Appendix 2.5D—Data Report
Vogtle Units 3 & 4
Engineered Fill Below Grade Test Pad

Prepared by
MACTEC Engineering and Consulting, Inc.

March 14, 2008

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DATA REPORT

VOGTLE UNITS 3&4
ENGINEERED FILL BELOW GRADE TEST PAD
PHASE 1
VOGTLE ELECTRIC GENERATING PLANT

Waynesboro, Burke County, Georgia
March 14, 2008

Prepared By:

MACTEC ENGINEERING AND CONSULTING, INC

ATLANTA, GEORGIA

MACTEC PROJECT NUMBER 6141-06-0286

Submitted To:

GEORGIA POWER COMPANY
c/o SOUTHERN NUCLEAR OPERATING COMPANY

Birmingham, Alabama

SNC SUBCONTRACT NUMBER 7074425

DCN VGCOL 441
Revision 0, 3/14/08

MACTEC

March 14, 2008

Mr. Tom McCallum
Georgia Power Company
C/O Southern Nuclear Operating Company, Inc.
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Subject: **Geotechnical Data Report**
Vogtle Units 3 & 4 Engineered Fill Below Grade Test Pad
Phase 1
Vogtle Electric Generating Plant
Burke County, Georgia
MACTEC Project Number 6141-06-0286

Dear Mr. McCallum:

MACTEC Engineering & Consulting, Inc. is pleased to submit this Data Report of the field and laboratory testing for the Vogtle Units 3 & 4 Engineered Fill Below Grade Test Pad located adjacent to the existing Vogtle Electric Generating Plant near Waynesboro, Burke County, Georgia.

It has been a pleasure to perform the work described in the attached report. If you have any questions, or if we may be of further service, we hope that you will contact us at your convenience.

Sincerely,

MACTEC ENGINEERING & CONSULTING, INC.

Matthew F. Cooke
Lead Geotechnical
Senior Geologist
Registered, Georgia 1887

For Matthew F. Cooke
with permission

Stephen E. Woodham
Project Geotechnical Engineer

Wm. Allen Lancaster
Project Manager
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Pieter J. DePree
Principal Geotechnical Engineer.
Registered, Georgia 19637

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LIST OF ATTACHMENTS (Submitted under Separate Covers on Dates Listed Below)

Attachment	Revision Number	Submittal Date	Attachment Title
A	0	March 14, 2008	Test Pad Specification and Work Procedure
B	0	March 14, 2008	Survey Report (Patterson and Dewar)
C	0	March 14, 2008	Laboratory Test Data Sheets
D	0	March 14, 2008	Geotechnical Boring Logs and SPT Energy Test Report
E	0	March 14, 2008	Geophysical Testing Report

LIST OF ACRONYMS, SYMBOLS AND TERMINOLOGY

AP1000	Nuclear Technology by Westinghouse Electric Company
ASTM	American Society for Testing and Materials
Bechtel	Bechtel Power Corporation
bpf	blows per foot
c	total cohesion
c’	effective cohesion
C’	bearing capacity index

C_c	compression index
C_e	SPT Energy Ratio to ER=60%
CD	consolidated drained triaxial test
cf	cubic feet
CH	highly plastic clay
CL	clay of low plasticity
C_n	vertical effective stress correction factor for SPT-N
COC	Chain of Custody
COE	Corps of Engineers
COL	Combined Construction and Operating License
CPT	cone penetration test sounding (used in lieu of SCPTU or CPTU where distinction is not important)
CPTU	piezocone penetration test sounding
C_r	recompression index
CU	consolidated undrained triaxial test
Cv	coefficient of consolidation
D_{50}	mean grain size
DCC	Document Control Center
DCN	Document Control Number
DOE	Department of Energy
D_r	relative density
EPA	Environmental Protection Agency
ER	Energy Ratio for Standard Penetration Test
e	void ratio
e_o	initial void ratio
fps	feet per second
fr or FR	CPT friction ratio
fs	CPT sleeve stress (also called sleeve friction)
FS	factor of safety
ft	foot or feet
g	acceleration of gravity
G	shear modulus
G_s	Specific Gravity

GPS	Global Positioning System
gINT	Geotechnical Data presentation Software provided by gINT, Inc.
G_{max}	low strain shear modulus
GW	groundwater table or groundwater depth
H	layer thickness
HSA	hollow stem auger
K	soil permeability coefficient (hydraulic conductivity)
K_a	active earth pressure coefficient
K_d	Distribution Coefficient
K_o	at-rest earth pressure coefficient
K_p	passive earth pressure coefficient
kip	1,000 pounds
km	kilometer
ksf	kips per square foot
LL	liquid limit
LL	Live Load, force or pressure
m/sec	meters per second
MACTEC	MACTEC Engineering and Consulting, Inc. f/k/a LAW
MDD	Maximum Dry Density (Modified Proctor)
MH	high plasticity silt
micaceous	containing mica
ML	low plasticity silt
mm	millimeter
MOD	modified
MSL	mean sea level, ft
M&TE	Measuring and Test Equipment
N-value	Sum of second and third set of recorded blows from the SPT
N60, N_{60}	SPT N-value corrected to 60 percent energy ratio (ER)
N_1	SPT N-value normalized to 1 tsf
$(N_1)_{60}$	SPT N-value normalized to 1 tsf and 60% max. hammer energy ratio (also modified to account for room for liner but no sample liner used for Project)
NIST	National Institute of Standards and Technology

NRC	Nuclear Regulatory Commission
MDD	maximum dry density, pcf (laboratory compaction test)
OCR	overconsolidation ratio
OD	outside diameter
OMC	optimum moisture content, % (laboratory compaction test)
OW	Observation Well
P	P-wave, compressional seismic wave
P	Pitcher Samples (UD, Soil Sampling)
p - q	total stress path strength parameters
p' - q'	effective stress path strength parameters
pH	Index of acidity
p_c or P_c	preconsolidation pressure (also called σ_c')
p_o or P_o	existing vertical effective stress (also called σ_o')
pcf	pounds per cubic foot
pci	pounds per cubic inch
PDA	pile driving analyzer
% fines	percent fines – material passing the #200 sieve
PI	plasticity index
PL	plastic limit
Pitcher	Pitcher Sampler (Undisturbed (UD) soil sampling, also see ST)
psf	pounds per square foot
psi	pounds per square inch
QA	quality assurance
QAPD	Quality Assurance Project Document
QAR	Quality Assurance Representative
Q_a	allowable bearing pressure
q_c or Q_c	measured CPT tip resistance
$Q_{t,,}$ q_{NT}	normalized CPT tip resistance $Q_t = (q_t-\sigma_{vo})/ \sigma'_o$
$q_{t,,}$ qT	CPTU tip stress corrected for unequal area effects
$(q_c)_1$	CPT tip resistance normalized to 1 ton per square foot
QC	quality control
RC	Relative Compaction

RCTS	Resonant Column Torsional Shear (Laboratory Test)
REC	Recovery (SPT Samples, UD Samples)
ReMi	Refraction Microtremor Testing
r_u	pore water pressure ratio = $\Delta u/\sigma_0'$
SC	clayey sand
SCPTU	seismic piezocone penetration test sounding
slickenside surface	parting surface in sample with particles oriented parallel to surface, giving shiney appearance
SM	silty sand
SNC	Southern Nuclear Operating Company, Inc.
SP	poorly graded sand
SPT	Standard Penetration Test
Specification	SNC Technical Specification SVO-SSAR-XGS-001, Version 3.0, issued January 10, 2008, Engineered Fill Below Grade Test Pad for Vogtle Electric Generating Plant – Units 3 & 4.
SRP	Standard Review Plan
ST	Shelby tube (undisturbed (UD) soil sampling)
STD	standard
STDEV	standard deviation (also known as σ)
S_u	undrained shear strength
t	time
TP	Test Pit
tsf	tons per square foot
TX	triaxial
UD	undisturbed (soil sampling, either ST (Shelby Tube), pushed or P (Pitcher Sample), drilled
US	United States
USCS	Unified Soil Classification System (e.g. SM. SC, etc.)
USNRC	U. S. Nuclear Regulatory Commission
UU	Unconsolidated Undrained Triaxial Test
VEGP	Vogtle Electric Generating Plant
v_s	S-wave velocity (Shear wave velocity)
$(v_s)_1$	S-wave velocity normalized to 1 ton per square foot

WI	Work Instruction
Work Procedure	SNC Work Procedure-Engineered Fill Test Pad Phase 1 Activities, Version 4.0, Issued December 14, 2007
WC or W	water content (moisture content)
α	total stress path angle
α'	effective stress path angle
ε or γ	normal strain or shear strain
ε_r or γ_r	reference strain
ϕ	total stress friction angle
ϕ'	effective stress friction angle
γ	unit weight of soil
γ_s	saturated unit weight of soil
γ'	effective or buoyant unit weight of soil, γ_s - γ_w
γ_w	unit weight of water
ρ	mass density of the soil
σ	standard deviation
σ_1, σ_3	principal normal stresses
σ_c'	preconsolidation pressure
σ_o'	initial effective vertical stress
σ_v'	effective vertical stress
σ_{vo}	initial total vertical stress
τ	shear stress
υ	Poisson's ratio

SECTION 1
OVERVIEW

1.1 INTRODUCTION

MACTEC Engineering and Consulting (MACTEC) was retained by Georgia Power Company by and through its agent Southern Nuclear Operating Company (SNC) as the Geotechnical Contractor to conduct field and laboratory testing for the Engineered Below Grade Test Pad Phase 1 at the Vogtle Units 3 & 4 COL Project Site. The site is located adjacent to the existing Vogtle Electric Generating Plant (VEGP) near Waynesboro, Burke County, Georgia. MACTEC executed these services per SNC Subcontract Number 7074425.

The objective of the Phase 1 test pad construction was to simulate the compaction processes for production backfill operations. The pad was utilized to demonstrate that a minimum shear wave velocity of 1,000 feet per second could be achieved at or above the foundation depth of the nuclear island with a well compacted, on site, granular backfill. Phase 2 will expand the test pad effort to include an investigation of backfill placement techniques to determine site specific procedures for Vogtle Units 3 and 4 backfill placement.

The geotechnical services were completed as part of the combined construction and operating license (COL) project for SNC. The field work commenced on November 20, 2007 and was substantially completed on January 25, 2008.

The work was performed in accordance with the Specification for Engineered Fill Below Grade Test Pad prepared by SNC (Specification No. SVO-SSAR-XGS-001). The Scope of Work was defined in the Work Procedure for Engineered Test Pad Phase 1 Activities prepared by SNC (Work Procedure ND-ARL-014). The MACTEC scope of work is briefly described below:

- Prepare and submit a quality plan (Quality Assurance Project Document).
- Submit a qualified Safety Program.
- Provide quality assurance inspectors (surveillance) of the field and laboratory work activities.
- Perform a utility location survey using one or more approved methods prior to excavation activities.
- Provide the Geotechnical Lead responsible for technical direction of soil selection, sampling, stockpiling, backfilling, and compaction and testing activities.
- Established an on-site field soil laboratory and performed calibrations on field and laboratory test equipment before use and at completion of testing
- Collect and transport samples to the secure, on-site sample storage facility provided by SNC
- Perform laboratory tests, including moisture content, sieve analysis, Atterberg Limits, Modified Proctor, Specific Gravity on samples as directed by the Geotechnical Lead
- Perform field density tests
- Maintain daily field reports documenting earthwork activities performed by the Earthwork Contractor
- Perform Spectral Analysis of Surface Waves (SASW) Testing
- Perform Standard Penetration Testing (SPT) in 4 boring locations upon the completion of backfilling
- Install casing for Cross-Hole Seismic Testing in 3 of the 4 boring locations (CHB-1, CHB-2, CHB-3)

- Check casing alignment in Cross-Hole boring locations using a slope inclinometer.
- Install a temporary observation well at 1 of the 4 boring locations (CHB-4)
- Perform Cross-Hole Seismic Testing at CHB-1, CHB-2, CHB-3
- Perform Resonant Column Torsional Shear Testing

The work was completed under a Quality Assurance Program meeting the Code of Federal Regulations 10CFR50, Appendix B and conforming to the provisions of ANSI/ASME N45.2-1977.

This Data Report describes the field and laboratory testing methods and presents the results.

1.2 PERSONNEL

All work to prepare this report was performed by MACTEC with assistance from SNC in providing office space, laboratory space, and sample storage facilities located in the former Vogtle Security Building. This facility is located on Plant Vogtle property near the proposed Units 3 & 4 Site. The logistical assistance and White Badge training sessions given to MACTEC and subcontractor personnel provided by Mr. Greg Lee are gratefully acknowledged. Bechtel site representatives during the field work were Mr. Mike Lewis and Mr. John Damm. MACTEC personnel and their responsibilities were:

MACTEC PERSONNEL

Wm. Allen Lancaster, P.E., Project Manager
Pieter J. DePree, P.E., Principal Geotechnical Engineer
Matthew F. Cooke, P.G., Senior Geologist, Geotechnical Lead
Stephen E. Woodham, Geotechnical Engineer
John E. Lynch, Quality Assurance Manager
Autumn A. Wycoff, Geotechnical Engineer
Mark W. Davis, Senior Engineering Technician
Roger Blalock, Senior Engineering Technician
Todd Hill, P.E., Civil Engineer
Soraya Agudelo, Civil Engineer
Scott Towe, Drilling Manager
Phillip Pitts, Senior Driller
Daniel Juhan, Driller Helper
Harry Johnson, Senior Geotechnical Laboratory Technician
Jianren Wang, P.E., Geotechnical Laboratory Manager
Bianca Mejia, Geotechnical Laboratory Staff

UNIVERSITY OF TEXAS-AUSTIN PERSONNEL

Dr. Kenneth H. Stokoe, II, Professor of Geotechnical Engineering
Min Jae Jung, Graduate Student-Geotechnical Engineering
Jiabei Yuan, Graduate Student-Geotechnical Engineering

The organizations that performed on-site work or laboratory testing of samples as part of this effort are listed in Table 1.

1.3 ORGANIZATION OF REPORT

This report and its attachments are organized in the following sequence; this report consists of the transmittal letter; table of contents; list of tables; list of figures; acronyms, symbols and terminology; text; tables; and figures. The attachments are in separate volumes and are as follows:

Attachment	Contains
A	Test Pad Specification and Work Procedure
B	Survey Report
C	Laboratory Test Data Sheets
D	Geotechnical Boring Logs and SPT Energy Measurements
E	Geophysical and Dynamic Testing Report (SASW, Cross-Hole, RCTS)

The current revision status and date of the Attachments are summarized in the Table of Contents.

1.4 QUALITY ASSURANCE

Quality related activities performed by MACTEC and its subcontractor organizations during the work herein presented were in accordance with the MACTEC Quality Assurance Manual and the MACTEC Quality Assurance Project Document. The MACTEC QA program complies with NQA-1 Subpart 2.20 and to the requirements of 10CFR50 Appendix B.

1.5 HEALTH AND SAFETY

This work was performed under MACTEC's Health and Safety Plan prepared for Vogtle Units 3 & 4 COL Project, dated October 31, 2006. Periodic safety training sessions were held at the site during field activities. There were no accidents or injuries during the course of this work. The Earthwork Contractor, J.M. Miles Construction Company, Inc. operated under a separate health and safety program. To the best of our knowledge and belief, there were no accidents or injuries to J.M. Miles personnel during the course of the work.

SECTION 2
FIELD METHODS

2.1 SURVEYING

Surveying was performed by Patterson and Dewar Engineers, Inc. of Norcross, Georgia under direct subcontract to SNC.

The surveying for the project began with initial layout and staking of the test pad project area, including location of the test pad excavation, the down ramp, detention pond areas, and stockpile areas. The surveyor was present during backfill placement and provided assistance in lift thickness control. After placement and compaction of each lift, the surveyor staked the corners of the test area, and recorded the as-built elevation of the top of each lift by survey of several established grid points across the test area. In addition, the surveyor recorded the coordinates and elevations of each sample and density test location for each lift.

Other duties performed by the surveyor included layout of the cross-hole boring and SASW test locations. As-built coordinates and elevations for the cross-hole boring and SASW test locations were recorded by the surveyor after installation/testing.

At the end of field activities, the surveyor performed an as-built topographic survey of the test pad project area.

The survey report prepared by Patterson and Dewar is contained in Attachment B.

2.2 UTILITY LOCATION

Utility location was performed by GEL Geophysics, a subcontractor to MACTEC. Prior to the start of excavation and backfilling activities, MACTEC and GEL reviewed the available utility drawings of the test pad site area provided by SNC. Utility surveying was performed within the Test Pad site area using the following geophysical equipment:

- Radiodetection RD4000 Electromagnetic Utility Locator
- Mala Geoscience X3M GPR

In general, the utility location procedures consisted of the following for each location:

- Visually inspected the area surrounding each location for evidence of subsurface utilities (manholes, valve boxes, etc.).
- Delineated the surface trace of identified utilities and mark their surface trace using a color code established by the American Public Works Association.
- Scanned the target area with an 8 to 66 KHz signal connected directly to underground utilities such as telephone, electric, water and gas to identify those and any other utilities that the signal bleeds into.
- Scanned the site with the utility locator in passive 60 Hz and Radio modes to attempt to locate any active electrical lines not already located.

- Conducted two-man sweeps to attempt to identify abandoned conduits and conduits that have not surface expression within the area of investigation.
- Conducted perpendicular GPR traverses throughout the target area to attempt to trace any additional pipes or cables encountered.
- Held the Radiodetection 4000 transmitter over the target and circled at an approximate 40-foot radius tracing and traced and marked any additional pipes/cables detected.
- Daily Field Summaries and sketches showing the utilities encountered and any recommended offset were prepared and submitted to the MACTEC Lead Geotechnical.

Utility survey as described above was not performed in some locations. These locations included undisturbed wooded areas where there was no evidence to indicate that underground utilities might exist. In all cases where utility survey was not performed, MACTEC and/or SNC's site representative reviewed the available utility drawings and obtained approval from SNC prior to excavation.

2.3 WEATHER AND FIELD CONDITIONS

Weather and field conditions were observed by MACTEC personnel and documented on daily field reports. There were several days where rain and/or freezing conditions resulted in suspension of backfill and/or stockpiling activities. The decision to suspend these activities was made by the MACTEC Lead Geotechnical based on visual inspection of the test pad and stockpile, along with confirmatory moisture content testing. A rain gauge was maintained on the site by SNC. The rain gauge was checked daily by SNC personnel. The rain gauge data was reported to the MACTEC Geotechnical Lead and is reported in Figure 19.

2.4 Excavation Equipment/Methods

2.4.1 Earthwork Equipment

The excavation, backfilling, stockpiling, and other activities necessary to accomplish the work were performed by J.M. Miles Construction Company, Inc. The equipment used was either owned or leased by J.M. Miles Construction Company, Inc. The equipment used is tabulated below.

- Link Belt 210 LX Excavator
- Link Belt 2800 Excavator
- Caterpillar 320C-L Excavator
- John Deere 250 Wheel Loader with rake and bucket
- Case Rubber Tired Backhoe Series 2
- John Deere 17 ZTS Rubber Tracked Backhoe
- Ford F450 Service Truck
- Tubgrinder
- MACK Truck with dump trailer
- Peterbilt with dump trailer
- White Kenworth with dump trailer
- Kenworth Tandem Axle Dump Truck
- Ford 8000 Tractor with box blade and offset harrow

- Ditch Witch Trencher
- Caterpillar D4 Dozer
- Caterpillar D6 Dozer Model D6N-LGP
- Light Plants (2)
- VIBROMAX Model 1105 Vibratory Roller
- 2000 Gallon Water Truck
- Caterpillar 130G Motor-Grader

2.4.2 Best Management Practices/Erosion Control Measures

The test pad construction area consists of approximately 5.0 acres. The disturbed area included the compaction test pad, graded test pad slopes, access loop road, existing ramp, stockpile zone, and borrow area. Construction began with installation of the perimeter silt protection barriers, construction entrances and two sediment basins per the Erosion and Sedimentation Pollution Control Plan. After erosion control best management practices had been implemented, clearing and grubbing of the vegetation commenced in the disturbed area. The site was then graded, including excavation of the pad through existing fill to a depth of 20 feet and construction of the test pad. Side slopes of excavation were no steeper than 2(H):1(V), and surface runoff to the sediment ponds was provided by maintaining a two percent slope of the fill surface. The material for the fill test pad was obtained from the test pad excavation, the ramp excavation, and the borrow area located northeast of the test pad.

Best Management Practices were used in preparing the design for and implementing the Erosion and Pollution Control Plan. The E&PCP consisted of an initial, intermediate and final erosion control plans as well as a comprehensive monitoring plan. The initial erosion and sediment control plan depicted the erosion and sediment control measures that must be implemented at the beginning of land disturbing activities such as perimeter sediment control fencing and construction exit. The intermediate erosion and sediment control plan depicted the erosion and sediment control measures that are required during construction when mass grading is in progress. These included perimeter and interior sediment control fencing, inlet sediment protection, sedimentation basins, mulching, and temporary grassing. The final erosion and sediment control plan depicted the measures that must be in place near the end of construction as the site is nearing final stabilization. These typically include inlet sediment protection and permanent grassing. A comprehensive monitoring plan was required by the Georgia NPDES general permit and indicated the monitoring locations, required frequency of monitoring, and inspection program required by the permit.

2.4.3 Test Pad and Down Ramp Excavation

Excavation for the Test Pad and Down Ramp began substantially on November 27, 2007. The excavation was performed using track-mounted excavators and dozers to strip material and place material in dump trucks for stockpiling. The MACTEC Geotechnical Lead or his designee observed excavation activities and materials and determined if material was acceptable for placement in the backfill stockpile.

2.4.4 Backfill Selection and Stockpiling

Backfill was selected by the Geotechnical Lead based on visual manual observations (ASTM D2488) and/or laboratory testing performed on representative samples during test pad and down ramp excavation. During excavation, material meeting the Specification was placed in the stockpile area as directed by MACTEC. Material that was determined to be unacceptable, including material containing gravel, organic material, or other debris from near the surface was placed in the spoil pile. Some material within about 5 to 10 feet from the bottom of the Test Pad and Down Ramp excavation was determined to be unacceptable due to zones containing excessive fines and high plasticity and was placed in the spoil pile. Materials from the spoil pile were ultimately used in non-structural fill areas outside of the Test Pad, such as the ramp to the south of the Test Pad.

2.4.5 Backfill Placement

Backfill was placed in the same manner for each lift. Material from the stockpile was loaded in dump trucks, transported to the test pad site, and dumped. A Caterpillar D6 dozer was used to spread the fill into an approximate 8 inch loose lift. The survey crew performing spot checks of the lift thickness. A tractor with a box blade attachment then smoothed out the 8 inch lift prior to compaction. The loose lift was then evaluated for moisture content by MACTEC field personnel, based on stockpile moisture contents obtained at the beginning of each day and/or visual inspection of the lift. If needed, an appropriate amount of water was added to the lift to adjust the moisture content.

For identification purposes, lifts were numbered sequentially by six-inch increments where the first lift at the base of the test pad was designated 1 and the last lift (20-ft) designated 40. Lifts were compacted from a loose 8 inch lift to a nominal 6 inch compacted lift. Compaction was performed, with little exception, in the same manner on each lift. Typically, 4 passes were made with the roller traveling between 4 and 6 mph. One pass was equivalent to a single traverse by the roller.

The same vibratory roller (VIBROMAX Model 1105, Serial Number JCK8310000) was used for compaction for the entire project. Except for the second lift, the low amplitude setting for the roller (second stage) was used during compaction of all lifts. The second stage setting results in a frequency of 36 Hz, Amplitude of 0.024 inches and centrifugal force of 29,440 pounds. The first stage used on lift 2 only results in a frequency of 29 Hz, amplitude of .063 inches and a centrifugal force of 50,565 pounds.

A photograph containing the full specifications sheet for the VIBROMAX roller can be found in the photographs section of the report.

2.5 REPORTING

A summary of the equipment used on site, including make and model, can be found in Table 5. The compaction data for each lift, including the lift thickness, number of roller passes, estimated roller speed, vibratory settings, and moisture conditioning data are summarized in Table 6.

SECTION 3
SAMPLING AND TEST METHODS

3.1 BULK SAMPLING PROCEDURE

Bulk samples were excavated on each lift at locations identified by MACTEC Geotechnical Lead. A shovel was used to obtain the samples.

- G samples were taken at random locations in each quadrant of each test pad lift. G samples were placed in 4 x 6 inch concrete cylinder molds with sealable tops.
- P samples were taken adjacent to a corresponding field density test in the selected fill lift. P samples were placed in new, sealable, plastic, 5-gallon buckets. Glass jar samples with air tight caps were collected and placed in each P sample bucket for in-situ moisture content determination.
- TPAD samples were taken from different soil types at various potential fill material or stockpiled material locations. TPAD samples were placed in new, sealable, plastic, 5-gallon buckets.
- BS samples were taken from the side slopes of the test pad excavation and placed in gallon zip-closure plastic bags.

The excavated areas for performing sand cone density tests and obtaining P samples were refilled with suitable backfill material and compacted using a gasoline powered plate tamper (Wacker Packer). The survey crew recorded the locations immediately after each sample was obtained. The samples collected were labeled and transported to the on-site storage area to be processed for laboratory testing or storage.

3.2 FIELD DENSITY TESTING – SAND CONE

Field density tests were performed on each lift by the sand cone method in general accordance with ASTM D1556. Density tests were performed on each lift after the next lift above had been placed and compacted. An area to be tested was selected and excavated with shovels, leveled, and recorded by the survey team. The sand cone test was conducted on the subject lift and completed in the on site laboratory. A one point Proctor test (check plug) was performed for each field density test with soil from immediately adjacent to the density test to aid in selection of the appropriate Proctor test curve.

Generally, the field densities fell within a band between 95% and 107% of the modified proctor maximum density. However, there were two points considered outliers, D-36 and D-39. D-36 had an initial test density of 91% maximum dry density. After placing and compacting lift 38, lift 36 was retested approximately 2 feet away from the original test. The retest had a result of 106% of maximum dry density.

For test D-39 the as tested unit weight was 130.8 lb/ft^3 and represented 114% of maximum dry density. Lift 40, the last lift, was rolled several times both dynamically and statically, therefore some elevated compaction would be expected, although 114% was not expected. Although the two above mentioned test are considered outliers, they have not been excluded from the data sets (Tables 3 and 7).

3.3 LABORATORY TESTING

3.3.1 Sample Storage Facility and Transportation

Consistent with MACTEC's QAPD Requirements, on-site sample storage facilities were established. The former Vogtle Security Building was used as a field laboratory and sample storage area. At this facility, samples were stored in a room with controlled access (locked). Plant Vogtle Gate #13, which leads to the former Vogtle Security Building, was locked nightly. The area was patrolled frequently by Plant Vogtle Security personnel.

Disturbed samples sent to the MACTEC Atlanta Laboratory were conveyed by MACTEC employees and chain of custody documentation was maintained. No undisturbed samples were obtained during the project. The samples were transported in accordance with ASTM D4220 requirements for Group B samples.

Resonant Column Torsional Shear, RCTS, samples were sent under chains of custody by commercial carrier (Federal Express) to Fugro Laboratories in Houston, Texas, and to the geotechnical laboratory of the University of Texas, Austin

3.3.2 Moisture Content

Moisture content tests were performed in general accordance with ASTM D2216-05 (oven), D4643-00 (microwave), and/or D4959-00 (direct heating). A test specimen is dried in an oven, microwave oven, or by a direct heat source (stove top) at a temperature and/or length of time according to the ASTM standard to a constant weight. The loss of weight due to drying is considered to be water. The water content is calculated by dividing the weight of water by the weight of the dry specimen. The water content is expressed as a percentage value.

ASTM method D2216-05 was used on tests performed in the field laboratory. Method D4959 was used for moisture contents performed in the field, including daily moisture contents of the stockpile and moisture contents for calculating the results of field density tests. Method D4643 was used when more rapid results were desired, or to confirm results observed by method D2216-05.

3.3.3 Sieve Analysis and Hydrometer

Grain size analyses were performed in general accordance with ASTM D 422-63 (2002) and ASTM D 6913-04.

Sieve Analysis – The dried soil sample is separated into a series of fractions using a standard set of nested sieves. The sieving operation is conducted by means of a lateral and vertical motion of the nest of sieves, accompanied by jarring action to keep the sample moving continuously over the surface of the sieves. The weights retained on each of the set of nested sieves are used to calculate the percent of the sample passing each sieve size.

