

Appendix F. 2007 Geotechnical Assessment

Appendix

This page intentionally left blank.

Appendix F: Geology and Soils

F.1 - Report of Phase 2 Geotechnical Investigation
Prepared by GMU Geotechnical, Inc. - March 16, 2007

F.2 - Response to Review Comment by City of Chino Geotechnical Reviewer
Prepared by GMU Geotechnical, Inc. - August 28, 2007

**F.1 - Report of Phase 2 Geotechnical Investigation
Prepared by GMU Geotechnical, Inc. - March 16, 2007**



23241 Arroyo Vista
Rancho Santa Margarita
CA 92688

voice: 949 888 6513
fax: 949 888 1380
web: www.gmugeo.com

**Report of Phase 2 Geotechnical Investigation,
Edgewater Development,
City of Chino, California**

**Prepared For
Edgewater Associates, LLC**

March 16, 2007

GMU Project No 04-15-03



23241 Arroyo Vista
Rancho Santa Margarita
CA 92688

voice: 949 888 6513
fax: 949 888 1380
web: www.gmugeo.com

TRANSMITTAL

EDGEWATER ASSOCIATES, LLC
165 South Union Boulevard, Suite 510
Lakewood, CO 80228

DATE: March 16, 2007

PROJECT: 04-15-03

ATTENTION: Mr Don Rosier

SUBJECT: Report of Phase 2 Geotechnical Investigation, Edgewater Development,
City of Chino, California

WE ARE SENDING THE FOLLOWING:

Three (3) wet-signed copies of our "Report of Phase 2 Geotechnical Investigation, Edgewater Development, City of Chino, California," dated March 16, 2007.

COPIES OF REPORT DISTRIBUTED TO:

CMG Funding
Attn: Mr Eddie Callan (one copy)

Huitt-Zollars
Attn: Mr. Robert Sundstrom (one copy)

Waterscapers
Attn: Mr Rick McGuire (one copy via email)

TABLE OF CONTENTS

Description	Page
INTRODUCTION.....	1
PURPOSE	1
SCOPE	1
LOCATION	2
SITE DESCRIPTION	2
LAND USE	2
TOPOGRAPHY AND VEGETATION.....	3
PLANNED GRADING AND DEVELOPMENT	3
SUBSURFACE EXPLORATION.....	4
GEOLOGIC FINDINGS	5
REGIONAL GEOLOGY	5
SOIL AND ROCK MATERIALS	6
Undocumented Fill (Qafu)	6
Native Soil	7
Quaternary Alluvial Deposits (Qal)	7
Quaternary Older Alluvial Fan Deposits (Qof)	7
SUBSURFACE CONDITIONS.....	8
GROUNDWATER	8
Regional Groundwater	8
Local Groundwater Conditions	9
SEISMIC HAZARDS	12
Fault Rupture	12
Ground Shaking	12
Landslides	15
Seiche	15
Liquefaction and Related Hazards	16
GEO TECHNICAL ENGINEERING FINDINGS AND DESIGN	16
SLOPES	16
Planned Slopes.....	16
Natural Slopes	17
Construction Slopes	17

TABLE OF CONTENTS (continued)

Description	Page
SLOPE STABILITY ANALYSES	17
General	17
Groundwater	17
Design Shear Strengths	18
Cross Section A-A' and C-C' Analysis	19
LIQUEFACTION, SEISMIC SETTLEMENT, AND LATERAL SPREADING	19
Mode Magnitude Earthquake Event	19
Design Groundwater	19
Liquefaction	19
Seismic Settlement	20
Lateral Spreading	20
SETTLEMENT	20
Static Settlements	20
Seismic Settlement	21
Settlement Monitoring	21
ORGANIC SOILS	22
EXPANSIVE SOILS	22
CORROSIVE SOILS	23
SOIL MOISTURE CONDITIONS	23
EXCAVATION CHARACTERISTICS	24
Rippability and Oversize Rock	24
Volume Change	24
Trenching	24
FILL SUPPORT	25
CONCLUSIONS	25
RECOMMENDATIONS	27
GRADING PLANS AND SPECIFICATIONS	27
SITE PREPARATION AND GRADING	27
General	27
Clearing	27
Removal of Existing Improvements	28
Buried Trash/Waste	28
Removal of Existing Lake	28
Corrective Grading	29

TABLE OF CONTENTS (continued)

Description	Page
DEWATERING	31
FILL MATERIAL AND PLACEMENT	31
Suitability	31
Compaction Standard and Methodology	32
Fill Slope Compaction	32
Use of Rock or Broken Concrete	32
SUBDRAINS	33
PLANNED LAKES	34
SEISMIC DESIGN CRITERIA FOR STRUCTURES	35
PRELIMINARY FOUNDATION SYSTEM DESIGN CONSIDERATION	36
General	36
Anticipated Post-grading Geotechnical Conditions	36
Bearing Material	36
Foundation Type	37
Concrete	37
PRELIMINARY PAVEMENT DESIGN	37
UTILITY TRENCH BACKFILL	38
TEMPORARY EXCAVATIONS	38
CORROSION PROTECTION OF METAL STRUCTURES	39
SLOPE LANDSCAPING	39
SURFACE DRAINAGE	40
LIMITATIONS	40
SUPPORTING DATA	42
REFERENCES	43
PLATE 1	-- Location Map
PLATES 2.1 through 2.4	-- Geotechnical Map
PLATE 3	-- Geotechnical Sections A-A' – C-C'
PLATE 4	-- Regional Seismicity
PLATE 5	-- Alquist-Priolo Earthquake Fault Zone Map
PLATE 6	-- Typical Buttress or Stabilization Fill
PLATE 7	-- Typical Benching and Keyway
PLATE 8	-- Typical Detail Over-Excavation of Transition Lots
PLATE 9	-- Recommended Placement Method for Oversize Rock or Concrete
PLATE 10	-- Subdrain Outlet Detail
PLATE 11	-- Typical Backdrain Detail

APPENDICES

APPENDIX A	-- Exploration Logs
APPENDIX B	-- Laboratory Testing
APPENDIX C	-- Slope Stability Analyses
APPENDIX D	-- Liquefaction Analyses

INTRODUCTION

PURPOSE

This report presents the results of our Phase 2 geotechnical investigation for the Edgewater development within the City of Chino, California. This investigation is based on the reference (1) plans and supplements the Phase 1 investigation completed in 2004 (reference (2)). The report is intended to support the submittal of the tentative tract map.

SCOPE

The scope of our geotechnical studies was as follows:

1. Completed a subsurface investigation that included advancing cone penetration test soundings, hollow-stem auger drill holes, and excavating backhoe pits. These subsurface excavations were located in areas that required further investigation or were not yet addressed. Bulk and undisturbed samples of the soil and rock materials were obtained for laboratory testing. All subsurface locations were cleared for underground public utilities prior to the field investigation.
2. Completed a laboratory testing program including moisture and density, grain size, Atterberg limits, maximum density, direct shear, expansion index, consolidation, R-value, corrosion, and percent organics.
3. Integrated logs, test results, etc. from our Phase 1 investigation.

4. Completed geotechnical analyses including liquefaction, settlement, slope stability, and preliminary foundation and pavement design.
5. Prepared this report summarizing the results of our previous report, exploration, testing, and analysis, and presenting our conclusions and preliminary recommendations pertinent to the planned grading and ultimate use of the property.

LOCATION

The site is located east of Cucamonga Road and south of Chino-Corona Road in the City of Chino, California. Mill Creek and Comet Avenue bound the site on the east, and the south is bounded by undeveloped property of the Prado Air Park. The general location of the project is shown on Plate 1 – Location Map

SITE DESCRIPTION

LAND USE

Surface conditions are variable across the site. The northern portion of the site is in use as an active dairy, while the southern portion of the site is agricultural. The dairy portion of the site consists of several residences, barns, and associated structures. Cattle holding pens make up the majority of the dairy area, which is also crossed by dirt and concrete roads. Multiple small waste discharge ponds are located in the southwestern portion of the dairy area. The agricultural portion of the site, currently cultivating oat hay, has several structures, including a residence and a barn, several

dirt access roads, and irrigation pipelines. One man-made pond, located in the southeast corner, provides crop irrigation. Local areas of debris were also observed in both the northern and southern portions of the site, including a stockpile of soil and debris in the northwest portion of the site.

TOPOGRAPHY AND VEGETATION

Topography at the site is variable, ranging from essentially flat in the northern portion, to gently rolling hills in the southern portion. The southern portion consists of a small north-south trending ridge bounded by smaller knobs and gently graded low areas. Vegetation at the site consists of scattered trees, a variety of weeds in local areas, and riparian growth adjacent to the creek on the eastern edge of the property.

PLANNED GRADING AND DEVELOPMENT
--

The planned development, as shown on the reference (1) grading plan utilized here as the base map for Plates 2.1 through 2.4 – Geotechnical Map, consists of residential, educational, and open space areas. The designed grading to accomplish this development includes fills up to 25 feet and cuts up to 27 feet. Fill and cut slopes are planned at inclinations of 2:1 (horizontal:vertical) or flatter with maximum heights up to 20 feet and 47 feet, respectively. In addition to creating residential lots and open space, the grading will also create five artificial lakes, recreational areas, and associated streets, slopes, and landscape areas.

The proposed graded area just west of Mill Creek and east of the residential area is a proposed open space area intended for recreation. It is our understanding that no habitable structures are planned for this area.

SUBSURFACE EXPLORATION

Our previous investigation report (reference (2)) included 6 CPT soundings and 18 test pit excavations. Current subsurface exploration included 16 CPT soundings, 26 test pit excavations, and 8 hollow-stem auger drill holes. After completion of the drill holes, temporary standpipe piezometers were installed where possible to measure groundwater elevations. The locations of both previous and current CPTs, drill holes, and test pits are shown on Plates 2.1 through 2.4 – Geotechnical Map, and the logs are included in Appendix A.

Our current field exploration program was intended to supplement our previous investigation and explore areas previously inaccessible, as well as provide further detail in areas previously explored. Therefore, excavations were planned throughout the site. However, current dairy activities prevented exploration in some areas of the northern portion of the site.

The CPT soundings provided data for seismic hazard analyses, including liquefaction. The test pits were intended to provide shallow subsurface data across the site for use in determining removal depths and extent of undocumented fill deposits. The drill holes were intended to provide data and soil samples at depth as well as groundwater data.

These data were used in conjunction with surficial geologic mapping and published geologic maps in order to identify geotechnical conditions within and immediately adjacent to the proposed development.

GEOLOGIC FINDINGS

REGIONAL GEOLOGY

The project site is located within the eastern portion of the Peninsular Ranges geomorphic province in California. The Peninsular Ranges province is characterized by predominately igneous basement rock overlain by sedimentary and volcanic deposits. Tectonic activity beginning during the Tertiary and continuing to present has created a complex system of faults and folds throughout the province.

The site itself is located within the Chino Basin on a thick accumulation of alluvial and fan deposits derived from surrounding ranges. The Chino Hills, approximately one mile west of the site, was the likely source of the older fan deposits that are exposed across the site (Dibblee, 2001, and Morton). These fan deposits are currently dissected by various alluvial channels, including Mill Creek, located just east of the site.

Geologic structure in the area is predominately controlled by faulting and folding. Within the Chino Basin the alluvial sediments are generally horizontal. The Chino-Central Avenue fault is the closest fault to the site, and lies approximately 1.8 miles to the west, as shown on Plate 4 – Regional Seismicity, and on Plate 5 – Alquist-Priolo Earthquake Fault Zone Map.

SOIL AND ROCK MATERIALS

The soil and rock materials encountered during our investigation are shown on Plates 2.1 through 2.4 – Geotechnical Map and Plate 3 – Geotechnical Cross-Sections. The predominant geologic materials are described below.

Undocumented Fill (Qafu). Areas of undocumented artificial fill were encountered across the site, predominately within the northern portion of the site in the dairy area. These areas of artificial fill generally consist of silts and sands with some clays. The deposits vary in color, moisture, and density. Zones of debris and organic materials were found within some excavations. Where encountered, these deposits were observed to be up to 11 feet thick. In general, organic content of the undocumented fill varies across the site and is generally less than 2%. Estimated limits of undocumented fill, based on our previous and current investigations, are shown on our Geotechnical Map – Plates 2.1 through 2.4. It should be noted that other areas of undocumented fill may occur at the site, however, we anticipate areas not encountered during our investigations would be relatively localized. All deposits of undocumented fill are considered unsuitable for support of fill and will require removal.

Native Soil. Native soil was encountered within the southern portion of the site and generally consists of dark brown, organic rich mixtures of clays, silts, and sands. This unit is porous, damp to moist, with no developed soil structure. Organic content of the native soil is estimated to be between 2.5 and 6.7%. Where encountered, the native soil was observed to be up to 6 feet thick, with an average thickness of approximately 2 feet. The upper 1 to 2 feet of native soil was observed to be disturbed in most of the excavations by the agricultural use of the site. As the native soil occurs as a thin blanket across most of the site, it is not illustrated on our Geotechnical Map – Plates 2.1 through 2.4. Native soil is considered unsuitable for fill support, and will require removal.

Quaternary Alluvial Deposits (Qal). Alluvial deposits were encountered on the site in the eastern portion, adjacent to Mill Creek. These deposits, likely derived from sediment deposited by Mill Creek, generally consist of mixtures of light brown to brown silts and sands with some clays. The soils range from loose to dense, damp to wet, and slightly to moderately porous. Organic content of the alluvial soils is anticipated to vary across the unit. The upper 2 to 5 feet of alluvium is considered unsuitable for fill support, and will require removal.

Quaternary Older Alluvial Fan Deposits (Qof). Older alluvial fan deposits were encountered at either the surface or underlying the artificial fill across the site. Where observed, the older alluvial deposits consisted of varicolored silts and sands with some clays and gravels. These deposits are generally porous at shallow depths, medium dense to dense, with moderately to well-developed soil structure. The organic content of the older alluvium tested ranges from

1 0 to 6 1%. The upper 2 to 4 feet of older alluvial deposits is considered unsuitable for fill support, and will require removal.

SUBSURFACE CONDITIONS

In general, the majority of the site appears to be underlain by older alluvial deposits. These deposits are anticipated to be up to several hundred feet thick, and are generally horizontal (Fife, 1976). In the far eastern portion of the site, alluvial deposits placed by Mill Creek overlie the older alluvial deposits. These deposits are generally horizontal. The thickness of this unit is unknown, as the contact between alluvium and older alluvium was not observed in the subsurface explorations. The northern portion of the site, currently in use as a dairy operation, is underlain by undocumented fill deposits of variable thickness and origin.

No evidence of landsliding was observed during our investigation. No faulting was observed during our investigation, and review of published reports do not indicate inactive or active faulting previously mapped under the site (Dibblee, 2001, and Jennings, 1994).

GROUNDWATER

Regional Groundwater. The subject site is located within the topographic Chino Basin, on the northern limit of the Prado Flood Control Basin. This basin flows into the Santa Ana River, which flows east-west from the San Jacinto Mountains to the Pacific Ocean. Historically, groundwater within the Chino Basin has fluctuated dramatically due to human intervention. Early

mapping done by Mendenhall around 1900 (Fife, 1976) documented relatively shallow groundwater levels throughout the basin, as well as artesian conditions in a large area northwest of the site. An increase in population and agricultural activity triggered a decline in groundwater elevations until the 1970s. During the first half of the 20th century, significant areas of subsidence were documented across the Basin. In the 1970s efforts were started to restore the groundwater regime (Fife, 1976, and Wildermuth Environmental, 1999). Groundwater management by the Chino Basin Watermaster as well as imported water have led to more stabilized groundwater elevations within the Chino Basin.

Groundwater within the Chino Basin consists of several stacked aquifers within the basin alluvial deposits, which are up to several hundred feet thick. The shallowest of these varies across the basin in elevation and thickness. Historical regional data on the Chino Basin Watermaster website indicates groundwater elevations of approximately 525 feet msl underlying the site in the 1930s, and elevations of approximately 500 feet msl in the late 1990s. Current regional groundwater elevations have not yet been posted by the Watermaster, but are anticipated to be higher than reported in the 1990s.

Local Groundwater Conditions. Groundwater data collected during our previous investigation indicated groundwater depths of approximately 13 to 23 feet below the site (elevations of approximately 523 to 547 feet msl). Our current investigation encountered perched zones of seepage in scattered locations across the site. These locations are likely local zones of minor seepage. Groundwater was encountered between approximately 6 and 40 feet below the existing

March 16, 2007

Project 04-15-03 (Edgewater, Chino)

ground surface across the site (elevations of approximately 519 to 539 feet msl) during our current investigation. Groundwater elevations observed during our current investigation were compiled with data from our previous investigation to complete the site subsurface groundwater model. The following table lists the groundwater data collected:

Exploration Number	Date of Reading/Test	Depth to Groundwater (feet bgs)	Elevation of Groundwater (feet msl)
CPT-1	2-13-04	16	546
CPT-3	2-13-04	13	547
CPT-5	2-13-04	23	523
DH-3	2-7-07	26.2	535.8
DH-5	2-7-07	6.8	529.2
DH-6	2-7-07	38.6	519.4
DH-7	2-7-07	20.0	525.0
DH-8	2-7-07	30.2	519.8

In general, the groundwater surface beneath the site appears to slope gently to the south and east. The shallowest groundwater elevations occur along the southern boundary of the site (approximately 520 feet msl) and the eastern boundary, adjacent to Mill Creek (approximately 520 to 525 feet msl). The groundwater surface ramps upward toward the northern portion of the site, with elevations up to approximately 545 feet msl.

In comparison to historical data, the current groundwater table appears to be up to approximately 20 feet higher in the northern portion of the site. As a result, current groundwater elevations were utilized in both liquefaction and slope stability analyses as the historic high elevations.

Based on the regional published data, historical groundwater data, and the site-specific data collected during our investigations, we anticipate groundwater will likely be encountered during grading in the following areas:

- The proposed bottom of Lake 1 is less than 5 feet above the estimated groundwater elevation.
- The proposed bottom of Lake 2 is at the estimated groundwater elevation.
- The proposed bottom of Lake 3 is approximately 5 feet below the estimated groundwater elevation.
- The proposed bottom of Lake 4 is less than 5 feet above the estimated groundwater elevation.
- The proposed bottom of Lake 5 is less than 10 feet above the estimated groundwater elevation.
- In the eastern portion of the site, within the non-structural park area adjacent to the creek, estimated groundwater elevations range from 5 feet above the planned grade to 5 feet below the planned grade.

After grading, groundwater is not anticipated to impact the developed portions of the site. Future groundwater elevations are anticipated to be approximately 20 feet below the graded developable surface, given normal amounts of rainfall and irrigation, and provided our recommendations contained in this report are followed.

SEISMIC HAZARDS

Fault Rupture. No known active or potentially active faults are shown on current available geologic maps as crossing the site. The site is not within a designated Alquist-Priolo Earthquake Fault Zone (Jennings, 1994; Hart and Bryant, 1999). However, the site is located within close proximity of several surface faults that are presently zoned as active or potentially active by the California Geological Survey (CGS) pursuant to the guidelines of the Alquist-Priolo Earthquake Fault Zoning Act (Jennings, 1994; Hart and Bryant, 1999). The nearest of these faults, the right-lateral, reverse oblique-slip Chino-Central Avenue fault zone, trends northwest-southeast and is located approximately 5.1 kilometers from the site.

Ground Shaking. A probabilistic seismic hazard analysis (PSHA) of horizontal ground shaking was performed to evaluate the likelihood of future earthquake ground motions occurring at the site. A PSHA is a mathematical process based on probability and statistics that is used to estimate the mean number of events per year (Annual Frequency of Exceedance) in which the level of some ground motion parameter exceeds a specified risk level. The mathematical computations of probability and statistics are based on work by Cornell (1968). The commercial computer program *EZ-FRISK* ver 7.21 was used to make the mathematical computations for this analysis. The software program *EZ-FRISK* is based on earlier work of McGuire (1976) but has been updated and modified to analyze earthquake sources as 3-D planes using modern attenuation relationships.

The seismic source model used for the PSHA computation was the CGS Statewide Database of faults and gridded seismicity (CDMG OFR 96-08; Petersen et al., 1996; Cao et al., 2003). A search radius of 80 kilometers was selected as this is the maximum site-to-source distance applicable to the attenuation relationship used in the PSHA computations (Boore et al., 1997). Review of the CDMG database indicates that 31 seismogenic faults are located within a radius of 80 kilometers of the site coordinates (USGS Prado Dam 7-1/2 minute quadrangle, Latitude 33.9390°N, Longitude 117.6280°W). The “Maximum Moment Magnitude” presented in Appendix A of CGS OFR 96-08 and the CGS California Fault Parameters web page are taken to represent the maximum earthquake each of the 31 faults presented in following table are capable of generating under the current tectonic regime

Seismic Source Table¹

Fault Name	Distance (km)	Seismology Parameters		
		Maximum M_w	Fault Type	Slip Rate (mm/yr)
Chino-Central Avenue	5.1	6.7	rl-r-o	1.0
Whittier	8.8	6.8	rl-ss	2.5
Elsinore - Glen Ivy	10.0	6.8	rl-ss	5.0
Puente Hill Thrust	22.7	7.1	bt	0.4
Sierra Madre	25.3	7.2	r	2.0
Cucamonga	25.9	6.9	r	5.0
Newport-Inglewood (Offshore)	27.0	7.1	rl-ss	1.5
San Jacinto - San Bernardino	31.9	6.7	rl-ss	12.0
San Joaquin Hill Blind Thrust	35.6	6.6	bt	0.5
San Andreas - San Bernardino M-1c-4	39.5	7.5	rl-ss	24.0
San Andreas - SB-Coach. M-1b-2	39.5	7.7	rl-ss	27.0
San Andreas - SB-Coach. M-2b	39.5	7.7	rl-ss	24.0
San Andreas - Whole M-1a	39.5	8.0	rl-ss	30.0
San Andreas - 1857 Rupture M-2a	40.9	7.8	rl-ss	34.0
San Andreas - Cho-Moj M-1b-1	40.9	7.8	rl-ss	34.0
San Andreas - Mojave M-1c-3	40.9	7.4	rl-ss	30.0
Elsinore - Temecula	41.9	6.8	rl-ss	5.0
Clamshell-Sawpit	42.2	6.5	r	0.5
Raymond	42.4	6.5	ll-r-o	1.5
Cleghorn	44.1	6.5	ll-ss	3.0
Newport-Inglewood (L.A. Basin)	44.7	7.1	rl-ss	1.0
Elysian Park Thrust (upper)	45.9	6.4	r	1.3
Verdugo	52.6	6.9	r	0.5
North Frontal Fault Zone (western)	52.8	7.2	r	1.0
Hollywood	59.6	6.4	ll-r-o	1.0
Palos Verdes	61.3	7.3	rl-ss	3.0
San Jacinto - Anza	69.3	7.2	rl-ss	12.0
San Gabriel	73.5	7.2	rl-ss	1.0
Sierra Madre (San Fernando)	73.7	6.7	r	2.0
Santa Monica	75.0	6.6	ll-r-o	1.0
Coronado Bank	79.6	7.6	rl-ss	3.0

¹ - CDMG Statewide Fault Database (reference (11), revised 2003)

² - rl = right-lateral; ll = left-lateral; ss = strike-slip; r = reverse; o = oblique; bt = blind thrust

The PSHA computations were performed for peak horizontal ground acceleration (PHGA) using equally-weighted attenuation relationships of Abrahamsom and Silva (1997), Boore et al (1997), Campbell and Bozorgnia (2003), and Sadigh et al. (1997). These attenuation relationships require that the site be categorized according to material type in the upper 30 meters of the site. Review of the boring logs and available geologic literature indicate that the site is predominantly underlain by alluvial fan deposits and soft bedrock. Seismic CPT data indicates that the alluvial soils have a shear wave velocity of about 403 meters/second, which corresponds to a S_D Soil Profile Type (Boore et al., 1997). In accordance with Sec 1631.2 of the 1997 UBC, the specified risk level for this analysis was a ~475 ARP hazard level (i.e., 10 percent probability of exceedance in 50 years). The site coordinates used in the PSHA were 33 9390° North Latitude and 117.6280° West Longitude. The PSHA included contributions of earthquake events with magnitude of 5.0 or greater. The PHGA at the specified risk level of ~475 ARP is 0.50g.

Landslides. Given the existing topography of the site, the proposed grading, and the proposed corrective grading recommended in subsequent sections of this report, the potential for seismically induced landsliding is considered to be negligible.

Seiche. Earthquakes can cause seiches, which is oscillation of the surface of water in an enclosed basin. The proposed lakes within the development could pose a potential seiche hazard, given the proximity of active faulting in the area. However, given that the proposed elevation of lake

water is at least 20 feet below the elevation of the residential areas, and the relatively shallow depth of the lakes (15 feet), the potential for damage from a seiche is considered to be low.

Liquefaction and Related Hazards. Given the shallow groundwater table and the alluvial nature of the subsurface soils, the potential for liquefaction, seismic settlement, and lateral spreading at the site was quantitatively addressed. Liquefaction and related hazard analyses and conclusions are discussed in detail in a subsequent section of this report.

GEOTECHNICAL ENGINEERING FINDINGS AND DESIGN

SLOPES

Planned Slopes. The current plans (reference (1)) indicated designed slopes are planned around the five artificial lakes, and along the eastern limit of the residential development. All of these slopes are planned fill-over-cut slopes, as illustrated on Plates 2.1 through 2.4 – Geotechnical Map. Geotechnical Cross-Sections were generated along the most critical of these slopes, and along representative slopes. These sections were analyzed for stability, as described in a subsequent section of this report.

Based on the results of our analyses, these planned slopes are anticipated to be grossly and superficially stable following the corrective grading as described in subsequent sections of this report, provided the recommendations in this report are followed and under normal conditions of rainfall and maintenance.

Natural Slopes. Natural slopes adjacent to the site are limited to the southern limit of the property. These slopes descend gently from the site, and are likely underlain by older alluvial deposits. Based on the existing configuration of these slopes, the planned grading, and the subsurface materials, the proposed development should not impact the offsite natural slopes.

Construction Slopes. Some of the construction slopes required to accomplish the removals recommended in subsequent sections of this report may be unstable over prolonged periods of time. In addition, construction slopes in the northern portion of Lake 1, Lake 2, Lake 3, and excavated for the construction of the east-facing slope east of Lake 5 will likely encounter saturated soils in the lower portion of the backcut. Recommendations to minimize, but not eliminate, the potential for construction slope failures are presented in a subsequent section of this report.

SLOPE STABILITY ANALYSES

General. Stability analysis was performed on Cross Sections A-A' and C-C', as shown on Plate 3 -- Geotechnical Cross Sections. Each of the cross sections is considered the most critical for the given geometry and subsurface conditions. Section A-A' was analyzed for the largest design slope, while Section C-C' was analyzed for the largest lake slope. Stability was analyzed utilizing the computer program PCSTABL and the STEDWIN processor.

Groundwater. The historic high groundwater table was utilized in the analyses and is shown on Plate 3 -- Geotechnical Cross Sections.

Design Shear Strengths. Design shear strengths were modeled based on our laboratory testing contained in Appendix B in conjunction with methods outlined in Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines For Analyzing and Mitigating Landslide Hazards in California (ASCE/SCEC, 2002) The design strengths used in the analysis are summarized and discussed below:

Condition	Static		Pseudo-static	
	Phi (degrees)	Cohesion (psf)	Phi (degrees)	Cohesion (psf)
Engineered Fill	30	250	30	250
Older Alluvial Deposits (Qof)	27	350	27	350

Engineered Fill. The design strength for engineered fill is based upon ultimate strength obtained from a remolded fill sample. It is assumed that the fill materials used will be comprised of soil derived primarily from existing undocumented fill, older alluvial deposits, and younger alluvium deposits. Peak strengths were utilized in our pseudo-static analyses.

Older Alluvial Deposits (Qof) The design static strength for older alluvial deposits is based upon ultimate strengths obtained from the laboratory testing performed for this investigation. An average of all applicable tests was used in determining the design strengths. Peak strengths were utilized in our pseudo-static analyses.

Cross Section A-A' and C-C' Analysis. The design shear strengths discussed above were applied to the appropriate subsurface materials to form the strength model used in the analyses. The failure method is assumed to be a rotational failure through the post-grading fill and older fan deposits. The slopes were also checked pseudo-statically utilizing an earthquake coefficient of 0.15. The results of the analyses indicate adequate static and pseudo-static safety factors for the slope (i.e., safety factors in excess of 1.5 and 1.1, respectively). Results of the slope stability analyses are presented in this report as Appendix C.

LIQUEFACTION, SEISMIC SETTLEMENT, AND LATERAL SPREADING

Mode Magnitude Earthquake Event. The previously discussed probabilistic seismic hazard analysis (PSHA) was deaggregated at the PGA of 0.50g in order to determine the mode magnitude earthquake event to be used in the liquefaction analyses. Based on the hazard deaggregation, the mode magnitude earthquake is 6.75 at a PGA of 0.50g.

Design Groundwater. The historic high design groundwater level as discussed in the groundwater section was utilized in the analyses.

Liquefaction. Our liquefaction analysis was based on the methods outlined in "Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils," (Youd and Idriss, 1997), and in conjunction with "Evaluating Cyclic Liquefaction Potential Using the Cone Penetration Test," (Robertson and Wride, 1998). The results of our liquefaction analyses are presented in Appendix D and indicate that discrete thin zones within the alluvial and older alluvial

soils may be subject to liquefaction during the design seismic event. However, the potential for surface effects due to liquefaction are considered very low due to the presence of a fill cap on most of the site (i.e., design fill plus corrective) and the depth of the liquefiable soil layers below the proposed ground elevation.

Seismic Settlement. Seismic settlement analyses were performed based on “Estimating Liquefaction-Induced Ground Settlements from CPT for Level Ground,” (Zhang, Robertson and Brachman, 2002). The results of the analyses (Appendix D) indicate that under the design earthquake, seismic settlements up to about 2.5 inches may be expected. Differential settlement was found by looking at the variation of seismic settlements at CPT locations in close proximity to each other. Differential settlement is not anticipated to exceed 1.0 inch across 40 feet. The CPT with the largest amount of calculated liquefaction and seismic settlement were CPT-9, CPT-10, and CPT-11 all of which are on the western side of the site.

Lateral Spreading. Based on the discontinuous nature of potentially liquefiable layers, the potential for liquefaction-induced lateral spread and flow failure adjacent to the design slopes is anticipated to be low for the design seismic event.

SETTLEMENT

Static Settlements.

Fill Self Weight. Fill depths following corrective grading are anticipated to be less than 30 to 40 feet. These fills will be placed on top of dense older alluvium that is either

fine-grained and partially saturated, or granular in composition and partially to fully saturated. Given the low plasticity and partially saturated conditions of the fine-grained native soils, secondary settlement of these soils is anticipated to be negligible. Based on our field observations and laboratory testing results (i.e., consolidation testing, moisture and density, CPT soundings, etc.), the potential for significant hydro-collapse of the native soils is considered to be low. Given the shallow proposed fill height and the required over-optimum fill placement conditions, secondary settlement and hydro-collapse of the proposed fill materials are anticipated to be negligible. Consequently, long-term post-grading settlements due to the fill's self weight are anticipated to be negligible (i.e., will not exceed 1.0 inch total and ½-inch over 40 feet differential) and be complete by the conclusion of fill placement.

Seismic Settlement. As indicated in previous sections of this report, seismic settlement is estimated to be up to 2.5 inches, with differential seismic settlement up to 1.0 inch over 40 feet.

Settlement Monitoring. Settlement monitoring is not considered necessary due to the relatively shallow fill depths and favorable characteristics of underlying native soils (i.e., granular and partially to fully saturated).

ORGANIC SOILS

In order to evaluate the organic content of the on-site soils, laboratory testing was completed on soil samples taken from selected excavations across the site. Samples tested ranged in collected depth from 0 feet to 15 feet below ground surface. In general, the upper 5 feet of soil, regardless of geologic unit, contains organic content greater than 2%. Below 5 feet, the organic content drops to between 1 and 2%. The lowest organic content found during testing is 1%. These low results were found both at the surface and at depth. The highest concentrations of organics were found in the southern portion of the site, within the area used as an agricultural field. These concentrations were found at depths ranging from 0 to 5 feet.

Any corrective grading recommendations required for methane mitigation will be made at a later date, after completion of the methane study and Phase II Environmental Assessment.

EXPANSIVE SOILS

Based on laboratory testing of on-site soils, expansion potential ranging from very low to moderate should be anticipated. The results of our laboratory testing for expansion potential are included in Appendix B.

CORROSIVE SOILS

Based on laboratory testing results, we anticipate the on-site soils to be potentially severely corrosive to ferrous metals and have a moderate sulfate exposure potential. In addition, given the past site uses (i.e., dairy), the site is potentially corrosive to copper. The results of our laboratory testing for corrosion are included in Appendix B.

SOIL MOISTURE CONDITIONS

Observation of the on-site soils, in addition to the moisture and density data included in Appendix B, suggests that the soils encountered during grading will likely have variable moisture contents. Shallow cut and fill areas will likely encounter variable moistures, ranging from below to just above optimum moisture content. These soils will likely require a combination of moisture conditioning, drying, and/or blending. Deeper cut areas will likely encounter soils at or above the optimum moisture content, and the lake bottom and open space areas will likely encounter saturated soils that will require drying and blending. In addition, a dewatering system will likely be required to complete the grading process, as discussed in a subsequent section of this report. It should be noted that moisture content of the soil, particularly shallow soils, is affected by the time of year grading occurs and the amount of rainfall occurring the previous winter.

EXCAVATION CHARACTERISTICS

Rippability and Oversize Rock. The surficial materials present at the site (i.e., undocumented fill, alluvium, and older alluvium) can be excavated with scrapers after light to medium ripping with a Caterpillar D9, or equivalent equipment. Oversized hard rock materials (i.e., >12 inches) are not anticipated within the native materials. In areas of undocumented fill, concrete and asphalt fragments greater than 12 inches in diameter were encountered during our exploration. These fragments are localized, and can be excavated using standard grading equipment (i.e., dozers).

Volume Change. Corrective grading to support the planned grading will involve removal and recompaction of low-density, compressible materials such as undocumented fill, native soil, alluvium, and older alluvium. These soils are anticipated to shrink about 2 to 6%. Deeper cut areas will encounter medium-dense older alluvium. These soils are anticipated to shrink about 0 to 4%. It should be noted that these shrinkage estimates are based on visual observation and laboratory testing of samples collected from limited areas on-site. Therefore, some variability in actual shrinkage values should be anticipated. These values should be used for approximate quantity values only.

Trenching. Trenching within the majority of the site is expected to require the use of conventional trenching equipment. Trench support requirements are expected to consist of those required by safety laws and/or government regulations.

FILL SUPPORT

The near-level areas within the project that are underlain by dense and competent older alluvium will be suitable for the support of the planned fills after the removal of all topsoil and low-density or potentially unstable or compressible alluvium, older alluvium, or existing undocumented fill. Specific corrective grading recommendations are provided in subsequent sections of this report.

CONCLUSIONS

It is our opinion that it is geotechnically feasible to grade the Edgewater project as illustrated on the reference (1) plans, assuming that the recommendations presented in subsequent sections of this report are followed and all applicable grading codes and ordinances are adhered to. A summary of conclusions is as follows:

1. Corrective grading to accomplish the planned grading will include buttressing the eastern fill-over-cut slope and removing all undocumented fill and the upper 5 feet of alluvium and older alluvium.
2. The project area is not underlain by any known active faults. The closest active fault is the Chino-Central Avenue fault, which is located approximately 3.2 miles (5.1 kilometers) from the site. A probabilistic seismic hazard analysis for the site suggests a PGA of 0.50g.

3. The alluvium and older alluvium at the site are subject to liquefaction. Our liquefaction analysis indicates up to 2.5 inches of seismic settlement due to liquefaction of discrete alluvial strata. The potential for liquefaction-induced lateral spreading and flow failures is anticipated to be low.
4. All graded slopes on the reference (1) grading plan will be grossly and surficially stable under normal conditions of rainfall and maintenance provided they are graded in accordance with the recommendations presented in subsequent sections of this report.
5. The organic content of the on-site soils is generally higher than 2% within the upper 5 feet, and drops significantly in percentage below 5 feet. Special corrective grading recommendations in regards to methane mitigation (if required) will be determined after the methane study and Phase II Environmental Assessment are completed.
6. Corrective grading removals will encounter saturated soils in the areas of the lakes and the open space west of Mill Creek. Depending on the time of year grading occurs, groundwater may be a significant factor during grading, and dewatering may be required. The elevation and volume of groundwater encountered during grading will be dependent on the time of year that grading occurs and the amount of prior precipitation in this area.
7. Groundwater is not anticipated to impact the proposed development after grading is

completed, provided the recommendations in this report are followed, and given normal amounts of rainfall.

RECOMMENDATIONS

GRADING PLANS AND SPECIFICATIONS

The geotechnical aspects of the project grading plans and technical specifications for the project grading and improvements should be reviewed by GMU Geotechnical prior to advertisement of bids for grading. Particular care should be taken to confirm that the technical specifications and grading plans conform with the recommendations provided in this report. All planned and corrective grading should also be monitored by GMU Geotechnical to verify general compliance with the recommendations outlined in this report.

SITE PREPARATION AND GRADING

General. All site preparation and grading should be performed in accordance with the City of Chino Grading Code and the recommendations presented in this report.

Clearing. All significant organic materials such as weeds, brush, tree branches, roots, or other decomposable materials should be removed from areas to be graded. Within the dairy area, all dairy waste should be stockpiled and removed from the site. All debris, including concrete, asphalt, demolished structures or cattle pens, should be removed from areas to be graded prior to grading activities.

Removal of Existing Improvements. Existing improvements at the site include asphalt drives, underground utilities, residential housing, agricultural sheds, dairy buildings, fences, cattle pens, retaining walls, etc. These improvements should be removed or abandoned in accordance with any applicable County, State, and Federal guidelines. Concrete and asphalt debris can be disposed of within the fills provided they are disposed of in accordance with the recommendations in this report. Any decomposable or compressible debris should be disposed of off site. Requirements pertinent to environmental or hazardous materials regulations that may be applicable to removal of the on-site existing improvements are outside the scope of this report.

Buried Trash/Waste. Although not encountered during our exploration, buried trash/waste should be anticipated. All trash/waste materials should be removed from the site.

Removal of Existing Lake. After the existing lake located in the southeastern corner of the site has been drained of water, all saturated and compressible soils below the lake bottom should be removed to competent material. In addition, the undocumented fill placed as a dam across the southern portion of the lake should be removed to the property line or to competent material. These soils may be used as fill provided the recommendations in this report for moisture conditioning and fill placement are followed

The former lake (currently dry) in the southwestern corner of the site is also bounded by a dam of undocumented fill. These undocumented fill soils should also be removed to the property line or to competent material. All slopes constructed for these removals should not exceed 1:1 (horizontal to vertical) slope gradient and should follow appropriate safety guidelines.

Corrective Grading. Corrective grading will involve removal of existing soil materials from areas to receive fill. It should be noted that the recommendations provided herein are approximations based on our subsurface exploration and knowledge of the on-site geotechnical conditions. Actual removals may vary based on observations of geologic materials encountered during grading. The bottom of all corrective grading removals shall be observed by a GMU representative to verify the suitability of in-place soils prior to fill placement. Corrective grading should be anticipated as follows:

- (a) Removals in Dairy Areas. In all dairy areas, the upper foot of material is predominately dairy waste and is not suitable for fill placement. This material should be removed, stockpiled, and hauled offsite. In the areas that are currently in use as waste ponds, all saturated material should be removed, stockpiled, and hauled offsite. Undocumented fill, native soil, and low-density older alluvium encountered below the dairy waste should be removed. The corrective grading removals are anticipated to be about 5 to 11 feet deep. The corrective grading should extend to sufficient depths until dense older alluvium is encountered.

- (b) Removals in Agricultural Field Area. In the agricultural area, all undocumented fill, native soil, and low-density or compressible alluvium and older alluvium should be removed. The corrective grading removals in this area are anticipated to range from 5 to 8 feet deep. The corrective grading should extend to sufficient depths until dense alluvium or older alluvium is encountered.
- (c) Eastern Slope Keyway. The east-facing fill-over-cut slope located along the eastern portion of the development will require a keyway and drainage system. Depending on groundwater elevations at the time of grading, the lower portion of the slope may encounter saturated materials. A keyway is recommended along the slope with a minimum width of 15 feet. In addition, a dewatering system is recommended in this area to temporarily lower the groundwater table to accomplish the corrective grading. The keyway should be located either 5 feet below toe grade, or at the depth of saturated conditions. A backdrain system will be required at the heel of the keyway as shown on the Geotechnical Cross-Sections -- Plate 3. A typical buttress detail is presented as Plate 6.
- (d) Fill Support Benches. Fill support benches should be constructed where cut slopes transition to fill slopes, and should be founded on competent in-place soils. This corrective grading will apply to all fill over cut slopes, except for the slope discussed above. The bottoms of these initial benches should be 15 feet in minimum width,

and any non-engineered fill, topsoil, or low-density older alluvium should be completely removed to expose in-place dense soil. Further benching should be performed uphill from these keys or initial benches simultaneously with fill placement to remove any remaining surficial soil materials and provide additional level surfaces for fill support where the natural ground surface is 5 horizontal to 1 vertical, or steeper. A typical benching and keyway detail is presented as Plate 7

- (e) Over-Excavation. Based on review of the reference (1) plans, some planned lots will be within cut areas. These cut lots, as well as any transition lots, will require over-excavation to a minimum depth of 5 feet across the entire lot. A typical lot over-excavation detail is presented as Plate 8

DEWATERING

Prior to excavation of the lakes or the east-facing slope, a dewatering system should be installed to temporarily lower and control the groundwater surface to reduce the impact of groundwater on grading operations. The dewatering system should be designed and implemented by the contractor

FILL MATERIAL AND PLACEMENT

Suitability. All on-site soil material, including that removed by corrective grading, is suitable for use as compacted fill from a geotechnical perspective if care is taken to remove all

significant organic and other decomposable debris and separate and stockpile rock materials larger than 12 inches in maximum diameter.

Compaction Standard and Methodology. All soil material used as compacted fill, or material processed in-place or used to backfill trenches, should be moistened, dried, or blended as necessary, and densified to at least 90% relative compaction as determined by ASTM Test Method D 1557. It is recommended that fills be placed a minimum of 2% above optimum moisture content.

Fill Slope Compaction. Fill slopes should be carefully constructed and backrolled during grading to obtain the specified degree of compaction. These slopes should either be overfilled and trimmed back to expose firm, dense fill or, after “backrolling” during placement, compacted to the specified density using cable-lowered sheepsfoot and grid rollers. “Track walking” is not a recommended means of compacting fill slope surfaces.

Use of Rock or Broken Concrete. Native rock materials greater than 12 inches in diameter are not expected to be generated during the subject grading. However, concrete and asphaltic concrete fragments may be placed within the fill (excluding the lake bottom areas) if the following recommendations are followed. The oversize materials may be placed in limited quantities within the deeper fills if placed in accordance with the following procedures and as illustrated on Plate 9 – Recommended Placement Method for Oversized Rock or Concrete. Oversize material is not to be placed below the lake bottoms.

- (a) Fragments 12 inches or more in diameter should be placed in rows at least 15 feet apart, 15 feet from the edge of the fill, and 10 feet or more below subgrade. Spaces should be left between each fragment to allow for placement and compaction of soil around the fragments.
- (b) Fill materials consisting of soil meeting the minimum moisture content requirements and free of oversize material should be placed between and over the rows of rock or concrete. Ample water and compactive effort should be applied to the fill materials as they are placed in order that all of the voids between each of the fragments are filled and compacted to the specified density.
- (c) Subsequent rows of fragments should be placed such that they are not directly above a row placed in the previous lift of fill
- (d) Fragments should not be used where they will obstruct excavation of storm drains, utility trenches, or other planned or future underground improvements.

Oversize material in lake bottom areas should be limited to 4 inches in diameter.

SUBDRAINS

Subdrain systems should be constructed at the rear of the recommended keyway to provide long-term drainage of the slope. This drain system should consist of 4-inch-diameter perforated plastic pipe embedded in 4 cubic feet of filter material per lineal foot of pipe installed in a "V" cut or shallow backhoe trench at the heel of each keyway. An additional tier of drain will be required

March 16, 2007

Project 04-15-03 (Edgewater, Chino)

 GMU Page 34

approximately 10 feet above the first drain, or at no more than 10 feet above the saturated soils encountered during grading, as determined by GMU Geotechnical in the field. Additional tiers may be required at no more than 30-foot vertical intervals. Should significant seepage be observed during grading, additional drains may be recommended by the geotechnical representative in the field.

The collector drains should have a minimum gradient of 1% toward the outlet pipe locations. The outlet drains should consist of non-perforated plastic pipe connected with a "T" to the collector pipe and installed in shallow, narrow trenches excavated through the fill and sloping at a minimum gradient of 1% toward the toe of slope or as specified by the geotechnical consultant in the field. The outlet trenches should be backfilled with select on-site soils free of any fragments of hard material. The outlets should be constructed at intervals of about 100 feet and at each end of the collector systems where possible and practical, or as specified by our office based on conditions exposed during grading. Where practical, outlet pipe should extend into a permanent structure such as a gunite terrace drain or riprap pad. Outlets exiting a slope face that cannot be tied to a permanent structure should be outletted using the devices shown on Plate 10. Standards and details illustrating the configuration of the backdrains are shown on Plate 11.

PLANNED LAKES

It is our understanding that the lakes will be lined with a PVC liner. Prior to installation of the liner, the lake bottom must be relatively smooth and free of fragments or debris. In order to install the liner properly, the dewatering system will be required to lower the groundwater table so

that the bottom surface can be prepped for line installation. No corrective grading is anticipated within the lake areas. However, any undocumented fill, native soil, or low-density alluvium encountered during excavation of the lake bottom should be removed and recompact as recommended in this report.

SEISMIC DESIGN CRITERIA FOR STRUCTURES

No active or potentially active faults are known to cross the site, therefore, the potential for primary ground rupture due to faulting on-site is very low to negligible. However, the site will likely be subject to seismic shaking at some time in the future.

The seismic sources and site to source distance for UBC seismic design purposes were determined utilizing "*Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada*" prepared by CGS. This document was prepared in cooperation with the Structural Engineers Association of California Seismology Committee and published by the ICBO for use with the UBC. GMU recommends that seismic design for structures at the site take into consideration the nearest known active fault, the Chino-Central Avenue fault. On-site structures should be designed in accordance with the following 1997 UBC criteria:

Seismic Source Type:	B
Site to Source Distance:	5.1 km
Seismic Zone:	4
Seismic Zone Factor:	0.4
Soil Type:	S _D

It should be recognized that much of southern California is subject to some level of damaging ground shaking as a result of movement along the major active (and potentially active) fault zones that characterize this region. Construction in accordance with the standards of the most current version of the UBC is intended to “*safeguard against major structural failures and loss of life, not to limit damage or maintain function.*” Therefore, the preceding parameters should be considered as minimum design criteria.

PRELIMINARY FOUNDATION SYSTEM DESIGN CONSIDERATIONS

General. The following design considerations have been presented for planning purposes only. Detailed geotechnical foundation recommendations will be developed at the completion of grading. All applicable guidelines, codes, and ordinances should be followed in the design of the foundation system.

Anticipated Post-grading Geotechnical Conditions. Assuming the grading is performed per our recommendations contained herein, it is anticipated that soils exposed at the surface and in the foundation influence zone following rough grading will have very low to moderate expansion potential. Based on the results of chemical testing, it is anticipated that the soils within the foundation influence zone will be severely corrosive to ferrous metals and copper, and possess a moderate potential for sulfate exposure to concrete (as defined by the UBC).

Bearing Material. All structures supported by shallow foundations will need to bear into the engineered fill materials.

Foundation Type. Based on the results of the liquefaction and seismic settlement analysis, it is recommended that a post-tensioned foundation system designed per the Post-tension Institute design methodology be utilized. Foundations will need to be designed for both static and seismic settlements as well as potential movements from moderately expansive soils.

Concrete. Based on our laboratory testing results, the on-site soils are anticipated to be moderately corrosive to concrete. Therefore, concrete with a maximum w/c ratio of 0.50 and minimum compressive strengths of 4000 psi will be required, based on the UBC Table 19-A-4. Utilization of the 0.50 w/c ratio will also serve to reduce the permeability of the concrete and help minimize the potential of water and/or vapor transmission through the concrete.

PRELIMINARY PAVEMENT DESIGN

To preliminarily evaluate the required thickness of the asphalt pavement for streets, drives, and parking areas, at the site, R-value testing was completed for selected samples from the site. The results of these tests indicate the post-grading surficial soils may have R-values ranging from 8 to 14. Based upon an R-value of 8 and Traffic Indices of 4.5 and 5.5, the following preliminary pavement sections were developed:

R-Value	Traffic Index	Asphalt Concrete (inches)	Aggregate Base (Inches)
8	4.5	4.0	5.5
8	5.5	4.0	9.0

Aggregate base materials (AB), and asphaltic concrete materials (AC) should be of a type meeting the minimum City of Chino standards. The subgrade soils should be compacted to at least 90% relative compaction, and the AB and AC should be compacted to at least 95% relative compaction

Final design sections will be based on field verification and possible additional testing at the completion of rough grading.

UTILITY TRENCH BACKFILL

Backfill compaction of utility trenches in and immediately adjacent to any areas that will be improved should be such that no significant settlement will occur. Backfill for all of these trenches should be compacted to at least 90% relative compaction subject to sufficient observation and testing.

TEMPORARY EXCAVATIONS

Temporary excavations and trench walls to a depth of 4 feet may be made vertically without shoring subject to verification of safety by the contractor. Deeper excavations should be braced, shored, or sloped no steeper than 1:1 (horizontal to vertical). No surcharge loads should be allowed within 5 feet from the top of cuts

All work associated with excavation, shoring, and bracing should meet the minimal requirements as set forth by CAL-OSHA. Temporary excavation recommendations are provided as general guidelines. Temporary slope and trench excavation construction, maintenance, and safety are the responsibility of the contractor.

CORROSION PROTECTION OF METAL STRUCTURES

The severely corrosive nature of the soil at the site should be considered in the design of ferrous metal and copper structure utilities that will be in direct contact with the soil (i.e., underground metal conduits, pipelines, metal sign posts, metal fence posts, metal door frames, etc.). If metal fencing is to be used, special precautions should be taken due to the close proximity to the highly corrosive soils. Consideration should be given to the use of coated steel, stainless steel, aluminum, or other coated alternatives for metals (including copper) in contact with the soils. Our evaluation was not a full corrosion study. If a full corrosion study is desired, the services of a corrosion engineer should be obtained.

SLOPE LANDSCAPING

The plans for landscaping and irrigation of the slopes to be created during the project grading should be prepared by a qualified landscape architect experienced in utilizing plant materials for long-term reduction of slope erosion hazards.

The use of plant materials requiring minimum cultivation and irrigation is recommended. Irrigation of graded slopes must be carefully controlled to prevent saturation of the compacted fill forming the slopes. Any irrigation system should consist of above-ground piping to avoid the need for trenching and disturbance to the slope surfaces.

SURFACE DRAINAGE

Surface drainage should be carefully controlled during and after grading to prevent ponding adjacent to, and runoff onto, graded or natural slopes. Particular care will be required during construction to maintain the berms and swales needed to direct runoff to surface drainage facilities. Where possible, all surface drainage should be directed toward storm drains and not be directed onto off-site slopes

LIMITATIONS

All parties reviewing or utilizing this report should recognize that the findings, conclusions, and recommendations presented represent the results of our professional geological and geotechnical engineering efforts and judgments. Due to the inexact nature of the state of the art of these professions and the possible occurrence of undetected variables in subsurface conditions, we cannot guarantee that the conditions actually encountered during grading will be identical to those observed and sampled during our study or that there are no unknown subsurface conditions which could have

an adverse effect on the use of the property. We have exercised a degree of care comparable to the standard of practice presently maintained by other professionals in the fields of geotechnical engineering and engineering geology, and believe that our findings present a reasonably representative description of geotechnical conditions and their probable influence on the grading and use of the property.

Because our conclusions and recommendations are based on a limited amount of current and previous geotechnical exploration and analysis, all parties should recognize the need for possible revisions to our conclusions and recommendations during grading of the project. **Additionally, our conclusions and recommendations are based on the assumption that our firm will act as the geotechnical engineer of record during grading of the project to observe the actual conditions exposed, to verify our design concepts and the contractors' general compliance with the project geotechnical specifications, and to provide our revised conclusions and recommendations should subsurface conditions differ significantly from those used as the basis for our conclusions and recommendations presented in this report.** The scope of our investigation did not include research or testing pertaining to the possible presence of toxic or hazardous waste materials.

SUPPORTING DATA

The following Plates and Appendices that complete this report are listed in the Table of Contents.



Respectfully submitted,

GMU GEOTECHNICAL, INC.

David Van Thiel, M.Sc., P.E. 70628
Staff Engineer



Lisa L. Bates-Seabold, CEG 2293
Senior Engineering Geologist

Gregory Silver, M.Sc., GE 2336
Principal Engineer



lbs/04-15-03R (3-16-07)

REFERENCES

SITE SPECIFIC REFERENCES

- (1) Huitt-Zollars, Inc , “Edgewater Project Plan (Applicant Plan),” dated April 11, 2005 (H-Z Job No. 10-1073-02).
- (2) Our “Report of Phase 1 Geotechnical Investigation, Planning Stage Geotechnical Site Characterization, Chino Project, Chino, California,” dated February 25, 2004 (GMU Proj No 04-15-00).

GENERAL REFERENCES

- Abrahamsom, N.A , and Silva, W.J., 1997, Empirical response spectral attenuation relations for shallow crustal earthquakes: *Seismological Research Letters*, v. 68, no. 1, p. 94-127
- Boore, D M , Joyner, W.B., and Fumal, T E., 1997, Equations for estimating horizontal response spectra and peak acceleration from western North America earthquakes: A summary of recent work: *Seismological Research Letters*, v 68, p 128-153.
- Campbell, K.W., and Bozorgnia, Y., 2003, Updated near-source ground motion (attenuation) relations for the horizontal and vertical components of peak ground acceleration and acceleration response spectra: *Bulletin of the Seismological Society of America*, vol. 93, no. 1, p. 314-331.
- Cao, T , Bryant, W.A., Rowshandel, B., Branum, D and Wills, C J., 2003, The revised 2002 California probabilistic seismic hazard maps: California Geological Survey, 11p.
- CDMG Staff, 1997, “Guidelines for Evaluating and Mitigating Seismic Hazards in California,” CDMG Special Publication 117.
- Cornell, C A., 1968, Engineering seismic risk analysis: *Bulletin of the Seismological Society of America*, v. 58, p. 1583-1606

March 16, 2007

Project 04-15-03 (Edgewater, Chino)

 CMU Page 44

- Dibblee, Thomas W (Jr.), 2001, Geologic Map of the Yorba Linda and Prado Dam Quadrangles (Eastern Puente Hills), Dibblee Geological Foundation Map No 75.
- Fife, et al , 1976, Geologic Hazards in Southwestern San Bernardino County, California, CDMG Special Report 113.
- Greenwood, R.B , and Morton, P.K., 1991, Geology of the Santa Ana 1:100,000 quadrangle, California: CDMG Open File Report 91-17.
- Hart, E W., and Bryant, W A , 1997 (revised 1999), Fault-rupture hazard zones in California: CDMG Special Publication 42, 38p.
- Jennings, C W., 1994, Fault activity map of California and adjacent areas: CDMG Data Map No. 6, scale 1:750,000
- McGuire, R K., 1976, Fortran program for seismic risk analysis: U S Geol Survey Open File Report 76-67, 90p
- Morton, Douglas M., and Gray, C H. (Jr.), Version 1.0, Geologic Map of the Corona North 7.5' Quadrangle, Riverside and San Bernardino Counties, California, USGS Open File Report 02-22
- Petersen, M D. and eight others, 1996, Probabilistic seismic hazard assessment for the State of California: CDMG Open File Report 96-08
- Robertson, P K , and Wride C.E., 1997, Evaluating Cyclic Liquefaction Potential Using the Cone Penetration Test: Canadian Journal of Geotechnical Engineering Volume 35, p 442-459
- Sadigh, K., Chang, C Y., Egan, J., Makdisi, F , and Youngs, R., 1997, Attenuation relationships for shallow crustal earthquakes based on California strong motion data: Seismological Research Letters, v 68, p 180-189.
- SCEC, 1999, Recommended Procedures for Implementation of DMG Special Publication 117 - Guidelines for Analyzing and Mitigating Liquefaction in California . . . ,” organized by the Southern California Earthquake Center at the University of Southern California, dated March 1999.

March 16, 2007

Project 04-15-03 (Edgewater, Chino)

 CMU Page 45

SCEC, 2002, Recommended Procedures for Implementation of DMG Special Publication 117 - Guidelines for Analyzing and Mitigating Landslide Hazards in California . . . ,” organized by ASCE Los Angeles Section Geotechnical Group, dated June 2002.

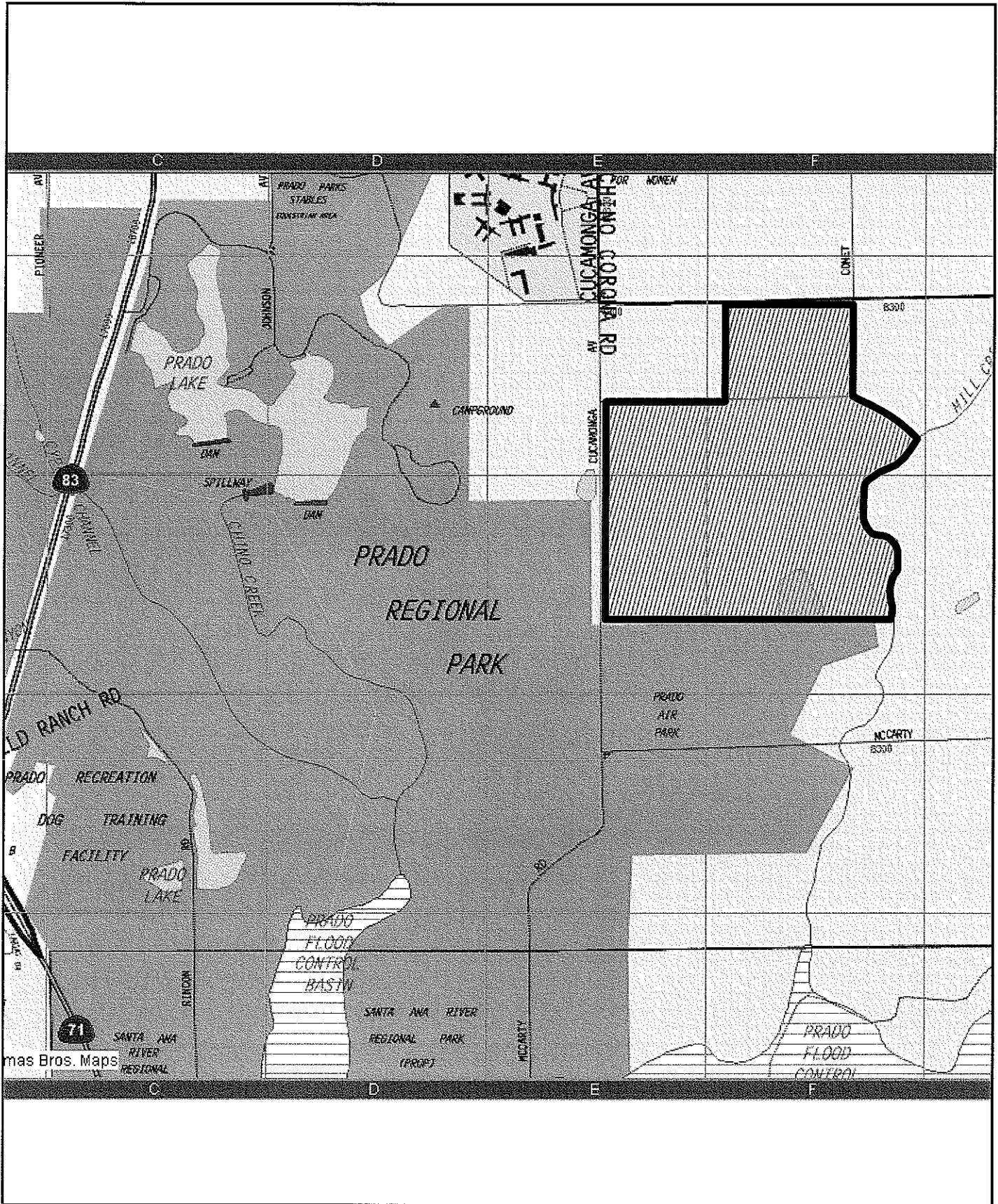
Wildermuth Environmental, Inc , 1999, Optimum Basin Management Program, Draft Phase 1 Report, prepared for Chino Basin Watermaster, <http://www.cbwm.org>.

Youd, T. L. and Idriss, I. M., 1997, Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils: Technical Report NCEER-97-0022, dated December 31, 1997.

Zhang, G., Robertson, P.K., and Brachman, R.W I, 2002, Estimating Liquefaction-Induced Ground Settlements from CPT for Level Ground: Canadian Geotechnical Journal, Volume 39, p. 1168-1180.

PLATES





Location Map

Plate

1

Project Name:
Edgewater Chino

Project No:
04-15-03

Date:
March 16, 2007

EDGEWATER PROJECT PLAN (APPLICANT PLAN)

IN THE CITY OF CHINO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
377 NUMBERED LOTS AND 56 LETTERED LOTS

GEOTECHNICAL MAP

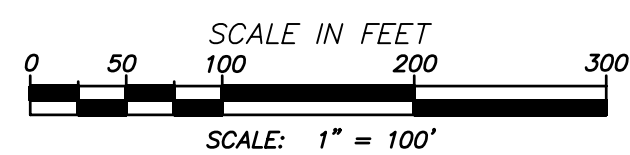
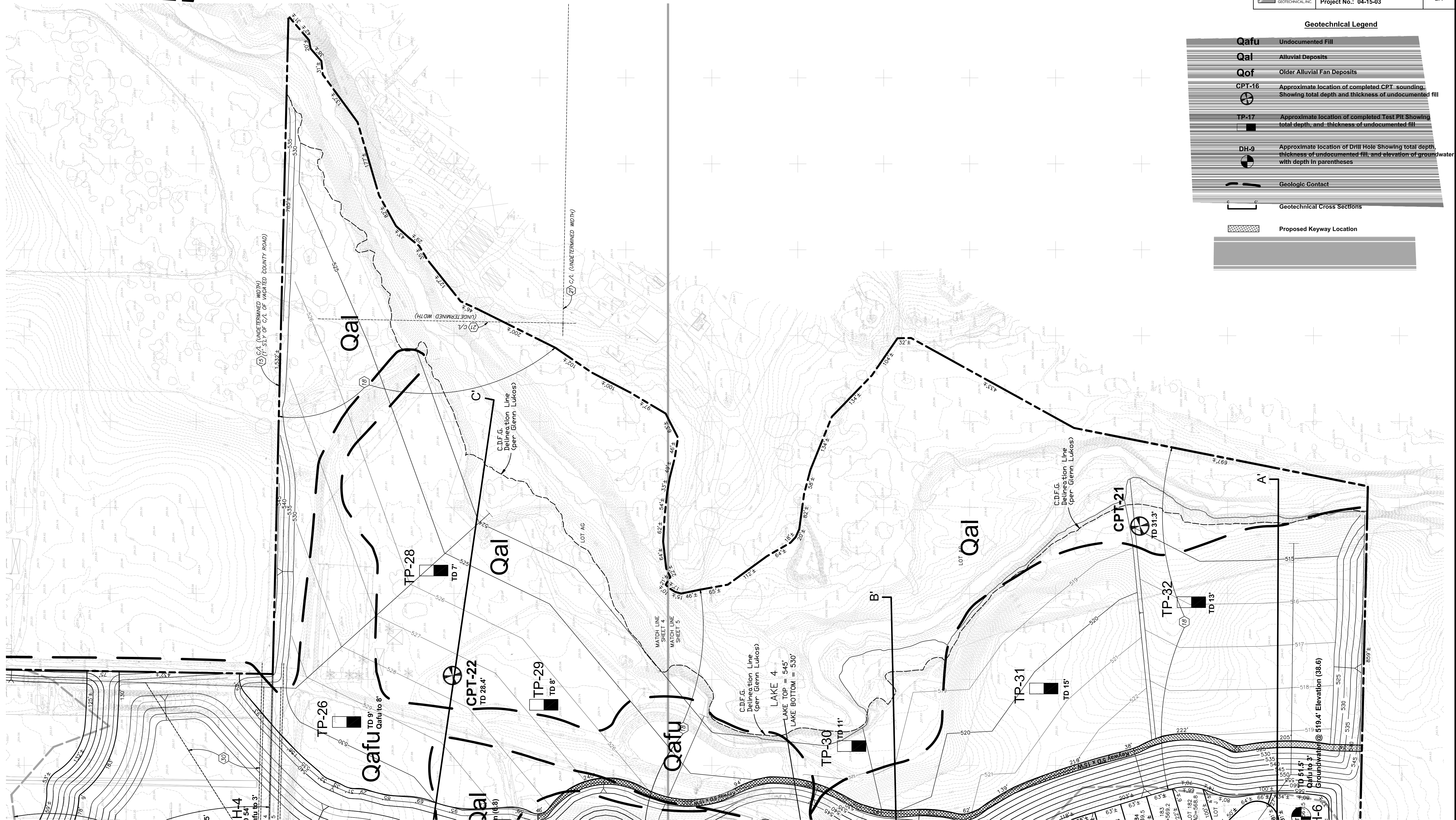


Date: March 16, 2007
Project No.: 04-15-03

Plate
2.4

Geotechnical Legend

Qafu	Undocumented Fill
Qal	Alluvial Deposits
Qof	Older Alluvial Fan Deposits
CPT-16	Approximate location of completed CPT sounding, Showing total depth and thickness of undocumented fill
TP-17	Approximate location of completed Test Pit Showing total depth, and thickness of undocumented fill
DH-9	Approximate location of Drill Hole Showing total depth, thickness of undocumented fill, and elevation of groundwater with depth in parentheses
	Geologic Contact
	Geotechnical Cross Sections
	Proposed Keyway Location



LEGEND

C.D.F.G. - CALIFORNIA DEPARTMENT OF FISH & GAME

HUIT-ZOLLARS

Huit-Zollars, Inc.
430 Exchange, Suite 200
Irvine, California 92602-1309
Phone (714) 734-5100 Fax (714) 734-5155

DESIGNED BY RH/TB	R.C.E.	EXPIRES	DATE	CHECKED BY RS
DRAWN BY PMP				
PREPARED UNDER THE SUPERVISION OF				JOB NO. 10-1073-02

EDGEWATER PROJECT
PLAN
(APPLICANT PLAN)

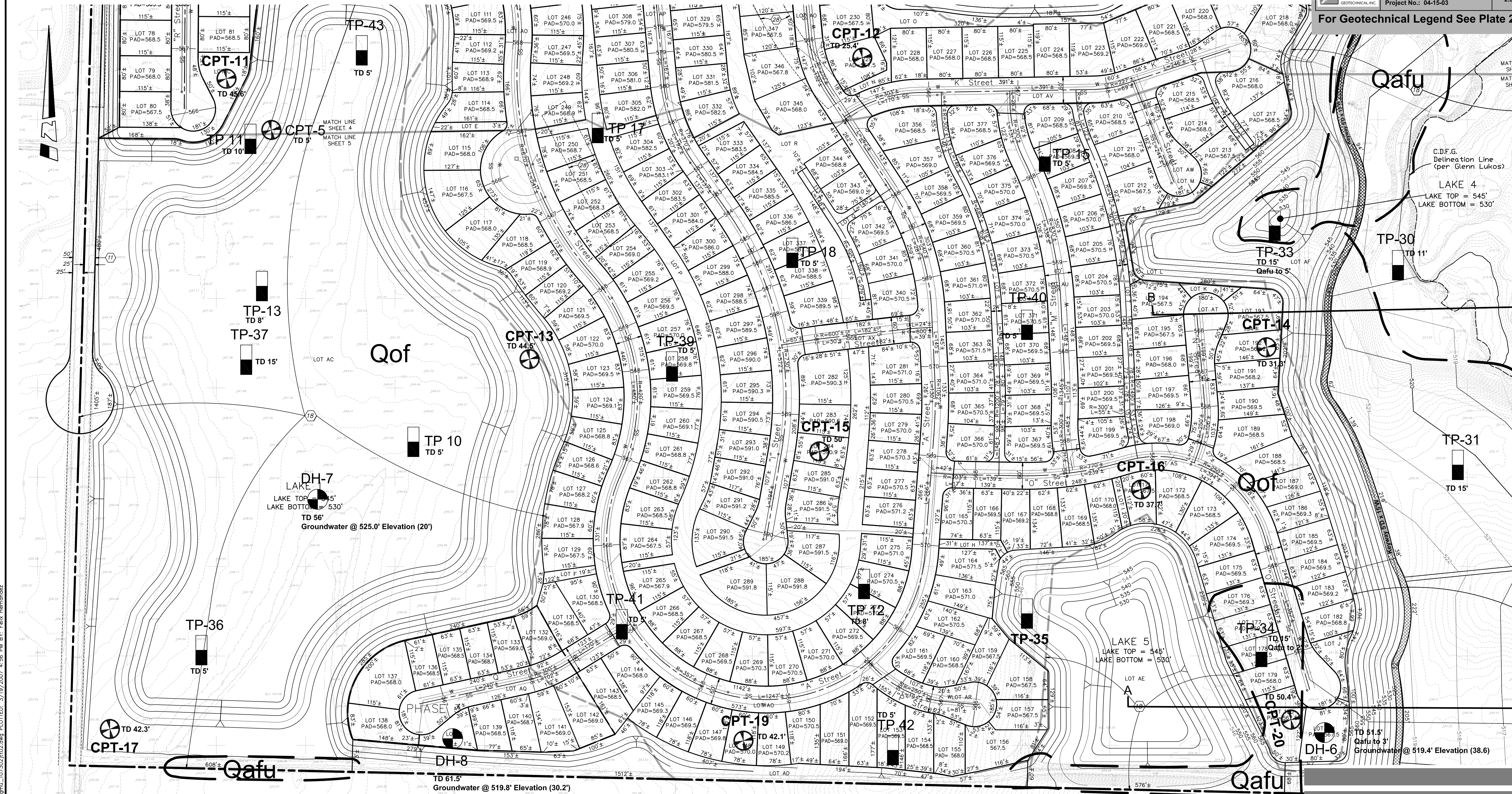
SHEET
7
OF
7
SHEETS

EDGEWATER PROJECT PLAN (APPLICANT PLAN)

IN THE CITY OF CHINO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
377 NUMBERED LOTS AND 56 LETTERED LOTS

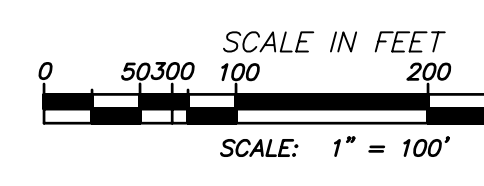
GEOTECHNICAL MAP

	Date: March 16, 2007	Plate
	Project No.: 04-15-03	2.3
For Geotechnical Legend See Plate 2.4		



DRAWING: c:\2004\04-15-03 edgewater_chino\gm_u_107302\102.dwg PLOTTED: 3/19/2007 4:56 PM BY: Felix Hernandez

FILENAME: c:\2004\04-15-03 Edgewater_Chino\gm_u_107302\102.dwg, Mar 19 2007 4:47pm



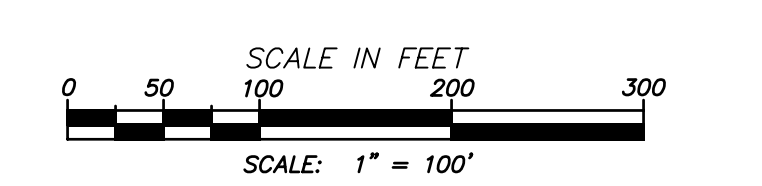
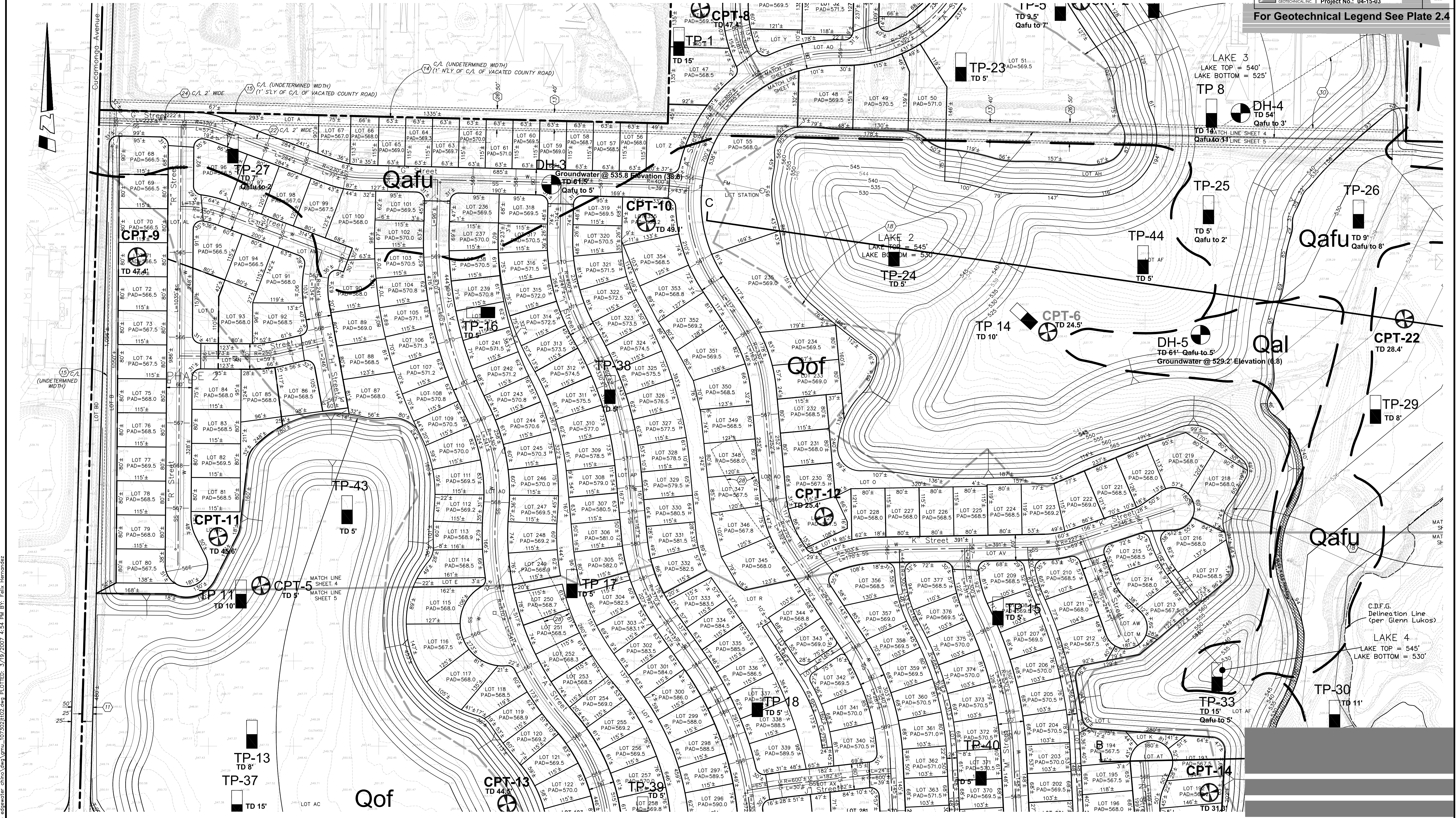
HUITT-ZOLIARS Huitt-Zoliars, Inc., Exchange, Suite 200 Irvine, California 92602-1309 Phone (714) 734-5100 Fax (714) 734-5155		DESIGNED BY RH/TB DRAWN BY PMP PREPARED UNDER THE SUPERVISION OF R.C.E.	EDGEWATER PROJECT PLAN (APPLICANT PLAN)	SHEET 6 OF 7 SHEETS SHE NO. 10-1073-02
EXPIRES DATE CHECKED BY RS		SHEET 6 OF 7 SHEETS	SHEET 6 OF 7 SHEETS	SHEET 6 OF 7 SHEETS

EDGEWATER PROJECT PLAN (APPLICANT PLAN)

IN THE CITY OF CHINO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
377 NUMBERED LOTS AND 56 LETTERED LOTS

GEOTECHNICAL MAP

	Date: March 16, 2007	Plate
	Project No.: 04-15-03	2.2
For Geotechnical Legend See Plate 2.4		



	DESIGNED BY	RH/TB
	DRAWN BY	PMP
PREPARED UNDER THE SUPERVISION OF	R.C.E.	EXPIRES DATE
CHECKED BY	RS	
EDgewater Project PLAN (APPLICANT PLAN)		SHEET 5 of 7 SHEETS
JOB NO. 10-1073-02		FILENAME: G:\2004\04-15-03 Edgewater Chino\Map\GMU_107302\T02.dwg, Mar. 19. 2007 4:47pm

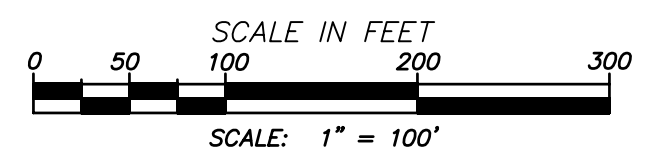
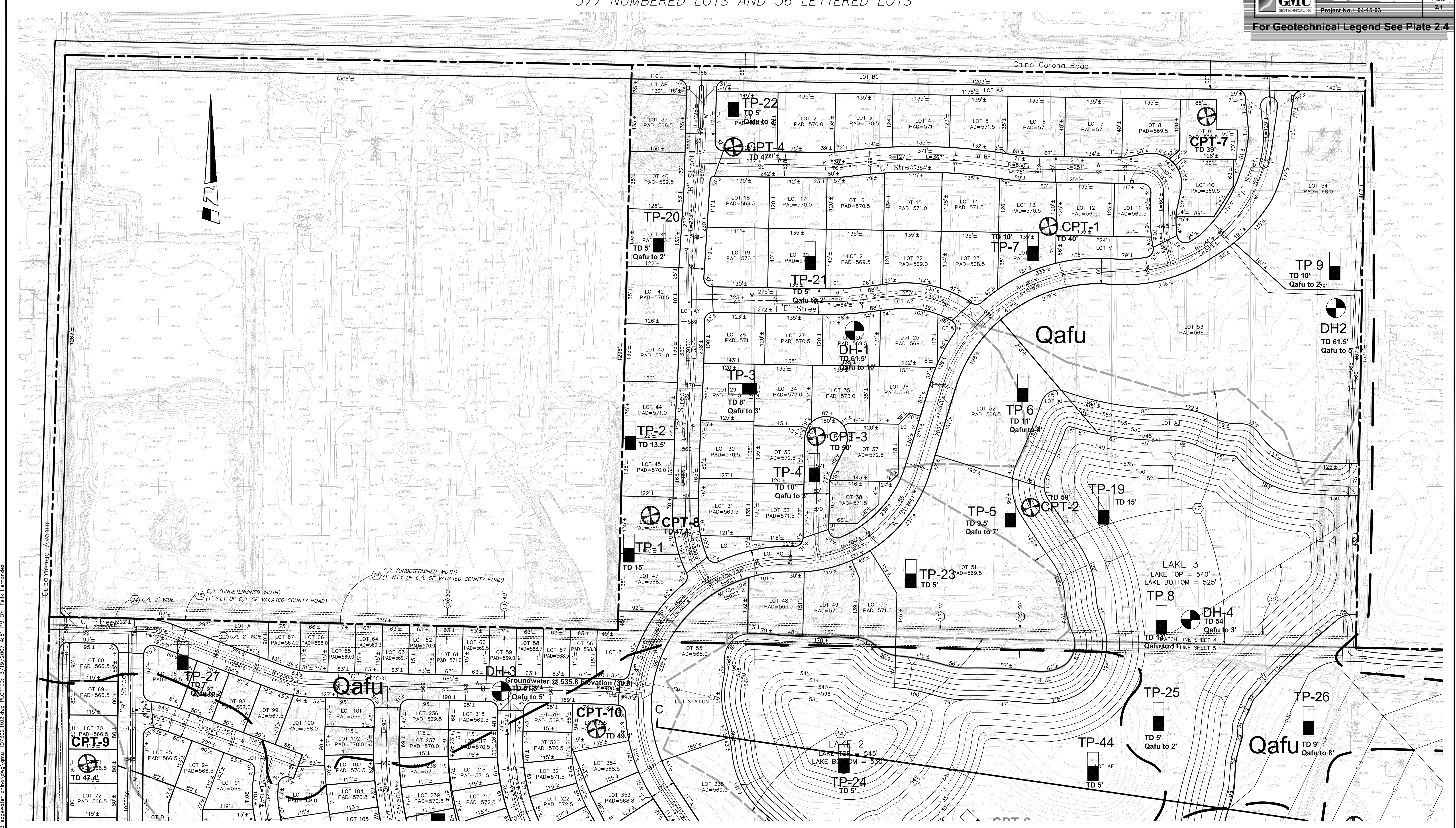
DRAWING: G:\2004\04-15-03 Edgewater Chino\Map\GMU_107302\T02.dwg PLOTTED: 3/19/2007 4:54 PM BY: Felix Hernandez

EDGEWATER PROJECT PLAN (APPLICANT PLAN)

IN THE CITY OF CHINO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA
377 NUMBERED LOTS AND 56 LETTERED LOTS

GEOTECHNICAL MAP

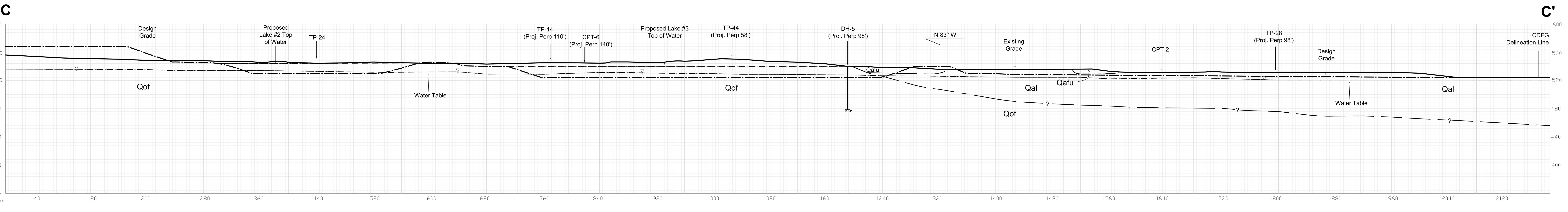
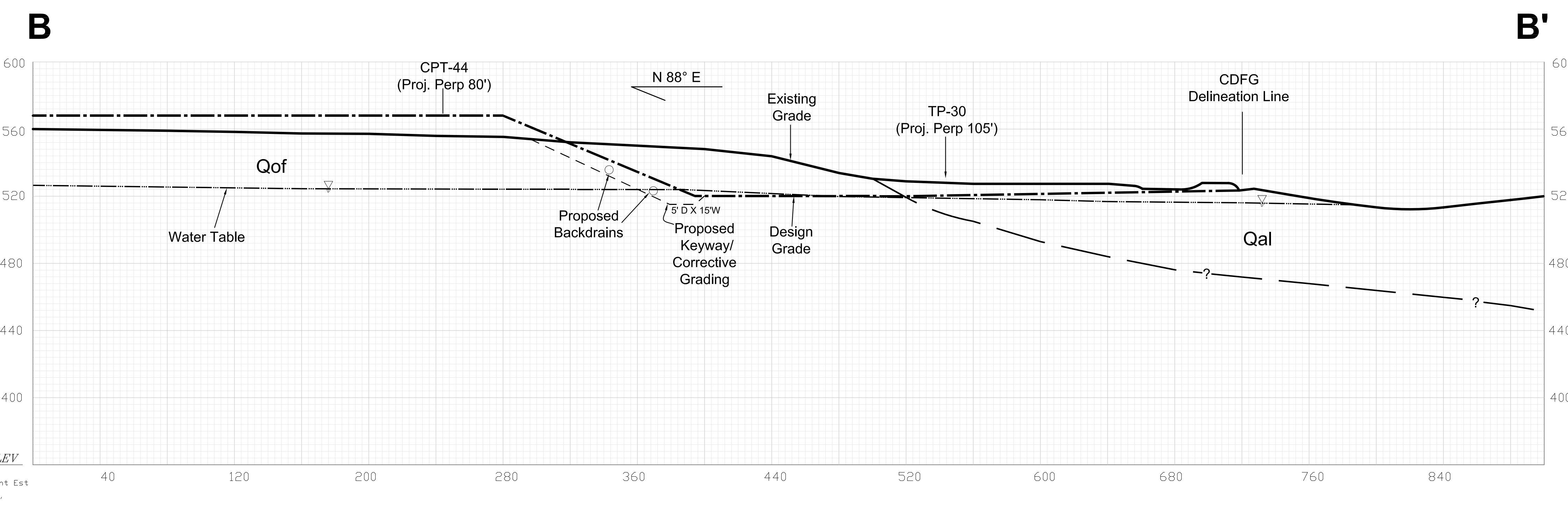
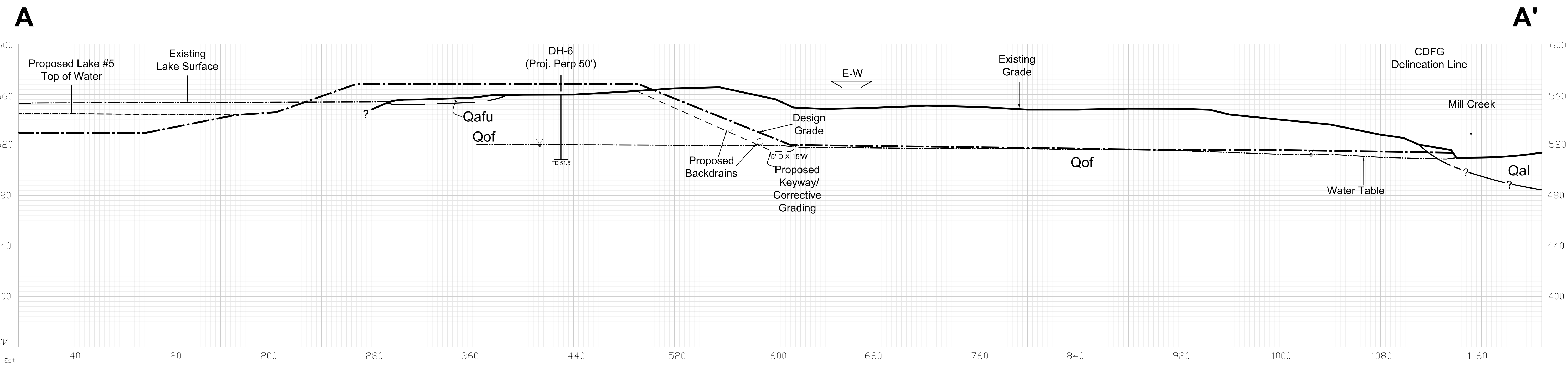
	Date: March 16, 2007	Plate
	Project No.: 04-15-03	2.1
For Geotechnical Legend See Plate 2.4		



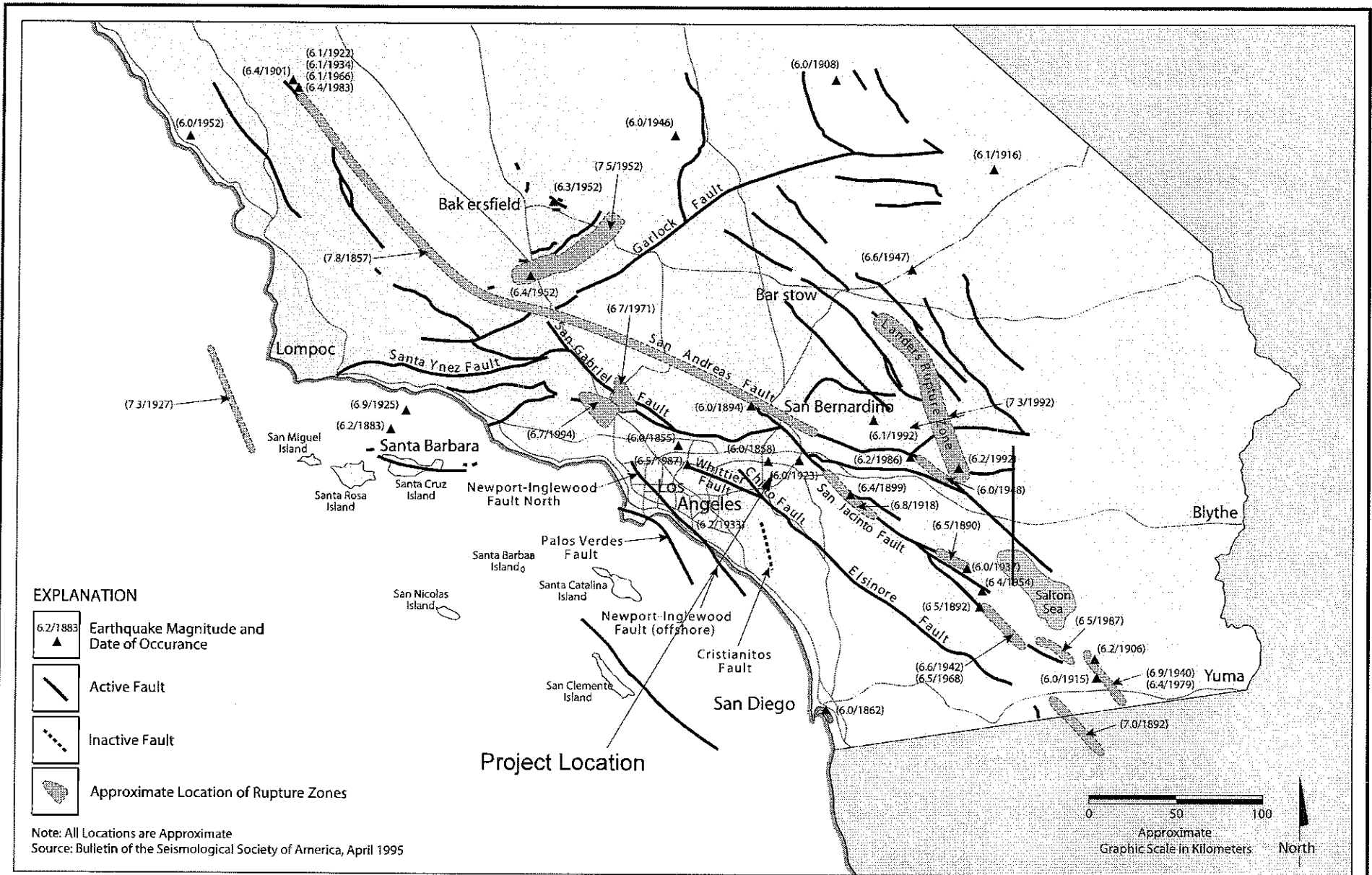
HUIT-ZOLIARS Huit-Zoliars, Inc. 430 Exchange, Suite 200 Irvine, California 92602-1309 Phone (714) 734-5100 Fax (714) 734-5155	DESIGNED BY RH/TB	EDGEWATER PROJECT PLAN (APPLICANT PLAN)	SHEET 4 of 7 SHEETS
	DRAWN BY PMP		CHECKED BY RS
PREPARED UNDER THE SUPERVISION OF R.C.E.	EXPIRES DATE		

DRAWING: c:\2004\04-15-03.edgewater.chino\data\cmu_107302\102.dwg PLOTTED: 3/19/2007 4:51 PM BY: Felix Hernandez

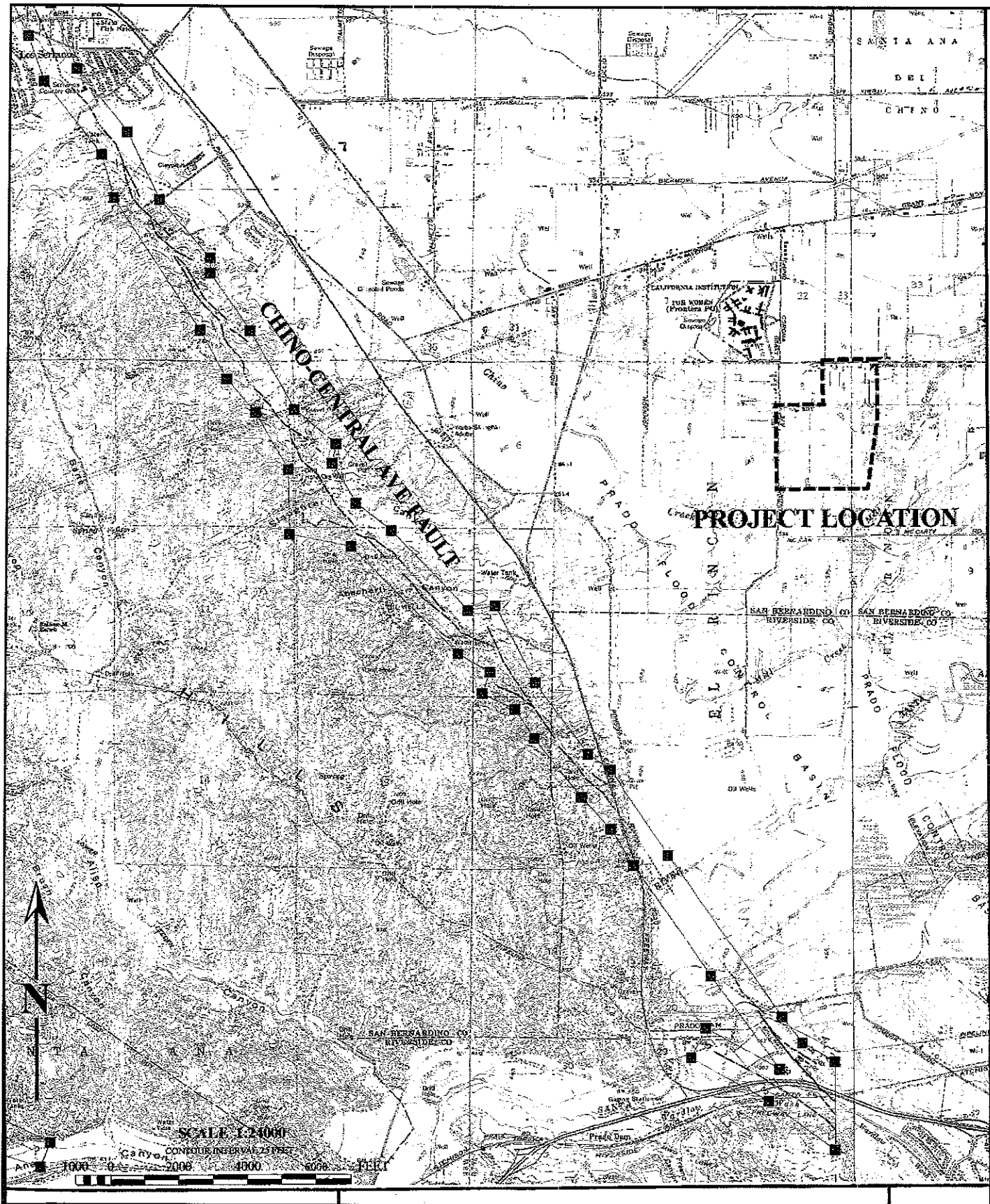
FILENAME: c:\2004\04-15-03.edgewater.chino\data\cmu_107302\102.dwg, Mar. 19. 2007 4:47pm

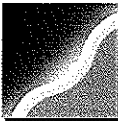


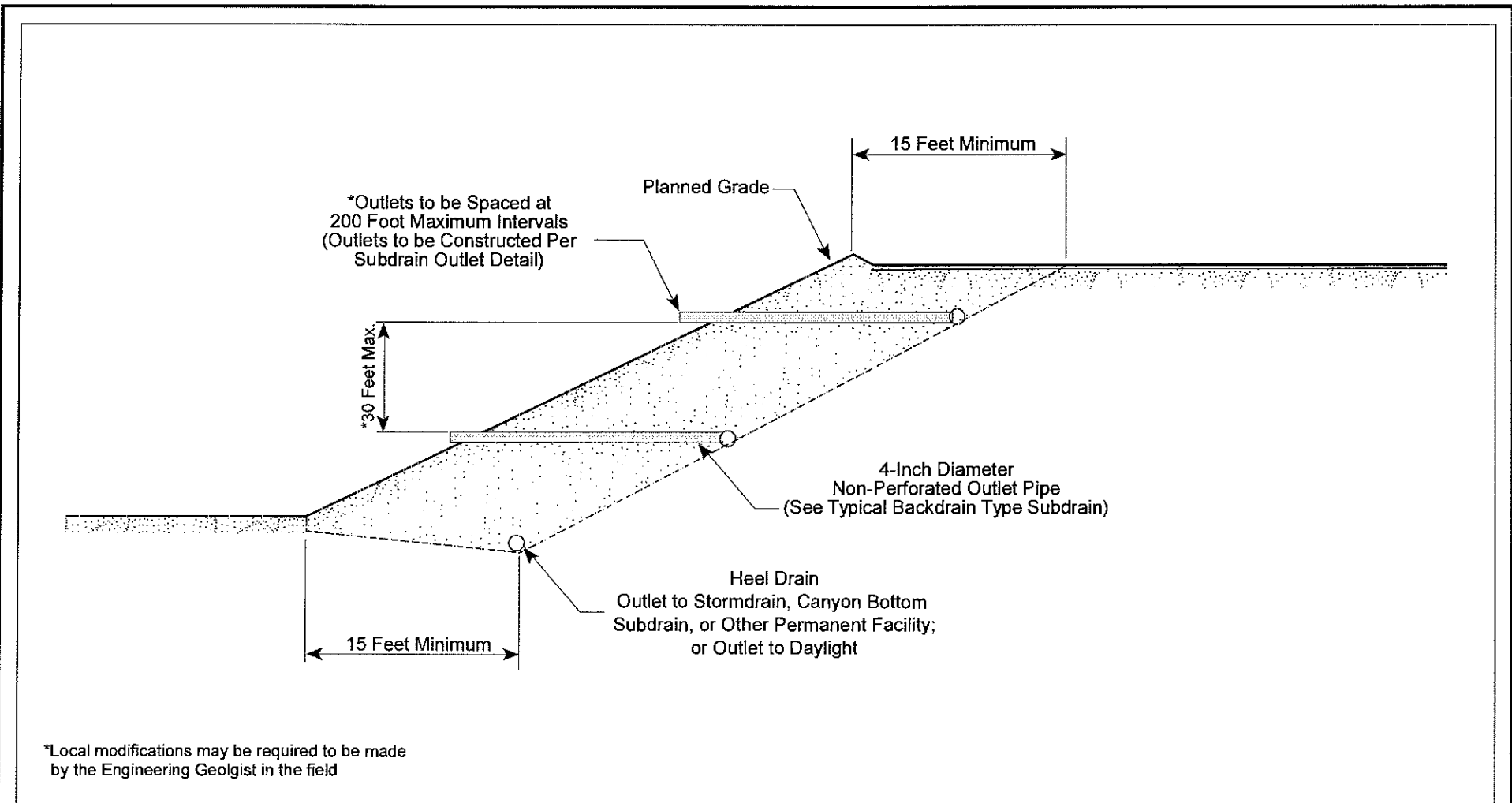
**GEOTECHNICAL SECTIONS
A-A' -- C-C'**



REGIONAL SEISMICITY:
Location of Major Active Surface Faults, Significant Inactive Faults,
and Major Earthquake Epicenters (M>6.0)



 GMU GEOTECHNICAL, INC.	<h2>Alquist-Priolo Earthquake Fault Zone Map</h2>		Plate 5
	Project Name: Edgewater Chino	Project No: 04-15-03	Date: March 16, 2007



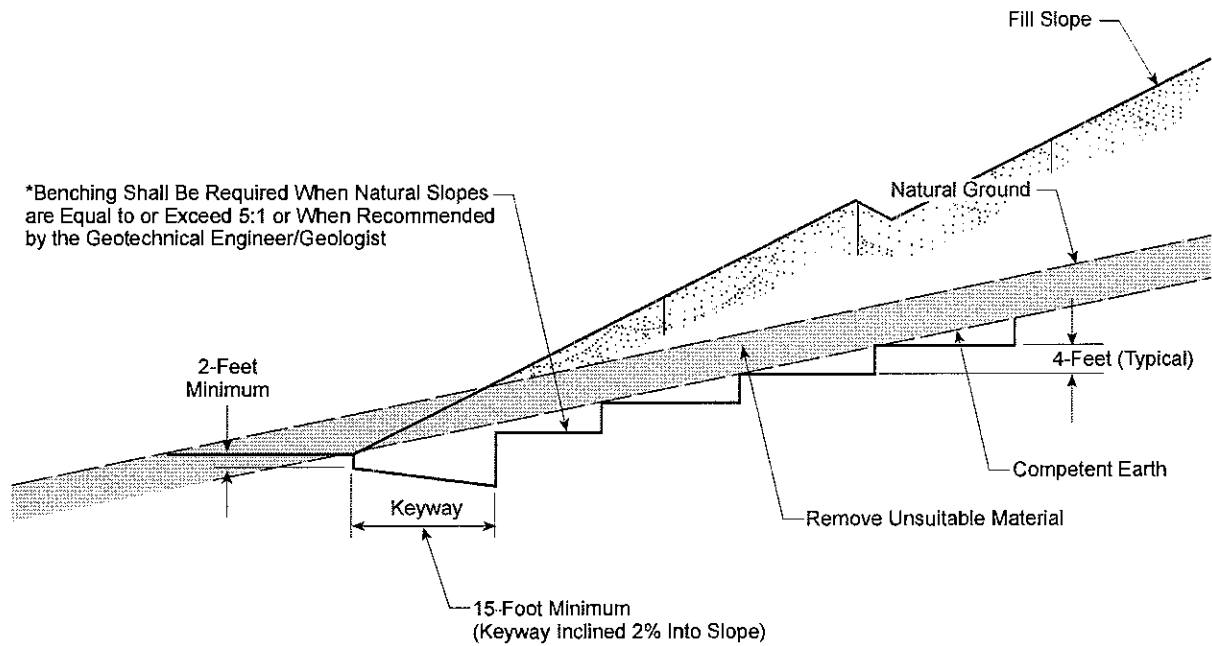
Notes:

1. All Buttress or Stabilization Dimensions to be Determined by Geotechnical Engineer/Geologist
2. Backdrains to be Located in Field by Geotechnical Engineer/Geologist
3. Drawing not to Scale.

