

INFORMATION HANDOUT

MATERIALS INFORMATION

FOUNDATION INVESTIGATION REPORT
FOR WOODFORDS MAINTENANCE STATION
COVERED MATERIAL BIN
Dated September 15, 2008

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. JOE ESFANDIARY
Branch Chief
Structural Design Branch1
Office of Transportation Architecture
Structure Design Services &
Earthquake Engineering
Division of Engineering Services

Date: September 15, 2008

File: 10-ALP-5725
10-0F1401
Woodfords MS

Attention: BILL ROCHA

**From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5**

Subject: Foundation Investigation Report for Woodfords Maintenance Station Covered Material Bin

Introduction

Per your request, this report has been prepared to provide foundation recommendations regarding construction of the proposed six bin covered material bin in CalTrans Woodfords Maintenance Station located at 18935 Highway 88 in Alpine County, California. A Vicinity Map is presented in Plate 1.

Based on the plans and details provided, we understand that the proposed material bin will be a single story metal-framed structure with concrete wall, metal siding, and soil-supported floor slab. The plan dimension of the building is approximately 22 by 90 square feet. The height of the building is approximately 16 feet. The building is considered as an Occupancy Category I structure with an Importance Factor of 1.0.

Pertinent Report and Investigation

The following documents and maps were reviewed to assist in the assessment of the subject site conditions:

- Terminous, CA 7.5-minute quadrangle, United States Geological Survey, 1978,
- Geology Map of California, Walker Lake Sheet, Scale 1:250,000 (1963), CDMG (Third Printing, 1992),
- California Seismic Hazard Map 1996, Caltrans, L. Mualchin, 1996,

- A Technical Report to Accompany the Caltrans-California Seismic Hazard Map, CalTrans, L. Mualchin, 1996, and
- 2007 California Building Code (2007 CBC) January 2008 Revision, CBSC, 2008

Physical Setting

The physical setting of the project site and surrounding area was reviewed to provide topography and drainage, man-made and natural features, and geology to aid in project design and construction planning. The information gathered during this review is disused below.

Topography and Drainage

The site is located in the Sierra Nevada Mountain Range. The general terrain is mountainous with an elevation of approximately 5693 feet above sea level at the project site. The immediate project area is essentially flat with gentle downward slope toward south and southwest. The approximate maximum topographic relief is less than 5 feet over the immediate project area. Most of the regional or localized drainage is generally trending to southwest. No drainage feature is observed in the immediate project area.

Geology

The regional geologic features pertaining to the site were evaluated by referencing the *Geologic Map of California, Walker Lake Sheet*. The site lies within the northeastern part of the Sierra Nevada geomorphic province of California. According to the map, the project area is underlain by Jurassic Mesozoic Granitic Rocks consisting of granite, adamellite, granodiorite, tonalite, and diorite. A site geologic map is provided in Plate 2.

Seismicity

Based on the CalTrans' *California Seismic Hazard Map 1996*, the controlling fault for the site is the Genoa fault (GNA). This fault possesses a Maximum Credible Earthquake (MCE) with a moment magnitude, M_w , of 7.25. The GNA is a normal fault and is located approximately 1 mile (1½ kilometers) east of the project site. Based on the referenced map, the peak bedrock acceleration (PBA) is estimated to be 0.6g at the site.

Site Classification

Based on Table 1613.5.2 of 2007 CBC, the site is judged to be *Class D*.

The following mapped spectral response accelerations at the project site were interpreted based on Figures 1613.5(3) and 1613.5(4) of 2007 CBC.

Mapped 0.2 second spectral acceleration, S_s , 1.75g
Mapped 1.0 second spectral acceleration, S_1 , 0.75g

Field Exploration

The site was explored with Cone Penetrometer Test (CPT). On September 2, 2008, three CPTs, CPT-1 (Test ID 02S803-1), CPT-2 (Test ID 02S803-2), and CPT-3 (Test ID 02S803-3), were advanced to depths of 13 to 20 feet below the existing ground surface at the site. Locations of the CPTs were determined in the field based on the site plan provided and the identifiable existing site features. The approximate locations of the CPTs are provided in Plate 3. Logs of the CPTs are provided in Plates 4, 5, and 6. The CPT logs show the interpretation of the subsurface conditions at the dates and locations indicated, and it is not warranted that they are representative of subsurface conditions at other locations and times.