Hydrometer Analysis – The portion of the soil sample passing the No. 10 (2.0 mm) sieve is soaked in water and dispersed using a dispersing agent. The solution is placed in a cylinder and stirred, and the density of the solution is monitored over time with a hydrometer to observe the settling out of suspended

soil particles. Diameters corresponding to the readings of the hydrometer are then calculated using Stoke's law.

Grain size analyses were typically performed in the MACTEC field laboratory. However, some of the grain size tests and all hydrometer portions of grain size analyses were performed in the MACTEC Atlanta Laboratory.

3.3.4 Atterberg Limits

Limits testing was performed in general accordance with ASTM D 4318-05. The specimen is processed to remove any material retained on the 425-µm (No. 40) sieve. The liquid limit is determined by performing trials in which a portion of the specimen is spread in a brass cup, divided in two by a grooving tool, and then allowed to flow together from the shocks caused by repeatedly dropping the cup in a standard mechanical device. The multipoint liquid limit, Method A, requires three or more trials over a range of water contents to be performed and the data from the trials plotted or calculated to make a relationship from which the liquid limit is determined.

The plastic limit is determined by alternately pressing together and rolling into 3.2-µm (1/8-inch) diameter thread a small portion of plastic soil until its water content is reduced to a point at which the thread crumbles and can no longer be pressed together and re-rolled. The water content of the soil at this point is reported as the plastic limit.

The plasticity index is calculated as the difference between the liquid limit and the plastic limit.

3.3.5 Moisture Density Determinations (Modified Proctor Compaction Tests)

Moisture Density Relationships were determined in general accordance with ASTM D1557-00 (Modified Proctor). Five-gallon bulk samples of soil were obtained in the field (P samples) immediately adjacent to field density test locations. Five-gallon bulk samples (TPAD samples) were obtained from soil stockpiles and from test pits of potential borrow materials. Where bulk samples consisted of multiple buckets from the same location, the soil from all buckets was thoroughly mixed to produce uniform test samples. Modified Proctor tests as well as well as other laboratory tests were performed on these bulk samples. The Modified Proctor test yielded the optimum moisture content and corresponding maximum dry density for the bulk sample. Companion one-point Proctor compaction tests (check plugs) were performed for each field density test.

3.3.6 Specific Gravity

Specific gravity testing of soil was performed in general accordance with ASTM D854-06. The specific gravity is required in calculation of the soil properties void ratio and degree of saturation. Specific gravity G is defined as the ratio of the unit weight (or density) of soil solids (particles) to the unit weight (or density) of water. The specific gravity of the soil particles is determined according to Method B of the ASTM standard.

3.3.7 Consolidated Undrained Triaxial Compression Tests with Pore Pressure Measurements

Consolidated undrained triaxial compression tests with pore pressure measurements were performed in general accordance with ASTM D-4767. These tests were performed on laboratory compacted specimen of sample P-16 from the Phase 1 test fill and samples TP-B-1125 and TP-B-1194 from the COL investigation.

3.3.8 Direct Shear Testing

Direct Shear testing of soil samples from the COL investigation were assigned by Bechtel and performed in general accordance with ASTM D 3080. The Direct Shear testing was performed by the Fugro Consultants laboratory in Houston, Texas. The test results for samples TP-B-1108 and TP-B-1121 are presented in Attachment C.

3.3.9 Resonant Column Torsional Shear

The Resonant Column Torsional Shear (RCTS) testing of soil samples from the Phase I Test Fill were assigned by Bechtel and performed using testing procedures developed by Dr. Kenneth H. Stokoe of the University of Texas. The RCTS testing was performed by the Fugro Consultants laboratory in Houston, Texas, a subcontractor to MACTEC, under the technical overview of Dr. Stokoe. Dr. Stokoe observed sample preparation procedures and the testing of sample P-16 at Fugro's laboratory in Houston on January 4, 2008. RCTS testing was also performed at the University of Texas, Austin, Geotechnical laboratory, under the direction of Dr. Stokoe, samples P-6 and P-26. The RCTS test results for samples P-6, P-16 and P-26 are presented in Attachment C.

3.4 DRILLING EQUIPMENT AND METHODS

The drilling for the cross-hole borings (CHB-1, CHB-2, CHB-3) and observation well boring (CHB-4) was performed using a CME-55 truck-mounted drill rig (Hammer/Drill Rig Serial Marker 219505) from the MACTEC Atlanta fleet. The drill rig was operated by Phillip Pitts, a Senior Driller with MACTEC.

The borings designated for cross-hole seismic testing (CHB-1, CHB-2, CHB-3) were advanced in soil using mud rotary wash drilling techniques. Water used for drilling was obtained from an on-site potable water supply discharge point. Boring CHB-4 was drilled using hollow stem augers as requested by SNC/Bechtel to obtain representative soil samples for moisture content testing. PVC casings were installed in borings CHB-1, CHB-2, and CHB-3 for cross-hole seismic testing. The casing installation procedures are described in Section 3.7. A temporary observation well was installed in boring CHB-4. The well installation procedures are described in Section 3.8.

3.5 SPT SAMPLING IN GEOTECHNICAL BORINGS

Soil sampling in the borings using the SPT was conducted in general accordance with ASTM D1586. Samples were taken at intervals of 2.0 feet within the upper 20 feet and thereafter at 5 foot intervals. An automatic hammer was used to perform the SPT tests. The sampler was typically driven 18 inches in soil with the number of hammer blows recorded for each six inch interval of penetration.

The split tube sampler was opened at the drill site and the recovered materials were photographed and visually described and classified by MACTEC's field geologist or engineer in general accordance with ASTM D2488. The recovered sample was split and the upper and lower sections were placed in separate glass sample jars with moisture proof lids. Sample jars were labeled, placed in cardboard boxes, and transported to the on-site storage area.

3.6 SPT ENERGY MEASUREMENTS

SPT energy measurements were made on the drill rig performing standard penetration testing (SPT). Energy measurements were recorded during sampling at the depth intervals shown in the SPT Energy Ratio Measurement Reports in Attachment D. The energy measurements were performed with a Pile Driving Analyzer (PDA) model PAK and calibrated accelerometers and strain gages in general accordance with ASTM D 4633-05. The ratio of the average measured energy to the theoretical potential energy of the SPT system (140 lb weight with the specified 30 inch fall) is the Energy Transfer Ratio (ETR). The ETR range of the automatic hammer used at the site is 75.7% to 84.6% of the theoretical potential energy of the SPT. These ETR values are within the range of typical values for automatic hammers. The ETR values (as percent of the theoretical value) are shown in the SPT Energy Ratio Measurement Reports in Attachment D.

3.7 CROSS-HOLE CASING INSTALLATION

Cross-hole borings (CHB-1, CHB-2, and CHB-3) were initially mud rotary wash drilled to approximately 40 feet below grade using a nominal 4 inch diameter tricone bit. The borehole was then expanded by reaming out with a nominal 7 inch diameter tricone bit. The borings were flushed with water until relatively clean water return was achieved. 3 inch ID flush threaded schedule 40 PVC pipe was installed the full length of the boring, with approximately 5 feet of stick-up above grade. Stainless steel centralizers were placed on the casing approximately 10 feet above the bottom of the boring. Grout was mixed in general accordance with the Bechtel approved mix design (approximately 8 gallons water and 2.5 lbs of betonite for every 94 lb bag of cement). A tremie pipe (1 inch ID PVC) was extended the full depth of the boring and grout was pumped until the annulus was completely filled. In borings where grout settling occurred, additional grout was added to bring grout to grade. The stick-up was trimmed to approximately 2 feet above grade.

The horizontal location of each of the three casings at various elevations was determined using a Slope Indicator Company (SINCO) Digitilt Inclinometer (Product Number 50302500). A temporary slope inclinometer casing was centralized in each of the cross-hole casings and aligned with true north, provided by the surveyor. The slope inclinometer was lowered into the temporary casing. Readings were taken at 2 foot intervals. Data was reduced to determine the horizontal locations of the casing center at the various elevations. The temporary inclinometer casing was removed immediately after testing.

3.8 TEMPORARY OBSERVATION WELL INSTALLATION

The temporary observation well (CHB-4) was augured with a 3 ¼ inch ID hollow stem auger and split spoon sampled to a depth of 19.5 feet. Fifteen feet of 2 inch ID flush threaded schedule 40, 0.01-inch slotted, PVC pipe, with a 0.5 foot sump, was installed from the bottom of the borehole to approximately 4

feet below grade. 10 feet of 2 inch ID flush threaded schedule 40 PVC riser was installed in the remainder of the borehole, with approximately 6 feet of stick-up above grade. A filter pack of clean sand was installed from the bottom of the borehole to a depth of 1.5 feet below grade. A 0.3 foot bentonite seal was placed on top of the filter pack. The remaining annulus was grouted to be flush with the top of the test pad. The stick-up was then trimmed to approximately 2 feet above grade and a cap was placed to seal off the observation well. CHB-4 was installed prior to drilling and sampling the cross hole borings. Water levels in CHB-4 were recorded daily during field work.

3.9 BORING LOGS

The soil description on the boring logs in Attachment B are based on the field descriptions (ASTM D 2488) by the field geologist or engineer, modified according to ASTM D 2487 where lab test results are available. The water depths on these boring logs are from observations during drilling. Because water was introduced during mud rotary wash and core drilling, the water depths on the boring logs may not represent the stabilized water depths. The boring logs in Attachment B were prepared using the computer program "gINT" (Version 7). Electronic files with gINT data are provided with Attachment B.

3.10 SPECTRAL ANALYSIS OF SURFACE WAVES (SASW) TESTING

SASW testing was performed at lift 12 (approximate elevation 230 feet), lift 22 (236 feet), lift 28 (239 feet), and lift 40 (245 feet). The testing was performed by Dr. K.H. Stokoe, and graduate students Min Jae Jung and Jaibei Yuan of the University of Texas / Austin. The tests were performed using the procedure supplied by Dr. Stokoe. See Attachment E for details.

3.11 CROSS-HOLE SEISMIC TESTING

Cross-hole Seismic Testing was performed in general accordance with ASTM D4428-07 with two exceptions. Exception 1 was that 7 feet is the approximate surface distance used between adjacent boreholes in the linear array of three boreholes. Exception 2 is the mechanical-wedge source was placed in the middle borehole (not end borehole) for testing at shallower depths from 2 to 10 feet where a small amount of refraction may be present due to the velocity gradient near the surface. The shorter source-to-receiver travel path (about 7 feet) minimizes the impact of refraction on these measurements.

The testing was performed by Dr. K.H. Stokoe, and graduate students Min Jae Jung and Jiaibei Yuan of the University of Texas/Austin.

3.12 REPORTING

The laboratory test reports, with a few exceptions, consists of individual test data and results sheets as required by the testing standard, and are contained in Attachment C. A summary of the test results on soil samples in Attachment C is found in Tables 2, 3 and 4 of the Data Report. Laboratory test results statistics can be found in Table 9 of the Data Report.

The exceptions noted above include the SASW and Cross-hole tests. These test result are reported in Attachment E.

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TABLE 1
ORGANIZATIONS PERFORMING WORK AT THE SITE OR IN THE LABORATORY

Organization	Function
MACTEC Engineering and Consulting, Inc.	USCS Soil Classification (ASTM D 2488); QA Surveillance; SPT sampling; Bulk Sampling; Geotechnical Laboratory Testing; SPT Energy Measurement of MACTEC Drill Rig
JM Miles Construction	Clearing of pad area, site grading, excavation of test pad site, placement of backfill
Patterson and Dewar, Inc.	Survey control of pad, surveying of sample locations, borings, test pits, and SASW locations
Fugro Consultants – Houston, Texas	RCTS Testing
Prof. K.H. Stokoe, Min Jae Jung, and Jaibei Yuan, University of Texas / Austin Consultants	SASW, RCTS, and Crosshole Testing

Prepared By/Date: Stephen Woodham/02-04-08

Checked By/Date: William A. Lancaster/02-04-08

Table 2
Lab Test Results - Stockpile and Borrow Samples
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number: 6141-06-0286

Sample ID	Northing (ft)	Easting (ft)	Elevation (ft)	Test Date	MDD (pcf)	Optimum Moisture (%)	Natural Moisture - As Sampled (%)			% Fines	LL	PL	PI	USCS	Location/Comments
	PLANT GRID SYSTEM COORDINATES		NVGD VERTICAL DATUM				Oven	Hot Plate	Microw						
TPAD-1	8337.7	6974.6	246.1	11/29/2007	113.2	8.4	2.4	- -	- -	10.8	NV	NP	NP	SP-SM	Near CL of Test Pad ~5 feet from top of slope (pre-excavation). Existing fill.
TPAD-1*				11/29/2007	114.8	5.8	- -	- -	- -	10.1	- -	- -	- -	- -	
TPAD-2	8311.5	6978.9	226.0	11/29/2007	122.7	10.6	11.1	- -	- -	22.8	41	21	20	SC	Near CL of Test Pad ~5 feet from bottom of slope.
TPAD-2*				11/29/2007	124.1	10.6	- -	- -	- -	21.4	- -	- -	- -	- -	
TPAD-3	NA	NA	NA	11/28/2007	114.0	11.1	4.9	4.9	--	11.0	NV	NP	NP	SP-SM	Stockpile SW Corner
TPAD-3*				11/30/2007	114.6	6.3	- -	- -	- -	10.4	- -	- -	- -	- -	
TPAD-4	NA	NA	NA	11/28/2007	120.6	9.8	6.6	6.5	--	14.7	- -	- -	- -	- -	Stockpile NE Corner
TPAD-4*				11/30/2007	121.6	9.9	- -	- -	- -	13.9	NV	NP	NP	SM	
TPAD-5	NA	NA	NA	11/30/2007	123.1	9.5	7.2	7.5	7.5	14.6	NV	NP	NP	SM	Center of Stockpile
TPAD-6	NA	NA	NA	11/30/2007	117.4	9.9	6.1	5.8	6.1	12.2	NV	NP	NP	SM	North Center of Stockpile
TPAD-7	NA	NA	NA	1/4/2008	- -	- -	4.6	- -	- -	10.2	- -	- -	- -	- -	Stockpile-Material from New Borrow Site NE of test pad.
TPAD-8	NA	NA	NA	1/10/2008	- -	- -	11.7	- -	- -	22.4	30	20	10	SC	New Northeast Borrow Area. 20 feet below grade.
BS-1	8425.886	7003.85	239.129	1/14/2008	- -	- -	2.9	- -	- -	10.2	- -	- -	- -	- -	Test Pad excavation side slope
BS-2	8393.805	7006.76	237.21	1/14/2008	- -	- -	4.0	- -	- -	10.8	NV	NP	NP	SP-SM	Test Pad excavation side slope
BS-3	8347.848	7005.063	235.085	1/14/2008	- -	- -	3.3	- -	- -	10.4	- -	- -	- -	- -	Test Pad excavation side slope
BS-4	8424.543	6992.059	231.669	1/14/2008	- -	- -	8.4	- -	- -	21.7	33	17	16	SC	Test Pad excavation side slope
BS-5	8386.152	6992.293	228.688	1/14/2008	- -	- -	11.6	- -	- -	22.2	31	17	14	SC	Test Pad excavation side slope
BS-6	8347.895	6990.996	226.457	1/14/2008	- -	- -	4.1	- -	- -	11.1	NV	NP	NP	SP-SM	Test Pad excavation side slope
BS-7	8358.719	6938.96	237.019	1/14/2008	- -	- -	3.7	- -	- -	9.2	NV	NP	NP	SP-SM	Test Pad excavation side slope
BS-8	8394.797	6943.396	236.002	1/14/2008	- -	- -	9.7	- -	- -	19.9	NV	NP	NP	SM	Test Pad excavation side slope
BS-9	8430.09	6946.607	238.764	1/14/2008	- -	- -	3.4	- -	- -	11.4	- -	- -	- -	- -	Test Pad excavation side slope
BS-10	8427.202	6957.252	231.978	1/14/2008	- -	- -	10.3	- -	- -	21.6	NV	NP	NP	SM	Test Pad excavation side slope
BS-11	8394.862	6995.59	229.404	1/16/2008	- -	- -	10.1	- -	- -	23.7	NV	NP	NP	SM	Test Pad excavation side slope
BS-12	8358.892	6953.174	229.788	1/16/2008	- -	- -	10.8	- -	- -	21.9	- -	- -	- -	- -	Test Pad excavation side slope

***denotes duplicate sample sent to MACTEC Atlanta Laboratory for testing**

Prepared by: SEW
Reviewed by: WAL

Table 3
Laboratory Test Results - Backfill Samples
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number: 6141-06-0286

LIFT No	Sample ID	Northing (ft)	Easting (ft)	Elevation (ft)	Modified Proctor		Natural Moisture - As Sampled (%)			G_s at Test Temp	G_s at 20 degree C	C_u	% Fines	LL	PL	PI	USCS
		PLANT GRID SYSTEM COORDINATES		NVGD VERTICAL DATUM	MDD (pcf)	Optimum Moisture (%)	Oven	Hot Plate	Microw								
1	P-1	8372.5	6975.0	225.42	121.4	9.9	8.9	9.0	8.8	- -	- -	- -	17.2	NV	NP	NP	SM
	P-1*	8372.5	6975.0	225.42	- -	- -	- -	- -	- -	- -	- -	350.0 [1]	15.3	NV	NP	NP	SM
	G-1-1	8394.3	6970.0	225.49	- -	- -	10.8	8.7	7.4	- -	- -	- -	18.9	- -	- -	- -	- -
	G-1-2	8391.1	6979.2	225.44	- -	- -	8.1	8.1	7.4	- -	- -	- -	16.1	- -	- -	- -	- -
	G-1-3	8349.5	6979.6	225.18	- -	- -	6.4	- -	6.5	- -	- -	- -	- -	- -	- -	- -	- -
	G-1-4	8350.9	6968.6	225.31	- -	- -	- -	- -	- -	- -	- -	- -	17.1	NV	NP	NP	SM
	G-1-4*	8350.9	6968.6	225.31	- -	- -	- -	- -	- -	- -	- -	- -	- -	NV	NP	NP	SM
2	P-2	8356.0	6875.0	225.99	120.3	9.4	7.0	7.0	6.6	- -	- -	- -	15.3	NV	NP	NP	SM
	P-2*	8356.0	6875.0	225.99	- -	- -	- -	- -	- -	- -	- -	324.9	14.8	- -	- -	- -	- -
	G-2-1	8384.7	6966.4	225.98	- -	- -	5.8	- -	- -	- -	- -	- -	15.0	- -	- -	- -	- -
	G-2-2	8384.5	6979.0	225.77	- -	- -	5.6	- -	- -	- -	- -	- -	14.4	- -	- -	- -	- -
	G-2-3	8360.3	6967.1	225.94	- -	- -	4.3	- -	- -	- -	- -	- -	15.0	NV	NP	NP	SM
	G-2-4	8353.9	6980.9	225.98	- -	- -	5.9	- -	- -	- -	- -	- -	14.6	- -	- -	- -	- -
3	G-3-1	8381.881	6966.093	226.32	- -	- -	4.4	- -	- -	- -	- -	- -	15.1	- -	- -	- -	- -
	G-3-2	8372.405	6976.174	226.34	- -	- -	5.1	- -	- -	- -	- -	- -	14.8	- -	- -	- -	- -
	G-3-3	8346.932	6982.336	226.36	- -	- -	5.8	- -	- -	- -	- -	- -	15.6	NV	NP	NP	SM
	G-3-4	8345.271	6966.345	226.42	- -	- -	5.4	- -	- -	- -	- -	- -	15.2	- -	- -	- -	- -
4	P-4	8347.203	6980.053	227.05	119.3	9.3	6.5	6.3	6.7	- -	- -	- -	14.8	NV	NP	NP	SM
	P-4*	8347.203	6980.053	227.05	- -	- -	- -	- -	- -	- -	- -	265.2	13.8	- -	- -	- -	- -
	G-4-1	8388.221	6968.833	226.86	- -	- -	5.3	- -	- -	- -	- -	- -	12.4	- -	- -	- -	- -
	G-4-2	8390.25	6979.337	226.86	- -	- -	6.4	- -	- -	- -	- -	- -	14.0	NV	NP	NP	SM
	G-4-3	8359.041	6978.814	227.09	- -	- -	5.9	- -	- -	- -	- -	- -	13.4	- -	- -	- -	- -
	G-4-4	8367.446	6968.048	227.02	- -	- -	5.6	- -	- -	- -	- -	- -	13.3	- -	- -	- -	- -
5	G-5-1	8385.942	6971.196	227.44	- -	- -	7.9	- -	- -	- -	- -	- -	14.6	NV	NP	NP	SM
	G-5-2	8383.179	6980.414	227.32	- -	- -	8.2	- -	- -	- -	- -	- -	14.3	- -	- -	- -	- -
	G-5-3	8350.298	6970.748	227.44	- -	- -	6.5	- -	- -	- -	- -	- -	14.4	- -	- -	- -	- -
	G-5-4	8347.203	6980.053	227.05	- -	- -	6.7	- -	- -	- -	- -	- -	13.6	- -	- -	- -	- -
6	P-6	8357.825	6977.089	228.02	119.4	9.4	6.2	6.1	6.8	- -	- -		13.8	NV	NP	NP	SM
	P-6*	8357.825	6977.089	228.02	- -	- -	- -	- -	- -	- -	- -	282.8	13.7	- -	- -	- -	- -
	G-6-1	8385.952	6971.491	228.04	- -	- -	7.7	- -	- -	- -	- -	- -	13.9	- -	- -	- -	- -
	G-6-2	8372.964	6981.332	228.08	- -	- -	7.4	- -	- -	- -	- -	- -	14.1	- -	- -	- -	- -
	G-6-3	8358.389	6981.984	228.12	- -	- -	7.1	- -	- -	- -	- -	- -	13.4	- -	- -	- -	- -
	G-6-4	8363.163	6969.874	228.09	- -	- -	6.9	- -	- -	- -	- -	- -	14.2	NV	NP	NP	SM
7	G-7-1	8386.017	6971.671	228.41	- -	- -	6.1	- -	- -	- -	- -	- -	13.9	- -	- -	- -	- -
	G-7-2	8376.723	6980.334	228.37	- -	- -	7.6	- -	- -	- -	- -	- -	14.3	NV	NP	NP	SM
	G-7-3	8355.424	6983.323	228.50	- -	- -	9.7	- -	- -	- -	- -	- -	14.0	- -	- -	- -	- -
	G-7-4	8346.779	6971.85	228.41	- -	- -	6.3	- -	- -	- -	- -	- -	14.0	- -	- -	- -	- -

Table 3
Laboratory Test Results - Backfill Samples
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number: 6141-06-0286

LIFT No	Sample ID	Northing (ft)	Easting (ft)	Elevation (ft)	Modified Proctor		Natural Moisture - As Sampled (%)			G_s at Test Temp	G_s at 20 degree C	C_u	% Fines	LL	PL	PI	USCS
		PLANT GRID SYSTEM COORDINATES		NVGD VERTICAL DATUM	MDD (pcf)	Optimum Moisture (%)	Oven	Hot Plate	Microw								
8	P-8	8396.807	6967.166	229.00	- -	- -	6.9	- -	6.4	- -	- -	- -	- -	- -	- -	- -	- -
	P-8*	8396.807	6967.166	229.00	117.9	9.2	6.8	- -	- -	- -	- -	102.4	13.0	NV	NP	NP	SM
	G-8-1	8396.874	6967.337	228.82	- -	- -	7.9	- -	- -	- -	- -	- -	14.7	NV	NP	NP	SM
	G-8-2	8394.869	6980.252	228.95	- -	- -	8.5	- -	- -	- -	- -	- -	13.7	- -	- -	- -	- -
	G-8-3	8345.238	6981.205	228.85	- -	- -	8.4	- -	- -	- -	- -	- -	12.5	- -	- -	- -	- -
	G-8-4	8351.276	6970.741	228.78	- -	- -	9.0	- -	- -	- -	- -	- -	13.4	- -	- -	- -	- -
9	G-9-1*	8383.252	6972.746	229.63	- -	- -	6.6	- -	- -	- -	- -	- -	16.2	NV	NP	NP	SM
	G-9-2*	8392.348	6977.53	229.57	- -	- -	7.2	- -	- -	- -	- -	- -	12.8	- -	- -	- -	- -
	G-9-3*	8367.735	6980.166	229.82	- -	- -	7.0	- -	- -	- -	- -	- -	13.2	NV	NP	NP	SM
	G-9-4*	8364.938	6971.198	229.66	- -	- -	7.5	- -	- -	- -	- -	- -	13.1	- -	- -	- -	- -
10	P-10	8375.442	6971.762	230.01	119.9	9.5	6.9	6.4	6.2	- -	- -	- -	16.2	NV	NP	NP	SM
	P-10*	8375.442	6971.762	230.01	- -	- -	- -	- -	- -	- -	- -	325.0	13.6	- -	- -	- -	- -
	G-10-1*	8386.44	6967.674	230.22	- -	- -	9.6	- -	- -	- -	- -	- -	13.0	- -	- -	- -	- -
	G-10-2*	8381.433	6979.66	230.36	- -	- -	8.5	- -	- -	- -	- -	- -	13.3	NV	NP	NP	SM
	G-10-3*	8349.644	6979.697	230.26	- -	- -	9.9	- -	- -	- -	- -	- -	14.1	- -	- -	- -	- -
	G-10-4*	8347.491	6966.807	230.25	- -	- -	8.0	- -	- -	- -	- -	- -	13.6	NV	NP	NP	SM
11	G-11-1	8388.773	6968.132	230.49	- -	- -	9.9	- -	- -	- -	- -	- -	14.3	- -	- -	- -	- -
	G-11-2	8385.418	6979.489	230.60	- -	- -	10.3	- -	- -	- -	- -	- -	15.4	NV	NP	NP	SM
	G-11-3	8360.375	6978.936	230.61	- -	- -	9.7	- -	- -	- -	- -	- -	14.4	- -	- -	- -	- -
	G-11-4	8360.861	6967.984	230.50	- -	- -	8.4	- -	- -	- -	- -	- -	14.5	- -	- -	- -	- -
12	P-12	8399.233	6978.684	230.97	118.7	9.6	9.2	9.7	9.4	- -	- -	- -	13.2	NV	NP	NP	SM
	P-12*	8399.233	6978.684	230.97	- -	- -	- -	- -	- -	- -	- -	160.4	13.4	- -	- -	- -	- -
	G-12-1	8400.726	6965.481	230.95	- -	- -	10.3	- -	- -	- -	- -	- -	14.5	- -	- -	- -	- -
	G-12-2	8400.173	6982.254	230.89	- -	- -	10.2	- -	- -	- -	- -	- -	15.0	- -	- -	- -	- -
	G-12-3	8342.659	6982.103	231.01	- -	- -	12.2	- -	- -	- -	- -	- -	15.1	NV	NP	NP	SM
	G-12-4	8343.132	6966.755	230.93	- -	- -	10.2	- -	- -	- -	- -	- -	14.2	- -	- -	- -	- -
13	G-13-1	8400.499	6964.761	231.38	- -	- -	7.4	- -	- -	- -	- -	- -	15.2	- -	- -	- -	- -
	G-13-2	8400.168	6982.606	231.36	- -	- -	7.4	- -	- -	- -	- -	- -	15.5	- -	- -	- -	- -
	G-13-3	8342.48	6982.323	231.42	- -	- -	7.0	- -	- -	- -	- -	- -	14.4	- -	- -	- -	- -
	G-13-4	8342.56	6965.035	231.34	- -	- -	7.2	- -	- -	- -	- -	- -	16.1	NV	NP	NP	SM
14	G-14-1	8392.381	6965.74	231.86	- -	- -	7.8	- -	- -	- -	- -	- -	13.8	- -	- -	- -	- -
	G-14-2	8392.201	6979.361	231.75	- -	- -		- -	- -	- -	- -	- -	13.2	- -	- -	- -	- -
	G-14-3	8357.772	6980.276	231.98	- -	- -	6.9	- -	- -	- -	- -	- -	13.3	- -	- -	- -	- -
	G-14-4	8345.748	6966.815	231.87	- -	- -	8.7	- -	- -	- -	- -	- -	15.7	NV	NP	NP	SM

Table 3
Laboratory Test Results - Backfill Samples
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number: 6141-06-0286

