation: 1297.876

Cone: 20 TON A 092
Date: 02:10:00 11:33



Max. Depth: 15.40 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

Boring: SB-23-290C
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Poorly Graded GRAVEL with sand - medium dense, gray, with occasional clayey seam, fine to coarse-grained				SPT	457			9 8 9 14	23							
		5	1														
			2		SH	0											
1295		10	3		SH	0											
			4														
		15	5		SPT	127			15 11 13 8	24							
	SILT - stiff, wet, brown						ML	A-4									
		20	6		SPT	330			19 6 5 7	11							
			7														
1290		25	8														
		30	9		SH	762					38	14.7	34	32	8	95	C TR SG
			10														
	- soft, some fine-grained sand, laminae (micaceous)	35	11		SPT	610			0 0 4 6	3							
	Lean CLAY - stiff, moist to wet, grayish brown, with frequent fine-grained sand, laminae (micaceous)		12				CL	A-6									
1285		40			SH	508					53	15.1	30			93	C SG
			13														
	Silty GRAVEL - dense, wet, dary gray	45	14		SPT	25	GP	A-1-a	10 8 9 21	13							
			15														
	- very dense	50			SPT	25			18 50/ 100mm								
			16														
		55	17		SPT	254			8 27 34 28	41							
1280			18														
		60			SPT	0			50/125mm								
			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: **SB-23-290C**

Sheet 1 of 1

Logged by:	A. Waldman
Date Start:	2/9/00
Date Finish:	2/14/00
Station:	60+599.449 4.87 LT
Line:	I-15 SB TO LP SB
Coordinates (m):	N 124,132.337 E 19,070.781
Elevation (m):	1297.427
Total Depth Drilled (m):	18.4
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

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 6/31/00

Boring: SB-24-255
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ 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
1295	SILT - very stiff, wet, dark brown				SPT	559	ML	A-4	5 5 5 5	20							
		5	1		SH	610					43 *43*	14.7	32			93	pH WSS R C TR SG
		10	2		SPT	610			2 5 1 2	8						17	
	- medium stiff	15	3														
1290	Silty SAND - loose, wet, gray, with seams of clay, clay seams are reddish-brown		4		MC	457	SM	A-2-4	2 3 4 5	8							
	Silty CLAY - stiff, wet, reddish-brown, with occasional seams of fine-grained sand	20	5		SPT	610	CL	A-6	3 4 5 6	12							
		25	6														
	Silty SAND - medium dense, wet, gray, with clay seams, clay seams are red-brown	30	7		MC	610	SM	A-2-4	5 11 10 12	21							
			8		SPT				4 2 4 8	7							
1285		35	9		MC	457			3 3 14 24	16							
		40	10		SPT	508			14 16 27 36	46							
		45	11		MC	229			37 39 29 13	○							
1280		50	12		SPT	610			3 8 11 9	19							
		55	13														
		60	14		MC	203			9 18 27 24	35							
	SILT interbedded with Silty SAND - hard, wet, greenish gray	65	15				ML	A-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-24-255**

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

Logged by:	M. Bostrom
Date Start:	3/16/00
Date Finish:	3/17/00
Station:	20+512.743 20.84 LT
Line:	LP NB to I-15 NB (US 89)
Coordinates (m):	N 123,943.153 E 19,142.978
Elevation (m):	1295.236
Total Depth Drilled (m):	38.7
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB28.GPJ 5/31/00

Boring: SB-24-255
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1275	Silty CLAY - stiff, wet, reddish-brown, with occasional seams of fine-grained sand (continued)																
		70	21		SPT	610			4 7 12 10	16							
			22														
		75	23														
			24														
		80	25		MC	102			50/100mm								
1270		85	26														
			27														
	Silty SAND with gravel - medium dense, wet, greenish gray	90	28		SPT	305	SM	A-2-4	40 54 50/125mm								
	Sandy Lean CLAY - very stiff, wet, dark brown, contains frequent seams of silt and silty sand and layers	95	29		SPT	457	CL	A-4	17 7 11 14	13							
1265			30														
		100	31		MC	152			25 50/75mm								
		105	32		SPT	559			21 15 17 22	23							
			33														
		110	34														
1260		115	35		MC	356			21 39 60/125mm								
			36														
		120	37		SPT	457			13 17 23 29	28							
		125	38		SPT	406			24 26 19 20	30							
			39														
		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-24-255**

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

Logged by:	M. Bostrom
Date Start:	3/16/00
Date Finish:	3/17/00
Station:	20+512.743 20.84 LT
Line:	LP NB to I-15 NB (US 89)
Coordinates (m):	N 123,943.153 E 19,142.978
Elevation (m):	1295.236
Total Depth Drilled (m):	38.7
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

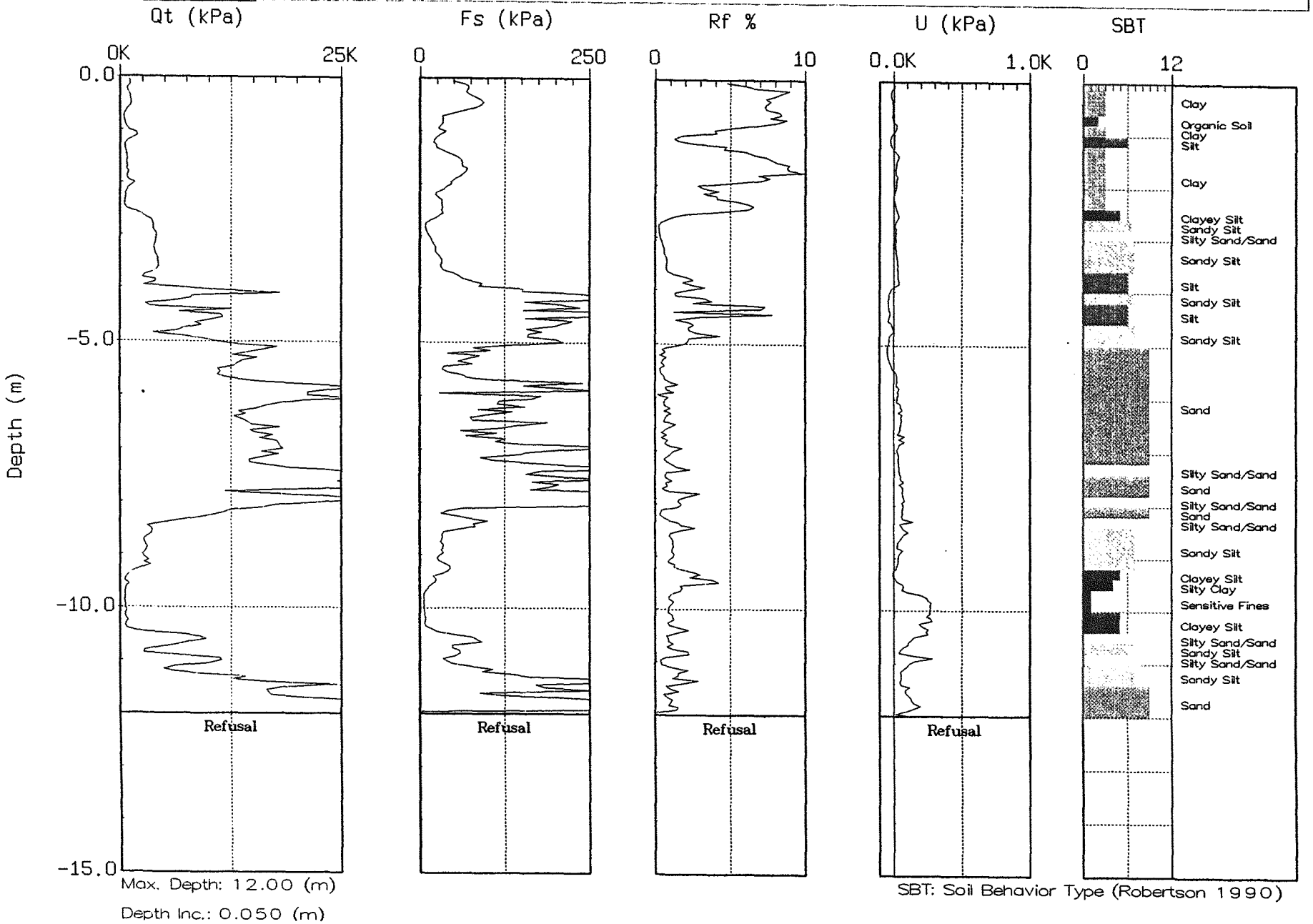
BAG = Bulk Sample

UTDOT Z0035B2B.GPJ 5/31/00

Legacy Parkway

Site: -24-256
Station: 20+554.154 10.26 LT
Elevation: 1295.320

Cone: 20 TON A 0
Date: 02:22:00 11:04



Max. Depth: 12.00 (m)
Depth Inc.: 0.050 (m)

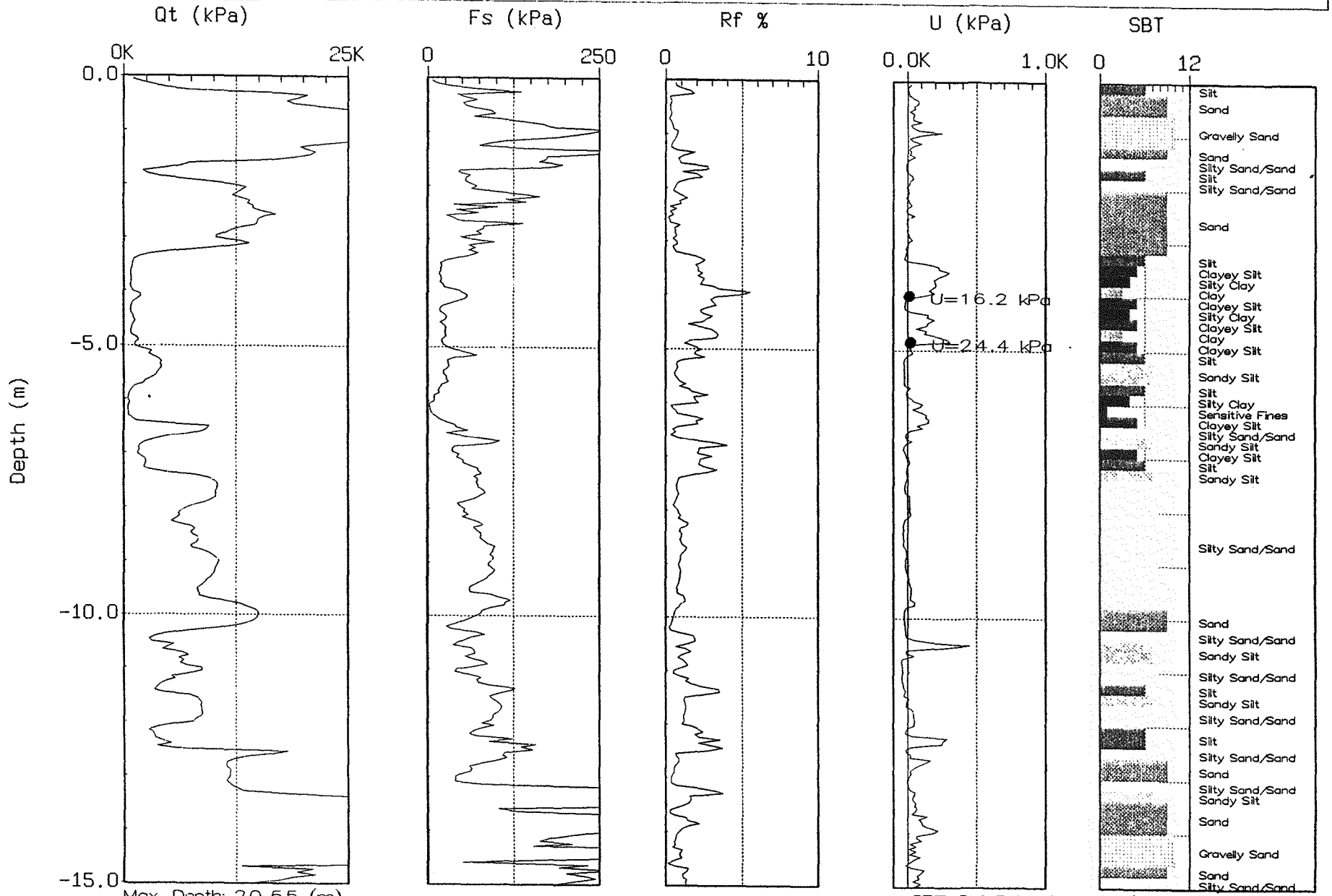
SBT: Soil Behavior Type (Robertson 1990)

PLATE B-256

Legacy Parkway

Sit C-24-257
Station: 20+623.800 11.20 RT
Elevation: 1297.923

Cone: 20 TON
Date: 02:10:00



Max. Depth: 20.55 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

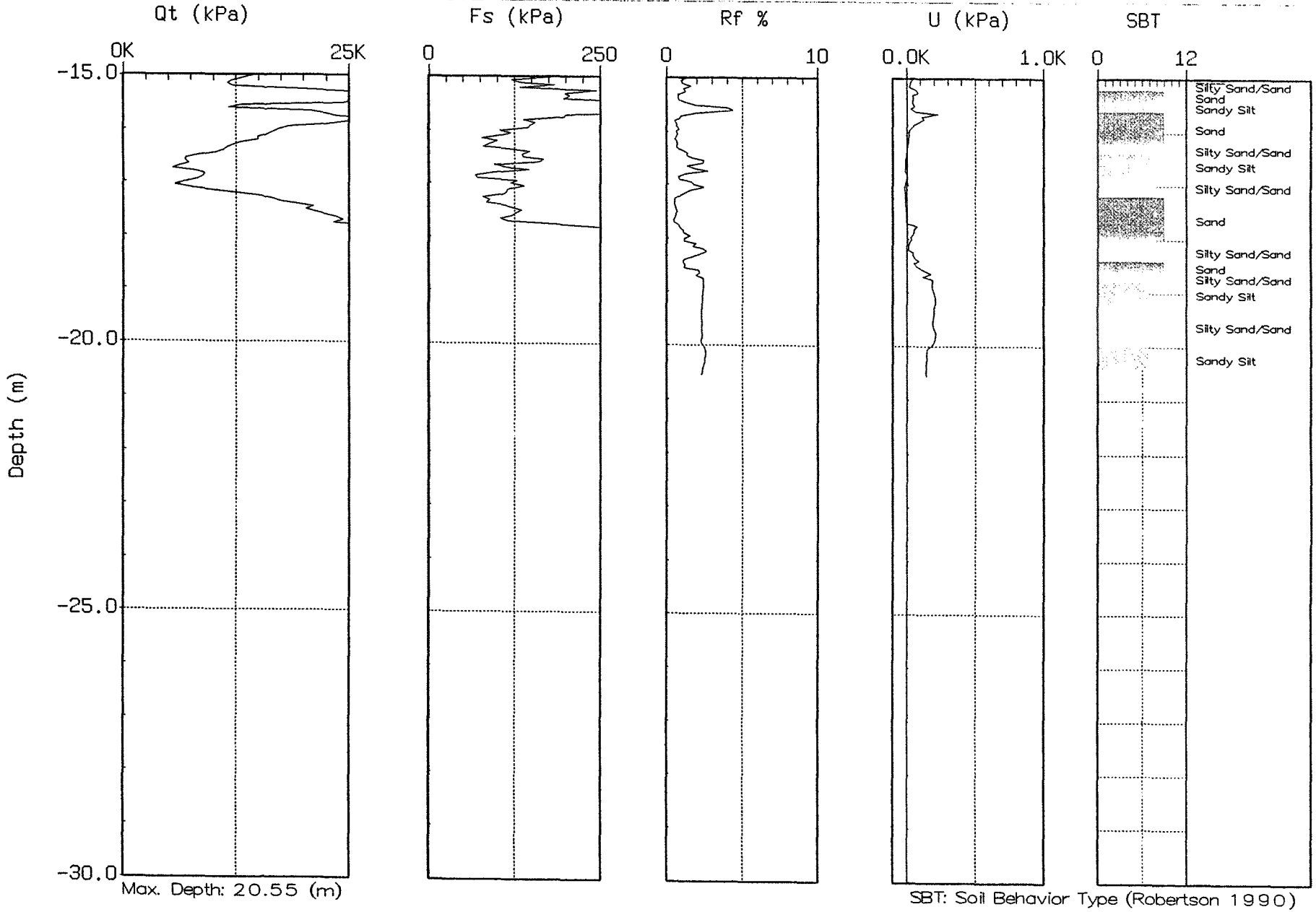
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-257

Legacy Parkway

Site: SC-24-257
Station: 20+623.800 11.20 RT
Elevation: 1297.923

Cone: 20 TON A 092
Date: 02:10:00 14:15



Max. Depth: 20.55 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-258

Boring: SB-24-258
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / 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
	Silty SAND - medium dense, moist, dark brown, with trace gravel				SPT	610	SM	A-2-4	4 6 7 6	26							
	SILT with sand - medium stiff, moist, dark brown	5	1		SPT	610	ML	A-4	1 2 1 2	5							pH WSS R
1295	Lean CLAY - soft, moist, yellow-brown	10	2	P	P	508	CL	A-6			39 *53*	15.7	30			82	C SG
	Poorly Graded SAND with silt - medium dense, moist, gray, with trace gravel	15	3		SPT	457	SP-SM	A-2-4	4 6 4 3	13							
	SILT with sand - soft, moist, dark brown, with fine-grained sand, with trace and organic soil	20	4		SPT	381	ML	A-4	0 1 2 2	4							
1290	Poorly Graded SAND with silt - dense, wet, gray, with trace fine-grained gravel	25	5		SPT	381	SP-SM	A-2-4	13 24 16	40							
	Lean CLAY with sand - medium stiff, moist, yellow-brown	30	6		SPT	102	CL	A-6	5 4 3 4	7							
	- medium stiff, moist, yellow-brown	35	7	P	P	610					10 *38*	15.8	27			5	C TR SG
	Silty SAND - loose, moist, gray	40	8		SPT	508	SM	A-2-4	4 5 2 3	7							
1285	SILT with sand - medium stiff, moist, gray, with fine-grained sand		9				ML	A-4									
	Poorly Graded GRAVEL with sand - very dense, wet, gray, with trace fines	45	10		SPT	381	GP	A-1-a	18 45 24								
	Poorly Graded SAND with silt - very dense, moist, gray	50	11		SPT	457	SP-SM	A-2-4	10 30 50/ 140mm								
	- silt lense 100 mm thick	55	12		SPT	457			5 15 35 35	42							
1280	- with gravel	60	13		SPT	356			20 30 19	39							
		65	14														

UTDOT Z603SB2B.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-24-258**

Sheet 1 of 2

Logged by:	J. Rajek
Date Start:	2/10/00
Date Finish:	2/10/00
Station:	20+666.464 1.21 RT
Line:	LP NB to I-15 NB (US 89)
Coordinates (m):	N 129,099.054 E 19,118.949
Elevation (m):	1297.705
Total Depth Drilled (m):	24.4
Drill Contractor:	Haz-tech
Driller:	C. Peterson
Rig Type:	CME-75
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: SB-24-258
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ (● / ○ Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly Graded SAND with silt - very dense, moist, gray (continued)		21														
	Poorly Graded SAND with silt - dense, wet, gray	70	22		SPT	457	SP-SM	A-2-4	9 18 14	● 25							
1275	- with gravel	75	23		SPT	457			17 18 11		○						
	Silty SAND - medium dense, moist, gray, fine-grained sand		24				SM	A-2-4									
	- with gravel	80	25		SPT	610			13 30 13 29	● 31							
		85	26														
		90	27														
1270			28														
		95	29														
			30														
		100	31														
		105	32														
1265			33														
		110	34														
		115	35														
			36														
		120	37														
1260		125	38														
			39														
		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-24-258**

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

Logged by:	J. Rajek
Date Start:	2/10/00
Date Finish:	2/10/00
Station:	20+666.464 1.21 RT
Line:	LP NB to I-15 NB (US 89)
Coordinates (m):	N 129,099.054 E 19,118.949
Elevation (m):	1297.705
Total Depth Drilled (m):	24.4
Drill Contractor:	Haz-tech
Driller:	C. Peterson
Rig Type:	CME-75
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Boring: SB-25-334
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / 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 - soft, moist, dark brown, with fine to coarse-grained sand				SPT	508	ML	A-4	2 2 3 2	●10							
	Lean CLAY - soft, wet, dark brown, with fine to coarse-grained sand		1				CL	A-7-6									
1295		5	2		SPT	610			1 1 2 2	●5							pH WSS R
	- yellow-brown	10	3	P	P	584					17 *38*	12.8	41	42	16		C SG
			4														
		15	5		SPT	610			1 2 2 1	●6							
		20	6	P	P	0											
1290			7	P	P	610					*48*						
		25	8		SPT	610			1 2 1 1	●4							
		30	9	P	P	508		A-6			54 *48*	15.2	28	35	13	97	C TR SG
			10														
	- medium stiff	35	11		SPT	508			0 4 7 5	●13							
1285	Silty SAND - medium dense, wet, gray, with trace gravel		12				SM	A-2-4									
	Silty GRAVEL with sand - dense, wet, gray	40	13		SPT	406	GM	A-2-4	10 20 16	●40							
		45	14		SPT	254			10 22 11	●34							
		50	15		SPT	381			16 33 35	○							
	- very dense		16														
1280		55	17														
		60	18		SPT				5 20 20	●36							
		65	19														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-25-334**

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

Logged by:	J. Rajek
Date Start:	2/8/00
Date Finish:	2/8/00
Station:	20+723.909 2.88 LT
Line:	LP NB to I-15 NB (US 89)
Coordinates (m):	N 124,153.922 E 19,101.451
Elevation (m):	1296.737
Total Depth Drilled (m):	21.9
Drill Contractor:	Haz-tech
Driller:	C. Peterson
Rig Type:	CME-75
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Boring: SB-25-334
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty GRAVEL with sand - very dense, wet, gray (continued)															
		70	21		SPT	381			14 23 50/ 100mm							
1275			22													
		75	23													
			24													
		80	25													
		85	26													
1270			27													
		90	28													
		95	29													
			30													
		100	31													
1265		105	32													
			33													
		110	34													
		115	35													
			36													
1260		120	37													
		125	38													
			39													
		130														

● SPT $(N_1)_{60}$
○ SPT $(N_1)_{60}$ (Greater than 50 Blows)
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: **SB-25-334**

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

Logged by:	J. Rajek
Date Start:	2/8/00
Date Finish:	2/8/00
Station:	20+723.909 2.88 LT
Line:	LP NB to I-15 NB (US 89)
Coordinates (m):	N 124,153.922 E 19,101.451
Elevation (m):	1296.737
Total Depth Drilled (m):	21.9
Drill Contractor:	Haz-tech
Driller:	C. Peterson
Rig Type:	CME-75
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

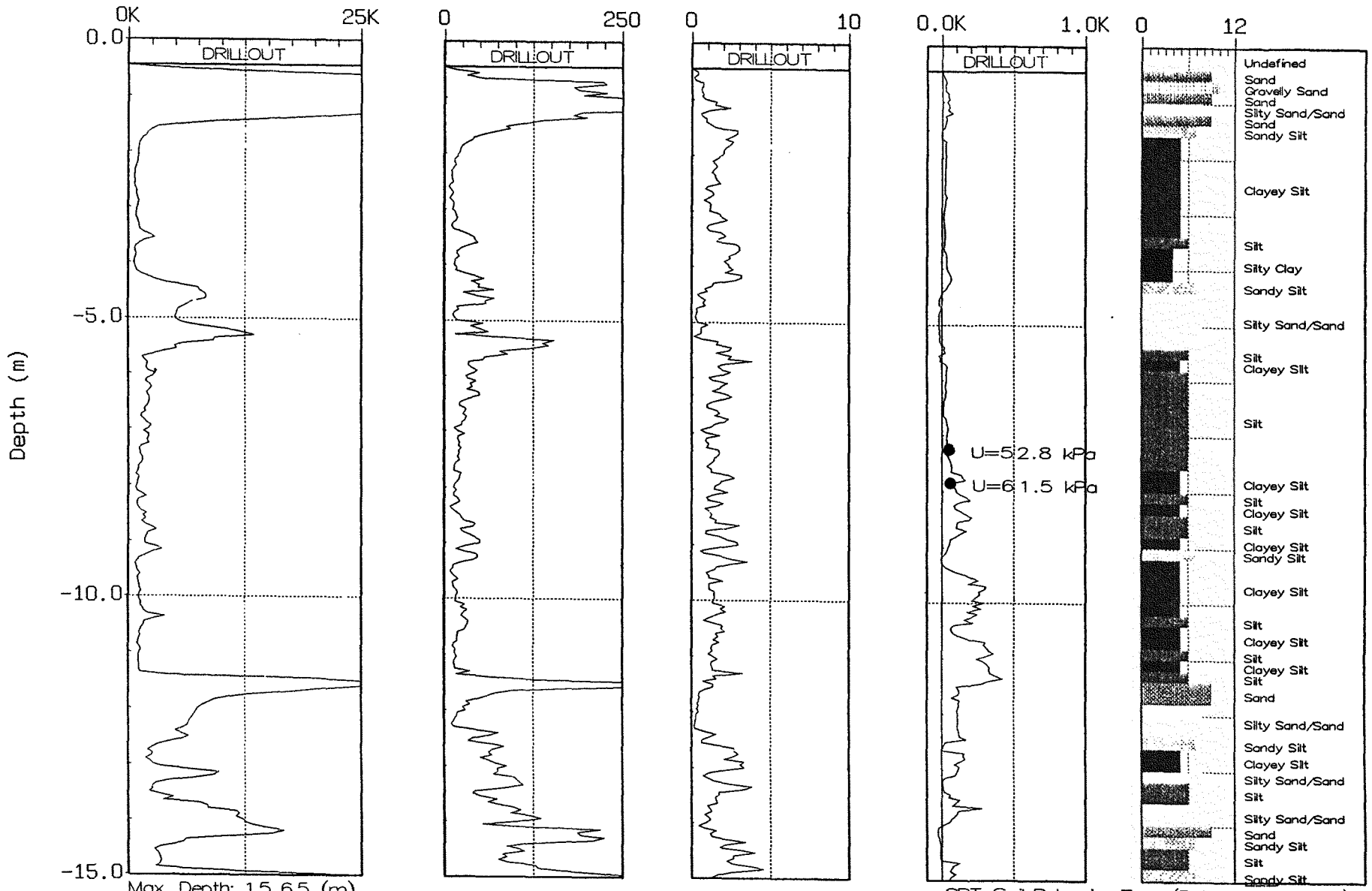
BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 5/31/00

Legacy Parkway

Si. SC-25-335
Station: 20+791.718 1.98 RT
Elevation: 1297.649

Cone: 20 TON . 70
Date: 02:29:00 09:41



Max. Depth: 15.65 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

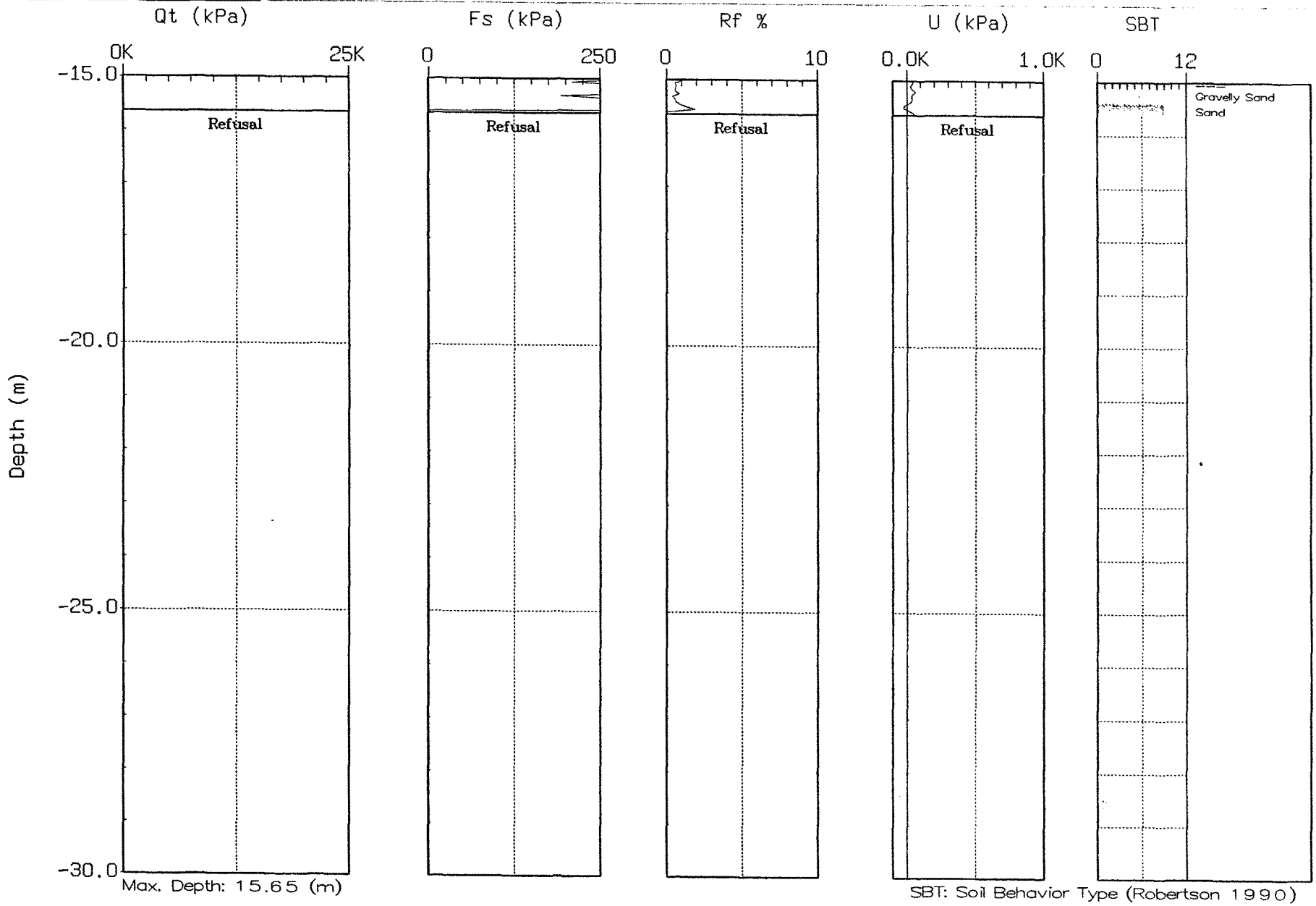
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-263

Legacy Parkway

Site: SC-25-335
Station: 20+791.718 1.98 RT
Elevation: 1297.649

Cone: 20 TON A 070
Date: 02:29:00 09:41



Max. Depth: 15.65 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-264

Boring: SB-25-336
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT - very soft, wet to moist, brown, with trace of coarse-grained sand						ML	A-4									
1295		5	1		SPT	0			2 1 1 2	2							
		10	2		SH	508					*38*						pH WSS R
		15	3		SPT				3 3 4 5	9							SV
	- stiff, olive gray	20	4		SH	559					39 *34*	15.3	28			87	C SG
1290	Silty SAND - medium dense, wet, gray	25	5		SPT	610	SM	A-2-4	1 3 1 4	4							
	Lean CLAY - stiff, wet, brown mottled with gray, some sand seams	30	6		SH	610	CL	A-6									
		35	7		SPT				3 4 5 17	9							
1285	Poorly Graded SAND - medium dense, wet, black	40	8		SPT	610	SP	A-3	5 6 6 11	12							
	- gravel layer	45	9		SPT	508			5 11 22 20	30							
		50	10		SPT	381			33 48 50/ 75mm								
	- very dense	55	11		SPT	51			50/ 100mm								
1280		60	12														
		65	13														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-25-336**

Sheet 1 of 1

Logged by:	M. Ivers
Date Start:	2/8/00
Date Finish:	2/9/00
Station:	20+862.412 6.42 RT
Line:	LP NB to I-15 NB (US 89)
Coordinates (m):	N 124,287.360 E 19,062.514
Elevation (m):	1297.153
Total Depth Drilled (m):	17.4
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 6/31/00

Boring: SB-26-337
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: SAND and GRAVEL - loose, moist, brownish-tan																
			1		SH	457											pH WSS R
1295		5	2														
		10	3		SPT	457			2 1 3	●7							
			4														
	Lean CLAY - soft, wet, brownish-gray, with silt						CL	A-6									
		15	5		SH	559					38						
		20	6		SPT	457			2 2 2	●6							
			7														
1290		25	8		SH	610					34 57	15.5	29	40	18		C TR SG
		30	9		SPT				0 1 2	●4							
			10														
	Poorly Graded SAND - medium dense, wet, gray, fine-grained - with gravel	35	11		SPT	610	SP	A-3	1 8 14	●28							
1285	- dense	40	12		SPT	279			19 17 16	●40							
			13														
		45	14		SPT				10 20 21	●47							
		50	15		SPT	305			19 38 22	○							
			16														
1280		55	17		SPT	305			28 34 28	○							
	Silty SAND - very dense, wet, gray		18				SM	A-2-4									
	- with gravel and cobbles	60			SPT	152			250/75mm	○							
			19														
		65								●23							

UTDOT Z003SB2B.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-26-337**

Sheet 1 of 2

Logged by:	C. Wieden
Date Start:	2/10/00
Date Finish:	2/10/00
Station:	12+605.204 1.91 LT
Line:	US 89 SB to I-15 SB
Coordinates (m):	N 124,130.372 E 19,139.171
Elevation (m):	1297.073
Total Depth Drilled (m):	24.8
Drill Contractor:	Layne Christensen
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: SB-26-337
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (N₁)₆₀ / SPT (N₁)₆₀ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	- Silty SAND, continued				SPT	229			17 16 14								
	CLAY - stiff, wet, gray, with silt	70	21		SPT		CL	A-6	5 4 22	24							
1275	Silty SAND with gravel - medium dense, wet, gray		22				SM	A-2-4									
	- brown, with some organics	75	23		SPT				7 12 10	20							
		80	24		SPT	51			20 10 9	16							
			25														
		85	26														
1270			27														
		90	28														
		95	29														
			30														
		100	31														
1265		105	32														
			33														
		110	34														
		115	35														
			36														
		120	37														
1260			38														
		125	39														
		130															

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-26-337**

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

Logged by:	C. Wieden
Date Start:	2/10/00
Date Finish:	2/10/00
Station:	12+605.204 1.91 LT
Line:	US 89 SB to I-15 SB
Coordinates (m):	N 124,130.372 E 19,139.171
Elevation (m):	1297.073
Total Depth Drilled (m):	24.8
Drill Contractor:	Layne Christensen
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

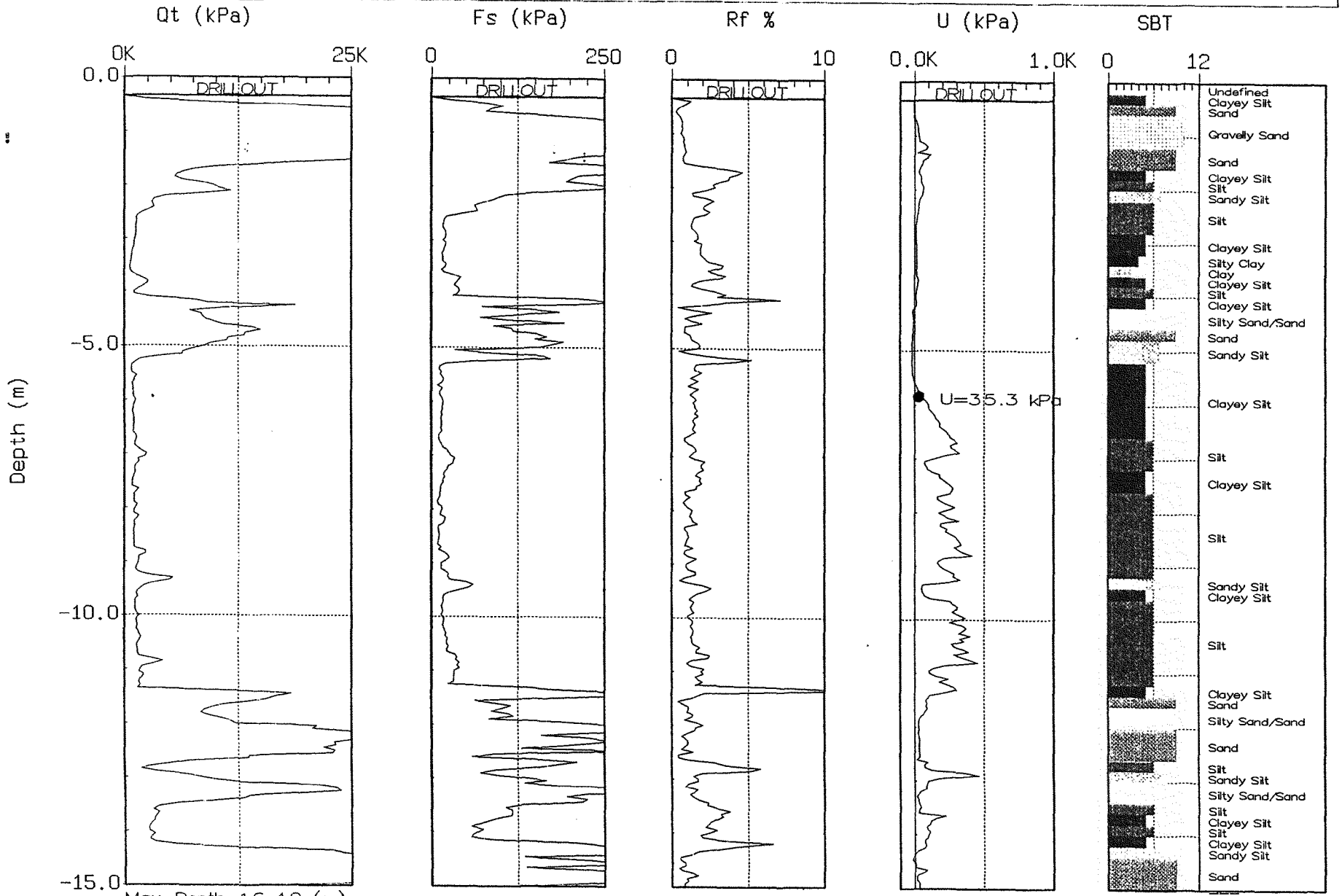
B BAG = Bulk Sample

UTDOT Z003SB2B.GPJ 6/31/00

Legacy Parkway

S SC-26-338
Station: 12+670.717 4.98 LT
Elevation: 1297.766

Cone: 20 TON J70
Date: 02:29:00 11:04



Max. Depth: 16.40 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

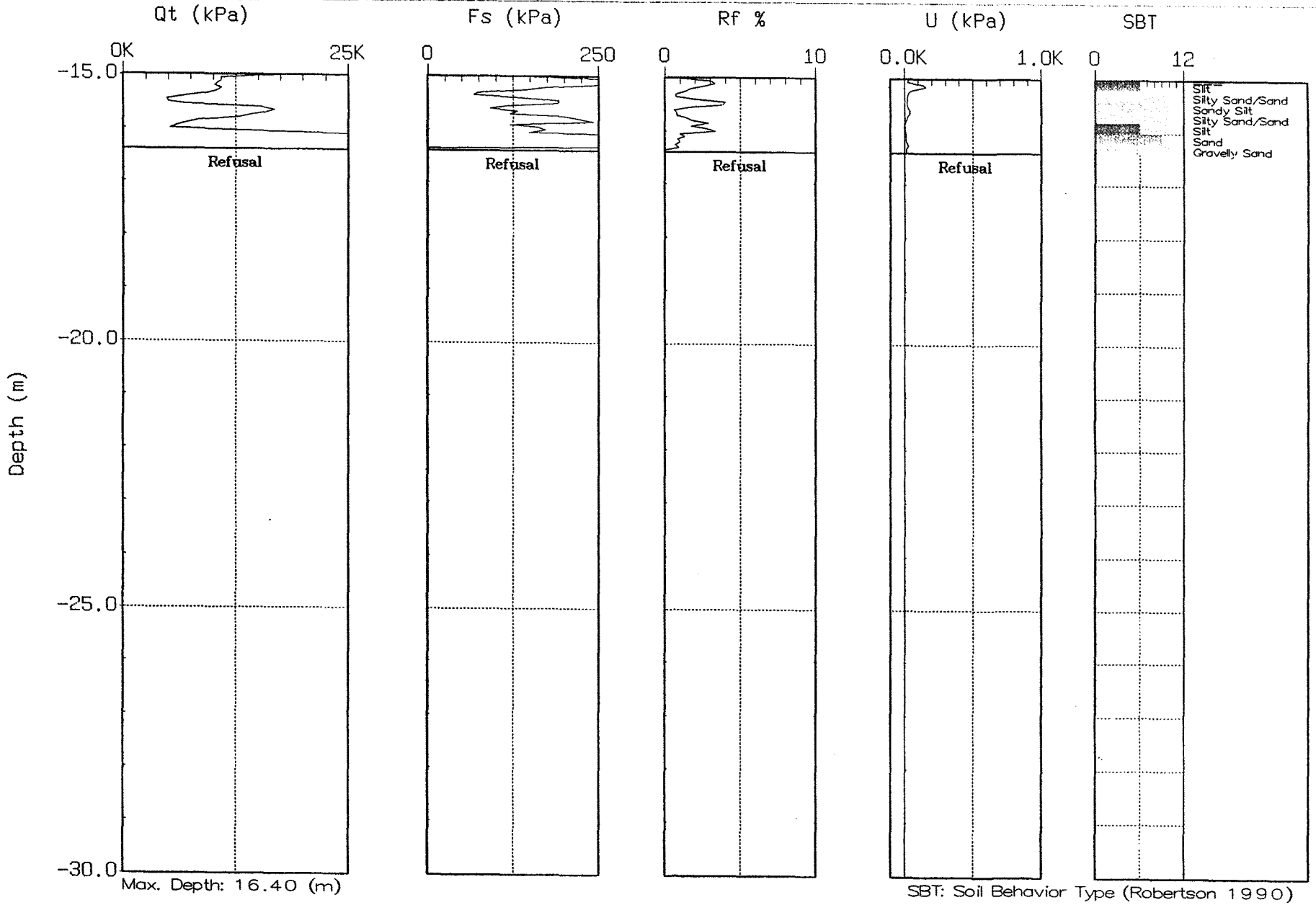
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-268

Legacy Parkway

Site: SC-26-338
Station: 12+670.717 4.98 LT
Elevation: 1297.766

Cone: 20 TON A 070
Date: 02:29:00 11:04



Max. Depth: 16.40 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

Boring: SB-26-339
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (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
	FILL: SILT with cobbles and boulders - wet, brown		1														
	SILT - medium stiff, wet, brown, trace of fine gravel	5	2		SH	508	ML	A-7-6			*38*						
1295	- stiff, banded gray, with rust and black, occasional sand seams	10	3		SPT	610			2 4 4 4	●10			33	45	17		
			4														
	- with fine-grained sand	15	5		SH	559					*29*	15.0	30			93	C SG
	- medium stiff, with interbedded brown clay, occasional black coarse-grained sand, with frequent fine-grained partings	20	6		SPT	610			3 2 4 5	●8							
			7														
1290		25	8		SH	508					33 *38*	15.4	29			92	
	- interbedded brown clay, occasional sand seams	30	9		SPT	610			0 3 2 3	●5							
		35	11		SH	559					50 *48*	16.5	25			96	
	- medium stiff, gray, with coarse-grained sand seams																
	Poorly Graded GRAVEL with sand - dense, wet, gray, 40% medium to coarse-grained sand, fine to coarse-grained gravel	40	12		SPT	508	GP	A-1-b	9 17 18 21	●35							
1285			13														
	Poorly Graded SAND with gravel - medium dense, wet, gray, with 10% fine-grained gravel, medium to coarse-grained sand	45	14		SPT	381	SP	A-3	34 13 16 20	●27							
	Poorly Graded GRAVEL - medium dense, wet, gray	50	15		SPT	305	GP	A-1-b	25 9 21 21	●26							
		55	17														
1280	Poorly Graded SAND with silt and gravel - medium dense, wet, occasional 50 mm layers of clay	60	18		SPT	356	SP-SM	A-1-b	5 10 17 6	●21							
		65	19														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-26-339**