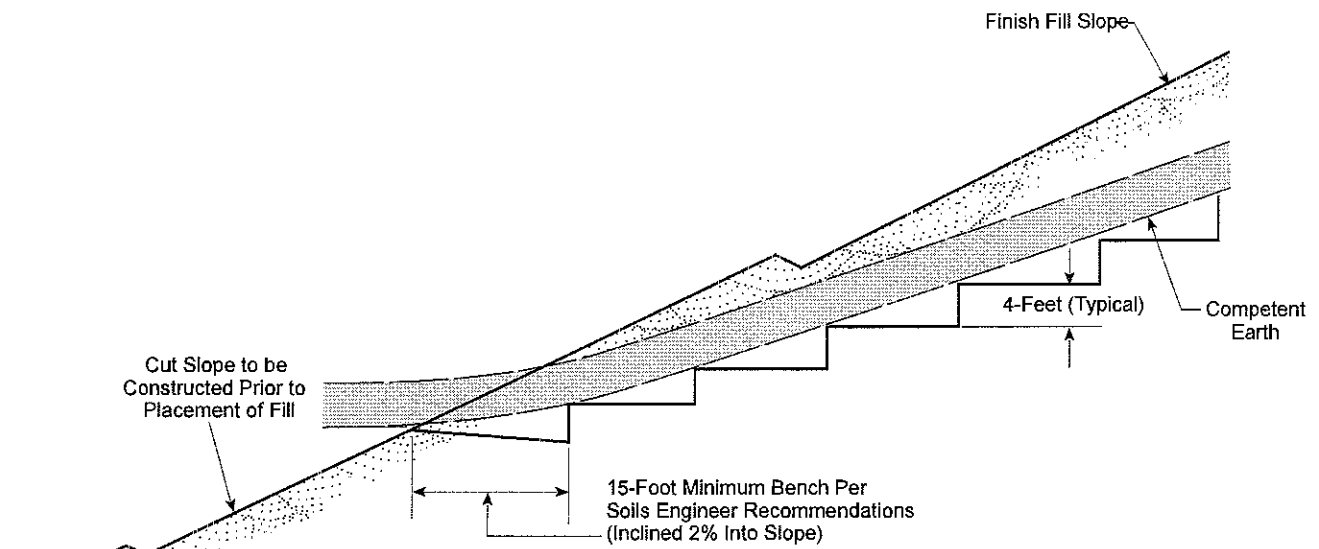


TYPICAL BUTTRESS OR STABILIZATION FILL

*Benching Shall Be Required When Natural Slopes are Equal to or Exceed 5:1 or When Recommended by the Geotechnical Engineer/Geologist



BENCHED FILL OVER NATURAL



BENCHED FILL OVER CUT

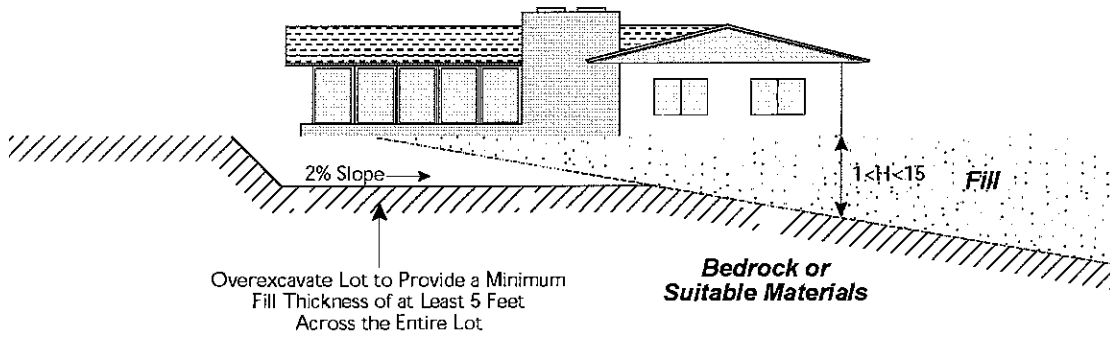


TYPICAL BENCHING AND KEYWAY

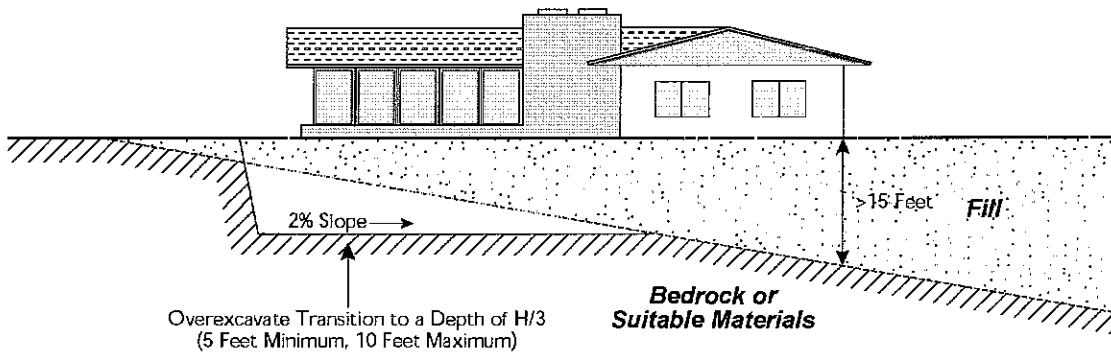
Plate

7

SCENARIO 2

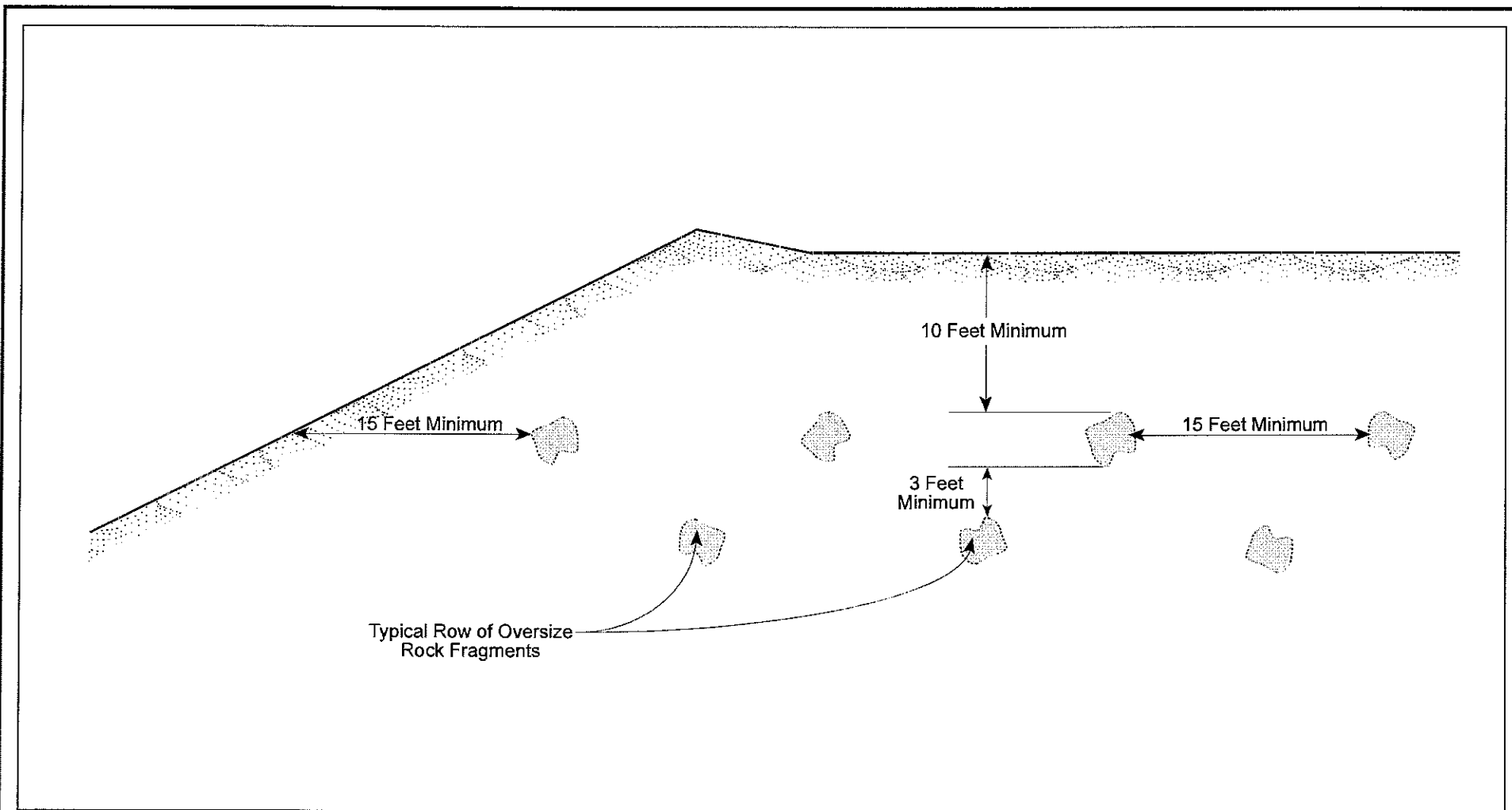


SCENARIO 3

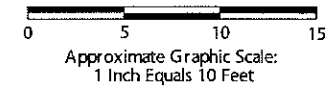


TYPICAL DETAIL OVER-EXCAVATION OF TRANSITION LOTS

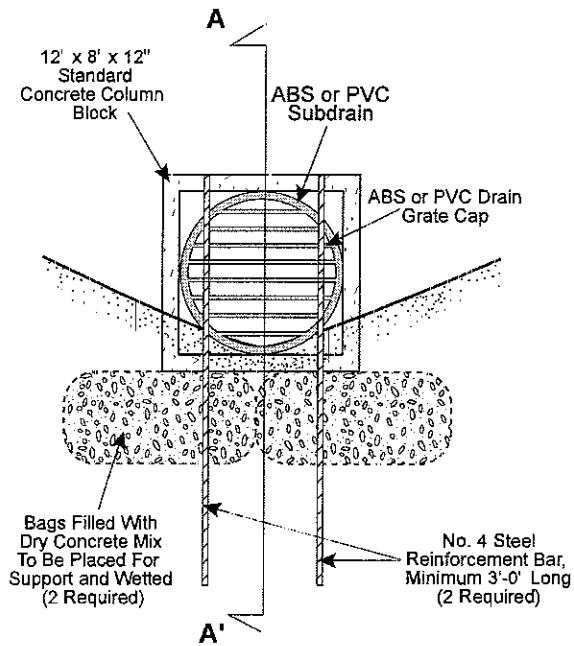
Plate
8



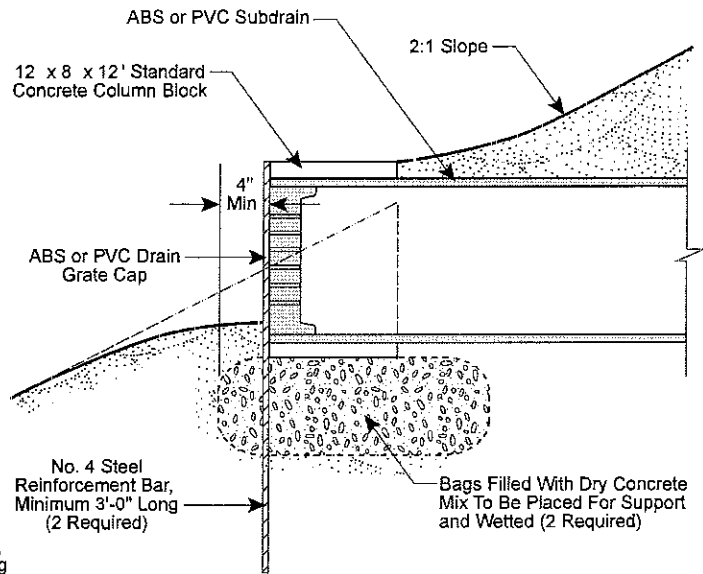
- Notes:
1. All Dimensions and Locations are Approximate
 2. Drawing is not to scale



**RECOMMENDED PLACEMENT METHOD FOR
OVERSIZE ROCK OR CONCRETE**

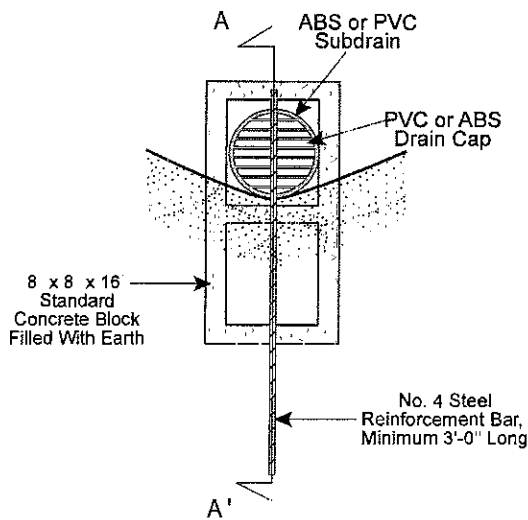


Elevation
No Scale

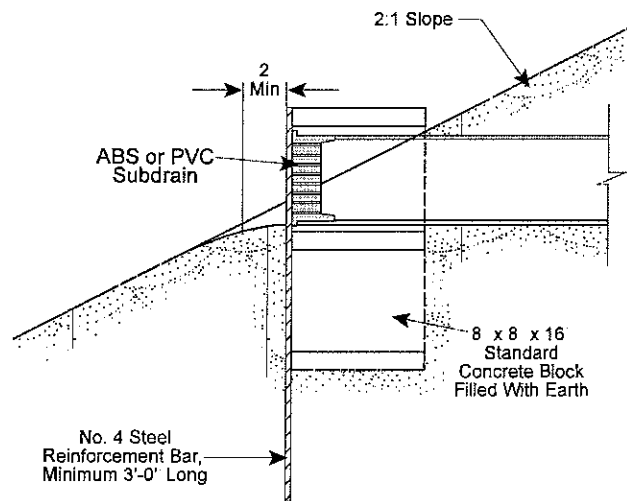


Section A-A'
No Scale

SUBDRAIN OUTLET MARKER FOR 6" AND 8" PIPES



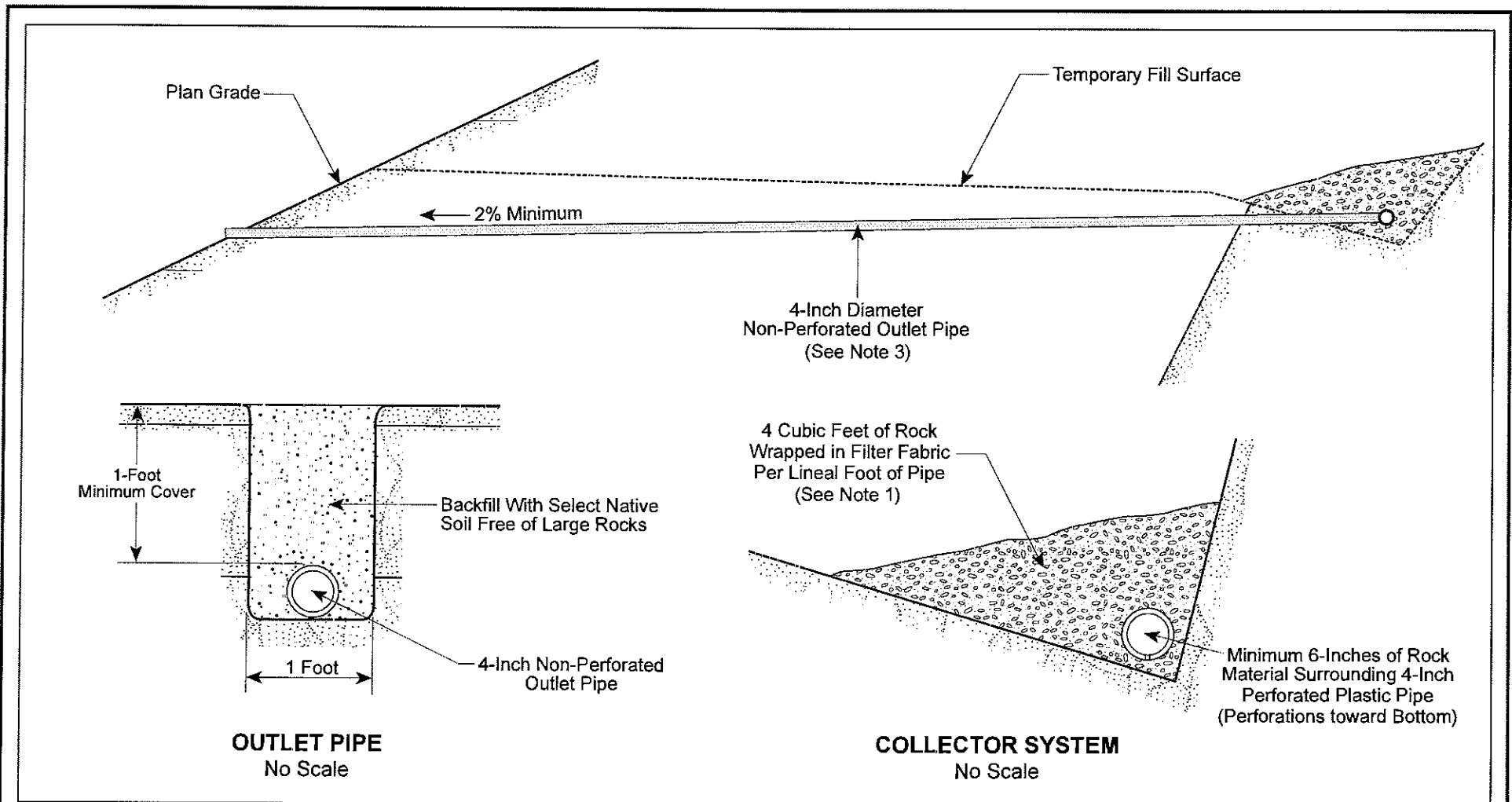
Elevation
No Scale



Section A-A'
No Scale

SUBDRAIN OUTLET MARKER FOR 4" PIPE





Notes:

- 1 Rock to be clean 3/4-inch hard rock approved by GMU. Alternate rock sizes may be approved by GMU on a case by case basis. Filter fabric as a minimum should meet the requirements of Mirafi 140N and should be approved by GMU
- 2 Pipe to meet minimum requirements of PVC Schedule 40 pipe (ASTM D1785)
- 3 Outlet pipes to be constructed such that significant pipe deformation does not occur (i.e. placed in trench, etc)
- 4 All dimensions and locations are approximate
5. Drawing is not to scale.



TYPICAL BACKDRAIN TYPE SUBDRAIN

APPENDIX A

Exploration Logs



GMIU
GEOTECHNICAL, INC.

APPENDIX A

GMU GEOTECHNICAL EXPLORATION PROCEDURES, DRILL HOLE LOGS, TEST PIT LOGS, AND CPT LOGS

Our report includes data from both GMU investigations at the site. Our previous exploration included excavation of 17 test pits to a maximum depth of 15 feet, and advancing 6 CPTs to a maximum depth of approximately 50 feet. Our current exploration consisted of 8 hollow stem drill holes to an approximate maximum depth of 61 feet, 44 test pits to a maximum depth of 15 feet, and 21 CPTs to a maximum depth of 50 feet. When the CPT locations were numbered, CPT-18 was inadvertently skipped.

The estimated locations of the drill holes, test pits, and CPTs are shown on our Geotechnical Map -- Plates 2.1 through 2.4. Our logs of each drill hole and test pit are contained in this Appendix A, and the Legend to Logs is presented as Plate A-1. It should be noted that the format of the test pit logs differs between the two investigations; however, the data included on the logs is consistent.

Our drill holes and test pits were logged, and “undisturbed” samples were taken from the drill holes using a 3.5-inch outside-diameter drive sampler that contains a 2.416-inch-diameter brass sample sleeve 6 inches in length. In addition, blow counts recorded during sampling from the drive sampler are shown on the drill hole logs. Standard Penetration Tests (SPT) were also taken in the drill holes. Small bulk samples of the material were collected, and blow counts for each SPT were

recorded on the logs. Bulk samples were taken in the drill holes and selected test pits. Results of the CPTs are contained in Appendix A. Shear wave velocity readings were taken at various depths in selected CPTs and are also included in Appendix A.

The geologic and engineering field descriptions and classifications that appear on these logs are prepared according to Corps of Engineers and Bureau of Reclamation standards. Major soil classifications are prepared according to the Unified Soil Classification System as modified by ASTM Standard No. 2487. Since the description and classification that appear on the Log of Drill Hole are intended to be that which most accurately describe a given interval of a drill hole (frequently an interval of several feet), discrepancies do occur in the Unified Soil Classification System nomenclature between that interval and a particular sample in that interval. For example, an 8-foot-thick interval in the Log of Drill Hole may be identified as silty sand (SM) while one sample taken within the interval may have individually been identified as sandy silt (ML). This discrepancy is frequently allowed to remain to emphasize the occurrence of local textural variations in the interval.

The descriptive terminology of the logs is modified from current ASTM Standards to suit the purposes of this study and is summarized as follows:

- a. Soil Type - per Legend to Logs
- b. Color - at field moisture

March 16, 2007

Project 04-15-03 (Edgewater, Chino)

 GMU Page A-3

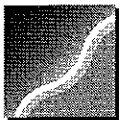
- c. Moisture - (as estimated during drilling)
 - "dry"
 - "damp" - some moisture but less than optimum for compaction.
 - "moist" - near optimum.
 - "wet" - above optimum.
 - "saturated" - containing free moisture.
- d. Grain size - "fine," "medium" and "coarse"
- e. Density (granular soils) - "loose" and "dense"
- f. Consistency (cohesive soils)
 - "very soft" Thumb will penetrate soil more than 1 inch (25 mm)
 - "soft" Thumb will penetrate soil about 1 inch (25 mm).
 - "firm" Thumb will indent soil about ¼ inch (5 mm)
 - "hard" Thumb will not indent soil but readily indented with thumbnail.
 - "very hard" Thumbnail will not indent soil.

MAJOR DIVISIONS			Group Letter	Symbol	TYPICAL NAMES		
COARSE-GRAINED SOILS More Than 50% Retained On No. 200 Sieve Based on The Material Passing The 3-Inch (75mm) Sieve Reference: ASTM Standard D2487	GRAVELS 50% or More of Coarse Fraction Retained on No. 4 Sieve	Clean Gravels	GW		Well Graded Gravels and Gravel-Sand Mixtures, Little or No Fines.		
			GP		Poorly Graded Gravels and Gravel-Sand Mixtures Little or No Fines.		
		Gravels With Fines	GM		Silty Gravels Gravel-Sand-Silt Mixtures		
			GC		Clayey Gravels, Gravel-Sand-Clay Mixtures.		
	SANDS More Than 50% of Coarse Fraction Passes No. 4 Sieve	Clean Sands	SW		Well Graded Sands and Gravelly Sands, Little or No Fines.		
			SP		Poorly Graded Sands and Gravelly Sands, Little or No Fines		
		Sands With Fines	SM		Silty Sands, Sand-Silt Mixtures		
			SC		Clayey Sands, Sand-Clay Mixtures		
			FINE-GRAINED SOILS 50% or More Passes The No. 200 Sieve Based on The Material Passing The 3-Inch (75mm) Sieve. Reference: ASTM Standard D2487	SILTS AND CLAYS Liquid Limit Less Than 50%	ML		Inorganic Silts, 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					
SILTS AND CLAYS Liquid Limit 50% or Greater	MH			Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silts.			
	CH			Inorganic Clays of High Plasticity Fat Clays.			
	OH			Organic Clays of Medium To High Plasticity Organic Silts			
HIGHLY ORGANIC SOILS		PT		Peat and Other Highly Organic Soils			

ADDITIONAL TESTS
DS = Direct Shear
HY = Hydrometer Test
TC = Triaxial Compression Test
UC = Unconfined Compression
CN = Consolidation Test
(T) = Time Rate
EX = Expansion Test
CP = Compaction Test
PS = Particle Size Distribution
EI = Expansion Index
SE = Sand Equivalent Test
AL = Atterberg Limits
FC = Chemical Tests
RV = Resistance Value
SG = Specific Gravity
SU = Sulfates
CH = Chlorides
MR = Minimum Resistivity
pH
(N) = Natural Undisturbed Sample
(R) = Remolded Sample

SAMPLE SYMBOLS	
	Undisturbed Sample (California Sample)
	Undisturbed Sample (Shelby Tube)
	Bulk Sample
	Unsuccessful Sampling Attempt
	SPT Sample
10: 10 Blows for 12-Inches Penetration	
6/4: 6 Blows Per 4-Inches Penetration	
P: Push	
(13): Uncorrected Blow Counts (N Values) for 12-Inches Penetration- Standard Penetration Test (SPT)	

GEOLOGIC NOMENCLATURE	
B = Bedding	S = Shear
C = Contact	F = Fracture
J = Joint	Ft = Fault
RS = Rupture Surface	
	= Groundwater



GMU
 GEOTECHNICAL, INC.

LEGEND TO LOGS
 ASTM Designation: D 2487
 (Based on Unified Soil Classification System)

Plate
A-1

Project: EDGEWATER/CHINO PROJECT

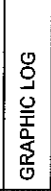



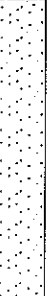

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-1

Sheet 1 of 3

Date(s) Drilled	12/20/06	Logged By	DS	Checked By	LBS	
Drilling Method	Hollow Stem Auger	Drilling Contractor	2R Drilling, Inc.	Total Depth of Drill Hole	61.5 feet	
Drill Rig Type	CME 75	Diameter(s) of Hole, inches	10	Approx. Surface Elevation, ft MSL	562.0	
Groundwater Depth [Elevation], feet	23.5 [538.5]	Sampling Method(s)	Open drive sampler with 6-inch sleeve/SPT	Drill Hole Backfill	Native, Tamped	
Remarks					Driving Method and Drop	140 lb automatic hammer

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA				TEST DATA	
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
560	5		UNDOCUMENTED FILL (Qafu) 2 inches of asphalt		CLAYEY SAND (SC); dark brown, moist, fine grained	X					AL EI, RV TC
555	10		OLDER FAN DEPOSITS (Qof)		SILTY SAND (SM); light olive, slightly moist, dense, fine grained, trace coarse sand SILTY SAND (SM); yellowish brown to light olive, medium dense slightly moist well graded some gravel		36	18	101	DS	
550	15				SILTY SAND (SM) to SAND(SP); gray wet very dense		(21)				PS
545					SILTY SAND (SM) to SAND(SP); gray wet very dense		52	22	108	CN	

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-1

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-1

Sheet 2 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA			
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS	
540					SAND (SP) to SILTY SAND (SM); dark olive very moist medium dense		(21)					
25					SILTY SAND (SM); dark olive, very dense, wet, over 2" diameter cobble encountered		50/6		16	107	CN	
535					SAND with SILT (SP-SM); gray very dense, wet		(52)					
30					SAND with SILT (SP-SM); gray very dense, wet		(52)					
530					SAND with SILT (SP-SM); gray very dense, wet		(52)					
35					SAND with SILT (SP-SM); gray very dense, wet		50/6		18	110	PS	
525					SAND with SILT (SP-SM); gray very dense, wet		50/6		18	110	PS	
40					SILTY SAND (SM) to SANDY SILT (ML); gray medium dense to very stiff wet		(16)					
520					SILTY SAND (SM) to SANDY SILT (ML); gray medium dense to very stiff wet		(16)					

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-1

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-1

Sheet 3 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
515					trace coarse gravel		50/3"		20	106	
50					no gravel		50/5"				
510											
55					SAND with SILT (SW-SM); gray very dense wet		50/5"		21	105	
505											
60					SAND (SP); gray, moist, poorly graded very dense some coarse gravel		50/5"				

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-1

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-2

Sheet 1 of 3

Date(s) Drilled	12/20/06	Logged By	DS	Checked By	LBS
Drilling Method	Hollow Stem Auger	Drilling Contractor	2R Drilling, Inc.	Total Depth of Drill Hole	61.5 feet
Drill Rig Type	CME 75	Diameter(s) of Hole, inches	10	Approx. Surface Elevation, ft MSL	559.0
Groundwater Depth [Elevation], feet	22.0 [537.0]	Sampling Method(s)	Open drive sampler with 6-inch sleeve/SPT	Drill Hole Backfill	Native, Tamped
Remarks	Driving Method and Drop 140 lb automatic hammer				

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA				TEST DATA	
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
			<u>UNDOCUMENTED FILL (Qafu)</u>		CLAYEY SAND (SC); light olive, dry, medium dense	X					AL, MD, DS, RV, TC
555	5		<u>OLDER FAN DEPOSITS (Qof)</u>		POORLY GRADED SAND (SP); some silt, reddish brown slightly moist very dense		50/5"		11	123	
550	10				SILTY SAND (SM); olive brown moist dense		(31)				PS
545	15				medium dense		24		39	82	CN
540											

DH_REV3 04-15-00.GPJ_GMULAB.GPJ 03/12/07



Drill Hole DH-2

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-2

Sheet 2 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA	
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf
535	25				SANDY SILT (ML); olive brown moist firm	(5)				
530	30					(16)				
525	35				SILTY SAND (SM); olive, moist very dense	50/5"		24	102	CN
520	40				dense	(46)				
515										

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07

Drill Hole DH-2



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-2

Sheet 3 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
510	50				very dense		50/2"		21	109	
505	55				POORLY GRADED SAND (SP); gray, very moist very dense some coarse gravel		50/4'				
500	60				SILTY SAND (SM); olive, moist dense		(50)		15	114	

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-2

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-3

Sheet 1 of 3

Date(s) Drilled	12/20/06	Logged By	DS	Checked By	LBS	
Drilling Method	Hollow Stem Auger	Drilling Contractor	2R Drilling, Inc.	Total Depth of Drill Hole	61.5 feet	
Drill Rig Type	CME 75	Diameter(s) of Hole, inches	10	Approx. Surface Elevation, ft MSL	562.0	
Groundwater Depth [Elevation], feet	30.3 [531.7]	Sampling Method(s)	Open drive sampler with 6-inch sleeve/SPT	Drill Hole Backfill	Native, Tamped	
Remarks					Driving Method and Drop	140 lb automatic hammer

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
560			<u>UNDOCUMENTED FILL (Qafu)</u>		SILTY SAND (SM); olive, very dense slightly moist fine grained	X					
555	5		<u>OLDER FAN DEPOSITS (Qof)</u>		SILTY SAND (SM); olive, very dense slightly moist, fine grained		69		21	105	CN
550	10				POORLY GRADED SAND (SP); with silt olive medium dense, moist		(13)				
545	15						53		26	101	DS

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07

Drill Hole DH-3



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-3

Sheet 2 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
540					SANDY SILT to SILTY SAND (ML to SM); olive to brown stiff to medium dense, moist		(12)				
535	25				POORLY GRADED SAND (SP); olive, very dense, moist medium grained (2" diameter gravel in the tip of sampler)		50/6"		15	117	PS
530	30				SAND (SP); olive, wet, very dense, numerous gravel (over 1" diameter)		50/1"				
525	35				dense		44		33	90	
520	40				medium dense fine grained		(20)				

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-3

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-3

Sheet 3 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
515					very dense, fine to coarse grained		50/4"		26	98	
50					SANDY GRAVEL (GP); olive, wet very dense		50/5"				
510											
55							50/6'		20	111	
505											
60					2.5" Diameter slotted pipe was installed up to 10' below finish grade, from 10' Finish grade- solid pipe backfilled with sand last 5' bentonite		50/6"				

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-3

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-4

Sheet 1 of 3

Date(s) Drilled	12/21/06	Logged By	DS	Checked By	LBS	
Drilling Method	Hollow Stem Auger	Drilling Contractor	2R Drilling, Inc.	Total Depth of Drill Hole	54.0 feet	
Drill Rig Type	CME 75	Diameter(s) of Hole, inches	10	Approx. Surface Elevation, ft MSL	552.0	
Groundwater Depth [Elevation], feet	24.5 [527.5]	Sampling Method(s)	Open drive sampler with 6-inch sleeve/SPT	Drill Hole Backfill	Native, Tamped	
Remarks					Driving Method and Drop	140 lb automatic hammer

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
550			UNDOCUMENTED FILL (Qafu) 8-inches of asphaltic concrete		CLEYEY SAND TO SANDY CLAY (SC); reddish brown to light olive, very dense/hard, slightly moist trace of gypsum and gravel						
			OLDER FAN DEPOSITS (Qof)		CLEYEY SAND TO SANDY CLAY (SC); reddish brown to light olive, very dense/hard, slightly moist trace of gypsum and gravel						
545	5				SILTY SAND (SM); brown, medium dense, slightly moist, trace gravel		67		14	119	CN
540	10				SILTY SAND (SM); olive dense slightly moist, trace gravel		(24)				PS
535	15				SILTY SAND (SM); olive dense moist fine grained		41		37	85	CN

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07

Drill Hole DH-4



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-4

Sheet 2 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
530					POORLY GRADED SAND (SP); olive slightly moist, dense trace gravel		(39)				
	25				CLEAN SAND (SP); gray wet very dense, coarse grained		(D)		15	112	PS
525											
	30						(66)				
520											
	35						50/3		15	116	DS
515											
	40						(50/5"				
510											

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-4

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-4

Sheet 3 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
505		[Dotted Pattern]					50/3"		15	118	
500	50	[Dotted Pattern]			POORLY GRADED SAND (SP) to SILTY SAND (SM); gray very dense, very moist coarse grained		50/6"				

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-4

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-5

Sheet 1 of 3

Date(s) Drilled	12/21/06	Logged By	DS	Checked By	LBS
Drilling Method	Hollow Stem Auger	Drilling Contractor	2R Drilling, Inc.	Total Depth of Drill Hole	61.0 feet
Drill Rig Type	CME 75	Diameter(s) of Hole, inches	10	Approx. Surface Elevation, ft MSL	536.0
Groundwater Depth [Elevation], feet	18.8 [517.2]	Sampling Method(s)	Open drive sampler with 6-inch sleeve/SPT	Drill Hole Backfill	Native, Tamped
Remarks	Driving Method and Drop 140 lb automatic hammer				

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA	
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf
535			<u>UNDOCUMENTED FILL (Qafu)</u>		CLAYEY SAND (SC); dark brown moist medium dense, well graded					
530	5		<u>ALLUVIAL DEPOSITS (Qal)</u>		CLAYEY SAND (SC); dark brown moist medium dense, well graded		23		15	117
525	10				SANDY CLAY (CL); brown to red moist firm		(5)			AL
520	15				SANDY GRAVEL (GP); brown to olive moist, very dense		50/5"		10	126 DS

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-5

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-5

Sheet 2 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
515					POORLY GRADED SAND (SP); to SILTY SAND (SM) olive, very moist medium dense	(26)					
	25						50/3"				
510											
	30					(24)					
505											
	35				CLAYEY SAND (SC); olive moist, very dense		50/3"		23	106	PS AL
500											
	40				POORLY GRADED SAND (SP); to SILTY SAND (SM) olive, very moist medium dense		50/4"				
495											

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07

Drill Hole DH-5



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-5

Sheet 3 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pct	ADDITIONAL TESTS
490					SILTY SAND (SM); olive moist very dense		74		29	96	
50					SILTY SAND (SM); brown, very dense moist		(88)				
485											
55					very moist		77		26	99	
480											
60					GRAVELY SAND with SILT (SG-SC); olive, very dense very moist		(50/1")				
475											

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07

Drill Hole DH-5



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-6

Sheet 1 of 3

Date(s) Drilled	12/22/06	Logged By	LBS	Checked By	N/A	
Drilling Method	Hollow Stem Auger	Drilling Contractor	2R Drilling, Inc.	Total Depth of Drill Hole	51.5 feet	
Drill Rig Type	CME 75	Diameter(s) of Hole, inches	10	Approx. Surface Elevation, ft MSL	558.0	
Groundwater Depth [Elevation], feet	44.0 [514.0]	Sampling Method(s)	Open drive sampler with 6-inch sleeve/SPT	Drill Hole Backfill	Native, Tamped	
Remarks					Driving Method and Drop	140 lb automatic hammer

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA				TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS	
			<u>UNDOCUMENTED FILL (Qafu)</u>		CLAYEY SAND (SC); dark brown, dry to damp, medium dense fine to medium grained	X					AL DS RV	MD EI FC
555			<u>OLDER FAN DEPOSITS (Qof)</u>		CLAYEY SAND (SC); dark brown, dry to damp, medium dense fine to medium grained							
	5				SAND (SP); red/orange brown, damp, dense, fine grained to pebbly		23		4	120	DS	
550												
	10				SAND (SP); with minor CLAY, brown and light gray mottles, damp grained to moist dense, fine to medium grained		50/5"				PS	
545												
	15				CLAYEY SAND (SC); brown, moist dense, fine to coarse grained		50/5"		6	112	DN	
540												

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07

Drill Hole DH-6



Project: EDGEWATER/CHINO PROJECT
 Project Location: Chino CA
 Project Number: 04-15-03

Log of Drill Hole DH-6
 Sheet 2 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS	
535	25				SAND (SP); with minor CLAY, brown and light gray mottles, damp grained to moist dense, fine to medium grained	(91)					
530	30						50/6'	8	122	DS	
525	35				SAND (SP); red/brown to gray, moist dense, fine to coarse grained with scattered pebbles	50/5"		8	113		
520	40				Becomes gray wet at 40 feet	50/4					
515											

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-6

Project: EDGEWATER/CHINO PROJECT
 Project Location: Chino CA
 Project Number: 04-15-03

Log of Drill Hole DH-6
 Sheet 3 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
510		[Dotted Pattern]			SAND (SP); gray, wet dense, medium to very coarse grained		50/2"		23	103	
50		[Dotted Pattern]			SAND (SM); brownish gray wet dense fine to medium grained	[Diagonal Lines]	(45)				

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-6

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-7

Sheet 1 of 3

Date(s) Drilled	12/22/06	Logged By	DS	Checked By	LBS	
Drilling Method	Hollow Stem Auger	Drilling Contractor	2R Drilling, Inc	Total Depth of Drill Hole	56.0 feet	
Drill Rig Type	CME 75	Diameter(s) of Hole, inches	10	Approx. Surface Elevation, ft MSL	545.0	
Groundwater Depth [Elevation], feet	25.0 [520.0]	Sampling Method(s)	Open drive sampler with 6-inch sleeve/SPT	Drill Hole Backfill	Native, Tamped	
Remarks					Driving Method and Drop	140 lb automatic hammer

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA			
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS	
540	5		OLDER FAN DEPOSITS (Qof)		SAND (SP); light brown moist medium dense							
535	10				with gravel		(26)					PS
530	15					SILTY SAND (SM); olive, moist very dense trace coarse gravel		59		24	100	CN

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-7

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-7

Sheet 2 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE NUMBER	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
520	25				SANDY GRAVEL/GRAVELY SAND with clay (SP-SC/GP-GC); dark olive very moist very dense	50/5"			16	116	PS
515	30				SANDY GRAVEL/GRAVELY SAND (SP/GP); dark olive wet, very dense	50/5"					
510	35				reddish brown	50/5"			21	97	
505	40				SANDY GRAVEL (GP); white green to olive wet very dense	50/3					

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07

Drill Hole DH-7



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-7

Sheet 3 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
						○	50/0"		19	118	
495	50				SANDY GRAVEL (GP); gray wet very dense	○	50/6"				
490	55				2.5" diameter slotted pipe lost 10'- solid backfilled/ sand up to 10' - bentonite up to finish grade	○	50/2"				

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-7

Project: EDGEWATER/CHINO PROJECT
 Project Location: Chino CA
 Project Number: 04-15-03

Log of Drill Hole DH-8
 Sheet 1 of 3

Date(s) Drilled	12/22/06	Logged By	LBS	Checked By	N/A
Drilling Method	Hollow Stem Auger	Drilling Contractor	2R Drilling, Inc.	Total Depth of Drill Hole	61.5 feet
Drill Rig Type	CME 75	Diameter(s) of Hole, inches	10	Approx. Surface Elevation, ft MSL	550.0
Groundwater Depth [Elevation], feet	53.8 [496.2]	Sampling Method(s)	Open drive sampler with 6-inch sleeve/SPT	Drill Hole Backfill	Native, Tamped
Remarks	Driving Method and Drop 140 lb automatic hammer				

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA			
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS	
			OLDER FAN DEPOSITS (Qof)		CLAYEY SAND (SC); red brown with mottles, damp to moist medium dense, fine grained to cobbly	X						AL MD EI, RV FC
545	5						█	45	18	110	CN	
540	10					(31)						PS
535	15				SAND (SP); red, orange, brown mottled, moist dense medium grained to cobbly	█	50/4"	10	129	DS		

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-8

Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Drill Hole DH-8

Sheet 2 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE NUMBER	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
							(57)				PS
525	25				minor clay		50/4		12	115	CN
520	30						(94)				
515	35				some clay		50/5		12	122	
510	40						50/4				

DH_REV3 04-15-03.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-8

Project: EDGEWATER/CHINO PROJECT
 Project Location: Chino CA
 Project Number: 04-15-03

Log of Drill Hole DH-8
 Sheet 3 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
					CLAYEY SAND (SC); red, orange, brown mottled. moist dense medium grained to cobbly		50/5"		17	110	
500	50						(76)				
					higher clay content wet		50/4"		27	98	
495	55										
					CLAYEY SILT (ML); brown, wet, firm		(18)				
490	60										

DH_REV3 04-15-00.GPJ GMULAB.GPJ 03/12/07



Drill Hole DH-8

Project Name: Caillon-Chino Project

Location: Chino, CA

TEST PIT NO.: TP-1

Logged By: LLB

Project No.: 04-15-00

Contractor: Al-Roy Backhoe

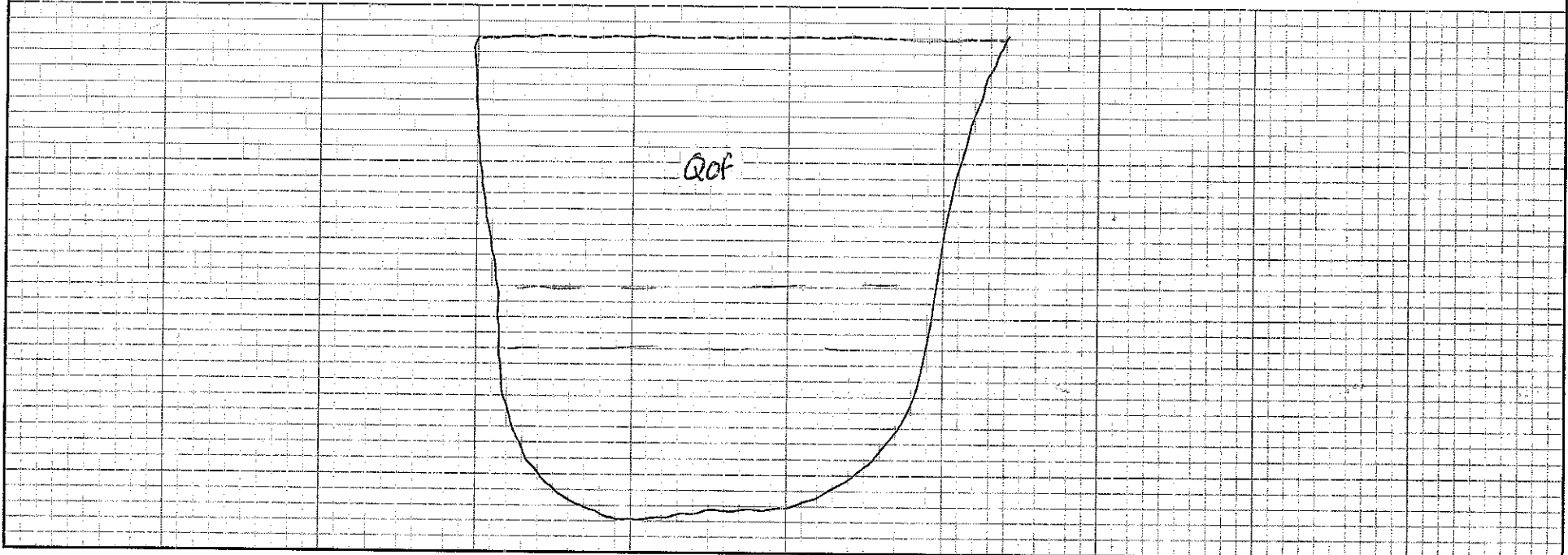
Date: 2-12-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>OLDER FAN DEPOSITS</u></p> <p>@0', SILTY SAND(SM), light brown, damp to moist, dense, fine to medium grained, rare pebbles, porous to 6', abundant white carbonate deposits</p> <p>@8', as above, brown and gray, moist, pockets of clay</p> <p>@10', SAND(SM), brown, moist, dense, coarse to very coarse grained, scattered pebbles, pockets of clayey sand, carbonate to 12'; occasional sub-rounded cobbles below 12'; wet below 14'</p> <p style="text-align: center;">T.D. 15' No GW or Caving Backfilled with Native, 2/12/04</p>	<u>Qof</u>		<p><u>DRIVE</u> <u>@2'</u> <u>@6'</u> <u>BULK</u> <u>@8'</u></p>		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →



Project Name: Callan Chino Project

Location: Chino, CA

TEST PIT NO.: TP-2

Logged By: LLB

Project No.: 04-15-00

Contractor: Al-Roy Backhoe

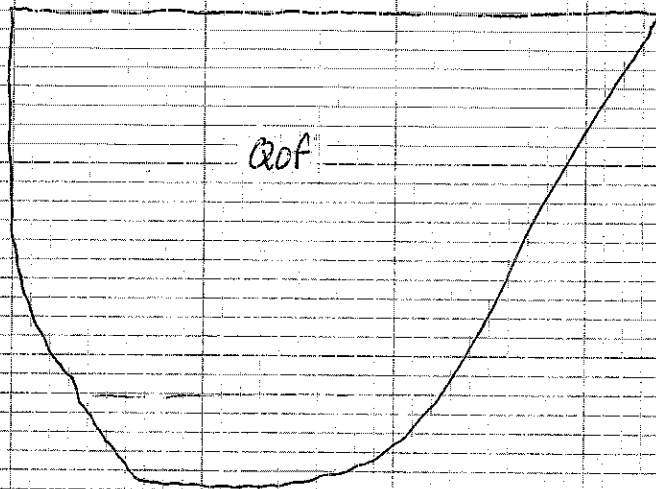
Date: 2-12-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>OLDER FAN DEPOSITS</u></p> <p>@0', CLAYEY SILT (ML), brown, damp to moist, firm, porous, scattered subrounded pebbles</p> <p>@6', as above, less porous</p> <p>@8', as above, slightly porous</p> <p>@10', CLAYEY SAND (SC), brown, moist, fine to coarse grained, dense, rare pebbles</p> <p>@13', SILTY SAND (SM), brown, wet, dense, fine to coarse grained, occasional pebbles</p> <p style="text-align: center;">T.D. 13.5'</p> <p style="text-align: center;">No GW or caving</p> <p style="text-align: center;">Backfilled with Native, 2/12/04</p>	<u>Qof</u>		<p><u>DRIVE</u> <u>@ 4'</u> <u>@ 8'</u> <u>BULK</u> <u>@ 13'</u></p>		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →





Goffman, McCormick & Urban, Inc.
Geotechnical Consultants

Project Name: Callan-Chino Project

Location: Chino, CA

TEST PIT NO.: TP-3

Logged By: LLB

Project No: 04-15-00

Contractor: M-Roy Backhoe

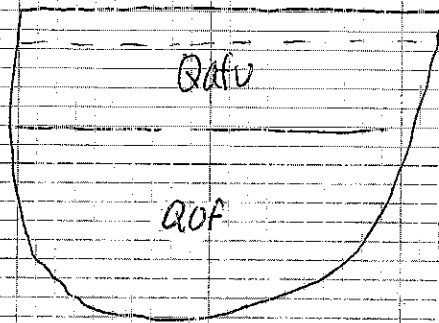
Date: 2-12-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>FILL</u></p> <p>@0', Gravel and SILT (ML), from roadway</p> <p>@1', SANDY SILT (ML), dark brown, damp, firm, porous, highly organic, diffuse contact</p> <p><u>OLDER FAN DEPOSITS</u></p> <p>@3', SANDY SILT (ML), light brown, damp to moist, firm, porous, rootmarks, well-developed soil structure; abundant white carbonate deposits</p> <p>@8', SILTY SAND (SM), light brown, moist, dense, fine to medium grained, very slightly porous, abundant white carbonate deposits</p> <p>T.D. 8"</p> <p>NO GW or Caving, Backfilled with Native 2/12/04</p>	<p>Qafu</p> <p>Qof</p>		<p>DRIVE @ 2'</p> <p>@ 5'</p> <p>BULK @ 6'-8'</p>		

Scale: 1" = 5'

Surface Slope: 0°

Trend: ← E



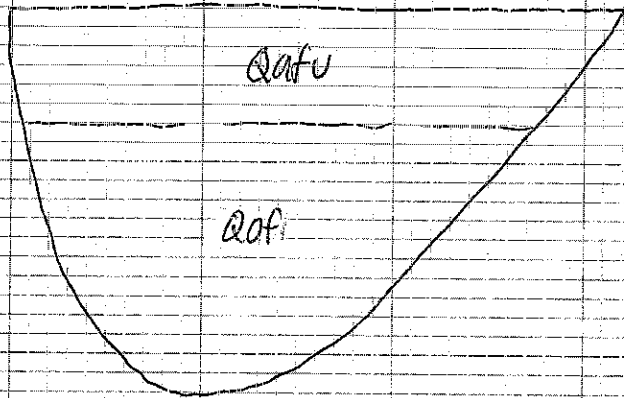
Project Name: Callan-Chino Project Location: Chino, CA TEST PIT NO.: TP-4
 Project No.: 04-15-00 Contractor: Al-Roy Backhoe Logged By: LLB
 Date: 2-12-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>ALL</u></p> <p>@0', SANDY SILT (ML), light brown to brown, damp, very firm, abundant white carbonate deposits, diffuse lower contact, fine grained</p> <p><u>OLDER FAN DEPOSITS</u></p> <p>@3', CLAYEY SILT (ML), dark brown, damp, firm, some fine sand, organic, scattered very coarse grains</p> <p>@9', CLAYEY SAND (SC), brown, moist to wet, dense, scattered pebbles; wet at 10'</p> <p>T.D. 10'</p> <p>No GW or Caving</p> <p>Backfilled with Native, 2/12/04</p>	<p>Qofu</p> <p>Qof</p>		<p>DRIVE @ 4' @ 8'</p>		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →



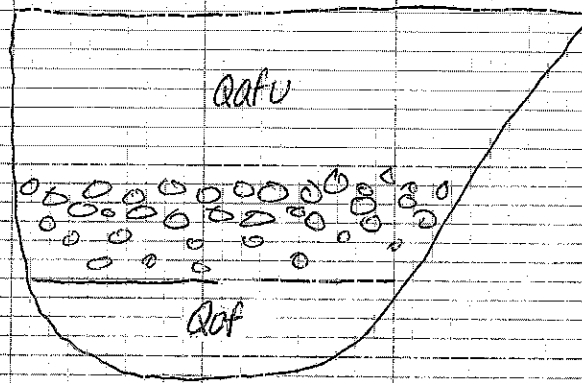
Project Name: Callan-Chino Project Location: Chino, CA TEST PIT NO.: TP-5
 Project No.: 04-15-00 Contractor: A1-Roy Backhoe Logged By: LLB
 Date: 2-12-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			U.S.C.S.	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>FILL</u> @0', SANDY SILT (ML), minor CLAY, light brown, damp to moist, firm, fine to medium grained, weathered, very porous; moist at 4.5'; scattered to abundant pebbles and cobbles below 6'</p> <p><u>OLDER FAN DEPOSITS</u> @7', SILTY SAND (SM), dark brown, damp to moist, firm, fine to medium grained, slightly porous, root hairs, some clay @8.5', SANDY SILT (ML), brown, moist, firm, fine grained, soil structure</p> <p>T.D. 9.5' No GW or caving Backfilled with Native 2/12/04</p>	<p>Qafv</p> <p>Qaf</p>		<p>DRIVE @2' @6'</p> <p>BULK @6'</p>		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →



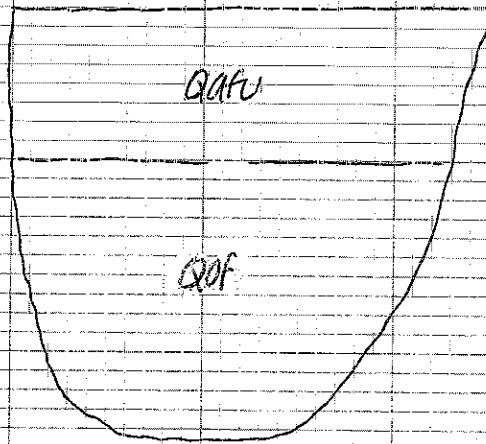
Project Name: Callan-Chino Project Location: Chino, CA TEST PIT NO.: TP-6
 Project No.: 04-15-00 Contractor: Al-Roy Backhoe Logged By: LLB
 Date: 2-12-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>FILL</u> @0', SANDY SILT (ML), light brown, damp to moist, firm, fine grained, very porous, scattered rock fragments, diffuse lower contact <u>OLDER FAN DEPOSITS</u> @4', SANDY SILT (ML), brown, moist, firm, fine grained, porous, abundant rootlets @10', as above, very slightly porous</p> <p style="text-align: center;">T.D. 11' NO GW OR CAVING BACKFILLED WITH NATIVE, 2/12/04</p>	<p>Qafu</p> <p>Qof</p>		<p>DRIVE @4' @8'</p> <p>BULK @10'</p>		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →



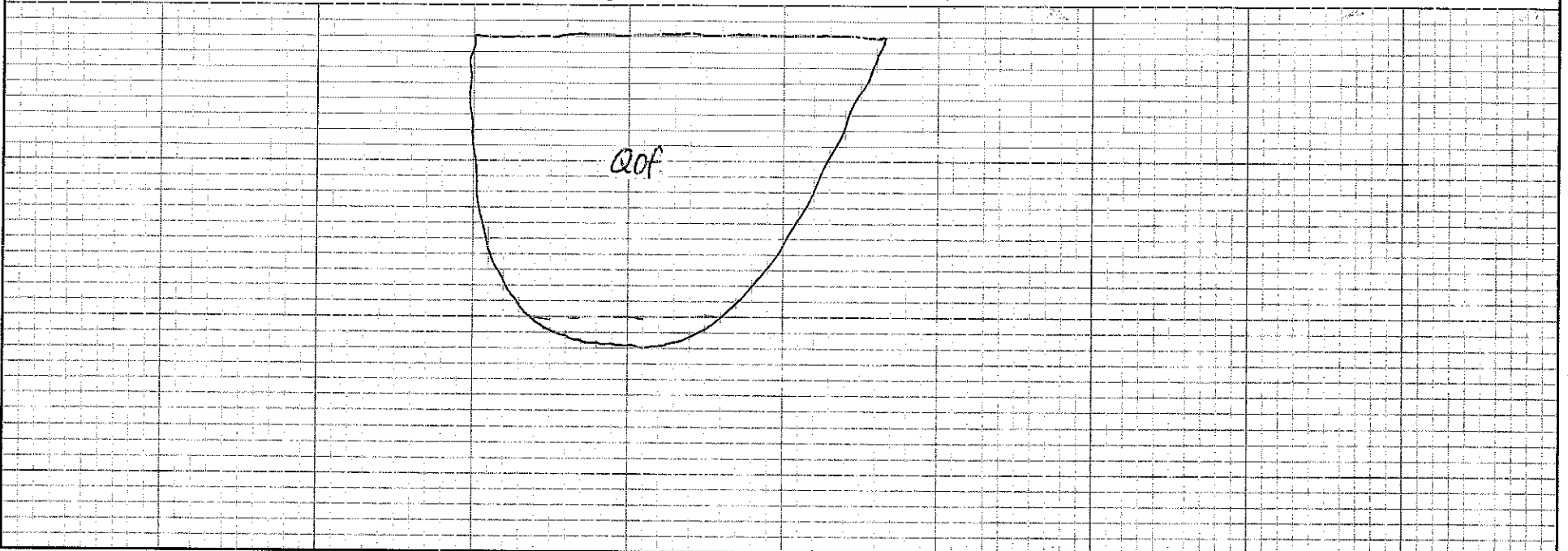
Project Name: Callan-Chino Project Location: Chino, CA TEST PIT NO.: TP-7
 Project No.: 04-15-00 Contractor: Al-Roy Backhoe Logged By: LLB
 Date: 2-12-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>OLDER FAN DEPOSITS</u></p> <p>@ 0', CLAYEY SILT (ML), dark brown, damp, firm, scattered nodules, porous</p> <p>@ 2', as above, abundant white carbonate deposits, moist</p> <p>@ 5', as above, moist to wet, slightly porous</p> <p>@ 9', SILTY SANDS (SM), brown, moist to wet, dense, non-porous, fine to coarse grained, minor clay</p> <p>T.O. 10'</p> <p>No GW or Caving</p> <p>Backfilled with Native, 2/12/04</p>	<u>Qof</u>		<p>DRIVE</p> <p>@ 2'</p> <p>@ 5'</p> <p>BULK</p> <p>@ 5'</p>		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →





Goffman, McCormick & Urban, Inc.
Geotechnical Consultants

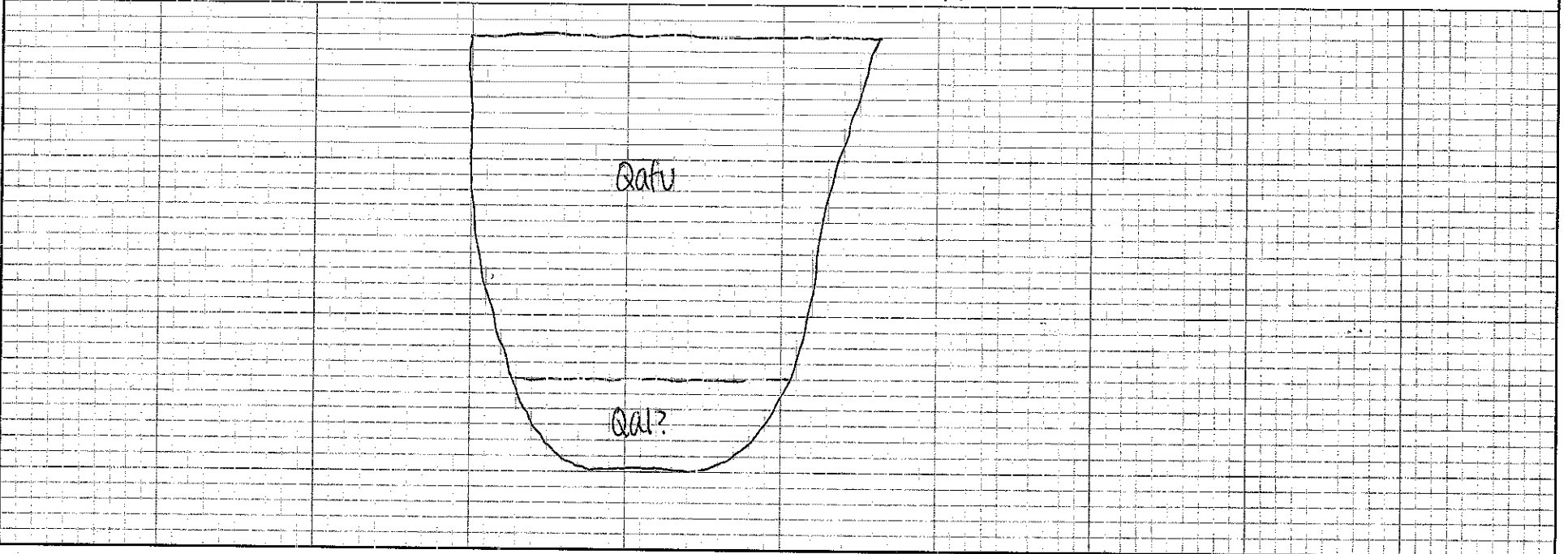
Project Name: Callan-Chino Project Location: Chino, CA TEST PIT NO.: TP-8
 Project No.: 04-15-00 Contractor: AI-Roy Backhoe Logged By: LLB
 Date: 2-12-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			U.S.C.S.	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	FILL @0', CLAYEY SILT (ML), brown, damp, firm, organic, scattered man-made debris @8', AS ABOVE, highly organic layer, black, moist, abundant, plants, roots, wood, wres, old hay, approximately 1' thick ALLUVIUM? @11', CLAYEY SILT (ML), black, moist, firm, poorly developed soil structure, abundant rootlets, strong organic odor to 12' T.D. 14' No Gw or caving Backfilled with Native 2/12/04	Qafu Qal?		DRIVE @ 4'		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →



Project Name: Callan-Chino Project
Project No: 04-15-00

Location: Chino, CA
Contractor: A1-Roy Backhoe

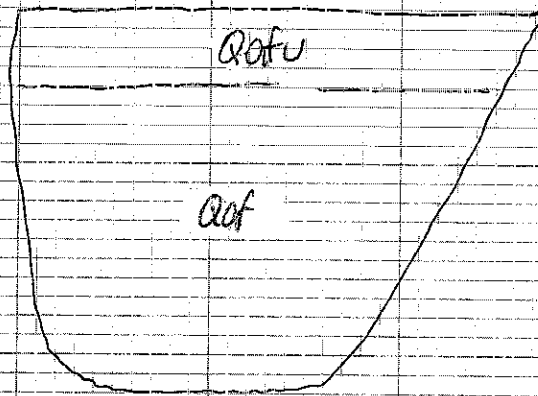
TEST PIT NO.: TP-9
Logged By: LLB
Date: 2-13-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			U.S.C.S.	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>FILL</u> @0', SILT (ML), brown, damp, firm, highly organic, abrupt lower contact <u>OLDER FAN DEPOSITS</u> @2', SILTY SAND (SM), minor CLAY, brown, damp to moist, dense, weathered, porous, fine to coarse grained, abundant white carbonate deposits @6', SAND (SM), brown, moist, dense, fine to very coarse grained, non-porous, scattered sub-rounded pebbles @8.5', SANDY SILT (ML), brown, moist, firm to very firm, fine grained, very slightly porous T.D. 10' No GW or caving Backfilled w/ Native 2/13/04</p>	<p>Qafu Qof</p>		<p>DRIVE @2' @6'</p>		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →



Project Name: Callan Chino Project
Project No.: 04-15-00

Location: Chino, CA

Contractor: Al-Roy Backhoe

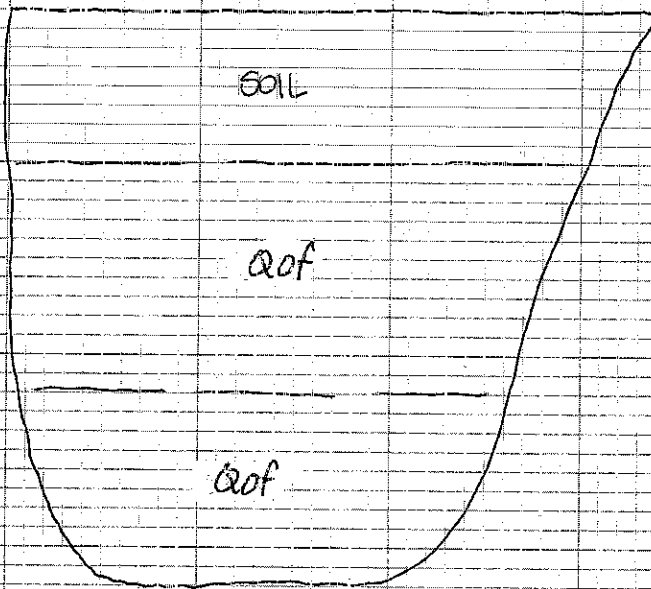
TEST PIT NO.: TP-10
Logged By: LS
Date: 2-13-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt (pcf)
	<p><u>NATIVE SOIL/FILL</u></p> <p>@ 0', SANDY SILT (ML), dark brown, moist, firm, fine grained, porous, organic odor</p> <p>@ 2', SILT (ML), dark brown, moist, firm, porous, organic odor, diffuse contacts</p> <p><u>OLDER FAN DEPOSITS</u></p> <p>@ 4', SILTY CLAY (CL), gray, moist, firm, scattered roots and rootlets, abundant carbonate</p> <p>@ 8', CLAYEY SAND (SC), gray with orange and red staining, moist, dense, slightly porous, fine to medium grained</p> <p>@ 10', as above, density increasing, non-porous, clay content decreasing with depth</p> <p>T.D. 15' NO GW or caving Backfilled with Native, 2/13/04</p>	Qof		<p>DRIVE @ 4'</p> <p>@ 8'</p> <p>BULK @ 10'</p>		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →



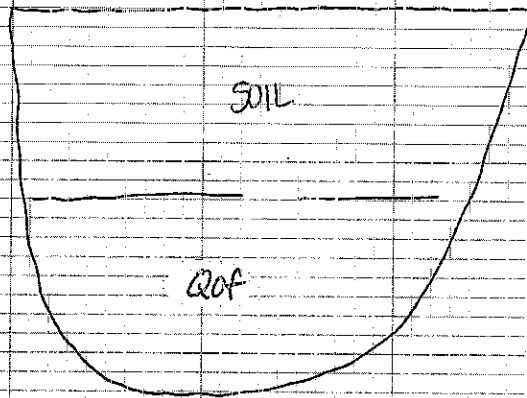
Project Name: Callan-Chino Project Location: Chino, CA TEST PIT NO.: TP-11
 Project No: 04-15-00 Contractor: Al-Roy Backhoe Logged By: LLB
 Date: 2-13-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			U.S.C.S.	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>NATIVE SOIL</u></p> <p><u>@0', SILTY CLAY (CL), dark brown to black, moist, firm, abundant organics, porous</u></p> <p><u>OLDER FAN DEPOSITS</u></p> <p><u>@5', SILTY CLAY (CL), gray, moist, firm, abundant roots and rootlets, abundant orange staining, abundant white carbonate deposits, diffuse upper contact</u></p> <p><u>@8', AS ABOVE, increase in density, increase in carbonate</u></p> <p><u>@9', CLAYEY SAND (SC), brown, moist, dense, fine to medium grained, non-porous, pockets of clay</u></p> <p style="text-align: center;"><u>T.D. 10'</u> <u>NO GW OR CAVING</u> <u>Backfilled with Native 2/13/04</u></p>	Qof		<p><u>DRIVE</u> <u>@ 2'</u> <u>@ 5'</u> <u>BULK</u> <u>@ 3'-4'</u></p>		

Scale: 1" = 5'

Surface Slope: 0°

Trend: ← N



Project Name: Callan-Chino Project
Project No: 04-15-00

Location: Chino, CA
Contractor: A1-Roy Backhoe

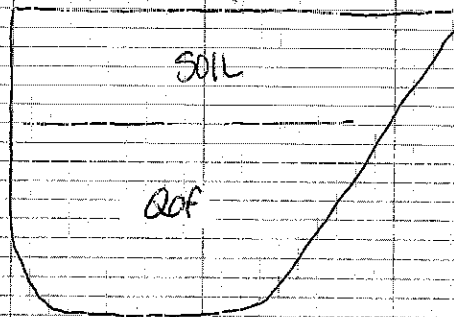
TEST PIT NO.: TP-12
Logged By: LLB
Date: 2-13-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>NATIVE SOIL</u></p> <p>@0', SILTY SAND (SM), dark brown, damp to moist, fine to coarse grained, porous, abundant rootlets, diffuse lower contact</p> <p>@2', SANDY CLAY (CL), dark brown, moist, firm, fine to coarse grained, porous, abundant rootlets, scattered pebbles, diffuse lower contact</p> <p><u>OLDER FAN DEPOSITS</u></p> <p>@3', CLAYEY SAND (SC), dark brown to red-brown, moist, dense, fine to coarse grained, slightly porous</p> <p>@6', SILT (ML), brown, moist, firm, slightly porous to non-porous</p> <p>T.D. 8' No GW or Caving Backfilled with Native, 2/13/04</p>	Qof		<p>DRIVE @4' @8'</p> <p>BULK @8'</p>		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →



Project Name: Cañon-Chino Project
Project No: 04-15-00

Location: Chino, CA
Contractor: A1-Roy Backhoe

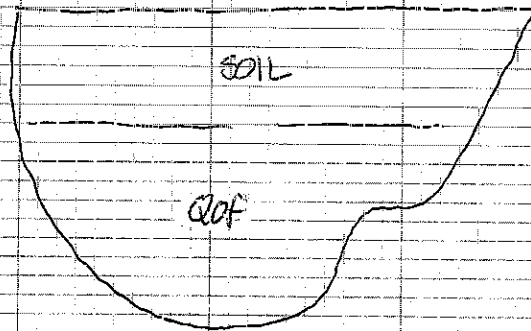
TEST PIT NO.: TP-13
Logged By: LWB
Date: 2-13-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>NATIVE SOIL</u> @0' SILTY CLAY (CL), dark brown, damp to moist, firm, porous, diffuse lower contact</p> <p><u>OLDER FAN DEPOSITS</u> @3' SILTY CLAY (CL), gray, moist, firm, porous @6.5' SILTY CLAY (CL), gray, moist to wet, firm, very porous, seepage</p> <p>T.D. 8' No casing, seepage below 6' Backfilled with Native, 2/13/04</p>	Qof				

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →



Project Name: Caillan-Chino Project
Project No: 04-15-00

Location: Chino, CA
Contractor: M-Roy Backhoe

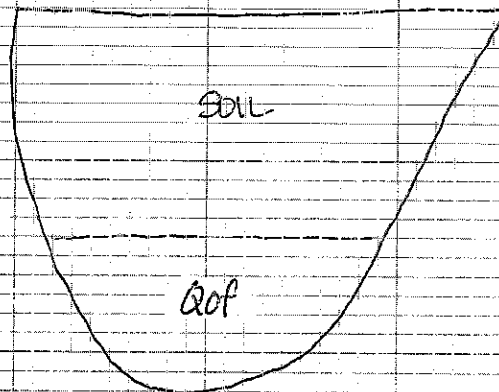
TEST PIT NO.: TP-14
Logged By: LLB
Date: 2-13-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>NATIVE SOIL</u></p> <p>@0', CLAYEY SILT (ML), dark brown, moist, firm, some fine SAND, porous, abundant organics, diffuse lower contact</p> <p><u>OLDER FAN DEPOSITS</u></p> <p>@6', CLAYEY SAND (SC), brown, moist to wet, dense, fine to coarse grained, scattered pebbles; abundant pebbles, scattered cobbles below 7'</p> <p>@8', wet: increasing moisture content with depth, no free water observed</p> <p>T.D. 10'</p> <p>No GW or caving</p> <p>Backfilled with Native 2/13/04</p>	Qof		DRIVE @4'		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N45°W ←



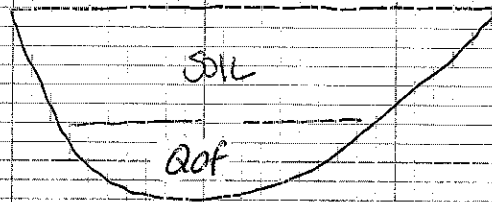
Project Name: Callan - Chino Project Location: Chino, CA TEST PIT NO.: TP-15
 Project No.: 04-15-00 Contractor: Al-Roy Backhoe Logged By: LLB
 Date: 2-13-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>NATIVE SOIL</u> @0', CLAYEY SAND(SC), dark brown, damp to moist, loose to dense, fine to medium grained, porous, abundant rootlets, diffuse lower contact</p> <p><u>OLDER FAN DEPOSITS</u> @3', SILTY SAND(SM), brown, moist, dense, fine to coarse grained, scattered pebbles and cobbles</p> <p>T.D 5' NO GW OR CAVING BACKFILLED WITH NATIVE, 2/13/04</p>	Qof		DRIVE @3'		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →

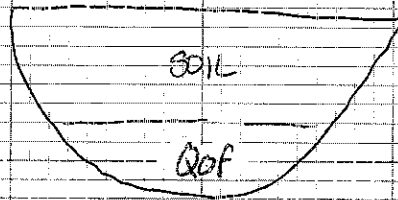


Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>NATIVE SOIL</u></p> <p>@0', SANDY CLAY (CL), dark brown, damp to moist, firm, fine to medium grained, porous, abundant roots and rootlets, diffuse lower contact</p> <p><u>OLDER FAN DEPOSITS</u></p> <p>@3', CLAYEY SAND (SC), brown and gray, moist, dense, fine to coarse grained, slightly porous to 5', abundant white carbonate deposits</p> <p>T.D. 5'</p> <p>NO GW OR CAVING</p> <p>Backfilled with Native, 2/13/04</p>	Qof				

Scale: 1" = 5'

Surface Slope: 0°

Trend: E →



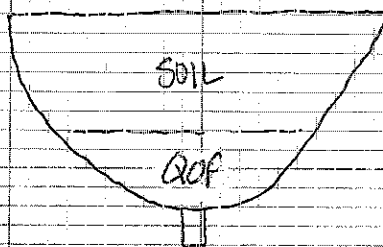
Project Name: Callan-Chino Project Location: Chino, CA TEST PIT NO.: TP-17
 Project No: 04-15-00 Contractor: A1-Roy Backhoe Logged By: LLB
 Date: 2-13-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			USCS	Sample	Moisture (%)	Dry Unit Wt. (pcf)
	<p><u>NATIVE SOIL</u></p> <p>@ 0', SANDY CLAY (CL), dark brown, damp to moist, firm, fine to medium grained, porous, abundant roots and rootlets, diffuse lower contact</p> <p><u>OLDER FAN DEPOSITS</u></p> <p>@ 3', SILTY SAND (SM), light brown, moist, dense, fine grained, porous to 5', abundant white carbonate deposits</p> <p style="text-align: center;">T.D. 5' No GW or caving Backfilled with Native, 2/13/04</p>	Qof		DRIVE @ 5'		

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →





Goffman, McCormick & Urban, Inc.
Geotechnical Consultants

Project Name: Callan - Chino Project

Location: Chino, CA

TEST PIT NO.: TP-18

Logged By: LLB

Project No: 04-15-00

Contractor: M-Ray Backhoe

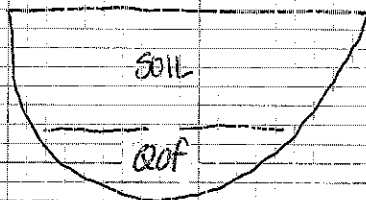
Date: 2-13-04

Geologic Attitudes	Description	Geologic Unit	Engineering Properties			
			U.S.C.S.	Sample	Moisture (%)	Dry Unit Wt (pcf)
	<p><u>NATIVE SOIL</u> @0', SANDY CLAY (CL), dark brown, damp to moist, firm, fine to medium grained, porous, abundant roots and rootlets, diffuse lower contact <u>OLDER FAN DEPOSITS</u> @3', SILTY SAND (SM), brown, moist, dense, fine to coarse grained, scattered pebbles, rare cobbles</p> <p>T.D. 5' NO, GW or caving Back-filled with Native, 2/13/04</p>	Qof				

Scale: 1" = 5'

Surface Slope: 0°

Trend: N →



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP- 19

Sheet 1 of 1

Date(s) Excavated	12/20/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	Al-Roy Drilling, Inc.	Total Depth of Test Pit	15.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			553.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 12 ft; Depth: 15 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	ADDITIONAL TESTS
	<u>DAIRY WASTE/MANURE</u>									
	<u>OLDER FAN DEPOSITS (Qof)</u>		552							
2		CLAYEY SAND (SC) dark brown, damp medium dense porous fine to medium grained		2						
		Slightly porous below 3 feet	550							
4			548	4						
		Very dark gray, scattered organic debris moist below 7 feet	546							
8			544	8						
		Scattered cobbles below 13 feet	540							
10			542	10						
		Bluish gray moist to wet below 14 feet	540							
12			538	12						
14				14						

TP_REV1 04-15-00 GPJ GM&U GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP- 20

Sheet 1 of 1

Date(s) Excavated 12/20/06	Logged By LBS	Checked By N/A
Excavation Equipment Backhoe	Excavation Contractor Al-Roy Drilling, Inc.	Total Depth of Test Pit 5.0 feet
Sampling Method(s) N/A	Approx. Surface Elevation, ft MSL 565.0	
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 7 ft; Depth: 5 ft	
Remarks		

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	ADDITIONAL TESTS
	UNDOCUMENTED FILL (Qafu) Disturbed soil to 2 feet	CLAYEY SAND (SC), dark brown, dry to damp, loose to medium dense, fine to coarse grained	564							
2	OLDER FAN DEPOSITS (Qof) Pockets of caliche below 2 feet	SAND W/ CLAY (SC-SM), brown damp to moist medium dense fine to coarse grained	562	2						
4			560	4						

TP_REV1 04-15-00.GPJ GM&U.GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP- 21

Sheet 1 of 1

Date(s) Excavated	12/20/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	Al-Roy Drilling, Inc.	Total Depth of Test Pit	5.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			562.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 7 ft; Depth: 5 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				ADDITIONAL TESTS
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	
	UNDOCUMENTED FILL (Qafu) Disturbed soil to 2 feet	CLAYEY SAND (SC), dark brown, dry to damp, loose to medium dense, fine to medium grained								
2	OLDER FAN DEPOSITS (Qof) Abundant caliche below 2 feet	SAND W/CLAY (SC-SM), brown, damp to moist, medium dense, fine to coarse grained slightly porous	560	2						
4			558	4						

TP_REV1 04-15-00.GPJ GM&U_GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP- 22

Sheet 1 of 1

Date(s) Excavated 12/20/06	Logged By LBS	Checked By N/A
Excavation Equipment Backhoe	Excavation Contractor Al-Roy Drilling, Inc.	Total Depth of Test Pit 5 0 feet
Sampling Method(s) N/A	Approx. Surface Elevation, ft MSL 565.0	
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 6 ft; Depth: 5 ft	
Remarks		

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA			
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf
2	UNDOCUMENTED FILL (Qafu) Abundant man-made debris below 0 feet	SILTY SAND (SM), dark brown, damp to moist medium dense fine to coarse grained	564	2					
4	OLDER FAN DEPOSITS (Qof)	SAND W/CLAY (SC-SM), brown, moist, medium dense slightly porous, fine to coarse grained	562	4					
			560						

TP_REV1 04-15-00.GPJ GM&J GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP- 23

Sheet 1 of 1

Date(s) Excavated	12/20/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	Al-Roy Drilling, Inc.	Total Depth of Test Pit	5.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			559.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 6 ft; Depth: 5 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	ADDITIONAL TESTS
	<u>DAIRY WASTE/MANURE</u>									
2	<u>OLDER FAN DEPOSITS (Qof)</u>	SANDY CLAY (CL), very dark brown, damp, firm, highly organic strong organic odor fine to medium grained	558	2						
4		SAND W/CLAY (SC-SM), brown, moist, medium dense slightly porous, fine to coarse grained	556	4						
			554							

TP_REV1 04-15-00.GPJ GM&U.GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP- 24

Sheet 1 of 1

Date(s) Excavated	12/18/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	Al-Roy Drilling, Inc.	Total Depth of Test Pit	5.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			545.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 7 ft; Depth: 5 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				ADDITIONAL TESTS
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	
	<u>NATIVE SOIL</u> Disturbed by discing below 0 feet	SILTY SAND (SM), dark brown dry to damp loose to medium dense fine to medium grained	544							
2	<u>OLDER FAN DEPOSITS (Qof)</u> Scattered caliche below 2 feet	SILTY SAND (SM), dark brown, damp to moist, medium dense fine to medium grained slightly porous	542	2						
4		Minor clay no porosity observed below 4 feet	540	4						

TP_REV1 04-15-00 GPJ GM&J.GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP- 25

Sheet 1 of 1

Date(s) Excavated	12/18/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	Al-Roy Drilling, Inc.	Total Depth of Test Pit	5.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			543.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 6 ft; Depth: 5 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	SAMPLE	TEST DATA			
							MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	ADDITIONAL TESTS
	UNDOCUMENTED FILL (Qafu) Abundant caliche below 0 feet	SANDY SILT (ML), brown dry to damp, firm, fine to medium grained	542							
2	ALLUVIAL DEPOSITS (Qal) Abundant caliche below 2 feet	SILTY SAND (SM), light brown, damp to moist, dense, fine to medium grained, slightly to moderately porous	540	2						
4	Rare caliche observed below 4 feet		538	4						

TP_REV1 04-15-00.GPJ GM&U GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP- 26

Sheet 1 of 1

Date(s) Excavated 12/18/06	Logged By LBS	Checked By N/A
Excavation Equipment Backhoe	Excavation Contractor Al-Roy Drilling, Inc.	Total Depth of Test Pit 9.0 feet
Sampling Method(s) N/A	Approx. Surface Elevation, ft MSL 539.0	
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 11 ft; Depth: 9 ft	
Remarks		

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				ADDITIONAL TESTS
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	
2	UNDOCUMENTED FILL (Qafu)	SANDY SILT (ML), dark brown dry to damp firm, fine to medium grained	538							
2	UNDOCUMENTED FILL? (Qafu?) No porosity or soil structure observed, abundant caliche strong odor from spoil pile below 2 feet	SILTY SAND (SM), dark brown, damp dense fine grained strong odor	536	2						
4	Strong odor and color, possibly contains dairy waste or man-made debris, possibly contaminated (?) below 4 feet	SILTY SAND W/SOME CLAY (SM), very dark gray to bluish black damp dense fine to medium grained	534	4						
6			532	6						
8	ALLUVIAL DEPOSITS (Qal) No odor or staining observed below 8 feet	SILTY SAND W/SOME CLAY (SM), brown moist dense fine to medium grained	530	8						

TP_REV1 04-15-00 GP J GM&U GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP- 27

Sheet 1 of 1

Date(s) Excavated	12/20/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	Al-Roy Drilling, Inc.	Total Depth of Test Pit	7.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			561.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 9 ft; Depth: 7 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				ADDITIONAL TESTS
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	
	UNDOCUMENTED FILL (Qafu)	CLAYEY SAND (SC), dark brown, damp to moist medium dense, fine to medium grained	560							
2	OLDER FAN DEPOSITS (Qof) Scattered caliche pockets below 2 feet	CLAYEY SAND (SC), with SILT, brown moist, medium dense fine to medium grained porous	558	2						
4			556	4						
6		No porosity observed below 6 feet	554	6						

TP_REV1 04-15-00.GPJ GM&U.GDT 03/12/07



Date(s) Excavated: 12/19/06	Logged By: ABM	Checked By: N/A
Excavation Equipment: Backhoe	Excavation Contractor: AI-Roy Drilling, Inc.	Total Depth of Test Pit: 11 0 feet
Sampling Method(s): N/A	Approx. Surface Elevation ft MSL: 527.0	
Groundwater Depth [Elevation], feet: 11.0 [516.0]	Test Pit Dimensions: Width: 2 ft; Length: 12 ft; Depth: 11 ft	
Remarks		

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA			
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf
2	ALLUVIAL DEPOSITS (Qal)	SILTY SAND (SM) gray to light brown, dry, loose fine grained Becoming moist to wet with minor caving below 4 feet Becoming wet below 6 feet Trace of free moisture below 9 feet Heavy caving below 10 feet	526	2					
4			524	4					
6			522	6					
8			520	8					
10			518	10					
			516	▽					

TP_REV1 04-15-00.GPJ GM&U GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP-31

Sheet 1 of 1

Date(s) Excavated 12/19/06	Logged By ABM	Checked By N/A
Excavation Equipment Backhoe	Excavation Contractor Al-Roy Drilling, Inc.	Total Depth of Test Pit 15.0 feet
Sampling Method(s) N/A	Approx. Surface Elevation, ft MSL 551.0	
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 12 ft; Depth: 15 ft	
Remarks		

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA			
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf
2	NATIVE SOIL Roots and rootlets below 0 feet	SILTY SAND (SM) dark brown dry to damp loose fine grained porous	550	2					
			548	4					
6	OLDER FAN DEPOSITS (Qof)	SILTY SAND (SM), reddish brown, damp to moist, dense, fine to medium grained with gravel slightly porous	546	6					
		SAND (SP) reddish brown, damp to moist, very dense medium to coarse grained with increase in gravel	544	8					
		GRAVELLY SAND (SP), light brown, damp to moist, very dense medium to coarse grained minor amounts of silt and clay, average gravel size 3 to 4-inches, maximum diameter 6-inches Increase in gravel content below 9 feet	542	10					
		Rare cobbles greater than 6-inches diameter below 10 feet	540	12					
		SILTY SAND (SM), reddish brown, moist, medium dense fine to medium grained	538	14					
14		GRAVELLY SAND (SP), reddish brown, damp, very dense medium to coarse grained abundant cobbles	536						

TP_REV1 04-15-00.GPJ GM&J GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP-32

Sheet 1 of 1

Date(s) Excavated	12/19/06	Logged By	ABM	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	Al-Roy Drilling, Inc.	Total Depth of Test Pit	13.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation ft MSL			533.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 12 ft; Depth: 13 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				ADDITIONAL TESTS
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	
0 - 2	<u>NATIVE SOIL</u> Rootlets below 0 feet	SILTY SAND (SM) dark brown damp, loose, porous	532	2						
2 - 10	<u>OLDER FAN DEPOSITS (Qof)</u>	SILTY SAND (SM), reddish brown, damp, medium dense, slightly porous some pores up to 1/8-inch diameter Becomes light brown to reddish brown moist dense fine to medium grained	530 528 526	4 6 8						
10 - 12		CLAYEY SAND (SC), reddish brown, moist to wet, dense, fine to coarse grained with some gravel Scattered cobbles up to 6-inches diameter below 11 feet	524 522	10						
12 - 13		SAND (SP), reddish brown moist to wet, dense, coarse grained with abundant gravel and cobbles	520	12						

TP_REV1 04-15-00.GPJ GM&U.GDT 03/12/07



Date(s) Excavated: 12/19/06	Logged By: ABM	Checked By: N/A
Excavation Equipment: Backhoe	Excavation Contractor: At-Roy Drilling, Inc.	Total Depth of Test Pit: 15.0 feet
Sampling Method(s): N/A	Approx. Surface Elevation, ft MSL: 542.0	
Groundwater Depth [Elevation], feet	Test Pit Dimensions: Width: 2 ft; Length: 13 ft; Depth: 15 ft	
Remarks		

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	ADDITIONAL TESTS
	UNENGINEERED FILL (Qafu) Scattered man-made debris below 0 feet	CLAYEY SAND (SC), dark brown, moist, loose to medium dense, fine to coarse grained								
2	Scattered pieces of metal pipe glass plastic below 2 feet		540	2						
4			538	4						
6	OLDER FAN DEPOSITS (Qof) Uneven contact at 5 feet; west side depth of 5 feet, east side depth of 7.5 feet	SILTY SAND (SM), light brown to brown, moist to wet, medium dense, medium to coarse grained, some gravel, less porous	536	6						
8			534	8						
10			532	10						
12		SAND (SP), light brown, moist, medium dense fine to coarse grained, some gravel	530	12						
14		Cobbles below 13 feet	528	14						

TP_REV1 04-15-00.GPJ GM&U GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP-34

Sheet 1 of 1

Date(s) Excavated	12/18/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	Al-Roy Drilling, Inc.	Total Depth of Test Pit	15.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			558.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 13 ft; Depth: 15 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				ADDITIONAL TESTS
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	
	<u>UNENGINEERED FILL (Qafu)</u>	SANDY SILT (ML), dark brown, dry to damp firm fine to medium grained								
2	<u>NATIVE SOIL</u>	CLAYEY SAND (SC), dark reddish brown, dry to damp, dense, fine to medium grained, very porous	556	2						
4	<u>OLDER FAN DEPOSITS (Qof)</u> Abundant caliche below 4 feet	SAND (SP), orange brown, damp to moist dense, medium to very coarse grained, abundant cobbles and scattered boulders non-porous	554	4						
6			552	6						
8			550	8						
10		Increase in moisture moist to wet below 10 feet	548	10						
12		Abundant gravels, rare cobbles and boulders below 11 feet Scattered boulders below 12 feet	546	12						
14			544	14						

TP_REV1 04-15-00.GPJ GM&U.GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP-35

Sheet 1 of 1

Date(s) Excavated 12/18/06	Logged By LBS	Checked By N/A
Excavation Equipment Backhoe	Excavation Contractor Al-Roy Drilling, Inc.	Total Depth of Test Pit 5.0 feet
Sampling Method(s) N/A	Approx. Surface Elevation, ft MSL 558.0	
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 6 ft; Depth: 5 ft	
Remarks		

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				ADDITIONAL TESTS
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	
	<u>NATIVE SOIL</u> Disturbed by discing below 0 feet	SILTY SAND (SM), dark brown, damp to moist, firm, fine to coarse grained								
2	<u>OLDER FAN DEPOSITS (Qof)</u>	SAND (SP), orange brown damp, dense, medium to coarse grained scattered cobbles and boulders, non-porous	556	2						
4			554	4						

TP_REV1 04-15-00.GPJ GM&J.GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP-36