LIFT No	Sample ID	Northing (ft)	Easting (ft)	Elevation (ft)	Modified Proctor		Natural Moisture - As Sampled (%)			G_s at Test Temp	G_s at 20 degree C	C_u	% Fines	LL	PL	PI	USCS
		PLANT GRID SYSTEM COORDINATES		NVGD VERTICAL DATUM	MDD (pcf)	Optimum Moisture (%)	Oven	Hot Plate	Microw								
15	P-15	8397.898	6972.882	232.43	120.2	9.4	8.7	8.6	8.7	- -	- -	- -	14.8	NV	NP	NP	SM
	P-15*	8397.898	6972.882	232.43	- -	- -	- -	- -	- -	- -	- -	319.4	13.5	- -	- -	- -	- -
	G-15-1	8396.491	6966.92	232.28	- -	- -	9.3	- -	- -	- -	- -	- -	15.0	- -	- -	- -	- -
	G-15-2	8398.462	6979.562	232.28	- -	- -	9.5	- -	- -	- -	- -	- -	15.9	NV	NP	NP	SM
	G-15-3	8347.15	6983.309	232.39	- -	- -	7.9	- -	- -	- -	- -	- -	14.6	- -	- -	- -	- -
	G-15-4	8345.427	6965.071	232.25	- -	- -	9.0	- -	- -	- -	- -	- -	13.9	- -	- -	- -	- -
16	P-16	8345.827	6966.873	232.92	121.2	9.7	7.2	6.7	6.6	- -	- -	- -	16.1	NV	NP	NP	SM
	P-16*	8345.827	6966.873	232.92	122.8	10	7.5	- -	- -	2.79	2.78	311.1 [2]	15.2	NV	NP	NP	SM
	G-16-1	8389.73	6967.941	232.88	- -	- -	7.0	- -	- -	- -	- -	- -	14.7	- -	- -	- -	- -
	G-16-2	8389.22	6980.449	232.72	- -	- -	7.2	- -	- -	- -	- -	- -	15.3	- -	- -	- -	- -
	G-16-3	8364.714	6978.973	232.79	- -	- -	6.9	- -	- -	- -	- -	- -	14.7	- -	- -	- -	- -
	G-16-4	8348.47	6968.055	232.83	- -	- -	8.6	- -	- -	- -	- -	- -	17.6	NV	NP	NP	SM
17	G-17-1	8393.57	6971.657	233.42	- -	- -	7.0	- -	- -	- -	- -	- -	11.4	- -	- -	- -	- -
	G-17-2	8382.453	6979.747	233.36	- -	- -	6.6	- -	- -	- -	- -	- -	13.9	- -	- -	- -	- -
	G-17-3	8353.519	6982.043	233.49	- -	- -	6.9	- -	- -	- -	- -	- -	13.9	- -	- -	- -	- -
	G-17-4	8354.019	6969.264	233.42	- -	- -	7.5	- -	- -	- -	- -	- -	15.5	NV	NP	NP	SM
18	G-18-1	8386.985	6968.371	233.97	- -	- -	7.6	- -	- -	- -	- -	- -	14.3	- -	- -	- -	- -
	G-18-2	8391.21	6979.899	233.97	- -	- -	9.8	- -	- -	- -	- -	- -	14.4	- -	- -	- -	- -
	G-18-3	8360.321	6981.236	234.02	- -	- -	8.2	- -	- -	- -	- -	- -	14.8	NV	NP	NP	SM
	G-18-4	8355.216	6970.396	234.06	- -	- -	7.8	- -	- -	- -	- -	- -	13.7	- -	- -	- -	- -
19	G-19-1	8395.842	6969.632	234.48	- -	- -	11.7	- -	- -	- -	- -	- -	14.3	- -	- -	- -	- -
	G-19-2	8384.596	6977.881	234.30	- -	- -	9.0	- -	- -	- -	- -	- -	13.8	- -	- -	- -	- -
	G-19-3	8350.142	6979.065	234.37	- -	- -	9.8	- -	- -	- -	- -	- -	14.1	- -	- -	- -	- -
	G-19-4	8363.949	6968.706	234.44	- -	- -	9.7	- -	- -	- -	- -	- -	14.8	NV	NP	NP	SM
20	P-20	8369.683	6965.776	234.98	119.1	9.5	8.7	9.9	9.5	- -	- -	- -	15.1	NV	NP	NP	SM
	P-20*	8369.683	6965.776	234.98	- -	- -	- -	- -	- -	- -	- -	222.2	13.1	- -	- -	- -	- -
	G-20-1	8398.585	6970.124	235.08	- -	- -	8.5	- -	- -	- -	- -	- -	13.7	- -	- -	- -	- -
	G-20-2	8397.809	6980.026	235.02	- -	- -	8.7	- -	- -	- -	- -	- -	13.2	- -	- -	- -	- -
	G-20-3	8345.52	6981.23	234.75	- -	- -	9.0	- -	- -	- -	- -	- -	16.5	NV	NP	NP	SM
	G-20-4	8347.442	6966.226	235.00	- -	- -	9.3	- -	- -	- -	- -	- -	14.2	- -	- -	- -	- -
21	G-21-1	8400.524	6965.066	235.65	- -	- -	8.7	- -	- -	- -	- -	- -	14.1	NV	NP	NP	SM
	G-21-2	8400.68	6982.772	235.64	- -	- -	8.9	- -	- -	- -	- -	- -	12.9	- -	- -	- -	- -
	G-21-3	8342.812	6982.843	235.29	- -	- -	8.6	- -	- -	- -	- -	- -	13.7	- -	- -	- -	- -
	G-21-4	8342.884	6965.047	235.35	- -	- -	7.8	- -	- -	- -	- -	- -	13.3	- -	- -	- -	- -

Table 3
Laboratory Test Results - Backfill Samples
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number: 6141-06-0286

LIFT No	Sample ID	Northing (ft)	Easting (ft)	Elevation (ft)	Modified Proctor		Natural Moisture - As Sampled (%)			G_s at Test Temp	G_s at 20 degree C	C_u	% Fines	LL	PL	PI	USCS
		PLANT GRID SYSTEM COORDINATES		NVGD VERTICAL DATUM	MDD (pcf)	Optimum Moisture (%)	Oven	Hot Plate	Microw								
22	G-22-1	8401.559	6964.131	236.02	- -	- -	5.9	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	G-22-2	8401.632	6983.719	235.92	- -	- -	6.3	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	G-22-3	8342.671	6983.983	235.83	- -	- -	5.9	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	G-22-4	8341.611	6964.197	236.00	- -	- -	6.1	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
22A	P-22A	8342.837	6981.512	235.97	121.0	9.4	8.4	8.5	8.4	- -	- -	- -	16.2	NV	NP	NP	SM
	P-22A*	8342.837	6981.512	235.97	- -	- -	- -	- -	- -	- -	- -	233.3 [3]	14.6	- -	- -	- -	- -
	G-22A-1	8390.564	6967.479	235.89	- -	- -	8.0	- -	- -	- -	- -	- -	14.5	- -	- -	- -	- -
	G-22A-2	8386.05	6978.27	235.94	- -	- -	7.9	- -	- -	- -	- -	- -	13.3	- -	- -	- -	- -
	G-22A-3	8354.272	6977.967	235.81	- -	- -	7.7	- -	- -	- -	- -	- -	13.4	- -	- -	- -	- -
	G-22A-4	8345.295	6965.97	235.89	- -	- -	7.4	- -	- -	- -	- -	- -	14.0	NV	NP	NP	SM
23	G-23-1	8389.911	6969.302	236.67	- -	- -	7.2	- -	- -	- -	- -	- -	14.3	- -	- -	- -	- -
	G-23-2	8380.942	6978.291	236.56	- -	- -	7.4	- -	- -	- -	- -	- -	15.0	- -	- -	- -	- -
	G-23-3	8351.824	6979.49	236.62	- -	- -	7.6	- -	- -	- -	- -	- -	15.5	- -	- -	- -	- -
	G-23-4	8356.019	6968.39	236.75	- -	- -	7.0	- -	- -	- -	- -	- -	15.3	NV	NP	NP	SM
24	G-24-1	8397.17	6966.676	236.77	- -	- -	10.4	- -	- -	- -	- -	- -	14.2	- -	- -	- -	- -
	G-24-2	8396.208	6981.57	236.94	- -	- -	11.2	- -	- -	- -	- -	- -	13.5	- -	- -	- -	- -
	G-24-3	8346.412	6980.345	236.83	- -	- -	10.9	- -	- -	- -	- -	- -	13.7	- -	- -	- -	- -
	G-24-4	8360.35	6968.269	236.82	- -	- -	9.5	- -	- -	- -	- -	- -	14.6	NV	NP	NP	SM
25	G-25-1	8394.261	6966.199	237.56	- -	- -	7.4	- -	- -	- -	- -	- -	16.7	NV	NP	NP	SM
	G-25-2	8397.285	6978.794	237.53	- -	- -	7.9	- -	- -	- -	- -	- -	14.1	- -	- -	- -	- -
	G-25-3	8347.557	6979.074	237.46	- -	- -	8.8	- -	- -	- -	- -	- -	13.7	- -	- -	- -	- -
	G-25-4	8351.139	6967.108	237.44	- -	- -	8.1	- -	- -	- -	- -	- -	15.4	- -	- -	- -	- -
26	P-26	8373.899	6981.284	237.95	120.3	8.9	9.3	9.1	- -	- -	- -	- -	14.7	NV	NP	NP	SM
	P-26*	8373.899	6981.284	237.95	120.6	8.7	- -	- -	- -	2.74	2.74	233.3 [4]	14.4	NV	NP	NP	SM
	G-26-1	8393.406	6967.396	238.24	- -	- -	10.0	- -	- -	- -	- -	- -	15.6	NV	NP	NP	SM
	G-26-2	8386.02	6979.917	238.15	- -	- -	9.6	- -	- -	- -	- -	- -	14.2	- -	- -	- -	- -
	G-26-3	8355.439	6981.014	238.07	- -	- -	10.4	- -	- -	- -	- -	- -	14.9	- -	- -	- -	- -
	G-26-4	8361.043	6968.488	238.02	- -	- -	10.3	- -	- -	- -	- -	- -	14.7	- -	- -	- -	- -
27	G-27-1	8399.748	6966.049	238.38	- -	- -	8.1	- -	- -	- -	- -	- -	14.7	- -	- -	- -	- -
	G-27-2	8399.293	6982.315	238.39	- -	- -	8.5	- -	- -	- -	- -	- -	14.3	- -	- -	- -	- -
	G-27-3	8343.555	6981.585	238.47	- -	- -	9.5	- -	- -	- -	- -	- -	14.2	- -	- -	- -	- -
	G-27-4	8343.117	6965.941	238.48	- -	- -	9.4	- -	- -	- -	- -	- -	15.0	NV	NP	NP	SM

Table 3
Laboratory Test Results - Backfill Samples
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number: 6141-06-0286

LIFT No	Sample ID	Northing (ft)	Easting (ft)	Elevation (ft)	Modified Proctor		Natural Moisture - As Sampled (%)			G_s at Test Temp	G_s at 20 degree C	C_u	% Fines	LL	PL	PI	USCS
		PLANT GRID SYSTEM COORDINATES		NVGD VERTICAL DATUM	MDD (pcf)	Optimum Moisture (%)	Oven	Hot Plate	Microw								
28	G-28-1	8399.036	6965.746	239.02	- -	- -	9.1	- -	- -	- -	- -	- -	16.4	NV	NP	NP	SM
	G-28-2	8388.796	6977.621	238.87	- -	- -	9.3	- -	- -	- -	- -	- -	15.0	- -	- -	- -	- -
	G-28-3	8363.313	6978.175	238.97	- -	- -	8.9	- -	- -	- -	- -	- -	15.9	- -	- -	- -	- -
	G-28-4	8350.116	6968.605	239.12	- -	- -	10.2	- -	- -	- -	- -	- -	16.3	- -	- -	- -	- -
29	G-29-1	8388.22	6968.855	239.40	- -	- -	9.9	- -	- -	- -	- -	- -	16.3	NV	NP	NP	SM
	G-29-2	8381.076	6980.371	239.39	- -	- -	10.6	- -	- -	- -	- -	- -	16.4	- -	- -	- -	- -
	G-29-3	8347.998	6978.55	239.41	- -	- -	10.0	- -	- -	- -	- -	- -	14.7	- -	- -	- -	- -
	G-29-4	8356.451	6968.903	239.49	- -	- -	9.7	- -	- -	- -	- -	- -	15.1	- -	- -	- -	- -
30	G-30-1	8390.038	6969.118	240.06	- -	- -	11.5	- -	- -	- -	- -	- -	13.6	- -	- -	- -	- -
	G-30-2	8392.321	6976.883	240.05	- -	- -	13.1	- -	- -	- -	- -	- -	14.1	- -	- -	- -	- -
	G-30-3	8354.831	6977.552	240.06	- -	- -	10.6	- -	- -	- -	- -	- -	16.4	NV	NP	NP	SM
	G-30-4	8350.957	6968.568	239.99	- -	- -	9.3	- -	- -	- -	- -	- -	15.0	- -	- -	- -	- -
31	P-31	8399.377	6966.201	240.42	113.7	9.4	7.8	7.7	7.7	- -	- -	- -	10.0	NV	NP	NP	SP-SM
	P-31*	8399.377	6966.201	240.42	- -	- -	- -	- -	- -	2.68	2.68	3.9	9.9	- -	- -	- -	- -
	G-31-1	8392.629	6970.462	240.64	- -	- -	6.6	- -	- -	- -	- -	- -	10.1	- -	- -	- -	- -
	G-31-2	8392.186	6980.712	240.72	- -	- -	6.9	- -	- -	- -	- -	- -	10.7	- -	- -	- -	- -
	G-31-3	8349.556	6979.187	240.63	- -	- -	7.0	- -	- -	- -	- -	- -	10.7	NV	NP	NP	SP-SM
	G-31-4	8351.588	6968.256	240.66	- -	- -	6.9	- -	- -	- -	- -	- -	10.6	- -	- -	- -	- -
32	G-32-1	8381.453	6968.156	240.98	- -	- -	9.5	- -	- -	- -	- -	- -	12.4	- -	- -	- -	- -
	G-32-2	8397.085	6980.272	241.03	- -	- -	11.8	- -	- -	- -	- -	- -	14.9	NV	NP	NP	SM
	G-32-3	8367.838	6978.314	240.93	- -	- -	11.1	- -	- -	- -	- -	- -	13.1	- -	- -	- -	- -
	G-32-4	8365.815	6969.637	240.98	- -	- -	10.0	- -	- -	- -	- -	- -	11.4	- -	- -	- -	- -
33	G-33-1	8392.542	6968.16	241.51	- -	- -	6.9	- -	- -	- -	- -	- -	10.7	- -	- -	- -	- -
	G-33-2	8395.432	6980.332	241.53	- -	- -	7.4	- -	- -	- -	- -	- -	13.4	NV	NP	NP	SM
	G-33-3	8358.454	6981.803	241.28	- -	- -	7.5	- -	- -	- -	- -	- -	12.7	- -	- -	- -	- -
	G-33-4	8353.484	6968.14	241.37	- -	- -	7.7	- -	- -	- -	- -	- -	11.7	- -	- -	- -	- -
34	G-34-1	8395.775	6968.333	241.94	- -	- -	6.7	- -	- -	- -	- -	- -	11.5	- -	- -	- -	- -
	G-34-2	8390.151	6981.352	242.01	- -	- -	7.1	- -	- -	- -	- -	- -	11.5	- -	- -	- -	- -
	G-34-3	8349.498	6980.319	241.96	- -	- -	7.0	- -	- -	- -	- -	- -	11.6	NV	NP	NP	SP-SM
	G-34-4	8347.497	6966.01	241.92	- -	- -	6.0	- -	- -	- -	- -	- -	10.5	- -	- -	- -	- -

Table 3
Laboratory Test Results - Backfill Samples
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number: 6141-06-0286

LIFT No	Sample ID	Northing (ft)	Easting (ft)	Elevation (ft)	Modified Proctor		Natural Moisture - As Sampled (%)			G_s at Test Temp	G_s at 20 degree C	C_u	% Fines	LL	PL	PI	USCS
		PLANT GRID SYSTEM COORDINATES		NVGD VERTICAL DATUM	MDD (pcf)	Optimum Moisture (%)	Oven	Hot Plate	Microw								
35	P-35	8374.209	6968.958	242.44	114.2	7.4	- -	6.7	- -	- -	- -	- -	10.6	NV	NP	NP	SP-SM
	P-35*	8374.209	6968.958	242.44	116.6	7.4	6.8	- -	- -	2.73	2.72	4.8	11.7	NV	NP	NP	SP-SM
	G-35-1	8387.949	6965.28	242.57	- -	- -	7.1	- -	- -	- -	- -	- -	10.5	- -	- -	- -	- -
	G-35-2	8388.516	6978.983	242.58	- -	- -	6.2	- -	- -	- -	- -	- -	10.9	- -	- -	- -	- -
	G-35-3	8354.778	6982.202	242.54	- -	- -	7.2	- -	- -	- -	- -	- -	10.9	- -	- -	- -	- -
	G-35-4	8354.234	6967.278	242.45	- -	- -	6.5	- -	- -	- -	- -	- -	11.0	NV	NP	NP	SP-SM
36	G-36-1	8392.38	6967.677	243.06	- -	- -	8.0	- -	- -	- -	- -	- -	11.0	- -	- -	- -	- -
	G-36-2	8389.375	6982.926	243.04	- -	- -	6.9	- -	- -	- -	- -	- -	12.6	NV	NP	NP	SM
	G-36-3	8355.744	6980.542	243.11	- -	- -	7.5	- -	- -	- -	- -	- -	10.9	- -	- -	- -	- -
	G-36-4	8357.01	6967.726	242.99	- -	- -	7.9	- -	- -	- -	- -	- -	10.6	- -	- -	- -	- -
37	G-37-1	8395.598	6966.513	243.56	- -	- -	9.6	- -	- -	- -	- -	- -	12.3	NV	NP	NP	SM
	G-37-2	8395.016	6979.738	243.51	- -	- -	7.3	- -	- -	- -	- -	- -	9.5	- -	- -	- -	- -
	G-37-3	8345.404	6981.15	243.66	- -	- -	8.4	- -	- -	- -	- -	- -	10.2	- -	- -	- -	- -
	G-37-4	8345.823	6967.007	243.53	- -	- -	8.5	- -	- -	- -	- -	- -	10.3	- -	- -	- -	- -
38	G-38-1	8397.54	6964.802	243.97	- -	- -	6.9	- -	- -	- -	- -	- -	10.2	- -	- -	- -	- -
	G-38-2	8398.653	6979.409	243.88	- -	- -	7.1	- -	- -	- -	- -	- -	11.2	NV	NP	NP	SP-SM
	G-38-3	8344.81	6982.925	243.90	- -	- -	7.2	- -	- -	- -	- -	- -	10.2	- -	- -	- -	- -
	G-38-4	8344.664	6965.293	243.98	- -	- -	7.1	- -	- -	- -	- -	- -	10.1	- -	- -	- -	- -
39	P-39	8345.871	6980.324	244.48	114.4	9.8	7.8	7.2	- -	- -	- -	- -	11.9	NV	NP	NP	SP-SM
	P-39*	8345.871	6980.324	244.48	- -	- -	- -	- -	- -	2.68	2.68	31.6	11.2	- -	- -	- -	- -
	G-39-1	8397.966	6967.878	244.47	- -	- -	7.5	- -	- -	- -	- -	- -	10.6	NV	NP	NP	SP-SM
	G-39-2	8392.632	6980.327	244.53	- -	- -	6.4	- -	- -	- -	- -	- -	9.3	- -	- -	- -	- -
	G-39-3	8346.122	6982.046	244.51	- -	- -	7.2	- -	- -	- -	- -	- -	10.5	- -	- -	- -	- -
	G-39-4	8345.267	6965.598	244.53	- -	- -	7.1	- -	- -	- -	- -	- -	10.4	- -	- -	- -	- -
40	G-40-1	8380.859	6968.812	245.08	- -	- -	9.5	- -	- -	- -	- -	- -	11.9	- -	- -	- -	- -
	G-40-2	8382.752	6980.853	245.13	- -	- -	8.6	- -	- -	- -	- -	- -	10.8	- -	- -	- -	- -
	G-40-3	8355.531	6982.392	244.97	- -	- -	8.0	- -	- -	- -	- -	- -	13.9	NV	NP	NP	SM
	G-40-4	8360.011	6968.838	244.95	- -	- -	9.1	- -	- -	- -	- -	- -	11.4	- -	- -	- -	- -

***denotes duplicate sample sent to MACTEC Atlanta Laboratory for testing**

[1] Grainsize slope does not cross $D_{10.}$ Diameter at 11.2% finer used to calculate C_u

[2] Grainsize slope does not cross $D_{10.}$ Diameter at 11.8% finer used to calculate C_u

[3] Grainsize slope does not cross $D_{10.}$ Diameter at 11.1% finer used to calculate C_u

[4] Grainsize slope does not cross $D_{10.}$ Diameter at 10.9% finer used to calculate C_u

Prepared by: SEW
Reviewed by: WAL

Table 4
Laboratory Test Results - Soil Test Borings
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number: 6141-06-0286

Boring Number	Sample No.	Sample Depth	Test Date	Natural Moisture (As Sampled) (%)		% Fines	LL	PL	PI	USCS
				Oven	Hot Plate					
CHB-1	SS-2	2.0	1/18/2008	8.7	- -	12.9	NV	NP	NP	SM
CHB-1	SS-3	4.0	1/18/2008	8.2	- -	12.2	NV	NP	NP	SM
CHB-1	SS-7	12.0	1/18/2008	13.8	- -	16.4	NV	NP	NP	SM
CHB-1	SS-11	19.5	1/18/2008	14.8	- -	17.6	NV	NP	NP	SM
CHB-1	SS-13	28.5	1/18/2008	15.5	- -	21.3	35	17	18	SC
CHB-1	SS-15	38.5	1/18/2008	21.7	- -	15.3	NV	NP	NP	SM
CHB-2	SS-2	2.0	1/22/2008	8.5	- -	11.4	NV	NP	NP	SP-SM
CHB-2	SS-4	6.0	1/22/2008	12.1	- -	15.8	NV	NP	NP	SM
CHB-2	SS-8	14.0	1/22/2008	14.1	- -	15.8	NV	NP	NP	SM
CHB-2	SS-11	19.5	1/22/2008	13.8	- -	17.3	NV	NP	NP	SM
CHB-2	SS-13	28.5	1/22/2008	15.1	- -	19.3	30	17	13	SC
CHB-2	SS-15	38.5	1/22/2008	22.9	- -	20.5	36	20	16	SC
CHB-3	SS-2	2.0	1/16/2008	8.1	- -	12.1	NV	NP	NP	SM
CHB-3	SS-5	8.0	1/16/2008	15.4	- -	15.8	NV	NP	NP	SM
CHB-3	SS-7	12.0	1/16/2008	15.0	- -	14.2	NV	NP	NP	SM
CHB-3	SS-10	18.0	1/16/2008	11.4	- -	16.5	NV	NP	NP	SM
CHB-3	SS-11A	19.5	1/17/2008	- -	- -	17.3	NV	NP	NP	SM
CHB-3	SS-11B	20.25	1/17/2008	- -	- -	16.0	NV	NP	NP	SM
CHB-3	SS-13	28.5	1/16/2008	17.9	- -	18.1	42	18	24	SC
CHB-4	SS-1A	0.0	1/15/2008	7.4	7.6	- -	- -	- -	- -	- -
CHB-4	SS-1B	0.75	1/15/2008	8.4	9.2	- -	- -	- -	- -	- -
CHB-4	SS-2A	2.0	1/15/2008	8.1	8.2	- -	- -	- -	- -	- -
CHB-4	SS-2B	2.75	1/15/2008	8.1	8.3	- -	- -	- -	- -	- -
CHB-4	SS-3A	4.0	1/15/2008	8.9	8.5	- -	- -	- -	- -	- -
CHB-4	SS-3B	4.75	1/15/2008	7.4	8.4	- -	- -	- -	- -	- -
CHB-4	SS-4A	6.0	1/15/2008	9.5	9.7	- -	- -	- -	- -	- -
CHB-4	SS-4B	6.75	1/15/2008	9.6	9.7	- -	- -	- -	- -	- -
CHB-4	SS-5A	8.0	1/15/2008	9.4	9.6	- -	- -	- -	- -	- -
CHB-4	SS-5B	8.75	1/15/2008	11.0	11.6	- -	- -	- -	- -	- -
CHB-4	SS-6A	10.0	1/15/2008	9.1	9.1	- -	- -	- -	- -	- -
CHB-4	SS-6B	10.75	1/15/2008	9.4	9.5	- -	- -	- -	- -	- -
CHB-4	SS-7A	12.0	1/15/2008	9.9	10.7	- -	- -	- -	- -	- -
CHB-4	SS-7B	12.75	1/15/2008	9.3	10.1	- -	- -	- -	- -	- -
CHB-4	SS-8A	14.0	1/15/2008	10.9	11.2	- -	- -	- -	- -	- -
CHB-4	SS-8B	14.75	1/15/2008	9.2	9.5	- -	- -	- -	- -	- -
CHB-4	SS-9A	16.0	1/15/2008	8.3	7.6	- -	- -	- -	- -	- -
CHB-4	SS-9B	16.75	1/15/2008	6.1	6.2	- -	- -	- -	- -	- -
CHB-4	SS-10A	18.0	1/15/2008	5.9	6.9	- -	- -	- -	- -	- -
CHB-4	SS-10B	18.75	1/15/2008	6.4	6.4	- -	- -	- -	- -	- -

Note: CHB-1, 2 and 3 were wash borings
CHB-4 was a hollow stem auger boring

Prepared by: SEW
Reviewed by: WAL

Table 5
Earthwork Equipment Used at Site
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286

Type of Equipment	Make and Model of Equipment
Excavation/ Placement	Link Belt 210 LX Excavator
Excavation/ Placement	Link Belt 2800 Excavator
Excavation/ Placement	Caterpillar 320C-L Excavator
Excavation/ Placement	John Deere 250 Wheel Loader with power rake and bucket
Excavation/ Placement	Case Rubber Tired Backhoe Series 2
Excavation/ Placement	John Deere 17 ZTS Rubber Tracked Backhoe
Material Transportation	MACK Truck with dump trailer
Material Transportation	Peterbilt with dump trailer
Material Transportation	White Kenworth with dump trailer
Material Transportation	Kenworth Tandem Axle Dump Truck
Placement/ Compaction	Caterpillar 130G Motor-Grader
Placement/ Compaction	Caterpillar D4 Dozer
Placement/ Compaction	Caterpillar D6 Dozer Model D6N-LGP
Placement/ Compaction	VIBROMAX Model 1105 Vibratory Roller
Placement/ Compaction	Ford 8000 Tractor with box blade and offset harrow
Placement/ Compaction	2000 Gallon Water Truck
Service Truck	Ford F450 Service Truck
General	Ditch Witch Trencher
General	Tubgrinder
General	Light Plants (2)

Prepared by: AAW
Reviewed by: WAL

Table 6
Compactive Effort and Moisture Conditioning
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286