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

Logged by:	M. Ivers
Date Start:	2/9/00
Date Finish:	2/9/00
Station:	12+741.455 16.33 LT
Line:	US 89 SB to I-15 SB
Coordinates (m):	N 124,261.994 E 19,097.767
Elevation (m):	1297.582
Total Depth Drilled (m):	29.6
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 5/31/00

Boring: SB-26-339
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (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
	Poorly Graded SAND with silt and gravel - medium dense, wet, occasional 50 mm layers of clay (continued)		21														
		70			SH	0											
			22														
1275		75	23		SPT	330			14 18 50/125mm								
	- dense, with gravel																
			24														
		80															
			25														
		85	26		SPT				7 22 11 8	●22							
	- medium dense, frequent layers of clay and silt																
			27														
		90															
1270			28														
		95	29		SPT				49 30 8 11	●7							
	- loose, clay layer 150 mm thick																
			30														
		100															
			31														
		105	32														
1265																	
			33														
		110															
			34														
		115	35														
			36														
		120															
			37														
1260		125	38														
			39														
		130															

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-26-339**

Sheet 2 of 2

Logged by:	M. Ivers
Date Start:	2/9/00
Date Finish:	2/9/00
Station:	12+741.455 16.33 LT
Line:	US 89 SB to I-15 SB
Coordinates (m):	N 124,261.994 E 19,097.767
Elevation (m):	1297.582
Total Depth Drilled (m):	29.6
Drill Contractor:	Layne Christensen
Driller:	S. Church
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 6/31/00

Boring: SB-27-340
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND with gravel																
1295		5	1		SPT	152			5 2 2 3	●6							
		10	2		SPT	330	ML	A-4	3 3 3 8	●8							
	SILT - medium stiff, moist to wet, grayish-brown, mottled orange		3														
	Well Graded SAND with silt and gravel - loose, moist to wet, gray		4				SW-SM	A-1-b									
	- medium dense	15	5		MC	330			6 9 7 9	●16							
1290	- loose, wet, micaceous	20	6		SPT	457			2 3 3 4	●8							
			7														
	- medium dense	25	8		SPT				2 4 7 11	●13			23				SV
		30	9		MC	457			4 3 4 5	●7							
	Sandy SILT - medium stiff, wet, gray sand, light brown silt		10				ML	A-4									
1285	Silty SAND - wet, gray, with frequent layers of silt and clay	35	11		SH	610	SM	A-2-5									
		40	12		SPT	610			12 22 20 20	●46							
	Poorly Graded SAND with gravel - dense, wet, gray		13				SP-SM	A-1-b									
		45	14		MC	254			20 50/115mm	○							
		50	15		SPT	610			20 32 30 48	○							
1280	- very dense		16														
		55	17		SPT	457			25 48 50/125mm	○							
	- gravel increasing		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: **SB-27-340**

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

Logged by:	M. Hislop
Date Start:	2/24/00
Date Finish:	2/25/00
Station:	70+686.974 0.76 RT
Line:	US 89 SB to LP SB
Coordinates (m):	N 123,852.107 E 19,215.247
Elevation (m):	1295.848
Total Depth Drilled (m):	17.4
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

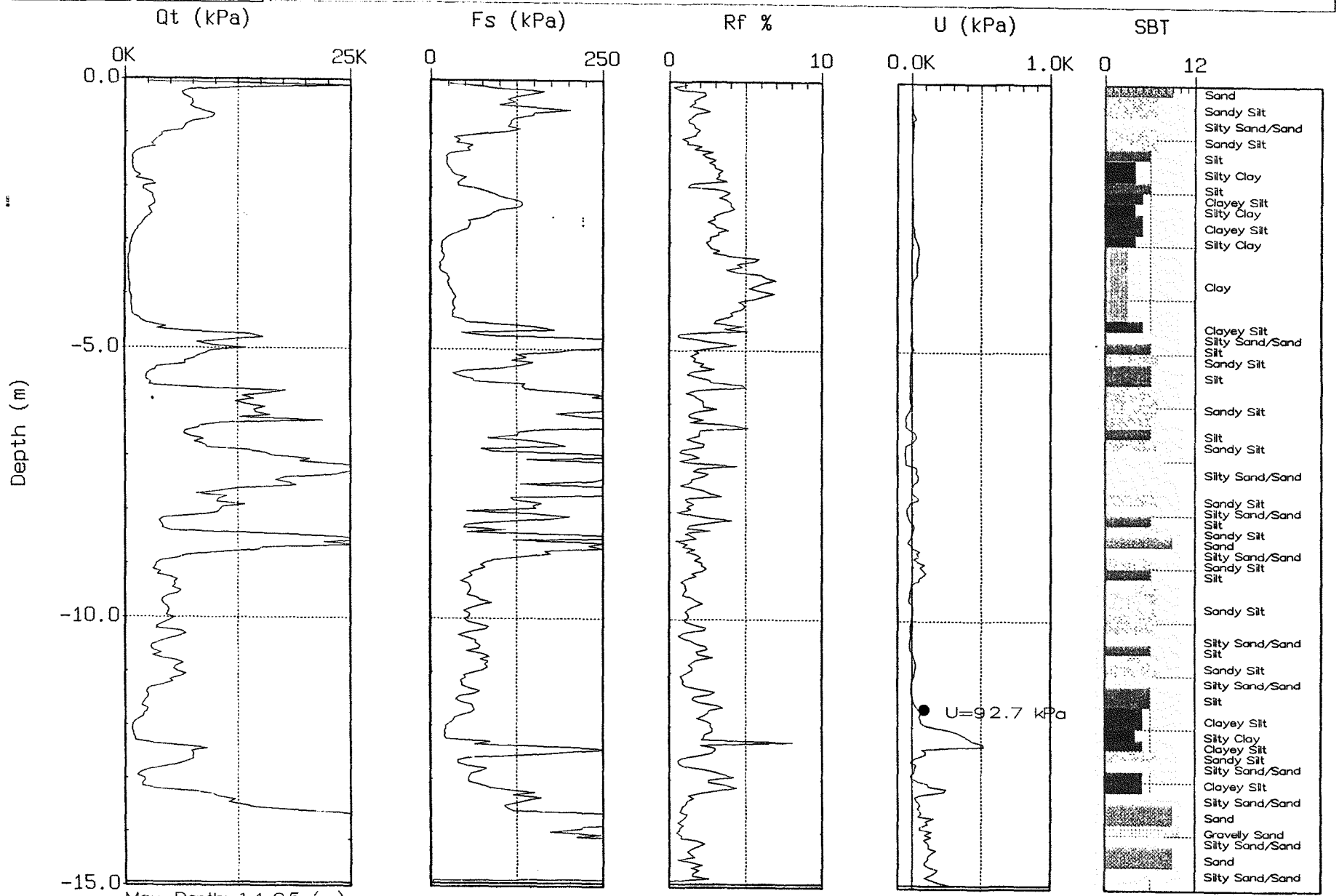
BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 5/31/00

Legacy Parkway

Site: -27-341
Station: 70+750.382 0.47 RT
Elevation: 1297.574

Cone: 20 TON A
Date: 02:16:00 15.23



Max. Depth: 14.95 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

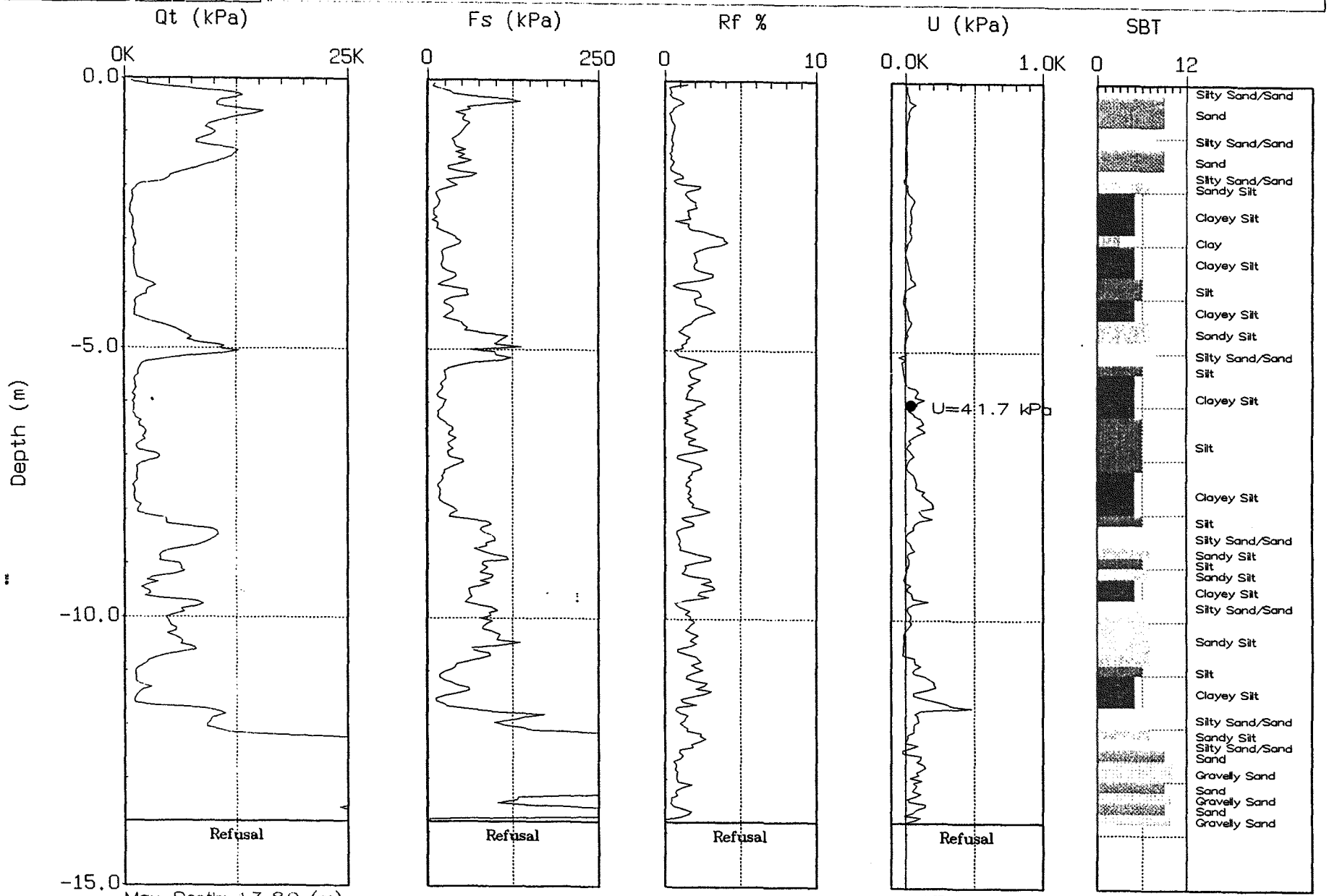
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-273

Legacy Parkway

Site -27-342
Station: 70+835.805 14.36 LT
Elevation: 1297.770

Cone: 20 TON A
Date: 02:15:00 10:31



Max. Depth: 13.80 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

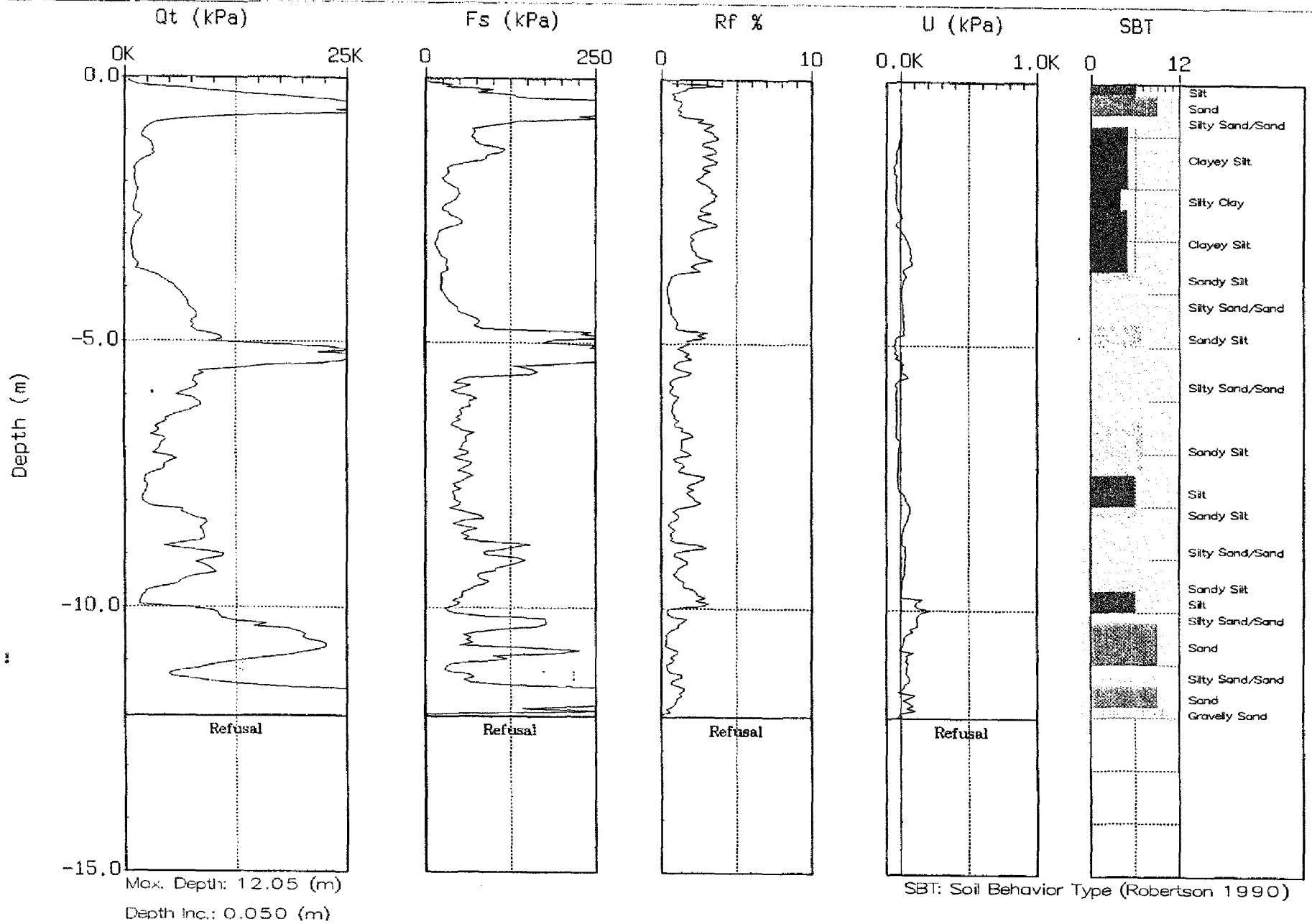
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-274

Legacy Parkway

Site: -27-343
Station: 70+880.983 13.03 RT
Elevation: 1297.174

Cone: 20 TON A C
Date: 02:15:00 12:09



Max. Depth: 12.05 (m)
Depth Inc.: 0.050 (m)

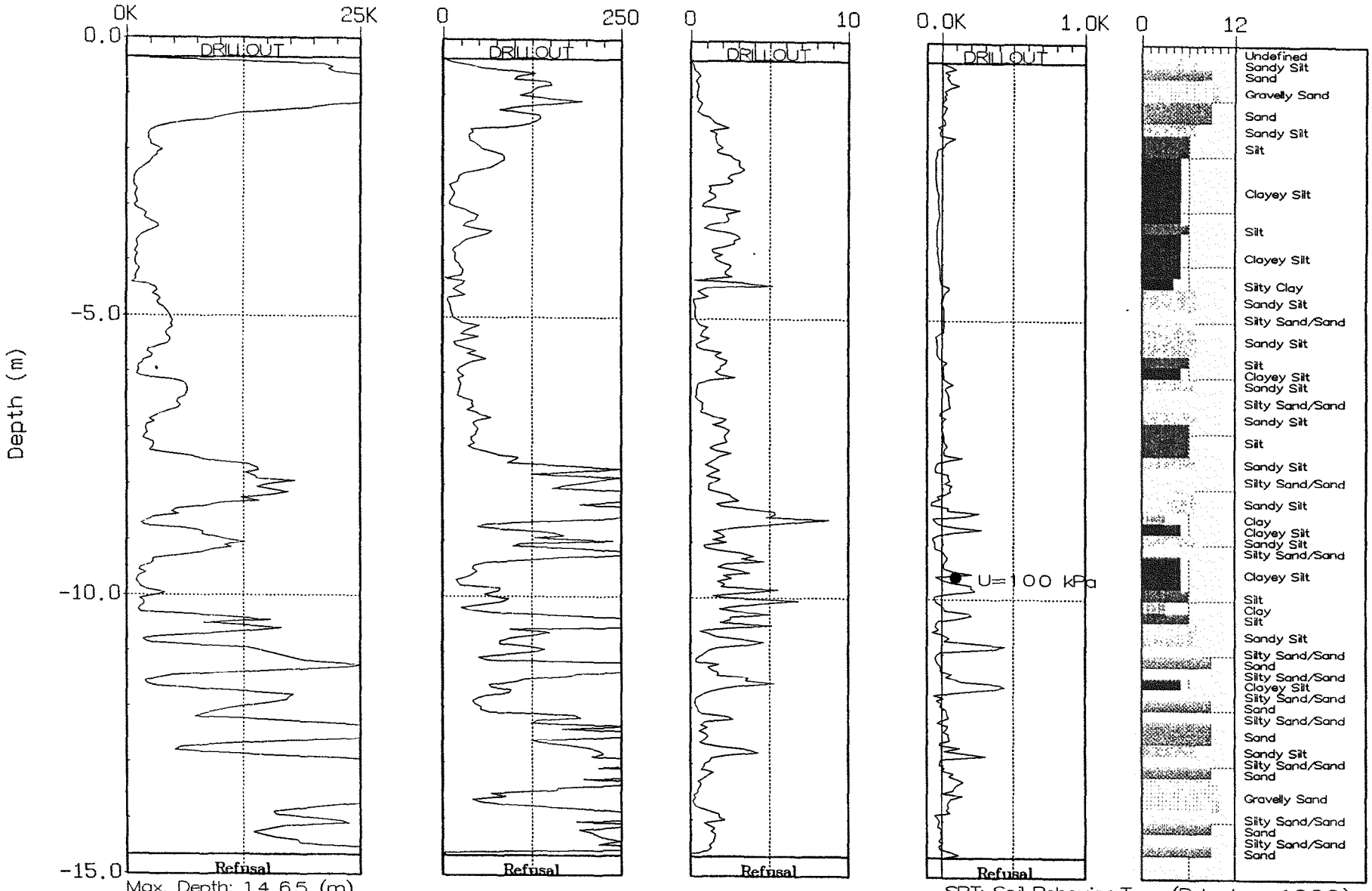
SBT: Soil Behavior Type (Robertson 1990)

PLATE B-275

Legacy Parkway

Site. J-27-344
Station: 70+944.734 0.00 LT
Elevation: 1296.850

Cone: 20 TON A 0/0
Date: 02:29:00 12:42



Max. Depth: 14.65 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-276

Boring: SB-27-345
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / 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: Poorly Graded SAND with gravel - moist to very moist, brownish-tan to gray																
	- medium dense	5	1		SPT	457			7 5 4	18							
			2				CL	A-6									
	Lean CLAY with SAND - very moist, mottled brownish-tan and gray																
1295	- medium stiff	10	3		SH	559					*43*						pH WSS R
			4														
	- light brown	15	5		SPT	229			1 1 2	5							
		20	6		SH	610					24 *34*	15.9	27		11	84	C TR SG
			7														
1290		25	8		SPT				0 2 2	6							
		30	9		SH	610					9 29	14.9	32			80	C SG
	Poorly Graded SAND - medium dense, wet, bluish-gray, fine-grained sand, with silt and organic layers		10				SP	A-3									
	- occasional gravel	35	11		SPT				6 6 9	20							
	- loose	40	12		SPT				8 5 3	10							
1285			13														
	- dense	45	14		SPT	25			16 20 21	47							
	SILT - stiff, wet, gray, with sand		15				ML	A-4									
		50			SPT				5 5 8	15							
	Poorly Graded SAND with gravel - very dense, wet, gray		16				SP	A-3									
		55	17		SPT				16 23 34	○							
1280		60	18		SPT				26 24 43	○							
		65	19							20							

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-27-345**

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

Logged by:	C. Wieden
Date Start:	2/9/00
Date Finish:	2/9/00
Station:	71+011.211 0.83 RT
Line:	US 89 SB to LP SB
Coordinates (m):	N 124,175.305 E 19,195.454
Elevation (m):	1298.191
Total Depth Drilled (m):	24.8
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: SB-27-345
Sheet 2 of 2

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
	- medium dense, occasional silt layers, fine-grained sand				SPT				8 10 16								
	Silty SAND - medium dense, wet, gray	70	21		SPT		SM	A-2-5	5 9 7	15							
	SILT - stiff, wet, gray, with occasional sand and lean clay layers	75	22		SPT		ML	A-4	6 8 9	15							
1275	Poorly Graded SAND with gravel - very dense, wet, olive to gray	80	23		SPT		SP	A-3	35 56 50/125mm								
		85	24														
		90	25														
1270		95	26														
		100	27														
		105	28														
1265		110	29														
		115	30														
		120	31														
1260		125	32														
		130	33														
			34														
			35														
			36														
			37														
			38														
			39														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-27-345**

Sheet 2 of 2

Logged by:	C. Wieden
Date Start:	2/9/00
Date Finish:	2/9/00
Station:	71+011.211 0.83 RT
Line:	US 89 SB to LP SB
Coordinates (m):	N 124,175.305 E 19,195.454
Elevation (m):	1298.191
Total Depth Drilled (m):	24.8
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 6/31/00

Boring: SB-28-346
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy Lean CLAY - stiff, wet, light brown, very fine-grained sand				SPT	457	CL	A-4	2 2 4 5							
		5	1		SPT				6 4 5 4							pH WSS R
	- light brown to brown, occasional silt layers	10	2		P	610				37 *38*	16.7	26	29	7		C TR SG
1290		15	3		SPT	457			5 4 5 7							
	- frequent layers of fine-grained sand 15 to 50 mm		4													
	Silty CLAY - stiff, wet, olive-brown to dark brown		5				CL-ML	A-6								
		20	6		P	610				*43*						
	SILT - wet, olive-brown		7				ML	A-4								
	- stiff	25	8		SPT	610			3 4 7 9							
1285		30	9		P	305				*38*	15.2	30				C SG
			10													
	Silty CLAY - medium stiff, wet, olive-brown to dark brown	35	11		SPT	610	CL-ML	A-6	3 3 4 6							
		40	12		P	254				108	17 0	23	32	12	99	
	Lean CLAY		13				CL	A-6								
1280	Silty SAND with gravel - very dense, wet, gray, gravel is subangular gnessis and quartzites	45	14		SPT	457	SM	A-2-4	15 43 29 21							
		50	15		SPT	406			15 13 15 20							
	- medium dense		16													
		55	17													
		60	18		SPT	254			9 24 24 25							
1275	- dense, grayish-brown to olive-gray, medium to coarse-grained sand, fine to coarse-grained gravel		19													
			65													

Test Results *

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-28-346**

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

Logged by:	M. Bostrom
Date Start:	3/3/00
Date Finish:	3/3/00
Station:	4+859.468 3.67 RT
Line:	BURKE LANE
Coordinates (m):	N 124,322.805 E 18,698.933
Elevation (m):	1294.321
Total Depth Drilled (m):	26.5
Drill Contractor:	Layne Christensen
Driller:	J. Hulse
Rig Type:	Terramac
Drilling Method:	Mud Rotary
Hammer Type:	Safety
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 6/31/00

Boring: SB-28-346
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (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
		70	21														
			22		SPT	51			33 26 17 10	●32							
		75	23		SPT	406			7 43 39 46	○							
	- occasional layers of poorly graded sand - very dense		24														
1270		80			SPT	305			7 29 41 25	●48							
	- dense		25														
		85	26		SPT	305			23 39 48 37	○							
	- very dense		27														
		90	28														
1265		95	29														
			30														
		100	31														
		105	32														
			33														
		110	34														
1260		115	35														
			36														
		120	37														
		125	38														
			39														
1255		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-28-346**

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

Logged by:	M. Bostrom
Date Start:	3/3/00
Date Finish:	3/3/00
Station:	4+859.468 3.67 RT
Line:	BURKE LANE
Coordinates (m):	N 124,322.805 E 18,698.933
Elevation (m):	1294.321
Total Depth Drilled (m):	26.5
Drill Contractor:	Layne Christensen
Driller:	J. Hulse
Rig Type:	Terramac
Drilling Method:	Mud Rotary
Hammer Type:	Safety
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 8/31/00

Boring: SB-28-347
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ 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: Poorly Graded SAND with silt and gravel - dense, moist, brown				SPT	610			3 13 10 13	46							
1295	SILT - medium stiff, moist, brown to yellowish-brown, with fine-grained sand	5	1		SPT	203	ML	A-4	6 2 1 2	6							pH WSS R
		10	2		SH	610					*24*						
	- frequent silt seams	15	3		SPT	610			2 2 2 2	6							
1290		20	4	P	P	610					56 38	15.4	28	33	9		C SG
	- medium stiff	25	5		SPT	610			2 3 4 5	10							
		30	6	P	P	508					*38*						
1285	- very stiff, gray to yellowish-brown	35	7		SPT				4 8 13 13	27							
	Lean CLAY - very stiff, moist, yellowish-brown	40	8	P	P	508	CL	A-6			58 *53*	15.2	27	35	12	98	C TR SG
		45	9		SPT	610			5 7 13 13	23							
	Poorly Graded SAND with silt - medium dense, moist, gray						SP-SM	A-3									
	- dense, wet, trace fine and trace gravel	50	10		SPT	610			15 23 21 20	48							
1280	SILT - stiff, wet, gray	55	11		SPT	305	ML	A-4	5 7 8	15							
	Silty SAND - very dense, wet, gray, fine to coarse-grained sand	60	12		SPT	610	SM	A-2-5	15 35 40 20								
		65	13														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-28-347**

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

Logged by:	J. Rajek
Date Start:	2/10/00
Date Finish:	2/11/00
Station:	4+934.261 1.02 RT
Line:	BURKE LANE
Coordinates (m):	N 124,380.313 E 18,746.828
Elevation (m):	1296.383
Total Depth Drilled (m):	26.5
Drill Contractor:	Haz-tech
Driller:	C. Peterson
Rig Type:	CME-75
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 5/31/00

Boring: SB-28-347
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND - very dense, wet, gray, fine to coarse-grained sand (continued) - trace gravel		21														
1275		70			SPT	457			10 15 13	● 26							
	SILT - very stiff, wet, gray, with fine-grained sand		22				ML	A-4									
	Poorly Graded SAND with silt - dense, wet, gray	75	23		SPT	610	SP-SM	A-3	11 19 19 9	● 34							
			24														
	Silty SAND with gravel - dense, wet, bluish-gray, fine to medium-grained sand	80	25		SPT	254	SM	A-2-4	22 15 30	● 39							
1270		85	26		SPT	254			33 23 30	● 44							
			27														
		90	28														
		95	29														
			30														
		100	31														
1265		105	32														
			33														
		110	34														
		115	35														
			36														
1260		120	37														
		125	38														
			39														
		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-28-347**

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

Logged by:	J. Rajek
Date Start:	2/10/00
Date Finish:	2/11/00
Station:	4+934.261 1.02 RT
Line:	BURKE LANE
Coordinates (m):	N 124,380.313 E 18,746.828
Elevation (m):	1296.383
Total Depth Drilled (m):	26.5
Drill Contractor:	Haz-tech
Driller:	C. Peterson
Rig Type:	CME-75
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 6/31/00

Boring: SB-29-348
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Poorly Graded GRAVEL with silt and sand - dense, moist, dark brown				SPT	457			5 10 13 16	46							
1295	SILT - stiff, moist, reddish-brown, with gravel to 15 mm	5	1		SPT	0	ML	A-4	2 3 3 4	10							
			2		P	584					14						pH WSS R
		10	3		SPT	610			3 3 3 2	8							
	- medium stiff		4														
	- gray	15	5		P	610					39 29	16.5	24			90	C TR SG
1290	- medium stiff, with fine-grained sand	20	6		SPT	381			3 3 3 4	8							
			7														
		25	8		P	610					24						
	- stiff	30	9		SPT	610			5 8 5 5	15							
			10														
1285		35	11		P	610					36 29	16.3	23			90	C SG
	- frequent seams of lean clay to 15 mm	40	12		SPT	508			4 4 5 6	9							
			13														
	Silty SAND - moist, gray, fine to coarse-grained sand	45	14		P	305	SM	A-2-5									
	Poorly Graded SAND with silt - medium dense, moist, gray, with gravel to 20 mm	50	15		SPT	610	SP-SM	A-3	10 15 15 13	28							
1280		55	17		SPT	381			7 12 18 18	27							
	- dense, gravel to 15 mm	60	18		SPT	406			12 27 30	50							
		65	19														

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-29-348**

Sheet 1 of 1

Logged by:	J. Rajek
Date Start:	2/7/00
Date Finish:	2/7/00
Station:	4+961.767 0.38 LT
Line:	BURKE LANE
Coordinates (m):	N 124,401.740 E 18,764.131
Elevation (m):	1296.269
Total Depth Drilled (m):	18.9
Drill Contractor:	Haz-tech
Driller:	C. Peterson
Rig Type:	CME-75
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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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

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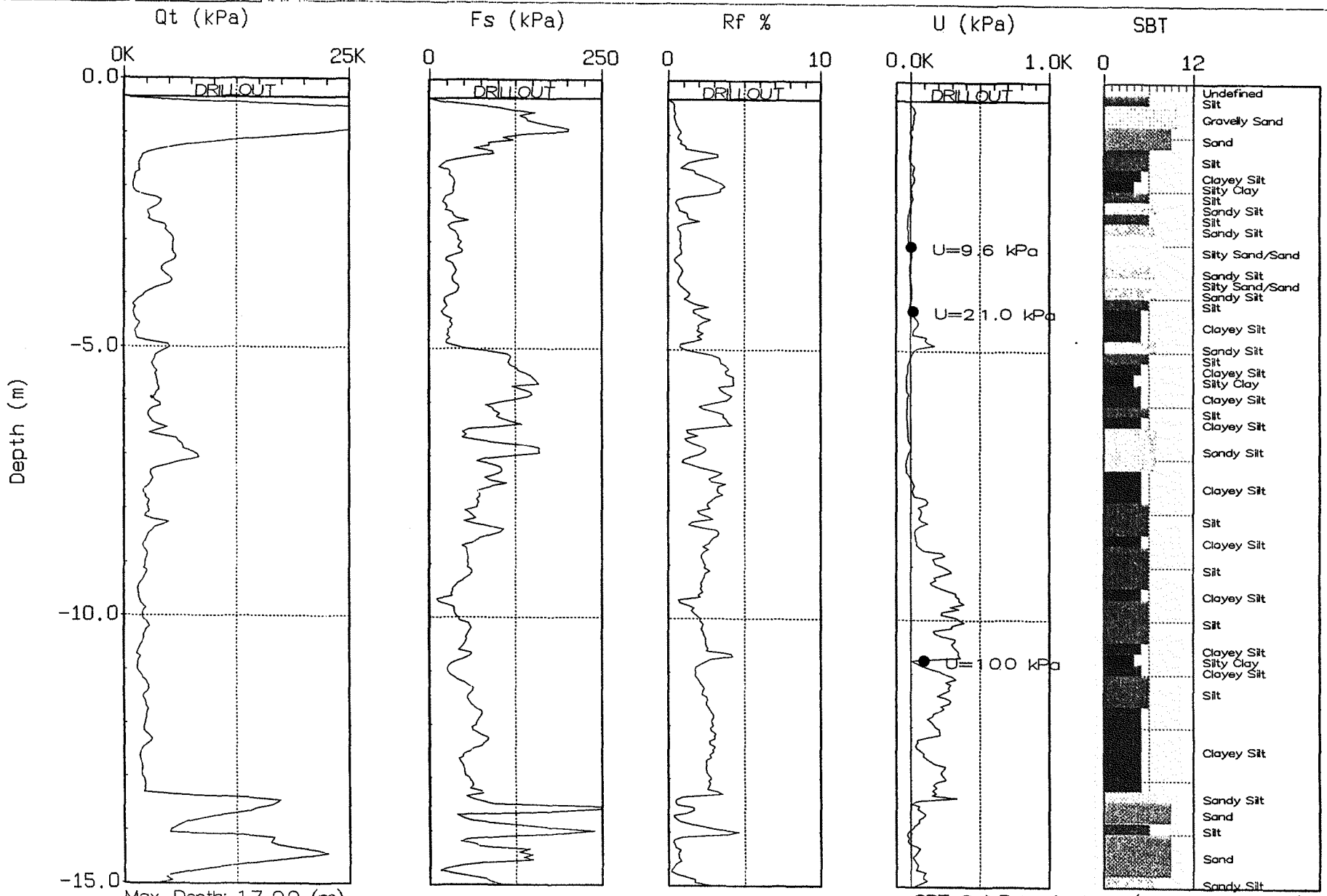
Legacy Parkway

Site: C-29-349
Station: 5+000.045 0.01 LT
Elevation: 1296.024

Cone: 20 TON A 70
Date: 02:28:00 11:03



Max. Depth: 17.00 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

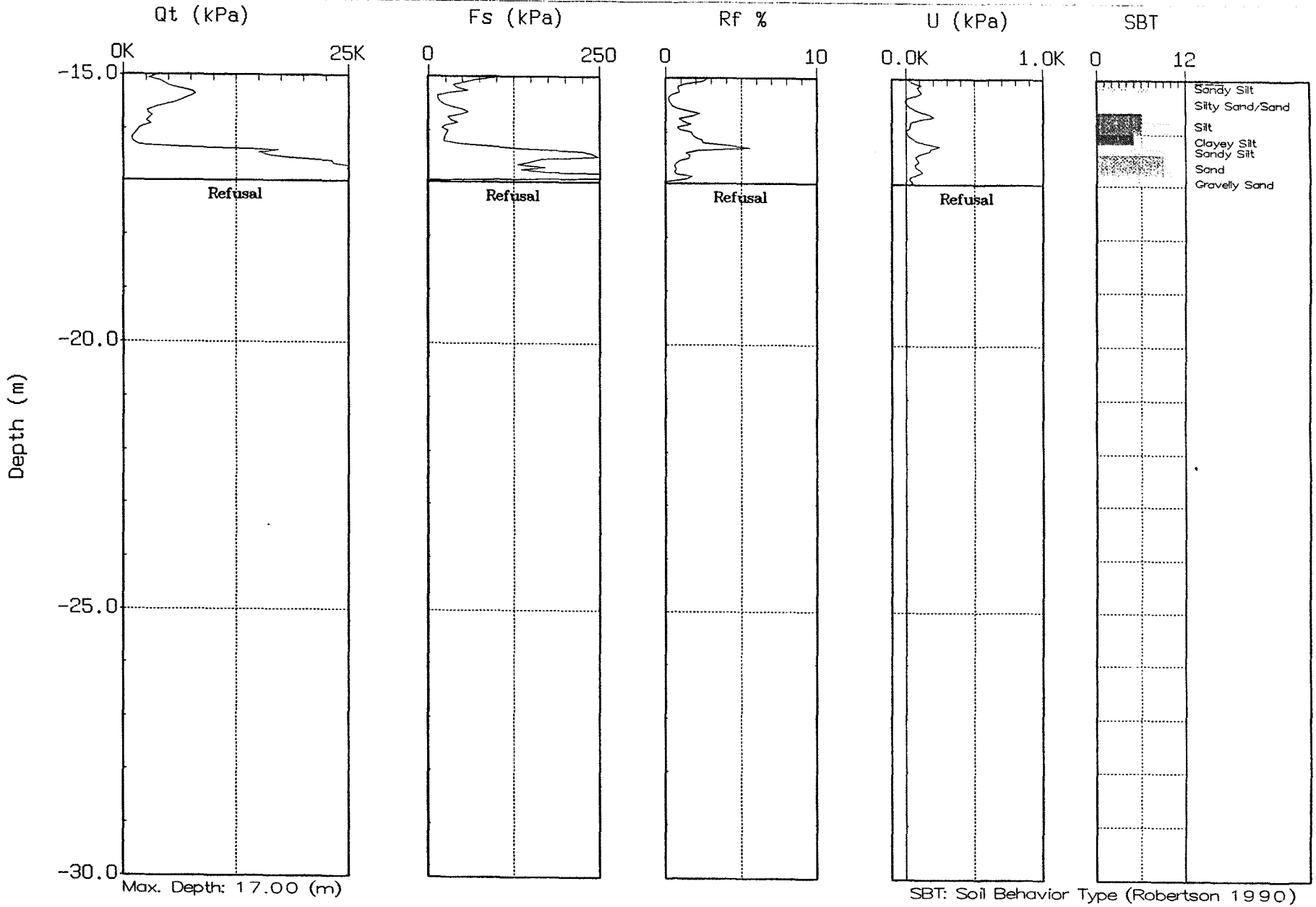
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE B-285

Legacy Parkway

Site: SC-29-349
Station: 5+000.045 0.01 LT
Elevation: 1296.024

Cone: 20 TON A 070
Date: 02:28:00 11:03



Max. Depth: 17.00 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

Boring: SB-29-350
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Poorly Graded SAND with gravel - moist, brownish-tan		1														
		5			SPT	457			8 8 11	36							
	FILL: SILT - hard, moist, reddish brown to black		2														
	FILL: Poorly Graded SAND with silt - moist, black to brownish-tan																
	- very dense, slightly moist, brownish-tan	10	3		SPT	457			15 17 19								
			4														
1300		15	5		SPT	457			23 33 38								
		20	6		SPT	457			20 26 27								
	- fine to coarse-grained with some gravel		7														
		25	8		SPT	457			20 26 32								
		30	9		SPT				37 24 25								
1295	Poorly Graded SAND with silt - very dense, wet, gray, fine-grained		10				SP-SM	A-1-b									
		35	11	P	P	457					14						
	Sandy SILT - medium stiff, wet, gray, with trace of clay and fine-grained sand	40	12		SPT		ML	A-4	2 2 5	7							
			13														
		45	14	P	P	0											
1290	Silty SAND - wet, gray, occasional gravel			P	P	254	SM	A-2-5			19	16.2	24			60	C SG
	SILT - very stiff, wet, brownish-gray, with sand seams 6 to 20 mm	50	15		SPT		ML	A-4	7 9 11	18							
			16														
		55	17														
		60	18	P	P	0											
			19	P	P	203	SP-SM	A-1-b			53	15.9	24			92	C TR SG
1285	Poorly Graded SAND with silt - medium dense, wet, gray, fine-grained, with occasional silt seams	65															

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-29-350**

Sheet 1 of 3

Logged by:	C. Wieden
Date Start:	2/11/00
Date Finish:	2/17/00
Station:	5+066.599 19.50 RT
Line:	BURKE LANE
Coordinates (m):	N 124,466.611 E 18,848.846
Elevation (m):	1304.756
Total Depth Drilled (m):	47.9
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	*121 mm*

LEGEND/NOTES

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

Coordinates are NAD '83

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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-29-350
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly Graded SAND with silt - medium dense, wet, gray, fine-grained, with occasional silt seams (continued)		21														
		70			SPT				8 10 9	●15							
			22														
		75	23														
			24				SP	A-3									
	Poorly Graded SAND with gravel - very dense, wet, gray, frequent clay and silt layers	80			SPT	305			37 44 39		○						
1280			25														
		85	26		SPT	406			15 16 25	●31							
	- dense		27														
		90			SPT	102			24 22 13	●26							
	- medium dense		28														
		95	29		SPT	305			5 7 10	●12							
1275			30														
		100	31														
		105	32		SPT	305			21 9 9	●12							
			33														
	- very dense	110	34		SPT	203			47 50/125mm		○						
1270		115	35		SPT				12 14 24	●25							
	- medium dense		36														
		120	37		SPT	457	ML	A-4	6 2 3	●3							
	SILT - soft, wet, gray, with fine-grained sand and organics	125	38		SPT	254			2 3 1	●3							
			39				SP	A-3									
	Poorly Graded SAND with gravel - wet, gray	130			SPT						○						
1265																	

UTDOT Z003SB2A.GPJ 6/31/00

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-29-350**

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

Logged by:	C. Wieden
Date Start:	2/11/00
Date Finish:	2/17/00
Station:	5+066.599 19.50 RT
Line:	BURKE LANE
Coordinates (m):	N 124,466.611 E 18,848.846
Elevation (m):	1304.756
Total Depth Drilled (m):	47.9
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

Boring: SB-29-350
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	- very dense, olive-gray								31 35 50/100mm								
	Clayey SAND - medium dense, wet, gray, fine to coarse-grained	135	41		SPT	457	SC	A-2-6	10 15 11	● 16							
	Lean CLAY - wet, olive-gray, with sand seams		42				CL	A-6									
	- stiff	140	43		SPT				0 6 9	● 10							
	Clayey SAND - medium dense, wet, brown, with clay and some organics	145	44		SPT		SC	A-2-6	7 8 10	● 11							
1260	Poorly Graded SAND - medium dense, wet, tan to reddish-brown, with some gravel		45				SP	A-3									
		150	46		SPT	229			47 50/125mm								
	Lean CLAY - hard, wet, brownish-tan, with sand		47				CL	A-6									
		155			P	0											
			48														
		160	49														
1255			50														
		165	51														
		170	52														
			53														
		175	54														
1250		180	55														
			56														
		185	57														
		190	58														
			59														
1245		195															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-29-350**

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

Logged by:	C. Wieden
Date Start:	2/11/00
Date Finish:	2/17/00
Station:	5+066.599 19.50 RT
Line:	BURKE LANE
Coordinates (m):	N 124,466.611 E 18,848.846
Elevation (m):	1304.756
Total Depth Drilled (m):	47.9
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type.	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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SAMPLE TYPE

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

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 5/31/00

Boring: SB-30-351
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Poorly Graded SAND with gravel - moist, brown to gray																
		5	1		SPT	254			10 17 13								
	- very dense		2														
	SILT - wet, light brown						ML	A-4									
1295		10	3		P	610					29	14.9	26				C TR SG
			4														
		15	5		SPT				2 2 4	●9				NP	NP		SV
	Silty SAND - loose, wet, gray, fine-grained						SM	A-2-5									
	SILT - wet, brown						ML	A-4									
		20	6		P						36						
			7														
		25	8		SPT				3 3 3	●8						85	
1290	- medium stiff, light brown																
		30	9		P	610					19 29	18.2	23	24	NP	77	C SG
			10														
		35	11		SPT	457	GP-GM	A-2-4	8 9 26	●43							
	Poorly Graded GRAVEL with silt and sand - dense, wet, gray																
		40	12		SPT	279			17 18 21	●46							SV
	- black		13														
1285		45	14		SPT	254			12 10 18	●31							
			15														
		50			SPT				24 20 34								
	- very dense		16														
		55	17		SPT				19 24 23	●49							
	- dense																
	- occasional silty sand seams and layers		18														
1280	- medium dense	60			SPT				17 8 12	●20							
			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: **SB-30-351**

Sheet 1 of 1

Logged by:	C. Wieden
Date Start:	2/8/00
Date Finish:	2/8/00
Station:	5+299.649 9.45 LT
Line:	BURKE LANE
Coordinates (m):	N 124,631.325 E 19,011.152
Elevation (m):	1298.287
Total Depth Drilled (m):	18.7
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z0035B2A.GPJ 5/31/00

