Doc ID# 7124

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION
POSTAL SERVICE CENTER BOX 8003
CHERRY POINT, NORTH CAROLINA 28533-0003

IN REPLY REFER TO:
5090/11401
FAC
March 12, 2009

RECEIVED
MAR 13 2009
SOLID WASTE SECTION

Mr. Ed Mussler, P.E.
North Carolina Department of
Environment and Natural Resources
Division of Waste Management
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Dear Mr. Mussler:

Reference your email of February 24, 2009 to Ms. Alicia Filzen of our office, the following information is provided to satisfy the requirements of NC 15A NCAC 13B.1700, Beneficial Use of Coal Combustion By-Products.

For several decades, MCAS Cherry Point has operated a 700' wide, 31' high earthen berm to absorb the impact of bullets from live fire rifle training exercises for United States Marines. Over time, natural erosion and hundreds of thousands of bullet impacts have deteriorated the berm surface to the point where safety and operational readiness have become significantly reduced. Consequently, a project is being implemented to restore and enlarge the existing berm plus improve the surrounding areas, including roads and drainage structures. This project, which is in the early stages of execution, is scheduled for completion by September 30, 2009.

The project will in part utilize standard structural soil fill supplemented with coal ash generated by our on-site coal fired heating plant. The coal ash will form a longitudinal core within the berm and will be surrounded by a minimum 18" thick compacted earthen shell sodden with a permanent vegetative cover. As required in 15 NCAC 13B .1703(b) and 15 NCAC 13B .1704, professional engineering plans and specifications confirm the siting of the berm will meet jurisdictional wetland setback requirements and confirm that the berm is out of the 100 year floodplain (9.8' MSL for Cherry Point). As an added precaution, the coal ash core will also be underlain and raised with 3' of compacted structural soil.

5090/11401
FAC
March 12, 2009

Enclosed additional information includes a USGS seven and one half minute map, an eight and one half by 11 inch topographical map, a TCLP analysis of the coal ash, location and contact information for the coal ash generating facility and a soil

classification and geotechnical evaluation of the coal ash as a construction material. As confirmed by Mr. Dennis Shackelford of your Fayetteville office on March 10, 2009, the statement of acceptance by the land owner requirement (15 NCAC 13B .1703(5) and the Register of Deeds recordation requirements of 15 NCAC 13B .1707 are not applicable since this is US Government owned property.

Finally, the construction practices and operational requirements of 15 NCAC 13B .1705, including protection against contravention of the 15A NCAC 2L groundwater standards, will be strictly followed. An approved stormwater management permit from Mr. Al Hodge, Washington Regional Office Supervisor - Division of Water Quality, is also enclosed.

The air station greatly appreciates your approval of this beneficial use of our coal ash and if you require further information please contact Alicia Filzen of the Environmental Affairs Department at (252) 466-5391.

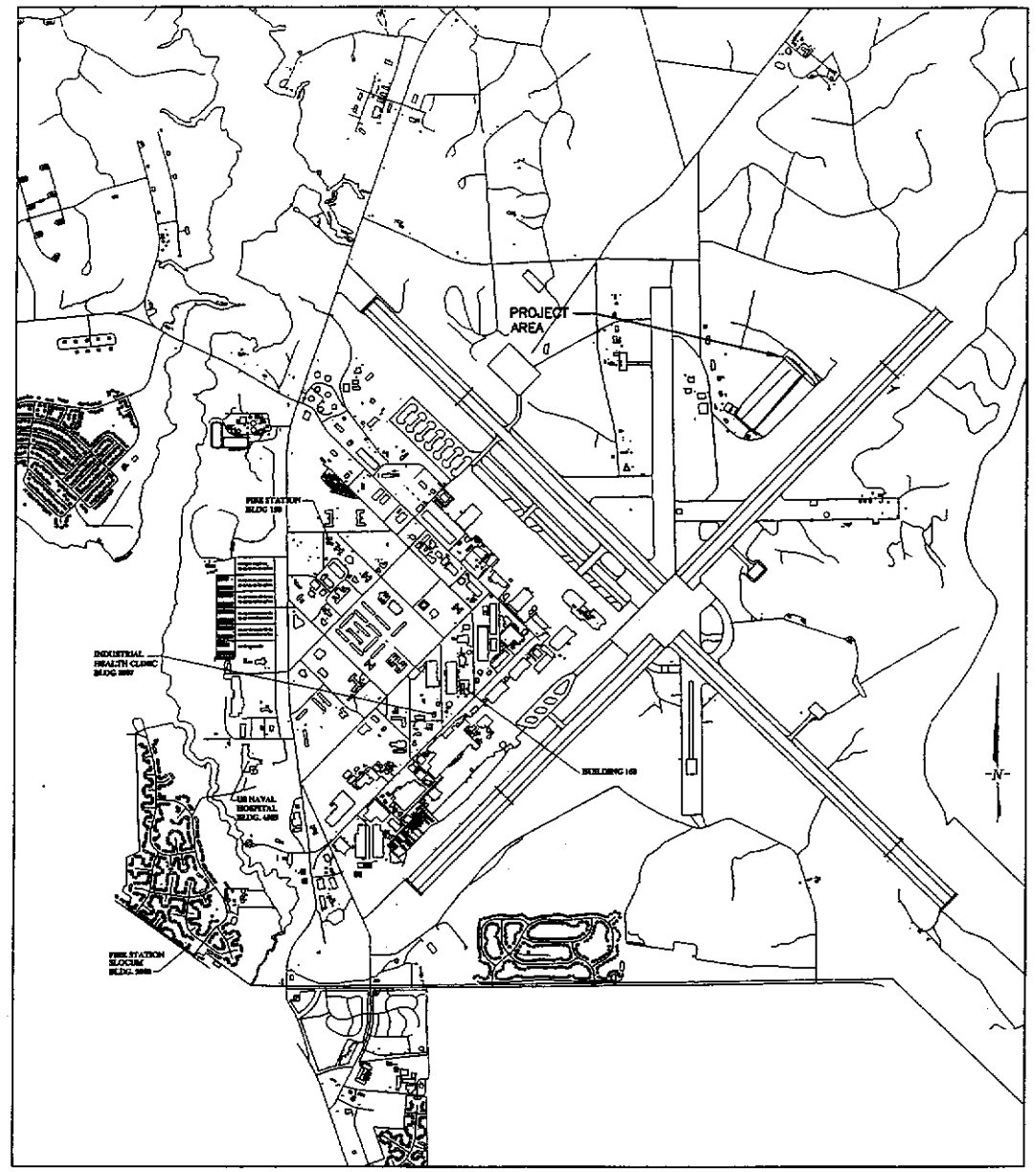
Sincerely

J. C. CURLIN
Supervisory Environmental Engineer
By direction of the
Commanding Officer

Enclosures:
1. Engineering Plans & Specifications
2. USGS Map
3. Topographical Map
4. TCLP Analysis
5. Generation facility information
6. Soil Classification and Geotechnical Evaluation
7. Stormwater Management Permit SW7090102

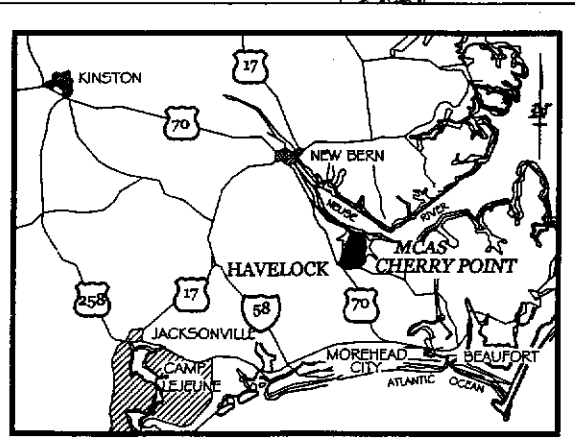
REMOVE / STABILIZE LEAD AND REPAIR IMPACT BERM, INCREASE IMPACT BERM HEIGHT

MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA
PROJECT NO. CP99019M & CP0719R



Location Map

0 1600 2400 3200 4800 8000
(IN FEET)
1 inch = 1600 ft.



0 5 10 20 30
Scale of Miles

Vicinity Map

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NO CHANGES.

FILE NAME: 12505652.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

SYM.	DESCRIPTION	DATE	APPR
	CLIENT REQUESTED REVISIONS	9/06	CHB

Dewberry

NORTH CAROLINA PROFESSIONAL SEAL 15376 ENGINEER CHRISTOPHER HOWARD BROWN

APPROVED
ACTIVITY - SATISFACTORY TO
DATE
APPROVED
FOR EFD FOR COMMANDER NAVFAC
DATE

A/E	EFD
CHB	DESIGN
FVR	DRAWN
CHB	REVIEW
SDH	CO
CHB	CHIEF ARCH./ ENGR.
PROJECT MANAGER	SDH
FIRE PROTECTION	
BRANCH MANAGER	
DESIGN DIRECTOR	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

COVER SHEET

CODE ID. NO. SIZE D
SCALE: AS SHOWN
FILE NO.
ST. PRJ. NO.
SPEC. NO.
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12505652
SHEET 1 OF 17
G-01

ENCLOSURE (1)

GENERAL NOTES:

1. CONTRACTOR SHALL HAVE A COMPLETE SET OF CONSTRUCTION DRAWINGS AND APPROVED PERMITS ON THE JOB SITE AT ALL TIMES.
2. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT WORK REQUIRED TO PROPERLY CONSTRUCT THE WORK.
3. CONTRACTOR SHALL MAKE EVERY EFFORT TO SAVE PROPERTY IRONS, MONUMENTS, OTHER PERMANENT POINTS AND LINES OF REFERENCE AND CONSTRUCTION STAKES. PROPERTY IRONS, MONUMENTS, AND OTHER PERMANENT POINTS OF REFERENCE DESTROYED BY THE CONTRACTOR SHALL BE REPLACED BY A NORTH CAROLINA LICENSED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
4. CONTRACTOR SHALL REPAIR ALL IMPROVEMENTS TO EXISTING OR BETTER CONDITIONS IF DISTURBED DURING CONSTRUCTION.
5. CONTRACTOR SHALL INSTALL MEASURES AS NECESSARY DURING CONSTRUCTION FOR SEDIMENTATION AND EROSION CONTROL.
6. CONTRACTOR SHALL PROTECT ALL FENCES, POLES, AND ALL OTHER PROPERTY UNLESS THEY ARE TO BE DEMOLISHED. ANY PROPERTY NOT AUTHORIZED FOR REMOVAL, BUT DAMAGED BY THE CONTRACTOR SHALL BE RESTORED BY THE CONTRACTOR TO THE CONTRACTING OFFICER'S SATISFACTION AT NO ADDITIONAL EXPENSE.
7. EXISTING ROADS SHALL REMAIN OPEN TO TRAFFIC AT ALL TIMES, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL CONTACT THE CONTRACTING OFFICER PRIOR TO ANY ROAD CLOSING. THE CONTRACTOR SHALL PROVIDE SUFFICIENT BARRICADES, LIGHTS, SIGNING, AND OTHER PROTECTIVE DEVICES IN ACCORDANCE WITH MUTCD.
8. CONTRACTOR SHALL MINIMIZE IMPACT OF TEMPORARY STORAGE OF EXCAVATED SOILS. EXCAVATED SOILS SHALL NOT BE STORED UNDER TREES WITHOUT PERMISSION OF CONTRACTING OFFICER.
9. CONTRACTOR SHALL HAVE ALL PERMITS AND APPROVALS PRIOR TO BEGINNING CONSTRUCTION.
10. ALL EXISTING UTILITIES HAVE BEEN LOCATED FROM THE INFORMATION AVAILABLE. THE LOCATION OF EXISTING UNDERGROUND UTILITIES INDICATED BY PLAN ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCURATELY LOCATE BOTH HORIZONTALLY AND VERTICALLY ALL EXISTING UTILITIES PRIOR TO START OF CONSTRUCTION. COST TO REPAIR DAMAGED UTILITIES SHALL BE BORNE BY THE CONTRACTOR.
11. PROTECT ALL STORM STRUCTURES AND PIPES DURING DEMOLITION AND CONSTRUCTION UNLESS OTHERWISE NOTED TO BE REMOVED.
12. EXCAVATION AND CONSTRUCTION SHALL PROCEED ACCORDING TO THE LATEST OSHA REGULATIONS.
13. BORINGS PERFORMED BY S&ME, INC. BORING & EARTHWORK INFORMATION FROM "SUBSURFACE EXPLORATION REPORT – PROPOSED RIFLE RANGE BERM MODIFICATIONS – PROJECTS CP99019M AND CP0719R – MARINE CORPS AIR STATION – CHERRY POINT, NORTH CAROLINA – S&ME PROJECT NO. 1051-06-439" DATED FEBRUARY 2, 2007 & "ADDENDUM TO SUBSURFACE EXPLORATION REPORT – PROPOSED RIFLE RANGE BERM MODIFICATIONS – PROJECT CP99019M AND CP0719R – MARINE CORPS AIR STATION – CHERRY POINT, NORTH CAROLINA – S&ME PROJECT NO. 1051-06-439" DATED JULY 6, 2007.
14. SOIL SAMPLE LOCATIONS AND REMOVAL AREA BASED ON "ENVIRONMENTAL SAMPLING AND ANALYSIS PLAN – PROPOSED RIFLE RANGE BERM MODIFICATIONS – MARINE CORPS AIR STATION – CHERRY POINT, NORTH CAROLINA – S&ME PROJECT NO. 1051-06-439" DATED FEBRUARY 2, 2007.

PHASE I EROSION & SEDIMENT CONSTRUCTION SEQUENCE:

1. IMPLEMENT THE REQUIREMENTS OF THE STATE APPROVED EROSION CONTROL PLAN. NOTIFY THE STATE LAND QUALITY SECTION, AT 252-946-6481, AND THE CONTRACTING OFFICER AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES.
2. NO DEMOLITION, CONSTRUCTION, OR LAND DISTURBANCE ACTIVITIES MAY BEGIN UNTIL ALL APPLICABLE EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED IN LOCATIONS AS SHOWN ON THE CONTRACT DRAWINGS. IF CLEARING IS REQUIRED FOR INSTALLATION OF A GIVEN MEASURE, ALL OTHER MEASURES SHALL BE INSTALLED FIRST. THE NECESSARY LAND DISTURBANCE ACTIVITIES REQUIRED FOR INSTALLATION OF THE GIVEN MEASURE MAY THEN PROCEED.
3. INSTALL GRAVEL CONSTRUCTION ENTRANCE PAD IN LOCATION SHOWN ON PHASE I EROSION CONTROL DRAWING.
4. INSTALL SILT FENCING IN LOCATIONS SHOWN ON PHASE I EROSION CONTROL DRAWING.
5. INSTALL INLET PROTECTION IN LOCATION SHOWN ON PHASE I EROSION CONTROL DRAWING.
6. INSTALL DIVERSION CHANNELS AND TEMPORARY SEDIMENT TRAPS IN LOCATIONS SHOWN ON PHASE I EROSION CONTROL DRAWING.
7. BEGIN SITE STRIPPING, EXCAVATION AND CONSTRUCTION WITHIN LIMITS OF CONSTRUCTION.
8. THE CONTRACTOR SHALL POST THE SEDIMENTATION "CERTIFICATE OF APPROVAL" AT THE CONSTRUCTION ENTRANCE AND MAINTAIN COPIES OF PROJECT EROSION AND STORM WATER PERMITS AT THE ON-SITE OFFICE. ANY CHANGES IN THE PROJECT DESIGN THAT RESULT IN ADDITIONAL LAND DISTURBANCE, OR CHANGE OF DRAINAGE PATTERNS SHALL BE SUBMITTED TO NCDENR FOR PERMIT MODIFICATION BY THE CONTRACTING OFFICER. CONTRACTOR SHALL COORDINATE ALL CHANGES WITH THE CONTRACTING OFFICER. NO CHANGES SHALL BE MADE WITHOUT APPROVAL OF THE CONTRACTING OFFICER.
9. THE CONTRACTOR SHALL CONDUCT PROJECT NPDES INSPECTIONS OF EROSION CONTROL MEASURES AND STORM WATER OUTFALLS WEEKLY AND AFTER EVERY RAIN EVENT ½ INCH OR GREATER. ALL CONTROL DEVICES SHALL BE MAINTAINED AS SPECIFIED IN THE NCDENR EROSION & SEDIMENT CONTROL PLANNING AND DESIGN MANUAL. A RAIN GAUGE SHALL BE INSTALLED AT THE PROJECT SITE TO FACILITATE RAINFALL MONITORING. THE CONTRACTOR SHALL MAINTAIN THESE RECORDS AT THE ON-SITE OFFICE FOR AUDIT BY REGULATORY AGENCIES. NPDES INSPECTIONS ARE REQUIRED UNTIL PROJECT STABILIZATION IS EVIDENT BY 95% VEGETATIVE GROWTH FOR AREAS PROVIDED SEEDING, AT SUCH TIME THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL DEVICES.
10. PROVIDE TEMPORARY SEEDING AFTER CLEARING AND GRUBBING OPERATION IF THE AREA IS TO REMAIN UNDISTURBED FOR MORE THAN 15 WORKING DAYS OR 60 CALENDAR DAYS, WHICHEVER IS LESS. PROVIDE PERMANENT SEEDING WITHIN 15 WORKING DAYS OR 60 CALENDAR DAYS, WHICHEVER IS LESS, OF ESTABLISHING FINAL GRADES. SLOPES SHALL BE SEEDED WITHIN 21 CALENDAR DAYS.

PHASE II EROSION & SEDIMENT CONSTRUCTION SEQUENCE:

1. ALL SEDIMENTATION AND EROSION CONTROL MEASURE FROM PHASE I SHALL REMAIN IN PLACE.
3. CONSTRUCT IMPACT BERM TO DIMENSIONS AND ELEVATIONS SHOWN ON DRAWINGS. PERMANENT STORMWATER SWALES AND STORMWATER PIPES SHALL BE INSTALLED CONCURRENT WITH SITE GRADING. CHANNELS SHALL BE PROTECTED WITH CHECK DAMS AND CHANNEL LINING, IF NECESSARY, AS SHOWN ON DRAWINGS. STORMWATER PIPES SHALL BE PROTECTED WITH INLET AND OUTLET PROTECTION MEASURES AS SHOWN ON THE PHASE 2 EROSION CONTROL DRAWING.
4. THE CONTRACTOR SHALL POST THE SEDIMENTATION "CERTIFICATE OF APPROVAL" AT THE CONSTRUCTION ENTRANCE AND MAINTAIN COPIES OF PROJECT EROSION AND STORM WATER PERMITS AT THE ON-SITE OFFICE. ANY CHANGES IN THE PROJECT DESIGN THAT RESULT IN ADDITIONAL LAND DISTURBANCE, OR CHANGE OF DRAINAGE PATTERNS SHALL BE SUBMITTED TO NCDENR FOR PERMIT MODIFICATION BY THE CONTRACTING OFFICER. CONTRACTOR SHALL COORDINATE ALL CHANGES WITH THE CONTRACTING OFFICER. NO CHANGES SHALL BE MADE WITHOUT APPROVAL OF THE CONTRACTING OFFICER.
5. THE CONTRACTOR SHALL CONDUCT PROJECT NPDES INSPECTIONS OF EROSION CONTROL MEASURES AND STORM WATER OUTFALLS WEEKLY AND AFTER EVERY RAIN EVENT ½ INCH OR GREATER. ALL CONTROL DEVICES SHALL BE MAINTAINED AS SPECIFIED IN THE NCDENR EROSION & SEDIMENT CONTROL PLANNING AND DESIGN MANUAL. A RAIN GAUGE SHALL BE INSTALLED AT THE PROJECT SITE TO FACILITATE RAINFALL MONITORING. THE CONTRACTOR SHALL MAINTAIN THESE RECORDS AT THE ON-SITE OFFICE FOR AUDIT BY REGULATORY AGENCIES. NPDES INSPECTIONS ARE REQUIRED UNTIL PROJECT STABILIZATION IS EVIDENT BY 95% VEGETATIVE GROWTH FOR AREAS PROVIDED SEEDING, AT SUCH TIME THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL DEVICES.
6. PROVIDE TEMPORARY SEEDING AFTER CLEARING AND GRUBBING OPERATION IF THE AREA IS TO REMAIN UNDISTURBED FOR MORE THAN 15 WORKING DAYS OR 60 CALENDAR DAYS, WHICHEVER IS LESS. PROVIDE PERMANENT SEEDING WITHIN 15 WORKING DAYS OR 60 CALENDAR DAYS, WHICHEVER IS LESS, OF ESTABLISHING FINAL GRADES. SLOPES SHALL BE SEEDED WITHIN 21 CALENDAR DAYS.

⚠1 EROSION & SEDIMENT CONSTRUCTION SEQUENCE HAS BEEN REVISED.

FILE NAME: 12505853.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

STAT.	CLIENT REQUESTED REVISIONS DESCRIPTION	DATE	APPR
1		9/08	CHB

Dewberry

NORTH CAROLINA PROFESSIONAL SEAL 13378 ENGINEER CHRISTOPHER H. BROWN

APPROVED

ACTIVITY – SATISFACTORY TO

DATE

APPROVED

FOR O/O FOR COMMANDER (NAVFAC)

DATE

A/E CHB DESIGN
FVR DRAWN
CHB REVIEW
SDH QC
CHB CHIEF ARCH./ ENGR.
PROJECT MANAGER SDH
FIRE PROTECTION
BRANCH MANAGER
DESIGN DIRECTOR

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

GENERAL NOTES

CODE IE. NO. SIZE D
SCALE: AS SHOWN
FILE NO.
ST. PAV. NO.
SPEC. NO.
CONSTR. CONTR. NO.
MARINE DRAWING NO. 12505853
SHEET 2 OF 17
G-02

LEGEND TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES
(Shown in Graphic Log)

- Fill
- Asphalt
- Concrete
- Topsoil
- Gravel
- Sand
- Silt
- Clay
- Organic
- Silty Sand
- Clayey Sand
- Sandy Silt
- Clayey Silt
- Sandy Clay
- Silty Clay
- Partially Weathered Rock
- Cored Rock

WATER LEVELS
(Shown in Water Level Column)

- = Water Level At Termination of Boring
- = Water Level Taken After 24 Hours
- = Loss of Drilling Water
- = Hole Caved

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	STD. PENETRATION RESISTANCE BLOWS/FOOT
Very Soft	0 to 2
Soft	3 to 4
Firm	5 to 8
Stiff	9 to 15
Very Stiff	16 to 30
Hard	31 to 50
Very Hard	Over 50

RELATIVE DENSITY OF COHESIONLESS SOILS

RELATIVE DENSITY	STD. PENETRATION RESISTANCE BLOWS/FOOT
Very Loose	0 to 4
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	Over 50

SAMPLER TYPES
(Shown in Samples Column)

- Shelby Tube
- Split Spoon
- Rock Core
- No Recovery

TERMS

Standard Penetration Resistance - The Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in. I.D. Split Spoon Sampler 1 Foot. As Specified in ASTM D-1586.

REC - Total Length of Rock Recovered in the Core Barrel Divided by the Total Length of the Core Run Times 100%.

RQD - Total Length of Sound Rock Segments Recovered that are Longer Than or Equal to 4" (mechanical breaks excluded) Divided by the Total Length of the Core Run Times 100%.

S&ME
ENGINEERING • TESTING
ENVIRONMENTAL SERVICES

PROJECT: Cherry Point Rifle Range, Cherry Point, North Carolina, 1051-06-439

TEST BORING RECORD B-1

DATE DRILLED: 10/5/06 | ELEVATION: 28.0 ft
DRILLING METHOD: 3-1/4" HSA | BORING DEPTH: 30.0 ft
LOGGED BY: A. Browning | WATER LEVEL: Cave @ 4.3'
DRILLER: A. Martin | DRILL RIG: CME-750

NOTES: Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NUMBER	ELEVATION (feet)	N-Value
		TOPSOIL (4 inches)				
		FILL: Medium Dense Olive Gray Silty Clayey Fine SAND (SC), Moist to Wet				20
5		Firm Gray-Tan Silty CLAY (CH), Moist to Wet	REC		15.0	4
		Very Soft Gray Silty CLAY (CH), Wet				2
10		Loose Gray Fine SAND (SP), Wet			10.0	4
		Very Dense Gray Medium to Fine SAND (SP), Wet				70
15					5.0	
20		Soft Gray Fine Sandy CLAY (CL), Wet			0.0	3
25		Firm Gray Fine Sandy CLAY (CL) With Shell Hash, Wet				4
		Dense Gray Slightly Clayey Medium to Fine SAND (SP-SC) With Shell Hash, Wet			-5.0	
30		Boring terminated at 30 feet below existing ground surface. Boreholes caved at 4.3 feet below existing ground surface. Borehole was observed dry at termination of boring.			-10.0	38

STANDARD PENETRATION TEST DATA (blows/ft) 10 20 30 50 80

NOTES:
1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IS IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. PENETRATION BLOW UNITS ARE THE NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.
4. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
5. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.

Page 1 of 1

S&ME
ENGINEERING • TESTING
ENVIRONMENTAL SERVICES
3201 Spring Forest Road
Raleigh, NC 27616

PROJECT: Cherry Point Rifle Range, Cherry Point, North Carolina, 1051-06-439

TEST BORING RECORD B-2

DATE DRILLED: 10/5/06 | ELEVATION: 28.0 ft
DRILLING METHOD: Wash Boring | BORING DEPTH: 38.0 ft
LOGGED BY: A. Browning | WATER LEVEL: 8.1' @ TOB
DRILLER: A. Martin | DRILL RIG: CME-750

NOTES: Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NUMBER	ELEVATION (feet)	N-Value
		TOPSOIL (4 inches)				
		FILL: Medium Dense Tan Silty Fine SAND (SM), Moist				19
5		Firm Gray-Tan Fine Sandy CLAY (CL), Moist			15.0	8
		Very Soft Tan to Gray Silty CLAY (CH), Wet	5.5-30			WOH
10			REC		10.0	2
		Dense Gray Fine SAND (SP), Saturated				28
15					5.0	
20		Firm Gray Fine Sandy CLAY (CL), Wet			0.0	5
25		Very Soft Gray Fine Sandy CLAY (CL) With Shell Hash, Wet				3
		Dense Gray Clayey Medium SAND (SC), Saturated			-5.0	
30		Boring terminated at 30 feet below existing ground surface. Boreholes caved at 11.2 feet below existing ground surface. Groundwater was observed in boreholes at a depth of 8.1 feet at termination of boring.			-10.0	35

STANDARD PENETRATION TEST DATA (blows/ft) 10 20 30 50 80

NOTES:
1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IS IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. PENETRATION BLOW UNITS ARE THE NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.
4. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
5. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.

Page 1 of 1

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ENVIRONMENTAL SERVICES
3201 Spring Forest Road
Raleigh, NC 27616

PROJECT: Cherry Point Rifle Range, Cherry Point, North Carolina, 1051-06-439

TEST BORING RECORD B-3

DATE DRILLED: 10/5/06 | ELEVATION: 29.0 ft
DRILLING METHOD: Wash Boring | BORING DEPTH: 38.0 ft
LOGGED BY: A. Browning | WATER LEVEL: 4.7' @ TOB
DRILLER: A. Martin | DRILL RIG: CME-750

NOTES: Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NUMBER	ELEVATION (feet)	N-Value
		TOPSOIL (4 inches)				
		FILL: Medium Dense Tan Clayey Fine SAND (SC), Moist				23
5		Loose Gray Clayey Fine SAND (SC), Moist			15.0	6
		Very Soft Orange-Tan Silty CLAY (CH), Wet				2
10		Very Soft Gray Fine Sandy Silty CLAY (CH), Wet	SS-4		10.0	WOH
		Medium Dense Gray Clayey Medium SAND (SC) With Shell Hash, Saturated	REC			18
15					5.0	
20		Firm Gray Fine Sandy CLAY (CL) With Shell Hash, Wet			0.0	5
25		Soft Gray Silty Fine Sandy CLAY (CL), Wet			-5.0	3
		Medium Dense Gray Clayey Medium SAND (SC) With Shell Hash, Saturated				10
30		Boring terminated at 35 feet below existing ground surface. Boreholes caved at 12.2 feet below existing ground surface. Groundwater was observed in boreholes at a depth of 4.7 feet at termination of boring.			-10.0	

STANDARD PENETRATION TEST DATA (blows/ft) 10 20 30 50 80

NOTES:
1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IS IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. PENETRATION BLOW UNITS ARE THE NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.
4. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
5. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.

Page 1 of 1

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ENGINEERING • TESTING
ENVIRONMENTAL SERVICES
3201 Spring Forest Road
Raleigh, NC 27616

PROJECT: Cherry Point Rifle Range, Cherry Point, North Carolina, 1051-06-439

TEST BORING RECORD B-4

DATE DRILLED: 10/11/06 | ELEVATION: 50.0 ft
DRILLING METHOD: Wash Boring | BORING DEPTH: 60.0 ft
LOGGED BY: A. Browning | WATER LEVEL: Cave @ 8.7'
DRILLER: A. Martin | DRILL RIG: CME-750

NOTES: Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NUMBER	ELEVATION (feet)	N-Value
		TOPSOIL (3 inches)				
		FILL: Medium Dense Gray-Brown Clayey Fine SAND (SC), Moist				17
5			REC		45.0	13
						10
10					40.0	11
		FILL: Tan-Brown Silty Clayey Fine SAND (SC), Moist		UD-1		
15					35.0	
20		FILL: Stiff Gray Fine Sandy CLAY (CL), Moist			30.0	8
		FILL: Medium Dense Black-Gray Clayey Fine SAND (SC) With Large Wood Fragments, Moist				19
25					25.0	
30		Medium Dense Black-Gray Silty Fine SAND (SM), Moist			20.0	15
		Firm Tan-Gray Fine Sandy CLAY (CL), Wet				5

STANDARD PENETRATION TEST DATA (blows/ft) 10 20 30 50 80

NOTES:
1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IS IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. PENETRATION BLOW UNITS ARE THE NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.
4. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
5. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.

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3201 Spring Forest Road
Raleigh, NC 27616

PROJECT: Cherry Point Rifle Range, Cherry Point, North Carolina, 1051-06-439

TEST BORING RECORD B-4

DATE DRILLED: 10/11/06 | ELEVATION: 50.0 ft
DRILLING METHOD: Wash Boring | BORING DEPTH: 60.0 ft
LOGGED BY: A. Browning | WATER LEVEL: Cave @ 8.7'
DRILLER: A. Martin | DRILL RIG: CME-750

NOTES: Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NUMBER	ELEVATION (feet)	N-Value
40		Loose Gray Medium to Fine SAND (SP), Saturated			10.0	8
45		Very Dense Gray Fine to Medium SAND (SP) With Shell Hash, Saturated			5.0	40
50		Very Soft Gray Clayey Fine SAND (SC), Saturated			0.0	WOH
55		Dense Gray Clayey Medium SAND (SC) With Shell Material, Saturated			-5.0	WOH
60		Boring terminated at 60 feet below existing ground surface. Boreholes caved at 8.7 feet below existing ground surface. Borehole was observed dry at termination of boring. * Bag sample obtained from 3 to 8 feet.			-10.0	27
65					-15.0	

STANDARD PENETRATION TEST DATA (blows/ft) 10 20 30 50 80

NOTES:
1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IS IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. PENETRATION BLOW UNITS ARE THE NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.
4. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
5. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.

Page 2 of 2

S&ME
ENGINEERING • TESTING
ENVIRONMENTAL SERVICES
3201 Spring Forest Road
Raleigh, NC 27616

NOTES:

1. BORINGS PERFORMED BY S&ME, INC. BORING & EARTHWORK INFORMATION FROM "SUBSURFACE EXPLORATION REPORT – PROPOSED RIFLE RANGE BERM MODIFICATIONS – PROJECTS CP99019M AND CP0719R – MARINE CORPS AIR STATION – CHERRY POINT, NORTH CAROLINA – S&ME PROJECT NO. 1051–06–439" DATED FEBRUARY 2, 2007.
2. SEE DRAWING C–01 FOR LOCATIONS OF BORINGS.

⚠ NO CHANGES.

FILE NAME: 12505854.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

STAT.	DATE	DESCRIPTION
1	11/08	CLIENT REQUESTED REVISIONS

Dewberry
Dewberry & Davis, Inc.

APPROVED
ACTIVITY – SATISFACTORY TO
DATE
APPROVED
FOR EFD FOR COMMANDER NAVFAC
DATE

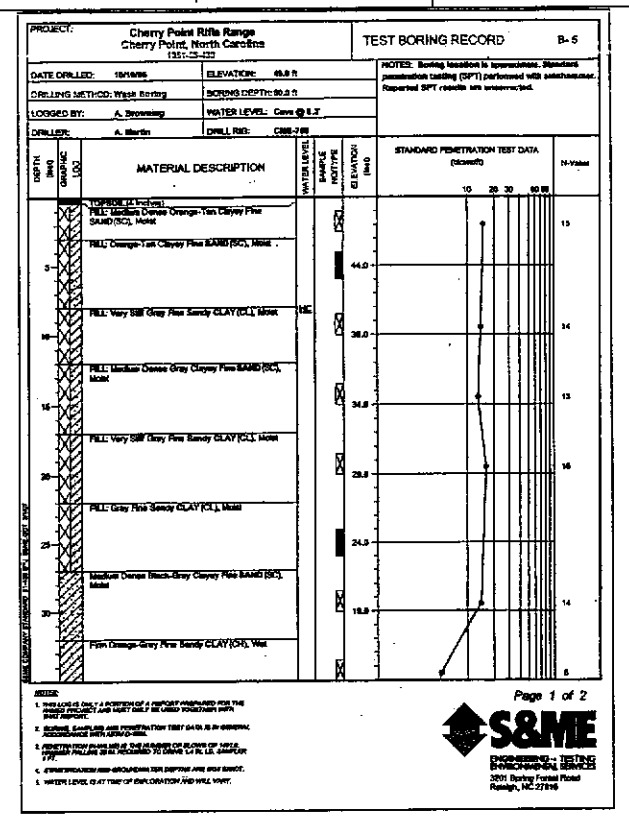
A/E	EFD
CHB	DESIGN
FVR	DRAWN
CHB	REVIEW
SDH	QC
CHB	CHIEF ARCH./ ENGR.
SDH	PROJECT MANAGER
	FIRE PROTECTION
	BRANCH MANAGER
	DESIGN DIRECTOR

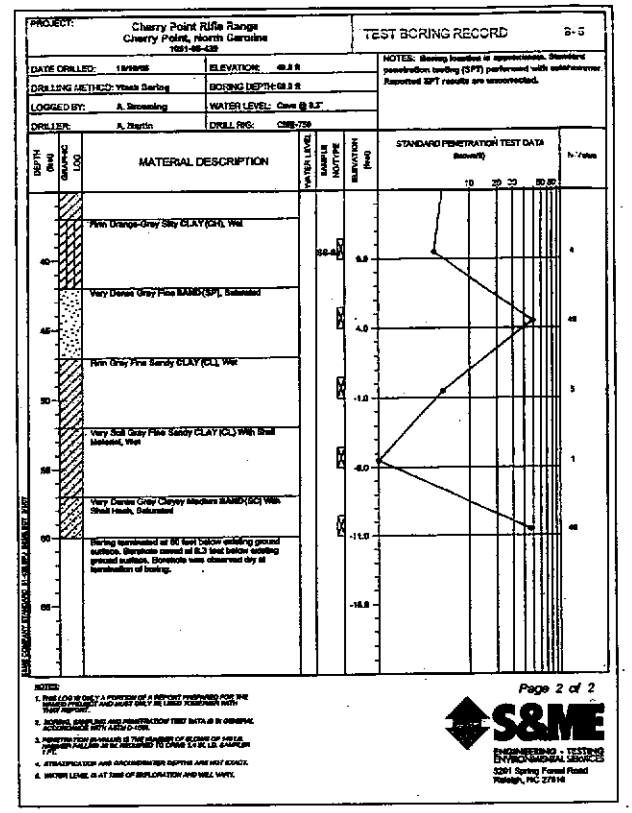
NAVAL FACILITIES ENGINEERING COMMAND
DEPARTMENT OF THE NAVY
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

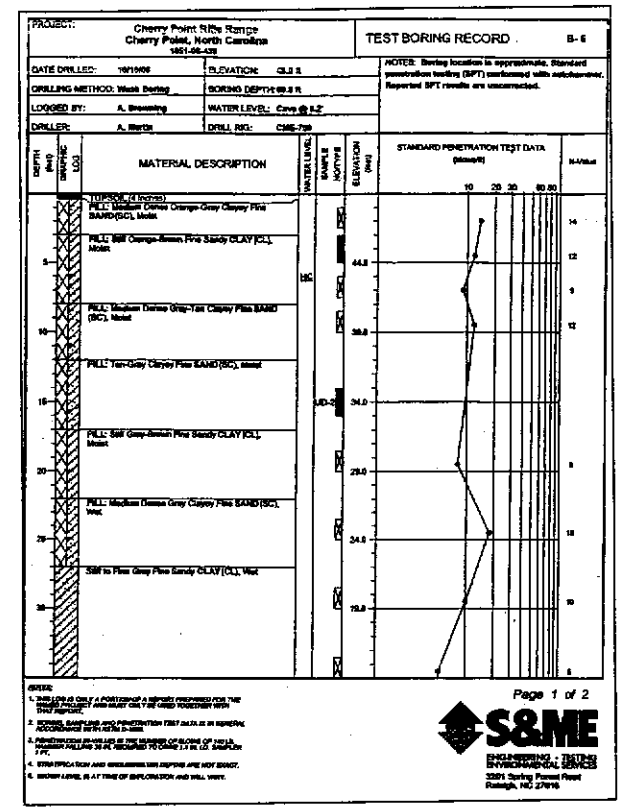
REPAIR IMPACT BERM

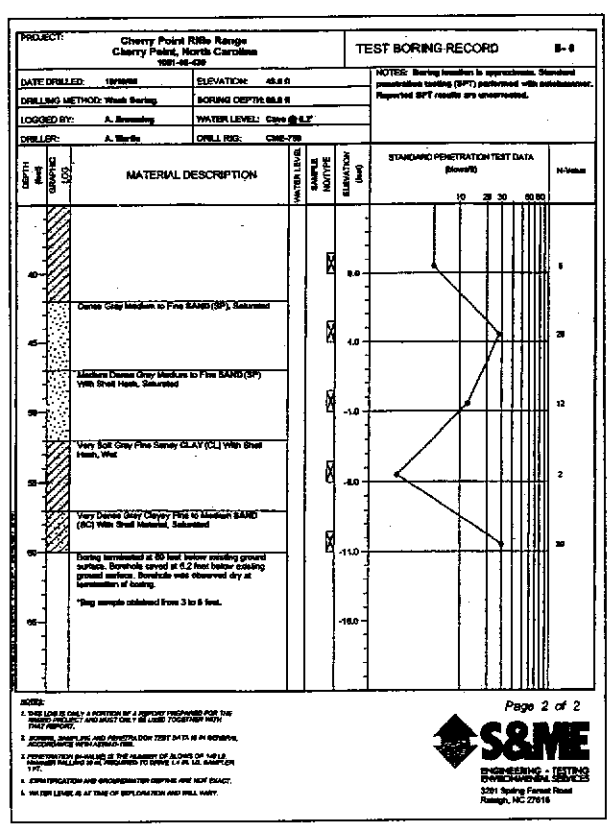
SOIL BORING LOGS

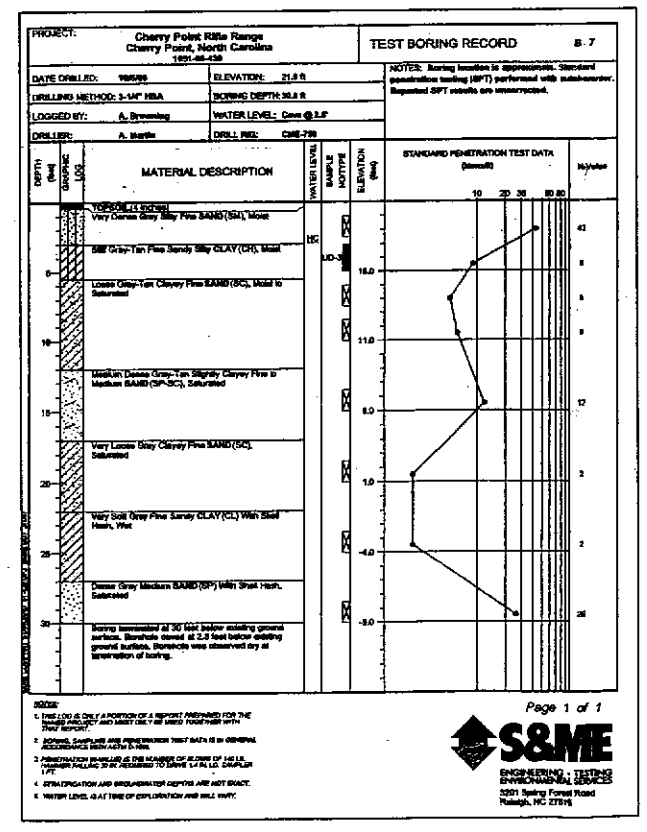
CODE ID. NO. | SIZE D
SCALE: AS SHOWN
FILE NO.
ST. PRJ. NO.
SPEC. NO.
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12505564
SHEET 3 OF 17
G–03

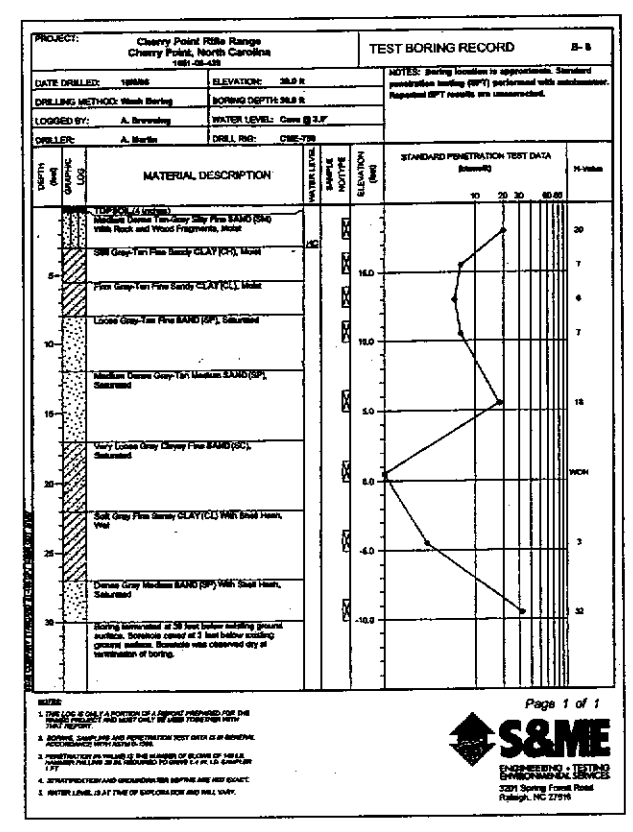












NOTES:

1. BORINGS PERFORMED BY S&ME, INC. BORING & EARTHWORK INFORMATION FROM "SUBSURFACE EXPLORATION REPORT – PROPOSED RIFLE RANGE BERM MODIFICATIONS – PROJECTS CP99019M AND CP0719R – MARINE CORPS AIR STATION – CHERRY POINT, NORTH CAROLINA – S&ME PROJECT NO. 1051-06-439" DATED FEBRUARY 2, 2007.
2. SEE DRAWING C-01 FOR LOCATIONS OF BORINGS.