Lift Number	Date of Lift Placement	Nominal Elevation Top of Lift (ft)	[1]Roller Passes	[2]Roller Vibe Setting	Passes with Water Truck (Pre-Compaction)	[3]Pre Compaction Water Added (gallons)	Passes with Water Truck (Post-Compaction)	Post Compaction Water Added approx. 95 gal/pass (gallons)	Comments
1	12/3/2007	225.50	10	Low	6	570	0	0	6 Roller passes down center, 4 each on side as placed. 6 Roller passes down sides and 4 down the center after water added
2	12/4/2007	226.00	6	High	0	0	0	0	
3	12/4/2007	226.50	3	Low	0	0	6	570	
4	12/5/2007	227.00	4	Low	4	380	0	0	
5	12/5/2007	227.50	4	Low	3	285	0	0	
6	12/5/2007	228.00	4	Low	3	285	0	0	
7	12/6/2007	228.50	4	Low	2	190	3	285	
8	12/6/2007	229.00	4	Low	0	0	6	570	
9	12/7/2007	229.50	4	Low	6	570	0	0	
10	12/7/2007	230.00	4	Low	3	285	6	570	
11	12/10/2007	230.50	4	Low	6	570	0	0	
12	12/10/2007	231.00	4	Low	9	855	0	0	
13	12/11/2007	231.50	4	Low	3	285	0	0	
14	12/11/2007	232.00	4	Low	6	570	0	0	
15	12/11/2007	232.50	4	Low	8	760	2	190	
16	12/12/2007	233.00	4	Low	2	190	6	570	
17	12/12/2007	233.50	4	Low	4	380	6	570	
18	12/12/2007	234.00	4	Low	6	570	0	0	
19	12/13/2007	234.50	4	Low	6	570	0	0	
20	12/13/2007	235.00	4	Low	9	855	0	0	
21	12/13/2007	235.50	4	Low	6	570	0	0	
22	12/14/2007	236.00	4	Low	0	0	0	0	
22A	12/19/2007		4	Low	0	0	0	0	
23	12/19/2007	236.50	4	Low	0	0	3	285	
24	12/19/2007	237.00	4	Low	6	570	0	0	
25	12/19/2007	237.50	4	Low	0	0	0	0	
26	12/20/2007	238.00	4	Low	0	0	0	0	
27	12/20/2007	238.50	4	Low	0	0	0	0	
28	1/3/2008	239.00	10	Low	0	0	0	0	4 roller passes when lift first placed. Low temps caused Lift 28 to freeze. In effort to thaw and dry, Lift 28 was harrowed and recompacted with 6 roller passes on 1/3/08
29	1/3/2008	239.50	4	Low	0	0	0	0	
30	1/4/2008	240.00	4	Low	0	0	0	0	
31	1/7/2008	240.50	4	Low	6	570	0	0	
32	1/7/2008	241.00	4	Low	6	570	0	0	
33	1/8/2008	241.50	4	Low	0	0	0	0	
34	1/8/2008	242.00	4	Low	0	0	0	0	
35	1/8/2008	242.50	4	Low	0	0	0	0	
36	1/9/2008	243.00	4	Low	0	0	4	380	
37	1/9/2008	243.50	4	Low	4	380	0	0	
38	1/10/2008	244.00	4	Low	0	0	0	0	
39	1/10/2008	244.50	4	Low	0	0	4	380	
40	1/10/2008	245.00	8	Low/Static	4	380	0	0	4 Roller passes on low after placement. 4 subsequent passes on static to smooth roll the pad

[1] Roller Type: Virbomax Model 1105. See Report Section 2.4.5 for roller specifications
[2]Low = 36 Hz and .024" amplitude
High = 29 Hz and .063" amplitude
[3]Approx. 95 galons per pass

Prepared by: SEW
Reviewed by: WAL

Table 7
Field Density Test Results
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
Mactec Engineering and Consulting, Inc.
Mactec Project Number: 6141-06-0286

LIFT No	Sample ID	Northing (ft)	Easting (ft)	Corrected Elevations (ft)	Test Date	FIELD DENSITY DATA									Proctor Check Point Data			% Fines	Location/Comments
		PLANT GRID SYSTEM COORDINATES		NVGD VERTICAL DATUM		Dry Weight (pcf)	Wet Weight (pcf)	Moisture Content	Void Ratio e	Reference Proctor ID	Modified Proctor MDD (pcf)	Proctor Optimum Moisture (%)	% Compaction	Moisture Condition - % from Optimum	Water Added (mL)	Moisture Content (%)	Dry Density (pcf)		
Subgrade	D-0	8366.0	6976.6	224.85	12/4/2007	117.4	124.1	5.7	- -	- -	- -	- -	- -		100.0	9.0	119.8	19.4	Subgrade test. Center of pad. Before placement of lift 1
1	D-1-1	8372.5	6975.0	225.42	12/4/2007	122.7	132.6	8.1	- -	P-1	121.4	9.9	101	-1.8	0.0	7.6	120.05	- -	Center of test pad. Tested before placement of lifts 2 and 3
	D-1-2	8383.8	6976.0	225.57	12/5/2007	123.4	133.2	7.9	- -	P-1	121.4	9.9	102	-2.0	- -	- -	- -	- -	South center of test pad lift 1. tested after placement of lifts 2 and 3
2	D-2-1	8356.0	6875.0	225.99	12/5/2007	117.7	125.5	6.6	- -	P-2	120.3	9.4	98	-2.8	0.0	6.5	118.4	- -	South center of test pad. Tested after placement of lift 3
3	D-3-1	8391.861	6979.908	226.40	12/6/2007	120.5	128.5	6.6	- -	P-1	121.4	9.9	99	-3.3	18.0	9.9	120.7	- -	NW corner test pad. Lift 3. tested after placement of lift 4
4	D-4-1	8347.203	6980.053	227.05	12/6/2007	117.7	125.1	6.3	- -	P-4	119.3	9.3	99	-3.0	100.0	8.9	116.6	- -	SE corner of test pad. Lift 4. Tested after placement of lift 5
									- -					0.0	0.0	6.1	117.7		
5	D-5-1	8371.241	6973.804	227.63	12/7/2007	118.0	125.1	6.0	- -	P-4	119.3	9.3	99	-3.3	100.0	8.7	119	- -	Center of Test Pad. Tested after placement of lift 6
6	D-6-1	8357.825	6977.089	228.02	12/7/2007	117.1	123.8	5.7	- -	P-6	119.4	9.4	98	-3.7	100.0	9.2	120.1	- -	Center of Test Pad. Tested after placement of lift 7
7	D-7-1	8347.267	6967.603	228.45	12/7/2007	121.0	130.4	7.8	- -	P-2	120.3	9.4	101	-1.6	0.0	7.5	118.4	- -	SW corner of Test Pad. Tested after placement of lift 8
8	D-8-1	8396.807	6967.166	229.00	12/8/2007	114.9	122.3	6.4	- -	P-8	117.9	9.2	97	-2.8	0.0	6.4	117.1	- -	NW corner of Test Pad lift 8. Tested after placement of lift 9
9	D-9-1	8373.119	6981.549	229.81	12/8/2007	118.4	124.9	5.5	- -	P-6	119.4	9.4	99	-3.9	150.0	9.8	119.2	- -	Center east side of test pad. Tested after placement of lift 10.
10	D-10-1	8375.442	6971.762	230.01	12/11/2007	117.3	124.3	6.0	- -	P-10	119.9	9.5	98	-3.5	150.0	10.7	119.6	- -	Center of Test Pad. Tested after placement of lift 11
11	D-11-1	8369.725	6965.987	230.34	12/11/2007	122.7	132.1	7.7	- -	P-12	118.7	9.6	103	-1.9	0.0	7.5	117.3	- -	Center west side of test pad lift 11. Tested after placement of lift 12.
12	D-12-1	8399.233	6978.684	230.97	12/12/2007	121.9	133.0	9.1	- -	P-12	118.7	9.6	103	-0.5	0.0	8.8	118.9	- -	NE Corner of Test Pad Lift 12. Tested after placement of lift 13.
13	D-13-1	8346.035	6974.506	231.46	12/12/2007	117.9	126.9	7.6	- -	P-12	118.7	9.6	99	-2.0	0.0	7.0	117.9	- -	South end center of test pad. Tested after placement of lift 14.
14	D-14-1	8371.416	6972.396	231.94	12/12/2007	120.6	118.8	7.7	- -	P-10	119.9	9.5	101	-1.8	0.0	7.4	119.1	- -	Center of test pad. Tested after placement of lift 15.

Table 7
Field Density Test Results
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
Mactec Engineering and Consulting, Inc.
Mactec Project Number: 6141-06-0286

LIFT No	Sample ID	Northing (ft)	Easting (ft)	Corrected Elevations (ft)	Test Date	FIELD DENSITY DATA									Proctor Check Point Data			% Fines	Location/Comments
		PLANT GRID SYSTEM COORDINATES		NVGD VERTICAL DATUM		Dry Weight (pcf)	Wet Weight (pcf)	Moisture Content	Void Ratio e	Reference Proctor ID	Modified Proctor MDD (pcf)	Proctor Optimum Moisture (%)	% Compaction	Moisture Condition - % from Optimum	Water Added (mL)	Moisture Content (%)	Dry Density (pcf)		
15	D-15-1	8397.898	6972.882	232.43	12/13/2007	122.6	132.8	8.3	- -	P-15	120.2	9.4	102	-1.1	0.0	8.1	118.6	- -	North end center of test pad. Tested after placement of lift 16
16	D-16-1	8345.827	6966.873	232.92	12/13/2007	115.9	123.7	6.7	0.46	P-16	121.2	9.7	96	-3.0	150.0	12.4	117.8	- -	SW corner of test pad lift 16. Tested after placement of lift 17.
17	D-17-1	8371.817	6972.292	233.44	12/13/2007	119.7	127.6	6.6	- -	P-2	120.3	9.4	100	-2.8	- -	- -	- -	- -	Center of Test pad. Tested after placement of lift 18.
18	D-18-1	8400.056	6965.343	233.96	12/14/2007	120.4	128.7	6.9	- -	P-15	120.2	9.4	100	-2.5	100.0	8.9	119.9	- -	NW corner of test pad. Tested after placement of lift 19.
19	D-19-1	8370.008	6975.694	234.47	12/14/2007	121.4	130.6	7.6	- -	P-16	121.2	9.7	100	-2.1	0.0	7.1	118.9	- -	East side center of test pad. Tested after placement of lift 20.
20	D-20-1	8369.683	6965.776	234.98	12/14/2007	120.3	131.9	9.6	- -	P-20	119.1	9.5	101	0.1	0.0	8.1	118.6	- -	West side center of test pad. Tested after placement of lift 21.
21	D-21-1	8341.789	6983.641	235.47	12/15/2007	114.0	122.5	7.5	- -	P-15	120.2	9.4	95	-1.9	0.0	7.1	118.9	- -	SE corner of test pad. Tested after placement of lift 22.
	D-21-2	8346.856	6970.531	235.38	12/20/2007	118.9	128.5	8.1	- -	P-15	120.2	9.4	99	-1.3	0.0	7.7	118.8	- -	Center of south end of test pad. Tested after placement of lift 22A.
22	D-22-1	Density Test Not Performed. See 22A for replacement lift				- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
22A	D-22A-1	8342.837	6981.512	235.97	12/20/2007	120.2	129.6	7.8	- -	P-22A	121.0	9.4	99	-1.6	0.0	7.5	119.5	- -	SE Corner test pad Lift 22A. Tested after placement of lift 23.
23	D-23-1	8368.715	6972.665	236.34	12/20/2007	117.6	126.7	7.7	- -	P-20	119.1	9.5	99	-1.8	0.0	7.3	118.1	- -	Center of Test Pad. Lift 23. Tested after placement of Lift 24.
24	D-24-1	8399.342	6968.598	236.89	12/20/2007	122.2	132.8	8.7	- -	P-20	119.1	9.5	103	-0.8	0.0	8.2	118.2	- -	NW Corner of Test Pad, Lift 24. Tested after placement of lift 25.
25	D-25-1	8370.02	6980.827	237.44	12/21/2007	118.7	127.2	7.2	- -	P-20	119.1	9.5	100	-2.3	0.0	6.8	117.8	- -	Center of east side of test pad. Tested after placement of lift 26.
26	D-26-1	8373.899	6981.284	237.95	12/21/2007	124.8	135.9	8.9	0.34	P-26	120.3	8.9	104	0.0	0.0	8.4	119.9	- -	Center West Side of Test Pad. Tested after placement of lift 27
27	D-27-1	8399.338	6981.608	238.41	12/21/2007	123.8	134.3	8.9	- -	P-26	120.3	8.9	103	0.0	0.0	7.9	119.9	- -	Northeast corner of Test Pad. Tested after placement of lift 28
	D-27-2	8399.338	6981.608	238.41	1/4/2008	120.3	133.2	10.7	- -	P-26	120.3	8.9	100	1.8	- -	- -	- -	- -	Center of Test Pad. Tested after lift 28 harrowed up and recompacted
28	D-28-1	8345.98	6966.124	238.98	1/5/2008	124.0	134.8	8.7	- -	P-26	120.3	8.9	103	-0.2	0.0	8.3	119.5	- -	SW Corner of Test Pad. Tested after placement of lift 29

Table 7
Field Density Test Results
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
Mactec Engineering and Consulting, Inc.
Mactec Project Number: 6141-06-0286

LIFT No	Sample ID	Northing (ft)	Easting (ft)	Corrected Elevations (ft)	Test Date	FIELD DENSITY DATA									Proctor Check Point Data			% Fines	Location/Comments
		PLANT GRID SYSTEM COORDINATES		NVGD VERTICAL DATUM		Dry Weight (pcf)	Wet Weight (pcf)	Moisture Content	Void Ratio e	Reference Proctor ID	Modified Proctor MDD (pcf)	Proctor Optimum Moisture (%)	% Compaction	Moisture Condition - % from Optimum	Water Added (mL)	Moisture Content (%)	Dry Density (pcf)		
29	D-29-1	8397.348	6970.433	239.52	1/5/2008	118.6	130.8	10.3	- -	P-26	120.3	8.9	99	1.4	- -	- -	- -	- -	North End of test pad. Tested after placement of lift 30.
30	D-30-1	8370.56	6979.459	240.01	1/8/2008	121.9	133.6	9.6	- -	P-26	120.3	8.9	101	0.7	0.0	9.3	118.8	- -	Center of east side. Tested after placement of lift 31.
31	D-31-1	8399.377	6966.201	240.42	1/8/2008	116.6	124.3	6.6	0.43	P-31	113.7	9.4	103	-2.8	100.0	8.8	113.7	- -	NW Corner of Test Pad. Tested after placement of lift 32
32	D-32-1	8373.202	6974.541	240.97	1/9/2008	121.6	132.2	8.7	- -	P-31	113.7	9.4	107	-0.7	0.0	8.4	114.7	- -	Center of Test Pad. Tested after placement of lift 33
	D-32-2	8381.194	6970.373	240.92	1/9/2008	119.9	129.4	7.9	- -	P-31	113.7	9.4	105	-1.5	0.0	7.3	114.2	- -	Center of Test Pad. Tested after placement of lift 34
33	D-33-1	8345.581	6973.278	241.41	1/9/2008	116.3	124.0	6.6	- -	P-31	113.7	9.4	102	-2.8	0.0	6.4	113.7	- -	South End of Test Pad. Tested after placement of lift 34
34	D-34-1	8398.12	6972.695	241.89	1/9/2008	113.7	121.4	6.8	- -	P-31	113.7	9.4	100	-2.6	100.0	8.9	112.8	- -	North End of test pad. Tested after placement of lift 35
35	D-35-1	8374.209	6968.958	242.44	1/10/2008	121.7	129.9	6.7	0.38	P-35	114.2	7.4	107	-0.7	150.0	10.7	114.2	- -	Center of West Side of Test Pad. Tested after placement of lift 36
36	D-36-1	8369.727	6971.072	242.88	1/10/2008	103.2	110.4	7.0	- -	P-31	113.7	9.4	91	-2.4	100.0	9.8	113.2	- -	Center of Test Pad . Tested after placement of lift 37
	D-36-2	8369.819	6975.378	242.97	1/10/2008	120.1	129.3	7.7	- -	P-31	113.7	9.4	106	-1.7	100.0	9.8	113.5	- -	Retest due to low compaction on initial test. Center of Test Pad 1 foot below grade. Tested after placement of Lift 38.
37	D-37-1	8346.646	6967.343	243.41	1/10/2008	120.0	128.6	7.2	- -	P-31	113.7	9.4	106	-2.2	- -	- -	- -	- -	SW Corner of Test Pad. Tested after placement of Lift 38
38	D-38-1	8397.57	6980.032	243.97	1/11/2008	117.1	127.5	8.9	- -	P-31	113.7	9.4	103	-0.5	0.0	8.5	113.5	- -	NW Corner of Test Pad. Tested after placement of lift 39
39	D-39-1	8345.871	6980.324	244.48	1/11/2008	130.8	141.0	7.8	0.28	P-39	114.4	9.8	114	-2.0	0.0	7.6	112.5	- -	SW Corner of Test Pad. Tested after placement of lift 40
40	D-40-1	8397.728	6967.863	245.14	1/11/2008	122.1	131.1	7.4	- -	P-39	114.4	9.8	107	-2.4	- -	- -	- -	- -	NW corner of Test Pad. Tested at grade.

Prepared by: SEW
Reviewed by: WAL

TABLE 8
CERTAIN TERMS USED FOR SOIL DESCRIPTIONS ON gINT BORING LOGS IN ATTACHMENT B

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	GRAVEL, well graded
			GP	GRAVEL, poorly graded
		GRAVELS WITH FINES (Appreciable amount of fines)	GM	GRAVEL, sand and silt
			GC	GRAVEL, clay
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size)	CLEAN SANDS (Little or no fines)	SW	SAND, well graded
			SP	SAND, poorly graded
		SANDS WITH FINES (Appreciable amount of fines)	SM	SAND, silty
			SC	SAND, clayey
FINE GRAINED SOILS (More than 50% of material is SMALLER than the No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	SILT, sandy or clayey, low plasticity
			CL	CLAY, low plasticity
			OL	SILT, organic or CLAY organic, low plasticity
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	SILT, sandy or clayey, high plasticity
			CH	CLAY, high plasticity
			OH	CLAY, organic, or SILT, organic, high plasticity

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

Correlation of Penetration Resistance with Relative Density and Consistency			
SAND & GRAVEL		SILT & CLAY	
No. of Blows	**Relative Density**	**No. of Blows**	**Consistency**
0 - 4	Very Loose	0 - 1	Very Soft
5 – 10	Loose	2 – 4	Soft
11 – 30	Medium Dense	5 – 8	Medium Stiff
31 - 50	Dense	9 – 15	Stiff
Over 50	Very Dense	16 - 30	Very Stiff
		Over 31	Hard

TABLE 8
CERTAIN TERMS USED FOR SOIL DESCRIPTIONS ON gINT BORING LOGS IN ATTACHMENT B

MOISTURE CONDITION:

Dry	Absence of moisture, dusty, dry to the touch.
Damp	Slight moisture content, difficult to mold fines into ball.
Moist	Moisture evident but no visible water, fines can be molded into ball.
Wet	Visible free water, soil is usually below water table.

SAMPLE TYPE

SS	Split spoon sample
UD	Undisturbed sample (direct push or pitcher)
BK	Bulk Sample
AU	Hand Auger Cuttings

LINE TYPE

- - - - - - - - - -	Soil layer contact where contact was not observed in samples
————————	Soil layer contact where contact was observed in samples
. . . . .	Soil layer contact above and below samples with no recovery

Prepared By/Date: Stephen Woodham/2-08-08

Checked By/Date: Wm. Allen Lancanster/2-08-08

Table 9
Statistical Summary of Lab Test Results
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number: 6141-06-0286

Natural Moisture Content Data from P and G Samples				
Count	Stdev	Max	Min	Average
210	1.5	13.1	4.3	8.0

Cu (Lifts 1 to 30) Data from P samples				
Count	Stdev	Max	Min	Average
12	74.4	350.0	102.4	260.8

Cu (Lifts 31 to 40) Data from P samples				
Count	Stdev	Max	Min	Average
3	15.7	31.6	3.9	13.4

% Fines (Lifts 1 to 30) Data from P and G samples				
Count	Stdev	Max	Min	Average
142	1.1	18.9	11.3	14.5

% Fines (Lifts 31 to 40) Data from P and G samples				
Count	Stdev	Max	Min	Average
46	1.1	14.9	9.3	11.2

Dry Density Data from D samples				
Count	Stdev	Max	Min	Average
46	4.0	130.8	103.2	119.5

Wet Density Data from D samples				
Count	Stdev	Max	Min	Average
46	5.2	141.0	110.4	128.4

[1] For P-1, P-16, P-22A, and P-26 D_{10} was not achieved by hydrometer analysis. In these cases C_u has been calculated based on $D_{11.2}$, $D_{11.8}$, $D_{11.1}$, and $D_{10.9}$, respectively.

Prepared by: SEW
Reviewed by: WAL

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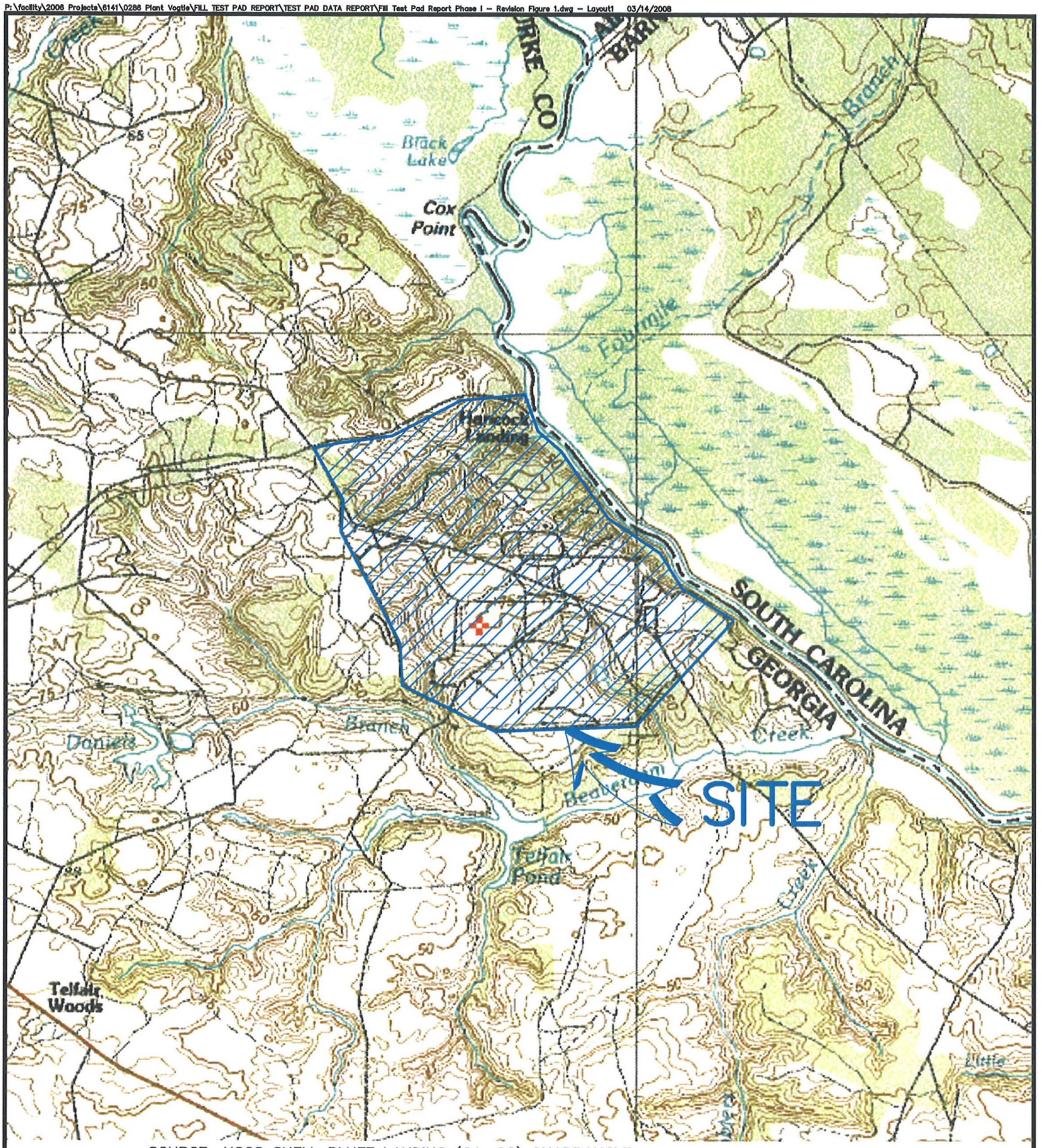
P:\facility\2006 Projects\6141\0286 Plant Vogtle\FILL TEST PAD REPORT\TEST PAD DATA REPORT\Fill Test Pad Report Phase I - Revision Figure 1.dwg - Layout1 03/14/2008



SOURCE: USGS SHELL BLUFF LANDING (GA, SC) QUADRANGLE

N

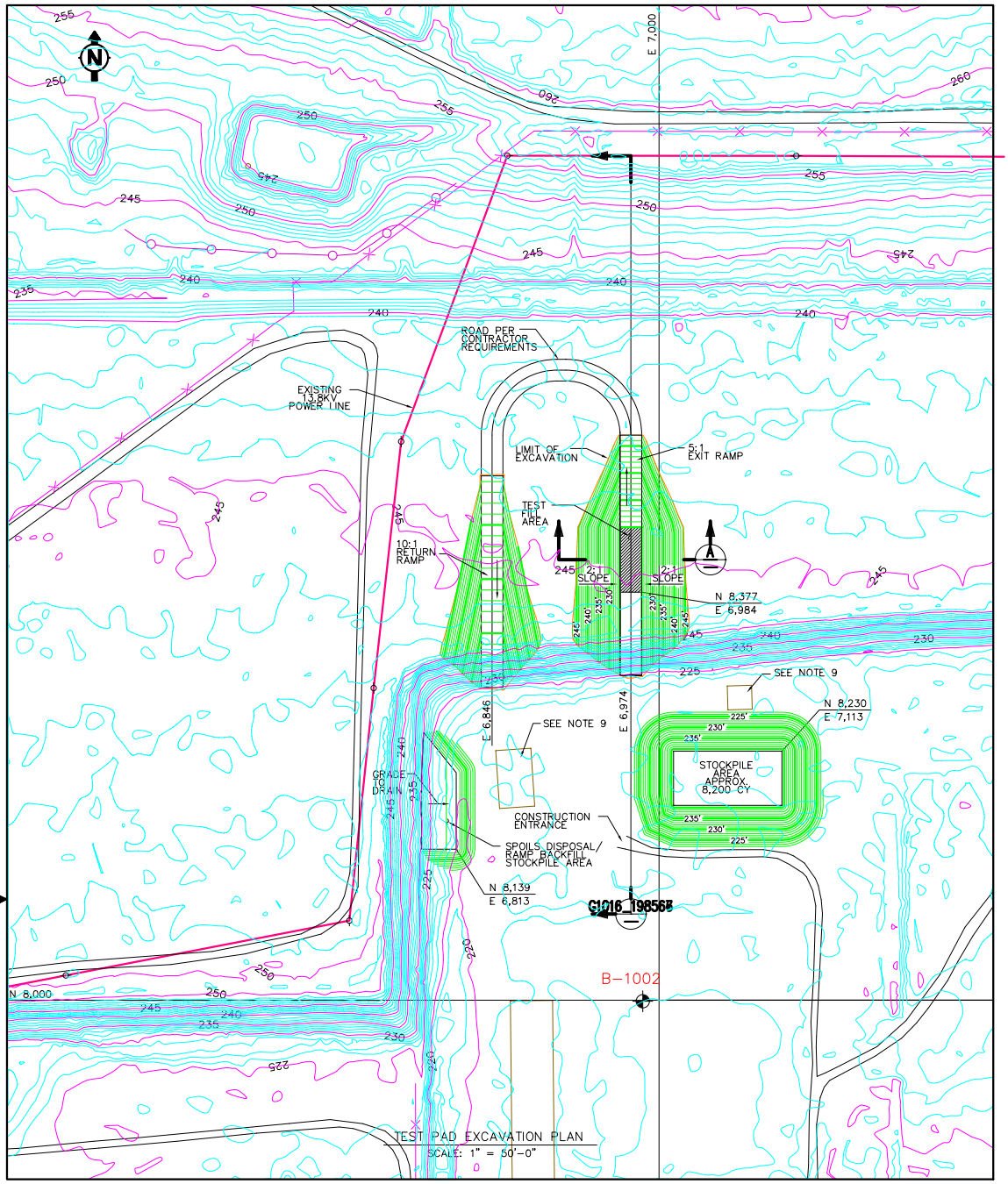
RED MARKER DOES NOT INDICATE LOCATION OF FILL TEST PAD

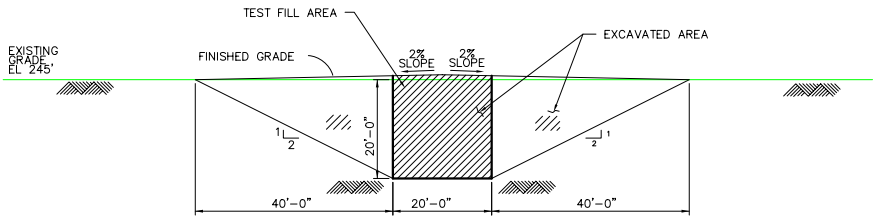
SCALE IN MILES

0 0.50 1 2

VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4 ENGINEERED FILL BELOW GRADE TEST PAD BURKE COUNTY, GEORGIA	MACTEC Mactec Engineering and Consulting, Inc. 396 PLASTERS AVENUE, N.E. ATLANTA, GEORGIA 30324 (404)873-4761	SITE LOCATION MAP