Subsurface Conditions

Soil Condition

Based on the results of CPTs, the subsurface materials at the site consist of medium dense to dense sands and sandy silts. The values of the static cone tip resistances ranged approximately between 25 to 200 tons per square foot (tsf).

Groundwater

No Department of Water Resources (DWR) record of groundwater is available at the site. Groundwater was not encountered in any of the CPTs at the time of exploration. Groundwater is not anticipated to be encountered during construction.

Liquefaction

Due to the low potential for groundwater, liquefaction potential is considered low at the site.

Recommendations

Footing Foundation

The proposed covered material bin building should be supported on conventional spread and strip footing foundations using an allowable soil bearing pressure of 2,000 pounds per square foot (psf).

The footing should have a minimum width of 12 inches and should be founded at least 36 inches below the adjacent finish grade.

Total and differential settlements of the footing under the aforementioned bearing pressure are estimated to be on the order of 1 and ½ inch, respectively.

Lateral Earth Pressure

An active earth pressure equal to an equivalent fluid pressure of 36 pounds per square foot per foot (psf/ft) and a passive earth pressure equal to an equivalent fluid pressure of 360 (psf/ft) should be used for design.

Slab-on-Grade

Soil supported slab should be designed using a subgrade reaction modulus, k, of 120 pounds per square inch per inch (pci).

Frost Depth

According to Alpine County Building Code, the frost depth should be 18 inches below finish grade at the site.

Moisture Barrier

Due to the moisture elevated by snow in winter season, moisture barrier should be implemented. A vinyl membrane with a minimum thickness of 6 mils should be placed over 4 inches of clean sand. The membrane should be covered by 3 inches of sand to aid in a uniform concrete cure.

The recommendations contained in this memorandum are based on specific project information regarding structure type, location, and design loads that have been provided. If any conceptual changes to the structure are proposed during final project design, the Office of Geotechnical Design – North should review those changes to determine if the foundation recommendations contained herein are still applicable.

A full sized Log of Test Boring (LOTB) of the CPTs which is to be incorporated in the project plans is being prepared by Geotechnical Services, Office of Geotechnical Support Branch D – Contracts, Graphics & Records, and will be forwarded when completed. Mrs. Irma Gamarra-Remmen of the Contracts, Graphics, & Records branch may be contacted directly for information on the LOTB.

If you have any questions or comments, please contact Thomas Song at (916) 227-1039 or Qiang Huang at (916) 227-1037.



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Transportation Engineer
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Branch E