⚠ NO CHANGES.

SYM.	DESCRIPTION	DATE	APPR.
	CLIENT REQUESTED REVISIONS	9/06	CHB

Dewberry

APPROVED

ACTIVITY – SATISFACTORY TO

DATE

APPROVED

FOR CO FOR COMMANDER NAVFAC

DATE

	AVE	STD
CHB	DESIGN	
FVR	DRAWN	
CHB	REVIEW	
SDH	QC	
CHB	CHIEF ARCH./ ENGR.	

PROJECT MANAGER SDH

FIRE PROTECTION

BRANCH MANAGER

DESIGN DIRECTOR

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

SOIL BORING LOGS

CODE ID. NO. | SIZE D

SCALE: AS SHOWN

FILE NO.

ST. PRJ. NO.

SPEC. NO.

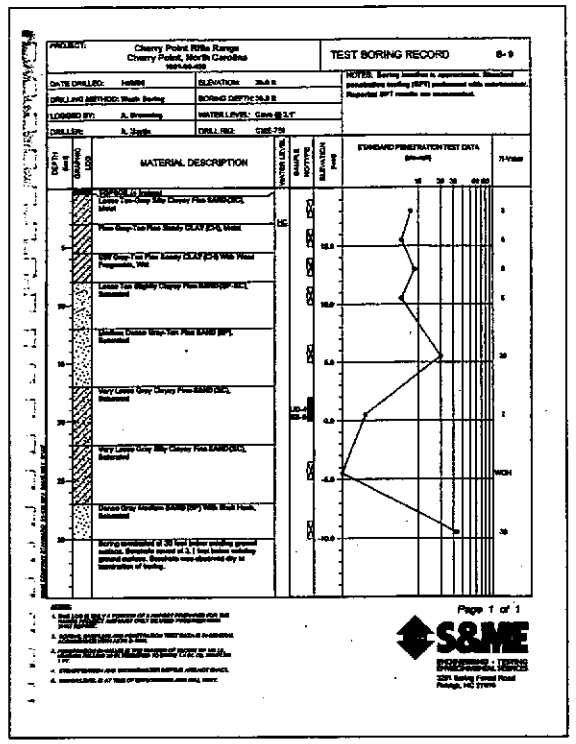
CONSTR. CONTR. NO.

NAVFAC DRAWING NO. 12505655

SHEET 4 OF 17

G-04

FILE NAME: 12505655.dwg PLOT SCALE: 1"=1" (PAPER SPACE)



NOTES:

1. BORINGS PERFORMED BY S&ME, INC. BORING & EARTHWORK INFORMATION FROM "SUBSURFACE EXPLORATION REPORT – PROPOSED RIFLE RANGE BERM MODIFICATIONS – PROJECTS CP980019M AND CP0719R – MARINE CORPS AIR STATION – CHERRY POINT, NORTH CAROLINA – S&ME PROJECT NO. 1051–06–439" DATED FEBRUARY 2, 2007.
2. SEE DRAWING C–01 FOR LOCATIONS OF BORINGS.

SYM.	DESCRIPTION	DATE	APPR
	CLIENT REQUESTED REVISIONS	9/08	CHB

Dewberry

APPROVED
ACTIVITY – SATISFACTORY TO
DATE
APPROVED
FOR BID FOR COMMANDER NAVFAC
DATE

A/E	BID
CHB	DESIGN
FVR	DRAWN
CHB	REVIEW
SDH	QC
CHB	CHIEF ARCH./ ENGR.
SDH	PROJECT MANAGER
	FIRE PROTECTION
	BRANCH MANAGER
	DESIGN DIRECTOR

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

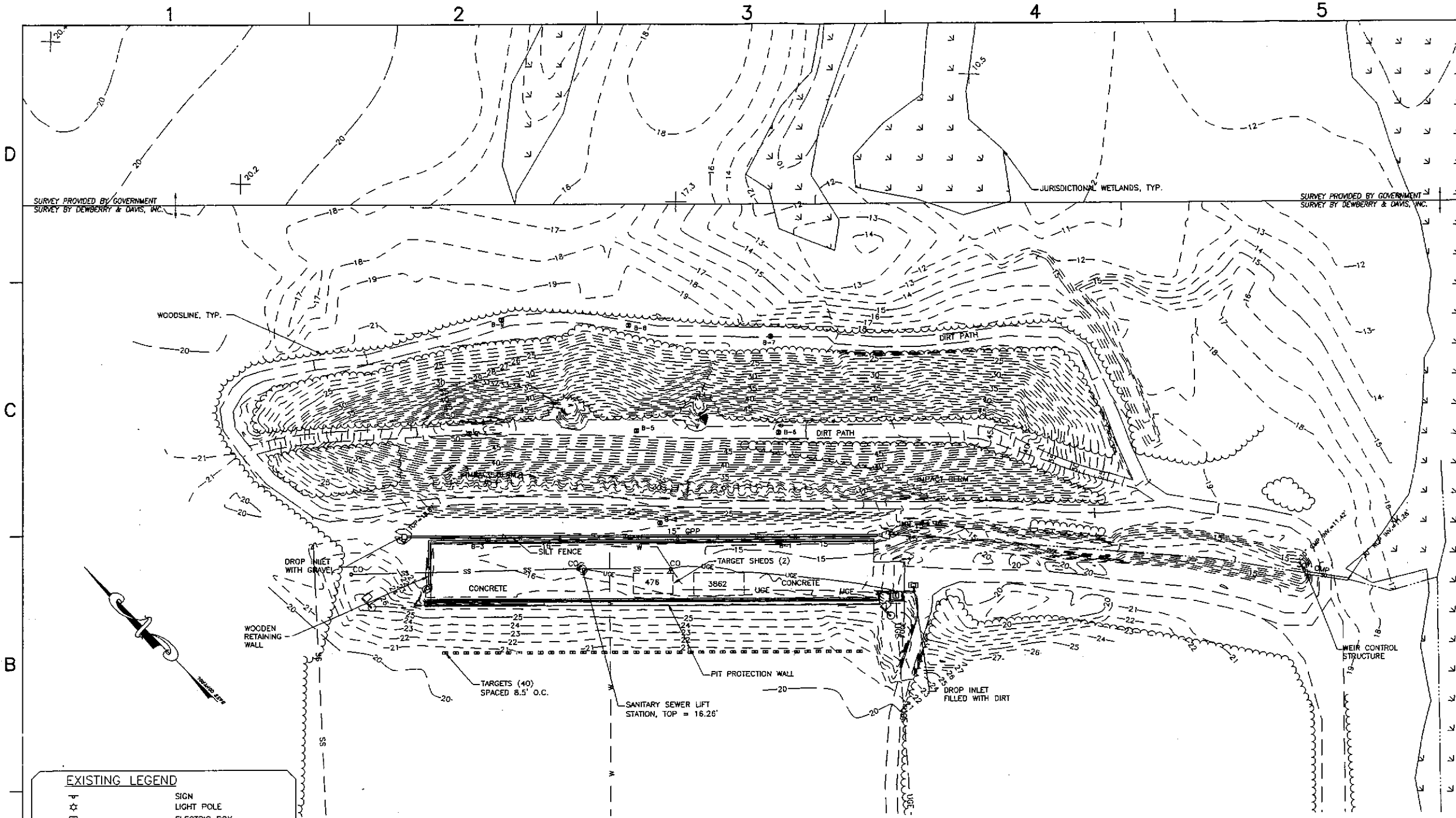
REPAIR IMPACT BERM

SOIL BORING LOGS

CODE ID. NO. | SIZE D
SCALE: AS SHOWN
FILE NO.
ST. PRJ. NO.
SPEC. NO.
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12505656
SHEET 5 OF 17

G–05

FILE NAME: 12505656.dwg PLOT SCALE: 1"=1" (PAPER SPACE)



EXISTING LEGEND

	SIGN
	LIGHT POLE
E	ELECTRIC BOX
CO	CLEAN OUT
S	SANITARY MANHOLE
	FLARED END SECTION
CPP	CORRUGATED PLASTIC PIPE
CMP	CORRUGATED METAL PIPE
RCP	REINFORCED CONCRETE PIPE
	PATH OR TRAIL
	EDGE OF GRAVEL
UGE	BURIED ELECTRIC
SS	SEWER
	FENCE
	TREE LINE
	JURISDICTIONAL WETLANDS
B-X	SOIL BORING LOCATION

NOTES:

1. SURVEY BY DEWBERRY & DAVIS, INC. DATED OCTOBER 17, 2006. SURVEY HAS BEEN SUPPLEMENTED WITH TOPOGRAPHICAL DATA PROVIDED BY THE GOVERNMENT.
2. HORIZONTAL AND VERTICAL DATUM PROVIDED BY CHERRY POINT MCAS, BASED ON MONUMNETS "23-93" AND "24-93" WITH GIVEN COORDINATES AS FOLLOWS:

   MONUMENTS "23-93" N=430214.52 E=2636142.30 ELEV=23.87'
   MONUMENTS "24-93" N=431074.62 E=2636047.70 ELEV=24.71'
3. CONTOUR INTERVALS ARE 1 FOOT.
4. WETLANDS DATA BASED ON INFORMATION PROVIDED BY MCAS CHERRY POINT. WETLANDS INDICATE US ARMY CORPS OF ENGINEERS JURISDICTIONAL WETLANDS.
5. BORINGS PERFORMED BY S&ME, INC. BORING INFORMATION FROM "SUBSURFACE EXPLORATION REPORT – PROPOSED RIFLE RANGE BERM MODIFICATIONS – MARINE CORPS AIR STATION – CHERRY POINT, NORTH CAROLINA – S&ME PROJECT NO. 1051-06-439".

△1 TOPOGRAPHY REVISED.

GRAPHIC SCALE: 1" = 40'
0' 20' 40' 80'
1 INCH = 40 FT.

FILE NAME: 12505657.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

SYM.	DESCRIPTION	DATE	APPR
△1	CLIENT REQUESTED REVISIONS	9/08	CHB

Dewberry
Dewberry & Davis, Inc.

NORTH CAROLINA PROFESSIONAL SEAL 15370 ENGINEER CHRISTOPHER HOWARD BROWN

APPROVED
ACTIVITY – SATISFACTORY TO
DATE
APPROVED
FOR EFD FOR COMMANDER AMFAC
DATE

A/E	EFD
CHB	DESIGN
FVR	DRAWN
CHB	REVIEW
SDH	QC
CHB	CHIEF ARCH./ ENGR.
PROJECT MANAGER	SDH
FIRE PROTECTION	
BRANCH MANAGER	
DESIGN DIRECTOR	

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

EXISTING CONDITIONS

CODE ID. NO. | SIZE D
SCALE: AS SHOWN
FILE NO.
ST. PRJ. NO.
SPEC. NO.
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12505657
SHEET 6 OF 17

C-01

SURVEY PROVIDED BY GOVERNMENT
SURVEY BY DEWBERRY & DAVIS, INC.

JURISDICTIONAL WETLANDS, TYP.

LIMITS OF CONSTRUCTION

DO NOT ENCROACH INTO ANY JURISDICTIONAL WETLAND AREAS

CLEAR AND GRUB

COMPOSITE SOIL SAMPLE AREA

SOIL REMOVAL AREA

WOODSLINE, TYP.

DIRT PATH

SOIL SAMPLE POINT LOCATION

N 431175.460
E 2638058.5715

REMOVE SILT FENCE

REMOVE 18" CMP & GRAVEL BED

CONCRETE

SOIL PROCESSING AREA

TARGET SHEDS (2)

476

3862

REMOVE WOODEN RETAINING WALL

P/I PROTECTION WALL

REMOVE DROP INLET, CONCRETE, AND STORM DRAINAGE PIPE

DROP INLET FILLED WITH DIRT

WEIR CONTROL STRUCTURE

DROP INLET WITH GRAVEL

REMOVE DROP INLET & GRAVEL

WOODEN RETAINING WALL

REMOVE WOODEN RETAINING WALL

TARGETS (40) SPACED 8.5' O.C.

SANITARY SEWER LIFT STATION, TOP = 16.26'
DO NOT DISTURB SANITARY SEWER LIFT STATION

GRAPHIC SCALE: 1" = 40'

0' 20' 40' 80'

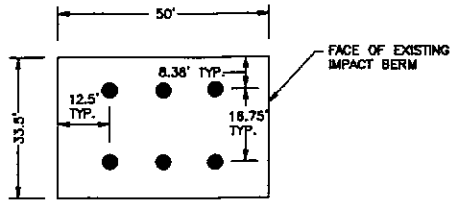
1 INCH = 40 FT.

NEW WORK LEGEND

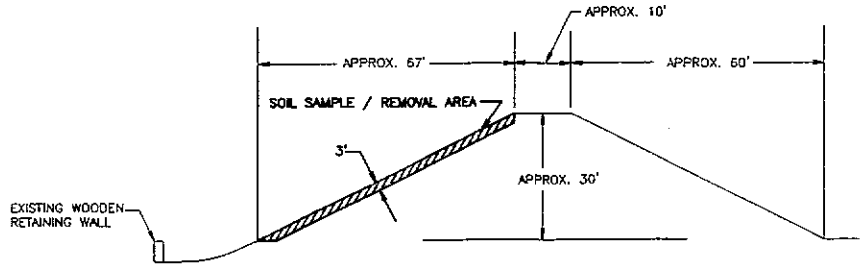
- DEMOLISH
- LIMITS OF CONSTRUCTION
- SOIL REMOVAL AREA
- SOIL SAMPLE POINT LOCATION
- SS-X COMPOSITE SOIL SAMPLE AREA

NOTES:

1. SOIL SAMPLE LOCATIONS AND REMOVAL AREA BASED ON "ENVIRONMENTAL SAMPLING AND ANALYSIS PLAN – PROPOSED RIFLE RANGE BERM MODIFICATIONS – MARINE CORPS AIR STATION – CHERRY POINT, NORTH CAROLINA – S&ME PROJECT NO. 1051-06-439" DATED FEBRUARY 2, 2007.
2. SIX INDIVIDUAL SOIL SAMPLES SHALL BE COLLECTED FROM WITHIN EACH OF THE FOURTEEN COMPOSITE SOIL SAMPLE AREAS (SS-1 TO SS-14). THE INDIVIDUAL SAMPLES SHALL BE COLLECTED FROM APPROXIMATELY 6-INCHES UP TO 3 FEET BELOW GROUND SURFACE. THE SIX SAMPLES FROM EACH COMPOSITE SOIL SAMPLE AREA SHALL BE SCREENED TO SEPARATE LEAD SHOT FROM SOIL AND THEN COMBINED TO FORM ONE REPRESENTATIVE COMPOSITE SOIL SAMPLE FOR EACH OF THE FOURTEEN COMPOSITE AREAS. THERE SHALL BE A TOTAL OF FOURTEEN SAMPLES PREPARED AND SUBMITTED TO A CERTIFIED LABORATORY FOR ANALYSIS.
3. ALL SOIL WITHIN DESIGNATED SOIL REMOVAL AREA, SHALL BE REMOVED TO A DEPTH OF 3' FROM EXISTING BERM SURFACE AND MINED FOR LEAD. LEAD SHALL BE MINED IN THE SOIL PROCESSING AREAS.



TYPICAL COMPOSITE SOIL SAMPLE AREA
N.T.S.



EXISTING IMPACT BERM TYPCIAL CROSS SECTION
N.T.S.

⚠ TOPOGRAPHY AND CLEARING LIMITS REVISED.

FILE NAME: 12505658.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

STM.	CLIENT REQUESTED REVISIONS DESCRIPTION	DATE	APPR
1		9/06	CHB

Dewberry

Dewberry & Davis, Inc.

NORTH CAROLINA PROFESSIONAL SEAL 15378 ENGINEER CHRISTOPHER HOWARD BROWN
05.11.08

APPROVED

ACOMY – SATISFACTORY TO

DATE

APPROVED

FOR EFD FOR COMMANDER NAVFAC

DATE

A/E	EFD
CHB	DESIGN
FVR	DRAWN
CHB	REVIEW
SDH	QC
CHB	CHIEF ARCH./ ENGR.

PROJECT MANAGER SDH
FIRE PROTECTION
BRANCH MANAGER
DESIGN DIRECTOR

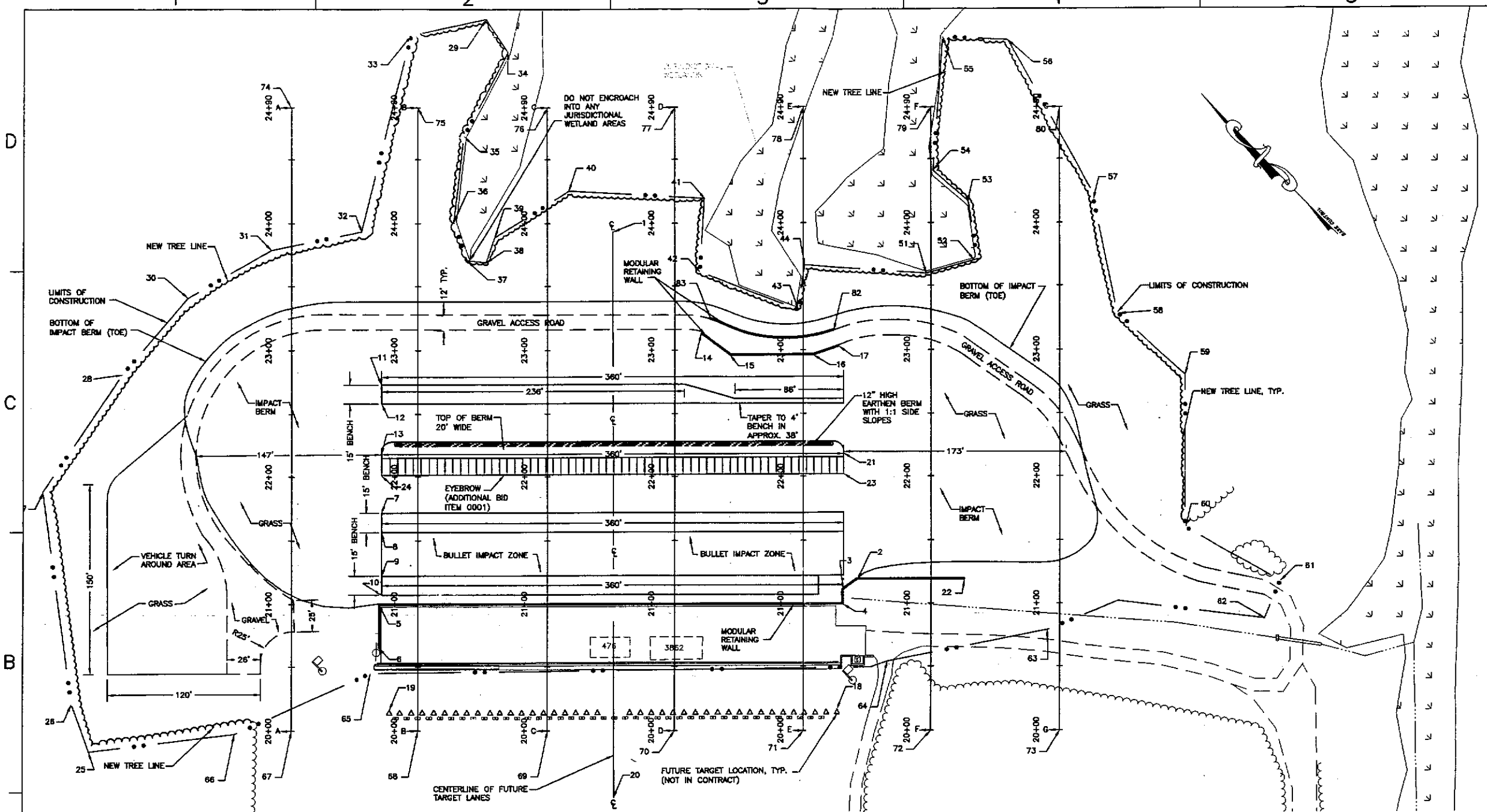
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

DEMOLITION PLAN & LEAD MINING PLAN

CODE ID. NO. SIZE D
SCALE: AS SHOWN
FILE NO.
EC. FILE NO.
SPEC. NO.
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12505658
SHEET 7 OF 17

C-02



LEGEND

- LIMITS OF CONSTRUCTION
- LIMITS OF NEW IMPACT BERM
- LIMITS OF NEW GRAVEL ROADWAY
- △ FUTURE TARGET LOCATION

NOTES:

1. SEE SHEETS C-07 AND C-08 FOR IMPACT BERM CROSS SECTIONS A-A THROUGH G-G.
2. SEE SHEET C-09 FOR TYPICAL IMPACT BERM CROSS SECTIONS.
3. ALL UTILITIES NOT SHOWN FOR CLARITY.

POINT TABLE

POINT #	NORTHING	EASTING
1	431395.6160	2638083.3798
2	431088.0181	2638029.2628
3	431068.2109	2638015.3003
4	431059.8628	2638007.1623
5	431313.0789	2637748.8393
6	431287.9240	2637724.3310
7	431362.5505	2637800.2339
8	431351.8095	2637789.7634
9	431327.2486	2637765.8208
10	431316.5076	2637755.3502
11	431435.3025	2637871.1544
12	431424.5615	2637860.6838
13	431395.7042	2637832.5530
14	431290.2843	2638078.4108
15	431262.7748	2638080.7720
16	431217.0434	2638127.6845
17	431208.0233	2638147.0461
18	431003.7391	2637945.6268
19	431247.0046	2637696.0608
20	431078.1586	2637773.0792

POINT TABLE

POINT #	NORTHING	EASTING
21	431144.8202	2638090.5254
22	431008.4727	2638088.0305
23	431132.9019	2638079.1315
24	431383.8752	2637821.0377
25	431389.1919	2637503.8715
26	431424.9251	2637520.1782
27	431560.6868	2637621.0933
28	431584.0580	2637730.3931
29	431584.1032	2638128.4054
30	431590.6477	2637808.7242
31	431572.1929	2637882.1249
32	431532.2248	2637944.0264
33	431614.9774	2638078.4810
34	431583.4374	2638122.5697
35	431530.5560	2638052.3971
36	431488.3231	2638000.0883
37	431459.2760	2637986.1142
38	431447.8944	2637995.3290
39	431457.3698	2638014.0436
40	431443.1377	2638081.2556

POINT TABLE

POINT #	NORTHING	EASTING
41	431365.0306	2638152.7976
42	431325.5529	2638109.3572
43	431250.4850	2638143.6013
44	431272.3363	2638171.9737
45	NOT USED	NOT USED
46	NOT USED	NOT USED
47	NOT USED	NOT USED
48	NOT USED	NOT USED
49	NOT USED	NOT USED
50	NOT USED	NOT USED
51	431200.7837	2638235.4264
52	431181.5492	2638271.4239
53	431219.2398	2638297.4453
54	431255.3461	2638295.9546
55	431324.7300	2638374.1008
56	431287.6907	2638406.5508
57	431152.0944	2638389.1341
58	431074.7178	2638320.0252
59	431003.0950	2638323.9331
60	430915.9019	2638239.8198

POINT TABLE

POINT #	NORTHING	EASTING
61	430834.4356	2638263.6954
62	430821.9149	2638233.9917
63	430934.3822	2638106.8572
64	431002.6211	2638000.6793
65	431277.9390	2637705.4762
66	431319.3267	2637595.1566
67	431289.7502	2637628.9942
68	431219.9466	2637700.6005
69	431150.1430	2637772.2068
70	431080.3394	2637843.8130
71	431010.5358	2637915.4193
72	430940.7322	2637987.0256
73	430870.9288	2638058.6318
74	431640.6209	2637971.0319
75	431570.8173	2638042.6381
76	431501.0137	2638114.2444
77	431431.2101	2638185.8507
78	431361.4065	2638257.4569
79	431291.6029	2638329.0632
80	431221.7993	2638400.6695

△ CLEARING LIMITS REVISED.

GRAPHIC SCALE: 1" = 40'
0' 20' 40' 80'
1 INCH = 40 FT.

FILE NAME: 12505659.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

△	CLIENT REQUESTED REVISIONS DESCRIPTION	9/08 DATE	CHB APPR

Dewberry

NORTH CAROLINA PROFESSIONAL SEAL 15378 ENGINEER CHRISTOPHER HOWARD BRUNN

APPROVED
ACCEPT - SATISFACTORY TO
DATE
APPROVED
FOR D/O FOR COMMENT MATRIX
DATE

A/E		EFD
CHB	DESIGN	
FVR	DRAWN	
CHB	REVIEW	
SDH	QC	
CHB	CHIEF ARCH./ ENGR.	

PROJECT MANAGER SDH
FIRE PROTECTION
BRANCH MANAGER
DESIGN DIRECTOR

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

SITE PLAN

CODE IS. NO. SIZE D
SCALE: AS SHOWN
FILE NO.
ST. PLN. NO.
SPEC. NO.
CONSTR. CONTR. NO.
MANTAC DRAWING NO. 12505659
SHEET 8 OF 17

C-03

LEGEND

- LIMITS OF CONSTRUCTION
- STORM DRAINAGE
- + XX.XX' NEW SPOT SHOT
- △ FUTURE TARGET LOCATION
- SWALE
- DIVERSION CHANNEL

NOTES:

1. SEE DRAWINGS C-05 AND C-06 FOR LOCATION OF SEDIMENT AND EROSION CONTROL DEVICES.
2. PROVIDE MINIMUM 3' OF COVER ON 4" CPP. ALL FITTINGS NOT SHOWN.
3. ALL UTILITIES NOT SHOWN FOR CLARITY.
4. EYEBROW NOT SHOWN FOR CLARITY.
5. DROP INLET (DI) – NCDOT STANDARD 840.14
6. STORM DRAIN MANHOLE (MH) – NCDOT STANDARD 840.52
7. SEE SHEET C-11 FOR STORM DRAINAGE SCHEDULE. ALL PIPES NOT LABELED AS P-X SHALL BE 12" CORRUGATED PLASTIC PIPE. OTHER PIPE SIZES AND INFORMATION ARE SHOWN ON STORM DRAINAGE SCHEDULE.

GRAPHIC SCALE: 1" = 40'

0' 20' 40' 80'

1 INCH = 40 FT.

KEYED NOTE:

1. OPEN STRAIGHT PIPE OUTLET SIMILAR TO TOP OF SLOPE DRAIN PREFABRICATED T-SECTION.

INSET B SCALE: 1" = 20'

INSET A SCALE: 1" = 20'

SWALES ADDED TO NORTHEAST OF BERM. ADDITIONAL STORM DRAINAGE ADDED.
SPOT SHOTS REMOVED FROM INSET A.

FILE NAME: 12505680.dwg PLOT SCALE: 1"=1' (PAPER SPACE)

DESCRIPTION	DATE	APPR.
CONTRACTOR INQUIRIES	5/06	CHB
CLIENT REQUESTED REVISIONS	9/06	CHB

Dewberry

NORTH CAROLINA PROFESSIONAL SEAL 15370 ENGINEER CHRISTOPHER HUGHES BOWN

APPROVED

SIGNATURE – SUBMITTED TO

DATE

APPROVED

FOR BID FOR CONTRACTOR USE

A/E DFD

CHB DESIGN

EVG DRAWN

CHB REVIEW

SDH QA

CHB QUALITY CONTROL

PROJECT MANAGER SDH

PROJECT ENGINEER

SERVICE MANAGER

DESIGN DIRECTOR

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

GRADING & DRAINAGE PLAN

CODE ID. NO. SIZE D

SCALE AS SHOWN

FEC NO.

N. FIL. NO.

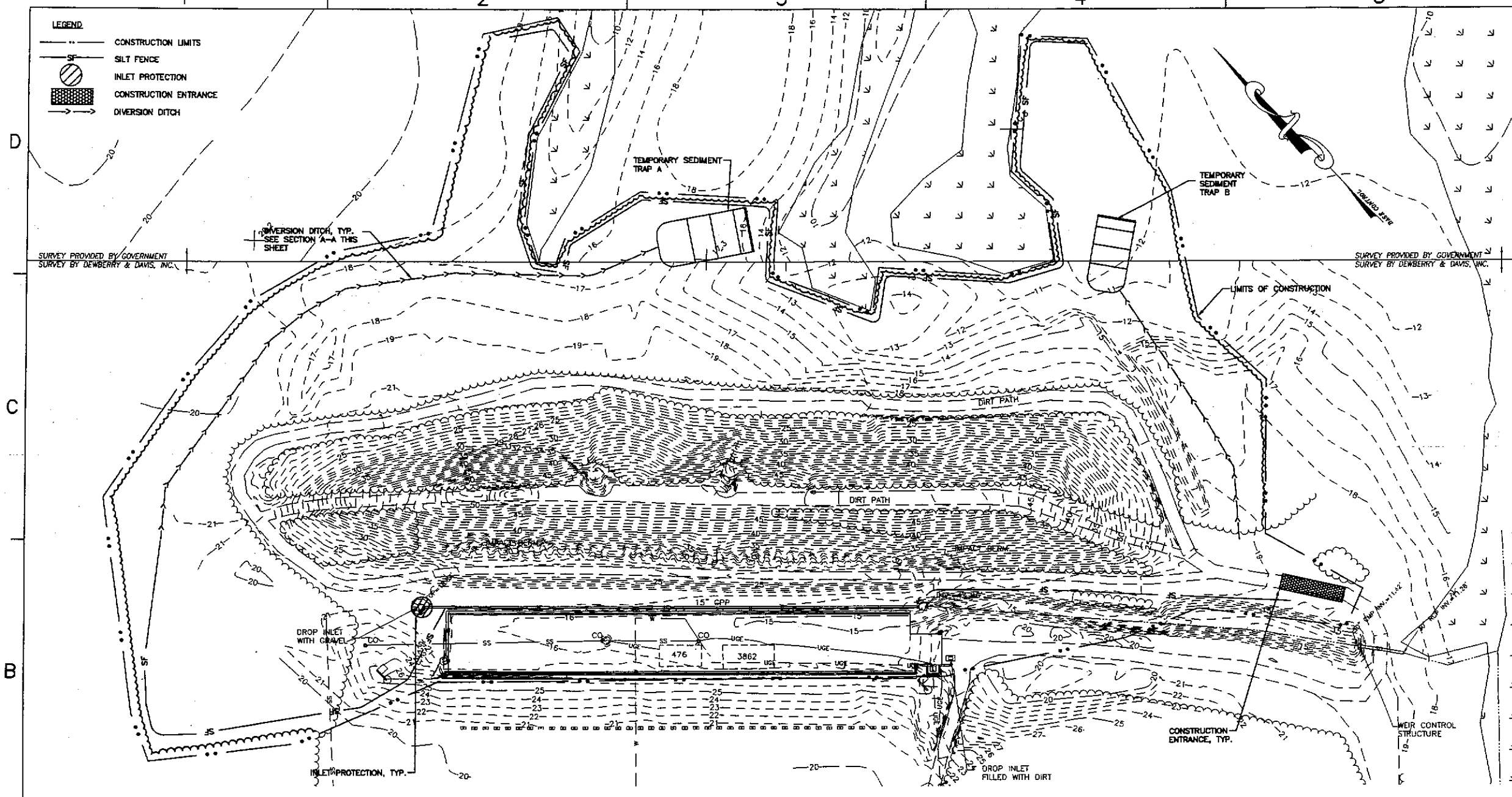
SPEC. NO.

CONTR. CONTL. NO.

NAVFAC DRAWING NO. 12505680

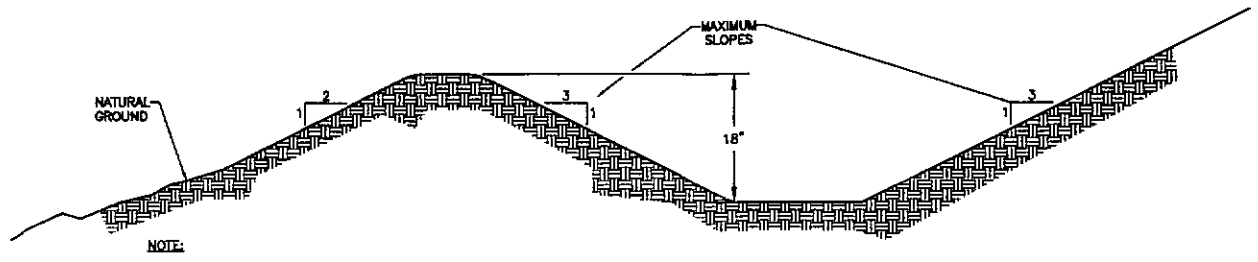
DATE 9 07 17

C-04



NOTES:

1. DISTURBED AREA = 7.05 AC
2. SEE SHEET G-02 FOR EROSION AND SEDIMENT CONTROL CONSTRUCTION SEQUENCE.
3. CONTRACTOR SHALL MAINTAIN EROSION CONTROL FEATURES IN ACCORDANCE WITH NORTH CAROLINA EROSION CONTROL MANUAL.
4. EYEBROW NOT SHOWN FOR CLARITY.



NOTE:

1. CONTRACTOR SHALL VEGETATE THE RIDGE IMMEDIATELY AFTER CONSTRUCTION UNLESS IT WILL REMAIN IN PLACE MORE THAN 30 WORKING DAYS.
2. SEED AND MULCH ALONG ENTIRE LENGTH OF ALL DITCHES AND ASSOCIATED RIDGE.