Boring: SB-30-352
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Lean CLAY - moist, mottled gray to brownish tan						CL	A-6								
	- medium stiff	5	1		SPT	457			1 2 2							pH WSS R
1295	Silty SAND - wet, gray, fine to medium-grained	10	2				SM	A-2-5								
	- some gravel or cobbles		3		P	457				24						
	SILT - stiff, wet, brownish-gray, occasional sand layers 0.3 meters thick	15	4				ML	A-4								
			5		SPT	305			3 3 5							
	- brown	20	6		SPT	305			4 4 4							
1290	Silty SAND - wet, brown	25	7				SM	A-2-5								
			8		P	610				34	14.7	28				C TR SG
	- brown to gray	30	9		P	508				23	17.3	23			49	
	Poorly Graded SAND with silt - medium dense, wet, gray, fine to medium-grained, with some coarse-grained	35	10				SP-SM	A-1-b								
			11		SPT	152			8 9 8							SV
	- occasional gravel	40	12													
1285	- dense, with gravel, fine to coarse-grained sand and gravel				SPT	254			4 8 23							
		45	14		SPT	203			8 15 21							
	- dense, interbedded silt	50	15		SPT				18 12 5							
	- very dense	55	17		SPT	330			32 34 34							
1280	- dense, occasional gravel layers	60	18		SPT	152			19 26 24							
		65	19													

Test Results *

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-30-352**

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

Logged by:	C. Wieden
Date Start:	2/6/00
Date Finish:	2/7/00
Station:	5+352.141 2.08 RT
Line:	BURKE LANE
Coordinates (m):	N 124,632.729 E 19,065.430
Elevation (m):	1297.435
Total Depth Drilled (m):	21.8
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

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P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 6/31/00

Boring: SB-30-352
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly Graded SAND with silt - dense, wet, gray (continued)				SPT	229			14 17 21								
	- yellowish-brown	70	21		SPT	305			7 9 38	●42							
1275		75	22														
		80	23														
		85	24														
1270		90	25														
		95	26														
		100	27														
1265		105	28														
		110	29														
		115	30														
		120	31														
1260		125	32														
		130	33														
			34														
			35														
			36														
			37														
			38														
			39														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **SB-30-352**

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

Logged by:	C. Wieden
Date Start:	2/6/00
Date Finish:	2/7/00
Station:	5+352.141 2.08 RT
Line:	BURKE LANE
Coordinates (m):	N 124,632.729 E 19,065.430
Elevation (m):	1297.435
Total Depth Drilled (m):	21.8
Drill Contractor:	Haz-tech
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SB2A.GPJ 5/31/00

Boring: WB- 1-240
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: SAND, SILT, and GRAVEL, very moist to wet, light brown, occasional grass roots in upper 150 mm				MC	559			26 39 50 47							
			1		SPT	2921			28 32 34 50							
1295		5	2													
	Silty SAND - medium dense, wet, gray, occasional gravel layers				SPT	305	SM	A-2-5	50							
		10	3		MC	0			13 10 10 14							
			4		SPT	457			11 10 10 9							
		15	5		MC	0			7 5 5 6							
	SILT with sand - stiff to very stiff, wet, light brown to gray				SPT	610	ML	A-4	5 7 9 9							
		20	6		MC	406			11 4 7 8			27			79	
1290			7		SPT	610			3 4 4 6							
	- frequent sand seams and layers	25	8		MC	2921			15 8 8 10							
	Poorly Graded SAND - loose to medium dense, wet, gray, frequent gravel andt silt layers				SPT	610	SP	A-3	7 11 11 15							
		30	9		MC	305			3 2 5 8			21				
	- loose		10		SPT	610			2 2 3 2							
	- no visible silt layers	35	11		MC	0			15 16 22 19							
					SPT	76			13 12 20 24							
1285	SILT - very stiff to hard, wet, light brown, frequent silty sand seams and layers	40	12		MC	406	ML	A-4	6 7 7 9							
			13		SPT	610			9 11 10 12			21	33	13		
		45	14		MC	457	SM	A-2-5	8 12 26 41							
	Silty SAND with gravel - dense, wet, gray, frequent silt seams and layers				SPT	305			17 30 31 34							
	- very dense		15													
1280		50	16													
		55	17													
			18													
		60	19													
		65														

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **WB- 1-240**

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

Logged by:	M. Bostrom
Date Start:	1/12/00
Date Finish:	1/13/00
Station:	59+493.295 70.03 LT
Line:	I-15
Coordinates (m):	N 124,334.943 E 18,805.525
Elevation (m):	1296.647
Total Depth Drilled (m):	14.9
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120
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

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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 Z003WB.GPJ 5/30/00

Boring: WB- 2-241
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	Su, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND and GRAVEL, medium dense to dense, moist, olive-brown				MC	610			2 8 16 18	31							
			1		SPT	305			17 15 17 24								
		5			MC	457			11 15 19 22	41							
			2		SPT	610			15 15 24 28	49							
		10	3		MC	0			50/125mm								
	- cobbles approximately 250 to 350 mm in size																
	-very dense		4		SPT	406			17 28 29 27								
1295	- cobbles approximately 400 mm in size	15	5														
	Lean CLAY with sand - medium stiff to stiff, moist to wet, dark gray-black, frequent silt seams and layers				SPT	610	CL	A-6	2 3 3 6	6							
		20	6		MC	457			3 3 4 5	7							
▽			7		MC	610			3 3 4 5	6							
		25	8		SH	610					42 *38*	16.8	23	28	6	79	C SG
					SPT	610			3 5 7 9	9							
		30	9		MC	610			4 4 6 6	7	*57*						
1290			10		SPT	610											
		35	11		SH	610					*53*			32	10		
	- becomes reddish brown				SPT	610			4 4 6 6	7							
		40	12		MC	508			5 5 8 8	8	*57*						
			13		SPT	610			6 8 9 11	12							
		45	14		SH	635					*62*						
1285					SPT	610			13 12 20 24	22							
		50	15														
			16														
		55	17														
			18														
		60	19														
1280		65															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **WB- 2-241**

Sheet 1 of 1

Logged by:	R. Yates
Date Start:	1/13/00
Date Finish:	1/14/00
Station:	59+647.927 57.07 LT
Line:	I-15
Coordinates (m):	N 124,432.213 E 18,684.621
Elevation (m):	1299.532
Total Depth Drilled (m):	14.9
Drill Contractor:	Haztech Drilling
Driller:	R. Knott
Rig Type:	CME-850
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

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

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SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003WB.GPJ 6/30/00

Boring: WB- 3-242
Sheet 1 of 1

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)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND with gravel - dense to very dense, moist, olive-brown				MC	610			14 19 20 29								
		5	1		SPT	457			19 22 28 50/125 mm								
			2		MC	229			14 50/100mm								
1295		10	3		MC	381			20 21 8 5	26							
			4		SPT	508			5 5 7 9								
		15	5		MC	457			6 8 7 7	13							
	Sandy SILT - medium stiff to stiff, wet, olive-brown, occasional gravel				SPT	51	ML	A-4	5 5 7 7	12							
		20	6		SH	102					29	15.7	26	25	1		C SG
			7														
		25	8		MC	813			2 5 6 7	8							
1290					SPT	610			3 3 5 6	7							
		30	9		SH	610					38						
	- very stiff		10		SPT	762			2 2 3 5	5							
		35	11		MC	610			4 5 4 7	6							
					SPT	610			3 6 8 9	12							
		40	12		SH	762					57						
1285			13		SPT	610			5 5 7 9	10							
		45	14		MC	610			3 6 7 10	8							
			15		SPT	610			5 9 11 14	15							
		50	16														
		55	17														
1280		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: **WB- 3-242**

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

Logged by:	R. Yates
Date Start:	1/12/00
Date Finish:	1/13/00
Station:	59+706.550 29.93 LT
Line:	I-15
Coordinates (m):	N 124,488.338 E 18,651.781
Elevation (m):	1298.223
Total Depth Drilled (m):	14.9
Drill Contractor:	Haztech Drilling
Driller:	R. Knott
Rig Type:	CME-850
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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

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SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003WB.GPJ 5/30/00

Boring: WB- 4-239
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	TOPSOIL; Silty Lean CLAY - moist, brown, roots				MC	457			2 8 16 17	44							
	Silty SAND - medium dense, moist to wet, brown - with occasional gravel		1		SPT	356	SM	A-2-5	10 12 10 5	49							
1295	Lean CLAY - very stiff, wet, dark brown	5			MC	0	CL	A-6	7 7 7 7	26							
			2		SPT	457	SM	A-2-5	5 3 4 3	16							
	Silty SAND - medium dense, wet, gray mottled rust	10	3		SH	254											
			4		SPT	559			4 7 7 9	28							
		15			MC	610			5 8 8 6	26			20			18	SV
	Sandy SILT- stiff, wet, gray to brown, fine-grained, with occasional silty sand layers and gravel		5		SPT	610	ML	A-4	3 3 3 4	12							
1290	Poorly Graded SAND with silt - dense, wet, gray	20	6		MC	610	SP-SM	A-3	3 5 9 10	20							
			7		SPT	610			5 6 9 11	25							
		25			MC	559			2 4 9 11	17							
			8		SPT	457			12 12 9 9	33							
	SILT - very stiff, wet, brown - hard, with occasional sand and gravel	30	9		MC	229		A-4	12 17 16 15	41							
	Poorly Graded SAND - dense, wet, gray, contains frequent layers of light brown silt. - very dense - occasional fine to coarse-grained gravels		10		SPT	610	SP-SM	A-3	6 12 18 17	45							
		35	11		MC	381			20 24 25 29	○							
1285					SPT	305			20 24 25 29	○							
		40	12		MC	254			13 15 16 18	33			23	31	12		
	Lean CLAY - hard, wet, light brown to brown, contains frequent silt seams and layers		13		SPT	305	CL	A-6	8 8 12 8	26							
	Poorly Graded SAND with gravel - very dense, wet, gray - fine to coarse-grained gravels - dense - organic layer (peat) with roots	45	14		MC	457		A-3	10 18 15 15	34							
					SPT	457			30 30 19 5	○							
1280		50	15														
			16														
		55	17														
			18														
		60	19														
		65															

UTDOT Z003WB.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: **WB- 4-239**

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

Logged by:	M. Bostrom
Date Start:	1/11/00
Date Finish:	1/12/00
Station:	59+480.935 39.09 LT
Line:	I-15
Coordinates (m):	N 124,353.674 E 18,833.082
Elevation (m):	1296.335
Total Depth Drilled (m):	14.9
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120
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

Boring: WB- 9-226
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND with gravel - medium dense, moist, brown				MC	610			6 12 12 10							
	SILT - soft, moist, black		1		SPT	457	ML	A-4	2 3 3 3							
		5			MC	0			3 3 2 4							
			2		SPT	610			5 3 3 3							
		10	3		SH	610	CL	A-7-6		26	14.2	32	47	21	92	
1295	Lean CLAY - soft, moist, blue-gray, with frequent sand lenses															
			4		SPT	356			2 2 1 2							
		15			MC	127			5 7 9 12							
			5													
	Silty GRAVEL with sand - medium, dense, wet, blue-gray				SPT	305	GM	A-2-4	12 14 16 14							
		20	6		MC	254			12 16 12 18		22.0	9				SV
			7		SPT	0			11 14 16 14							
		25														
	- dense		8		MC	330			8 16 33 19							
1290	- medium dense				SPT	559			8 7 9 8							
		30	9		MC	508			11 11 8 10							
			10		SPT	457			7 3 5 5							
	SILT - medium stiff, wet, gray mottled black						ML	A-4								
	Poorly Graded SAND with silt - gray, wet, loose	35	11		MC	610	SP-SM	A-3	7 3 5 5							SV
	- medium dense				SPT	610			3 4 9 24							
		40	12		MC	610			12 14 14 8							
	- dense - with gravel		13		SPT	610			4 8 25 16							
1285		45														
	- medium dense		14		MC	610			5 10 18 13							
					SPT	559			7 6 10 12							
			15													
		50														
			16													
		55	17													
			18													
1280		60														
			19													
		65														

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **WB- 9-226**

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

Logged by:	G. Hales
Date Start:	1/10/00
Date Finish:	1/10/00
Station:	1+406.133 1.01 RT
Line:	I-15 NB to US 89 NB
Coordinates (m):	N 423,822.721 E 19,430.441
Elevation (m):	1298.210
Total Depth Drilled (m):	14.9
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

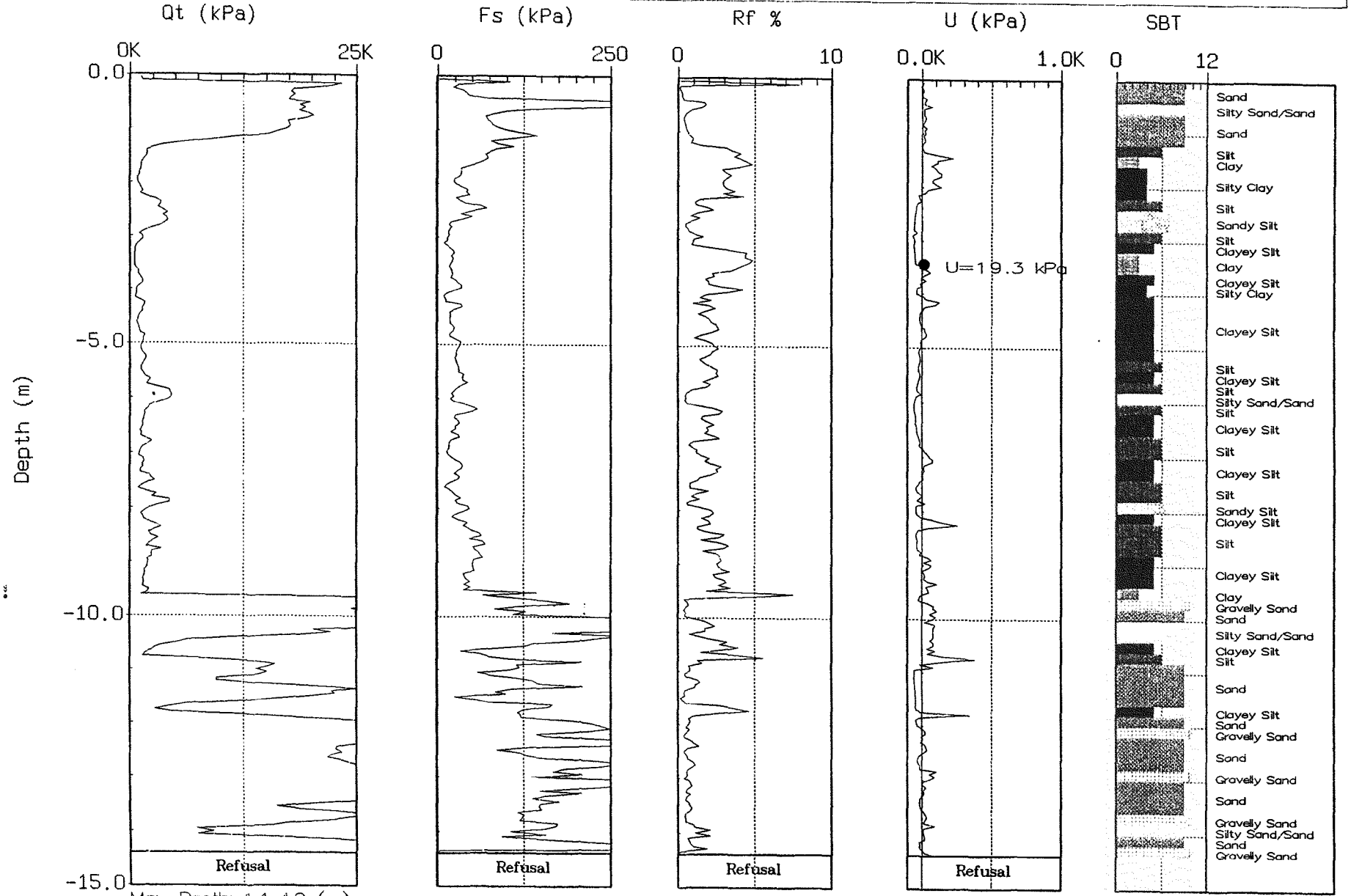
BAG = Bulk Sample

UTDOT Z003WB.GPJ 5/30/00

Legacy Parkway

Site. ..3-9-227
Station: 1+500.557 8.10 RT
Elevation: 1301.460

Cone: 20 TON A 038
Date: 01:07:00 11:34



Max. Depth: 14.40 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE C-6

Boring: WB- 9-228
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL; Silty SAND and GRAVEL, slightly moist, brown				MC	508			14 12 13 12	25							
	ASPHALT																
	FILL: Silty SAND with gravel - medium dense, moist, brown																
	SILT with sand - medium stiff, very moist to wet, brown, with fine to medium-grained sand, with frequent small-sized gravel		1		SPT	559	ML	A-4	4 3 4 4	7							
		5			MC	0			4 3 2 1	5							
			2		SPT	610			2 2 2 1	4							
	- with frequent layers of sandy lean clay 12 to 100 mm thick	10	3		MC	610			1 2 2 1	4		14.1	31	33	9	30	
1295	Lean CLAY - medium stiff, wet, brown, with frequent layers of silt 6 to 50 mm thick		4		SPT	610	CL	A-6	1 2 1 2	3							
	- gray with numerous roots	15															
	SILT - medium stiff, wet, brown, with frequent layers of silty sand 12 to 75 mm thick		5	P	P	0	ML	A-4									
					SPT	610			2 3 2 3	5							
		20	6	P	P	0											
	Silty SAND - loose to medium dense, wet, gray, with frequent layers of silt 13 to 25 mm thick		7		SPT	610	SM	A-2-5	2 4 4 5	8							SV
		25			MC	559			10 11 9 7	20							
	- medium dense, brown and gray, with silt layers		8		SPT	508			3 4 5 5	9							
1290		30	9		MC	610	SC	A-2-6	2 2 1 1	3							
	Clayey SAND - loose, wet, brown, with occasional gravel																
	Sandy Lean CLAY - stiff, wet, brown, with occasional gravel		10		SPT	610	CL	A-6	13 11 11 14	22							SV
	Silty SAND with gravel - dense, wet, gray	35					SM	A-2-5									
			11		MC	559			18 22 24 21	48							
					SPT	508			16 18 22 21	38							
		40	12		MC	508			18 18 20 29	38							
	Poorly Graded SAND with gravel - dense, wet, olive-gray		13		SPT	559	SP	A-3	8 9 12 14	19							
1285	- medium dense	45	14		MC	457			8 9 12 14	19							
	Silty SAND with gravel - medium dense, wet, olive-gray				SPT	559	SM	A-2-5	8 14 12 10	24							
		50	15														
			16														
		55	17														
			18														
1280		60	19														
		65															

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: **WB- 9-228**

Sheet 1 of 1

Logged by:	T. Thompson
Date Start:	1/7/00
Date Finish:	1/7/00
Station:	1+608.843 8.56 RT
Line:	I-15 NB to US 89 NB
Coordinates (m):	N 124,005.160 E 19,340.414
Elevation (m):	1298.795
Total Depth Drilled (m):	14.9
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003WB.GPJ 8/30/00

Boring: WB- 9-229
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Sandy SILT with gravel, medium dense, moist, yellowish brown				MC	508			1 8 13 12							
			1		SPT	203			5 50							
	FILL: Silty GRAVEL with silt and sand, medium dense to dense, moist to very moist, frequent small roots	5			MC	457	ML	A-4	4 2 2 2							
	Sandy SILT - medium stiff, wet, dark brown		2		SPT	610			2 2 1 2							
		10	3		P	610	CL	A-6							62	DS
	Sandy Lean CLAY - very soft, wet, brown, with frequent layers of sandy silt 25 to 75 mm thick															
1295			4		SPT	610			1 0 1 1							
		15			MC	533	SM	A-2-5	3 3 4 5		15.8	24				SV
	Silty SAND - loose to medium dense, wet, greenish-gray, fine to medium-grained		5		SPT	457			4 6 11 15							
	Poorly Graded GRAVEL with silt - loose to medium dense, wet, greenish gray						GP-GM	A-2-4								
		20	6		MC	203			4 8 12 14		21.1	7				SV
			7		SPT	457			3 3 4 5							
		25			MC	0			12 11 12 14							
			8		SPT	457			8 7 6 8							
1290	SILT - very stiff, wet, gray-brown, approximately 900 mm thick						ML	A-4								
		30	9		MC	457			5 8 9 6		17.6	17			35	
	Silty SAND with gravel - medium dense, wet, green-gray - loose						SM	A-2-5								
			10		SPT	305			3 2 3 4							
		35														
	- medium to very dense		11		MC	356			11 26 34 42							
					SPT	508			6 8 4 18							
		40	12													
					MC	508			12 21 36 35							
			13		SPT	610			12 21 24 18							
		45														
1285	- dense		14		MC	457			16 18 21 16		20.0	10				SV
	- very loose				SPT	406			2 1 2 3							
			15													
		50														
			16													
		55	17													
			18													
		60														
1280			19													
		65														

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **WB- 9-229**

Sheet 1 of 1

Logged by:	T. Thompson
Date Start:	1/7/00
Date Finish:	1/10/00
Station:	1+719.031 12.69 RT
Line:	I-15 NB to US 89 NB
Coordinates (m):	N 124,098.389 E 19,282.261
Elevation (m):	1298.981
Total Depth Drilled (m):	7.3
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

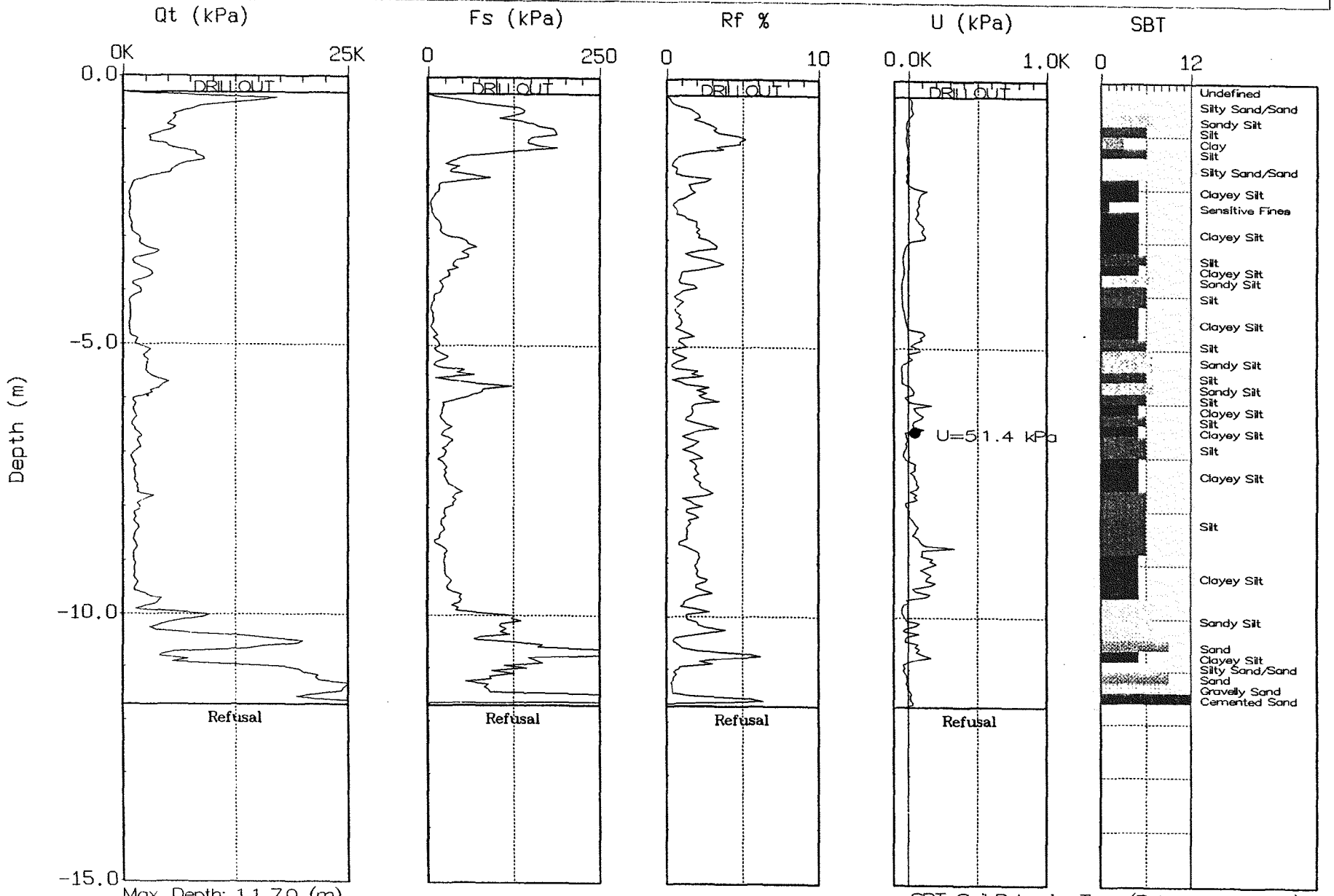
BAG = Bulk Sample

UTDOT Z003WB.GPJ 6/30/00

Legacy Parkway

Site: wC-9-230
Station: 1+822.003 19.87 RT
Elevation: 1299.148

Cone: 20 TON A 070
Date: 03:02:00 08:50



Max. Depth: 11.70 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE C-9

Boring: WB- 9-231
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Pooly Graded GRAVEL, slightly moist, gray, fine-grained, little fines															
	Lean CLAY - medium stiff to stiff, moist, dark brown, with trace sand and fine-grained gravel		1		MC	356	CL	A-6	8 10 7 7							
		5	2		SPT	457			4 3 3 3							
1300																
		10	3		MC	457			4 4 3 2							
	- becomes soft, wet, light brown, thinly interbedded with frequent silt seams and silty sand layers up to 300 mm thick, occasional organic *material*		4		SPT	610			2 1 2 3							
		15			SH	508									17	
	- medium stiff, occasional organics		5		SPT	610			4 3 3 4	*24*						
		20	6		MC	457			3 4 3 3							
	-frequent silty sand layers up to 100 mm thick		7		SPT	610			3 4 5 3							
1295		25	8		SH	610				37 *43*	14.4	33	35	15		C SG
	Silty SAND - dense to very dense, wet, gray, with fine to medium-grained sand				SPT	610	SM	A-2-5	3 3 6 9							
	- Lean CLAY layer,stiff, wet, light brown	30	9		MC	0			50/ 75mm							
	- with trace gravel		10		SPT	305			15 31 19 9							
	- no recovery, heaving sand	35	11		MC	127	GM	A-2-4	50/145mm							
	Silty GRAVEL - very dense, wet, gray, with sand		12													
1290	Silty SAND - very dense, wet, greenish gray, with frequent silt layers and some gravel	40			SPT	152	SM	A-2-5	40 50/150mm							
			13		SPT	254			35 45 21 10							
		45	14		MC	305			18 13 26 12							
	- *very loose*				SPT	610			2 1 1 2							
		50	15													
			16													
		55	17													
1285																
		60	18													
			19													
		65														

● SPT $(N_1)_{60}$
○ SPT $(N_1)_{60}$ (Greater than 50 Blows)
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: **WB- 9-231**

Sheet 1 of 1

Logged by:	M. Bostrom
Date Start:	3/28/00
Date Finish:	3/28/00
Station:	1+9203.608 44.42 RT
Line:	I-15 NB to US 89 NB
Coordinates (m):	N 127,295.100 E 19,198.787
Elevation (m):	1302.344
Total Depth Drilled (m):	15.2
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

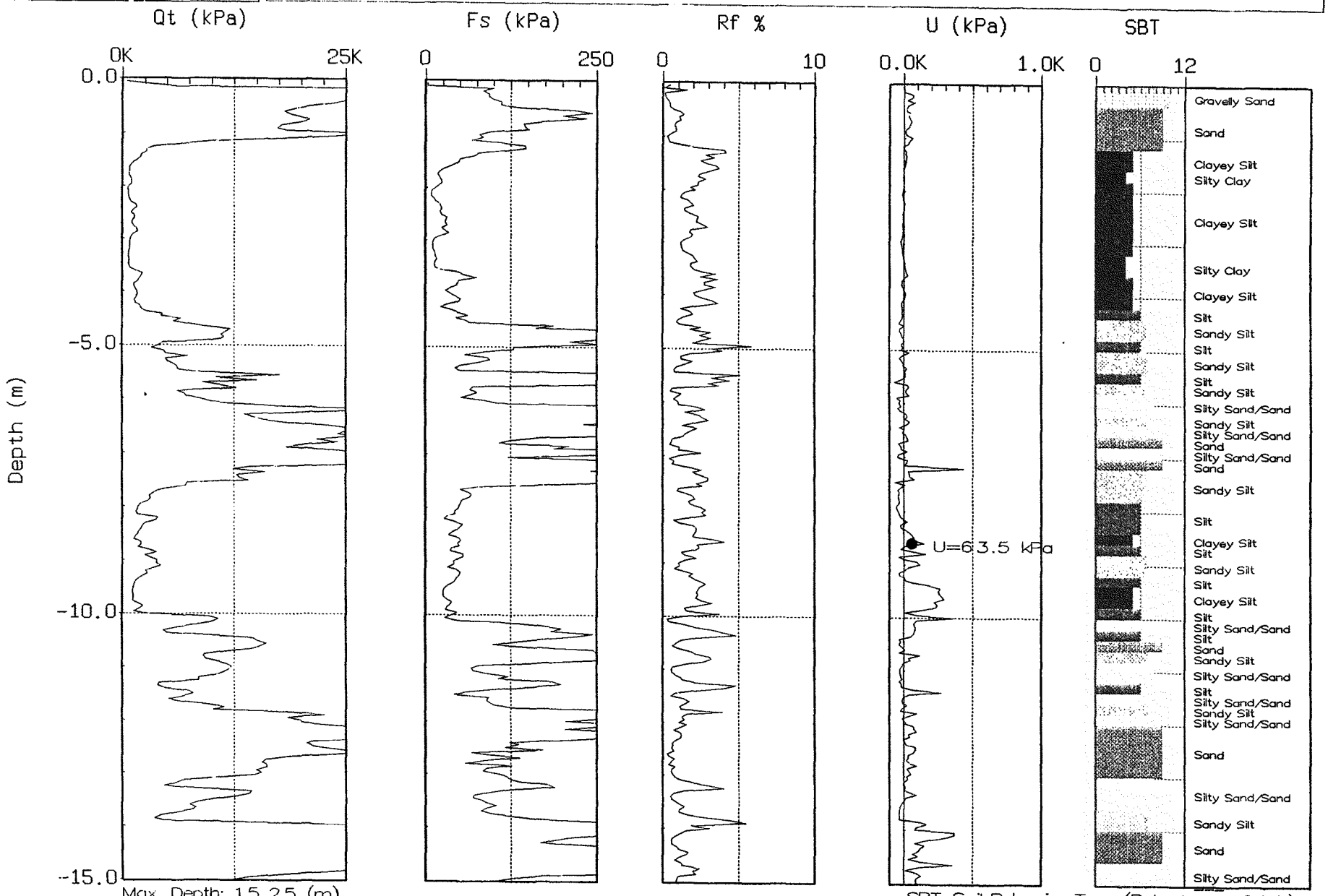
BAG = Bulk Sample

UTDOT Z003WB.GPJ 5/30/00

Legacy Parkway

Si .VC-10-232
Station: 58+734.533 23.51 RT
Elevation: 1301.210

Cone: 20 TON , .58
Date: 01:07:00 10:17



Max. Depth: 15.25 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

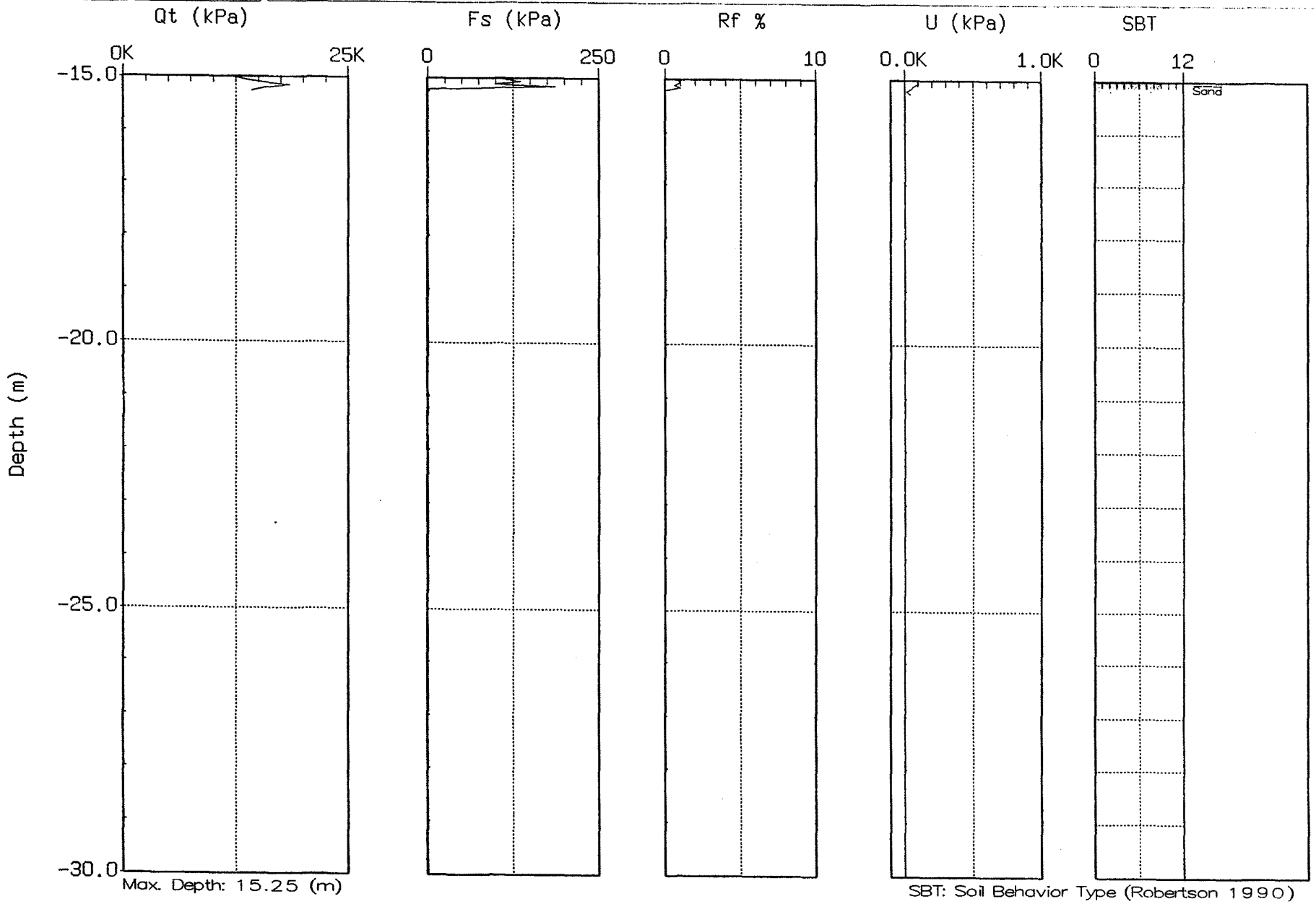
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE C-11

Legacy Parkway

Site: WC-10-232
Station: 58+734.533 23.51 RT
Elevation: 1301.210

Cone: 20 TON A 058
Date: 01:07:00 10:17



Max. Depth: 15.25 (m)
Depth Inc.: 0.050 (m)

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

PLATE C-12

Boring: WB-10-233
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows)	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 to wet, tan				MC	610			12 4 3 4	12							
			1		SPT	305			11 10 12 14	49							
1300		5			MC	102			4 8 11 9	28							
			2		SPT	508	MH	A-5	4 3 3 3	10							
	Elastic SILT - soft, moist, brown to black	10	3		SH	610					35 *48*	13.9	36	50	21		C SG
			4		SPT	305	CL	A-6	5 4 4 3	12							
	Lean CLAY - soft, moist to wet, gray to green, with sand lenses	15	5		MC	0			1 3 3 4	8							
					SPT	508	ML	A-4	3 4 4 5	12							
	SILT - soft, moist to wet, brown, with thin sand lenses	20	6		SH	559					*34*	15.2	28				C SG SV
1295					SPT	610	SM	A-2-5	4 5 4 6	12							
	Silty SAND - loose to medium dense, wet, blue-gray		7														
		25			MC	610	ML	A-4	6 7 6 5	13							
	Sandy SILT - soft, wet, grayish brown		8														
					SPT	610	SM	A-2-5	2 3 2 2	7							
	Silty SAND - loose, wet, grayish brown	30	9														
					MC	610	ML	A-4	3 4 8 17	12							
	SILT - soft, wet, brown, with sand lenses		10		SPT	610			3 6 2 6	9							SV
							SW	A-1-b									
	Well Graded SAND - loose to medium dense, wet, blue-gray, slightly silty	35	11		MC	152			3 6 2 6	9							
1290	- with some gravels, dense				SPT	610			7 11 11 12	26							
		40	12		MC	508			9 13 17 16	28							
			13		SPT	610			12 17 23 23	45							
	Silty SAND with gravel - dense, wet, blue-gray						SM	A-2-5									
		45	14		MC	457			11 19 33 35	47							
					SPT	610			6 8 17 16	28							
			15														
		50															
1285			16														
		55	17														
			18														
		60															
			19														
		65															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **WB-10-233**

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

Logged by:	G. Hales
Date Start:	1/7/00
Date Finish:	1/7/00
Station:	85+881.649 1.16 RT
Line:	I-15
Coordinates (m):	N 123,990.684 E 19,299,166.000
Elevation (m):	1301.036
Total Depth Drilled (m):	14.9
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003WB.GPJ 5/30/00

Boring: WB-10-234
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND with gravel - dense, moist, olive-brown				MC	610			8 16 21 24								
	SILT - soft, wet, black		1		SPT	610	ML	A-4	6 6 3 4	18						22	
		5			MC	610			3 1 2 5	5							
	Poorly Graded SAND with gravel - medium dense, olive-brown, coarse-grained gravel, organics		2		SPT	610	SP	A-3	6 8 4 7	25						5	
		10	3		P	0											
1295			4		MC	610			1 2 1 3	4	43						
	Lean CLAY - soft, wet, gray	15			P	610	CL	A-6									
			5		SPT	610	SM	A-2-5	1 2 5 8	11							
	Silty SAND - medium dense, wet, gray	20	6		MC	610			4 6 5 7	14							
	Lean CLAY - very stiff, wet, gray, frequent silt and sand seams and layers		7		SPT	610	CL	A-6	4 5 6 6	16							
		25	8		P	610											
1290					SPT	610			4 6 6 4	18							
		30	9		MC	610			6 14 18 10	36							
	Silty SAND- medium dense to dense, wet, gray, occasional gravel layers		10		SPT	610	SM	A-2-5	2 2 9 12	15	34						
		35	11		MC	51			45 48 12 13								
					SPT	610			5 1 11 30	15							
		40	12		MC	610			15 16 34 45	50							
			13		SPT	610			8 12 14 13	30							
1285		45	14		MC	610			25 27 27 38	50							
					SPT	457			38 38 29 50								SV
		50	15														
			16														
		55	17														
			18														
1280		60															
			19														
		65															

UTDOT Z003WB.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: **WB-10-234**

Sheet 1 of 1

Logged by:	R. Yates
Date Start:	1/10/00
Date Finish:	1/11/00
Station:	59+019.306 27.99 RT
Line:	I-15
Coordinates (m):	N 124,117.524 E 19,235.458
Elevation (m):	1298.520
Total Depth Drilled (m):	14.9
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

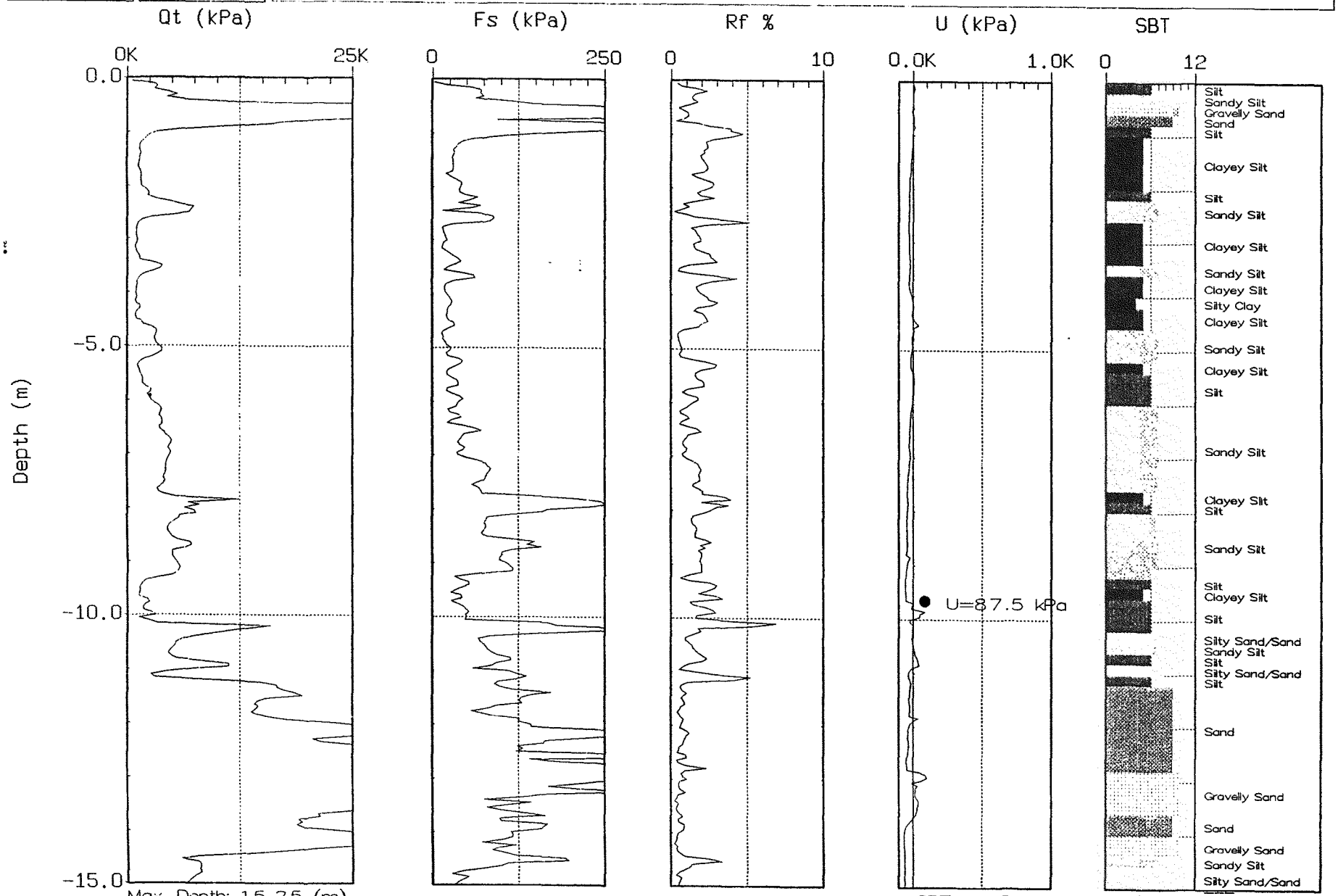
SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Legacy Parkway

Site: WC-10-234
Station: 59+019.196 27.36 RT
Elevation: 1298.457

Cone: 20 TON A 058
Date: 01:12:00 10:40



Max. Depth: 15.25 (m)
Depth Inc.: 0.050 (m)