JOB NO.	DATE:		FIGURE:
6141-06-0286	FEB 8, 2008		1
TASK: 19	DRAWN: AAW	APPROV.: WAL	SCALE: AS SHOWN

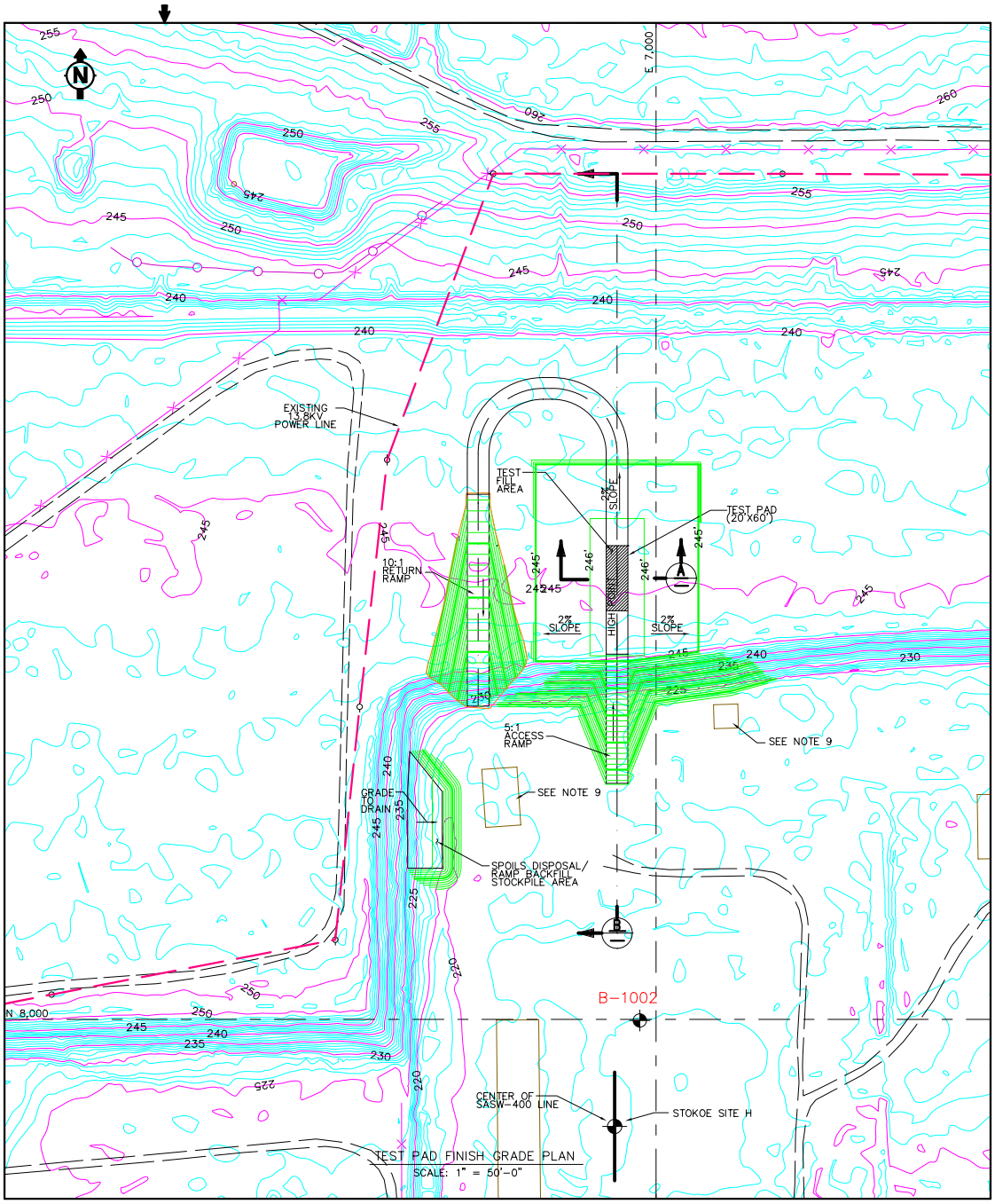


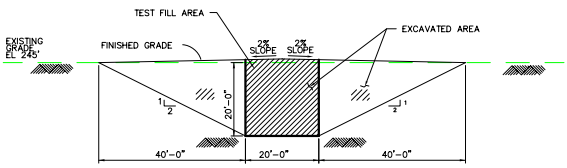


SECTION A
NTS

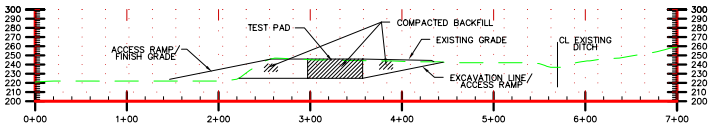
SOUTHERN NUCLEAR OPERATING COMPANY, INC. BIRMINGHAM, ALABAMA BECHTEL FREDERICK, MD VOGTLE ELECTRIC GENERATING PLANT BURKE COUNTY, GA	MACTEC Mactec Engineering and Consulting, Inc. 396 PLASTERS AVENUE, N.E. ATLANTA, GEORGIA 30324 (404)873-4761	TEST PAD EXCAVATION PLAN AND SECTION

JOB NO.	DATE:		FIGURE:
6141-06-0286	02/18/2008		2A
TASK No: 60	DRAWN: AAW	APPROV.: WAL	SCALE: N/A





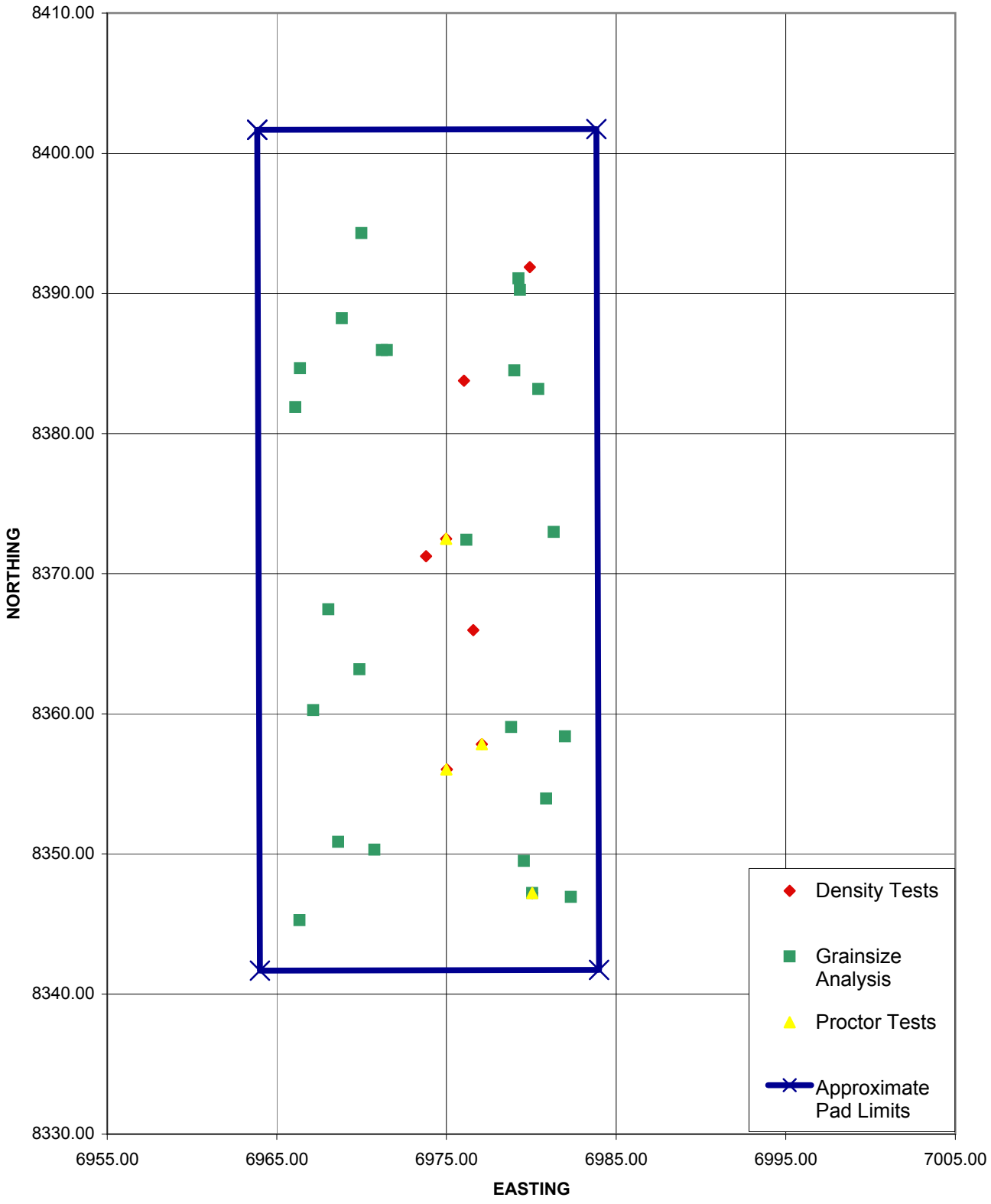
SECTION A
NTS



SECTION B

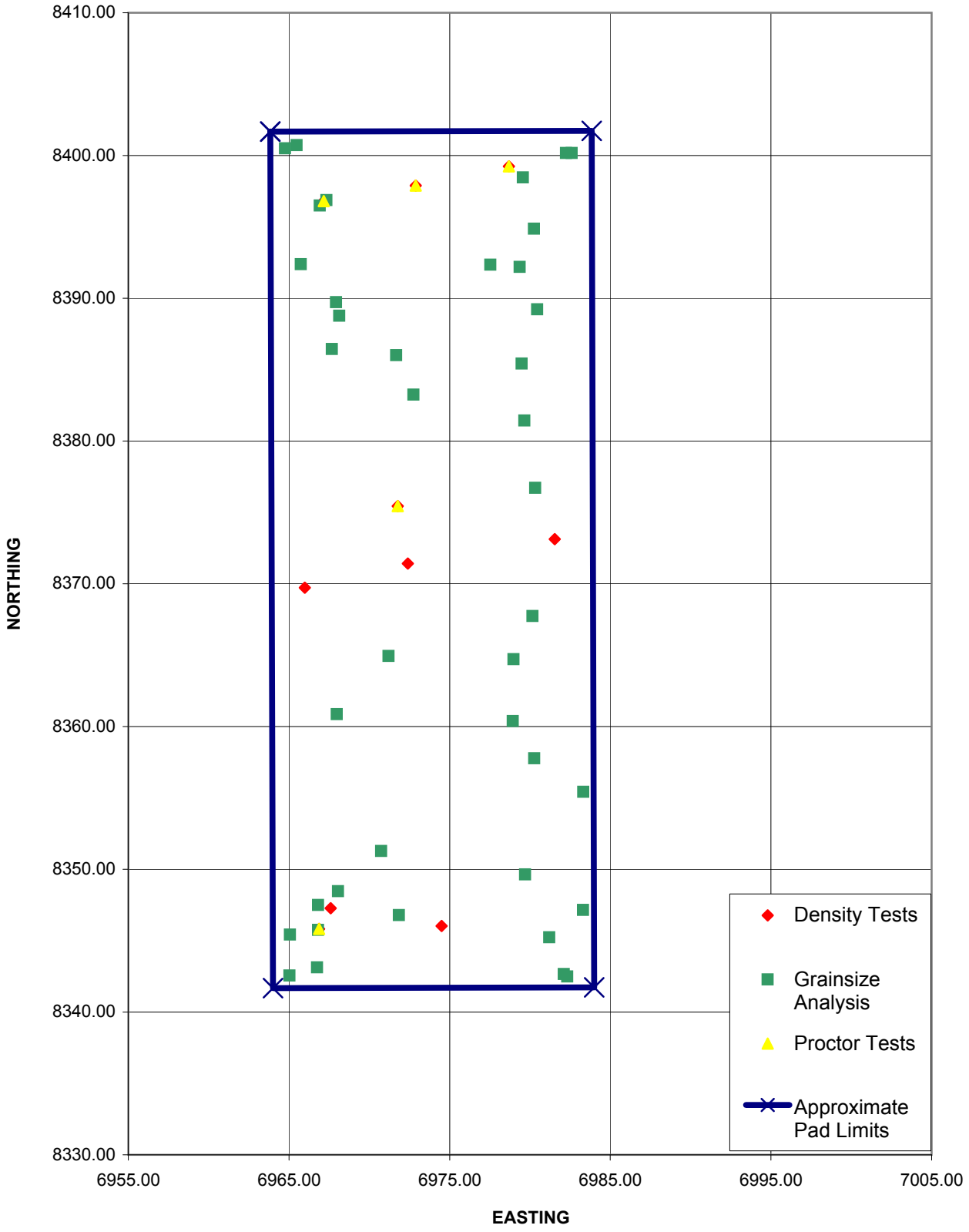
SOUTHERN NUCLEAR OPERATING COMPANY, INC. BIRMINGHAM, ALABAMA	MACTEC Mactec Engineering and Consulting, Inc. 396 PLASTERS AVENUE, N.E. ATLANTA, GEORGIA 30324 (404)873-4761	TEST PAD FINISHED GRADE PLAN AND SECTION	
BECHTEL FREDERICK, MD		JOB NO. 6141-06-0286	DATE: 02/18/2008	FIGURE: 2B
VOGTLE ELECTRIC GENERATING PLANT BURKE COUNTY, GA		TASK No: 60	DRAWN: AAW / APPROV.: WAL	SCALE: N/A

Figure 3A
Test Sample and Test Location Plan (Lifts 0 to 6)
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



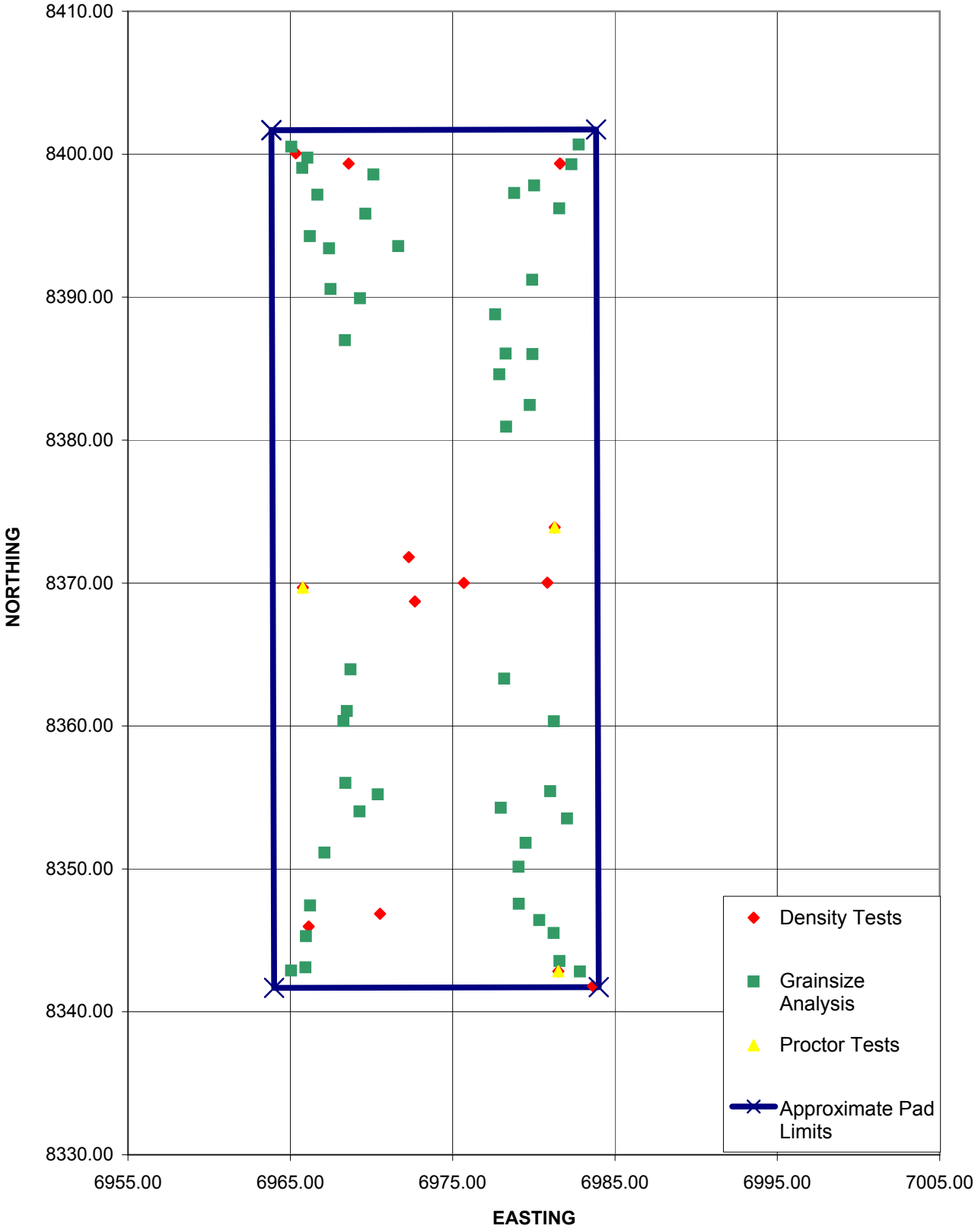
Prepared by: AAW
Reviewed by: WAL

Figure 3B
Test Pad Sample and Test Location Plan (Lifts 7 to 16)
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



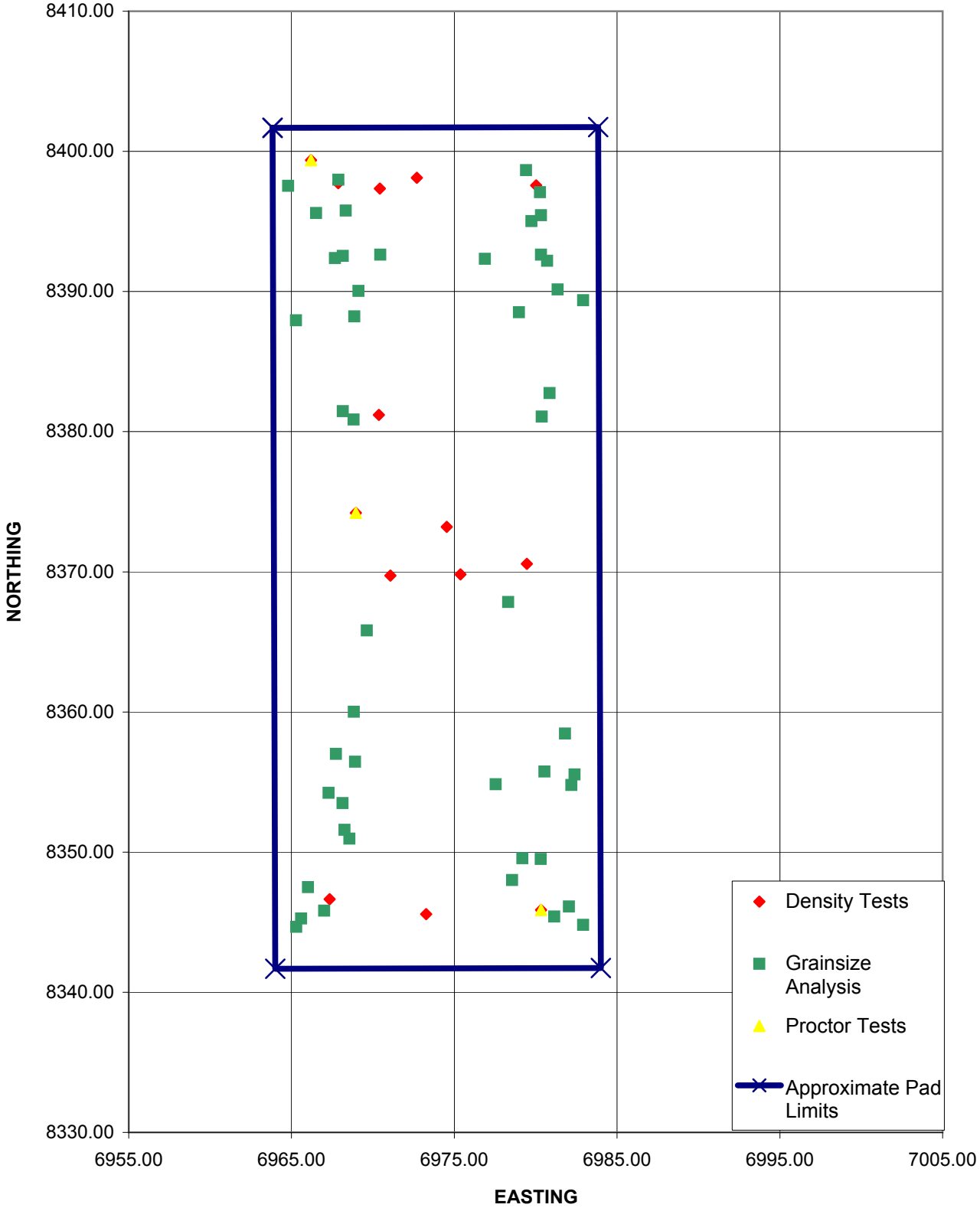
Prepared by: AAW
Reviewed by: WAL

Figure 3C
Test Pad Sample and Test Location Plan (Lifts 17 to 28)
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



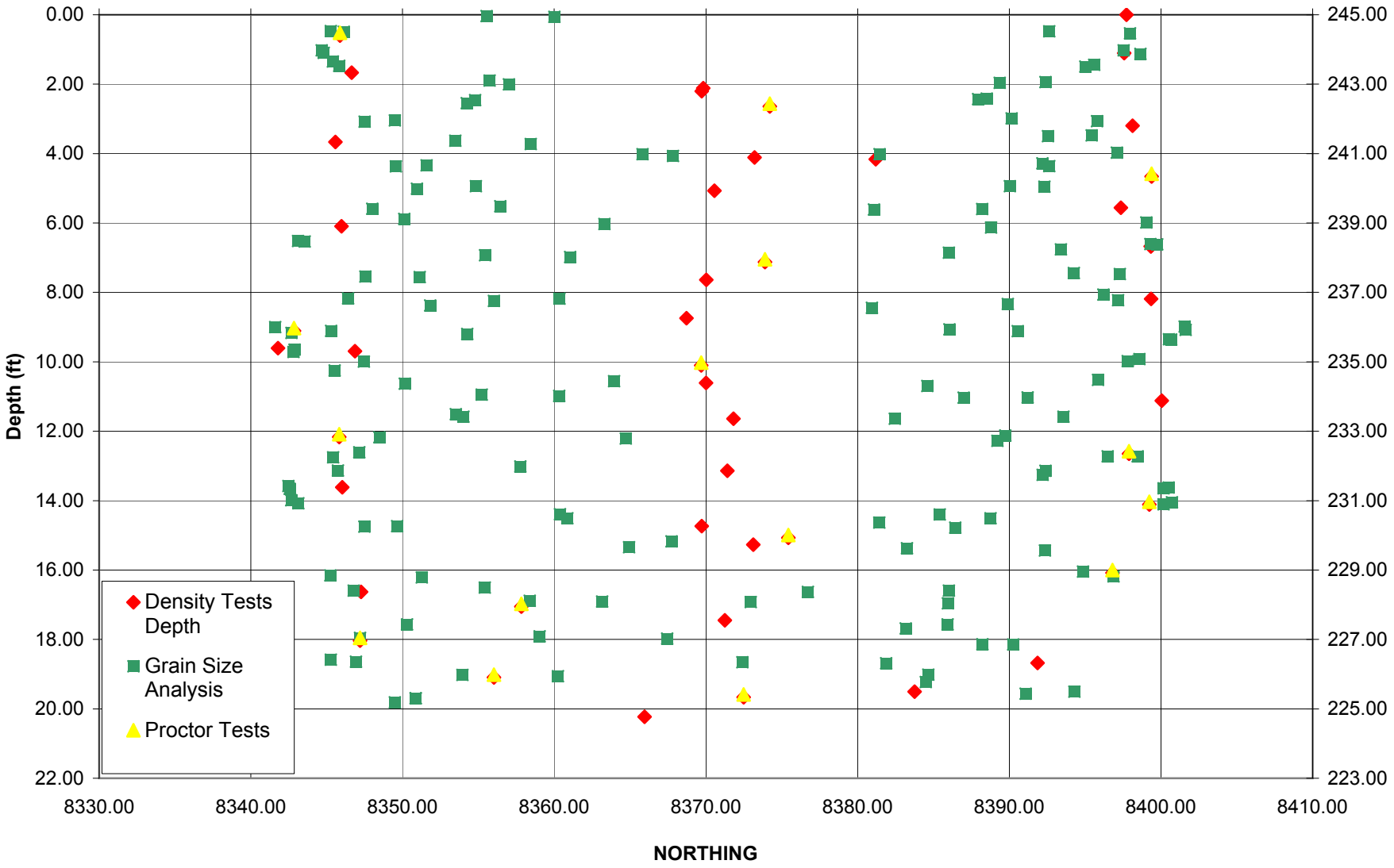
Prepared by: AAW
Reviewed by: WAL

Figure 3D
Test Pad Sample and Test Location Plan (Lifts 28 to 40)
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



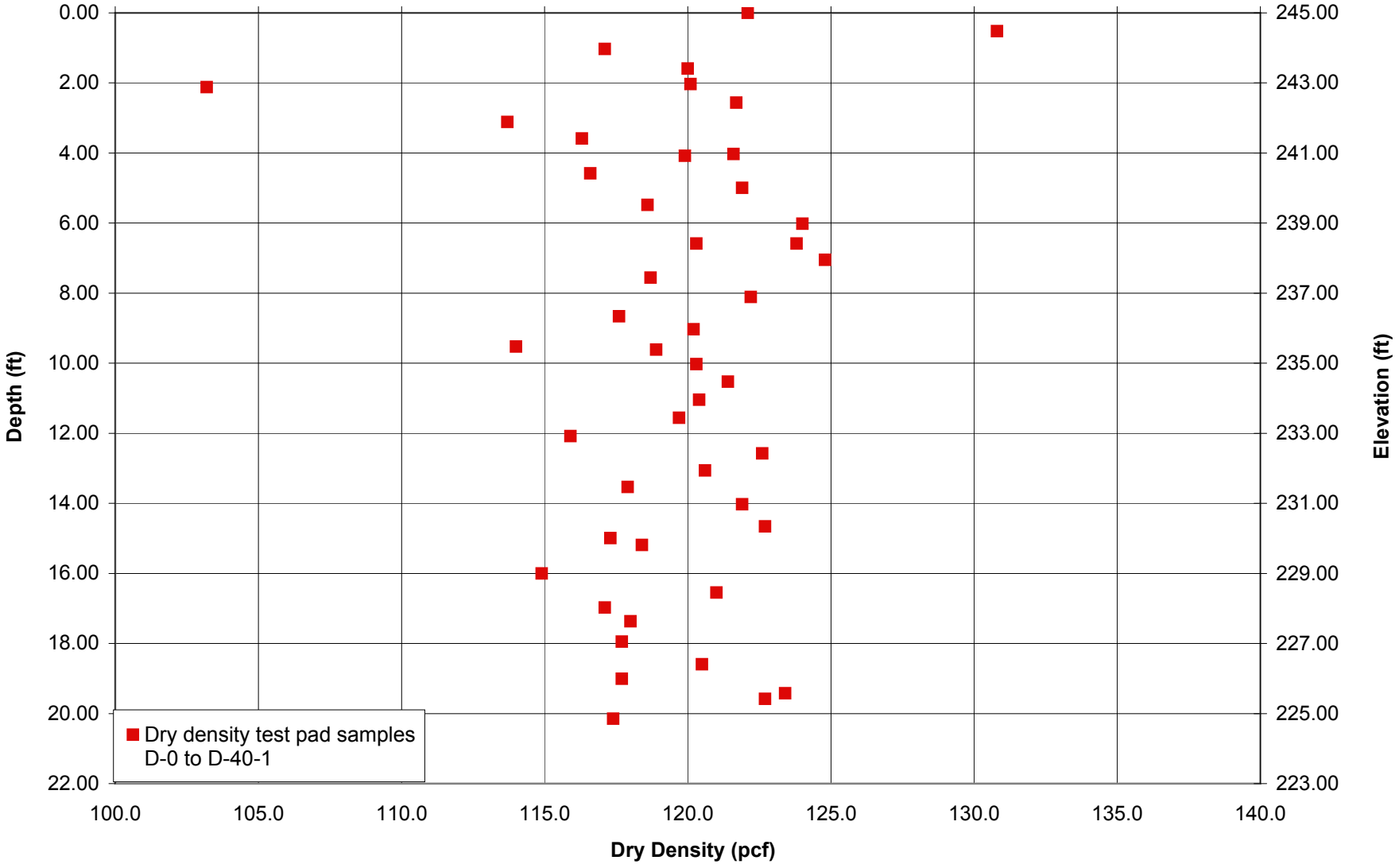
Prepared by: AAW
Reviewed by: WAL

Figure 4
Test Pad Sample Location Profile
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