TYPICAL DIVERSION DITCH (SECTION A-A)
NTS

CHANNEL NO.	LINING TYPE	MINIMUM SHEER STRESS LB / FT SQ
1	NO LINING REQUIRED	N/A
2	STRAW W/ NET LINING	1.5

GRAPHIC SCALE 1" = 40'
0' 20' 40' 80'
1 INCH = 40 FT.

△1 CLEARING LIMITS REVISED.

FILE NAME: 12505661.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

SYM.	DESCRIPTION	DATE	APPR
△1	CLIENT REQUESTED REVISIONS	9/08	CHB

Dewberry
Dewberry & Davis, Inc.

NORTH CAROLINA PROFESSIONAL SEAL 15376 ENGINEER CHRISTOPHER HOWARD BROWN

APPROVED
ACTIVITY - SATISFACTORY TO
DATE
APPROVED
FOR LTD FOR COMMANDER NAVFAC
DATE

A/E		DFB
CHB	DESIGN	
FVR	DRAWN	
CHB	REVIEW	
SDH	QC	
CHB	CHIEF ARCH./ ENGR.	
PROJECT MANAGER	SDH	
FIRE PROTECTION		
BRANCH MANAGER		
DESIGN DIRECTOR		

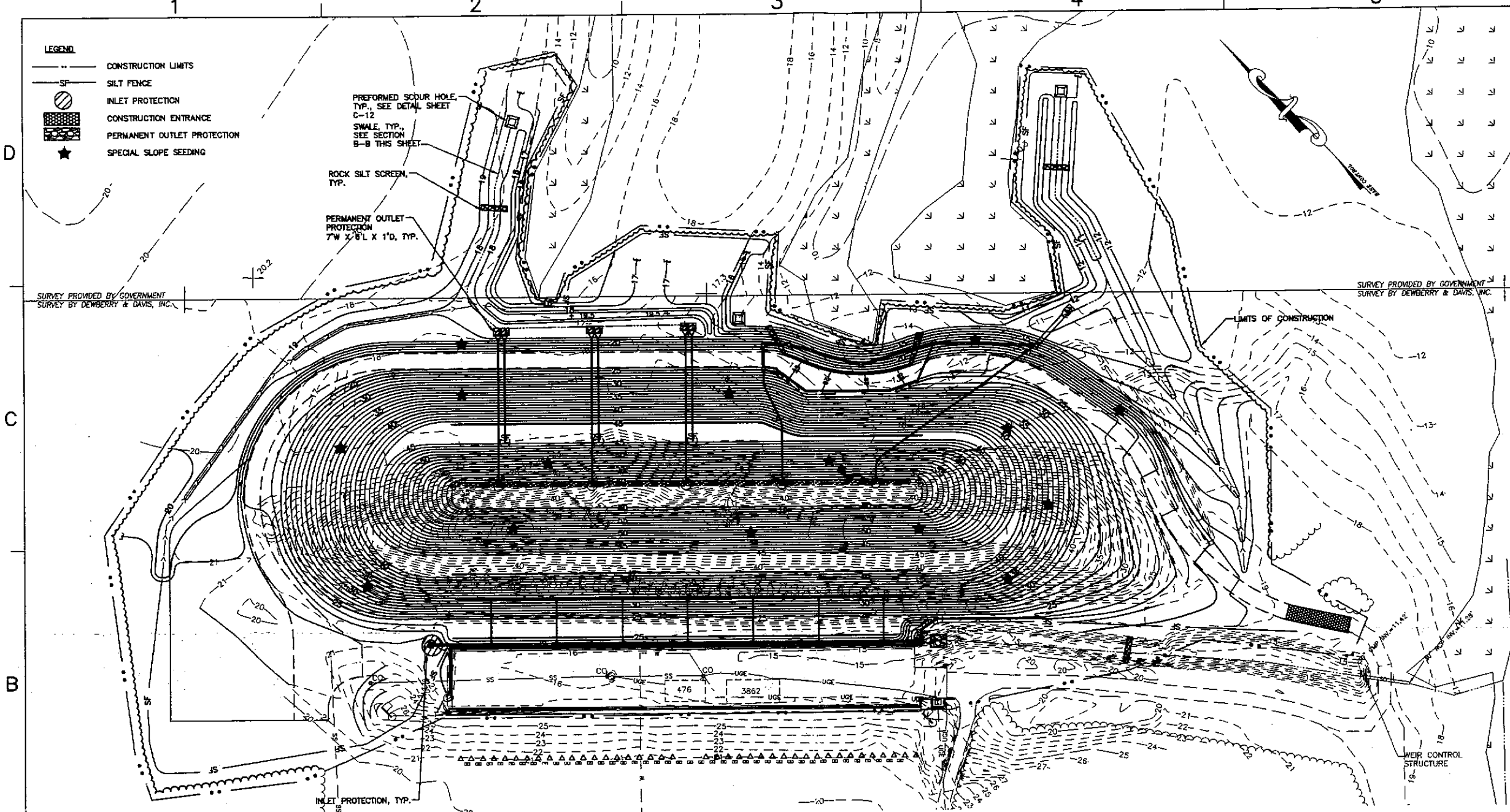
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

PHASE I EROSION CONTROL PLAN

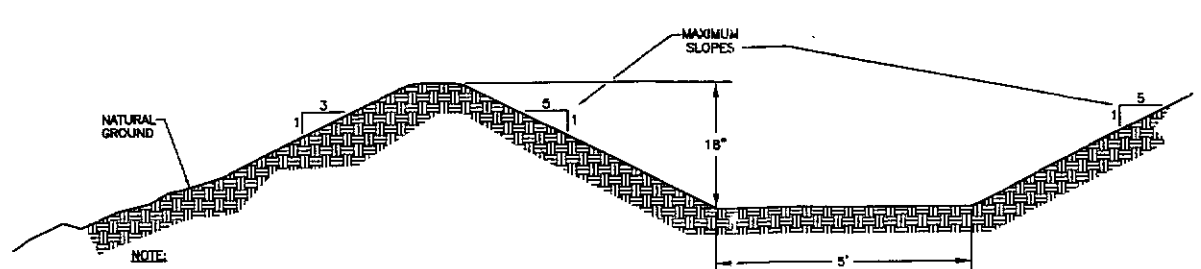
CODE ID. NO. SIZE D
SCALE: AS SHOWN
FILE NO.
ST. PAU. NO.
SPEC. NO.
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12505661
SHEET 10 OF 17

C-05



NOTES:

1. DISTURBED AREA = 7.05 AC
2. SEE SHEET G-02 FOR EROSION AND SEDIMENT CONTROL CONSTRUCTION SEQUENCE.
3. CONTRACTOR SHALL MAINTAIN EROSION CONTROL FEATURES IN ACCORDANCE WITH NORTH CAROLINA EROSION CONTROL MANUAL.
4. EYEBROW NOT SHOWN FOR CLARITY.



NOTE:

1. CONTRACTOR SHALL VEGETATE THE RIDGE IMMEDIATELY AFTER CONSTRUCTION.
2. SEED AND MULCH ALONG ENTIRE LENGTH OF ALL DITCHES AND ASSOCIATED RIDGE.

TYPICAL SWALE (SECTION B-B)
NTS

GRAPHIC SCALE: 1" = 40'
0' 20' 40' 80'
1 INCH = 40 FT.

⚠1 SWALES ADDED NORTHEAST OF BERM. ADDITIONAL STORM DRAINAGE ADDED.

FILE NAME: 12505662.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

SYM.	DESCRIPTION	DATE	APPR
1	CLIENT REQUESTED REVISIONS	9/08	CHB

Dewberry
Dewberry & Davis, Inc.

NORTH CAROLINA PROFESSIONAL SEAL 15370 ENGINEER CHRISTOPHER RICHARD BROWN

APPROVED
ACTIVITY - SATISFACTORY TO
DATE
APPROVED
FOR EFD FOR COMMANDER NAVFAC
DATE

A/E	EFD
CHB	DESIGN
FVR	DRAWN
CHB	REVIEW
SDH	QC
CHB	CHIEF ARCH./ ENGR.
PROJECT MANAGER	SDH
FIRE PROTECTION	
BRANCH MANAGER	
DESIGN DIRECTOR	

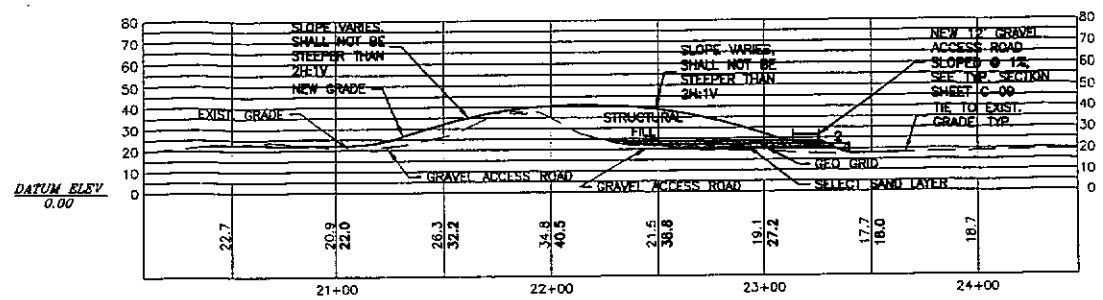
DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

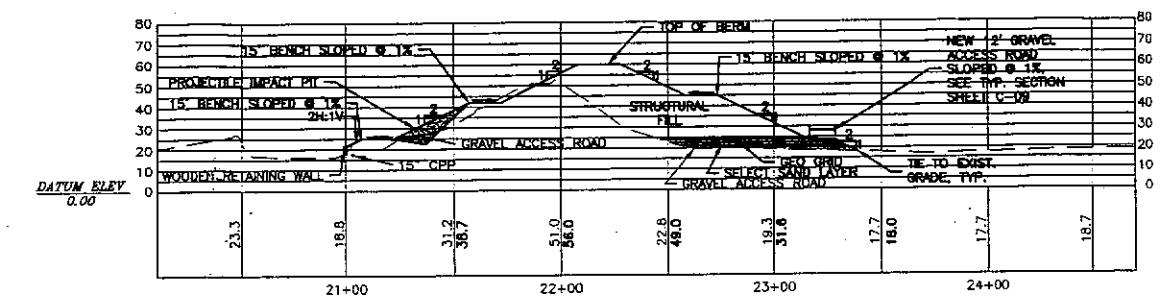
PHASE II EROSION CONTROL PLAN

CODE ID. NO. SIZE D
SCALE: AS SHOWN
FILE NO.
ST. PRL. NO.
SPEC. NO.
CONSTR. CONTR. NO.
NAVFAC DRAWING NO. 12505662
SHEET 11 OF 17

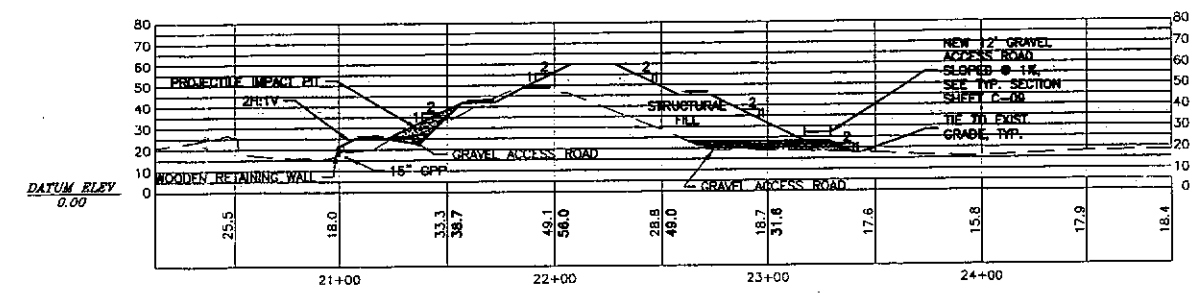
C-06



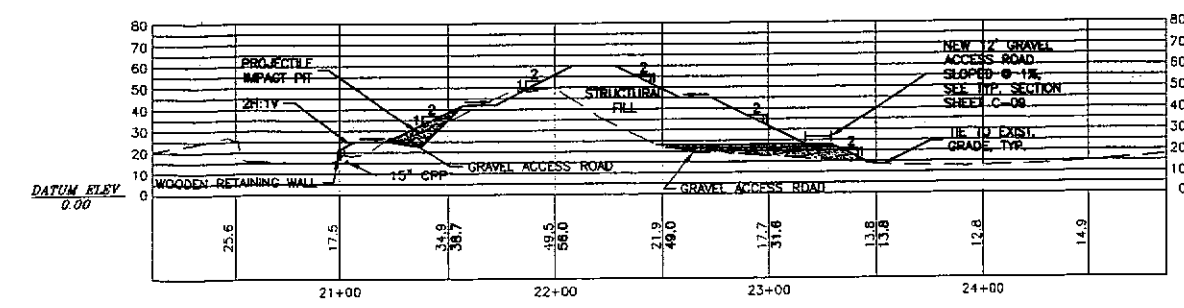
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

NOTE:

1. EYEBROW NOT SHOWN FOR CLARITY.

GRAPHIC SCALE: 1" = 40'

0' 20' 40' 80'

1 INCH = 40 FT.

⚠ NO CHANGES MADE TO SECTIONS. REFER TO OTHER DRAWINGS FOR NEW WORK CHANGES.

FILE NAME: 12505663.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

SYM.	CLIENT REQUESTED REVISIONS DESCRIPTION	DATE	CHB APPR

Dewberry

Dewberry & Davis, Inc.

NORTH CAROLINA PROFESSIONAL SEAL 25370 ENGINEER CHRISTOPHER HOWARD BROWN

APPROVED

ACTIVITY – SATISFACTORY TO

DATE

APPROVED

FOR EFD FOR COMMANDER NAVFAC

DATE

A/E	EFD
CHB	DESIGN
FVR	DRAWN
CHB	REVIEW
SDH	QC
CHB	CHIEF MECH./ ENGR.
PROJECT MANAGER	SDH
FIRE PROTECTION	
BRANCH MANAGER	
DESIGN DIRECTOR	

NAVAL FACILITIES ENGINEERING COMMAND

DEPARTMENT OF THE NAVY

MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

CROSS SECTIONS

CODE ID. NO. SIZE D

SCALE: AS SHOWN

FILE NO.

ST. PAL. NO.

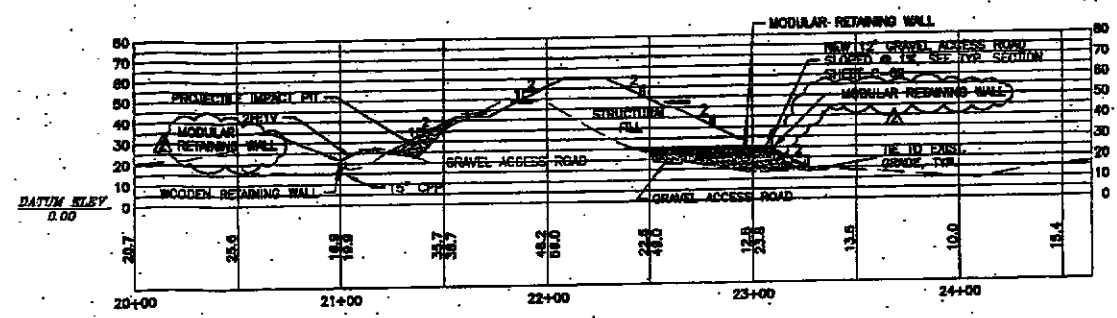
SPEC. NO.

CONSTR. CONTR. NO.

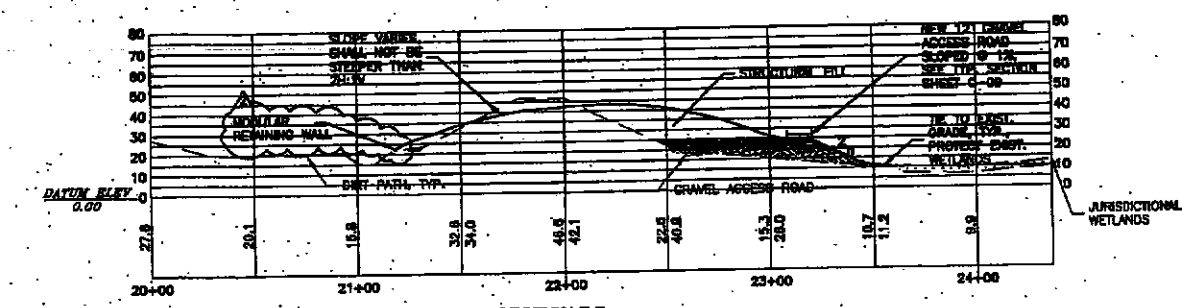
NAVFAC DRAWING NO. 12505663

SHEET 12 OF 17

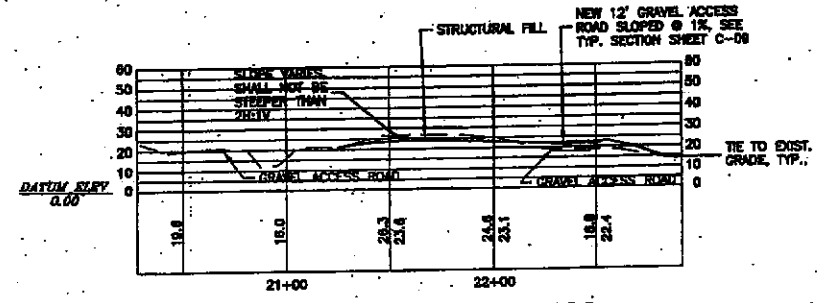
C-07



SECTION E-E



SECTION F-F



SECTION G-G

NOTE:

1. EYEBROW NOT SHOWN FOR CLARITY.

GRAPHIC SCALE: 1" = 40'

0' 20' 40' 80'

1 INCH = 40 FT.

⚠ NO CHANGES MADE TO SECTIONS. REFER TO OTHER DRAWINGS FOR NEW WORK CHANGES.

⚠ SECTIONS E-E AND F-F UPDATED TO SHOW NEW MODULAR RETAINING WALL LOCATIONS.

FILE NAME: 12505684.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

3	CONTRACTOR INQUIRIES	3/09	CHB
2	CLIENT REQUESTED REVISIONS	9/08	CHB
STAL	DESCRIPTION	DATE	APPR

Dewberry

NORTH CAROLINA PROFESSIONAL SEAL 15370 ENGINEER CHRIS BOYLE, JR. PE

03, 24, 09

A/E DFP

CHB
FVR
CHB
SDH
CHB

SDH

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

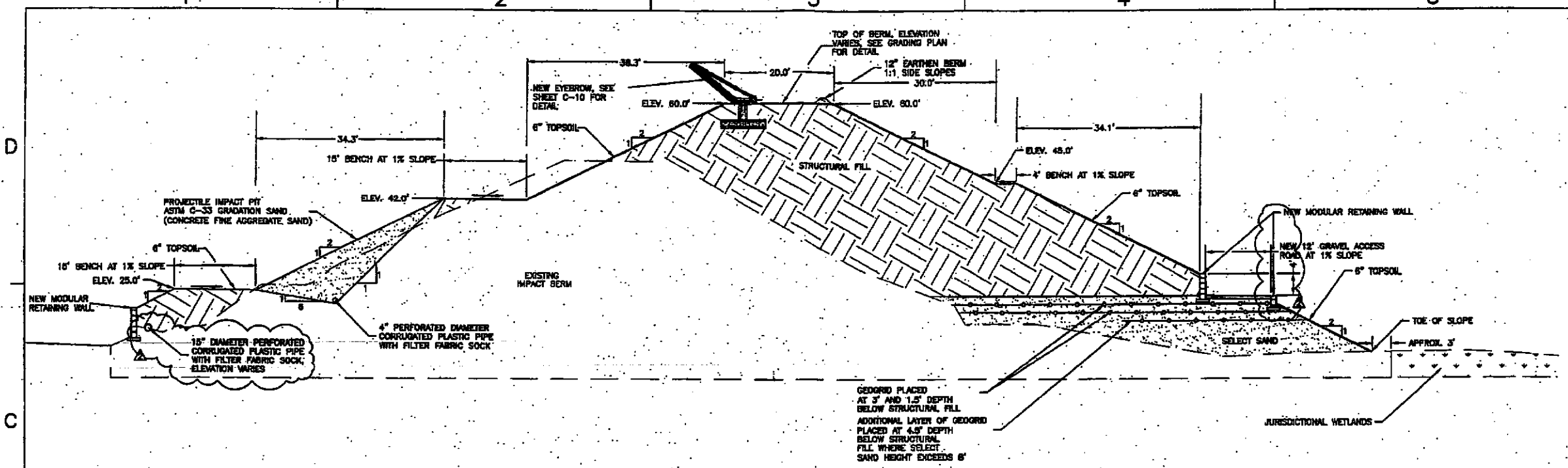
CROSS SECTIONS

SCALE AS SHOWN

12505684

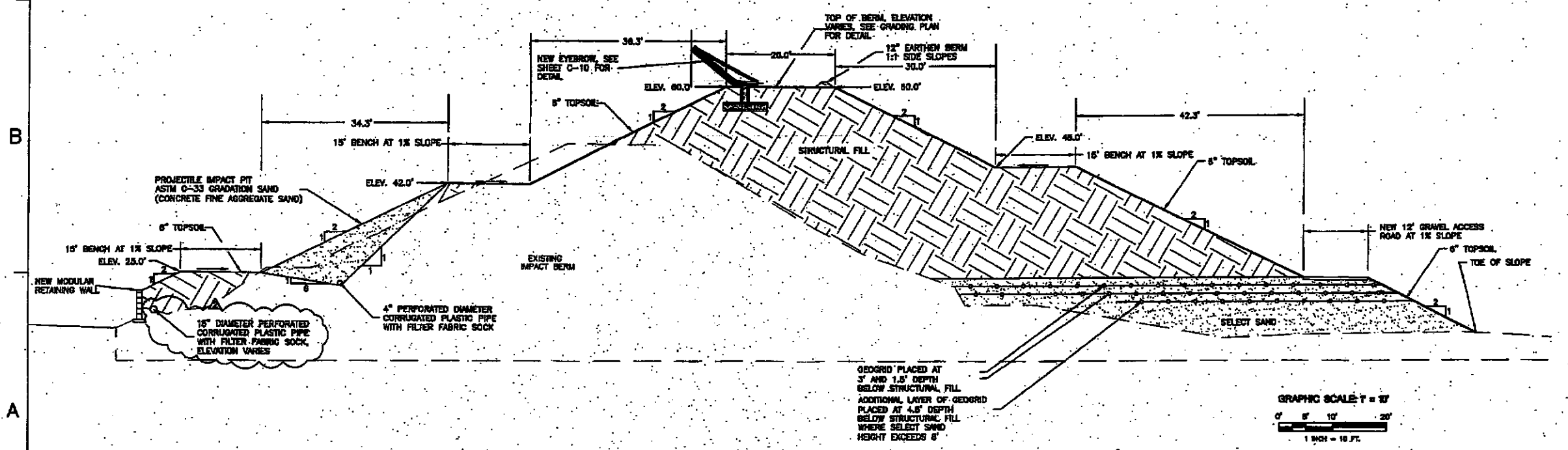
SHEET 13 OF 17

C-08



TYPICAL EMBANKMENT SECTION WITH RETAINING WALL

SCALE: 1" = 10'



TYPICAL EMBANKMENT SECTION WITHOUT RETAINING WALL

SCALE: 1" = 10'

△1 NO CHANGES.

△2 15" DIAMETER CPP ADDED TO SECTIONS. NEW MODULAR RETAINING WALL ADDED TO "TYPICAL EMBANKMENT SECTION WITH RETAINING WALL".

SYM.	DESCRIPTION	DATE	APPR.
△1	CONTRACTOR INQUIRIES	3/09	CHB
△2	CLIENT REQUESTED REVISIONS	9/09	CHB

Dewberry

NORTH CAROLINA PROFESSIONAL SEAL 15376 ENGINEER CHRISTOPHER HOWARD BROWN

03, 05, 09

APPROVED

ACCEPT - SUBMITTED TO

DATE

APPROVED

FOR USE FOR COMMENT BOARD

DATE

A/E CHB, FVR, CHB, SDH, CHB

PROJECT MANAGER SDH

CONSTRUCTION OF THE NAVY MARINE CORPS AIR STATION, CHERRY POINT, N.C.

NAVAL FACILITIES ENGINEERING COMMAND

REPAIR IMPACT BERM

CROSS SECTIONS

CONTR. IN. NO. | SIZE D

SCALE AS SHOWN

FILE NO.

REV. FILE NO.

DRAWING NO. 12505865

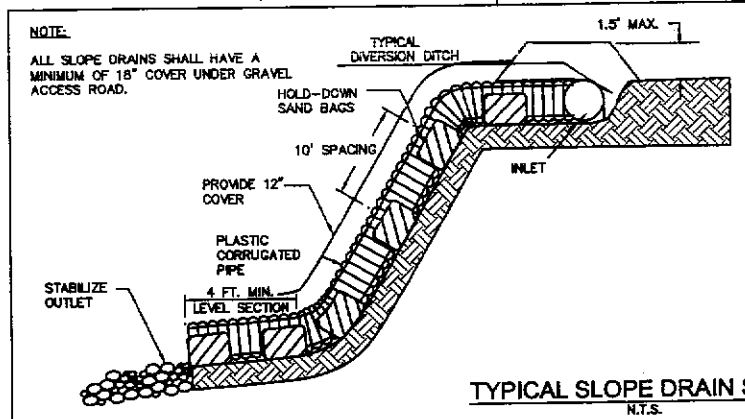
SHEET 14 OF 17

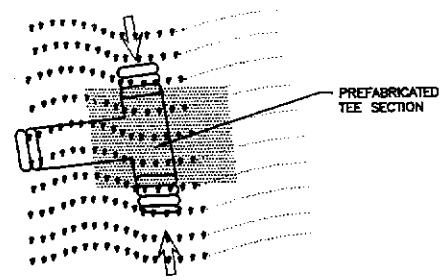
C-09

FILE NAME: 12505865.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

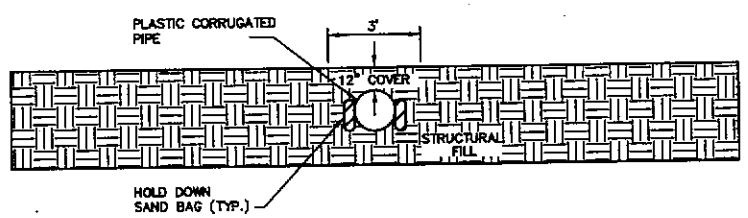
NOTE:

ALL SLOPE DRAINS SHALL HAVE A MINIMUM OF 18" COVER UNDER GRAVEL ACCESS ROAD.

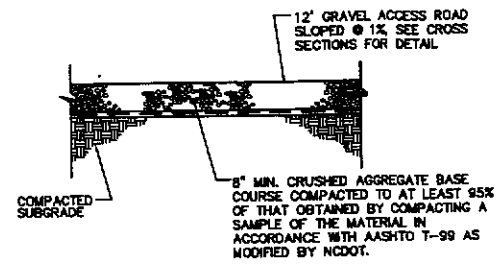




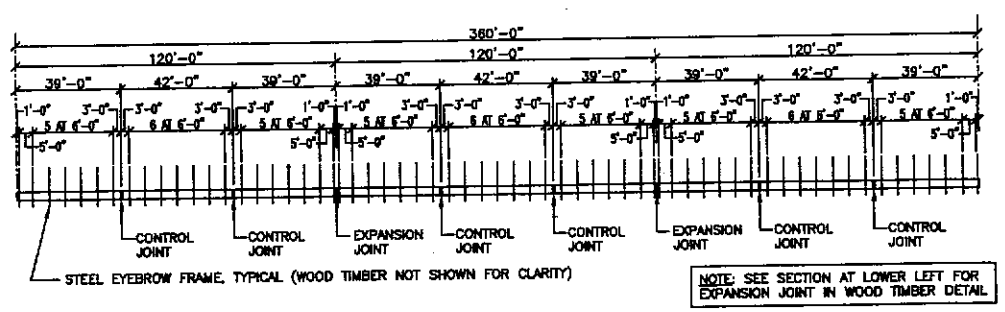
TYPICAL SLOPE DRAIN SECTION
N.T.S.



TYPICAL SLOPE DRAIN SECTION (SINGLE PIPE)
N.T.S.

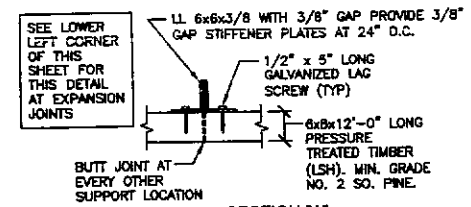


TYPICAL GRAVEL ACCESS ROAD SECTION
N.T.S.

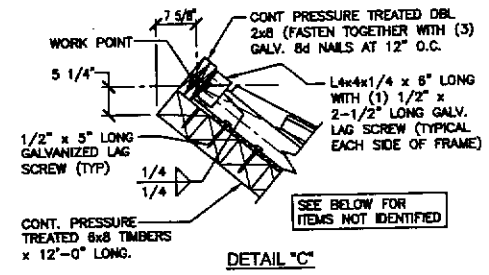


NOTE: SEE SECTION AT LOWER LEFT FOR EXPANSION JOINT IN WOOD TIMBER DETAIL

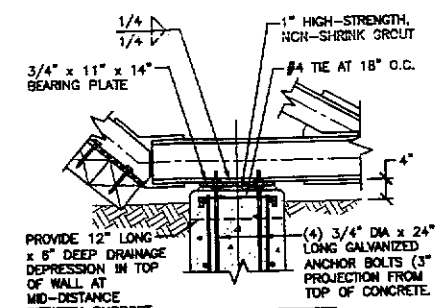
EYEBROW SCHEMATIC PLAN
N.T.S.



SECTION "A"

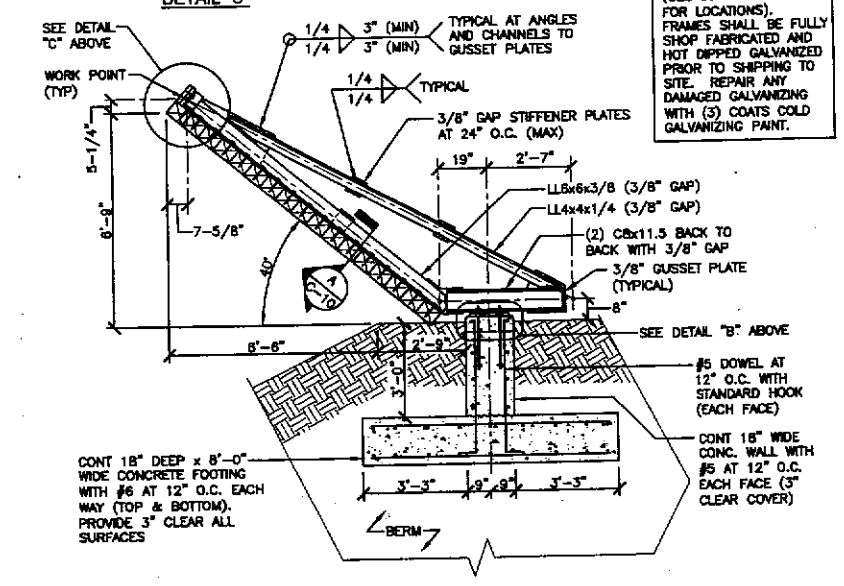


DETAIL "C"

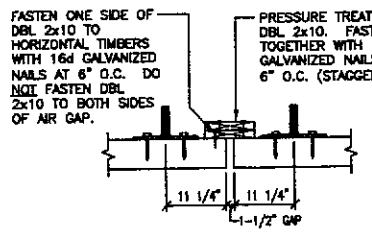


DETAIL "B"

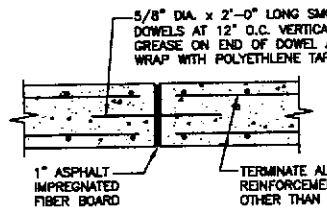
NOTE: STEEL FRAMES SHALL BE INSTALLED AT 6'-0" O.C. MAXIMUM (SEE SCHEMATIC PLAN FOR LOCATIONS). FRAMES SHALL BE FULLY SHOP FABRICATED AND HOT DIPPED GALVANIZED PRIOR TO SHIPPING TO SITE. REPAIR ANY DAMAGED GALVANIZING WITH (3) COATS COLD GALVANIZING PAINT.



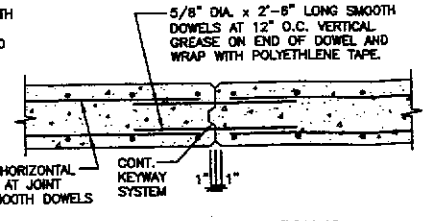
TYPICAL EYEBROW DETAIL
3/8" = 1'-0" (DETAILS AT 3/4" = 1'-0")
ADDITIVE BID ITEM 0001



SECTION "A" AT EXPANSION JOINTS



EXPANSION JOINT



CONTROL / CONSTRUCTION JOINT

NOTE: CONSTRUCTION AND EXPANSION JOINTS IN WALLS SHALL BE LOCATED SUCH THAT A CONCRETE POUR DOES NOT EXCEED FORTY-TWO (42) FEET. JOINTS SHALL BE LOCATED AS SHOWN IN THE SCHEMATIC PLAN VIEW ON THIS SHEET. NO CONSTRUCTION JOINTS SHALL BE PLACED IN FOOTINGS WITHOUT WRITTEN APPROVAL OF THE ENGINEER.

TYPICAL WALL CONTROL / CONSTRUCTION & EXPANSION JOINTS DETAIL
N.T.S.

REINFORCED CONCRETE:

1. U.N.O., ALL CONCRETE WORK, DETAILING, FABRICATION, AND PLACING OF REINFORCING AND CONCRETE SHALL BE GOVERNED BY THE LATEST REVISIONS OF:

   A. ACI 301, ACI 315, AND ACI 318.
   B. CRSI RECOMMENDED PRACTICE OF PLACING REINFORCING BARS.
   C. ACI 306 AND ACI 305 FOR COLD AND HOT WEATHER CONCRETING RESPECTIVELY.

2. ALL CONCRETE SHALL BE NORMAL WEIGHT WITH A MAXIMUM UNIT WEIGHT OF 150 POUNDS PER CUBIC FOOT AND SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, AND SHALL BE GRADE 60.
4. PROVIDE CONTROL/CONSTRUCTION JOINTS IN CONCRETE EYEBROW WALL (SEE DETAIL AT LEFT).

STRUCTURAL STEEL:

1. DESIGN, DETAILING, FABRICATION, AND ERECTION OF STUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE AISC "MANUAL OF STEEL CONSTRUCTION", NINTH EDITION AND THE AISC CODE OF STANDARD PRACTICE, U.N.O.
2. ALL MISCELLANEOUS STEEL ANGLES AND PLATES SHALL CONFORM TO ASTM A36 (Fy = 36 KSI MINIMUM).
3. ALL WELDING SHALL BE DONE BY WELDERS CURRENTLY CERTIFIED BY THE AMERICAN WELDING SOCIETY (AWS) AS HAVING PASSED AWS QUALIFICATION TESTS FOR THE TYPE OF WELDING THEY ARE TO PERFORM. ALL WELDERS SHALL USE E70XX ELECTRODES AND SHALL CONFORM TO AWS STANDARDS.

FOUNDATIONS:

1. FOUNDATION DESIGN IS BASED ON A REPORT OF SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEEREING BY S&ME, INC. DATED FEBRUARY 2, 2007 (S&ME PROJECT NUMBER 1051-06-439).
2. THE STRUCTURAL ENGINEER OF RECORD IS NOT RESPONSIBLE FOR SUBSURFACE CONDITIONS ENCOUNTERED IN THE FIELD CONTRARY TO THOSE ASSUMED FOR DESIGN.
3. FOUNDATION BEARING PRESSURE USED IN DESIGN IS 2,000 PSF (POUNDS PER SQUARE FOOT)
4. LOOSE OR SOFT SOILS SHALL BE CLEANED FROM FOUNDATION EXCAVATION BOTTOMS PRIOR TO PLACING OF CONCRETE. SUBGRADES NEEDING UNDERCUTTING SHALL BE BACKFILLED TO THE ORIGINAL SUBGRADE ELEVATION WITH SUITABLE FILL (LEAN CONCRETE OR A GRADED WASHED STONE SUCH AS No. 57 OR No. 67 AGGREGATE) UNLESS DIRECTED OTHERWISE BY THE GEOTECHNICAL ENGINEER.
5. FOUNDATION CONCRETE SHOULD BE PLACED ON THE SAME DAY THAT EXCAVATIONS ARE MADE. IF THE BEARING SOILS ARE SOFTENED BY SURFACE WATER INTRUSION OR EXPOSURE, THEN THE SOFTENED SOILS MUST BE REMOVED FROM THE FOUNDATION EXCAVATION BOTTOM IMMEDIATELY PRIOR TO PLACING OF CONCRETE. IF THE EXCAVATION MUST REMAIN OPEN OVERNIGHT, OR IF RAINFALL IS IMMINENT WHILE THE BEARING SOILS ARE EXPOSED, THEN A 1 TO 3 INCH THICK LAYER OF LEAN CONCRETE (2,000 PSI MINIMUM STRENGTH) SHALL BE PLACED ON THE BEARING SOILS BEFORE THE PLACEMENT OF REINFORCING STEEL.

⚠ ADDED NOTE TO TYPICAL SLOPE DRAIN SECTION DETAIL.

FILE NAME: 12505666.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

CLIENT REQUESTED REVISIONS DESCRIPTION	19/08 CHB DATE APPR

Dewberry

NORTH CAROLINA PROFESSIONAL SEAL 15376 ENGINEER CHRISTOPHER HOWARD BROWN

APPROVED
ACTIVITY - SATISFACTORY TO
DATE
APPROVED
FOR CFD FOR COMMANDER MWFAC
DATE

A/E	CFD
CHB	DESIGN
EVR	DRAWN
CHB	REVIEW
SDH	QC
CHB	CHIEF ARCH./ ENGR.
SDH	PROJECT MANAGER
	FIRE PROTECTION
	BRANCH MANAGER
	DESIGN DIRECTOR

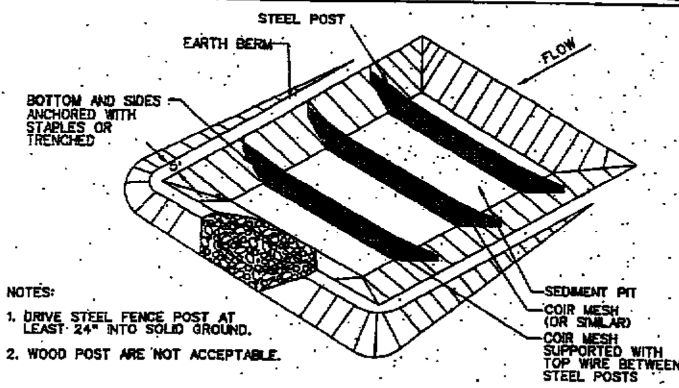
NAVAL FACILITIES ENGINEERING COMMAND
DEPARTMENT OF THE NAVY
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

DETAILS

CODE IDENT. NO. SIZE D
SCALE: AS SHOWN
FILE NO.
DT. FILE NO.
SPEC. NO.
CONSTR. CONTR. NO.
MWFAC DRAWING NO. 12505666
SHEET 15 OF 17

C-10



NOTES:
1. DRIVE STEEL FENCE POST AT LEAST 24" INTO SOLID GROUND.
2. WOOD POST ARE NOT ACCEPTABLE.