Mr. Joe Esfndiary
September 12, 2008
Page 6

Foundation Report
Woodfords MS

Attachments

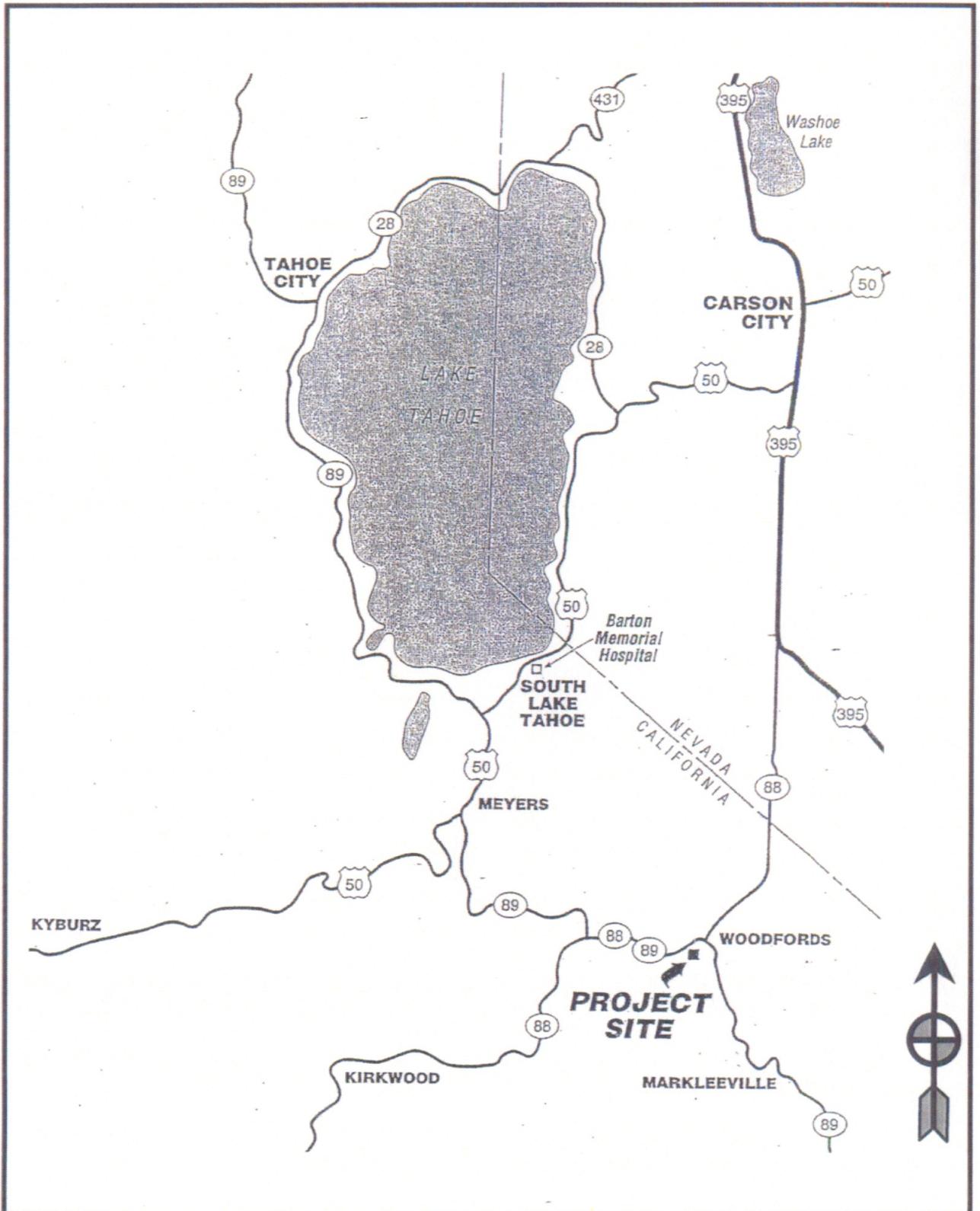
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Structure OE
PCE (E-copy)
DME (E-copy)
GDN File
GS File Room

Mr. Joe Esfndiary
September 12, 2008
Page 7

Foundation Report
Woodfords MS

List of Attachments

Plate 1	Vicinity Map
Plate 2	Geologic Map
Plate 3	CPT Location Plan
Plate 4, 5, 6	CPT Logs