Sheet 1 of 1

Date(s) Excavated	12/18/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	AI-Roy Drilling, Inc.	Total Depth of Test Pit	5.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			548.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 7 ft; Depth: 5 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	SAMPLE	TEST DATA				ADDITIONAL TESTS
							MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf		
	NATIVE SOIL Disturbed by discing abundant roots and rootlets below 0 feet	SILTY SAND (SM), dark brown, dry to damp, loose to medium dense fine grained, slightly porous									
2	OLDER FAN DEPOSITS (Qof) Abundant caliche below 2 feet	SILTY SAND (SM), light brown to brown, damp dense fine grained slightly porous	546	2							
4			544	4							
		Large boulder at bottom of test pit at 5 feet									

TP_REV1 04-15-00.GPJ GM&J GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP-37

Sheet 1 of 1

Date(s) Excavated 12/18/06	Logged By LBS	Checked By N/A
Excavation Equipment Backhoe	Excavation Contractor Al-Roy Drilling, Inc.	Total Depth of Test Pit 15.0 feet
Sampling Method(s) N/A	Approx. Surface Elevation, ft MSL 547.0	
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 12 ft; Depth: 15 ft	
Remarks		

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				ADDITIONAL TESTS
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	
0 - 2	<u>NATIVE SOIL</u> Disturbed by discing abundant rootlets below 0 feet	SILTY SAND (SM), dark brown, dry to damp, loose to medium dense fine grained	546	2						
2 - 4	<u>OLDER FAN DEPOSITS (Qof)</u>	SILTY SAND (SM), dark brown, damp to moist, medium dense fine grained slightly porous Becoming slightly clayey moist at 4 feet	544	4						
4 - 8		SILTY CLAY (CL) dark brown moist firm, slightly porous	542	6						
8 - 10			540	8						
10 - 12		CLAYEY SAND (SC) gray, moist, medium dense fine to coarse grained slightly porous	538	10						
12 - 14		Decrease in clay content, slightly porous below 13 feet	536	12						
14 - 15			534	14						
15			532	15						

TP_REV1 04-15-00.GPJ GM&J GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT Project Location: Chino CA Project Number: 04-15-03	<h2 style="margin: 0;">Log of Test Pit TP-38</h2> <p style="margin: 0;">Sheet 1 of 1</p>
---	--

Date(s) Excavated: 12/18/06	Logged By: LBS	Checked By: N/A
Excavation Equipment: Backhoe	Excavation Contractor: Al-Roy Drilling, Inc.	Total Depth of Test Pit: 5.0 feet
Sampling Method(s): N/A	Approx. Surface Elevation, ft MSL: 572.0	
Groundwater Depth [Elevation], feet	Test Pit Dimensions: Width: 2 ft; Length: 6 ft; Depth: 5 ft	
Remarks		

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	ADDITIONAL TESTS
	<u>NATIVE SOIL</u> Disturbed by discing below 0 feet	SILTY SAND (SM) with CLAY, dark brown, dry to damp, loose to medium dense, fine to medium grained								
2	<u>OLDER FAN DEPOSITS (Qof)</u>	SILTY SAND (SM), with CLAY, dark brown, damp, medium dense, fine to medium grained	570	2						
4		SANDY SILT (ML), yellow brown moist firm fine grained, non-porous	568	4						

TP_REV1 04-15-00.GPJ GM&U GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP-39

Sheet 1 of 1

Date(s) Excavated 12/19/06	Logged By LBS	Checked By N/A
Excavation Equipment Backhoe	Excavation Contractor AI-Roy Drilling, Inc.	Total Depth of Test Pit 5.0 feet
Sampling Method(s) N/A	Approx. Surface Elevation, ft MSL 566.0	
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 6 ft; Depth: 5 ft	
Remarks		

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	ADDITIONAL TESTS
	<u>NATIVE SOIL</u> Disturbed by discing abundant rootlets below 0 feet	SILTY SAND (SM), with minor CLAY, dark brown dry to damp, loose to medium dense fine to medium grained								
2	<u>OLDER FAN DEPOSITS (Qof)</u>	SILTY SAND (SM), with CLAY dark brown, damp to moist, medium dense, fine to medium grained slightly porous	564	2						
4	Abundant caliche staining below 4 feet	CLAYEY SAND (SC), light brown, damp to moist, medium dense, fine to medium grained, slightly porous	562	4						

TP_REV1 04-15-00.GPJ GM&J GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP-40

Sheet 1 of 1

Date(s) Excavated	12/19/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	Al-Roy Drilling, Inc.	Total Depth of Test Pit	5.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			564.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 7 ft; Depth: 5 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	ADDITIONAL TESTS
0	NATIVE SOIL Disturbed by discing abundant rootlets below 0 feet	SILTY SAND (SM) with CLAY, dark brown, dry to damp, loose to medium dense, fine to medium grained								
2	OLDER FAN DEPOSITS (Qof)	SILTY SAND (SM), with CLAY, dark brown damp, medium dense fine to medium grained, porous	562	2						
4		SAND (SP), orange brown, damp to moist dense, fine to coarse grained, abundant cobbles, rare boulders non-porous	560	4						

TP_REV1 04-15-00.GPJ GM&J.GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP-41

Sheet 1 of 1

Date(s) Excavated	12/18/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	Al-Roy Drilling, Inc.	Total Depth of Test Pit	5.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			559.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 6 ft; Depth: 5 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				ADDITIONAL TESTS
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	
2	NATIVE SOIL Disturbed by discing abundant roots and rootlets below 0 feet	SILTY SAND (SM), with CLAY, dark brown damp, medium dense fine grained	558	2						
	OLDER FAN DEPOSITS (Qof) Abundant caliche below 2 feet	CLAYEY SAND (SC), dark brown, damp medium dense fine to medium grained Becomes porous at 3 feet	556							
	Well-developed soil structure abundant caliche below 4 feet	SILTY SAND (SM), brown, damp medium dense fine grained, slightly porous	554							

TP_REV1 04-15-00.GPJ GM&U.GDT 03/12/07



Date(s) Excavated: 12/18/06	Logged By: LBS	Checked By: N/A
Excavation Equipment: Backhoe	Excavation Contractor: Al-Roy Drilling, Inc.	Total Depth of Test Pit: 5.0 feet
Sampling Method(s): N/A	Approx. Surface Elevation, ft MSL: 577.0	
Groundwater Depth [Elevation], feet	Test Pit Dimensions: Width: 2 ft; Length: 7 ft; Depth: 5 ft	
Remarks		

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	ADDITIONAL TESTS
	<u>NATIVE SOIL</u> Disturbed by discing below 0 feet	SILTY SAND (SM), dark brown, damp medium dense fine grained								
-2	<u>OLDER FAN DEPOSITS (Qof)</u>	SAND (SP), orangish brown, damp, dense abundant cobbles and boulders fine to coarse grained, non-porous	576	2						
-4			574	4						
			572							

TP_REV1 04-15-00.GPJ GM&U.GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP-43

Sheet 1 of 1

Date(s) Excavated	12/20/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	AI-Roy Drilling, Inc.	Total Depth of Test Pit	5.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			548.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 6 ft; Depth: 5 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				ADDITIONAL TESTS
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	
2	<u>NATIVE SOIL</u> Abundant rootlets below 0 feet; disturbed by discing between 0 and 2 feet	SILTY SAND (SM), dark brown dry to damp loose to medium dense, fine to medium grained	546	2						
4	<u>OLDER FAN DEPOSITS (Qof)</u>	SILTY SAND (SM), with minor CLAY, dark brown, damp to moist, medium dense fine to medium grained, slightly porous	544	4						

TP_REV1 04-15-00.GPJ GM&U GDT 03/12/07



Project: EDGEWATER/CHINO PROJECT

Project Location: Chino CA

Project Number: 04-15-03

Log of Test Pit TP-44

Sheet 1 of 1

Date(s) Excavated	12/20/06	Logged By	LBS	Checked By	N/A
Excavation Equipment	Backhoe	Excavation Contractor	Al-Roy Drilling, Inc.	Total Depth of Test Pit	5.0 feet
Sampling Method(s)	N/A	Approx. Surface Elevation, ft MSL			551.0
Groundwater Depth [Elevation], feet	Test Pit Dimensions Width: 2 ft; Length: 6 ft; Depth: 5 ft				
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	TEST DATA				ADDITIONAL TESTS
						SAMPLE	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	MAXIMUM DENSITY, pcf	
	NATIVE SOIL Disturbed by discing below 0 feet	SILTY SAND (SM), with minor CLAY, dark brown dry to damp, loose to medium dense fine to medium grained	550							
2	OLDER FAN DEPOSITS (Qof) Abundant caliche below 1.5 feet	SILTY SAND (SM), with CLAY light brown, damp to moist, medium dense. fine to medium grained slightly porous	548	2						
4			546	4						

TP_REV1 04-15-00.GPJ GM&U.GDT 03/12/07

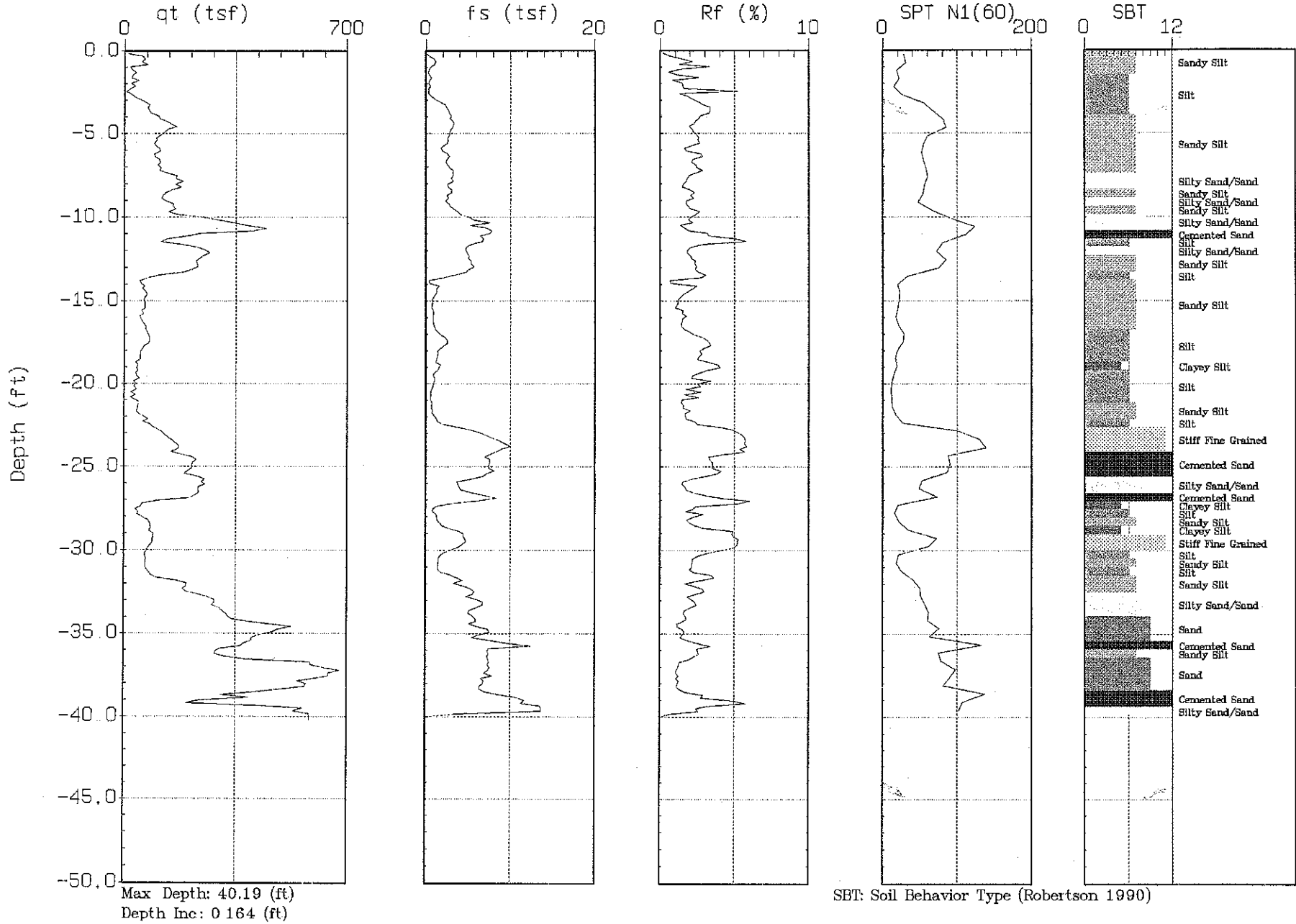




GMU

Site: CHINO PROJECT
Location: CPT-01

Engineer: A. TAYLOR
Date: 02:13:04 07:22

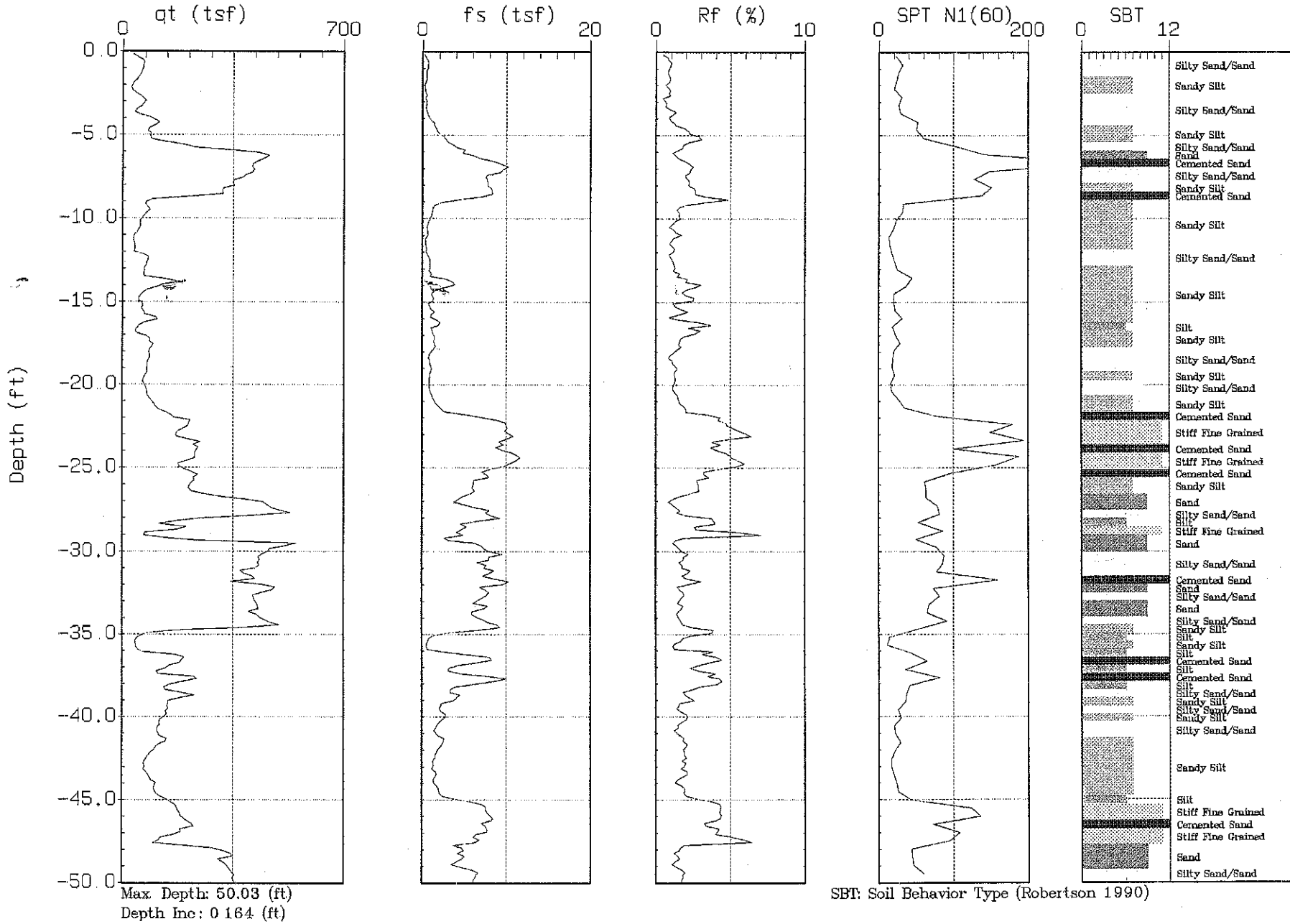




GMU

Site: CHINO PROJECT
Location: CPT-02

Engineer: A. TAYLOR
Date: 02:13:04 07:59

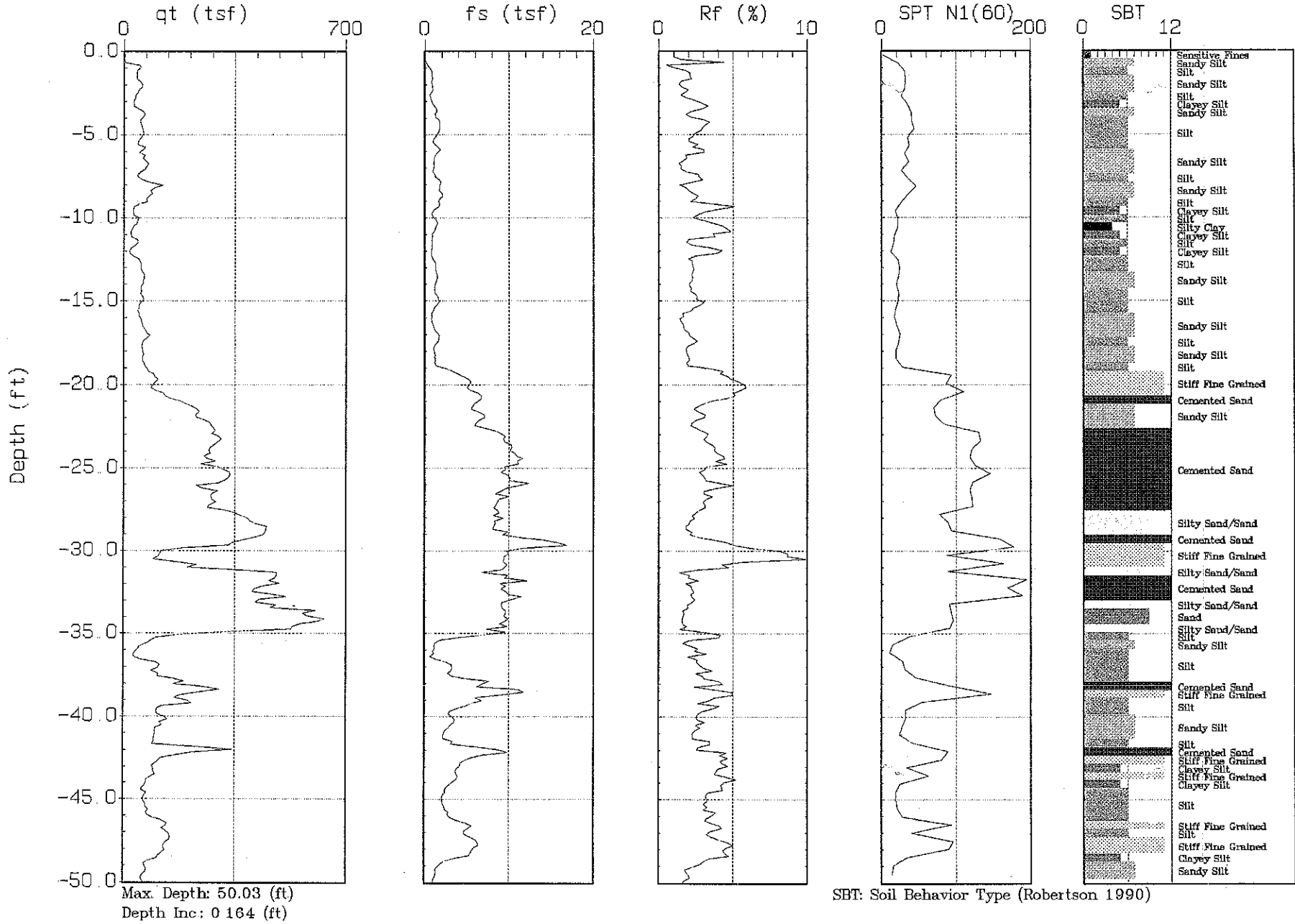




GMU

Site: CHINO PROJECT
Location: CPT-03

Engineer: A. TAYLOR
Date: 02:13:04 08:35

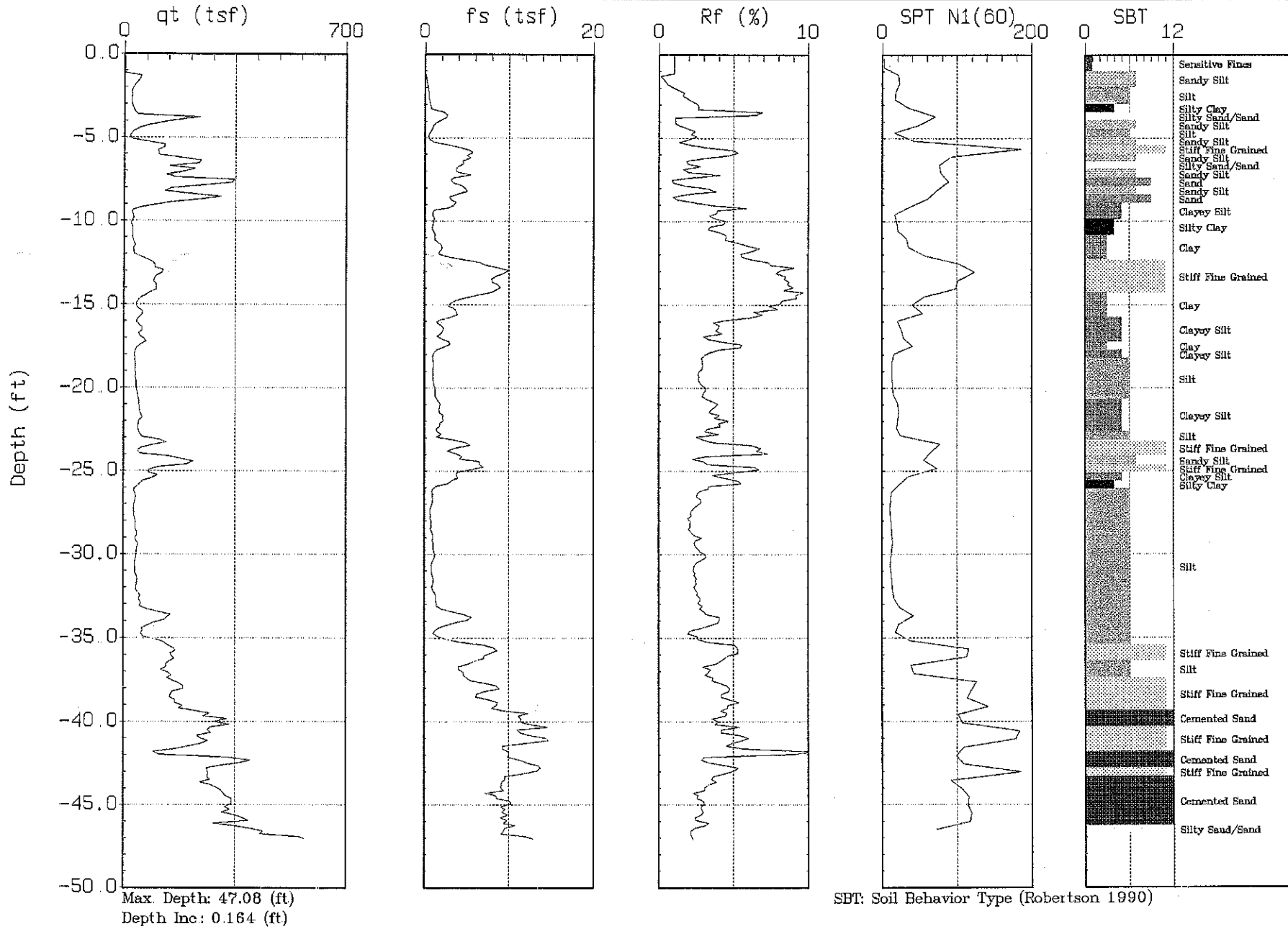




GMU

Site: CHINO PROJECT
Location: CPT-04

Engineer: A. TAYLOR
Date: 02:13:04 09:24

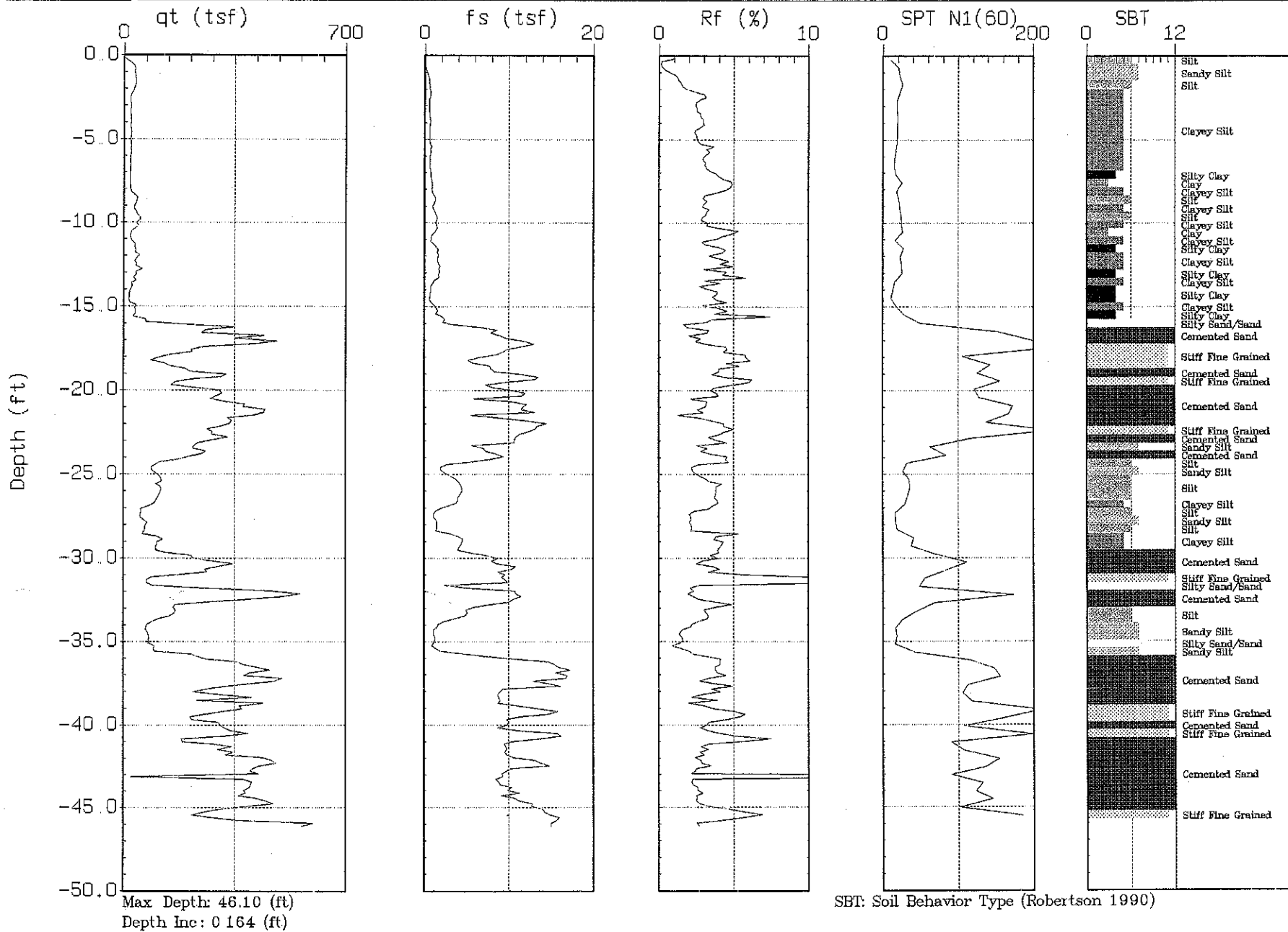




GMU

Site: CHINO PROJECT
Location: CPT-05

Engineer: A. TAYLOR
Date: 02:13:04 10:07

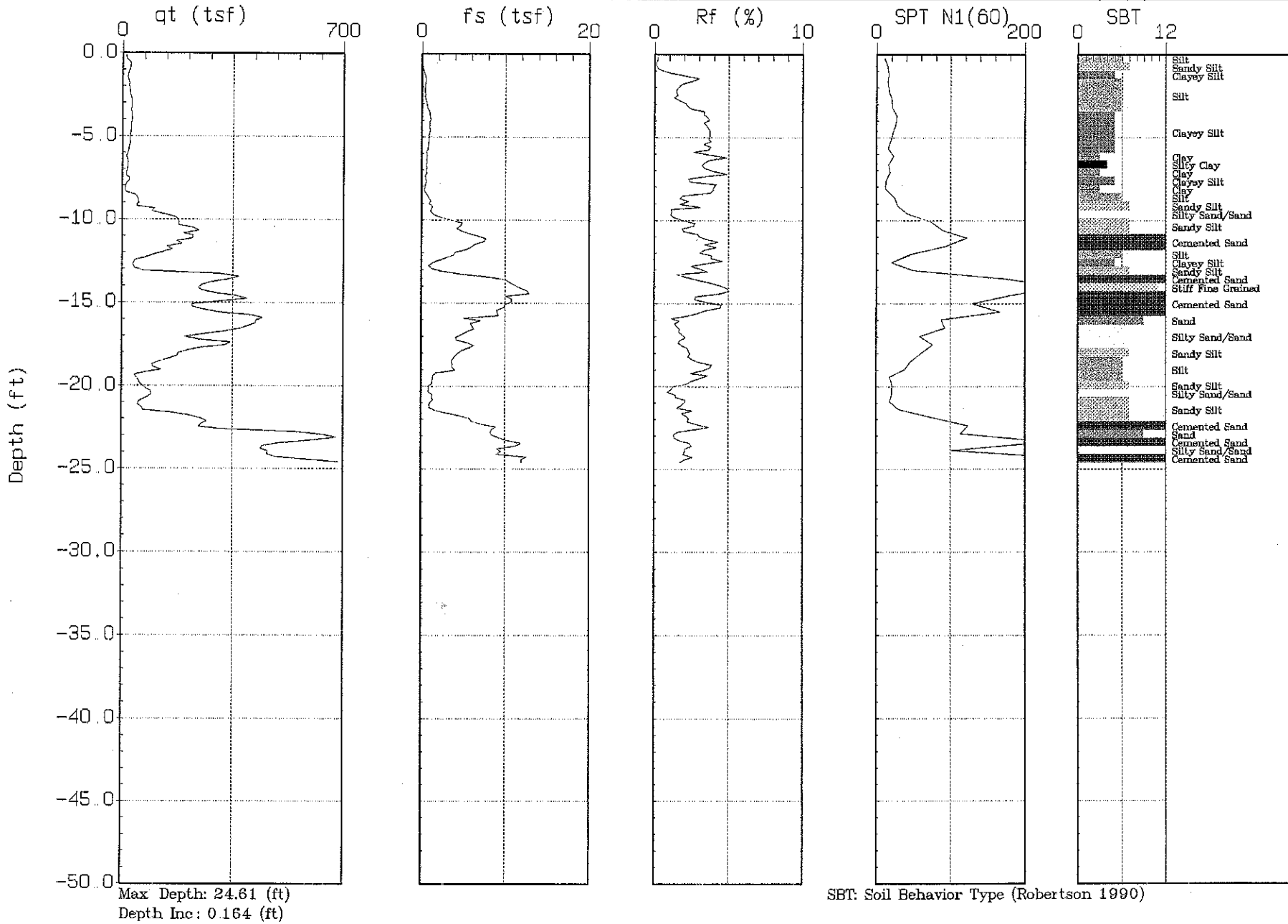




GMU

Site: CHINO PROJECT
Location: CPT-06

Engineer: A. TAYLOR
Date: 02:13:04 10:55





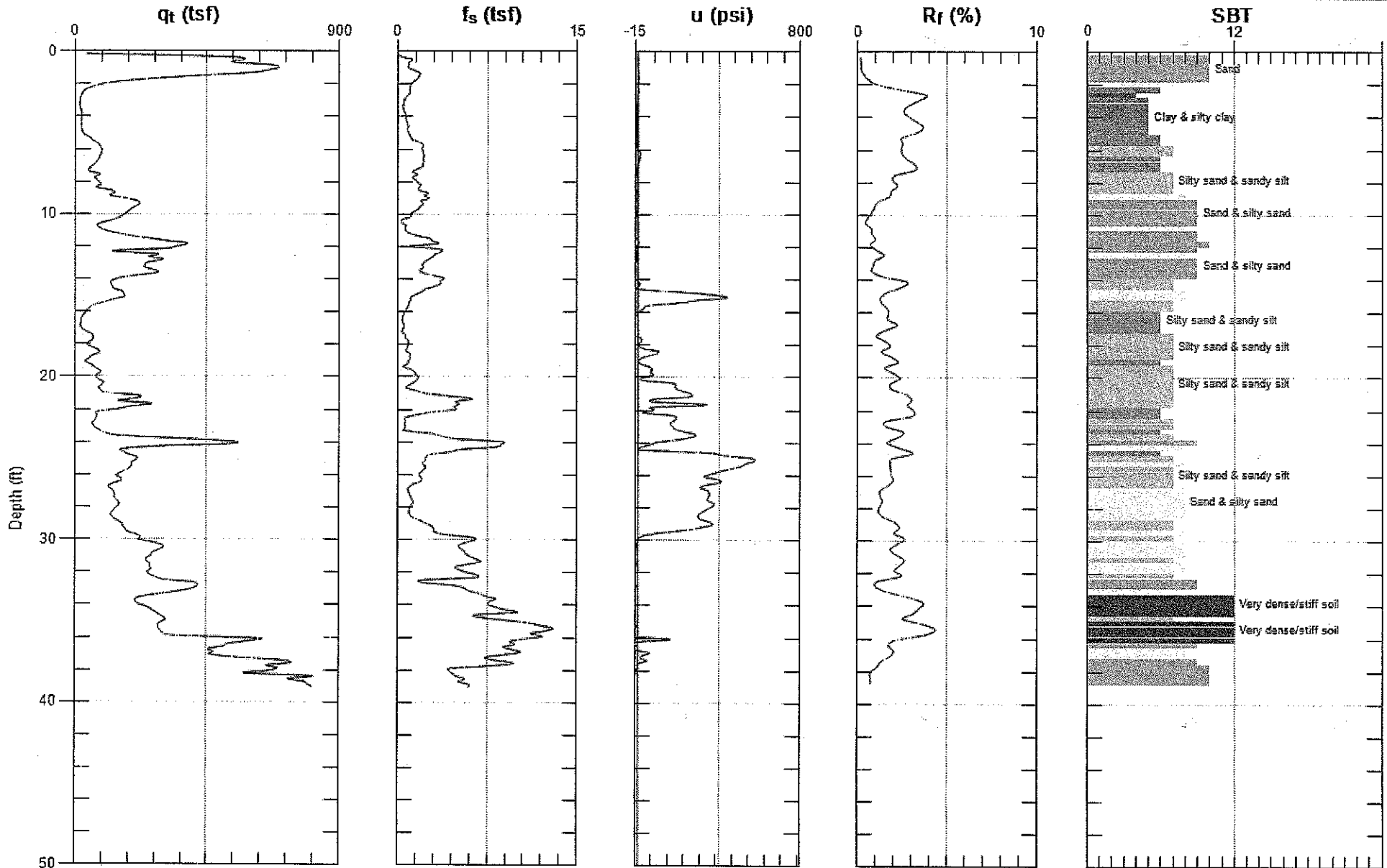
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: CPT-07

Date: 12/21/2006 08:24



Max. Depth: 39.040 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



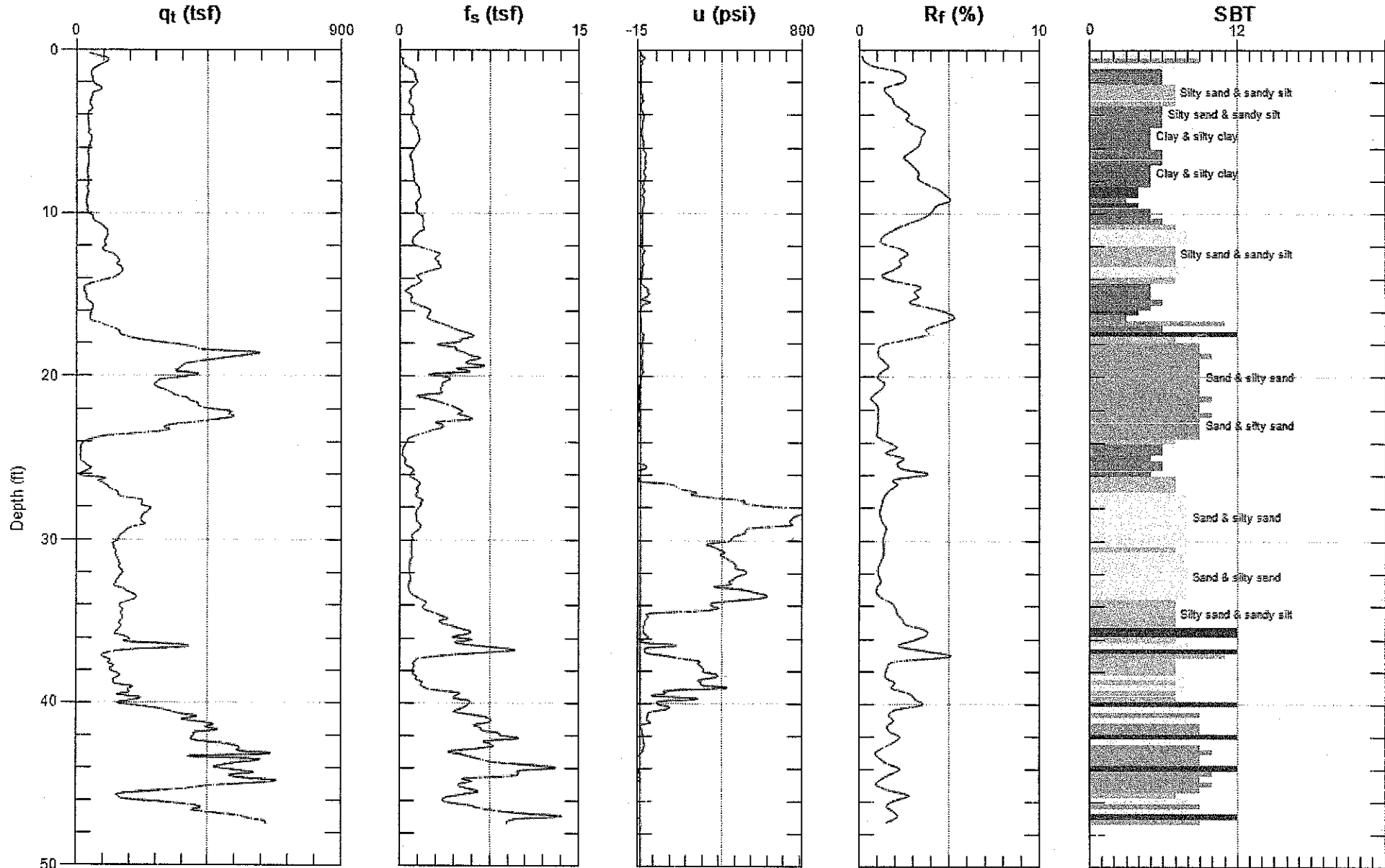
GMU

Site: CHINO

Sounding: SCPT-08

Engineer: D.VAN THIEL

Date: 12/21/2006 09:10



Max. Depth: 47.410 (ft)
Avg. Interval: 0.328 (ft)

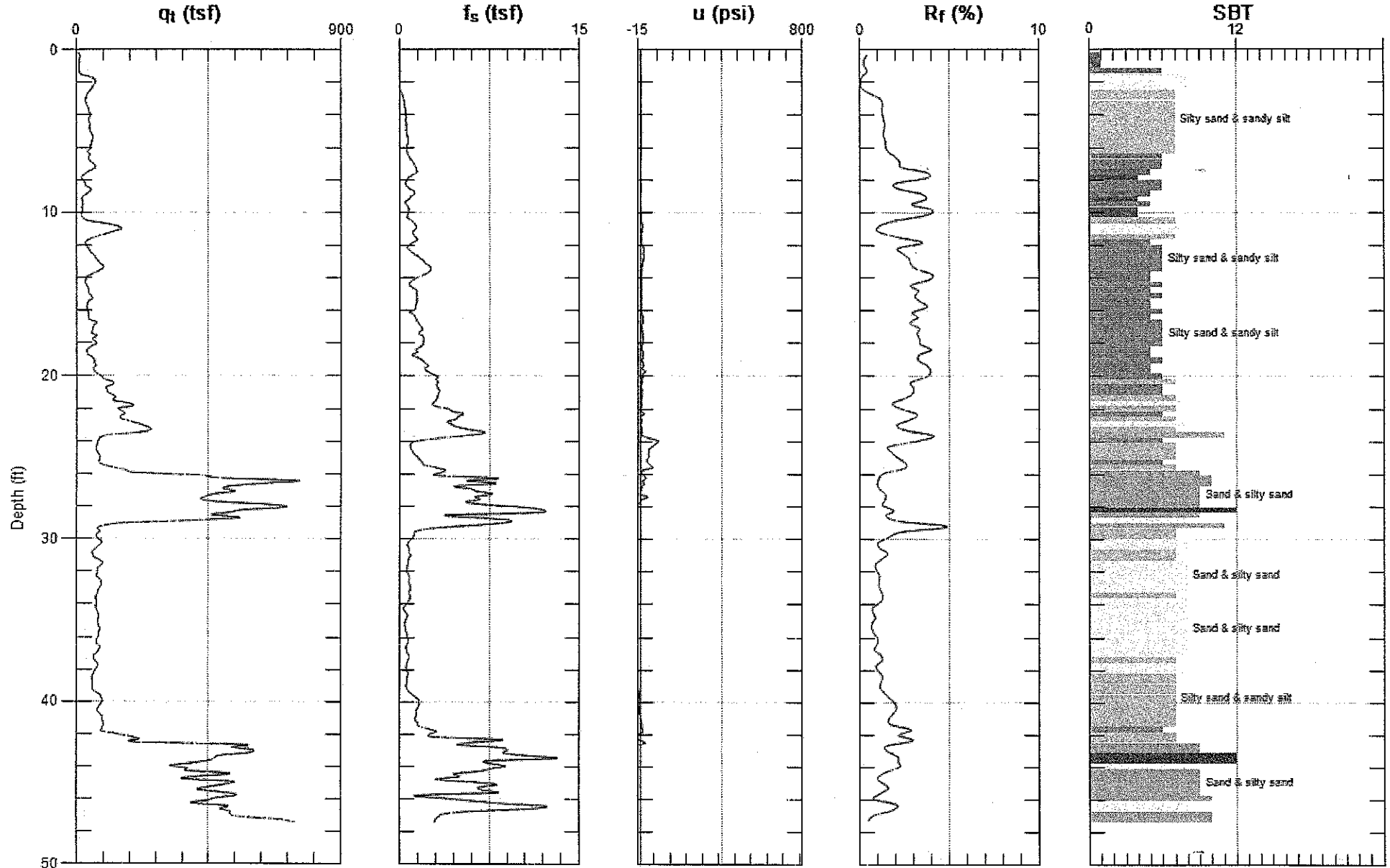
SET: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-09

Engineer: D.VAN THIEL
Date: 12/21/2006 09:55



Max. Depth: 47.410 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



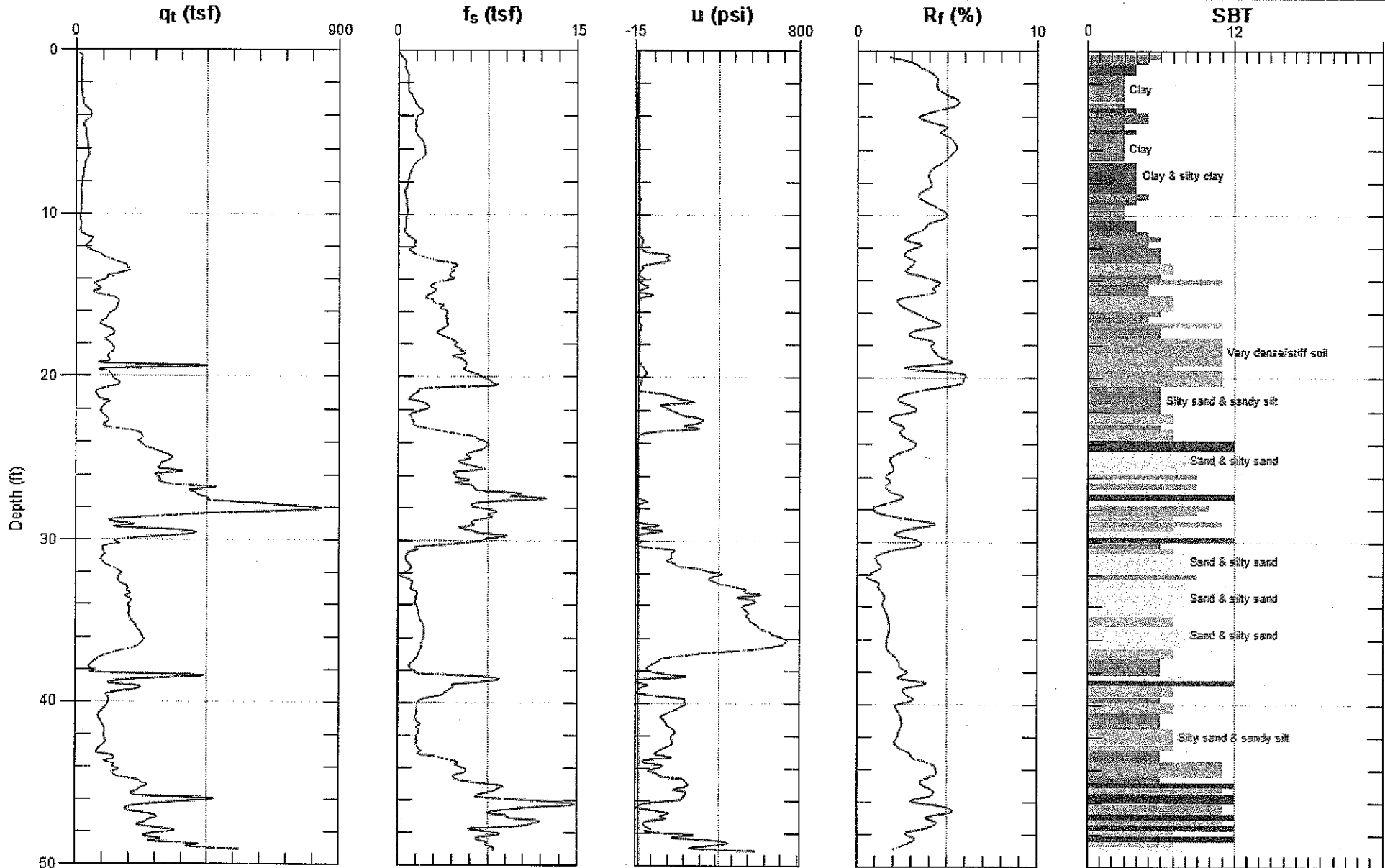
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: CPT-10

Date: 12/21/2006 12:17



Max. Depth: 49.050 (ft)
Avg. Interval: 0.328 (ft)

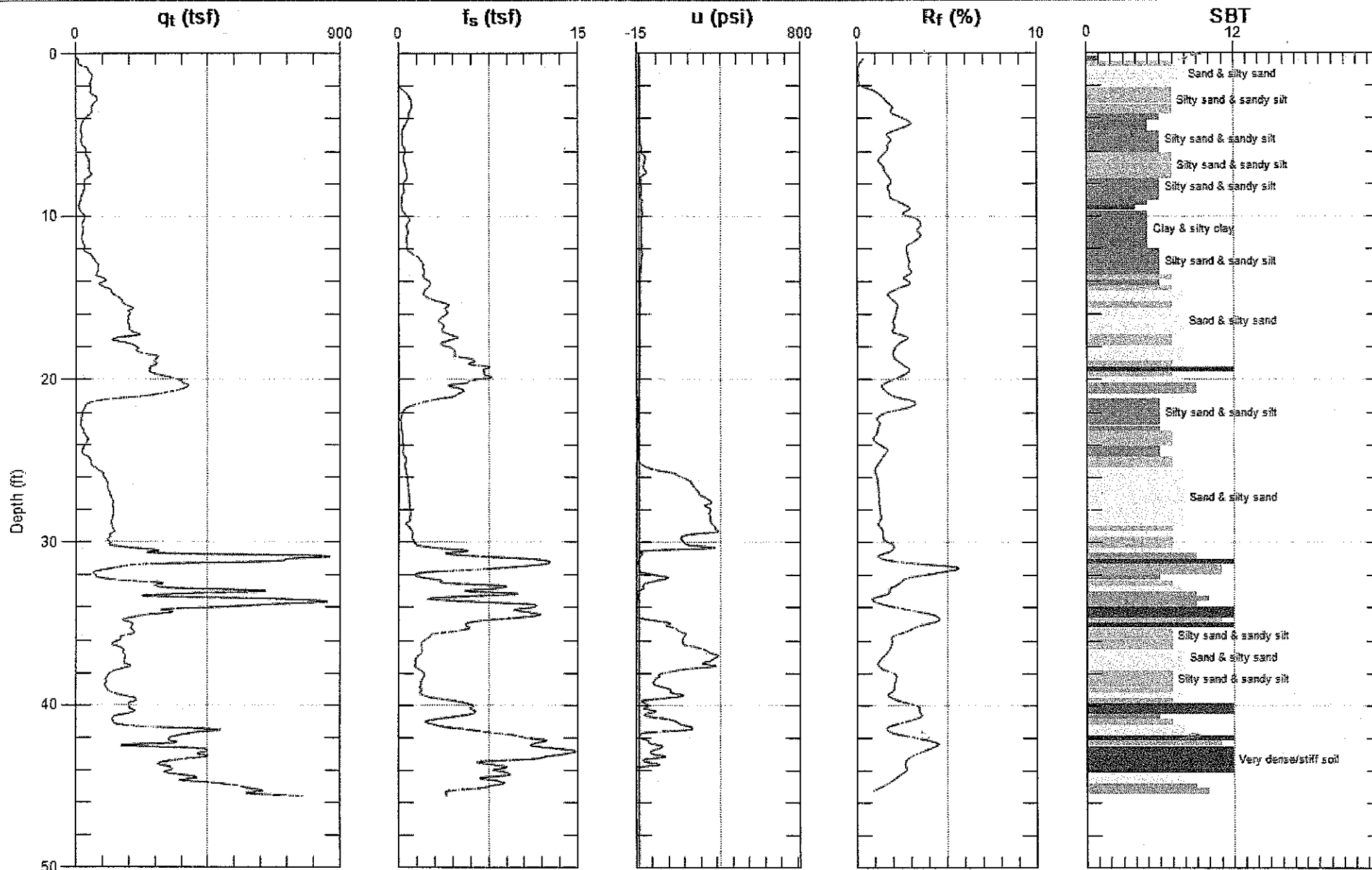
SBT: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-11

Engineer: D.VAN THIEL
Date: 12/21/2006 11:12



Max. Depth: 45.600 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



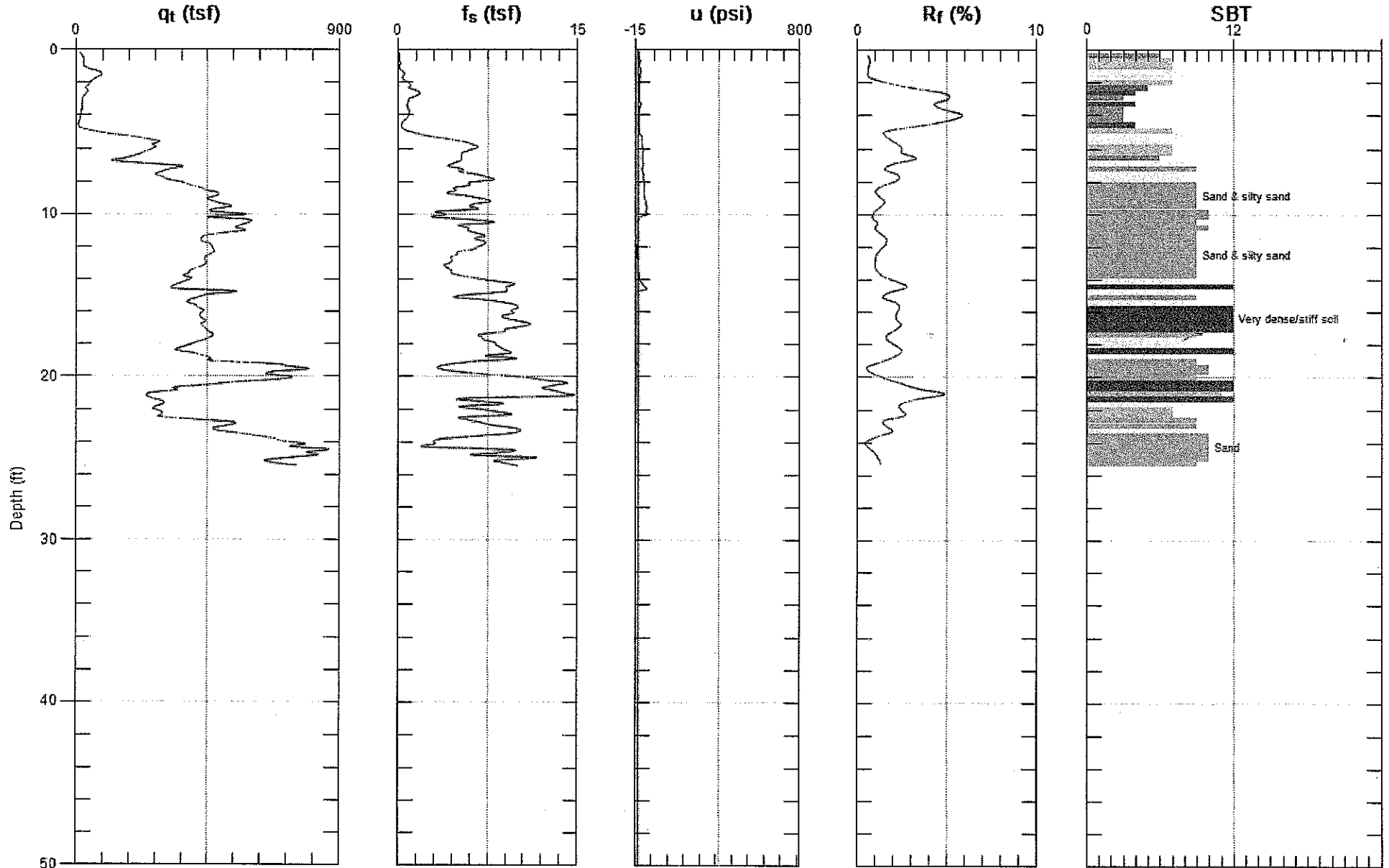
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: SCPT-12

Date: 12/21/2006 12:55



Max. Depth: 25.430 (ft)
Avg. Interval: 0.328 (ft)

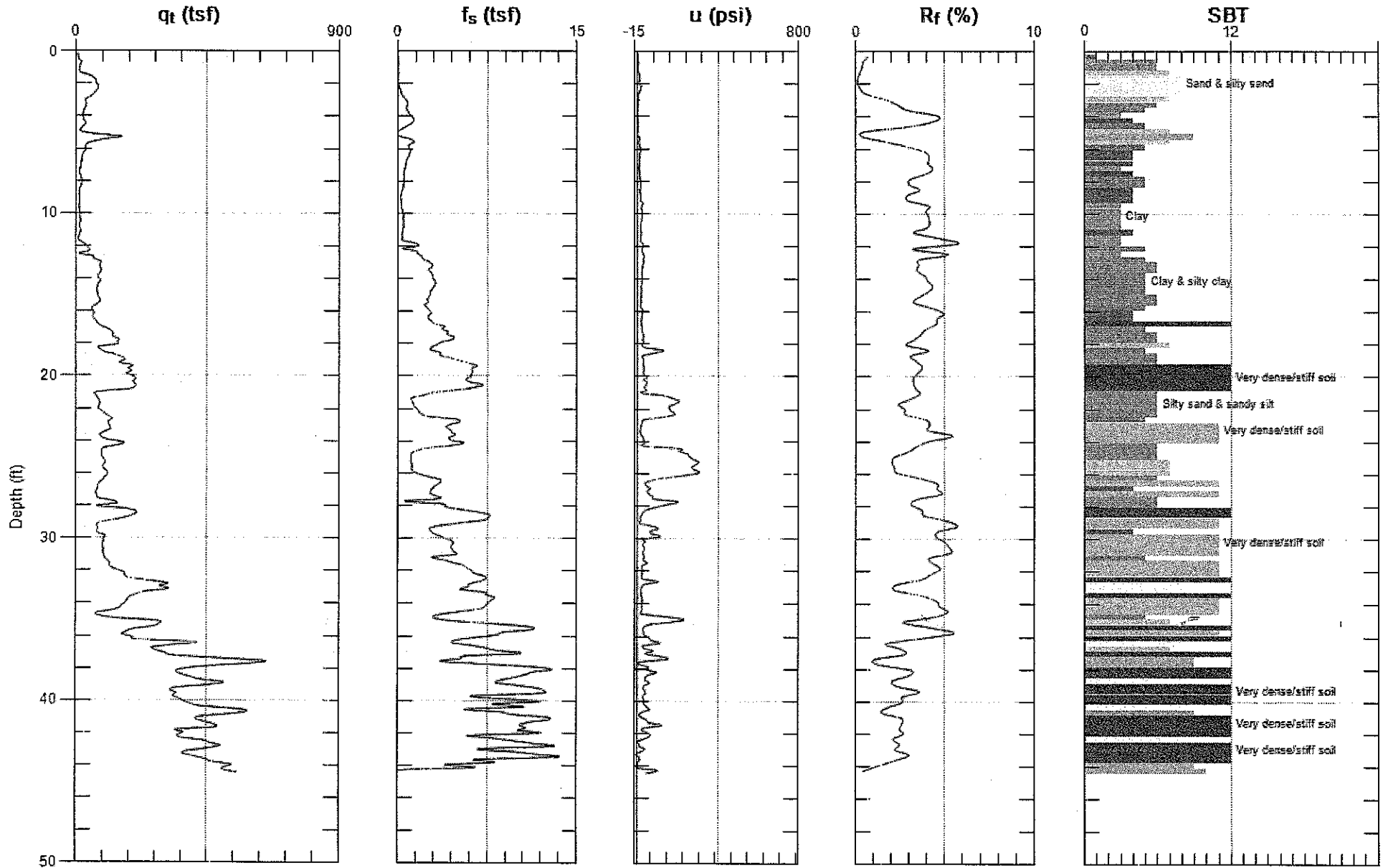
SBT: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-13

Engineer: D. VAN THIEL
Date: 12/21/2006 01:47



Max. Depth: 44.460 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



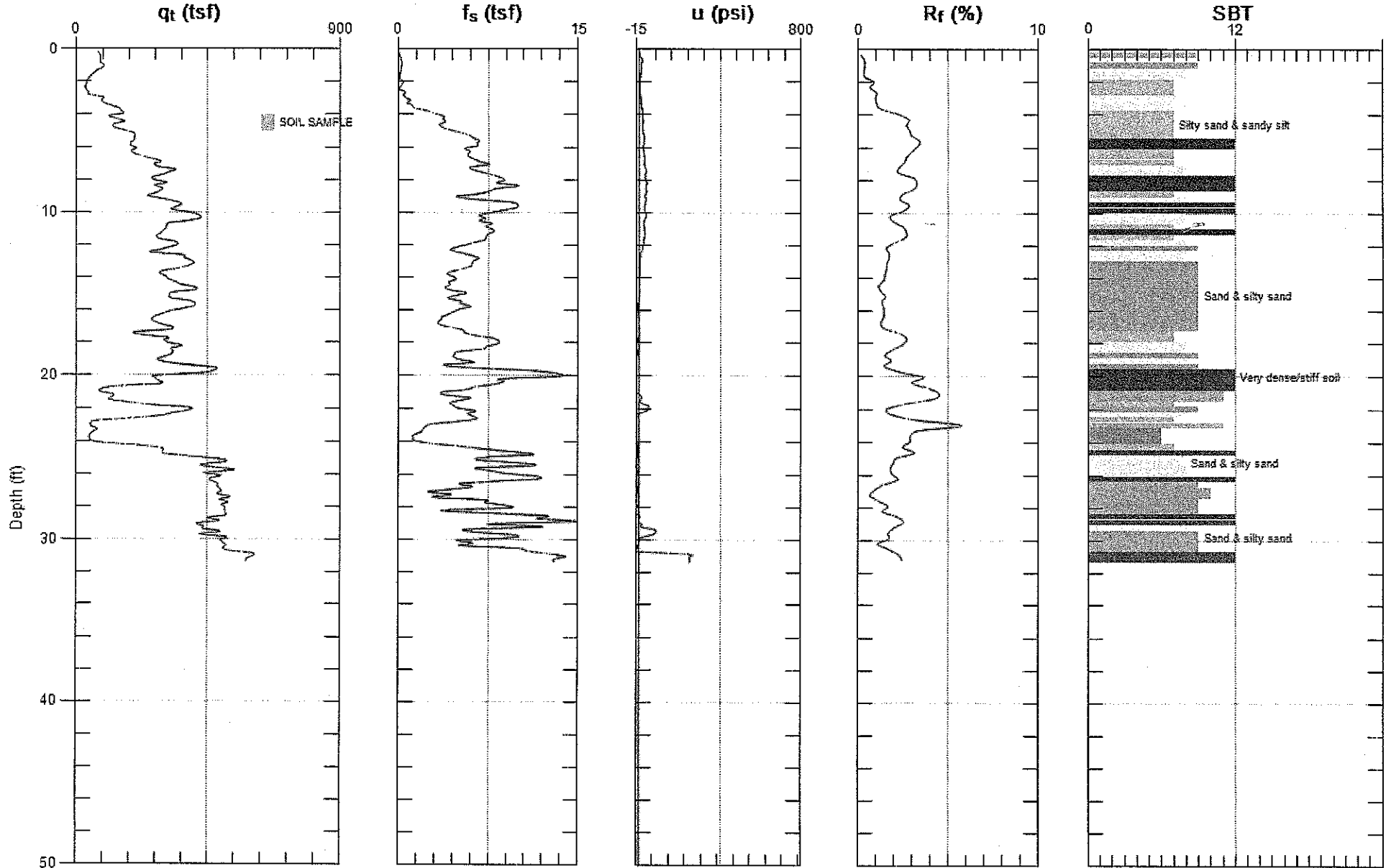
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: CPT-14

Date: 1/3/2007 12:32



Max. Depth: 31.330 (ft)
Avg Interval: 0.328 (ft)

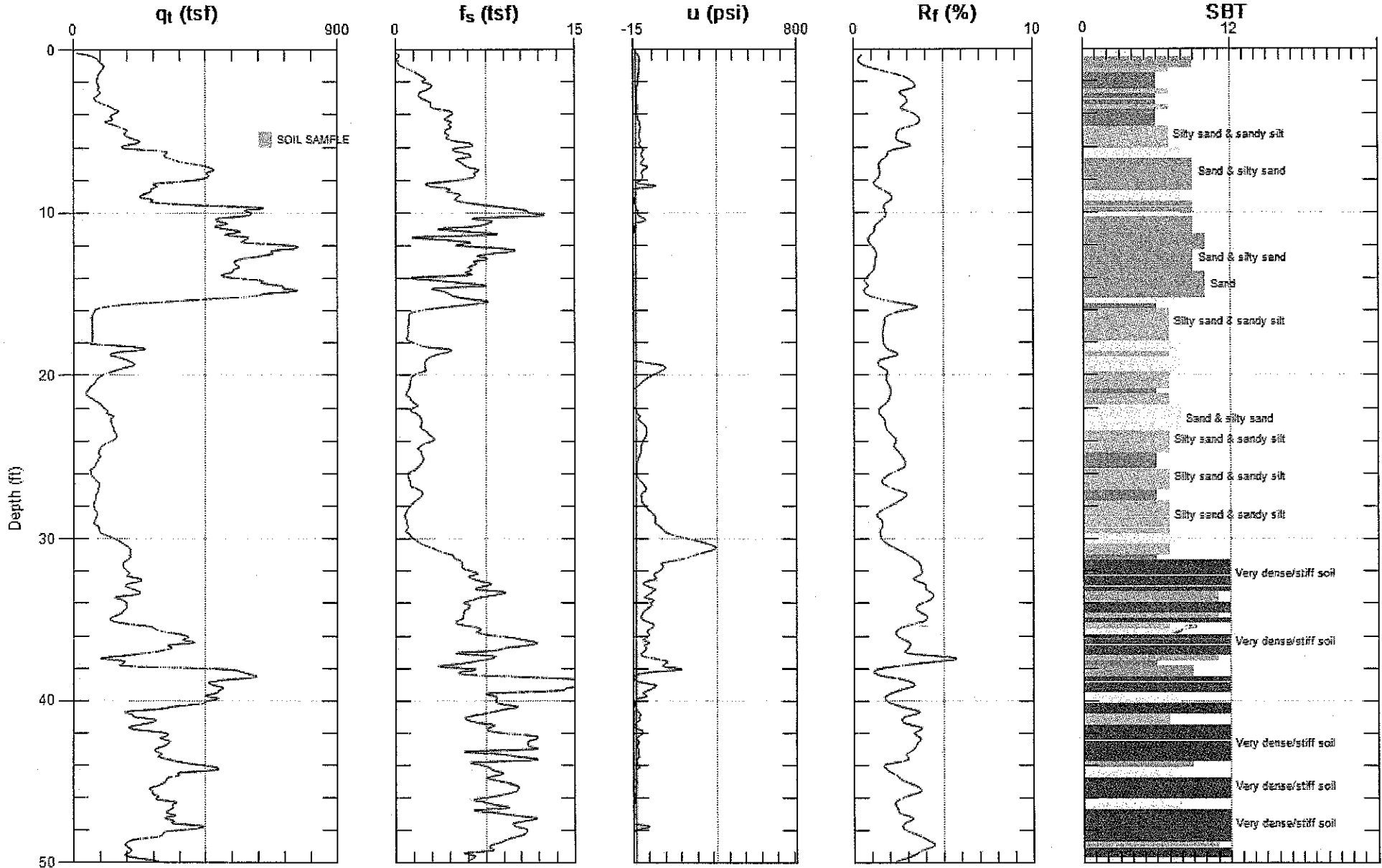
SBT: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-15

Engineer: D.VAN THIEL
Date: 1/3/2007 08:39



Max Depth: 50.030 (ft)
Avg. Interval: 0.328 (ft)

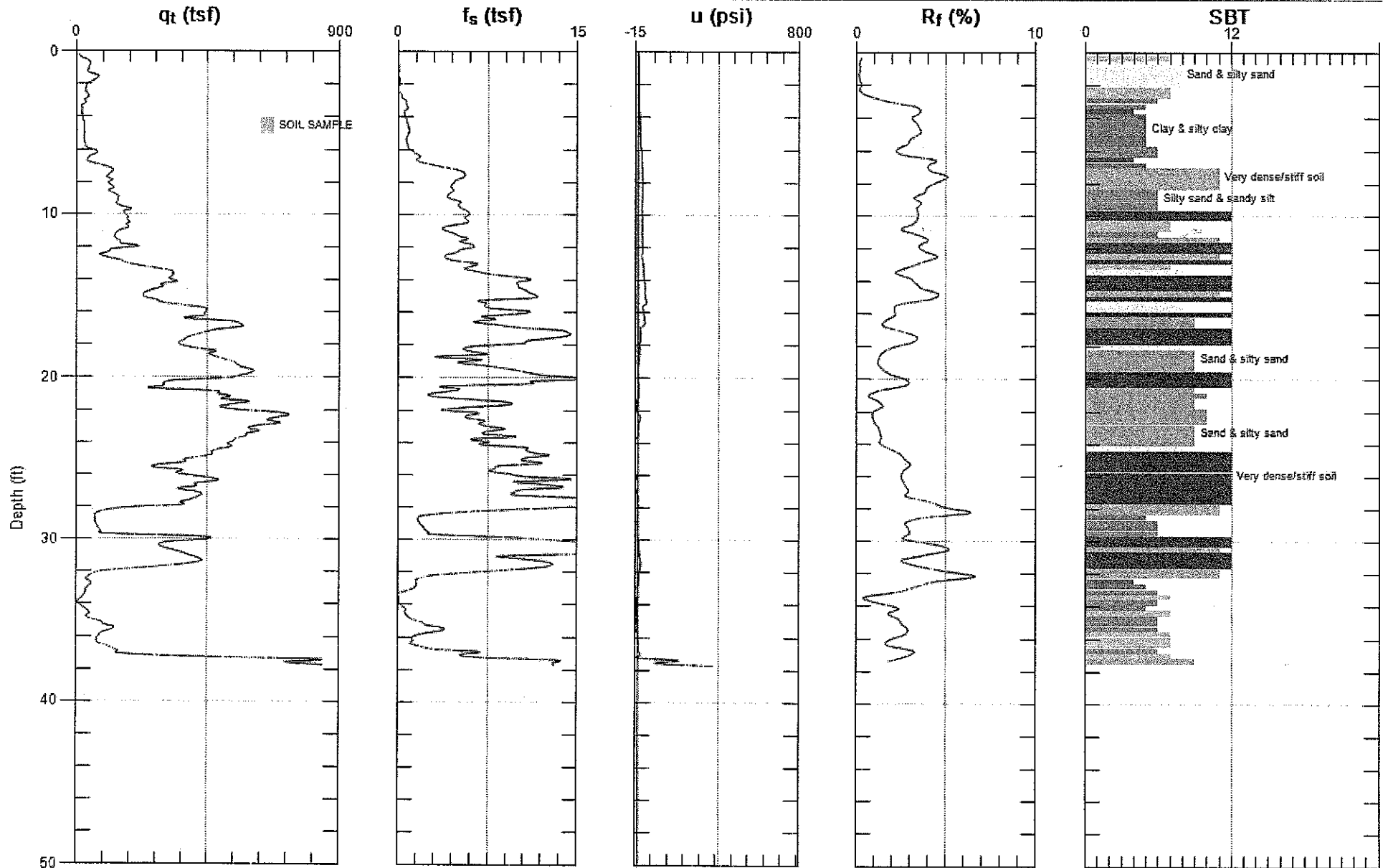
SBT: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-16

Engineer: D.VAN THIEL
Date: 1/3/2007 11:35



Max. Depth: 37.730 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



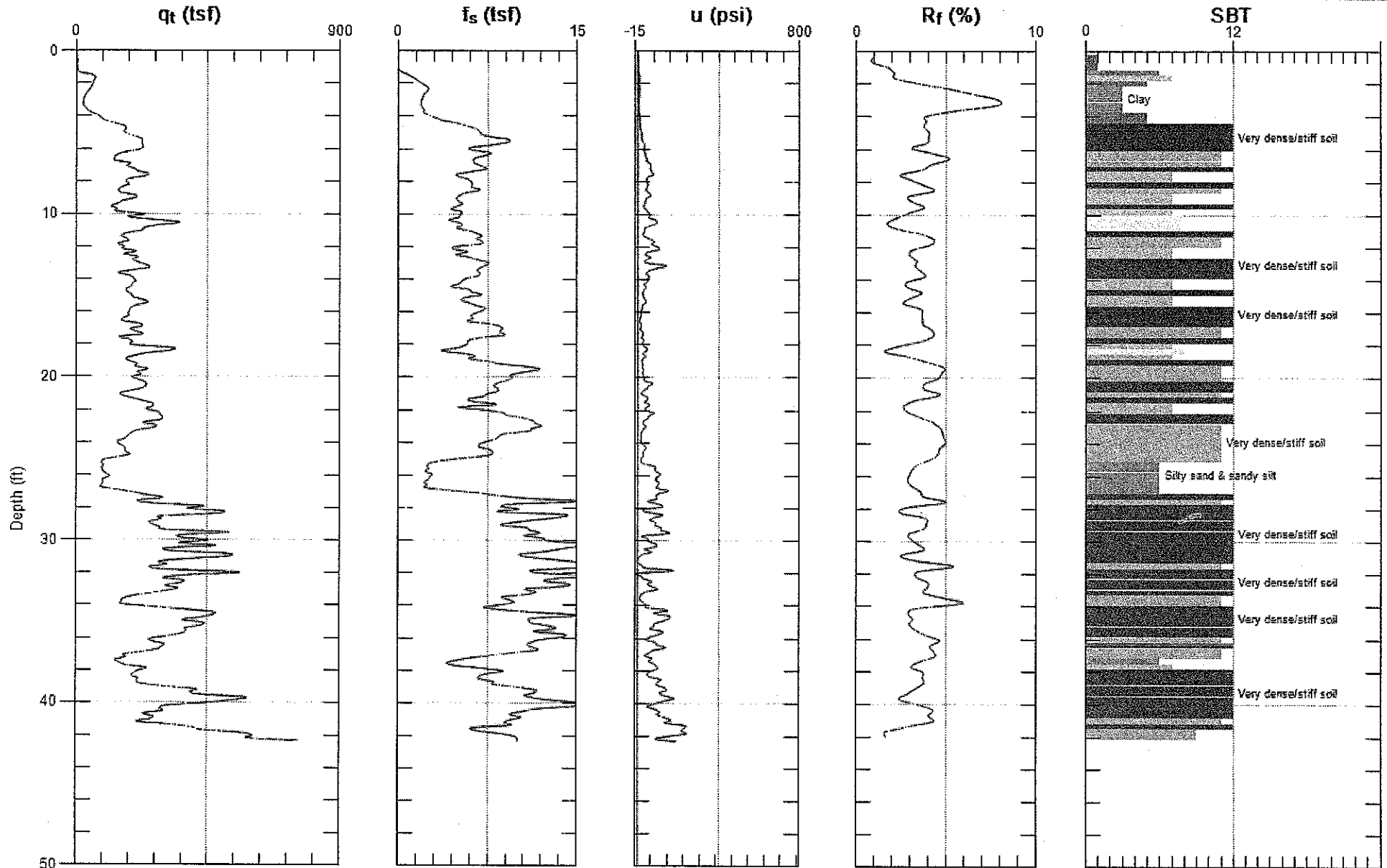
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: CPT-17

Date: 12/21/2006 02:29



Max. Depth: 42.320 (ft)
Avg. Interval: 0.328 (ft)

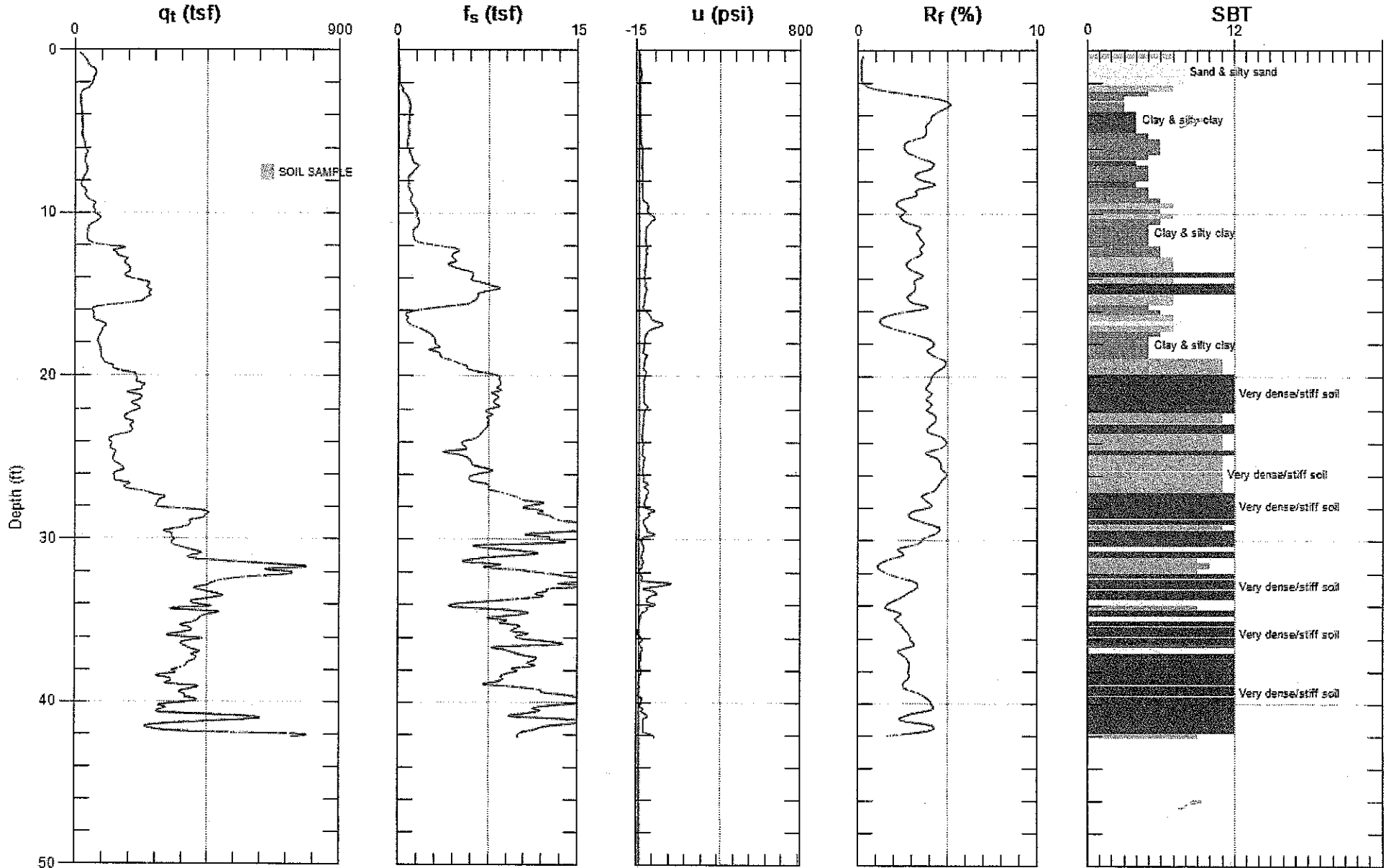
SBT: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-19

Engineer: D.VAN THIEL
Date: 1/3/2007 09:43



Max. Depth: 42.160 (ft)
Avg. Interval: 0.328 (ft)

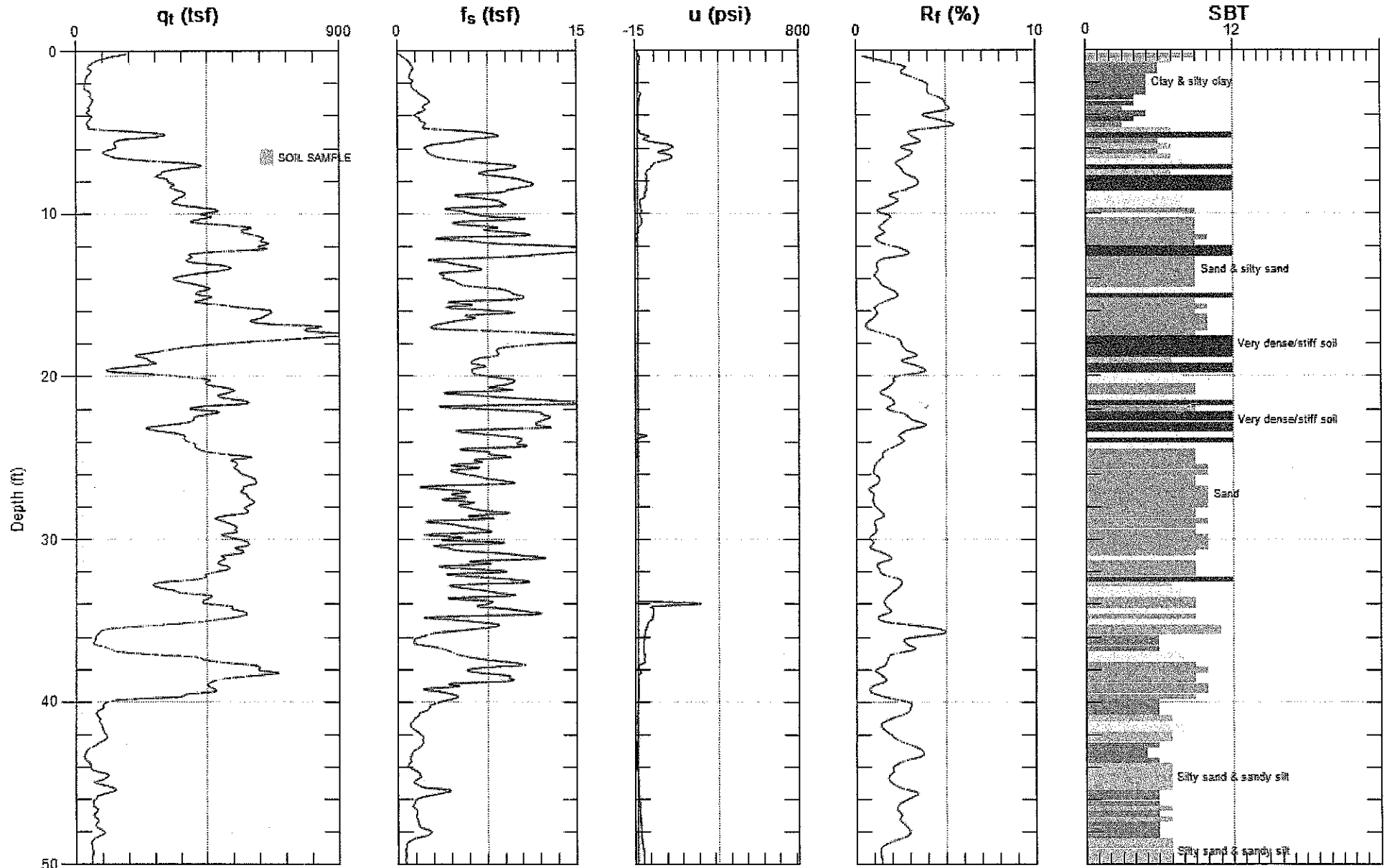
SBT: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-20

Engineer: D.VAN THIEL
Date: 1/3/2007 10:52



Max. Depth: 50.360 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



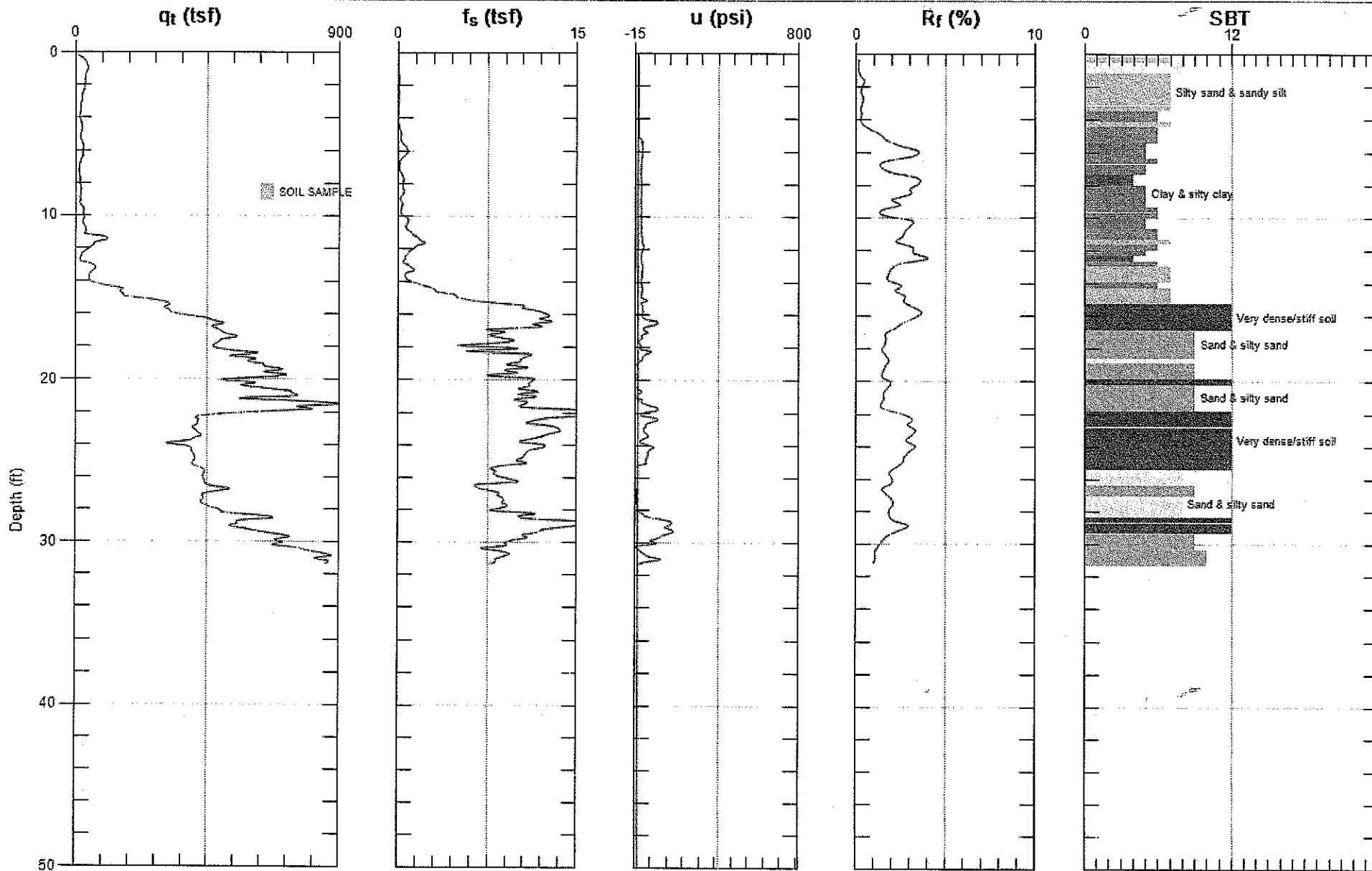
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: SCPT-21

Date: 1/3/2007 01:28



Max. Depth: 31.330 (ft)
Avg. Interval: 0.328 (ft)

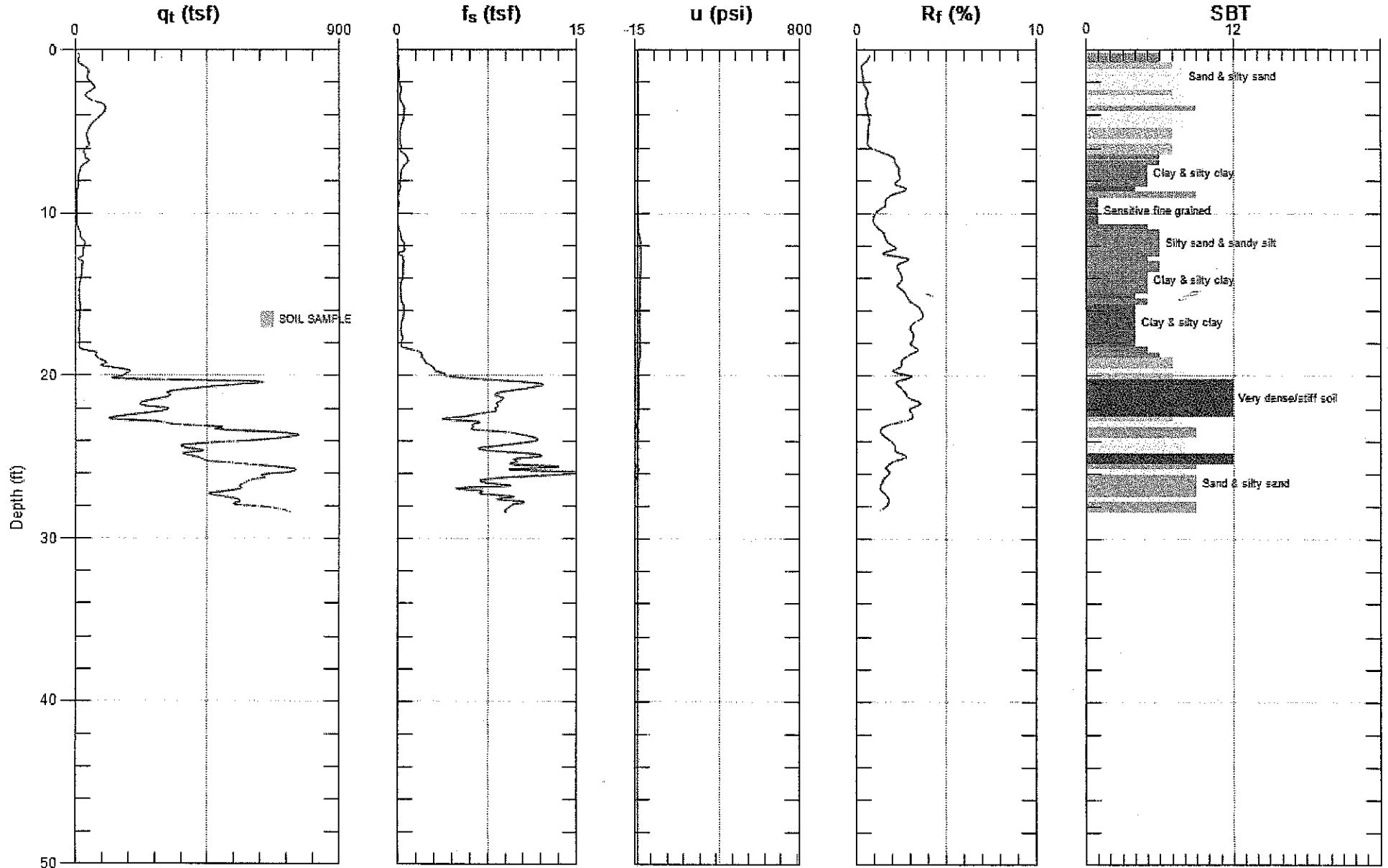
SBT: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-22

Engineer: D.VAN THIEL
Date: 1/3/2007 03:00



Max. Depth: 28.380 (ft)
Avg. Interval: 0.328 (ft)

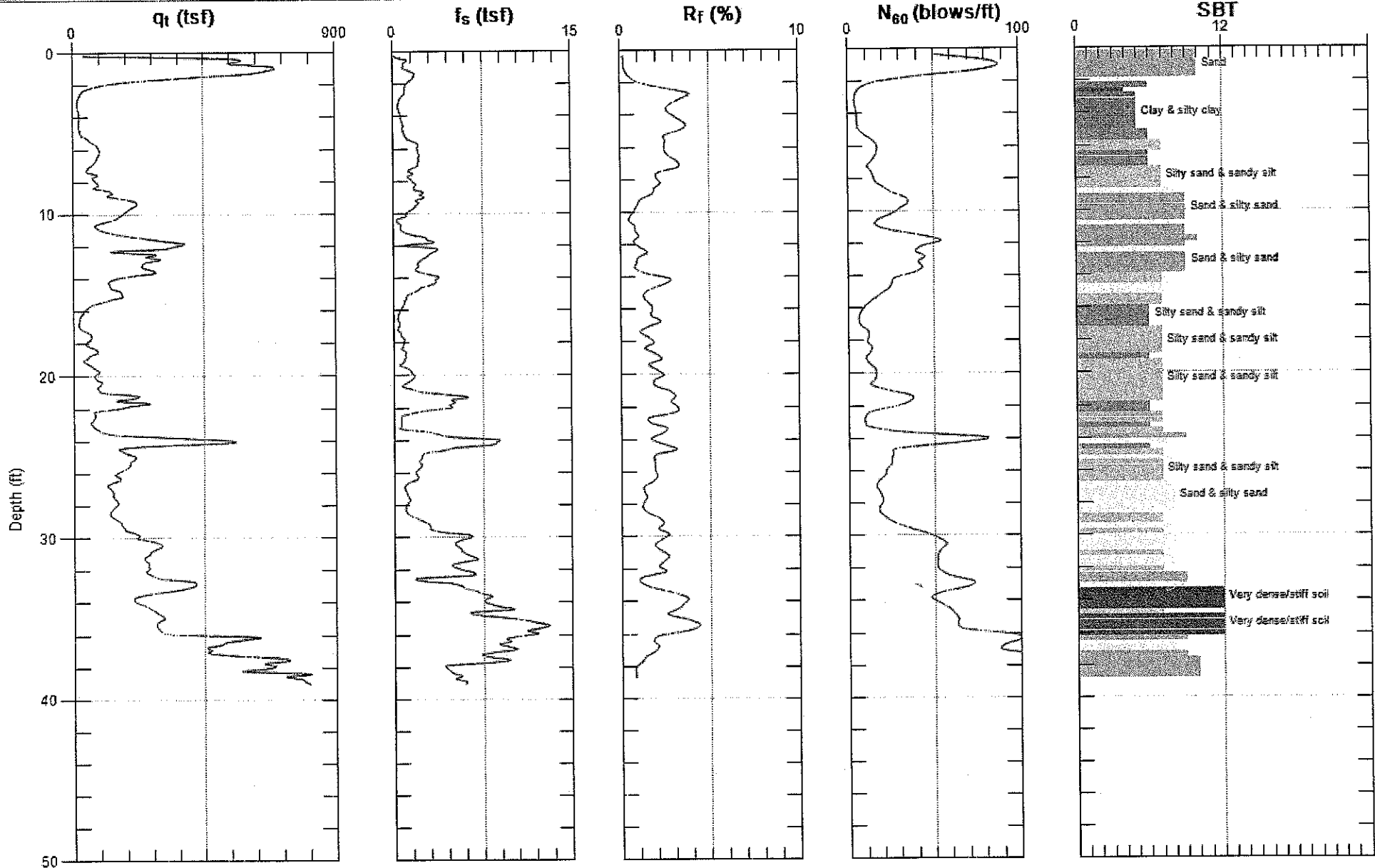
SBT: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-07

Engineer: D.VAN THIEL
Date: 12/21/2006 08:24



Max. Depth: 39.040 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



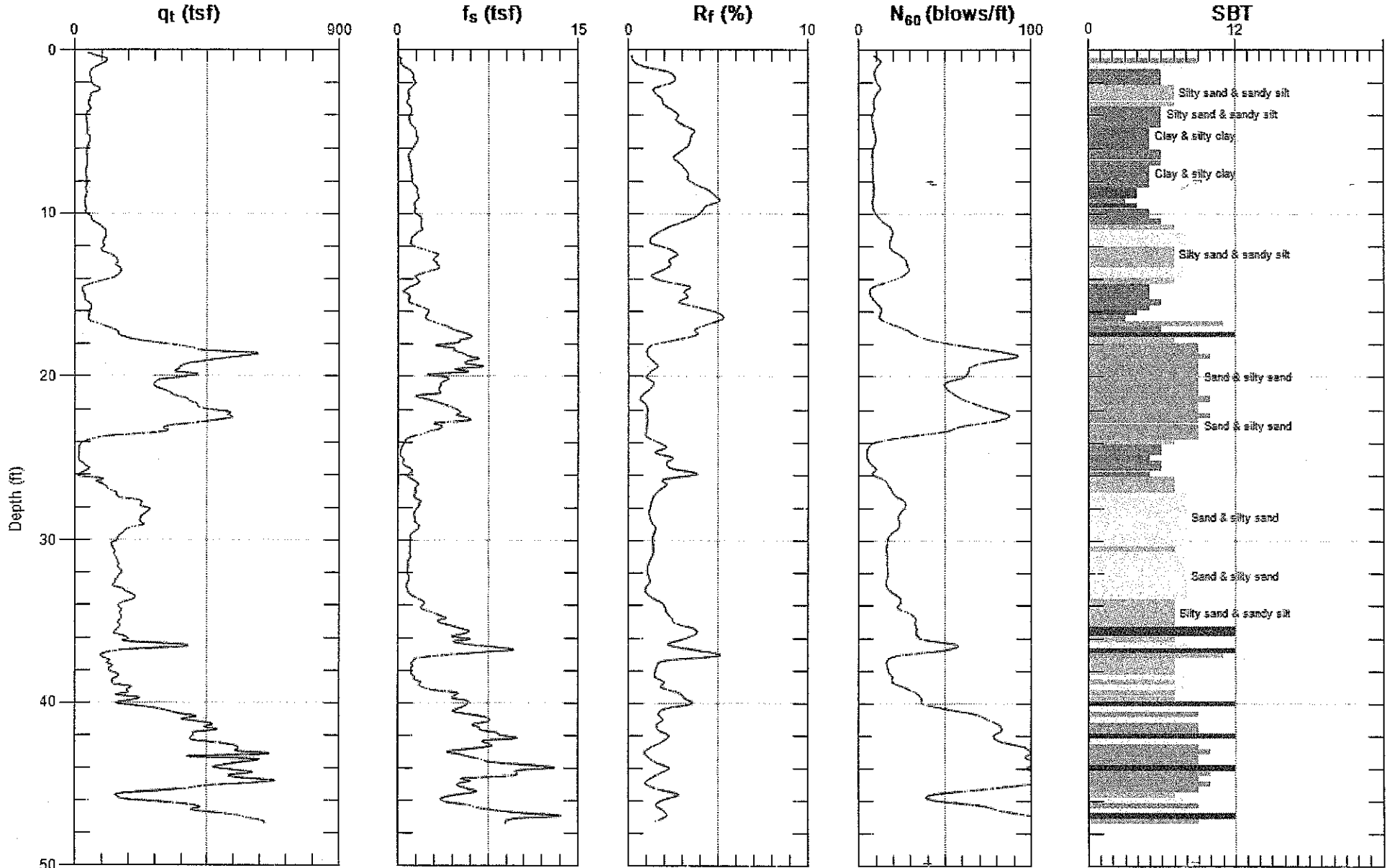
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: SCPT-08