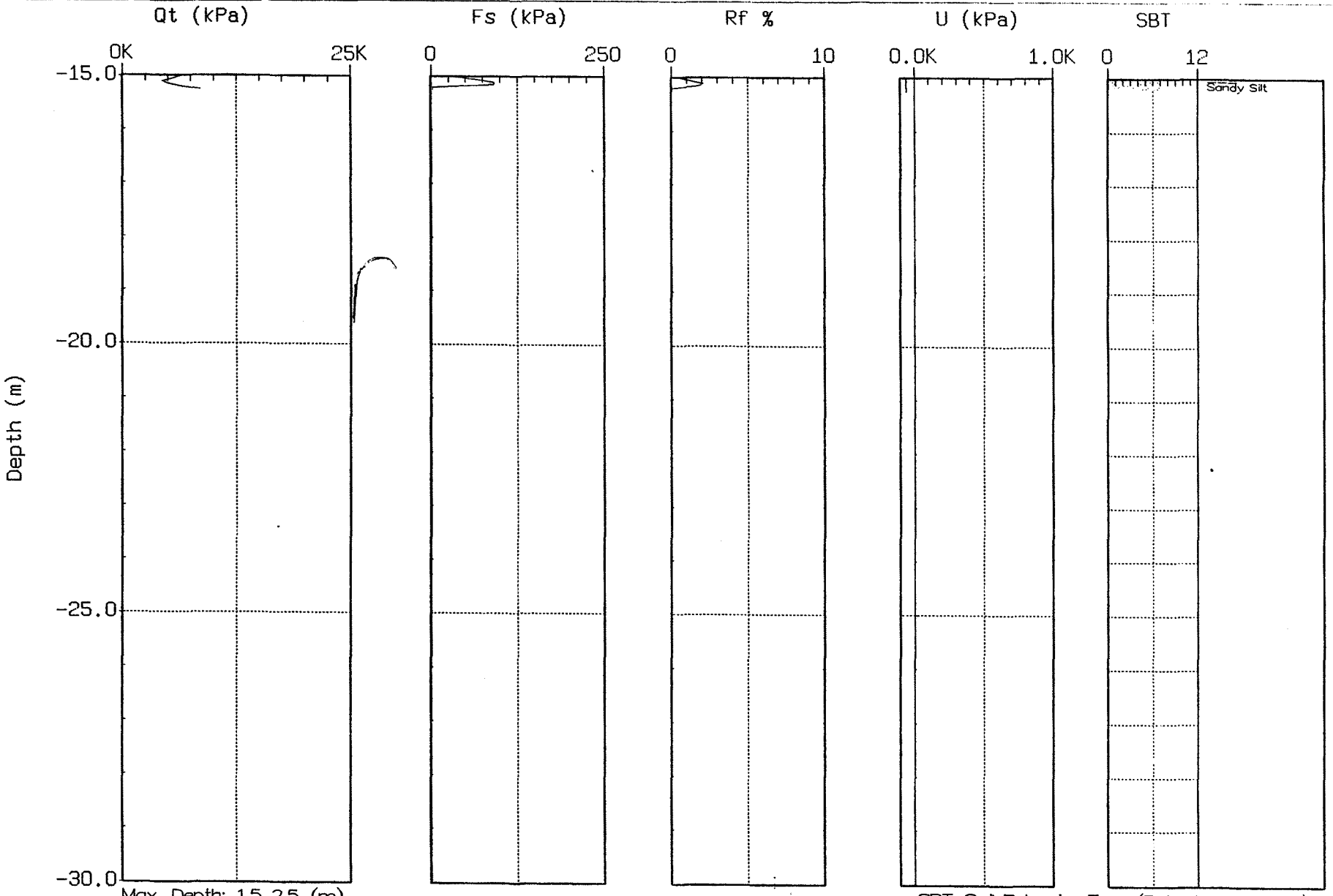
SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

Legacy Parkway

Site: WC-10-234
Station: 59+019.196 27.36 RT
Elevation: 1298.457

Cone: 20 TON A 058
Date: 01:12:00 10:40



Max. Depth: 15.25 (m)
Depth Inc.: 0.050 (m)

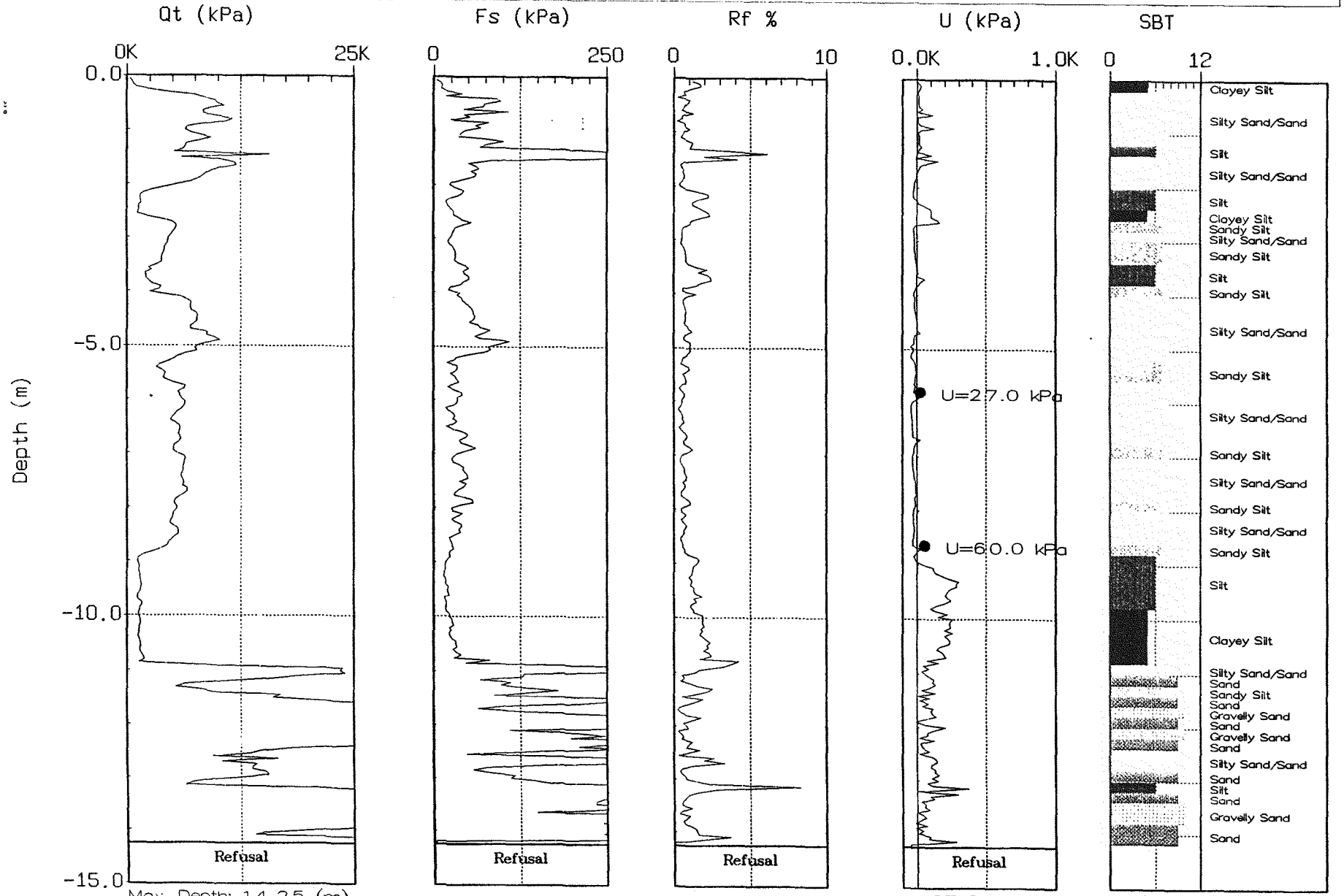
SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

Legacy Parkway

Site: WC-13-235
Station: 71+619.643 18.65 LT
Elevation: 1298.069

Cone: 20 TON A 058
Date: 01:07:00 09:11



Max. Depth: 14.25 (m)
Depth Inc.: 0.050 (m)

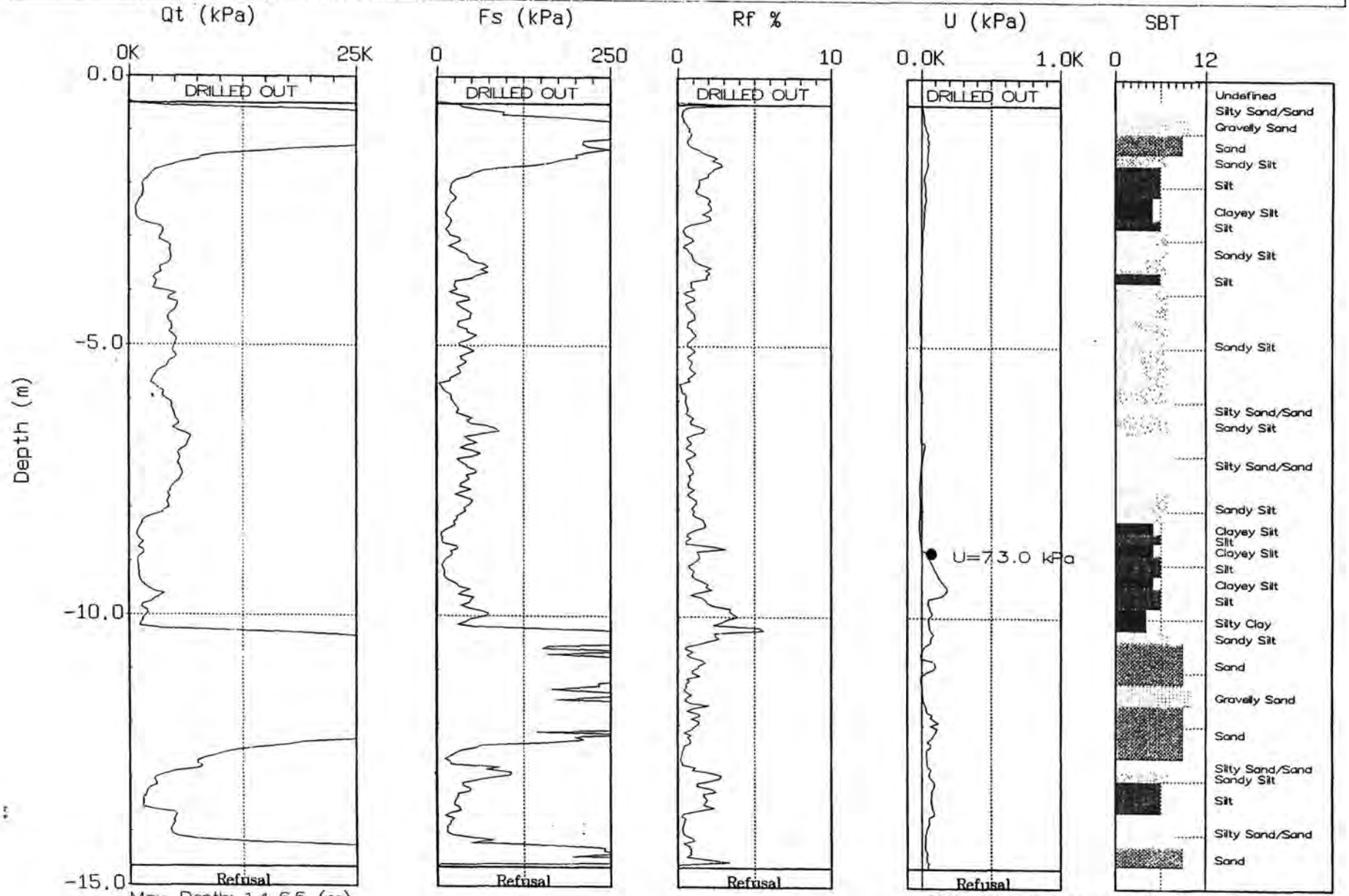
SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

Legacy Parkway

Site: WC-14-237
Station: 71+606.215 18.72 RT
Elevation: 1301.664

Cone: 20 TON A 058
Date: 01:12:00 12:46



Max. Depth: 14.65 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

Boring: WB-10-236
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly Graded SAND with Silt and Gravel - medium dense to dense, wet, light brown				MC	457	SP-SM	A-1-b	10 11 11 9						9	
			1		SPT	51			5 5 3 1							
		5			MC	0			8 9 9 7							
			2		SPT	508			6 7 7 7							
1295		10	3		SH	610					9.6	108	NP	NP		C SG
	- Lean CLAY layer, medium stiff to stiff, moist									*19*						
	Silty SAND - medium dense, wet, gray, occasional layers of fine-graded gravel		4		SPT	559	SM	A-2-5	3 5 8 5						20	
		15			MC	457			5 6 4 4		20.8	6				SV
			5		SPT	610	ML	A-4	3 4 4 4							
	SILT - stiff, wet, gray	20	6		MC	127			5 11 16 22							
	Silty SAND - dense, wet, gray		7		SPT	508	SM	A-2-5	11 6 7 7						9	
	SILT - very stiff, wet, gray	25					ML	A-4								
1290			8		MC	457			4 4 5 6							
					SPT	610			3 3 6 8							
	- with frequent Silty SAND layers	30	9		SH	610				*29*	9.9	100	NP	NP		C SG
			10		SPT	0			7 5 11 13							
		35	11		MC	610			4 6 9 9							
					SPT	457			5 6 10 13							
		40	12		SPT	457			3 4 4 6							
1285			13		SPT	533			4 7 8 20							
	Lean CLAY layer, very stiff, wet, gray	45	14		MC	533			49 30 42 40							
	SILT with sand, light brown															
	Silty GRAVEL with sand - dense to very dense, wet, black, coarse-grained				SPT	305	GM	A-2-4	14 14 27 24							
		50	15													
			16													
		55	17													
1280			18													
		60	19													
		65														

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **WB-10-236**

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

Logged by:	M. Bostrom
Date Start:	1/10/00
Date Finish:	1/11/00
Station:	71+721.381 20.11 LT
Line:	US 89 SB to LP SB
Coordinates (m):	N 124,834.150 E 18,932.579
Elevation (m):	1297.739
Total Depth Drilled (m):	14.9
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120
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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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 Z003WB.GPJ 5/30/00

Boring: WB-14-238
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Lean CLAY - hard, moist, olive-brown, organics, occasional gravel				MC	610	CL	A-6	8 11 12 18	38							
	- stiff, moist, dark brown		1		SPT	610			6 3 2 2	10							
		5			MC	610	ML	A-4	5 3 3 2	8							SV
	SILT - medium to very stiff, wet, light brown, frequent sand layers		2		SPT	610			4 9 4 7	22						23	
		10	3		SH	610											
1295	Clayey SAND, medium dense, wet, light to olive brown		4		SPT	610	SC	A-2-6	5 2 2 6	6							SV
		15			SH	610					60	16.0	25	25	4	89	C
			5		SPT	610			5 6 8 9	21	43						SG
		20	6		MC	610			5 8 6 6	16							
			7		SPT	610			7 6 5 8	15							
		25			SH	610						16.8	22				C
			8		SPT	610			10 11 8 12	24	57						SG
1290	- hard	30	9		MC	610			11 13 18 12	32							
			10		SPT	610			8 12 18 12	37							
		35	11		SH	610					120	17.6	22				C
	- very stiff				SPT	610			5 8 7 8	17	81						SG
		40	12		MC	610			5 7 8 12	13							
			13		SPT	610			7 10 18 28	31							
1285	Silty SAND - dense, wet, gray, fine-grained - heaving sands - medium dense	45	14		MC	559	SM	A-2-5	7 10 18 28	31							
					SPT	305			7 8 13 15	22							
		50	15														
			16														
		55	17														
			18														
1280		60	19														
		65															

UTDOT Z003WB.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: **WB-14-238**

Sheet 1 of 1

Logged by:	R. Yates
Date Start:	1/11/00
Date Finish:	1/11/00
Station:	71+998.327 23.07 RT
Line:	US 89 SB to LP SB
Coordinates (m):	N 125,107.784 E 18,871.845
Elevation (m):	1298.629
Total Depth Drilled (m):	14.9
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120
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

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P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: RB-365
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / 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
	Sandy SILT with gravel - stiff, moist to wet, brown, with micaceous silts				MC	305	ML	A-4	4 5 5 6	16							
			1		SPT	305			3 5 3 2	16							
		5			SH	305					60 *62*	14.2	32			94	C TR SG
			2		SPT	457			4 4 7 8	19							
		10	3		SH	457											
	Silty GRAVEL with sand - medium dense, wet, gray		4		SPT	508	GM	A-2-4	3 6 9 10	25							
		15			MC	457			7 14 13 17	33							
1290			5		SPT	559			11 14 14 15	44							
		20	6		MC	457			13 41 22 9								
	Silty SAND with gravel - very dense, wet, gray				SPT	610	SM	A-2-4	2 3 4 4	10							
			7														
	SILT - stiff, wet, brown	25			SH	432	ML	A-4			27 *38*	15.4	28			88	C SG
	Silty SAND - dense, wet, gray		8		SPT	610	SM	A-2-4	9 15 14 18	37							
		30	9		MC	356			14 23 31 27								
1285			10		SPT	610			7 10 7 6	22							
		35	11		MC	406			3 4 5 12	9							
	- with gravel				SPT	356			23 13 15 7	33							
		40	12		MC	356			10 10 9 15	17							
			13		SPT	610			16 30 34 20								
		45	14		MC	305			15 31 29 21								
					SPT	457			6 9 13 21	23							
1280		50	15		MC	356			17 34 50								
			16														
		55	17		SPT	330			8 10 8 13	18							
			18														
	Silty GRAVEL with sand - very dense, wet, gray	60			MC	330	GM	A-2-4	51 53 53 33								
			19														
		65															

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-365**

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

Logged by:	M. Hislop
Date Start:	3/1/00
Date Finish:	3/2/00
Station:	60+408.284 1.91 RT
Line:	I-15 SB to LP SB
Coordinates (m):	N 123,949.836 E 19,120.112
Elevation (m):	1295.070
Total Depth Drilled (m):	22.6
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

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P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 6/30/00

Boring: RB-365
Sheet 2 of 2

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
	Silty GRAVEL with sand - very dense, wet, gray (continued)				SPT	356			22 25 36 34								
			21														
		70			MC	508			14 21 38 42	●45							
			22		SPT	356			15 31 40 54	○							
		75	23														
			24														
		80															
1270			25														
		85	26														
			27														
		90															
			28														
		95	29														
1265			30														
		100															
			31														
		105	32														
			33														
		110															
			34														
1260		115	35														
			36														
		120															
			37														
		125	38														
			39														
		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-365**

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

Logged by:	M. Hislop
Date Start:	3/1/00
Date Finish:	3/2/00
Station:	60+408.284 1.91 RT
Line:	I-15 SB to LP SB
Coordinates (m):	N 123,949.836 E 19,120.112
Elevation (m):	1295.070
Total Depth Drilled (m):	22.6
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

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P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 6/30/00

Boring: RB-366
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / 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 - medium stiff, moist, dark brown, trace of mica				MC	457	ML	A-4	3 3 4 4	12							
			1		SPT	610			2 2 4 5	12							
	Fat CLAY - stiff, wet, brown mottled orange, with trace mica	5					CH	A-7-6									
			2		SH	457					30 *48*	13.4	38	59	31		C TR SG SV
	Silty SAND - medium dense, wet, brown, micaceous - trace gravel				SPT	610	SM	A-2-4	2 4 5 6	16							
		10	3		MC	305			4 4 15 16	28							
	Silty CLAY - very stiff, moist, brown mottled orange and gray, with mica						CL-ML	A-6									
	Silty GRAVEL with sand - dense, wet, gray		4		SPT	610	GM	A-2-4	8 8 11 22	31							
1290		15	5		MC	305			4 14 21 31	48							
					SPT	610			7 6 22 31	45							
		20	6		MC	305			6 8 24 31	39							
			7		SPT	610			8 6 12 20	26							
		25	8		MC	737			18 15 14 1	31							
					SPT	457			6 21 7 10	14							
	SILT - stiff, wet, brown	30	9				ML	A-2-4									
					SH	610											
1285			10														
		35	11		MC	305			6 7 13 19	20							
					SPT	610			4 5 26 27	37							
	Silty GRAVEL with sand - dense, wet, gray	40	12				GM	A-2-4									
					MC	356			24 28 49 50								
	SILT - hard, wet, brown		13		SPT	356	ML	A-4	16 29 35 32								
	Silty GRAVEL with sand - very dense, wet, gray						GM	A-2-4									
		45	14		MC	203			26 , 50/ 100mm								
					SPT	356			37 40 50/ 125mm								
1280		50	15		MC	457			10 25 69								
			16														
		55	17		SPT	406			29 29 30 30								
			18														
		60			MC	330			12 21 21 20	40							
			19														
1275	Silty SAND with gravel- dense, wet, gray	65					SM	A-2-4		58							

UTDOT Z003RB.GPJ 6/30/00

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-366**

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

Logged by:	M. Hislop
Date Start:	3/2/00
Date Finish:	3/3/00
Station:	60+267.794 3.08 LT
Line:	I-15 SB to LP SB
Coordinates (m):	N 123,811.316 E 19,143.614
Elevation (m):	1294.723
Total Depth Drilled (m):	22.6
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

B BAG = Bulk Sample

Boring: RB-366
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel- very dense, wet, gray (continued)				SPT	457			11 15 18 17								
			21														
		70			MC	508			10 27 46 51								
			22		SPT	610			13 50 17 9								
	- very dense																
		75	23														
			24														
		80															
1270			25														
		85	26														
			27														
		90															
			28														
		95	29														
1265			30														
		100															
			31														
		105	32														
			33														
		110															
			34														
1260		115	35														
			36														
		120															
			37														
		125	38														
			39														
1255		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-366**

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

Logged by:	M. Hislop
Date Start:	3/2/00
Date Finish:	3/3/00
Station:	60+267.794 3.08 LT
Line:	I-15 SB to LP SB
Coordinates (m):	N 123,811.316 E 19,143.614
Elevation (m):	1294.723
Total Depth Drilled (m):	22.6
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 5/30/00

Boring: RB-367
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / 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 - medium stiff, wet, black						CL	A-6									
			1		MC	559			3 4 3 3	9							
		5	2		SPT	610			0 2 4 6	9							
		10	3	P	P	635					*19*						
					SPT	483			7 8 6 8	18							
	Silty SAND - medium dense, wet, gray to black		4				SM	A-2-4									
1290		15			SPT	305			10 12 10 12	24							
			5														
		20	6		MC	305			16 15 14 19	27							
	- dense				SPT	356			14 22 24 28	50							
			7														
		25			SPT	203			12 18 24	43							
			8														
	Silty CLAY - soft, wet, brown to black						CL	A-6									
		30	9		MC	559			1 3 4 5	5							
1285			10														
	Sandy Lean CLAY - soft, wet, brown to black						CL	A-6									
		35		P	P	406					36 *43*	15.2	29			88	C TR SG
			11		SPT	508			1 1 3 4	4							
		40	12														
					MC	406			19 26 35 32	44							
	Silty SAND with gravel - dense, wet, gray to black						SM	A-2-4									
			13														
		45	14		MC	0			14 14 18 18	23							
1280	- medium dense																
		50	15		SPT	203			21 32 35 41								
	- very dense		16														
		55	17		SPT	279			29 33 46 32								
			18														
		60			SPT	178			10 30 35 33	48							
	- dense		19														
1275		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-367**

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

Logged by:	J. Criss
Date Start:	3/7/00
Date Finish:	3/9/00
Station:	60+110.925 19.11 RT
Line:	I-15 SB to LP SB
Coordinates (m):	N 123,676.840 E 19,226.605
Elevation (m):	1294.645
Total Depth Drilled (m):	23.2
Drill Contractor:	Haztech Drilling
Driller:	R. Knott
Rig Type:	CME-850
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 6/30/00

Boring: RB-367
Sheet 2 of 2

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 with gravel - dense, wet, gray to black (continued)				SPT	127			36 50/ 100mm								
		70	21		SPT	305			18 24 31 38	● 43							
		75	22		SPT	254			39 42 50/ 100mm	● 31							
1270		80	23														
		85	24														
		90	25														
		95	26														
1265		100	27														
		105	28														
		110	29														
1260		115	30														
		120	31														
		125	32														
1255		130	33														
			34														
			35														
			36														
			37														
			38														
			39														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-367**

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

Logged by:	J. Criss
Date Start:	3/7/00
Date Finish:	3/9/00
Station:	60+110.925 19.11 RT
Line:	I-15 SB to LP SB
Coordinates (m):	N 123,676.840 E 19,226.605
Elevation (m):	1294.645
Total Depth Drilled (m):	23.2
Drill Contractor:	Haztech Drilling
Driller:	R. Knott
Rig Type:	CME-850
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 5/30/00

Boring: RB-372
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (N1)60 ● / (N1)60 (Greater than 50 Blows) ○ (0 – 25 – 50)	Su kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty CLAY - soft, wet, grayish-brown						CL-ML	A-6									
			1														
		5			MC	457			3 1 2 3	4							
			2		SPT	457			2 1 2 3	5							
	- mottled gray and rust-colored, occasional lenses of medium to coarse-grained sands	10	3		SH	508					53						
			4		SPT	457			2 2 5 5	9							
	- stiff	15			MC	305			4 7 12 17	19							
1290	Silty SAND with gravel - medium dense, wet, gray, with fine-grained gravel		5		SPT	406	SM	A-2-4	9 10 12 9	29							
		20	6		MC	305			21 17 18 15	37							
	- dense		7		SPT	356			11 12 4 3	20							
	SILT - soft to medium stiff, wet, reddish-brown, with frequent seams of gray very fine-grained sand	25					CL-ML	A-6									
	- medium dense		8		SH	508					28 43	15.7	30	33	7	93	C TR SG
					SPT	610			3 2 4 4	7							
	- stiff	30	9		MC	229			6 6 5 5	11							
1285	- medium stiff		10		SPT	610			3 3 2 3	6							
		35			SH	610						15.1	28				C SG
			11		SPT	610			3 3 5 5	9	38						
	- stiff, with frequent seams of fine to medium-grained sands	40	12		MC	457	SM	A-2-4	14 23 15 13	35							
	Silty SAND - dense, wet, gray		13		SPT	610	CL-ML	A-6	4 5 5 3	12							
	Silty CLAY - stiff, wet, gray, with frequent seams of medium to coarse-grained sand 25 mm thick	45															
	- very stiff		14		MC	457			8 16 11 15	24							
	Silty SAND - medium dense to dense, wet, gray, with medium-grained sand				SPT	610	SM	A-2-4	7 7 13 18	22							
1280		50	15		MC	457			11 22 17 20	35							
			16														
		55	17		SPT	305			20 14 14 15	30							
			18														
		60			MC	508			14 10 28 50/125mm	34							
	SILT - very stiff, wet, gray, with some coarse-grained sand		19				ML	A-4									
		65								24							

UTDOT Z003RB.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: **RB-372**

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

Logged by:	M. Bostrom
Date Start:	3/23/00
Date Finish:	3/23/00
Station:	70+447.152 11.43 RT
Line:	US 89 SB to LP SB
Coordinates (m):	N 123,619.606 E 19,255.658
Elevation (m):	1295.022
Total Depth Drilled (m):	22.6
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	203 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: RB-372
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT - very stiff, wet, gray, with some coarse-grained sand (continued)				SPT	457			13 10 12 22								
		70	21		MC	457			14 14 11 11	●26							
	Silty SAND - very dense, wet, gray, with medium to coarse-grained sand		22		SPT	508	SM	A-2-4	6 17 50/ 125mm	○							
		75	23														
			24														
		80															
1270			25														
		85	26														
			27														
		90															
			28														
		95	29														
1265			30														
		100															
			31														
		105	32														
			33														
		110															
			34														
1260		115	35														
			36														
		120															
			37														
		125	38														
			39														
		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-372**

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

Logged by:	M. Bostrom
Date Start:	3/23/00
Date Finish:	3/23/00
Station:	70+447.152 11.43 RT
Line:	US 89 SB to LP SB
Coordinates (m):	N 123,619.606 E 19,255.658
Elevation (m):	1295.022
Total Depth Drilled (m):	22.6
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	203 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 6/30/00

Boring: RB-373
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / 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
1295	FILL: Poorly Graded GRAVEL with sand - loose, moist, gray																
	Lean CLAY - medium stiff, wet, mottled gray, dark brown and reddish brown	5	1				CL	A-6									
			2		MC	51			6 7 10 8	17							
	Silty SAND - loose, gray, fine-grained				SPT	406	SM	A-2-4	9 3 4 3	8						40	
		10	3		MC	203			4 3 5 8	7							
	- some gravel				SPT	152			4 3 5 7	8							
			4														
	Well graded GRAVEL with silt and sand - dense, wet, gray	15			MC	305	GW-GM	A-1	16 26 30 27	45							SV
			5		SPT	76			6 13 17 15	28							
1290		20	6		MC	152			17 19 20 19	31							
			7		SPT	152	SM	A-2-4	9 9 7 3	15							
	Silty SAND - loose, wet, brownish-gray	25			MC	305			2 3 2 5	6						38	
			8		SPT	356			2 3 6 9	10							
	Lean CLAY - medium stiff, wet, gray, frequent silty sand seams	30	9		MC	305	CL	A-6	1 3 6 7	6							
			10		SPT	483			3 4 5 6	7							
1285		35	11		P	610					36 *51*	16.6	25	32	12	91	C TR SG DS
					SPT	356			2 3 16 11	15							
	Poorly Graded GRAVEL with sand - medium dense, wet, gray, fine-grained	40	12				GP	A-1									
	Clayey SAND - medium dense, wet, olive gray, fine to medium-grained				MC	305	SC	A-2-6	3 6 7 16	8							
	Well graded GRAVEL with silt and sand - dense, wet, gray		13		SPT	356	GW-GM	A-1	16 33 15 25	37							SV
		45	14		MC	152			3 17 23 30	26							
	Silty SAND - medium dense, wet, gray, fine to coarse-grained, occasional clay seams				SPT	203	SM	A-2-4	7 15 12 9	21							
		50	15		MC	457	GP	A-1	4 8 29 49	24							
1280	Poorly Graded GRAVEL with sand - medium dense, wet, gray		16		SPT	305	GM	A-1	12 25 28 30	42							
	Silty GRAVEL - very dense, wet, olive gray	55	17		MC	305			15 33 47 41								
			18														
	- medium dense	60			SPT	305			7 18 17 31	27							
			19														
		65								40							

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-373**

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

Logged by:	A. Waldman
Date Start:	3/2/00
Date Finish:	3/3/00
Station:	70+604.650 4.71 RT
Line:	US 89 SB to LP SB
Coordinates (m):	N 123,766.960 E 19,220.257
Elevation (m):	1295.507
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

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = *American Association of State Highway and Transportation Officials*

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 6/1/00

Boring: RB-373
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1275	Silty GRAVEL - dense, wet, olive gray (continued)				MC	203			16 31 32								
	Fat CLAY - medium stiff to stiff, olive gray	70	21		SPT	178	CH	A-7-6	1 6 8 7	● 11							
	Silty GRAVEL - dense to medium dense, wet, gray	75	22		MC	1295	GM	A-2-4	26 50/ 125mm								
		80	23		SPT	254			1 2 32 50	● 31							
1270	Lean CLAY - very stiff, wet, olive gray	85	24		MC	483	CL	A-6	2 13 21 50	● 25							
	Clayey SAND with gravel - medium dense, wet, olive gray		25				SC	A-2-6									
		90	26		SPT	305			4 11 17 20	● 21							
		95	27		MC	152			21 18 22 25	● 20							
1265		100	28		SPT	406			8 5 21 50	● 17							
		105	29														
		110	30														
		115	31														
1260		120	32														
		125	33														
		130	34														
			35														
			36														
			37														
			38														
			39														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-373**

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

Logged by:	A. Waldman
Date Start:	3/2/00
Date Finish:	3/3/00
Station:	70+604.650 4.71 RT
Line:	US 89 SB to LP SB
Coordinates (m):	N 123,766.960 E 19,220.257
Elevation (m):	1295.507
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

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

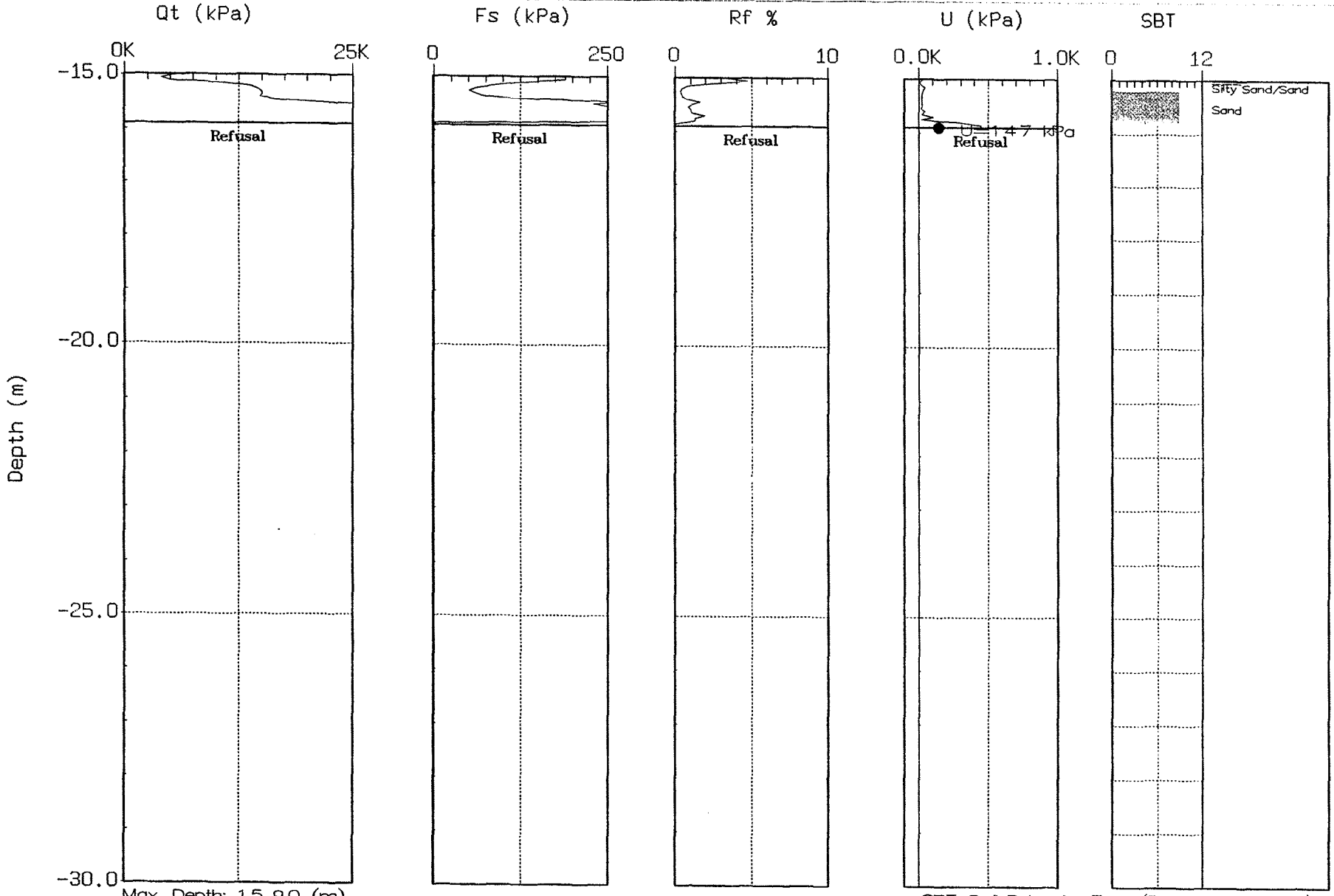
BAG = Bulk Sample

UTDOT Z003RB.GPJ 6/1/00

Legacy Parkway

Site: RC-373
Station: 70+601.725 2.71 RT
Elevation: 1295.444

Cone: 20 TON A 070
Date: 05:09:00 09:14



Max. Depth: 15.90 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

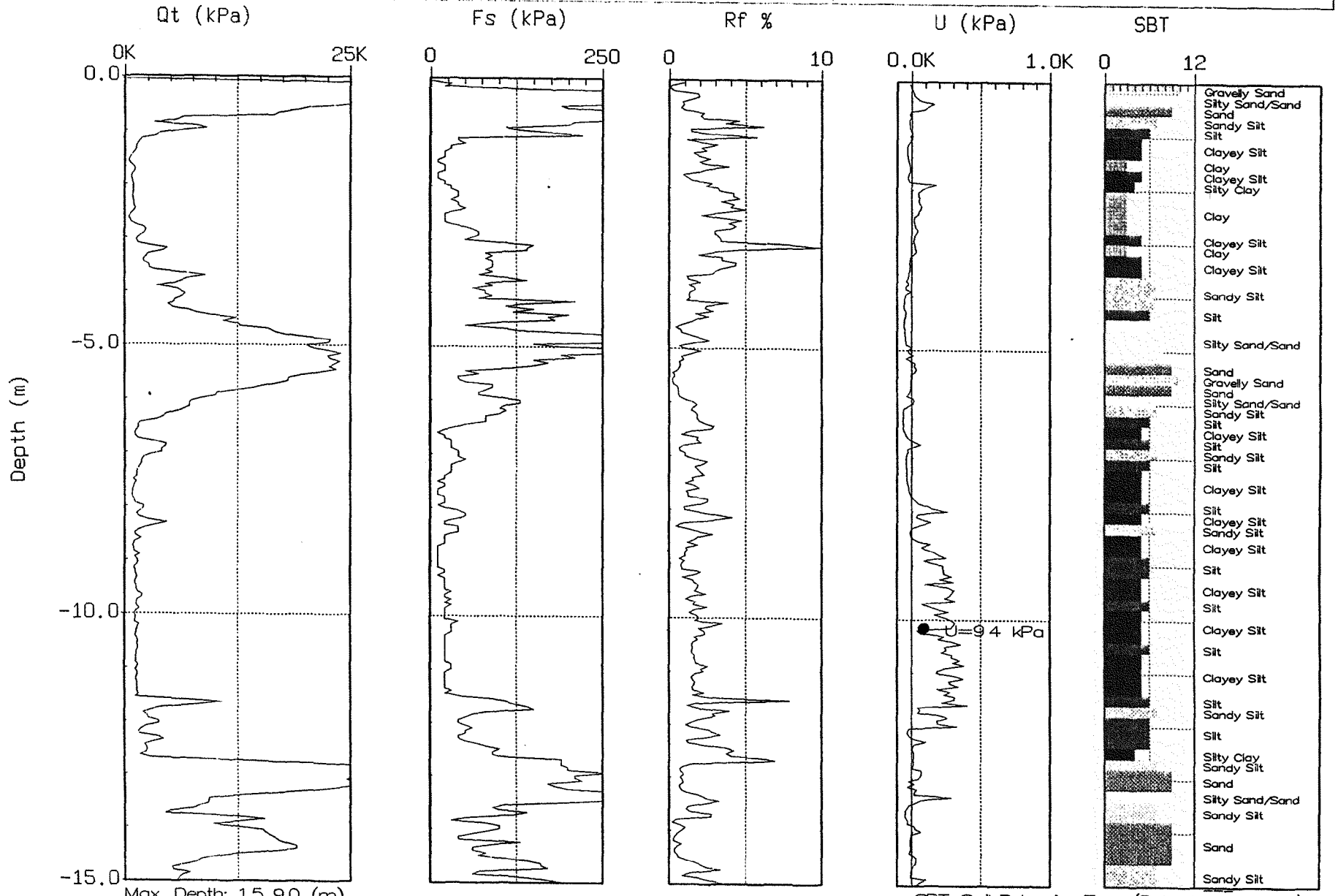
● Equilibrium (or near) Pore Pressure from Dissipation

PLATE D-36

Legacy Parkway

S. RC-373
Station: 70+601.725 2.71 RT
Elevation: 1295.444

Cone: 20 TON , 370
Date: 05:09:00 09:14



Max. Depth: 15.90 (m)
Depth Inc.: 0.050 (m)

SBT: Soil Behavior Type (Robertson 1990)

● Equilibrium (or near) Pore Pressure from Dissipation

PLATE D-35

Boring: RB-374
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND with gravel - dense, moist, light brown				MC	457			2 14 18 20	44							
			1		SPT	406			7 14 15 15	48							
		5			MC	0			7 5 6 5	13							
			2		SPT	406			1 2 1 2	3							
	Sandy Lean CLAY - soft, wet, dark gray						CL	A-6									
		10	3		P	559					34						
1295	Lean CLAY - soft, wet, dark brown																
			4		SPT	432	CL	A-6	0 2 2 3	6							
		15			MC	330			0 2 2 3	4							
			5		SPT	610			0 1 2 3	3							
		20	6		P	584					36 34	15.7	27	36	17	90	C SG
			7		SPT	508			1 2 3 2	5							
		25			MC	584			0 1 3 4	4							
			8		SPT	610			0 0 7 7	7							
1290	- medium stiff																
		30	9		P	508					38 57	14.2	25	35	14	94	C SG
			10		SPT	457			0 1 32 30	35							
	Poorly Graded SAND with gravel - very dense, wet, gray, angular gravel	35					SP	A-3									
			11		MC	76			34 50 48 22								
					SPT	203			9 13 20 45	33							
		40	12		MC	178			24 14 10 29	19							
			13		SPT	127			5 5 5 13	10							
1285		45			MC	305			32 43 34 25								
			14		SPT	178			5 10 23 50	29							
		50	15		MC	25			13 3 2 2	3							
	Sandy SILT - medium stiff, wet, gray, some clay, medium to fine-grained sand		16		SPT	610	ML	A-4	4 5 8 9	11							
	Silty SAND - loose, wet, gray, fine to medium-grained	55	17		SPT	610	SM	A-2-4	4 6 5 9	9							
	- with gravel, very dense																
1280		60	18		SPT	203			17 31 36 50/130 mm								
			19														
		65								38							

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-374**

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

Logged by:	G. Burgess
Date Start:	3/6/00
Date Finish:	3/8/00
Station:	71+086.495 1.40 RT
Line:	US 89 SB to LP SB
Coordinates (m):	N 124,248.802 E 19,178.835
Elevation (m):	1298.436
Total Depth Drilled (m):	31.1
Drill Contractor:	Layne Christensen
Driller:	C. Davis
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

B BAG = Bulk Sample

UTDOT Z003RB.GPJ 5/30/00

Boring: RB-374
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)				● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel - very dense, wet, gray (continued)		21		SPT	178			8	34	18	24								
	Sandy SILT - stiff, wet, gray	70	22		SPT	330	ML	A-4	19	10	10	12	14							
1275	- medium dense	75	23		SPT	610			4	10	18	50/125 mm	20							
		80	24		SPT	610			3	11	6	5	11							
		85	25		SPT	457			2	5	9	10	10							
		90	26		SPT	559			4	5	9	10	9							
1270		95	27		SPT	305			3	7	10	14	12							
	Silty SAND with gravel - dense, wet, gray, brown, trace of clay	100	28		SPT	305	SM	A-2-4	9	25	25	28	35							
1265		105	29																	
		110	30																	
		115	31																	
		120	32																	
1260		125	33																	
		130	34																	
			35																	
			36																	
			37																	
			38																	
			39																	

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-374**

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

Logged by:	G. Burgess
Date Start:	3/6/00
Date Finish:	3/8/00
Station:	71+086.495 1.40 RT
Line:	US 89 SB to LP SB
Coordinates (m):	N 124,248.802 E 19,178.835
Elevation (m):	1298.436
Total Depth Drilled (m):	31.1
Drill Contractor:	Layne Christensen
Driller:	C. Davis
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 5/30/00