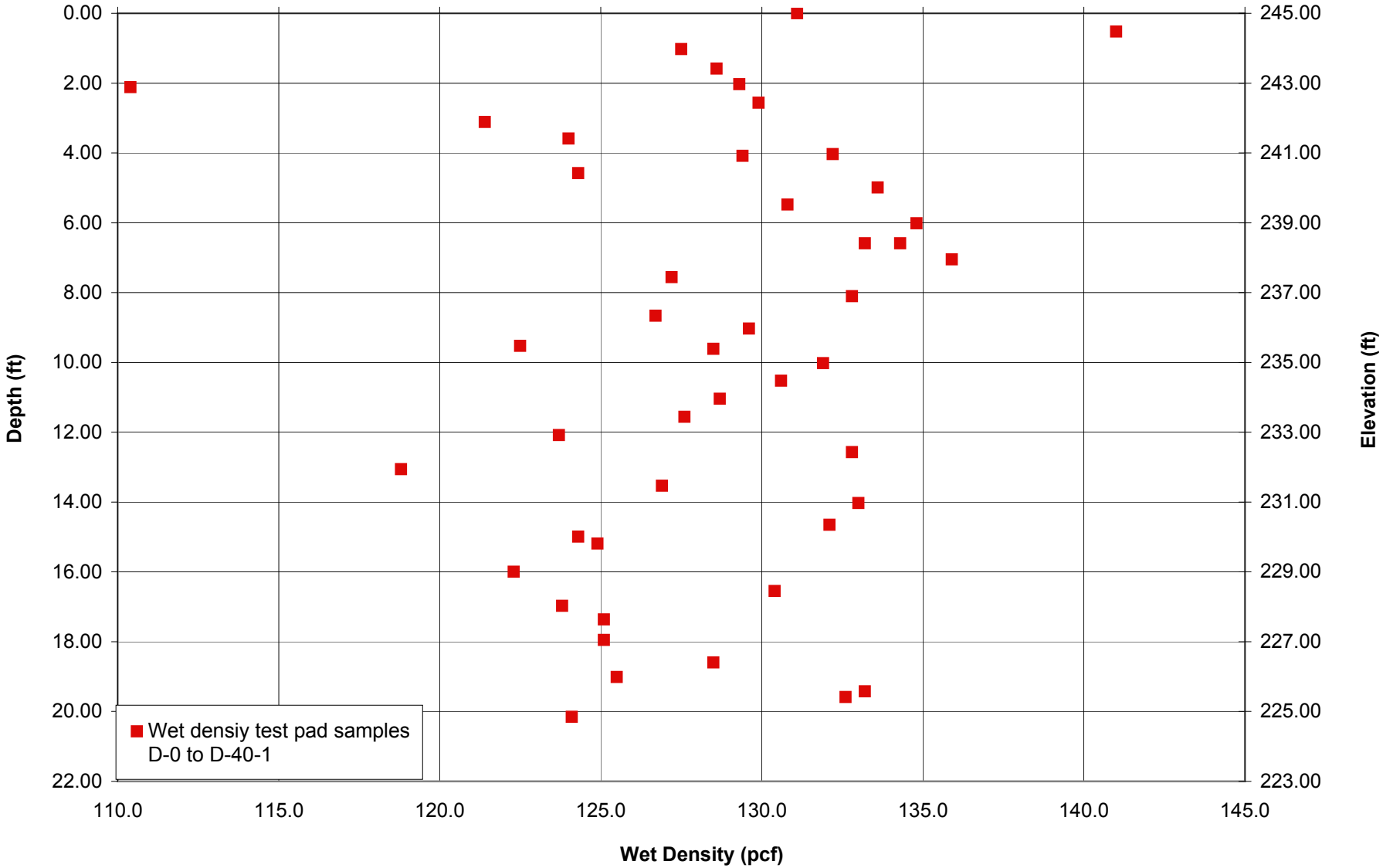
Prepared by: AAW
Reviewed by: WAL

Figure 5
Dry Density Vs. Depth/Elevation
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



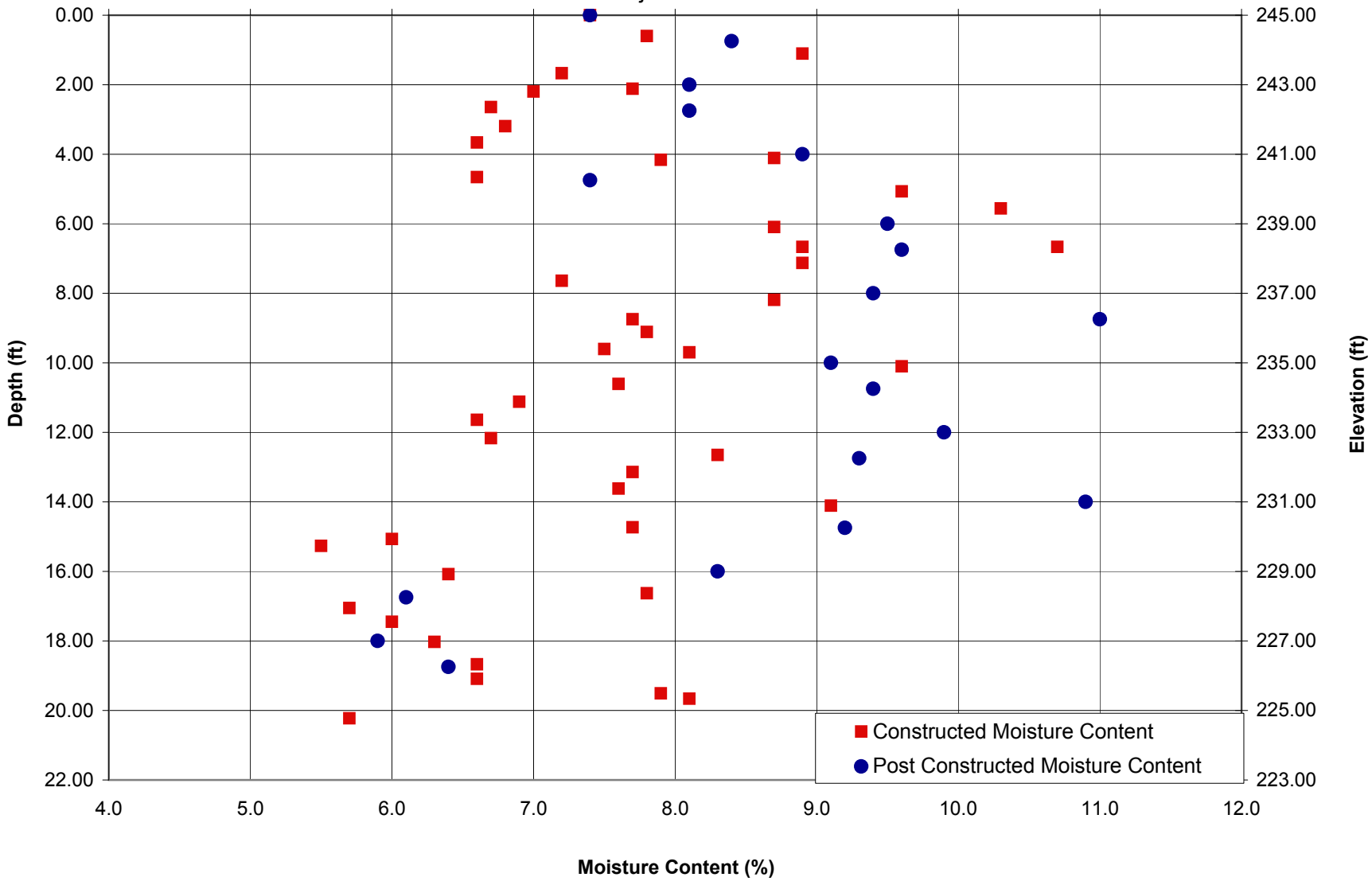
Prepared by: AAW
Reviewed by: WAL

Figure 6
Wet Density Vs. Depth/Elevation
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



Prepared by: AAW
Reviewed by: WAL

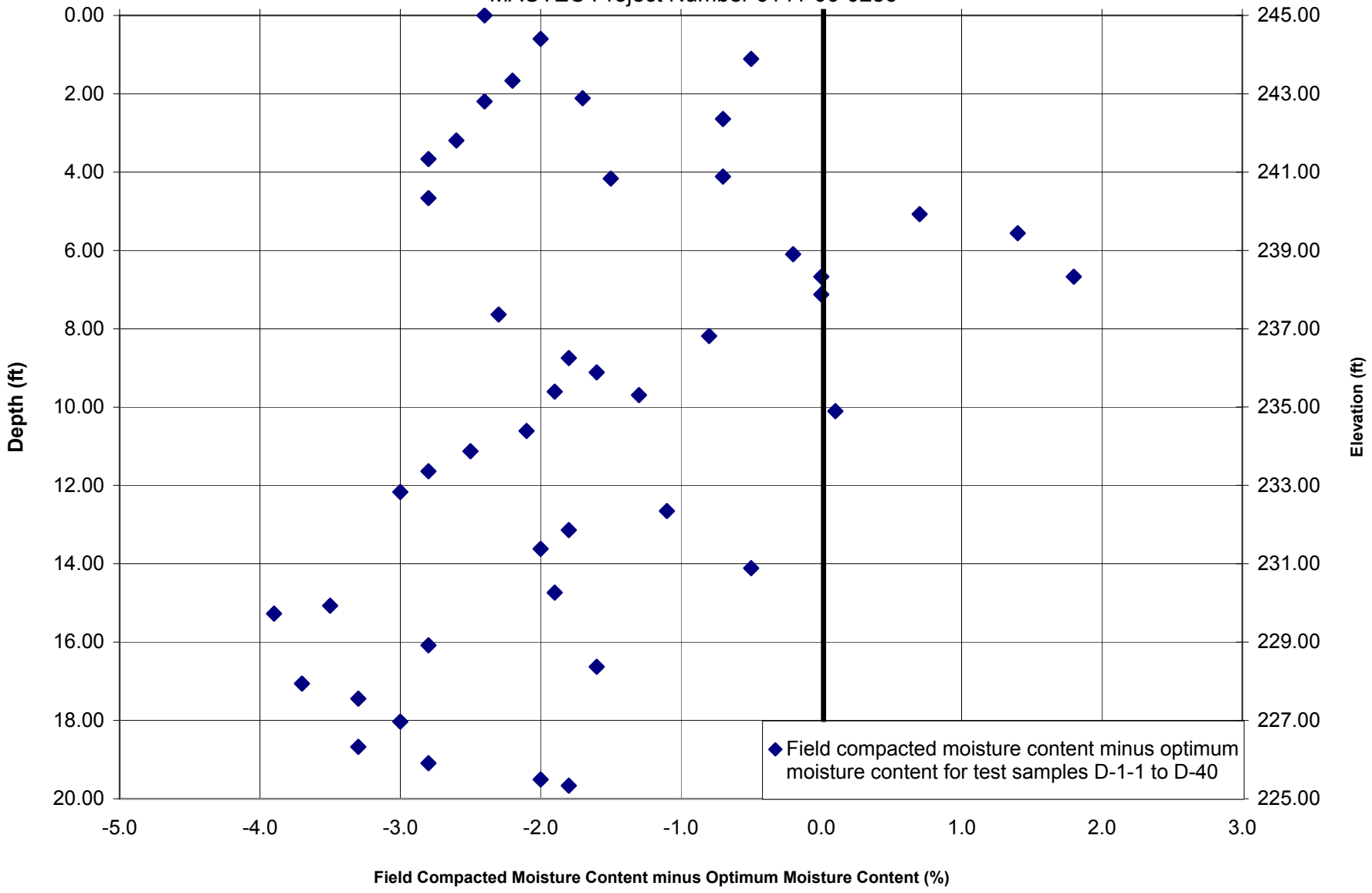
Figure 7
Constructed and Post Constructed Moisture Content Vs. Depth/Elevation
MACTEC Engineering and Consulting, Inc.
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Project Number 6141-06-0286



Note: Constructed moisture content taken from test pad density samples from D-0 to D-40-1
Post constructed moisture contents taken from hollow stem auger boring CHB-4

Prepared by: AAW
Reviewed by: WAL

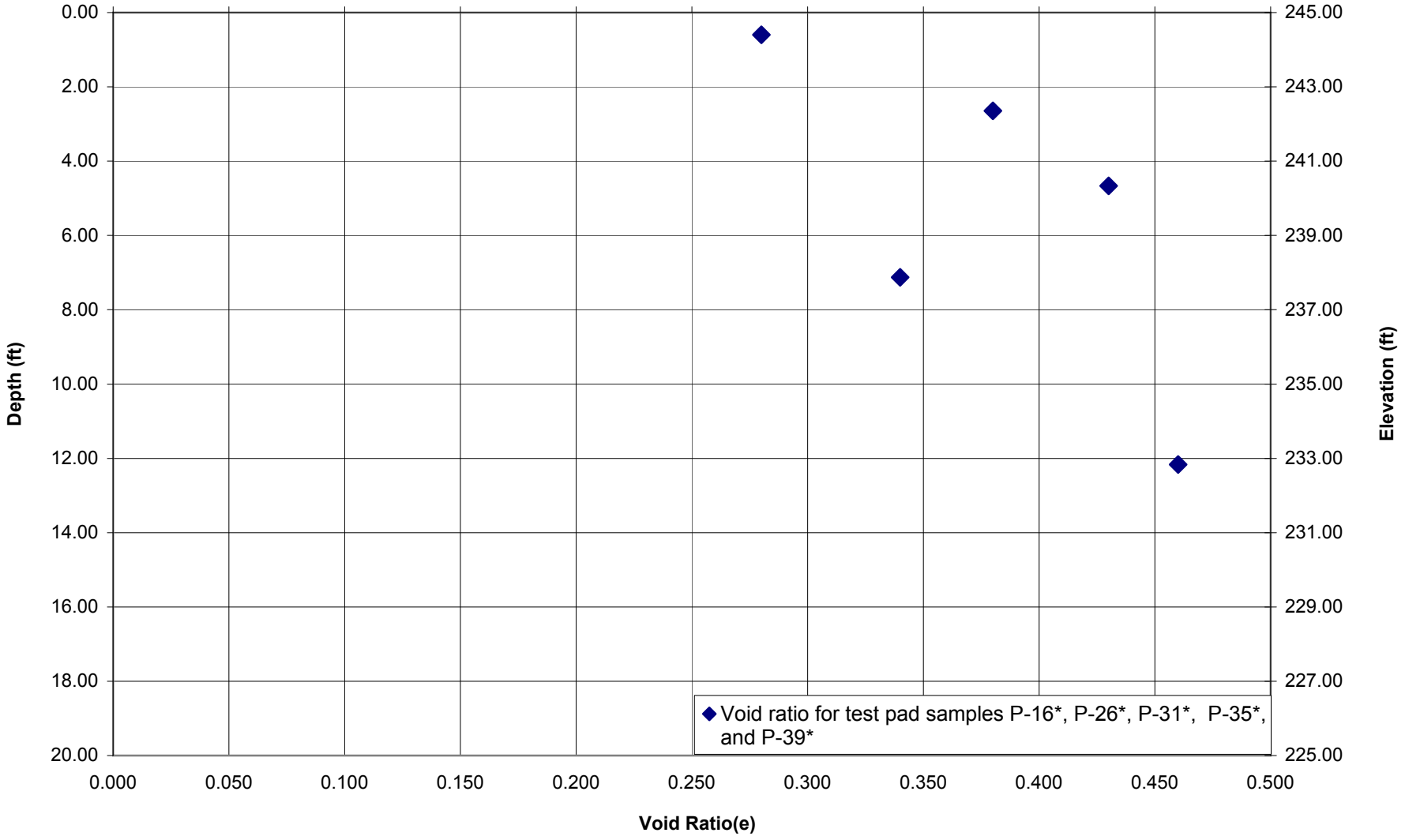
Figure 8
Compacted Moisture Content minus OMC Vs. Depth/Elevation
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



Note: Negative values on figure represent compacted soil dry of Optimum Moisture Content

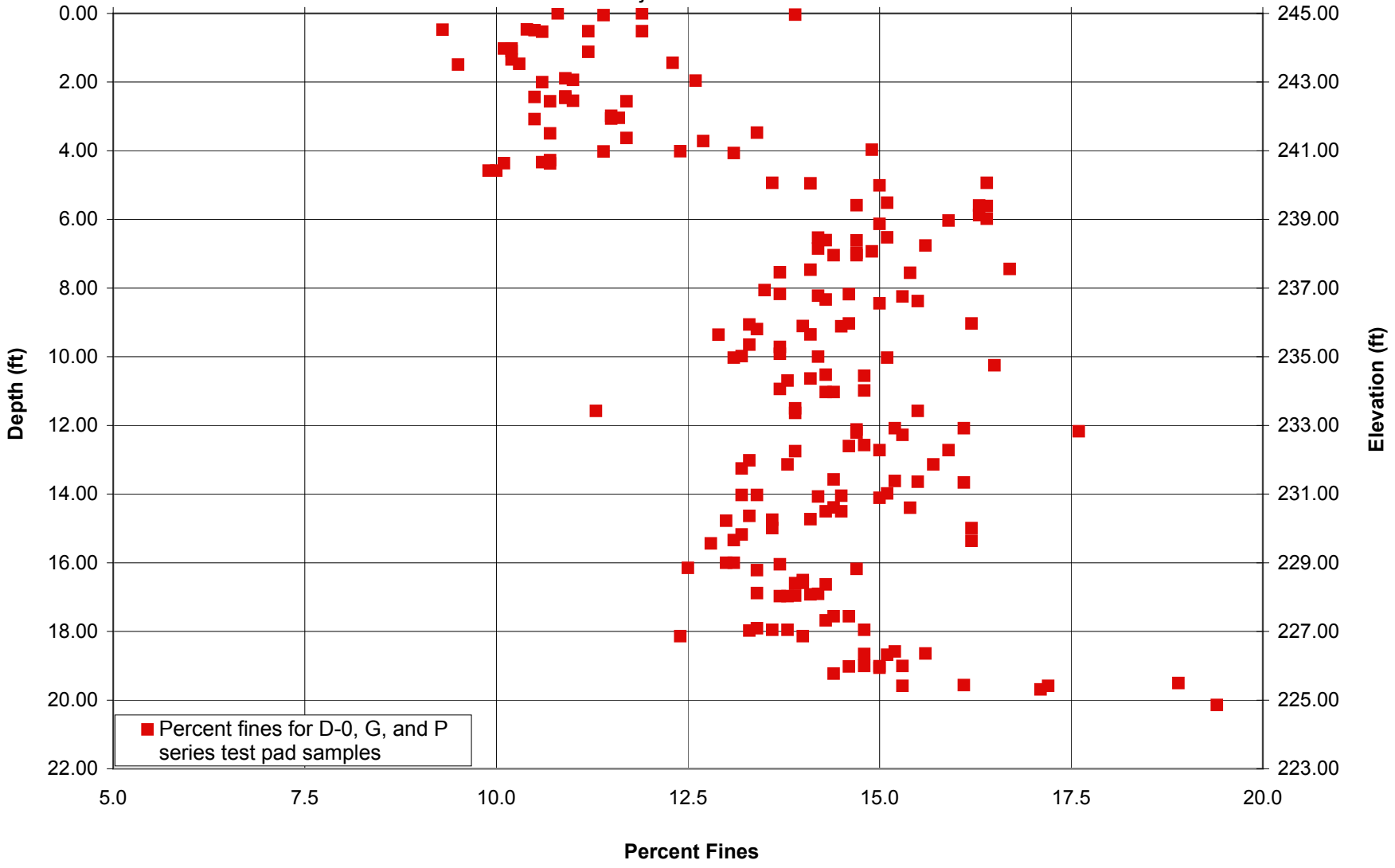
Prepared by: AAW
Reviewed by: WAL

Figure 9
Void Ratio Vs. Depth/Elevation
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



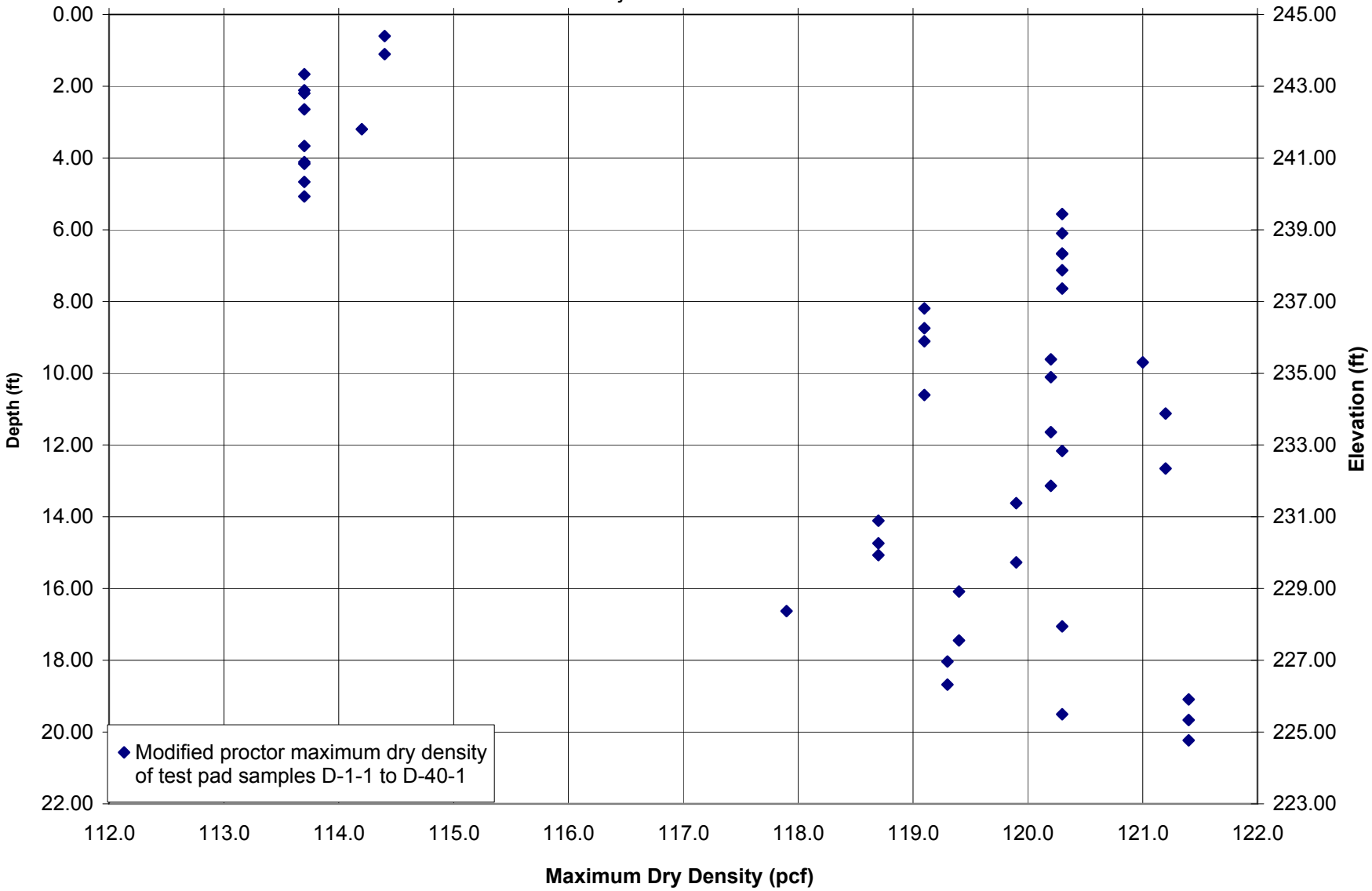
Prepared by: AAW
Reviewed by: WAL

Figure 10
Percent Fines Vs. Depth/Elevation
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



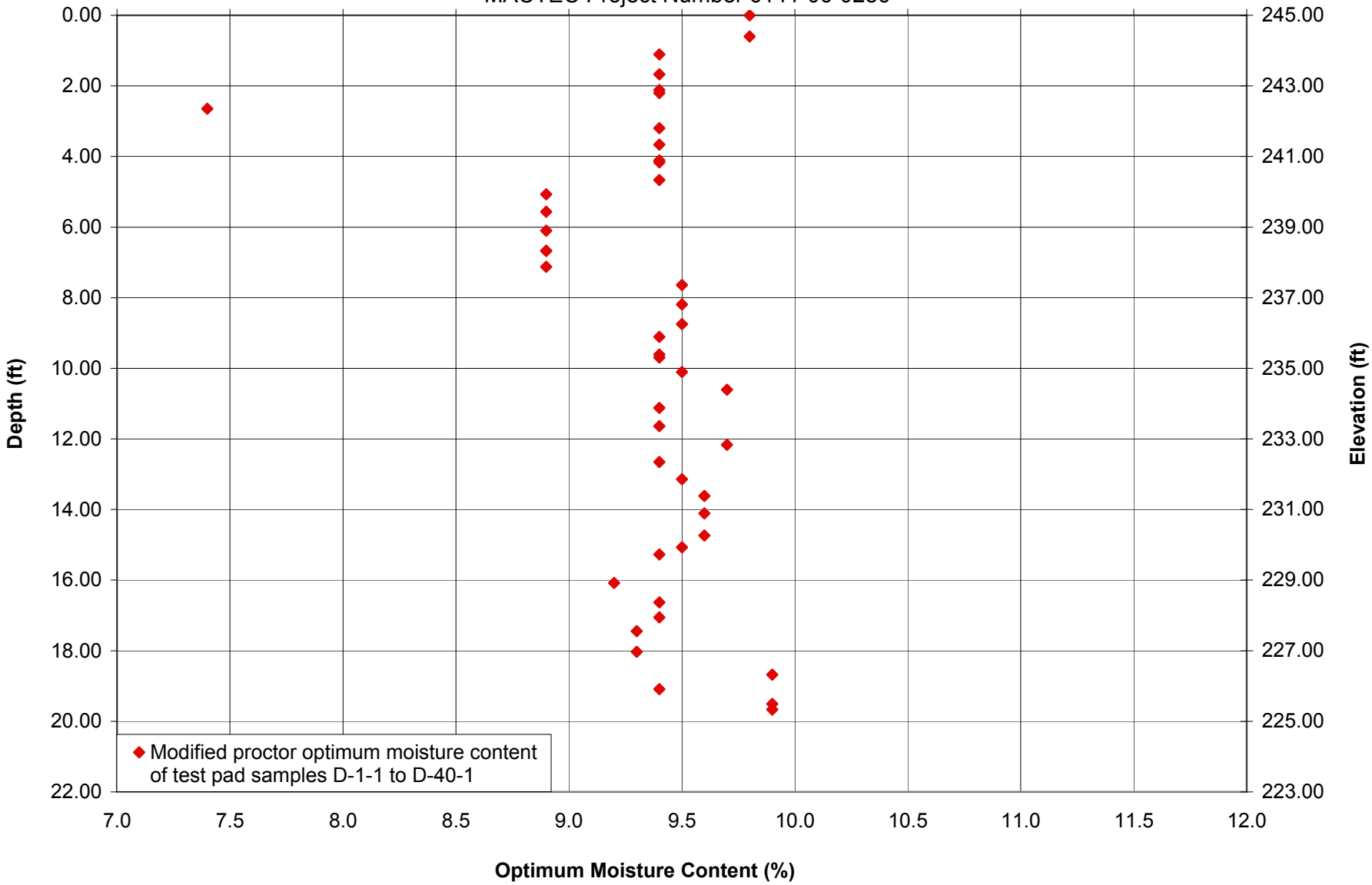
Prepared by: AAW
Reviewed by: WAL

Figure 11
Modified Proctor Maximum Dry Density Vs. Depth/Elevation
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