Date: 12/21/2006 09:10



Max. Depth: 47.410 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



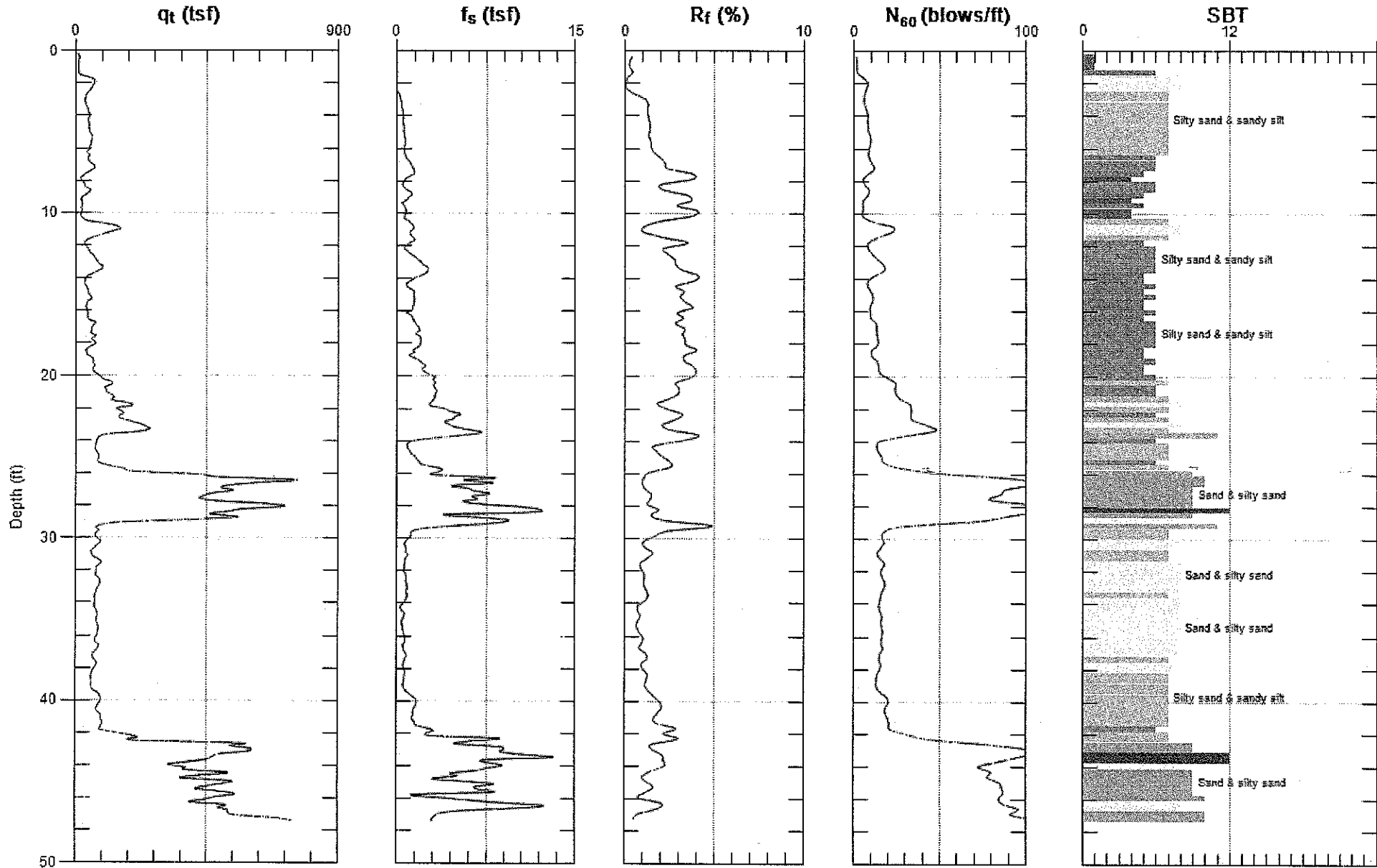
GMU

Site: CHINO

Sounding: CPT-09

Engineer: D.VAN THIEL

Date: 12/21/2006 09:55



Max. Depth: 47.410 (ft)
Avg. Interval: 0.328 (ft)

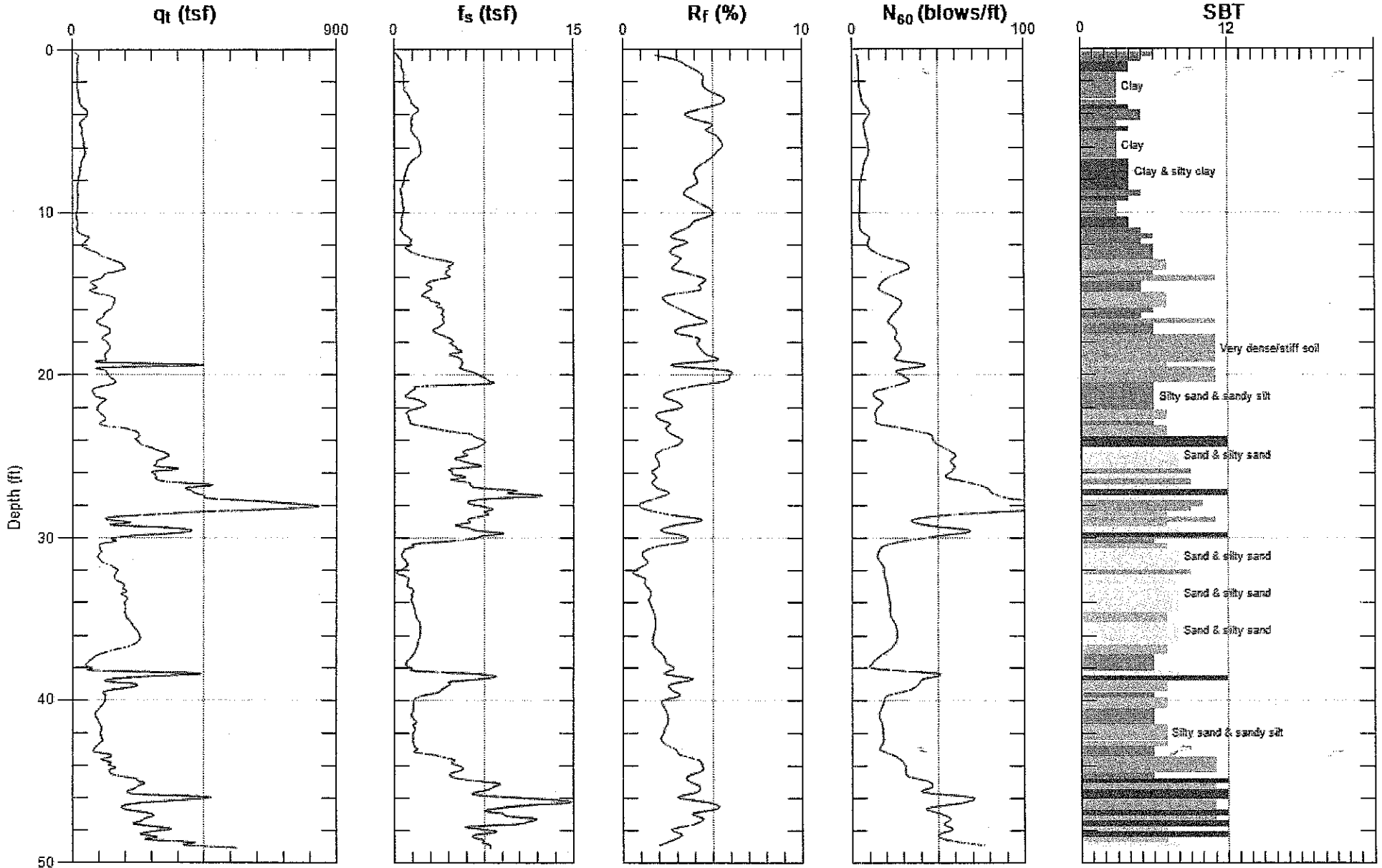
SBT: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-10

Engineer: D.VAN THIEL
Date: 12/21/2006 12:17



Max. Depth: 49.050 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



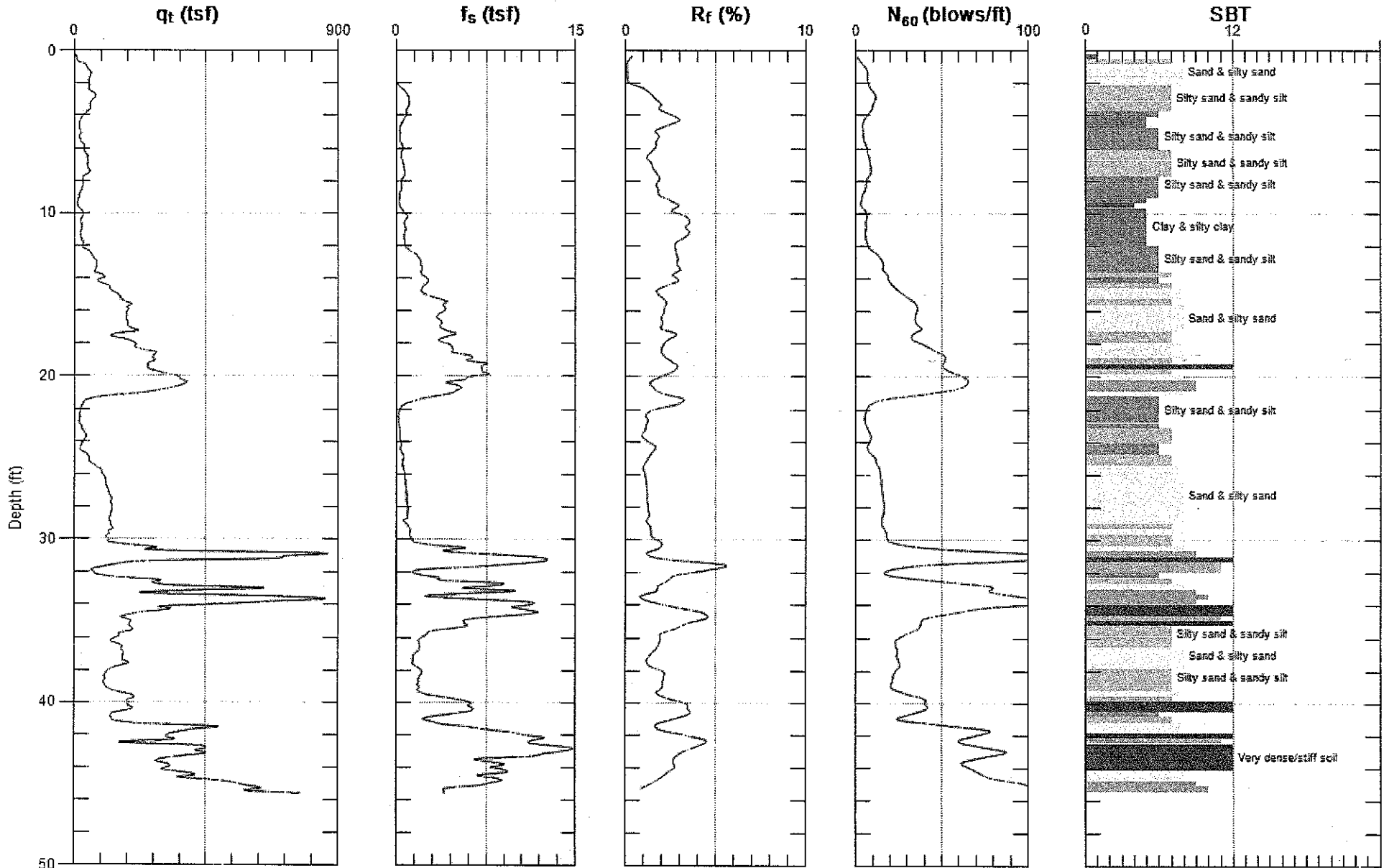
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: CPT-11

Date: 12/21/2006 11:12



Max. Depth: 45.600 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



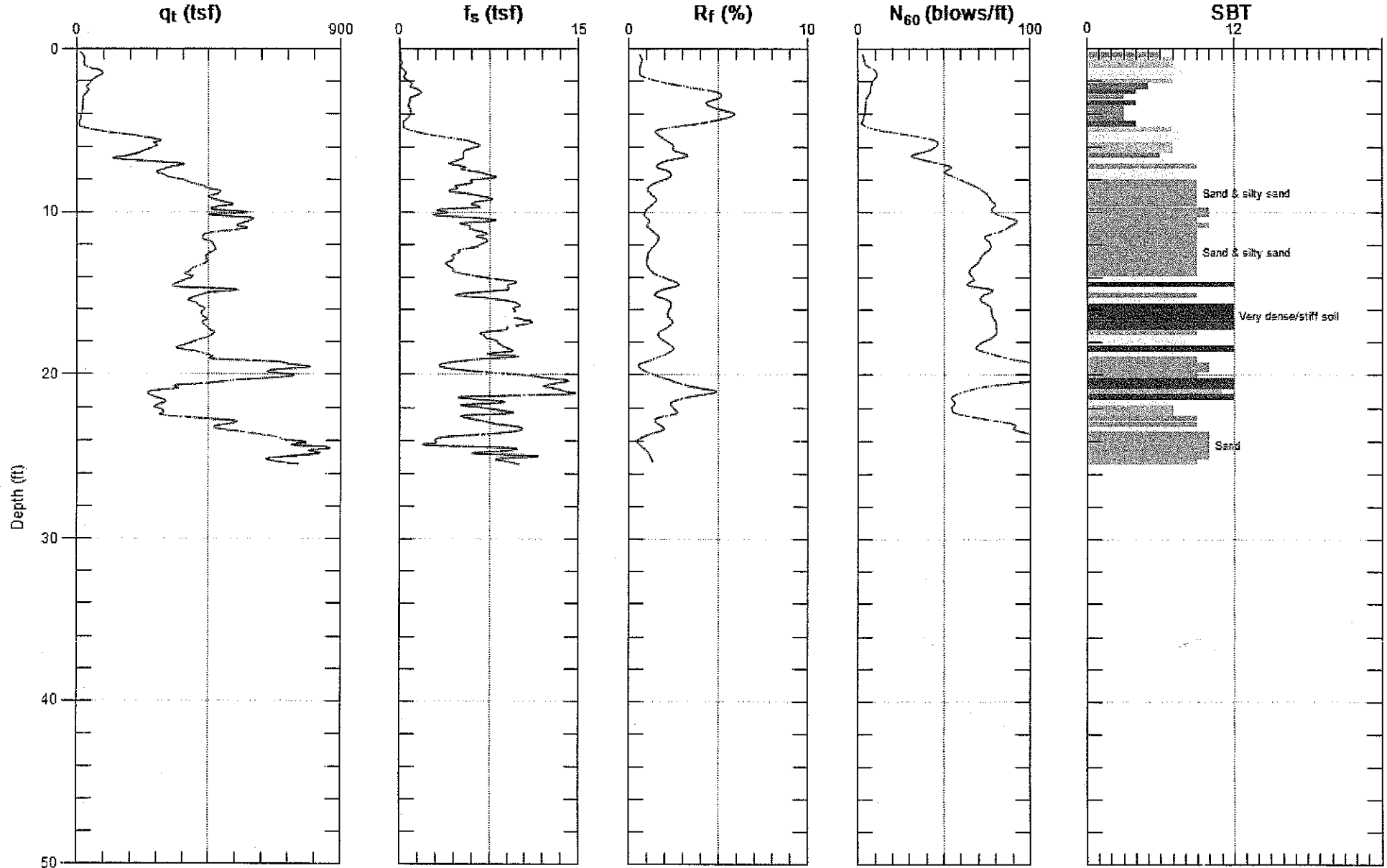
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: SCPT-12

Date: 12/21/2006 12:55



Max. Depth: 25.430 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



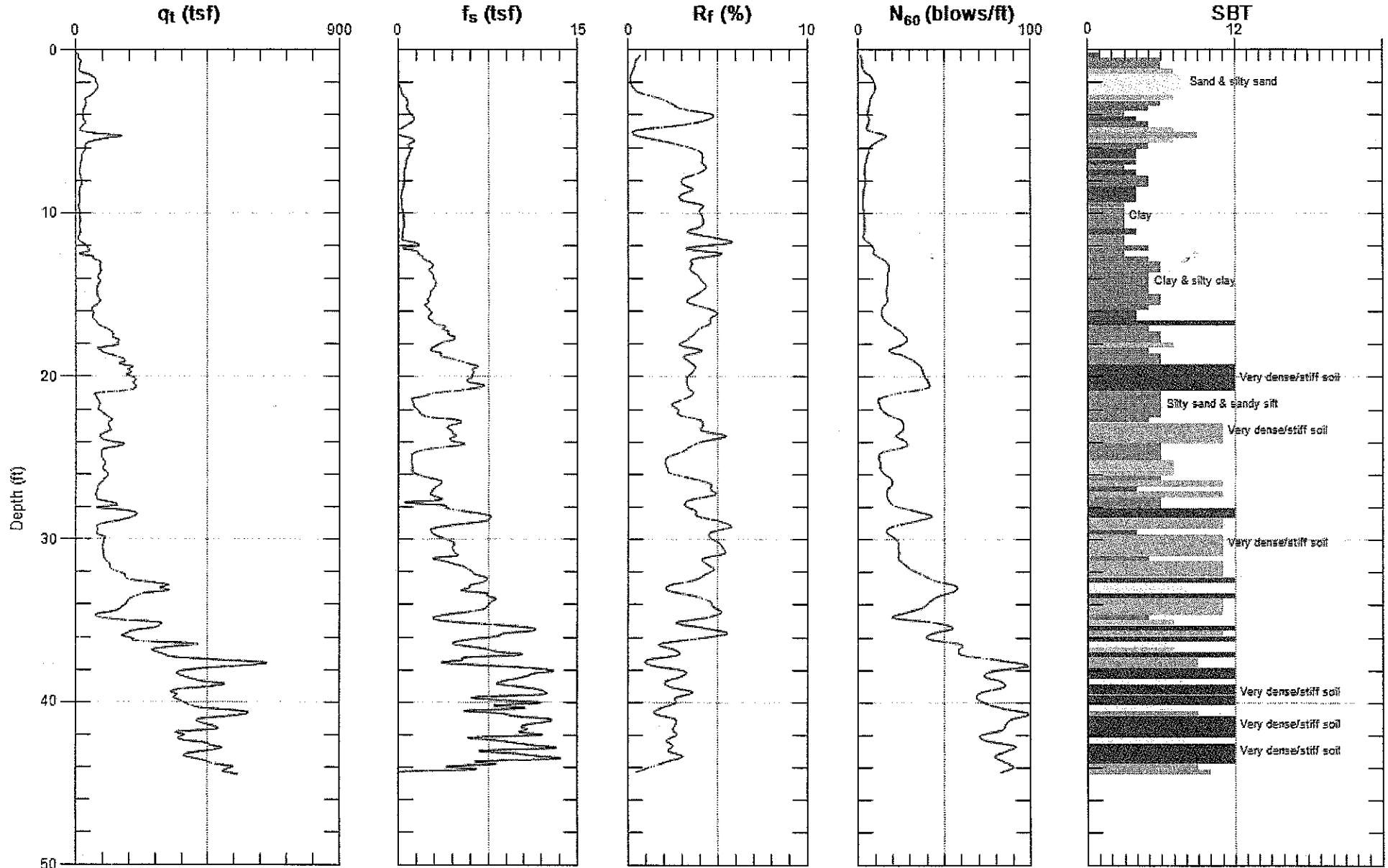
GMU

Site: CHINO

Sounding: CPT-13

Engineer: D.VAN THIEL

Date: 12/21/2006 01:47



Max. Depth: 44.460 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



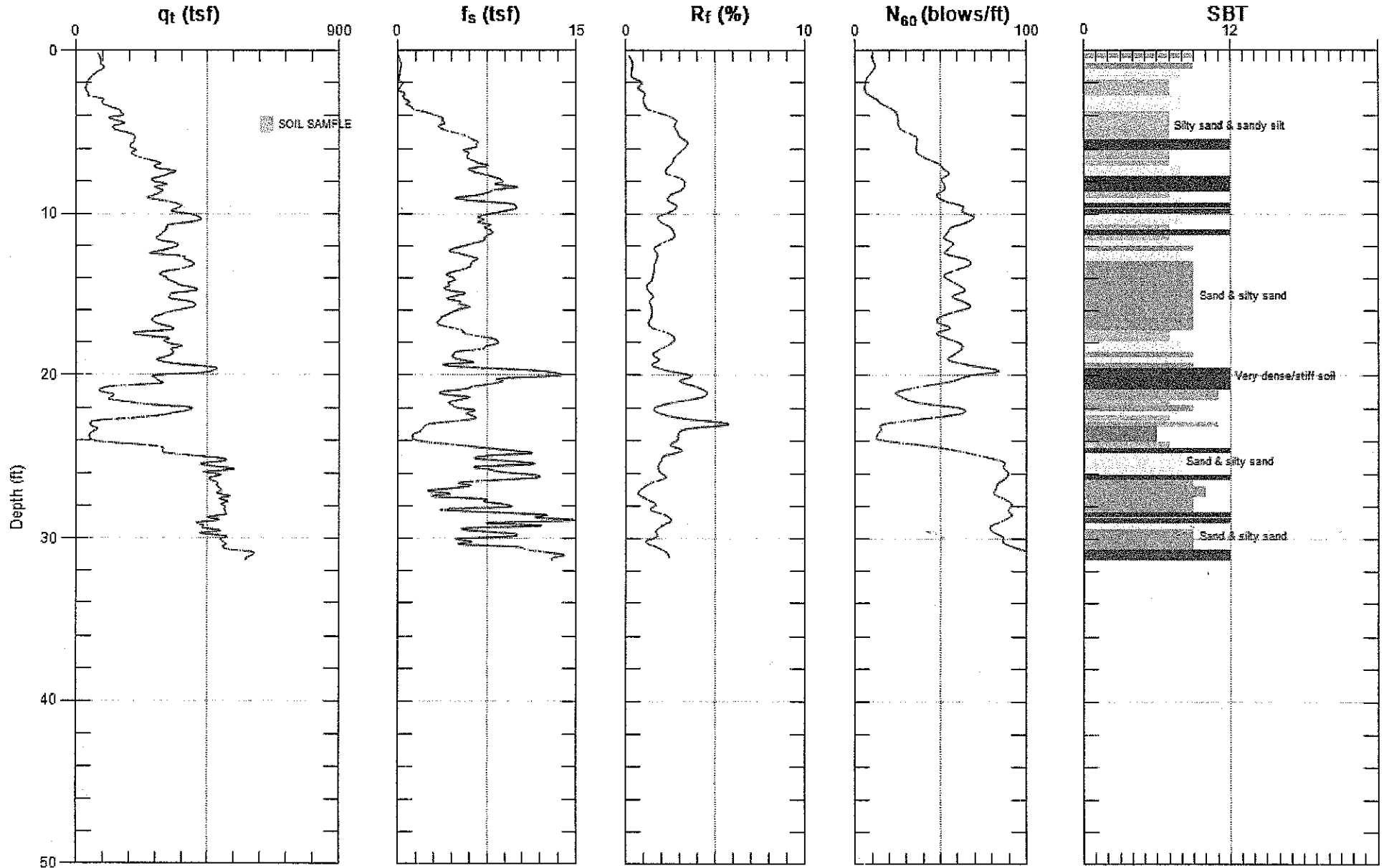
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: CPT-14

Date: 1/3/2007 12:32



Max. Depth: 31.330 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



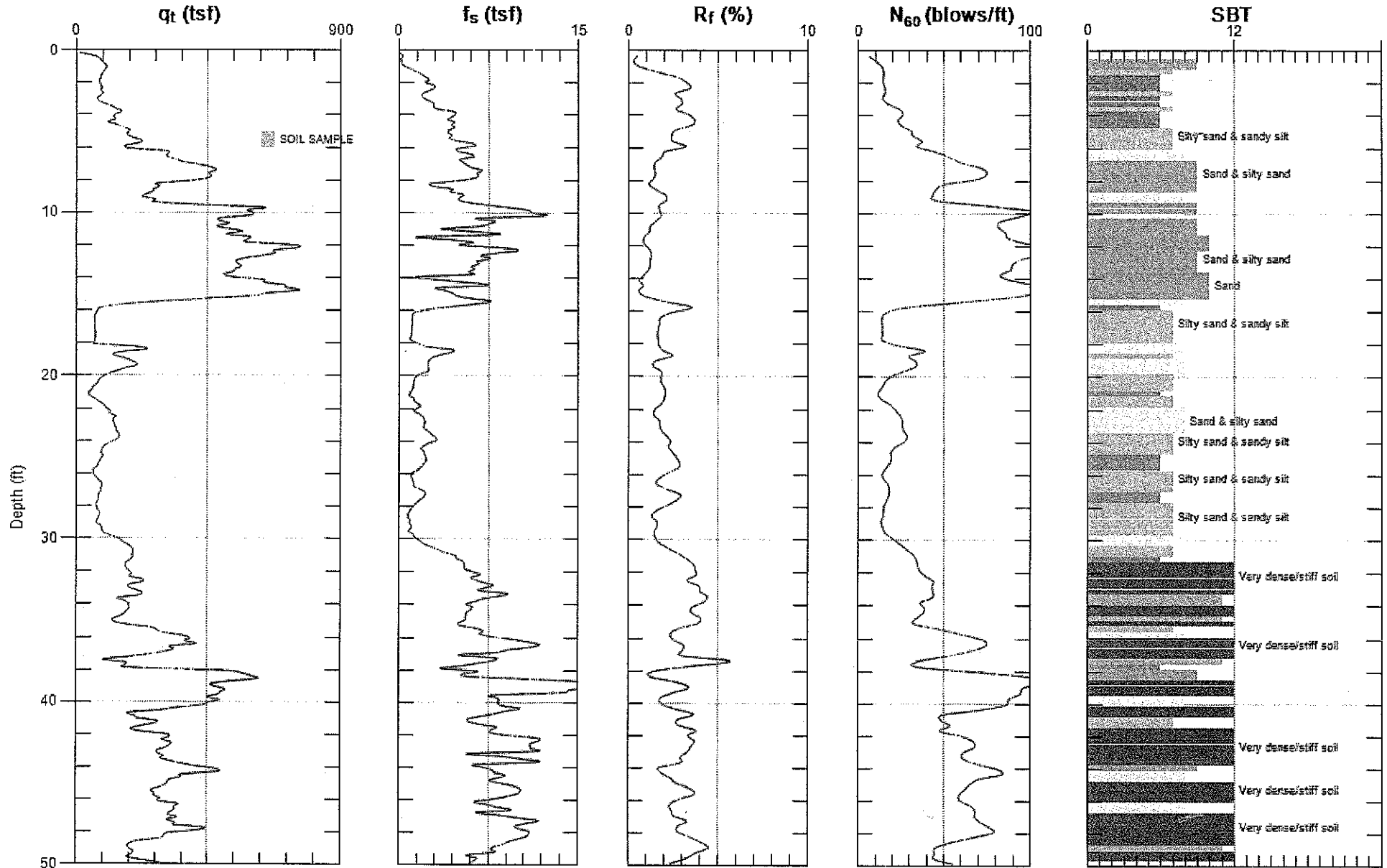
GMU

Site: CHINO

Sounding: CPT-15

Engineer: D.VAN THIEL

Date: 1/3/2007 08:39



Max. Depth: 50.030 (ft)
Avg. Interval: 0.328 (ft)

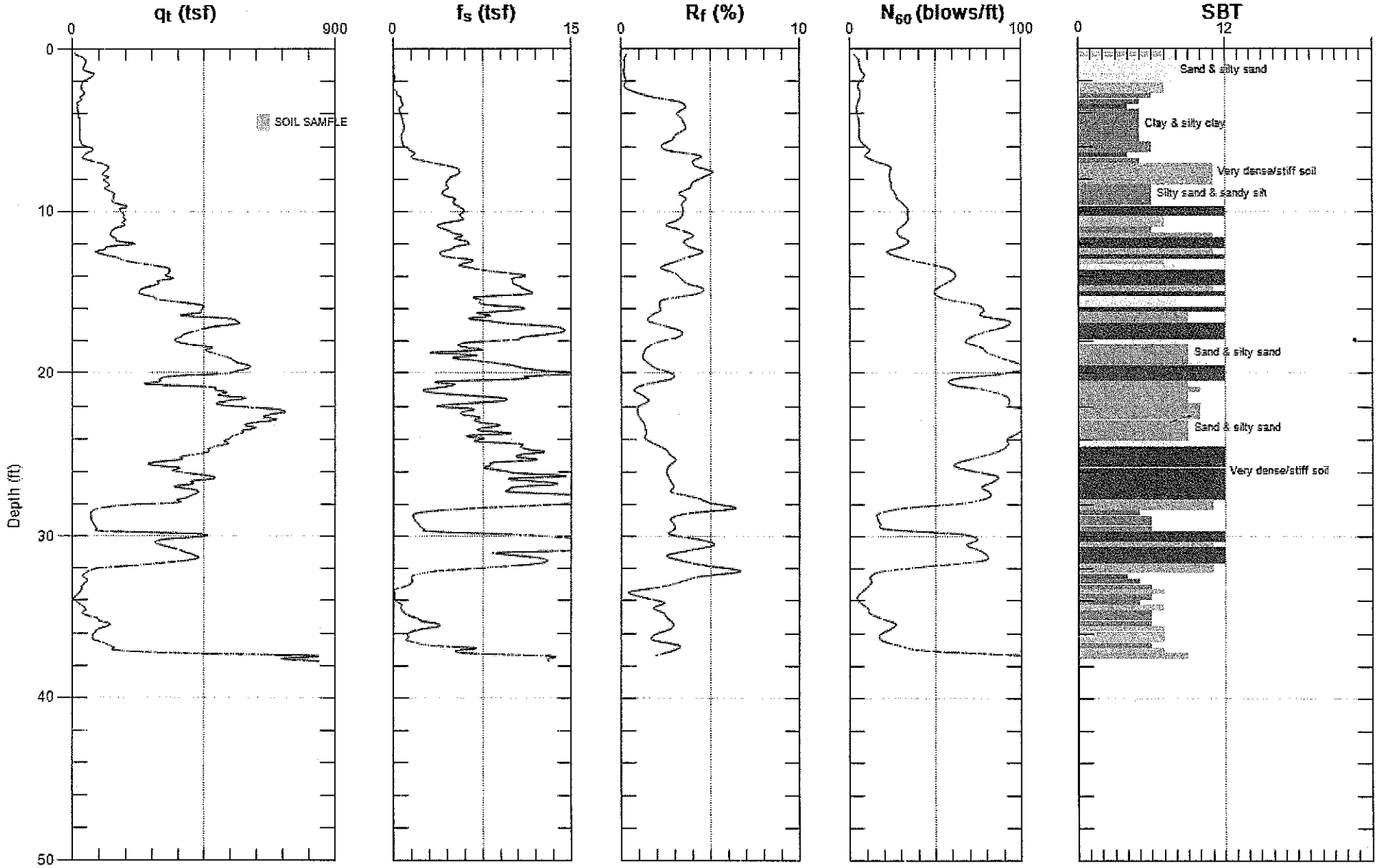
SBT: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-16

Engineer: D.VAN THIEL
Date: 1/3/2007 11:35



Max. Depth: 37.730 (ft)
Avg Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



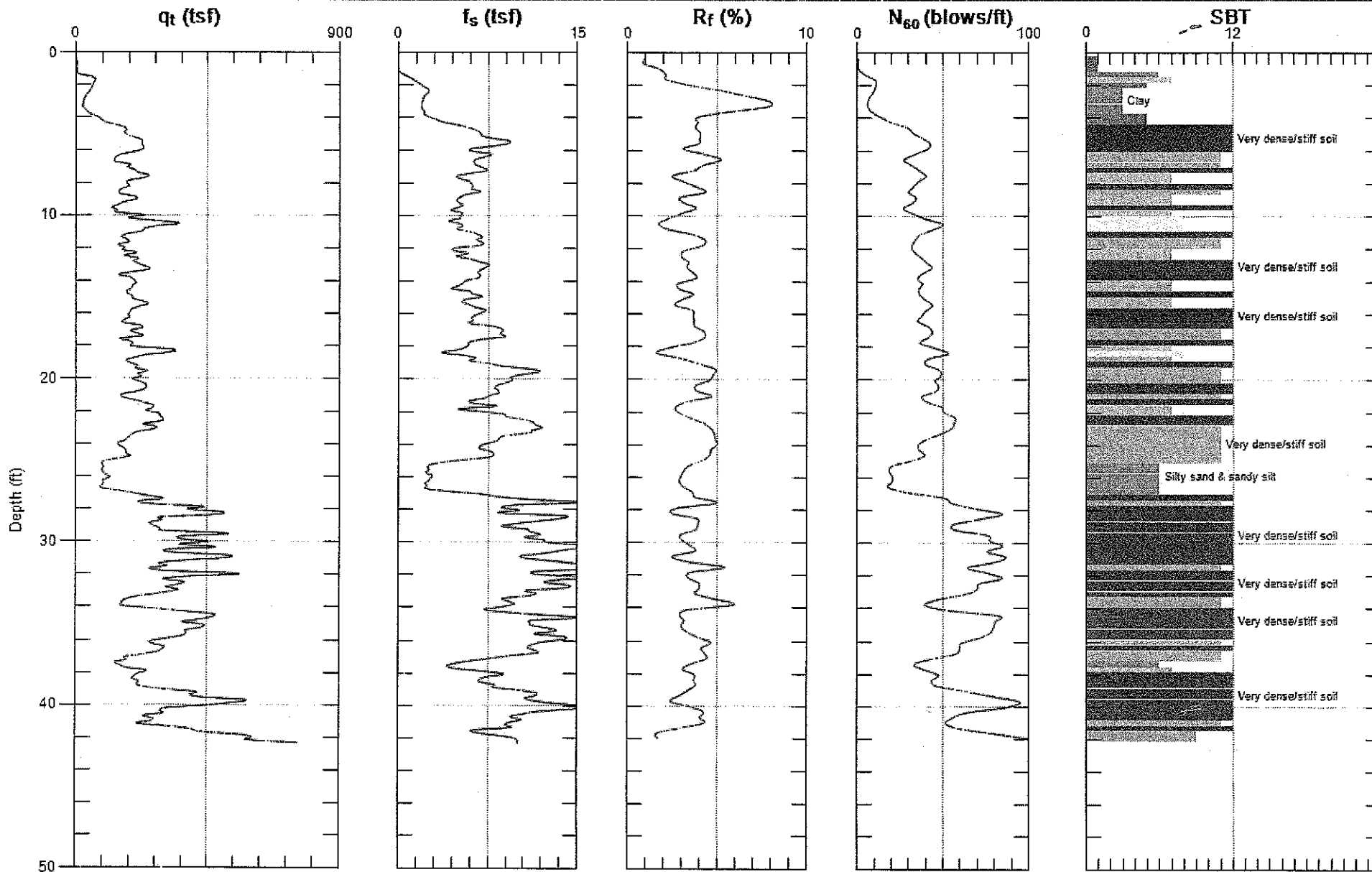
GMU

Site: CHINO

Sounding: CPT-17

Engineer: D.VAN THIEL

Date: 12/21/2006 02:29



Max. Depth: 42.320 (ft)
Avg. Interval: 0.328 (ft)

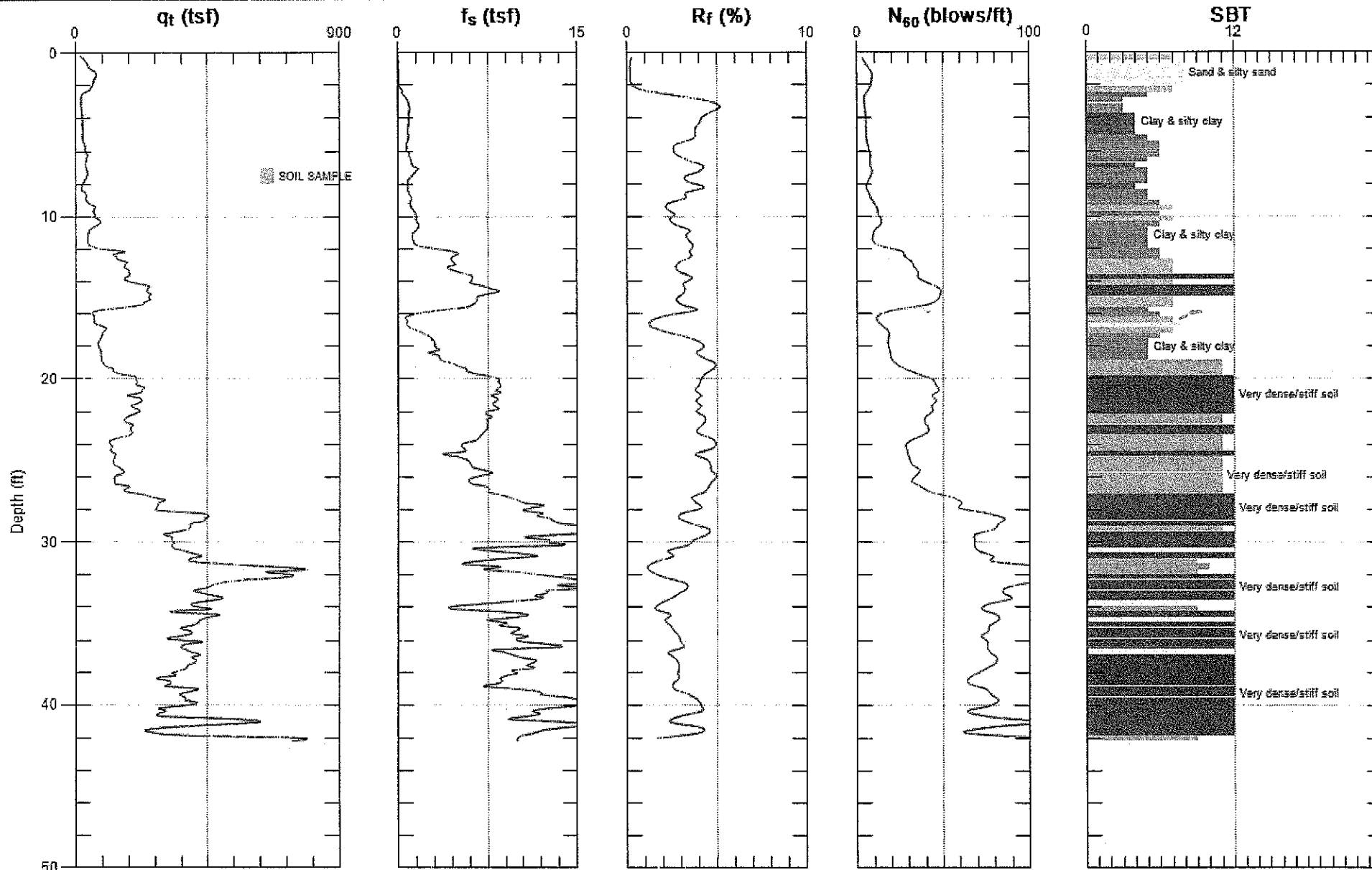
SBT: Soil Behavior Type (Robertson 1990)



GMU

Site: CHINO
Sounding: CPT-19

Engineer: D.VAN THIEL
Date: 1/3/2007 09:43



Max Depth: 42.160 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



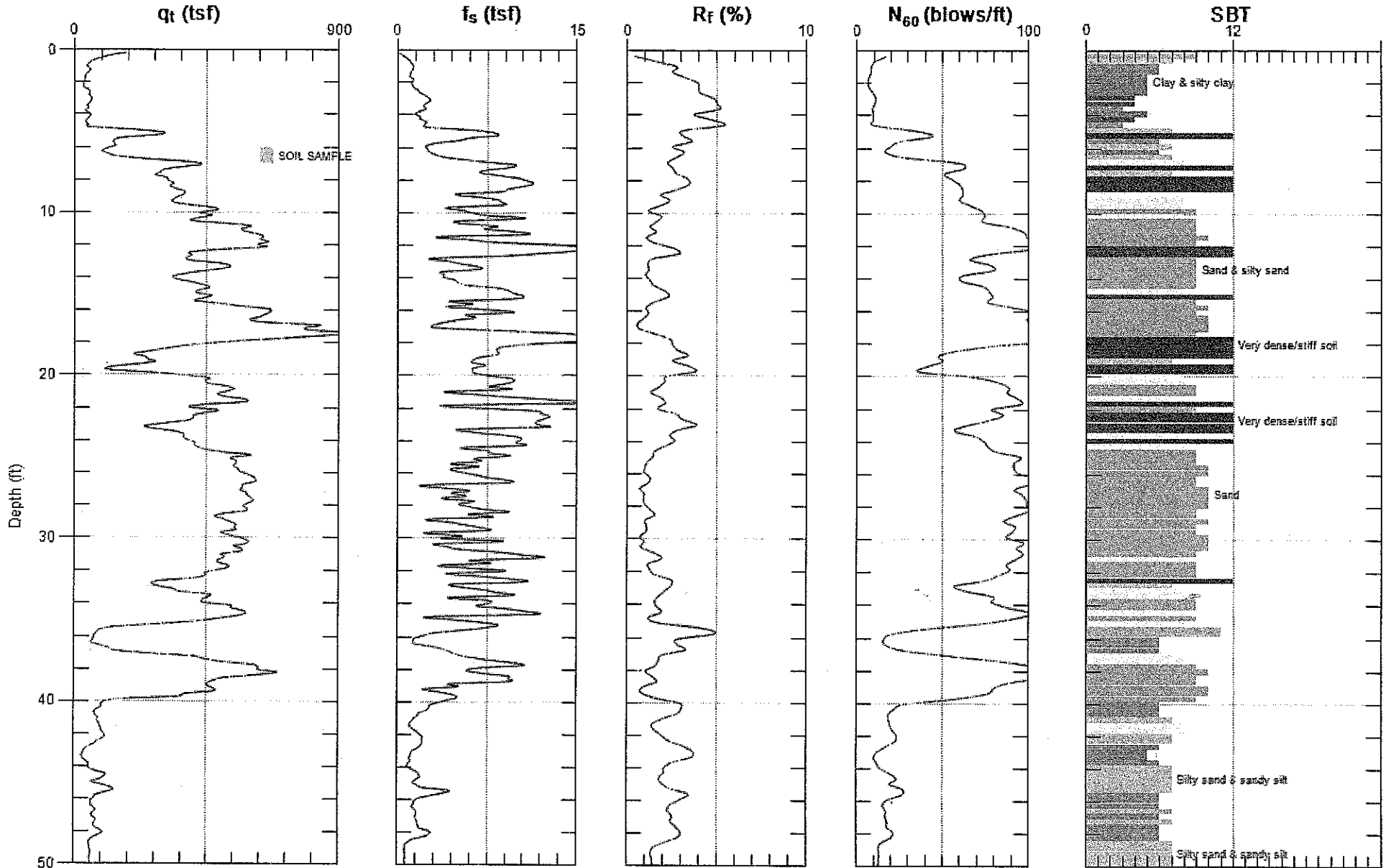
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: CPT-20

Date: 1/3/2007 10:52



Max. Depth: 50.360 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



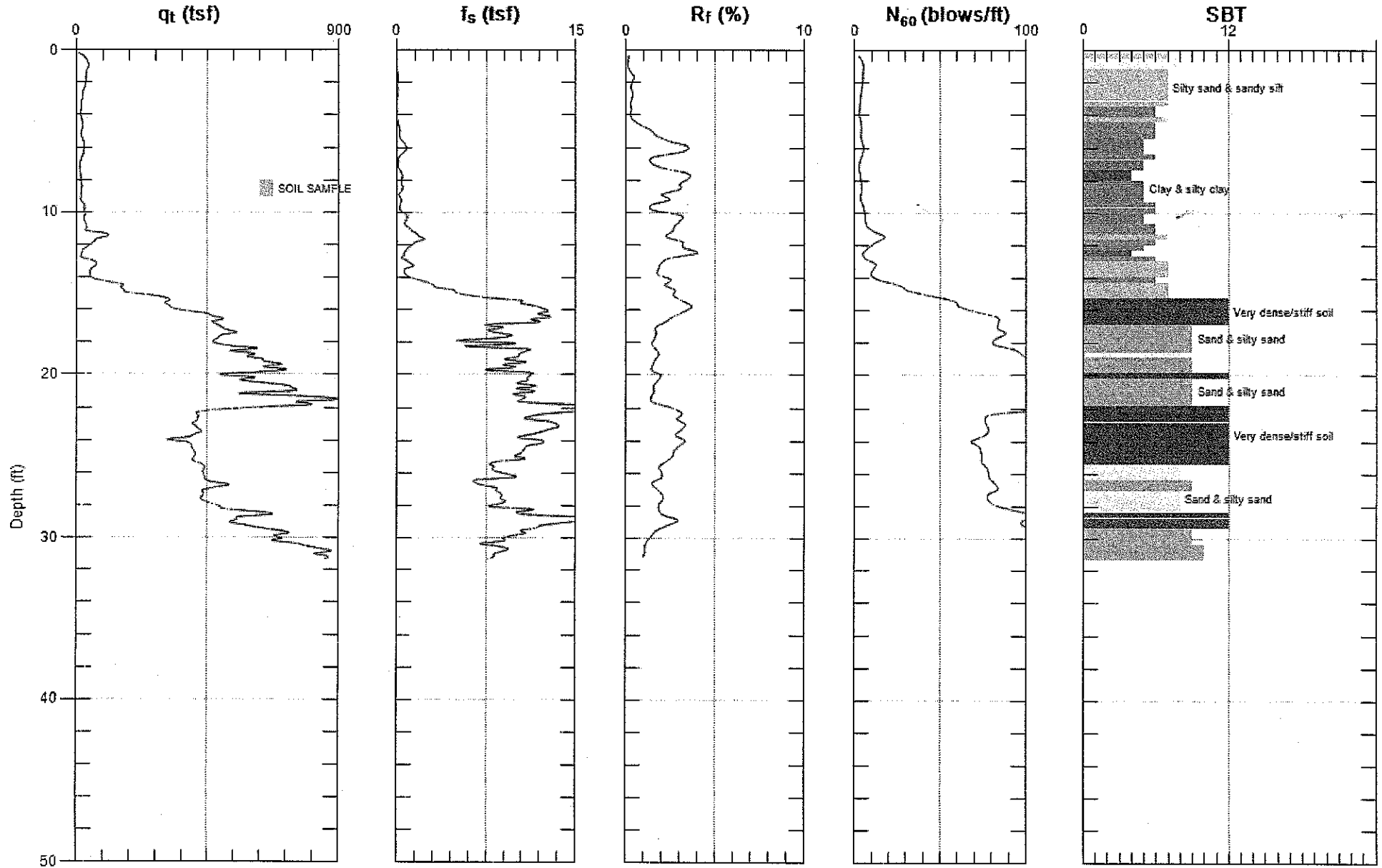
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: SCPT-21

Date: 1/3/2007 01:28



Max. Depth: 31.330 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



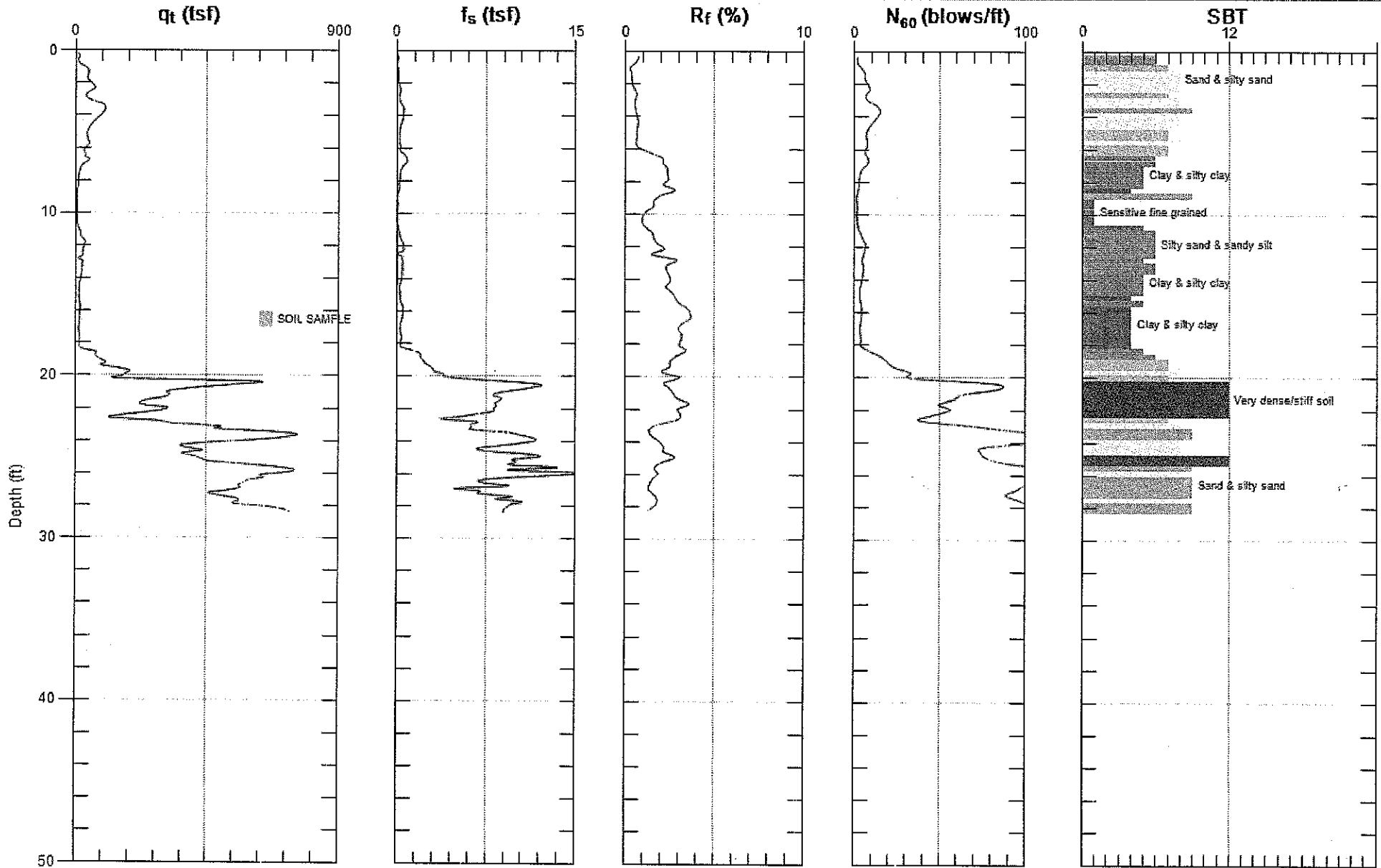
GMU

Site: CHINO

Sounding: CPT-22

Engineer: D.VAN THIEL

Date: 1/3/2007 03:00



Max. Depth: 28.380 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



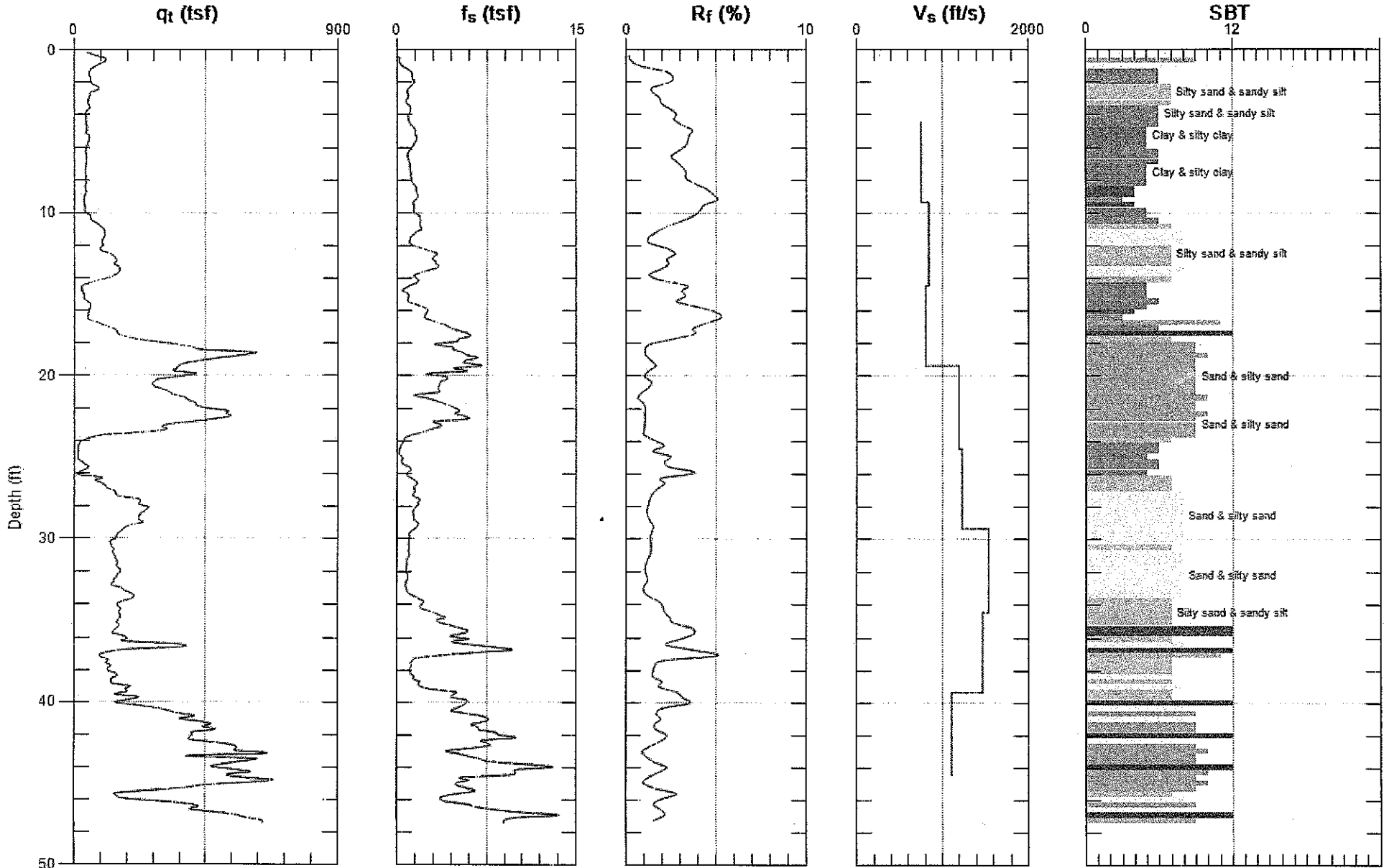
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: SCPT-08

Date: 12/21/2006 09:10



Max. Depth: 47.410 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



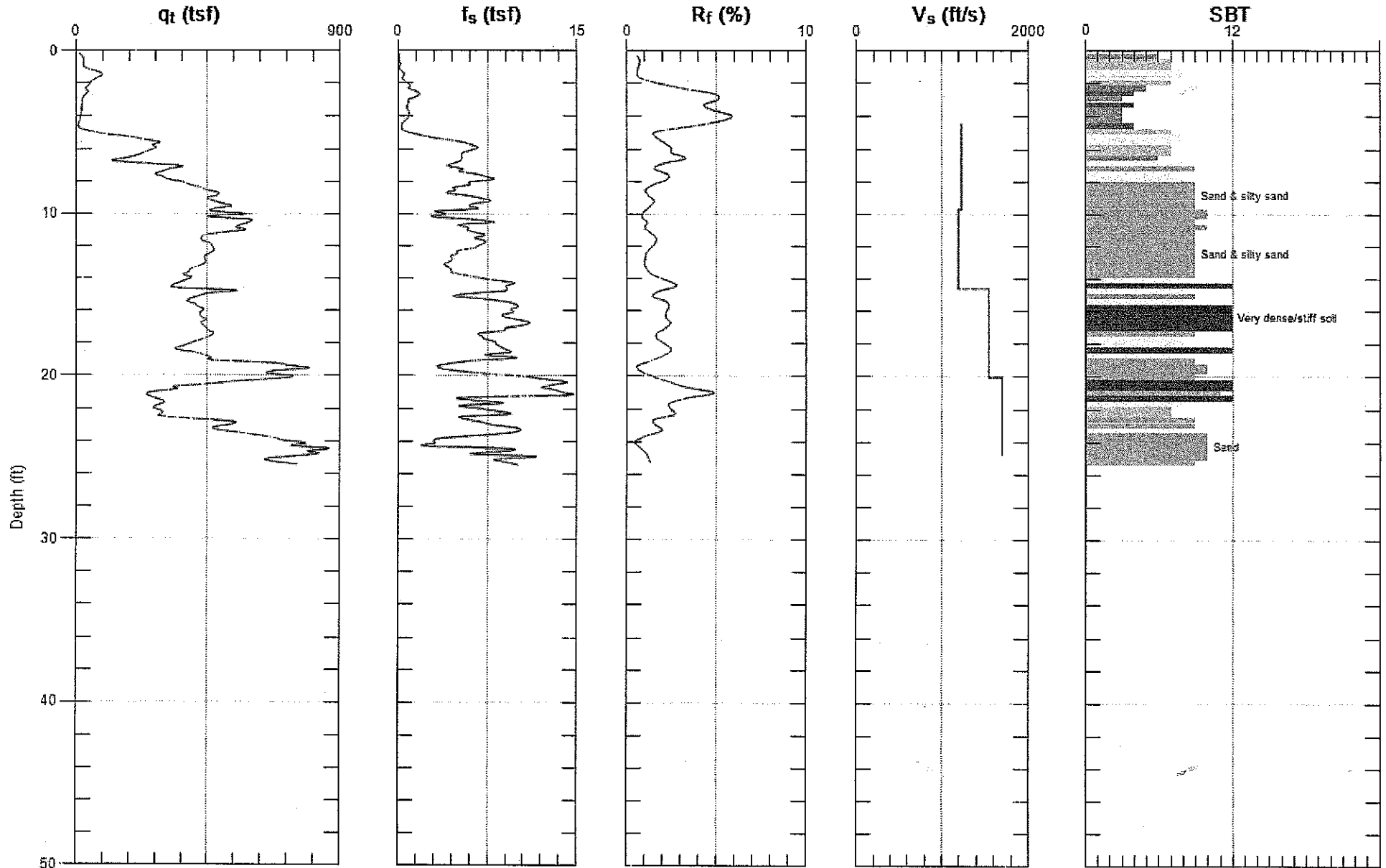
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: SCPT-12

Date: 12/21/2006 12:55



Max. Depth: 25.430 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



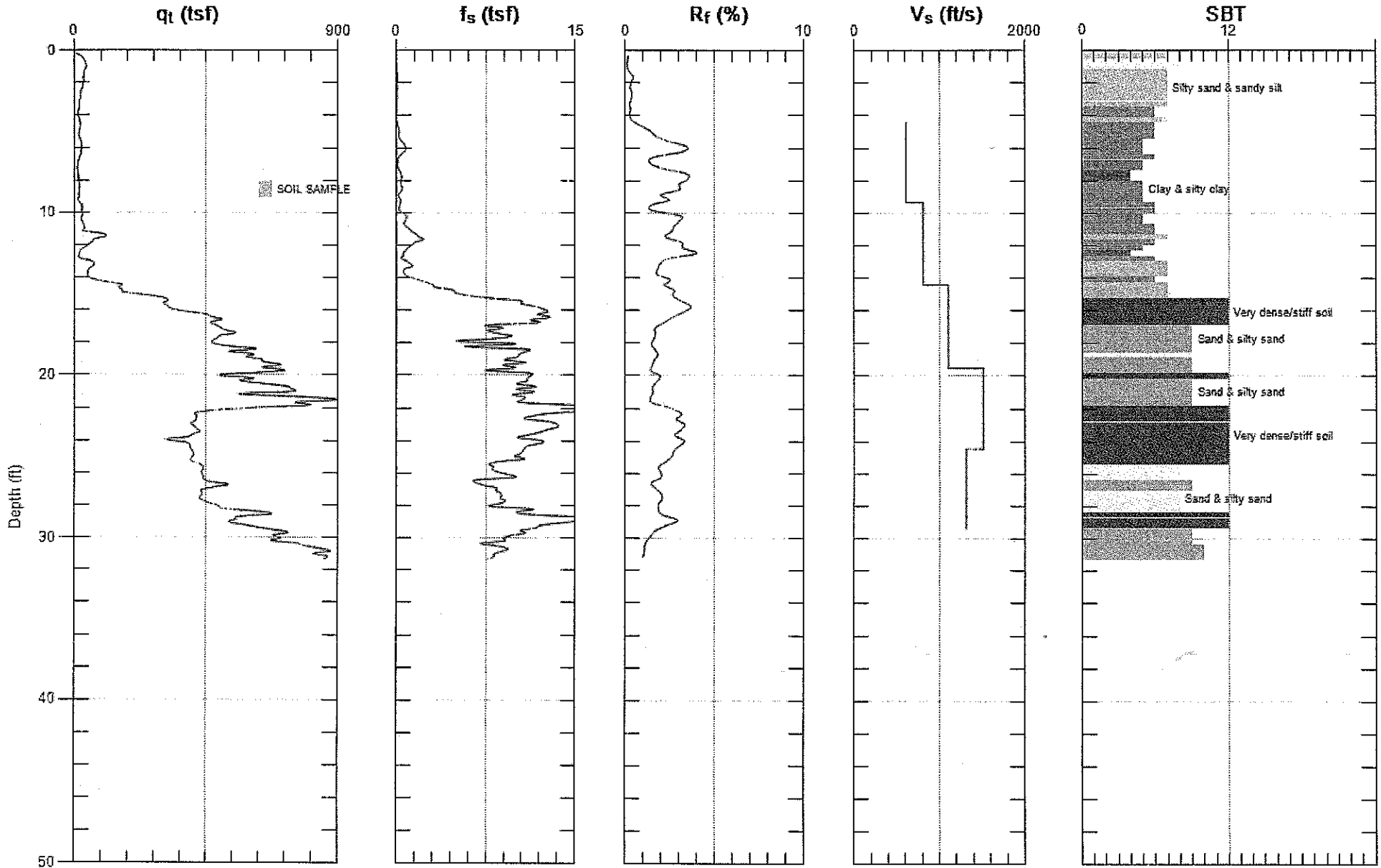
GMU

Site: CHINO

Engineer: D.VAN THIEL

Sounding: SCPT-21

Date: 1/3/2007 01:28



Max. Depth: 31.330 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

APPENDIX B

Laboratory Testing



APPENDIX B

GEOTECHNICAL LABORATORY PROCEDURES AND TEST RESULTS

Moisture and Density. Field moisture content and in-place density were determined for each 6-inch sample sleeve of undisturbed soil material obtained from the drill holes. The field moisture content was determined according to ASTM Test Method D 2216 by obtaining one-half the moisture sample from each end of the 6-inch sleeve. The in-place dry density of the sample was determined by using the wet weight of the entire sample.

At the same time the field moisture content and in-place density were determined, the soil material at each end of the sleeve was classified according to the Unified Soil Classification System. The results of the field moisture content and in-place density determinations are presented on the right-hand column of the Log of Drill Hole and are summarized on Table B-1. The results of the visual classifications were used for general reference.

Particle Size Distribution. As part of the engineering classification of the materials underlying the site, samples were tested to determine the distribution of the particle sizes. The distribution was determined in general accord with ASTM Test Method D 422 using U.S. Standard Sieve Openings 3", 1.5", $\frac{3}{4}$ ", $\frac{3}{8}$ ", and U.S. Standard Sieve Nos 4, 10, 20, 40, 60, 100, and 200. In addition, on some samples, a standard hydrometer test was also performed to determine the distribution of particle sizes passing the No. 200 sieve (i.e., silt and clay-size particles). The results

of the tests are contained on Plates B-1.1 through B-1.4 -- Particle Size Distribution. Key distribution categories (% gravel; % sand, etc) are contained on Table B-1.

Atterberg Limits. As part of the engineering classification of the soil underlying the site, samples of the on-site soil materials were tested to determine relative plasticity. This relative plasticity is based on the Atterberg limits using ASTM Test Method D 4318. The results of this test are contained on Plate B-2 -- Atterberg Limits and also Table B-1.

Expansion Tests. To provide a standard definition of one-dimensional expansion, a test was performed on typical on-site materials according to ASTM Test Method D 4829. The results from this test procedure is reported as an "expansion index " The results are summarized on Plate B-3 -- Expansion Index and Chemical Test Results.

Chemical Tests. The corrosion potential of typical on-site materials under long-term contact with both metal and concrete was determined by chemical and electrical resistance tests. The soluble sulfate test for potential concrete corrosion was performed in accordance with California Test Method 417, the minimum resistivity tests for potential metal corrosion were performed in accordance with California Test Method 643, and the concentration of soluble chlorides was determined by California Test Method 422. The results are summarized on Plate B-3 -- Expansion Index and Chemical Test Results.

Compaction Tests. A bulk sample representative of the underlying on-site materials was tested to determine the maximum dry density and optimum moisture content of the soil. These

March 16, 2007

Project 04-15-03 (Edgewater, Chino)

 CMU Page B-3

compactive characteristics were determined in general accordance with ASTM Test Method D 1557. The results of this test are contained on Plates B-4.1 through B-4.3 – Compaction Test Data and also on Table B-1

Consolidation Tests. The one-dimensional consolidation properties of “undisturbed” samples were evaluated according to the provisions of ASTM Test Method D 2435. Sample diameter was 2.625 inches and sample height was 1.00 inch. Water was added during the test at various normal loads to evaluate the potential for hydro-collapse and to produce saturation during the remainder of the testing. Consolidation readings were taken regularly during each load increment until the change in sample height was less than approximately 0.0001 inch over a two-hour period. The graphic presentation of consolidation data is a representation of volume change in change in axial load. As a result, both expansion and consolidation are illustrated. The results of the consolidation load tests are summarized on Plates B-5.1 through B-5.12 -- Consolidation Test Data

R-value Tests. The resistance value (R-value) of typical on-site soil materials was determined for preliminary use on pavement section design. The results are summarized on Plates B-6.1 through B-6.4 – R-Value Test Results.

Direct Shear Strength Tests. Direct shear tests were performed on typical on-site materials. The general philosophy and procedure of the tests were in accord with ASTM Test Method D 3080 - “Direct Shear Tests for Soils Under Consolidated Drained Conditions”

March 16, 2007

Project 04-15-03 (Edgewater, Chino)

 GMU Page B-4

The tests are single shear tests and are performed using a sample diameter of 2.625 inches and a height of 1.00 inch. The normal load is applied by a vertical dead load system. A constant rate of strain is applied to the upper one-half of the sample until failure occurs. Shear stress is monitored by a strain gauge-type precision load cell and deflection is measured with a digital dial indicator. This data is transferred electronically to data acquisition software which plots shear strength vs. deflection. The shear strength plots are then interpreted to determine peak and ultimate shear strengths. Ultimate strengths were assumed to have been reached at approximately 12% strain unless the test results indicate that the ultimate strength had been reached at a lesser amount of strain. A strain rate compatible with the grain size distribution of the soils was utilized. Moisture contents shown on the Shear Test Data plots indicate dry densities and water contents of the samples prior to shearing. The interpreted results of the direct shear tests are shown on Plates B-7.1 through B-7.9 -- Shear Test Data

Organic Content. To provide a standard definition of organic content, a test was performed on typical on-site materials according to ASTM Test Method D 2974. The results from this test procedure is reported as an "organic content." The results are summarized on Plate B-8 -- Organic Content.

**TABLE B-1
SUMMARY OF SOIL LABORATORY DATA**

Sample Information			Geologic Unit	USCS Group Symbol	In Situ Water Content, %	In Situ Dry Unit Weight, pcf	In Situ Saturation, %	Sieve/Hydrometer				Atterberg Limits			Laboratory Compaction			Other Laboratory Tests
Boring Number	Depth, feet	Elevation, feet						Gravel, %	Sand, %	<#200, %	<2µ, %	LL	PL	PI	Maximum Dry Unit Weight, pcf	Optimum Water Content, %	Compaction Test Method	
DH-1	0	562.0	Qafu	SC	17.5							32	21	11	117.0	14.0	1557B	AL, CP, EI, RV, FC
DH-1	5	557.0	Qof	SM	17.7	101	74											DS
DH-1	10	552.0	Qof	SM				0	68	32	8							SV,HD
DH-1	15	547.0	Qof	SM	22.3	108	110											CS
DH-1	25	537.0	Qof	SM	16.4	107	80											CS
DH-1	35	527.0	Qof	SP	18.0	110	94	0	83	17	8	NP	NP	NP				SV,HD,AL
DH-1	45	517.0	Qof	SP	19.9	106	93											
DH-1	55	507.0	Qof	SP	21.4	105	99											
DH-2	0	559.0	Qafu	SC	13.0							31	21	10	119.0	13.0	1557A	AL, CP, DS(R), RV
DH-2	5	554.0	Qof	SP	11.3	123	87											
DH-2	10	549.0	Qof	SM				0	62	38	11							SV, AL
DH-2	15	544.0	Qof	SM	38.7	82	102											CN
DH-2	35	524.0	Qof	SM	24.1	102	102											CN
DH-2	45	514.0	Qof	SM	20.7	109	106											
DH-2	55	504.0	Qof	SP	15.1	114	89											
DH-3	5	557.0	Qafu	SM	20.8	105	96											CN
DH-3	15	547.0	Qof	SP	26.0	101	107											DS(R)
DH-3	25	537.0	Qof	SP	15.1	117	95	0	85	15	4							SV, HY
DH-3	35	527.0	Qof	SP	32.8	90	103											
DH-3	45	517.0	Qof	SP	26.4	98	101											
DH-3	55	507.0	Qof	GP	19.7	111	105											
DH-4	5	547.0	Qof	SC	14.0	119	95											CN
DH-4	10	542.0	Qof	SM														SV, HY
DH-4	15	537.0	Qof	SM	37.5	85	106											
DH-4	25	527.0	Qof	SP	15.3	112	86	0	52	48	13							

GMU_TABLE_SOIL_LAB_DATA_OLD_04-15-00.GPJ_FNC AB GWGN01.GDT_03/15/07

Project: EDGEWATER/CHINO PROJECT
Project No 04-15-03



Sheet 1 of 4

**TABLE B-1
SUMMARY OF SOIL LABORATORY DATA**

Sample Information			Geologic Unit	USCS Group Symbol	In Situ Water Content, %	In Situ Dry Unit Weight, pcf	In Situ Saturation, %	Sieve/Hydrometer				Atterberg Limits			Laboratory Compaction			Other Laboratory Tests
Boring Number	Depth, feet	Elevation, feet						Gravel, %	Sand, %	<#200, %	<2µ, %	LL	PL	PI	Maximum Dry Unit Weight, pcf	Optimum Water Content, %	Compaction Test Method	
DH-4	35	517.0	Qof	SP	14.7	116	92										DS	
DH-4	45	507.0	Qof	SP	14.9	118	98											
DH-5	5	531.0	Qafu	SC	15.3	117	98											
DH-5	10	526.0	Qal	SC	13.8							31	20	11			AL	
DH-5	15	521.0	Qal	GP	9.9	126	84										DS	
DH-5	35	501.0	Qal	SC	22.5	106	107	0	40	60	20	36	18	18			SV, HY, AL	
DH-5	45	491.0	Qal	SM	28.9	96	105											
DH-5	55	481.0	Qal	SM	26.5	99	104											
DH-6	0	558.0	Qof	SC	9.0							27	19	8	130.0	9.0	1557B	AL, CP, DS(R), EI RV, FC
DH-6	5	553.0	Qof	SP	4.1	120	29											DS
DH-6	10	548.0	Qof	SP				0	78	22	4							SV, HY
DH-6	15	543.0	Qof	SC	5.9	112	32											CN
DH-6	25	533.0	Qof	SP	7.9	122	58											DS
DH-6	35	523.0	Qof	SP	8.4	113	48											
DH-6	45	513.0	Qof	SP	22.9	103	101											
DH-7	5	540.0	Qof	SP	16.0	113	92											CN
DH-7	10	535.0	Qof	SP				26	44	8	4							SV, HY
DH-7	15	530.0	Qof	SM	24.1	100	98											CN
DH-7	25	520.0	Qof	SP	16.4	116	102	34	53	12	3							SV, HY
DH-7	35	510.0	Qof	SP	20.6	97	78											
DH-7	45	500.0	Qof	SP	18.5	118	123											
DH-8	0	550.0	Qof	SC	12.1							33	18	15	119.5	12.5	1557B	AL, CP, EI RV, FC
DH-8	5	545.0	Qof	SC	18.1	110	96											CN
DH-8	10	540.0	Qof	SC				16	66	17	8							SV, HY
DH-8	15	535.0	Qof	SP	10.1	129	95											DS

GMU_TABLE_SOIL_LAB_DATA_OLD_04-15-03.GPJ FNC AB GWGN01.GDT 03/15/07

Project: EDGEWATER/CHINO PROJECT
Project No. 04-15-03



**TABLE B-1
SUMMARY OF SOIL LABORATORY DATA**

Sample Information			Geologic Unit	USCS Group Symbol	In Situ Water Content, %	In Situ Dry Unit Weight, pcf	In Situ Saturation, %	Sieve/Hydrometer				Atterberg Limits			Laboratory Compaction			Other Laboratory Tests
Boring Number	Depth, feet	Elevation, feet						Gravel, %	Sand, %	<#200, %	<2µ, %	LL	PL	PI	Maximum Dry Unit Weight, pcf	Optimum Water Content, %	Compaction Test Method	
DH-8	20	530.0	Qof	SM				44	44	12	3							SV, HY
DH-8	25	525.0	Qof	SP	11.9	115	71											CN
DH-8	35	515.0	Qof	SP	12.5	122	93											
DH-8	45	505.0	Qof	SC	17.1	110	89											
DH-8	55	495.0	Qof	SC	26.9	98	104											
TP-1	2	NA	Qof	CL	12.6	109	65											PP=4.5+/4.5+ TSF : OC=1.4%
TP-1	6	NA	Qof	CL-CH	33.1	84	91	0	25	75	42							PP=4.5+/4.5+ TSF
TP-1	8	NA	Qof	CL										97.0	25.0	1557B		
TP-10	4	NA	Qof	CL	20.9	105	96	0	25	75	38	44	15	29				PP=2.5/1.75 TSF : OC=3.1%
TP-10	8	NA	Qof	CL	20.5	105	95											PP=3.25/1.75 TSF
TP-10	10	NA	Qof	SC/CL										123.0	12.5	1557B		
TP-11	2	NA	Native Soil	CL	28.6	89	89											PP=2.5/2.25 TSF : OC=6.7%
TP-11	3	NA	Native Soil	CL										113.5	14.5	1557B		
TP-11	5	NA	Qof	CL	27.6	93	95											PP=2.75/3.5 TSF
TP-12	4	NA	Qof	SM/ML	25.4	84	70	0	54	46	11	40	20	20				PP=2.25/4.5+ TSF
TP-12	8	NA	Qof	CL	22.9	100	93							102.5	20.0	1557B		PP=3.75/4.5+ TSF
TP-14	4	NA	Qof	CL	14.6	116	92											PP=3.5/3.0 TSF
TP-15	3	NA	Qof	SM	6.1	110	31											PP=2.5/1.5 TSF
TP-17	4	NA	Qof	CL	10.9	116	67											PP=4.5+/4.5+ TSF
TP-2	4	NA	Qof	CL	16.2	95	58											PP=1.5/4.5+ TSF : OC=1.5%
TP-2	8	NA	Qof	CL-CH	27.9	93	96											PP=4.5/3.25 TSF
TP-3	2	NA	Qofu	ML	12.3	110	64											PP=4.25/4.5+ TSF
TP-3	5	NA	Qof	CL	18.7	98	72											PP=4.5+/4.0 TSF
TP-4	4	NA	Qof	CL	13.2	117	84											PP=4.5+/4.5+ TSF
TP-4	8	NA	Qof	CL	27.1	95	97											PP=1.0/2.0 TSF

GMU_TABLE_SOIL_LAB_DATA_OLD_04-15-00.GPJ FNC AB GWGN01.GDT 03/15/07

Project: EDGEWATER/CHINO PROJECT
Project No. 04-15-03



**TABLE B-1
SUMMARY OF SOIL LABORATORY DATA**

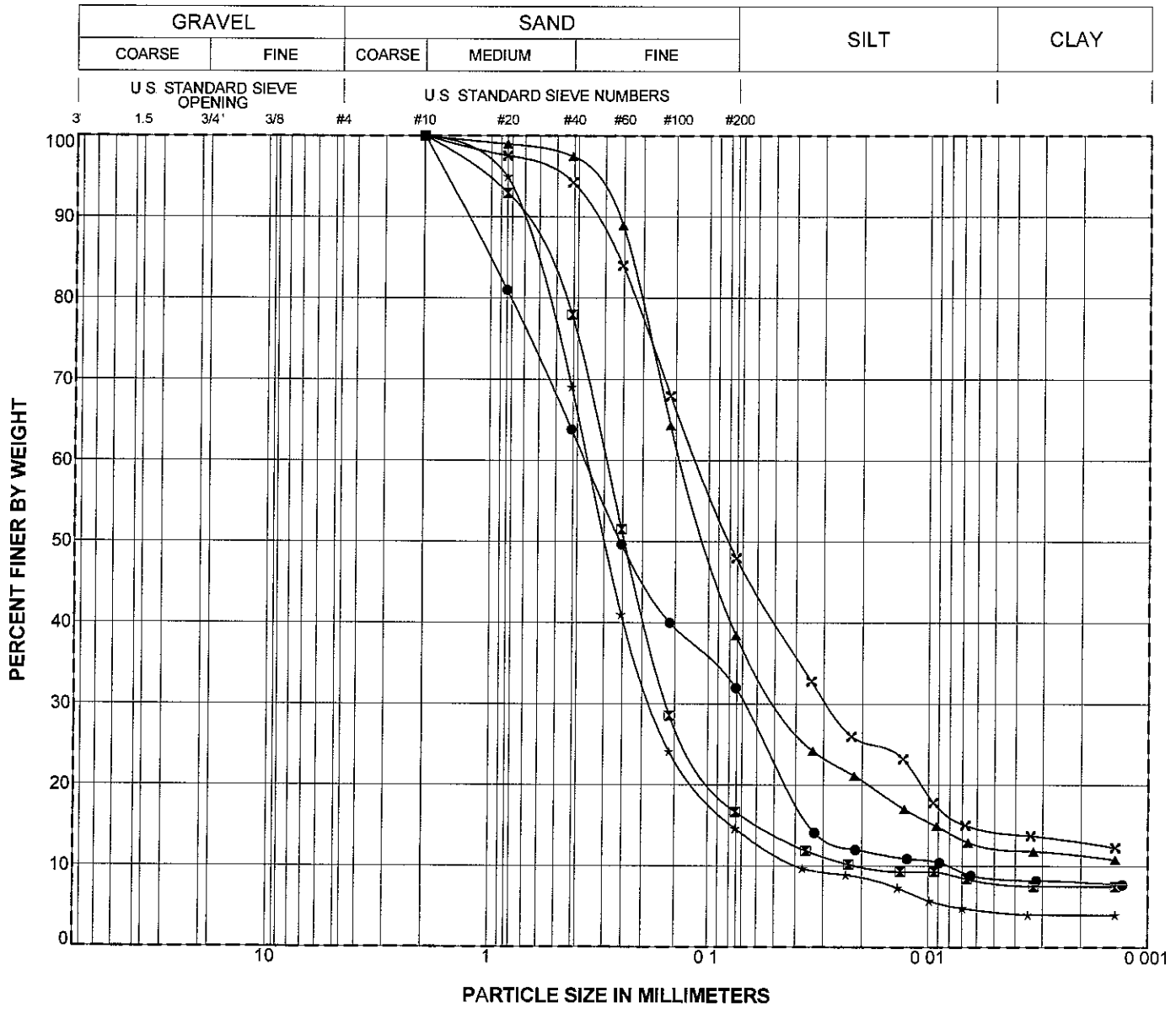
Sample Information			Geologic Unit	USCS Group Symbol	In Situ Water Content, %	In Situ Dry Unit Weight, pcf	In Situ Saturation, %	Sieve/Hydrometer				Atterberg Limits			Laboratory Compaction			Other Laboratory Tests
Boring Number	Depth, feet	Elevation, feet						Gravel, %	Sand, %	<#200, %	<2µ, %	LL	PL	PI	Maximum Dry Unit Weight, pcf	Optimum Water Content, %	Compaction Test Method	
TP-5	2	NA	Qof	CL	13.3	84	37	0	23	77	23	49	22	27				PP=4.5+/4.5+ TSF
TP-5	6	NA	Qof	SC	4.9													OC=1.9%
TP-6	4	NA	Qof	CL	7.2	94	25											PP=4.5+/4.5+ TSF
TP-6	8	NA	Qof	CL	17.6	105	82											PP=4.5+/4.5+ TSF : OC=1.6%
TP-6	10	NA	Qof	CL											114.0	14.0	1557B	
TP-7	2	NA	Qof	CL	16.6	107	80											PP=4.5+/4.5+ TSF
TP-7	5	NA	Qof	CL	9.1	119	62	0	38	62	28	37	17	20	116.0	15.0	1557B	PP=4.5+/4.5+ TSF
TP-8	4	NA	Qafu	SM	11.4	96	42											PP=2.25/3.75 TSF
TP-9	2	NA	Qof	ML	15.7	99	61											PP=2.5/4.5+ TSF : OC=1.5%
TP-9	6	NA	Qof	SM	8.5	116	53											PP=4.5+/4.5+ TSF

GMU_TABLE_SOIL_LAB_DATA_OLD_04-15-00.GPJ FNC AB GWGN01.GDT 03/15/07

Project: EDGEWATER/CHINO PROJECT
Project No 04-15-03

Sheet 4 of 4





Boring Number	Depth (feet)	Geologic Unit	Symbol	LL	PI	Classification
DH-1	10.0	Qof	●			SILTY SAND (SM)
DH-1	35.0	Qof	⊠	NP	NP	POORLY GRADED SAND (SP)
DH-2	10.0	Qof	▲			SILTY SAND (SM)
DH-3	25.0	Qof	★			POORLY GRADED SAND (SP)
DH-4	25.0	Qof	✕			CLEAN SAND (SP)

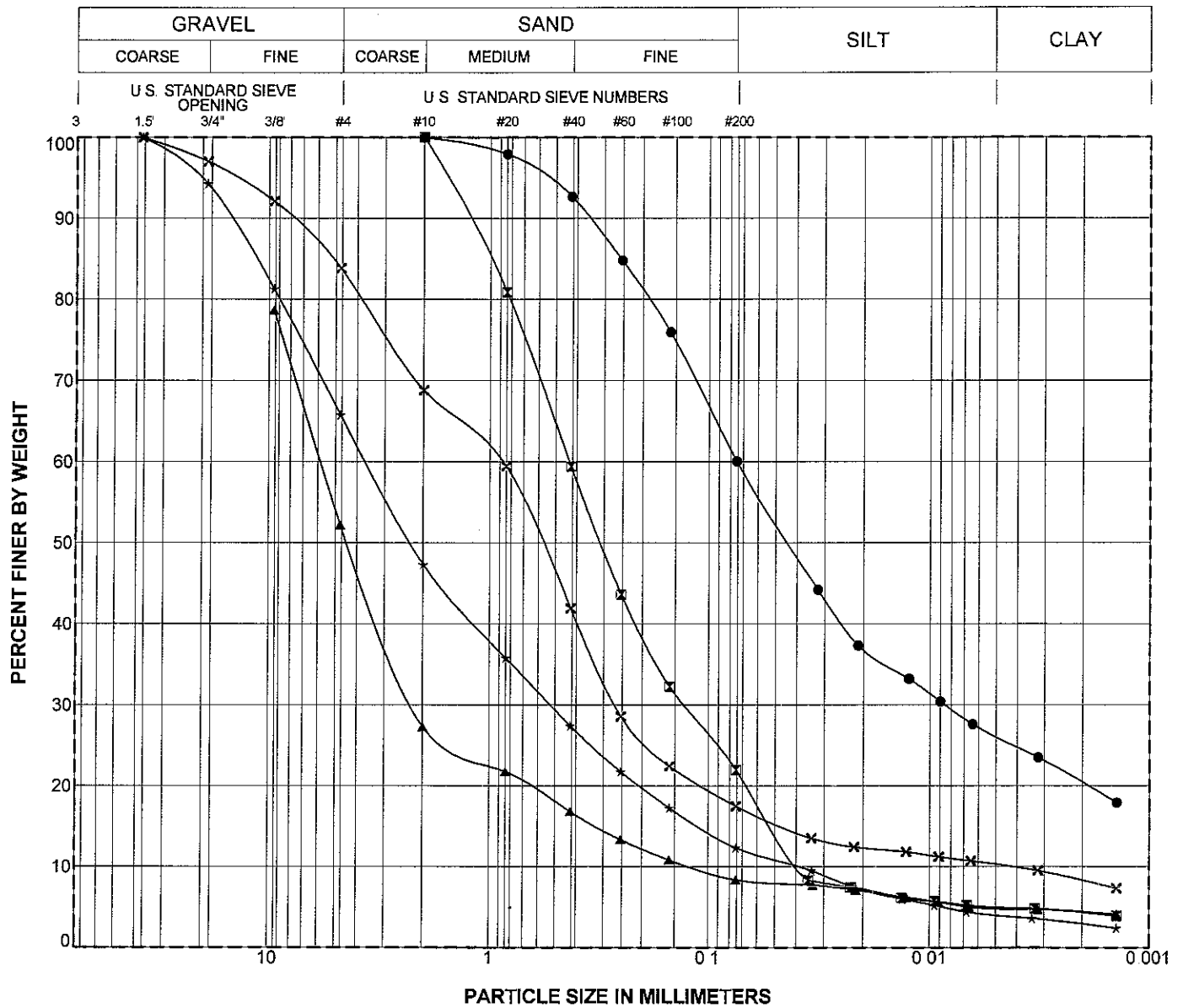
PARTICLE SIZE DISTRIBUTION

Project: EDGEWATER/CHINO PROJECT
Project No 04-15-03



PLATE B-1.1

GMU_GRAIN_SIZE 04-15-00.GPJ 03/13/07



Boring Number	Depth (feet)	Geologic Unit	Symbol	LL	PI	Classification
DH-5	35.0	Qal	●	36	18	CLAYEY SAND (SC)
DH-6	10.0	Qof	⊠			POORLY GRADED SAND (SP)
DH-7	10.0	Qof	▲			POORLY GRADED SAND (SP)
DH-7	25.0	Qof	★			POORLY GRADED SAND (SP)
DH-8	10.0	Qof	✕			CLAYEY SAND (SC)

PARTICLE SIZE DISTRIBUTION

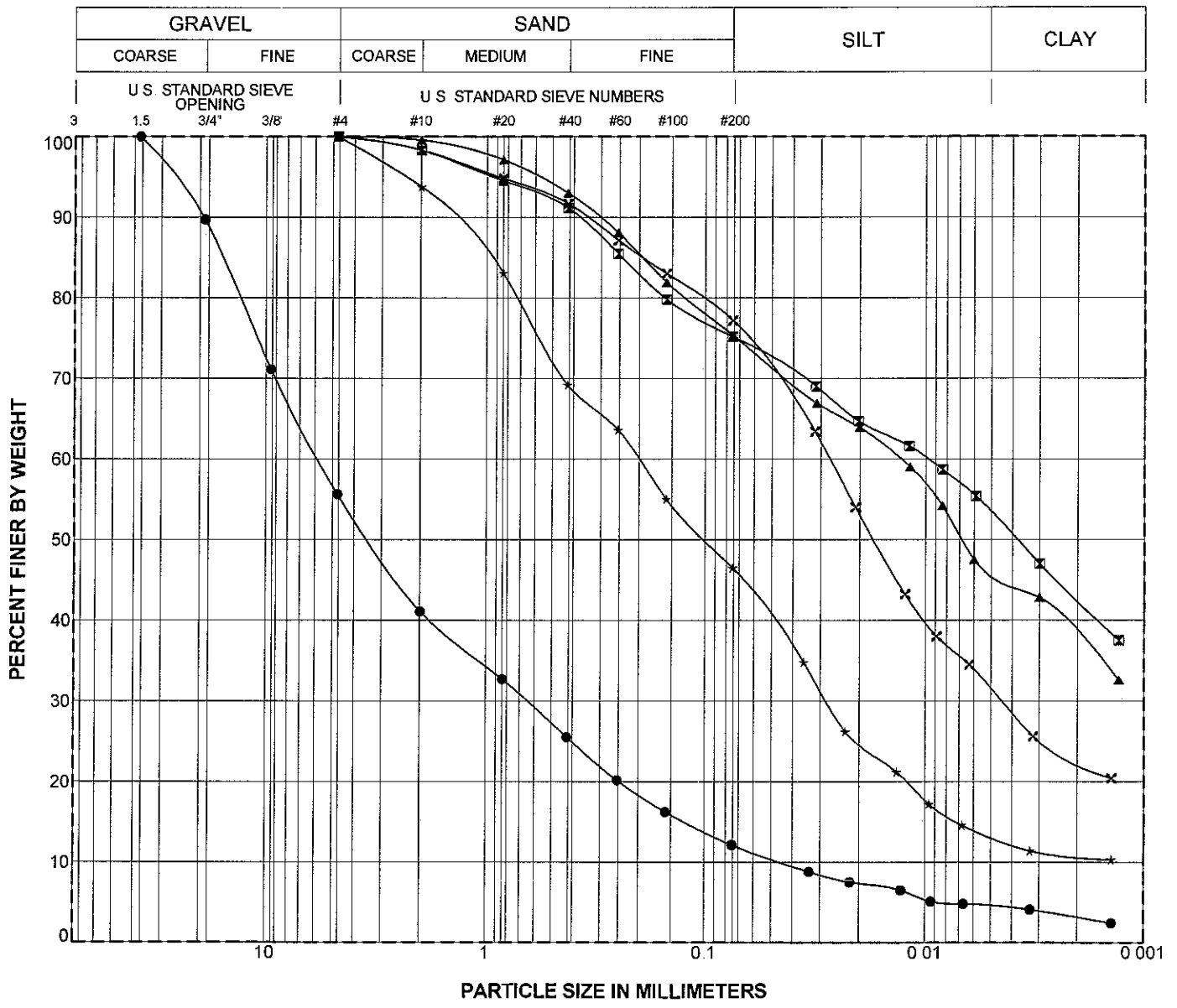
Project: EDGEWATER/CHINO PROJECT

Project No 04-15-03

PLATE B-1.2

GMU_GRAIN_SIZE_04-15-00.GPJ 03/19/07





Boring Number	Depth (feet)	Geologic Unit	Symbol	LL	PI	Classification
DH-8	20.0	Qof	●			SAND (SP)
TP-1	6.0	Qof	⊠	107	74	FAT CLAY with SAND(CH)
TP-10	4.0	Qof	▲	44	29	SANDY CLAY (CL)
TP-12	4.0	Qof	★	40	20	SANDY CLAY (CL)
TP-5	2.0	Qof	✕	49	27	SANDY CLAY (CL)

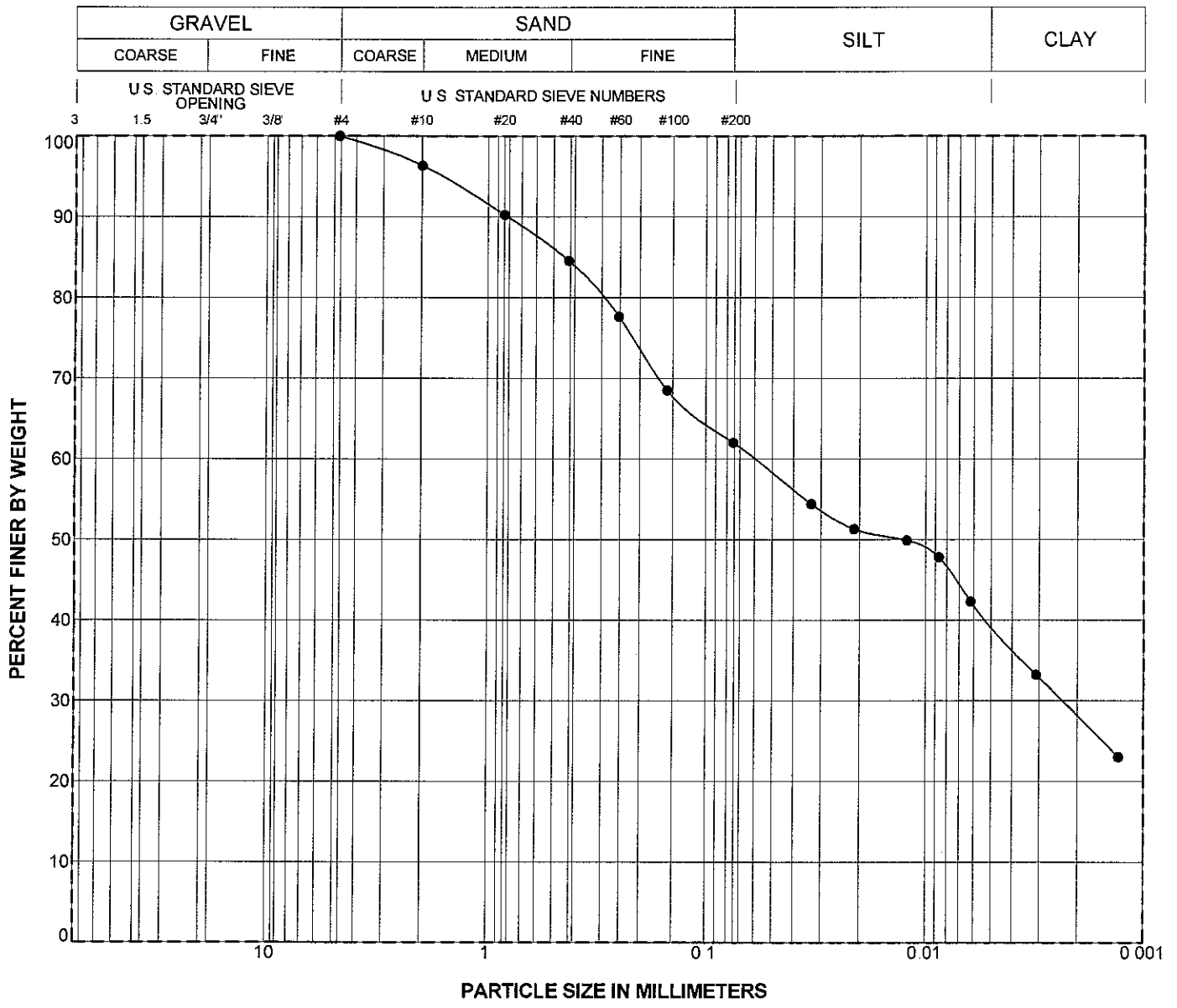
PARTICLE SIZE DISTRIBUTION

Project: EDGEWATER/CHINO PROJECT
 Project No. 04-15-03

PLATE B-1.3

GMU_GRAIN_SIZE_04-15-00.GPJ 03/13/07





Boring Number	Depth (feet)	Geologic Unit	Symbol	LL	PI	Classification
TP-7	5.0	Qof	●	37	20	SANDY LEAN CLAY (CL)

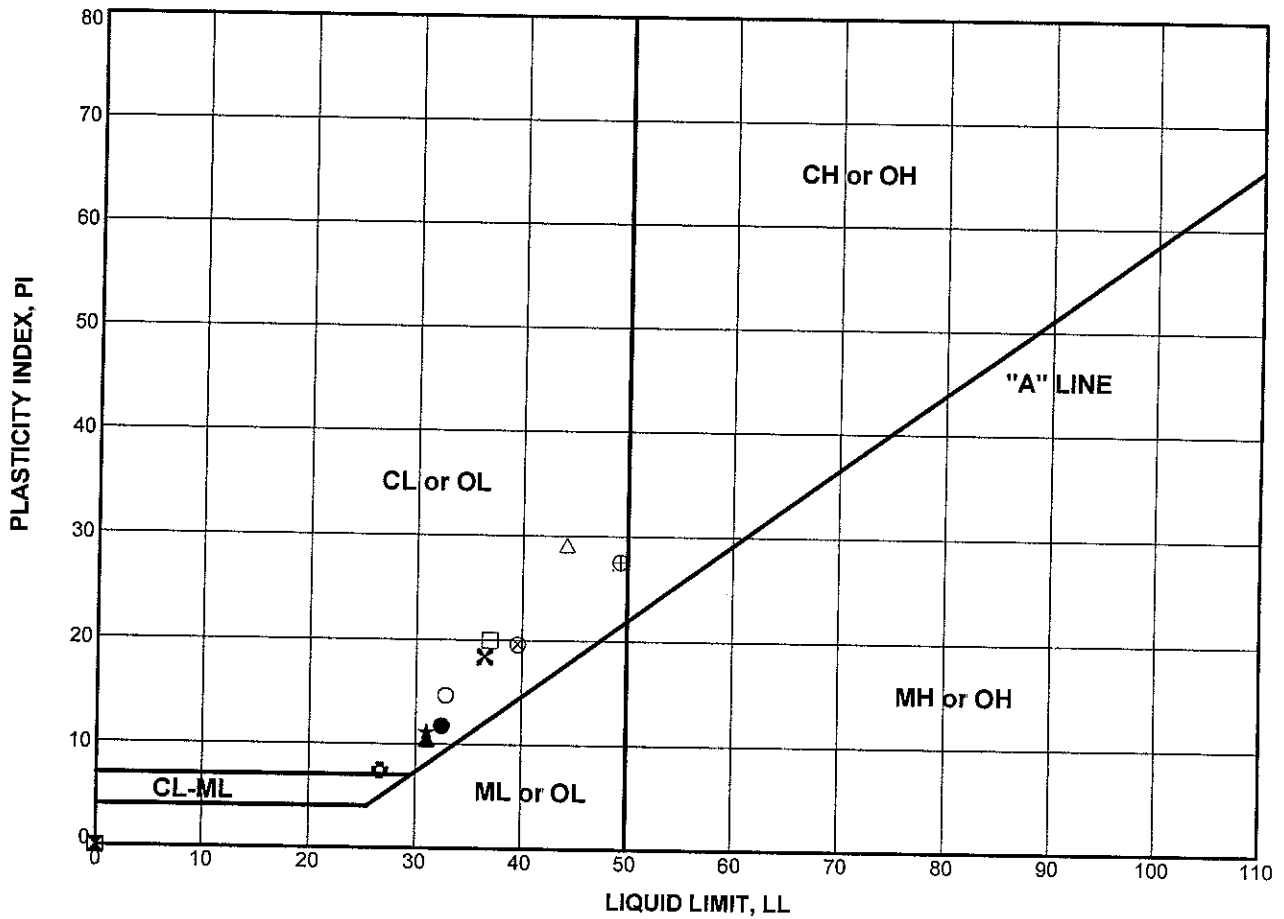
PARTICLE SIZE DISTRIBUTION

Project: EDGEWATER/CHINO PROJECT
Project No 04-15-03

PLATE B-1.4



GMU_GRAIN_SIZE 04-15-00.GPJ 03/13/07



Boring Number	Depth (feet)	Geologic Unit	Test Symbol	Water Content (%)	LL	PL	PI	Classification
DH-1	0.0	Qafu	●	18	32	21	11	CLAYEY SAND (SC)
DH-1	35.0	Qof	⊠	18	NP	NP	NP	POORLY GRADED SAND (SP)
DH-2	0.0	Qafu	▲	13	31	21	10	CLAYEY SAND (SC)
DH-5	10.0	Qal	★	14	31	20	11	CLAYEY SAND (SC)
DH-5	35.0	Qal	✕	23	36	18	18	CLAYEY SAND (SC)
DH-6	0.0	Qof	⊕	9	27	19	8	CLAYEY SAND (SC)
DH-8	0.0	Qof	○	12	33	18	15	CLAYEY SAND (SC)
TP-10	4.0	Qof	△	21	44	15	29	SANDY CLAY (CL)
TP-12	4.0	Qof	⊗	25	40	20	20	SANDY CLAY (CL)
TP-5	2.0	Qof	⊕	13	49	22	27	SANDY CLAY (CL)
TP-7	5.0	Qof	□	9	37	17	20	SANDY LEAN CLAY (CL)

ATTERBERG LIMITS

Project: EDGEWATER/CHINO PROJECT
 Project No. 04-15-03

PLATE B-2

GMU_ATTERBERG_LIMITS_12 PTS 04-15-00.GPJ GMSU.GDT 3/15/07

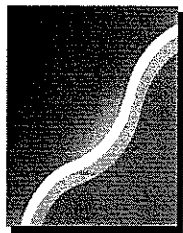


EXPANSION INDEX AND CHEMICAL TEST RESULTS

LOCATION	DEPTH	pH	SOLUBLE SULFATES (ppm)	SOLUBLE CHLORIDES (ppm)	MINIMUM RESISTIVITY ohm-cm	EXPANSION INDEX	EXPANSION POTENTIAL
DH-1	0-5'	8.6	N/D	1,650	570	41	LOW
DH-6	0-5'	7.0	N/D	660	810	4	VERY LOW
DH-8	0-5'	8.2	N/D	840	720	55	MEDIUM
TP-3	2	6.4	630	400			
TP-4	4	6.7	540	640			
TP-6	10	6.0	1,650	320			
TP-7	5	6.7	1,220	420			
TP-11	3	7.8	930	640			
TP-12	8	6.9	1,260	360			

n/d=non-detectable

PERFORMED IN GENERAL ACCORDANCE WITH CT 417/422/643 AND ASTM D4829

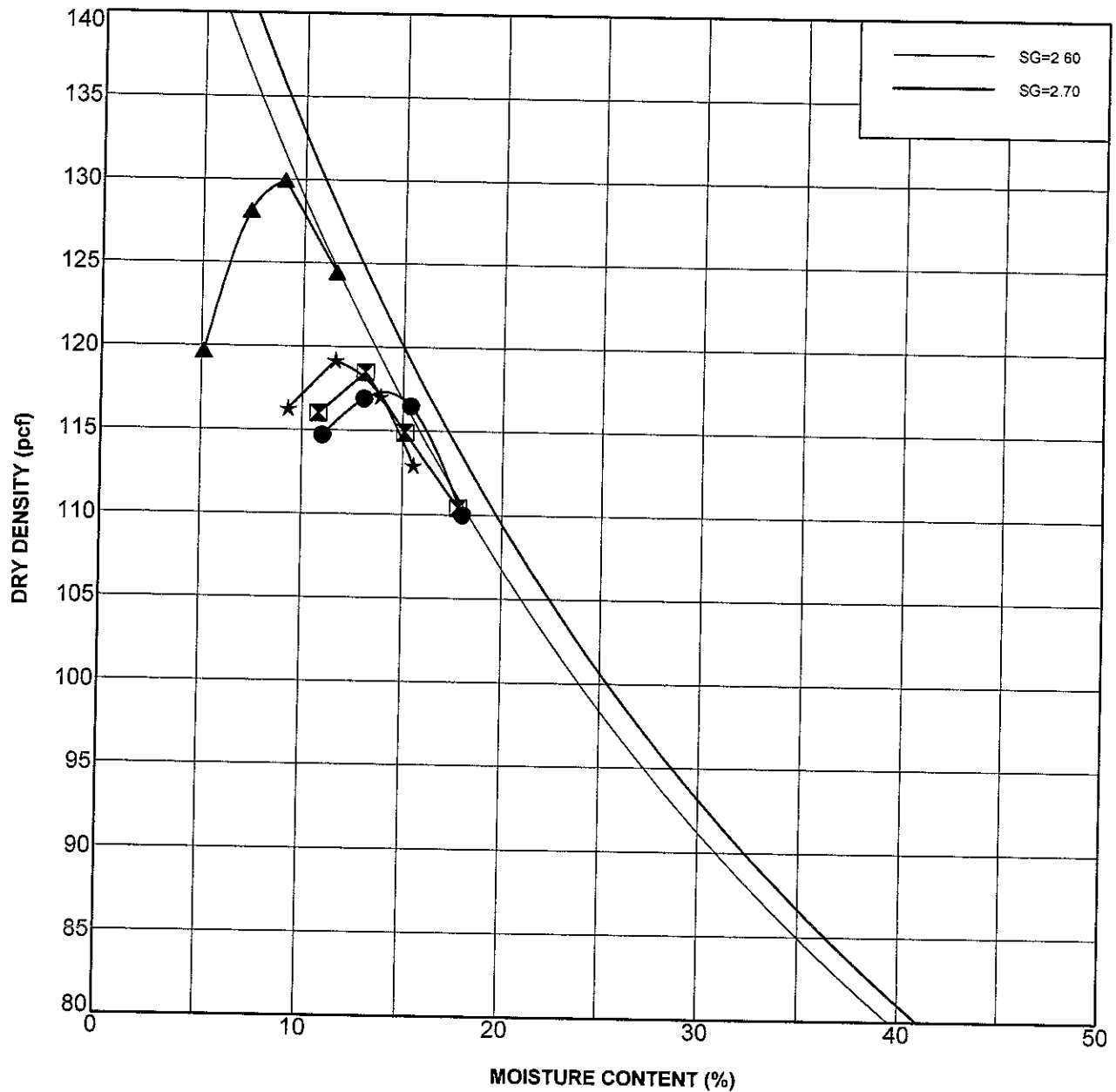


GMU

GEOTECHNICAL, INC.