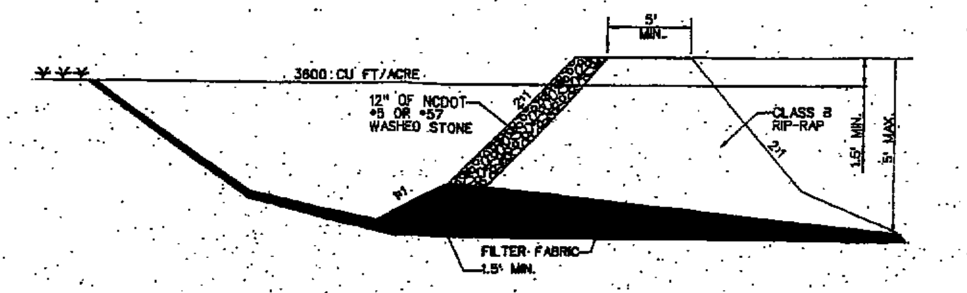
PERSPECTIVE VIEW

1. GRADE THE BASIN SO THAT THE BOTTOM IS LEVEL FRONT-TO-BACK AND SIDE TO SIDE.
2. INSTALL POSTS OR SAWHORSES ACROSS THE WIDTH OF THE SEDIMENT TRAP.
3. STEEL POSTS SHOULD BE DRIVEN TO A DEPTH OF 24 INCHES, SPACED A MAXIMUM OF 4 FEET APART, AND INSTALLED UP THE SIDES OF THE BASIN AS WELL. THE TOP OF THE FABRIC SHOULD BE 6 INCHES HIGHER THAN THE INVERT OF THE SPILLWAY. TOPS OF BAFFLES SHOULD BE 2 INCHES LOWER THAN THE TOP OF THE BERMS.
4. INSTALL AT LEAST THREE ROWS OF BAFFLES BETWEEN THE INLET AND OUTLET DISCHARGE POINT. BASINS LESS THAN 20 FEET IN LENGTH MAY USE 2 BAFFLES.
5. WHEN USING POSTS, ADD A SUPPORT WIRE TO ROPE ACROSS THE TOP OF THE MEASURE TO PREVENT SAGGING.
6. WRAP POROUS MATERIAL, LIKE JUTE BACKED BY COIR MATERIAL, OVER A SAWHORSE OR THE TOP WIRE. HAMMER REBAR INTO THE SAWHORSE LEGS FOR ANCHORING. THE FABRIC SHOULD HAVE FIVE TO TEN PERCENT OPENING IN THE WEAVE. ATTACH FABRICTO A ROPE AND A SUPPORT STRUCTURE WITH ZIP TIES, WIRE, OR STAPLES.
7. THE BOTTOM AND SIDES OF THE FABRIC SHOULD BE ANCHORED IN A TRENCH OR PINNED WITH 8-INCH EROSION CONTROL MATTING STAPLES.
8. DO NOT SPLICE THE FABRIC, BUT USE A CONTINUOUS PIECE ACROSS BASIN.

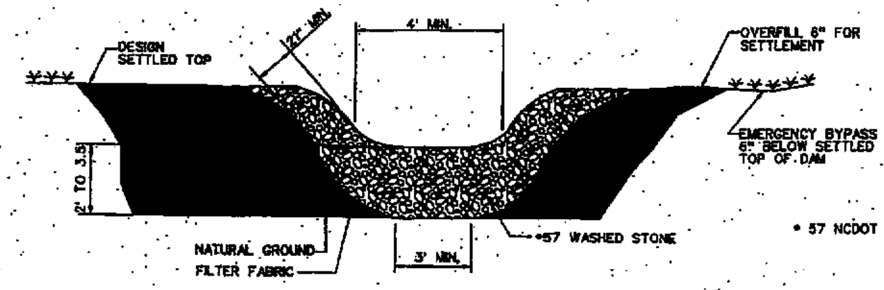
SEDIMENT TRAP CONSTRUCTION SCHEDULE

TRAP NO.	VOLUME REQUIRED (CF)	VOLUME PROVIDED (CF)	LENGTH (FT)	WIDTH (FT)	DEPTH, (FT)	DISCHARGE WEIR, (FT)	LOCATION OF FIRST BAFFLE * (FT)	LOCATION OF SECOND BAFFLE * (FT)	LOCATION OF THIRD BAFFLE * (FT)
A	5760	8346	70	35	3.5	6	25	42	60
B	1980	2114	44	22	3.5	4	15	28	37

* BAFFLES SHALL BE INSTALLED AT DISTANCES INDICATED IN TABLE MEASURED FROM THE ENTRANCE OF THE SEDIMENT TRAP.



CROSS-SECTION



PLAN VIEW

MAINTENANCE:

INSPECT TEMPORARY SEDIMENT TRAPS AND BAFFLES AT LEAST ONCE PER WEEK AND AFTER EVERY RAINFALL 1/2 INCH OR GREATER

TO ONE-HALF THE DESIGN DEPTH OF THE TRAP. PLACE THE SEDIMENT THAT IS REMOVED IN A DESIGNATED DISPOSAL AREA AND REPLACE THE CONTAMINATED PART OF THE GRAVEL FACING. SHOULD THE FABRIC OF A BAFFLE COLLAPSE, TEAR DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.

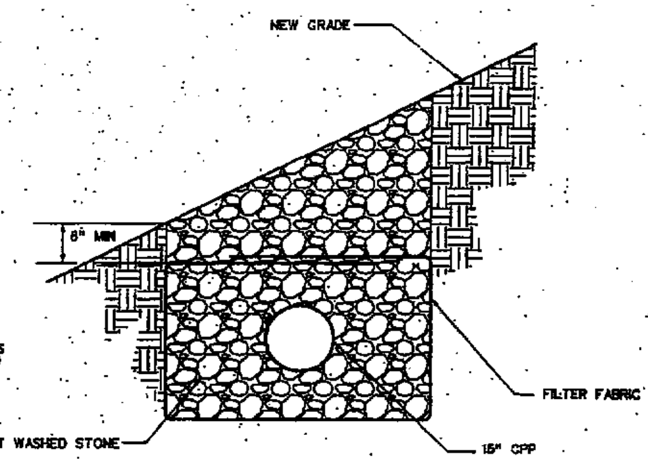
CHECK THE STRUCTURE FOR DAMAGE FROM EROSION OR PIPING. PERIODICALLY CHECK THE DEPTH OF THE SPILLWAY TO ENSURE IT IS A MIN. OF 1.5 FT BELOW THE LOW POINT OF THE EMBANKMENT. IMMEDIATELY FILL ANY SETTLEMENT OF THE EMBANKMENT TO SLIGHTLY ABOVE DESIGN GRADE. ANY RIP RAP DISPLACED FROM THE SPILLWAY MUST BE REPLACED IMMEDIATELY.

STABILIZE THE EMBANKMENT AND ALL DISTURBED AREAS ABOVE THE SEDIMENT POOL AND DOWNSTREAM FROM THE TRAP IMMEDIATELY AFTER CONSTRUCTION WITH SEEDING.

AFTER ALL SEDIMENT-PRODUCING AREAS HAVE BEEN PERMANENTLY STABILIZED, REMOVE THE STRUCTURE AND ALL UNSTABLE SEDIMENT. SMOOTH THE AREA TO BLEND WITH THE ADJOINING AREAS, AND STABILIZE PROPERLY.

TYPICAL SEDIMENT TRAP DETAIL AND SCHEDULE

N.T.S. (TEMPORARY)



TYPICAL FRENCH DRAIN DETAIL

N.T.S.

SPECIAL SLOPE SEEDING

★ SLOPE PROTECTION SHALL REQUIRE IMMEDIATE STABILIZATION OF ALL DENOTED GRADED SLOPES IN ACCORDANCE WITH THE SEEDING SPECIFICATION. STABILIZATION AND SEEDING SHALL OCCUR IMMEDIATELY AFTER THE GRADING OF THE SLOPE. MULCH AND ANCHOR SHALL BE APPLIED AT THE RATE SPECIFIED.

SURFACE ROUGHENING FOR CUTS, FILLS, AND GRADED SLOPES

MAKE MOWED SLOPES NO STEEPER THAN 3:1 UNLESS INDICATED
ROUGHEN THESE AREAS TO SHALLOW GROOVES BY NORMAL TILLING, DISKING, HARROWING, OR USE OF CULTIPACKER-SEEDER. MAKE THE FINAL PASS OF ANY SUCH TILLAGE IMPLEMENT ON THE CONTOUR.
MAKE GROOVES FORMED BY SUCH IMPLEMENTS CLOSE TOGETHER (LESS THAN 10 INCHES) AND NOT LESS THAN 1 INCH DEEP.
ROUGHENING WITH TRACKED MACHINERY.
LIMIT ROUGHENING WITH TRACKED MACHINERY TO SANDY SOILS TO AVOID UNDUE COMPACTION OF THE SOIL SURFACE.
OPERATE TRACKED MACHINERY UP AND DOWN THE SLOPE TO LEAVE HORIZONTAL DEPRESSIONS IN THE SOIL. DO NOT BACK-BLADE DURING THE FINAL GRADING OPERATION.
SEEDING - IMMEDIATELY SEED, AND MULCH, AND ANCHOR ROUGHENED AREAS TO OBTAIN OPTIMUM SEED GERMINATION AND GROWTH.

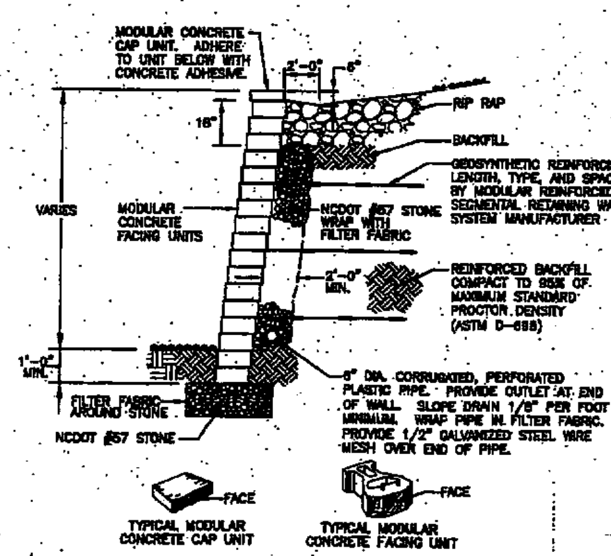
MAINTENANCE:

PERIODICALLY CHECK THE SEEDED SLOPES FOR RILLS AND WASHES. FILL THESE AREAS SLIGHTLY ABOVE THE ORIGINAL GRADE, THEN RESEED AND MULCH AS SOON AS POSSIBLE.

TYPICAL SPECIAL SLOPE SEEDING SCHEDULE

NOTES:

1. MODULAR REINFORCED SEGMENTAL RETAINING WALL SYSTEM SHALL BE DESIGNED AND PROVIDED BY CONTRACTOR. CONTRACTOR SHALL USE "ADDENDUM TO SUBSURFACE EXPLORATION REPORT - PROPOSED RIFLE RANGE BERM MODIFICATIONS - PROJECT CP98019M AND CP0719R - MARINE CORPS AIR STATION - CHERRY POINT, NORTH CAROLINA - SAME PROJECT NO. 1051-08-43P" DATED JULY 6, 2007 "CONCLUSIONS AND RECOMMENDATIONS - MECHANICALLY STABILIZED EARTH (MSE) WALLS" FOR WALL DESIGN PARAMETERS. THE SEGMENTAL RETAINING WALL SYSTEM SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA.
2. MODULAR RETAINING WALL SYSTEM SHOP DRAWINGS AND CALCULATIONS SHALL BE SIGNED AND SEALED BY THE PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR DESIGN. SHOP DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED TO CONTRACTING OFFICER FOR REVIEW AND APPROVAL.
3. FOR UNITS TO BE EMBEDDED, COMPACT FILL IN FRONT OF UNITS AT THE SAME TIME THAT FILL BEHIND THE UNITS IS COMPACTED.
4. INSTALL #57 STONE IN A 2'-0" WIDTH DIRECTLY BEHIND THE WALL AND EXTEND STONE TO WITHIN 18" OF THE TOP OF THE WALL. DRAINAGE AGGREGATE SHALL NOT EXTEND BELOW FINAL GRADE IN FRONT OF THE WALL.
5. COMPACTION SHALL BE TO 95% OF MAXIMUM STANDARD PROCTOR DENSITY (ASTM D-698).
6. COMPACTION WITHIN 5 FEET OF WALL SHALL BE LIMITED TO HAND OPERATED EQUIPMENT.
7. GEOSYNTHETIC REINFORCEMENT SHALL BE PLACED WITH STRONGEST DIRECTION PERPENDICULAR TO WALL. FOLLOW GEOSYNTHETIC REINFORCEMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS.
8. CONTRACTOR SHALL DIRECT SURFACE RUNOFF TO AVOID DAMAGING WALL DURING CONSTRUCTION.
9. FOLLOW APPLICABLE PROVISIONS OF THE MODULAR RETAINING WALL SYSTEM MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS.
10. COORDINATE MODULAR CONCRETE UNIT STYLE, PATTERN, AND COLOR WITH CONTRACTING OFFICER.



TYPICAL MODULAR REINFORCED SEGMENTAL RETAINING WALL DETAIL

N.T.S.

STORM DRAINAGE SCHEDULE

Struct No.	Struct Type	Top (Hood) (ft)	Pipe No.	Pipe Dia. (in)	Pipe Type	Length (ft)	Slope (ft/ft)	Invert In (ft)	Invert Out (ft)	NORTHING	EASTING
1	MH	26.50						(12" CPP) = 23.5	17.00	431297.1692	2836070.324
			P-1	15	CPP	20	0.0150				
2	MH	22.00						16.70	16.60	431310.8912	2836083.642
			P-2	15	CPP	19	0.0150				
3	MH	20.00						16.22	16.02	431297.5154	2836097.964
			P-3	15	CPP	58	0.0150				
4	MH	20.50						15.15	14.95	431248.1699	2836128.417
				15	CPP	60	0.0200				
5	MH	18.00						13.75	13.65	431219.8859	2836177.536
			P-5	18	CPP	79	0.0200	(12" CPP) = 16			
6	MH	17.00						11.97	11.77	431165.2776	2836291.597
			P-6	24	CPP	15	0.0177	(12" CPP) = 14.6			
7	FES							11.50	-		

STORM DRAINAGE SCHEDULE

△1 STORM DRAINAGE SCHEDULE ADDED.
△2 STORM DRAINAGE SCHEDULE ORIENTATION CORRECTED.

FILE NAME: 12505667.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

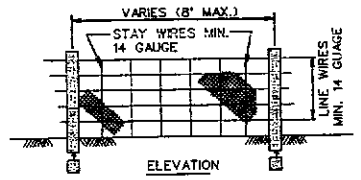
SYM.	DESCRIPTION	DATE	APPR
△2	CONTRACTOR INQUIRIES	3/09	CHB
△1	CLIENT REQUESTED REVISIONS	9/08	CHB

Dewberry

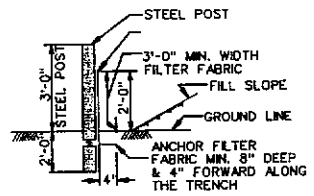
NORTH CAROLINA PROFESSIONAL SEAL 15378 ENGINEER CHRISTOPHER HOWARD BROWN

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.
REPAIR IMPACT BERM
DETAILS

CHB, EVR, CHB, SDH, CHB — SDH
SCALE: AS SHOWN
12505667
SHEET 16 OF 17
C-11



ELEVATION



SECTION

GENERAL NOTES:

1. SILT FENCE SHALL BE INSTALLED OUTSIDE TOE OF EARTHFILL EMBANKMENTS. MAY ALSO BE INSTALLED AROUND ALL STORM DRAIN INLETS, & MANHOLES AS DIRECTED.
2. WIRE SHALL BE A MINIMUM OF 36" IN WIDTH AND SHALL HAVE A MAXIMUM MESH SPACING OF 6".
3. FILTER FABRIC SHALL BE A MINIMUM OF 36" IN WIDTH AND SHALL BE FASTENED SECURELY TO THE WIRE.
4. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF SELF-FASTENER ANGLE STEEL TYPE.

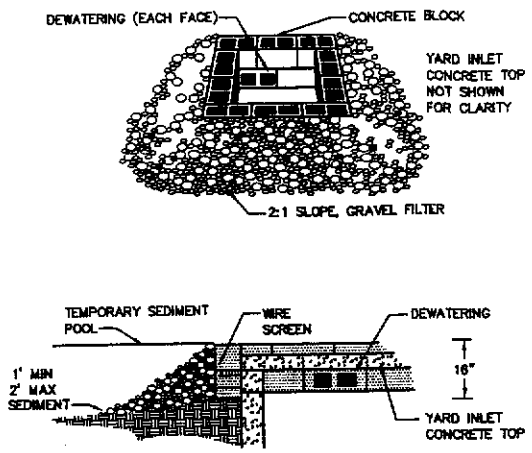
NOTE:
THE FILTER FABRIC SHALL MEET THE FOLLOWING REQUIREMENTS:
A) EOS IS NOT LARGER THAN U.S. STANDARD SIEVE NO.30
B) GRAB STRENGTH 90-120 LB

MAINTENANCE:

1. INSPECT SILT FENCE ONCE PER WEEK AND AFTER EVERY RAINFALL.
2. PERIODICALLY REMOVE ACCUMULATED SEDIMENT AND REPAIR ANY DAMAGE TO FENCE.

TYPICAL SILT FENCE DETAIL (TEMPORARY)

N.T.S.



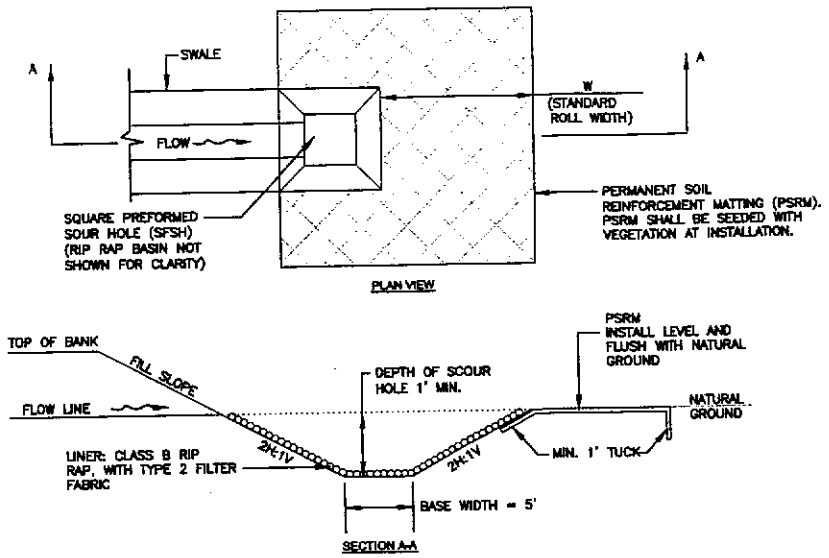
(TEMPORARY MEASURE)

MAINTENANCE REQUIREMENTS:

1. CONTRACTOR SHALL INSPECT THE GRAVEL FILTER AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL AND MAKE REPAIRS AS NEEDED.
2. CONTRACTOR SHALL REMOVE SEDIMENT AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR SUBSEQUENT RAINS.
3. WHEN THE CONTRIBUTING DRAINAGE AREA HAS BEEN ADEQUATELY STABILIZED, CONTRACTOR SHALL REMOVE ALL MATERIALS AND ANY UNSTABLE SOIL. CONTRACTOR SHALL BRING THE DISTURBED AREA TO PROPER GRADE, THEN SMOOTH AND COMPACT IT AND APPROPRIATELY STABILIZE ALL BARE AREAS AROUND THE INLET.

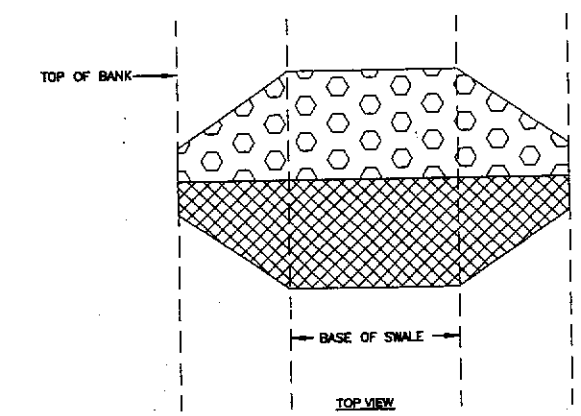
TYPICAL GRATE INLET PROTECTION DETAIL (TEMPORARY)

N.T.S.

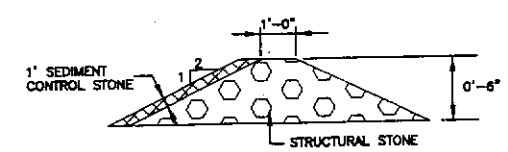


TYPICAL PREFORMED SCOUR HOLE

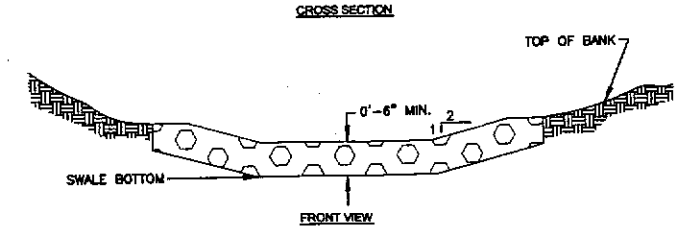
NTS



TOP VIEW



CROSS SECTION



FRONT VIEW

NOTES:

1. CONTRACTOR SHALL USE CLASS B RIP RAP FOR STRUCTURAL STONE. USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.
2. CONTRACTOR SHALL CONSTRUCT DAM A MAXIMUM OF 0'-6" ABOVE NORMAL FLOW DEPTH.

TYPICAL ROCK SILT SCREEN

NTS

SEEDING SCHEDULE IN COASTAL AREAS

1. LIME, SEED AND FERTILIZER SHALL BE APPLIED WITH NECESSARY EQUIPMENT TO GIVE UNIFORM DISTRIBUTION OF THESE MATERIALS. THE KINDS OF MATERIALS TO BE APPLIED PER ACRE:

TEMPORARY SEEDING

DATE	TYPE	PLANTING RATE	FERTILIZER 10-10-10 BLEND	LIMESTONE	STRAW MULCH
DEC. 1 – APR. 15	RYE (GRAIN) KOBE LESPEDEZA *	120 LBS./ACRE 50 LBS./ACRE	750 LBS./ACRE	2000 LBS./ACRE	4000 LBS./ACRE
APR. 15 – AUG. 15	GERMAN MILLET	40 LBS./ACRE	750 LBS./ACRE	2000 LBS./ACRE	4000 LBS./ACRE
AUG. 15 – DEC. 30	RYE (GRAIN)	120 LBS./ACRE	1000 LBS./ACRE	2000 LBS./ACRE	4000 LBS./ACRE

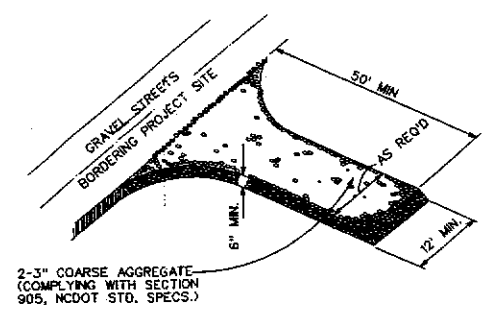
PERMANENT SEEDING

DATE	TYPE	PLANTING RATE	FERTILIZER ** 10-10-10 BLEND	LIMESTONE **	STRAW MULCH
APR. 1 – JULY 15 FEB. 1 – MAR. 31	PENSACOLA BAHIAGRASS CENTIPEDEGRASS GERMAN MILLET	50 LBS./ACRE 5 LBS./ACRE 10 LBS./ACRE	500 LBS./ACRE	3000 LBS./ACRE	4000 LBS./ACRE

* OMIT KOBE LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE.

** QUANITY OF FERTILIZER AND LIME SHALL BE CONFIRMED BY SOILS TEST.

2. SEEDED AREA SHALL BE CULTIPACKED TO FIRM SEEDBED AND COVER SEED.
3. GRAIN STRAW SHALL BE APPLIED OVER SEEDED AREAS AS A MULCH WITHIN 24 HOURS OF THE INITIAL SEEDING OPERATION. NO BARE GROUND SHALL BE VISIBLE WHEN RIDING BY A MULCHED AREA IF PROPER APPLICATION IS ACHIEVED. THICK CLUMPS OF STRAW ARE NOT PERMISSIBLE AS A UNIFORM COVERAGE IS EXPECTED.
4. MULCHED AREA SHALL BE TACKED WITH LIQUID ASPHALT AT A RATE OF 0.10 GALLON PER SQUARE YARD (10 GAL/1000 SQ. FT.). HYDRAULIC TACKING MATERIAL SHALL BE USED IN HIGH QUALITY WATER ZONES AND CRITICAL HABITAT AREAS.
5. DITCH TREATMENT SHALL BE USED IN AREAS WHERE STEEP GRADES COULD CAUSE DITCH EROSION. USE OF EXCELSIOR MATTING OR FIBERGLASS/SYNTHETIC ROVING IS ACCEPTABLE. DITCH TREATMENT SHALL BE INSTALLED BEFORE MULCHING OPERATION.
6. PROVIDE TEMPORARY SEEDING AFTER CLEARING AND GRUBBING OPERATION IF THE AREA IS TO REMAIN UNDISTURBED FOR MORE THAN 15 WORKING DAYS OR 60 CALENDAR DAYS, WHICHEVER IS LESS. PROVIDE PERMANENT SEEDING WITHIN 15 WORKING DAYS OR 60 CALENDAR DAYS, WHICHEVER IS LESS, OF ESTABLISHING FINAL GRADES. SLOPES SHALL BE SEEDED WITHIN 21 CALENDAR DAYS.



NOTE:
GRAVEL PAD IS REQUIRED TO PROVIDE BUFFER AREA WHERE VEHICLES CAN DROP THEIR MUD AND SEDIMENT TO AVOID TRANSPORTING IT ONTO PAVED STREETS, TO CONTROL EROSION FROM SURFACE RUNOFF, AND TO HELP CONTROL DUST.

MAINTENANCE:

1. INSPECT TEMPORARY ENTRANCE/EXIT PAD ONCE PER WEEK AND AFTER EVERY RAINFALL.
2. REPLACE GRAVEL PAD WHEN AGGREAGATE IS CLOGGED WITH SEDIMENT AND/OR WHEN SEDIMENT IS BEING TRACKED ON ROADWAY.
3. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO ROADWAYS.

TYPICAL CONSTRUCTION ENTRANCE DETAIL (TEMPORARY)

N.T.S.

⚠ TYPICAL PREFORMED SCOUR HOLE AND TYPICAL ROCK SILT SCREEN DETAILS ADDED.

FILE NAME: 12505668.dwg PLOT SCALE: 1"=1" (PAPER SPACE)

SYM.	DESCRIPTION	DATE	APPR.
1	CLIENT REQUESTED REVISIONS	9/06	CHB

Dewberry

NORTH CAROLINA PROFESSIONAL SEAL 15379 ENGINEER CHRISTOPHER HOBGOOD BROWN

APPROVED

ACTIVITY – SATISFACTORY TO

DATE

APPROVED

FOR GOV FOR COMMERCIAL IMPROV.

DATE

AVE	EPD
CHB	DESIGN
FVR	DRAWN
CHB	REVIEW
SDH	QC
CHB	CHIEF ARCH./ ENGR.

PROJECT MANAGER SDH

FIRE PROTECTION

BRANCH MANAGER

DESIGN DIRECTOR

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

REPAIR IMPACT BERM

DETAILS

CODE ID. NO. SIZE D

SCALE: AS SHOWN

FILE NO.

ST. PRJ. NO.

SPEC. NO.

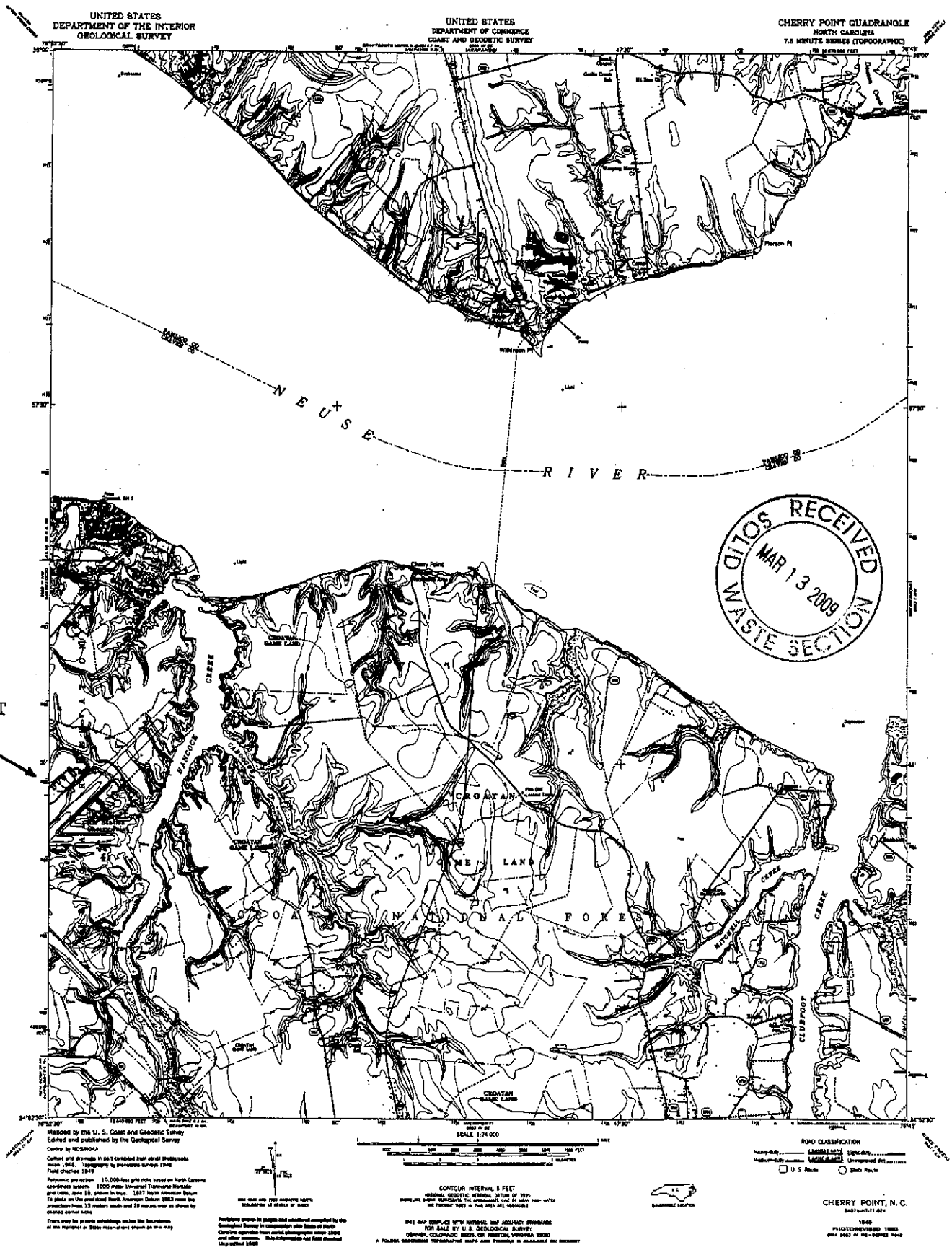
CONSTR. CONTR. NO.

HAVFAC DRAWING NO. 12505668

SHEET 17 OF 17

C-12

IMPACT BERM



SOLID WASTE SECTION
RECEIVED
MAR 13 2009

IMPACT BERM

ENCLOSURE (2)

ENCLOSURE (3)

PRECISION ANALYTICAL, INC.

4450 Johnston Parkway Unit B
Cleveland, OH 44128
TEL: (216) 663-0808
FAX: (216) 663-0656
Website:
www.precisionanalytical.com

February 17, 2009

Tony Oatess
Applied Technology, Inc.
10078 Lantern Road
Fishers, IN 46038

TEL: (317) 842-0722
FAX: (317) 841-0644

RE: D/O #675, Sample EAD09002

Order No.: 0902384

Dear Tony Oatess:

Precision Analytical, Inc. received 1 sample(s) on 2/16/2009 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in an attached Case Narrative. Quality control data is within laboratory defined or method specified acceptance limits except if noted.

Solid samples are reported in ug/Kg or mg/Kg as received, unless specified in the units as dry weight. Unless otherwise noted, results have not been background or blank corrected.

If you have any questions regarding these tests results, please feel free to call.

Certifications: Ohio EPA - 4041; NELAC NY - 11167; NELAC PA - 68-00434;
NELAC IL - 001922; W.Va DEP - 245; KY UST - 69

Sincerely,

Scott Bolam

Scott Bolam
QA/QC Manager

ENCLOSURE (4)

PRECISION ANALYTICAL, INC.

4450 Johnston Parkway Unit B
Cleveland, OH 44128
TEL: (216) 663-0808
FAX: (216) 663-0656
Website:
www.precisionanalytical.com

Analytical Report

(consolidated)

WO#: 0902384

Date Reported: 2/17/2009

CLIENT: Applied Technology, Inc.

Collection Date: 2/12/2009 9:00:00 AM

Project: D/O #675, Sample EAD09002

Lab ID: 0902384-001

Matrix: SOLID

Client Sample ID D/O #675/Sample EAD09002/Item 1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
CLIN 6403 TCLP METALS METALS ANALYSIS BY ICP, TCLP				**SW6010B**		Analyst: **RLG**
Arsenic	ND	0.0500		mg/L	1	2/17/2009 2:12:31 PM
Barium	ND	1.00		mg/L	1	2/17/2009 2:12:31 PM
Cadmium	ND	0.100		mg/L	1	2/17/2009 2:12:31 PM
Chromium	ND	0.100		mg/L	1	2/17/2009 2:12:31 PM
Lead	0.496	0.200		mg/L	1	2/17/2009 2:12:31 PM
Selenium	ND	0.200		mg/L	1	2/17/2009 2:12:31 PM
Silver	ND	0.100		mg/L	1	2/17/2009 2:12:31 PM
CLIN 6403 TCLP METALS MERCURY, TCLP				**SW7470A**		Analyst: **TT**
Mercury	ND	0.000600		mg/L	1	2/17/2009

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
DF	Dilution Factor	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	M	Manual Integration used to determine area response
MDL	Method Detection Limit	ND	Not Detected at the Reporting Limit
PL	Permit Limit	RL	Reporting Detection Limit (PQL)

Coal Ash Generating Facility Information

Per 15A NCAC 13B .1703(6):

(A) Generating Facility	Central Heating Plant
(B) Physical location	Building 152 Langley Rd – MCAS Cherry Point
(C) Address	PSC Box 8006 LCE MCAS Cherry Point 28533-0006
(D) Generator Contact	Milton Rolison
(E) Generator Telephone	(252) 466-2890

ENCLOSURE (5)

CAROLINA ENGINEERS, PA

Geotechnical • Materials Testing • Forensic • Site Development • Surveying

February 23, 2009

Trader Construction Co.
PO Drawer 1578
New Bern, NC 28563

Attention: Mr. Chuck Gilgo

Subject: Soil Classification and Geotechnical Evaluation
Increase Impact Berm Height
Marine Corps Air Station, Cherry Point, North Carolina

Dear Mr. Gilgo,

Carolina Engineers, P. A. has completed a material classification and geotechnical evaluation on the Bottom Ash Product stock piled in the Land Fill site at Marine Corps Air Station, Cherry Point, North Carolina. The purpose of our material classification and evaluation was to verify the Bottom Ash Product meets contract specification requirements and confirm the suitability of the product for use as structural fill on the Impact Berm project. The following report contains the results of material classification on a product sample and our opinion as to how this product should be applied in construction of the Impact Berm.

If you have any questions or need additional assistance, please call.

Sincerely,
CAROLINA ENGINEERS, P.A.

CARL C. HUDDLE, P.E.
Project Engineer
North Carolina Registration No. 20670

STATE OF NORTH CAROLINA
PROFESSIONAL ENGINEER NO. 20670
CARL C. HUDDLE

Enclosures: Sieve Analysis Report (1)
Standard Proctor (1)

PO Box 1595 • New Bern, NC 28563 • Tel: (252) 633-2425 • Fax: (252) 633-1370 • www.carolinaengineers.com

ENCLOSURE (6)

1. INTRODUCTION

It is our understanding the Bottom Ash Product is currently a waste material sited in a stock pile at the Land Fill Site. The Impact Berm project is a modification to the existing firing range berm and is located approximately three miles from the Land Fill site. The utilization of the Bottom Ash Product at the Impact Berm would benefit MCAS Cherry Point by recycling waste material and providing additional capacity at the Land Fill site. The Impact Berm project would benefit by obtaining approximately 10,000 cubic yards of required structural fill material.

2. LABORATORY TESTING

A recovered product sample was received at our laboratory for visual classification and index testing. Testing included Particle Size Analysis, Atterberg Limits, and Percent Fines Determinations. The results of these tests were used to aid in classifying the sample. All tests were performed in accordance with current ASTM standards and are summarized below:

Location	MCAS Cherry Point Land Fill
Visual description	Dark gray silty sand with gravel
% passing No. 200 sieve	17.0 %
Liquid Limit	25
Plasticity Index	Non-plastic
Natural Moisture Content	18.5 %
USCS Classification	SM

In accordance with the Unified Soil Classification System (USCS), the sample material classifies as a Silty Sand with Gravel with a Group Symbol SM. This soil classification meets the Contract Specification requirements for Structural Fill as defined in Section 3100, paragraph 2.5.