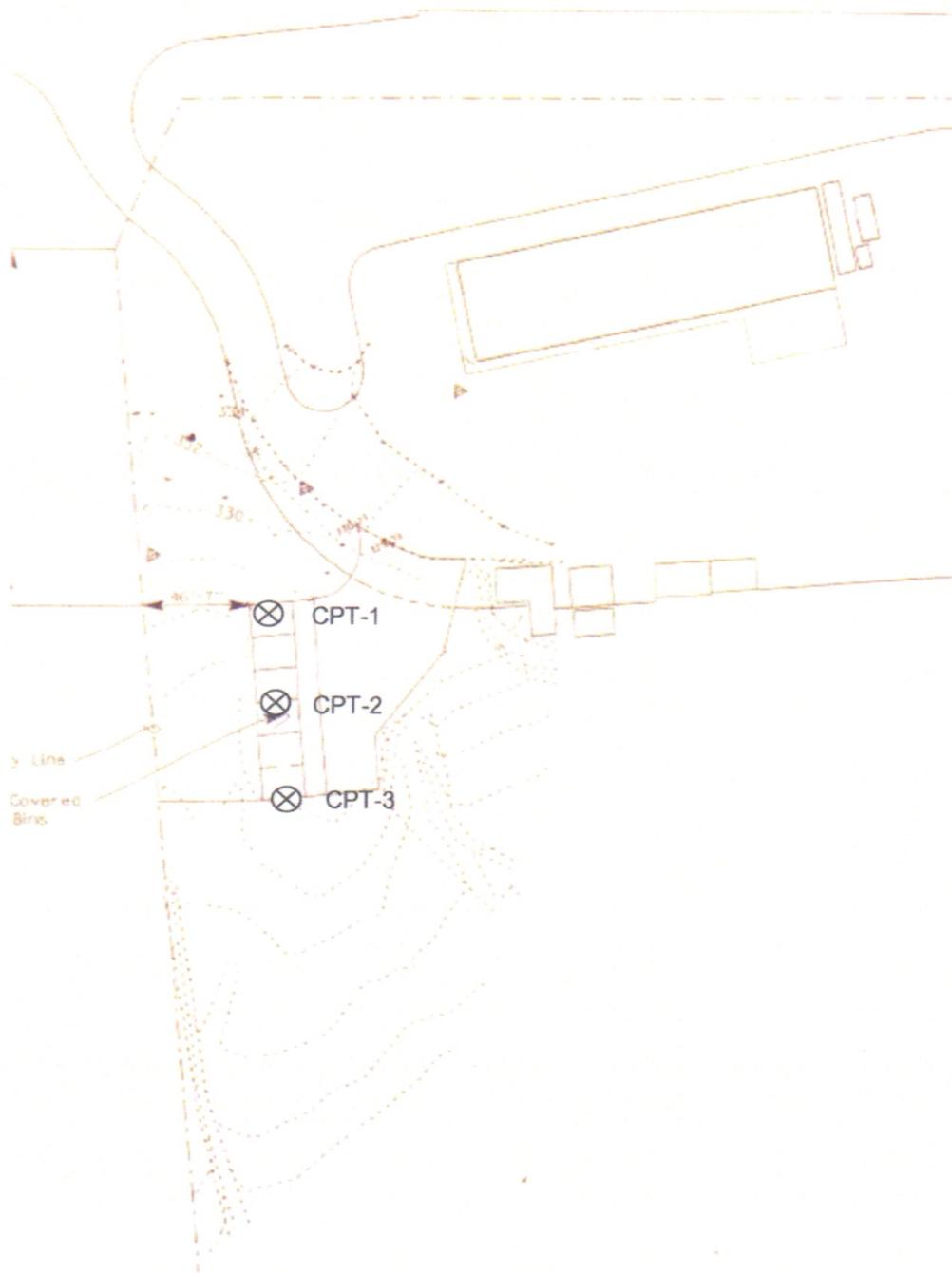
CALTRANS
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