EDGEWATER
CHINO HILLS
04-15-03

PLATE B-3



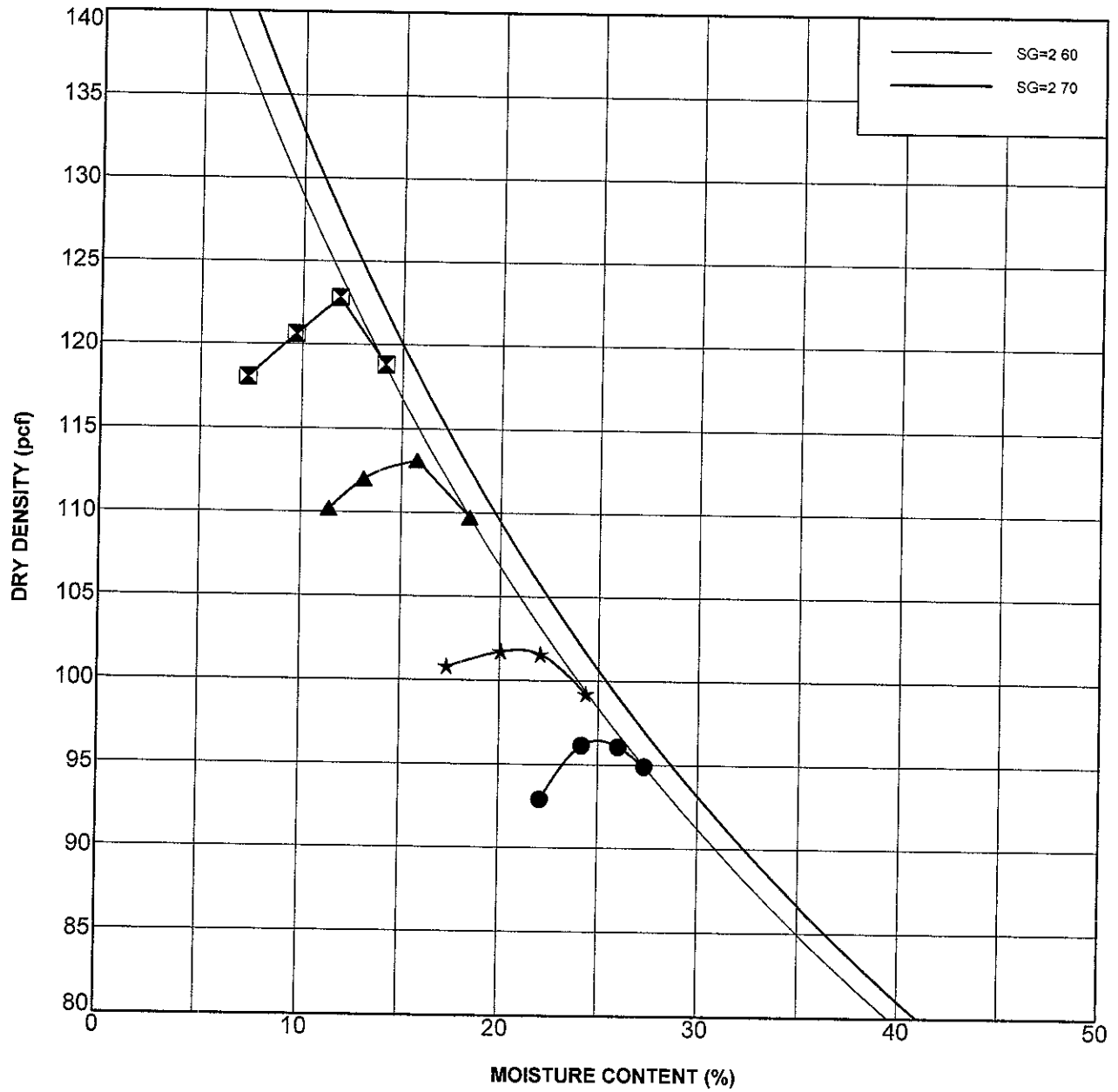
Boring Number	Depth (feet)	Geologic Unit	Symbol	Maximum Dry Density, pcf	Optimum Moisture Content, %	Classification
DH-1	0.0	Qafu	●	119.5	12.5	CLAYEY SAND (SC)
DH-2	0.0	Qafu	⊠	119.5	12.5	CLAYEY SAND (SC)
DH-6	0.0	Qof	▲	119.5	12.5	CLAYEY SAND (SC)
DH-8	0.0	Qof	★	119.5	12.5	CLAYEY SAND (SC)

COMPACTION TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No 04-15-03



PLATE B-4.1



Boring Number	Depth (feet)	Geologic Unit	Symbol	Maximum Dry Density, pcf	Optimum Moisture Content, %	Classification
TP-1	8.0	Qof	●	102.5	20	SANDY FAT CLAY (CL)
TP-10	10.0	Qof	◻	102.5	20	SANDY LEAN CLAY (CL)
TP-11	3.0	Native Soil	▲	102.5	20	SANDY LEAN CLAY (CL)
TP-12	8.0	Qof	★	102.5	20	SANDY LEAN CLAY (CL)

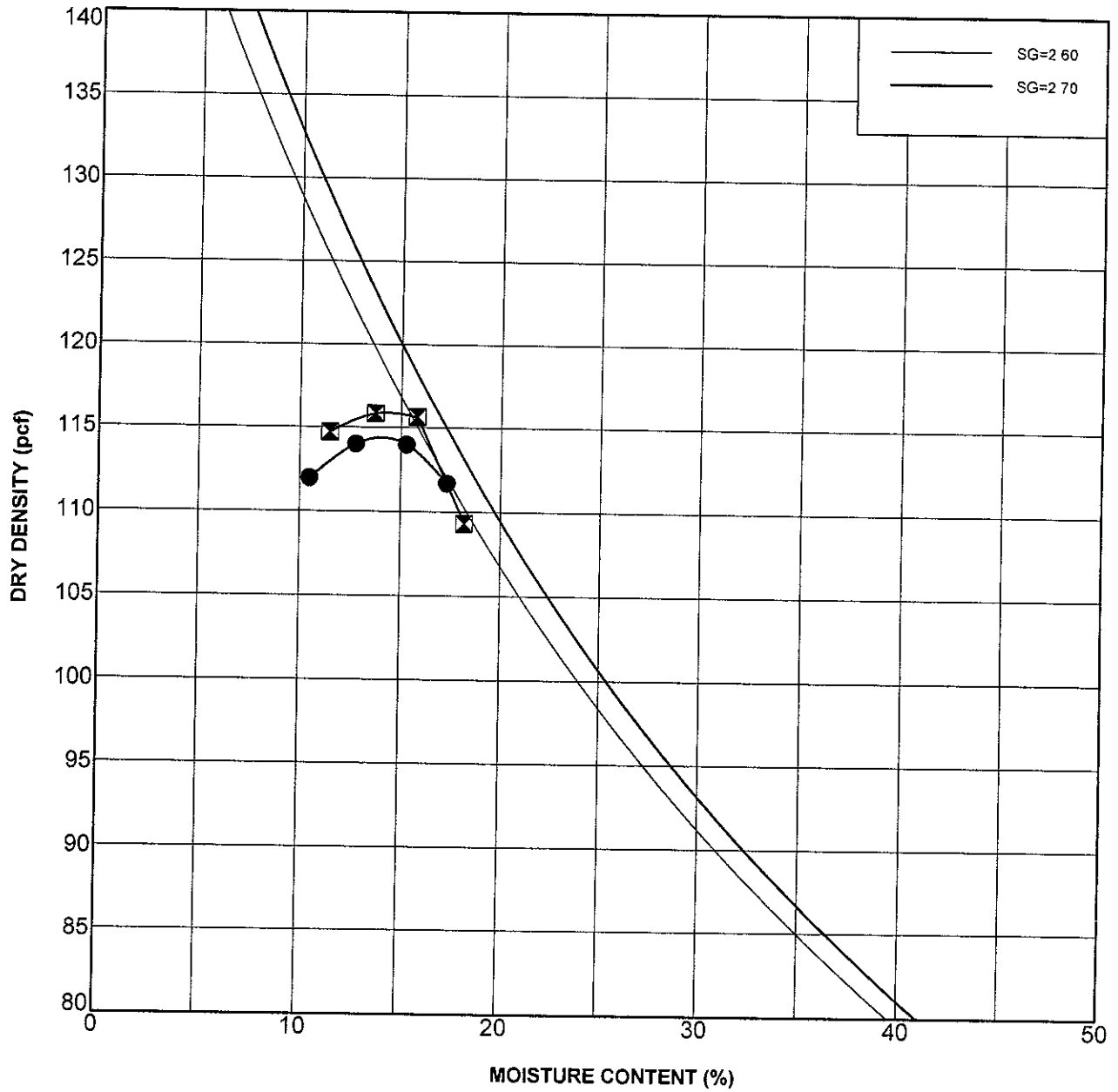
COMPACTION TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No. 04-15-03

PLATE B-4.2

GMU_COMPACTION_4_SETS 04-15-00.GPJ 3/13/07





Boring Number	Depth (feet)	Geologic Unit	Symbol	Maximum Dry Density, pcf	Optimum Moisture Content, %	Classification
TP-6	10.0	Qof	●	116	15	SANDY LEAN CLAY (CL)
TP-7	5.0	Qof	◻	116	15	SANDY LEAN CLAY (CL)

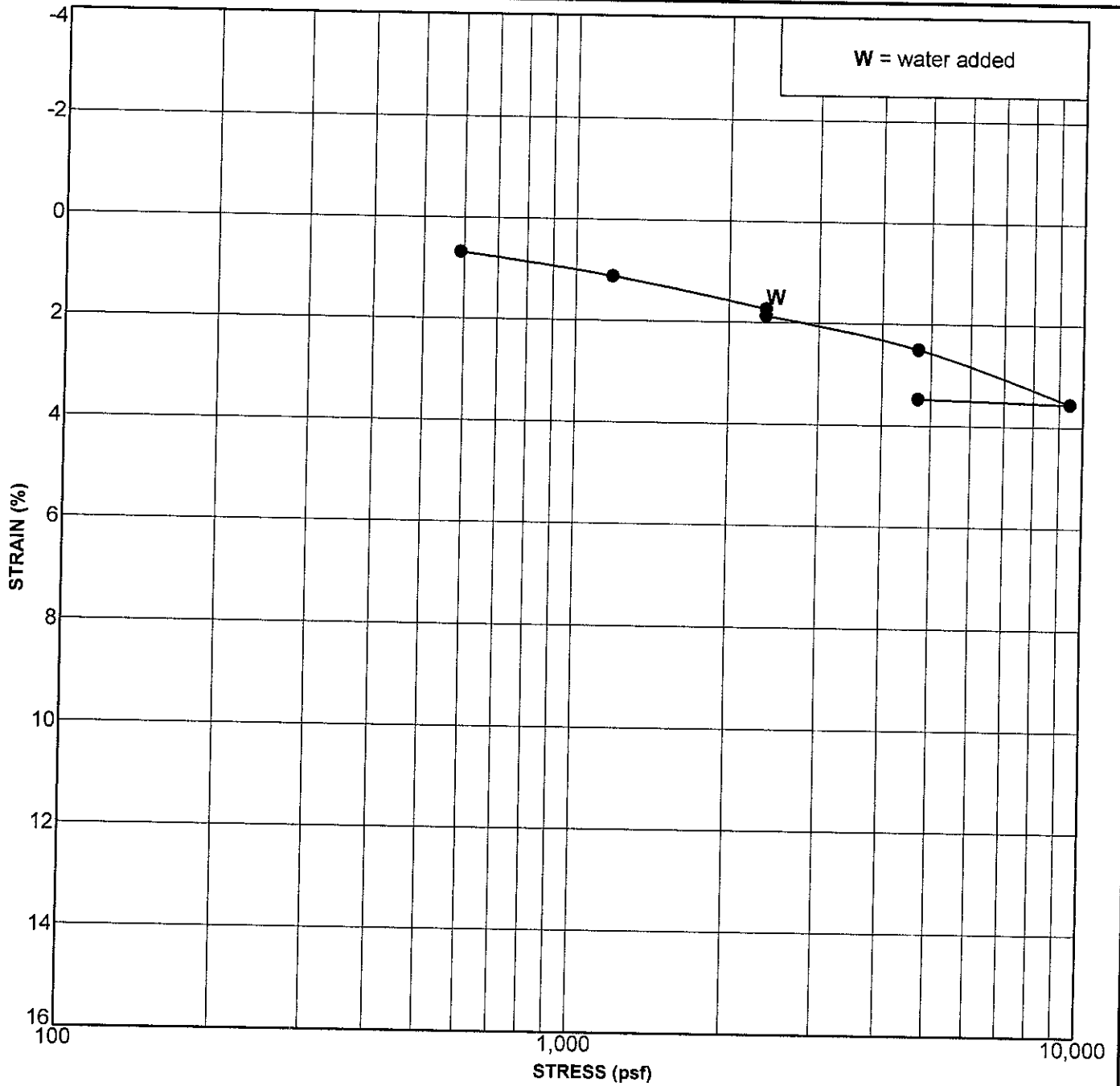
COMPACTION TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No 04-15-03

PLATE B-4.3

GMU_COMPACTION_4_SETS 04-15-00.GPJ 3/13/07





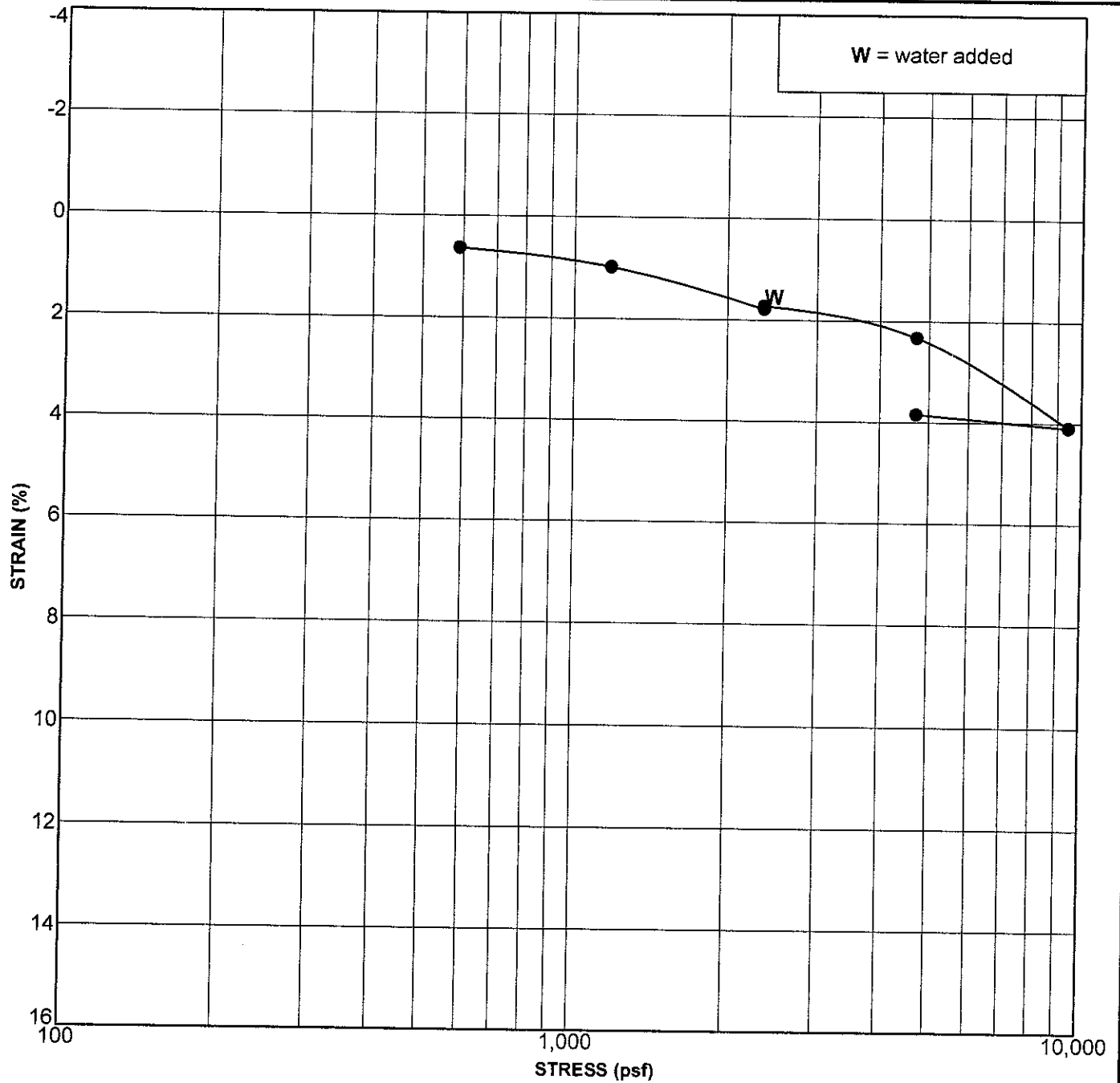
Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-1	15.0	Qof	●	In Situ	14	SILTY SAND (SM)

CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No 04-15-03

PLATE B-5.1





GMU_CONSOL 04-15-00.GPJ GM&L.GDT 3/13/07

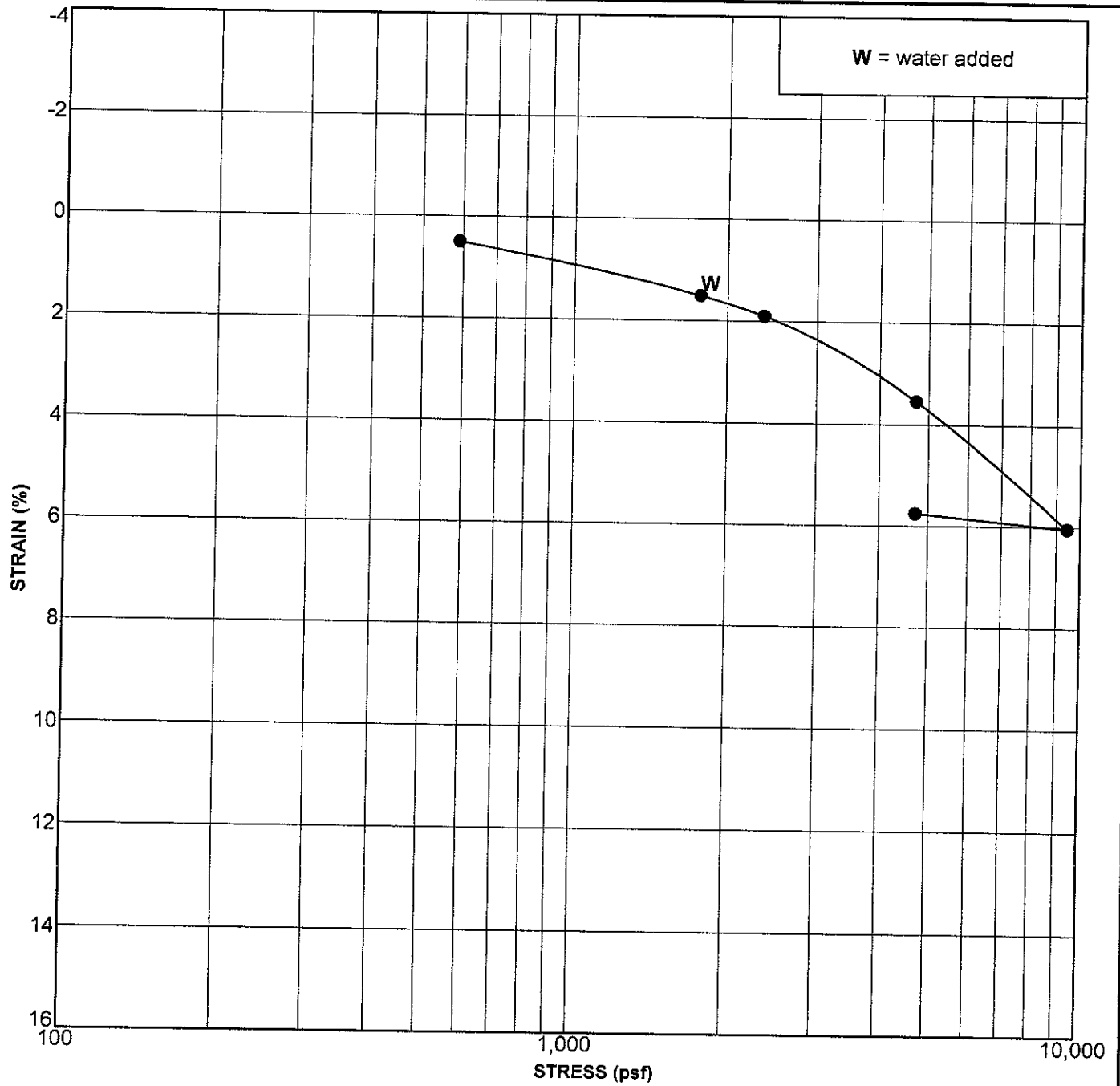
Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-1	25.0	Qof	●	In Situ	-06	SILTY SAND (SM)

CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT
Project No. 04-15-03



PLATE B-5.2



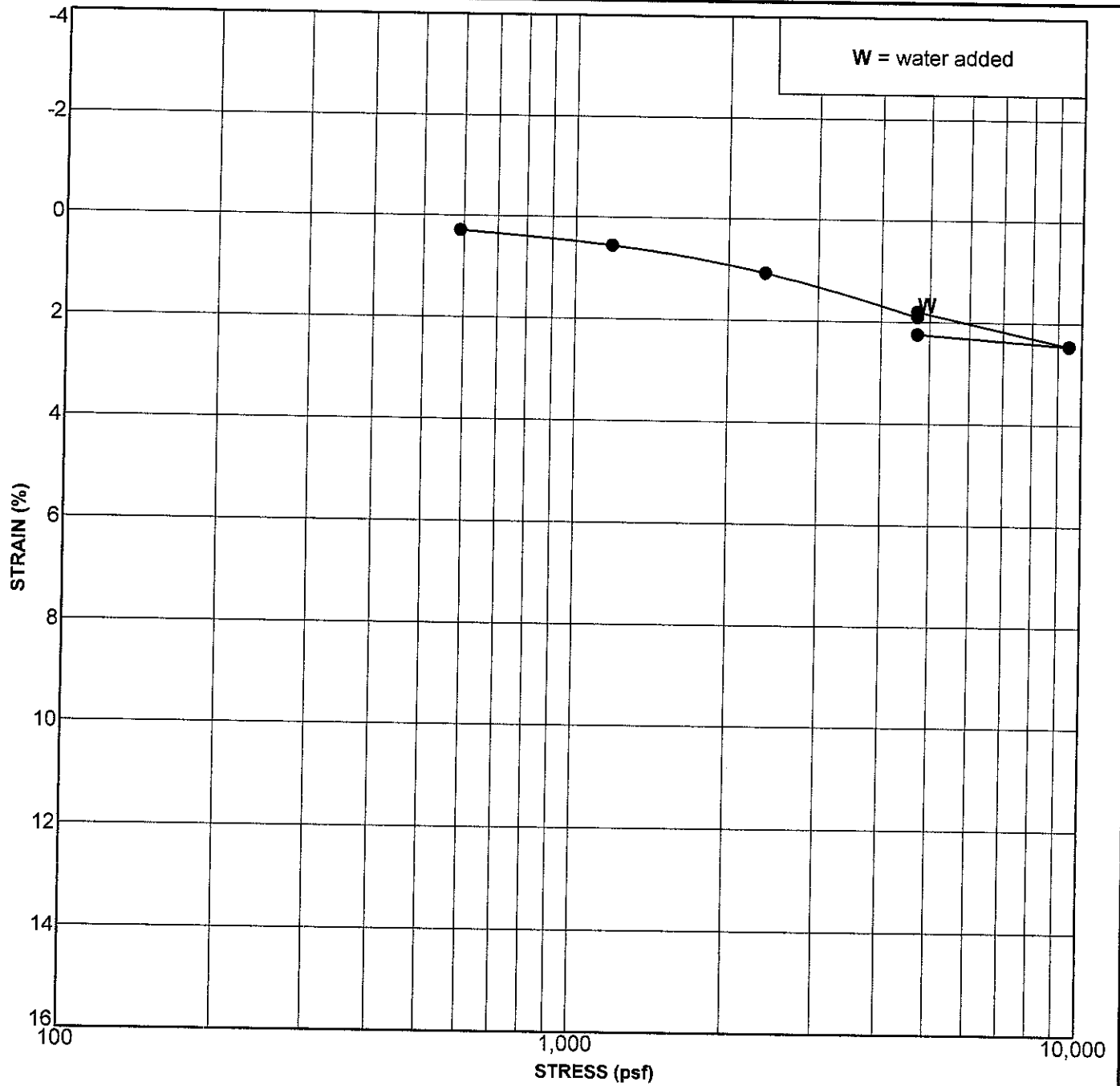
Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-2	15.0	Qof	●	In Situ	0	SILTY SAND (SM)

CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT

Project No. 04-15-03

PLATE B-5.3



Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-2	35.0	Qof	●	In Situ	- 1	SILTY SAND (SM)

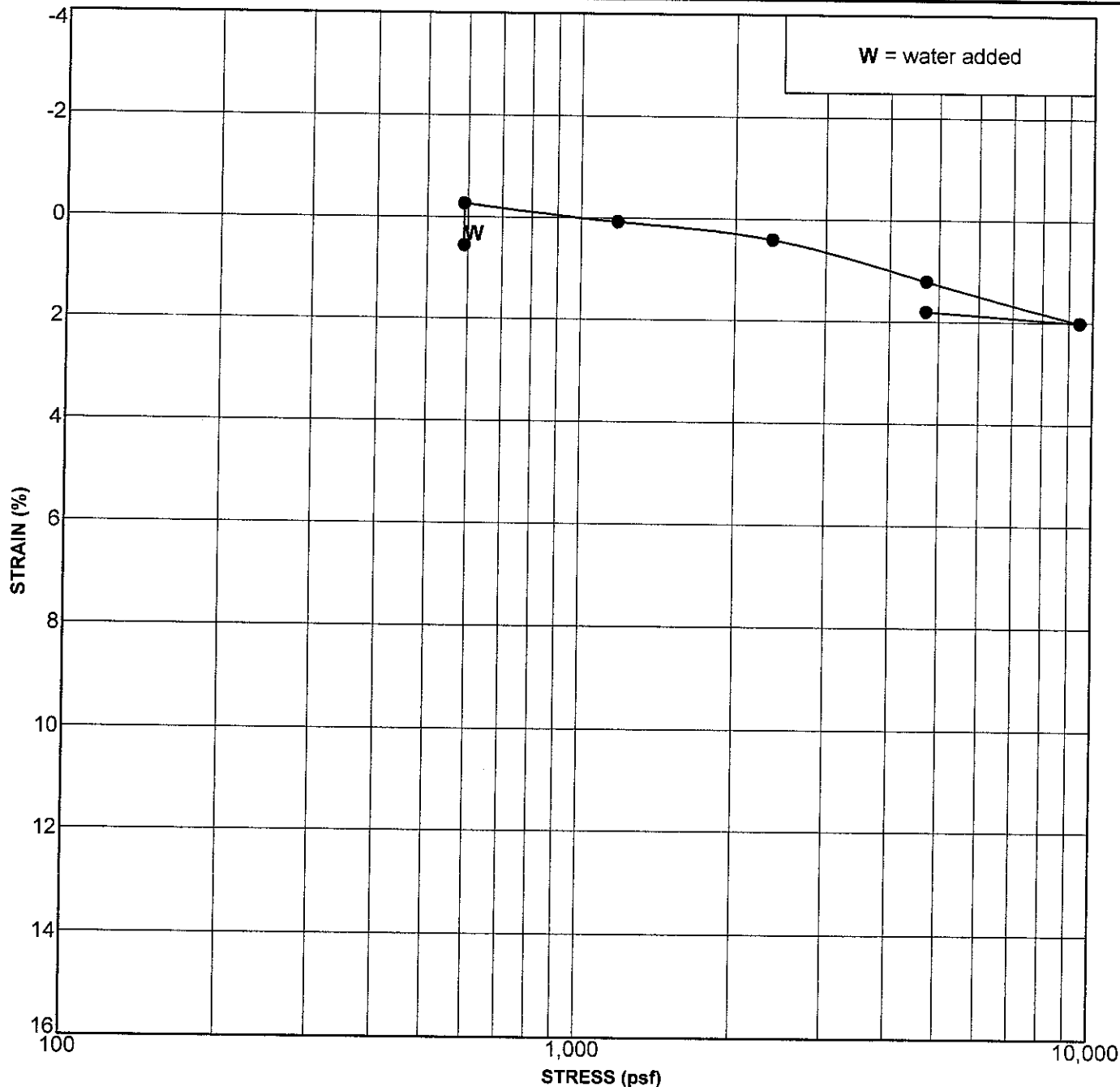
CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT

Project No 04-15-03

PLATE B-5.4





Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-3	50	Qafu	●	In Situ	- 82	SILTY SAND (SM)

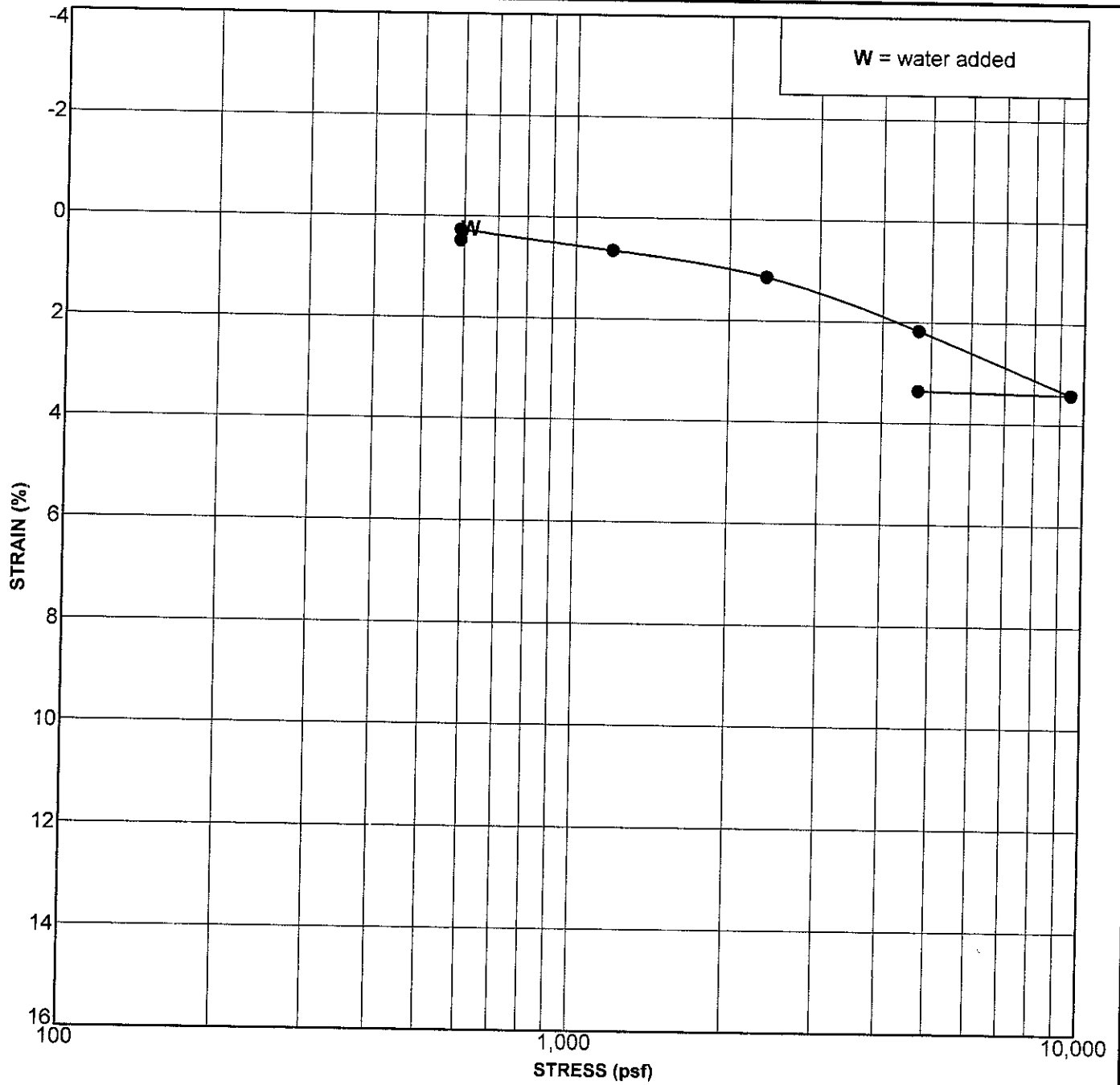
CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No 04-15-03



PLATE B-5.5

GMU_CONSOL 04-15-00.GPJ GM&U.GDT 3/13/07



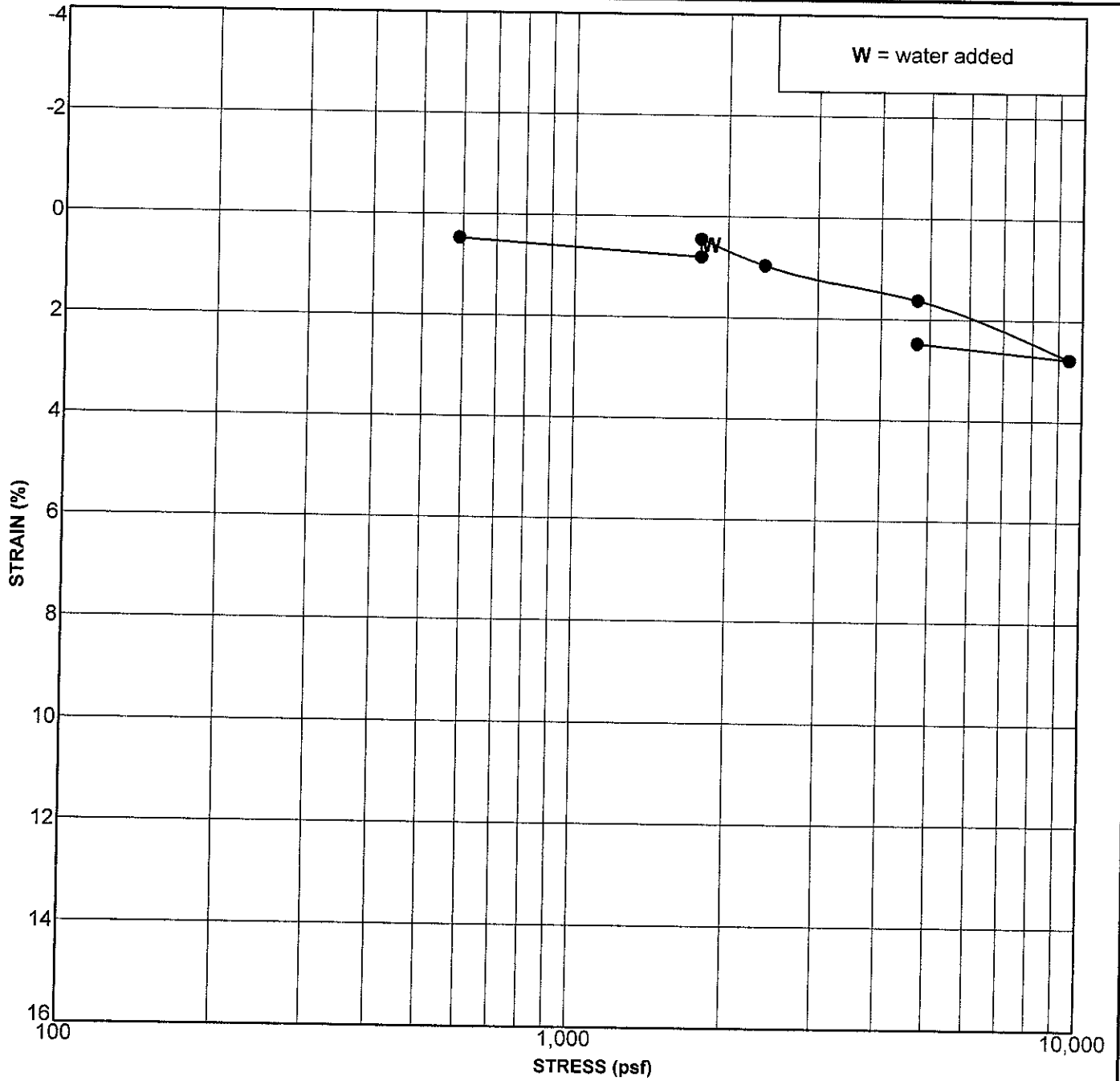
Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-4	5.0	Qof	●	In Situ	- 21	SANDY CLAY (SC)

CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT
Project No 04-15-03



PLATE B-5.6



Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-4	15.0	Qof	●	In Situ	-35	SILTY SAND (SM)

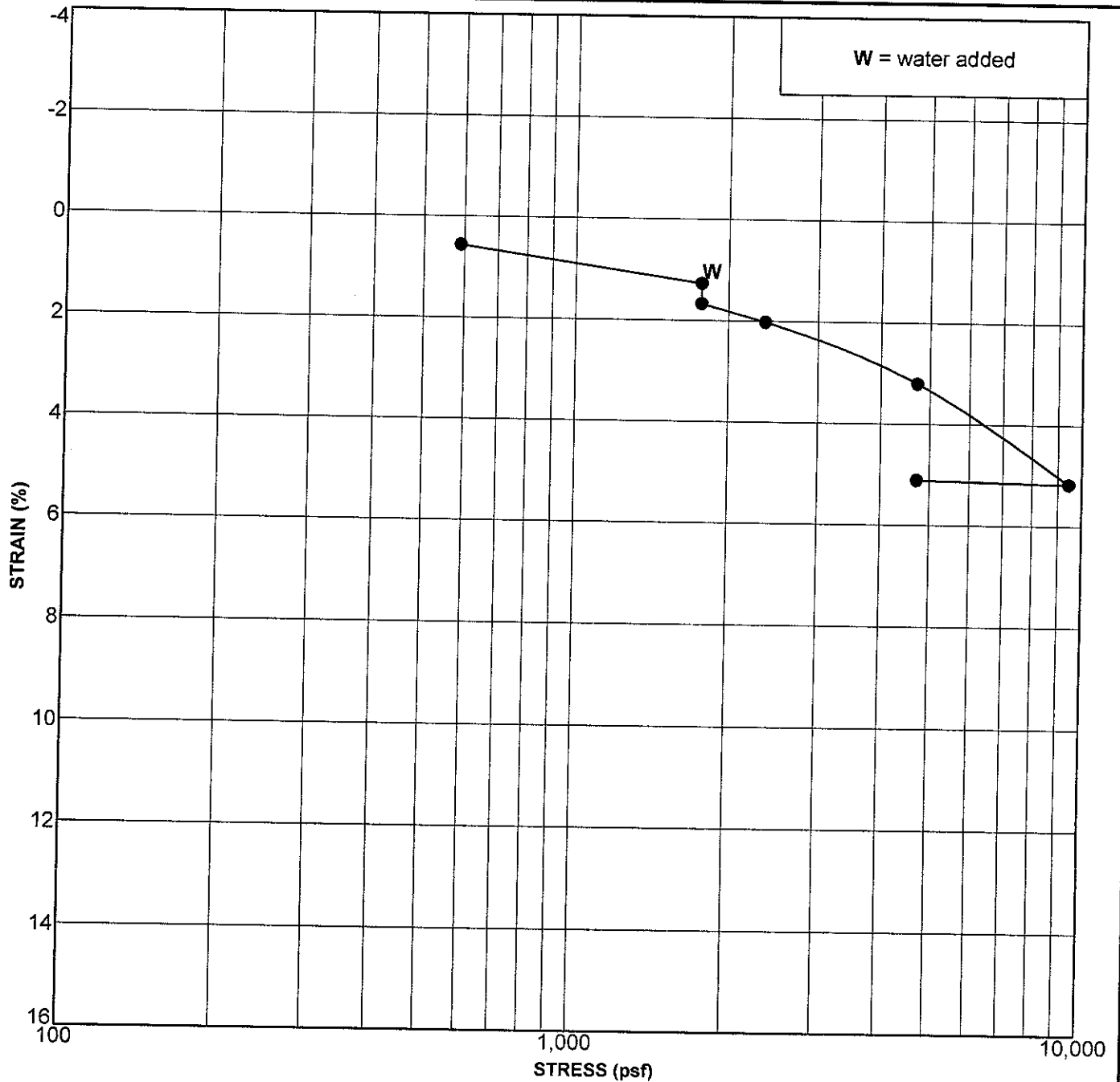
CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No 04-15-03

PLATE B-5.7

GMU_CONSOL_04-15-00.GPJ GM&U.GDT 3/13/07





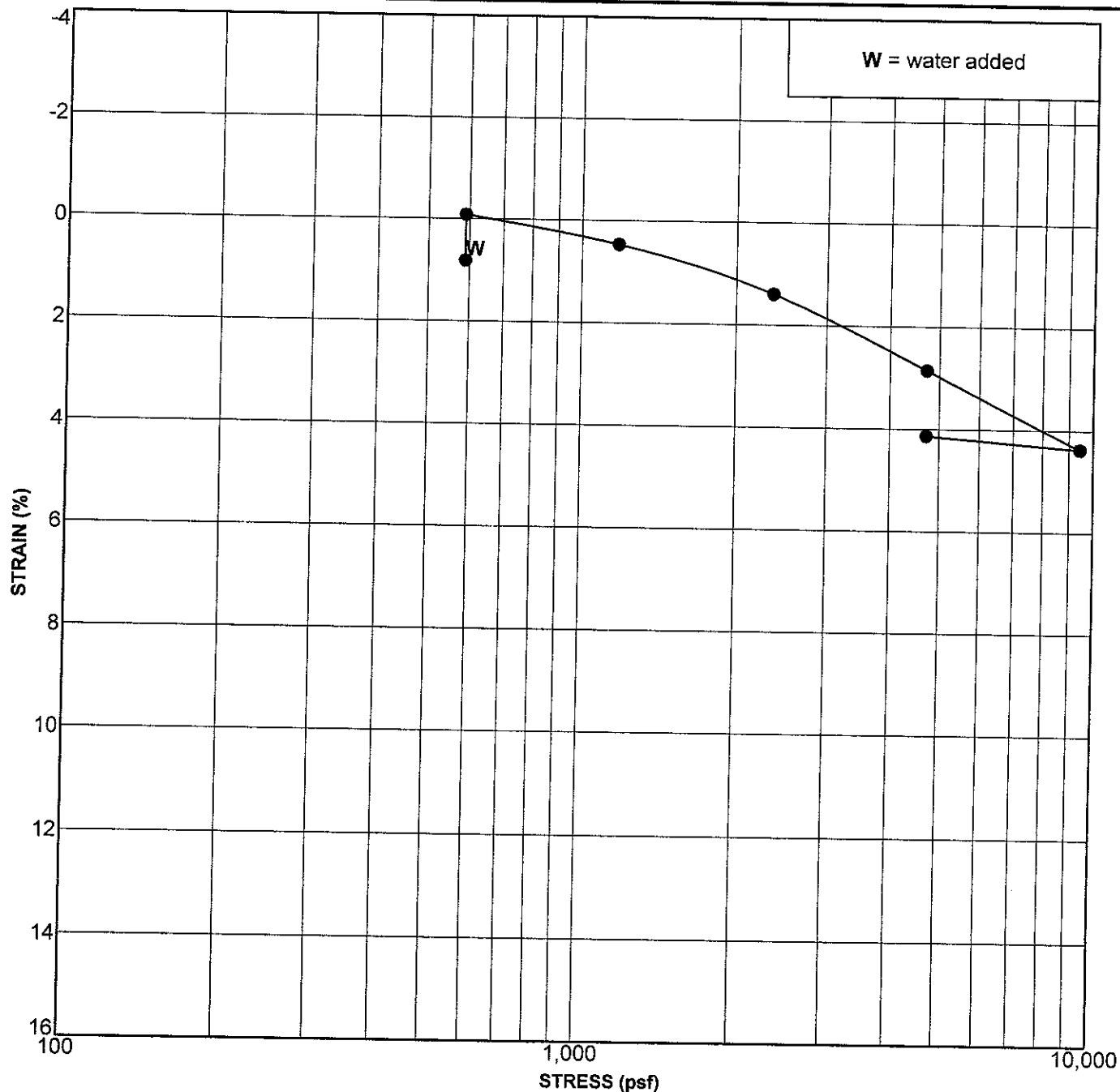
Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-6	15.0	Qof	●	In Situ	40	SANDY CLAY (SC)

CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No. 04-15-03



PLATE B-5.8



Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-7	5.0	Qof	●	In Situ	- 90	POORLY GRADED SAND (SP)

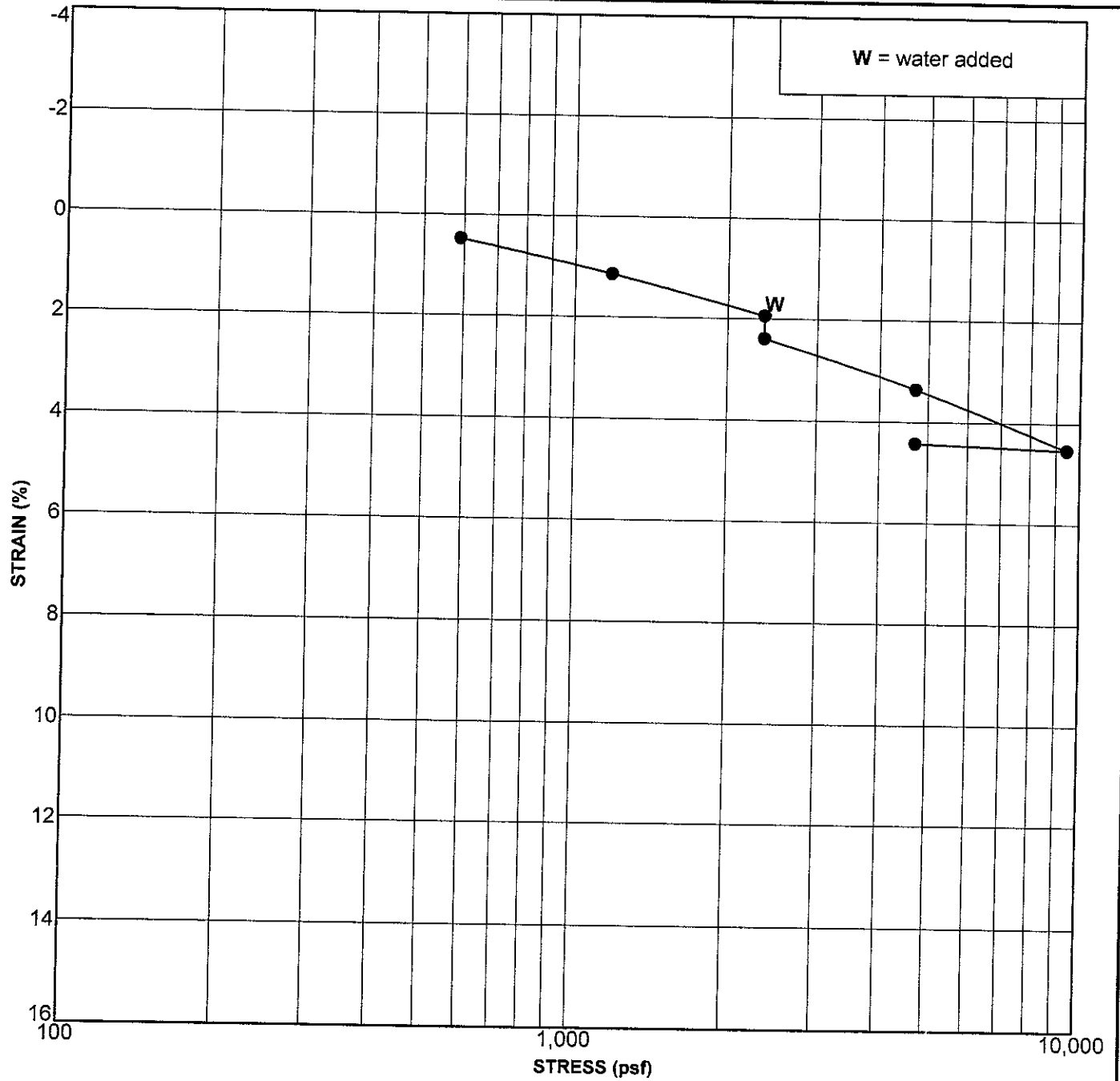
CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No. 04-15-03



PLATE B-5.9

GMU_CONSOI_04-15-00.GPJ GM&U.GDT 3/13/07



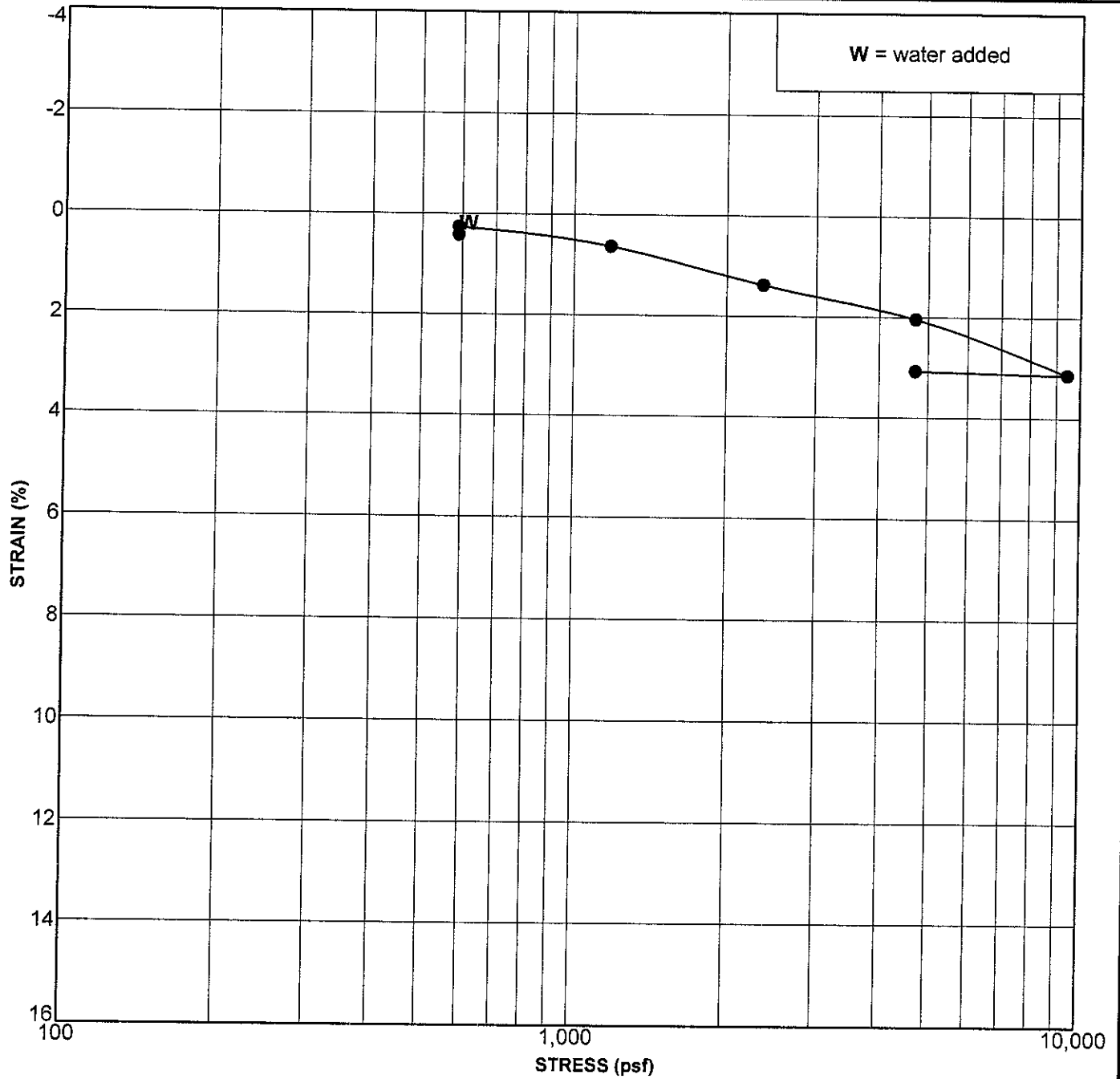
Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-7	15.0	Qof	●	In Situ	45	SILTY SAND (SM)

CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No 04-15-03



PLATE B-5.10



GMU_CONSOL 04-15-00.GPJ GM&J.GDT 3/13/07

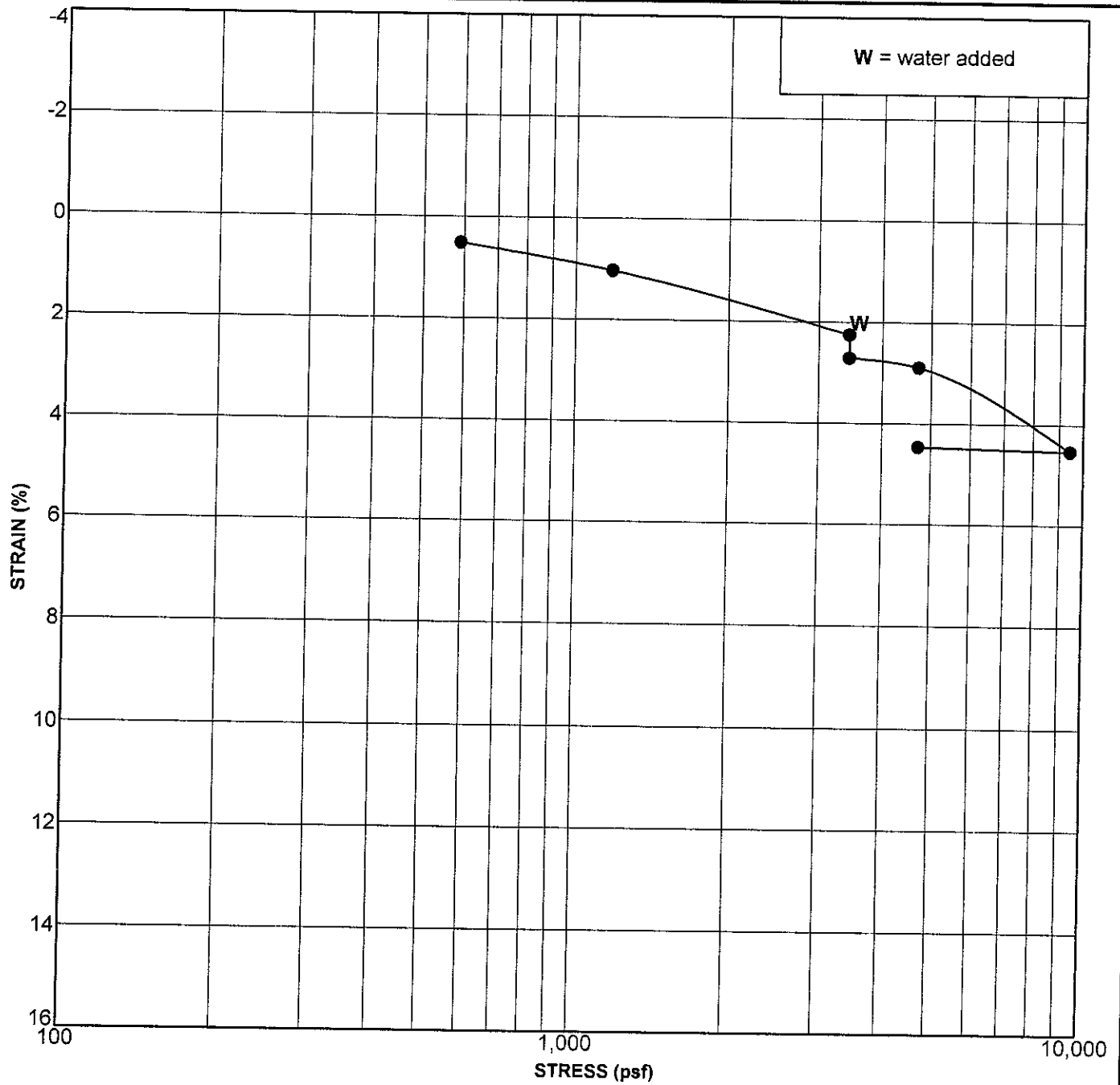
Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-8	5.0	Qof	●	In Situ	- 16	CLAYEY SAND (SC)

CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT
Project No. 04-15-03



PLATE B-5.11



Boring Number	Depth (feet)	Geologic Unit	Symbol	In Situ or Remolded Sample	% Hydro-Collapse	Classification
DH-8	25.0	Qof	●	In Situ	46	SAND (SP)

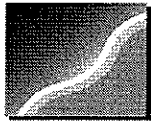
CONSOLIDATION TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No 04-15-03

PLATE B-5.12

GMU_CONSOL_04-15-00.GPJ GM&U.GDT 3/13/07





R-VALUE TEST RESULTS

PROJECT NAME: EDGEWATER

PROJECT NUMBER: 04-15-03

SAMPLE LOCATIO: _____

SAMPLE NUMBER: DH-1@0-5

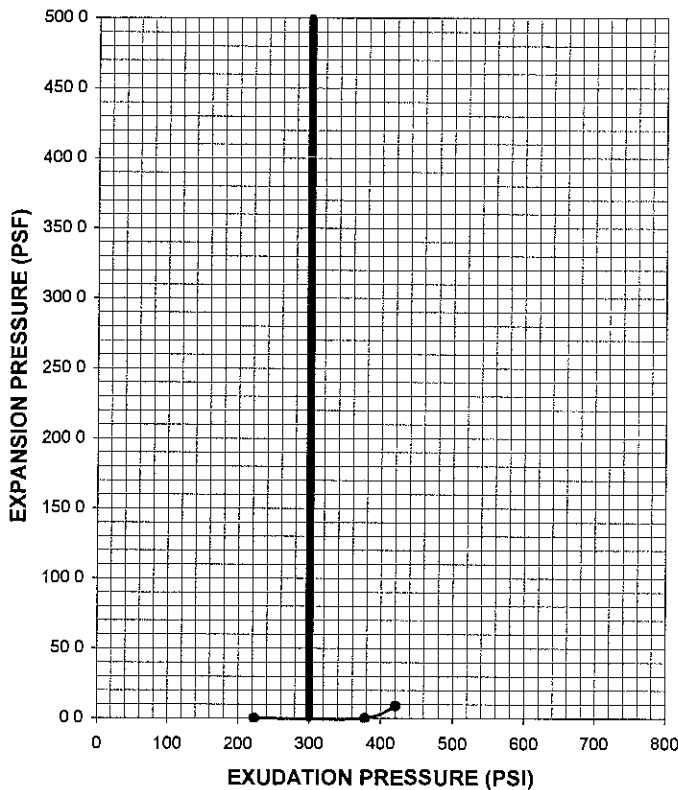
SAMPLE DESCRIP SC

TECHNICIAN: DVT

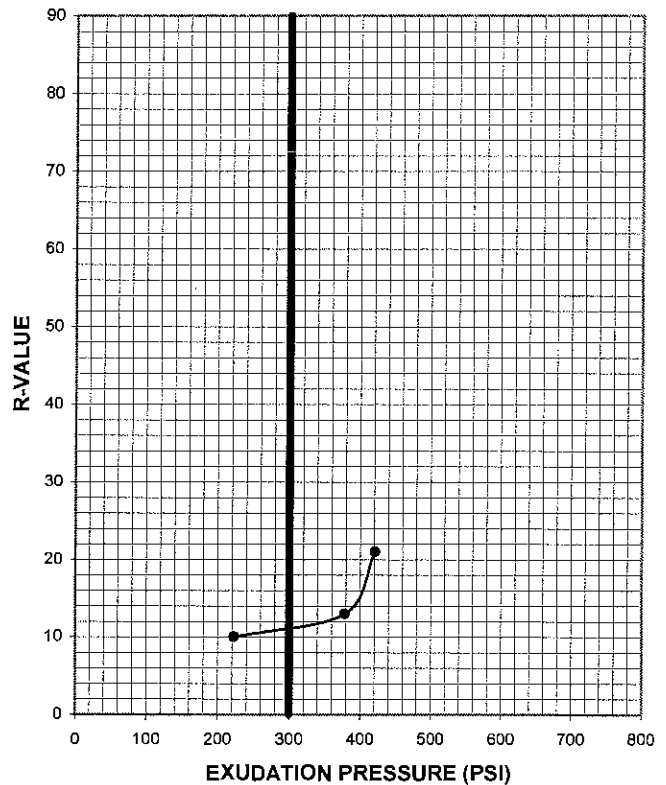
DATE SAMPLED 12/21/2006

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	14.4	16.7	18.9
WEIGHT OF SAMPLE, grams	1078	1068	1050
HEIGHT OF SAMPLE, Inches	2.51	2.52	2.53
DRY DENSITY, pcf	113.7	110.1	105.8
COMPACTOR AIR PRESSURE, psf	230	120	70
EXUDATION PRESSURE, psf	421	378	223
EXPANSION, Inches x 10exp-4	2	0	0
STABILITY Ph 2,000 lbs (160 psi)	116	130	136
TURNS DISPLACEMENT	3.60	3.83	4.14
R-VALUE UNCORRECTED	21	13	10
R-VALUE CORRECTED	21	13	10

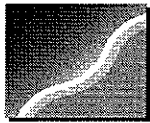
EXPANSION PRESSURE VS. EXUDATION PRESSURE



R-VALUE VS. EXUDATION PRESSURE



R-VALUE AT 300 PSI EXUDATION PRESSURE :	12
EXP. PRESSURE AT 300 PSI EXUDATION PRESSURE (PSF) :	0



R-VALUE TEST RESULTS

PROJECT NAME: EDGEWATER

PROJECT NUMBER: 04-15-03

SAMPLE LOCATION

SAMPLE NUMBER: DH-2@0-5

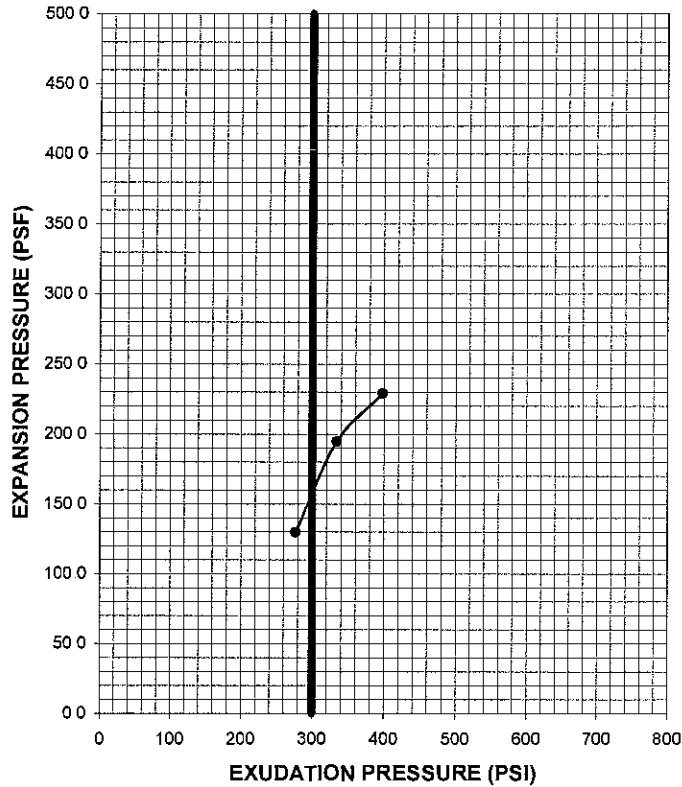
SAMPLE DESCRIPTION

TECHNICIAN: DVT

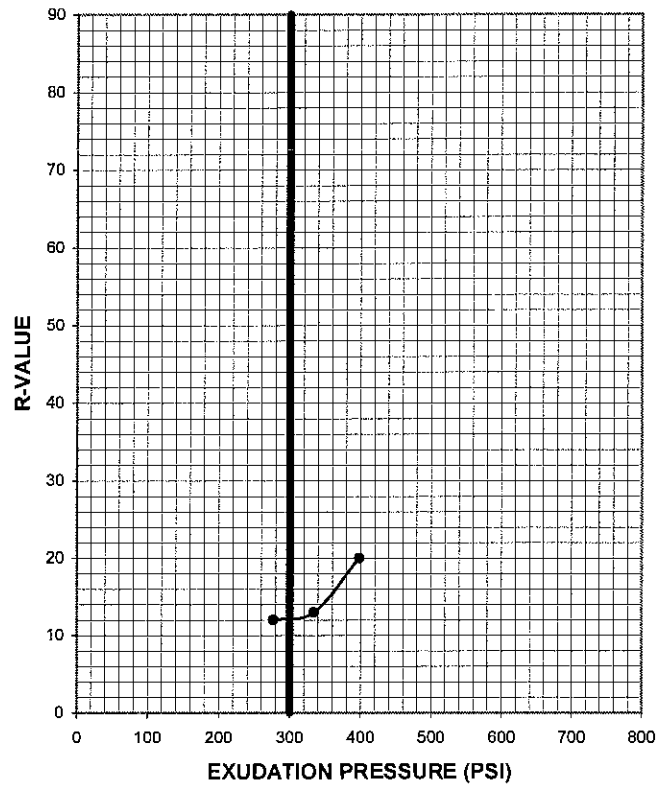
DATE SAMPLED 12/21/2006

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	15.5	16.6	17.7
WEIGHT OF SAMPLE, grams	1076	1067	1061
HEIGHT OF SAMPLE, Inches	2.55	2.53	2.55
DRY DENSITY, pcf	110.7	109.6	107.1
COMPACTOR AIR PRESSURE, psf	190	160	120
EXUDATION PRESSURE, psf	398	334	277
EXPANSION, Inches x 10 ^{exp-4}	53	45	30
STABILITY Ph 2,000 lbs (160 psi)	120	130	132
TURNS DISPLACEMENT	3.39	3.74	4.07
R-VALUE UNCORRECTED	20	13	12
R-VALUE CORRECTED	20	13	12

EXPANSION PRESSURE VS. EXUDATION PRESSURE

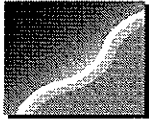


R-VALUE VS. EXUDATION PRESSURE



R-VALUE AT 300 PSI EXUDATION PRESSURE :	12
EXP. PRESSURE AT 300 PSI EXUDATION PRESSURE (PSF) :	160

PLATE B-6.2



R-VALUE TEST RESULTS

PROJECT NAME: EDGEWATER

PROJECT NUMBER: 04-15-03

SAMPLE LOCATIO: _____

SAMPLE NUMBER: DH-6@0-5

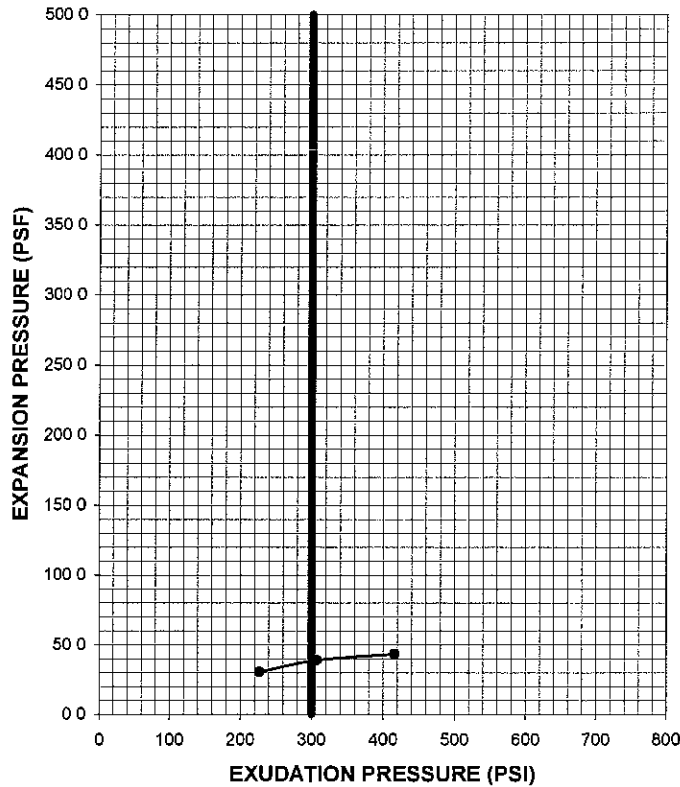
SAMPLE DESCRI: SC

TECHNICIAN: DVT

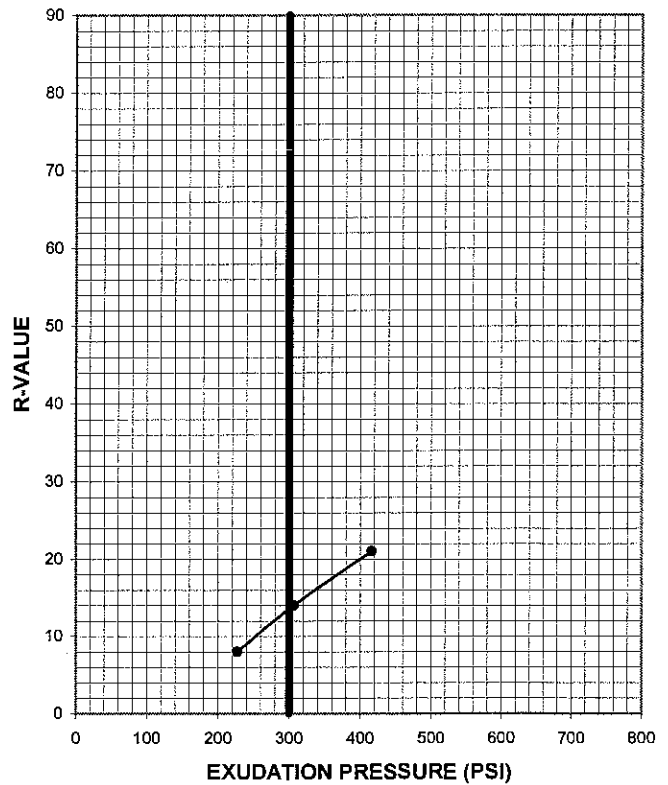
DATE SAMPLED: 12/21/2006

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	9.7	10.2	10.7
WEIGHT OF SAMPLE, grams	1094	1101	1097
HEIGHT OF SAMPLE, Inches	2.42	2.46	2.48
DRY DENSITY, pcf	124.9	123.1	121.0
COMPACTOR AIR PRESSURE, psf	240	200	130
EXUDATION PRESSURE, psf	416	307	227
EXPANSION, Inches x 10 ^{exp-4}	10	9	7
STABILITY Ph 2,000 lbs (160 psi)	118	130	140
TURNS DISPLACEMENT	3.14	3.62	4.17
R-VALUE UNCORRECTED	22	14	8
R-VALUE CORRECTED	21	14	8

EXPANSION PRESSURE VS. EXUDATION PRESSURE



R-VALUE VS. EXUDATION PRESSURE



R-VALUE AT 300 PSI EXUDATION PRESSURE :	14
EXP. PRESSURE AT 300 PSI EXUDATION PRESSURE (PSF) :	40



R-VALUE TEST RESULTS

PROJECT NAME: EDGEWATER

PROJECT NUMBER: 04-15-03

SAMPLE LOCATIO: _____

SAMPLE NUMBER: DH-8@0-5

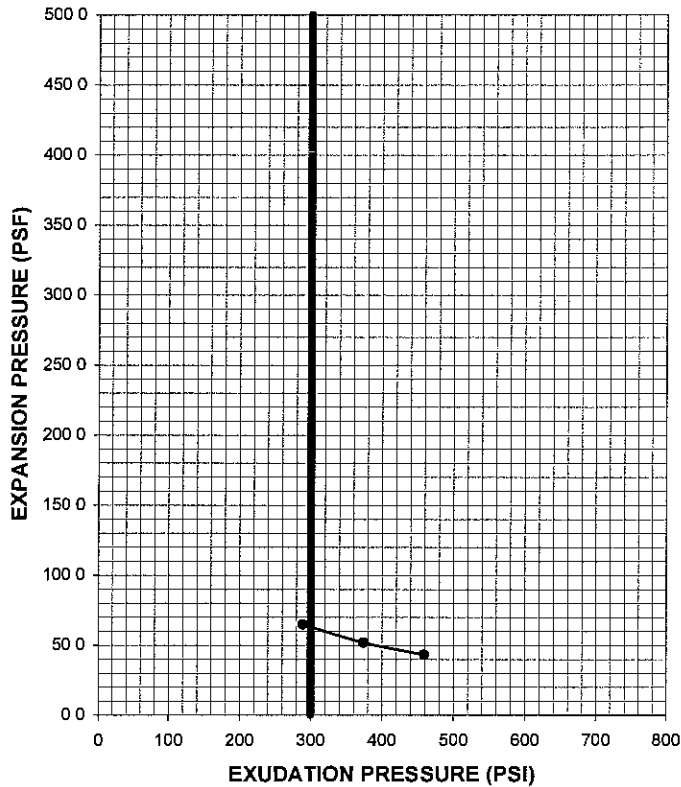
SAMPLE DESCRIP ML

TECHNICIAN: DVT

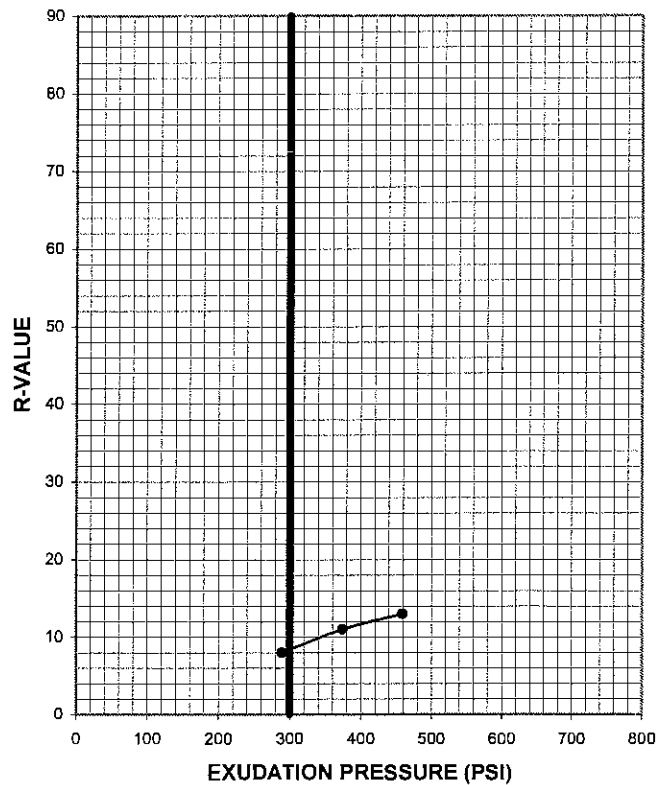
DATE SAMPLED 12/21/2006

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	15.1	16.2	17.3
WEIGHT OF SAMPLE, grams	1067	1054	1087
HEIGHT OF SAMPLE, Inches	2.55	2.54	2.44
DRY DENSITY, pcf	110.1	108.2	115.1
COMPACTOR AIR PRESSURE, psf	120	100	90
EXUDATION PRESSURE, psf	459	374	289
EXPANSION, Inches x 10exp-4	10	12	15
STABILITY Ph 2,000 lbs (160 psi)	132	136	140
TURNS DISPLACEMENT	3.45	3.73	3.80
R-VALUE UNCORRECTED	13	11	9
R-VALUE CORRECTED	13	11	8

EXPANSION PRESSURE VS. EXUDATION PRESSURE

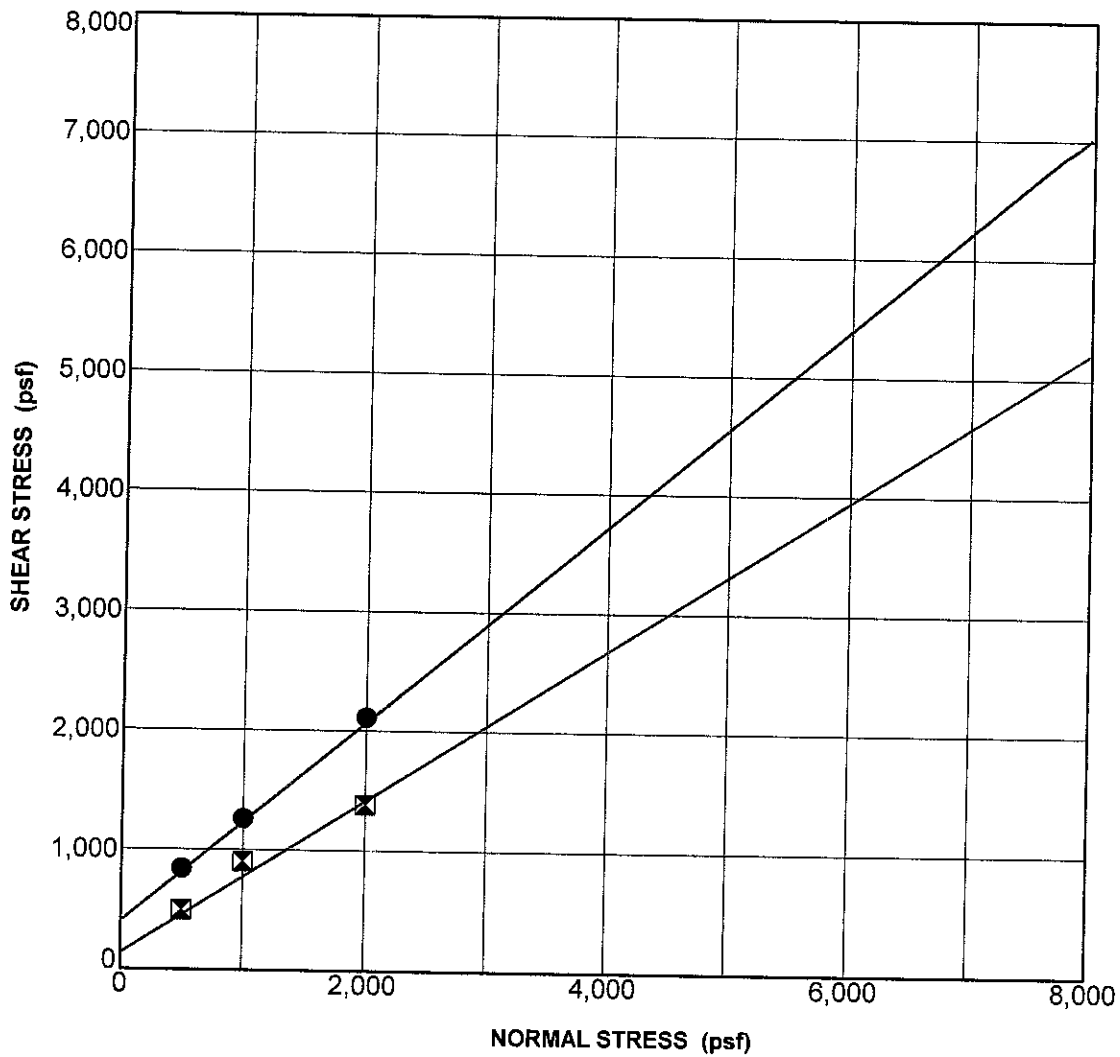


R-VALUE VS. EXUDATION PRESSURE



R-VALUE AT 300 PSI EXUDATION PRESSURE :	8
EXP. PRESSURE AT 300 PSI EXUDATION PRESSURE (PSF) :	65

PLATE B-6.4



SAMPLE AND TEST DESCRIPTION

Sample Location: DH-1 @ 50 ft	Geologic Unit: Qof
Test Description: IN-SITU SAMPLE, STRAIN RATE .001 IN/MIN	
Avg. Dry Density (pcf): 91	Avg. Moisture Content (%): 30 Avg. Saturation (%): 98

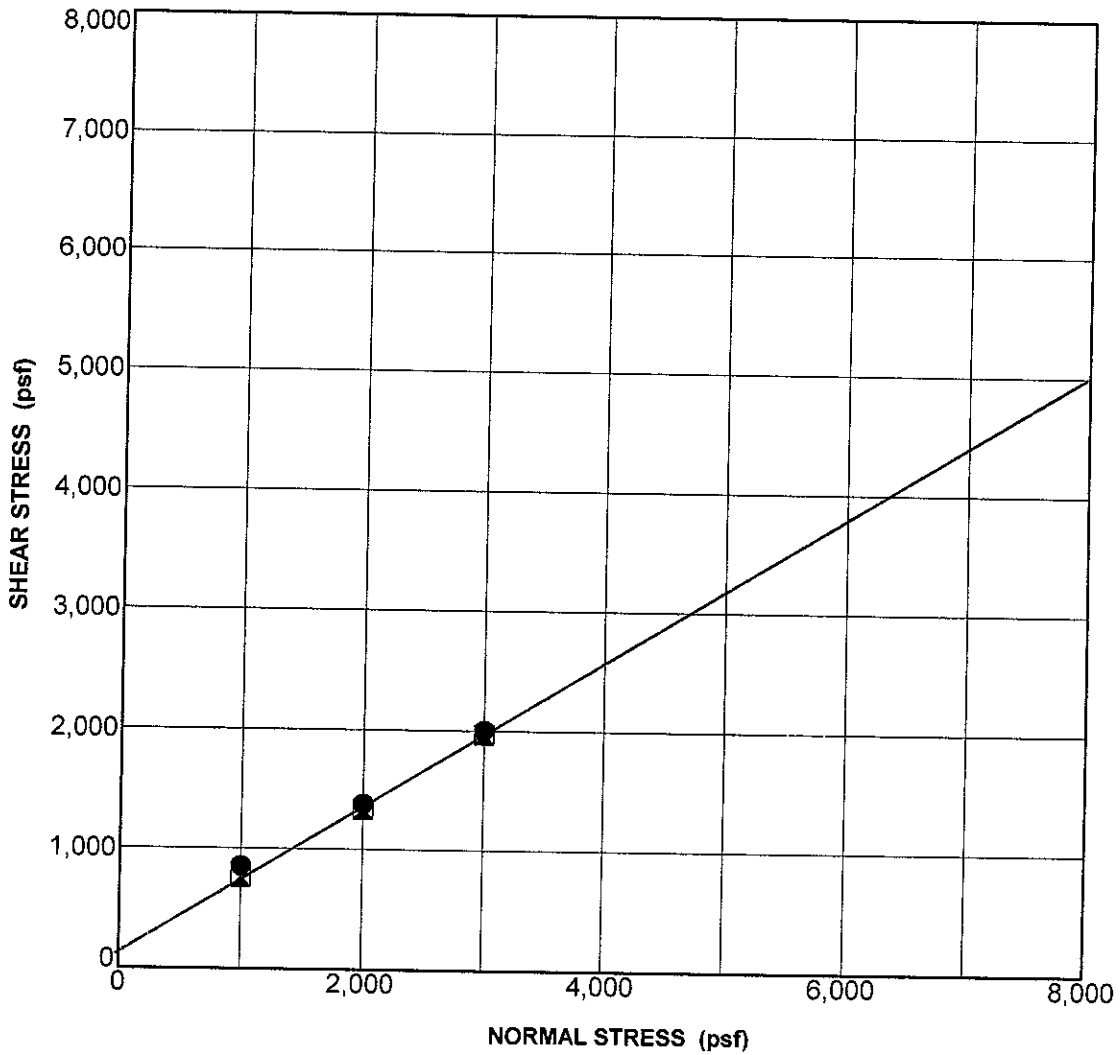
STRENGTH PARAMETERS

STRENGTH TYPE	COHESION (psf)	FRICTION ANGLE (degrees)
● Peak Strength	500	40 0
⊠ Ultimate Strength	200	31 0

SHEAR TEST DATA

Project: EDGEWATER/CHINO PROJECT
Project No. 04-15-03





SAMPLE AND TEST DESCRIPTION

Sample Location: DH-2 @ 0 0 ft	Geologic Unit: Qafu
Test Description: REMOLDED TO 90% COMPACTION, RUN AT 005 IN/MIN	
Avg. Dry Density (pcf): 100	Avg. Moisture Content (%): 22 Avg. Saturation (%): 88