3. EVALUATION AND RECOMMENDATIONS

The Bottom Ash Product consists of gravel, sands and fines. The material has a Standard Proctor maximum dry density of 70.9 pounds per cubic foot at an optimum moisture content of 23.5 percent. Properties of the product result in a flat compaction curve representing a wide range of moisture content values for establishing the contract

specified dry density of 95 percent of the Standard Proctor. The optimum moisture content of the product is much higher relative to the optimum moisture content of the existing structural fill. In order to not saturate and potentially destabilize the existing structural fill, the Bottom Ash Product should be placed at a moisture content below optimum. We recommend the material be placed around the natural moisture content of the product (18.5 percent) plus or minus 3 percent. The material should be placed in layers not exceeding 12 inches in thickness with each layer compacted to the contract specified density.

The gravel fragments are sufficiently durable and maintain structural composition when impacted and loaded. The fines are non-plastic and should not exhibit long term consolidation settlement. However, the gravel and fines content should be taken into consideration with the placement of the Bottom Ash Product. We recommend the Bottom Ash Product be covered with a minimum 18 inches of existing structural fill to cover the gravel and fines. Allowing 18 inches of cover will prevent possible bullet ricochet and excessive dusting from the non-cohesive fines.

4. CLOSING

These analyses and recommendations are, of necessity, based on concepts made available to us at the time of writing this report. Assumption has been made that the sample is a sound representative of the Bottom Ash Product. If during placement of the product conditions are encountered which differ significantly from those reported herein, we should be immediately notified so our analyses and recommendations can be reviewed and/or revised as necessary.

Carolina Engineers, P.A.
Sieve Analysis Report

SOURCE OF MATERIAL:	MCAS Cherry Point Land Fill	CLIENT:	Trader Construction Co.
PROJECT:	Increase Impact Berm Height	PROP. USE:	Off-Site Fill
SAMPLED:	Received 2-19-08	PROJECT NO.	ce.239-08
SAMPLE NUMBER:	TRA 21 -09		

SIEVE ANALYSIS BY WEIGHT

DATE:	2/20/2009	SAMPLE SIZE:	231.3 grams
TECHNICIAN:	Mike Jones	SOIL CLASSIFICATION:	USCS SM

Sieve Size	Weight Retained	Percent Retained	Total Percent Passed	ASTM Specification
1"				
1/2"				
3/8"				
#4	74.9	32.4%	67.6%	
#8				
#10	103.2	44.6%	55.4%	
#16				
#30				
#40	146.7	63.4%	36.6%	
#50				
#100				
#200	192	83.0%	17.0%	

HYDROMETER ANALYSIS

Particle Size			Percent Smaller	
0.074 mm				
< 0.005 mm				

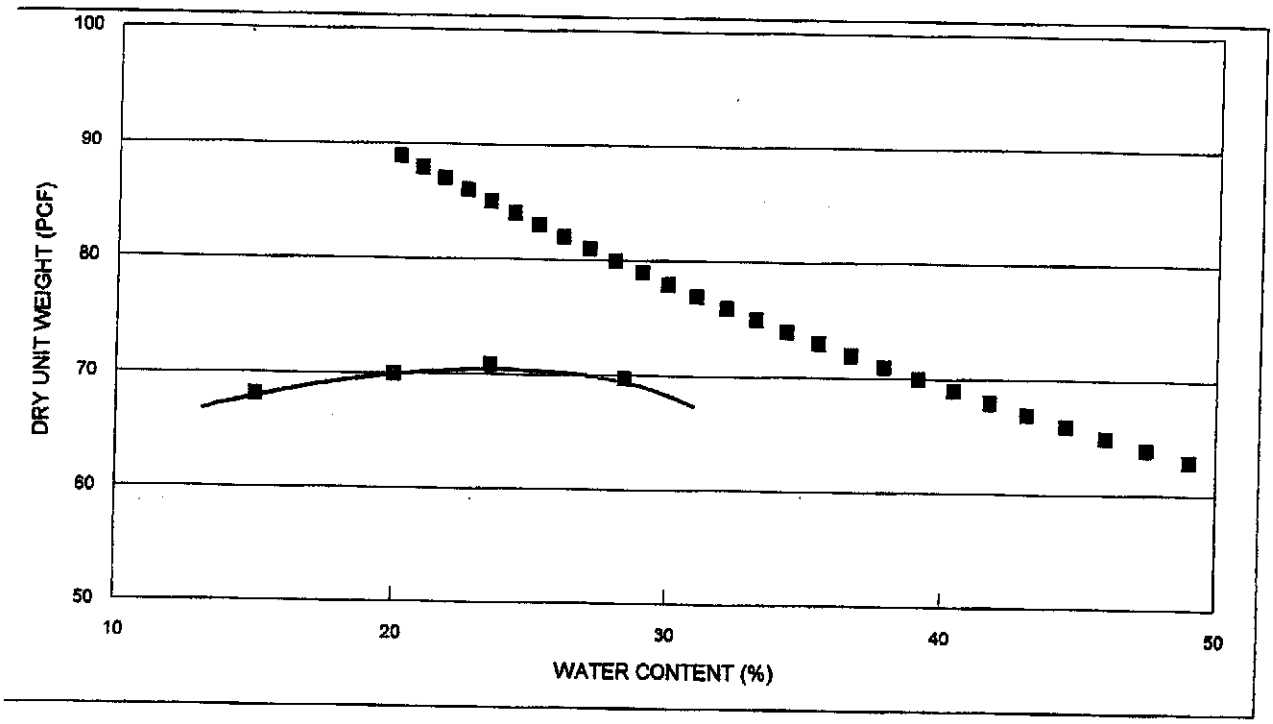
GRAIN SIZE PERCENTAGES BY WEIGHT

Gravel (75mm TO 4.75 mm)	32.4%
Coarse Sand (4.75mm TO 2.0mm)	12.2%
Medium Sand (2.0mm to .425mm)	18.9%

Fine Sand (.425mm to .075 mm)	19.5%
Silt (.075mm to .005mm)	17.0%
Clay (<.005mm)	0.0%

STATE OF PROFESSIONAL CARL C. HUDDLE NORTH CAROLINA

Carolina Engineers, P.A.



Increase Impact Berm Height, MCAS Cherry Point

Trader Construction Co.
Moisture Density Relationship
ASTM D-698
Sample #1 (MCAS Land Fill Bottom Ash Product)

STATE OF NORTH CAROLINA PROFESSIONAL ENGINEER SEAL CARL C. HUDDLE

Maximum Dry Density:	70.9 pcf
Optimum Moisture Content:	23.5 %
Plasticity Index:	NP
Natural Moisture Content:	18.5 %
Specific Gravity:	2.25
Sample Description:	Poorly Graded Sand with Silt and Gravel (SM)

SIEVE SIZE	% PASSING
1.5"	100
1"	100
.5"	100
#4	67.6
#10	55.4
#40	36.6
#200	17

CAROLINA ENGINEERS, PA P. O. Box 1595 New Bern, NC 28562	
Trader Construction Co. PO Drawer 1578 New Bern, NC 28563	
Date: 2-20-09	Technician: M. Jones

Beverly Eaves Perdue, Governor

Dee Freeman, Secretary
North Carolina Department of Environment and Natural Resources

Coleen H. Sullins, Director
Division of Water Quality

January 13, 2009

Mr. George W. Radford, Jr., Environmental Affairs Officer
Marine Corps Air Station, Cherry Point
MCAS-Cherry Point, PSC Box 8006
Cherry Point, NC 28533

Subject: Permit No. SW7090102
Repair Impact Berm
Low Density Stormwater Project
Craven County

Dear Mr. Radford:

The Washington Regional Office received a complete Stormwater Management Permit Application for the Repair Impact Berm on January 6, 2009. Staff review of the plans and specifications has determined that the project, as proposed, will comply with the Stormwater Regulations set forth in Title 15A NCAC 2H.1000. We are forwarding Permit No. SW7090102 dated January 13, 2009, for the construction of the subject project.

This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein, and does not supercede any other agency permit that may be required.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within thirty (30) days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made this permit shall be final and binding.

If you have any questions, or need additional information concerning this matter, please contact either Scott Vinson or me at (252) 946-6481.

Sincerely,

Al Hodge
Regional Supervisor
Surface Water Protection Section

AH/sv: S:\WQS\STORMWATER\PERMIT\SW7090102

cc: Rana Dydula, PE – Dewberry & Davis
Craven County Inspections
Washington Regional Office
Central Files

Mailing Address
943 Washington Square Mall
Washington, NC 27889

Phone (252) 946-6481
Fax (252) 946-9215

Location
943 Washington Square Mall
Washington, NC 27889

Internet: www.ncwaterquality.org

Customer Service 1-877-623-6748

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ENCLOSURE (7)

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WATER QUALITY
STATE STORMWATER MANAGEMENT PERMIT
LOW DENSITY DEVELOPMENT

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules and Regulations

PERMISSION IS HEREBY GRANTED TO

MCAS – Cherry Point

Repair Impact Berm

Craven County

FOR THE

construction, operation and maintenance of a low density development in compliance with the provisions of 15A NCAC 2H .1000 (hereafter referred to as the *"stormwater rules"*) and the approved stormwater management plans and specifications, and other supporting data as attached and on file with and approved by the Division of Water Quality and considered a part of this permit.

The Permit shall be effective from the date of issuance until rescinded and shall be subject to the following specific conditions and limitations:

I. DESIGN STANDARDS

1. This permit covers the construction of 20,036 square feet of built-upon area.

2. The overall tract built-upon area percentage for the project must be maintained at 15%, as required by Section .1005 of the stormwater rules.

3. Approved plans and specifications for projects covered by this permit are incorporated by reference and are enforceable parts of the permit.

4. The only runoff conveyance systems allowed will be vegetated conveyances such as swales with minimum side slopes of 3:1 (H:V) as defined in the stormwater rules and approved by the Division.

5. No piping is allowed except that minimum amount necessary to direct runoff beneath an impervious surface such as a road or to provide access and that which is shown on the approved plans for conveyance down the impact berm.

6. Unless specified elsewhere, permanent seeding requirements for the swales must follow the guidelines established in the North Carolina Erosion and Sediment Control Planning and Design Manual.

7. Roof drains must terminate at least 50 feet from the Mean High Water line.

II. SCHEDULE OF COMPLIANCE

1. Projects covered by this permit will maintain a minimum 50 foot wide vegetative buffer between all impervious areas and surface waters.

2. The permittee is responsible for verifying that the proposed built-upon area does not exceed the allowable built-upon area.

3. The Director may notify the permittee when the permitted site does not meet one or more of the minimum requirements of the permit. Within the time frame specified in the notice, the permittee shall submit a written time schedule to the Director for modifying the site to meet minimum requirements. The permittee shall provide copies of revised plans and certification in writing to the Director that the changes have been made.

4. Prior to the subdivision and/or sale of this project, in whole or in part, the following deed restrictions must be recorded with the Office of the Register of Deeds:

   a. The following covenants are intended to ensure ongoing compliance with State Stormwater Management Permit Number SW7090102, as issued by the Division of Water Quality under NCAC 2H.1000.

   b. The State of North Carolina is made a beneficiary of these covenants to the extent necessary to maintain compliance with the Stormwater Management Permit.

   c. These covenants are to run with the land and be binding on all persons and parties claiming under them.

   d. The covenants pertaining to stormwater may not be altered or rescinded without the express written consent of the State of North Carolina, Division of Water Quality.

   e. Alteration of the drainage as shown on the approved plans may not take place without the concurrence of the Division of Water Quality.

   f. Lots within CAMA's Area of Environmental Concern may the permitted maximum built-upon area reduced due to CAMA jurisdiction within the AEC.

   g. Construction of additional built-upon area in excess of 20,036 square feet will require a permit modification.

   h. Construction of additional impervious areas such that low density requirements are no longer met must be submitted to DWQ and a permit modification must be issued prior to construction. An engineered system will be required to collect and treat the runoff from all built-upon area associated with the project, including that area permitted under the low density option.

   i. Filling in or piping of any vegetative conveyances (ditches, swales, etc.) associated with this development, except for average driveway crossings, is strictly prohibited by any persons.

   j. A minimum 50 foot wide vegetated buffer area shall be provided between surface waters and all impervious surfaces.

5. A copy of the recorded restrictions must be received in this Office within 30 days of the date of sale.

6. Filling in or piping of any vegetative conveyances (ditches, swales, etc.) associated with the permitted development, except for average driveway crossings, is strictly prohibited by any persons.

7. Projects within CAMA's Area of Environmental Concern (AEC) are subject to a reduction of the permitted amount of built-upon area due to CAMA jurisdiction within the AEC.

8. The permittee shall submit to the Director and shall have received approval for revised plans, specifications, and calculations prior to construction, for any modification to the approved plans, including, but not limited to, those listed below:

   a. Any revision to the approved plans, regardless of size.
   b. Project name change.
   c. Transfer of ownership.
   d. Redesign or addition to the approved amount of built-upon area.
   e. Further subdivision, acquisition, or sale of the project area. The project area is defined as all property owned by the permittee, for which Sedimentation and Erosion Control Plan approval was sought.
   f. Filling in, altering or piping any vegetative conveyance shown on the approved plan.

9. Swales and other vegetated conveyances shall be constructed in their entirety, vegetated, and be operational for their intended use prior to the construction of any built-upon surface.

10. During construction, erosion shall be kept to a minimum and any eroded areas of the swales or other vegetated conveyances will be repaired immediately.

11. The permittee shall at all times provide the operation and maintenance necessary to operate the permitted stormwater management systems at optimum efficiency to include:

    a. Inspections
    b Sediment removal.
    c. Mowing, and revegetating of the side slopes.
    d. Immediate repair of eroded areas.
    e. Maintenance of side slopes in accordance with approved plans and specifications.

12. Within 30 days of completion of the project, the permittee shall certify in writing that the project has been constructed in accordance with the approved plans.

13. The permittee shall submit all information requested by the Director or his representative within the time frame specified in the written information request.

III. GENERAL CONDITIONS

1. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to an enforcement action by the Division of Water Quality, in accordance with North Carolina General Statutes 143-215.6A to 143-215.6C.

2. The permit issued shall continue in force and effect until revoked or terminated.

3. The permit may be modified, revoked and reissued or terminated for cause. The filing of a request for a permit modification, revocation and reissuance, or termination does not stay any permit condition.

4. The issuance of this permit does not prohibit the Director from reopening and modifying the permit, revoking and reissuing the permit, or terminating the permit as allowed by the laws, rules, and regulations contained in Title 15A of the North Carolina Administrative Code, Subchapter 2H.1000; and North Carolina General Statute 143-215.1 et. al.

5. This permit is not transferable except after notice to and approval by the Director. The Director may require modification or revocation and reissuance of the permit to change the name and incorporate such other requirements as may be necessary. A formal permit request must be submitted to the Division of Water Quality accompanied by the appropriate fee, documentation from both parties involved, and other supporting materials as may be appropriate. The approval of this request will be considered on its merits, and may or may not be approved. The permittee is responsible for compliance with all permit conditions until the Director approves the transfer.

6. The permittee grants permission to DENR Staff to enter the property for the purpose of inspecting all components of the stormwater management facility.

7. The permittee shall notify the Division of any name, ownership or mailing address changes within 30 days.

8. The issuance of this permit does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances which may be imposed by other government agencies (local, state and federal) which have jurisdiction.

Permit issued this the 13th day of January, 2009.

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

_____ *for*

Coleen H. Sullins, Director
Division of Water Quality
By Authority of the Environmental Management Commission

Permit Number SW7090102

DEPARTMENT OF THE NAVY

ATLANTIC DIVISION, NAVAL FACILITIES ENGINEERING COMMAND

MARINE CORPS AIR STATION, CHERRY POINT, NORTH CAROLINA

SOLID WASTE SECTION RECEIVED MAR 13 2009

REMOVE/STABILIZE LEAD AND REPAIR IMPACT BERM AT RANGE AND INCREASE IMPACT BERM HEIGHT

AT THE

MARINE CORPS AIR STATION

CHERRY POINT, NORTH CAROLINA

PROJECTS NO.: CP99019M and CP0719R

DESIGNED BY:

DEWBERRY & DAVIS, INC.
2301 REXWOODS DRIVE
SUITE 200
RALEIGH, NORTH CAROLINA 27607

SPECIFICATION PREPARED BY:

CIVIL: CHRISTOPHER H. BROWN, P.E.

NORTH CAROLINA PROFESSIONAL SEAL 15370 ENGINEER CHRISTOPHER HOWARD BROWN

08.22.07

SPECIFICATION APPROVED BY:

Design Director: _____
R. W. LAWRENCE, P.E.

Date: 24 Aug 07

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-- End of Project Table of Contents --

DOCUMENT 00 01 15

LIST OF DRAWINGS
04/06

PART 1 GENERAL

1.1 SUMMARY

This document lists the drawings for the project pursuant to contract clause "DFARS 252.236-7001, Contract Drawings, Maps and Specifications."

1.2 DFARS 252.236.7001,CONTRACT DRAWINGS,MAPS AND SPECIFICATIONS (AUG 2000)

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference, in electronic or paper media as chosen by the Contracting Officer.

(b) The Contractor shall-

(1) Check all drawings furnished immediately upon receipt;

(2) Compare all drawings and verify the figures before laying out the work;

(3) Promptly notify the Contracting Officer of any discrepancies;

(4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and

(5) Reproduce and print contract drawings and specifications as needed.

(c) In general-

(1) Large-scale drawings shall govern small-scale drawings; and

(2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

(e) The work shall conform to the specifications and the contract drawings.

Contract drawings are as follows:

DRAWING NO.	NAVFAC DWG NO.	TITLE
G-01	12505652	COVER SHEET
G-02	12505653	GENERAL NOTES

DRAWING NO.	NAVFAC DWG NO.	TITLE
G-03	12505654	SOIL BORING LOGS
G-04	12505655	SOIL BORING LOGS
G-05	12505656	SOIL BORING LOGS
C-01	12505657	EXISTING CONDITIONS
C-02	12505658	DEMOLITION PLAN & LEAD MINING PLAN
C-03	12505659	SITE PLAN
C-04	12505660	GRADING & DRAINAGE PLAN
C-05	12505661	PHASE I EROSION CONTROL PLAN
C-06	12505662	PHASE II EROSION CONTROL PLAN
C-07	12505663	CROSS SECTIONS
C-08	12505664	CROSS SECTIONS
C-09	12505665	DETAILS
C-10	12505666	DETAILS
C-11	12505667	DETAILS
C-12	12505668	DETAILS

1.3 SUPPLEMENTARY DRAWINGS

1.3.1 Boring Logs

The Government does not guarantee that borings indicate actual conditions, except for the exact locations and the time that they were made.

1.3.2 Subsurface Data

Subsurface data, not specified or indicated, have been obtained by the Government at the station. The soils report is included as part of the solicitation.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 11 00

SUMMARY OF WORK
04/06

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

The work includes clearing and grubbing of trees and vegetation, composite soil sampling, soil processing for lead removal, construction of a new impact berm, new gravel access road, new eyebrow (bullet deflector), slope drains, wooden retaining wall, and other incidental related work.

1.1.2 Location

The work shall be located at the Rifle Range at Marine Corps Air Station, Cherry Point, approximately as indicated. The exact location will be shown by the Contracting Officer.

1.2 EXISTING WORK

In addition to "FAR 52.236-9, Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements":

a. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.

b. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work shall be in a condition equal to or better than that which existed before new work started.

1.3 LOCATION OF UNDERGROUND FACILITIES

It shall be the responsibility of the contractor to locate all existing underground utilities that are within the limits of work, prior to any excavation activities. These include but are not limited to the following buried utilities: water lines, sanitary and storm sewers, steam, condensate, fuel lines, gas lines, electrical ducts and direct buried conductors, commercial telephone, Base telephone, commercial cable TV, Base instructional cable TV, EMCS and fire alarm. The contractor shall employ the services of a qualified Utility locating company to locate, identify and mark all underground utilities. The entire construction limits shall be thoroughly scanned and researched to determine existing utility locations. Any existing utilities that are indicated on the project drawings shall be considered for reference use by the locating company and shall be verified. All underground utilities shall be clearly marked with flags, paint or stakes prior to any digging operation except that required to determine exact utility location and depth. CAUTION shall be used when trenching or excavating around or near buried utilities. The contractor shall be responsible for the timely repair and/or replacement of direct and collateral damage on any and all underground utilities that are severed, crushed, broken, displaced or otherwise disturbed by the construction operation. The Government shall not incur any additional cost for such

repair or replacement. The contractor shall notify the ROICC a minimum of three working days prior to utility location. Do not continue with excavations or installation of new work without resolving elevation discrepancies and conflicts.

1.3.1 Notification Prior to Excavation

Notify the Contracting Officer at least 48 hours prior to starting excavation work.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 14 00

WORK RESTRICTIONS
04/06

PART 1 GENERAL

1.1 SPECIAL SCHEDULING REQUIREMENTS

a. Have materials, equipment, and personnel required to perform the work at the site prior to the commencement of the work.

b. The Action, Pistol, and Rifle Ranges will not remain in operation during the entire construction period. The Contractor shall conduct his operations so as to cause the least possible delay.

c. Construction work at the Rifle Range shall not begin until 1 March 2008. The contract completion date shall not be affected by this starting date. Preliminary work, such as submittal review and material procurement, shall be accomplished prior to 1 March 2008 to the extent practical.

1.2 CONTRACTOR ACCESS AND USE OF PREMISES

1.2.1 Station Regulations

Ensure that Contractor personnel employed on the Station become familiar with and obey Station regulations. Keep within the limits of the work and avenues of ingress and egress. Wear hard hats in designated areas. Do not enter any restricted areas unless required to do so and until cleared for such entry. The Contractor's equipment shall be conspicuously marked for identification.

1.2.2 Working Hours

Regular working hours shall consist of an 8 1/2 hour period normally between the hours of 7:00 am to 4:30 PM, Monday through Friday, excluding Government holidays.

1.2.3 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Make application 15 calendar days prior to such work to allow arrangements to be made by the Government for inspecting the work in progress. During periods of darkness, the different parts of the work shall be lighted in a manner approved by the Contracting Officer.

1.2.4 Utility Cutovers and Interruptions

a. Permission to interrupt any Activity utility service shall be requested in writing a minimum of 15 calendar days prior to desired date of interruption.

b. Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in the paragraph "Work Outside Regular Hours."

1.3 SECURITY REQUIREMENTS

1.3.1 Contractor Access to MCAS Cherry Point and Outlying Areas

Per Air Station Order 5500.14, within five (5) days of contract award, the contractor shall provide the following information on all personnel that will be providing services aboard the US Marine Corps Air Station, Cherry Point, North Carolina and its outlying areas. These areas include, but are not limited to Oak Grove, Piney Island, BT-11, MCALF Bogue Field and MCOLF Atlantic.

a. A list of all employees including name, last four (4) of their social security number, date of birth and mailing address.

b. In order to obtain access to MCAS Cherry Point and obtain an identification badge, each contractor employee shall be required to present the following information to the Pass and Identification Office:

1. Documentation less than 30 days old of a criminal records check from the state or county covering the previous two years. Criminal record checks may be obtained from, but is not limited to the following sources: County Courthouse, Defense Security Service (www.dss.mil) and/or Infolink Screening Services, Inc. (www.infolinkscreening.com). Infolink Screening Services is listed as another possible source to obtain a criminal background check. The Government does not endorse nor is it affiliated with Infolink Screening Services.

2. Picture Identification Card from a state or federal agency.

3. Proof of immigration status. Acceptable documents include birth certificate, Immigration and Naturalization Service (INS) forms, and passports.

4. Proof of employment.

5. Letter from contractor reflecting the contract number and term of the contract.

c. If an employee is terminated prior to the end of the contract, the contractor shall return the base identification card to the Contracting Officer. This requirement also applies to all subcontract employees.

d. Identification card (badge) shall be worn and visible at all times while on the job site.

e. In no event will a contractor employee be permitted access to the MCAS Cherry Point for the purpose of on-site performance without the documentation listed above. Failure to obtain this information will not result in extensions to contract start, delivery, or completion dates.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 20 00.00 20

PRICE AND PAYMENT PROCEDURES
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE EP-1110-1-8	(1995) Construction Equipment Ownership and Operating Expense Schedule

1.2 SUBMITTALS

Submit the following per Section 01 33 00, "Submittal Procedures."

SD-01 Preconstruction Submittals

Schedule of prices; G

1.3 SCHEDULE OF PRICES

1.3.1 Data Required

Within 15 calendar days of notice of award, prepare and deliver to the Contracting Officer a schedule of prices (construction contract) on the forms furnished by the Government, each with an original signature. Provide a detailed breakdown of the contract price, giving quantities for each of the various kinds of work, unit prices, and extended prices therefore. Each item in the Schedule of Prices shall be structured so as to identify the section of specification to which it applies. Further, the section number shall be listed. Pursuant to clause entitled "Payments Under Fixed-Price Construction", payments will not be made until the Schedule of Prices has been submitted and approved.

1.3.2 Schedule Instructions

Payments will not be made until the Schedule of Prices has been submitted to and accepted by the Contracting Officer.

1.4 CONTRACT MODIFICATIONS

In conjunction with the Contract Clause "DFARS 252.236-7000, Modification Proposals-Price Breakdown," and where actual ownership and operating costs of construction equipment cannot be determined from Contractor accounting records, equipment use rates shall be based upon the applicable provisions of the COE EP-1110-1-8.

1.5 CONTRACTOR'S INVOICE

1.5.1 Content of Invoice

Requests for payment per the terms of the contract shall consist of the following:

a. Contractor's Invoice on NAVFAC Form 7300/41, which shall show, in summary form, the basis for arriving at the amount of the invoice.

b. Contractor's Monthly Estimate for Voucher (LANTNAVFACENGCOM Form 4-4330/110 (New 7/84)), with subcontractor and supplier payment certification.

c. Affidavit to accompany invoice (LANTDIV NORVA Form 4-4235/4 (Rev. 5/81)).

d. Updated copy of progress schedule. Furnish as specified in "FAR 52.236-15, Schedules for Construction Contracts."

1.5.2 Monthly Invoices and Supporting Forms

Forms will be furnished by the Contracting Officer. Requests for payment shall be processed per "FAR 52.232-5, Payments Under Fixed-Price Construction Contracts." Monthly invoices and supporting forms for work performed through the anniversary award date of the contract shall be submitted to the Contracting Officer between the 1st-7th if contract's last digit is 0, 1, or 2; 8th-14th if contract's last digit is 3 or 4; 15th -21st if contract's last digit is 5, 6, or 7; 22nd and last if the contract's last digit is 8 or 9 day of the month. Payments will be made using Wide Area Workflow (WAWF). Submit the following documents with invoice WAWF:

a. Contractor's invoice

b. Contractor's monthly estimate for voucher

c. Affidavit

d. Updated submittal register

e. Progress schedule

f. Certificate for Progress Payments

g. Contractor Safety Self Evaluation Checklist

1.6 PAYMENTS TO THE CONTRACTOR

Payments will be made on submission of itemized requests by the Contractor which comply with the requirements of this section, and will be subject to reduction for overpayments or increase for underpayments made on previous payments to the Contractor.

1.6.1 Obligation of Government Payments

The obligation of the Government to make payments required under the provisions of this contract will, at the discretion of the Contracting Officer, be subject to reductions and/or suspensions permitted under the

FAR and agency regulations including the following per "FAR 32.503-6:

a. Reasonable deductions due to defects in material or workmanship;

b. Claims which the Government may have against the Contractor under or in connection with this contract;

c. Unless otherwise adjusted, repayment to the Government upon demand for overpayments made to the Contractor; and

d. Failure to provide up to date record drawings not current as stated in Contract Clause "FAC 5252.236-9310, Record Drawings."

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS
04/06

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted per Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List of contact personnel

1.2 MINIMUM INSURANCE REQUIREMENTS

Procure and maintain during the entire period of performance under this contract the following minimum insurance coverage:

a. Comprehensive general liability: $500,000 per occurrence

b. Automobile liability: $200,000 per person, $500,000 per occurrence for bodily injury, $20,000 per occurrence for property damage

c. Workmen's compensation as required by Federal and State workers' compensation and occupational disease laws.

d. Employer's liability coverage of $100,000, except in States where workers compensation may not be written by private carriers,

e. Others as required by North Carolina State law.

f. The Cancellation clause on the insurance certificate should read:

"Cancellation or any material change in the policies adversely affecting the interest of the Government in such insurance shall not be effective for such period as may be prescribed by the laws of the State in which this contract is to be performed and in no event less than **thirty (30)** days after written notice thereof to the Contracting Officer."

1.3 CONTRACTOR PERSONNEL REQUIREMENTS

1.3.1 Subcontractors and Personnel

Furnish a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

1.3.2 Identification Badges

Identification badges will be furnished without charge. Application for and use of badges will be as directed. Immediately report instances of lost or stolen badges to the Contracting Officer.

Within five (5) days of contract award, the contractor shall provide the following information on all personnel that will be providing services aboard the US Marine Corps Air Station, Cherry Point, NC.

(1) A list of all employees including name, last four (4) of their social security number, date of birth and mailing address.

(2) In order to obtain access to the US Marine Corps Air Station, Cherry Point, NC and obtain an identification badge, per Air Station Order 5500.14 dated 15MAR2002, each contractor employee shall be required to present the following information to the Pass and Identification Office:

a. Documentation of less than 30 days of a criminal records check from the state or county covering the previous two years. Criminal records checks may be obtained from, but is not limited to the following sources: County Courthouse, Defense Security Service (www.dss.mil) and/or Infolink Screening Services, Inc. (www.infolinkscreening.com). Infolink Screening Services is listed as another possible source to obtain a criminal background check. The Government does not endorse nor is it affiliated with Infolink Screening Services.

b. Picture Identification Card from a state or federal agency.

c. Proof of immigration status. Acceptable documents include birth certificate, Immigration and Naturalization Service (INS) forms, and passports.

d. Proof of employment.

e. Letter from contractor reflecting the contract number and term of the contract.

f. Identification card (badge) shall be worn and visible at all times while on the job site.

(3) If an employee is terminated prior to end of the contract, the contractor shall return the base identification card to the Contracting Officer. This requirement also applies to all sub-contract employees.

(4) In no event will a contractor employee be permitted access to the US Marine Corps Air Station for the purpose of on-site performance without the documentation listed above. Failure to obtain this information will not result in extensions to contract start, delivery, or completion dates.

1.3.3 Subcontractor Special Requirements

1.3.3.1 Asbestos Containing Material

All contract requirements assigned to the Private Qualified Person (PQP) shall be accomplished directly by a first tier subcontractor.

1.3.4 Contractor Personnel Requirements

Failure to obtain entry approval will not affect the contract price or time of completion.

1.4 SUPERVISION

Have at least one qualified supervisor capable of reading, writing, and conversing fluently in the English language on the job site during working hours. In addition, if a Quality Control (QC) representative is required on the contract, then that individual shall also have fluent English communication skills.

1.5 PRECONSTRUCTION CONFERENCE

After award of the contract but prior to commencement of any work at the site, meet with the Contracting Officer to discuss and develop a mutual understanding relative to the administration of the value engineering and safety program, preparation of the schedule prices, shop drawings, and other submittals, scheduling programming, and prosecution of the work. Major subcontractors who will engage in the work shall also attend.

1.6 LEVEL "C" PARTNERING

To most effectively accomplish the contract, the Government requires the formation of a cohesive partnership with the contractor and its subcontractors. The partnering relationship is based upon trust, dedication to common goals, an understanding of each other's expectations and values, and a commitment to success. The goals of the partnering process are improved communication, efficiency and cost effectiveness, increased opportunity for innovation, and the continuous improvement of product quality. The partnership will strive to draw in the strength of each organization in an effort to achieve a quality project done right the first time, within budget, on schedule, and without any safety mishaps, thereby providing the opportunity for the contractor to make a reasonable profit. This level of partnering is an introduction to partnering concepts and benefits and should become a part of the preconstruction conference. The senior ROICC and contract persons present will jointly host the initial session. The partners will determine the frequency of the follow-on sessions. Partnering sessions should be held at or near the location of the ROICC office.

1.7 ELECTRONIC MAIL (E-MAIL) ADDRESS

The Contractor shall establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments in Microsoft, Adobe Acrobat, and other similar formats. Within 10 days after contractor award, the Contractor shall provide the Contracting Officer a single (only one) e-mail address for electronic communications from the Contracting Officer related to this contract including, but not limited to contract documents, invoice information, request for proposals, and other correspondence. The Contracting Officer may also use e-mail to notify the Contractor of base access conditions when emergency conditions warrant, such as hurricanes, terrorist threats, etc. Multiple e-mail addresses will not be allowed.

It is the Contractor's responsibility to make timely distribution of all Contracting Officer initiated e-mail with its own organization including the field office(s). The Contractor shall promptly notify the Contracting

Officer, in writing, of any changes to this e-mail address.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 31 23

WEB BASED CONSTRUCTION MANAGEMENT (WEBCM)
04/06

PART 1 GENERAL

1.1 DESCRIPTION

The Government and Contractor shall utilize the Naval Facilities Engineering Command's (NAVFAC) WebCM system for electronic submittal of all data and documents (unless specified otherwise by the Contracting Officer) throughout the duration of the Contract. WebCM is a web-based electronic media site that is hosted by Primavera Systems, Inc. utilizing their PrimeContract (hereinafter referred to as WebCM) web solution and will be made available only to key Prime Contractor personnel,and QC Specialist personnel working for subcontractors. The joint use of this system is to facilitate; electronic exchange of information, key processes, and overall management of the contract. WebCM shall be the primary means of project information submission and management. When required by the Contracting Officer, paper documents will also be provided (i.e.; e.g. the signature of Contract Modifications and submission of Contract Claims). In the event of discrepancy between the electronic version and paper documents, the paper documents will govern.

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1.2 USER ACCESS LIMITATIONS

The Contracting Officer will control the Contractor's access to WebCM by allowing access and assigning user profiles to accepted Contractor personnel. User profiles will define levels of access into the system; determine assigned function-based authorizations (determines what can be seen) and user privileges (determines what they can do). Sub-contractors and suppliers will not have direct access to WebCM. Entry of information exchanged and transferred between the Contractor, and its Designer of Record, sub-contractors and suppliers on WebCM shall be the responsibility of the Contractor.

1.2.1 Joint Ownership of Data

Data entered in a collaborative mode (entered with the intent to share as determined by permissions and workflows within the WebCM system) by the Contracting Officer and the Contractor will be jointly owned.

1.3 AUTOMATED SYSTEM NOTIFICATION AND AUDIT LOG TRACKING

Review comments made (or lack thereof) by the Government on Contractor submitted documentation shall not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for managing, tracking, and documenting the Work to comply with the requirements of the Contract Documents. Government acceptance via automated system notifications or audit logs extends only to the face value

of the submitted documentation and does not constitute validation of the Contractor's submitted information.

1.4 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List of Contractor's key WebCM personnel.

Include descriptions of key personnel's roles and responsibilities for this project.

1.5 COMPUTER REQUIREMENTS

The Contractor shall use computer hardware and software that meets the requirements of the WebCM system as recommended by Primavera Systems, Inc. to access and utilize WebCM. As recommendations are modified by Primavera, the Contractor will upgrade their system(s) to meet the recommendations or better. Upgrading of the Contractor's computer systems will not be justification for a cost or time modification to the Contract.

The contractor will ensure that connectivity to the WebCM system (whether at the home office or jobsite) is accomplished through DSL, cable or wireless communications systems. Requests for use of 56K modems will not be allowed for use in the system, as the time required to download information and input data becomes excessive and will cause the system to "time out".

1.6 CONTRACTOR RESPONSIBILITY

The Contractor shall be responsible for the validity of their information placed in WebCM and for the abilities of their personnel. Accepted users shall be knowledgeable in the use of computers, including Internet Explorer, e-mail programs such as Outlook, word processing programs such as Word, spreadsheet programs such as Excel, and Adobe Portable Document Format (PDF) document distribution program. The Contractor shall utilize the existing forms in WebCM to the maximum extent possible. If a form does not exist in WebCM and the Contractor must include as an attachment or by uploading the data file, PDF documents will be created through electronic conversion rather than optically scanned. The Contractor is responsible for the training of their personnel in the use of WebCM and the other programs indicated above as needed. All costs associated with the use of this system will be evenly distributed in the project overheads and spread across the duration of the contract; a separate cost line item will not be allowed.

1.6.1 User Access Administration

Provide a list of Contractor's key WebCM personnel for the Contracting Officer's acceptance. Notify the Contracting Officer immediately of any users that are to have access removed. Resubmit the personnel list whenever modified. User changes will take effect within 1 one working day of accepting the requested change. The Contracting Officer reserves the right to perform a security check on all potential users. The Contractor will be allocated 5 key personnel with access to WebCM. Access will include 2 key personnel from the Designer of Record and one access for each

QC Specialist while they are performing their duties, per Section 01 45 00.00 20 DESIGN AND CONSTRUCTION QUALITY CONTROL.

1.7 CONNECTIVITY PROBLEMS

WebCM is a web-based environment and therefore subject to the inherent speed and connectivity problems of the Internet. The Contractor is responsible for its own connectivity to the Internet. WebCM response time is dependent on the Contractor's equipment, including processor speed, modem speed, Internet access speed, etc. and current traffic on the Internet. The Government will not be liable for any delays associated from the usage of WebCM including, but not limited to: slow response time, down time periods, connectivity problems, or loss of information.

The contractor will ensure that connectivity to the WebCM system (whether at the home office or jobsite) is accomplished through DSL, cable or wireless communications systems. Requests for use of 56K modems will not be allowed for use in the system, as the time required to download information and input data becomes excessive and will cause the system to "time out".

Under no circumstances shall the usage of the WebCM be grounds for a time extension or cost adjustment to the contract.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 WEBCM UTILIZATION

WebCM shall be utilized in connection with submittal preparation and information management required by Section 01 33 00 SUBMITTAL PROCEDURES, Section 01 45 00.00 20 CONSTRUCTION QUALITY CONTROL and other Division One sections. Requirements of this section are in addition to requirements of all other sections of the specifications.