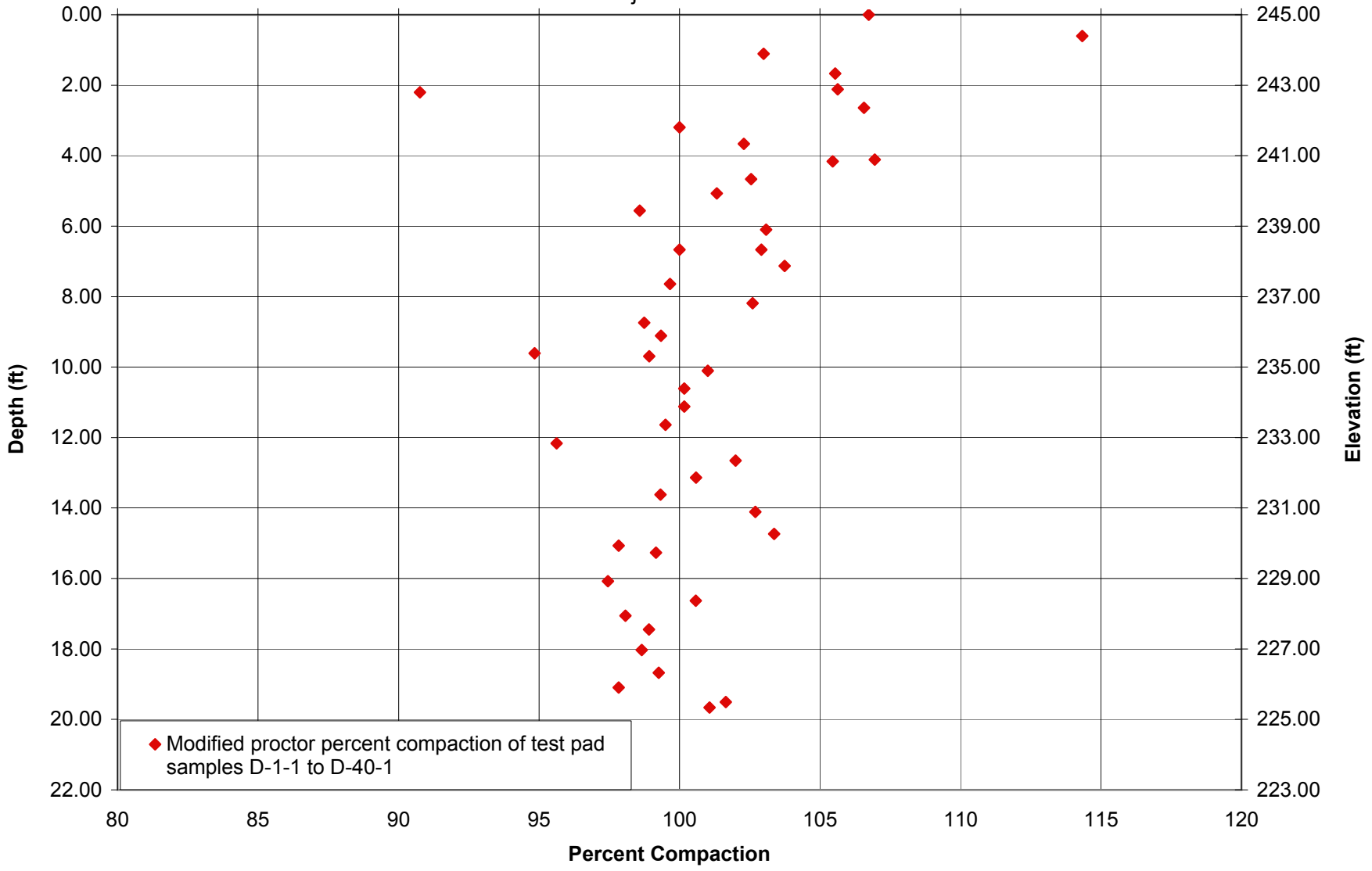
Prepared by: AAW
Reviewed by: WAL

Figure 12
Optimum Moisture Content Vs. Depth/Elevation
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



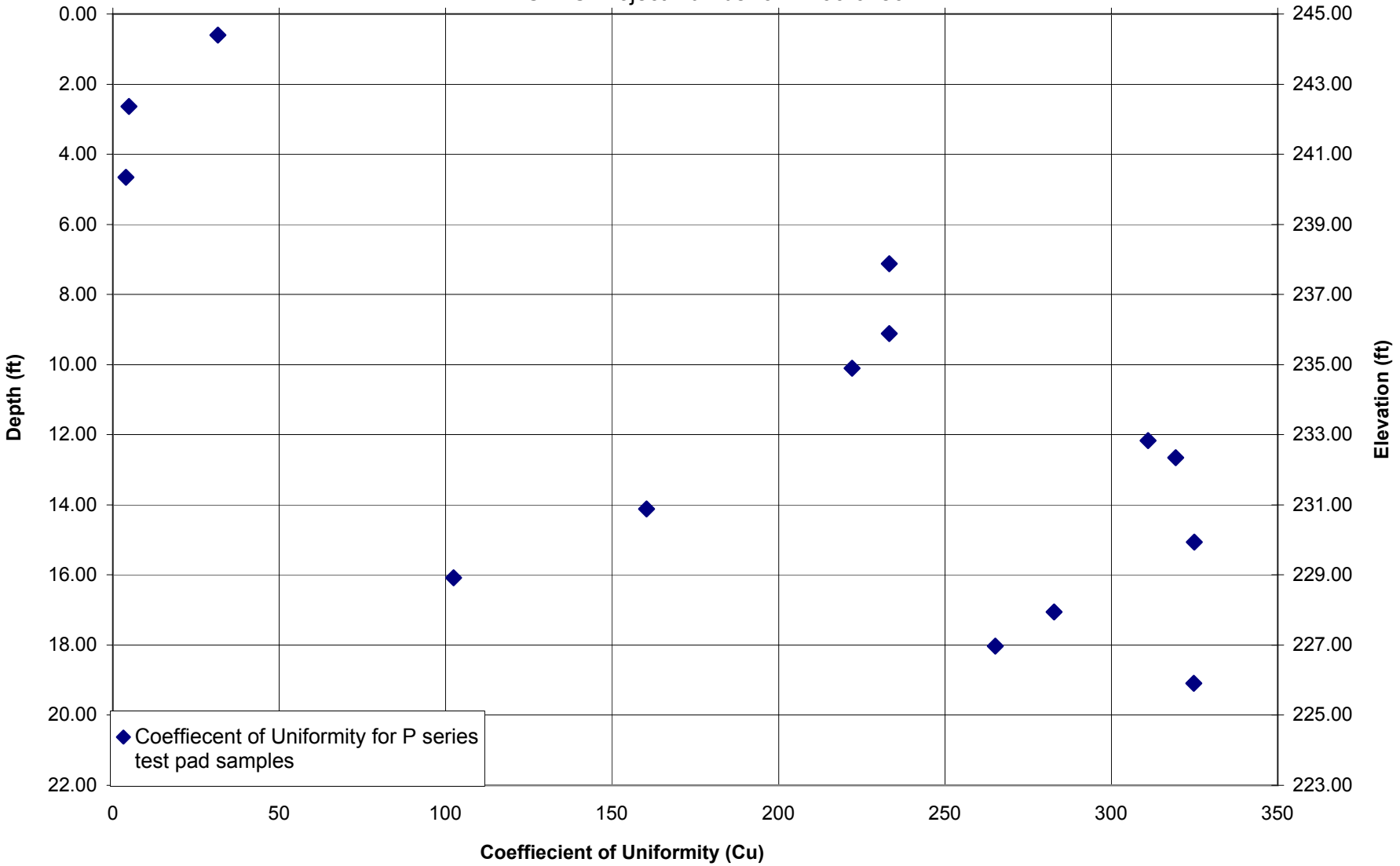
Prepared by: AAW
Reviewed by: WAL

Figure 13
Modified Proctor Percent Compaction Vs. Depth/Elevation
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



Prepared by: AAW
Reviewed by: WAL

Figure 14
Coefficient of Uniformity Vs. Depth/Elevation
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



Prepared by: AAW
Reviewed by: WAL

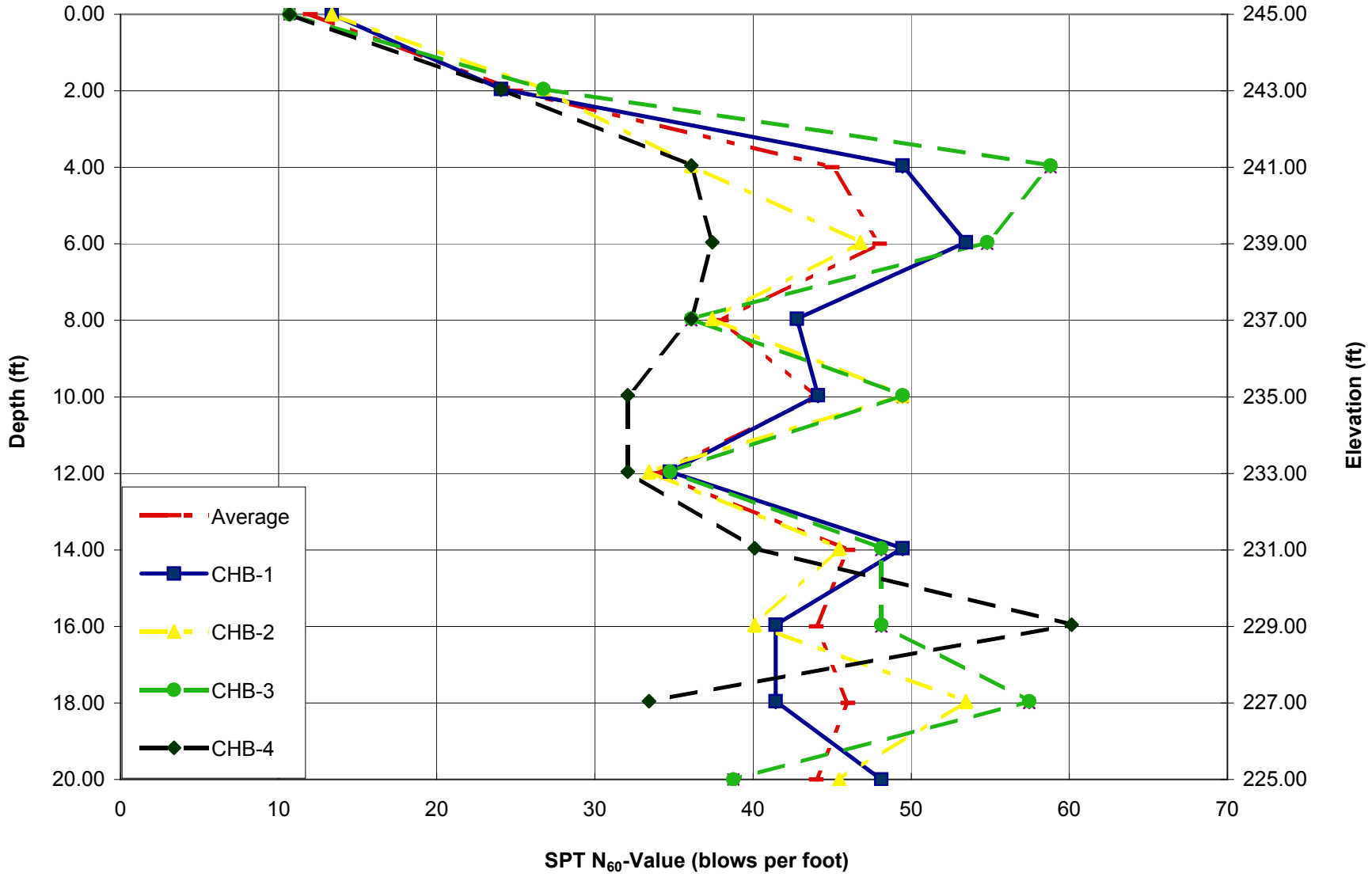
Figure 15

N_{60} Vs. Depth/Elevation

Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad

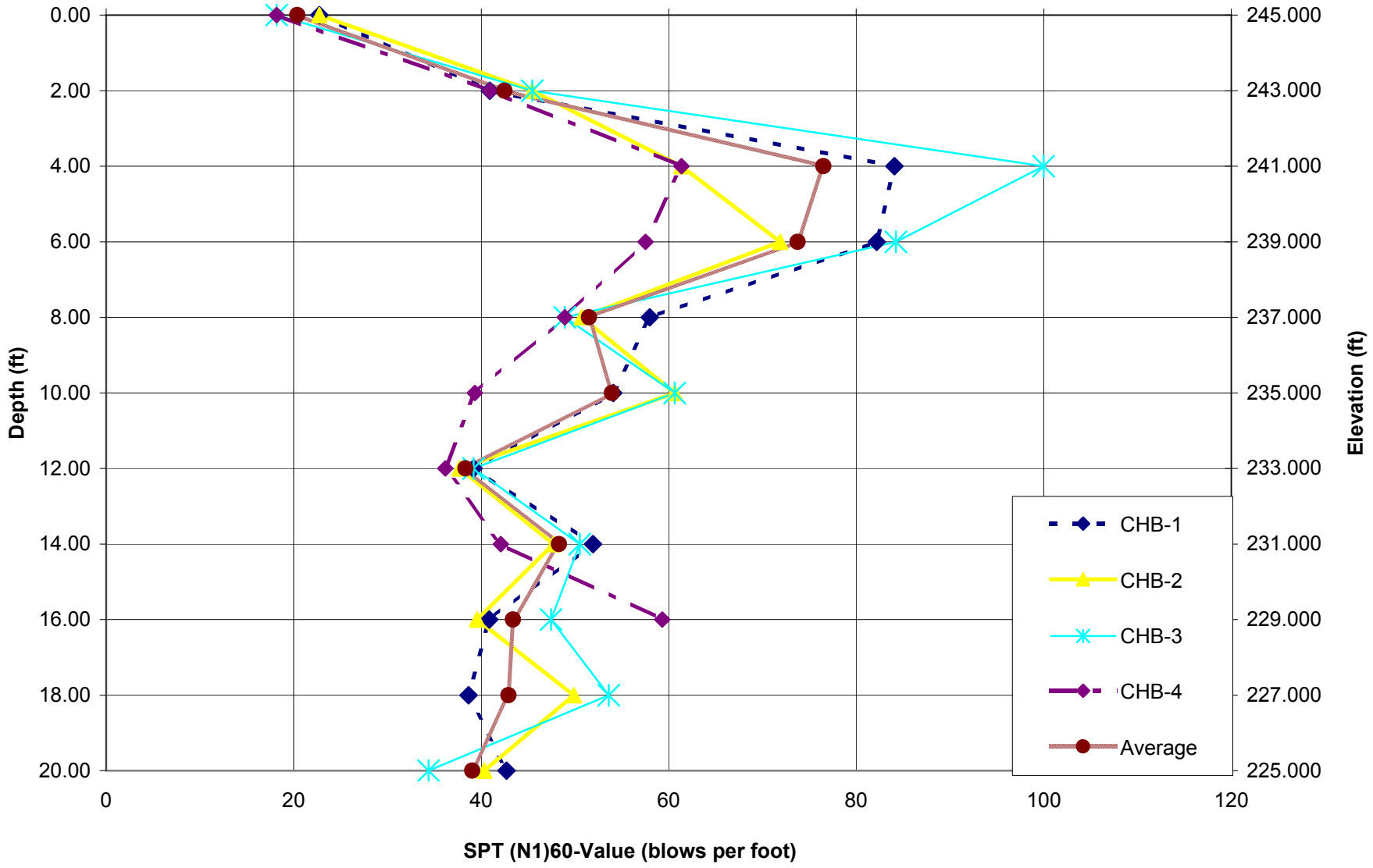
Mactec Engineering and Consulting, Inc.

Mactec Project Number 6141-06-0286



Prepared by: AAW
Reviewed by: WAL

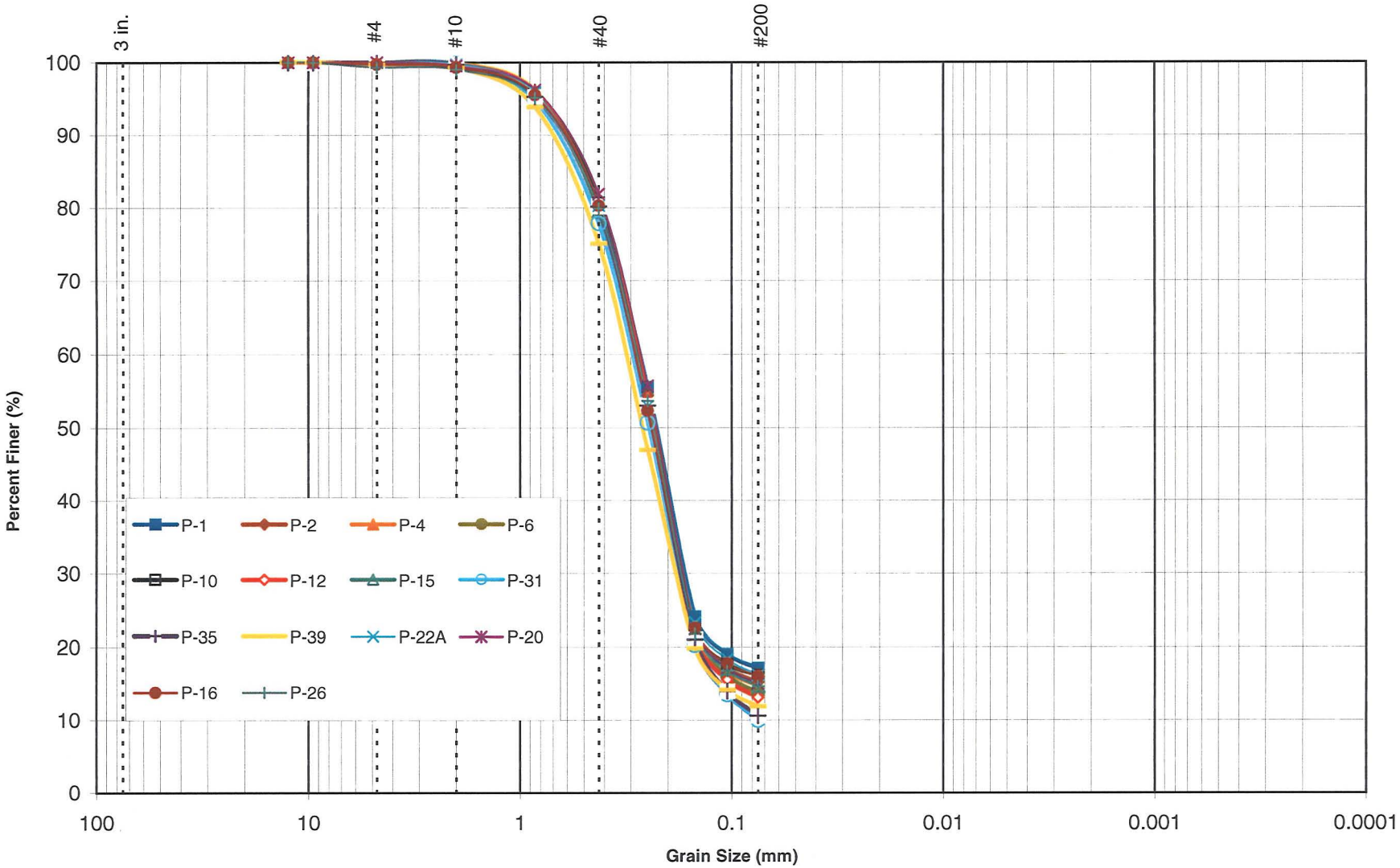
Figure 16
N1(60) Vs. Depth/Elevation
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



Note: No adjustments for fines content were made in the calculation of the N_{160} value

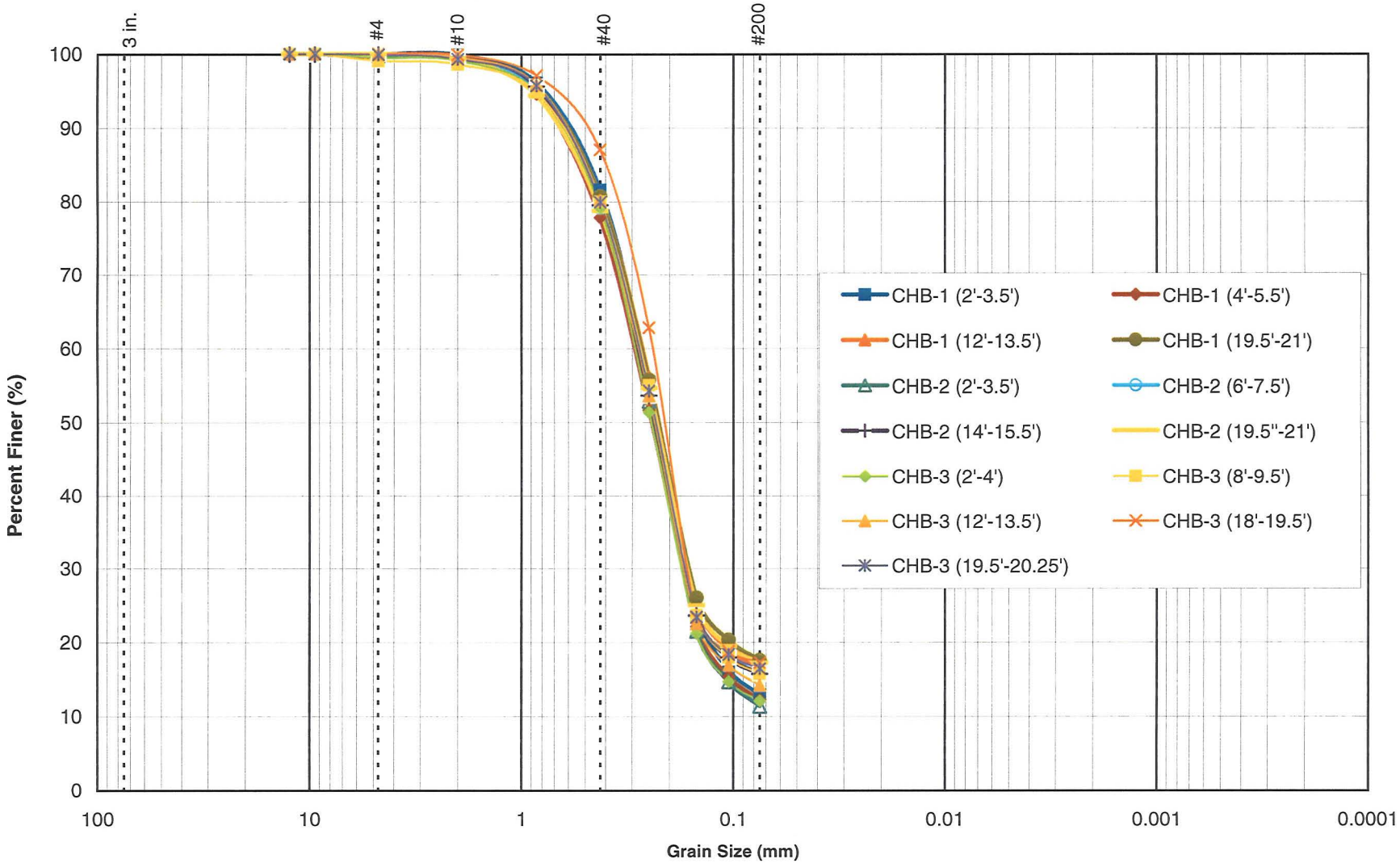
Prepared by: AAW
Reviewed by: WAL

Figure 17A
Grain Size Distribution Plot
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



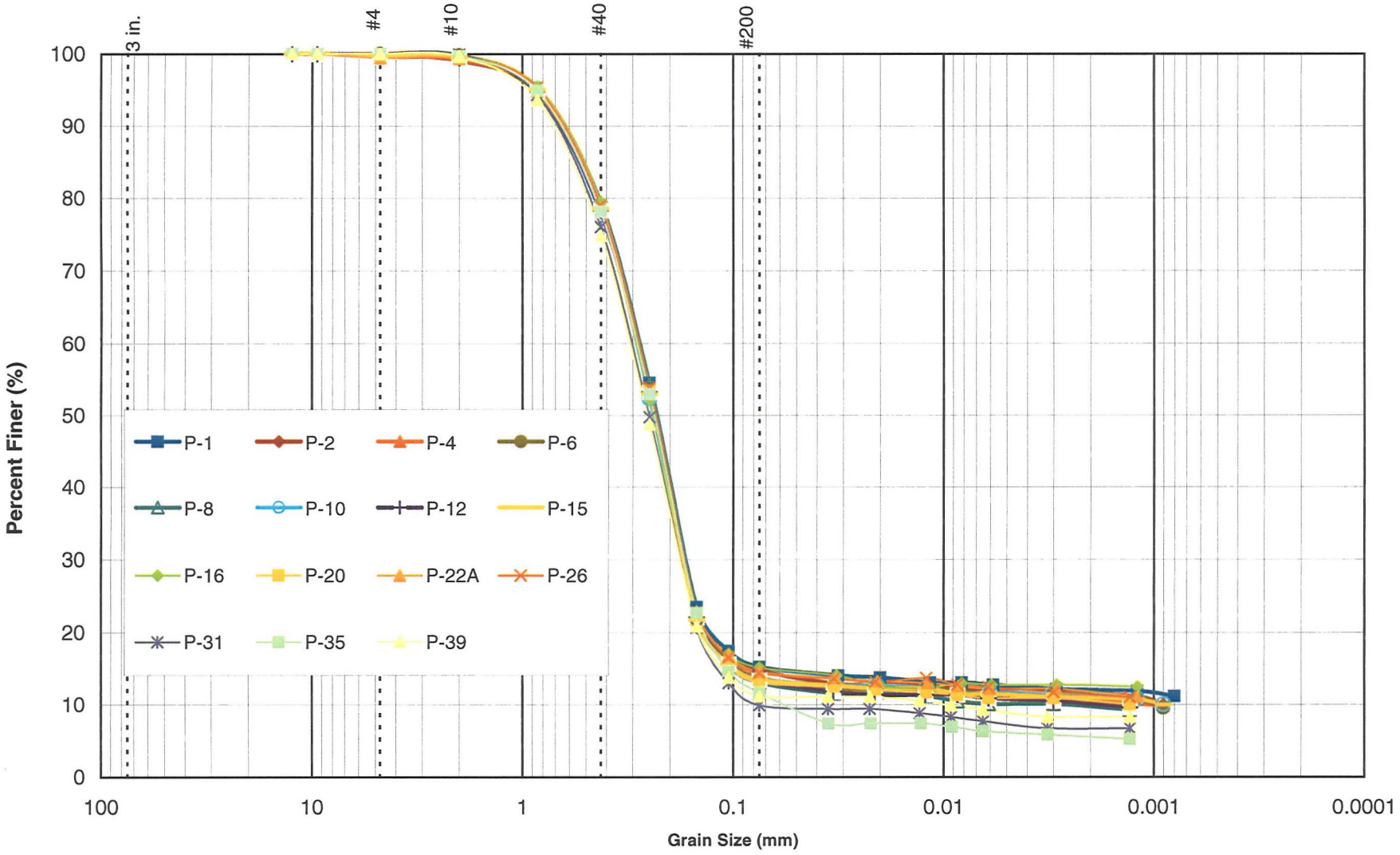
Prepared by: AAW
Reviewed by: WAL

Figure 17B
Grain Size Distribution Plot
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