EA:10-0F1401
 Date: September 2008

VICINITY MAP

**WOODFORDS MAINTENANCE STATION
 COVERED BIN STORAGE
 FOUNDATION REPORT**

Plate
 No. 1



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 Date: September 2008

CPT LOCATION PLAN

**WOODFORDS MAINTENANCE STATION
 COVERED BIN STORAGE
 FOUNDATION REPORT**

Plate
 No. 3

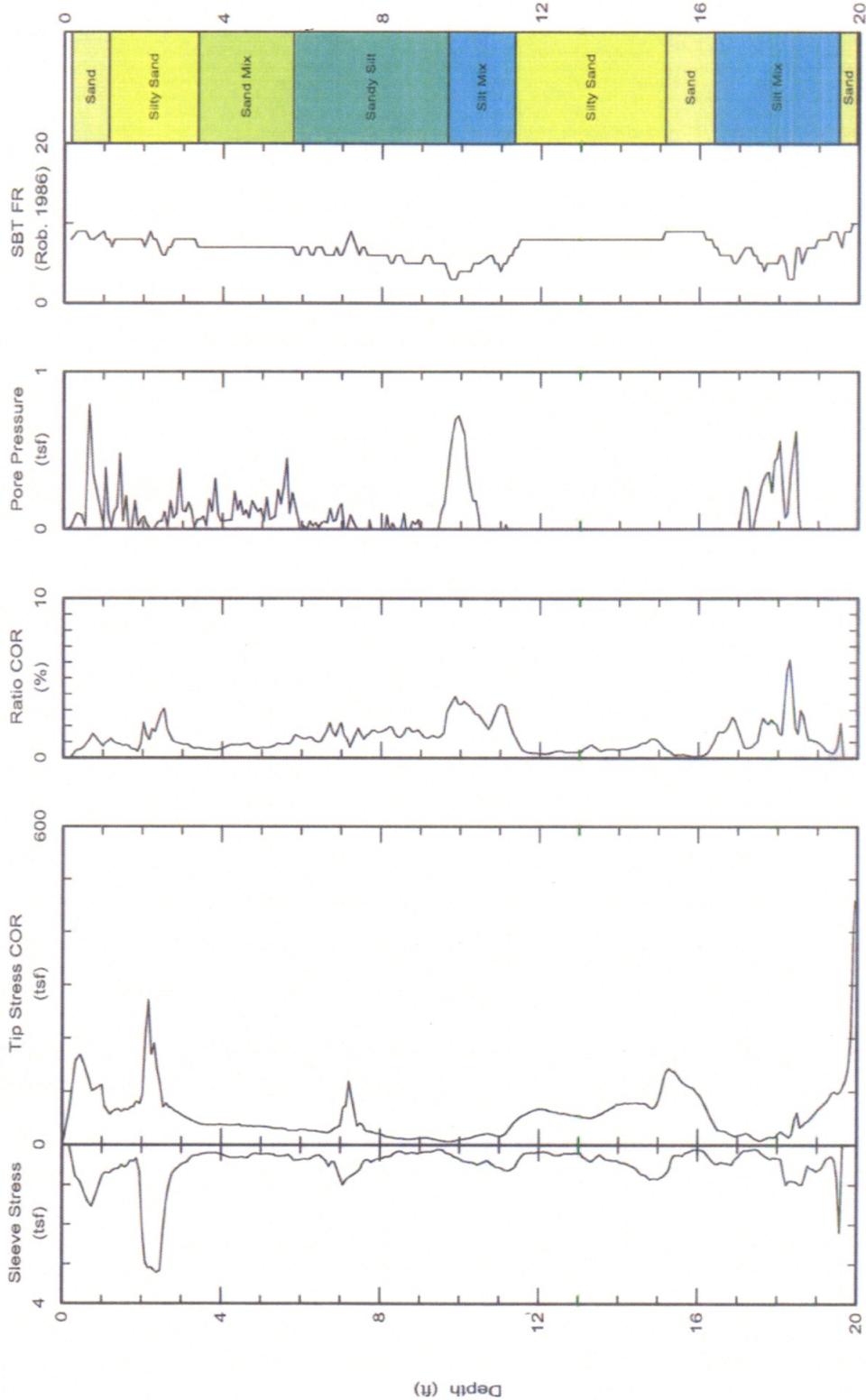


Division of Engineer Service
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Lat: 0
Lon: 0
Elev.: 0

Customer: TOM SONG
Job Site: 10-ALP-88

Date: 02/Sep/2008
Test ID: 02S801-1
Project: 10-0F1401



Maximum depth: 19.95 (ft)



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EA: 10-0F1401

Date: December 2005

CPT-1 LOG

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COVERED STORAGE FOUNDATION REPORT