3.1.1 Shop Drawings

Shop drawing and design data documents shall be submitted as PDF attachments to the WebCM submittal workflow process and form. All PDF shop drawing submittal documents shall have the Contractor's review and submittal stamp (including signatures) as specified in Section 01 33 00 SUBMITTAL PROCEDURES the same as if submitted as hard copy. Examples of shop drawings include, but are not limited to:

a. Standard manufacturer installation drawings.

b. Drawings prepared to illustrate portions of the work designed or developed by the Contractor.

c. Steel fabrication, piece, and erection drawings.

3.1.2 Product Data

Product catalog data and manufacturers instructions shall be submitted as PDF attachments to the Webs submittal workflow process and form, except that color charts and similar color oriented pages shall be submitted as

hard copy separate from and in addition to the PDF copy. Submittal forms shall indicate when hard copy color documents are submitted. All PDF product data submittal documents shall have the Contractors review and submittal stamp (including signatures) as specified in Section 01 33 00, "Submittal Procedures" the same as if submitted as hard copy. Examples of product data include, but are not limited to:

a. Manufacturer's printed literature.

b. Preprinted product specification data and installation instructions.

3.1.3 Samples

Sample submittals shall be physically submitted as specified in Section 01 33 00 SUBMITTAL PROCEDURES. Contractor shall enter submittal data information into WebCM with a copy of the transmittal form(s) attached to the submittal. Examples of samples include, but are not limited to:

a. Product finishes and color selection samples.

b. Product finishes and color verification samples.

c. Finish/color boards.

d. Physical samples of materials.

3.1.4 Administrative Submittals

All correspondence and Preconstruction submittals shall be submitted on WebCM. Examples of administrative submittals include, but are not limited to:

a. Digging permits and notices for excavation.

b. List of Contractor personnel accessing WebCM.

c. List of contact personnel.

d. Notices for roadway interruption, work outside regular hours, and utility cutovers.

e. Requests for Information (RFI).

f. Submittal Register: Use the submittal register data provided by the Government. Contractor shall input data for dates as specified and upon acceptance of the register, load the register up to WebCM and update as required by the Contract documents.

g. Plans for safety, demolition, environmental protection, and similar activities.

h. Quality Control Plan(s), Testing Plan and Log, Quality Control Reports, Production Reports, Quality Control Specialist Reports, Preparatory Phase Checklist, Initial Phase Checklist, Field Test reports, Summary reports, Rework Items List, etc.

i. Meeting minutes for quality control meetings, progress meetings, pre-installation meetings, etc.

j. Any general correspondence submitted.

3.1.5 Compliance Submittals

Test report, certificate, and manufacture field report submittals shall be submitted on WebCM as PDF attachments. Examples of compliance submittals include, but are not limited to:

a. Field test reports.

b. Quality Control certifications.

c. Manufacturers documentation and certifications for quality of products and materials provided.

3.1.6 Record and Closeout Submittals

Operation and maintenance data and closeout submittals shall be submitted on WebCM as PDF documents during the approval and review stage as specified, with actual set of documents submitted for final. Examples of record submittals include, but are not limited to:

a. Operation and Maintenance Manuals: Final documents shall be submitted as specified.

b. As-built Drawings: Final documents shall be submitted as specified.

c. Extra Materials, Spare Stock, etc.: Submittal forms shall indicate when actual materials are submitted.

3.1.7 Exceptions

Documents with legal consequences, contract modifications, contract claims, security implications, and those required by other agencies may require an additional submittal as original hard copy with original signatures and seals. Hard copies of these documents shall be submitted as specified or as directed by the Contracting Officer.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES
04/06

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal

Contract Clauses "FAR 52.236-5, Material and Workmanship," paragraph (b) and "FAR 52.236-21, Specifications and Drawings for Construction," paragraphs (d), (e), and (f) apply to all "submittals."

1.1.2 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by SD numbers and titles as follows.

SD-01 Preconstruction Submittals

Certificates of insurance.
Surety bonds.
List of proposed subcontractors.
List of proposed products.
Construction Progress Schedule.
Submittal register.
Schedule of prices.
Health and safety plan.
Work plan.
Quality control plan.
Environmental protection plan.

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-05 Design Data

Calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

Statements signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Special requirements necessary to properly close out a construction contract. For example, Record Drawings, manufacturer's help and product lines necessary to maintain and install equipment. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

1.1.3 Approving Authority

Office authorized to approve submittal.

1.1.4 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control review and certification prior to being sent to the Architect-Engineer of Record for approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Submittal register; G

1.3 USE OF SUBMITTAL REGISTER

Submittal register will be delivered to the Contractor. Register will have the following fields completed, to the extent that will be required by the Government during subsequent usage.

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-04 Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Column (f): Indicate approving authority for each submittal. A "G" indicates approval by Contracting Officer; a blank indicates approval by the Architect-Engineer.

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved.

1.3.1 Submittal Register

Submit submittal register with quality control plan and project schedule required by Section 01 45 00.00 20. Verify that all submittals required for project are listed and add missing submittals. Complete the following on the register database:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval

of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.3.2 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program:

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.3.3 Approving Authority Use of Submittal Register

Update the following fields in the Government-furnished submittal register program.

Column (b).

Column (l) List date of submittal receipt.

Column (m) through (p).

Column (q) List date returned to Contractor.

1.3.4 Contractor Action Code and Action Code

Entries used shall be as follows (others may be prescribed by Transmittal Form):

NR - Not Received

AN - Approved as noted

A - Approved

RR - Disapproved, Revise, and Resubmit

1.3.5 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request. Deliver in electronic format, unless a paper copy is requested by Contracting Officer.

1.4 PROCEDURES FOR SUBMITTALS

1.4.1 Reviewing, Certifying, Approving Authority

QC organization shall be responsible for reviewing and certifying that submittals are in compliance with contract requirements. At each "Submittal" paragraph in individual specification sections, a notation "G,"

following a submittal item, indicates Contracting Officer is approving authority for that submittal item. A blank indicates the Architect-Engineer of record is the approving authority.

1.4.2 Constraints

a. Submittals listed or specified in this contract shall conform to provisions of this section, unless explicitly stated otherwise.

b. Submittals shall be complete for each definable feature of work; components of definable feature interrelated as a system shall be submitted at same time.

c. When acceptability of a submittal is dependent on conditions, items, or materials included in separate subsequent submittals, submittal will be returned without review.

d. Approval of a separate material, product, or component does not imply approval of assembly in which item functions.

1.4.3 Scheduling

a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential requirements to resubmit.

b. Except as specified otherwise, allow review period, beginning with receipt by approving authority, that includes at least 15 working days for submittals for Architect-Engineer approval and 20 working days for submittals for Contracting Officer approval. Period of review for submittals with Contracting Officer approval begins when Government receives submittal from QC organization. Period of review for each resubmittal is the same as for initial submittal.

c. For submittals requiring review by fire protection engineer, allow review period, beginning when Government receives submittal from QC organization, of 30 working days for return of submittal to the Contractor. Period of review for each resubmittal is the same as for initial submittal.

1.4.4 Variations

Variations from contract requirements require Government approval pursuant to contract Clause entitled "FAR 52.236-21, Specifications and Drawings for Construction" and will be considered where advantageous to Government.

1.4.4.1 Considering Variations

Discussion with Contracting Officer prior to submission, will help ensure functional and quality requirements are met and minimize rejections and resubmittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

1.4.4.2 Proposing Variations

When proposing variation, deliver written request to the Contracting

Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government. If lower cost is a benefit, also include an estimate of the cost saving. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

1.4.4.3 Warranting That Variations Are Compatible

When delivering a variation for approval, Contractor warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.4.4.4 Review Schedule Is Modified

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the Government of submittals with variations.

1.4.5 Contractor's Responsibilities

a. Determine and verify field measurements, materials, field construction criteria; review each submittal; and check and coordinate each submittal with requirements of the work and contract documents.

b. Transmit submittals to QC organization in accordance with schedule on approved Submittal Register, and to prevent delays in the work, delays to Government, or delays to separate Contractors.

c. Advise Contracting Officer of variation, as required by paragraph entitled "Variations."

d. Correct and resubmit submittal as directed by approving authority. When resubmitting disapproved transmittals or transmittals noted for resubmittal, the Contractor shall provide copy of that previously submitted transmittal including all reviewer comments for use by approving authority. Direct specific attention in writing or on resubmitted submittal, to revisions not requested by approving authority on previous submissions.

e. Furnish additional copies of submittal when requested by Contracting Officer, to a limit of 20 copies per submittal.

f. Complete work which must be accomplished as basis of a submittal in time to allow submittal to occur as scheduled.

g. Ensure no work has begun until submittals for that work have been returned as "approved," or "approved as noted", except to the extent that a portion of work must be accomplished as basis of submittal.

1.4.6 QC Organization Responsibilities

a. Note date on which submittal was received from Contractor on each submittal.

b. Review each submittal; and check and coordinate each submittal with requirements of work and contract documents.

c. Review submittals for conformance with project design concepts and compliance with contract documents.

d. Act on submittals, determining appropriate action based on QC organization's review of submittal.

(1) When the Architect-Engineer of record is the approving authority, forward the submittal to the A&E with the certifying statement or return submittal marked "not reviewed" or "revise and resubmit" as appropriate.

(2) When Contracting Officer is approving authority or when variation has been proposed, forward submittal to approving approving authority with certifying statement or return submittal marked"not reviewed" or "revise and resubmit" as appropriate.

e. Ensure that material is clearly legible.

f. Stamp each sheet of each submittal with QC certifying statement, except that data submitted in bound volume or on one sheet printed on two sides may be stamped on the front of the first sheet only.

The following certifying statement shall be used:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number (_____), is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is submitted for Government approval.

Certified by Submittal Reviewer _____, Date _____
(Signature when applicable)

Certified by QC Manager _____, Date _____"
(Signature)

g. Sign certifying statement. The person signing certifying statements shall be QC organization member designated in the approved QC plan. The signatures shall be in original ink. Stamped signatures are not acceptable.

h. Update submittal register as submittal actions occur and maintain the submittal register at project site until final acceptance of all work by Contracting Officer.

i. Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.

1.4.7 Government's Responsibilities

When approving authority is Contracting Officer or Architect-Engineer, the approving authority will:

a. Note date on which submittal was received from QC manager, on each submittal for which the Contracting Officer is approving authority.

b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.

c. Identify returned submittals with one of the actions defined in paragraph entitled "Actions Possible" and with markings appropriate for action indicated.

1.4.8 Actions Possible

Submittals will be returned with one of the following notations:

a. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required , does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

b. Submittals marked "approved" "approved as submitted" authorize Contractor to proceed with work covered.

c. Submittals marked "approved as noted" or "approval except as noted; resubmission not required" authorize Contractor to proceed with work as noted provided Contractor takes no exception to the notations.

d. Submittals marked "revise and resubmit" or "disapproved" indicate submittal is incomplete or does not comply with design concept or requirements of the contract documents and shall be resubmitted with appropriate changes. No work shall proceed for this item until resubmittal is approved.

1.5 FORMAT OF SUBMITTALS

1.5.1 Transmittal Form

Transmit each submittal, except sample installations and sample panels, to office of approving authority. Transmit submittals with transmittal form prescribed by Contracting Officer and standard for project. The transmittal form shall identify Contractor, indicate date of submittal, and include information prescribed by transmittal form and required in paragraph entitled "Identifying Submittals." Process transmittal forms to record actions regarding sample panels and sample installations.

1.5.2 Identifying Submittals

Identify submittals, except sample panel and sample installation, with the following information permanently adhered to or noted on each separate component of each submittal and noted on transmittal form. Mark each copy of each submittal identically, with the following:

a. Project title and location.

b. Construction contract number.

c. Section number of the specification section by which submittal is required.

d. Submittal description (SD) number of each component of submittal.

e. When a resubmission, add alphabetic suffix on submittal description, for example, SD-10A, to indicate resubmission.

f. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other second tier Contractor associated with submittal.

g. Product identification and location in project.

1.5.3 Format for SD-02 Shop Drawings

a. Shop drawings shall not be less than 8 1/2 by 11 inches nor more than 30 by 42 inches.

b. Present 8 1/2 by 11 inches sized shop drawings as part of the bound volume for submittals required by section. Present larger drawings in sets.

c. Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph entitled "Identifying Submittals."

d. Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to scale. Shop drawing dimensions shall be the same unit of measure as indicated on the contract drawings. Identify materials and products for work shown.

e. Drawings shall include the nameplate data, size and capacity. Also include applicable federal, military, industry and technical society publication references.

1.5.4 Format of SD-03 Product Data and SD-08 Manufacturer's Instruction

a. Present product data submittals for each section as a complete, bound volume. Include table of contents, listing page and catalog item numbers for product data.

b. Indicate, by prominent notation, each product which is being submitted; indicate specification section number and paragraph number to which it pertains.

c. Supplement product data with material prepared for project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project.

e. Product data shall include the manufacturer's name, trade name, place of manufacture, and catalog model or number. Submittals shall also include applicable federal, military, industry and technical society publication references. Should manufacturer's data require supplemental information for clarification, the supplemental information shall be submitted as specified for SD-07 Certificates.

f. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's

Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

g. Submit manufacturer's instruction prior to installation.

1.5.5 Format of SD-04 Samples

a. Furnish samples in sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately same size as specified:

(1) Sample of Equipment or Device: Full size.

(2) Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.

(3) Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.

(4) Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or materials are conduit and handrails.

(5) Sample of Non-Solid Materials: Pint. Examples of non-solid materials are sand and paint.

(6) Color Selection Samples: 2 by 4 inches.

(7) Sample Panel: 4 by 4 feet.

(8) Sample Installation: 100 square feet.

b. Samples Showing Range of Variation: Where variations are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range.

c. Reusable Samples: Incorporate returned samples into work only if so specified or indicated. Incorporated samples shall be in undamaged condition at time of use.

d. Recording of Sample Installation: Note and preserve the notation of area constituting sample installation but remove notation at final clean up of project.

e. When color, texture or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

1.5.6 Format of SD-05 Design Data and SD-07 Certificates

a. Provide design data and certificates on 8 1/2 by 11 inches paper. Provide a bound volume for submittals containing numerous pages.

1.5.7 Format of SD-06 Test Reports and SD-09 Manufacturer's Field Reports

a. Provide reports on 8 1/2 by 11 inches paper in a complete bound volume.

b. Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.

1.5.8 Format of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

a. When submittal includes a document which is to be used in project or become part of project record, other than as a submittal, do not apply Contractor's approval stamp to document, but to a separate sheet accompanying document.

1.6 QUANTITY OF SUBMITTALS

1.6.1 Number of Copies of SD-02 Shop Drawings

a. Submit six copies of submittals of shop drawings requiring review and approval only by QC organization and seven copies of shop drawings requiring review and approval by Contracting Officer.

1.6.2 Number of Copies of SD-03 Product Data and SD-08 Manufacturer's Instructions

Submit in compliance with quantity requirements specified for shop drawings.

1.6.3 Number of Samples SD-04 Samples

a. Submit two samples, or two sets of samples showing range of variation, of each required item. One approved sample or set of samples will be retained by approving authority and one will be returned to Contractor.

b. Submit one sample panel. Include components listed in technical section or as directed.

c. Submit one sample installation, where directed.

d. Submit one sample of non-solid materials.

1.6.4 Number of Copies SD-05 Design Data and SD-07 Certificates

a. Submit in compliance with quantity requirements specified for shop drawings.

1.6.5 Number of Copies SD-06 Test Reports and SD-09 Manufacturer's Field Reports

b. Submit in compliance with quantity with quality requirements specified for shop drawings.

1.6.6 Number of Copies of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

a. Unless otherwise specified, submit administrative submittals compliance with quantity requirements specified for shop drawings.

1.7 FORWARDING SUBMITTALS

1.7.1 Submittals Required from the Contractor

As soon as practicable after award of contract, and before procurement or fabrication, forward, except as specified otherwise, to the Architect-Engineer: Dewberry & Davis, Inc., 2301 Rexwoods Drive, Suite 200, Raleigh, North Carolina, 20607, submittals required in the technical sections of this specification. The Architect-Engineer for this project will review and approve submittals for the Contracting Officer to determine if submittals comply with the contract requirements. Forward one copy of the transmittal form for all submittals to the Resident Officer in Charge of Construction, NAVFAC Contracts, Facilities MCAS, PSC Box 8006, Cherry Point, North Carolina 28533-0006. Submit to the Resident Officer in Charge of Construction, NAVFAC Contracts, at the above address, for review and approval, the following:

a. All submittals required by Division 01 - General Requirements.

b. All submittals with "G" designation.

1.8 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.8.1 Government Approved

Government approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.8.2 Information Only

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.9 APPROVED SUBMITTALS

The Contracting Officer's and Architect-Engineer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details,

and the satisfactory construction of all work. After submittals have been approved by the approving authority, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.10 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

1.11 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

1.12 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.13 SUBMITTAL REGISTER

At the end of this section is a submittal register showing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The Government will provide the initial submittal register in electronic format. Thereafter, the Contractor shall maintain a complete list of all submittals, including completion of all data columns. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall track all submittals.

1.14 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted

concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 14 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

1.15 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

1.16 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

1.16.1 Procedures

The Government will further discuss detailed submittal procedures with the Contractor at the Preconstruction Conference.

1.16.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.17 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.18 GOVERNMENT AND ARCHITECT-ENGINEER APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. One copy of the submittal will be retained by the Architect-Engineer, three copies will be retained by the Contracting Officer and three copies of the submittal will be returned to the Contractor.

1.19 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work;

and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.20 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR

(Firm Name)

_____ Approved

_____ Approved with corrections as noted on submittal data and/or attached sheets(s).

SIGNATURE: _____

TITLE: _____

DATE: _____

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Increase Impact Berm Height

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 20 00.00 20	SD-01 Preconstruction Submittals															
			Schedule of prices	1.3	G													
		01 30 00	SD-01 Preconstruction Submittals															
			List of contact personnel	1.3.1														
		01 31 23	SD-01 Preconstruction Submittals															
			List of Contractor's key WebCM	1.6.1														
			personnel.															
		01 33 00	SD-01 Preconstruction Submittals															
			Submittal register	1.3.1	G													
		01 35 29	SD-01 Preconstruction Submittals															
			Accident Prevention Plan (APP)	1.9	G													
			ACTIVITY HAZARD ANALYSIS	1.10	G													
			(AHA)															
			Crane Critical Lift Plan	1.9.1	G													
			Crane Operators	1.7.3	G													
			SD-06 Test Reports															
			Reports	1.14														
			Accident Reports	1.14.1														
			Monthly Exposure Reports	1.14.3	G													
			Crane Reports	1.14.4														
			Regulatory Citations and	1.14.5	G													
			Violations															
			SD-07 Certificates															
			Contractor Safety Self-Evaluation	1.4	G													
			Checklist															
			Confined Space Entry Permit	1.11	G													

SUBMITTAL REGISTER

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 35 29	Certificate of Compliance	1.14.6														
		01 45 00.00 20	SD-01 Preconstruction Submittals															
			(QC) plan	1.6														
		01 50 00.00 20	SD-01 Preconstruction Submittals															
			Traffic control plan	1.4.1														
		01 57 19.00 20	SD-01 Preconstruction Submittals															
			Preconstruction Survey	1.5.1	G													
			Solid Waste Management Plan	3.3	G													
			and Permit															
			Regulatory Notification	1.5.2	G													
			Environmental Protection Plan	3.1	G													
			Construction Dewatering Plan	3.1.2.1	G													
			Dirt and Dust Control Plan	3.13.1														
			SD-06 Test Reports															
			Laboratory Analysis	3.4.2														
			SD-11 Closeout Submittals															
			Waste Determination	3.4	G													
			Documentation															
			Disposal Documentation for	3.5.1	G													
			Hazardous and Regulated Waste															
			Solid Waste Management Report	3.3.1	G													
			Contractor Hazardous Material	3.4.1	G													
			Inventory Log															
			Contractor Hazardous Material	3.5	G													
			Inventory Log															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Increase Impact Berm Height

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							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 57 19.00 20	Hazardous Waste/Debris Management	3.12.1	G													
		01 57 23.00 10	SD-07 Certificates															
			Mill Certificate or Affidavit	2.1.3														
		01 77 00.00 20	SD-11 Closeout Submittals															
			As-Built Drawings	1.2.1	G													
		02 83 13.00 20	SD-01 Preconstruction Submittals															
			Occupational and Environmental Assessment Data Report	1.5.2.3	G													
			Lead Compliance Plan	1.5.2.2	G													
			Competent Person	1.5.1.1	G													
			Training Certification	1.5.1.2	G													
			written evidence	3.5.2.1	G													
			Medical Examinations	1.5.2.4	G													
			SD-06 Test Reports															
			sampling results	1.5.2.3														
			SD-07 Certificates															
			Testing laboratory	1.5.1.3	G													
			Third party consultant qualifications	1.5.1.4	G													
			Clearance Certification	3.5.1	G													
			SD-11 Closeout Submittals															
			hazardous waste manifest	3.5.2.1	G													
			turn-in documents or weight tickets	3.5.2.1	G													
		03 30 00.00 20	SD-02 Shop Drawings															

SUBMITTAL REGISTER

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		03 30 00.00 20	Reinforcing steel	1.6.2.1														
			SD-03 Product Data															
			Materials for curing concrete	2.4.6														
			Joint filler	2.4.8														
			Epoxy bonding compound	2.4.9														
			SD-05 Design Data															
			mix design	2.3.1														
			SD-06 Test Reports															
			Concrete mix design	1.6.4.1														
			Fly ash	1.6.4.2														
			Pozzolan	1.6.4.2														
			Ground iron blast-furnace slag	1.6.4.3														
			Aggregates	1.6.4.4														
			Compressive strength tests	3.8.2.3														
		31 00 00	SD-01 Preconstruction Submittals															
			Shoring	3.5														
			SD-03 Product Data															
			Utilization of Excavated Materials	3.8														
			Rock Excavation	1.5.2														
			Opening of any Excavation or	3.4														
			Borrow Pit															
			SD-06 Test Reports															
			Testing	3.15														
			SD-07 Certificates															
			Testing	3.15														
		31 11 00	SD-03 Product Data															

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							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		31 11 00	Nonsaleable Materials	3.5.2													
		31 32 11	SD-02 Shop Drawings														
			Erosion Control Plan	3.1													
			Maintenance Record	3.6													
			SD-03 Product Data														
			Equipment	1.2													
			Finished Grade	3.1.1													
		32 11 23	SD-03 Product Data														
			Plant, Equipment, and Tools	1.6													
			Waybills and Delivery Tickets	1.7													
			SD-06 Test Reports														
			Sampling and Testing	1.4													
			Field Density Tests	1.4.2.4													
		32 92 19	SD-03 Product Data														
			Fertilizer	2.4													
			SD-06 Test Reports														
			Topsoil composition tests	2.2.3													
			SD-07 Certificates														
			seed	2.1													
			SD-08 Manufacturer's Instructions														
			Erosion Control Materials	2.7													
		33 40 01	SD-03 Product Data														
			Placing Pipe	3.3													
			SD-07 Certificates														
			Frame and Cover for Gratings	2.3.5													

SECTION 01 35 29

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASME INTERNATIONAL (ASME)

ASME B30.3	(1996) Construction Tower Cranes
ASME B30.5	(2000) Mobile and Locomotive Cranes
ASME B30.8	(2000) Floating Cranes and Floating Derricks
ASME B30.22	(2000) Articulating Boom Cranes

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.500	Fall Protection

U. S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2003) Safety -- Safety and Health Requirements

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(1998) Portable Fire Extinguishers
NFPA 51B	(2003) Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 241	(2000) Safeguarding Construction, Alteration, and Demolition Operations

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G

ACTIVITY HAZARD ANALYSIS (AHA); G

Crane Critical Lift Plan; G

Proof of Qualification for Crane Operators; G

SD-06 Test Reports

Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

Accident Reports

Monthly Exposure Reports; G

Crane Reports

Regulatory Citations and Violations; G

SD-07 Certificates

Contractor Safety Self-Evaluation Checklist; G

Confined Space Entry Permit; G

Certificate of Compliance (Crane)

Hot Work Permit

Submit one copy of each permit/certificate attached to each Daily Production and Quality Control Report.

1.3 DEFINITIONS

a. Associate Safety Professional (ASP). An individual who is currently certified as an ASP by the Board of Certified Safety Professionals.

b. Certified Construction Health & Safety Technician (CHST). An individual who is currently certified as a CHST by the Board of Certified Safety Professionals.

c. Certified Industrial Hygienist (CIH). An individual who is currently certified as a CIH by the American Board of Industrial Hygiene.

d. Certified Safety Professional (CSP). An individual who is currently certified as a CSP by the Board of Certified Safety Professionals.

e. Certified Safety Trained Supervisor (STS). An individual who is currently certified as an STS by the Board of Certified Safety Professionals.

f. Competent Person for Fall Protection. A person who is capable of

identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as their application and use with related equipment, and has the authority to take prompt corrective measures to eliminate the hazards of falling.

g. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.

h. Low-slope roof. A roof having a slope less than or equal to 4 in 12 (vertical to horizontal).

i. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

j. Multi-Employer Work Site (MEWS). A multi-employer work site, as defined by OSHA, is one in which many employers occupy the same site. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors.

k. Operating Envelope. The area surrounding any crane. Inside this "envelope" is the crane, the operator, riggers, rigging gear between the hook and the load, the load and the crane's supporting structure (ground, rail, etc.).

l. Qualified Person for Fall Protection. A person with a recognized degree or professional certificate, extensive knowledge, training and experience in the field of fall protection who is capable of performing design, analysis, and evaluation of fall protection systems and equipment.

m. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

(1) Death, regardless of the time between the injury and death, or the length of the illness;

(2) Days away from work;

(3) Restricted work;

(4) Transfer to another job;

(5) Medical treatment beyond first aid;

(6) Loss of consciousness; or

(7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

n. Site Safety and Health Officer (SSHO). The superintendent or other qualified or competent person who is responsible for the on-site safety and health required for the project. The Contractor quality control (QC) person can be the SSHO on this project.

o. Steep roof. A roof having a slope greater than 4 in 12 (vertical to horizontal).

p. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

q. Weight Handling Equipment (WHE) Accident. A WHE accident occurs when any one or more of the six elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; and collision, including unplanned contact between the load, crane, and/or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.).

1.4 CONTRACTOR SAFETY SELF-EVALUATION CHECKLIST

Contracting Officer will provide a "Contractor Safety Self-Evaluation checklist" to the Contractor at the pre-construction conference. The checklist will be completed monthly by the Contractor and submitted with each request for payment voucher. An acceptable score of 90 or greater is required. Failure to submit the completed safety self-evaluation checklist or achieve a score of at least 90, will result in a retention of up to 10 percent of the voucher.

1.5 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, work performed shall comply with USACE EM 385-1-1, and the following Federal, State, and local laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.6 DRUG PREVENTION PROGRAM

Conduct a proactive drug and alcohol use prevention program for all workers, prime and subcontractor, on the site. Ensure that no employee uses illegal drugs or consumes alcohol during work hours. Ensure there are no employees under the influence of drugs or alcohol during work hours. After accidents, collect blood, urine, or saliva specimens and test the injured and involved employees for the influence of drugs and alcohol. A copy of the test shall be made available to the Contracting Officer upon request.

1.7 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.7.1 Personnel Qualifications

1.7.1.1 Site Safety and Health Officer (SSHO)

Site Safety and Health Officer (SSHO) shall be provided at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The

Contractor Quality Control (QC) person can be the SSHO on this project. The SSHO shall meet the The SSHO shall meet the following requirements:

Level 3:
A minimum of 5 years safety work on similar projects.
30-hour OSHA construction safety class or equivalent within the last 5 years.
An average of at least 24 hours of formal safety training each year for the past 5 years.
Competent person training as needed.

1.7.2 Competent Person for Confined Space Entry

Provide a competent person for confined space meeting the definition and requirements of EM 385-1-1.

1.7.3 Crane Operators

Crane operators shall meet the requirements in USACE EM 385-1-1, Section 16 and Appendix G. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacitates of 50,000 pounds or greater, crane operators shall be designated as qualified by a source that qualifies crane operators (i.e., union, a government agency, or and organization that tests and qualifies crane operators). Proof of current qualification shall be provided.

1.7.4 Personnel Duties

1.7.4.1 Site Safety and Health Officer (SSHO)/Superintendent

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors' daily production and quality control report.

b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.

c. Maintain applicable safety reference material on the job site.

d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.

e. Implement and enforce accepted APPS and AHAs.

f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. A list of unresolved safety and health deficiencies shall be posted on the safety bulletin board.

g. Ensure sub-contractor compliance with safety and health requirements.

Failure to perform the above duties will result in dismissal of the superintendent and/or SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.7.5 Meetings

1.7.5.1 Preconstruction Conference

a. The Contractor will be informed, in writing, of the date of the preconstruction conference. The purpose of the preconstruction conference is for the Contractor and the Contracting Officer's representatives to become acquainted and explain the functions and operating procedures of their respective organizations and to reach mutual understanding relative to the administration of the overall project's Accident Prevention Plan (APP) before the initiation of work.

b. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

c. The Contractor shall discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, a schedule for the preparation, submittal, review, and acceptance of AHAs shall be established to preclude project delays.

d. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Work shall not begin until there is an accepted APP.

1.7.5.2 Weekly Safety Meetings

Conduct weekly safety meetings at the project site for all employees. The Contracting Officer will be informed of the meeting in advance and be allowed attendance. Minutes showing contract title, signatures of attendees and a list of topics discussed shall be attached to the Contractors' daily quality control report.

1.7.5.3 Work Phase Meetings

The appropriate AHA shall be reviewed and attendance documented by the Contractor at the preparatory, initial, and follow-up phases of quality control inspection. The analysis should be used during daily inspections to ensure the implementation and effectiveness of safety and health controls.

1.8 TRAINING

1.8.1 New Employee Indoctrination

New employees (prime and sub-contractor) will be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

1.8.2 Periodic Training

Provide Safety and Health Training in accordance with USACE EM 385-1-1 and the accepted APP. Ensure all required training has been accomplished for all onsite employees.

1.8.3 Training on Activity Hazard Analysis (AHA)

Prior to beginning a new phase, training will be provided to all affected employees to include a review of the AHA to be implemented.

1.9 ACCIDENT PREVENTION PLAN (APP)

The Contractor shall use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Preparation of Accident Prevention Plan". Where a paragraph or subparagraph element is not applicable to the work to be performed indicate "Not Applicable" next to the heading. Specific requirements for some of the APP elements are described below at paragraph 1.8.1. The APP shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Any portions of the Contractor's overall safety and health program referenced in the APP shall be included in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer and any designated CSP and/or CIH.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. The Contracting Officer reviews and comments on the Contractor's submitted APP and accepts it when it meets the requirements of the contract provisions.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. Should any unforeseen hazard become evident during the performance of work, the project superintendent shall inform the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, all necessary action shall be taken by the Contractor to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment.

Copies of the accepted plan will be maintained at the Contracting Officer's office and at the job site.
The APP shall be continuously reviewed and amended, as necessary, throughout the life of the contract. Unusual or high-hazard activities not identified in the original APP shall be incorporated in the plan as they are discovered.

1.9.1 EM 385-1-1 Contents

In addition to the requirements outlines in Appendix A of USACE EM 385-1-1, the following is required:

a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other competent and qualified personnel to be used such as CSPs, CIHs, STSs, CHSTs. The duties of each position shall be specified.

b. Qualifications of competent and of qualified persons. As a minimum, competent persons shall be designated and qualifications submitted for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.

c. Confined Space Entry Plan. Develop a confined space entry plan in accordance with USACE EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

d. Health Hazard Control Program. The Contractor shall designate a competent and qualified person to establish and oversee a Health Hazard Control Program in accordance with USACE EM 385-1-1, Section 6. The program shall ensure that employees, on-site Government representatives, and others, are not adversely exposed to chemical, physical and biological agents and that necessary controls and protective actions are instituted to ensure health.

e. Alcohol and Drug Abuse Plan

(1) Describe plan for random checks and testing with pre-employment screening in accordance with the DFAR Clause subpart 252.223-7004, "Drug Free Work Force."

(2) Description of the on-site prevention program

f. Fall Protection and Prevention (FP&P) Plan. The plan shall be site specific and address all fall hazards in the work place and during different phases of construction. It shall address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A qualified person for fall protection

shall prepare and sign the plan. The plan shall include fall protection and prevention systems, equipment and methods employed for every phase of work, responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Fall Protection and Prevention Plan shall be revised every six months for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. The accepted Fall Protection and Prevention Plan shall be kept and maintained at the job site for the duration of the project. The Fall Protection and Prevention Plan shall be included in the Accident Prevention Plan (APP).

g. Lead Compliance Plan. The safety and health aspects of lead work, prepared in accordance with Section 02 83 13.00 20 LEAD IN CONSTRUCTION.

h. Site Safety and Health Plan.

i. Excavation Plan. The safety and health aspects prepared in accordance with Section 31 00 00 EARTHWORK.

j. Training Records and Requirements. List of mandatory training and certifications which are applicable to this project (e.g. explosive actuated tools, confined space entry, fall protection, crane operation, vehicle operator, forklift operators, personal protective equipment); list of requirements for periodic retraining/certification; outline requirements for supervisory and employee safety meetings.

k. Crane Critical Lift Plan. Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. The plan shall be submitted 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.C.18. and the following:

(1) For lifts of personnel, the plan shall demonstrate compliance with the requirements of 29 CFR 1926.550(g).

(2) For barge mounted mobile cranes, barge stability calculations identifying barge list and trim based on anticipated loading; and load charts based on calculated list and trim. The amount of list and trim shall be within the crane manufacturer's requirements.

1.10 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1. Submit the AHA for review at least 15 calendar days prior to the start of each phase. Format subsequent AHAs as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

The activity hazard analyses shall be developed using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the Contracting Officer.

1.11 DISPLAY OF SAFETY INFORMATION

Within 1 calendar days after commencement of work, erect a safety bulletin board at the job site. The following information shall be displayed on the safety bulletin board in clear view of the on-site construction personnel, maintained current, and protected against the elements and unauthorized removal:

a. Map denoting the route to the nearest emergency care facility.

b. Emergency phone numbers.

c. Copy of the most up-to-date APP.

d. Current AHA(s).

e. OSHA 300A Form.

f. OSHA Safety and Health Protection-On-The-Job Poster.

g. Confined space entry permit.

h. Hot work permit.

i. A sign indicating the number of hours worked since last lost workday accident.

1.12 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in the article "References." Maintain applicable equipment manufacturer's manuals.

1.13 EMERGENCY MEDICAL TREATMENT

Contractors will arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.14 REPORTS

1.14.1 Accident Reports

a. For recordable injuries and illnesses, and property damage accidents resulting in at least $2,000 in damages, the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the Navy Contractor Significant Incident Report (CSIR) form and provide the report to the Contracting Officer within 1 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.

b. For any weight handling equipment accident (including rigging gear accidents) the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the WHE

Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Crane operations shall not proceed until cause is determined and corrective actions have been implemented to the satisfaction of the contracting officer. The Contracting Officer will provide a blank copy of the accident report form.

1.14.2 Accident Notification

Notify the Contracting Officer as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than $2,000, or any weight handling equipment accident. Information shall include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

1.14.3 Monthly Exposure Reports

Monthly exposure reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

1.14.4 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix H and as specified herein with Daily Reports of Inspections.

1.14.5 Regulatory Citations and Violations

Contact the Contracting Officer immediately of any OSHA or other regulatory agency inspection or visit, and provide the Contracting Officer with a copy of each citation, report, and contractor response. Correct violations and citations promptly and provide written corrective actions to the Contracting Officer.

1.14.6 Certificate of Compliance

The Contractor shall provide a Certificate of Compliance for each crane entering an activity under this contract (see Contracting Officer for a blank certificate). Certificate shall state that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance shall comply with 29 CFR 1926 and USACE EM 385-1-1 section 16 and Appendix H. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used. The Contractor shall also certify that all of its crane operators working on the DOD activity have been trained in the proper use of all safety devices (e.g., anti-two block devices). These certifications shall be posted on the crane.

1.15 HOT WORK

Prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, a written permit shall be requested from the Fire Department. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. The Contractor will provide at least two (2) twenty (20) pound 4A:20 BC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch shall be trained in accordance with NFPA 51B and remain on-site for a minimum of 30 minutes after completion of the task or as specified on the hot work permit.

When starting work in the facility, Contractors shall require their personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Department phone number. ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED TO THE RESPONSIBLE FIRE DEPARTMENT IMMEDIATELY.

1.16 HEALTH AND SAFETY PLAN (HASP)

Prepare as required by 29 CFR 1910.120 AND EM 385-1-1. Retain the CIH or CSP for the duration of the contract.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 CONSTRUCTION AND/OR OTHER WORK

The Contractor shall comply with USACE EM 385-1-1, NFPA 241, the APP, the AHA, Federal and/or State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard shall prevail.

3.1.1 Hazardous Material Use

Each hazardous material must receive approval prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with USACE EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocynates, lead-based paint are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials.

3.1.3 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead paint, and friable and non-friable asbestos. If material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

3.2 EQUIPMENT

3.2.1 Material Handling Equipment

a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.2.2 Weight Handling Equipment

a. Cranes and derricks shall be equipped as specified in EM 385-1-1, section 16.

b. The Contractor shall notify the Contracting Officer 15 days in advance of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated. Prior to cranes entering federal activities, a Crane Access Permit must be obtained from the Contracting Officer. A copy of the permitting process will be provided at the Preconstruction Conference. Contractor's operator shall remain with the crane during the spot check.

c. The Contractor shall comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Erection shall be performed under the supervision of a designated person (as defined in ASME B30.5). All testing shall be performed in accordance with the manufacturer's recommended procedures.

d. The Contractor shall comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.

e. Under no circumstance shall a Contractor make a lift at or above 90% of the cranes rated capacity in any configuration.

f. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of USACE EM 385-1-1 section 11 and ASME B30.5

or ASME B30.22 as applicable.

g. Crane suspended personnel work platforms (baskets) shall not be used unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Personnel shall not be lifted with a line hoist or friction crane.

h. Portable fire extinguishers shall be inspected, maintained, and recharged as specified in NFPA 10, Standard for Portable Fire Extinguishers.

i. All employees shall be kept clear of loads about to be lifted and of suspended loads.

j. The Contractor shall use cribbing when performing lifts on outriggers.

k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

l. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.

m. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Contracting Officer personnel.

n. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.

o. Certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. Prior to conducting lifting operations the contractor shall set a maximum wind speed at which a crane can be safely operated based on the equipment being used, the load being lifted, experience of operators and riggers, and hazards on the work site. This maximum wind speed determination shall be included as part of the activity hazard analysis plan for that operation.