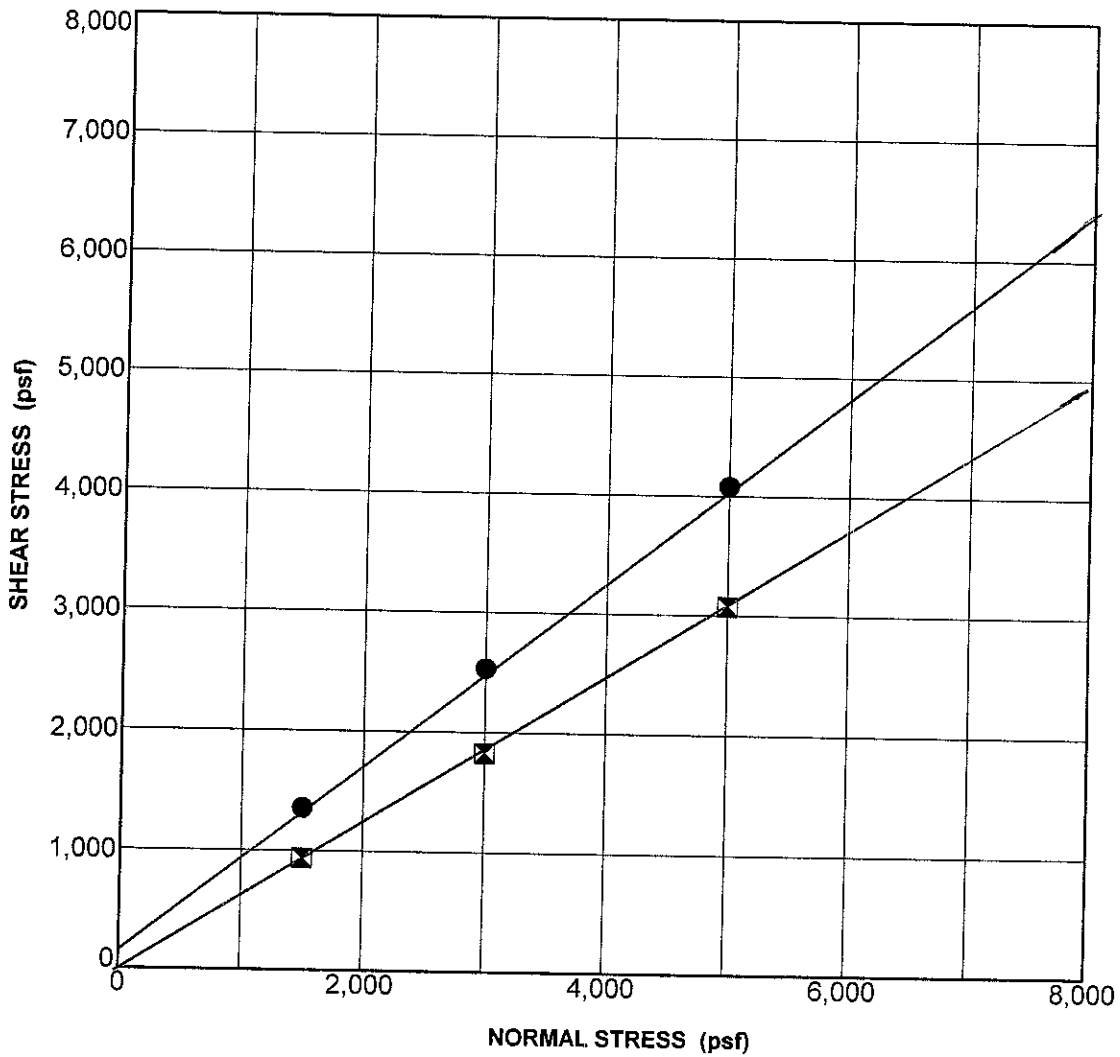
STRENGTH PARAMETERS

STRENGTH TYPE	COHESION (psf)	FRICION ANGLE (degrees)
● Peak Strength	250	30 0

SHEAR TEST DATA

Project: EDGEWATER/CHINO PROJECT
Project No 04-15-03





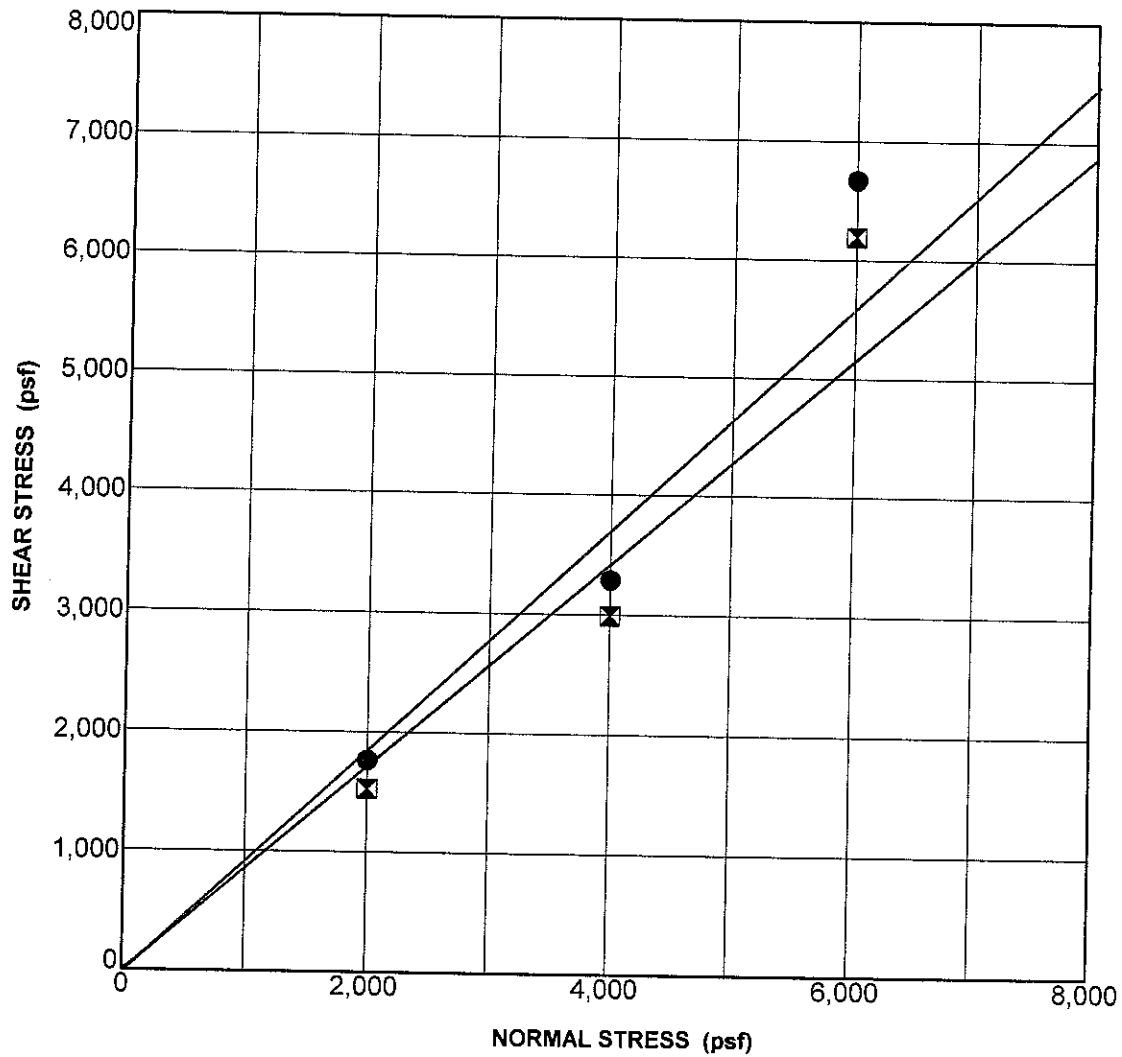
SAMPLE AND TEST DESCRIPTION		
Sample Location:	DH-3 @ 15.0 ft	Geologic Unit: Qof
Test Description:	IN-SITU SAMPLE, RUN AT 01 IN/MIN	
Avg. Dry Density (pcf):	101	Avg. Moisture Content (%): 22
		Avg. Saturation (%): 92

STRENGTH PARAMETERS		
STRENGTH TYPE	COHESION (psf)	FRICITION ANGLE (degrees)
● Peak Strength	300	37.0
⊠ Ultimate Strength	0	32.0

SHEAR TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No. 04-15-03





SAMPLE AND TEST DESCRIPTION

Sample Location: DH-4 @ 35.0 ft Geologic Unit: Qof
 Test Description: IN-SITU SAMPLE, RUN AT .01 IN/MIN
 Avg. Dry Density (pcf): 116 Avg. Moisture Content (%): 16 Avg. Saturation (%): 96

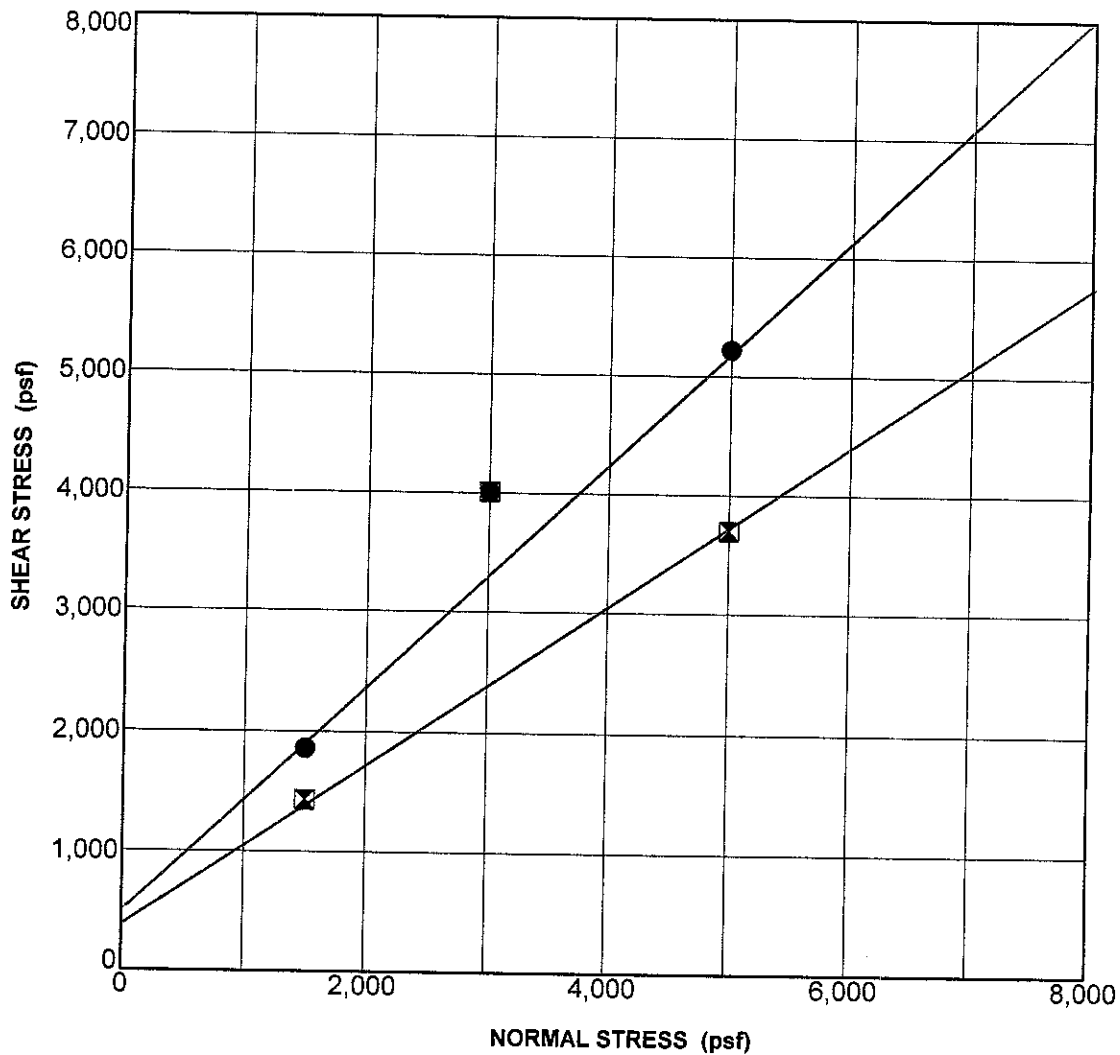
STRENGTH PARAMETERS

STRENGTH TYPE	COHESION (psf)	FRICTION ANGLE (degrees)
● Peak Strength	0	43.0
⊠ Ultimate Strength	0	38.0

SHEAR TEST DATA

Project: EDGEWATER/CHINO PROJECT
 Project No 04-15-03





SAMPLE AND TEST DESCRIPTION		
Sample Location:	DH-5 @ 15.0 ft	Geologic Unit: Qal
Test Description:	IN-SITU SAMPLE, RUN AT 01 IN/MIN	
Avg. Dry Density (pcf):	118	Avg. Moisture Content (%): 15
		Avg. Saturation (%): 97

STRENGTH PARAMETERS		
STRENGTH TYPE	COHESION (psf)	FRICTION ANGLE (degrees)
● Peak Strength	750	43.0
⊠ Ultimate Strength	500	37.0

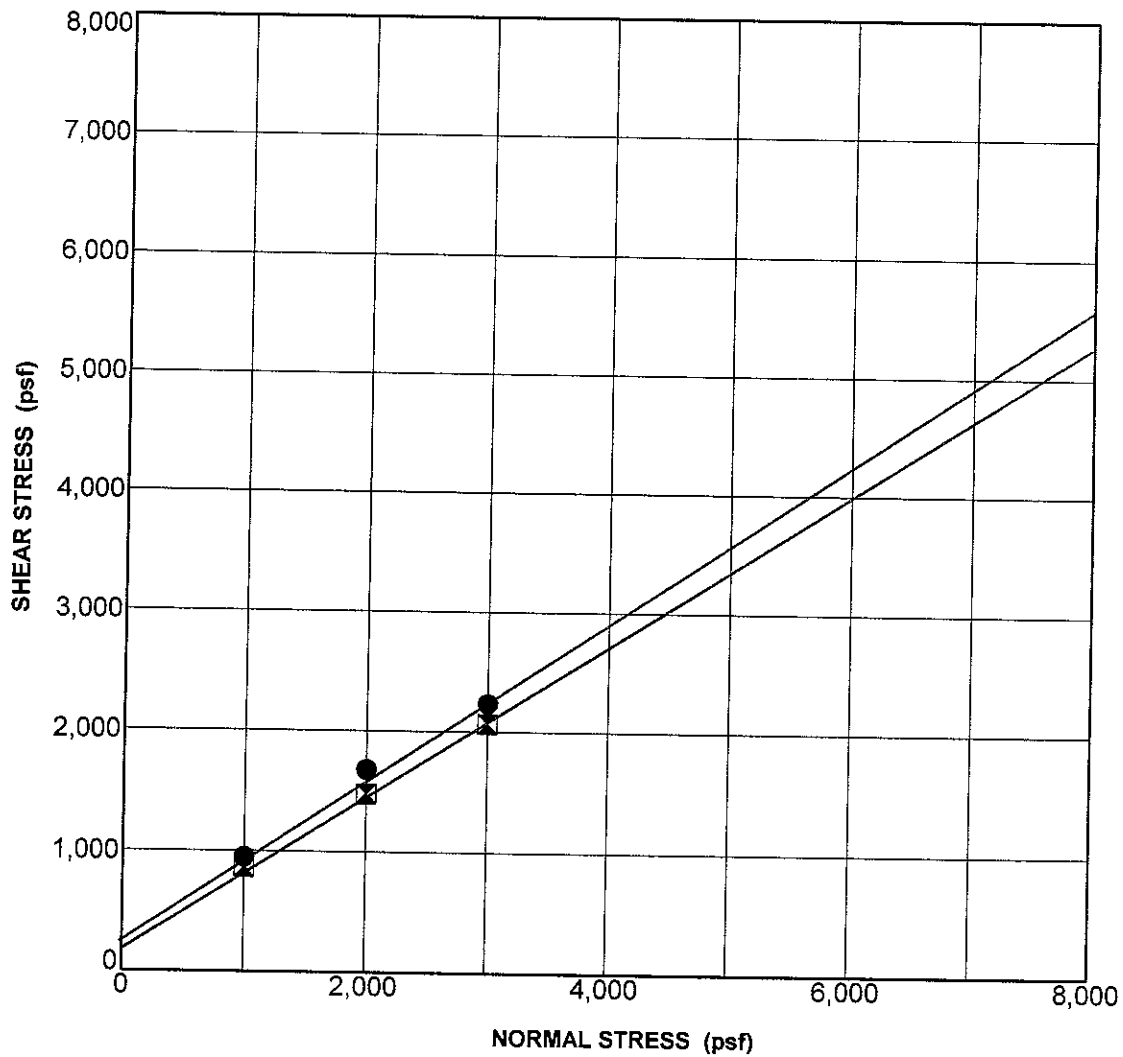
SHEAR TEST DATA

Project: EDGEWATER/CHINO PROJECT
Project No. 04-15-03

PLATE B-7.5

GMU_DIRECT_SHEAR_OLD_04-15-00.GPJ GM&U.GDT 3/13/07





SAMPLE AND TEST DESCRIPTION

Sample Location: DH-6 @ 0.0 ft	Geologic Unit: Qof
Test Description: REMOLDED TO 90% COMPACTION, RUN AT 005 IN/MIN	
Avg. Dry Density (pcf): 115	Avg. Moisture Content (%): 16 Avg. Saturation (%): 95

STRENGTH PARAMETERS

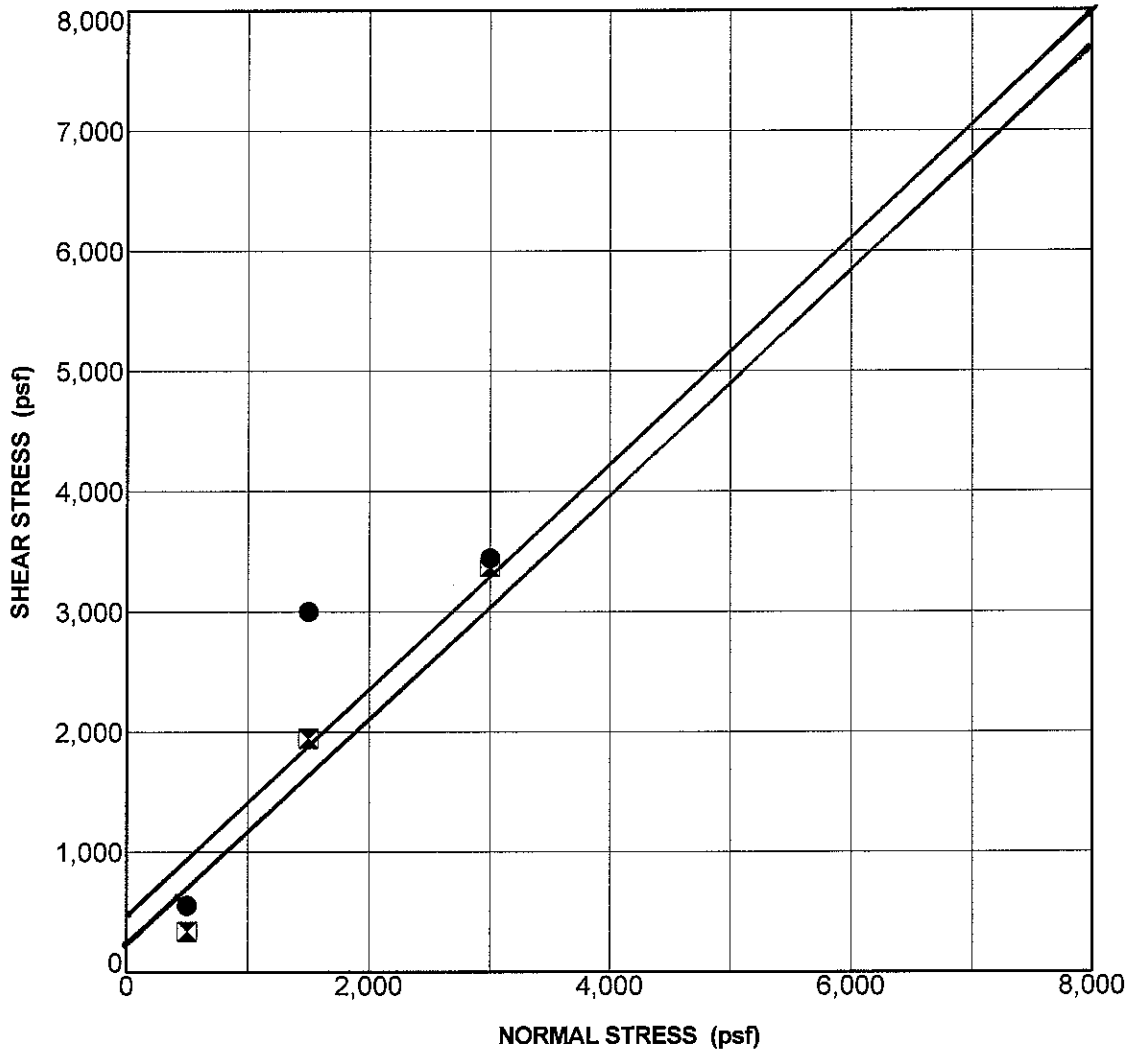
STRENGTH TYPE	COHESION (psf)	FRICITION ANGLE (degrees)
● Peak Strength	300	31.0
⊠ Ultimate Strength	250	30.0

SHEAR TEST DATA

Project: EDGEWATER/CHINO PROJECT
Project No. 04-15-03



GMU_DIRECT_SHEAR_OLD 04-15-00.GPJ GM&U.GDT 3/13/07



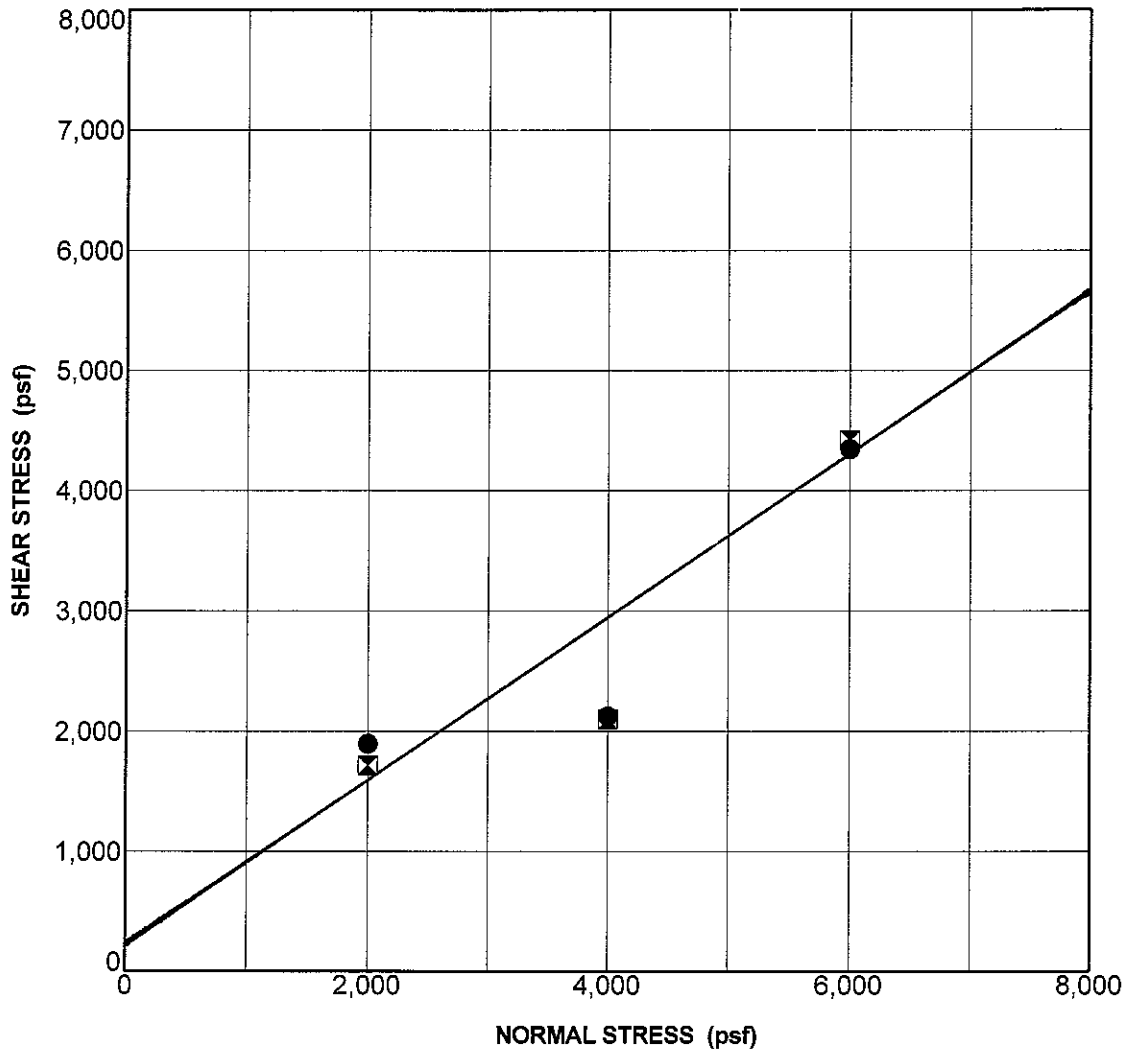
SAMPLE AND TEST DESCRIPTION		
Sample Location: DH-6 @ 5.0 ft	Geologic Unit: Qof	
Test Description: SLIGHTLY DISTURBED SAMPLES, IN-SITU SAMPLE, RUN AT 01 IN/MIN		
Avg. Dry Density (pcf): 115	Avg. Moisture Content (%): 13	Avg. Saturation (%): 76

STRENGTH PARAMETERS		
STRENGTH TYPE	COHESION (psf)	FRICTION ANGLE (degrees)
● Peak Strength	500	43.0
☒ Ultimate Strength	200	43.0

SHEAR TEST DATA

Project: EDGEWATER/CHINO PROJECT
Project No. 04-15-03

GMU_DIRECT_SHEAR_OLD 04-15-00.GPJ GM&U.GDT 08/15/07



SAMPLE AND TEST DESCRIPTION		
Sample Location:	DH-6 @ 25.0 ft	Geologic Unit: Qof
Test Description:	SLIGHTLY DISTURBED SAMPLES, IN-SITU SAMPLE, RUN AT .01 IN/MIN	
Avg. Dry Density (pcf):	99	Avg. Moisture Content (%): 17
		Avg. Saturation (%): 66

STRENGTH PARAMETERS		
STRENGTH TYPE	COHESION (psf)	FRICTION ANGLE (degrees)
● Peak Strength	200	33.0
☒ Ultimate Strength	200	33.0

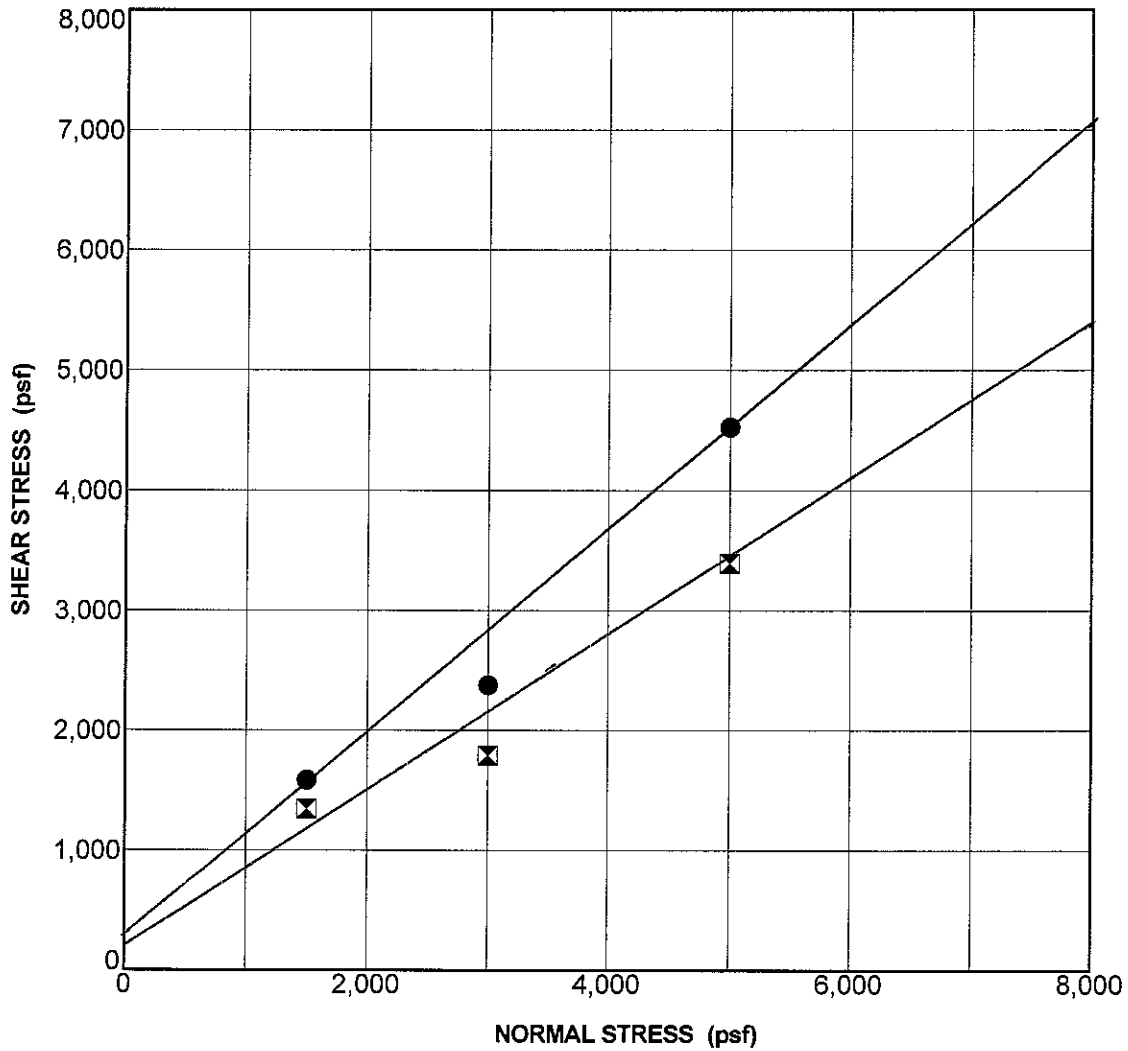
SHEAR TEST DATA

Project: EDGEWATER/CHINO PROJECT
Project No 04-15-03

PLATE B-7.8



GMU_DIRECT_SHEAR_OLD_04-15-00.GPJ GM&SU_GDT_03/14/07



SAMPLE AND TEST DESCRIPTION		
Sample Location: DH-8 @ 15.0 ft	Geologic Unit: Qof	
Test Description: IN-SITU SAMPLE, RUN AT .01 IN/MIN		
Avg. Dry Density (pcf): 111	Avg. Moisture Content (%): 16	Avg. Saturation (%): 86

STRENGTH PARAMETERS		
STRENGTH TYPE	COHESION (psf)	FRICTION ANGLE (degrees)
● Peak Strength	300	38.0
☒ Ultimate Strength	250	31.0

SHEAR TEST DATA

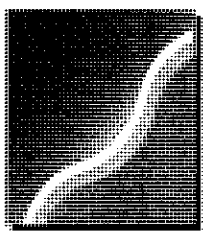
Project: EDGEWATER/CHINO PROJECT
Project No 04-15-03



ORGANIC CONTENT (D-2974)ASTM

BORING	DEPTH (FT.)	IN-SITU MOISTURE (%)	ORGANIC CONTENT (%)
DH-1	15	22.3	1.70
DH-1	0-9	15.9	1.00
DH-2	0-5'	12.5	3.00
DH-2	5	11.3	1.00
DH-3	5	20.8	1.00
DH-4	5	14.0	1.60
DH-6	0-7	8.4	2.50
DH-6	15	5.9	1.10
DH-8	0-5	10.9	5.10
TP-1	2	12.8	1.40
TP-2	4	12.6	1.50
TP-5	6	8.8	1.90
TP-6	8	17.3	1.60
TP-9	2	15.7	1.50
TP-10	4	21.0	3.10
TP-11	2	28.5	6.70

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2974



GMU

GEOTECHNICAL, INC.

EDGEWATER
CHINO HILLS
04-15-03

PLATE B-8

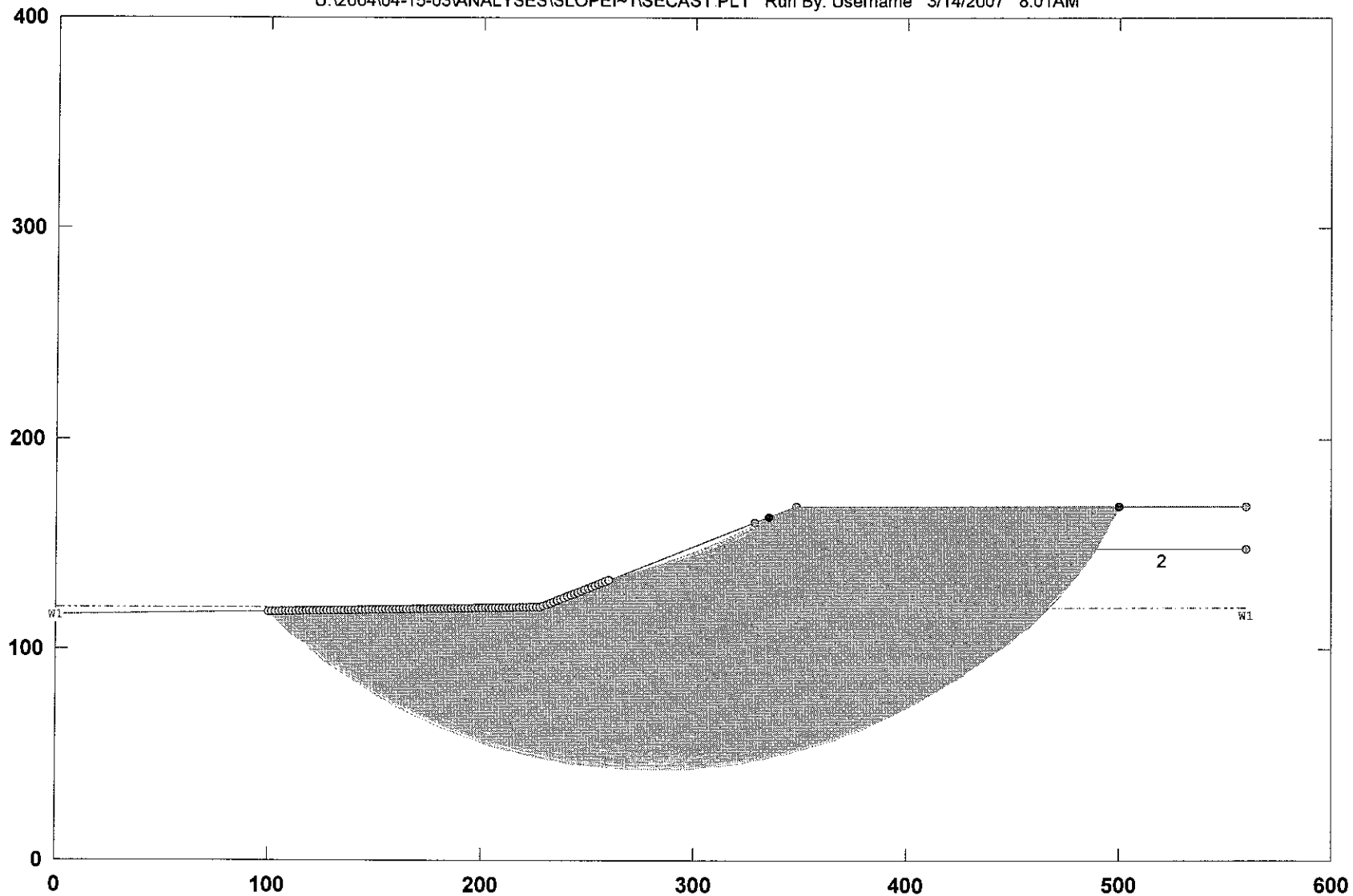
APPENDIX C

Slope Stability Analyses



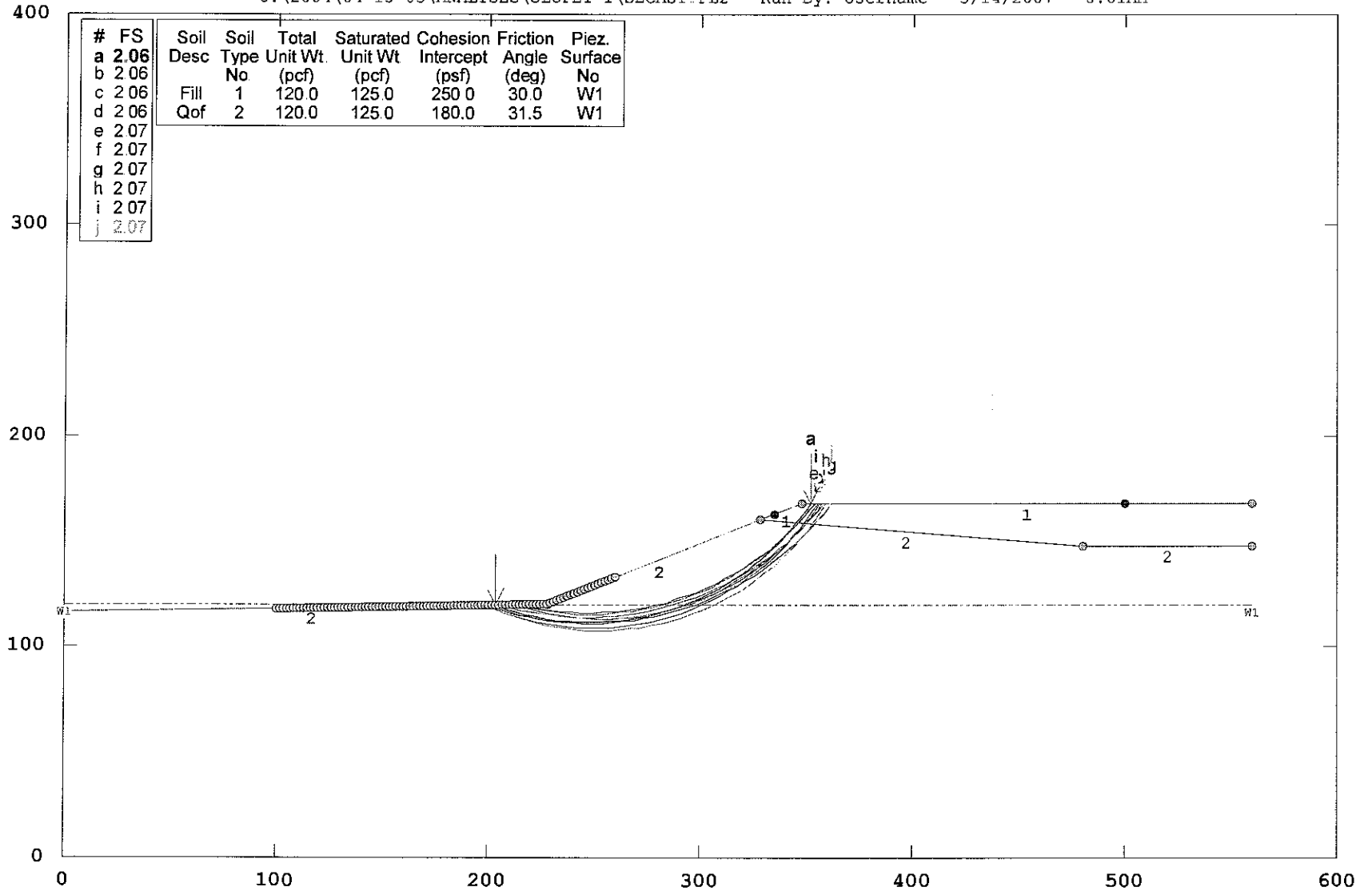
Section A-A' - Static

U:\2004\04-15-03\ANALYSES\SLOPEI~1\SECAST.PLT Run By: Username 3/14/2007 8:01AM



Section A-A' - Static

U:\2004\04-15-03\ANALYSES\SLOPEI-1\SECAST.PL2 Run By: Username 3/14/2007 8:01AM



GSTABL7 v.2 FSmin=2.06
Safety Factors Are Calculated By The Modified Bishop Method



*** GSTABL7 ***

** GSTABL7 by Garry H. Gregory, P.E. **

** Original Version 1.0, January 1996; Current Version 2.002, December 2001 **
 (All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
 (Includes Spencer & Morgenstern-Price Type Analysis)
 Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
 Nonlinear Undrained Shear Strength, Curved Phi Envelope,
 Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
 Surfaces, Pseudo-Static Earthquake, and Applied Force Options.

Analysis Run Date: 3/14/2007
 Time of Run: 8:01AM
 Run By: Username
 Input Data Filename: U:SECAST.
 Output Filename: U:SECAST.OUT
 Unit System: English
 Plotted Output Filename: U:SECAST.PLT
 PROBLEM DESCRIPTION: Section A-A' - Static

BOUNDARY COORDINATES

4 Top Boundaries
 6 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	116.00	228.00	120.00	2
2	228.00	120.00	328.00	160.00	2
3	328.00	160.00	348.00	168.00	1
4	348.00	168.00	560.00	168.00	1
5	328.00	160.00	480.00	148.00	2
6	480.00	148.00	560.00	148.00	2

Default Y-Origin = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param. (psf)	Pressure Constant (psf)	Piez. Surface No.
1	120.0	125.0	250.0	30.0	0.00	0.0	1
2	120.0	125.0	180.0	31.5	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED

Unit Weight of Water = 62.40 (pcf)
 Piezometric Surface No. 1 Specified by 2 Coordinate Points
 Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	120.00
2	560.00	120.00

A Critical Failure Surface Searching Method, Using A Random
 Technique For Generating Circular Surfaces, Has Been Specified.
 5000 Trial Surfaces Have Been Generated.

50 Surface(s) Initiate(s) From Each Of 100 Points Equally Spaced
 Along The Ground Surface Between X = 100.00(ft)
 and X = 260.00(ft)
 Each Surface Terminates Between X = 335.00(ft)
 and X = 500.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation
 At Which A Surface Extends Is Y = 0.00(ft)
 5.00(ft) Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial
 Failure Surfaces Evaluated. They Are
 Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Total Number of Trial Surfaces Evaluated = 5000

Statistical Data On All Valid FS Values:

FS Max = 6.422 FS Min = 2.059 FS Ave = 3.051
 Standard Deviation = 0.667 Coefficient of Variation = 21.85 %

Failure Surface Specified By 35 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.44	119.57
2	208.14	117.87
3	212.90	116.36
4	217.73	115.05
5	222.60	113.93
6	227.52	113.01
7	232.46	112.28
8	237.44	111.76
9	242.43	111.44
10	247.42	111.32
11	252.42	111.40
12	257.42	111.69
13	262.39	112.17
14	267.35	112.86
15	272.27	113.74
16	277.15	114.82
17	281.98	116.10
18	286.76	117.57
19	291.48	119.24
20	296.12	121.09
21	300.69	123.13
22	305.16	125.35
23	309.55	127.75
24	313.84	130.32
25	318.02	133.07
26	322.08	135.98
27	326.02	139.05
28	329.84	142.28
29	333.52	145.67
30	337.07	149.19
31	340.47	152.86
32	343.72	156.66
33	346.81	160.59
34	349.74	164.64
35	351.97	168.00

Circle Center At X = 247.89 ; Y = 235.25 ; and Radius = 123.93

Factor of Safety

*** 2.059 ***

Individual data on the 39 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force		Tie Force		Earthquake Force		
			Top (lbs)	Bot (lbs)	Norm (lbs)	Tan (lbs)	Hor (lbs)	Ver (lbs)	Surcharge Load (lbs)
1	4.7	523.6	114.4	399.5	0.	0.	0.0	0.0	0.0
2	4.8	1535.9	91.2	899.9	0.	0.	0.0	0.0	0.0
3	4.8	2456.1	67.0	1340.2	0.	0.	0.0	0.0	0.0
4	4.9	3274.1	41.8	1719.8	0.	0.	0.0	0.0	0.0
5	4.9	3981.1	15.8	2038.1	0.	0.	0.0	0.0	0.0
6	0.5	424.7	0.1	214.4	0.	0.	0.0	0.0	0.0
7	4.5	4601.5	0.0	2080.2	0.	0.	0.0	0.0	0.0
8	5.0	6617.1	0.0	2488.7	0.	0.	0.0	0.0	0.0
9	5.0	8095.8	0.0	2620.3	0.	0.	0.0	0.0	0.0
10	5.0	9446.2	0.0	2689.1	0.	0.	0.0	0.0	0.0
11	5.0	10659.1	0.0	2695.0	0.	0.	0.0	0.0	0.0
12	5.0	11726.3	0.0	2638.0	0.	0.	0.0	0.0	0.0
13	5.0	12641.4	0.0	2518.1	0.	0.	0.0	0.0	0.0
14	5.0	13399.6	0.0	2335.6	0.	0.	0.0	0.0	0.0
15	4.9	13997.4	0.0	2090.8	0.	0.	0.0	0.0	0.0
16	4.9	14433.1	0.0	1784.0	0.	0.	0.0	0.0	0.0
17	4.8	14706.3	0.0	1415.8	0.	0.	0.0	0.0	0.0
18	4.8	14818.4	0.0	986.8	0.	0.	0.0	0.0	0.0
19	4.7	14772.5	0.0	497.6	0.	0.	0.0	0.0	0.0
20	1.9	6006.7	0.0	49.0	0.	0.	0.0	0.0	0.0
21	2.7	8573.5	0.0	0.0	0.	0.	0.0	0.0	0.0

22	4.6	14273.4	0.0	0.0	0.	0.	0.0	0.0	0.0
23	4.5	13832.5	0.0	0.0	0.	0.	0.0	0.0	0.0
24	4.4	13261.9	0.0	0.0	0.	0.	0.0	0.0	0.0
25	4.3	12571.3	0.0	0.0	0.	0.	0.0	0.0	0.0
26	4.2	11771.5	0.0	0.0	0.	0.	0.0	0.0	0.0
27	4.1	10874.3	0.0	0.0	0.	0.	0.0	0.0	0.0
28	3.9	9893.0	0.0	0.0	0.	0.	0.0	0.0	0.0
29	2.0	4673.3	0.0	0.0	0.	0.	0.0	0.0	0.0
30	1.8	4168.0	0.0	0.0	0.	0.	0.0	0.0	0.0
31	3.7	7734.1	0.0	0.0	0.	0.	0.0	0.0	0.0
32	3.5	6587.1	0.0	0.0	0.	0.	0.0	0.0	0.0
33	3.4	5416.5	0.0	0.0	0.	0.	0.0	0.0	0.0
34	3.2	4238.9	0.0	0.0	0.	0.	0.0	0.0	0.0
35	1.6	1669.0	0.0	0.0	0.	0.	0.0	0.0	0.0
36	1.5	1402.6	0.0	0.0	0.	0.	0.0	0.0	0.0
37	1.2	908.5	0.0	0.0	0.	0.	0.0	0.0	0.0
38	1.7	951.0	0.0	0.0	0.	0.	0.0	0.0	0.0
39	2.2	449.2	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 37 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	198.59	119.48
2	203.18	117.52
3	207.86	115.74
4	212.60	114.15
5	217.40	112.75
6	222.25	111.55
7	227.15	110.54
8	232.08	109.74
9	237.05	109.13
10	242.03	108.73
11	247.03	108.53
12	252.03	108.53
13	257.02	108.73
14	262.01	109.13
15	266.97	109.73
16	271.90	110.54
17	276.80	111.54
18	281.66	112.74
19	286.46	114.13
20	291.20	115.72
21	295.87	117.50
22	300.47	119.47
23	304.98	121.62
24	309.41	123.95
25	313.73	126.45
26	317.95	129.13
27	322.06	131.98
28	326.06	134.99
29	329.92	138.16
30	333.66	141.49
31	337.25	144.96
32	340.71	148.58
33	344.01	152.33
34	347.16	156.21
35	350.15	160.22
36	352.98	164.34
37	355.28	168.00

Circle Center At X = 249.55 ; Y = 232.22 ; and Radius = 123.72

Factor of Safety

*** 2.062 ***

Failure Surface Specified By 37 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	198.59	119.48
2	203.31	117.86
3	208.10	116.40

4	212.93	115.12
5	217.81	114.01
6	222.72	113.08
7	227.66	112.33
8	232.63	111.77
9	237.62	111.38
10	242.61	111.17
11	247.61	111.14
12	252.61	111.30
13	257.60	111.64
14	262.57	112.15
15	267.52	112.85
16	272.44	113.73
17	277.33	114.78
18	282.18	116.02
19	286.98	117.42
20	291.72	119.00
21	296.40	120.75
22	301.02	122.67
23	305.56	124.76
24	310.03	127.01
25	314.41	129.42
26	318.70	131.99
27	322.89	134.71
28	326.99	137.58
29	330.97	140.60
30	334.85	143.76
31	338.60	147.06
32	342.24	150.49
33	345.75	154.06
34	349.12	157.74
35	352.36	161.55
36	355.46	165.48
37	357.31	168.00

Circle Center At X = 245.82 ; Y = 248.90 ; and Radius = 137.76

Factor of Safety
 *** 2.063 ***

Failure Surface Specified By 34 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	213.13	119.74
2	217.89	118.20
3	222.71	116.86
4	227.57	115.71
5	232.48	114.76
6	237.42	114.00
7	242.39	113.45
8	247.38	113.10
9	252.38	112.96
10	257.38	113.01
11	262.37	113.27
12	267.35	113.72
13	272.31	114.38
14	277.23	115.24
15	282.12	116.30
16	286.96	117.56
17	291.74	119.00
18	296.47	120.65
19	301.12	122.48
20	305.70	124.49
21	310.18	126.70
22	314.58	129.08
23	318.88	131.63
24	323.07	134.36
25	327.14	137.26
26	331.10	140.32
27	334.93	143.53

28	338.63	146.90
29	342.18	150.41
30	345.59	154.07
31	348.85	157.86
32	351.96	161.78
33	354.90	165.82
34	356.36	168.00

Circle Center At X = 253.53 ; Y = 236.50 ; and Radius = 123.56
 Factor of Safety
 *** 2.064 ***

Failure Surface Specified By 33 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	213.13	119.74
2	217.98	118.51
3	222.87	117.46
4	227.79	116.60
5	232.75	115.93
6	237.72	115.44
7	242.72	115.15
8	247.71	115.04
9	252.71	115.13
10	257.71	115.40
11	262.68	115.86
12	267.64	116.52
13	272.57	117.35
14	277.46	118.38
15	282.32	119.59
16	287.12	120.98
17	291.86	122.56
18	296.55	124.31
19	301.16	126.24
20	305.69	128.35
21	310.15	130.62
22	314.51	133.06
23	318.78	135.67
24	322.94	138.43
25	327.00	141.35
26	330.95	144.43
27	334.77	147.65
28	338.47	151.01
29	342.04	154.51
30	345.47	158.14
31	348.77	161.91
32	351.92	165.79
33	353.57	168.00

Circle Center At X = 248.00 ; Y = 246.82 ; and Radius = 131.78
 Factor of Safety
 *** 2.068 ***

Failure Surface Specified By 36 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	205.05	119.60
2	209.87	118.25
3	214.72	117.07
4	219.62	116.06
5	224.55	115.22
6	229.51	114.56
7	234.48	114.06
8	239.47	113.75
9	244.47	113.61
10	249.47	113.64
11	254.47	113.85
12	259.45	114.23
13	264.42	114.79
14	269.37	115.52
15	274.28	116.42

16	279.17	117.50
17	284.01	118.74
18	288.81	120.16
19	293.55	121.74
20	298.23	123.48
21	302.86	125.39
22	307.41	127.46
23	311.88	129.69
24	316.28	132.07
25	320.59	134.60
26	324.81	137.29
27	328.93	140.12
28	332.95	143.09
29	336.87	146.20
30	340.67	149.45
31	344.35	152.83
32	347.92	156.33
33	351.36	159.96
34	354.68	163.70
35	357.85	167.56
36	358.19	168.00

Circle Center At X = 246.02 ; Y = 256.44 ; and Radius = 142.85

Factor of Safety

*** 2.068 ***

Failure Surface Specified By 38 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	200.20	119.51
2	204.92	117.87
3	209.70	116.39
4	214.53	115.08
5	219.40	113.95
6	224.30	112.99
7	229.24	112.20
8	234.20	111.59
9	239.19	111.16
10	244.18	110.91
11	249.18	110.84
12	254.18	110.94
13	259.17	111.22
14	264.15	111.68
15	269.11	112.32
16	274.04	113.13
17	278.94	114.12
18	283.81	115.28
19	288.62	116.62
20	293.39	118.13
21	298.10	119.80
22	302.75	121.64
23	307.33	123.65
24	311.84	125.82
25	316.26	128.15
26	320.60	130.63
27	324.85	133.27
28	329.00	136.05
29	333.05	138.99
30	336.99	142.06
31	340.82	145.27
32	344.54	148.62
33	348.13	152.10
34	351.59	155.71
35	354.93	159.43
36	358.13	163.27
37	361.19	167.23
38	361.74	168.00

Circle Center At X = 248.76 ; Y = 251.06 ; and Radius = 140.23

Factor of Safety

*** 2.070 ***
 Failure Surface Specified By 38 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	198.59	119.48
2	203.14	117.42
3	207.78	115.55
4	212.48	113.85
5	217.25	112.35
6	222.08	111.05
7	226.95	109.93
8	231.87	109.01
9	236.81	108.29
10	241.79	107.77
11	246.78	107.45
12	251.77	107.33
13	256.77	107.41
14	261.77	107.68
15	266.74	108.16
16	271.70	108.84
17	276.62	109.71
18	281.50	110.79
19	286.34	112.05
20	291.12	113.51
21	295.84	115.16
22	300.49	117.00
23	305.07	119.02
24	309.56	121.22
25	313.95	123.60
26	318.25	126.16
27	322.44	128.88
28	326.52	131.77
29	330.48	134.83
30	334.32	138.03
31	338.02	141.39
32	341.59	144.90
33	345.01	148.54
34	348.28	152.32
35	351.40	156.23
36	354.37	160.26
37	357.16	164.40
38	359.39	168.00

Circle Center At X = 252.32 ; Y = 232.13 ; and Radius = 124.81

Factor of Safety
 *** 2.070 ***

Failure Surface Specified By 33 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	214.75	119.77
2	219.62	118.64
3	224.53	117.69
4	229.47	116.92
5	234.44	116.34
6	239.42	115.95
7	244.42	115.74
8	249.42	115.72
9	254.41	115.88
10	259.40	116.23
11	264.37	116.76
12	269.32	117.48
13	274.24	118.38
14	279.12	119.47
15	283.96	120.73
16	288.74	122.18
17	293.47	123.80
18	298.14	125.59
19	302.73	127.56

20	307.25	129.70
21	311.69	132.01
22	316.04	134.47
23	320.29	137.10
24	324.44	139.89
25	328.49	142.83
26	332.42	145.91
27	336.24	149.14
28	339.93	152.51
29	343.50	156.02
30	346.93	159.66
31	350.23	163.42
32	353.38	167.30
33	353.91	168.00

Circle Center At X = 247.55 ; Y = 250.04 ; and Radius = 134.34

Factor of Safety

*** 2.072 ***

Failure Surface Specified By 36 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	209.90	119.68
2	214.68	118.22
3	219.51	116.93
4	224.39	115.82
5	229.30	114.89
6	234.24	114.14
7	239.21	113.57
8	244.20	113.19
9	249.19	112.98
10	254.19	112.96
11	259.19	113.13
12	264.18	113.48
13	269.15	114.01
14	274.10	114.72
15	279.02	115.61
16	283.90	116.69
17	288.74	117.94
18	293.53	119.37
19	298.27	120.97
20	302.94	122.75
21	307.55	124.69
22	312.08	126.81
23	316.53	129.08
24	320.89	131.52
25	325.17	134.12
26	329.34	136.88
27	333.41	139.78
28	337.37	142.83
29	341.22	146.03
30	344.94	149.36
31	348.54	152.83
32	352.01	156.43
33	355.35	160.15
34	358.55	164.00
35	361.61	167.95
36	361.64	168.00

Circle Center At X = 252.21 ; Y = 249.24 ; and Radius = 136.29

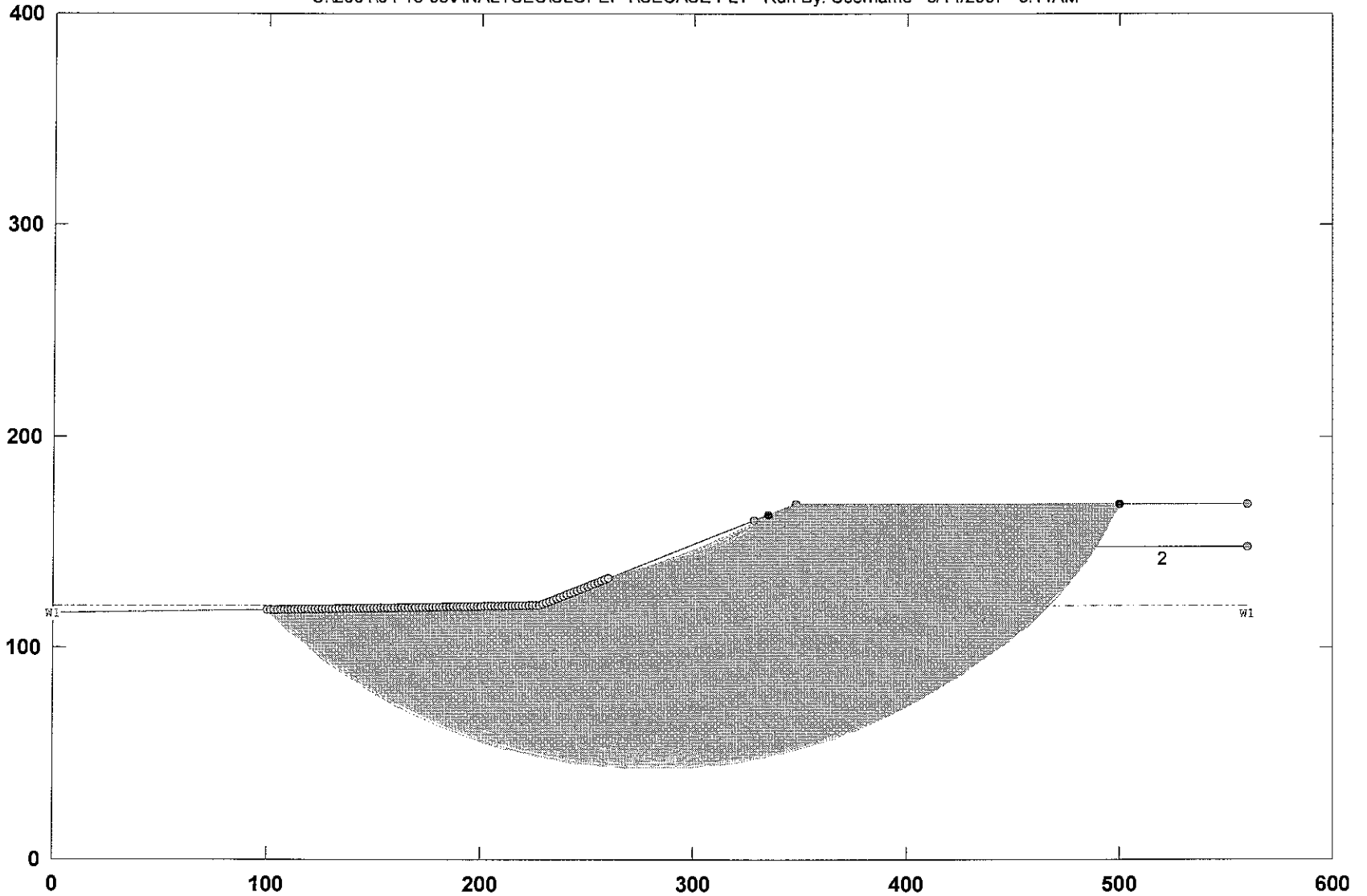
Factor of Safety

*** 2.074 ***

**** END OF GSTABL7 OUTPUT ****

Section A-A' - Seismic

U:\2004\04-15-03\ANALYSES\SLOPEI~1\SECASE PLT Run By: Username 3/14/2007 8:11AM

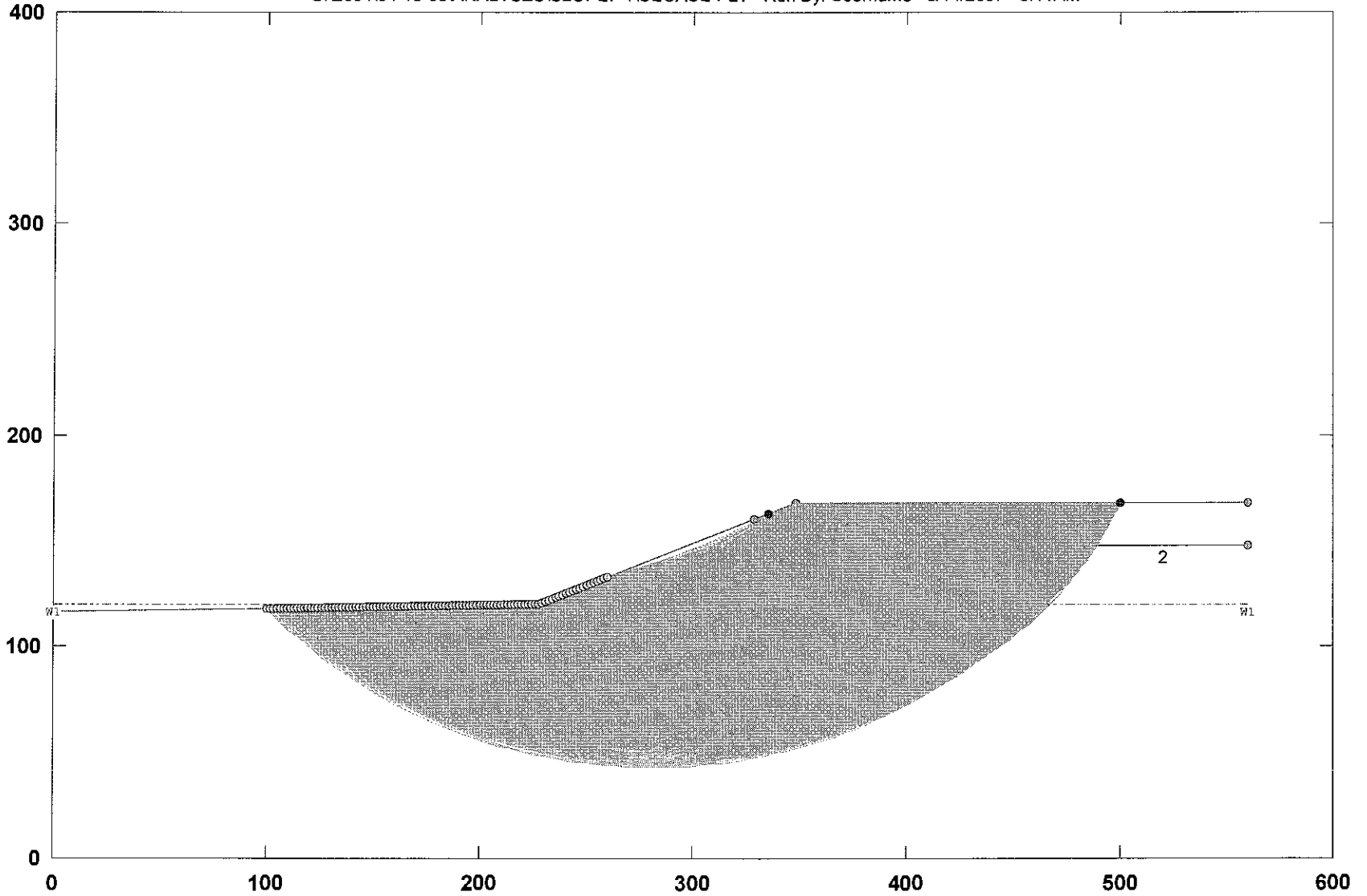


GSTABL7



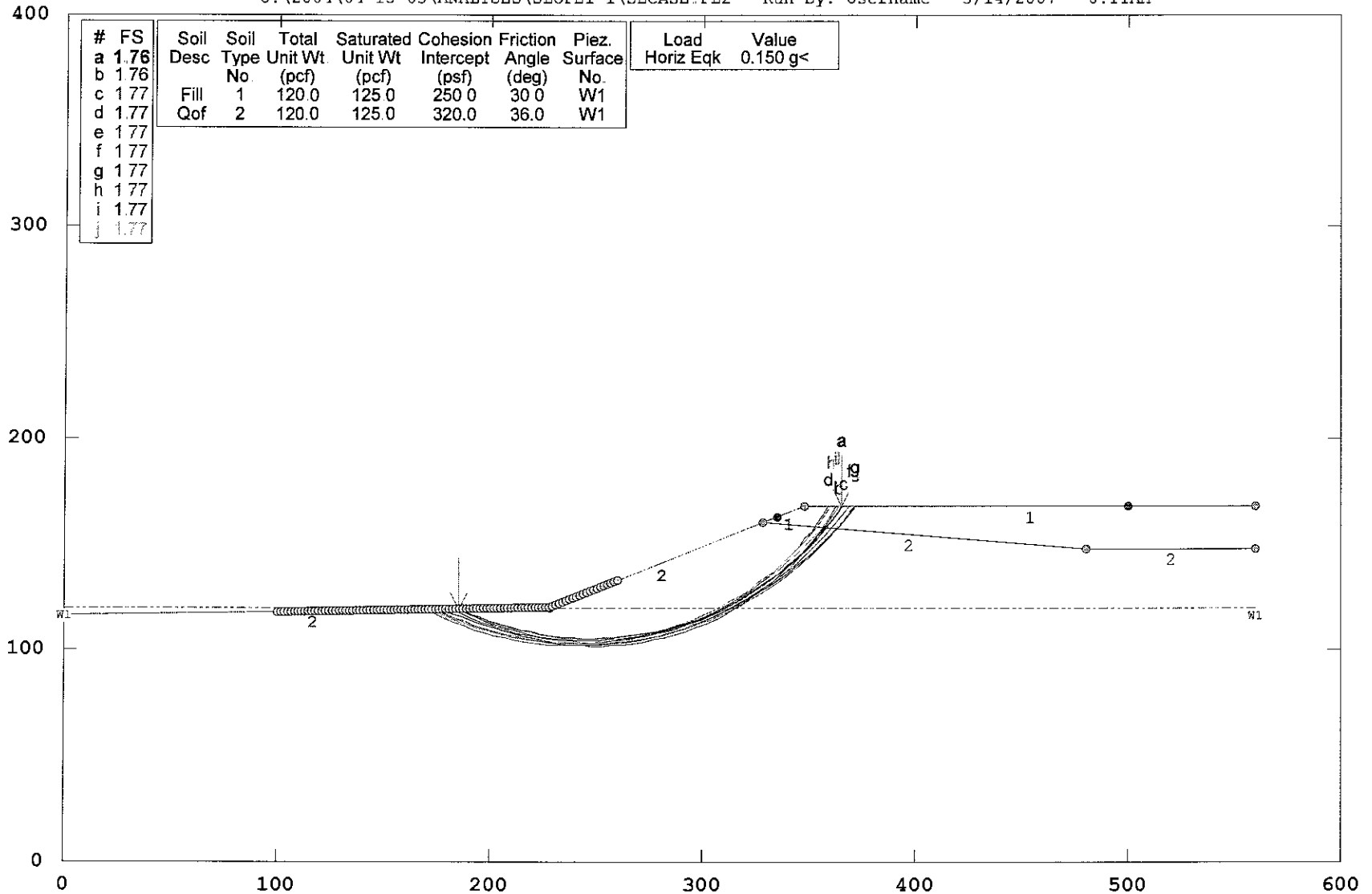
Section A-A' - Seismic

U:\2004\04-15-03\ANALYSES\SLOPEI-1\SECASE PLT Run By: Username 3/14/2007 8:11AM



Section A-A' - Seismic

U:\2004\04-15-03\ANALYSES\SLOPEI-1\SECASE.PL2 Run By: Username 3/14/2007 8:11AM



GSTABL7 v.2 FSmin=1.76
Safety Factors Are Calculated By The Modified Bishop Method



*** GSTABL7 ***

** GSTABL7 by Garry H. Gregory, P.E. **

** Original Version 1.0, January 1996; Current Version 2.002, December 2001 **
 (All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
 (Includes Spencer & Morgenstern-Price Type Analysis)
 Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
 Nonlinear Undrained Shear Strength, Curved Phi Envelope,
 Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
 Surfaces, Pseudo-Static Earthquake, and Applied Force Options.

Analysis Run Date: 3/14/2007
 Time of Run: 8:11AM
 Run By: Username
 Input Data Filename: U:SECASE.
 Output Filename: U:SECASE.OUT
 Unit System: English
 Plotted Output Filename: U:SECASE.PLT
 PROBLEM DESCRIPTION: Section A-A' - Seismic

BOUNDARY COORDINATES

4 Top Boundaries
 6 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	116.00	228.00	120.00	2
2	228.00	120.00	328.00	160.00	2
3	328.00	160.00	348.00	168.00	1
4	348.00	168.00	560.00	168.00	1
5	328.00	160.00	480.00	148.00	2
6	480.00	148.00	560.00	148.00	2

Default Y-Origin = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param. (psf)	Pressure Constant (psf)	Piez. Surface No.
1	120.0	125.0	250.0	30.0	0.00	0.0	1
2	120.0	125.0	320.0	36.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED

Unit Weight of Water = 62.40 (pcf)

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	120.00
2	560.00	120.00

A Horizontal Earthquake Loading Coefficient

Of 0.150 Has Been Assigned

A Vertical Earthquake Loading Coefficient

Of 0.000 Has Been Assigned

Cavitation Pressure = 0.0 (psf)

A Critical Failure Surface Searching Method, Using A Random

Technique For Generating Circular Surfaces, Has Been Specified.

5000 Trial Surfaces Have Been Generated.

50 Surface(s) Initiate(s) From Each Of 100 Points Equally Spaced

Along The Ground Surface Between X = 100.00(ft)

and X = 260.00(ft)

Each Surface Terminates Between X = 335.00(ft)

and X = 500.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation

At Which A Surface Extends Is Y = 0.00(ft)

5.00(ft) Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial

Failure Surfaces Evaluated. They Are

Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Total Number of Trial Surfaces Evaluated = 5000

Statistical Data On All Valid FS Values:

FS Max = 4.503 FS Min = 1.764 FS Ave = 2.204

Standard Deviation = 0.310 Coefficient of Variation = 14.05 %

Failure Surface Specified By 42 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	185.66	119.26
2	190.21	117.18
3	194.82	115.26
4	199.51	113.51
5	204.25	111.92
6	209.04	110.50
7	213.88	109.24
8	218.76	108.16
9	223.68	107.25
10	228.62	106.51
11	233.59	105.94
12	238.57	105.55
13	243.57	105.33
14	248.57	105.29
15	253.57	105.43
16	258.56	105.73
17	263.54	106.22
18	268.49	106.87
19	273.42	107.70
20	278.32	108.70
21	283.18	109.87
22	288.00	111.22
23	292.77	112.72
24	297.48	114.40
25	302.13	116.24
26	306.71	118.24
27	311.22	120.40
28	315.65	122.71
29	320.00	125.18
30	324.26	127.80
31	328.42	130.57
32	332.48	133.48
33	336.44	136.54
34	340.30	139.73
35	344.03	143.05
36	347.65	146.50
37	351.15	150.07
38	354.52	153.77
39	357.75	157.58
40	360.85	161.50
41	363.82	165.53
42	365.50	168.00

Circle Center At X = 247.27 ; Y = 248.10 ; and Radius = 142.81

Factor of Safety

*** 1.764 ***

Individual data on the 46 slices

Slice No.	Width (ft)	Weight (lbs)	Water		Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake		
			Force Top (lbs)	Force Bot (lbs)			Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	4.5	613.2	199.5	555.8	0.	0.	92.0	0.0	0.0
2	4.6	1821.8	179.4	1178.9	0.	0.	273.3	0.0	0.0
3	4.7	2969.1	158.1	1751.6	0.	0.	445.4	0.0	0.0
4	4.7	4045.8	135.6	2273.1	0.	0.	606.9	0.0	0.0
5	4.8	5043.1	112.1	2742.9	0.	0.	756.5	0.0	0.0
6	4.8	5952.9	87.7	3160.3	0.	0.	892.9	0.0	0.0
7	4.9	6768.3	62.4	3524.9	0.	0.	1015.2	0.0	0.0
8	4.9	7482.6	36.5	3836.2	0.	0.	1122.4	0.0	0.0
9	4.3	7044.1	10.2	3565.8	0.	0.	1056.6	0.0	0.0

10	0.6	1055.2	0.0	527.9	0.	0.	158.3	0.0	0.0
11	5.0	9294.0	0.0	4297.4	0.	0.	1394.1	0.0	0.0
12	5.0	10814.3	0.0	4446.8	0.	0.	1622.1	0.0	0.0
13	5.0	12223.9	0.0	4541.7	0.	0.	1833.6	0.0	0.0
14	5.0	13515.4	0.0	4582.2	0.	0.	2027.3	0.0	0.0
15	5.0	14682.0	0.0	4568.0	0.	0.	2202.3	0.0	0.0
16	5.0	15718.2	0.0	4499.2	0.	0.	2357.7	0.0	0.0
17	5.0	16619.5	0.0	4376.0	0.	0.	2492.9	0.0	0.0
18	5.0	17382.0	0.0	4198.4	0.	0.	2607.3	0.0	0.0
19	4.9	18003.3	0.0	3966.7	0.	0.	2700.5	0.0	0.0
20	4.9	18481.6	0.0	3681.2	0.	0.	2772.2	0.0	0.0
21	4.9	18816.3	0.0	3342.2	0.	0.	2822.4	0.0	0.0
22	4.8	19008.1	0.0	2950.1	0.	0.	2851.2	0.0	0.0
23	4.8	19058.4	0.0	2505.4	0.	0.	2858.8	0.0	0.0
24	4.7	18969.6	0.0	2008.7	0.	0.	2845.4	0.0	0.0
25	4.6	18745.3	0.0	1460.5	0.	0.	2811.8	0.0	0.0
26	4.6	18390.1	0.0	861.6	0.	0.	2758.5	0.0	0.0
27	3.7	14624.4	0.0	224.1	0.	0.	2193.7	0.0	0.0
28	0.8	3286.0	0.0	0.0	0.	0.	492.9	0.0	0.0
29	4.4	17344.2	0.0	0.0	0.	0.	2601.6	0.0	0.0
30	4.3	16683.9	0.0	0.0	0.	0.	2502.6	0.0	0.0
31	4.3	15921.0	0.0	0.0	0.	0.	2388.1	0.0	0.0
32	3.7	13570.7	0.0	0.0	0.	0.	2035.6	0.0	0.0
33	0.4	1493.3	0.0	0.0	0.	0.	224.0	0.0	0.0
34	4.1	14121.9	0.0	0.0	0.	0.	2118.3	0.0	0.0
35	4.0	13104.8	0.0	0.0	0.	0.	1965.7	0.0	0.0
36	3.9	12023.1	0.0	0.0	0.	0.	1803.5	0.0	0.0
37	3.7	10888.1	0.0	0.0	0.	0.	1633.2	0.0	0.0
38	3.6	9711.2	0.0	0.0	0.	0.	1456.7	0.0	0.0
39	0.3	889.6	0.0	0.0	0.	0.	133.4	0.0	0.0
40	3.1	7377.3	0.0	0.0	0.	0.	1106.6	0.0	0.0
41	3.4	6499.4	0.0	0.0	0.	0.	974.9	0.0	0.0
42	3.2	4788.1	0.0	0.0	0.	0.	718.2	0.0	0.0
43	0.1	67.3	0.0	0.0	0.	0.	10.1	0.0	0.0
44	3.0	3081.6	0.0	0.0	0.	0.	462.2	0.0	0.0
45	3.0	1594.6	0.0	0.0	0.	0.	239.2	0.0	0.0
46	1.7	250.3	0.0	0.0	0.	0.	37.5	0.0	0.0

Failure Surface Specified By 43 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.42	119.20
2	186.87	116.90
3	191.39	114.77
4	195.99	112.81
5	200.65	111.01
6	205.38	109.39
7	210.17	107.93
8	215.00	106.66
9	219.88	105.56
10	224.79	104.64
11	229.74	103.90
12	234.71	103.34
13	239.69	102.96
14	244.69	102.77
15	249.69	102.76
16	254.69	102.93
17	259.67	103.28
18	264.65	103.81
19	269.59	104.53
20	274.51	105.42
21	279.40	106.50
22	284.24	107.75
23	289.03	109.18
24	293.77	110.78
25	298.44	112.55
26	303.05	114.49
27	307.58	116.60

28	312.03	118.88
29	316.40	121.31
30	320.68	123.90
31	324.86	126.65
32	328.93	129.55
33	332.90	132.59
34	336.75	135.78
35	340.48	139.10
36	344.09	142.56
37	347.58	146.15
38	350.92	149.86
39	354.14	153.70
40	357.20	157.64
41	360.13	161.70
42	362.90	165.86
43	364.21	168.00

Circle Center At X = 247.53 ; Y = 239.73 ; and Radius = 136.99

Factor of Safety

*** 1.765 ***

Failure Surface Specified By 45 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	174.34	119.06
2	178.86	116.91
3	183.44	114.90
4	188.08	113.05
5	192.79	111.36
6	197.54	109.82
7	202.35	108.44
8	207.20	107.21
9	212.08	106.15
10	217.00	105.25
11	221.95	104.51
12	226.91	103.94
13	231.90	103.53
14	236.89	103.28
15	241.89	103.20
16	246.89	103.29
17	251.88	103.54
18	256.87	103.95
19	261.83	104.53
20	266.78	105.27
21	271.70	106.18
22	276.58	107.24
23	281.43	108.47
24	286.23	109.86
25	290.99	111.40
26	295.69	113.10
27	300.33	114.95
28	304.91	116.96
29	309.42	119.12
30	313.86	121.42
31	318.22	123.87
32	322.50	126.46
33	326.68	129.19
34	330.78	132.06
35	334.78	135.06
36	338.68	138.19
37	342.47	141.45
38	346.15	144.83
39	349.72	148.33
40	353.17	151.95
41	356.50	155.68
42	359.71	159.52
43	362.79	163.46
44	365.73	167.50
45	366.07	168.00

Circle Center At X = 241.83 ; Y = 254.74 ; and Radius = 151.54

Factor of Safety
 *** 1.767 ***

Failure Surface Specified By 41 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	185.66	119.26
2	190.11	116.98
3	194.64	114.87
4	199.25	112.94
5	203.93	111.18
6	208.68	109.61
7	213.49	108.23
8	218.34	107.02
9	223.24	106.01
10	228.17	105.19
11	233.13	104.56
12	238.11	104.12
13	243.10	103.87
14	248.10	103.81
15	253.10	103.95
16	258.09	104.28
17	263.06	104.80
18	268.01	105.51
19	272.93	106.41
20	277.81	107.50
21	282.64	108.78
22	287.42	110.25
23	292.14	111.89
24	296.80	113.72
25	301.38	115.73
26	305.88	117.91
27	310.29	120.26
28	314.61	122.78
29	318.82	125.47
30	322.93	128.32
31	326.93	131.32
32	330.81	134.47
33	334.57	137.77
34	338.19	141.22
35	341.68	144.80
36	345.03	148.51
37	348.23	152.35
38	351.29	156.31
39	354.18	160.38
40	356.92	164.57
41	358.99	168.00

Circle Center At X = 247.05 ; Y = 233.52 ; and Radius = 129.71

Factor of Safety
 *** 1.768 ***

Failure Surface Specified By 46 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	172.73	119.03
2	177.23	116.86
3	181.81	114.84
4	186.44	112.96
5	191.13	111.23
6	195.87	109.65
7	200.67	108.22
8	205.50	106.94
9	210.37	105.82
10	215.28	104.85
11	220.21	104.04
12	225.17	103.39
13	230.14	102.89
14	235.13	102.55

15	240.13	102.37
16	245.13	102.34
17	250.13	102.48
18	255.12	102.77
19	260.10	103.23
20	265.06	103.84
21	270.00	104.60
22	274.92	105.52
23	279.80	106.60
24	284.64	107.83
25	289.45	109.22
26	294.21	110.76
27	298.91	112.44
28	303.56	114.28
29	308.16	116.26
30	312.68	118.38
31	317.14	120.65
32	321.52	123.06
33	325.82	125.61
34	330.04	128.29
35	334.18	131.10
36	338.22	134.04
37	342.16	137.11
38	346.01	140.31
39	349.76	143.62
40	353.39	147.05
41	356.92	150.60
42	360.33	154.25
43	363.63	158.01
44	366.80	161.87
45	369.85	165.83
46	371.41	168.00

Circle Center At X = 243.35 ; Y = 260.04 ; and Radius = 157.70

Factor of Safety

*** 1.769 ***

Failure Surface Specified By 46 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	169.50	118.97
2	173.99	116.78
3	178.55	114.72
4	183.17	112.82
5	187.85	111.06
6	192.58	109.45
7	197.37	107.99
8	202.19	106.69
9	207.06	105.54
10	211.96	104.54
11	216.89	103.71
12	221.84	103.03
13	226.81	102.50
14	231.80	102.14
15	236.80	101.93
16	241.80	101.89
17	246.80	102.00
18	251.79	102.27
19	256.77	102.70
20	261.74	103.29
21	266.68	104.03
22	271.60	104.94
23	276.48	106.00
24	281.33	107.21
25	286.14	108.58
26	290.91	110.10
27	295.62	111.77
28	300.28	113.59
29	304.87	115.56

30	309.40	117.67
31	313.87	119.92
32	318.26	122.32
33	322.57	124.86
34	326.79	127.53
35	330.93	130.33
36	334.98	133.26
37	338.93	136.32
38	342.79	139.51
39	346.54	142.82
40	350.18	146.24
41	353.71	149.78
42	357.13	153.43
43	360.43	157.18
44	363.61	161.04
45	366.67	165.00
46	368.83	168.00

Circle Center At X = 240.76 ; Y = 258.98 ; and Radius = 157.10

Factor of Safety

*** 1.769 ***

Failure Surface Specified By 45 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	177.58	119.12
2	182.15	117.10
3	186.79	115.23
4	191.48	113.50
5	196.23	111.92
6	201.02	110.49
7	205.85	109.21
8	210.72	108.09
9	215.62	107.11
10	220.56	106.29
11	225.51	105.62
12	230.49	105.11
13	235.47	104.75
14	240.47	104.55
15	245.47	104.51
16	250.47	104.62
17	255.46	104.89
18	260.44	105.31
19	265.41	105.89
20	270.35	106.63
21	275.28	107.51
22	280.17	108.56
23	285.02	109.75
24	289.84	111.10
25	294.61	112.59
26	299.33	114.23
27	304.00	116.02
28	308.61	117.96
29	313.16	120.04
30	317.64	122.25
31	322.05	124.61
32	326.38	127.11
33	330.63	129.74
34	334.80	132.50
35	338.88	135.38
36	342.87	138.40
37	346.77	141.54
38	350.56	144.80
39	354.25	148.17
40	357.83	151.66
41	361.30	155.26
42	364.66	158.96
43	367.90	162.77
44	371.02	166.68

45 372.00 168.00
 Circle Center At X = 244.38 ; Y = 264.55 ; and Radius = 160.04
 Factor of Safety
 *** 1.770 ***

Failure Surface Specified By 44 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	174.34	119.06
2	178.83	116.85
3	183.39	114.80
4	188.02	112.90
5	192.71	111.17
6	197.45	109.60
7	202.25	108.20
8	207.10	106.97
9	211.98	105.90
10	216.90	105.01
11	221.85	104.28
12	226.82	103.73
13	231.81	103.35
14	236.80	103.15
15	241.80	103.12
16	246.80	103.26
17	251.79	103.57
18	256.77	104.06
19	261.72	104.73
20	266.65	105.56
21	271.55	106.56
22	276.41	107.74
23	281.23	109.08
24	285.99	110.59
25	290.71	112.26
26	295.36	114.10
27	299.94	116.09
28	304.45	118.25
29	308.89	120.56
30	313.24	123.02
31	317.50	125.63
32	321.67	128.39
33	325.74	131.29
34	329.71	134.33
35	333.57	137.51
36	337.32	140.82
37	340.95	144.26
38	344.46	147.82
39	347.84	151.50
40	351.10	155.30
41	354.22	159.21
42	357.20	163.22
43	360.04	167.33
44	360.46	168.00

Circle Center At X = 240.20 ; Y = 247.00 ; and Radius = 143.89
 Factor of Safety
 *** 1.771 ***

Failure Surface Specified By 42 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	185.66	119.26
2	190.03	116.83
3	194.49	114.57
4	199.03	112.49
5	203.66	110.58
6	208.35	108.86
7	213.11	107.32
8	217.92	105.96
9	222.78	104.80
10	227.69	103.82

11	232.62	103.03
12	237.59	102.44
13	242.57	102.04
14	247.57	101.84
15	252.57	101.82
16	257.56	102.01
17	262.55	102.38
18	267.52	102.95
19	272.46	103.72
20	277.37	104.67
21	282.24	105.81
22	287.05	107.14
23	291.82	108.66
24	296.52	110.36
25	301.15	112.25
26	305.71	114.31
27	310.18	116.55
28	314.56	118.96
29	318.84	121.53
30	323.03	124.28
31	327.10	127.18
32	331.05	130.24
33	334.89	133.45
34	338.59	136.80
35	342.17	140.30
36	345.60	143.93
37	348.89	147.70
38	352.03	151.59
39	355.02	155.60
40	357.85	159.72
41	360.52	163.95
42	362.86	168.00

Circle Center At X = 250.37 ; Y = 230.49 ; and Radius = 128.69

Factor of Safety

*** 1.771 ***

Failure Surface Specified By 45 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	171.11	119.00
2	175.65	116.89
3	180.25	114.93
4	184.91	113.13
5	189.62	111.47
6	194.39	109.96
7	199.21	108.61
8	204.06	107.42
9	208.95	106.38
10	213.88	105.51
11	218.82	104.79
12	223.79	104.23
13	228.78	103.84
14	233.77	103.60
15	238.77	103.53
16	243.77	103.62
17	248.76	103.87
18	253.75	104.28
19	258.71	104.86
20	263.66	105.59
21	268.58	106.48
22	273.47	107.54
23	278.32	108.75
24	283.13	110.11
25	287.89	111.63
26	292.60	113.31
27	297.26	115.13
28	301.85	117.11
29	306.38	119.23

30	310.84	121.50
31	315.22	123.91
32	319.52	126.46
33	323.73	129.15
34	327.86	131.97
35	331.89	134.93
36	335.83	138.01
37	339.66	141.22
38	343.39	144.56
39	347.00	148.01
40	350.51	151.57
41	353.89	155.25
42	357.16	159.04
43	360.30	162.93
44	363.32	166.92
45	364.08	168.00

Circle Center At X = 238.51 ; Y = 258.09 ; and Radius = 154.56

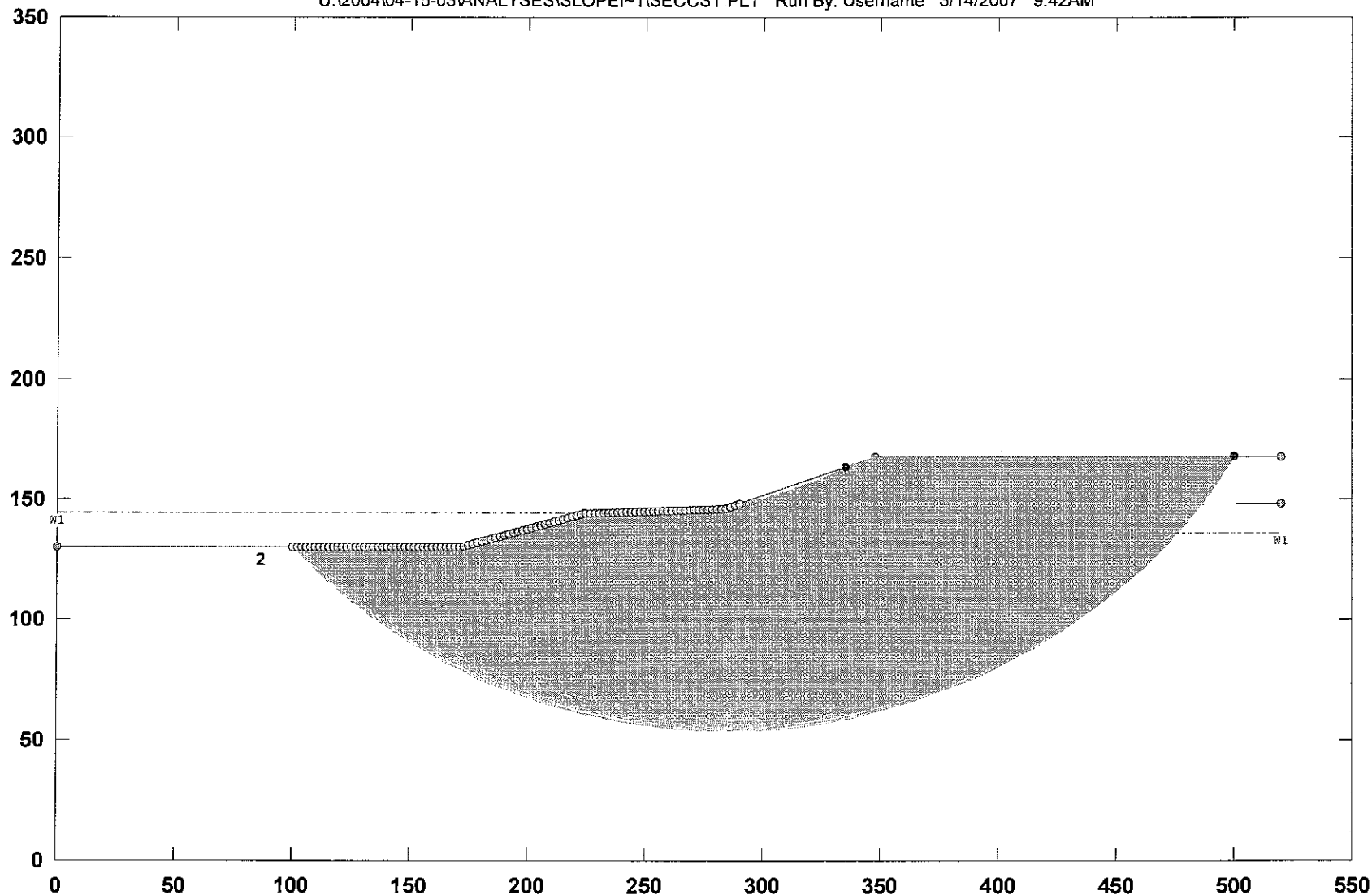
Factor of Safety

*** 1.771 ***

**** END OF GSTABL7 OUTPUT ****

Section C-C' - Static

U:\2004\04-15-03\ANALYSES\SLOPEI~1\SECCST.PLT Run By: Username 3/14/2007 9:42AM

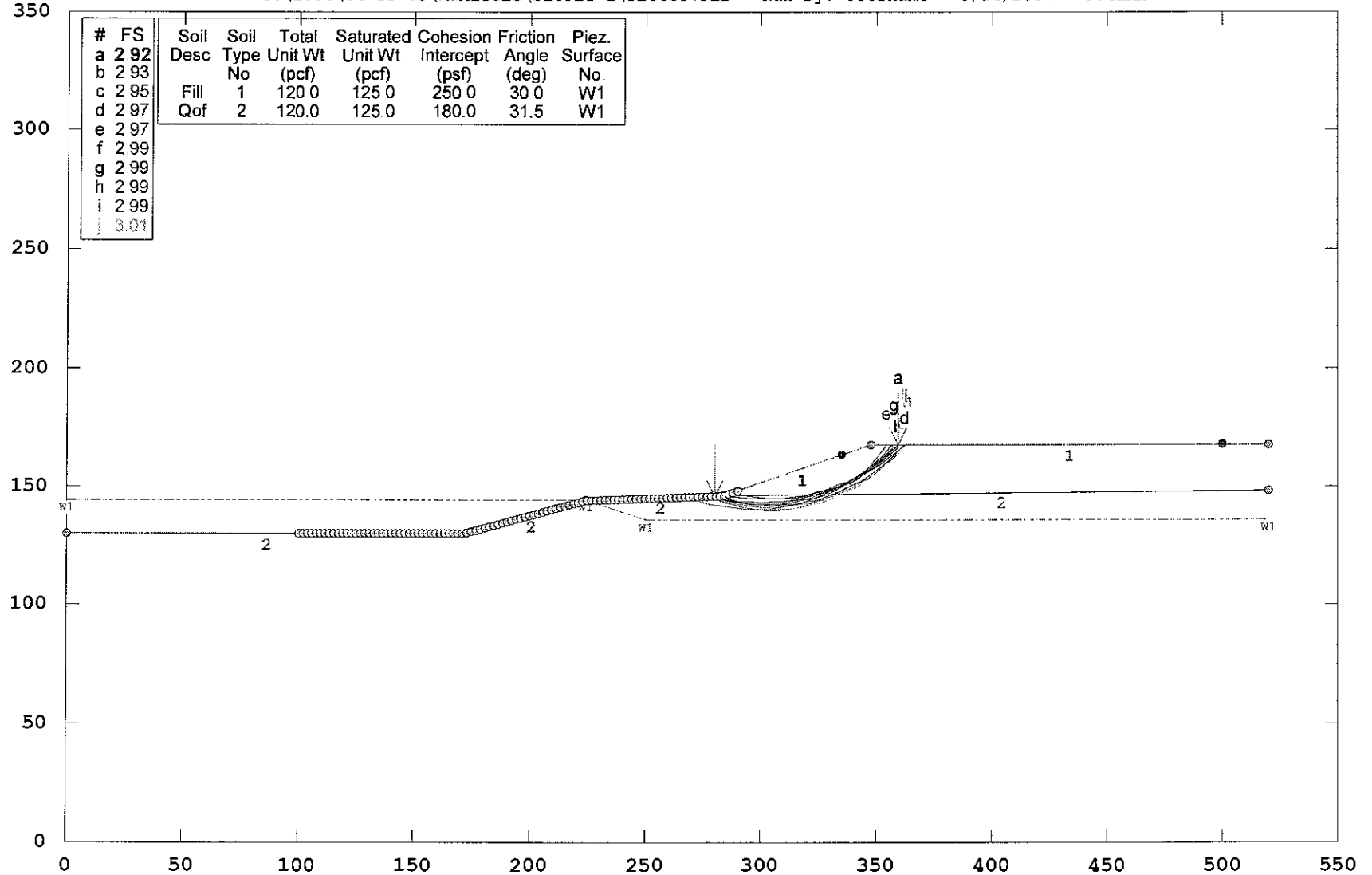


GSTABL7



Section C-C' - Static

U:\2004\04-15-03\ANALYSES\SLOPEI-1\SECCSI.PL2 Run By: Username 3/14/2007 9:42AM



GSTABL7 v.2 FSmin=2.92
Safety Factors Are Calculated By The Modified Bishop Method



*** GSTABL7 ***

** GSTABL7 by Garry H. Gregory, P.E. **

** Original Version 1.0, January 1996; Current Version 2.002, December 2001 **
 (All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
 (Includes Spencer & Morgenstern-Price Type Analysis)
 Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
 Nonlinear Undrained Shear Strength, Curved Phi Envelope,
 Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
 Surfaces, Pseudo-Static Earthquake, and Applied Force Options.

Analysis Run Date: 3/14/2007
 Time of Run: 9:42AM
 Run By: Username
 Input Data Filename: U:SECCST.
 Output Filename: U:SECCST.OUT
 Unit System: English
 Plotted Output Filename: U:SECCST.PLT
 PROBLEM DESCRIPTION: Section C-C' - Static

BOUNDARY COORDINATES

5 Top Boundaries
 6 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	130.00	172.00	130.00	2
2	172.00	130.00	224.00	144.00	2
3	224.00	144.00	284.00	146.00	2
4	284.00	146.00	348.00	168.00	1
5	348.00	168.00	520.00	168.00	1
6	284.00	146.00	520.00	148.00	2

Default Y-Origin = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param. (psf)	Pressure Constant (psf)	Piez. Surface No.
1	120.0	125.0	250.0	30.0	0.00	0.0	1
2	120.0	125.0	180.0	31.5	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED

Unit Weight of Water = 62.40 (pcf)
 Piezometric Surface No. 1 Specified by 4 Coordinate Points
 Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	144.00
2	224.00	144.00
3	250.00	136.00
4	520.00	136.00

A Critical Failure Surface Searching Method, Using A Random
 Technique For Generating Circular Surfaces, Has Been Specified.
 5000 Trial Surfaces Have Been Generated.