Plate No.
4

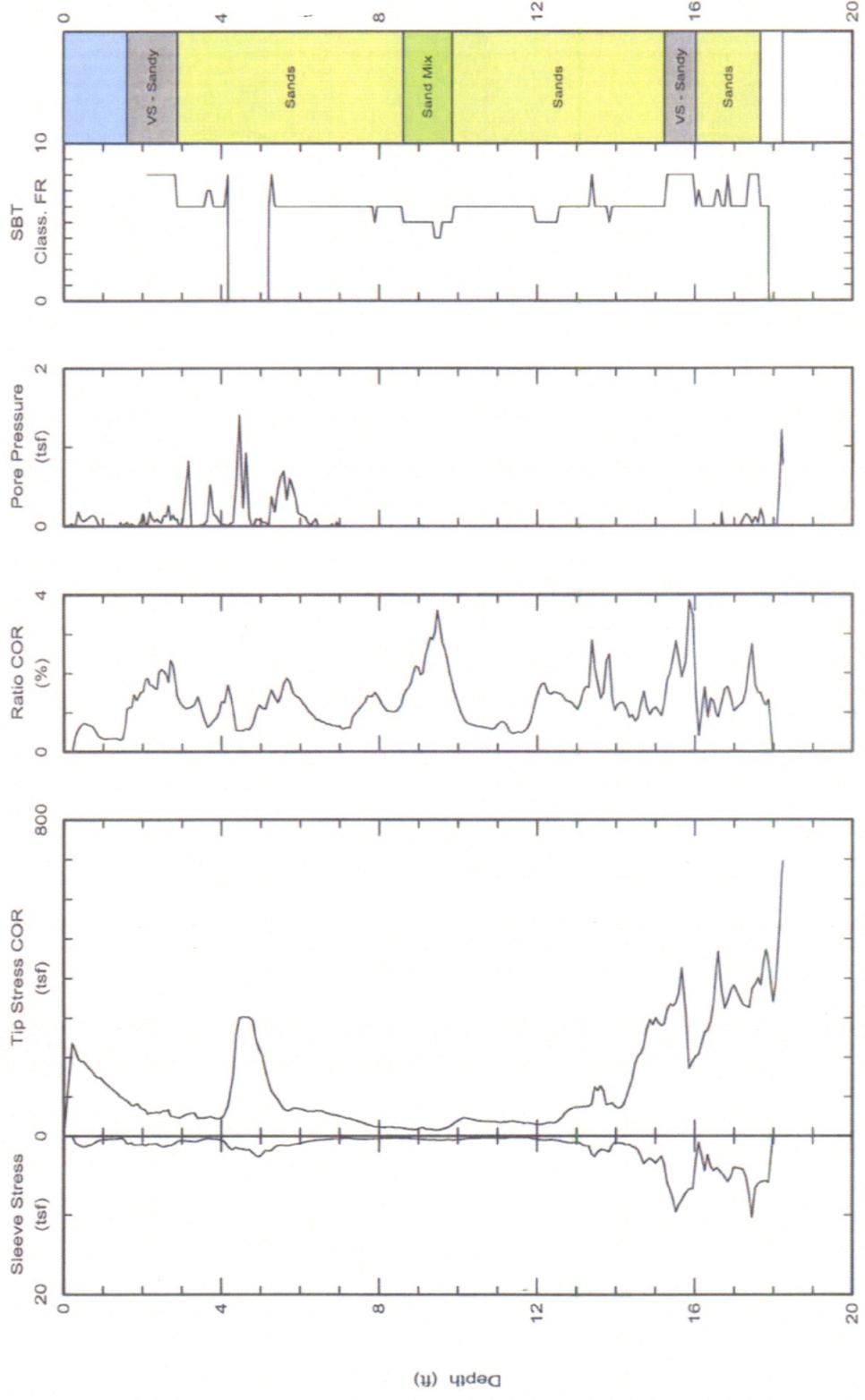


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Lat: 0
 Lon: 0
 Elev.: 0

Customer: TOM SONG
 Job Site: 10-ALP-88

Date: 02/Sep/2008
 Test ID: 02S802-2
 Project: 10-0F1401



Class FR: Friction Ratio Classification (Ref: Robertson 1990)

Maximum depth: 18.24 (ft)