3.2.3 Equipment and Mechanized Equipment

a. Proof of qualifications for operator shall be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment shall be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Such additional safety precautions or requirements shall be incorporated into the AHAs.

3.33.3 EXCAVATIONS

The competent person for excavations performed as a result of contract work

shall be on-site when excavation work is being performed, and shall inspect, and document the excavations daily prior to entry by workers. The competent person must evaluate all hazards, including atmospheric, that may be associated with the work, and shall have the resources necessary to correct hazards promptly. The competent person shall perform soil classification in accordance with 29 CFR 1926.

3.3.1 Utility Locations

Prior to digging, all underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service. Any markings made during the utility investigation must be maintained throughout the contract.

3.3.23.3.2 Utility Location Verification

The Contractor must physically verify underground utility locations by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system. Digging within 2 feet of a known utility must not be performed by means of mechanical equipment; hand digging shall be used. If construction is parallel to an existing utility the utility shall be exposed by hand digging every 100 feet if parallel within 5 feet of the excavation.

3.3.33.3.3 Fall Protection for Roofing Work

Fall protection controls shall be implemented based on the type of roof being constructed and work being performed. The roof area to be accessed shall be evaluated for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 1.8 m (6 feet) of an edge, on low-slope roofs, personnel shall be protected from falling by use of personal fall arrest systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized.

(2) For work greater than 1.8 m (6 feet) from an edge, warning lines shall be erected and installed in accordance with 29 CFR 1926.500 and USACE EM 385-1-1.

b. Steep-Sloped Roofs: Work on steep-sloped roofs requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also includes residential or housing type construction.

3.3.4 Utilities with Concrete Slabs

Utilities located within concrete slabs or pier decks, bridges, and the like are extremely difficult to identify. The location must be coordinated with station utility departments in addition to a private locating service. Outages on system utilities shall be used in circumstances where concrete chipping, saw cutting, or core drilling is required and utilities are unable to be completely identified.

3.3.53.3.5 Shoring Systems

Trench and shoring systems must be identified in the accepted safety plan

and AHA. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems shall be readily available on-site for review. Job-made shoring or shielding shall have the registered professional engineer stamp, specifications, and tabulated data. Extreme care must be used when excavating near direct burial electric underground cables.

3.3.63.3.6 Trenching Machinery

Trenching machines with digging chain drives shall be operated only when the spotters/laborers are in plain view of the operator. Operator and spotters/laborers shall be provided training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Documentation of the training shall be kept on file at the project site.

3.43.4 WORK IN CONFINED SPACES

The Contractor shall comply with the requirements in Section 06.I of USACE EM 385-1-1, OSHA 29 CFR 1910.146 and OSHA 29 CFR 1926.21(b)(6). Any potential for a hazard in the confined space requires a permit system to be used.

a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 06.I.06 of USACE EM 385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

b. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level.

c. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

3.53.5 HOUSEKEEPING

3.5.1 Clean-Up

All debris in work areas shall be cleaned up daily or more frequently if necessary. Construction debris may be temporarily located in an approved location, however garbage accumulation must be removed each day.

3.5.23.5.2 Falling Object Protection

All areas must be barricaded to safeguard employees. When working overhead, Barricade the area below to prevent entry by unauthorized employees. Construction warning tape and signs shall be posted so they are clearly visible from all possible access points. When employees are working overhead all tools and equipment shall be secured so that they will not fall. When using guardrail as falling object protection, all openings shall be small enough to prevent passage of potential falling objects.

-- End of Section --

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS
07/06

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g. ASTM B 564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

ACI INTERNATIONAL (ACI)
38800 Country Club Drive
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-- End of Section --

SECTION 01 45 00.00 20

CONSTRUCTION QUALITY CONTROL
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C 1077	(2002) Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM D 3666	(2002) Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D 3740	(2001) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(2002) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
ASTM E 543	(2002) Agencies Performing Nondestructive Testing

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2003) Safety -- Safety and Health Requirements

1.2 SUBMITTALS

Submit the following per Section 01 33 00, "Submittal Procedures."

SD-01 Preconstruction Submittals

Quality Control (QC) plan

Submit a QC plan within 20 calendar days after receipt of Notice of Award.

The QC Plan shall include a preliminary submittal of the list of definable features of work that shall cover the first 90 days of construction.

Any approval by the Government of the QC Plan shall be considered to be "approved as noted, resubmittal required" and will be in

effect only until the completed list of definable features of work is received and approved.

1.3 INFORMATION FOR THE CONTRACTING OFFICER

All electronic submissions of QC documentation will be through the Web Based Construction Management (WebCM) system. Refer to the requirements of Section 01 31 23 "Web Based Construction Management (WebCM)". The Contractor shall use the Daily Report forms that are available in WebCM. Prior to commencing work on construction, the Contractor can obtain a single copy set of the current report forms from the Contracting Officer. The report forms will consist of the Contractor Production Report, Contractor Production Report (Continuation Sheet), Contractor Quality Control (CQC) Report, (CQC) Report (Continuation Sheet), Preparatory Phase Checklist, Initial Phase Checklist, Rework Items List, and Testing Plan and Log.

Deliver the following to the Contracting Officer:

a. CQC Report: Submit the report electronically by 10:00 AM the next working day after each day that work is performed and for every seven consecutive calendar days of no-work.

b. Contractor Production Report: Submit the report electronically by 10:00 AM the next working day after each day that work is performed. and for every seven consecutive calendar days of no-work.

c. Preparatory Phase Checklist: Submit the report electronically in the same manner as the CQC Report for each Preparatory Phase held.

d. Initial Phase Checklist: Submit the report electronically in the same manner as the CQC Report for each Initial Phase held.

e. Field Test Reports: Within two working days after the test is performed, submit the report as an electronic attachment to the CQC Report.

f. Monthly Summary Report of Tests: Submit the report as an electronic attachment to the CQC Report at the end of each month.

g Testing Plan and Log: Submit the report as an electronic attachment to the CQC Report, at the end of each month. A copy of the final Testing Plan and Log shall be provided to the OMSI preparer for inclusion into the OMSI documentation.

h. Rework Items List: Submit lists containing new entries daily, in the same manner as the CQC Report.

i. CQC Meeting Minutes: Within two working days after the meeting is held, submit the report as an electronic attachment to the CQC Report.

j. QC Certifications: As required by the paragraph entitled "QC Certifications."

1.4 QC PROGRAM REQUIREMENTS

Establish and maintain a QC program as described in this section. The QC program consists of a QC Organization, a QC Plan, a QC Plan Meeting, a Coordination and Mutual Understanding Meeting, QC meetings, three phases of

control, submittal review and approval, testing, completion inspections, and QC certifications and documentation necessary to provide materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this Contract. The QC program shall cover on-site and off-site work and shall be keyed to the work sequence. No work or testing may be performed unless the QC Manager is on the work site. The QC Manager shall report to an officer of the firm and shall not be subordinate to the Project Superintendent or the Project Manager. The QC Manager, Project Superintendent and Project Manager must work together effectively. Although the Quality Control Manager is the primary individual responsible for quality control, all three individuals will be held responsible for the quality of work on the job. The project superintendent will be held responsible for the quality of production.

1.4.1 Preliminary Work Authorized Prior to Approval

The only work that is authorized to proceed prior to the approval of the QC Plan is mobilization of storage and office trailers, temporary utilities, and surveying.

1.4.2 Approval

Approval of the QC Plan is required prior to the start of construction. The Contracting Officer reserves the right to require changes in the QC Plan and operations as necessary, including removal of personnel, to ensure the specified quality of work. The Contracting Officer reserves the right to interview any member of the QC organization at any time in order to verify the submitted qualifications. All QC organization personnel shall be subject to acceptance by the Contracting Officer. The Contracting Officer may require the removal of any individual for non-compliance with quality requirements specified in the contract.

1.4.3 Notification of Changes

Notify the Contracting Officer, in writing, of any proposed change, including changes in the QC organization personnel, a minimum of seven calendar days prior to a proposed change. Proposed changes shall be subject to acceptance by the Contracting Officer.

1.5 QC ORGANIZATION

1.5.1 QC Manager

1.5.1.1 Duties

Provide a QC Manager at the work site to implement and manage the QC program. In addition to implementing and managing the QC program, the QC Manager may perform the duties of project superintendent. The QC Manager is required to attend the QC Plan Meeting, attend the Coordination and Mutual Understanding Meeting, conduct the QC meetings, perform the three phases of control, perform submittal review and approval, ensure testing is performed and provide QC certifications and documentation required in this contract. The QC Manager is responsible for managing and coordinating the three phases of control and documentation performed by Testing Laboratory personnel and any other inspection and testing personnel required by this Contract.

1.5.1.2 Qualifications

An individual with a minimum of 10 years experience as a superintendent, inspector, QC Manager, project manager, project engineer or construction manager on similar size and type construction contracts which included the major trades that are part of this Contract. The individual must be familiar with the requirements of EM 385-1-1, and have experience in the areas of hazard identification and safety compliance.

or

A graduate of a four year accredited college program in one of the following disciplines: Engineering, Architecture, Construction Management, Engineering Technology, Building Construction, or Building Science, with a minimum of 5 years experience as a superintendent, inspector, QC Manager, project manager, project engineer or construction manager on similar size and type construction contracts which included the major trades that are part of this Contract. The individual must be familiar with the requirements of EM 385-1-1, and have experience in the areas of hazard identification and safety compliance.

1.5.1.3 Construction Quality Management Training

In addition to the above experience and education requirements, the QC Manager shall have completed the course entitled "Construction Quality Management for Contractors." If the QC Manager does not have a current certification, they shall obtain the CQM course certification within 90 days of award. Contact Associated Builders and Contractors (ABC), 703-968-6205, joanna@abdva.org; mervin@abc.org for availability and cost associated with the class.

1.5.2 Alternate QC Manager Duties and Qualifications

Designate an alternate for the QC Manager at the work site to serve in the event of the designated QC Manager's absence. The period of absence may not exceed two weeks at one time, and not more than 30 workdays during a calendar year. The qualification requirements for the Alternate QC Manager shall be the same as for the QC manager.

1.6 QUALITY CONTROL (QC) PLAN

1.6.1 Requirements

Provide, for approval by the Contracting Officer, a QC plan submitted in a 3-ring binder with pages numbered sequentially that covers both on-site and off-site work and includes the following:

a. A table of contents listing the major sections identified with tabs in the following order:

I. QC ORGANIZATION
II. NAMES AND QUALIFICATIONS
III. DUTIES, RESPONSIBILITY AND AUTHORITY OF QC PERSONNEL
IV. OUTSIDE ORGANIZATIONS
V. APPOINTMENT LETTERS
VI. SUBMITTAL PROCEDURES
VII. TESTING LABORATORY INFORMATION
VIII. TESTING PLAN AND LOG
IX. PROCEDURES TO COMPLETE REWORK ITEMS

X. DOCUMENTATION PROCEDURES
XI. LIST OF DEFINABLE FEATURES
XII. PROCEDURES FOR PERFORMING THE THREE PHASES OF CONTROL
XIII. PERSONNEL MATRIX
XIV. PROCEDURES FOR COMPLETION INSPECTION

b. A chart showing the QC organizational structure.

c. Names and qualifications, in resume format, for each person in the QC organization. Include the CQM course certifications for the QC Manager and Alternate QC Manager as required by the paragraphs entitled "Construction Quality Management Training" and "Alternate QC Manager Duties and Qualifications".

d. Duties, responsibilities and authorities of each person in the QC organization.

e. A listing of outside organizations such as, architectural and consulting engineering firms that will be employed by the Contractor and a description of the services these firms will provide.

f. Letters signed by an officer of the firm appointing the QC Manager and Alternate QC Manager and stating that they are responsible for implementing and managing the QC program as described in this contract. Include in this letter the responsibility of the QC Manager and Alternate QC Manager to implement and manage the three phases of quality control, and their authority to stop work which is not in compliance with the contract. The QC Manager shall issue letters of direction to all outlining their duties, authorities, and responsibilities. Copies of the letters shall be included in the QC plan.

g. Procedures for reviewing, approving and managing submittals. Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval. Provide the initial submittal as specified in section entitled "Submittal Procedures."

h. Testing laboratory information required by the paragraphs entitled "Accreditation Requirements" or "Construction Materials Testing Laboratory Requirements", as applicable.

i. A Testing Plan and Log that includes the tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for each test.

j. Procedures to identify, record, track and complete rework items.

k. Documentation procedures, including proposed report formats.

l. List of definable features of work. A definable feature of work (DFOW) is a task which is separate and distinct from other tasks, has the same control requirements and work crews. The list shall be cross-referenced to the contractor's Construction Schedule and the specification sections. For projects requiring a Progress Chart, the list of definable features of work shall include but not be limited to all items of work on the schedule. For projects requiring a Network Analysis Schedule, the list of definable

features of work shall include but not be limited to all critical path activities.

m. Procedures for Performing the Three Phases of Control. For each DFOW, provide the DFOW's Preparatory and Initial Phase Checklists. Each list shall include a breakdown of quality checks that will be used when performing the quality control functions, inspections, and tests required by the contract documents. The Preparatory and Initial Phases and meetings shall be conducted with a view towards obtaining quality construction by planning ahead and identifying potential problems for each definable feature of work.

n. A personnel matrix showing for each section of the specification who will review and approve submittals, who will perform and document the three phases of control, and who will perform and document the testing.

o. Procedures for Identifying and Documenting the Completion Inspection process. Include in these procedures the responsible party for punch out inspection, prefinal inspection, and final acceptance inspection.

1.7 QC PLAN MEETING

Prior to submission of the QC plan, meet with the Contracting Officer to discuss the QC plan requirements of this Contract. The purpose of this meeting is to develop a mutual understanding of the QC plan requirements prior to plan development and submission.

1.8 COORDINATION AND MUTUAL UNDERSTANDING MEETING

After submission of the QC Plan, and prior to the start of construction, meet with the Contracting Officer to present the QC program required by this Contract. The purpose of this meeting is to develop a mutual understanding of the QC details, including documentation, administration for on-site and off-site work, and the coordination of the Contractor's management, production and QC personnel. At the meeting, the Contractor will be required to explain in detail how three phases of control will be implemented for each definable feature of work. As a minimum, the Contractor's personnel required to attend shall include an officer of the firm, the project manager, project superintendent, QC Manager, Alternate QC Manager, and subcontractor representatives. Each subcontractor who will be assigned QC responsibilities shall have a principal of the firm at the meeting. Minutes of the meeting will be prepared by the QC Manager and signed by the Contractor, and the Contracting Officer. A copy of the signed minutes shall be provided to all attendees by the Contractor. Repeat the coordination and mutual understanding meeting when a new QC Manager is appointed.

1.9 QC MEETINGS

After the start of construction, the QC Manager shall conduct weekly QC meetings at the work site with the project superintendent. The QC Manager shall prepare the minutes of the meeting and provide a copy to the Contracting Officer within 2 working days after the meeting. The Contracting Officer may attend these meetings. The QC Manager shall notify the Contracting Officer at least 48 hours in advance of each meeting. As a minimum, the following shall be accomplished at each meeting:

a. Review the minutes of the previous meeting;

b. Review the schedule and the status of work:

(1) Work or testing accomplished since last meeting

(2) Rework items identified since last meeting

(3) Rework items completed since last meeting;

c. Review the status of submittals:

(1) Submittals reviewed and approved since last meeting

(2) Submittals required in the near future;

d. Review the work to be accomplished in the next week and documentation required:

(1) Establish completion dates for rework items

(2) Update the schedule showing planned and actual dates of the preparatory, initial and follow-up phases, including testing and any other inspection required by this contract

(3) Discuss construction methods and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each definable feature of work

(4) Discuss status of off-site work or testing

(5) Documentation required;

(6) Discuss upcoming Activity Hazard Analyses:

e. Resolve QC and production problems:

(1) Assist in resolving Request for Information issues; and

f. Address items that may require revising the QC plan:

(1) Changes in QC organization personnel

(2) Changes in procedures;

g. Review health and safety plan

1.10 THREE PHASES OF CONTROL

The Three Phases of Control shall adequately cover both on-site and off-site work and shall include the following for each definable feature of work.

1.10.1 Preparatory Phase

Notify the Contracting Officer at least 2 work days in advance of each preparatory phase. This phase shall include a meeting conducted by the QC Manager and attended by the superintendent, and the foreman responsible for

the definable feature. Document the results of the preparatory phase actions in the daily Contractor Quality Control Report and in the Preparatory Phase Checklist. Perform the following prior to beginning work on each definable feature of work:

a. Review each paragraph of the applicable specification sections;

b. Review the Contract drawings;

c. Verify that appropriate shop drawings and submittals for materials have been submitted and approved. Verify receipt of approved factory test results, when required;

d. Review the testing plan and ensure that provisions have been made to provide the required QC testing;

e. Examine the work area to ensure that the required preliminary work has been completed;

f. Examine the required materials to ensure that they are on hand and conform to the approved shop drawings and submitted data;

g. Discuss construction methods, construction tolerances, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each definable feature of work; and

h. Review the safety plan and appropriate activity hazard analysis to ensure that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDS) are submitted.

1.10.2 Initial Phase

Notify the Contracting Officer at least 2 work days in advance of each initial phase. When construction crews are ready to start work on a definable feature of work, conduct the initial phase with the superintendent, and the foreman responsible for that definable feature of work. Observe the initial segment of the definable feature of work to ensure that the work complies with Contract requirements. Document the results of the initial phase in the daily Contractor Quality Control Report and in the Initial Phase Checklist. Repeat the initial phase for each new crew to work on-site, or when acceptable levels of specified quality are not being met. Perform the following for each definable feature of work:

a. Establish the quality of workmanship required;

b. Resolve conflicts;

c. Ensure that testing is performed by the approved laboratory, and

d. Check work procedures for compliance with the Safety Plan and the appropriate activity hazard analysis to ensure that applicable safety requirements are met.

1.10.3 Follow-Up Phase

Perform the following for on-going work daily, or more frequently as necessary until the completion of each definable feature of work and document in the daily Contractor Quality Control Report:

a. Ensure the work is in compliance with Contract requirements;

b. Maintain the quality of workmanship required;

c. Ensure that testing is performed by the approved laboratory;

d. Ensure that rework items are being corrected; and

e. Perform safety inspections.

1.10.4 Additional Preparatory and Initial Phases

Additional Preparatory and Initial Phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable QC organization, if there are changes in the on-site production supervision or work crew, if work on a definable feature is resumed after substantial period of inactivity, or if other problems develop.

1.10.5 Notification of Three Phases of Control for Off-Site Work

Notify the Contracting Officer at least two weeks prior to the start of the preparatory and initial phases.

1.11 SUBMITTAL REVIEW AND APPROVAL

Procedures for submission, review and approval of submittals are described in section entitled "Submittal Procedures."

1.12 TESTING

Except as stated otherwise in the specification sections, perform sampling and testing required under this Contract.

1.12.1 Accreditation Requirements

Construction materials testing laboratories performing work for Navy construction contracts will be required to submit the following:

a. A copy of the Certificate of Accreditation and Scope of Accreditation by an acceptable laboratory accreditation authority.

Construction materials testing laboratories performing work for Navy construction contracts must be accredited by one of the laboratory accreditation authorities. The laboratory's scope of accreditation must include the ASTM standards listed in the paragraph titled "Construction Materials Testing Laboratory Requirements" as appropriate to the testing field. The policy applies to the specific laboratory performing the actual testing, not just the "Corporate Office".

1.12.2 Construction Materials Testing Laboratory Requirements

Provide an independent construction materials testing laboratory accredited by an acceptable laboratory accreditation authority to perform sampling and tests required by this Contract. Testing laboratories that have obtained accreditation by an acceptable laboratory accreditation authority listed in the paragraph entitled "Laboratory Accreditation Authorities" submit to the Contracting Officer, a copy of the Certificate of Accreditation and Scope

of Accreditation. The scope of the laboratory's accreditation shall include the test methods required by the Contract. For testing laboratories that have not yet obtained accreditation by an acceptable laboratory accreditation authority listed in the paragraph entitled "Laboratory Accreditation Authorities" submit an acknowledgment letter from one of the laboratory accreditation authorities indicating that the application for accreditation has been received and the accreditation process has started, and submit to the Contracting Officer for approval, certified statements, signed by an official of the testing laboratory attesting that the proposed laboratory, meets or conforms to the ASTM standards listed below as appropriate to the testing field.

a. Laboratories engaged in testing of construction materials shall meet the requirements of ASTM E 329.

b. Laboratories engaged in testing of concrete and concrete aggregates shall meet the requirements of ASTM C 1077.

c. Laboratories engaged in testing of bituminous paving materials shall meet the requirements of ASTM D 3666.

d. Laboratories engaged in testing of soil and rock, as used in engineering design and construction, shall meet the requirements of ASTM D 3740.

f. Laboratories engaged in nondestructive testing (NDT) shall meet the requirements of ASTM E 543.

g. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA.

1.12.3 Laboratory Accreditation Authorities

Laboratory Accreditation Authorities are the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology, the American Association of State Highway and Transportation Officials (AASHTO) program, ICBO Evaluation Service, Inc. (ICBO ES), and the American Association for Laboratory Accreditation (A2LA) program and the Washington Association of Building Officials (WABO) (Approval authority for WABO is limited to projects within Washington State), and the Washington Area Council of Engineering Laboratories (WACEL) (Approval authority by WACEL is limited to projects within the Chesapeake Division and Public Works Center Washington geographical area).

Furnish to the Contracting Officer, a copy of the Certificate of Accreditation and Scope of Accreditation. The scope of the laboratory's accreditation shall include the test methods required by the Contract.

1.12.4 Capability Check

The Contracting Officer retains the right to check laboratory equipment in the proposed laboratory and the laboratory technician's testing procedures, techniques, and other items pertinent to testing, for compliance with the standards set forth in this Contract.

1.12.5 Test Results

Cite applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item tested or

analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify Contracting Officer immediately. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, whichever is applicable. Test results shall be signed by a testing laboratory representative authorized to sign certified test reports. Furnish the signed reports, certifications, and other documentation to the Contracting Officer via the QC Manager. Furnish a summary report of field tests at the end of each month. Attach a copy of the summary report to the last daily Contractor Quality Control Report of each month.

1.12.6 Test Reports and Monthly Summary Report of Tests

The QC Manager shall furnish the signed reports, certifications, and a summary report of field tests at the end of each month to the Contracting Officer. Attach a copy of the summary report to the last daily Contractor Quality Control Report of each month.

1.13 QC CERTIFICATIONS

1.13.1 Contractor Quality Control Report Certification

Each Contractor Quality Control Report shall contain the following statement: "On behalf of the Contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge, except as noted in this report."

1.13.2 Invoice Certification

Furnish a certificate to the Contracting Officer with each payment request, signed by the QC Manager, attesting that as-built drawings are current and attesting that the work for which payment is requested, including stored material, is in compliance with contract requirements.

1.13.3 Completion Certification

Upon completion of work under this Contract, the QC Manager shall furnish a certificate to the Contracting Officer attesting that "the work has been completed, inspected, tested and is in compliance with the Contract."

1.14 COMPLETION INSPECTIONS

1.14.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Contract Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings and specifications. Include in the punch list any remaining items on the "Rework Items List" which were not corrected prior to the Punch-Out Inspection. The punch list shall include the estimated date by which the deficiencies will be corrected. A copy of the punch list shall be provided to the Contracting Officer. The QC Manager or staff shall make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished the Contractor shall notify the Government that the facility is ready for the Government "Pre-Final Inspection."

1.14.2 Pre-Final Inspection

The Government will perform this inspection to verify that the facility is complete and ready to be occupied. A Government "Pre-Final Punch List" may be developed as a result of this inspection. The QC Manager shall ensure that all items on this list are corrected prior to notifying the Government that a "Final" inspection with the customer can be scheduled. Any items noted on the "Pre-Final" inspection shall be corrected in timely manner and shall be accomplished before the contract completion date for the work or any particular increment thereof if the project is divided into increments by separate completion dates.

1.14.3 Final Acceptance Inspection

The QC Manager, the superintendent or other primary contractor management personnel, and the Contracting Officer's representative will be in attendance at this inspection. Additional Government personnel may be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the "Pre-Final" inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final inspection stating that all specific items previously identified to the Contractor as being unacceptable, along with all the remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost per the Contract Clause entitled "Inspection of Construction." When the Contracting Officer takes possession of partially completed work, it will be per Contract Clause "Use and Possession Prior to Completion".

1.15 DOCUMENTATION

Maintain current and complete records of on-site and off-site QC program operations and activities. The Contractor shall submit all documentation per Section 01 31 23 WEB BASED CONSTRUCTION MANAGEMENT (WEBCM).

1.15.1 Contractor Production Report

Reports are required for each day that work is performed and shall accompany the submission of the Contractor Quality Control Report prepared for the same day. Account for each calendar day throughout the life of the Contract. The reporting of work shall be identified by terminology consistent with the construction schedule. Contractor Production Reports are to be prepared, signed and dated by the project superintendent and shall contain the following information:

a. Date of report, report number, name of contractor, Contract number, title and location of Contract and superintendent present.

b. Weather conditions in the morning and in the afternoon including maximum and minimum temperatures.

c. Identify work performed by corresponding Schedule Activity No., PC#, Modification No., etc.

d. A list of Contractor and subcontractor personnel on the work site, their trades, employer, work location, description of work

performed, hours worked by trade, daily total work hours on work site this date (including hours on continuation sheets), and total work hours from start of construction.

e. A list of job safety actions taken and safety inspections conducted. Indicate that safety requirements have been met including the results on the following:

(1) Was a job safety meeting held this date? (If YES, attach a copy of the meeting minutes.)

(2) Were there any lost time accidents this date? (If YES, attach a copy of the completed OSHA report.)

(3) Was crane/manlift/trenching/scaffold/hv electrical/high work/hazmat work done? (If YES, attach a statement or checklist showing inspection performed.)

(4) Was hazardous material/waste released into the environment? (If YES, attach a description of incident and proposed action.)

f. Identify Schedule Activity No. related to safety action and list safety actions taken today and safety inspections conducted.

g. Identify Schedule Activity No., Submittal # and list equipment/material received each day that is incorporated into the job.

h. Identify Schedule Activity No., Owner and list construction and plant equipment on the work site including the number of hours used.

i. Include a "remarks" section in this report which will contain pertinent information including directions received, problems encountered during construction, work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instructions given and corrective actions taken, delays encountered and a record of visitors to the work site. For each remark given, identify the Schedule Activity No. that is associated with the remark.

1.15.1.1 Contractor Production Report (Continuation Sheet)

Additional space required to contain daily information on the Contractor Production Report will be placed on its Continuation Sheet(s). An unlimited number of Continuation Sheets may be added as necessary and attached to the Production Report.

1.15.2 Contractor Quality Control Report

Reports are required for each day that work is performed and for every seven consecutive calendar days of no-work and on the last day of a no-work period. Account for each calendar day throughout the life of the Contract. The reporting of work shall be identified by terminology consistent with the construction schedule. Contractor Quality Control Reports are to be prepared, signed and dated by the QC Manager and shall contain the following information:

a. Date of report, report number, Contract Number, and Contract Title.

b. Indicate if Preparatory Phase work was performed today (Yes/No checkboxes).

c. If Preparatory Phase work was performed today (including on-site and off-site work), identify its Schedule Activity No. and Definable Feature of Work. The Index # is a cross reference to the Preparatory Phase Checklist. An example of the Index # is: 0025-P01, where "0025" is the Contractor Quality Control Report Number, "P" indicates Preparatory Phase, and "01" is the Preparatory Phase Checklist number(s) for this date. Each entry in this section must be accompanied with a corresponding Preparatory Phase Checklist.

d. Indicate if Initial Phase work was performed today (Yes/No checkboxes).

e. If Initial Phase work was performed today (including on-site and off-site work), identify its Schedule Activity No. and Definable Feature of Work. The Index # is a cross reference to the Initial Phase Checklist. An example of the Index # is: 0025-I01, where "0025" is the Contractor Quality Control Report Number, "I" indicates Initial Phase, and "01" is the Initial Phase Checklist number(s) for this date. Each entry in this section must be accompanied with a corresponding Initial Phase Checklist.

f. Results of the Follow-up Phase inspections held today (including on-site and off-site work), including Schedule Activity No., the location of the definable feature of work, Specification Sections, etc. Indicate in the report for this definable feature of work that the work complies with the Contract as approved in the Initial Phase, work complies with safety requirements, and that required testing has been performed and include a list of who performed the tests.

g. List the rework items identified, but not corrected by close of business; along with its associated Schedule Activity Number.

h. List the rework items corrected from the rework items list along with the corrective action taken and its associated Schedule Activity Number.

i. Include a "remarks" section in this report which will contain pertinent information including directions received, quality control problem areas, deviations from the QC plan, construction deficiencies encountered, QC meetings held, acknowledgement that as-built drawings have been updated, corrective direction given by the QC Organization and corrective action taken by the Contractor. For each remark given, identify the Schedule Activity No. that is associated with the remark.

j. Contractor Quality Control Report certification, signature and date.

1.15.2.1 Contractor Quality Control Report (Continuation Sheet)

Additional space required to contain daily information on the Contractor Quality Control Report will be placed on its Continuation Sheet(s). An unlimited number of Continuation Sheets may be added as necessary and

attached to the Contractor Quality Control Report.

1.15.3 Preparatory Phase Checklist

Each Definable Feature of Work that is in the Preparatory Phase shall have this checklist filled out for it. The checklist shall be identified by terminology consistent with the construction schedule. Attach this checklist to the Contractor Quality Control Report of the same date.

a. Specification Section, date of report, and Contract number shall be filled out. Duplicate this information in the header of the second page of the report.

b. Definable Feature of Work, Schedule Activity No. and Index # entry and format will match entry in the Preparatory Phase section of the Contractor Quality Control Report. Duplicate this information in the header of the second page of the report.

c. Personnel Present: Indicate the number of hours of advance notice that was given to the Government Representative and indicate (Yes/No checkboxes) whether or not the Government Rep was notified. Indicate the Names of Preparatory Phase Meeting attendees, their position and company/government they are with.

d. Submittals: Indicate if submittals have been approved (Yes/No checkboxes), if no indicate what has not been submitted. Are materials on hand (Yes/No checkboxes) and if not, what items are missing. Check delivered material/equipment against approved submittals and comment as required.

e. Material Storage: Indicate if materials/equipment is stored properly (Yes/No checkboxes) and if not, what action is/was taken.

f. Specifications: Review and comment on Specification Paragraphs that describe the material/equipment, procedure for accomplishing the work and clarify any differences.

g. Preliminary Work & Permits: Ensure preliminary work is per the contract documents and necessary permits are on file, if not, describe the action taken.

h. Testing: Identify who performs tests, the frequency, and where tests are to occur. Review the testing plan, report abnormalities, and if the test facilities have been approved.

i. Safety: Indicate if the activity hazard analysis has been approved (Yes/No checkboxes) and comment on the review of the applicable portions of the EM 385-1-1.

j. Meeting Comments: Note comments and remarks during the Preparatory Phase Meeting that was not addressed in previous sections of this checklist.

k. Other Items or Remarks: Note any other remarks or items that were a result of the Preparatory Phase.

l. QC Manager will sign and date the checklist.

1.15.4 Initial Phase Checklist

Each Definable Feature of Work that is in the Initial Phase shall have this checklist filled out for it. The checklist shall be identified by terminology consistent with the construction schedule. Attach this checklist to the Contractor Quality Control Report of the same date.

a. Specification Section, date of report, and Contract number shall be entered.

b. Definable Feature of Work, Schedule Activity No. and Index # entry and format will match entry in the Initial Phase section of the Contractor Quality Control Report.

c. Personnel Present: Indicate the number of hours of advance notice that was given to the Government Representative and indicate (Yes/No checkboxes) whether or not the Government Rep was notified. Indicate the Names of Initial Phase Meeting attendees, their position and company/government they are with.

d. Procedure Compliance: Comment on compliance with procedures identified at Preparatory Phase of Control and assurance that work is per plans, specifications and submittals.

e. Preliminary Work: Ensure preliminary work being placed is in compliance and if not, what action is/was taken.

f. Workmanship: Identify where initial work is located; if a sample panel is required (Yes/No checkboxes); is the initial work the sample (Yes/No checkboxes); and if Yes, describe the panel location and precautions taken to preserve the sample.

g. Resolution: Comment on any differences and the resolutions reached.

h. Check Safety: Comment on the safety review of the job conditions.

i. Other: Note any other remarks or items that were a result of the Initial Phase.

j. QC Manager will sign and date the checklist.

1.15.5 Quality Control Validation

Establish and maintain the following in a series of 3 ring binders. Binders shall be divided and tabbed as shown below. These binders shall be readily available to the Government's Quality Assurance Team during all business hours.

a. All completed Preparatory and Initial Phase Checklists, arranged by specification section.

b. All milestone inspections , arranged by Activity/Event Number.

c. A current up-to-date copy of the Testing and Plan Log with supporting field test reports, arranged by specification section.

d. Copies of all contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.

e. A current up-to-date copy of the Rework Items List.

f. Maintain up-to-date copies of all punch lists issued by the QC Staff on the Contractor and Sub-Contractors and all punch lists issued by the Government.

1.15.6 Testing Plan and Log

As tests are performed, the QC Manager shall record on the "Testing Plan and Log" the date the test was conducted, the date the test results were forwarded to the Contracting Officer, remarks and acknowledgement that an accredited or Contracting Officer approved testing laboratory was used. Attach a copy of the updated "Testing Plan and Log" to the last daily Contractor Quality Control Report of each month.

1.15.7 Rework Items List

The QC Manager shall maintain a list of work that does not comply with the Contract, identifying what items need to be reworked, the date the item was originally discovered, the date the item will be corrected by, and the date the item was corrected. There is no requirement to report a rework item that is corrected the same day it is discovered. Submit the "Rework Items List" to the last daily Contractor Quality Control Report of each month. The Contractor shall be responsible for including on this list items needing rework including those identified by the Contracting Officer.

1.15.8 As-Built Drawings

The QC Manager is required to ensure the as-built drawings, required by Section 01 77 00.00 20 "Closeout Procedures," are kept current on a daily basis and marked to show deviations which have been made from the Contract drawings. Ensure each deviation has been identified with the appropriate modifying documentation (e.g. PC No., Modification No., Request for Information No., etc.). The QC Manager shall initial each deviation and each revision. Upon completion of work, the QC Manager shall furnish a certificate attesting to the accuracy of the as-built drawings prior to submission to the Contracting Officer.

1.15.9 Report Forms

The following forms, are acceptable for providing the information required by the paragraph entitled "Documentation." Use of these specific formats are required, any other format shall not be used. One copy of each form will be provided at the Preconstruction Conference:

a. Combined Contractor Production Report and Contractor Quality Control Report w/ separate continuation sheet(s).

b. Contractor Quality Control Report w/ continuation sheet(s).

c. Contractor Production Report w/ continuation sheet(s).

d. Preparatory Phase Checklist.

e. Initial Phase Checklist.

f. Testing Plan and Log.

g. Rework Items List.

1.16 NOTIFICATION ON NON-COMPLIANCE

The Contracting Officer will notify the Contractor of any detected non-compliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time for excess costs or damages by the Contractor.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 50 00.00 20

TEMPORARY FACILITIES AND CONTROLS
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

FHWA SA-89-006	(2000: Rev 1, 2001) Manual on Uniform Traffic Control Devices

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00, "Submittal Procedures."

SD-01 Preconstruction Submittals

Traffic control plan

1.3 TEMPORARY UTILITIES

1.3.1 Contractor Utilities

The Contractor shall provide his own utilities.

1.3.2 Utilities at Special Locations

Reasonable amounts of utilities will be made available to the Contractor at the prevailing Government rates. These rates may be obtained upon application to the Commanding Officer, by way of the Contracting Officer. A $300.00 deposit will be required before connecting electricity. The Contractor will be responsible for making connections, providing transformers and meters (THE CONTRACTOR MUST CERTIFY THAT ALL TRANSFORMERS INSTALLED FOR TEMPORARY POWER DURING THIS CONTRACT ARE PCB FREE), and making disconnections; and for providing backflow preventer devices on connections to domestic water lines. Under no circumstances will taps to base fire hydrants be allowed for obtaining domestic water. Neither potable water nor sanitary facilities will be available at the main Contractor laydown area at Marine Corps Air Station (MCAS), Cherry Point, NC.

1.4 STATION OPERATION AFFECT ON CONTRACTOR OPERATIONS

1.4.1 Interruption of Vehicular Traffic

If during the performance of work, it becomes necessary to modify vehicular traffic patterns at any locations, notify the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan detailing the proposed controls to traffic movement for approval. The plan shall be per State and local regulations and the

FHWA SA-89-006, Part VI. Make all notifications and obtain any permits required for modification to traffic movements outside Station's jurisdiction. Provide cones, signs, barricades, lights, or other traffic control devices and personnel required to control traffic. Do not use foil-backed material for temporary pavement marking because of its potential to conduct electricity during accidents involving downed power lines.

1.5 TEMPORARY SANITARY FACILITIES

Provide adequate sanitary conveniences of a type approved for the use of persons employed on the work, properly secluded from public observation, and maintained in such a manner as required and approved by the Contracting Officer. Maintain these conveniences at all times without nuisance. Upon completion of the work, remove the conveniences from the premises, leaving the premises clean and free from nuisance. Dispose of sewage through connection to a municipal, district, or station sanitary sewage system. Where such systems are not available, use chemical toilets or comparably effective units, and periodically remove waste to a commercial facility or municipal sanitary sewage system. Include provisions for pest control and elimination of odors. Do not dispose of waste from chemical toilets into the Air Station sanitary sewer system.

1.6 WEATHER PROTECTION

1.6.1 Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property. Precautions shall include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work.

1.6.1.1 Hurricane Condition of Readiness

Unless directed otherwise, comply with:

a. Condition FOUR (Sustained winds of 50 knots or greater expected within 72 hours): Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 4 feet high. Remove all debris, trash, or objects that could become missile hazards. Contact Contracting Officer for Condition of Readiness (COR) updates and completion of required actions.

b. Condition THREE (Sustained winds of 50 knots or greater expected within 48 hours): Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition ONE" which cannot be completed within 18 hours. Cease all routine activities which might interfere with securing operations. Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness. Contact Contracting Officer for weather and COR updates and completion of required actions.

c. Condition TWO (Sustained winds of 50 knots or greater expected within 24 hours): Curtail or cease routine activities until securing operation is complete. Reinforce or remove form work and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact Contracting Officer for weather and Condition of Readiness (COR) updates and completion of required actions.

d. Condition ONE. (Sustained winds of 50 knots or greater expected within 12 hours): Secure the jobsite, and leave Government premises.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 TEMPORARY PHYSICAL CONTROLS

3.1.1 Access Controls

3.1.1.1 Temporary Barricades

Contractor shall provide for barricading around all work areas to prevent public access.