Boring: RB-375
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND with gravel - very dense, moist, brown				MC	457			2 9 34 39							
			1		SPT	508			20 23 29 38							
		5			MC	152			9 3 8 10							
	SILT - soft, wet, dark brown		2		SPT	152	ML	A-4	2 3 3 3							
		10	3		P	305	SM	A-2-4								
	Silty SAND - loose, wet, dark brown				SPT	356			2 4 4 2							
1295			4													
		15			MC	76			5 11 3 2							
			5		SPT	203			2 1 2 2							
	Sandy SILT - very soft, wet, brown	20	6		P	203	ML	A-4								
	Silty CLAY - medium stiff, wet, brown to gray, with sand lenses		7		SPT	356	CL-ML	A-6	5 5 4 4							
		25			MC	457			3 5 6 8							
			8		SPT	406			2 4 4 6							
1290	SILT - very soft, wet, dark gray, with fine to medium-grained sand lenses	30	9		P	457	ML	A-4		49 *48*	15.7	27			97	C TR SG
			10		SPT	610			2 1 2 3							
		35			MC	356			4 4 5 6							
	- medium stiff		11		SPT	356			15 12 4 5							
	Silty SAND with gravel - very dense, wet, gray, angular gravel	40	12		P		SM	A-2-4								
			13		SPT	152			11 33 49 51							
		45			MC	102			3 45 63 39							
1285			14		SPT	127			5 7 12 16							
	- medium dense		15													
		50			MC	0			11 20 26 33							
			16		SPT	483			14 18 38 21							
	- dense	55														
			17		SPT	178			8 11 14 20							
	-medium dense		18													
		60			SPT	0			5 8 9 6							
1280	- loose		19													
		65														

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-375**

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

Logged by:	G. Burgess
Date Start:	3/8/00
Date Finish:	3/9/00
Station:	71+238.091 0.81 RT
Line:	US 89 SB to LP SB
Coordinates (m):	N 124,391.737 E 19,128.227
Elevation (m):	1299.085
Total Depth Drilled (m):	18.9
Drill Contractor:	Layne Christensen
Driller:	C. Davis
Rig Type:	CME-750
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 5/30/00

Boring: RB-385
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND with gravel - medium dense, moist, with concrete and asphalt rubble		1														
		5			SPT	457			4 14 7	43							
1295			2														
	Lean CLAY - soft to medium stiff, wet, mottled gray and reddish-brown						CL	A-6									
		10	3		P	610					38 72	14.5	31			94	
					SPT	457			2 1 2	6							
			4														
	Poorly graded SAND with silt - medium dense, wet, brown, fine to coarse-grained	15					SP-SM	A-3									
			5		MC	457			4 7 15	28							
					SPT	457			8 12 14	41							SV
		20	6														
					MC	457			14 11 2	16							
					SPT	457			4 5 6	15							
1290			7														
	Sandy SILT - medium stiff, wet, gray to brown, fine-grained	25					ML	A-2-4									
			8		MC	457			3 3 4	8							
					SPT	457			3 5 9	19						63	
			9														
	Poorly graded SAND with silt - medium dense, wet, brown, fine to coarse-grained	30			MC	457	SP-SM	A-3	12 14 8	23							SV
			10		SPT	457	CL	A-6	3 4 4	10							
	Lean CLAY - medium stiff to stiff, wet, brown, with occasional fine-grained sand seams	35															
			11		P	559					62	16.2	24			88	C SG
					SPT	457			4 6 7	16							
1285			12														
	Silty SAND with gravel - dense to very dense, wet, gray	40			MC	457	SM	A-2-4	10 19 19	38							
			13		SPT	457			17 24 26								
		45															
			14		MC	457			30 33 25								
					SPT	457			11 16 15	37							
			15														
		50			MC	457			22 29 41								
			16		SPT	203			13 13 13	30							
	- medium dense to dense, olive-green	55															
1280			17		SPT	457			7 4 3	9							
			18														
		60			SPT	457			29 24 24								
			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-385**

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

Logged by:	C. Wieden
Date Start:	3/1/00
Date Finish:	3/2/00
Station:	20+438.886 16.47 RT
Line:	LP NB to I-15 NB (US 89)
Coordinates (m):	N 123,894.805 E 19,211.113
Elevation (m):	1297.058
Total Depth Drilled (m):	23.3
Drill Contractor:	Haztech Drilling
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 5/30/00

Boring: RB-385
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel - dense to very dense, wet, gray (continued)				SPT	229			34 50/ 130mm								
			21														
	Fat CLAY - stiff, wet, gray	70			P	610	CH	A-7-6			93 72	13.4	39	59	32		C TR SG
1275			22														
		75	23		SPT	457			5 4 5	● 11							
			24														
		80															
			25														
		85	26														
1270			27														
		90															
			28														
		95	29														
			30														
		100															
			31														
1265		105	32														
			33														
		110															
			34														
		115	35														
			36														
		120															
1260			37														
		125	38														
			39														
		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-385**

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

Logged by:	C. Wieden
Date Start:	3/1/00
Date Finish:	3/2/00
Station:	20+438.886 16.47 RT
Line:	LP NB to I-15 NB (US 89)
Coordinates (m):	N 123,894.805 E 19,211.113
Elevation (m):	1297.058
Total Depth Drilled (m):	23.3
Drill Contractor:	Haztech Drilling
Driller:	M. Corn
Rig Type:	Longyear BK-81
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 5/30/00

Boring: RB-390
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / 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
	Sandy SILT - stiff, moist, with trace of fine-grained sand				MC	559	ML	A-4	5 5 5 6	12							
			1		SPT	533			2 6 6 6	16							
1295		5	2														
		10	3		P	610					14						
					SPT	508			3 3 5 5	6							
	-medium stiff		4														
	Clayey SAND - loose, wet, gray to black	15			MC	457	SC	A-2-6	4 5 7 9	7							
			5		SPT	559			1 3 5 7	5							
					P	610					37	16.3	27			90	C
	Lean CLAY - medium stiff, wet, gray, some silt and and seams	20	6				CL	A-6			38						SG
1290					SPT	406			3 5 5 5	6							
			7														
		25			MC	457			3 6 6 8	6							
			8		SPT	584			2 4 4 8	8							
					P	610					62	15.5	29	31	9	97	C
		30	9								38						SG
					SPT	406			1 3 5 5	5							TR
			10														
		35			MC	533			4 5 8 9	7							
			11		SPT	432			0 3 4 8	4							
1285			12		P	610					38						
		40															
					SPT	584			3 4 7 7	6							
			13		SPT	305	SP	A-3	1 2 12 20	8							
	Poorly graded SAND - loose, wet, gray to black	45															
			14														
		50	15		SPT	508			8 20 21 18	22							
			16														
1280	-dense	55	17		SPT	508			14 28 41 37	36							
		60	18		SPT	432			39 45 43	43							
			19														
		65			SPT	203			4 11 11 10	10							

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-390**

Sheet 1 of 2

Logged by:	J. Criss
Date Start:	3/4/00
Date Finish:	3/6/00
Station:	4+804.884 0.88 LT
Line:	Burke Lane
Coordinates (m):	N 124,285.160 E 18,659.148
Elevation (m):	1296.707
Total Depth Drilled (m):	30.8
Drill Contractor:	Haztech Drilling
Driller:	R. Knott
Rig Type:	CME-850
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 5/30/00

Boring: RB-390
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy Lean CLAY - soft, wet, brown						CL	A-6									
		70	21		SPT	356			0 11 18 8	13							
1275	Poorly graded SAND - medium dense, wet, gray to black						SP	A-3									
		75	23		SPT	330			30 33 25 17	26							
		80	24		SPT	254			24 37 50 46	39							
			25														
	Sandy SILT - medium stiff, wet, black, trace of fine-grained gravel	85	26		SPT	406	ML	A-4	4 7 16 24	10							
	Silty SAND - black, fine to medium-grained						SM	A-2-4									
1270			27														
		90	28		SPT	203			12 9 43	23							
	Sandy SILT - medium stiff, wet, black	95	29		SPT	356	ML	A-4	13 12 30	19							
		100	30		SH	457											
			31														
1265		105	32														
		110	33														
			34														
		115	35														
			36														
1260		120	37														
		125	38														
			39														
		130															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-390**

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

Logged by:	J. Criss
Date Start:	3/4/00
Date Finish:	3/6/00
Station:	4+804.884 0.88 LT
Line:	Burke Lane
Coordinates (m):	N 124,285.160 E 18,659.148
Elevation (m):	1296.707
Total Depth Drilled (m):	30.8
Drill Contractor:	Haztech Drilling
Driller:	R. Knott
Rig Type:	CME-850
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	NW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 5/30/00

Boring: RB-391
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Clayey SAND - dense, dark grayish brown				MC	356	SC	A-2-6	14 17 23 15							
	- with gravel		1		SPT	305			7 12 23 19							
		5			MC	457			3 32 56 50							
			2		SPT	305			4 26 24 23							
1300																
	Silty GRAVEL - very dense, wet, gray	10	3		MC	0	GM	A-2-4	50/ 75mm							
			4		SPT	0			50/ 50mm							
		15			MC	0			50/100mm							
			5		SPT	0			50/ 50mm							
		20	6		MC	0			50/ 75mm							
			7													
1295		25			MC	102			7 7 9 10							
	Silty SAND - medium dense, wet, gray, fine-grained		8		SPT	406	SM	A-2-4	5 7 8 8			27			31	
		30	9		MC	305			7 8 10 10							
			10		SPT	406			4 7 8 14							
		35	11		MC	356			5 7 8 8							
					SPT	559			5 8 10 15							
	- some clayey sand layers	40	12		MC	406			4 13 19 21							
1290			13		SPT	356			5 10 11 17							
	- frequent clay seams	45	14		MC	356			5 10 14 16							
					SPT	356			7 8 8 16							
		50	15		MC	406	ML	A-4	2 4 9 24							
	Sandy SILT - medium stiff, wet, brown		16		SPT	406			5 9 10 13							
		55	17		MC	457			5 8 11 13							
1285			18													
		60			SPT	457	SM	A-2-4	2 12 35 25							
	Silty SAND with gravel - very dense, fine to coarse-grained sand , with fine-grained gravel		19													
	Poorly graded SAND with gravel- medium dense, wet, gray	65					SP	A-3								

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-391**

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

Logged by:	A. Waldman
Date Start:	3/4/00
Date Finish:	3/5/00
Station:	5+171.955 0.76 LT
Line:	Burke Lane
Coordinates (m):	N 124,557.265 E 18,904.272
Elevation (m):	1302.534
Total Depth Drilled (m):	23.5
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

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 5/30/00

Boring: RB-391
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly graded SAND with gravel- medium dense, wet, gray (continued)				MC	25			18 9 8 2								
		70	21		SPT	25			16 50/ 100mm								
1280		75	22		MC	229			23 27 23 50	● 17							
		80	23														
		85	24														
1275		90	25														
		95	26														
		100	27														
		105	28														
1270		110	29														
		115	30														
		120	31														
1265		125	32														
		130	33														
			34														
			35														
			36														
			37														
			38														
			39														

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-391**

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

Logged by:	A. Waldman
Date Start:	3/4/00
Date Finish:	3/5/00
Station:	5+171.955 0.76 LT
Line:	Burke Lane
Coordinates (m):	N 124,557.265 E 18,904.272
Elevation (m):	1302.534
Total Depth Drilled (m):	23.5
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

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003RB.GPJ 6/30/00

Boring: RB-421
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (N1)60 ● / (N1)60 ○ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel - medium dense, moist, gray to brown				MC	508	SM	A-2-4	5 6 9 7	24							
			1		SPT	330			3 3 3	14							
		5			SH	457					51 *62*	16.9	20	36	14	75	C SG
			2		SPT	457			2 4 3	16							
	Lean CLAY with sand - very stiff, wet, tan						CL	A-6									
1295		10	3		MC	127			4 5 6 10	19							
	Silty SAND with gravel - loose, wet, dark gray to brown and tan, fine-grained		4		SPT	406	SM	A-2-4	3 5 5	20				34	13		
	Lean CLAY - stiff, wet, brown, medium plasticity						CL	A-6									
		15			SH	610											
			5		SPT	457			3 4 4	16	53						
		20	6		MC	483			4 11 7 7	26							
			7		SPT	457			1 2 2	6			23			18	
	- loose silty sand layer	25			SH	610											
1290			8		SPT	610			2 3 2 2	8	48						
		30	9														
			10														
		35	11														
			12														
		40															
1285			13														
		45	14														
			15														
		50															
			16														
		55	17														
1280																	
		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-421**

Sheet 1 of 1

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

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SUP.GPJ 5/31/00

Boring: RB-422
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1295	FILL: Silty GRAVEL - medium dense, moist, dark brown to gray, some grass and roots				MC	508			11 12 14 11	32							
	Sandy SILT - very stiff, moist, brown to light brown, fine roots		1		SPT	610	ML	A-4	3 3 5 6	13							
	- grades to gray	5	2		SH	457					34						
▽	Silty SAND - loose, wet, brown fine to coarse-grained sand				SPT	610	SM	A-2-4	1 1 1 1	4							
		10	3		MC	0			2 2 2 3	13							
			4		SPT	457			2 2 2 2	6						21	
	- grades to dark brown	15	5		MC	406	ML	A-4	2 2 4 5	6							
1290	SILT - medium stiff, wet, gray silt, light reddish-brown clay, highly plastic clay				SPT	610			3 4 3 5	9							
	Lean CLAY - medium stiff, wet, gray						CL-ML	A-6									
		20	6		SH	610					75	14.8	27	36	16		C
			7		SPT	610			2 4 4 5	10	57						SG
		25	8		SH	610					48						
					SPT	610			2 2 2 3	4							
		30	9		SPT	610			2 2 3 4	5							
			10														
1285		35	11														
		40	12														
			13														
		45	14														
			15														
1280		50	16														
		55	17														
			18														
		60	19														
		65															

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-422**

Sheet 1 of 1

Logged by:	R. Davis
Date Start:	5/11/00
Date Finish:	5/11/00
Station:	6020+210.000 0.00 RT
Line:	D Mainline
Coordinates (m):	N 123,221.186 E 19,429.774
Elevation (m):	1295.398
Total Depth Drilled (m):	9.4
Drill Contractor:	RC Exploration
Driller:	M. Burns
Rig Type:	CME-750 Track
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

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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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SUP.GPJ 5/31/00

Boring: RB-423
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT - medium stiff to stiff, dry to moist, brown, fine roots				MC	457	ML	A-4	4 4 4 3							
					SPT	610	ML	A-4	2 3 4 5							
	Sandy SILT - medium stiff, moist, light brown		1													
1290		5			SH	0										
			2		SPT	203			3 4 4 3						70	
		10	3		MC	0			2 3 4 4							
	- very soft		4		SPT	0			0 0 0 0							
		15			SH	610				30	16.3	27				C SG
			5		SPT	610			5 7 8 10							
	- silt lenses, very stiff	20	6		MC	610			7 10 10 10							
1285	Silty SAND - medium dense, wet, dark gray, fine-grained sand		7		SPT	610	SM	A-2-4	9 9 9 12							
		25	8		SH	0										
	SILT - stiff, wet, dark gray				SPT	610	ML	A-4	4 5 5 5						92	
		30	9													
			10													
		35	11													
1280			12													
		40														
			13													
		45	14													
			15													
		50														
			16													
1275		55	17													
			18													
		60														
			19													
		65														

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

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

KLEINFELDER

Project No. 35-8163-05

FIELD TEST BORING LOG

Boring: **RB-423**

Sheet 1 of 1

Logged by:	R. Davis
Date Start:	5/12/00
Date Finish:	5/12/00
Station:	4+220.000 0.00 RT
Line:	Burke Lane
Coordinates (m):	N 123,819.432 E 18,320.892
Elevation (m):	1291.574
Total Depth Drilled (m):	9.1
Drill Contractor:	RC Exploration
Driller:	M. Burns
Rig Type:	CME-750 Track
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	152 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT Z003SUP.GPJ 5/31/00

Boring: LSB-21-475
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / 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
1300	Asphalt - 100 millimeters																
	Fill																
		5	1														
			2														
		10	3														
			4														
		15	5														
1295																	
		20	6														
			7														
		25	8				CL	A-6									
	Sandy Lean CLAY - medium stiff, moist, dark brown, occasional sand seams, trace gravel				SPT	610			2 2 3 4	4							
		30	9		SPT	610			0 2 2 3	3						63	
			10		SPT	610			1 3 4 4	6							
1290																	
	Silty CLAY with sand - medium stiff, moist, grey	35	11		SPT	610	CL-ML	A-4	2 3 5 6	6						85	
					SPT	610			2 3 3 4	5							
			12														
	Lean CLAY - medium stiff, moist, grey, occasional sand layers, frequent sand seams	40			SPT	610	CL	A-6	2 2 4 5	5						91	
			13		SPT	610			4 4 6 8	8							
		45	14		SPT	610			3 4 5 6	7						95	
			15		SPT	610			3 3 6 6	6							
1285		50			SPT	610			3 2 4 5	4							
			16		SPT	610			3 4 4 8	6							
		55	17		SPT	610			3 4 5 9	6						85	
	- with sand																
		60	18		SPT				4 6 6 8	8							
	Silty SAND - medium dense to dense, wet, brown		19		SPT		SM	A-2-4	8 10 38 28	32						16	
		65															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-21-475**

Sheet 1 of 2

Logged by:	S. Ward
Date Start:	9/5/01
Date Finish:	9/7/01
Station:	0+644.15 0.0 RT
Line:	STATE STREET
Coordinates (m):	N 123,432.374 E 19,297.884
Elevation (m):	1300.185
Total Depth Drilled (m):	38.1
Drill Contractor:	RC Exploration
Driller.	N. Young
Rig Type.	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50 8mm OD split spoon sampler

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

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-1
STRUCTURE 21

Boring: LSB-21-475
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1280					SPT				8 29 48 50								
			21		SPT	457			20 20 23 24	28							
		70			SPT				5 13 11 15	15							
			22		SPT	610			4 17 22 21	25							
	- frequent gravel	75	23		SPT				7 8 15 21	14							
			24														
	Poorly Graded GRAVEL with sand - dense, wet, brown	80			SPT	305	GP	A-3	16 27 17 27	27							
			25														
1275																	
	Silty SAND - dense to very dense, wet, olive grey, occasional clay layer	85	26		SPT	305	SM	A-2-4	38 50/2"		○						
			27														
	- some gravel	90	28		SPT	457			20 19 42 42	36						15	
	Sandy Lean CLAY - stiff to hard, moist, olive grey, occasional clayey sand layer, some gravel						CL	A-6									
		95	29		SPT	356			26 23 32 35	31							
			30														
1270		100			SPT	508			8 27 49 20	43							
			31														
		105	32		SPT	305			12 10 11 23	12							
			33														
		110			SPT	610			6 8 10 13	10							
			34														
	Clayey SAND - very dense, wet, olive grey	115	35		SPT	254	SC	A-2-6	19 29 32 15	32							
			36														
1265	Poorly Graded GRAVEL with silt and sand - very dense, wet, olive grey	120			SPT	0	GW-GM	A-3	69 50/3"		○					11	
			37		SPT	305			16 37 20 47	30							
		125	38														
			39														
		130															

UTDOT 3511ZLNI.GPJ 1/8/03

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-21-475**

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

Logged by:	S. Ward
Date Start:	9/5/01
Date Finish:	9/7/01
Station:	0+644.15 0.0 RT
Line:	STATE STREET
Coordinates (m):	N 123,432.374 E 19,297.884
Elevation (m):	1300.185
Total Depth Drilled (m):	38.1
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: LSB-21-477
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	Su, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Asphalt																
	FILL: Poorly Graded GRAVEL with sand - medium dense to dense, slightly moist, grey, angular, occasional clay layer		1														
		5	2														
		10	3														
1300			4														
		15	5														
		20	6														
			7		SPT	610			15 8 12 18	17							
		25	8														
1295		30	9		SPT	330			11 20 24	37							
			10														
	Sandy SILT with gravel - medium stiff to stiff, wet, dark brown, fine grained gravel, occasional clayey silt with gravel layers	35	11		SPT	508	ML	A-4	3 4 6 8	8							
					SPT	559			3 4 3 3	5			29	34	6		
		40	12		SPT	406			3 4 4 6	6							
			13		SPT	610			3 3 5 5	6			37	41	12	87	
		45			SPT	610			1 3 3 4	4							
1290			14														
	Lean CLAY with sand - medium stiff to stiff, moist, olive grey and brown				SPT	610	CL	A-6	2 3 5 7	6			31			81	
		50	15		SPT	610			3 4 5 7	5							
			16		SPT	610			4 4 6 7	7			27	31	10	94	
		55			SPT	610			3 4 5 6	6							
	- mottling		17		SPT	610			4 6 7 9	9			26	30	9	95	
		60	18		SPT	610			5 5 7 9	8							
1285			19		SPT	610			5 6 7 5	3			28	31	11	89	
		65			SPT	457			5 6 7 9	8							

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-21-477**

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

Logged by:	M. Ivers
Date Start:	7/18/01
Date Finish:	7/20/01
Station:	0+718.15 0.0 RT
Line:	STATE STREET
Coordinates (m):	N 123,431.795 E 19,371.787
Elevation (m):	1304.087
Total Depth Drilled (m):	45.7
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-3
STRUCTURE 21

Boring: LSB-21-477
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u kPa (*torvane in italics*)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty CLAY with sand - medium stiff to stiff, wet, olive grey to brown, frequent sand layers				SPT		CL-ML	A-4	5 6 7 8	8			30	24	6	84	
		70	21		SPT	610			6 8 14 20	14							
	Silty SAND - medium dense to dense, wet, dark grey, fine grained		22		SPT	330	SM	A-3	15 22 21 18	26			27			28	
	Refer to SB-22-285 for lithology between 23 and 30 meters.	75	23														
1280		80	24														
			25														
		85	26														
			27														
		90	28														
1275		95	29														
			30														
	Poorly Graded SAND with silt - very dense, wet, dark grey	100	31		SPT	406	SP-SM	A-3	19 26 24 21	27							
		105	32		SPT	381			12 24 31 27	30			10			11	
			33														
	SILT with sand - hard, wet, dark green, trace of fine grained gravel, occasional seamof clay or brown peat	110	34		SPT	559	ML	A-4	10 21 23 22	23							
1270																	
	- occasional grey silty clay with sand layers and peat layers	115	35		SPT	610			19 17 14 16	16							
			36														
	Poorly Graded SAND - very dense, grey, wet	120			SPT		SP	A-3	21 32 50/75 mm								
	Poorly Graded GRAVEL - very dense, wet, grey		37				GP	A-3									
	Silty SAND - very dense, wet, grey, occasional sand layer, trace clay	125	38		SPT	406	SM	A-2-6	150/125mm				18			30	
1265			39														
		130			SPT					33							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-21-477**

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

Logged by:	M. Ivers
Date Start:	7/18/01
Date Finish:	7/20/01
Station:	0+718.15 0.0 RT
Line:	STATE STREET
Coordinates (m):	N 123,431.795 E 19,371.787
Elevation (m):	1304.087
Total Depth Drilled (m):	45.7
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-4
STRUCTURE 21

Boring: LSB-21-477
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	- occasional sandy GRAVEL layer					457	CL-ML	A-6	45 50 16 16								
	Silty CLAY - hard, wet, grey																
	Poorly Graded SAND with gravel - very dense, wet, grey	135	41		SPT	406	SP	A-3	23 47 38 40	● 42							
			42														
	Sandy Lean CLAY - hard, wet, grey, occasional sand layers	140	43		SPT	406	CL	A-6	21 20 25 24	● 22							
1260	- occasional clayey sand layer	145	44		SPT	559			7 6 24 32	● 14							
			45														
		150	46		SPT	0			50/50 mm		○						
			47														
		155	48														
1255		160	49														
		165	50														
			51														
		170	52														
			53														
1250		175	54														
		180	55														
			56														
		185	57														
		190	58														
1245			59														
		195															

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-21-477**

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

Logged by:	M. Ivers
Date Start:	7/18/01
Date Finish:	7/20/01
Station:	0+718.15 0.0 RT
Line:	STATE STREET
Coordinates (m):	N 123,431.795 E 19,371.787
Elevation (m):	1304.087
Total Depth Drilled (m):	45.7
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type.	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-22-432
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)				SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1295	Refer to RB-367 for additional lithology above 30.5 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology above this depth.																			
		5	1																	
			2																	
		10	3																	
			4																	
		15	5																	
1290		20	6																	
			7																	
		25	8																	
		30	9		■	MC	610	SM	A-2-4	13	13	21	27	●28						
	Silty SAND with gravel - dense, wet, gray		10																	
1285		35	11		P	P	0													
	SILT - medium stiff, wet, olive				P	P	508	ML	A-4											
		40	12																	
			13																	
		45	14																	
			15																	
1280		50	16																	
		55	17																	
			18																	
		60	19																	
		65																		

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-432**

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

Logged by:	M. Ivers
Date Start:	6/5/01
Date Finish:	6/7/01
Station:	70+530 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,695.600 E 19,223.300
Elevation (m):	1295.248
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-6
STRUCTURE 24A

Boring: LSB-22-432
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)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1275	Refer to RB-367 for additional lithology above 30.5 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology above this depth.																
		70	21														
			22														
		75	23														
			24														
		80	25														
1270																	
		85	26														
			27														
		90	28														
		95	29														
			30														
1265	Silty SAND with gravel - very dense, wet, olive, occasional grey silt layer	100	31		SPT	254	SM	A-2-4	22 50/100 mm								
		105	32		SPT	305			50 62								
			33														
		110	34		SPT				50 55								
1260		115	35		SPT	178			27 50/50 mm								
			36														
		120	37		SPT	356			12 26 50/50 mm								
		125	38		SPT	127			37 60/100 mm								
			39														
		130			SPT					●47							

UTDOT 3511ZLNI.GPJ 1/8/03

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-432**

Sheet 2 of 3

Logged by:	M. Ivers
Date Start:	6/5/01
Date Finish:	6/7/01
Station:	70+530 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,695.600 E 19,223.300
Elevation (m):	1295.248
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: LSB-22-432
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0–25–50	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1255	Sandy SILT - hard, wet, gray, frequent sand lenses					381	ML	A-4	32 36 50								
		135	41														
			42														
		140	43		SPT	508			8 10 20 40	● 16							
	Lean CLAY - very stiff to hard, moist, olive gray						CL	A-6									
		145	44		MC	610			14 22 33 50/125 mm	● 22							
1250			45		SPT	406			14 23 36 50	● 31							
		150	46														
		155	47														
			48														
		160	49														
1245		165	50														
			51														
		170	52														
			53														
		175	54														
1240		180	55														
			56														
		185	57														
		190	58														
			59														
		195															

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-432**

Sheet 3 of 3

Logged by:	M. Ivers
Date Start:	6/5/01
Date Finish:	6/7/01
Station:	70+530 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,695.600 E 19,223.300
Elevation (m):	1295.248
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

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PLATE A-8
STRUCTURE 24A

Boring: LSB-22-433
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) (0–25–50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1295	Refer to RB-373 for additional lithology above 30.5 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology above this depth.																
		5	1														
			2														
		10	3		P	0											
	Silty SAND with gravel - medium dense, wet, olive		4		SPT	203	SM	A-2-4	14 14 14 8	● 31							
		15	5														
1290		20	6														
			7														
		25	8														
		30	9														
			10														
1285		35	11														
		40	12														
			13														
		45	14														
		50	15														
1280			16														
		55	17														
		60	18														
			19														
		65															

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-433**

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

Logged by:	M. Ivers
Date Start:	6/8/01
Date Finish:	6/11/01
Station:	70+570 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,735.200 E 19,217.700
Elevation (m):	1295.309
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512ZLNI.GPJ 1/8/03

PLATE A-9
STRUCTURE 24A

Boring: LSB-22-433
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)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1275	Refer to RB-373 for additional lithology above 30.5 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology above this depth.																
		70	21														
			22														
		75	23														
			24														
		80	25														
1270		85	26														
			27														
		90	28														
		95	29														
			30														
1265	SILT - hard, wet, dark to olive gray	100	31		SPT		ML	A-4	19 19 22 22	●26							
	Silty SAND with gravel - very dense, wet, olive	105	32		SPT	381	SM	A-2-4	22 27 40 50/100 mm	●41							
			33														
		110	34		SPT	203			48 57/100 mm	○							
		115	35		SPT	254			10 15 16 20	●18							
1260	Lean CLAY - hard, wet, dark gray		36				CL	A-6									
	Silty SAND - very dense, wet, olive gray, frequent silt seams	120	37		SPT	457	SM	A-2-4	39 42 32 19	●42							
		125	38		SPT	178			34 50/50 mm	○							
			39														
		130			SPT					●21							

UTDOT 35112LNI.GPJ 1/8/03

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-433**

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

Logged by:	M. Ivers
Date Start:	6/8/01
Date Finish:	6/11/01
Station:	70+570 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,735.200 E 19,217.700
Elevation (m):	1295.309
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: LSB-22-433
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1255	Silty SAND (continued) - very dense, wet, olive gray, frequent silt seams					508			9 15 24 40								
		135	41		SPT	483			27 42 44 50/75 mm	46							
		140	42														
	Lean CLAY - hard, wet, olive gray, occasional sand lenses		43		SPT		CL	A-6	14 17 19 23	19							
		145	44		MC				26 31 39 38	28							
			45		SPT				9 11 26 41	21							
1250		150	46														
		155	47														
			48														
		160	49														
			50														
1245		165	51														
		170	52														
			53														
		175	54														
		180	55														
1240			56														
		185	57														
		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-433**

Sheet 3 of 3

Logged by:	M. Ivers
Date Start:	6/8/01
Date Finish:	6/11/01
Station:	70+570 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,735.200 E 19,217.700
Elevation (m):	1295.309
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-11
STRUCTURE 24A

Boring: LSB-22-434
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1295	Refer to RB-373 for additional lithology above 15.2 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.															
1290																
1285																
1280	Poorly Graded SAND with silt - dense, wet, light gray, with occasional peat and gravel seams, fine- to medium-grained sand	50	15		SPT	381	SP-SM	A-2-4	8 19 18							
	Poorly Graded GRAVEL with silt and sand - very dense, wet, gray, coarse-grained gravel, some cobbles	55	17		SPT	356	GP-GM	A-2-4	19 27 30							
	Silty SAND - loose to very dense, wet, olive gray, fine- to medium-grained sand, occasional layers of clay and silt and gravel	60	18		SPT	432	SM	A-2-4	6 5 3						37	
		65	19													

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

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-434**

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

Logged by:	S. Lewis
Date Start:	6/6/01
Date Finish:	6/7/01
Station:	70+620 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,785.112 E 19,215.213
Elevation (m):	1295.430
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512ZLNI.GPJ 1/8/03

Boring: LSB-22-434
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1275	Silty SAND (continued) - loose to very dense, wet, olive gray, fine- to medium-grained sand, occasional layers of clay and silt and gravel				SPT	305			6 22 31								
		70	21		MC	305	GP-GM	A-2-4	29 14 10	15							
	Poorly Graded GRAVEL with silt and sand - medium, wet, gray, coarse-grained gravel, occasional peat layer		22														
	Sandy Lean CLAY - stiff, wet, olive gray to dark brown, occasional sand and silt seams,	75	23		SPT	381	CL	A-4	5 4 6	8				32	11		
			24														
		80			SPT	254			5 5 8	10							
			25														
1270																	
	Poorly Graded GRAVEL with silt and sand - dense to very dense, wet, grayish brown to olive gray, coarse-grained gravel	85	26		SPT	51	GP-GM	A-2-4	9 15 21	26							
			27														
		90			SPT	305			30 30 34	45							
			28														
	- occasional sand layers	95	29		MC	330			24 35 49	44							
			30														
1265	- occasional peat layers	100			SPT	457			26 40 50								
			31														
		105	32		SPT	102			21 27 17	29							
			33														
	Sandy SILT with gravel - very stiff, wet, dark olive gray	110	34		SPT	203	ML	A-4	4 11 12	15							
		115	35		SPT	457	GP-GM	A-2-4	16 45 50/75 mm								
1260	Poorly Graded GRAVEL with silt and sand - very dense, wet, olive gray, fine-grained gravel, occasional cobbles		36														
	Sandy SILT - stiff to very stiff, wet, dark olive gray	120	37		MC	406	ML	A-4	10 8 12	9							
	- occasional sand seams	125	38		SPT	457			12 7 8	9							
			39														
		130			SPT					18							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-434**

Sheet 2 of 3

Logged by:	S. Lewis
Date Start:	6/6/01
Date Finish:	6/7/01
Station:	70+620 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,785.112 E 19,215.213
Elevation (m):	1295.430
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-13
STRUCTURE 22

Boring: LSB-22-434
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1255	Silty SAND - very stiff to hard, wet, olive gray to dark olive gray, fine-grained sand					254	SM	A-2-4	10 11 19								
		135	41		SPT	381			16 19 28	● 27							
			42														
	Sandy SILT - stiff, wet, gray, occasional clay layers	140	43		SPT	457	ML	A-4	5 6 9	● 9							
			44														
	Lean CLAY - stiff to hard, wet, light reddish brown to light gray, trace fine-grained gravel	145			MC	102	CL	A-6	11 15 19	● 15							
			45														
1250	- occasional gray silt seams	150	46		SPT	457			2 4 6	● 5							
			47														
		155															
			48														
		160	49														
			50														
1245		165															
			51														
		170	52														
			53														
		175															
			54														
		180	55														
1240																	
			56														
		185															
			57														
		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-434**

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

Logged by:	S. Lewis
Date Start:	6/6/01
Date Finish:	6/7/01
Station:	70+620 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,785.112 E 19,215.213
Elevation (m):	1295.430
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 35112LNI.GPJ 1/8/03

PLATE A-14
STRUCTURE 22

Boring: LSB-22-435
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to RB-385 for additional lithology above 15.2 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1295		5	1														
		10	2														
		15	3														
		20	4														
1290		25	5														
		30	6														
		35	7														
		40	8														
		45	9														
1285	SILT - medium stiff, wet, dark olive to brown-olive	50	10		SPT	457	ML	A-4	2 3 4	● 7			25	24	4	88	
		55	11														
		60	12														
		65	13														
			14														
			15														
1280	Poorly Graded GRAVEL with sand - very dense, wet, dark olive to olive brown		16		SPT	457	GP	A-1-a	24 25 31	○							
	Poorly Graded SAND with gravel - very dense, wet, dark olive to olive brown		17		SPT	457	SP	A-3	22 32 32	○							
			18														
	Sandy SILT - very stiff, wet, gray		19		SPT	457	ML	A-4	4 9 16	● 21							
										○ 49							

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-435**

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

Logged by:	D. Krupicka
Date Start:	5/14/01
Date Finish:	5/16/01
Station:	70+879 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,848.606 E 19,214.498
Elevation (m):	1295.827
Total Depth Drilled (m):	46.2
Drill Contractor:	R.C. Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 35112LNI.GPJ 1/8/03

PLATE A-15
STRUCTURE 22

Boring. LSB-22-435
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) (0 – 25 – 50)	S_{LT}, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND - very dense, wet, olive brown				SPT	457	SM	A-2-4	8 27 32								
1275		70	21														
	Silty SAND with gravel - very dense, wet, olive gray to gray				SPT	457	SM	A-2-4	9 29 22	41							
		75	22														
			23		SPT	381			27 37 50/ 100mm								
			24														
		80			SPT	457			38 44 30								
			25														
1270		85	26		SPT	457			13 29 32	45						16	
			27														
	SILT - stiff to very stiff, wet, olive gray	90			MC	457	ML	A-4	13 18 2	11							
			28														
		95	29		SPT	457			7 4 8	8							
			30														
1265	Silty SAND with gravel - dense to very dense, wet, greenish gray	100	31		SPT	203	SM	A-2-4	48 50/ 125 mm								
		105	32		SPT	457			11 14 22	24							
			33														
		110	34		MC	305			13 18 50/ 125 mm			20.0	15			29	
	SILT - very stiff to hard, wet, gray, with some sand and fine gravel	115	35		SPT	457	ML	A-4	5 8 10	11							
1260			36														
		120	37		SPT	457			8 10 15	16							
	- occasional silty sand layer	125	38		SPT	457			9 12 8	12							
			39														
		130			SPT					18							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-435**

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

Logged by:	D. Krupicka
Date Start:	5/14/01
Date Finish:	5/16/01
Station:	70+879 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,848.606 E 19,214.498
Elevation (m):	1295.827
Total Depth Drilled (m):	46.2
Drill Contractor:	R.C. Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

MC = Modified California Sampler, 50 8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-16
STRUCTURE 22

Boring: LSB-22-435
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0–25–50	Test Results * S_{tr}, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
						457			5 7 22								
1255		135	41		SPT	457			7 12 16	17			30	35	7		
		140	42														
			43		SPT	457			6 8 16	14							
		145	44														
			45		SPT	457			9 15 16	18							
1250		150	46		SPT	457			6 7 9	9							
		155	47														
			48														
		160	49														
		165	50														
1245			51														
		170	52														
		175	53														
			54														
		180	55														
1240			56														
		185	57														
		190	58														
			59														
		195															

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-435**

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

Logged by:	D. Krupicka
Date Start:	5/14/01
Date Finish:	5/16/01
Station:	70+879 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m).	N 123,848.606 E 19,214.498
Elevation (m):	1295.827
Total Depth Drilled (m):	46.2
Drill Contractor:	R.C. Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50 8mm OD split spoon sampler

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-22-436
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to RB-385 for additional lithology above 22.2 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology above this depth.																
1295		5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19														
	Silty SAND with gravel - wet, grayish-brown, fine to coarse-grained sand, fine-grained gravel				SH	457	SM	A-2-4			*48*						
	- loose, gray, subangular gravel				SPT	279			3 3 4 4	●5			23	NP	NP	41	
1290	Poorly Graded SAND with silt and gravel - very dense, wet, gray, fine- to coarse-grained sand, trace silt and fine-grained gravel, occasional gravel layer with cobbles				SPT		SP-SM	A-3	9 17 41 22	●36			13			6	
1285																	
1280																	

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-436**

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

Logged by:	S. Fluke
Date Start:	4/19/01
Date Finish:	4/23/01
Station:	70+942 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,912.092 E 19,213.851
Elevation (m):	1297.503
Total Depth Drilled (m):	45.7
Drill Contractor:	R.C. Exploration
Driller:	R. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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SAMPLE TYPE

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

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

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512ZLNI.GPJ 1/8/03

PLATE A-18
STRUCTURE 22

Boring: LSB-22-436
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to RB-385 for additional lithology above 22.2 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology above this depth.	70	21														
			22														
1275	Silty SAND with gravel - very dense, wet, gray, fine- to coarse-grained sand	75	23		SPT	610	SM	A-2-4	24 28 35 41	27							
	Lean CLAY - stiff, very moist, gray, medium plasticity, trace fine-grained sand, subangular gravel	80	24		SPT	127	CL	A-6	8 6 6 7	5			30	36	16		
	Silty SAND - dense, wet, gray, fine-grained sand, frequet silt layers, some gravel layers	85	25		SPT	610	SM	A-2-4	4 9 36 50/140 mm	18							
			26														
		90	27		SPT	0			50/125 mm		○						
1270			28														
	Sandy SILT - very stiff, moist, gray, fine- to coarse-grained sand, trace clay and subangular gravel, frequent sand, gravel and clay layers	95	29		SPT	457	ML	A-4	16 12 14 14	10							
		100	30		SPT	584			6 12 12 14	9							
			31														
	Poorly Graded SAND with silt and gravel - medium dense to very dense, wet, gray, fine- to medium-grained sand, occasional silty gravel	105	32		SPT	483	SP-SM	A-3	22 39 50/125 mm		○					10	
1265		110	33		SPT	127			26 36 34 38	25							
			34														
		115	35		SPT	610			14 13 10 12	8							
			36		SPT	305			39 50/100 mm		○					11	
		120	37														
1260		125	38		SPT	457			17 23 40 50/65 mm	21							
			39		SPT	508			11 20 39 28	20						11	
		130															

UTDOT 3511ZLNI.GPJ 1/8/03

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-436**

Sheet 2 of 3

Logged by:	S. Fluke
Date Start:	4/19/01
Date Finish:	4/23/01
Station:	70+942 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,912.092 E 19,213.851
Elevation (m):	1297.503
Total Depth Drilled (m):	45.7
Drill Contractor:	R.C. Exploration
Driller:	R. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: LSB-22-436
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 $(N_1)_{60}$	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly Graded SAND with silt and gravel (continued)															
	Lean CLAY - very stiff, wet, gray to brown, with sand and gravel, frequent sandy silt layers	135	41	SPT	483	CL	A-6	6 9 15 24	8							
1255		140	42, 43	SPT	483			8 9 11 11	6				37	17	86	
		145	44	SPT	508			9 10 14 10	8							
		150	45	SPT	559			11 10 11 12	7							
1250		155	46, 47													
		160	48, 49													
1245		165	50													
		170	51, 52													
		175	53													
		180	54, 55													
		185	56													
1240		190	57, 58													
		195	59													

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

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-436**

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

Logged by:	S. Fluke
Date Start:	4/19/01
Date Finish:	4/23/01
Station:	70+942 0.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 123,912.092 E 19,213.851
Elevation (m):	1297.503
Total Depth Drilled (m):	45.7
Drill Contractor:	R.C. Exploration
Driller:	R. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512ZLNI.GPJ 1/8/03

Boring: LSB-22-437
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND with gravel - medium dense to dense, moist, brown		1														
1300		5	2		SPT	330			11 12 12	○							
		10	3		SPT	457			8 9 8	●31							
		15	4														
			5		SPT	229			10 17 13	●45							
	Clayey SAND - loose, moist, grayish brown						SC	A-2-6									
1295		20	6		SPT	330			3 2 2	●5			25	38	15	36	
	Silty SAND - loose to medium dense, wet, gray		7		SPT	152	SM	A-2-4	3 3 5	●10						48	
		25	8		SPT	356			6 6 9	●20							
	Lean CLAY - soft to medium stiff, wet, reddish-brown				SPT	203	CL	A-4	7 4 3	●9							
		30	9		SPT	457			2 2 2	●5			30	32	9	95	
			10		SPT	457			2 2 4	●7							
	Silty SAND - loose to medium dense, wet, gray	35	11		SPT	356	SM	A-2-4	5 3 7	●12						37	
1290			12		SPT	457			3 11 11	●26							
		40			SPT	381			7 6 8	●16							
			13														
	Lean CLAY - stiff, wet, reddish-brown						CL	A-4									
		45	14		SPT	457			2 6 8	●15							
	Silty SAND with gravel - medium dense, wet, gray		15				SM	A-2-4									
		50			SPT	406			7 5 9	●15						15	
	Poorly graded GRAVEL with silt and sand - dense to very dense, wet, olive gray		16				GP-GM	A-2-4									
1285		55	17		SPT	254			26 26 24	○							
			18														
		60			SPT	178			6 14 24	●37							
			19														
		65								●43							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-437**

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

Logged by:	W. Lewis
Date Start:	6/28/01
Date Finish:	6/30/01
Station:	71+053 0.3 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 124,023.461 E 19,211.742
Elevation (m):	1301.344
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-21
STRUCTURE 22

Boring: LSB-22-437
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT (N1)60 / SPT (N1)60 (Greater than 50 Blows) (0 25 50)	Su, kPa (torvane in italics)	Dry Density, kN/m3	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly graded GRAVEL with silt and sand (continued) - dense to very dense, wet, olive gray				SPT	229			8 20 25							7	
1280		70	21		MC	254			31 25 16	38							
		75	22		SPT	152			25 31 25	50							
	Silty SAND - medium dense, wet, olive gray		23				SM	A-2-4									
		80	24		SPT	178			6 14 6	17							
	Silty GRAVEL - medium dense to very dense, wet, olive gray		25				GM	A-2-4									
1275		85	26		SPT	305			12 5 19	20							
		90	27		SPT	127			50/ 125 mm								
	Poorly Graded SAND with silt - dense, wet, gray		28				SP-SM	A-2-4									
		95	29		SPT	381			14 17 23	32			13			11	
	Silty SAND with gravel - dense to very dense, wet, olive gray		30				SM	A-2-4									
1270		100	31		SPT	305			27 37 33								
		105	32		SPT	254			8 12 30	32							
			33														
		110	34		SPT	203			10 7 25	24							
	Sandy SILT - stiff to hard, wet, gray						ML	A-4									
		115	35		SPT	254			24 17 15	24							
			36														
1265		120	37		SPT	254			9 7 8	11							
	Poorly graded SAND - dense to very dense, wet, gray						SP	A-3									
		125	38		SPT	229			12 24 26	36							
			39														
	- with gravel	130			SPT												