50 Surface(s) Initiate(s) From Each Of 100 Points Equally Spaced
 Along The Ground Surface Between X = 100.00(ft)
 and X = 290.00(ft)
 Each Surface Terminates Between X = 335.00(ft)
 and X = 500.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation
 At Which A Surface Extends Is Y = 0.00(ft)

5.00(ft) Line Segments Define Each Trial Failure Surface.
 Following Are Displayed The Ten Most Critical Of The Trial

Failure Surfaces Evaluated. They Are
 Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Total Number of Trial Surfaces Evaluated = 5000

Statistical Data On All Valid FS Values:

FS Max = 11.107 FS Min = 2.924 FS Ave = 4.822
 Standard Deviation = 1.071 Coefficient of Variation = 22.21 %
 Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	280.40	145.88
2	285.28	144.77
3	290.21	143.95
4	295.19	143.44
5	300.18	143.23
6	305.18	143.33
7	310.16	143.73
8	315.11	144.44
9	320.01	145.45
10	324.84	146.75
11	329.57	148.35
12	334.21	150.24
13	338.71	152.40
14	343.08	154.84
15	347.29	157.53
16	351.33	160.48
17	355.18	163.67
18	358.82	167.09
19	359.68	168.00

Circle Center At X = 301.07 ; Y = 225.03 ; and Radius = 81.81

Factor of Safety
 *** 2.924 ***

Slice No.	Width (ft)	Weight (lbs)	Water Force		Tie Force		Earthquake Force		
			Top (lbs)	Bot (lbs)	Norm (lbs)	Tan (lbs)	Hor (lbs)	Ver (lbs)	Surcharge Load (lbs)
1	3.6	203.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	1.3	200.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	4.9	1734.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	5.0	3160.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	5.0	4417.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	5.0	5483.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	5.0	6342.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	4.9	6983.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	4.9	7400.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	3.3	5115.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	1.6	2475.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	4.7	7560.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	4.6	7317.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	4.5	6876.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	4.4	6256.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	4.2	5479.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.7	858.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	3.3	3487.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3.8	2735.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	3.6	1144.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.9	46.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	278.49	145.82
2	283.31	144.50
3	288.21	143.49
4	293.16	142.80
5	298.14	142.42
6	303.14	142.35
7	308.14	142.61
8	313.10	143.18
9	318.02	144.06
10	322.88	145.26
11	327.65	146.76

12	332.31	148.56
13	336.85	150.66
14	341.25	153.04
15	345.49	155.69
16	349.55	158.60
17	353.42	161.77
18	357.08	165.18
19	359.75	168.00

Circle Center At X = 301.63 ; Y = 221.08 ; and Radius = 78.74

Factor of Safety
 *** 2.929 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	276.57	145.75
2	281.42	144.54
3	286.33	143.60
4	291.29	142.96
5	296.27	142.61
6	301.27	142.55
7	306.27	142.78
8	311.24	143.30
9	316.17	144.12
10	321.05	145.22
11	325.86	146.60
12	330.57	148.26
13	335.18	150.20
14	339.67	152.40
15	344.03	154.86
16	348.23	157.57
17	352.27	160.52
18	356.12	163.70
19	359.79	167.10
20	360.65	168.00

Circle Center At X = 299.80 ; Y = 227.97 ; and Radius = 85.43

Factor of Safety
 *** 2.946 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	280.40	145.88
2	285.19	144.45
3	290.07	143.33
4	295.00	142.53
5	299.98	142.06
6	304.98	141.91
7	309.98	142.10
8	314.95	142.60
9	319.88	143.44
10	324.75	144.59
11	329.53	146.06
12	334.20	147.84
13	338.75	149.91
14	343.15	152.29
15	347.38	154.94
16	351.44	157.87
17	355.29	161.06
18	358.93	164.49
19	362.19	168.00

Circle Center At X = 304.70 ; Y = 218.32 ; and Radius = 76.41

Factor of Safety
 *** 2.971 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	278.49	145.82
2	283.06	143.81

3	287.80	142.20
4	292.65	141.00
5	297.59	140.22
6	302.58	139.86
7	307.58	139.93
8	312.55	140.44
9	317.46	141.36
10	322.28	142.70
11	326.96	144.45
12	331.48	146.60
13	335.80	149.12
14	339.88	152.01
15	343.71	155.23
16	347.24	158.77
17	350.46	162.59
18	353.33	166.68
19	354.10	168.00

Circle Center At X = 304.22 ; Y = 198.20 ; and Radius = 58.36

Factor of Safety
 *** 2.974 ***

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	268.89	145.50
2	273.63	143.91
3	278.46	142.62
4	283.36	141.63
5	288.32	140.94
6	293.30	140.56
7	298.30	140.48
8	303.30	140.71
9	308.27	141.24
10	313.20	142.08
11	318.07	143.21
12	322.86	144.65
13	327.55	146.37
14	332.13	148.38
15	336.58	150.66
16	340.88	153.21
17	345.01	156.02
18	348.97	159.08
19	352.73	162.38
20	356.28	165.90
21	358.16	168.00

Circle Center At X = 297.09 ; Y = 222.09 ; and Radius = 81.62

Factor of Safety
 *** 2.987 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	288.08	147.40
2	292.93	146.18
3	297.85	145.31
4	302.83	144.83
5	307.83	144.71
6	312.82	144.97
7	317.78	145.60
8	322.68	146.60
9	327.49	147.97
10	332.18	149.69
11	336.74	151.76
12	341.12	154.17
13	345.31	156.89
14	349.29	159.92
15	353.02	163.25
16	356.50	166.84
17	357.47	168.00

Circle Center At X = 306.87 ; Y = 211.42 ; and Radius = 66.71

Factor of Safety
 *** 2.990 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	276.57	145.75
2	281.33	144.22
3	286.17	143.00
4	291.09	142.07
5	296.05	141.46
6	301.04	141.15
7	306.04	141.16
8	311.03	141.48
9	315.99	142.12
10	320.90	143.06
11	325.74	144.30
12	330.50	145.85
13	335.15	147.68
14	339.67	149.81
15	344.06	152.21
16	348.28	154.89
17	352.33	157.82
18	356.19	161.00
19	359.85	164.41
20	363.23	168.00

Circle Center At X = 303.40 ; Y = 221.15 ; and Radius = 80.03

Factor of Safety
 *** 2.993 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	284.24	146.08
2	289.19	145.34
3	294.16	144.85
4	299.16	144.63
5	304.16	144.68
6	309.15	144.99
7	314.11	145.57
8	319.04	146.42
9	323.92	147.52
10	328.73	148.88
11	333.46	150.50
12	338.10	152.36
13	342.63	154.47
14	347.05	156.82
15	351.33	159.40
16	355.47	162.20
17	359.46	165.22
18	362.74	168.00

Circle Center At X = 300.77 ; Y = 238.44 ; and Radius = 93.83

Factor of Safety
 *** 2.994 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	278.49	145.82
2	283.15	144.02
3	287.93	142.56
4	292.81	141.45
5	297.75	140.69
6	302.73	140.28
7	307.73	140.23
8	312.72	140.54
9	317.68	141.21
10	322.57	142.23
11	327.38	143.59

12	332.08	145.30
13	336.65	147.34
14	341.06	149.70
15	345.29	152.36
16	349.31	155.33
17	353.12	158.57
18	356.68	162.08
19	359.98	165.84
20	361.63	168.00

Circle Center At X = 305.90 ; Y = 209.97 ; and Radius = 69.76

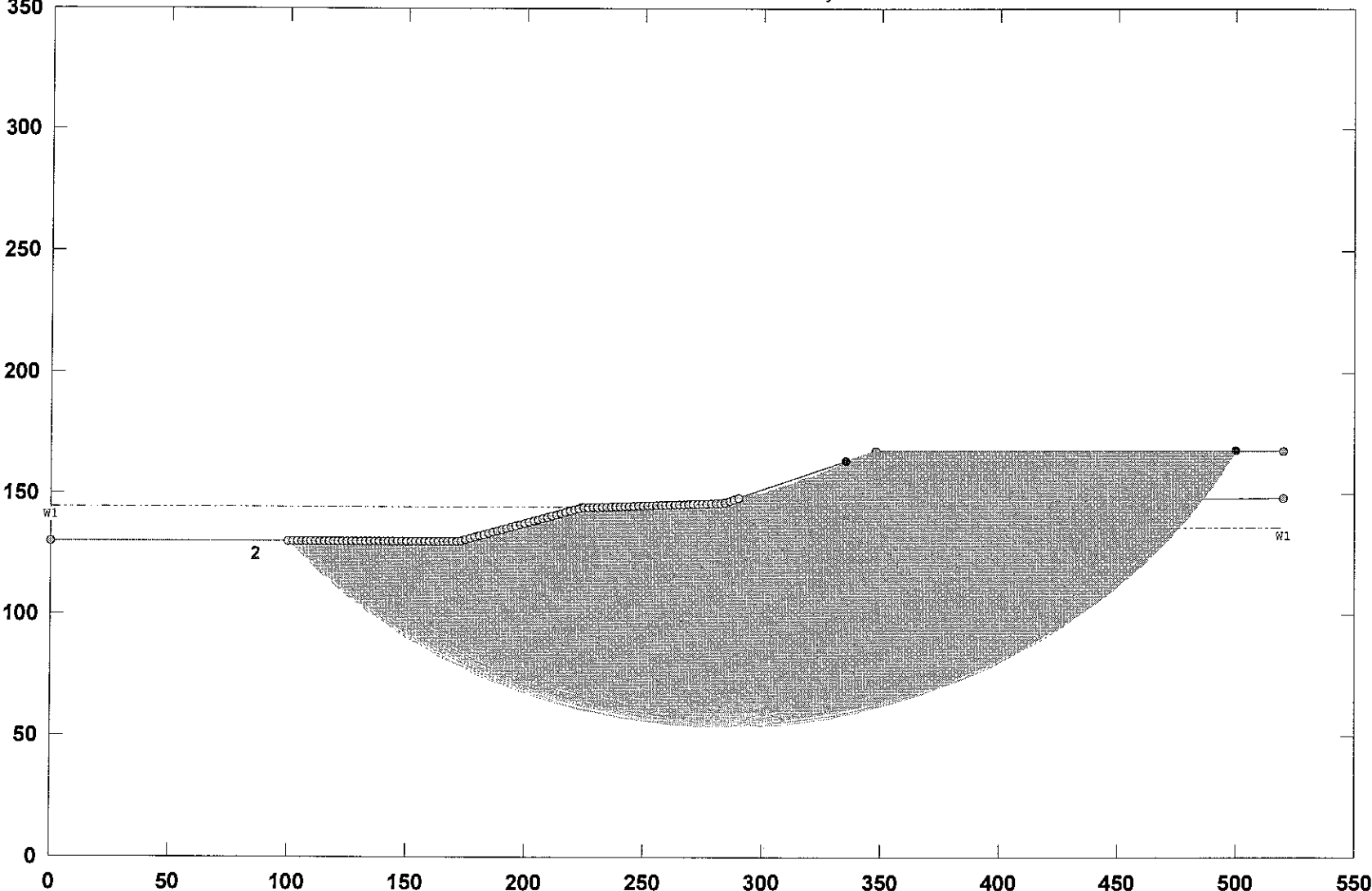
Factor of Safety

*** 3.005 ***

**** END OF GSTABL7 OUTPUT ****

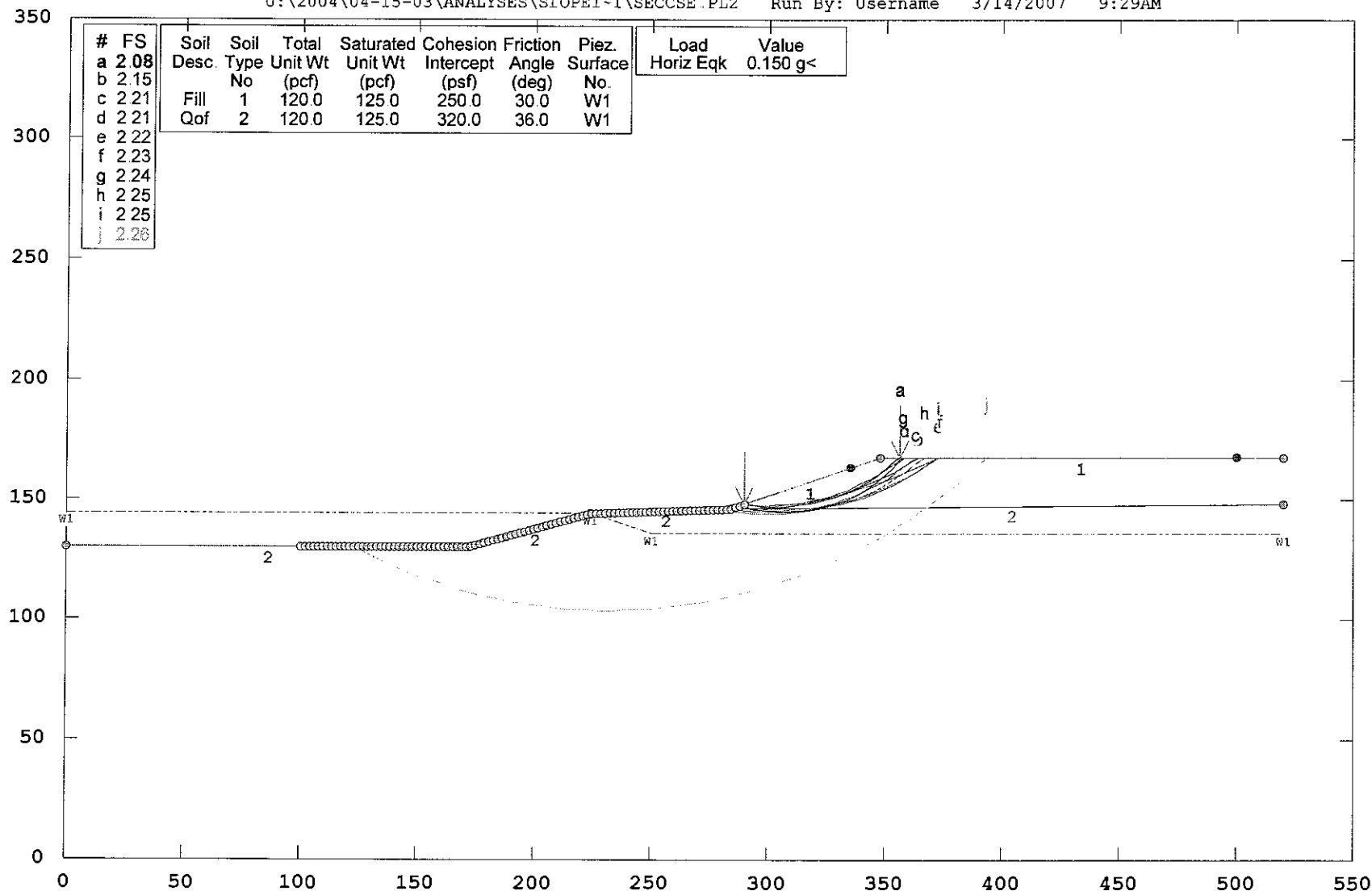
Section C-C' - Seismic

U:\2004\04-15-03\ANALYSES\SLOPEI~1\SECCSE.PLT Run By: Username 3/14/2007 9:29AM



Section C-C' - Seismic

U:\2004\04-15-03\ANALYSES\SIOPEI-1\SECCSE.PI2 Run By: Username 3/14/2007 9:29AM



GSTABL7 v.2 FSmin=2.08
Safety Factors Are Calculated By The Modified Bishop Method



*** GSTABL7 ***

** GSTABL7 by Garry H. Gregory, P.E. **

** Original Version 1.0, January 1996; Current Version 2.002, December 2001 **
 (All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
 (Includes Spencer & Morgenstern-Price Type Analysis)
 Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
 Nonlinear Undrained Shear Strength, Curved Phi Envelope,
 Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
 Surfaces, Pseudo-Static Earthquake, and Applied Force Options.

Analysis Run Date: 3/14/2007
 Time of Run: 9:29AM
 Run By: Username
 Input Data Filename: U:SECCSE.
 Output Filename: U:SECCSE.OUT
 Unit System: English
 Plotted Output Filename: U:SECCSE.PLT
 PROBLEM DESCRIPTION: Section C-C' - Seismic

BOUNDARY COORDINATES
 5 Top Boundaries
 6 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	130.00	172.00	130.00	2
2	172.00	130.00	224.00	144.00	2
3	224.00	144.00	284.00	146.00	2
4	284.00	146.00	348.00	168.00	1
5	348.00	168.00	520.00	168.00	1
6	284.00	146.00	520.00	148.00	2

Default Y-Origin = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param. (psf)	Pressure Constant (psf)	Piez. Surface No.
1	120.0	125.0	250.0	30.0	0.00	0.0	1
2	120.0	125.0	320.0	36.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED

Unit Weight of Water = 62.40 (pcf)

Piezometric Surface No. 1 Specified by 4 Coordinate Points

Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	144.00
2	224.00	144.00
3	250.00	136.00
4	520.00	136.00

A Horizontal Earthquake Loading Coefficient

Of 0.150 Has Been Assigned

A Vertical Earthquake Loading Coefficient

Of 0.000 Has Been Assigned

Cavitation Pressure = 0.0 (psf)

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.
 5000 Trial Surfaces Have Been Generated.

50 Surface(s) Initiate(s) From Each Of 100 Points Equally Spaced Along The Ground Surface Between X = 100.00(ft) and X = 290.00(ft)

Each Surface Terminates Between X = 335.00(ft) and X = 500.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00(ft)

5.00(ft) Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial

Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Total Number of Trial Surfaces Evaluated = 5000

Statistical Data On All Valid FS Values:

FS Max = 5.607 FS Min = 2.075 FS Ave = 2.765

Standard Deviation = 0.364 Coefficient of Variation = 13.18 %

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	290.00	148.06
2	294.96	147.42
3	299.95	147.10
4	304.95	147.08
5	309.94	147.38
6	314.90	148.00
7	319.82	148.92
8	324.66	150.15
9	329.42	151.68
10	334.07	153.51
11	338.60	155.63
12	342.99	158.03
13	347.22	160.70
14	351.27	163.62
15	355.13	166.80
16	356.42	168.00

Circle Center At X = 302.67 ; Y = 226.45 ; and Radius = 79.40

Factor of Safety

*** 2.075 ***

Slice No.	Width (ft)	Weight (lbs)	Individual data on the		16 slices		Earthquake		
			Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	5.0	697.6	0.0	0.0	0.	0.	104.6	0.0	0.0
2	5.0	2015.0	0.0	0.0	0.	0.	302.3	0.0	0.0
3	5.0	3151.6	0.0	0.0	0.	0.	472.7	0.0	0.0
4	5.0	4088.2	0.0	0.0	0.	0.	613.2	0.0	0.0
5	5.0	4811.0	0.0	0.0	0.	0.	721.7	0.0	0.0
6	4.9	5311.7	0.0	0.0	0.	0.	796.8	0.0	0.0
7	4.8	5587.4	0.0	0.0	0.	0.	838.1	0.0	0.0
8	4.8	5641.0	0.0	0.0	0.	0.	846.1	0.0	0.0
9	4.7	5480.7	0.0	0.0	0.	0.	822.1	0.0	0.0
10	4.5	5120.1	0.0	0.0	0.	0.	768.0	0.0	0.0
11	4.4	4578.1	0.0	0.0	0.	0.	686.7	0.0	0.0
12	4.2	3878.2	0.0	0.0	0.	0.	581.7	0.0	0.0
13	0.8	644.5	0.0	0.0	0.	0.	96.7	0.0	0.0
14	3.3	2182.7	0.0	0.0	0.	0.	327.4	0.0	0.0
15	3.9	1290.8	0.0	0.0	0.	0.	193.6	0.0	0.0
16	1.3	92.1	0.0	0.0	0.	0.	13.8	0.0	0.0

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	290.00	148.06
2	295.00	147.84
3	300.00	147.83
4	304.99	148.03
5	309.97	148.44
6	314.94	149.05
7	319.87	149.88
8	324.76	150.91
9	329.60	152.15
10	334.39	153.59
11	339.12	155.23
12	343.77	157.06
13	348.34	159.09
14	352.82	161.31

15 357.20 163.72
 16 361.48 166.31
 17 364.03 168.00
 Circle Center At X = 297.76 ; Y = 266.79 ; and Radius = 118.98
 Factor of Safety
 *** 2.153 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	284.24	146.08
2	289.19	145.34
3	294.16	144.85
4	299.16	144.63
5	304.16	144.68
6	309.15	144.99
7	314.11	145.57
8	319.04	146.42
9	323.92	147.52
10	328.73	148.88
11	333.46	150.50
12	338.10	152.36
13	342.63	154.47
14	347.05	156.82
15	351.33	159.40
16	355.47	162.20
17	359.46	165.22
18	362.74	168.00

Circle Center At X = 300.77 ; Y = 238.44 ; and Radius = 93.83
 Factor of Safety
 *** 2.209 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	280.40	145.88
2	285.39	145.57
3	290.39	145.49
4	295.39	145.61
5	300.38	145.96
6	305.35	146.52
7	310.29	147.29
8	315.19	148.28
9	320.04	149.48
10	324.84	150.88
11	329.57	152.50
12	334.23	154.32
13	338.81	156.33
14	343.29	158.55
15	347.67	160.95
16	351.95	163.55
17	356.11	166.32
18	358.40	168.00

Circle Center At X = 289.97 ; Y = 260.71 ; and Radius = 115.22
 Factor of Safety
 *** 2.215 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	286.16	146.74
2	291.13	146.18
3	296.12	145.82
4	301.12	145.67
5	306.11	145.72
6	311.11	145.98
7	316.09	146.44
8	321.04	147.11
9	325.97	147.97
10	330.85	149.04

11	335.69	150.31
12	340.47	151.77
13	345.19	153.43
14	349.83	155.28
15	354.40	157.32
16	358.87	159.55
17	363.26	161.95
18	367.54	164.54
19	371.71	167.29
20	372.69	168.00

Circle Center At X = 302.36 ; Y = 267.55 ; and Radius = 121.88
 Factor of Safety
 *** 2.218 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	284.24	146.08
2	289.24	146.25
3	294.23	146.53
4	299.22	146.93
5	304.19	147.45
6	309.15	148.10
7	314.09	148.85
8	319.01	149.73
9	323.91	150.73
10	328.79	151.84
11	333.63	153.07
12	338.45	154.41
13	343.23	155.87
14	347.98	157.45
15	352.68	159.14
16	357.35	160.93
17	361.97	162.85
18	366.54	164.87
19	371.07	167.00
20	373.07	168.00

Circle Center At X = 279.96 ; Y = 354.40 ; and Radius = 208.36
 Factor of Safety
 *** 2.226 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	288.08	147.40
2	292.93	146.18
3	297.85	145.31
4	302.83	144.83
5	307.83	144.71
6	312.82	144.97
7	317.78	145.60
8	322.68	146.60
9	327.49	147.97
10	332.18	149.69
11	336.74	151.76
12	341.12	154.17
13	345.31	156.89
14	349.29	159.92
15	353.02	163.25
16	356.50	166.84
17	357.47	168.00

Circle Center At X = 306.87 ; Y = 211.42 ; and Radius = 66.71
 Factor of Safety
 *** 2.245 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	282.32	145.94
2	287.25	145.11

3	292.22	144.52
4	297.21	144.17
5	302.21	144.08
6	307.20	144.24
7	312.19	144.65
8	317.14	145.31
9	322.06	146.21
10	326.93	147.36
11	331.73	148.75
12	336.46	150.39
13	341.09	152.25
14	345.63	154.34
15	350.06	156.66
16	354.37	159.20
17	358.55	161.95
18	362.58	164.91
19	366.38	168.00

Circle Center At X = 301.53 ; Y = 243.97 ; and Radius = 99.89

Factor of Safety

*** 2.248 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	286.16	146.74
2	291.11	146.05
3	296.09	145.57
4	301.08	145.31
5	306.08	145.27
6	311.08	145.45
7	316.06	145.85
8	321.03	146.47
9	325.95	147.31
10	330.84	148.36
11	335.68	149.63
12	340.46	151.10
13	345.16	152.79
14	349.79	154.68
15	354.33	156.78
16	358.77	159.07
17	363.11	161.56
18	367.34	164.23
19	371.44	167.09
20	372.64	168.00

Circle Center At X = 304.48 ; Y = 258.73 ; and Radius = 113.48

Factor of Safety

*** 2.254 ***

Failure Surface Specified By 60 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	123.03	130.00
2	127.50	127.75
3	132.01	125.60
4	136.57	123.54
5	141.17	121.58
6	145.81	119.72
7	150.49	117.95
8	155.20	116.29
9	159.95	114.73
10	164.73	113.26
11	169.54	111.90
12	174.38	110.64
13	179.24	109.49
14	184.13	108.43
15	189.04	107.48
16	193.97	106.64
17	198.91	105.90
18	203.87	105.26

19	208.85	104.73
20	213.83	104.31
21	218.82	103.99
22	223.81	103.77
23	228.81	103.67
24	233.81	103.66
25	238.81	103.77
26	243.81	103.98
27	248.80	104.29
28	253.78	104.72
29	258.75	105.24
30	263.71	105.87
31	268.66	106.61
32	273.58	107.45
33	278.49	108.40
34	283.38	109.45
35	288.25	110.60
36	293.09	111.86
37	297.90	113.21
38	302.68	114.67
39	307.43	116.23
40	312.15	117.89
41	316.83	119.65
42	321.47	121.51
43	326.07	123.47
44	330.63	125.52
45	335.14	127.67
46	339.61	129.92
47	344.03	132.26
48	348.40	134.69
49	352.72	137.21
50	356.98	139.83
51	361.18	142.53
52	365.33	145.33
53	369.42	148.21
54	373.44	151.17
55	377.40	154.22
56	381.30	157.36
57	385.13	160.57
58	388.89	163.87
59	392.58	167.24
60	393.37	168.00

Circle Center At X = 231.40 ; Y = 339.67 ; and Radius = 236.02

Factor of Safety

*** 2.256 ***

**** END OF GSTABL7 OUTPUT ****

APPENDIX D

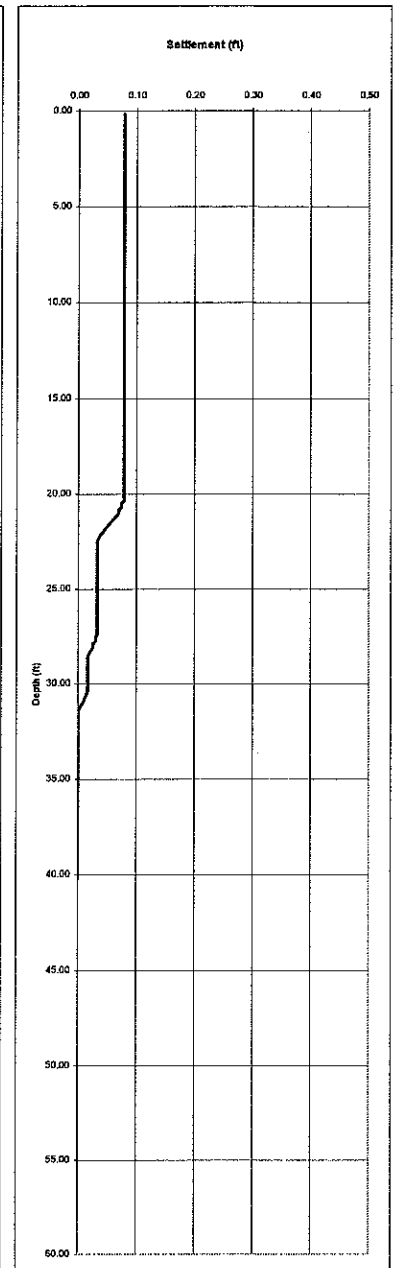
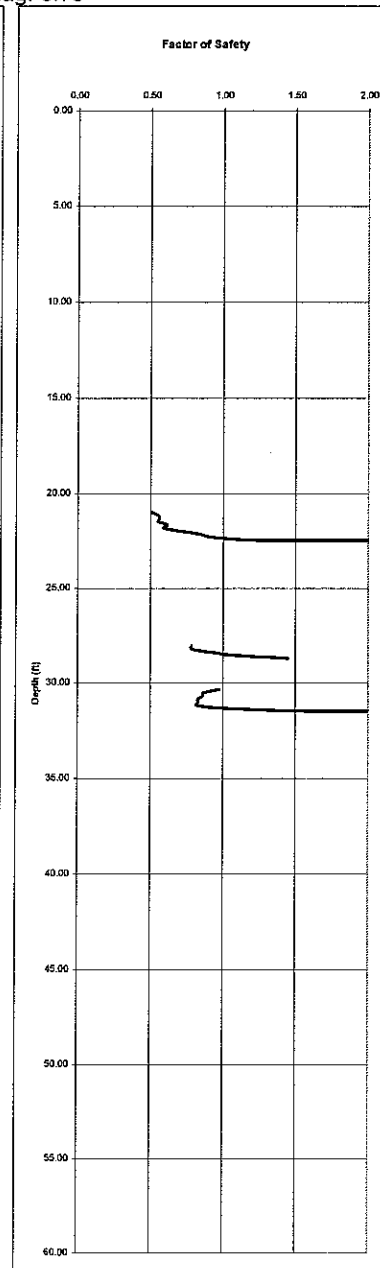
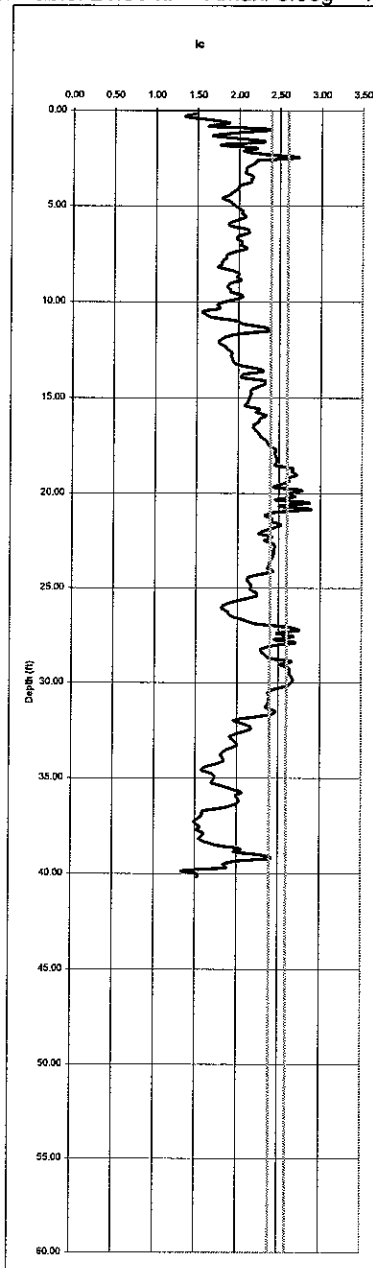
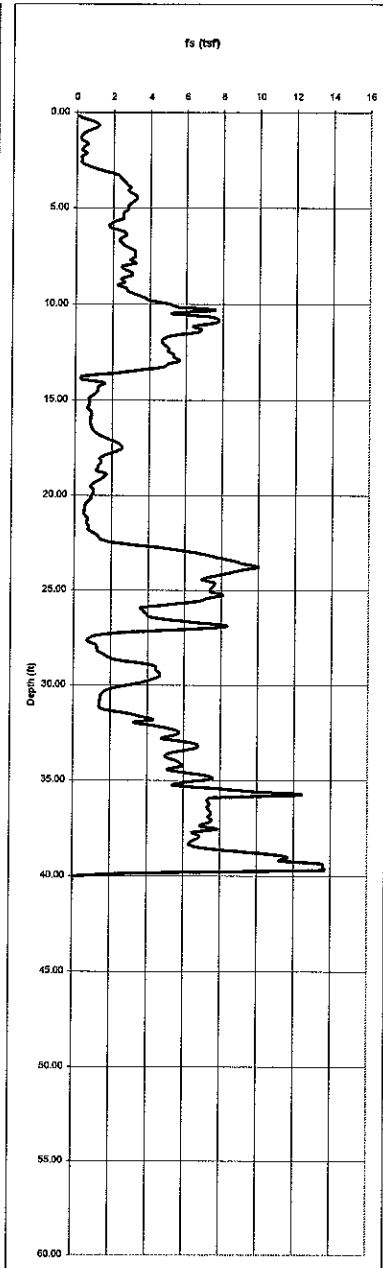
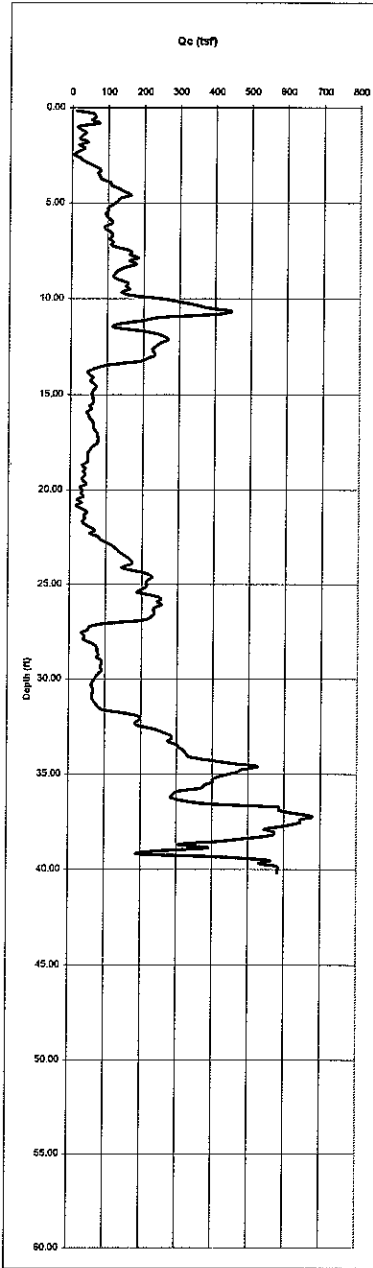
Liquefaction Analyses



Seismic Liquefaction and Settlement Charts (CPT-1)

Edgewater (04-15-03)

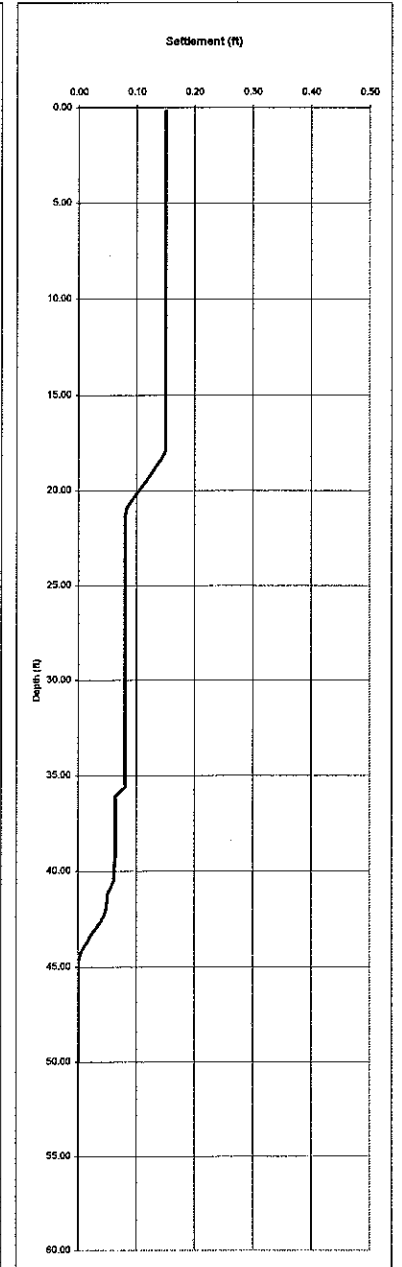
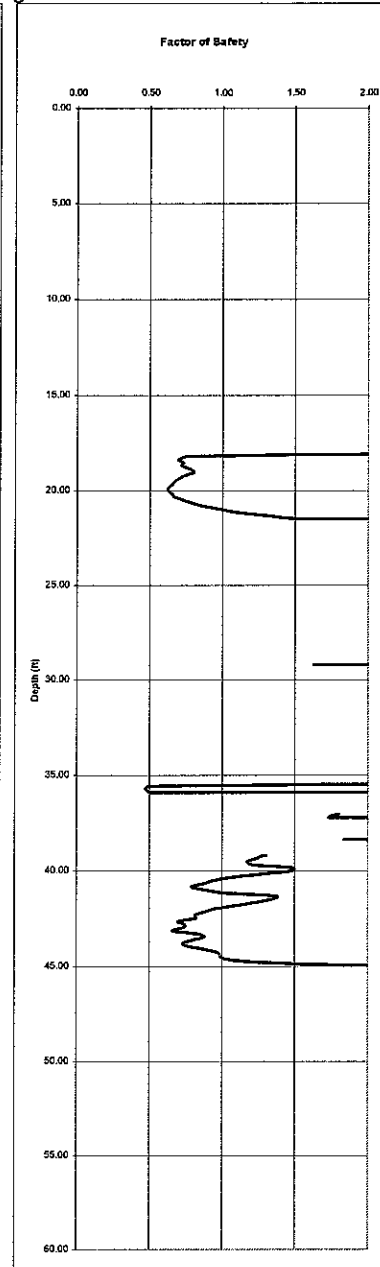
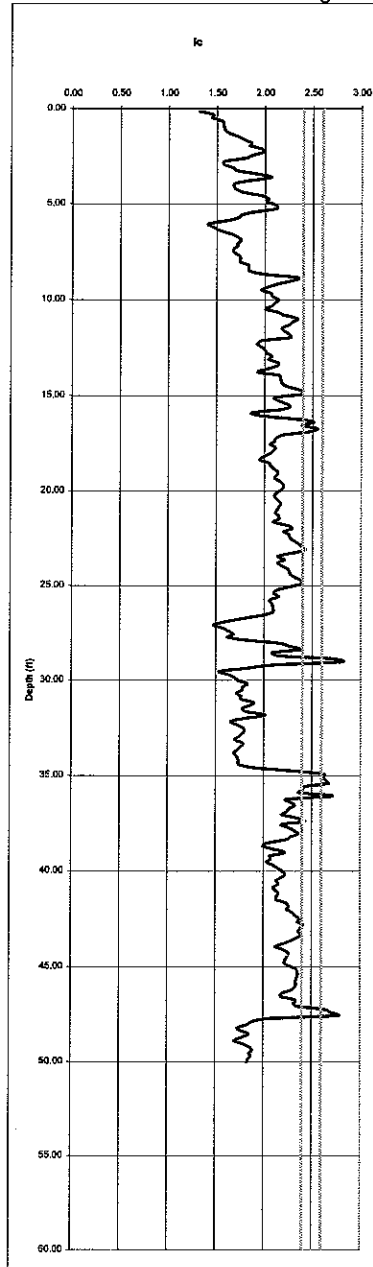
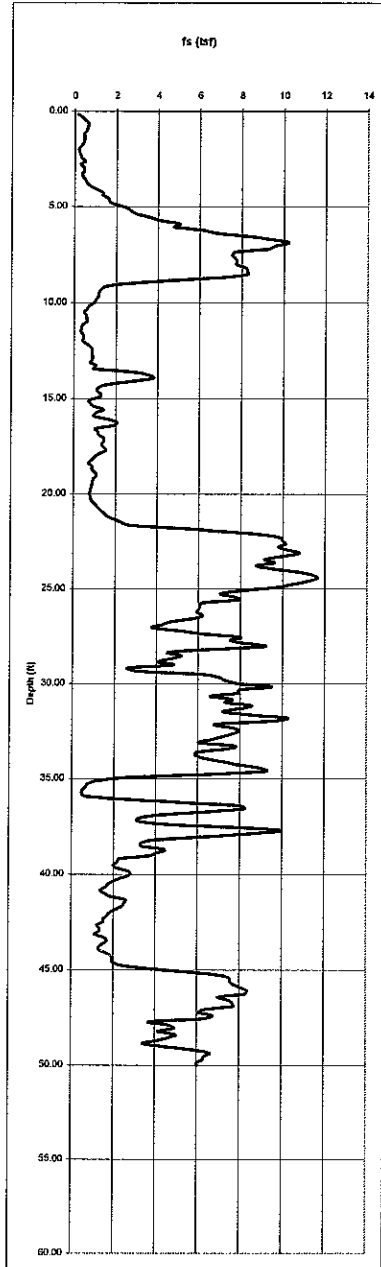
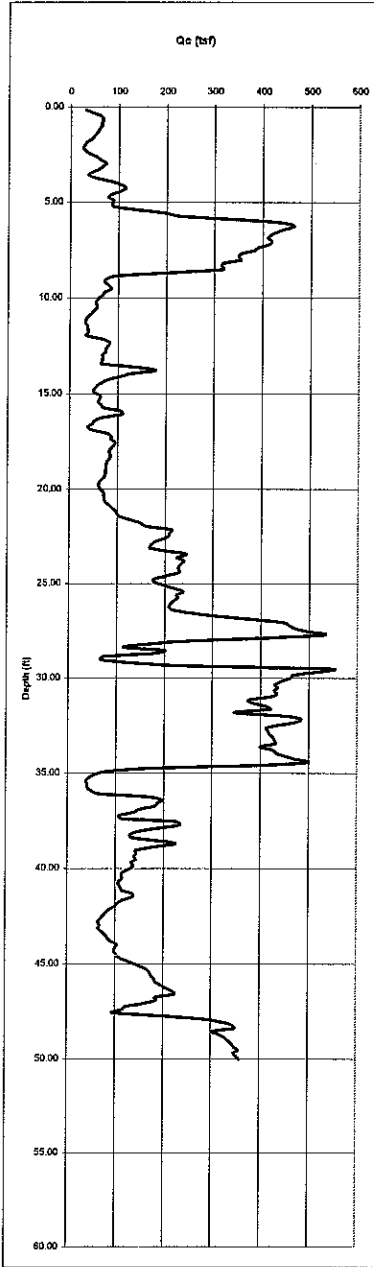
Water Table: 21.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-2)

Edgewater (04-15-03)

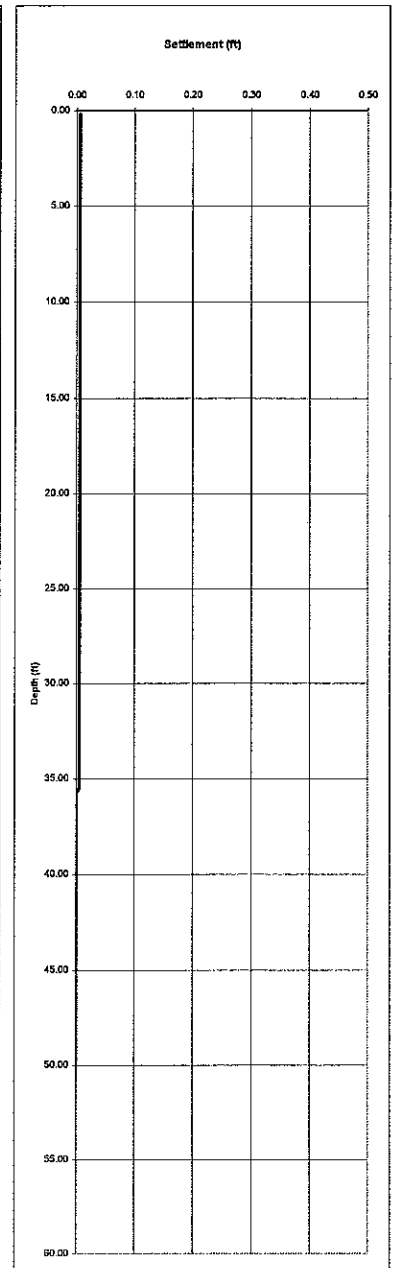
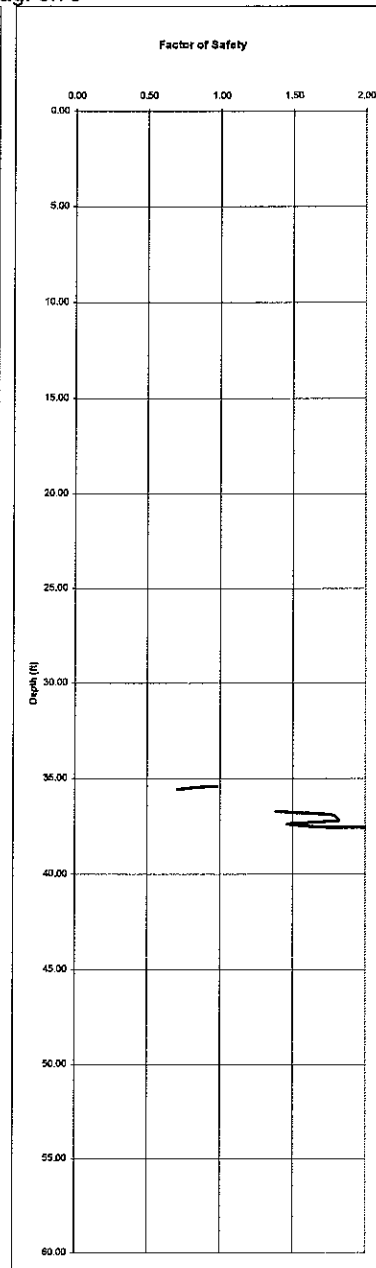
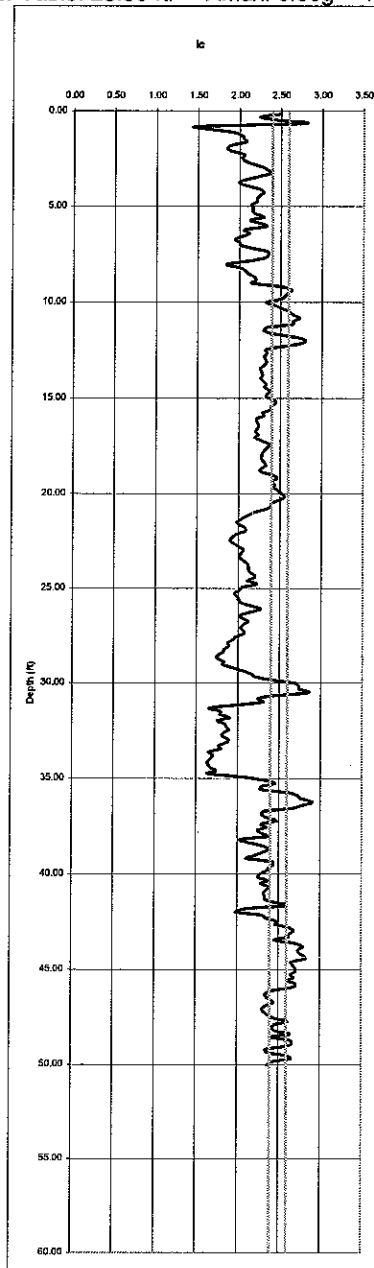
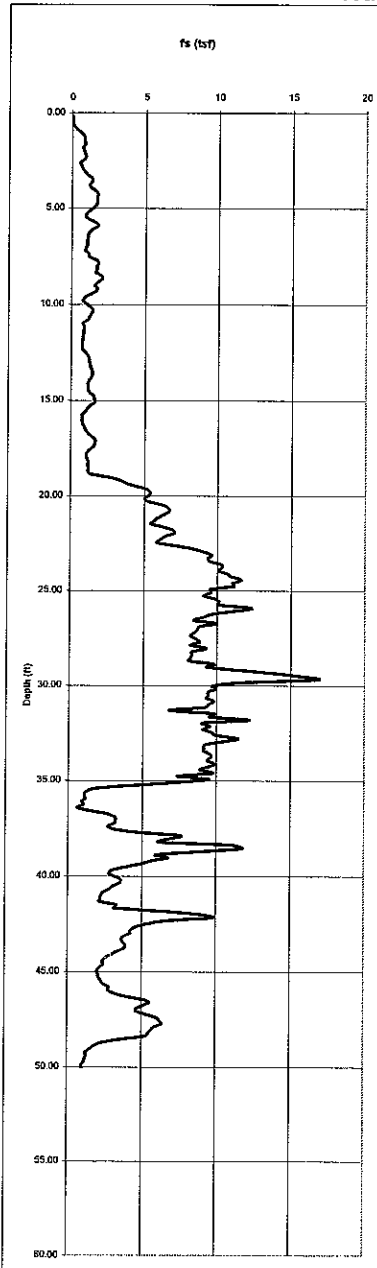
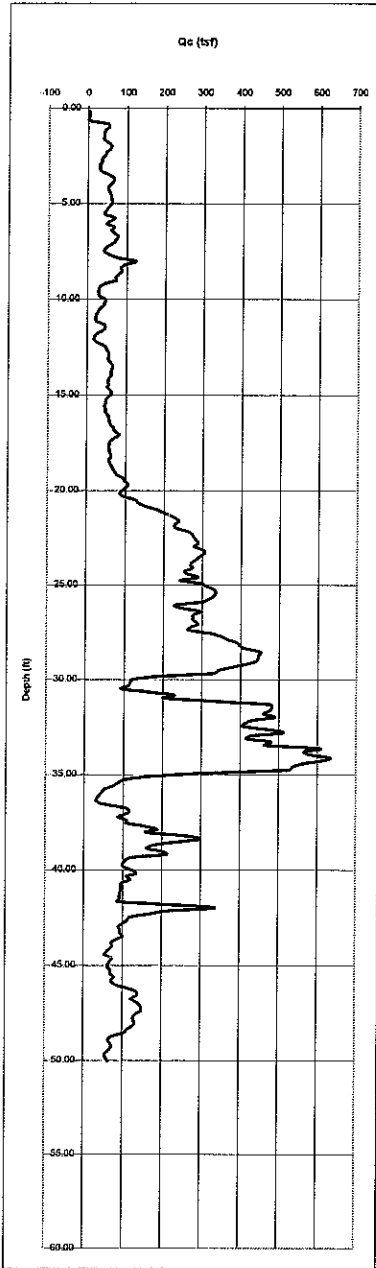
Water Table: 18.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-3)

Edgewater (04-15-03)

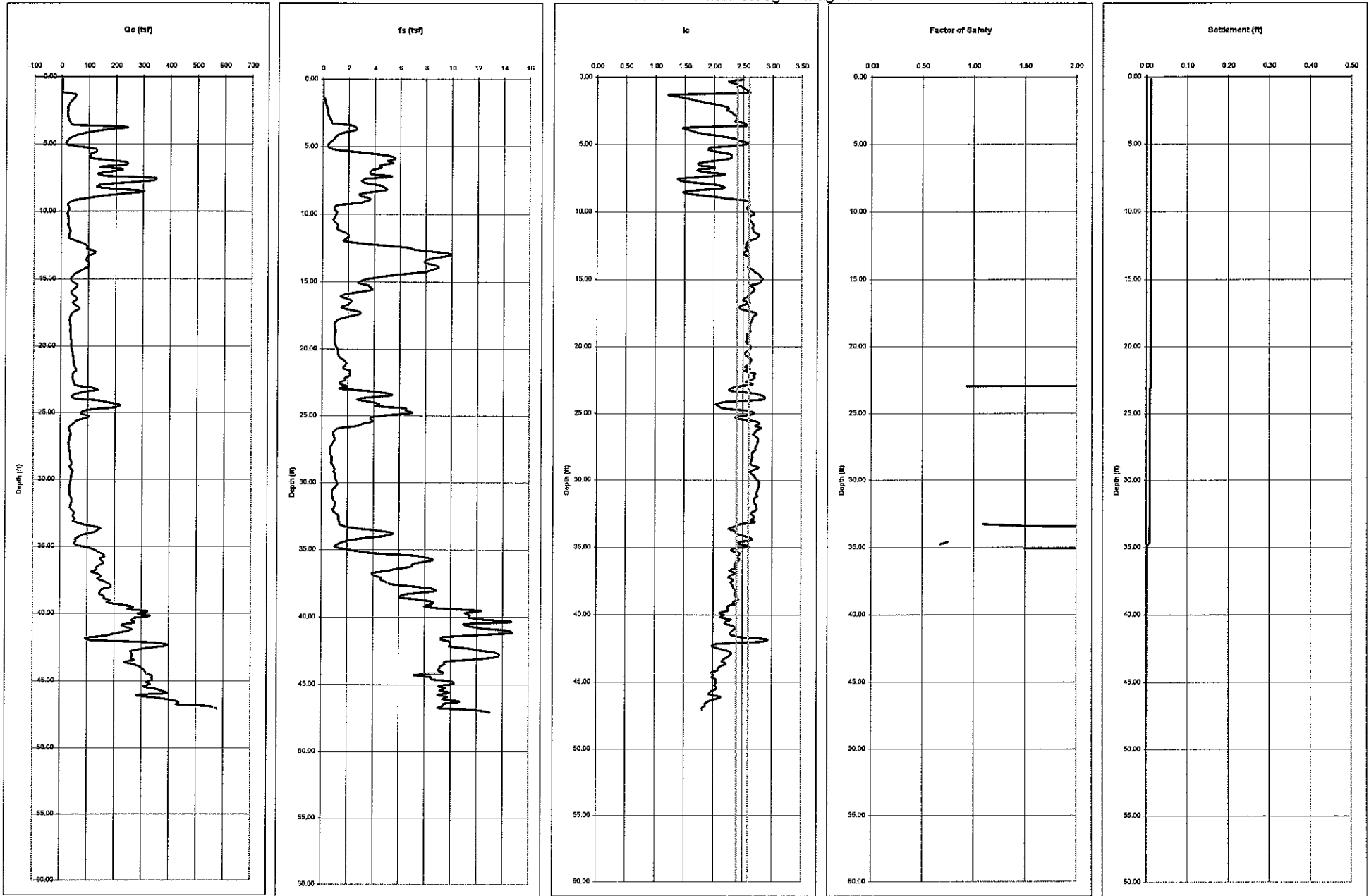
Water Table: 23.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-4)

Edgewater (04-15-03)

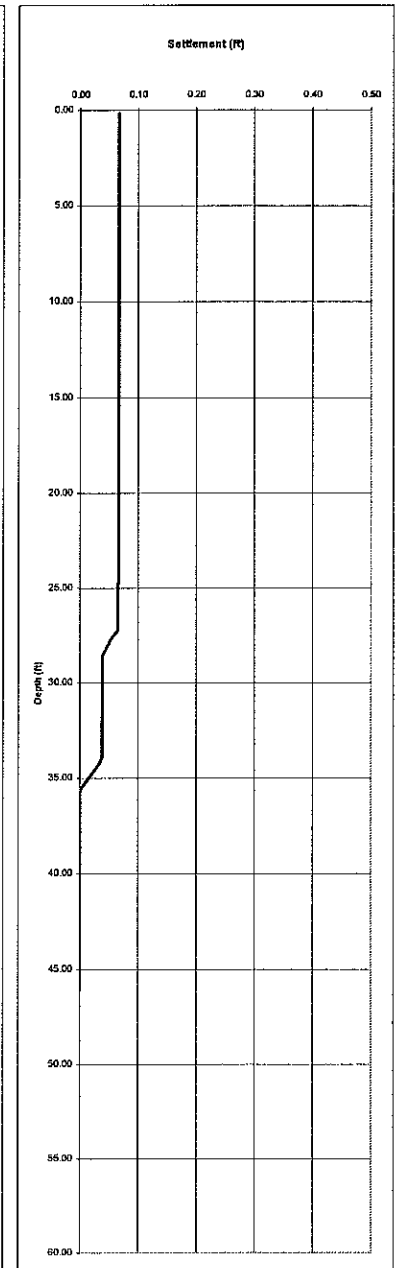
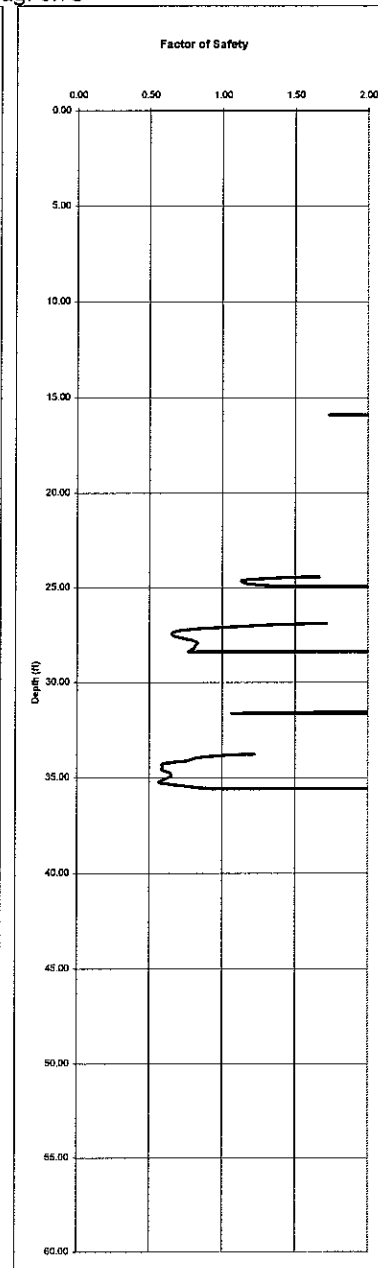
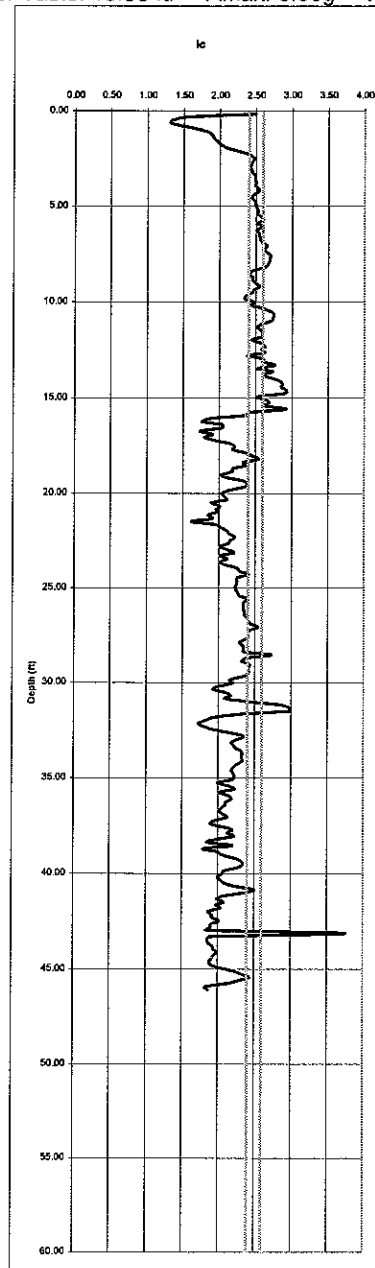
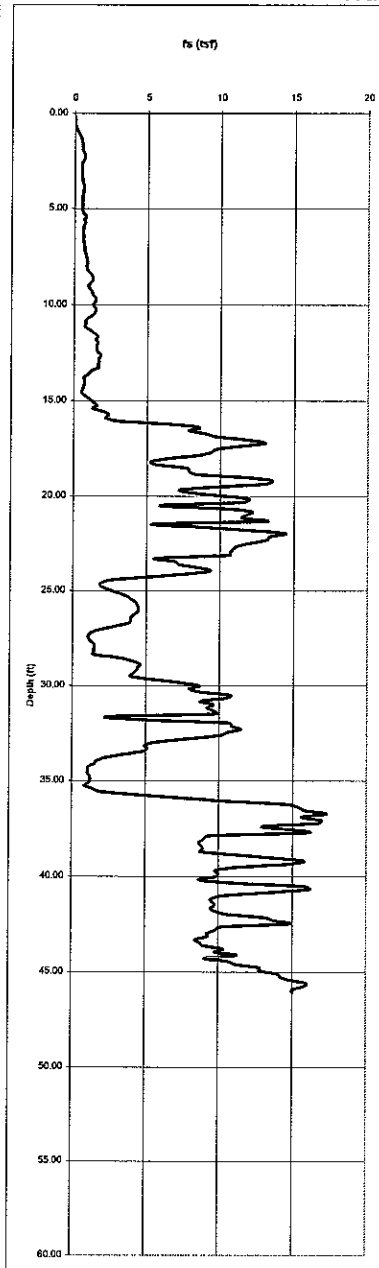
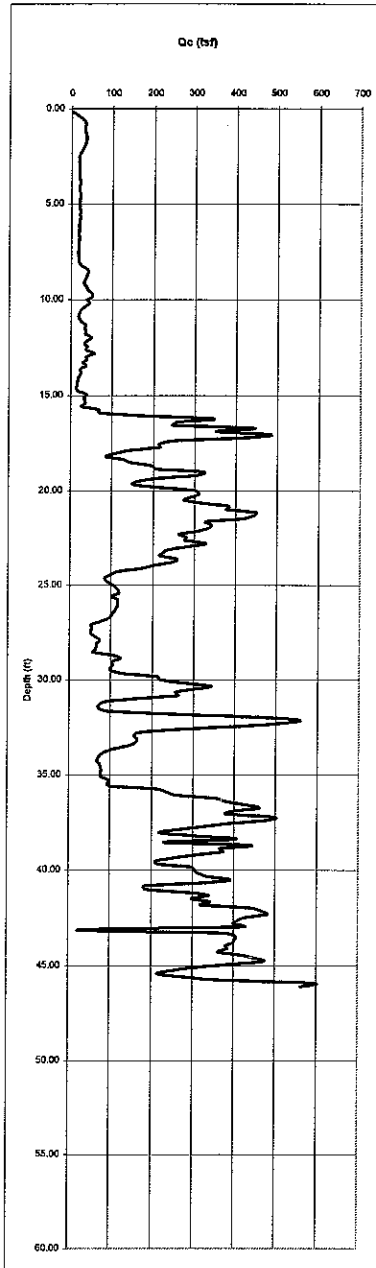
Water Table: 26.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-5)

Edgewater (04-15-03)

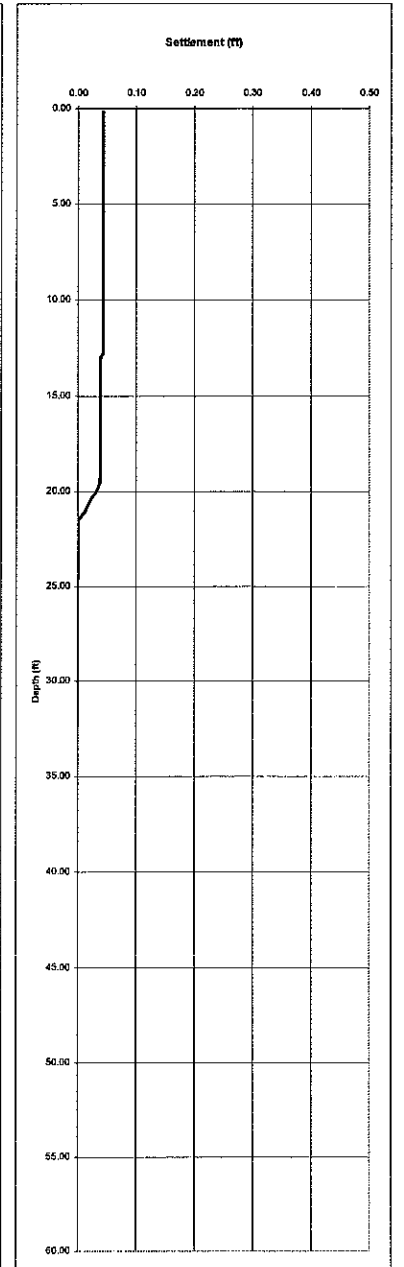
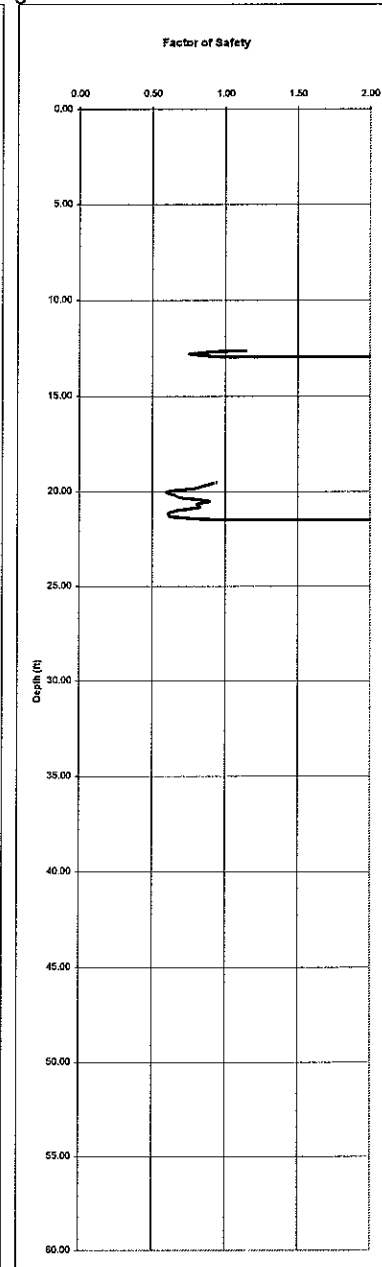
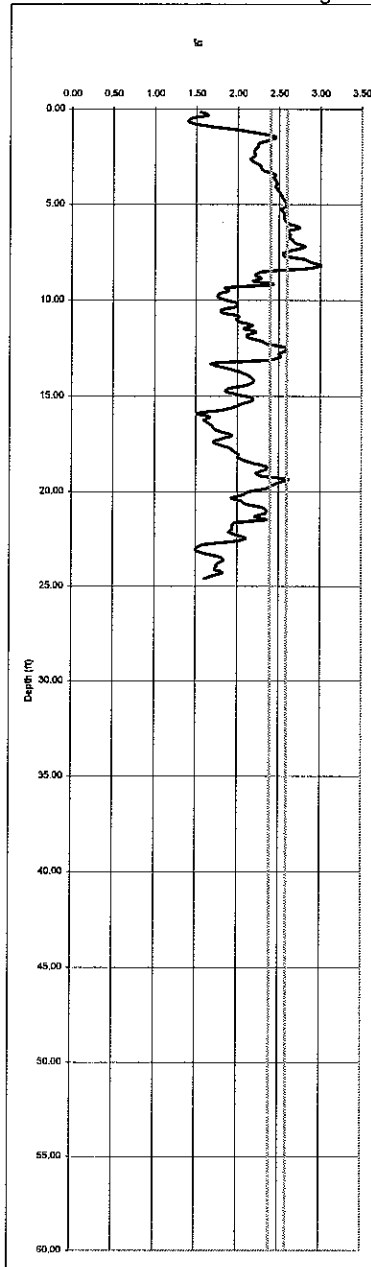
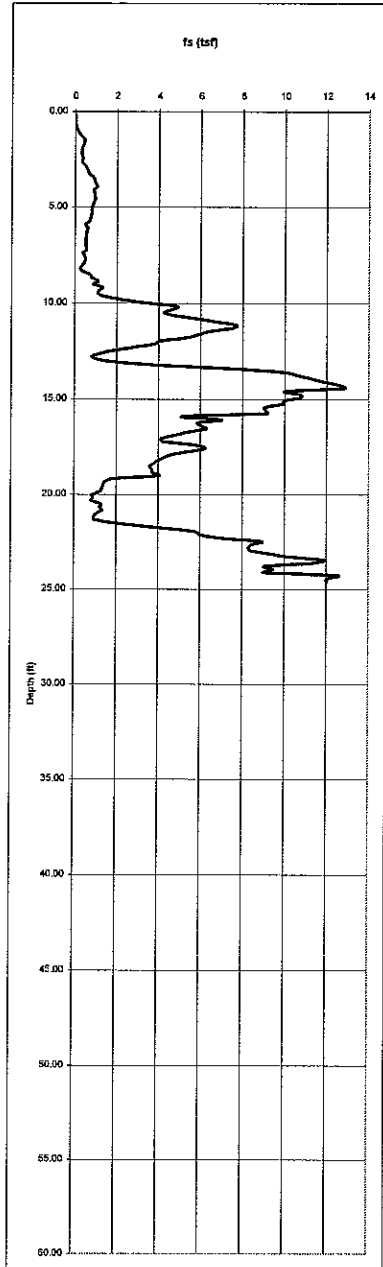
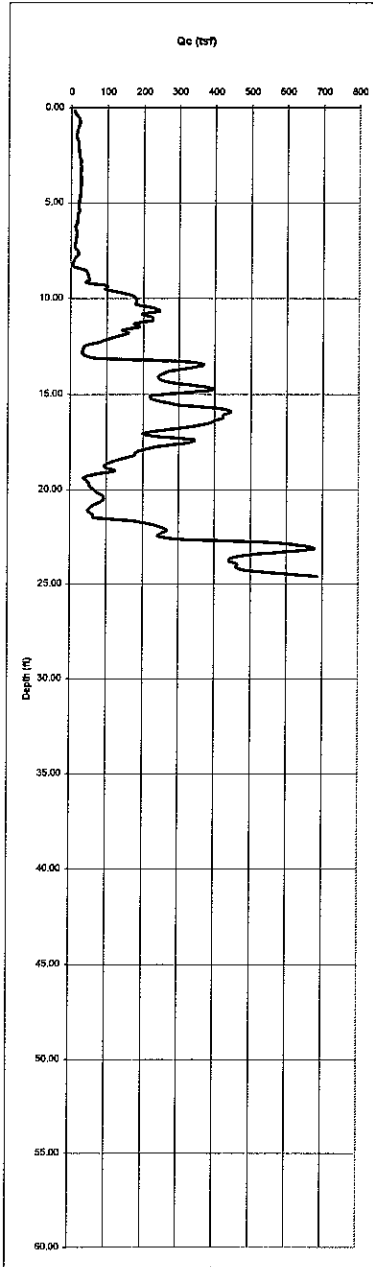
Water Table: 15.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-6)

Edgewater (04-15-03)

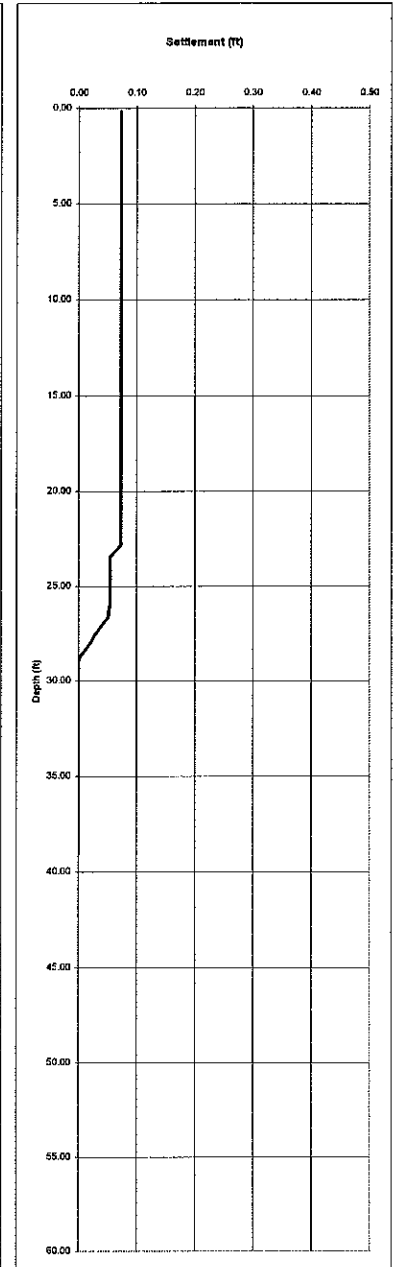
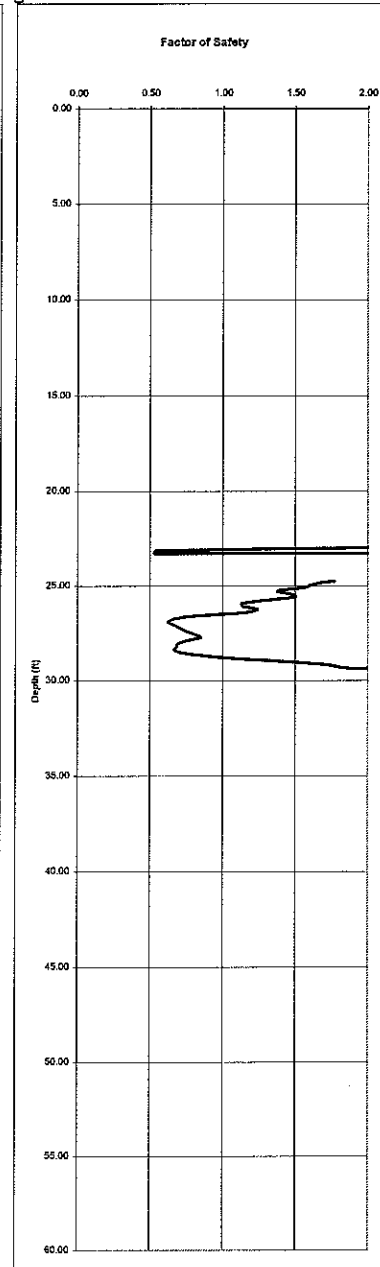
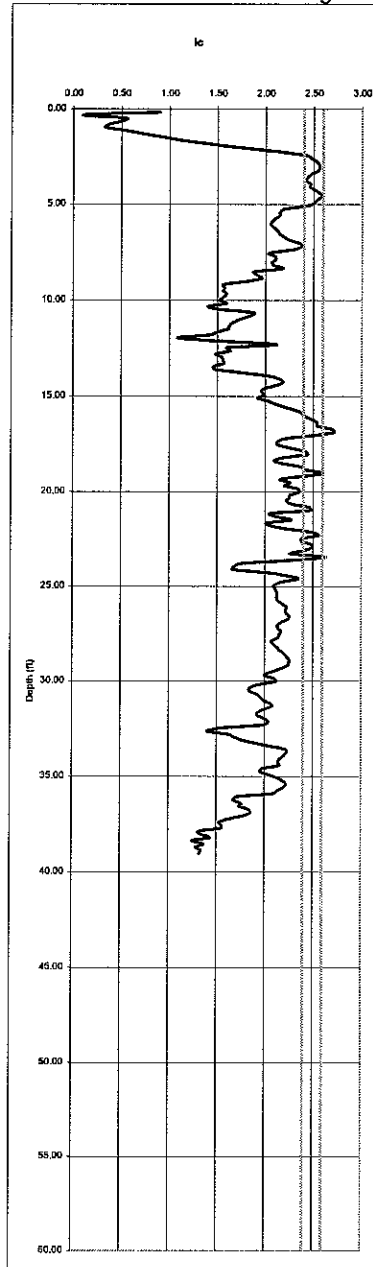
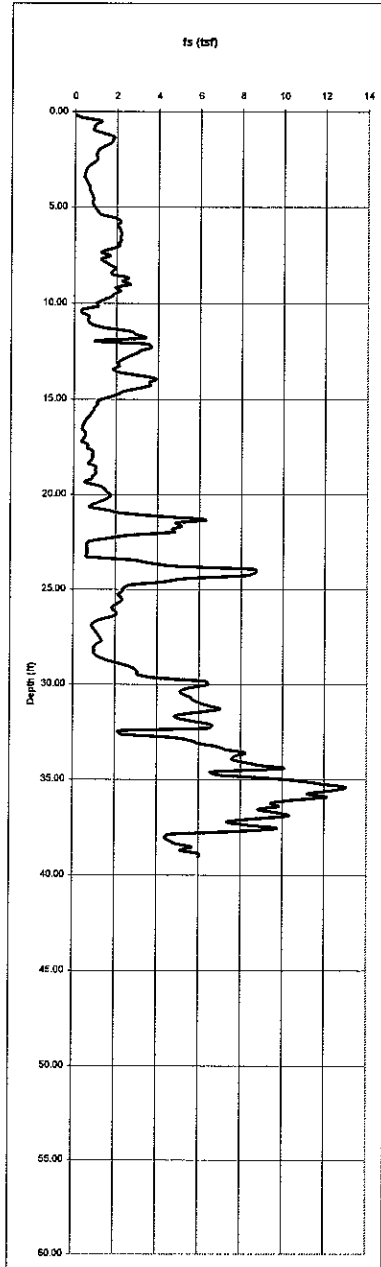
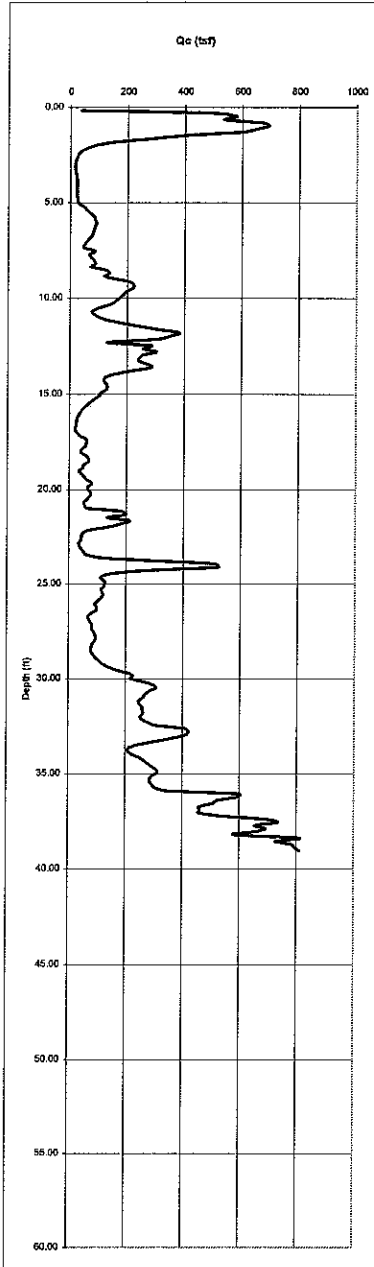
Water Table: 10.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-7)

Edgewater (04-15-03)

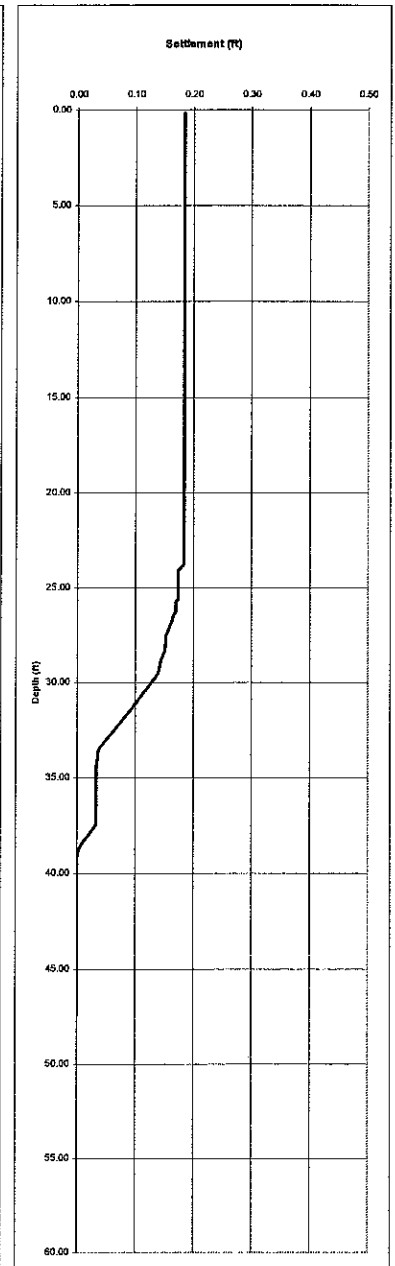
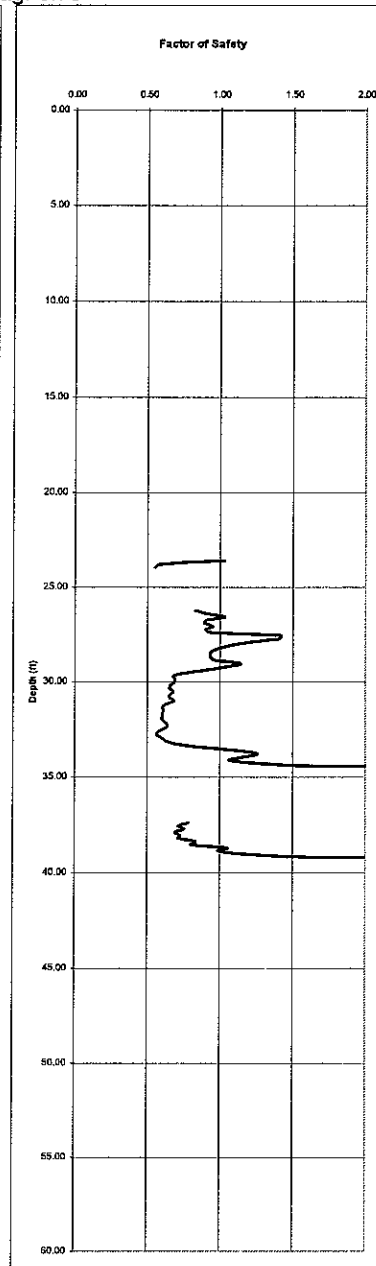
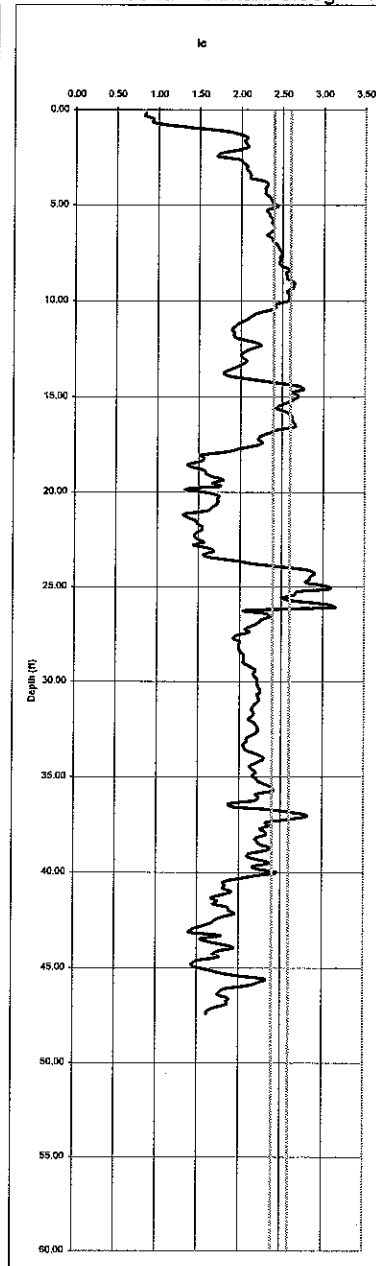
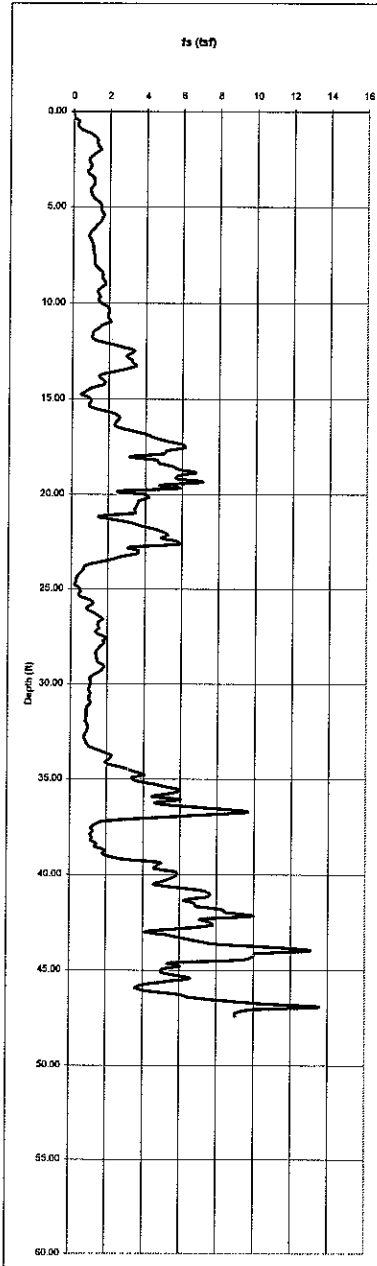
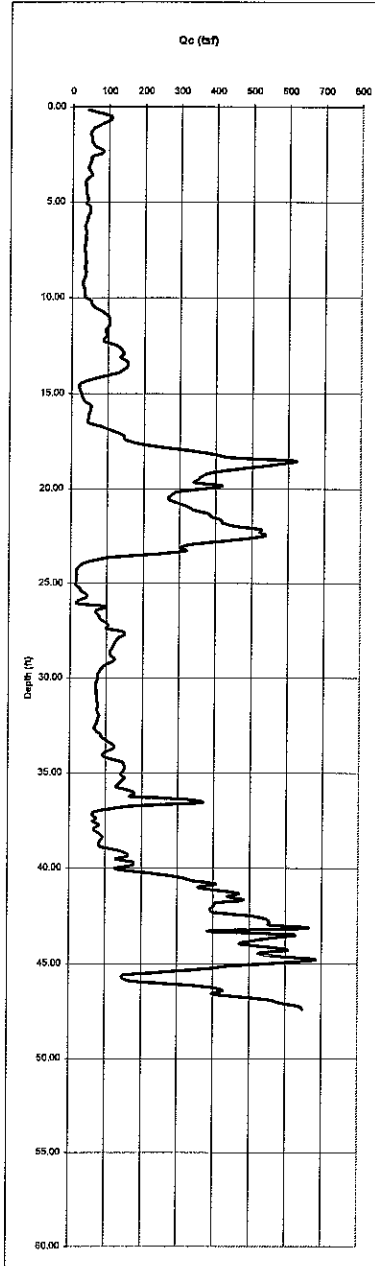
Water Table: 23.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-8)

Edgewater (04-15-03)

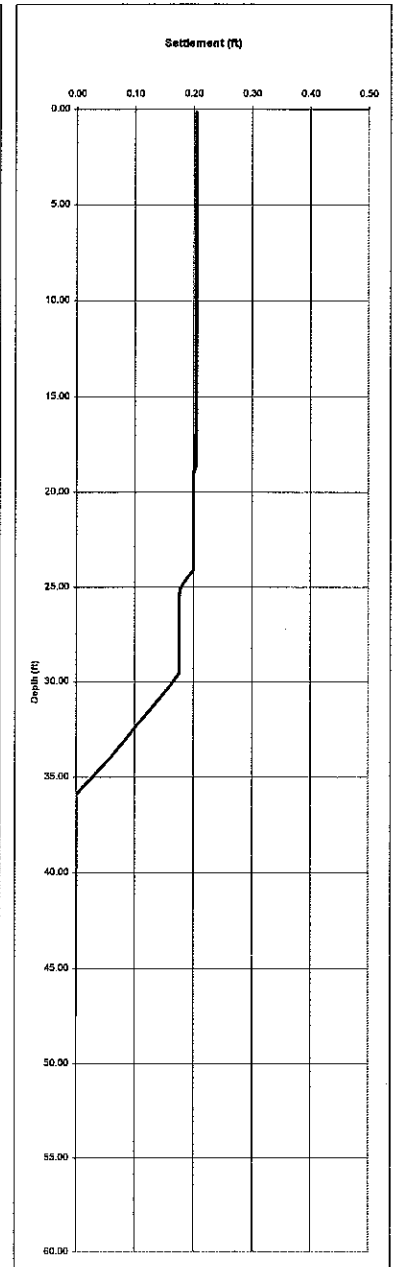
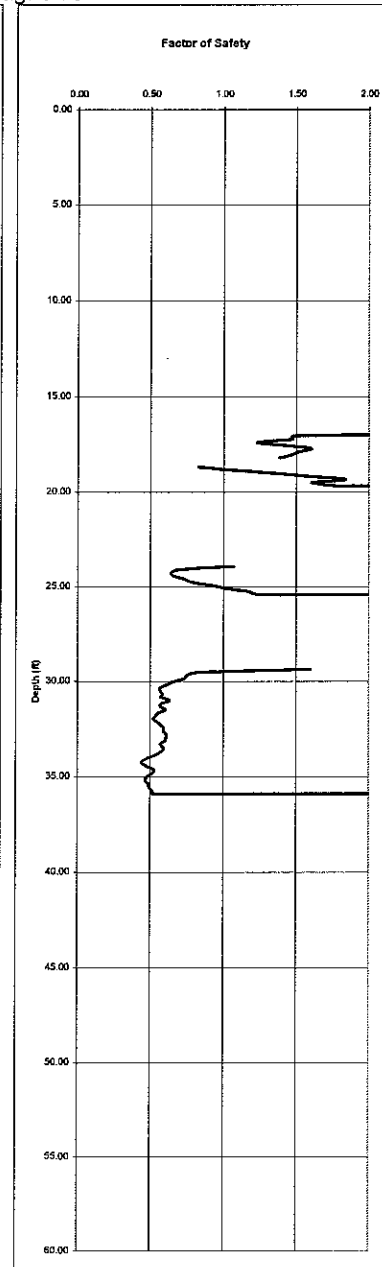
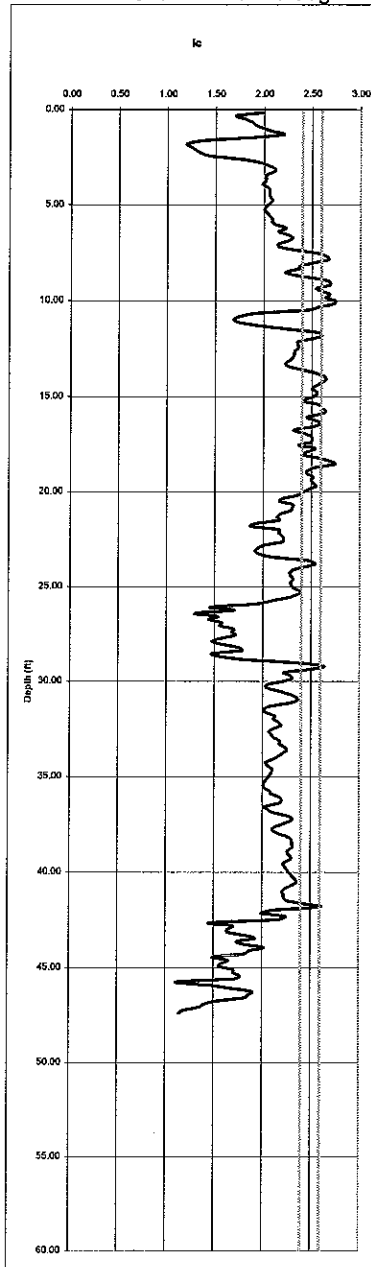
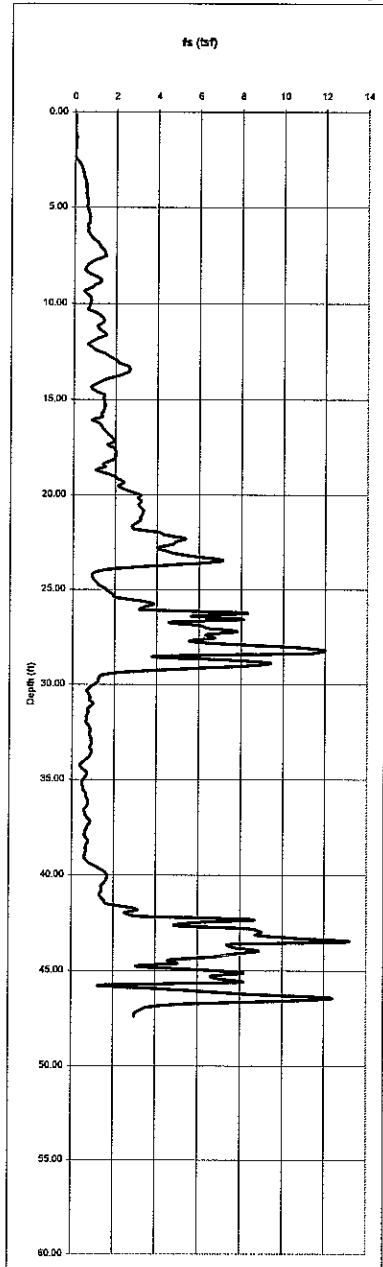
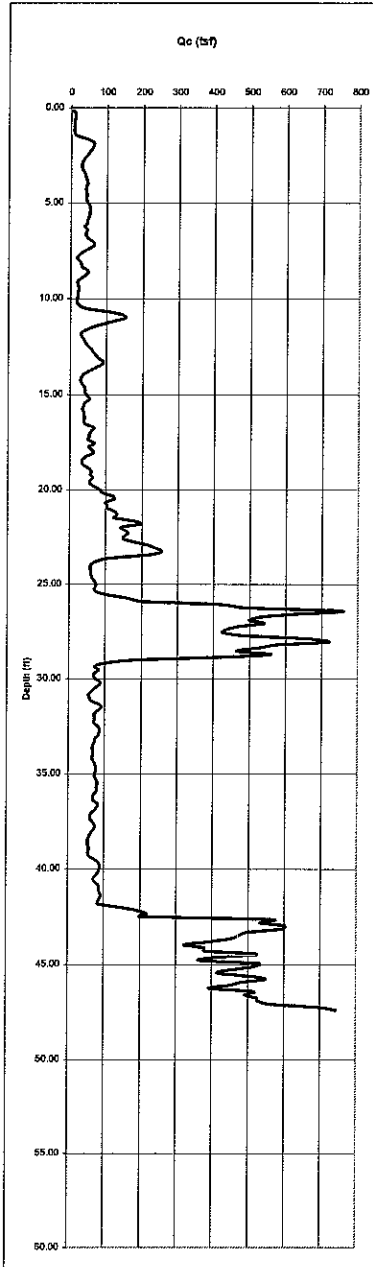
Water Table: 22.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-9)

Edgewater (04-15-03)