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EA: 10-0F1401

Date: December 2005

CPT-2 LOG

**WOODFORDS MAINTENANCE STATION
 COVERED STORAGE FOUNDATION REPORT**

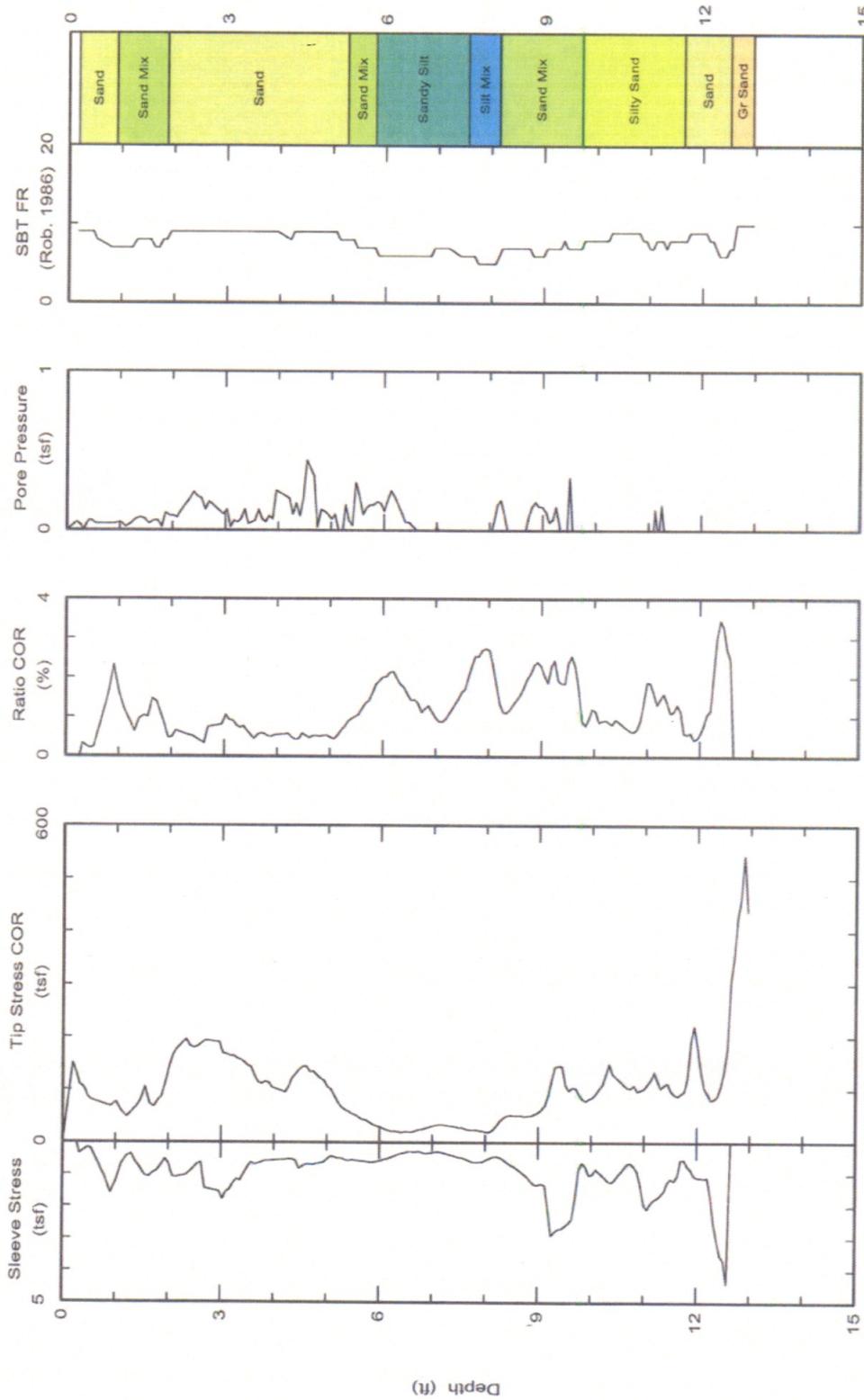
Plate No.
5


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Lat: 0
 Lon: 0
 Elev.: 0

Customer: TOM SONG
 Job Site: 10-ALP-88

Date: 02/Sep/2008
 Test ID: 02S803-3
 Project: 10-0F1401



Maximum depth: 12.95 (ft)



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EA: 10-0F1401

Date: December 2005

CPT-3 LOG

**WOODFORDS MAINTENANCE STATION
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Plate No.
 6