Test Results *

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-437**

Sheet 2 of 3

Logged by:	W. Lewis
Date Start:	6/28/01
Date Finish:	6/30/01
Station:	71+053 0.3 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 124,023.461 E 19,211.742
Elevation (m):	1301.344
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-22
STRUCTURE 22

Boring: LSB-22-437
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly graded SAND (continued) - dense to very dense, wet, gray					178			12 41 35								
	Silty SAND with gravel - dense, wet, gray						SM	A-2-4									
1260		135	41		SPT	152			7 20 22	29							
			42				ML	A-4									
	SILT - hard, wet, gray, with sand seams	140	43		SPT	152			11 16 19	24							
			44														
	Silty SAND - dense, wet, gray	145			SPT	305	SM	A-2-4	5 13 27	27							
			45														
		150	46		SPT	229			6 16 21	25							
1255			47														
		155	48														
		160	49														
			50														
		165	51														
1250		170	52														
			53														
		175	54														
		180	55														
			56														
1245		185	57														
		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-437**

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

Logged by:	W. Lewis
Date Start:	6/28/01
Date Finish:	6/30/01
Station:	71+053 0.3 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 124,023.461 E 19,211.742
Elevation (m):	1301.344
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
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

MC = Modified California Sampler, 50 8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-22-438
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND - loose to very dense, moist, brown	SPT	229			16 50/150 mm							
		SPT	356			18 17							
		SPT	356			4 20/2 2 2			21	26	1	29	
		SPT	508			4 5 7 7							
	Silty SAND - loose, wet, fine grained sand, occasional roots	SPT	559	SM	A-4	6 3 3 3			31	31	5	48	
1295	SILT with sand - medium stiff, wet	SPT	533	ML	A-4	5 3 3 5			30	26	NP	75	
	Well-Graded SAND - medium dense to very dense, wet, gray, fine-grained sand, occasional silt layers	SPT	254	SW	A-1-b	8 7 5 3						41	
		SPT	457			17 11 10 10			12			0	
		SPT	203			16 20 25 11							
		SPT	508			10 27 30 22			13			0	
	SILT - stiff, wet, gray, trace fine-grained gravel	SPT	559	ML	A-4	8 7 4 12			26	28	4	97	
1290	Silty CLAY - very stiff to hard, wet, brown, frequent dark gray silty sand layers, some gravel	SPT	432	CL-ML	A-4	6 10 12 10				27	5		
		SPT	584			19 17 14 11							
		SPT	406			12 9 7 10							
	Clayey SAND - medium dense to very dense, wet, gray, fine-grained sand	SPT	483	SC	A-4	12 10 11 12			21	28	8	42	
		SPT	102			50/150 mm 29							
	Poorly Graded GRAVEL with sand - dense to very dense, wet, gray, medium- to coarse-grained sand, trace silt, gravel clasts subrounded up to 40mm	SPT	254	GP	A-1-a	25 25							
1285		SPT	51			50/50 mm							
		SPT	0			50/100 mm							
		SPT	102			48 50/25 mm							
1280		SPT	406			8 16 19 21							

Depth: ft / m

Graphic Log

SAMPLE

Test Results *

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

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-438**

Sheet 1 of 3

Logged by:	M. Ivers
Date Start:	6/15/01
Date Finish:	6/20/01
Station:	71+141 0.6 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 124,110.645 E 19,202.999
Elevation (m):	1298.875
Total Depth Drilled (m):	45.4
Drill Contractor:	R.C. Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-24
STRUCTURE 22

Boring: LSB-22-438
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT - stiff, wet, gray, highly micaceous				SPT	406	ML	A-4	6 7 7 11							
	Poorly Graded SAND - medium dense, wet, gray, fine-grained sand	70	21		SPT	533	SP	A-3	8 10 17 22							
	Lean CLAY - very stiff, wet, olive gray occasional black silty fine-grained sand seams and layers		22				CL	A-6								
M7AE7		75	23		SPT	559			6 9 7 15							
1275			24													
		80	25		SPT	508			7 9 11 12							
	Poorly Graded SAND - medium dense, wet, gray, fine-grained sand	85	26		SPT	610	SP	A-3	5 8 10 12							
	SILT - very stiff, wet, gray, occasional clayey sand layer		27				ML	A-4								
		90	28		SPT	533			9 7 11 13							
1270	Poorly Graded SAND with silt - dense, wet, gray, fine grained sand	95	29		SPT	330	SP	A-3	11 18 18 36			18			15	
			30													
	Poorly Graded GRAVEL with sand - very dense, wet, gray, medium- to coarse-grained sand	100	31		SPT	432	GP	A-1-a	89 50							
	SILT with gravel - hard, wet, gray, fine-grained gravel	105	32		SPT	584	ML	A-4	14 18 22 32			29			78	
			33													
1265	Silty SAND - dense, wet, gray, poorly graded sand layers fine- to medium-grained sand, occasional gravelly lean clay layer	110	34		SPT	483	SM	A-4	0 15 27 39							
	Lean CLAY - hard, wet, brown, frequent organics such as wood, large amounts of wood (branches) in some parts of sample	115	35		SPT	559	CL	A-6	12 22 24 50/100 mm							
			36													
	Poorly Graded GRAVEL - very dense, wet, gray, coarse-grained gravel	120	37		SPT	152	GP	A-1-a	93/150 mm							
		125	38		SPT	0			50/75 mm							
1260			39													
		130			SPT											

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

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-438**

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

Logged by:	M. Ivers
Date Start:	6/15/01
Date Finish:	6/20/01
Station:	71+141 0.6 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 124,110.645 E 19,202.999
Elevation (m):	1298.875
Total Depth Drilled (m):	45.4
Drill Contractor:	R.C. Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-22-438
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy SILT - very dense, wet, olive green					152	ML	A-4	37 50/ 75 mm				27			64	
		135	41		SPT	102			50/ 125 mm	○							
			42														
	Lean CLAY - hard, wet, brown, frequent gray silty sand seams	140	43		SPT	559	CL	A-6	11 14 20 25	●18							
1255		145	44		MC	330			37 42 41 52	●34							
			45		SPT	406			21 34 41 50/ 100 mm	●39							
		150	46														
		155	47														
			48														
1250		160	49														
			50														
		165	51														
		170	52														
			53														
		175	54														
1245		180	55														
			56														
		185	57														
		190	58														
1240			59														
		195															

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-438**

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

Logged by:	M. Ivers
Date Start:	6/15/01
Date Finish:	6/20/01
Station:	71+141 0.6 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 124,110.645 E 19,202.999
Elevation (m):	1298.875
Total Depth Drilled (m):	45.4
Drill Contractor:	R.C. Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-26
STRUCTURE 22

Boring: LSB-22-439
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-27-345 for additional lithology above 22.9 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
▽		5	1														
			2														
1295		10	3														
			4														
	Silty GRAVEL - wet, dark brown, with trace organics	15	5		SH	203							17			20	
		20	6														
			7														
1290		25	8														
		30	9														
			10														
		35	11														
		40	12														
1285			13														
		45	14														
		50	15														
			16														
		55	17														
1280		60	18														
			19														
		65															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-439**

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

Logged by:	**W. Lewis**
Date Start:	**6/3/01**
Date Finish:	**6/4/01**
Station:	**71+222 0.7 RT**
Line:	**US 89 SB TO LP SB**
Coordinates (m):	**N 124,189.710 E 19,188.171**
Elevation (m)	**1298.000**
Total Depth Drilled (m):	**46.2**
Drill Contractor:	**Spectrum**
Driller:	**R. Dockery**
Rig Type:	**CME-750**
Rig Serial Number:	**307218**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Automatic**
Rod Type:	**AW**
Boring Diameter:	**133 mm**

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 35112LNI.GPJ 1/8/03

Boring: LSB-22-439
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-27-345 for additional lithology above 22.9 meters Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.	70	21														
			22														
1275	Sandy Lean CLAY - very stiff, wet, olive gray, frequent sand seams	75	23		SPT	457	CL	A-6	3 8 10	●18							
		80	24														
			25		SPT	406			9 13 16	●21		17.8	20	38	19	57	
	Poorly Graded GRAVEL with sand - dense, wet, gray, trace silt	85	26		SPT	254	GP	A-1-a	26 31 14	●42							
			27														
	Sandy Lean CLAY - very stiff, wet, olive gray, some gravel	90	28		SPT	457	CL	A-6	4 10 10	●18							
1270		95	29		SPT	457			5 9 11	●18			28	37	21	80	
			30														
	Poorly Graded GRAVEL with sand - very dense, wet, gray, with cobbles, trace silt, up to 100 mm diameter	100	31		MC	203	GP	A-1-a	47 50/125 mm	○							
	Silty SAND - medium dense to dense, wet, dark gray	105	32		SPT	102	SM	A-2-4	4 5 8	●11							
1265		110	33														
			34		SPT	356			7 15 10	●21							
		115	35		SPT	406			11 21 15	●29			25			26	
	Poorly Graded GRAVEL with sand - medium dense, wet, gray		36				GP	A-1-a									
		120	37		SPT	356			11 8 10	●14			28			51	
	Sandy SILT - very stiff, wet, olive gray with gray inclusions						ML	A-4									
1260	Silty GRAVEL - dense, wet, dark olive gray, with seams of peat	125	38		SH	102	GM	A-2-4	16 21 25	●28							
			39														
	Sandy SILT - very stiff, wet, olive gray with gray inclusions	130			SPT		ML	A-4		●21							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-439**

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

Logged by:	W. Lewis
Date Start:	6/3/01
Date Finish:	6/4/01
Station:	71+222 0.7 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 124,189.710 E 19,188.171
Elevation (m):	1298.000
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
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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AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50 8mm OD split spoon sampler

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

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-28
STRUCTURE 22

Boring: LSB-22-439
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows) (0 – 25 – 50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy SILT (continued) - very stiff, wet, olive gray with gray inclusions					457			15 12 15								
	Silty SAND with gravel - very dense, wet, gray	135	41		MC	305	SM	A-1-b	35 50		○		14			21	
			42														
1255	Lean CLAY - stiff to hard, wet, light red brown, with sand seams	140	43		SPT	457	CL	A-6	4 5 6	●8							
		145	44		MC	330	SM	A-2-4	11 14 23	●20			32	34	15	97	
	Silty SAND - medium dense, moist, dark gray		45														
	Lean CLAY - stiff, wet, light red brown, with sand seams	150	46		SPT	457	CL	A-6	0 6 7	●9							
		155	47														
1250			48														
		160	49														
		165	50														
			51														
		170	52														
1245			53														
		175	54														
		180	55														
			56														
		185	57														
1240		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-439**

Sheet 3 of 3

Logged by:	W. Lewis
Date Start:	6/3/01
Date Finish:	6/4/01
Station:	71+222 0.7 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 124,189.710 E 19,188.171
Elevation (m):	1298.000
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
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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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-29
STRUCTURE 22

Boring: LSB-22-490
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND with gravel - medium dense, slightly moist, brown				SPT	330			4 11 7 17	31							
			1		SPT	254			11 13 14 28	46							
	Sandy SILT - soft to stiff, moist to wet, dark brown, with some fine-grained gravel	5	2		MC	457	ML	A-4	3 4 4 3	9			36	NP	NP	51	
					SPT	508			1 2 2 3	5							
1295	Clayey SAND - loose to medium dense, wet, gray	10	3		MC	483	SC	A-2-4	2 2 2 3	4			27	31	9	46	
			4		SPT	381			3 6 6 7	15							
	Silty SAND with gravel - medium dense, wet, gray	15	5		MC	559	SM	A-2-4	5 4 7 12	11						21	
					SPT	254			7 7 10 5	22							
	SILT - soft to stiff, wet, brown, with occasional coarse-grained, wet, gray sand seam	20	6		MC	508	ML	A-4	4 5 6 6	10			30	29	6	89	
			7		SPT	432			2 2 3 3	6							
1290		25	8		MC	508			1 1 1 2	2			32	NP	NP	96	
					SPT	483			2 1 1 3	2							
		30	9		MC	559			3 3 7 26	6			16	28	3	14	
	Silty SAND - loose to dense, wet, gray, some fine-grained gravel		10		SPT	432	SP	A-3	12 13 11 13	25							
		35	11		MC	483			18 17 17 16	26							
					SPT	584			21 22 12 14	33							
			12														
	Poorly graded SAND with gravel - very dense, wet, gray	40			MC	457	SP	A-3	22 26 36	38						4	
1285			13		SPT	254			18 28 50/125mm								
		45	14		MC	508			30 38 46 43								
	Silty SAND with gravel - dense to very dense, wet, olive to brown, occasional silt lenses				SPT	0	SM	A-2-4	50/100 mm								
		50	15		SPT	127			52								
			16														
		55	17		SPT	203			39 50/75 mm								
1280		60	18		SPT	51			50/75 mm							22	
			19														
		65															

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-490**

Sheet 1 of 2

Logged by:	M. Ivers
Date Start:	8/7/01
Date Finish:	8/8/01
Station:	71+250 7.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 124,219.100 E 19,187.400
Elevation (m):	1298.143
Total Depth Drilled (m):	30.2
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-22-490
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel (continued) - dense to very dense, wet, olive to brown, occasional silt lenses				SPT	127			92								
		70	21		SPT	0			50/ 50 mm								
1275		75	22		SPT	508			28 40 19 24	42							
		80	23		SPT	457			12 13 20 22	23						13	
		85	24		SPT	457			16 16 31 41	32							
1270		90	25		SPT	610			15 24 13 21	24							
		95	26		MC	457			41 29 48 57	38							
			27		SPT	610			15 16 14 16	19							
		100	28														
1265		105	29														
		110	30														
		115	31														
		120	32														
1260		125	33														
		130	34														
			35														
			36														
			37														
			38														
			39														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-22-490**

Sheet 2 of 2

Logged by:	M. Ivers
Date Start:	8/7/01
Date Finish:	8/8/01
Station:	71+250 7.0 RT
Line:	US 89 SB TO LP SB
Coordinates (m):	N 124,219.100 E 19,187.400
Elevation (m):	1298.143
Total Depth Drilled (m):	30.2
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-31
STRUCTURE 25

Boring: LSB-23-440
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to RB-366 for additional lithology above 22.9 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1290		5	1														
		10	2														
		15	3														
		20	4														
		25	5														
		30	6														
1285	Gravelly SILT - very dense, wet, olive gray	35	7		PISTON		ML	A-4						50	12	51	
		40	8														
		45	9														
1280		50	10														
		55	11														
		60	12														
1275		65	13														
			14														
			15														
			16														
			17														
			18														
			19														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-440**

Sheet 1 of 3

Logged by:	S. Ward
Date Start:	6/8/01
Date Finish:	6/12/01
Station:	60+273 0.0 RT
Line:	I-15 SB TO LP SB
Coordinates (m):	N 123,817.189 E 19,144.972
Elevation (m):	1294.760
Total Depth Drilled (m):	46.8
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-23-440
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to RB-366 for additional lithology above 22.9 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples		21														
		70	22														
	Lean CLAY - medium, wet, olive gray, frequent sand seams, occasional sand layers	75	23		SPT	457	CL	A-4	9 12 12	19							
			24														
1270	Silty SAND - medium to very dense, wet, olive gray	80	25		SPT	457	SM	A-3	32 47 52							31	
		85	26		SPT	305			15 24 27	39							
			27														
	- frequent clay seams, occasional clay layers	90	28		SPT	305			6 10 12	16						45	
1265	Lean CLAY - very stiff to hard, wet, olive gray	95	29		SPT	508	CL	A-6	7 9 11	14							
			30														
	- increasing sand content, occasional sand layer	100	31		SPT	610			23 27 20	33							
	Poorly Graded GRAVEL with sand - very dense, wet, olive gray	105	32		SPT	152	GP	A-1-a	50/ 120 mm								
			33														
	Sandy Lean CLAY - medium to very dense, wet, olive brown to olive gray, frequent sand seams and layers, trace gravel	110	34		SPT	457	CL	A-4	11 14 14	19							
1260		115	35		SPT	457			12 7 17	16							
			36														
	- increasing gravel content	120			MC	356			44 47 48	48		18.2	9			22	
	Silty SAND with gravel - medium to very dense, wet, olive gray to light brown, occasional sandy clay seams		37				SM	A-3									
		125	38		SPT	356			14 25 34	38							
			39														
1255		130			SPT					15							

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

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-440**

Sheet 2 of 3

Logged by:	S. Ward
Date Start:	6/8/01
Date Finish:	6/12/01
Station:	60+273 0.0 RT
Line:	I-15 SB TO LP SB
Coordinates (m):	N 123,817.189 E 19,144.972
Elevation (m):	1294.760
Total Depth Drilled (m):	46.8
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

MC = Modified California Sampler, 50 8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-33
STRUCTURE 23

Boring: LSB-23-440
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT with sand - stiff to hard, wet, olive gray					457	ML	A-4	14 11 13					NP	NP	79	
	- occasional sand layers	135	41		SPT	457			15 11 12	14							
			42														
		140	43		MC	305			22 13 21	16							
			44														
	- frequent sand seams	145			SPT	305			9 21 21	25							
1250			45														
		150	46		MC	0			6 7 9	7							
					SPT	610			11 11 12 17	13							
			47														
		155															
			48														
		160	49														
1245			50														
		165															
			51														
		170	52														
			53														
		175															
			54														
1240		180	55														
			56														
		185															
			57														
		190	58														
			59														
		195															
1235																	

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-440**

Sheet 3 of 3

Logged by:	S. Ward
Date Start:	6/8/01
Date Finish:	6/12/01
Station:	60+273 0.0 RT
Line:	I-15 SB TO LP SB
Coordinates (m):	N 123,817.189 E 19,144.972
Elevation (m).	1294.760
Total Depth Drilled (m):	46.8
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

MC = Modified California Sampler, 50 8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 35112LNI GPJ 1/8/03

PLATE A-34
STRUCTURE 23

Boring: LSB-23-441
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to RB-366 for additional lithology above 22.9 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1290		5	1														
		10	2														
		15	3														
		20	4														
		25	5														
		30	6														
1285		35	7														
		40	8														
		45	9														
1280		50	10														
		55	11														
		60	12														
1275		65	13														
			14														
			15														
			16														
			17														
			18														
			19														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-441**

Sheet 1 of 3

Logged by:	S. Ward
Date Start:	6/9/01
Date Finish:	6/9/01
Station:	60+313 0.0 RT
Line:	I-15 SB TO LP SB
Coordinates (m):	N 123,855.695 E 19,134.125
Elevation (m):	1294.547
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-35
STRUCTURE 23

Boring: LSB-23-441
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to RB-366 for additional lithology above 22.9 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.	70	21													
			22													
	Silty SAND - medium, wet, gray to olive green, fine- to coarse-grained sand, trace gravel	75	23		SPT	254	SM	A-2-4	13 16 12						16	
			24													
1270		80	25		SPT	356			11 9 8							
	Poorly Graded GRAVEL with silt and sand - very dense, wet, olive gray	85	26		SPT	381	GP-GM	A-2-4	28 35 50/125 mm						9	
			27													
	Poorly Graded SAND with silt and gravel - medium dense, wet, olive gray, fine- to medium grained sand	90	28		SPT	254	SP-SM	A-2-4	12 17 11							
1265	Sandy Lean CLAY with gravel - very stiff, wet, olive gray to brown, occasional sand layers	95	29		MC	356	CL	A-6	6 8 15		13.7	29	42	23	54	
		100	30													
			31		SPT	457			4 8 20							
	Poorly Graded GRAVEL with silt - very dense, wet, gray, fine- to coarse-grained gravel	105	32		SPT	203	GP-GM	A-2-4	39 35 43						12	
			33													
	Lean CLAY - stiff, wet, olive	110	34		SPT	457	CL	A-6	7 6 9							
1260																
	Silty SAND - medium to dense, wet, gray to brown, fine- to coarse-grained sand, some silt seams, trace gravel	115	35		SPT	457	SM	A-2-4	8 11 34							
			36													
		120	37		SPT	457			11 10 10							
		125	38		SPT	457			9 12 12						19	
			39													
1255		130			SPT											

Graphic Log: 0 25 50

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

Test Results *

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-441**

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

Logged by:	**S. Ward**
Date Start:	**6/9/01**
Date Finish:	**6/9/01**
Station:	**60+313 0.0 RT**
Line:	**I-15 SB TO LP SB**
Coordinates (m):	**N 123,855.695 E 19,134.125**
Elevation (m):	**1294.547**
Total Depth Drilled (m):	**46.2**
Drill Contractor:	**Spectrum**
Driller:	**R. Dockery**
Rig Type:	**CME-750**
Rig Serial Number:	**307218**
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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-36
STRUCTURE 23

Boring: LSB-23-441
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND (continued) - medium to dense, wet, gray to brown, fine- to coarse-grained sand, some silt seams, trace gravel					457			11 15 17								
	Sandy SILT - hard, wet, gray, frequent silty sand and silty clay layers	135	41		SPT	406	ML	A-4	19 14 18	● 19							
	Lean CLAY - stiff, wet, olive gray, occasional black sand seams	140	42 43		SPT	356	CL	A-6	3 5 8	● 8							
1250	Poorly Graded SAND with silt - very dense, wet, gray	145	44 45		SPT	432	SM	A-2-4	21 28 29	● 33							
	Lean CLAY - stiff, wet, gray	150	46		SPT	457	CL	A-6	5 5 4	● 5							
1245		155	47 48														
		160	49														
		165	50 51														
		170	52														
		175	53 54														
1240		180	55														
		185	56 57														
		190	58														
1235		195	59														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-441**

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

Logged by:	S. Ward
Date Start:	6/9/01
Date Finish:	6/9/01
Station:	60+313 0.0 RT
Line:	I-15 SB TO LP SB
Coordinates (m):	N 123,855.695 E 19,134.125
Elevation (m):	1294.547
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI GPJ 1/8/03

Boring: LSB-23-442
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0–25–50	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to RB-365 for additional lithology above 22.9 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1290		5	1														
		10	2														
		15	3														
		20	4														
		25	5														
		30	6														
1285		35	7														
		40	8														
		45	9														
1280		50	10														
		55	11														
		60	12														
1275		65	13														
			14														
			15														
			16														
			17														
			18														
			19														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-442**

Sheet 1 of 3

Logged by:	S. Ward
Date Start:	6/11/01
Date Finish:	6/12/01
Station:	60+366 0.0 RT
Line:	I-15 SB TO LP SB
Coordinates (m):	N 123,907.661 E 19,123.702
Elevation (m):	1294.699
Total Depth Drilled (m):	45.7
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
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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AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-23-442
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to RB-365 for additional lithology above 22.9 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.	70	21														
			22														
	Poorly Graded SAND with silt - dense to very dense, wet, gray, occasional fine-grained peat seams and wood fragments, occasional gravel layers	75	23		SPT	330	SP-SM	A-2-4	5 8 28	28							
			24														
1270		80	25		SPT	406			22 28 25	40						9	
		85	26		SPT	457			18 36 48								
	Poorly Graded GRAVEL with silt with sand - very dense, wet, olive gray, fine-grained gravel						GP-GM	A-2-4									
			27														
		90	28		SPT	152			50/ 150 mm								
		95	29		MC	330			40 44 50	50							
1265			30														
	Sandy SILT - very stiff, wet, olive gray, occasional sand layers	100	31		SPT	432	ML	A-4	9 7 12	13							
	Silty SAND with gravel - dense to very dense, wet, fine- to medium-grained sand, occasional clay layers	105	32		SPT	356	SM	A-2-4	8 10 32	28						23	
			33														
		110	34		SPT	203			12 31 38	44							
1260																	
	Sandy SILT - stiff, wet, olive brown to light brown, frequent sand seams	115	35		SPT	457	ML	A-6	5 6 9	9				NP	NP	60	
			36														
	Poorly Graded SAND with silt - dense, wet, gray, fine- to medium-grained sand, occasional lean clay layer	120	37		MC	305	SP-SM	A-2-4	15 18 18	17							
	- no clay layers	125	38		SPT	406			19 18 20	23							
			39														
1255		130			SPT												

UTDOT 3511ZLNI.GPJ 1/8/03

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-442**

Sheet 2 of 3

Logged by:	S. Ward
Date Start:	6/11/01
Date Finish:	6/12/01
Station:	60+366 0.0 RT
Line:	I-15 SB TO LP SB
Coordinates (m):	N 123,907.661 E 19,123.702
Elevation (m):	1294.699
Total Depth Drilled (m):	45.7
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: LSB-23-442
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty GRAVEL with sand - very dense, wet, olive gray, fine-grained gravel					229	GM	A-2-4	43 50/100 mm							14	
	Lean CLAY - very stiff to hard, wet, light reddish brown to light gray to gray, occasional gray sand seams and layers	135	41		SPT	457	CL	A-6	11 8 10	●10				39	20		
			42														
		140	43		SPT	457			4 7 12	●11							
			44														
	- frequent sandy silt seams and layers	145			MC	305			11 19 23	●18							
1250			45														
		150	46		SPT	457			6 7 9	●9							
			47														
		155															
			48														
		160	49														
1245			50														
		165															
			51														
		170	52														
			53														
		175															
			54														
1240		180	55														
			56														
		185															
			57														
		190	58														
			59														
		195															
1235																	

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-442**

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

Logged by:	S. Ward
Date Start:	6/11/01
Date Finish:	6/12/01
Station:	60+366 0.0 RT
Line:	I-15 SB TO LP SB
Coordinates (m):	N 123,907.661 E 19,123.702
Elevation (m):	1294.699
Total Depth Drilled (m):	45.7
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512LNI.GPJ 1/8/03

Boring: LSB-23-443
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to RB-365 for additional lithology above 15.2 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1290		5	1														
		10	2														
		15	3														
		20	4														
		25	5														
1285		30	6														
		35	7														
		40	8														
		45	9														
1280		50	10														
	Lean CLAY - hard, wet, dark brown, some sand		11		SPT	152	CL	A-6	18 14 22	35			9	33	14		
			12														
	Silty SAND with gravel - medium to very dense, wet, olive gray		13				SM	A-2-4									
		55	14		SPT	457			23 23 22	40						13	
			15														
		60	16		SPT	0			14 9 13	20							
			17														
		65	18							47							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-443**

Sheet 1 of 3

Logged by:	S. Ward
Date Start:	6/5/01
Date Finish:	6/7/01
Station:	60+428 5.0 RT
Line:	I-15 SB to LP SB
Coordinates (m):	N 123,970.300 E 19,120.700
Elevation (m):	1295.065
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type.	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = *Unified Soil Classification System*

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-23-443
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel (continued) - medium to very dense, wet, olive gray				SPT	305			7 22 33								
		70	21		MC	152			3 15 15	● 19							
			22														
	Sandy Lean CLAY - very stiff to hard, wet, brown	75	23		SPT	457	CL	A-6	7 8 9	● 15			25	32	17	29 67	
			24														
		80			SPT	457			6 6 10	● 12							
1270			25														
		85	26		SPT	457			10 16 22	● 29							
	Sandy SILT with gravel - very stiff to hard, wet, olive gray						ML	A-4									
			27														
		90			SPT	457			14 13 15	● 20						57	
			28														
		95	29		MC	152			9 7 13	● 11							
1265			30														
	Silty SAND - very dense, wet, olive gray	100			SPT	254	SM	A-2-4	10 32 42								
			31														
	Lean CLAY - stiff to very stiff, wet, brown	105	32		SPT	457	CL	A-6	5 6 9	● 11							
			33														
		110			SPT	457			10 9 12	● 14				34	14		
			34														
1260	Poorly Graded SAND with silt and gravel - medium to very dense, wet, gray	115	35		SPT	305	SP-SM	A-2-4	23 33 50/125 mm								
			36														
		120			SPT	457			9 9 13	● 14							
			37														
		125	38		MC	305			17 32 33	● 31						11	
			39														
		130			SPT					● 41							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-443**

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

Logged by:	S. Ward
Date Start:	6/5/01
Date Finish:	6/7/01
Station:	60+428 5.0 RT
Line:	I-15 SB to LP SB
Coordinates (m):	N 123,970.300 E 19,120.700
Elevation (m):	1295.065
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512ZLNI.GPJ 1/8/03

PLATE A-42
STRUCTURE 23

Boring: LSB-23-443
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly Graded SAND with silt and gravel (continued) - medium to very dense, wet, gray					305			13 50/130 mm								
		135	41		SPT	356			20 13 13	16							
	Lean CLAY with sand - medium to very stiff, wet, olive gray		42				CL	A-6									
		140	43		SPT	457			5 6 9	9							
			44														
		145			MC	610			9 12 13 17	11							
1250			45		SPT	610			7 8 8 9	9							
		150	46														
		155	47														
			48														
		160	49														
1245		165	50														
			51														
		170	52														
		175	53														
			54														
1240		180	55														
			56														
		185	57														
		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-443**

Sheet 3 of 3

Logged by:	S. Ward
Date Start:	6/5/01
Date Finish.	6/7/01
Station:	60+428 5.0 RT
Line:	I-15 SB to LP SB
Coordinates (m):	N 123,970.300 E 19,120.700
Elevation (m):	1295.065
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50 8mm OD split spoon sampler

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

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-23-444
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-24-258 for additional lithology above 18.3 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1295		5	1														
		10	2														
		15	3														
		20	4														
		25	5														
1290		30	6														
		35	7														
		40	8														
1285		45	9														
		50	10														
		55	11														
		60	12														
		65	13														
			14														
			15														
			16														
			17														
1280			18														
	Silty SAND - medium, wet, olive gray		19		SPT	406	SM	A-2-4	12 15 11	23							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-444**

Sheet 1 of 3

Logged by:	S. Ward
Date Start:	5/30/01
Date Finish:	6/5/01
Station:	60+560 5.0 RT
Line:	I-15 SB to LP SB
Coordinates (m):	N 124,099.700 E 19,095.800
Elevation (m):	1297.899
Total Depth Drilled (m).	45.4
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-44
STRUCTURE 23

Boring. LSB-23-444
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)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND (continued) - medium, wet, olive gray				SPT	457			13 12 13							18	
		70	21		SPT	457			10 15 14	24						44	
			22														
1275	Sandy SILT - hard, wet, olive gray	75	23		MC	457	ML	A-4	9 18 17	22				28	NP	67	
			24														
	SILT with sand - stiff, wet, olive gray	80	25		SPT	457	ML	A-4	6 5 7	9						74	
	Silty SAND - medium, wet, olive gray	85	26		SPT	457	SM	A-2-4	5 15 14	22						44	
			27														
1270		90	28		SPT	457			8 6 14	12							
	Sandy SILT - stiff to hard, wet, olive gray	95	29		SPT	457	ML	A-4	14 6 8	10							
			30														
		100	31		MC	0			21 14 15	16							
		105	32		SPT	457			5 26 42	46						53	
1265			33														
		110	34		SPT	356			10 7 12	13							
	Lean CLAY - very stiff, wet, olive gray	115	35		SPT	457	CL	A-6	6 8 14	14				31	10		
			36														
	SILT - very stiff to hard, wet, olive gray	120	37		SPT	457	ML	A-4	6 7 13	13							
1260		125	38		SPT	152			25 28 20	23							
			39														
		130			SPT					17							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-444**

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

Logged by:	S. Ward
Date Start:	5/30/01
Date Finish:	6/5/01
Station:	60+560 5.0 RT
Line:	I-15 SB to LP SB
Coordinates (m):	N 124,099.700 E 19,095.800
Elevation (m):	1297.899
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-45
STRUCTURE 23

Boring: LSB-23-444
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND - medium to very dense, wet, olive gray					356	SM	A-2-4	4 12 16								
		135	41		SPT	457			12 25 38	38							
	SILT - stiff to hard, wet, olive gray		42				ML	A-4									
1255		140	43		SPT	457			14 22 36	34							
		145	44		MC	305			25 38 43 30	36							
			45		SPT	305			6 6 6 6	7							
		150	46														
		155	47														
1250			48														
		160	49														
		165	50														
			51														
		170	52														
1245			53														
		175	54														
		180	55														
			56														
		185	57														
1240		190	58														
			59														
		195															

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-444**

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

Logged by:	S. Ward
Date Start:	5/30/01
Date Finish:	6/5/01
Station:	60+560 5.0 RT
Line:	I-15 SB to LP SB
Coordinates (m):	N 124,099.700 E 19,095.800
Elevation (m):	1297.899
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type.	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-46
STRUCTURE 23

Boring: LSB-23-445
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-23-290C for additional lithology above 22.9 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1295		5	1														
		10	2														
		15	3														
		20	4														
	SILT - medium stiff, wet, gray		5		P	610	ML	A-4			29	12.6	42	NP	NP	91	
1290		25	6														
		30	7														
		35	8														
		40	9														
1285		45	10														
		50	11														
		55	12														
1280		60	13														
		65	14														
			15														
			16														
			17														
			18														
			19														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-445**

Sheet 1 of 3

Logged by:	S. Ward
Date Start:	5/23/01
Date Finish:	5/30/01
Station:	60+602
Line:	I-15 SB to LP SB
Coordinates (m):	N 124,136.847 E 19,073.937
Elevation (m):	1297.412
Total Depth Drilled (m):	46.9
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512ZLN.GPJ 1/8/03

Boring. LSB-23-445
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	Su kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-23-290C for additional lithology above 22.9 meters Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.	70	21														
			22														
1275		75	23		SPT	457	SP	A-3	12 16 17	26							
	Poorly Graded SAND - dense, wet, olive		24														
	SILT - hard, wet, olive gray, gravelly sand, trace clay	80					ML	A-4									
					SPT				18 25 30	43							
	Silty SAND with gravel - very dense, wet, gray		25				SM	A-2-4									
		85	26		SPT				24 50 50/135 mm								
			27														
1270	Silty SAND - medium dense, wet, olive gray, some gravel	90			SPT		SM	A-2-4	9 10 11	15			18	26	2	44	
			28														
		95	29		SPT				7 12 13	18							
			30														
	Clayey SAND - medium dense to very dense, wet, olive gray	100			MC		SC	A-2-6	9 9 14	12		18.1	20			41	
			31														
		105	32		SPT	305			31 22 23	31							
			33														
1265		110															
			34		SPT	152			35 40 24	42							
		115	35														
	Lean CLAY with sand - very stiff, wet, olive gray, trace gravel				SPT		CL	A-6	8 9 12	13			25	31	10	75	
			36														
		120															
			37		SPT	406			20 10 9	12							
1260																	
	Clayey SAND - very dense, wet, olive gray, trace gravel	125	38		MC	152	SC	A-2-6	25 26 34	29							
			39														
	SILT - hard, wet, olive gray with trace sand, occasional layers	130			SPT		ML	A-4		24							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-445**

Sheet 2 of 3

Logged by:	S. Ward
Date Start:	5/23/01
Date Finish:	5/30/01
Station:	60+602
Line:	I-15 SB to LP SB
Coordinates (m):	N 124,136.847 E 19,073.937
Elevation (m):	1297.412
Total Depth Drilled (m):	46.9
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512ZLNI.GPJ 1/8/03

PLATE A-48
STRUCTURE 23

Boring. LSB-23-445
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / $(N_1)_{60}$ (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 (continued) - hard, wet, olive gray with trace sand, occasional layers					305			15 17 23								
	Silty SAND with gravel - very dense, wet, olive	135	41		SPT		SM	A-2-4	20 51 50/110 mm	○							
			42														
1255	Lean CLAY - hard, wet, olive gray, some sand	140	43		SPT	406	CL	A-6	11 13 24	●22							
	Silty SAND - very dense, wet, olive gray	145	44		SPT	457	SM	A-2-4	10 19 20	●23			25			30	
			45														
	Lean CLAY - very stiff, wet, olive gray	150	46		MC	152	CL	A-6	10 10 12 14	●10							
					SPT	610			8 10 12 11	●13							
			47														
1250		155	48														
		160	49														
			50														
		165	51														
		170	52														
1245			53														
		175	54														
		180	55														
			56														
		185	57														
1240		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-23-445**

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

Logged by.	S. Ward
Date Start:	5/23/01
Date Finish:	5/30/01
Station:	60+602
Line.	I-15 SB to LP SB
Coordinates (m):	N 124,136.847 E 19,073.937
Elevation (m):	1297.412
Total Depth Drilled (m):	46.9
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-24-446
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-24-255 for additional lithology above 29.0 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.															
1295	Lean CLAY - stiff, moist, olive	5	2		P	610	CL	A-6			14.5	35	44	19	99	
1290	Silty GRAVEL - dense, wet, gray	20	6		MC	51	GM	A-2-4	14 19 31							
1285		35	11													
1280		55	17													

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

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-446**

Sheet 1 of 3

Logged by: M. Ivers
Date Start: 5/7/01
Date Finish: 5/17/01
Station: 20+796
Line: LP NB to I-15 NB
Coordinates (m): N 124,048.900 E 19,125.200
Elevation (m): 1296.101
Total Depth Drilled (m): 46.2
Drill Contractor: Spectrum
Driller: R. Dockery
Rig Type: CME 750
Rig Serial Number: (Old CME-750)
Drilling Method: Mud Rotary
Hammer Type: Automatic
Rod Type: AW
Boring Diameter: 121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLN.GPJ 1/8/03

PLATE A-50
STRUCTURE 24B

Boring: LSB-24-446
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-24-255 for additional lithology above 29.0 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.															
1275		70	21													
			22													
		75	23													
			24													
		80	25													
1270		85	26													
			27													
		90	28													
	Silty SAND with gravel - very dense, wet, gray, weak cementation	95	29		SPT	356	SM	A-2-4	6 19 50/140 mm							
			30													
		100	31													
1265																
	SILT with sand - stiff, wet, gray	105	32		P	381	ML	A-4								
			33													
		110	34													
		115	35													
			36													
1260		120	37													
	Silty SAND - dense, wet, dark gray	125	38		SPT	432	SM	A-2-4	20 21 21						21	
			39													
		130			SPT											

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

0 25 50

Test Results *

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-446**

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

Logged by:	M. Ivers
Date Start:	5/7/01
Date Finish:	5/17/01
Station:	20+796
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,048.900 E 19,125.200
Elevation (m):	1296.101
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME 750
Rig Serial Number:	(Old CME-750)
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNLGPJ 1/8/03

PLATE A-51
STRUCTURE 24B

Boring. LSB-24-446
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND (continued) - dense, wet, dark gray					330			18 20 16								
1255	Sandy SILT - very stiff, wet, dark gray-brown	135	41		MC	356	ML	A-4	6 8 12	12							
		140	42		SPT	457			10 10 14	14							
			43														
	Lean CLAY - stiff to hard, wet, brown	145	44		SPT	457	CL	A-6	8 5 8	7			30	37	16		
			45														
1250		150	46		SPT	457			6 8 24	17							
			47														
		155	48														
		160	49														
			50														
		165	51														
1245		170	52														
			53														
		175	54														
		180	55														
			56														
1240		185	57														
		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-446**

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

Logged by:	M. Ivers
Date Start:	5/7/01
Date Finish:	5/17/01
Station:	20+796
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,048.900 E 19,125.200
Elevation (m):	1296.101
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME 750
Rig Serial Number:	(Old CME-750)
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-24-447
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0–25–50	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-24-258 for additional lithology above 21.3 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1295		5	1														
			2														
		10	3														
			4														
		15	5														
		20	6														
1290			7														
		25	8														
		30	9														
			10														
		35	11														
1285			12														
		40	13														
		45	14														
			15														
		50	16														
1280		55	17														
			18														
		60	19														
		65															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-447**

Sheet 1 of 3

Logged by:	D. Krupicka
Date Start:	5/17/01
Date Finish:	5/22/01
Station:	20+896 5.0 LT
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,078.768 E 19,125.176
Elevation (m):	1296.497
Total Depth Drilled (m):	45.3
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME 750
Rig Serial Number:	(Old CME-750)
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

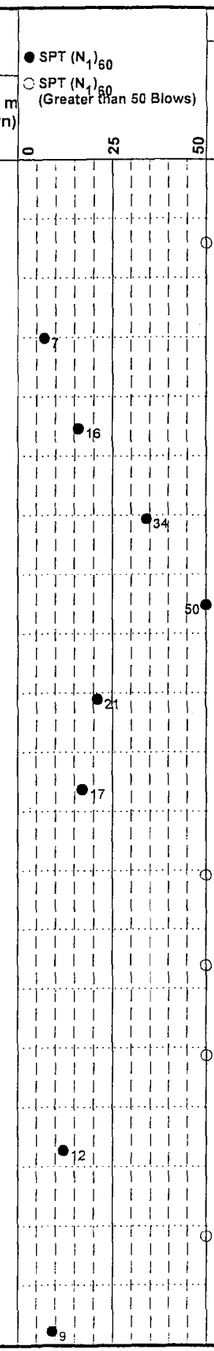
BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-53
STRUCTURE 24B

Boring: LSB-24-447
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)			Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-24-258 for additional lithology above 21.3 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.		21															
1275	Silty SAND with gravel - very dense, wet, olive gray	70	22		SPT	102	SM	A-2-4	33	36	31							
	SILT - stiff to very stiff, wet, olive gray	75	23		SPT	406	CL	A-6	7	4	5							
		80	24		SPT	279			9	10	11			31	33	9		
1270	Sandy Lean CLAY - hard, wet, gray	85	25		SPT	330	CL	A-6	10	18	27							
	Silty SAND with gravel - medium to very dense, wet, olive gray	90	26		MC	229	SM	A-2-4	13	38	50		21.5	12				
		95	27		SPT	279			18	19	10							
1265	Sandy SILT - very stiff to hard, wet, gray	100	28		SPT	406	ML	A-4	6	10	15			26	30	3	66	
		105	29		SPT	279			20	50/100 mm								
1260	Silty SAND with gravel - medium to very dense, wet, olive gray	110	30		SPT	-	SM	A-2-4	23	46	50/125 mm						20	
		115	31		SPT	229			27	40	46							
		120	32		SPT	356			5	10	9							
		125	33		SPT	178			24	50/125 mm								
		130	34		SPT													



Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-447**

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

Logged by:	D. Krupicka
Date Start:	5/17/01
Date Finish:	5/22/01
Station:	20+896 5.0 LT
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,078.768 E 19,125.176
Elevation (m):	1296.497
Total Depth Drilled (m):	45.3
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME 750
Rig Serial Number:	(Old CME-750)
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLN1.GPJ 1/8/03

PLATE A-54
STRUCTURE 24B

Boring: LSB-24-447
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT with sand - stiff to hard, wet, gray					178	ML	A-4	5 8 7								
1255		135	41		MC	330			50/ 100 mm	○							
		140	42														
			43		SPT	330			5 12 31	● 25							
		145	44														
					MC	0			12 31 32	● 36							
	Silty SAND - medium, wet, gray		45		SPT	330	SM	A-2-4	12 12 18	● 17							
1250		150	46														
		155	47														
			48														
		160	49														
		165	50														
1245			51														
		170	52														
		175	53														
			54														
		180	55														
1240		185	56														
			57														
		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-447**

Sheet 3 of 3

Logged by:	D. Krupicka
Date Start:	5/17/01
Date Finish:	5/22/01
Station:	20+896 5.0 LT
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,078.768 E 19,125.176
Elevation (m):	1296.497
Total Depth Drilled (m):	45.3
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME 750
Rig Serial Number:	(Old CME-750)
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLN1.GPJ 1/8/03

Boring: LSB-24-448
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-25-334 for additional lithology above 24.4 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1295		5	1														
			2														
		10	3														
			4														
		15	5														
		20	6														
1290			7														
		25	8														
		30	9														
			10														
		35	11														
1285		40	12														
			13														
		45	14														
		50	15														
			16														
1280		55	17														
		60	18														
			19														
		65															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-448**