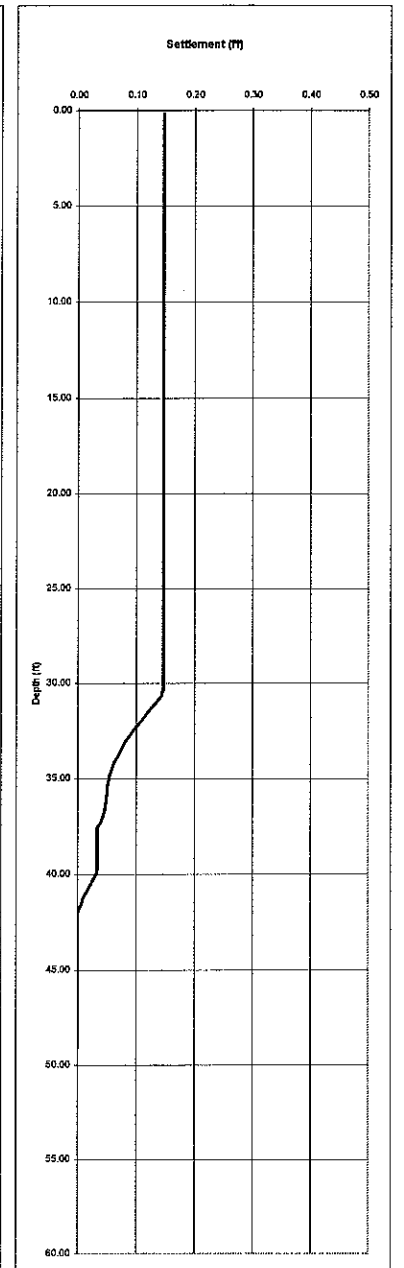
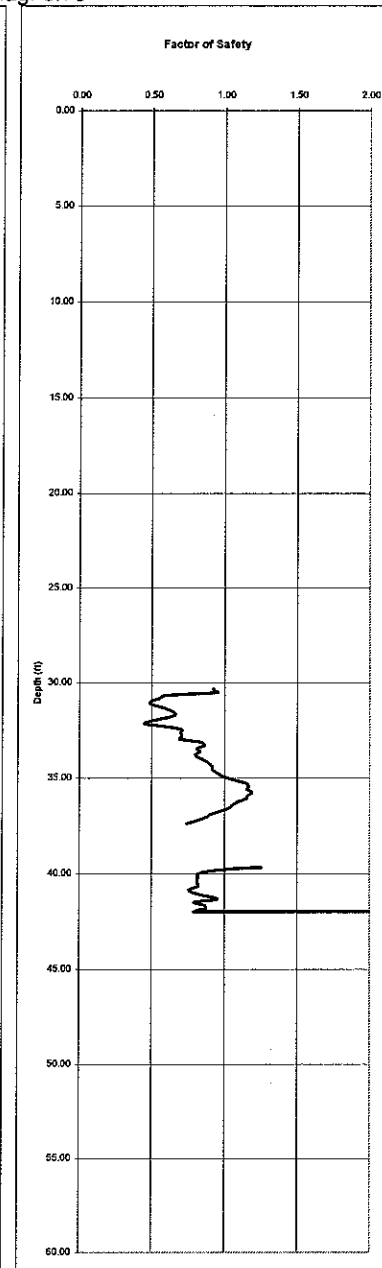
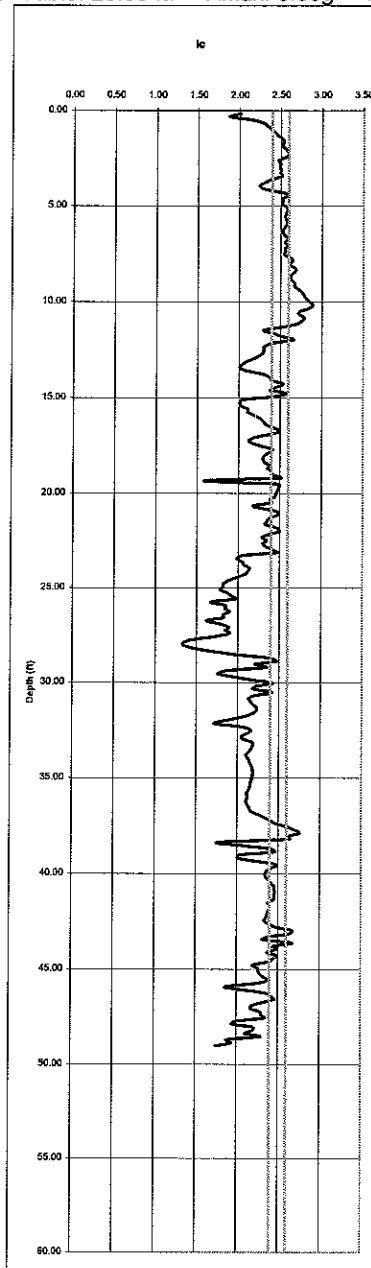
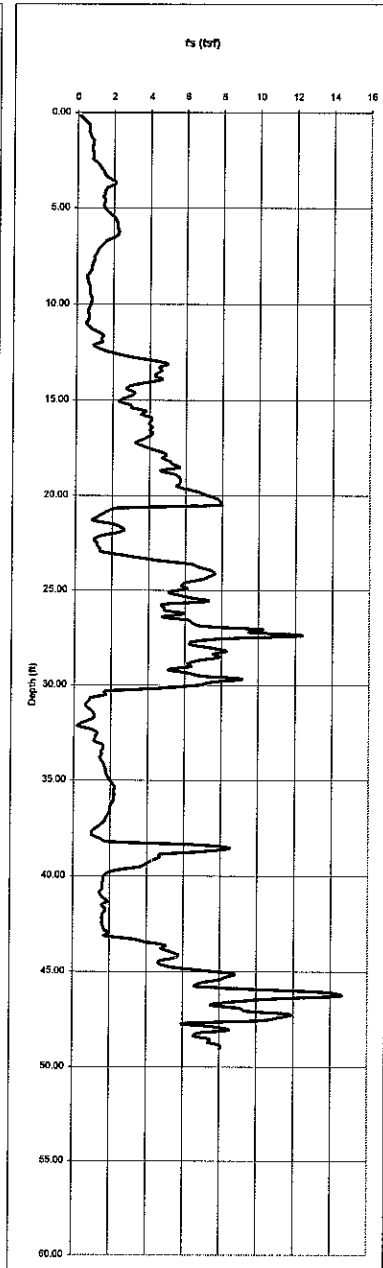
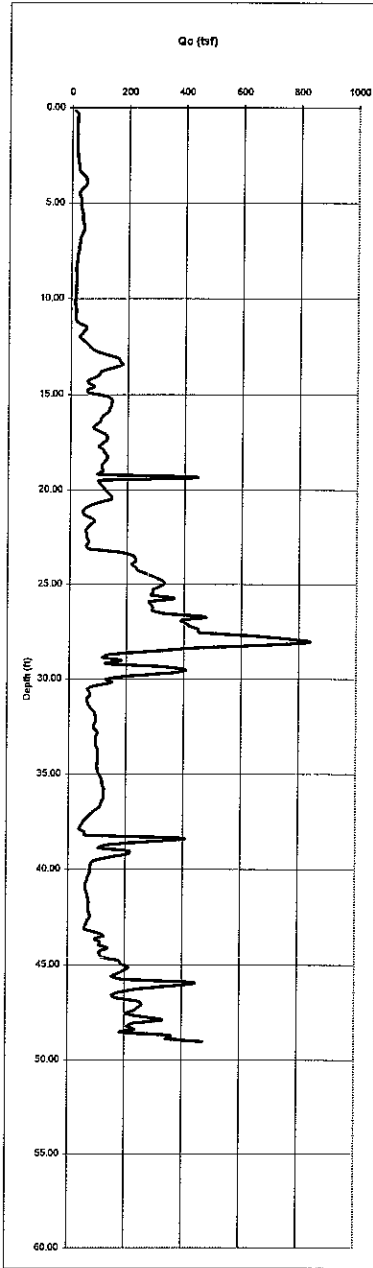
Water Table: 17.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-10)

Edgewater (04-15-03)

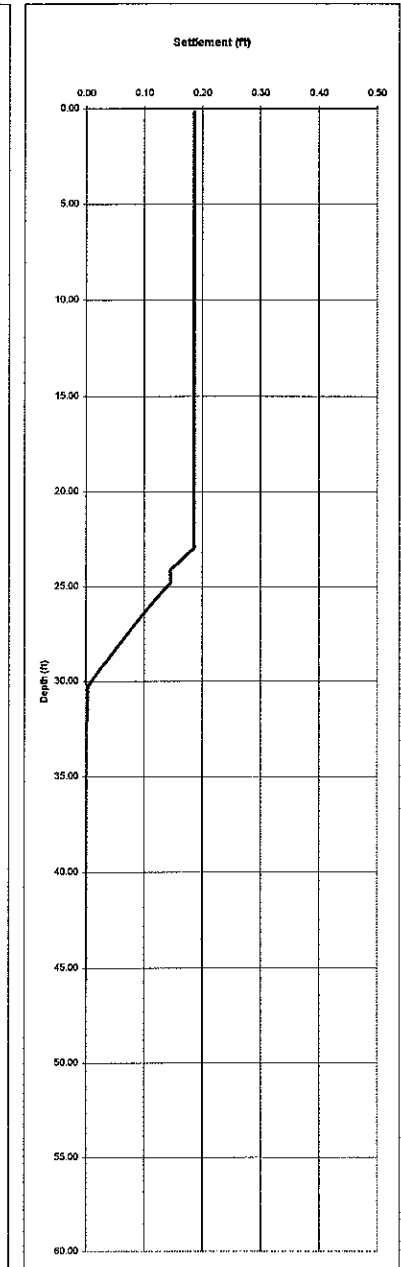
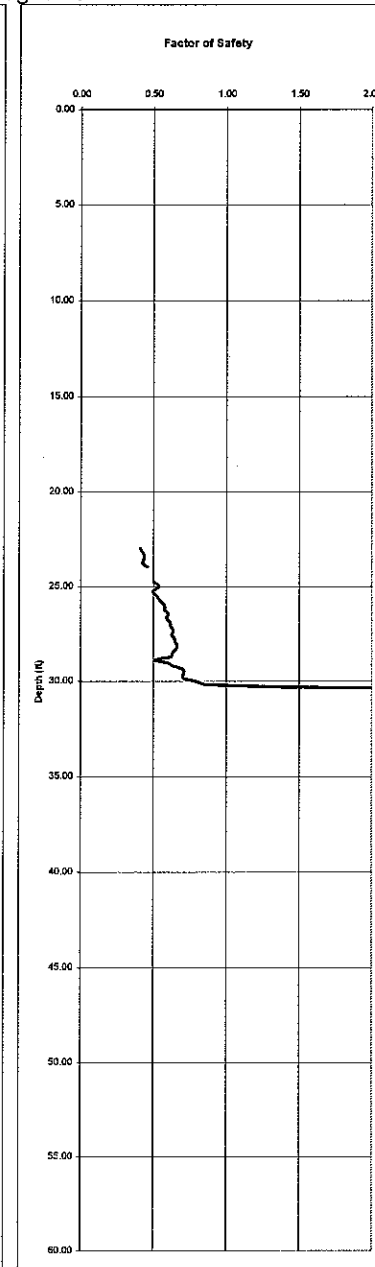
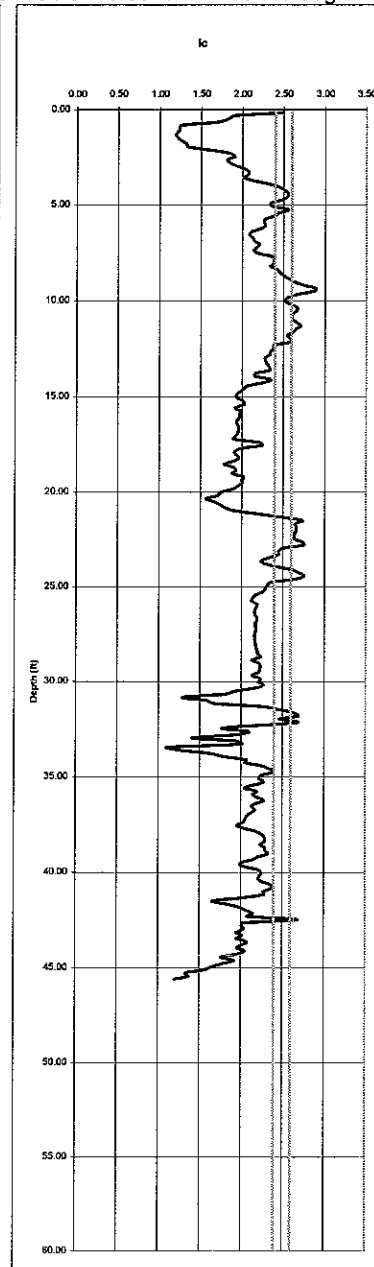
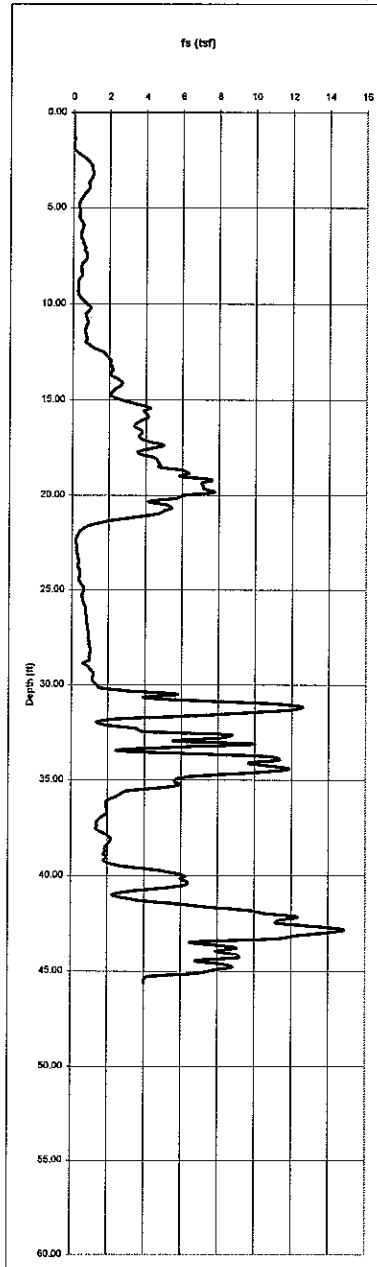
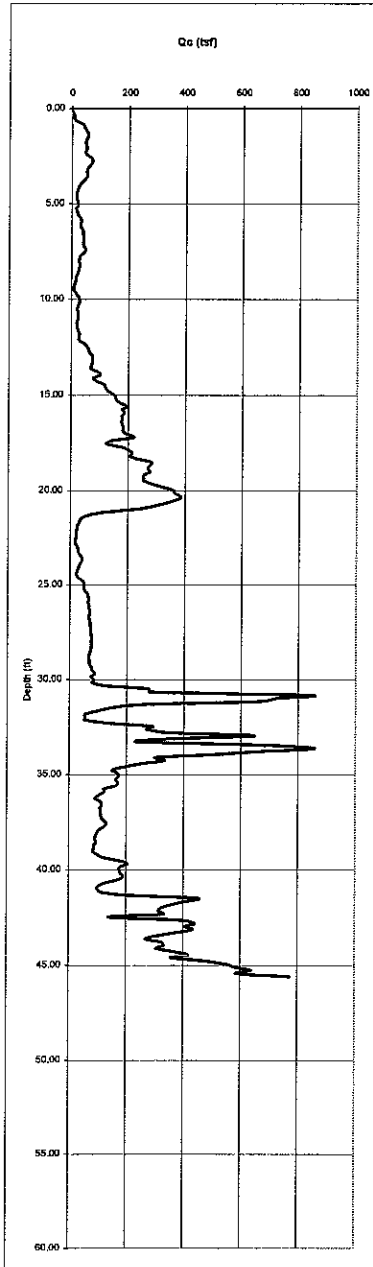
Water Table: 25.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-11)

Edgewater (04-15-03)

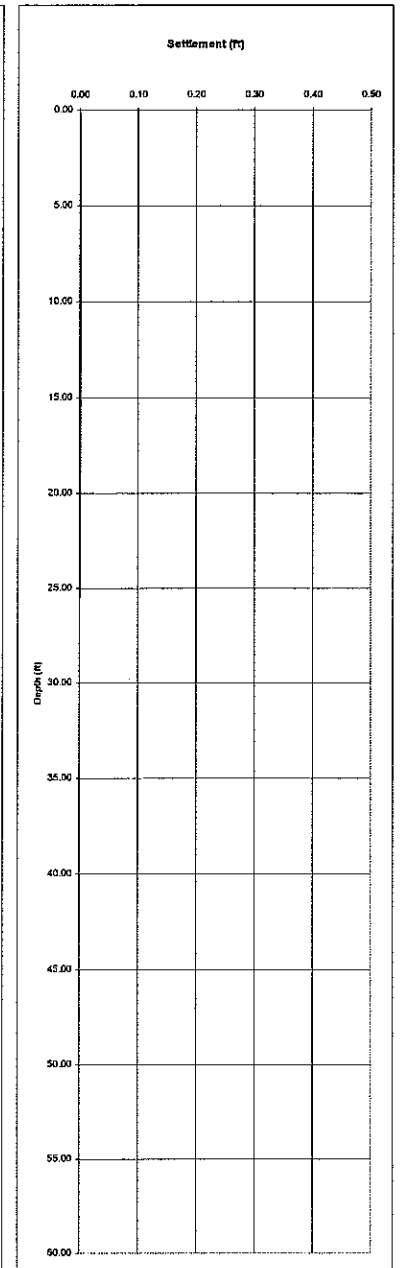
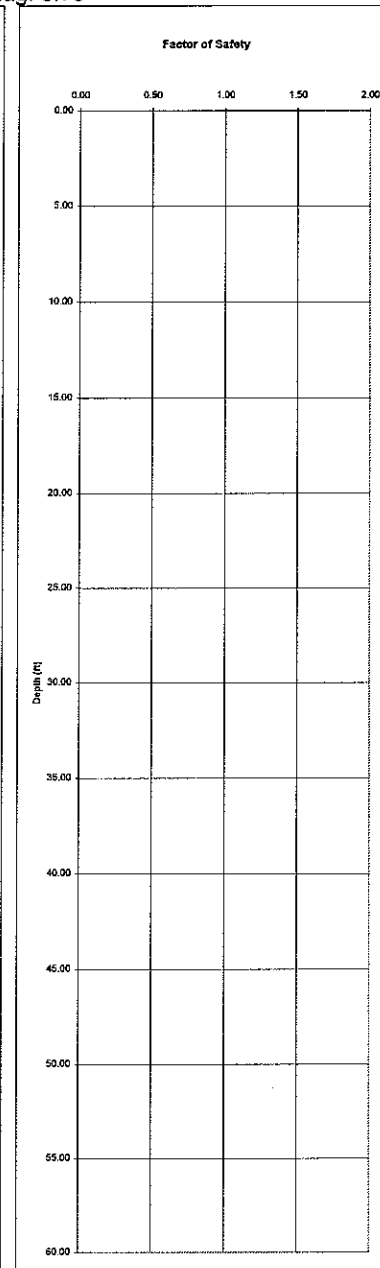
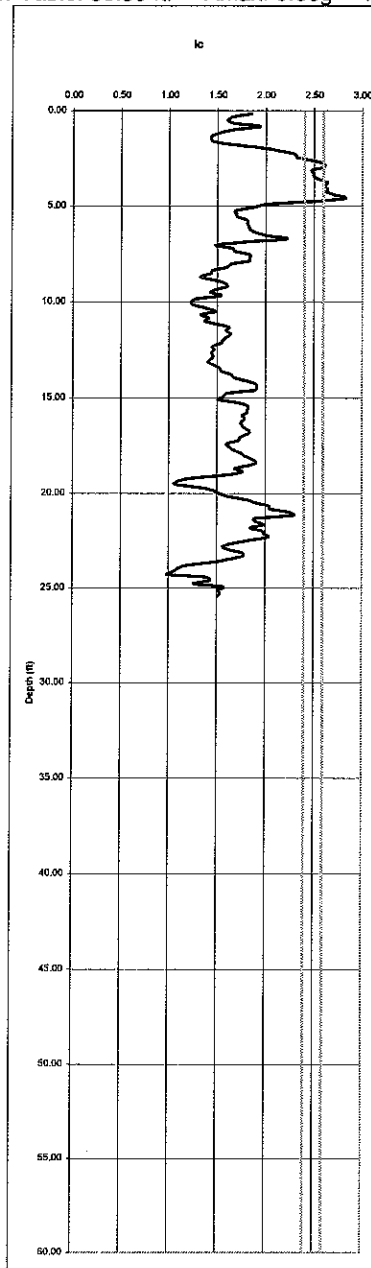
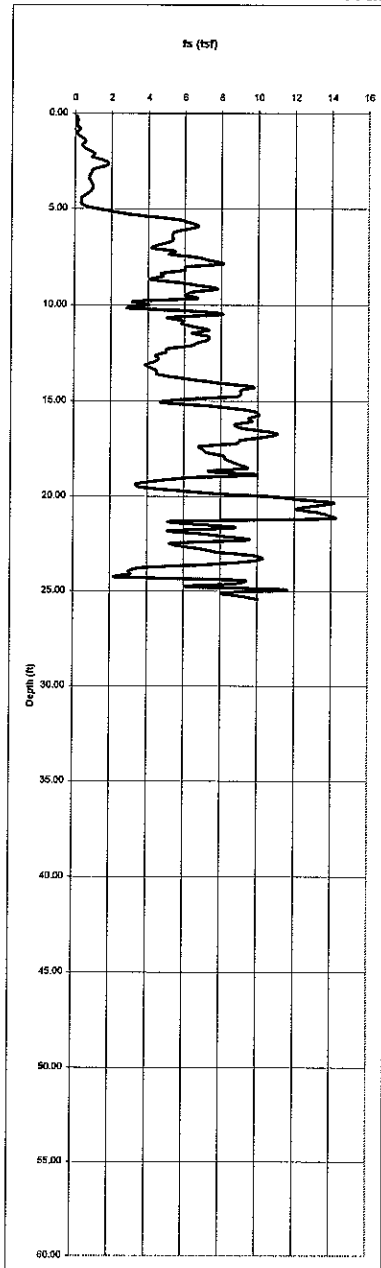
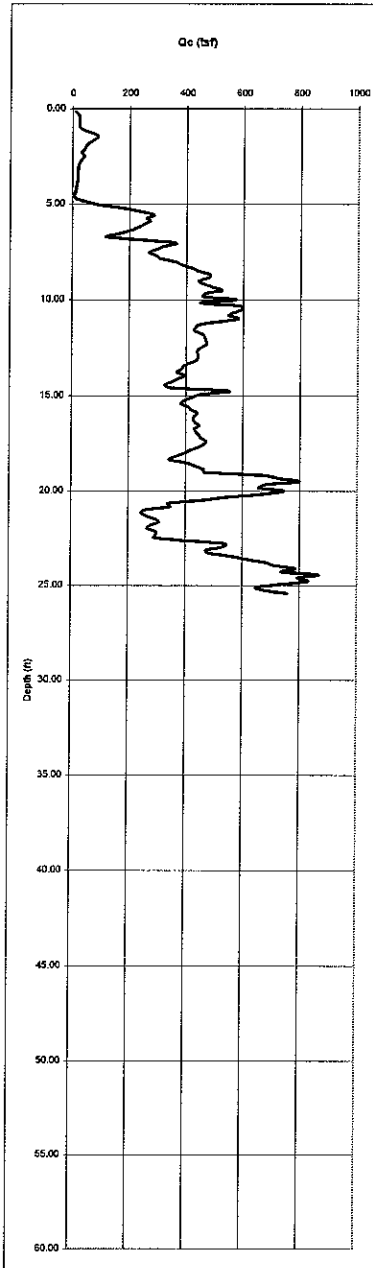
Water Table: 20.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-12)

Edgewater (04-15-03)

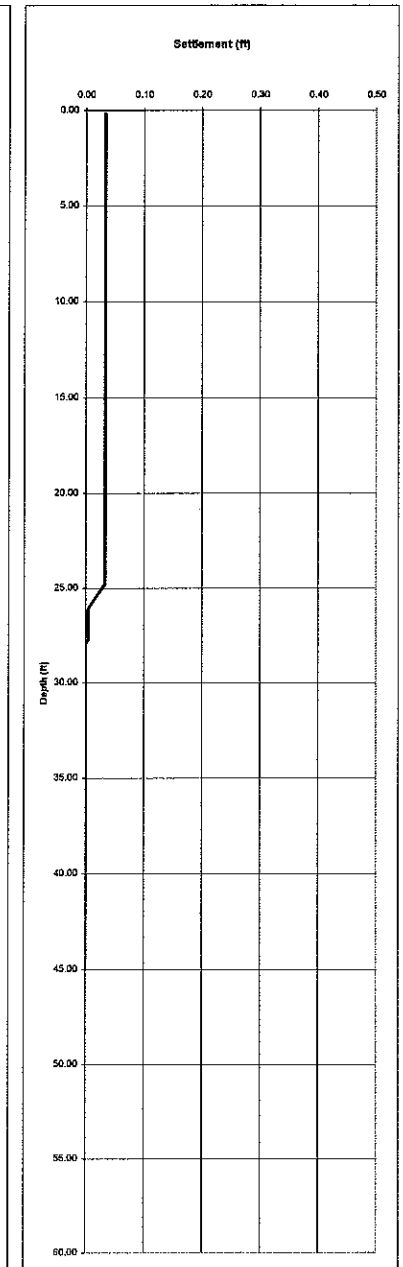
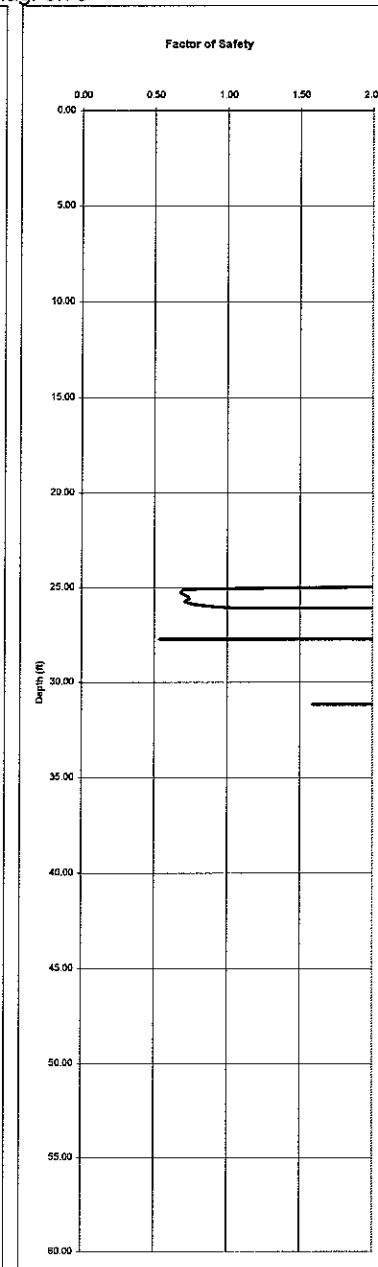
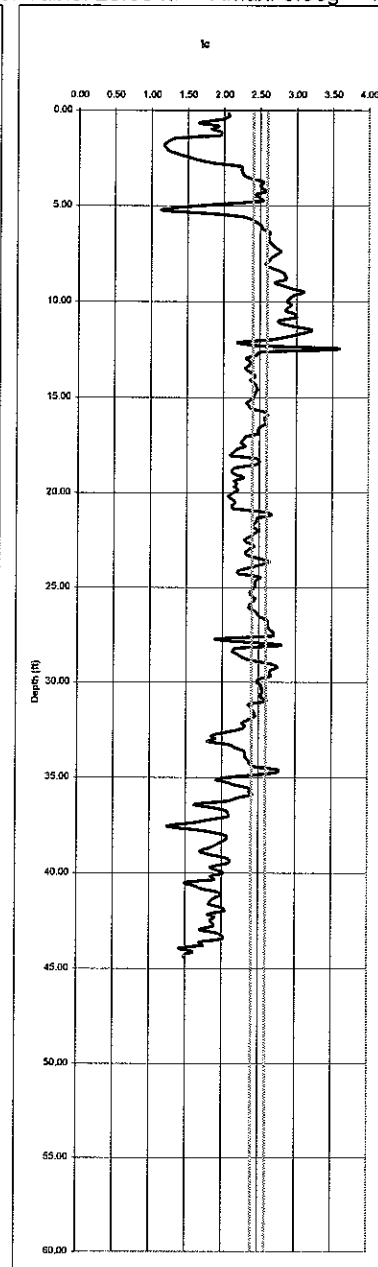
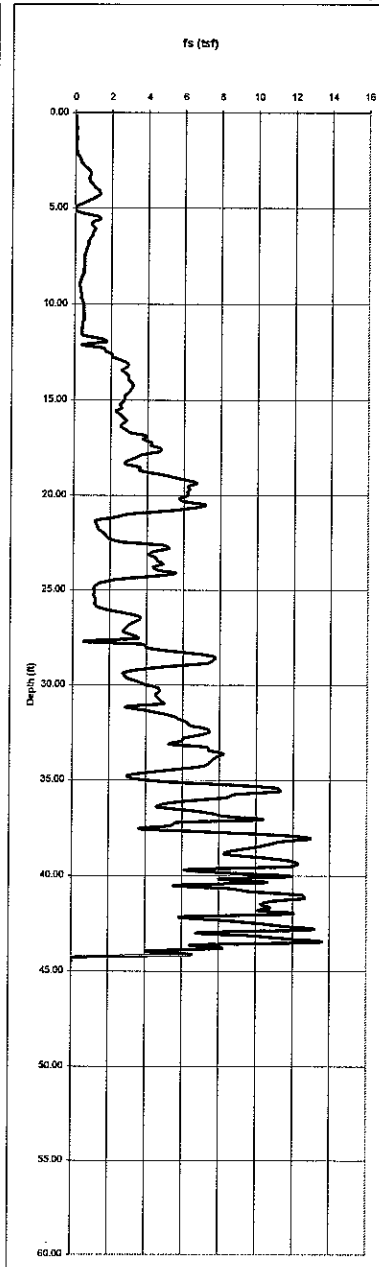
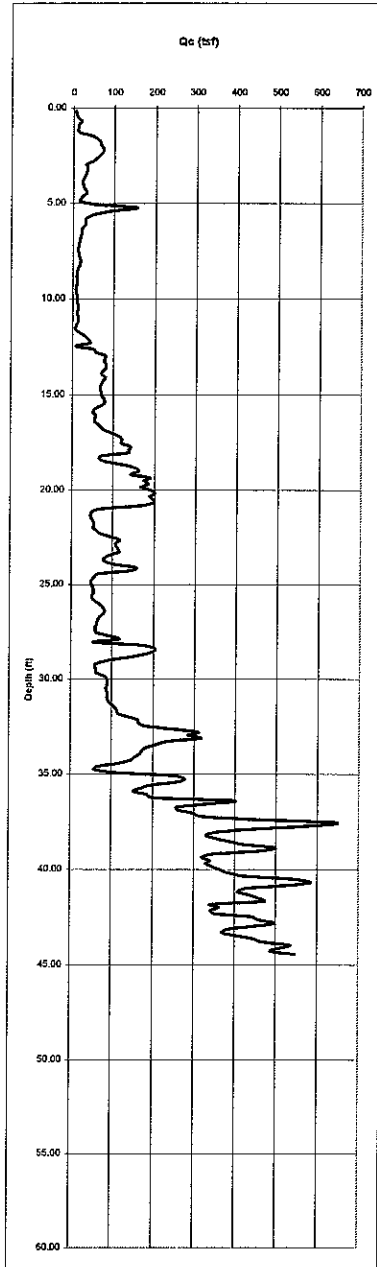
Water Table: 33.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-13)

Edgewater (04-15-03)

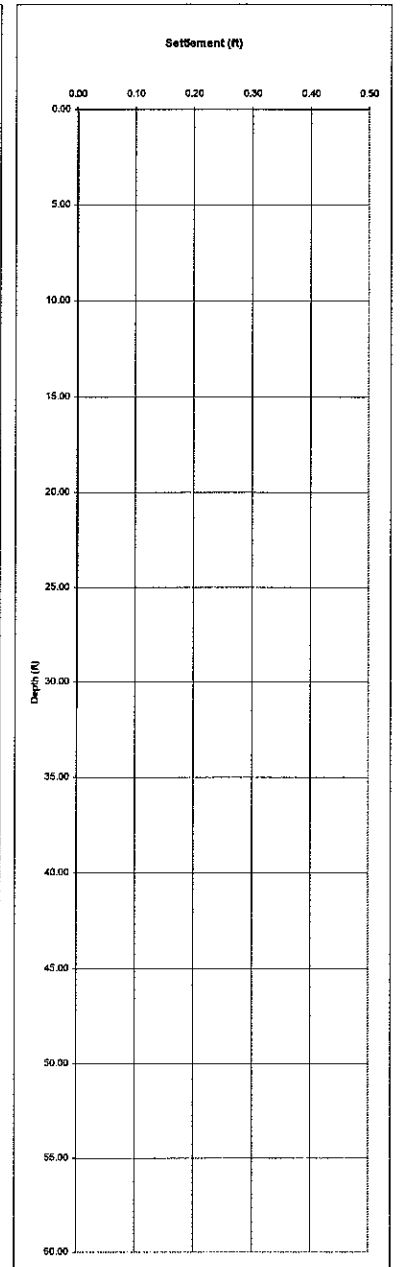
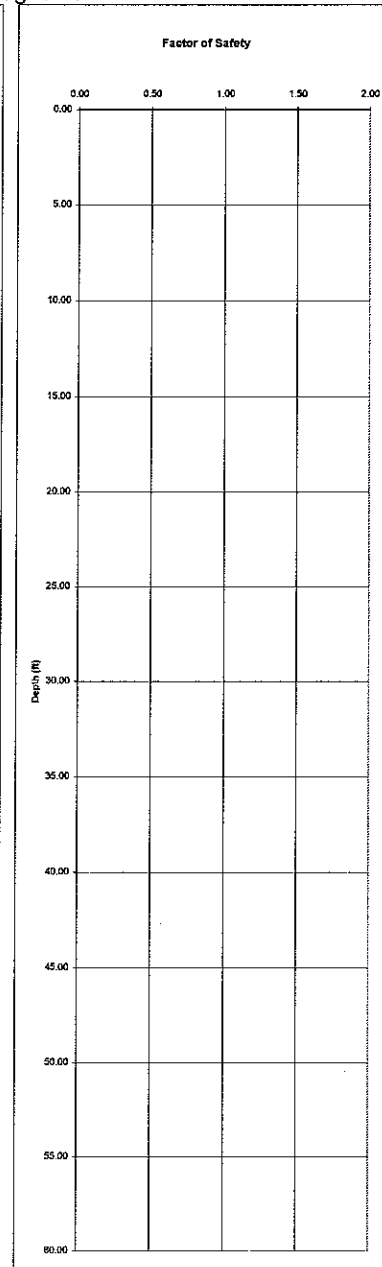
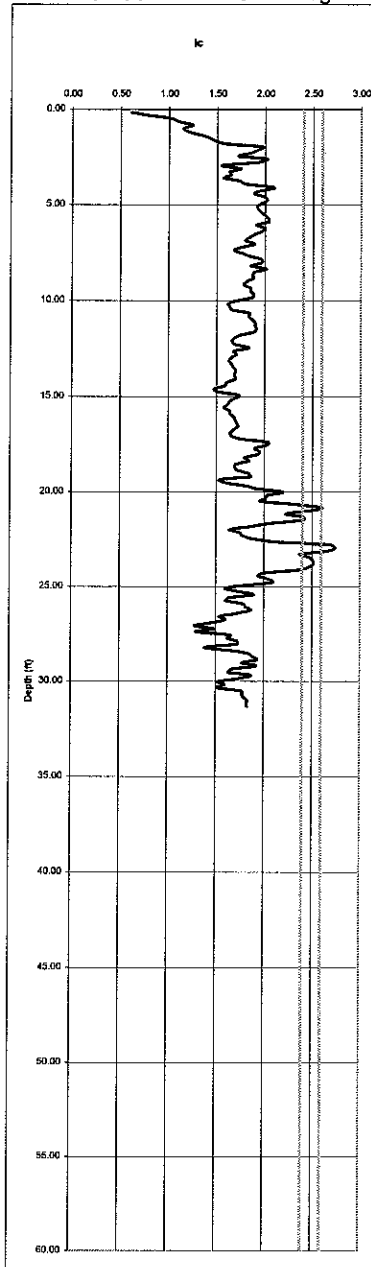
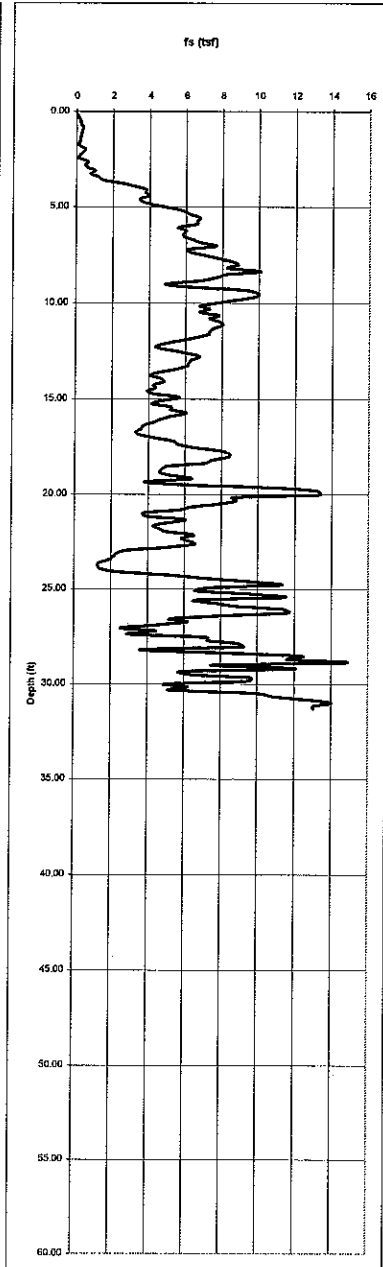
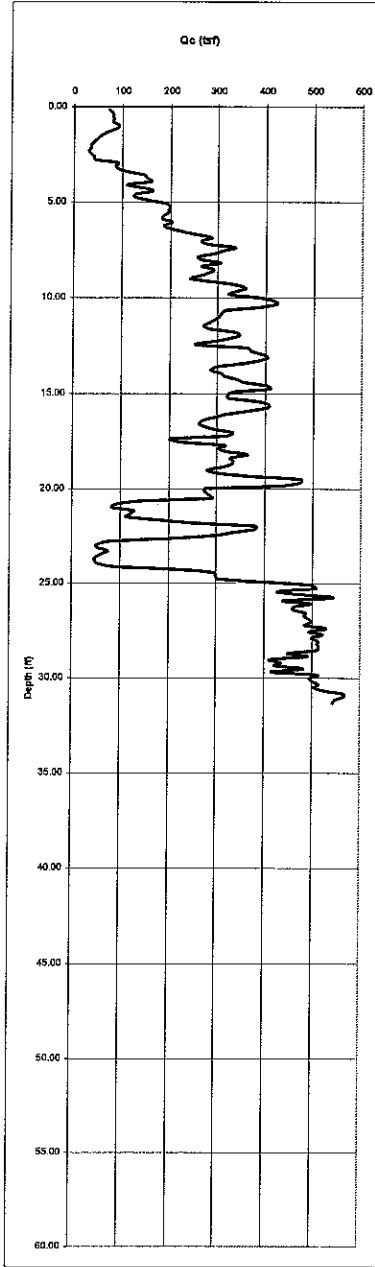
Water Table: 25.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-14)

Edgewater (04-15-03)

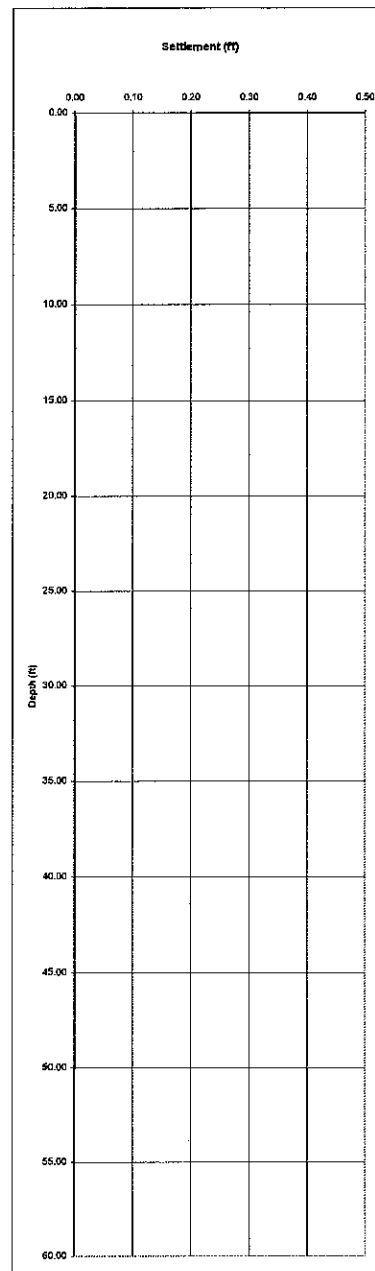
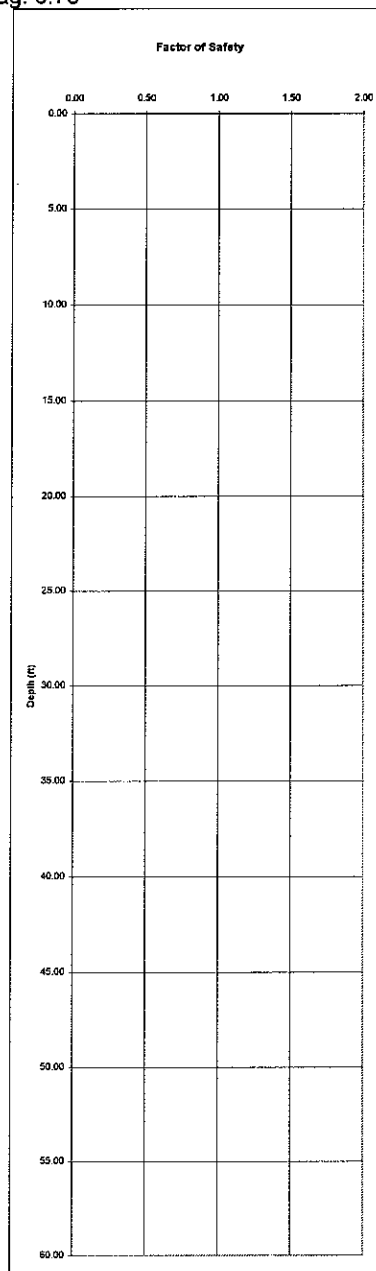
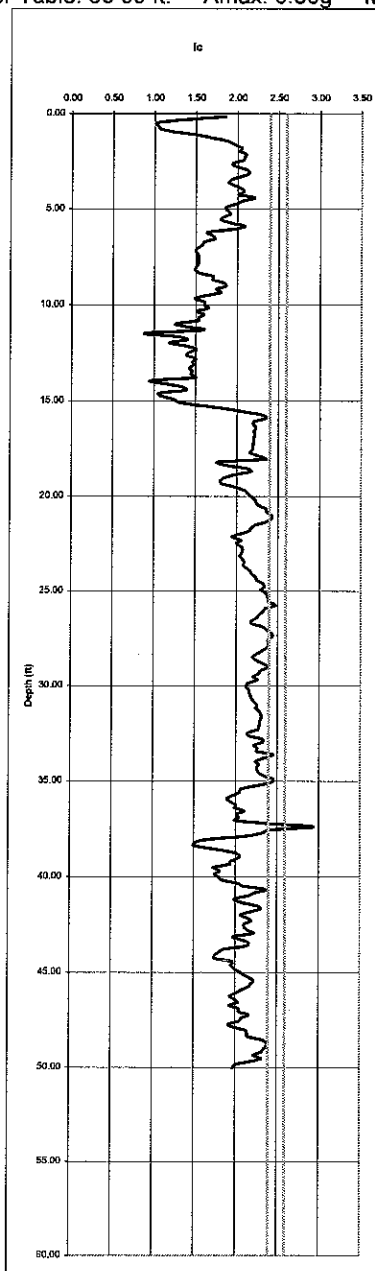
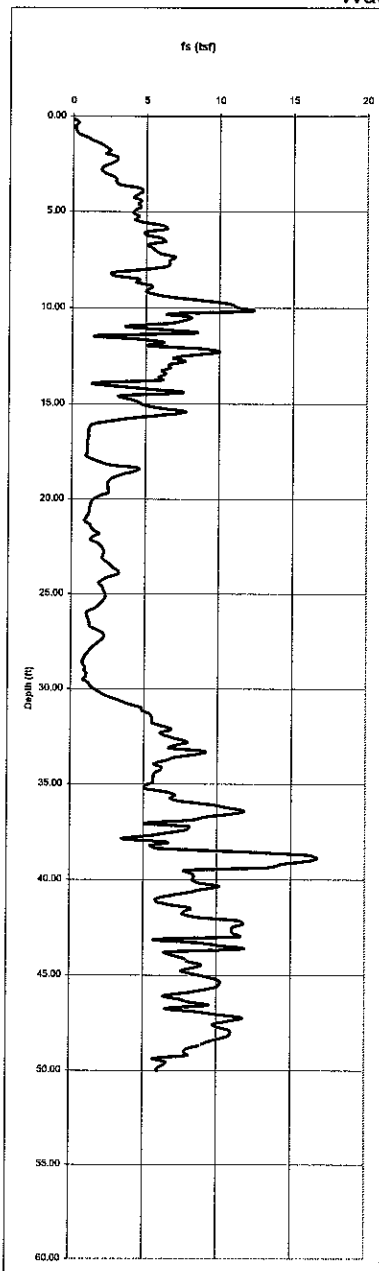
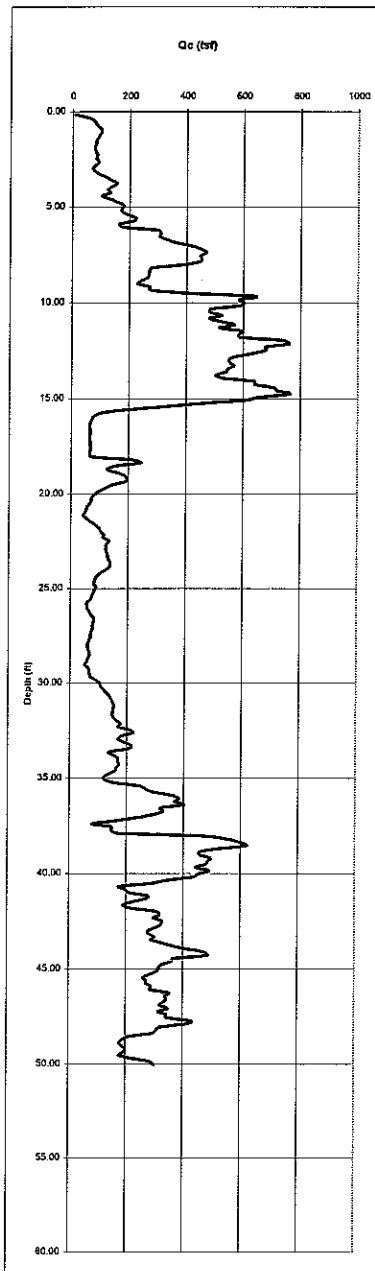
Water Table: 36.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-15)

Edgewater (04-15-03)

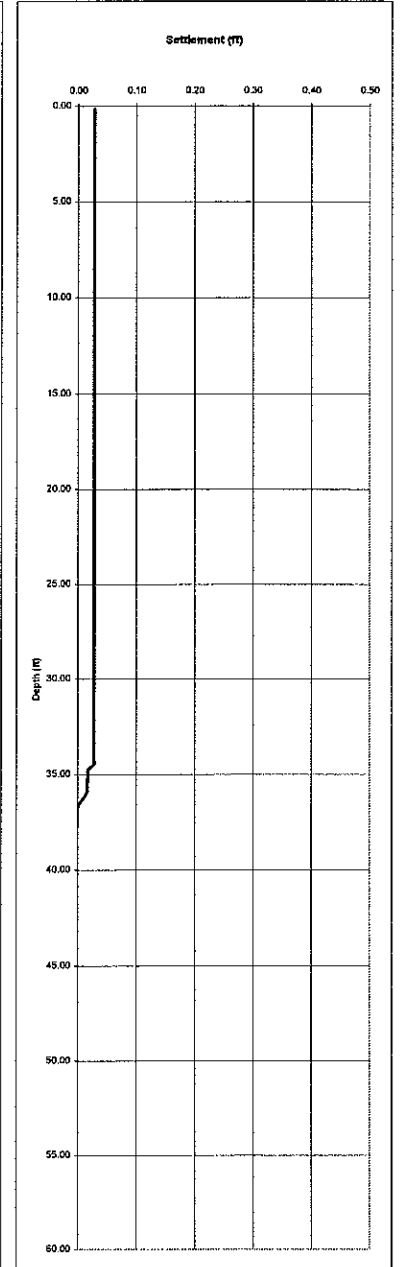
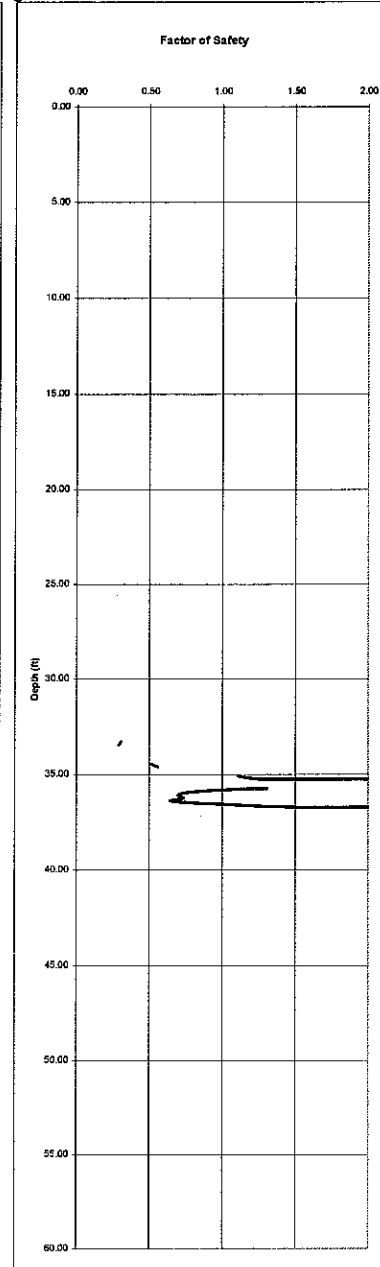
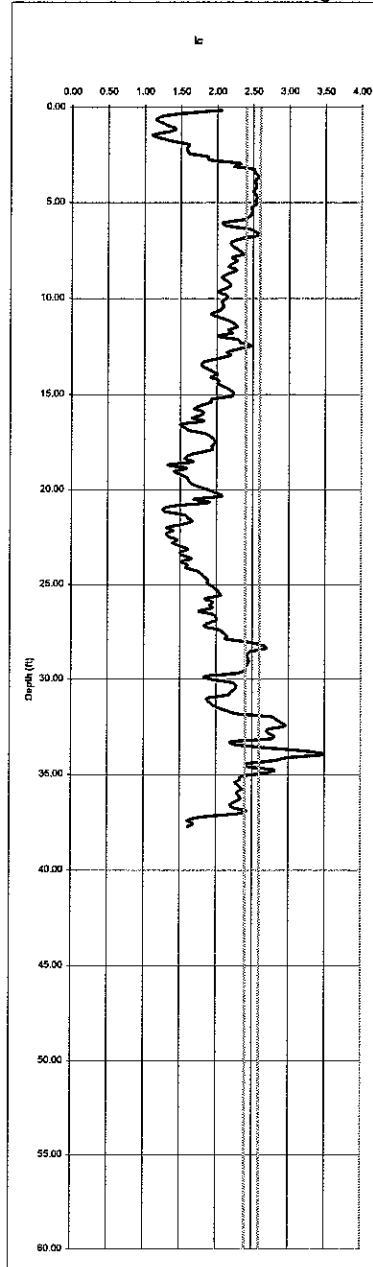
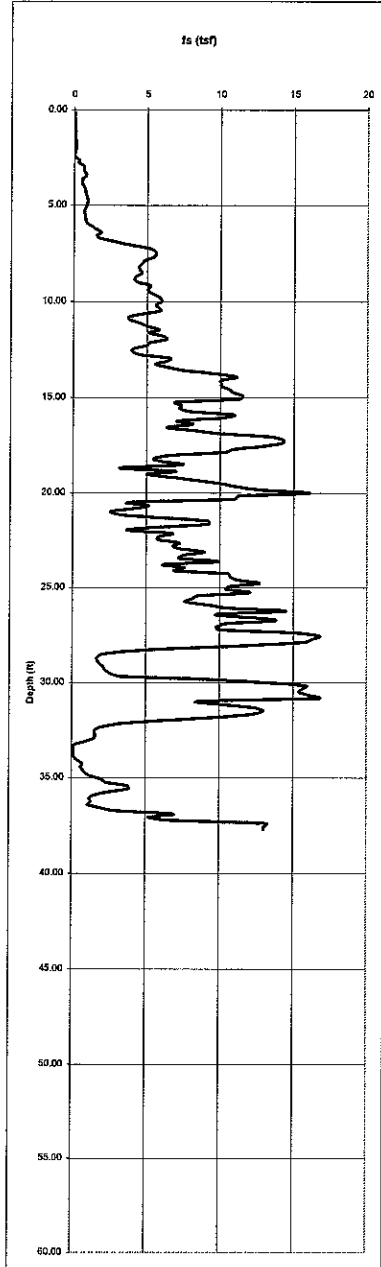
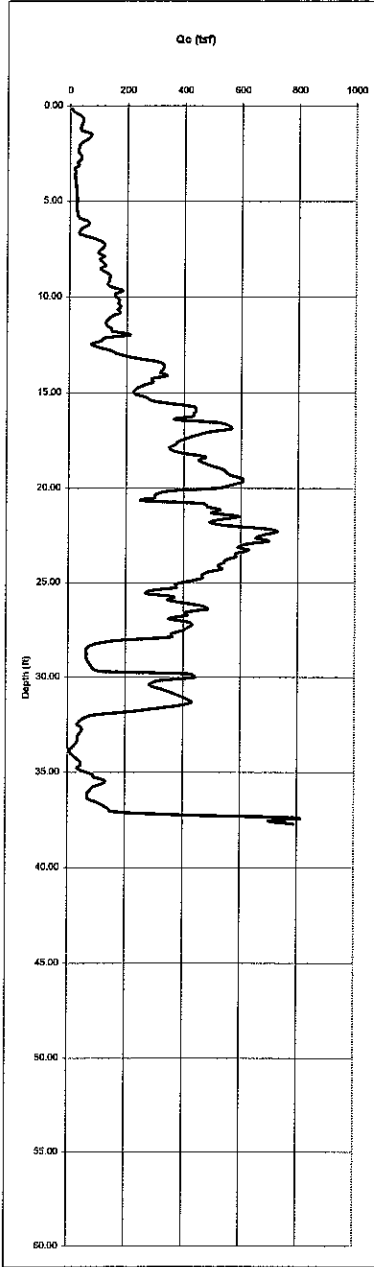
Water Table: 53.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-16)

Edgewater (04-15-03)

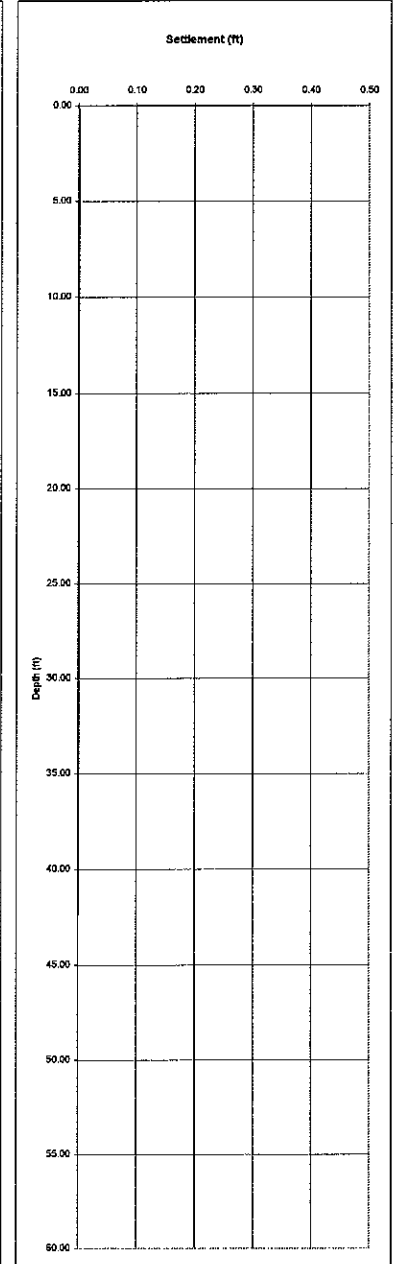
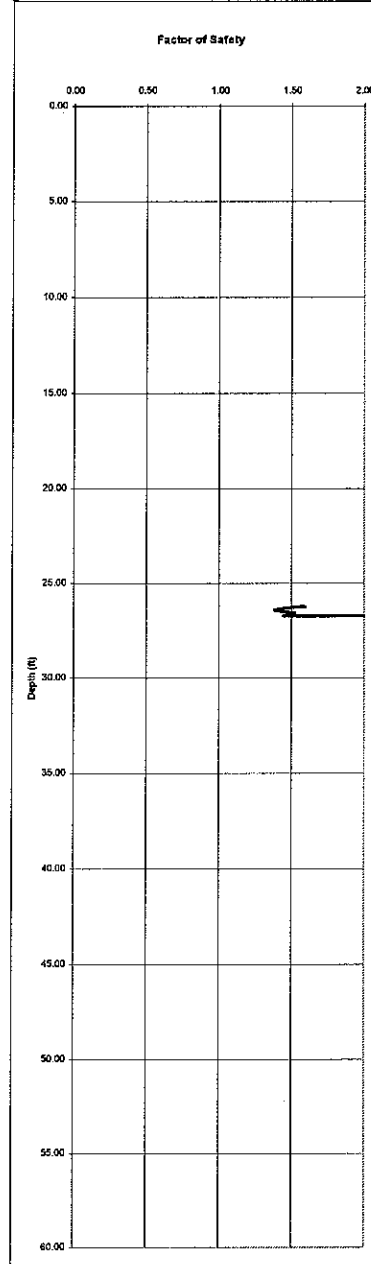
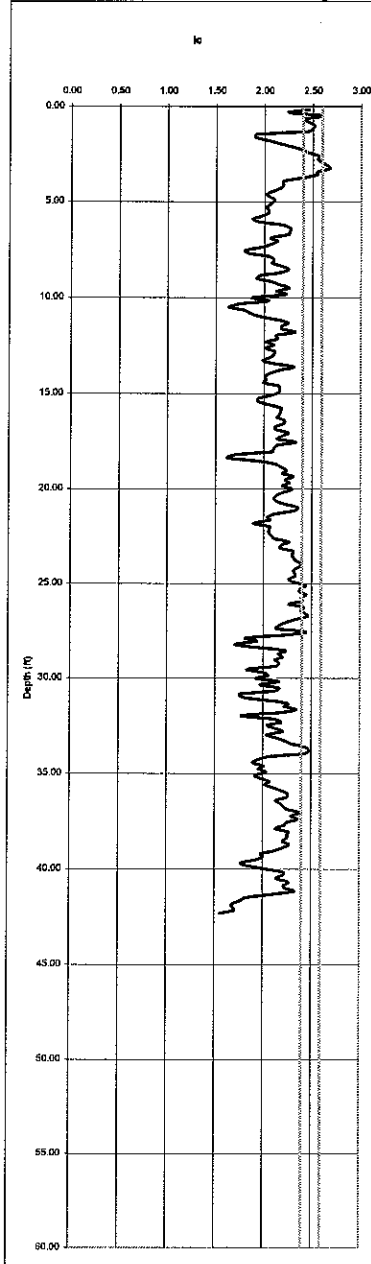
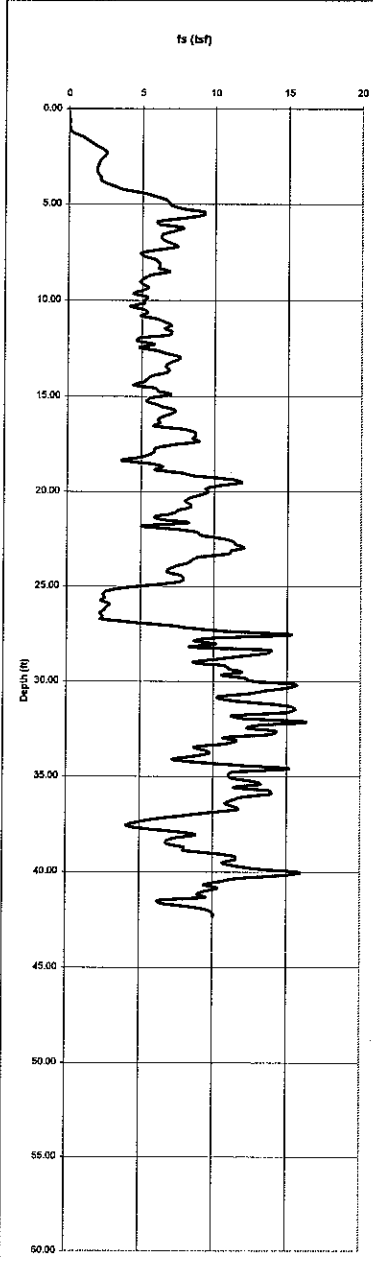
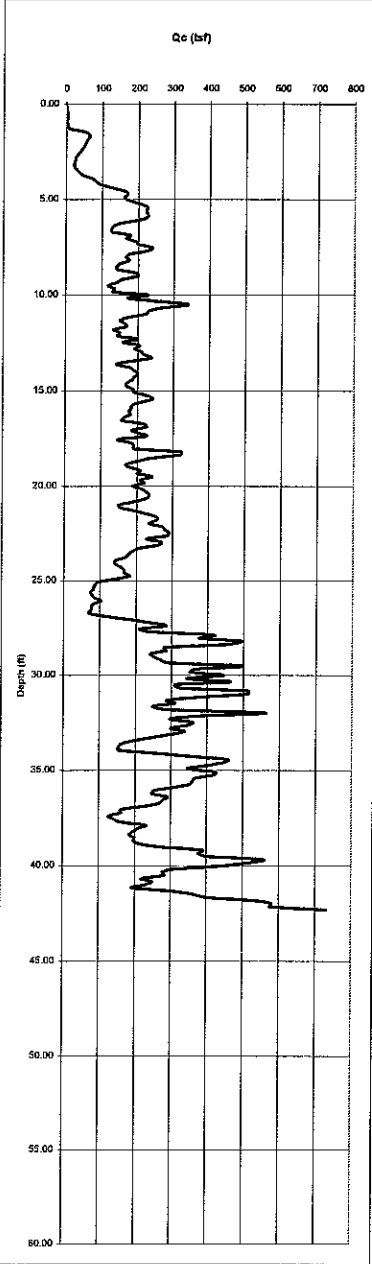
Water Table: 33.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-17)

Edgewater (04-15-03)

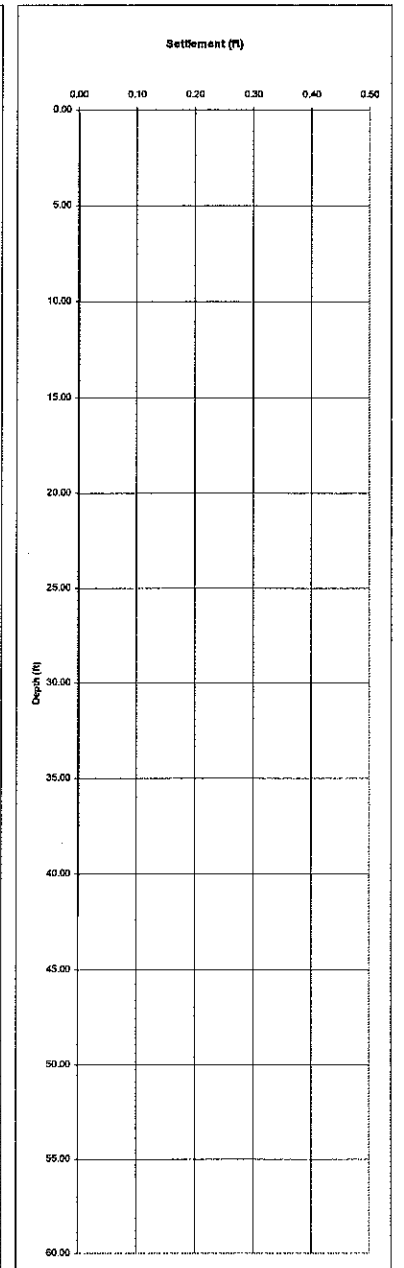
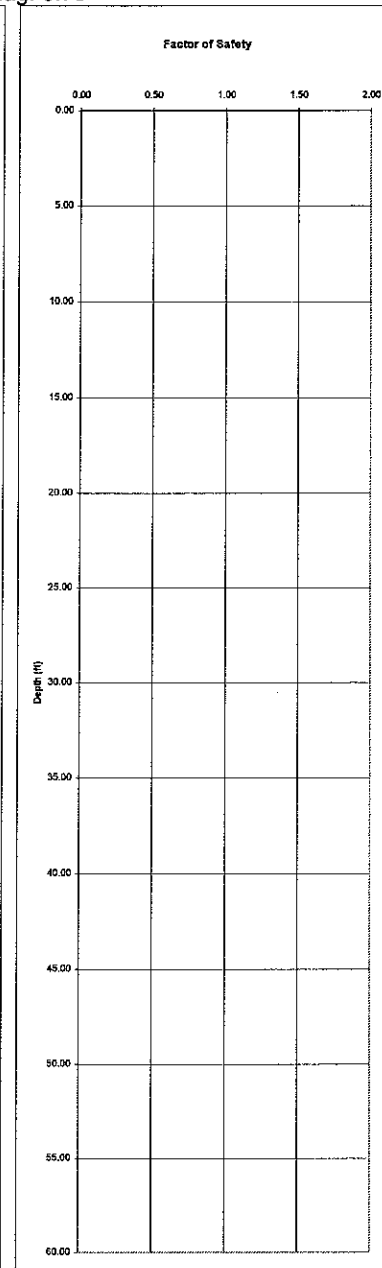
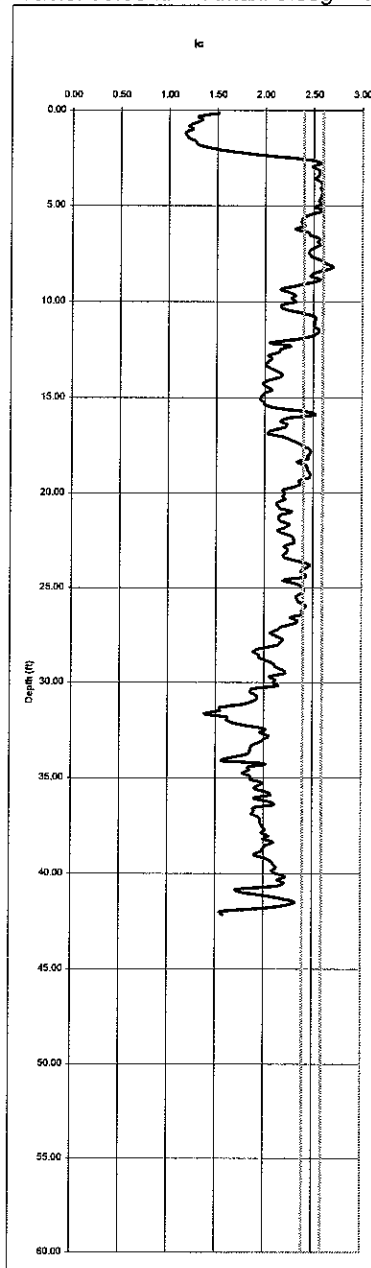
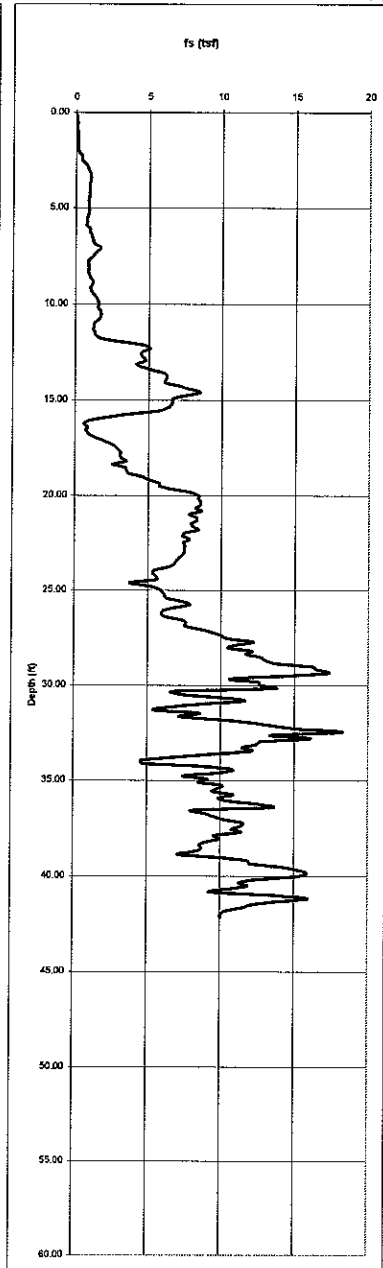
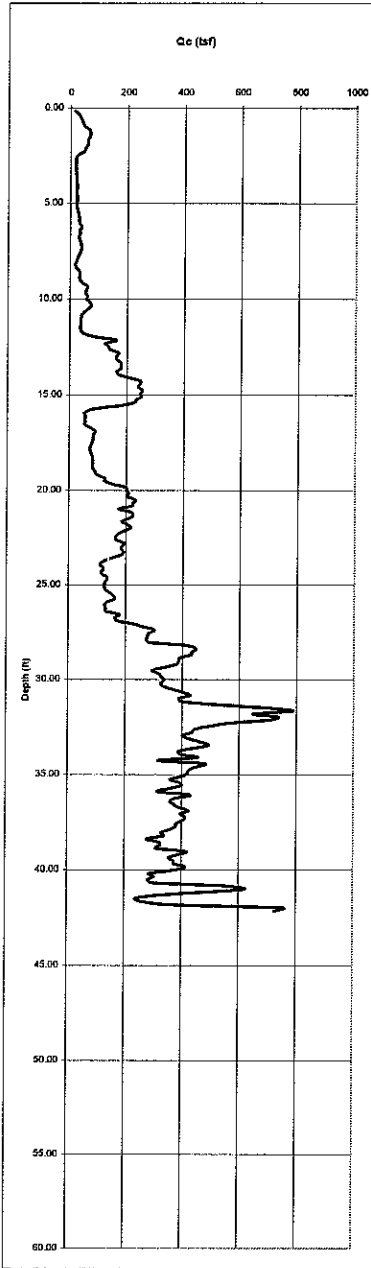
Water Table: 25.00 ft Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-19)

Edgewater (04-15-03)

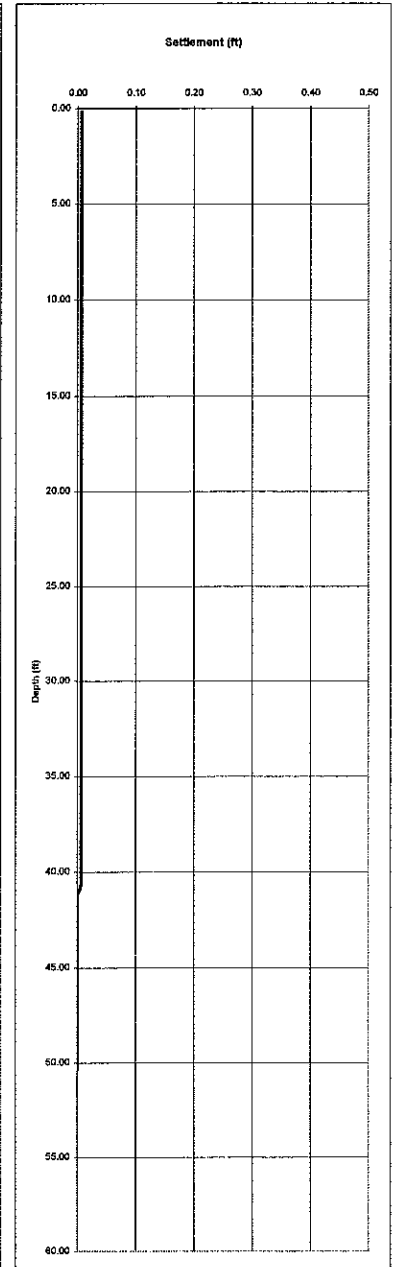
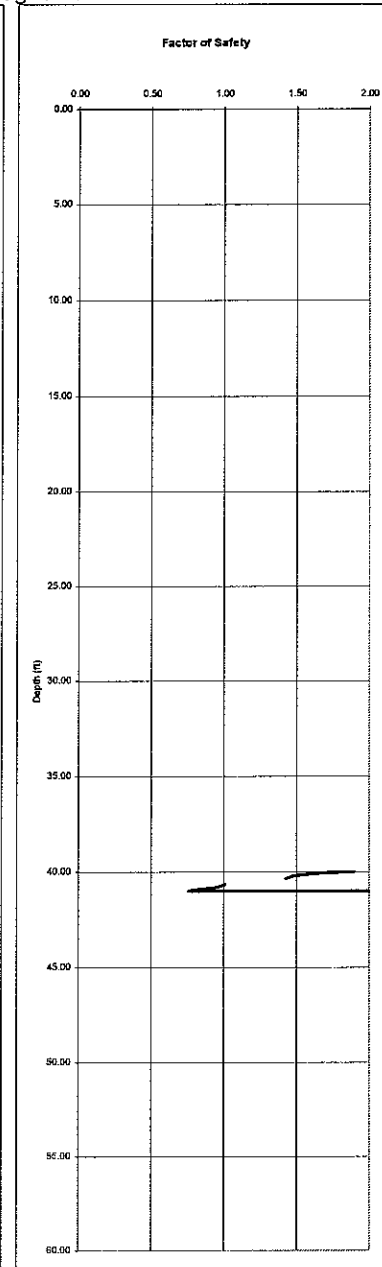
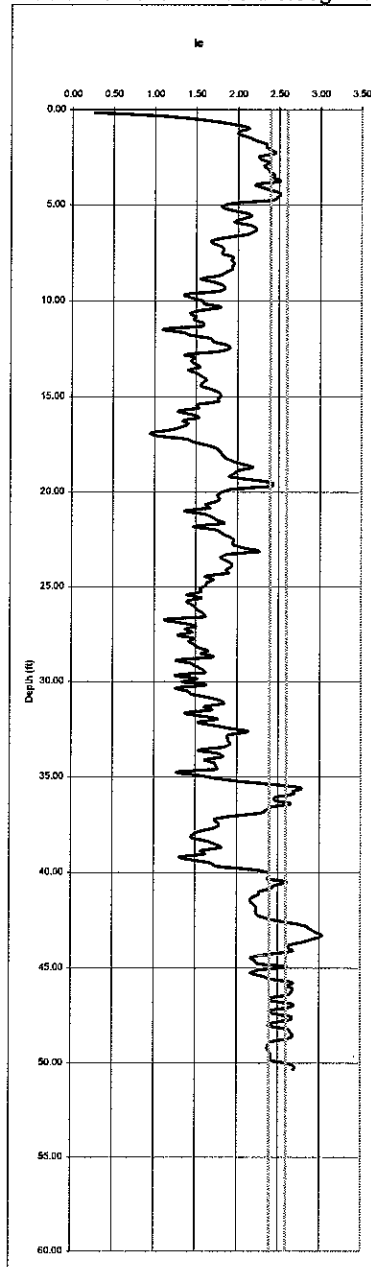
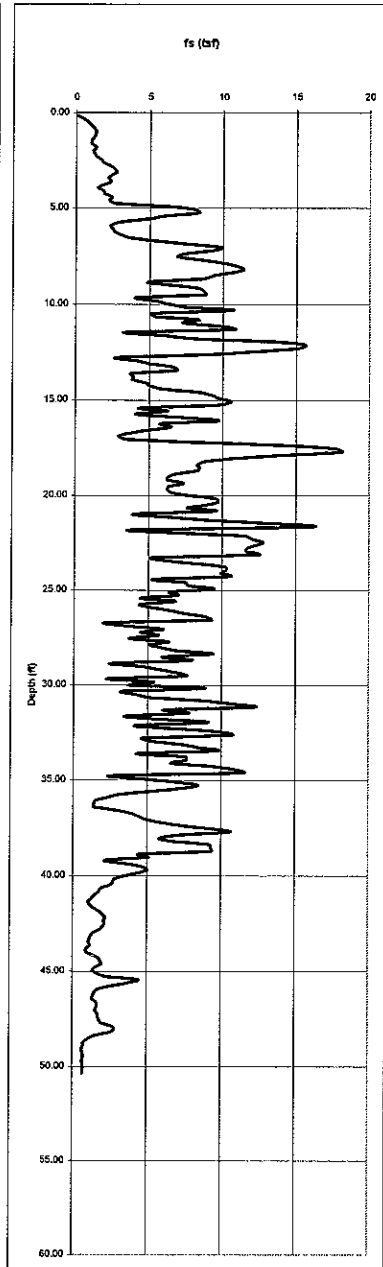
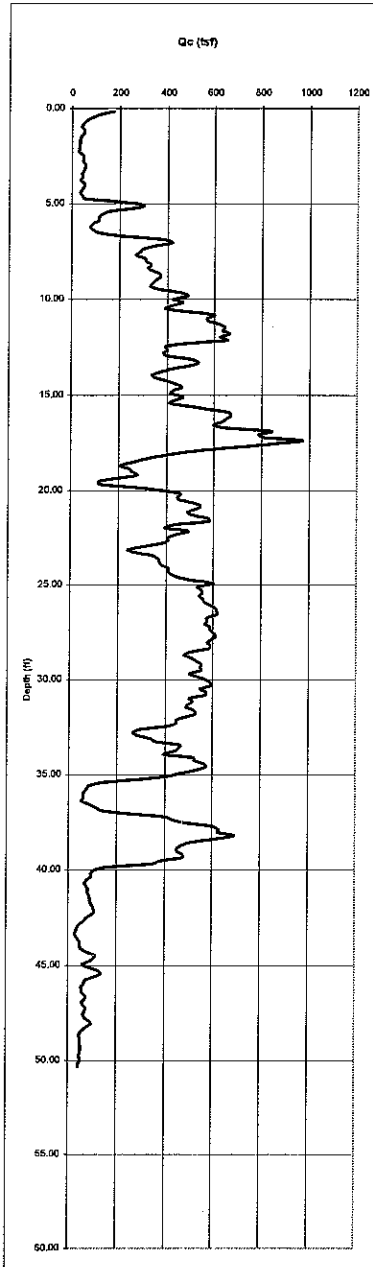
Water Table: 39.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-20)

Edgewater (04-15-03)

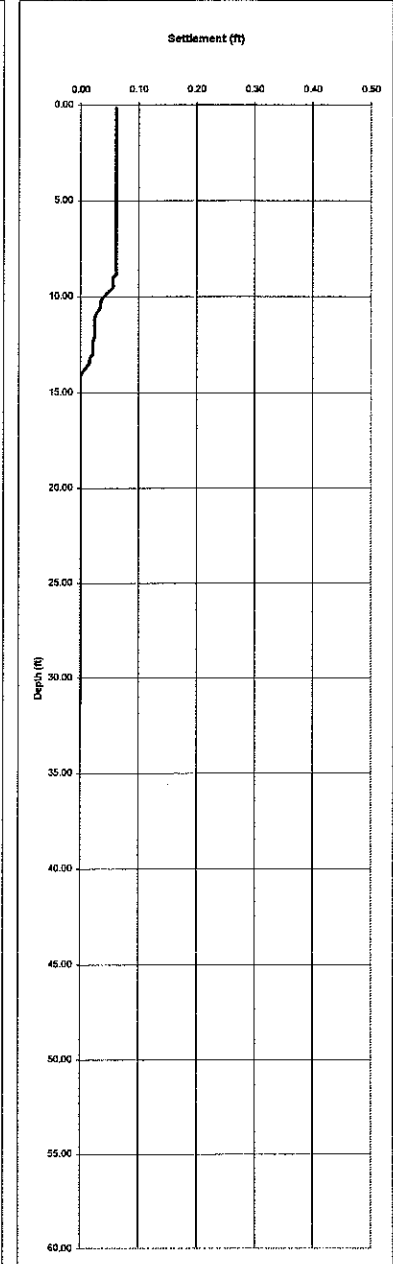
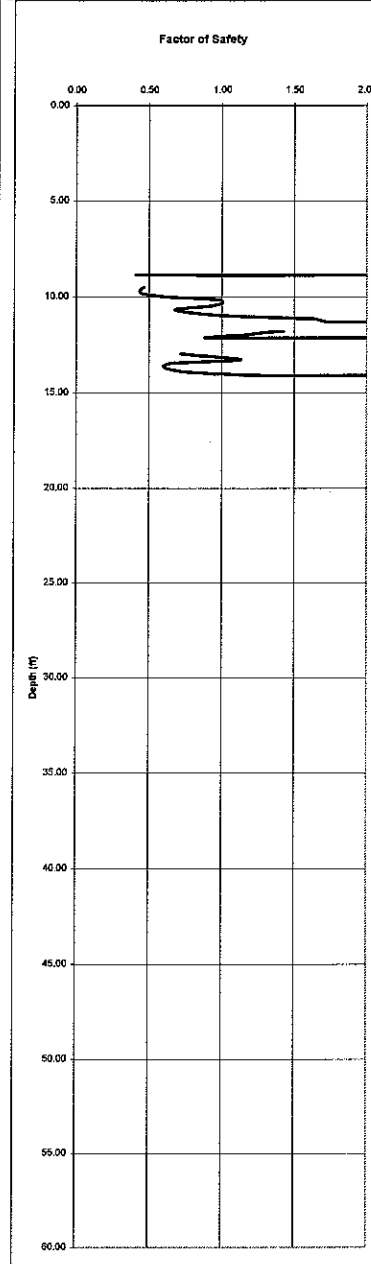
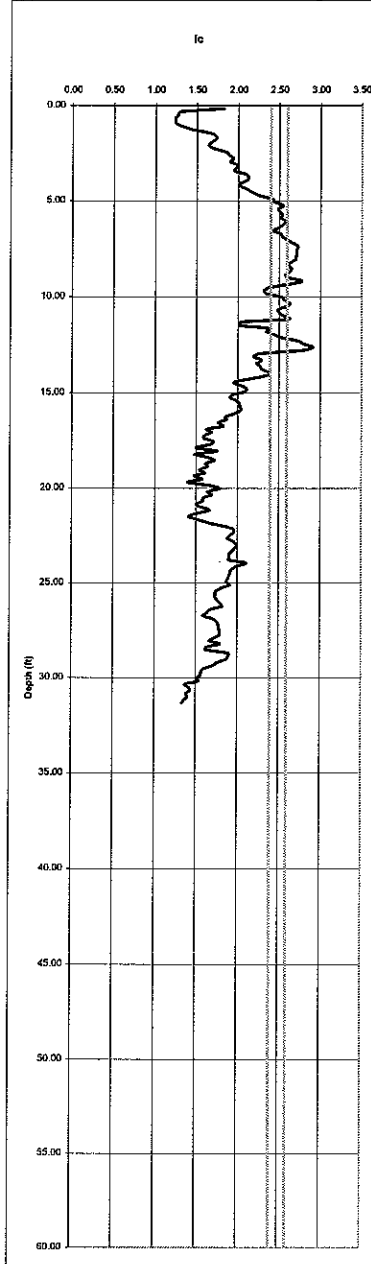
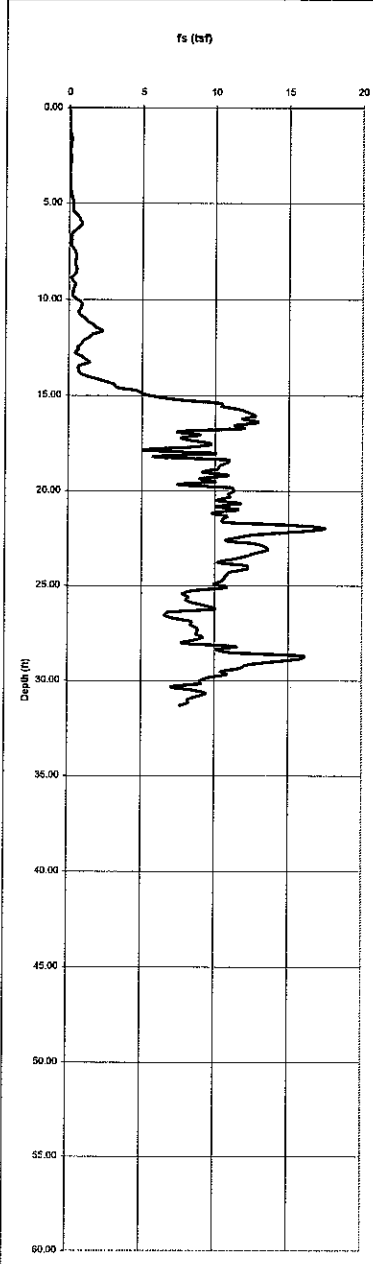
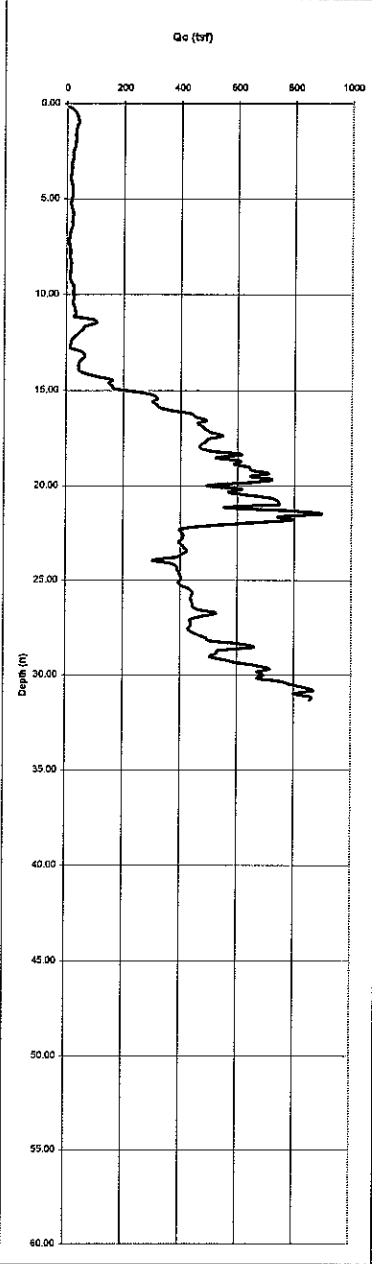
Water Table: 45.00 ft. Amax: 0.50g Mag: 6.75



Seismic Liquefaction and Settlement Charts (CPT-21)

Edgewater (04-15-03)

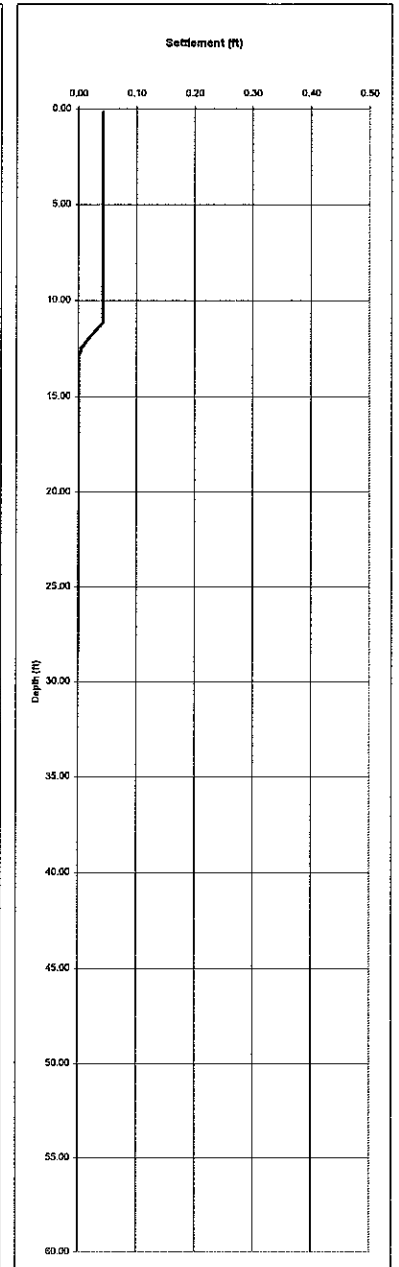
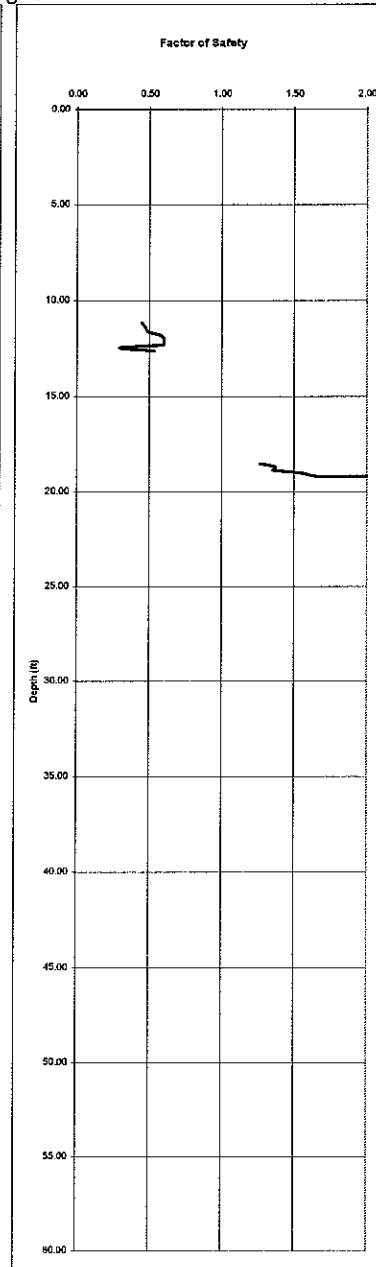
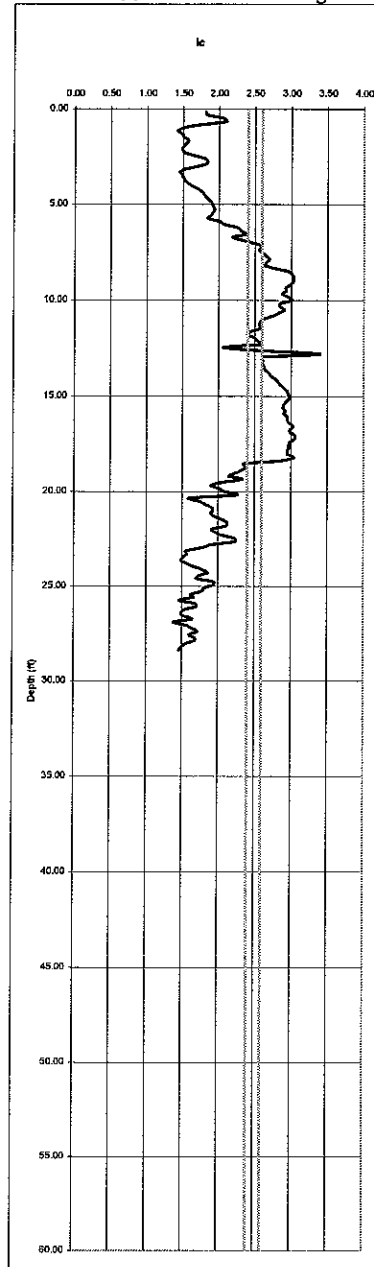
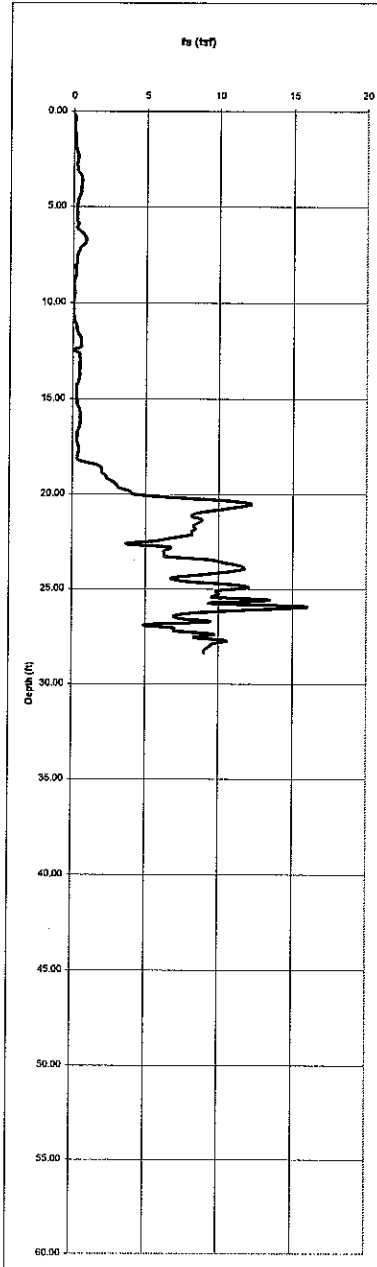
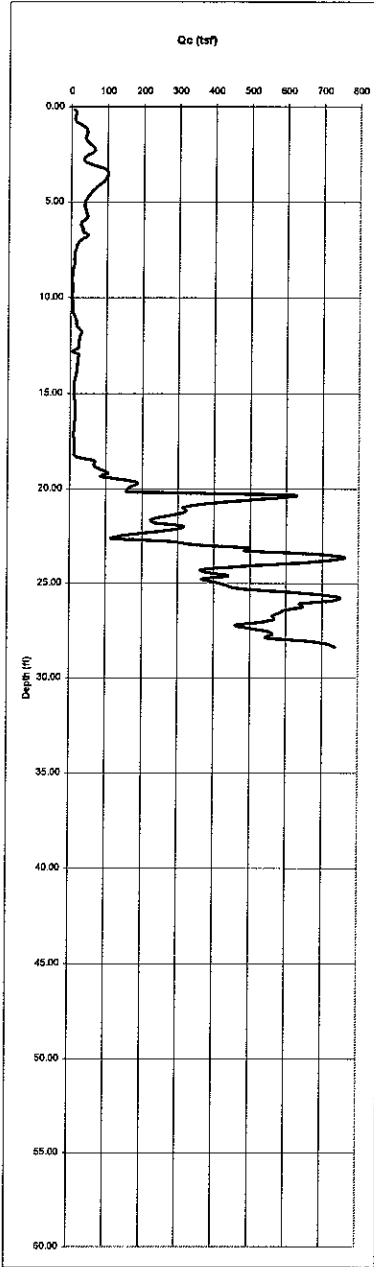
Water Table: 5.00 ft. Amax: 0.50g Mag: 6.75



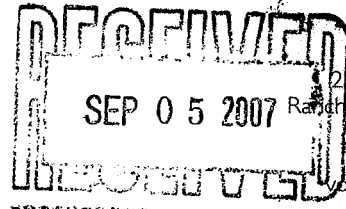
Seismic Liquefaction and Settlement Charts (CPT-22)

Edgewater (04-15-03)

Water Table: 8.00 ft. Amax: 0.50g Mag: 6.75



**F.2 - Response to Review Comment by
City of Chino Geotechnical Reviewer
Prepared by GMU Geotechnical, Inc. -
August 28, 2007**



23241 Arroyo Vista
Rancho Santa Margarita
CA 92688
voice: 949.888.6513
fax: 949.888.1380
web: www.gmugeo.com

August 28, 2007

Mr. Donald Rosier, Manager
EDGEWATER ASSOCIATES I, LLC
165 South Union Boulevard, Suite 510
Lakewood, CO 80228

GMU Project 04-15-03

Subject: Response to Review Comment by City of Chino Geotechnical
Reviewer, Edgewater Development, City of Chino, California

- References: (1) Our "Report of Phase 2 Geotechnical Investigation, Edgewater
Development, City of Chino, California," dated March 16, 2007
- (2) City of Chino, Community Development Department, "Methane
Assessment and Mitigation," undated.

Dear Mr. Rosier:

This correspondence presents our response to geotechnical review comments by the City of Chino Geotechnical Reviewer via email for the Edgewater development within the City of Chino, California. The reviewer's comment is reproduced below:

COMMENT – "The recommendation of methane mitigation needs to be addressed in the report as part of the Phase 2 study. Of course mitigation will be conducted at the time of grading operations and shall be certified by the appropriately assigned soil engineer."

RESPONSE – Agreed. Prior to issuance of a grading permit, soils testing shall occur, in accordance with the City of Chino methane assessment and mitigation protocol (reference (2)), to examine the methane potential and to prescribe specific mitigation measures for addressing the impact.


Mr. Donald Rosier
EDGEWATER ASSOCIATES I, LLC
August 28, 2007
Page 2

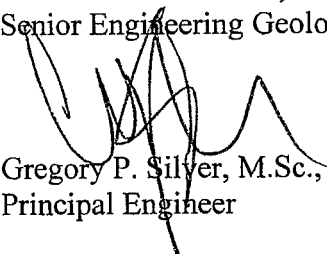
 **GMU** Project 04-15-03

Please do not hesitate to call if you have any questions.

Respectfully submitted,

GMU GEOTECHNICAL, INC.


Lisa L. Bates-Seabold, CEG 2293
Senior Engineering Geologist


Gregory P. Silver, M.Sc., GE 2336
Principal Engineer



cc: CMG Funding
Attn: Mr. Edward Callan

lbs/04-15-03L (8-28-07)