Prepared by: AAW
Reviewed by: WAL

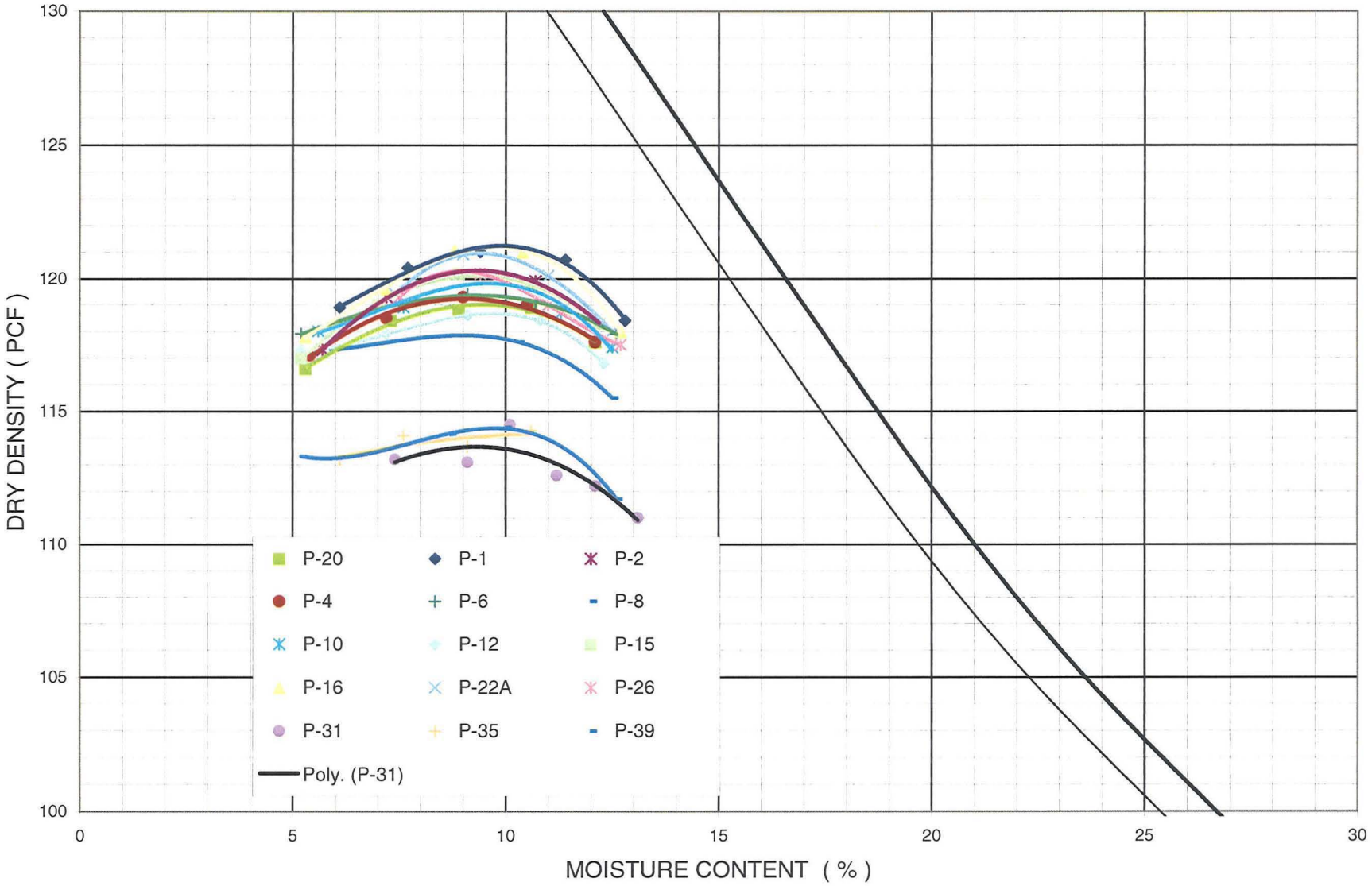
Figure 17C
Grain Size Distribution Plot with Hydromter Analysis
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number: 6141-06-0286



Prepared by: AAW
Reviewed by: WAL

Figure 18

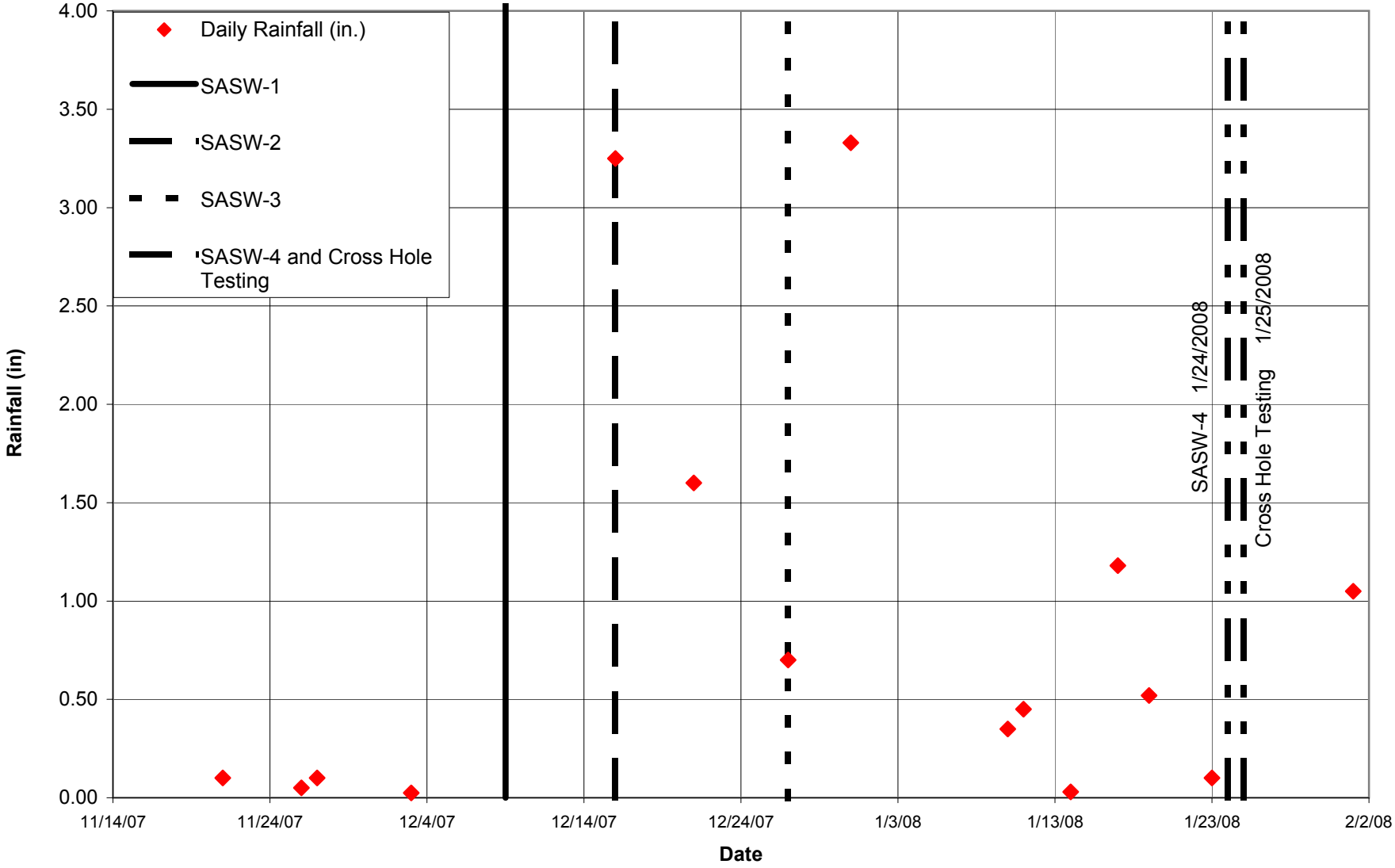
Moisture/ Density Relationships of Soil - P Samples
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



Procedure: ASTM D1557
Proctore Type: Modified

Prepared by: AAW
Reviewed by: WAL

Figure 19
Rainfall Daily Totals During Construction Activities
Vogtle Units 3 and 4 Engineered Fill Below Grade Test Pad
MACTEC Engineering and Consulting, Inc.
MACTEC Project Number 6141-06-0286



Prepared by: AAW
Reviewed by: WAL

Vogtle Units 3 & 4 Engineered Fill Below Grade Test Pad
Phase 1

Photographs

Volume 1 of 1

Job No. 6141-06-0286

**MACTEC ENGINEERING
AND CONSULTING, INC.**

March 14, 2008

Photo 1. November 13, 2007 - Fill Test Pad site prior to clearing.

Photo 2. November 26, 2007 – Clearing of Fill Test Pad site.

Photo 3. November 26, 2007 – Initial clearing of Fill Test Pad site. Photo was taken from crest of slope toward the east. Note silt fence around select backfill storage area in upper right of photo.

Photo 4. November 27, 2007 – Excavation of Fill Test Pad begins.

Photo 5. December 4, 2007- Vibromax 1105 vibratory smooth drum roller used to compact test pad fill.

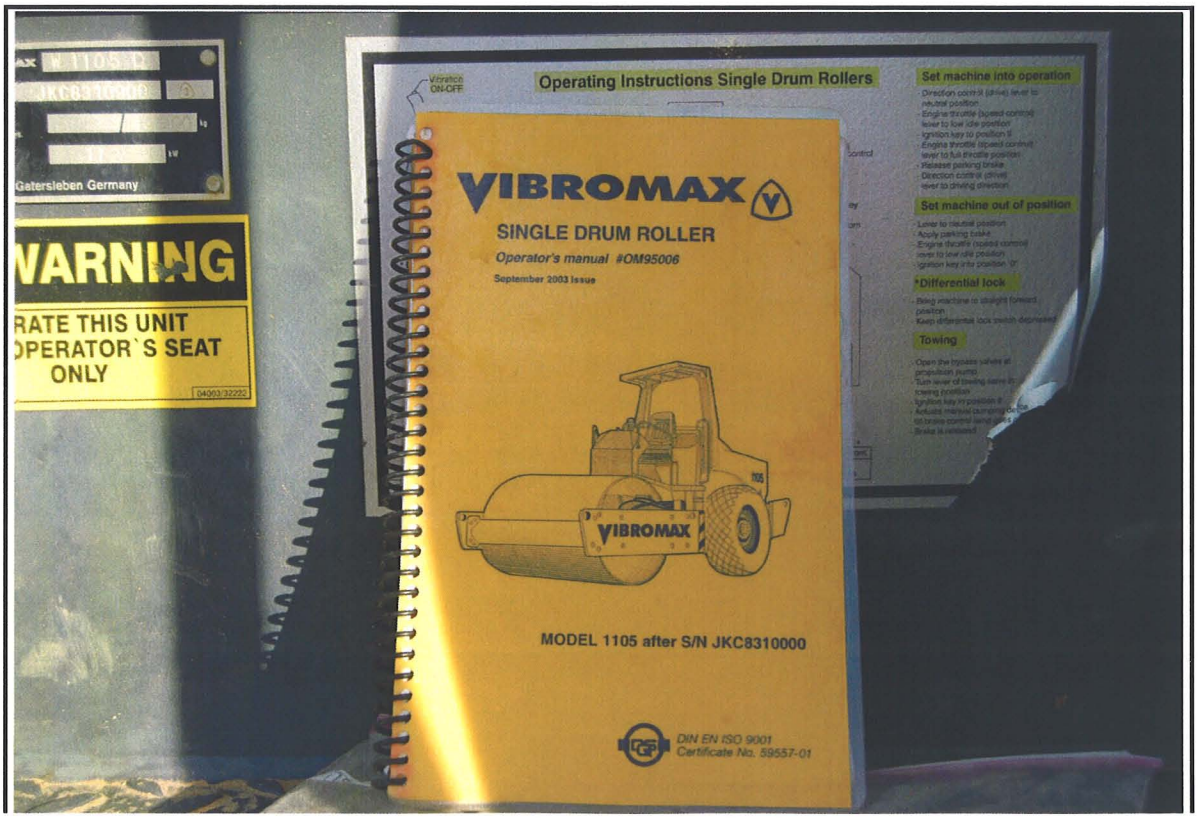
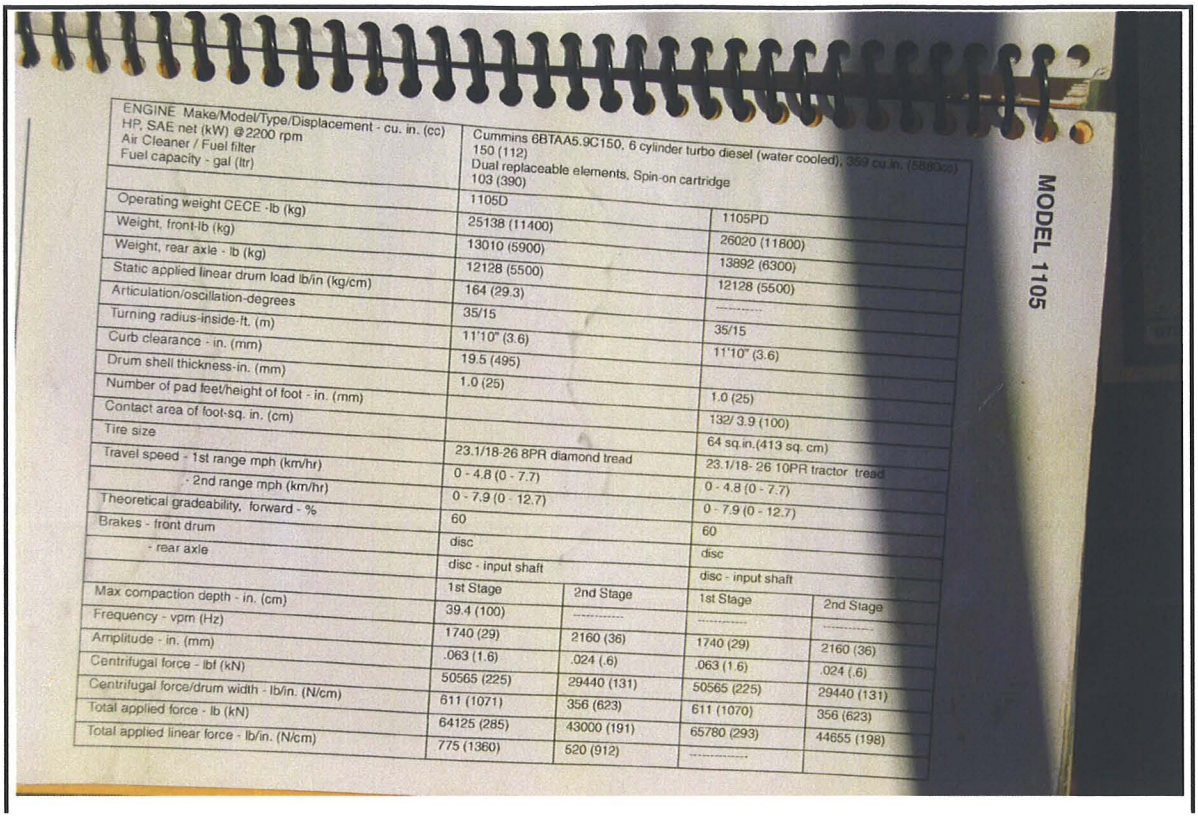


Photo 6. December 4, 2007- Cover of the Operations Manual for the Vibromax 1105 roller used during compaction of test pad fill.



MODEL 1105

ENGINE Make/Model/Type/Displacement - cu. in. (cc)	Cummins 6BTAA5.9C150, 6 cylinder turbo diesel (water cooled), 359 cu.in. (5880cc)			
HP, SAE net (kW) @2200 rpm	150 (112)			
Air Cleaner / Fuel filter	Dual replaceable elements, Spin-on cartridge			
Fuel capacity - gal (ltr)	103 (390)			
	1105D		1105PD	
Operating weight CECE -lb (kg)	25138 (11400)		26020 (11800)	
Weight, front-lb (kg)	13010 (5900)		13892 (6300)	
Weight, rear axle - lb (kg)	12128 (5500)		12128 (5500)	
Static applied linear drum load lb/in (kg/cm)	164 (29.3)		----------	
Articulation/oscillation-degrees	35/15		35/15	
Turning radius-inside-ft. (m)	11'10" (3.6)		11'10" (3.6)	
Curb clearance - in. (mm)	19.5 (495)			
Drum shell thickness-in. (mm)	1.0 (25)		1.0 (25)	
Number of pad feet/height of foot - in. (mm)			132/ 3.9 (100)	
Contact area of foot-sq. in. (cm)			64 sq.in.(413 sq. cm)	
Tire size	23.1/18-26 8PR diamond tread		23.1/18- 26 10PR tractor tread	
Travel speed - 1st range mph (km/hr)	0 - 4.8 (0 - 7.7)		0 - 4.8 (0 - 7.7)	
- 2nd range mph (km/hr)	0 - 7.9 (0 - 12.7)		0 - 7.9 (0 - 12.7)	
Theoretical gradeability, forward - %	60		60	
Brakes - front drum	disc		disc	
- rear axle	disc - input shaft		disc - input shaft	
	1st Stage	2nd Stage	1st Stage	2nd Stage
Max compaction depth - in. (cm)	39.4 (100)	----------	----------	----------
Frequency - vpm (Hz)	1740 (29)	2160 (36)	1740 (29)	2160 (36)
Amplitude - in. (mm)	.063 (1.6)	.024 (.6)	.063 (1.6)	.024 (.6)
Centrifugal force - lbf (kN)	50565 (225)	29440 (131)	50565 (225)	29440 (131)
Centrifugal force/drum width - lb/in. (N/cm)	611 (1071)	356 (623)	611 (1070)	356 (623)
Total applied force - lb (kN)	64125 (285)	43000 (191)	65780 (293)	44655 (198)
Total applied linear force - lb/in. (N/cm)	775 (1360)	520 (912)	----------	

Photo 7. December 4, 2007 – Specifications page from Vibromax 1105 Operations Manual.

Photo 8. December 4, 2007 – Sand cone density test is underway by Roger Blalock. Two 5-gallon bulk samples will be obtained from the density test layer for testing.

Photo 9. December 5, 2007- Moisture conditioning of fill layer.

Photo 10. December 5, 2007 – A sand cone density test excavation is being repaired with a "Wacker Packer".

Photo 11. December 9, 2007- Dr. Stokoe generates vibrations for Spectral Analysis of Surface Wave (SASW) testing, at shallow depth.

Photo 12. December 9, 2007- Jiabei Yuan Records SASW test data.

Photo 13. December 9, 2007 – Dr. Stokoe directs the bulldozer that is providing vibrations required for SASW testing, at depth.

Photo 14. December 10, 2007 – Vibratory compaction of test pad fill continues.

Photo 15. December 10, 2007 – Dr. Stokoe demonstrates SASW procedure to group including NRC representatives.

Photo 16. December 10, 2007 – Fill placement and testing are observed by group including NRC representatives.

Photo 17. January 10, 2008 – Moisture conditioning of fill lift prior to compaction.

Photo 18. January 10, 2008 – compaction of fill lift with Vibromax 1105 vibratory roller.

Photo 19. January 15, 2008 – SPT hammer energy calibration during drilling of boring drilled for Cross-Hole seismic testing.

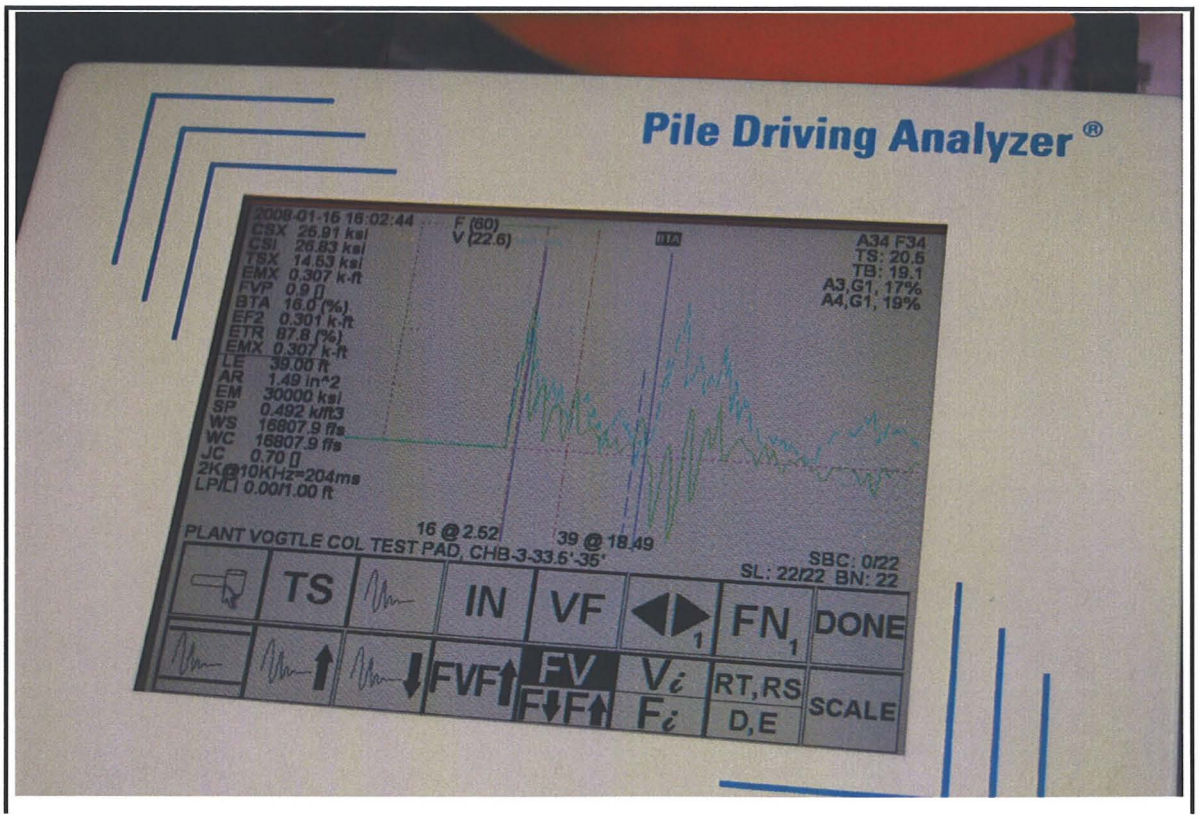


Photo 20. January 15, 2008 – SPT hammer energy data recorder.

Photo 21. January 22, 2008 – Cross-Hole casing (3" ID, schedule 40, flush coupled PVC) with blue slope indicator casing inside ready to perform the borehole location deviation survey.

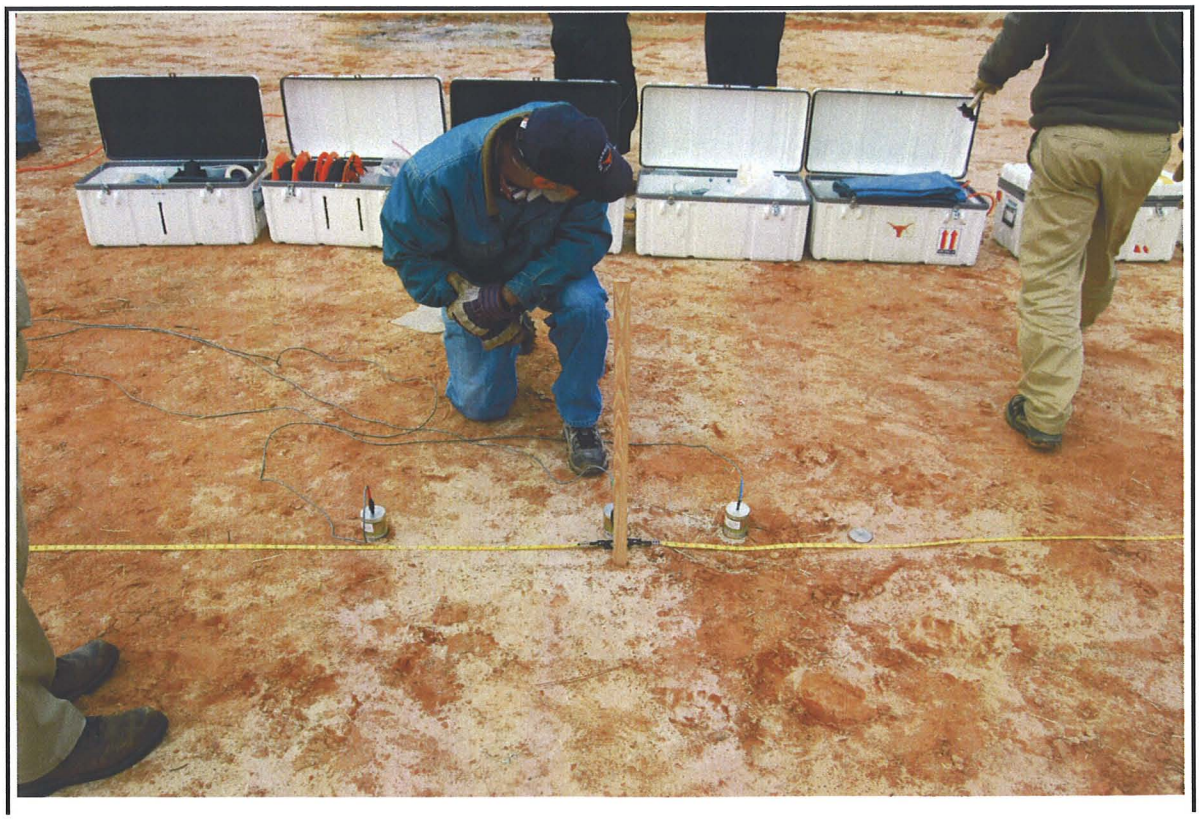


Photo 22. January 24, 2008 – SASW testing at depth begins with the placement of low frequency geophones.

Photo 23. January 24, 2008 – SASW Testing continues with vibrations generated by a bulldozer.

Photo 24. January 25, 2008 – Cross-Hole seismic test "trigger" being lowered into cased borehole by Dr. Stokoe assisted by Jiabei Yuan. Min Jae Jung controls pneumatic equipment that will lock the trigger in the borehole at the test depth.

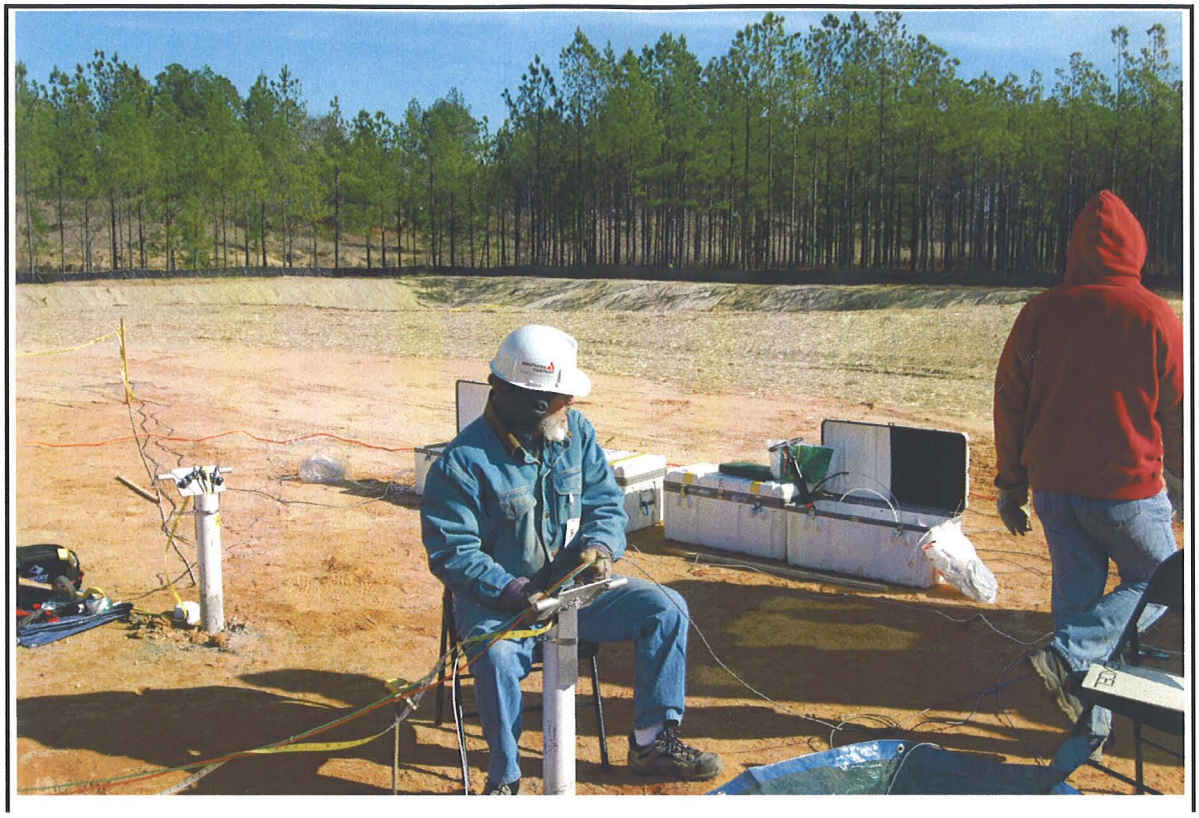


Photo 25. January 25, 2008 – Cross-Hole seismic triggering is being performed by Dr. Stokoe while others record the data.

Photo 26. January 25, 2008 – Dr. Stokoe checks that the recorded data are acceptable.

Photo 27. January 25, 2008 – Allen Lancaster, Dr. Kenneth Stokoe, John Lynch, Clay Sams, Min Jae Jung and Jiabei Yuan, left to right.

Photo 28. January 25, 2008 – Mike Lewis, John Lynch, and Dr. Kenneth Stokoe, left to right.

List of Attachments (Submitted Under Separate Covers on Various Dates)

Attachment A – Test Pad Specification and Work Procedure
Attachment B – Survey Report (Patterson and Dewar)
Attachment C – Laboratory Test Data Sheets
Attachment D – Geotechnical Boring Logs and SPT Energy Test Report
Attachment E – Geophysical Testing Report

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