Sheet 1 of 3

Logged by:	M. Ivers
Date Start:	5/21/01
Date Finish:	5/23/01
Station:	21+012
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,162.458 E 19,102.330
Elevation (m):	1296.680
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Drilling
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler 76 2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-56
STRUCTURE 24B

Boring: LSB-24-448
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / $(N_1)_{60}$ (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m^3	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-25-334 for additional lithology above 24.4 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.		21														
1275		70	22														
		75	23		SPT	0			50/ 100 mm								
			24														
	Silty SAND - medium to very dense, wet, gray	80	25		SPT	51	GM	A-2-4	50/ 75 mm								
		85	26		SPT	356			11 22 20 20	26			15			32	
1270			27														
		90			SPT	508			8 6 9 12	9							
	Lean CLAY - stiff, wet, olive gray		28				CL	A-6									
	Silty SAND - medium to very dense, wet, gray	95	29		SPT	508	SM	A-2-4	12 14 17 20	18			19	23	1	34	
			30														
	- some gravel	100	31		SPT	254			31 47 50/ 125 mm							16	
1265		105	32		SPT	330			41 33 47	45						29	
			33														
		110	34		SPT	229			36 50/ 125 mm	47							
		115	35		SPT	0			13 13 20	18							
			36														
1260		120	37		MC				12 50								
	Sandy SILT - hard, wet, gray, trace gravel	125	38		SPT	330	ML	A-4	7 18 19	19			31	37	9	65	
			39														
		130			SPT					38							

UTDOT 3512LNI.GPJ 1/8/03

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-448**

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

Logged by:	M. Ivers
Date Start.	5/21/01
Date Finish:	5/23/01
Station:	21+012
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,162.458 E 19,102.330
Elevation (m).	1296.680
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Drilling
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50.8mm OD split spoon sampler

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

PLATE A-57
STRUCTURE 24B

Boring: LSB-24-448
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND - dense to very dense, wet, olive gray					229	SM	A-2-4	13 24 51								
1255		135	41		SPT	457			10 24 25	24			26			43	
		140	42														
			43		SPT	406			4 12 24	18							
		145	44														
	Lean CLAY - very stiff, wet, olive gray, occasional seams of black sand				MC	0	CL	A-6	5 10 11 15	8							
			45		SPT	305			7 9 11 12	9							
		150	46														
1250		155	47														
			48														
		160	49														
		165	50														
			51														
1245		170	52														
		175	53														
			54														
		180	55														
			56														
1240		185	57														
		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-448**

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

Logged by:	M. Ivers
Date Start:	5/21/01
Date Finish:	5/23/01
Station:	21+012
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,162.458 E 19,102.330
Elevation (m):	1296.680
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Drilling
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLN.GPJ 1/8/03

PLATE A-58
STRUCTURE 24B

Boring: LSB-24-449
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-25-336 for additional lithology above 24.4 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1295		5	1														
		10	2														
		15	3														
		20	4														
1290		25	5														
	SILT - stiff, wet, gray		6		P	559											
		30	7														
		35	8														
1285		40	9														
		45	10														
		50	11														
		55	12														
1280		60	13														
		65	14														
			15														
			16														
			17														
			18														
			19														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-449**

Sheet 1 of 3

Logged by:	S. Lewis
Date Start:	5/20/01
Date Finish:	6/1/01
Station:	21+150
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,290.558 E 19,052.995
Elevation (m):	1297.259
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-59
STRUCTURE 24B

Boring. LSB-24-449
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-25-336 for additional lithology above 24 4 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1275		70	21														
		75	22														
			23														
		80	24														
	Sandy SILT with gravel - very stiff, wet, dark gray		25		SPT	229	ML	A-4	14 12 12	●18							
		85	26														
			27														
1270	Silty GRAVEL - medium to very dense, wet, olive gray	90	28				GM	A-2-4									
		95	29		SPT	305			40 38 50/125 mm								
			30														
		100	31		SPT	203	SP-SM	A-2-4	21 10 18	●19							
	Poorly Graded SAND with silt and gravel - medium to dense, wet, olive gray																
1265		105	32		SPT	356			12 15 23	●19			13			11	
			33														
	Sandy Lean CLAY - very stiff, wet, mottled gray brown	110	34		SPT	254	CL	A-2-6	6 7 14	●13			27	49	24	63	
		115	35		SPT	406			6 6 13	●12							
			36														
	Silty SAND with gravel - medium to very dense, wet, brown, some silt lenses	120	37		SPT	432	SM	A-2-4	18 26 23	●23			13			17	
1260		125	38		SPT	457			5 35 48	50●							
			39														
		130			SPT					●6							

UTDOT 3512ZLNI.GPJ 1/8/03

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-449**

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

Logged by:	S. Lewis
Date Start:	5/20/01
Date Finish:	6/1/01
Station:	21+150
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,290.558 E 19,052.995
Elevation (m):	1297.259
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: LSB-24-449
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) (0–25–50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
						457			9 6 7								
	Sandy SILT - stiff to hard, wet, gray brown	135	41		SPT	432	ML	A-4	10 11 11	13			23			52	
1255		140	42														
			43		SPT	381			9 13 25	21							
		145	44														
					SPT	457			9 21 24	25							
			45														
		150	46		SPT	457			6 5 7	7							
1250		155	47														
			48														
		160	49														
			50														
		165	51														
		170	52														
1245			53														
		175	54														
		180	55														
			56														
		185	57														
1240		190	58														
			59														
		195															

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-449**

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

Logged by:	S. Lewis
Date Start:	5/20/01
Date Finish:	6/1/01
Station:	21+150
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,290.558 E 19,052.995
Elevation (m):	1297.259
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLN.GPJ 1/8/03

PLATE A-61
STRUCTURE 24B

Boring: LSB-24-450
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-25-336 for additional lithology above 16.8 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology above this depth.																
		5	1														
			2														
	Silty SAND - dense, wet, dark brown	10	3		MC	406	ML	A-2-4	5 8 8	●28							
1295			4														
		15	5														
		20	6														
			7														
		25	8														
1290	Lean CLAY - very stiff, wet, light gray brown	30	9		P	P	610	CL	A-6			15.0	27	31	12	94	
			10														
		35	11														
		40	12														
			13														
		45	14														
1285																	
		50	15														
			16														
	Silty SAND with gravel - medium to very dense, wet, gray to light gray	55	17			SPT	406	SM	A-2-4	34 40 37	○						
			18														
		60	19			SPT	102			12 13 8	●24						
1280		65								●46							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-450**

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

Logged by:	S. Lewis
Date Start:	6/1/01
Date Finish:	6/2/01
Station:	21+194
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,326.000 E 19,027.100
Elevation (m):	1298.997
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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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 3512ZLNI.GPJ 1/8/03

PLATE A-62
STRUCTURE 24B

Boring: LSB-24-450
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel (continued) - medium to very dense, wet, gray to light gray				SPT	305			23 31 13								
		70	21		SPT	330			9 14 10	25							
	Lean CLAY - very stiff, wet, gray		22				CL	A-6									
		75	23		SPT	457	SM	A-2-4	18 9 14	13							
	Silty SAND - medium, wet, gray																
1275			24														
		80			MC	457			5 11 9	15		18.1	17	NP	NP	26	
			25														
	Sandy Lean CLAY - stiff to very stiff, wet, olive gray with brown mottling	85	26		SPT	457	CL	A-2-4	4 4 8	11			20	32	13	54	
			27														
		90			SPT	457			5 5 13	17							
	Silty SAND - medium to very dense, wet, gray		28				SM	A-2-4									
1270		95	29		SPT	0			6 7 10	15							
			30														
		100			SPT				4 6 11	15			28			39	
			31														
		105	32		SPT	229			41 51/ 140 mm								
			33														
	Lean CLAY - very stiff, wet, gray	110			MC	25	CL	A-6	6 9 10	12							
1265			34														
		115	35		MC	457			6 6 12	11		14.9	31	42	22	94	
			36														
		120			SPT	356			15 16 10	21							
			37														
	Silty SAND with gravel - very dense, wet, olive gray						SM	A-2-4									
		125	38		MC	279			29 50/ 125 mm								
1260			39														
		130			SPT					17							

Test Results *

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-450**

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

Logged by:	S. Lewis
Date Start:	6/1/01
Date Finish.	6/2/01
Station:	21+194
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,326.000 E 19,027.100
Elevation (m):	1298.997
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-63
STRUCTURE 24B

Boring. LSB-24-450
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND - medium to very dense, wet, brown					305	SM	A-2-4	8 10 12								
		135	41		SPT	356			11 19 25	63			19			21	
			42														
	Silty CLAY with sand - firm to hard, wet, yellow brown, with mice flakes	140	43		SPT	406	CL-ML	A-4	10 10 14	18							
1255		145	44		MC	356			7 24 32	32			26	24	4	74	
			45														
		150	46		SPT	457			5 5 3	8							
		155	47														
			48														
1250		160	49														
		165	50														
			51														
		170	52														
		175	53														
1245			54														
		180	55														
			56														
		185	57														
		190	58														
1240		195	59														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-450**

Sheet 3 of 3

Logged by:	S. Lewis
Date Start:	6/1/01
Date Finish:	6/2/01
Station:	21+194
Line:	LP NB to I-15 NB
Coordinates (m).	N 124,326.000 E 19,027.100
Elevation (m):	1298.997
Total Depth Drilled (m):	46.2
Drill Contractor	Spectrum
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number.	307218
Drilling Method:	Mud Rotary
Hammer Type	Automatic
Rod Type.	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 35112LNI GPJ 1/8/03

PLATE A-64
STRUCTURE 24B

Boring: LSB-24-486
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Poorly Graded SAND with gravel - dense, moist, brown		1														
	Lean CLAY with sand - soft to stiff, moist to wet, dark brown	5	2		SPT	457	CL	A-6	5 7 5 5	17							
1295					SPT	610			3 2 2 3	5							
		10	3		SPT	610			1 2 3 2	7							
			4		SPT	51			2 2 3 3	6							
	Sandy SILT - soft, wet, gray	15	5		SPT	381	ML	A-4	3 1 2 3	4			33	NP	NP	65	
					SPT	508			1 1 2 2	4				28	7	89	
	Lean CLAY with sand - soft to stiff, wet, brown	20	6		SPT	533	CL	A-6	2 2 2 3	5			30	27	7	83	
			7		SPT	508			1 2 2 2	4							
1290		25	8		SPT	533			2 2 3 5	8			29	32	11	86	
					SPT	508			3 3 2 4	5							
		30	9		SPT	432			2 2 2 3	4			26	26	8	73	
			10		SPT	330			2 3 5 6	8							
		35	11		SPT	305			2 3 6 9	9							
	Silty SAND - loose, wet, gray		12		SPT	584	SM	A-2-4	7 4 5 8	8			17			17	
		40			SPT	330			2 3 7 12	9			26	NP	NP	37	
1285			13														
	Silty GRAVEL with sand - very dense, wet, gray	45	14		SPT		GM	A-2-4	29 26 31 26	49							
			15														
	Silty SAND with gravel - medium dense to very dense, wet, gray, with silt interbeds	50	16		SPT	203	SM	A-2-4	11 50/150 mm								
		55	17		SPT	584			6 7 8 8	15							
1280			18														
		60	19		SPT	229			15 24 41 29	49							
		65															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-486**

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

Logged by:	M. Ivers
Date Start:	6/25/01
Date Finish:	6/27/01
Station:	21+063 8.3 RT
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,214.527 E 19,097.454
Elevation (m):	1297.625
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 35112LNI.GPJ 1/8/03

PLATE A-65
STRUCTURE 24B

Boring: LSB-24-486
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel (continued) - medium dense to very dense, wet, gray, with silt interbeds				SPT				8 7 47 50/100 mm								
			21														
		70			SPT	51			50/75 mm								
			22														
1275		75	23		SPT	76			50/100 mm								
			24														
		80			SPT	0			50/50 mm								
			25														
		85	26		SPT	127			18 32 50/100 mm								
			27														
1270	Sandy SILT - very stiff, wet, brownish gray	90			SPT	508	ML	A-4	4 10 10 16	13				NP	NP		
			28														
		95	29		SPT	254			8 11 12 19	14							
			30														
	Poorly Graded GRAVEL - very dense, moist, tan	100			SPT		GP	A-1-a	49 50/100 mm								
			31														
	Silty SAND - very dense, wet, tan	105	32		SPT	254	SM	A-2-4	43 50/100 mm							48	
1265			33														
	SILT - very stiff to hard, wet, gray	110			SPT	381	ML	A-4	5 6 11 17	10							
			34														
		115	35		SPT	457			10 2 34 35	30							
			36														
	Poorly Graded GRAVEL - very dense, wet, gray	120			SPT	76	GP	A-1-a	50/75 mm								
			37														
1260		125	38		SPT	102			50/100 mm								
			39														
		130			SPT												

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-486**

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

Logged by:	M. Ivers
Date Start:	6/25/01
Date Finish:	6/27/01
Station:	21+063 8.3 RT
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,214.527 E 19,097.454
Elevation (m):	1297.625
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 351IZLNI.GPJ 1/8/03

PLATE A-66
STRUCTURE 24B

Boring: LSB-24-486
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel - very dense, wet, gray					152	SM	A-2-4	27 50/ 100 mm								
		135	41		SPT	203			47 50/ 75 mm								
			42														
1255		140	43		SPT	0			50/ 50 mm								
			44														
		145			MC	203			24 44 50/ 75 mm								
			45		SPT	178			39 50/ 75 mm								
		150	46														
			47														
1250		155	48														
		160	49														
			50														
		165	51														
		170	52														
1245			53														
		175	54														
		180	55														
			56														
		185	57														
1240		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-486**

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

Logged by:	M. Ivers
Date Start:	6/25/01
Date Finish:	6/27/01
Station:	21+063 8.3 RT
Line:	LP NB to I-15 NB
Coordinates (m):	N 124,214.527 E 19,097.454
Elevation (m):	1297.625
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLN.GPJ 1/8/03

PLATE A-67
STRUCTURE 24B

Boring: LSB-24-498
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1295	FILL: Silty SAND with gravel - loose to very dense, moist, light gray				SPT	457			6 14 50/140 mm								
			1		SPT	305			4 5 1 1	10							
	Silty SAND with gravel - very loose to loose, moist to wet, olive gray	5			SPT	457	SM	A-2-4	1 2 2 2	5							
			2		SPT	305			2 3 4 4	3			20	34	11	28	
		10	3		SPT	356			4 3 2 2	6							
			4		SPT	610	ML	A-4	3 1 4 5	5			21	NP	NP	12 50	
	Sandy SILT with gravel - firm, wet, olive gray	15															
	Silty SAND - loose, wet, olive gray		5		SPT	406	SM	A-2-4	3 3 6 6	10						21	
1290					SPT	610			4 3 3 3	6							
	SILT - soft to stiff, wet, brown	20	6				ML	A-4									
					SPT	610			3 3 3 3	6			32	30	5	89	
			7		SPT	610			3 3 3 3	6							
		25	8		SPT	610			2 1 3 4	4			28	27	5	87	
					SPT	610			5 6 4 4	9							
		30	9		SPT	610	CL	A-4	2 3 3 4	6			29	28	8	88	
	Lean CLAY - firm to stiff, wet, brown		10		SPT	610			5 3 3 3	6							
1285		35	11		SPT	610			4 2 3 3	4			27	26	6	74	
					SPT				6 4 4 5	7							
		40	12		SPT	610			5 5 9 5	12			27	31	9	88	
	Silty SAND - medium to dense, wet, gray		13		SPT	610	SM	A-2-4	19 17 15 12	27						19	
		45	14		SPT	610			8 7 13 13	16						23	
					SPT				12 15 19 9	27							
1280		50	15		SPT				5 12 31 51	34							
			16														
	SILT with sand - very stiff, wet, gray	55	17		SPT	508	ML	A-4	6 7 10 20	13							
			18														
	Silty SAND - loose to very dense, wet, olive gray	60	19		SPT	356	SM	A-2-4	7 19 34 31	38							
		65								9							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-498**

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

Logged by:	S. Ward
Date Start:	9/17/01
Date Finish:	9/19/01
Station:	20+430 0.0 RT
Line:	LP NB to I-15 NB
Coordinates (m):	N 123,595.800 E 19,317.900
Elevation (m):	1295.217
Total Depth Drilled (m):	38.1
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

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

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-68
STRUCTURE 24A

Boring: LSB-24-498
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1275	Silty SAND (continued) - loose to very dense, wet, olive gray				SPT	203			3 3 4 3								
		70	21		SPT	356			26 44 45 31		○						
			22														
		75	23		SPT	406			16 40 50/80 mm		○						
			24														
		80	25		SPT	305			21 15 11 15	●17							
1270																	
	Sandy SILT - very stiff to hard, wet, olive gray	85	26		SPT	457	ML	A-4	4 7 21 12	●17							
			27														
		90			SPT	457			7 18 41 22	●36							
	Silty SAND - medium to very dense, wet, olive gray		28				SM	A-2-4									
		95	29														
			30														
1265		100	31														
		105	32		SPT	305			16 31 43 50/100 mm	●42							
			33														
		110	34		SPT				14 50/100 mm		○						
		115	35		SPT	457			3 8 11 16	●10							
1260			36														
		120	37		SPT	203			11 37 50/80 mm		○						
	Sandy SILT - hard, wet, olive gray	125	38		SPT		ML	A-4	11 50/80 mm		○						
			39														
		130															

UTDOT 3511ZLNI.GPJ 1/8/03

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-24-498**

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

Logged by:	S. Ward
Date Start:	9/17/01
Date Finish:	9/19/01
Station:	20+430 0.0 RT
Line:	LP NB to I-15 NB
Coordinates (m):	N 123,595.800 E 19,317.900
Elevation (m):	1295.217
Total Depth Drilled (m):	38.1
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

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SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring. LSB-25-451
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / $(N_1)_{60}$ (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: Poorly Graded SAND with gravel - medium dense, slightly moist, reddish-gray				SPT	406			12 12 8	40							
	Silty SAND - very loose, wet, moist to wet, gray	5	1		SPT	457	SM	A-3	2 2 2	6				31	5	47	
1295		10	2														
	SILT - stiff, wet, gray		3		P		ML	A-4			19	15.2	29			96	
		15	4														
	Poorly Graded SAND with gravel - medium dense, wet, gray		5		SPT	457	SP	A-3	6 6 5	16						54	
		20	6		SPT				22 23 14	47							
1290			7														
		25	8		SPT				35 20/50 mm								
	Sandy Silty CLAY - medium stiff, wet, gray	30	9		SPT	457	CL-ML	A-4	7 6 7	15			24			71	SV
		35	10														
			11		SPT	457			2 1 2	3			26	27	6	54	
1285	Poorly Graded GRAVEL with sand - very dense, wet, medium grained sand and gravel	40	12		SPT	203	GP	A-1	35 20/50 mm								
			13														
	Silty SAND with gravel - medium dense, wet, gray, medium-grainded sand, some gravel	45	14		SPT	305	SM	A-2-4	9 11 5	16						31	
			15														
		50	16		SPT	229			16 13 18	30							
		55	17		SPT	229			13 15 14	27							
1280			18														
		60	19		SPT	254			5 16 22	34			12			10	SV
		65								28							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-451**

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

Logged by:	B. Jellinek
Date Start:	5/23/01
Date Finish:	5/31/01
Station:	6+026.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 123,832.204 E 19,268.338
Elevation (m).	1297.168
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	D. Johnson
Rig Type:	CME-55
Rig Serial Number:	305205
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-70
STRUCTURE 25

Boring: LSB-25-451
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel (continued) - medium dense, wet, gray, medium-grainded sand, some gravel		21		SPT	229			19 16 14								
	SILT with sand - very stiff, wet, gray	70	22		SPT	0	ML	A-3	50/ 50 mm								
1275		75	23		SPT	356			11 12 12	● 20							
		80	24 25		SPT	457			6 8 10	● 14							
		85	26 27		SPT				6 6 12	● 14							
1270	Lean CLAY with sand - firm to very stiff, wet, olive-brown	90	28		SPT	457	CL	A-6	4 2 3	● 4			21	29	14	84	
		95	29 30		SPT	457			5 6 7	● 10							
		100	31		SPT	457			5 6 18	● 17							
1265		105	32 33		SPT	25			12 14 11	● 18							
		110	34		SPT	457			2 6 12	● 12			21	36	20	65	
	Silty SAND - medium, wet, stiff, *some gravel*	115	35 36		SPT	457	SM	A-4	15 13 14	● 18							
1260	Sandy Lean CLAY - stiff, wet, olive-brown	120	37		SPT	457	CL	A-6	5 8 7	● 10							
	Sandy SILT - very stiff to hard, wet, olive-brown	125	38 39		SPT	305	ML	A-4	8 8 8	● 10			30			67	SV
		130			SPT					● 26							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-451**

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

Logged by	B. Jellinek
Date Start:	5/23/01
Date Finish:	5/31/01
Station:	6+026.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 123,832.204 E 19,268.338
Elevation (m):	1297.168
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	D. Johnson
Rig Type:	CME-55
Rig Serial Number:	305205
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

MC = *Modified California* Sampler, 50 8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512ZLNI.GPJ 1/8/03

PLATE A-71
STRUCTURE 25

Boring: LSB-25-451
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy SILT (continued) - very stiff to hard, wet, olive-brown					356			14 20 20								
	Lean CLAY - stiff to very stiff, wet, olive-brown	135	41		SPT	457	CL	A-6	5 5 5	6			28	34	15	90	
1255			42														
		140	43		SPT	457			6 6 8	9							
			44														
		145			SPT	457			7 7 7	8							
			45														
		150	46		SPT	457			6 10 10	12							
1250			47														
		155	48														
		160	49														
			50														
		165	51														
1245		170	52														
			53														
		175	54														
		180	55														
			56														
		185	57														
1240		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-451**

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

Logged by:	B. Jellinek
Date Start:	5/23/01
Date Finish:	5/31/01
Station:	6+026.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 123,832.204 E 19,268.338
Elevation (m):	1297.168
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	D. Johnson
Rig Type:	CME-55
Rig Serial Number:	305205
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-72
STRUCTURE 25

Boring: LSB-25-452
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Poorly graded SAND with gravel - medium dense, slightly moist, brown				SPT	457			11 13 14 12	43							
1295	Sandy SILT - stiff, moist, dark brown	5	1 2		SPT	508	ML	A-4	5 6 3 2	12							
	Elastic SILT - very soft, wet, reddish-brown	10	3 4	P	P	457	MH	A-6				11.2	49	56	20	94	
		15	5		SPT	457			2 0 1 1	1							
1290	Silty SAND with gravel - medium, wet, gray,	20	6		MC	152	SM	A-2-4	11 10 18	14						28	
	Sandy SILT - stiff, wet, brown	25	7 8		SPT	381	ML	A-4	5 9 5 2	13			26	29	4	66	SV
	Silty SAND - stiff, wet, brown	30	9 10		SPT	559	SM	A-2-4	8 9 3 3	11				30	6	42	
1285	Sandy SILT - firm, wet, brown	35	11 12		SPT	305	ML	A-4	3 2 3	4			26	28	6	67	SV
	Silty GRAVEL with sand - very dense, wet, gray	40	13		SPT	152	GM	A-2-4	32 47 50							13	SV
		45	14		SPT				12 25 27	40							
		50	15 16		SPT	127			27 50/140 mm								
1280		55	17		SPT	102			25 50/140 mm								
	Silty SAND - medium, wet, olive gray, fine-grained sand	60	18 19		SPT	254	SM	A-2-4	11 12 14	18							
		65								13							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-452**

Sheet 1 of 3

Logged by:	M. Ivers
Date Start:	5/25/01
Date Finish:	5/29/01
Station:	6+066.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 123,870.541 E 19,256.942
Elevation (m):	1296.528
Total Depth Drilled (m):	45.9
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-73
STRUCTURE 25

Boring: LSB-25-452
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND (continued) - medium, wet, olive gray, fine-grained sand				SPT				2 8 11								
			21														
1275	Sandy SILT - very stiff to hard, wet, olive gray	70			SPT		ML	A-4	8 11 14	●16							
			22														
		75	23		SPT	254			9 25 37	●39							
			24														
	Silty SAND with gravel - medium to very dense, wet, olive, fine-grained sand	80			SPT	203	SM	A-2-4	30 50/100 mm		○						
			25														
		85	26		SPT	127			35 50/100 mm		○		7			17	
1270			27														
		90			SPT	406			6 11 14	●15							
			28														
		95	29		SPT				20 36 22	●33							
			30														
		100			SPT				28 41 32	●41							
			31														
1265		105	32		SPT	559			20 36 39	●41			7			11	
			33														
		110			SPT	0			39 50/140 mm	50●							
			34														
		115	35		SPT	76			34 50/140 mm	50●							
			36														
1260		120			SPT	203			24 32 26	●30							
			37														
		125	38		SPT	229			10 16 20	●18			23			45	
			39														
		130			SPT						○						

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-452**

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

Logged by:	M. Ivers
Date Start:	5/25/01
Date Finish:	5/29/01
Station:	6+066.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 123,870.541 E 19,256.942
Elevation (m):	1296.528
Total Depth Drilled (m):	45.9
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

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

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-25-452
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel (continued) - medium to very dense, wet, olive, fine-grained sand					203			47 50/ 75 mm								
1255		135	41														
			42														
	Lean CLAY - very stiff to hard, wet, reddish-brown	140	43		SPT	711	CL	A-6	8 9 15	● 11			34	47	24	93	
		145	44														
			45														
		150	46		SPT				50 50/ 50 mm		○						
1250			47														
		155	48														
		160	49														
			50														
		165	51														
1245		170	52														
			53														
		175	54														
		180	55														
			56														
1240		185	57														
		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-452**

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

Logged by:	M. Ivers
Date Start:	5/25/01
Date Finish:	5/29/01
Station:	6+066.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 123,870.541 E 19,256.942
Elevation (m):	1296.528
Total Depth Drilled (m):	45.9
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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

SAMPLE TYPE

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

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-75
STRUCTURE 25

Boring. LSB-25-453
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1300	FILL. Silty SAND - medium dense, moist, brown													
		SPT	305			14 17 25								
		SPT	76			6 3 3	9							
1295		SPT	406			2 3 4	9							
	Sandy Lean CLAY - firm, wet, gray, with frequent sand seams, light gray	SPT	457	CL	A-6	2 2 3	6			23	40	23	61	
	Poorly Graded SAND with silt and gravel - medium dense, wet, olive, fine to medium grained	SPT	305	SP-SM	A-2-4	4 5 5	12						12 15	
		SPT	229			5 11 14	30							
		SPT	305			22 22 20	50							
1290		SPT	381			6 6 6	14			26			50	
	Silty GRAVEL with sand - loose, wet, olive	SPT	356	GM	A-2-4	9 5 5	11						49	
	Sandy SILT - very stiff, wet, olive	SPT	305	ML	A-4	5 12 11	26						54	
	Silty SAND - medium, wet, olive	SPT	356	SM	A-2-4	7 9 8	19						29	
	Silty CLAY with sand - firm, wet, reddish brown, with occasional seams of fine-grained sand	SPT	406	ML	A-4	3 3 5	8				27	5	85	
1285	Poorly Graded SAND - medium dense to dense, wet, gray, fine- to medium-grained sand, trace gravel	SPT	356	SP	A-3	10 11 21	33							
		SPT	279			14 13 14	27							
	Sandy SILT - very stiff, wet, gray	SPT	76	ML	A-4	7 9 21	29							

Depth: ft / m

Graphic Log

SAMPLE

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

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

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-453**

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

Logged by:	**S. Lewis**
Date Start:	**6/26/01**
Date Finish:	**6/28/01**
Station:	**6+189.0**
Line:	**LP NB to US 89 NB**
Coordinates (m).	**N 123,990.353 E 19,230.314**
Elevation (m):	**1300.277**
Total Depth Drilled (m):	**46.2**
Drill Contractor:	**Spectrum**
Driller:	**R. Dockery**
Rig Type:	**CME750**
Rig Serial Number:	**307218**
Drilling Method:	**Mud Rotary**
Hammer Type:	**Automatic**
Rod Type:	**AW**
Boring Diameter:	**121 mm**

LEGEND/NOTES

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

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

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

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

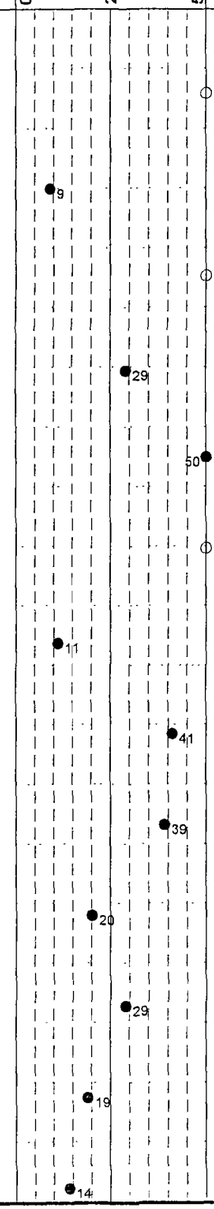
UTDOT 3511ZLNLGPJ 1/8/03

PLATE A-76
STRUCTURE 25

Boring LSB-25-453
Sheet 2 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)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1280	Sandy SILT (continued) - very stiff, wet, gray			MC	51			6 7 13			30	NP	NP	52	
		70	21												
	Poorly Graded SAND - very dense, wet, trace gravel			SPT	305	SP	A-3	16 37 38							
			22												
	Sandy SILT - stiff, wet, olive	75	23	SPT	76	ML	A-4	3 3 7							
			24												
	Poorly Graded SAND with silt and gravel - very dense, wet	80	25	SPT	406	SP-SM	A-3	21 34 50/125 mm						8	
1275															
	Silty SAND with gravel - dense, wet, olive gray, fine- to medium-grained with gravel	85	26	SPT	305	SM	A-2-4	21 20 14							
			27												
		90	28	SPT	381			21 20 14							
	Poorly Graded GRAVEL - very dense, wet, gray, with occasional layers of fine sand	95	29	SPT	178	GP	A-1	47 50							
			30												
1270	Sandy SILT - stiff to hard, wet, olive	100	31	SPT	432	ML	A-4	3 5 9							
		105	32	SPT	457			0 20 33							
			33												
	Poorly Graded GRAVEL - very dense, wet, olive gray, fine-grained with sand	110	34	SPT	229	GP	A-1	21 31 21							
1265	Silty SAND - medium to dense, wet, olive gray, fine- to medium-grained sand, trace gravel	115	35	SPT	254	SM	A-2-4	12 10 17							
			36												
		120	37	SPT	279			11 16 24							
	Sandy SILT - very stiff, wet, olive	125	38	SPT	457	ML	A-4	9 12 14							
			39												
		130		SPT											

Graphic Log



Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-453**

Sheet 2 of 3

Logged by:	S. Lewis
Date Start:	6/26/01
Date Finish:	6/28/01
Station:	6+189.0
Line:	LP NB to US 89 NB
Coordinates (m):	N 123,990.353 E 19,230.314
Elevation (m):	1300.277
Total Depth Drilled (m):	46.2
Drill Contractor	Spectrum
Driller:	R. Dockery
Rig Type:	CME750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type.	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = *Observed Groundwater depth at time of drilling*

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512ZLNI.GPJ 1/8/03

PLATE A-77
STRUCTURE 25

Boring: LSB-25-453
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ ○ (Greater than 50 Blows) 0 25 50	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1260	Sandy SILT (continued) - very stiff, wet, olive					457			5 7 13								
	Silty SAND - very dense, wet, gray, fine-grained sand with trace gravel	135	41		MC	305	SM	A-2-4	16 32 36	● 36							
			42														
	Sandy SILT - very stiff, wet, olive	140	43		SPT	356	ML	A-4	8 9 14	● 15							
			44														
	Poorly Graded SAND - dense, wet, gray	145	45		SPT	457	SP	A-3	8 17 27	● 27							
1255	Lean CLAY - very stiff, wet, gray, trace gravel	150	46		SPT	457	CL	A-6	5 8 12	● 12							
			47														
		155	48														
		160	49														
1250		165	50														
			51														
		170	52														
		175	53														
			54														
1245		180	55														
			56														
		185	57														
		190	58														
			59														
		195															

UTDOT 3511ZLNI.GPJ 1/8/03

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-453**

Sheet **3** of **3**

Logged by:	S. Lewis
Date Start:	6/26/01
Date Finish:	6/28/01
Station:	6+189.0
Line:	LP NB to US 89 NB
Coordinates (m):	N 123,990.353 E 19,230.314
Elevation (m):	1300.277
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: LSB-25-454
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Poorly Graded SAND with gravel -very loose to loose, moist to wet, tan		1													
		5	2		SPT	508			5 2 5 3							
					SPT	610			4 2 2 2			26	31	3	45	
1295		10	3		SPT	610			2 1 2 2							
	Lean CLAY - soft, wet, dark gray						CL	A-6								
			4		SPT	533			2 1 2 2			28	27	27	21	
	Silty SAND - very loose, wet, gray						SM	A-2-4								
	Poorly Graded SAND with silt - loose, wet, gray	15	5		SPT	584	SP-SM	A-3	1 0 5 6			25			9	
					SPT	610			7 11 14 18						13	
	Poorly Graded GRAVEL with sand - medium dense, wet, gray						GP	A-1								
	Silty SAND - medium to very dense, wet, gray, occasional silt layers	20	6		SPT	610	SM	A-2-4	14 15 21 20							
			7		SPT	610			17 22 25 27			9			14	
		25			SPT	102			12 34 32 27							
1290			8													
					SPT	533			7 7 10 13			28			11	
		30	9		SPT	483			5 14 13 15						65	
			10		SPT	406			8 12 29 31			20			26	
		35	11		SPT	254			12 8 23 25						13	
					SPT	305			27 32 32							
		40	12													
	Poorly Graded SAND with silt - very dense, wet, gray				SPT	254	SP-SM	A-3	18 32 47			8			11	
1285			13													
		45	14		SPT	152	SM	A-2-4	7 22 39							
	Silty SAND - very dense, wet, gray															
			15													
	Poorly Graded GRAVEL with silt - very dense, wet, gray	50			SPT	152	GP-GM	A-1	32 50/140 mm							
			16													
	SILT - stiff, wet, olive gray	55	17		SPT	406	SM	A-4	8 7 7 11							
			18													
1280	Silty GRAVEL - very dense, wet, olive gray	60	19		SPT	330	GM	A-2-4	20 42 50							
		65														

Legend: ● SPT $(N_1)_{60}$; ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-454**

Sheet 1 of 3

Logged by:	M. Ivers
Date Start:	6/12/01
Date Finish:	6/14/01
Station:	6+287.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 124,088.687 E 19,222.720
Elevation (m):	1298.082
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-79
STRUCTURE 25

Boring: LSB-25-454
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy SILT - very stiff, wet, dark gray				SPT	508	ML	A-4	9 11 14 19								
		70	21														
	Silty GRAVEL - very dense, wet, gray				SPT	457	GM	A-2-4	7 21 31 50	●35							
		75	22														
1275	Sandy SILT - hard, wet, dark gray		23		SPT	483	ML	A-4	10 21 20 24	●27							
		80	24														
			25		SPT	330			14 27 50/100 mm		○						
	Poorly Graded SAND with silt - medium to very dense, wet, gray	85	26		SPT	305	SP-SM	A-3	17 22 50/50 mm		○		10			11	
			27														
		90	28		SPT	0			21 12 18 32	●18							
1270																	
	Silty SAND with gravel - very dense, wet, gray	95	29		SPT	533	SM	A-2-4	12 22 47 45	●41							
			30														
		100	31		SPT				14 36 49 46	●49							
	SILT with sand - stiff to hard, wet, olive gray	105	32		SPT	610	ML	A-4	7 7 7 12	●8			28	31	10	78	
1265			33														
		110	34		SPT	610			8 21 50	●39							
	Silty SAND with gravel - very dense, wet, gray	115	35		SPT	559	SM	A-2-4	23 40 44 22	●46							
			36														
		120	37		SPT				49 50/75 mm		○		11			15	SV
1260	Lean CLAY - hard, wet, gray	125	38		SPT	0	CL	A-6	41 50/140 mm		○						
			39														
		130			SPT						○						

Test Results *

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-454**

Sheet **2** of **3**

Logged by:	M. Ivers
Date Start:	6/12/01
Date Finish:	6/14/01
Station:	6+287.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 124,088.687 E 19,222.720
Elevation (m):	1298.082
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-80
STRUCTURE 25

Boring: LSB-25-454
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Sample Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Lean CLAY (continued) - hard, wet, gray					279			34 50/125 mm							
		135	41		SPT	610			12 32 37 53							
			42													
1255		140	43		SPT	279			12 22 50/75 mm							
			44													
	Silty SAND - very dense, wet, gray	145			MC	152	SM	A-2-4	39 50/125 mm		18.1	15			31	
			45		SPT				33 50/140 mm							
		150	46													
			47													
1250		155	48													
		160	49													
			50													
		165	51													
		170	52													
1245			53													
		175	54													
		180	55													
			56													
		185	57													
1240		190	58													
			59													
		195														

● SPT $(N_1)_{60}$
○ SPT $(N_1)_{60}$ (Greater than 50 Blows)
0 25 50

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-454**

Sheet **3** of **3**

Logged by:	M. Ivers
Date Start:	6/12/01
Date Finish:	6/14/01
Station:	6+287.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 124,088.687 E 19,222.720
Elevation (m):	1298.082
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D-120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

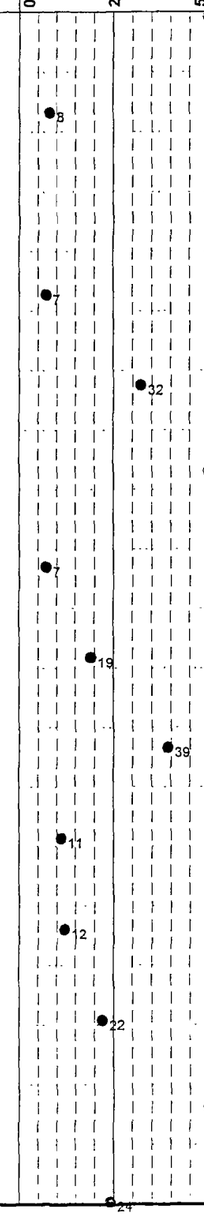
BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring LSB-25-455
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL. Silty SAND with gravel - dense, slightly moist, light brown, fine to medium grained with gravel				SPT	127			12 18 17							
	Silty SAND with gravel - very loose to loose, slightly moist to wet, light brown, fine to medium grained with gravel	5	1		MC	254	SM	A-2-4	3 2 3						19	
1295		10	2		P	610										
		15	3		SPT	305			4 2 2			18				
	Poorly Graded GRAVEL - medium to dense, wet, light gray, coarse grained	20	4		SPT	51	GP	A-1	4 9 10							
1290		25	5		SPT	76			11 20 14							
	SILT - firm, wet, lightly brown, with gray sand seams	30	6		SPT	279	ML	A-4	2 2 3			30	29	6	95	
	Silty SAND with gravel - medium, wet, dark gray	35	7		SPT	178	SM	A-2-4	4 4 10							
	Poorly Graded GRAVEL with silt - medium, wet, dark olive gray	40	8		SPT	229	GP-GM	A-2-4	17 14 16			10			10	
1285	Sandy SILT with gravel - stiff to very stiff, wet, dark gray	45	9		MC	305	ML	A-4	6 6 5							
		50	10		SPT	457			3 3 7							
	Silty SAND - medium, wet, olive gray	55	11		SPT	406	SM	A-2-4	3 10 9							
1280	Poorly Graded GRAVEL with sand - very dense, wet, dark olive gray	60	12		SPT	330	GP	A-1	26 28 31							
	Silty SAND - medium, wet, olive gray, fine- to medium-grained sand	65	13				SM	A-2-4								

● SPT $(N_1)_{60}$
○ SPT $(N_1)_{60}$ (Greater than 50 Blows)



Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-455**

Sheet **1** of **3**

Logged by:	S. Lewis
Date Start:	6/5/01
Date Finish:	6/6/01
Station:	6+372.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 124,171.640 E 19,204.700
Elevation (m):	1298.143
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter.	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-82
STRUCTURE 25

Boring: LSB-25-455
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND (continued) - medium, wet, olive gray, fine- to medium-grained sand				SPT	305			11 12 11								
		70	21		MC	356			7 10 14	19							
			22														
		75	23		SPT	457	ML	A-4	5 7 9	16							
1275	SILT - very stiff, wet, lightly brown, with gray sand seams																
			24														
	Silty GRAVEL - very dense, wet, yellow brown	80			SPT	457	GM	A-2-4	39 44 33		○						
			25														
	Silty SAND - medium dense, wet, dark gray	85	26		SPT	457	SM	A-2-4	6 6 5	10			24			47	
			27														
		90			SPT	305			3 5 7	11							
1270			28														
	Silty SAND with gravel - medium dense to dense, wet, dark olive gray	95	29		MC	254	SM	A-2-4	16 50/140 mm		○						
			30														
		100			SPT	152			16 45 45		○					16	
			31														
	Clayey SAND - medium dense, wet, dark gray						SC	A-2-4									
		105	32		SPT	432			4 8 11	16			30	10		41	
			33														
1265																	
	Lean CLAY - stiff to hard, wet, grayish-brown	110			SPT	457	CL	A-6	3 5 7	10							
			34														
		115	35		SPT	457			8 22 16	31							
			36														
	SILT - stiff, wet, brown	120			SPT	406	ML	A-4	10 11 14	20							
			37														
1260		125	38		MC	305			7 11 15	16							
	Silty SAND - medium dense, wet, gray, frequent peat seams, fine to medium grained						SM	A-2-4									
			39														
		130			SPT					28							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-455**

Sheet **2** of **3**

Logged by:	S. Lewis
Date Start:	6/5/01
Date Finish.	6/6/01
Station:	6+372.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 124,171.640 E 19,204.700
Elevation (m):	1298.143
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type.	CME750
Rig Serial Number:	307218
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type.	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-83
STRUCTURE 25

Boring: LSB-25-455
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND (continued) - medium dense, wet, gray, frequent peat seams, fine to medium grained					406			6 18 19					NP	NP	16	
		135	41		SPT	381			8 18 14	●24							
			42														
		140	43		SPT	457			3 4 7	●8							
1255																	
		145	44														
	Lean CLAY - stiff to hard, wet, reddish-brown				MC	381	CL	A-6	5 18 21	●21		13.6	33			96	
			45														
		150	46		SPT	305			4 5 7	●8							
			47														
		155	48														
1250																	
		160	49														
			50														
		165	51														
		170	52														
			53														
1245		175	54														
		180	55														
			56														
		185	57														
		190	58														
1240			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-25-455**

Sheet **3** of **3**

Logged by:	S. Lewis
Date Start:	6/5/01
Date Finish:	6/6/01
Station:	6+372.5
Line:	LP NB to US 89 NB
Coordinates (m):	N 124,171.640 E 19,204.700
Elevation (m).	1298.143
Total Depth Drilled (m):	46.2
Drill Contractor:	Spectrum
Driller:	R. Dockery
Rig Type:	CME750
Rig Serial Number:	307218
Drilling Method.	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNLGPJ 1/8/03

Boring: LSB-26-456
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-26-337 for additional lithology above 24.4 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1295		5	1														
			2														
	Silty SAND - wet, gray, with silt lenses	10	3		SH	508						16.1	13	33	3	16	
			4														
		15	5														
		20	6		SH	0											
1290			7		MC	0			6 9 8 7	●13							
	Lean CLAY - stiff to very stiff, moist, brown, frequent black sand seams	25	8		MC	203			5 5 6 5	●8		17.4	22				
		30	9														
			10														
		35	11														
1285		40	12														
			13														
		45	14														
		50	15														
			16														
1280		55	17														
		60	18														
			19														
		65															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-26-456**

Sheet **1** of **3**

Logged by:	M. Ivers
Date Start:	5/16/01
Date Finish:	5/18/01
Station:	12+600 10.0 LT
Line:	US 89 SB TO I-15 SB
Coordinates (m):	N 124,122.631 E 19,133.384
Elevation (m):	1296.954
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 35112LNLGPJ 1/8/03

Boring: LSB-26-456
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-26-337 for additional lithology above 24.4 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.		21														
		70	22														
1275		75	23														
			24														
	Lean CLAY - very stiff, wet, olive gray, occasional silt and black sand seams and layers	80	25		SPT	457	CL	A-6	3 6 10 10	10							
	Poorly Graded GRAVEL with sand - very dense, moist, olive gray	85	26		SPT	254	GP	A-3	17 31 47 15	48							
1270			27														
		90	28		SPT	0			48 50/150 mm								
	Lean CLAY - hard, moist, black, 50 mm gravel clast in sampler shoe	95	29		SPT	76	CL	A-6	18 24 39	36							
			30														
	Silty GRAVEL with sand - very dense, moist to wet, olive gray, fine- to coarse-grained gravel	100	31		SPT	330	GM	A-3	6 17 50	38						31	
1265	Silty SAND with gravel - very dense, wet, olive gray, fine- to coarse-grained gravel	105	32		SPT	305	SM	A-2-4	15 21 45	36							
			33														
	Lean CLAY - very stiff, moist, olive gray, occasional pockets of fine-grained gravel and medium-grained sand	110	34		SPT	457	CL	A-6	6 9 13	12			23	40	21		
		115	35		SPT	457			5 7 10	9							
	Silty SAND with gravel - dense to very dense, wet, gray		36				SM	A-3									
1260		120	37		SPT	102			50/140 mm								
	- increasing gravel content	125	38		SPT	203			34 50/140 mm							17	
			39														
		130			SPT					24							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-26-456**

Sheet **2** of **3**

Logged by:	M. Ivers
Date Start:	5/16/01
Date Finish:	5/18/01
Station:	12+600 10.0 LT
Line:	US 89 SB TO I-15 SB
Coordinates (m):	N 124,122.631 E 19,133.384
Elevation (m):	1296.954
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLN.GPJ 1/8/03

PLATE A-86
STRUCTURE 26

Boring: LSB-26-456
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel (continued) - dense to very dense, wet, gray					0			13 22 25								
	Poorly Graded SAND - medium dense to very dense, wet, gray, with silt seams	135	41		MC	406	SP	A-3	11 47 50	37							
1255			42														
	Lean CLAY - very stiff to hard, moist, gray	140	43		SPT	229	CL	A-6	9 12 17	14			29	34	15		
			44														
	- frequent black sand seams and layers	145			MC	457			9 10 21	11							
			45		SPT	610			12 18 22 33	19							
		150	46														
1250		155	47														
			48														
		160	49														
			50														
		165	51														
1245		170	52														
			53														
		175	54														
		180	55														
			56														
		185	57														
1240		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-26-456**

Sheet **3** of **3**

Logged by:	M. Ivers
Date Start:	5/16/01
Date Finish:	5/18/01
Station:	12+600 10.0 LT
Line:	US 89 SB TO I-15 SB
Coordinates (m):	N 124,122.631 E 19,133.384
Elevation (m):	1296.954
Total Depth Drilled (m):	45.4
Drill Contractor:	RC Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method.	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI GPJ 1/8/03

PLATE A-87
STRUCTURE 26

Boring LSB-26-487
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL: Silty SAND with gravel - loose to medium dense, slightly moist, brown		1													
		5	2		SPT	610			7 7 8 9							
	- some fine-grained gravel				SPT	76			5 4 4 4							
1295		10	3		SPT	508	CL	A-6	3 3 3 5			30	34	13	75	
	Lean CLAY with sand - firm, wet, brown, occasional poorly graded sand layers															
	SILT with sand - very stiff, wet, brown to gray		4		SPT	203	ML	A-4	7 10 7 15						67	
		15			SPT	152	GP-GM	A-2-4	21 17 15 14			10			7	
	Poorly Graded GRAVEL with silt and sand - medium to dense, wet, brown to gray		5													
					SPT	254			5 11 7 9						5	
		20	6		SPT	203			7 15 13 5							
			7		SPT	610	ML	A-4	2 2 2 2			35	31	7	95	
	SILT - soft, wet, brown	25														
1290			8		SPT	610			1 1 1 2							
					SPT	610			2 1 2 1			33	33	9	84	
		30	9													
	Lean CLAY - firm to stiff, moist to wet, brown, frequent sand seams				SPT	610	CL	A-6	1 2 4 2							
			10		SPT	610			2 2 3 5			27	33	15	95	
		35	11		SPT	279			2 3 7 12							
	Poorly Graded SAND with gravel - loose to very dense, wet, dark gray						SP	A-3								
		40	12													
					SPT	508			15 27 28 29							
1285	Poorly Graded GRAVEL with sand - very dense, wet, gray, fine- to coarse-grained gravel		13				GP	A-3								
		45	14		SPT	381			18 29 31 36							
			15													
	- occasional poorly graded sand layer	50			SPT	305			15 27 50/125 mm							
			16													
		55	17		SPT	76			50/100 mm							
1280			18													
		60			SPT	102			50/125 mm							
			19													
		65														

Graphic Log legend: SPT $(N_1)_{60}$; SPT $(N_1)_{60}$ (Greater than 50 Blows)

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-26-487**

Sheet 1 of 3

Logged by:	M. Ivers
Date Start:	6/21/01
Date Finish:	6/22/01
Station:	12+666 0.0 RT
Line:	US 89 SB TO I-15 SB
Coordinates (m).	N 124,190.072 E 19,124.774
Elevation (m):	1297.747
Total Depth Drilled (m):	45.6
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = *Number of blows required to drive split spoon sampler 150 mm or interval shown*

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI GPJ 1/8/03

PLATE A-88
STRUCTURE 26

Boring LSB-26-487
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly Graded GRAVEL with sand (continued) - very dense, wet, gray, fine- to coarse-grained gravel				SPT	457			15 29 50/125 mm								
		70	21		SPT	0			50/75 mm		○						
			22														
1275	Poorly Graded SAND with silt and gravel - very dense, wet, gray	75	23		SPT	203	SP-SM	A-2-4	26 49		○		9			7	
			24														
		80			SPT	127			50/150 mm		○						
			25														
	Lean CLAY - very stiff, wet, gray, trace gravel						CL	A-6									
		85	26		SPT	457			12 14 13 15	●17							
			27														
1270	Silty SAND - dense, wet, yellow-brown, occasional silt seams	90			SPT	508	SM	A-3	12 17 27 21	●27			21			40	
			28														
		95	29		SPT	483			44 35 15 24	●39							
	Sandy Fat CLAY - hard, wet, gray, trace fine-grained gravel						CH	A-7									
			30														
		100			SPT	508			15 19 19 32	●23			22	63	37	58	
	Silty SAND with gravel - dense, wet, yellow-brown		31				SM	A-2-4									
		105	32		SPT	102	GP	A-3	54/125 mm		○						
1265			33														
		110			SPT	76			50/125 mm		○						
			34														
	- with medium sand	115	35		SPT	406			17 10 10 47	●11							
			36														
		120			SPT	254			15 23 31 40	●29							
			37														
1260			38														
	SILT - hard, wet, gray, occasional sand seams	125			SPT	381	ML	A-4	10 20 25 41	●24							
			39														
		130			SPT					●28							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-26-487**

Sheet **2** of **3**

Logged by:	M. Ivers
Date Start:	6/21/01
Date Finish:	6/22/01
Station:	12+666 0.0 RT
Line.	US 89 SB TO I-15 SB
Coordinates (m):	N 124,190.072 E 19,124.774
Elevation (m):	1297.747
Total Depth Drilled (m):	45.6
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D120037
Drilling Method:	Hollow-Stem Auger
Hammer Type.	Automatic
Rod Type:	AW
Boring Diameter	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-89
STRUCTURE 26

Boring: LSB-26-487
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / (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 - very dense, wet, gray, some gravel					406	SM	A-2-4	15 22 31 37								
	SILT - hard, wet, gray, occasional medium-grained sand lense	135	41		SPT	381	ML	A-4	6 16 22 29	● 20							
1255		140	42		SPT	432			27 31 50/100 mm		○						
	Silty SAND with gravel - very dense, wet, gray, fine- to coarse-grained gravel	145	43		SPT	610	SM	A-2-4	11 27 28 23	● 27							
	Lean CLAY - hard, wet, gray, frequent sand seams		44		SPT	610	CL	A-6	10 15 17 23	● 16							
		150	45														
		155	46														
1250		160	47														
		165	48														
		170	49														
1245		175	50														
		180	51														
		185	52														
1240		190	53														
		195	54														
			55														
			56														
			57														
			58														
			59														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-26-487**

Sheet **3** of **3**

Logged by:	M. Ivers
Date Start:	6/21/01
Date Finish:	6/22/01
Station:	12+666 0.0 RT
Line:	US 89 SB TO I-15 SB
Coordinates (m):	N 124,190.072 E 19,124.774
Elevation (m):	1297.747
Total Depth Drilled (m).	45.6
Drill Contractor:	RC Exploration
Driller.	N. Young
Rig Type.	Diedrich D-120 Truck
Rig Serial Number:	D120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-90
STRUCTURE 26

Boring: LSB-26-489
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy Lean CLAY - very stiff, slightly moist, brown				SPT	610	CL	A-6	6 10 16 18	44							
			1		SPT	610			8 11 4 4	26							
		5			MC	254			7 4 4 3	10							
1295			2		SPT	610			1 2 2 3	6							
		10	3		MC	152			3 3 4 3	8							
	- frequent sand seams		4		SPT	610			3 3 3 5	8			34	35	35	60	
	Silty SAND - very loose to loose, wet, brown, trace gravel	15	5		MC	457	SM	A-2-4	5 4 3 2	7							
					SPT	610			2 2 2 3	5							
	SILT - soft, wet, gray, trace sand						ML	A-4									
	Silty SAND - medium dense, wet, gray to dark brown, trace clay	20	6		MC	406	SM	A-2-4	4 6 7 4	12						20	
			7		SPT	610			4 4 8 9	14							
1290		25	8		MC	305			7 7 8 7	13						14	
					SPT				9 8 7 7	7							
		30	9		MC	610			6 12 15 22	22							
	Poorly Graded SAND with silt - loose to very dense, wet, gray		10		SPT	610	SP-SM	A-2-4	11 17 14 19	32						9	
		35	11		MC	610			5 12 12 12	18							
					SPT	610			8 8 10 11	17							
1285		40	12		MC	610			5 11 14 14	18							
			13		SPT	610			3 1 3 8	4							
		45	14		MC	610			9 20 32 41	36						10	
					SPT	610			47 44 50/125 mm								
		50	15		SPT	508			11 24 26 31	43							
			16														
		55	17		SPT	610			16 19 18 24	30							
1280			18														
		60			SPT	508			12 22 27 43	38							
			19														
		65								19							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-26-489**

Sheet 1 of 2

Logged by:	S. Ward
Date Start:	8/1/01
Date Finish:	8/2/01
Station:	12+555 14.0 LT
Line:	US 89 SB TO I-15 SB
Coordinates (m):	N 124,085.700 E 19,161.400
Elevation (m):	1297.076
Total Depth Drilled (m):	30.2
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512LNI.GPJ 1/8/03

PLATE A-91
STRUCTURE 26

Boring: LSB-26-489
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly Graded SAND with silt (continued) - loose to very dense, wet, gray				SPT	305			5 10 15 23								
		70	21		SPT	610			3 4 3 9	5							
1275			22														
	Silty SAND - medium to very dense, wet, gray, occasional gravel layers	75	23		SPT	610	SM	A-2-4	9 7 9 14	11						14	
			24														
		80	25		SPT	610			9 12 50/100 mm								
	- occasional reddish-brown sandy silt layers	85	26		SPT	457			14 12 17 32	19							
1270			27														
	- frequent clayey silt with sand layers	90	28		SPT	610			8 16 13 15	19							
		95	29		MC	610			9 10 16 25	13							
	Poorly Graded SAND - very dense, wet, gray		30		SPT	610	SP	A-2-4	7 31 50/89 mm								
		100	31														
1265		105	32														
			33														
		110	34														
		115	35														
			36														
		120	37														
1260																	
		125	38														
			39														
		130															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-26-489**

Sheet **2** of **2**

Logged by:	S. Ward
Date Start:	8/1/01
Date Finish:	8/2/01
Station:	12+555 14.0 LT
Line:	US 89 SB TO I-15 SB
Coordinates (m):	N 124,085.700 E 19,161.400
Elevation (m):	1297.076
Total Depth Drilled (m):	30.2
Drill Contractor:	RC Exploration
Driller:	N. Young
Rig Type:	Diedrich D-120 Truck
Rig Serial Number:	D120037
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512ZLNI.GPJ 1/8/03

Boring. LSB-28-457
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-28-346 for additional lithology above 25.9 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
	Silty SAND with gravel - medium dense, wet, gray, coarse-grained, subrounded gravel up to 13 mm, occasional silt layers	10	3		SH	610	SM	A-4				14.8	16	30	5	37	TR
1290		15	5														
	-loose, olive gray, no gravel																
	Silty CLAY - firm, moist, gray to olive, frequent silt seams	20	6		SPT		CL-ML	A-6	3 2 3 5	●4			26	26	6	89	
		25	8														
1285	SILT with sand - stiff, moist, gray, very fine-grained	30	9		SPT		SP	A-3	5 6 7	●9			71	NP	NP	82	
		35	11														
	SILT with sand - firm, moist, olive brown, frequent black silt partings	40	12		SPT		ML	A-4	3 3 5 7	●5			29	25	NP	73	
1280		50	15														
		55	17														
		60	18														
1275		65	19														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-28-457**

Sheet 1 of 3

Logged by:	M. Ivers
Date Start:	4/26/01
Date Finish:	4/27/01
Station:	4+883 0.0 LT
Line:	Burke Lane
Coordinates (m):	N 124,342.924 E 18,712.009
Elevation (m):	1294.547
Total Depth Drilled (m):	46.3
Drill Contractor:	R.C. Exploration
Driller:	R. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-28-457
Sheet 2 of 3

SAMPLE DESCRIPTION
(ASTM D 2488/D 2487)

Elevation (m)	Sample Description
	Refer to SB-28-346 for additional lithology above 25.9 meters Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples
1270	Poorly Graded GRAVEL - loose to medium, wet, gray, subrounded gravel up to 19 mm, occasional black lean clay layers
1265	Clayey SAND - medium to very dense, wet, olive gray, medium-grained, occasional gravel layers
	Silty GRAVEL - medium to very dense, wet, gray to olive, coarse-grained, subrounded gravel up to 12 mm
1260	Lean CLAY - hard, wet, black, with slight odor and vertical roots
	Poorly Graded SAND - medium to very dense, wet, olive gray, occasional silt layers
1255	

Depth ft: 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130
Depth m: 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39

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)
SPT	0	GP	A-1-a	3	4	3	2	3	
SPT	457			2	22	15	19	16	
SPT	610	SC	A-6	13	13	12	11	10	
SPT	610	GM	A-4	6	30	47	50/75 mm		31
SPT	381			16	38	28	26		25
SPT	610			8	13	17	19	11	
SPT	356	CL / SP	A-6 / A-3	7	11	23		12	
SPT	508			12	12	15	44	10	
SPT	203			49	50/100 mm				
SPT								10	

Test Results *

Type	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
SPT							
SPT			27			6	
SPT			24			47	
SPT						38	
SPT							
SPT							
SPT							
SPT							
SPT							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No 35-8440-06

FIELD TEST BORING LOG
Boring: **LSB-28-457**
Sheet **2** of **3**

Logged by:	M. Ivers
Date Start:	4/26/01
Date Finish:	4/27/01
Station:	4+883 0.0 LT
Line:	Burke Lane
Coordinates (m).	N 124,342.924 E 18,712.009
Elevation (m):	1294.547
Total Depth Drilled (m):	46.3
Drill Contractor:	R.C. Exploration
Driller:	R. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES
Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = *Observed Groundwater depth at time of drilling*

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE
SPT = Standard Penetration Test, 34 9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI GPJ 1/8/03

PLATE A-94
STRUCTURE 28

Boring: LSB-28-457
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Poorly Graded SAND (continued) - medium to very dense, wet, olive gray, occasional silt layers					406			5 11 17 9								
		135	41		SPT	610			7 13 22 30	12							
	Poorly Graded GRAVEL - dense to very dense, wet, gray		42				GP	A-1-a									
		140	43		SPT				13 30 27 37	19							
			44														
1250	Poorly Graded SAND - dense to very dense, moist, gray, fine-grained, occasional silt and lean clay layers	145			SPT		SP	A-3	9 29 20 21	16							
			45														
		150	46		MC				8 24 31 32	14		16.8	22				
			47														
		155	48														
		160	49														
1245			50														
		165	51														
		170	52														
			53														
		175	54														
1240		180	55														
			56														
		185	57														
		190	58														
			59														
1235		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-28-457**

Sheet **3** of **3**

Logged by:	M. Ivers
Date Start:	4/26/01
Date Finish:	4/27/01
Station:	4+883 0.0 LT
Line:	Burke Lane
Coordinates (m):	N 124,342.924 E 18,712.009
Elevation (m):	1294.547
Total Depth Drilled (m):	46.3
Drill Contractor:	R.C. Exploration
Driller:	R. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-29-458
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-28-347 or SB-29-348 for additional lithology above 18.3 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.		1														
1295		5	2														
		10	3														
			4														
		15	5														
		20	6														
1290	SILT - firm, moist, gray		7		SPT	457	ML	A-4	3 3 3	●9			25	29	5	91	
	SILT with sand - moist, gray	25	8		P	76	ML	A-4					27	26	1	84	
	Lean CLAY - moist, brown to olive	30	9		P	533	CL	A-6				14.7	31	33	11	97	
			10														
		35	11														
1285		40	12														
			13														
		45	14														
			15														
		50	16														
1280		55	17														
			18														
	Poorly Graded GRAVEL with sand - very dense, wet, gray	60	19		SPT	127	GP	A-1-a	21 27 25	●47							
		65								●50							

UTDOT 3511ZLNI.GPJ 1/8/03

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-29-458**

Sheet **1** of **3**

Logged by:	M. Ivers
Date Start:	5/1/01
Date Finish:	5/4/01
Station:	5+043 0.0 RT
Line:	Burke Lane
Coordinates (m):	N 124,387.302 E 18,751.718
Elevation (m):	1296.619
Total Depth Drilled (m).	53.9
Drill Contractor:	Spectrum Drilling
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	(Old CME-750)
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

Boring: LSB-29-458
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND - dense, wet, gray				SPT	330	SM	A-2-4	12 13 21				21			25	
1275	Poorly Graded GRAVEL - dense, wet, gray	70	21		SPT	356	GP	A-1-a	14 23 27	42							
		75	22		SPT	381			19 21 23	35							
	Poorly Graded SAND with gravel - very dense, wet, gray, coarse- to medium-grained sand	80	23		SPT	330	SP	A-1-b	37 34 23	44							
1270	Poorly Graded GRAVEL with silt and sand - dense to very dense, wet, gray, fine- to coarse-grained, angular gravel up to 50 mm	85	24		SPT	356	GP-GM	A-1-a	17 29 22	38			9			10	
		90	25		SPT	0			13 22 27	35							
		95	26		SPT	330			16 20 22	30							
	Sandy Fat CLAY - very stiff to hard, wet, olive	100	27		SPT	102	CH	A-7-6	64/ 100 mm								
1265		105	28		SPT	457			4 6 12	12			24	50	30	67	
	Poorly Graded SAND with silt and gravel - dense, wet, brown, fine- to coarse-grained sand	110	29		MC	279	SP-SM	A-1-b	21 20 23	22			13			11	
	Sandy Lean CLAY - stiff, moist, olive, gravel up to 6 mm	115	30		MC	356	CL	A-6	7 10 13	11			22	33	14	63	
1260	Silty GRAVEL with sand - very dense, wet	120	31		SPT	203	GM	A-2-4	29 50/ 150 mm				15			29	
	Sandy Lean CLAY - very stiff, moist, brown	125	32		SPT		CL	A-6	6 8 15	14			29	40	18	69	
		130	33		SPT					13							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-29-458**

Sheet **2** of **3**

Logged by:	M. Ivers
Date Start:	5/1/01
Date Finish:	5/4/01
Station:	5+043 0.0 RT
Line:	Burke Lane
Coordinates (m):	N 124,387.302 E 18,751.718
Elevation (m):	1296.619
Total Depth Drilled (m):	53.9
Drill Contractor:	Spectrum Drilling
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	(Old CME-750)
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATE A-97
STRUCTURE 29

Boring: LSB-29-458
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy Lean CLAY (continued) - very stiff, moist, brown					457			7 9 12								
1255	Silty SAND - dense, wet, black, frequent brown silt seams	135	41		SPT	330	SM	S-2-4	10 18 28	27			22			46	
		140	42														
			43														
		145	44		SPT	457	SP-SM	A-3	13 21 23	25						9	
	Poorly Graded SAND with silt - dense to very dense, wet, black, frequent brown silt seams		45														
		150	46		SPT	406			13 16 22	21			17			11	
1250			47														
		155	48		SPT	457			19 50/150 mm								
		160	49														
			50														
	Lean CLAY - very stiff, wet, gray to brown, occasional black fine sand seams	165	51		SPT	457	CL	A-6	6 8 11	10							
1245		170	52		MC	279			5 9 12	8			28	35	15	93	
			53														
	Poorly Graded GRAVEL with sand - very dense, wet, gray	175	54		SPT	51	GP	A-1-a	36 50/125 mm								
		180	55														
			56														
1240		185	57														
		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-29-458**

Sheet **3** of **3**

Logged by:	M. Ivers
Date Start:	5/1/01
Date Finish:	5/4/01
Station:	5+043 0.0 RT
Line.	Burke Lane
Coordinates (m).	N 124,387.302 E 18,751.718
Elevation (m):	1296.619
Total Depth Drilled (m):	53.9
Drill Contractor:	Spectrum Drilling
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	(Old CME-750)
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

Boring: LSB-29-459
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-29-350 for additional lithology above 45.7 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1300		5	1														
		10	2														
		15	3														
		20	4														
1295	FILL: Clayey GRAVEL - very dense, moist, brown to gray		5		SPT	102			24 35 41								
		25	6														
		30	7														
	Sandy SILT - stiff, moist to wet, grey, fine-grained sand, trace of angular gravel		8		SPT	203	ML	A-4	5 5 6	● 10			27	28	5	61	
1290	Silty SAND - medium, moist to wet, grey, fine-grained sand, trace of angular gravel	35	9		SPT	254	SM	A-4	4 5 14	● 17			22	NP	NP	40	
		40	10														
		45	11														
		50	12														
1285	Silty SAND - dense, moist to wet, grey, fine-grained sand, trace of angular gravel		13		MC	254	SP	A-1-b	13 16 22	● 24			18	NP	NP	14	
		55	14														
		60	15														
		65	16														
			17														
			18														
			19														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-29-459**

Sheet 1 of 3

Logged by:	M. Ivers
Date Start:	5/5/01
Date Finish:	5/6/01
Station:	5+050 0.0 RT
Line:	Burke Lane
Coordinates (m):	N 124,467.416 E 18,823.402
Elevation (m):	1300.673
Total Depth Drilled (m):	53.9
Drill Contractor:	Spectrum Drilling
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	(Old CME-750)
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLN.GPJ 1/8/03

PLATE A-99
STRUCTURE 29

Boring. LSB-29-459
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0–25–50	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1280	Refer to SB-29-350 for additional lithology above 45.7 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.	70	21														
			22														
		75	23														
			24														
		80	25														
1275		85	26														
			27														
		90	28														
		95	29														
			30														
1270		100	31														
		105	32														
			33														
		110	34														
		115	35														
1265			36														
		120	37														
	Silty GRAVEL with sand - very dense, wet, olive green and white	125	38		MC	76	GM	A-1-a	50 50/75 mm				7			14	
			39														
		130															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-29-459**

Sheet **2** of **3**

Logged by	M. Ivers
Date Start:	5/5/01
Date Finish:	5/6/01
Station:	5+050 0.0 RT
Line:	Burke Lane
Coordinates (m):	N 124,467.416 E 18,823.402
Elevation (m):	1300.673
Total Depth Drilled (m):	53.9
Drill Contractor:	Spectrum Drilling
Driller:	R. Dockery
Rig Type:	CME-750
Rig Serial Number:	(Old CME-750)
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATEA-100
STRUCTURE 29

Boring. LSB-29-459
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
1260		135	41														
			42														
		140	43														
		145	44														
			45														
1255	Silty SAND with gravel - very dense, wet	150	46		SPT	0	SM	A-1-b	21 26 32	31							
		155	47		SPT	76			41 35 35	37							
			48														
		160	49		SPT	254			24 37 35	37			10			17	
			50														
1250	Lean CLAY with sand - very stiff, wet, olive and brown, frequent black fine sand seams	165	51		SPT	305	CL	A-6	12 13 14	14			28			83	
	Silty SAND -very dense, wet, olive gray	170	52		MC	279	SM	A-2-4	19 23 30	20		15.7	22			24	
			53														
	Lean CLAY with sand - hard, wet, olive gray	175	54		MC	305	CL	A-6	12 24 44	26		14.7	30			84	
1245		180	55														
		185	56														
		190	57														
		195	58														
			59														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-29-459**

Sheet 3 of 3

Logged by:	M. Ivers
Date Start:	5/5/01
Date Finish.	5/6/01
Station:	5+050 0.0 RT
Line:	Burke Lane
Coordinates (m):	N 124,467.416 E 18,823.402
Elevation (m):	1300.673
Total Depth Drilled (m):	53.9
Drill Contractor:	Spectrum Drilling
Driller:	R. Dockery
Rig Type.	CME-750
Rig Serial Number:	(Old CME-750)
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 35112LNI.GPJ 1/8/03

PLATEA-101
STRUCTURE 29

Boring. LSB-29-488
Sheet 1 of 1

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)	Test Results * Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200
	Sandy Lean CLAY - stiff to medium stiff, moist, grey, with some white streaks					CL	A-6					
1295		5	1	SPT	305			9 4 4 3				
			2	SPT	229	SM	A-2-4	9 8 7 8				39
	Silty SAND - medium, moist, grey											
	Sandy SILT - firm to stiff, moist to wet, grey to brown, with fine-grained sand lenses	10	3	SPT	0	ML	A-4	5 7 7 6				
			4	SPT	305			4 3 5 5				63
		15	5	SPT	254			3 3 5 6	26	NP	NP	67
				SPT	330			4 4 6 6				58
1290		20	6	SPT	229			3 3 6 7		NP	NP	64
	SILT - soft to stiff, wet, grey		7	SPT	406	ML	A-4	3 4 4 5	26	NP	NP	87
		25	8	SPT	356			1 1 4 4				83
				SPT	432			2 1 1 3	30	NP	NP	92
		30	9	SPT	457			1 2 4 5				93
			10	SPT	406			4 4 6 8	25	NP	NP	89
1285		35	11	SPT	381			2 3 5 7				87
	- frequent fine-grained, grey sand seams		12	SPT	457			4 2 6 8	23	NP	NP	88
		40		SPT	406			3 2 6 9				
	Poorly Graded SAND with silt and gravel - medium, wet, olive grey, coarse-grained gravel		13	SPT	254	SP-SM	A-3	2 4 17 24				
		45	14	MC	457			8 32 50				
	Poorly Graded GRAVEL with sand - very dense, wet, grey					GP	A-1-a					
		50	15	SPT	229			28 32 30 27				
1280			16									
		55	17									
		60	18									
		65	19									

Graphic Log

● SPT $(N_1)_{60}$
○ SPT $(N_1)_{60}$ (Greater than 50 Blows)

Test Results *: S_u kPa (torvane in italics); Dry Density, kN/m³; Other Tests

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-29-488**

Sheet **1** of **1**

Logged by:	M. Ivers
Date Start:	7/9/01
Date Finish:	7/9/01
Station:	5+025 5.0 RT
Line:	Burke Lane
Coordinates (m):	N 124,445.304 E 18,809.832
Elevation (m).	1296.010
Total Depth Drilled (m):	15.8
Drill Contractor:	R.C. Exploration
Driller:	M. Labenski
Rig Type:	Diedrich D-120 ATV
Rig Serial Number:	D-120009
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATEA-102
STRUCTURE 29

Boring: LSB-29-501
Sheet 1 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0 – 25 – 50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL. Poorly Graded SAND with silt - medium dense to very dense, slightly moist, yellowish brown, some gravel																
			1														
		5	2														
		10	3														
1300			4														
		15	5														
		20	6		SPT	559			13 13 16 16	30							
			7														
		25	8		SPT	457			24 30 31 39		○						
1295			9		SPT	533			12 13 8 3	19							
	Lean CLAY - stiff to very stiff, moist, dark brown, with roots						CL	A-6									
	Silty SAND - medium to dense, moist to wet, gray, fine-grained sand, occasional roots, trace fine-grained gravel		10		SPT	483	SM	A-2-4	3 6 6 8	10						35	
		35	11		SPT	533			8 6 8 7	12							
▽					SPT	559			4 7 9 10	13						31	
		40	12		SPT	584			13 20 16 8	28							
	SILT with sand - firm to very stiff, wet, gray to brown, frequent medium grained gray sand seams		13		SPT	305	ML	A-4	5 6 7	10			26	NP	NP	84	
1290		45	14		SPT	406			7 11 12 12	18							
					SPT	508			5 7 10 9	13			24	NP	NP	79	
		50	15		SPT	559			5 9 10 6	14							
			16		SPT	610			10 9 12 10	15			22	NP	NP	72	
		55	17		SPT	406			4 10 10 12	15			23	NP	NP	87	
			18		SPT	432			4 7 10 14	12						84	
1285	- frequent sand seams	60			SPT	356			2 6 7 10	9			24	NP	NP	77	
			19														
	- frequent interbedded clay, very fine-grained sand layers				SPT	508			3 3 4 4	5							
		65								9							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-29-501**

Sheet 1 of 2

Logged by:	M. Ivers
Date Start:	8/20/01
Date Finish:	8/20/01
Station:	5+070
Line:	Burke Lane
Coordinates (m):	N 124,482.700 E 18,837.000
Elevation (m).	1303.569
Total Depth Drilled (m):	24.2
Drill Contractor:	R.C. Exploration
Driller:	R. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter.	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATEA-103
STRUCTURE 29

Boring: LSB-29-501
Sheet 2 of 2

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	SILT with sand (continued) - firm to very stiff, wet, gray to brown, frequent medium grained gray sand seams				SPT	559			3 5 6 8				23	NP	NP	95	
	Silty SAND - loose to medium, wet, gray, occasional olive gray silty clay layers, some woody material, occasional peat seams		21		SPT		SM	A-2-4	10 11 12	16							
		70			SPT	533			4 4 5 10	6							
			22		SPT	406	SP	A-2-4	8 6 10 16	11						12	
	Poorly Graded SAND with silt and gravel - medium to very dense, wet, gray, fine-grained sand, fine-grained gravel	75	23		SPT	559			6 10 11 10	14							
1280	Poorly Graded GRAVEL with sand - very dense, wet, gray, medium- to coarse-grained sand		24		SPT	432	GP	A-2-4	12 25 33 42	38							
		80															
			25														
		85	26														
			27														
		90															
			28														
1275		95	29														
			30														
		100															
			31														
		105	32														
			33														
1270		110															
			34														
		115	35														
			36														
		120															
			37														
		125	38														
1265			39														
		130															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-29-501**

Sheet **2** of **2**

Logged by:	M. Ivers
Date Start:	8/20/01
Date Finish:	8/20/01
Station:	5+070
Line.	Burke Lane
Coordinates (m)	N 124,482.700 E 18,837.000
Elevation (m):	1303.569
Total Depth Drilled (m):	24.2
Drill Contractor:	R.C. Exploration
Driller	R. Livingston
Rig Type.	CME-850
Rig Serial Number	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATEA-104
STRUCTURE 29

Boring: LSB-30-460
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-30-351 for additional lithology above 21.4 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1295		5	1														
		10	2														
		15	3														
		20	4													80	
		25	5														
	Sandy SILT - medium stiff, wet, dark gray		6		P		ML	A-4					25	NP	NP	50	
1290		30	7														
		35	8														
		40	9														
1285		45	10														
		50	11														
		55	12														
1280		60	13														
		65	14														
			15														
			16														
			17														
			18														
			19														

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-30-460**

Sheet 1 of 3

Logged by:	B. Jellinek
Date Start:	5/9/01
Date Finish:	5/19/01
Station:	5+289.6 4.8 LT (rev. 1/02)
Line:	Burke Lane
Coordinates (m)	N 124,619.567 E 19,006.245
Elevation (m):	1298.539
Total Depth Drilled (m):	45.7
Drill Contractor.	Spectrum Drilling
Driller:	D. Johnson
Rig Type:	CME-55
Rig Serial Number:	305205
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3512ZLNI.GPJ 1/8/03

PLATEA-105
STRUCTURE 30

Boring: LSB-30-460
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-30-351 for additional lithology above 21.4 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
	Silty SAND with gravel - medium to very dense, wet, gray	70	21		MC		SM	A-2-4	5 8 11	13							
		75	22														
1275			23		SPT				10 15 12	21							
		80	24														
			25														
		85	26		SPT				7 9 19	22							
			27														
		90	28		SPT				11 50/ 25mm								
1270	Lean CLAY - very stiff, wet, olive	95	29		SPT		CL	A-6	4 7 12	14							
			30														
	Sandy Lean CLAY - very stiff to hard, wet, gray	100	31		SPT		CL	A-6	5 50/ 50mm							65	
		105	32		SPT				6 9 7	12							
			33														
1265	Silty SAND - medium to dense, wet, gray	110	34		SPT		SM	A-2-4	13 13 12	18						21	
		115	35		SPT				16 16 15	21							
			36														
		120	37		SPT				15 8 9	12							
			38														
1260	Sandy SILT - stiff to very stiff, wet, gray	125	39		SPT		ML	A-4	5 9 14	9			29	NP	NP	59	
		130			SPT					9							

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-30-460**

Sheet 2 of 3

Logged by:	B. Jellinek
Date Start:	5/9/01
Date Finish:	5/19/01
Station:	5+289.6 4.8 LT (rev. 1/02)
Line:	Burke Lane
Coordinates (m):	N 124,619.567 E 19,006.245
Elevation (m):	1298.539
Total Depth Drilled (m):	45.7
Drill Contractor:	Spectrum Drilling
Driller:	D. Johnson
Rig Type:	CME-55
Rig Serial Number:	305205
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = *Standard Penetration Test*, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATEA-106
STRUCTURE 30

Boring. LSB-30-460
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ ● / SPT $(N_1)_{60}$ (Greater than 50 Blows) ○ (0–25–50)	Test Results * S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Sandy SILT (continued) - stiff to very stiff, wet, gray								7 7 7								
		135	41														
			42														
	Silty GRAVEL - very dense, wet, yellow brown, fined-grained gravel	140	43		SPT		GM	A-2-4	32 35 22/ 100mm	●36							
1255			44														
	Silty SAND - medium, wet, gray, fine-grained sand	145			SPT		SM	A-2-4	3 4 7	●7							
			45														
		150			SPT				5 10 15	●15							
			46														
		155	47														
			48														
1250		160	49														
			50														
		165	51														
		170	52														
			53														
1245		175	54														
		180	55														
			56														
		185	57														
		190	58														
1240			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-30-460**

Sheet **3** of **3**

Logged by:	B. Jellinek
Date Start:	5/9/01
Date Finish:	5/19/01
Station:	5+289.6 4.8 LT (rev. 1/02)
Line:	Burke Lane
Coordinates (m):	N 124,619.567 E 19,006.245
Elevation (m):	1298.539
Total Depth Drilled (m):	45.7
Drill Contractor:	Spectrum Drilling
Driller:	D. Johnson
Rig Type:	CME-55
Rig Serial Number:	305205
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50 8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATEA-107
STRUCTURE 30

Boring: LSB-30-461
Sheet 1 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	● SPT $(N_1)_{60}$ ○ SPT $(N_1)_{60}$ (Greater than 50 Blows) 0 25 50	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-30-352 for additional lithology above 24.4 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.																
1295		5	1														
			2														
		10	3														
			4														
		15	5														
		20	6														
			7														
1290		25	8														
		30	9														
			10														
		35	11														
			12														
1285		40	13														
		45	14														
			15														
		50	16														
		55	17														
1280			18														
		60	19														
		65															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-30-461**

Sheet 1 of 3

Logged by:	B. Jellinek
Date Start:	5/20/01
Date Finish:	5/25/01
Station:	5+349.4 3.2 LT (rev. 1/02)
Line:	Burke Lane
Coordinates (m):	N 124,634.719 E 19,064.711
Elevation (m):	1297.381
Total Depth Drilled (m):	45.7
Drill Contractor:	Spectrum Drilling
Driller:	D. Johnson
Rig Type:	CME-55
Rig Serial Number:	305205
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

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SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 35112LNI.GPJ 1/8/03

PLATEA-108
STRUCTURE 30

Boring. LSB-30-461
Sheet 2 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Refer to SB-30-352 for additional lithology above 24 4 meters. Samples above this depth were taken intermittently and soil descriptions do not necessarily characterize the lithology between samples.		21														
	Poorly Graded GRAVEL with sand - very dense, wet, gray	70	22		MC	102	GP	A-1-a	50/ 125mm								
1275		75	23		SPT	203			23 30 21	42							
			24														
	SILT with sand - medium dense, wet, olive brown	80	25		SPT	51	ML	A-4	11 11 11	18							
	Clayey SAND - medium to dense, wet, olive gray	85	26		SPT	406	SC	A-2-4	4 9 5	11			17				
			27														
1270		90	28		SPT	381			5 8 17	19			22	31	16	39	
		95	29		SPT	457			6 13 8	16							
			30														
		100	31		SPT	406			6 15 25	29							
	Poorly Graded SAND - medium, wet, gray, fine to medium grained	105	32		SPT	457	SP / SM	A-3 / A-2-4	13 5 7	8							
1265	Silty SAND - loose to medium, wet, brown		33														
		110	34		SPT	406			8 5 5	7							
	Lean CLAY with gravel - very stiff, wet, brown, fine-grained gravel	115	35		SPT	457	CL	A-7	4 11 11	15			23	44	28		
	SILT - stiff to very stiff, wet, gray, trace gravel		36				ML	A-4									
1260		120	37		SPT	406			6 6 9	10							
		125	38		SPT	457			9 8 9	11			24	25	2		
			39														
		130			SPT												

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-30-461**

Sheet **2** of **3**

Logged by:	B. Jellinek
Date Start:	5/20/01
Date Finish:	5/25/01
Station:	5+349.4 3.2 LT (rev. 1/02)
Line:	Burke Lane
Coordinates (m):	N 124,634.719 E 19,064.711
Elevation (m):	1297.381
Total Depth Drilled (m)	45.7
Drill Contractor:	Spectrum Drilling
Driller:	D. Johnson
Rig Type.	CME-55
Rig Serial Number:	305205
Drilling Method.	Mud Rotary
Hammer Type:	Automatic
Rod Type.	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34 9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50 8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76 2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLNI.GPJ 1/8/03

PLATEA-109
STRUCTURE 30

Boring: LSB-30-461
Sheet 3 of 3

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	Test Results * S_u, kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	Silty SAND with gravel - medium to dense, wet, gray brown, fine-grained gravel					305	SM	A-3	9 35				19			33	
	(sample was driven only 300 mm)	135	41														
	(sample was driven only 300 mm)				SPT	102			9 25								
			42														
1255		140	43		SPT	330			10 10 10	12			22			32	
			44														
		145			SPT	406			11 8 10	11							
			45														
	Lean CLAY - very stiff, wet, gray				SPT		CL	A-6	11 10 11	12							
		150	46										30	34	13		
			47														
1250		155	48														
		160	49														
			50														
		165	51														
		170	52														
1245			53														
		175	54														
		180	55														
			56														
		185	57														
1240		190	58														
			59														
		195															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange

KLEINFELDER

Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-30-461**

Sheet **3** of **3**

Logged by:	B. Jellinek
Date Start:	5/20/01
Date Finish:	5/25/01
Station:	5+349.4 3.2 LT (rev. 1/02)
Line:	Burke Lane
Coordinates (m):	N 124,634.719 E 19,064.711
Elevation (m):	1297.381
Total Depth Drilled (m):	45.7
Drill Contractor:	Spectrum Drilling
Driller:	D. Johnson
Rig Type:	CME-55
Rig Serial Number:	305205
Drilling Method:	Mud Rotary
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	121 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

USCS = Unified Soil Classification System

AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63.5mm OD split spoon sampler

P = Piston Sampler, 76.2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLN.GPJ 1/8/03

PLATEA-110
STRUCTURE 30

Boring: LSB-30-503
Sheet 1 of 1

Elevation (m)	SAMPLE DESCRIPTION (ASTM D 2488/D 2487)	Depth ft	Depth m	Graphic Log	Type	Recovery (mm)	Soil Classification USCS	Soil Classification AASHTO	N, Blows per 0.15 m (or interval shown)	SPT $(N_1)_{60}$ / SPT $(N_1)_{60}$ (Greater than 50 Blows)	S_u kPa (torvane in italics)	Dry Density, kN/m³	Moisture, %	Liquid Limit	Plasticity Index	% Passing No. 200	Other Tests
	FILL																
	Lean CLAY - stiff, moist, dark brown		1		SPT	508	CL	A-6	8 9 6 6	29							
	Silty SAND - very loose to loose, moist to wet, gray, trace fine-grained gravel	5			SPT	127	SM	A-4	2 2 1 2	5						47	SV H
▽	- no gravel		2		SPT				1 2 1 4	5						50	SV H
					SPT				3 4 4 3	12						40	SV H
1295	- occasional dark mottling, trace fine-grained gravel	10	3		SPT				2 3 4 2	11						44	SV H
	SILT with sand - soft to firm, wet, gray to brown		4		SPT		ML	A-4	2 2 1 2	5						83	SV H
		15	5		SPT				1 2 3 2	7						90	SV H
		20	6														
			7														
1290		25	8														
		30	9														
			10														
		35	11														
		40	12														
1285			13														
		45	14														
		50	15														
			16														
		55	17														
1280		60	18														
			19														
		65															

Legacy Parkway Design/Build
I-215 to I-15/US 89 Interchange
KLEINFELDER
Project No. 35-8440-06

FIELD TEST BORING LOG

Boring: **LSB-30-503**

Sheet **1** of **1**

Logged by:	M. Ivers
Date Start:	8/23/01
Date Finish:	8/23/01
Station:	5+349.9 6.1 LT (rev. 1/02)
Line:	Burke Lane
Coordinates (m):	N 124,637.700 E 19,064.700
Elevation (m):	1298.052
Total Depth Drilled (m):	5.2
Drill Contractor:	RC Exploration
Driller:	M. Livingston
Rig Type:	CME-850
Rig Serial Number:	239022
Drilling Method:	Hollow-Stem Auger
Hammer Type:	Automatic
Rod Type:	AW
Boring Diameter:	133 mm

LEGEND/NOTES

Elevations based upon North American Vertical Datum of 1988 (NAVD '88)

Coordinates are NAD '83

▽ = Observed Groundwater depth at time of drilling

Blows = Number of blows required to drive split spoon sampler 150 mm or interval shown

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AASHTO = American Association of State Highway and Transportation Officials

* = See Key to Soil Logs for list of abbreviations and descriptions of tests

SAMPLE TYPE

SPT = Standard Penetration Test, 34.9mm ID and 50.8mm OD split spoon sampler

MC = Modified California Sampler, 50.8mm ID and 63 5mm OD split spoon sampler

P = Piston Sampler, 76 2 mm OD

SH = Shelby Tube, 76.2mm OD, pushed

BAG = Bulk Sample

UTDOT 3511ZLMI.GPJ 1/8/03

PLATEA-111
STRUCTURE 30