3.1.1.2 Fencing

Fencing shall be provided along the construction site for each road segment and isolated areas of work to prevent access by unauthorized people (special emphasis shall be placed on preventing access by children). Fencing shall be a four feet high orange plastic grid supported at intervals sufficient to resist at least 250 pounds of force applied against the fence. Fencing shall be moved as work progresses. Place fencing on the side opposite the street side of the walkway to allow adequate work space for the Contractor's activities.

3.1.1.3 Signs

Place warning signs at the construction area perimeter designating the presence of construction hazards requiring unauthorized persons to keep out. Signs must be placed on all sides of the project, with at least one sign every 300 feet. All points of entry shall have signs designating the construction site as a hard hat area.

3.1.1.4 Traffic Work

All work around/involving roadways, to include roadway excavations and utility crossings, will be conducted per Manual of Traffic Control Devices. Contractors shall provide and ensure appropriate road closure and detour signs are established as necessary for motor traffic management. All road closures shall be coordinated with the Contracting Officer in advance. Self-illuminated (lighted) barricades shall be provided during hours of darkness. Brightly-colored (orange) vests are required for all personnel working in roadways. Road closures shall require a road closure plan showing the location of signage.

3.2 GRASS CUTTING

Cut grass (or annual weeds) within the construction and storage sites to a maximum 4 inch height at least once a week during the growing season unless the grass area is not visible to the public. Trim the grass around fences at time of grass cutting. Maintain grass or weeds on stockpiled earth as descried above.

-- End of Section --

SECTION 01 57 19.00 20

TEMPORARY ENVIRONMENTAL CONTROLS
07/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 112	Oil Pollution Prevention
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 271	Requirements for Authorization of State Hazardous Waste Programs

40 CFR 272	Approved State Hazardous Waste Management Programs
40 CFR 273	Standards For Universal Waste Management
40 CFR 279	Standards for the Management of Used Oil
40 CFR 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 355	Emergency Planning and Notification
40 CFR 372-SUBPART D	Specific Toxic Chemical Listings
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packaging
49 CFR 178	Specifications for Packaging

1.2 DEFINITIONS

1.2.1 Sediment

Soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.2 Solid Waste

Garbage, refuse, debris, sludge, or other discharged material, including solid, liquid, semisolid, or contained gaseous materials resulting from domestic, industrial, commercial, mining, or agricultural operations. Types of solid waste typically generated at construction sites may include:

a. Green waste: The vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.

b. Surplus soil: Existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included.

c. Debris: Non-hazardous solid material generated during the

construction, demolition, or renovation of a structure which exceeds 2.5 inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (e.g. cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection..

d. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.

e. Scrap metal: Scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

f. Paint cans: Metal cans that are empty of paints, solvents, thinners and adhesives. If permitted by the paint can label, a thin dry film may remain in the can.

g. Recyclables: Materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable.

h. Hazardous Waste: By definition, to be a hazardous waste a material must first meet the definition of a solid waste. Hazardous waste and hazardous debris are special cases of solid waste. They have additional regulatory controls and must be handled separately. They are thus defined separately in this document.

Material not regulated as solid waste are: nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

1.2.3 Hazardous Debris

As defined in Solid Waste paragraph, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) per 40 CFR 261; or debris that exhibits a characteristic of hazardous waste per 40 CFR 261.

1.2.4 Chemical Wastes

This includes salts, acids, alkalizes, herbicides, pesticides, and organic chemicals.

1.2.5 Garbage

Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2.6 Hazardous Waste

Any discarded material, liquid, solid, or gas, which meets the definition of hazardous material or is designated hazardous waste by the Environmental Protection Agency or State Hazardous Control Authority as defined in 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 271, 40 CFR 272, 40 CFR 273, 40 CFR 279, and 40 CFR 280.

1.2.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that:

a. Is regulated as a hazardous material per 49 CFR 173, or

b. Requires a Material Safety Data Sheet (MSDS) per 29 CFR 1910.120, or

c. During end use, treatment, handling, packaging, storage, transpiration, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D.

Designation of a material by this definition, when separately regulated or controlled by other instructions or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this instruction for "control" purposes. Such material include ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs). Nonetheless, the exposure may occur incident to manufacture, storage, use and demilitarization of these items.

1.2.8 Waste Hazardous Material (WHM)

Any waste material which because of its quantity, concentration, or physical, chemical, or infectious characteristics may pose a substantial hazard to human health or the environment and which has been so designated. Used oil not containing any hazardous waste, as defined above, falls under this definition.

1.2.9 Oily Waste

Those materials which are, or were, mixed with used oil and have become separated from that used oil. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, used oil and may be appropriately tested and discarded in a manner which is in compliance with other State and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that:

a. It is not prohibited in other State regulations or local ordinances

b. The amount generated is "de minimus" (a small amount)

c. It is the result of minor leaks or spills resulting from normal process operations

d. All free-flowing oil has been removed to the practical extent possible

Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, a hazardous waste determination must be performed prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.10 Regulated Waste

Those solid waste that have specific additional Federal, state, or local controls for handling, storage, or disposal.

1.2.11 Class I Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act and includes the following chemicals:

chlorofluorocarbon-11 (CFC-11)	chlorofluorocarbon-213 (CFC-213)
chlorofluorocarbon-12 (CFC-12)	chlorofluorocarbon-214 (CFC-214)
chlorofluorocarbon-13 (CFC-13)	chlorofluorocarbon-215 (CFC-215)
chlorofluorocarbon-111 (CFC-111)	chlorofluorocarbon-216 (CFC-216)
chlorofluorocarbon-112 (CFC-112)	chlorofluorocarbon-217 (CFC-217)
chlorofluorocarbon-113 (CFC-113)	halon-1211
chlorofluorocarbon-114 (CFC-114)	halon-1301
chlorofluorocarbon-115 (CFC-115)	halon-2402
chlorofluorocarbon-211 (CFC-211)	carbon tetrachloride
chlorofluorocarbon-212 (CFC-212)	methyl chloroform

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preconstruction Survey; G

Solid Waste Management Plan and Permit; G

Regulatory Notification; G

Environmental Protection Plan; G

Construction Dewatering Plan; G

Dirt and Dust Control Plan

SD-06 Test Reports

Laboratory Analysis

Erosion and Sediment Control Inspection Reports;

Storm Water Inspection Reports for General Permit

SD-11 Closeout Submittals

Some of the records listed below are also required as part of other submittals. For the "Records" submittal, maintain on-site a separate three-ring Environmental Records binder and submit at the completion of the project. Make separate parts to the binder corresponding to each of the applicable sub items listed below.

Waste Determination Documentation; G

Disposal Documentation for Hazardous and Regulated Waste; G

Solid Waste Management Report; G

Contractor Hazardous Material Inventory Log; G

Hazardous Waste/Debris Management; G

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Federal, State, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

Marine Corps Air Station, Cherry Point is listed on the National Priorities List pursuant to the Comprehensive Environmental Response, Compensation and Liabilities Act 42 USCA, Section 9601.et seq. as amended April 15, 1996 (CERCLA). Bogue Field, Oakgrove, BT-11 and Atlantic Field are not listed on the National Priorities List. The Contractor shall immediately bring to the Contracting Officer's attention any unanticipated site condition which may involve hazardous materials or hazardous waste and the Contractor shall not disturb such conditions without the Contracting Officer's prior written documentation as to whether such conditions are outside the contract requirements.

1.5 QUALITY ASSURANCE

1.5.1 Preconstruction Survey

Perform a Preconstruction Survey of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record.

1.5.2 Regulatory Notification

The Contractor is responsible for all Regulatory Notification requirements in accordance with Federal, State and local regulations. In cases where the Navy must also provide public notification (such as stormwater permitting), the Contractor must coordinate with the Contracting Officer. The Contractor shall submit copies of all regulatory notifications to the Contracting Officer prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all inclusive): demolition, renovation, NPDES defined site work, remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.5.3 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be brought onto the activity; types and quantities of wastes/wastewater that may be generated during the contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer and activity environmental staff to discuss the proposed Environmental Protection Plan. Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, required permits, permit requirements, and other measures to be taken.

1.5.4 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager will be directly responsible for coordinating contractor compliance with Federal, State, local, and station requirements. The Environmental Manager will ensure compliance with Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the Environmental Protection Plan; ensure that all environmental permits are obtained, maintained, and closed out; ensure compliance with Storm Water Program Management requirements; ensure compliance with Hazardous Materials (storage, handling, and reporting) requirements; and coordinate any remediation of regulated substances (lead, asbestos, PCB transformers). This can be a collateral position; however the person in this position must be trained to adequately accomplish the following duties: ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite Accumulation areas; ensure only authorized personnel add wastes to containers; ensure all Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 ENVIRONMENTAL PROTECTION PLAN

Prior to initiating any work on site, the Contractor will meet with the Contracting Officer to discuss the proposed Environmental Protection Plan and develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, and other measures to be taken. The Environmental Protection Plan will be submitted in the following format and will, at a minimum, address the following elements:

a. Description of the Environmental Protection Plan

(1) General overview and purpose

(2) General site information

(3) A letter signed by an officer of the firm appointing the Environmental Manager and stating that he/she is responsible for managing and implementing the Environmental Program as described in this contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work.

b. Protection of Natural Resources

(1) Land resources

(2) Tree protection

(3) Replacement of damaged landscape features

(4) Temporary construction

(5) Stream crossings

(6) Fish and wildlife resources

(7) Wetland areas

c. Protection of Historical and Archaeological Resources

(1) Objectives

(2) Methods

d. Storm Water Management and Control

(1) Ground cover

(2) Erodible soils

(3) Temporary measures

(a) Mechanical retardation and control of runoff

(b) Vegetation and mulch

e. Protection of the Environment from Waste Derived from Contractor Operations

(1) Control and disposal of solid and sanitary waste

(2) Control and disposal of hazardous waste (Hazardous Waste Management Section)

This item will consist of the management procedures for all hazardous waste to be generated. The elements of those procedures will coincide with the Activity Hazardous Waste Management Plan. A copy of the Activity Hazardous Waste Management Plan will be provided by the Contracting Officer. As a minimum, include the following:

(a) Procedures to be employed to ensure a written waste determination is made for appropriate wastes which are to be generated;

(b) Sampling/analysis plan;

(c) Methods of hazardous waste accumulation/storage (i.e., in tanks and/or containers);

(d) Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted);

(e) Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268);

(f) Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and the like;

(g) Used oil management procedures in accordance with 40 CFR 279;

(h) Pollution prevention\hazardous waste minimization procedures;

(i) Plans for the disposal of hazardous waste by permitted facilities;

(j) Procedures to be employed to ensure all required employee training records are maintained.

f. Prevention of Releases to the Environment

(1) Procedures to prevent releases to the environment

(2) Notifications in the event of a release to the environment

g. Regulatory Notification and Permits

(1) List what notifications and permit applications must be made. Include copies of all applicable, environmental permits.

3.1.1 Environmental Protection Plan Review

Fourteen days after the environmental protection meeting, submit the proposed Environmental Protection Plan for further discussion, review, and approval. Commencement of work will not begin until the environmental protection plan has been approved.

3.1.2 Licenses and Permits

Obtain licenses and permits pursuant to the "Permits and Responsibilities" FAR Clause.

The following permits will be obtained by the Contracting Officer:

a. NCDENR Sediment & Erosion Control Permit

For permits obtained by the Contracting Officer, whether or not required by the permit, the Contractor is responsible for conforming to all permit requirements and performing all quality control inspections of the work in progress, and to submit notifications and certifications to the applicable regulatory agency via the Contracting Officer.

The inspections and certifications will be provided through the services of a Professional Engineer (PE), registered in the State where the work is being performed. As a part of the quality control plan, which is required to be submitted for approval by the quality control section, provide a sub item containing the name, appropriate professional registration or licence number, address, and telephone number of the professionals or other qualified persons who will be performing the inspections and certifications for each permit.

3.1.2.1 Construction Dewatering Plan

Dewatering using well points is considered a well contractor activity, and must be performed or personally supervised by a North Carolina Certified Well Driller. Construction and abandonment must be performed per 15A NCAC 2C, Titled 15A, Subchapter 2C. Well construction and abandonment records are required, and the original copies shall be submitted to the Contracting Officer for review and submittal to the state. Submittal must also include the name(s) of NC Certified Well Driller and a copy of their certification.

3.2 PROTECTION OF NATURAL RESOURCES

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified.

Do not disturb fish and wildlife. Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as indicated or specified.

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor will be responsible for any resultant damage.

Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. By approved excavation, remove trees with 30 percent or more of their root systems destroyed. Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain Contracting Officer's approval before replacement.

3.2.1 Erosion and Sediment Control Measures

3.2.1.1 Burnoff

Burnoff of the ground cover is not permitted.

3.2.1.2 Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

3.2.1.3 Temporary Protection of Erodible Soils

Use the following methods to prevent erosion and control sedimentation:

a. Mechanical Retardation and Control of Runoff

(1) Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, berms, and use of silt fences and straw bales to retard and divert runoff to protected drainage courses.

b. Sediment Basins

(1) Trap sediment in temporary sediment basins. Pump dry and remove the accumulated sediment, after each storm. Use a paved weir or vertical overflow pipe for overflow. Remove collected sediment from the site. Institute effluent quality monitoring programs.

(2) Install, inspect, and maintain best management practices (BMPs) as required by the general permit. Prepare BMP Inspection Reports as required by the general permit. If required by the permit, include those inspection reports.

c. Vegetation and Mulch

(1) Provide temporary protection on sides and back slopes as soon as rough grading is completed or sufficient soil is exposed to require erosion protection. Protect slopes by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such combination of these and other methods necessary for effective erosion control.

(2) Seeding: Provide new seeding where ground is disturbed. Include topsoil or nutriment during the seeding operation

necessary to establish a suitable stand of grass. The seeding operation will be as specified in Section 32 92 19 SEEDING.

3.2.2 Erosion, Sediment and Stormwater Control

Submit "Erosion and Sediment Control Reports" (E&S) (form provided at the pre-construction conference) and "Stormwater Inspections for General Permit NCG010000 - Land Disturbing Activities" (form provided at http://h2o.enr.state.nc.us/su/PDF_Files/SW_General_Permits/NCG01_Inspect_log.pdf) to the Contracting Officer once every 7 days and within 24 hours of a storm event that produces 0.5 inch or more of rain.

Comply with NCG010000, North Carolina Permit to Discharge Storm Water under the National Pollutant Discharge Elimination System. The existing permit may be obtained from: http://h20.enr.state.nc.us/su/PDF_Files/SW_General_Permits/NCG01_Inspect_log.pdf.

3.3 SOLID WASTE MANAGEMENT PLAN and PERMIT

Provide to the contracting officer written notification of the quantity of solid waste/debris that is anticipated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance or as applicable, submit one copy of a State and local permit or license showing such agencies' approval of the disposal plan before transporting wastes off Government property.

3.3.1 Solid Waste management Report

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste. Include copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. In lieu of sales documentation, the Contractor may submit a statement indicating the disposal location for the solid waste which is signed by an officer of the Contractor firm authorized to legally obligate or bind the firm. The sales documentation or Contractor certification will include the receiver's tax identification number and business, EPA or State registration number, along with the receiver's delivery and business addresses and telephone numbers. For each solid waste retained by the Contractor for his own use, the Contractor will submit on the solid waste disposal report the information previously described in this paragraph. Prices paid or received will not be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

3.3.2 Control and Disposal of Solid Wastes

Pick up solid wastes, and place in covered containers which are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Recycling is encouraged and can be coordinated with the Contracting Officer and the activity recycling coordinator. Remove all solid waste (including non-hazardous debris) from Government property and dispose off-site at an approved landfill. Solid waste disposal off-site must comply with most stringent local, State, and Federal requirements including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

3.4 WASTE DETERMINATION DOCUMENTATION

Complete a Waste Determination form (provided at the pre-construction conference) for all contractor derived wastes to be generated. Base the waste determination upon either a constituent listing from the manufacturer used in conjunction with consideration of the process by which the waste was generated, EPA approved analytical data, or laboratory analysis (Material Safety Data Sheets (MSDS) by themselves are not adequate). Attach all support documentation to the Waste Determination form. As a minimum, a Waste Determination form must be provided for the following wastes (this listing is not all inclusive): oil and latex based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and all containers of the original materials.

3.4.1 Contractor Hazardous Material Inventory Log

Submit the Contractor Hazardous Material Inventory Log (found at: http://www.wbdg.org/ccb/NAVGRAPH/01575n.pdf), which provides information required by (EPCRA Sections 312 and 313) along with corresponding Material Safety Data Sheets (MSDS) to the Contracting Officer at the start and at the end of construction (30 days from final acceptance), and update no later than January 31 of each calendar year during the life of the contract. Documentation for any spills/releases, environmental reports or off-site transfers may be requested by the Contracting Officer.

3.4.2 Laboratory Analysis

Submit a copy of a Laboratory Analysis of solid waste and debris with the potential of becoming classified as a hazardous waste (i.e., abrasive/sand blasting debris, etc.). Waste stream determinations are required at the point of generation and must sufficiently document whether the waste will be a solid waste, hazardous waste, or Resource Conservation and Recovery Act (RCRA) exempt waste. Determinations must use EPA approved methods and provide written rational for whether the waste is classified as hazardous or non-hazardous. The Contractor will bear the cost of the waste stream determinations, and the Contracting Officer reserves the right to request waste stream determinations on questionable waste streams.

3.5 CONTRACTOR HAZARDOUS MATERIAL INVENTORY LOG

Submit the "Contractor Hazardous Material Inventory Log"(found at: http://www.lantdiv.navfac.navy.mil/pls/lantdiv/docs/FOLDER/EICO/UFGS/GRAPHICS/01575.pdf), which provides information required by (EPCRA Sections 312 and 313) along with corresponding Material Safety Data Sheets (MSDS) to the Contracting Officer at the start and at the end of construction (30 days from final acceptance), and update no later than January 31 of each calendar year during the life of the contract. Documentation for any spills/releases, environmental reports or off-site transfers may be requested by the Contracting Officer.

3.5.1 Disposal Documentation for Hazardous and Regulated Waste

Manifest, pack, ship and dispose of hazardous or toxic waste and universal waste that is generated as a result of construction in accordance with the generating facilities generator status under the Recourse Conservation and Recovery Act. Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and State permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifest must be reviewed, signed, and approved by the Navy before the Contractor may ship waste. To obtain specific disposal instructions the Contractor must coordinate with the Activity environmental office at 252-466-4591.

3.6 POLLUTION PREVENTION/HAZARDOUS WASTE MINIMIZATION

minimize the use of hazardous materials and the generation of hazardous waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the Environmental Protection Plan. Consult with the activity Environmental Office for suggestions and to obtain a copy of the installation's pollution prevention/hazardous waste minimization plan for reference material when preparing this part of the plan. If no written plan exists, obtain information by contacting the Contracting Officer. Describe the types of the hazardous materials expected to be used in the construction when requesting information.

3.7 WHM/HW MATERIALS PROHIBITION

No waste hazardous material or hazardous waste shall be disposed of on government property. No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this contract. The government is not responsible for disposal of Contractor's waste material brought on the job site and not required in the performance of this contract. The intent of this provision is to dispose of that waste identified as waste hazardous material/hazardous waste as defined herein that was generated as part of this contract and existed within the boundary of the Contract limits and not brought in from offsite by the Contractor. Incidental materials used to support the contract including, but not limited to aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc. are the responsibility of the Contractor. The list is illustrative rather than inclusive. The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or to the river or conduct waste treatment or disposal on government property without written approval of the Contracting Officer.

3.8 HAZARDOUS MATERIAL CONTROL

Include hazardous material control procedures in the Safety Plan. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Submit a MSDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on base. Typical materials requiring MSDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. At the end of the project, provide the Contracting Officer with the maximum quantity of each material that was present at the site at any one time, the dates the material was present, the amount of each material that was used during the project, and how the material was used. Ensure that hazardous materials are utilized in a manner that will minimize the amount of hazardous waste that is generated. Ensure that all containers of hazardous materials have NFPA labels or their equivalent. Keep copies of the MSDS for hazardous materials on site at all times and provide them to the Contracting Officer at the end of the

project. Certify that all hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste per 40 CFR 261.

3.9 PETROLEUM PRODUCTS

Conduct the fueling and lubricating of equipment and motor vehicles in a manner that protects against spills and evaporation. Manage all used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while on-site exhibits a characteristic of hazardous waste. Used oil containing 1000 parts per million of solvents will be considered a hazardous waste and disposed of at Contractor's expense. Used oil mixed with a hazardous waste will also be considered a hazardous waste.

3.9.1 Oily and Hazardous Substances

Prevent oil or hazardous substances from entering the ground, drainage areas, or navigable waters. In accordance with 40 CFR 112, surround all temporary fuel oil or petroleum storage tanks with a temporary berm or containment of sufficient size and strength to contain the contents of the tanks, plus 10 percent freeboard for precipitation. The berm will be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs.

3.10 FUEL TANKS

Petroleum products and lubricants required to sustain up to 30 days of construction activity may be kept on site. Storage and refilling practices shall comply with 40 CFR Part 112. Secondary containment shall be provided and be no less than 110 percent of the tank volume plus five inches of free-board. If a secondary berm is used for containment then the berm shall be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Drips pans are required and the tanks must be covered during inclement weather.

3.11 RELEASES/SPILLS OF OIL AND HAZARDOUS SUBSTANCES

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated by environmental law. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Base or Activity Fire Department, the activity's Command Duty Officer, and the Contracting Officer. If the contractor's response is inadequate, the Navy may respond. If this should occur, the contractor will be required to reimburse the government for spill response assistance and analysis.

The Contractor is responsible for verbal and written notifications as required by the federal 40 CFR 355, State, local regulations and Navy Instructions. Spill response will be in accordance with 40 CFR 300 and applicable State and local regulations. Contain and clean up these spills without cost to the Government. If Government assistance is requested or required, the Contractor will reimburse the Government for such assistance.

Provide copies of the written notification and documentation that a verbal notification was made within 20 days.

Maintain spill cleanup equipment and materials at the work site. Clean up all hazardous and non-hazardous (WHM) waste spills. The Contractor shall reimburse the government for all material, equipment, and clothing generated during any spill cleanup. The Contractor shall reimburse the government for all costs incurred including sample analysis materials, equipment, and labor if the government must initiate its own spill cleanup procedures, for Contractor responsible spills, when:

a. The Contractor has not begun spill cleanup procedure within one hour of spill discovery/occurrence, or

b. If, in the government's judgment, the Contractor's spill cleanup is not adequately abating life threatening situation and/or is a threat to any body of water or environmentally sensitive areas.

3.12 CONTROL AND DISPOSAL OF HAZARDOUS WASTES

3.12.1 Hazardous Waste/Debris Management

Identify all construction activities which will generate hazardous waste/debris. Provide a documented waste determination for all resultant waste streams. Hazardous waste/debris will be identified, labeled, handled, stored, and disposed of in accordance with all Federal, State, and local regulations including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268. Hazardous waste will also be managed in accordance with the approved Hazardous Waste Management Section of the Environmental Protection Plan. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities will be identified as being generated by the Government. Prior to removal of any hazardous waste from Government property by the Contractor, all hazardous waste manifests must be signed by activity personnel from the Station Environmental Office. No hazardous waste will be brought onto Government property. Provide to the Contracting Officer a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D. For hazardous wastes spills, verbally notify the Contracting Officer immediately.

3.12.1.1 Regulated Waste Storage/Satellite Accumulation/90 Day Storage Areas

If the work requires the temporary storage/collection of regulated or hazardous wastes, the Contractor will request the establishment of a Regulated Waste Storage Area, a Satellite Accumulation Area, or a 90 Day Storage Area at the point of generation. The Contractor must submit a request in writing to the Contracting Officer providing the following information:

Contract Number	_____	Contractor	_____
Haz/Waste or Regulated Waste POC	_____	Phone Number	_____
Type of Waste	_____	Source of Waste	_____

Emergency POC _____ Phone Number _____

Location of the Site: _____
(Attach Site Plan to the Request)

Attach a waste determination form. Allow ten working days for processing this request.

3.12.2 Class I ODS Prohibition

Class I ODS as defined and identified herein will not be used in the performance of this contract, nor be provided as part of the equipment. This prohibition will be considered to prevail over any other provision, specification, drawing, or referenced documents.

3.13 DUST CONTROL

Keep dust down at all times, including during nonworking periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

3.13.1 Dirt and Dust Control Plan

Submit truck and material haul routes along with a plan for controlling dirt, debris, and dust on base roadways. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

3.14 Soil

Soils encountered during project activities shall be managed per Air Station soil management polices in affect for the duration of the project. If soil is encountered during construction operations that may be contaminated (as indicated by odor, color, or unusual appearance) that was not previously indicated as contaminated, stop the portion of work immediately and notify the Contracting Officer immediately.

3.14.1 Quarantine for Imported Fire Ants

Onslow, Jones, and Carteret Counties and portions of Duplin and Craven Counties have been declared a generally infested area by the United States Department of Agriculture (USDA) for the imported fire ant. Compliance with the quarantine regulations established by this authority as set forth is USDA Publication 301.81 of 31 December 1992, is required for operations hereunder. Pertinent requirements of quarantine for materials originating on the Camp Lejeune reservation, the Marine Corps Air Station (Helicopter), New River and the Marine Corps Air Station, Cherry Point, which are to be transported outside Onslow County or adjacent suppression areas, include the following:

a. Certification is required for the following articles and they shall not be moved from the reservation to any point outside Onslow County and adjacent designated areas unless accompanied by a valid inspection certificate issued by an Officer of the Plant Protection and a Quarantine Program (PPQ) of the U.S. Department

of Agriculture.

(1) Bulk soil

(2) Used Mechanized soil-moving equipment. (Used mechanized soil-moving equipment is exempt if cleaned of loose non compacted soil).

(3) Other products, articles, or means of conveyances, if it is determined by an inspector that they present a hazard of transporting spread of the imported fire ant and the person in possession therof has been so notified.

b. Authorization for movement of equipment outside the imported fire and regulated area shall be obtained from USDA, APHIS, PPQ, Attn: JB Perry, C/o NCSPA, 113 Arendell St. Room 216, Morehead City, NC 28557, telephone (252) 726-4358, fax (252) 726-5713. Requests for inspection shall be made sufficiently in advance of the date of movement to permit arrangement for the services of authorized inspectors. The equipment shall be prepared and assembled so that it may be readily inspected. Soil on or attached to equipment, supplies, and materials shall be removed by washing with water or such other means as necessary to accomplish complete removal. Resulting spoil shall be wasted as necessary and as directed.

-- End of Section --

SECTION 01 57 23.00 10

STORM WATER POLLUTION PREVENTION MEASURES
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 4439	(2004) Geosynthetics
ASTM D 4491	(1999; R 2004e1) Water Permeability of Geotextiles by Permittivity
ASTM D 4533	(2004) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(1991; R 2003) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(2004) Determining Apparent Opening Size of a Geotextile
ASTM D 4873	(2002) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

1.2 GENERAL REQUIREMENTS

Contractor shall implement the storm water pollution prevention measures to prevent sediment from entering streams or water bodies as specified in this Section in conformance with the requirements of Section 01 57 19.00 20 TEMPORARY ENVIRONMENTAL CONTROLS, and the requirements of the National Pollution Discharge Elimination System (NPDES) permit attached to that Section.

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Mill Certificate or Affidavit

Certificate attesting that the Contractor has met all specified requirements.

1.4 EROSION AND SEDIMENT CONTROLS

The controls and measures required by the Contractor are described below.

1.4.1 Stabilization Practices

The stabilization practices to be implemented shall include temporary seeding, temporary diversion ditches, temporary sediment traps, inlet protection, and silt fence. On his daily CQC Report, the Contractor shall record the dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, embankment, and grading); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated. Except as provided in paragraphs UNSUITABLE CONDITIONS and NO ACTIVITY FOR LESS THAN 21 DAYS, stabilization practices shall be initiated as soon as practicable, but no more than 14 days, in any portion of the site where construction activities have temporarily or permanently ceased.

1.4.1.1 Unsuitable Conditions

Where the initiation of stabilization measures by the fourteenth day after construction activity temporarily or permanently ceases is precluded by unsuitable conditions caused by the weather, stabilization practices shall be initiated as soon as practicable after conditions become suitable.

1.4.1.2 No Activity for Less Than 21 Days

When the total time period in which construction activity is temporarily ceased on a portion of the site is 21 days minimum, stabilization practices do not have to be initiated on that portion of the site until 14 days have elapsed after construction activity temporarily ceased.

1.4.2 Structural Practices

Structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Structural practices shall include the following devices: diversion ditches, sediment traps, inlet protection, and silt fence. Location and details of installation and construction are shown on the drawings.

1.4.2.1 Silt Fences

The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fences shall be installed in the locations indicated on the drawings. Final removal of silt fence barriers shall be upon approval by the Contracting Officer.

1.4.2.2 Diversion Ditches

Diversion ditches shall have a maximum channel slope of 2 percent and shall be adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. The Contractor shall ensure that the diversion ditches are not damaged by construction operations or traffic. Diversion ditches shall be located as shown on the drawings.

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Filter Fabric

The geotextile shall comply with the requirements of ASTM D 4439, and shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistance to deterioration due to ultraviolet and heat exposure. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F. The filter fabric shall meet the following requirements:

FILTER FABRIC FOR SILT SCREEN FENCE

PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Grab Tensile	ASTM D 4632	100 lbs. min.
Elongation (%)		30 % max.
Trapezoid Tear	ASTM D 4533	55 lbs. min.
Permittivity	ASTM D 4491	0.2 sec-1
AOS (U.S. Std Sieve)	ASTM D 4751	20-100

2.1.2 Silt Fence Stakes and Posts

The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 by 2 inches when oak is used and 4 by 4 inches when pine is used, and shall have a minimum length of 5 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds/linear foot and a minimum length of 5 feet.

2.1.3 Mill Certificate or Affidavit

A mill certificate or affidavit shall be provided attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified above. The mill certificate or affidavit shall specify the actual Minimum Average Roll Values and shall identify the fabric supplied by roll identification numbers. The Contractor shall submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the filter fabric.

2.1.4 Identification Storage and Handling

Filter fabric shall be identified, stored and handled in accordance with ASTM D 4873.

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES

Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6 inch overlap, and securely sealed. A trench shall be excavated approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4 by 4 inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Contracting Officer.

3.2 MAINTENANCE

The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

3.2.1 Silt Fence Maintenance

Silt fences shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with Section 32 92 19 SEEDING.

3.2.2 Diversion Ditch Maintenance

Diversion ditches shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged diversion ditches and necessary repairs shall be accomplished promptly. When diversion ditches are no longer required, they shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with Section 32 92 19 SEEDING.

3.3 INSPECTIONS

3.3.1 General

The Contractor shall inspect disturbed areas of the construction site, areas that have not been finally stabilized used for storage of materials exposed to precipitation, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every seven (7) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every

month.

3.3.2 Inspections Details

Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the Storm Water Pollution Prevention Plan shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

3.3.3 Inspection Reports

For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the Storm Water Pollution Prevention Plan, maintenance performed, and actions taken. The report shall be furnished to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily CQC REPORT. A copy of the inspection report shall be maintained on the job site.

-- End of Section --

SECTION 01 62 35

RECYCLED / RECOVERED MATERIALS

07/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247	Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.2 OBJECTIVES

Government procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled and recovered materials practicable consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The Environmental Protection Agency (EPA) has designated certain items which must contain a specified percent range of recovered or recycled materials. EPA designated products specified in this contract comply with the stated policy and with the EPA guidelines. The Contractor shall make all reasonable efforts to use recycled and recovered materials in providing the EPA designated products and in otherwise utilizing recycled and recovered materials in the execution of the work.

EPA maintains a Database of Manufacturers and Suppliers for each designated item at http://www.epa.gov/cpg/database.htm. Use of sources from this database is not required. It is intended as a tool to assist purchasers in locating products with recycled content.

1.3 EPA DESIGNATED ITEMS INCORPORATED IN THE WORK

Various sections of the specifications contain requirements for materials that have been designated by EPA as being products which are or can be made with recovered or recycled materials. These items, when incorporated into the work under this contract, shall contain at least the specified percentage of recycled or recovered materials unless adequate justification for non-use is provided. The following are considered adequate justifications for non-use:

a. The product does not meet appropriate performance standards.

b. The product is not available within a reasonable time frame.

c. The product is not available competitively (from two or more sources).

d. The product is only available at an unreasonable price (compared

with a comparable non-recycled content product).

When a designated item is specified as an option to a non-designated item, the designated item requirements apply only if the designated item is used in the work.

1.4 EPA PROPOSED ITEMS INCORPORATED IN THE WORK

Products other than those designated by EPA are still being researched and are being considered for future Comprehensive Procurement Guideline (CPG) designation. It is recommended that these items, when incorporated in the work under this contract, contain the highest practicable percentage of recycled or recovered materials, provided specified requirements are also met.

1.5 EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

There are many products listed in 40 CFR 247 which have been designated or proposed by EPA to include recycled or recovered materials that may be used by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. It is recommended that these non-construction products, when used in the conduct of the work, contain the highest practicable percentage of recycled or recovered materials and that these products be recycled when no longer needed.

-- End of Section --

SECTION 01 77 00.00 20

CLOSEOUT PROCEDURES
07/06

PART 1 GENERAL

1.1 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

As-Built Drawings; G

1.2 PROJECT RECORD DOCUMENTS

1.2.1 As-Built Drawings

"FAC 5252.236-9310, Record Drawings."

1.3 CLEANUP

Leave premises "broom clean." Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 80 00

REPORTS
10/03

PART 1 GENERAL

1.1 REPORTS INCLUDED

1.1.1 Geotechnical Exploration Report

Subsurface Exploration Report Proposed Rifle Range Berm Modifications MCAS Cherry Point, North Carolina prepared by S&ME, Inc., February 2, 2007 and Addendum to Subsurface Exploration Report prepared by S&ME, Inc., July 6, 2007.

1.1.2 Environmental Sampling and Analysis Plan

Environmental Sampling and Analysis Plan Proposed Rifle Range Berm Modifications MCAS Cherry Point North Carolina prepared by S&ME, Inc., February 2, 2007.

1.2 USE OF INFORMATION

1.2.1 Warranty

The information disclosed in the referenced reports is based on data obtained in specific locations and is assumed to be representative of conditions throughout the site. This information is furnished without warranty and is only for general information to be used by the contractor in the preparation of his bid and work schedule. It is not intended as a replacement for personal investigation and judgment, or interpretation of the information furnished, as required of the contractor in the performance of this contract.

1.2.2 Site Visit

Bidders should visit the site and acquaint themselves with all existing conditions prior to preparing their bid. This will include a review of the conditions contained in the enclosed report as they relate to the site. The contractor is responsible for including in his bid and work schedule, procedures for handling existing site conditions delineated in the included reports in accord with applicable laws and regulations as those conditions may effect the work.

1.2.3 Application of Information

Recommendations contained in the reports are to be used by the contractor only to the extent that these recommendations comply with applicable laws, regulations, and other sections of the these specifications.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 VARYING CONDITIONS

If during the course of the work, conditions are encountered which are not covered in the included reports or are different from conditions that would be reasonably anticipated from the included reports, the contractor shall immediately notify the Officer in Charge of Construction. If such conditions are hazardous or the continuation of work would cause a hazardous condition to develop, he shall stop work and proceed as directed by the Officer in Charge of Construction as directed by provisions contained in other sections of this specification. This may include modifications to, or the development of a new, Health and Safety Plan for this project, and alternate or additional appropriate abatement procedures.

3.2 CHANGES TO THE CONTRACT

Any changes to the contract made as a result of site conditions which differ from those delineated in the report may result in an adjustment of the contract amount. The adjustment will be an increase or decrease depending on the scope and nature of the change and will be in accord with other provisions of these specifications.

-- End of Section --

July 6, 2007

Dewberry
2301 Rexwoods Drive, Suite 200
Raleigh, North Carolina 27607

Attention: Mr. Steve Harvey, P.E.

Reference: **Addendum to Subsurface Exploration Report**
Proposed Rifle Range Berm Modifications
Projects CP99019M and CP0719R
Marine Corps Air Station
Cherry Point, North Carolina
S&ME Project No. 1051-06-439

Dear Mr. Harvey:

S&ME, Inc. is pleased to submit this addendum to our Subsurface Exploration Report dated February 2, 2007, for the above referenced project based on revised project information. This addendum was prepared as an additional service under our existing contract for this project and provides our understanding of the revised embankment height and geometry and geotechnical recommendations in light of these changes.

PROJECT INFORMATION

Based on our recent meeting on June 29, 2007, we understand that the existing embankment will be increased 10 feet in height instead of the original 20 feet. We also understand that two terraces will be constructed on the front slope and one terrace on the back slope effectively reducing the average slope of the embankment. The terraces on the front slope will be approximately 15 feet wide and established at elevations 25 feet and 42 feet. The terrace on the back slope will be approximately 15 feet wide and be established at elevation 45 feet. The top of the embankment will have a width of 20 feet and will be established at elevation 60 feet. A 4-foot height wall will be required on a portion of the back slope due to space constraints imposed by existing wetlands.

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DISCUSSION

"Specialized methods" involving either 1) the use of light weight fill to reduce the embankment weight, or 2) soil mixing to improve the embankment foundation soil strength were recommended in our previous report to achieve embankment global stability due to the soft embankment foundation soils encountered. Based on the reduced embankment height increase from 20 feet to 10 feet, terraces that reduce the average embankment slope, use of embankment basal reinforcement, and a stability berm at the toe of the embankment, we have developed embankment cross sections that do not require "specialized methods". The stability berm at the toe of the new embankment improves the embankment stability and provides a location for the service road. By locating the road on the reinforced stability berm, roadway subgrade improvement is not required (although embankment subgrade improvement may be required).

CONCLUSIONS AND RECOMMENDATIONS

A proposed slope cross section where space is not restricted by the existing wetlands (Figure 1) and where space is restricted by existing wetlands requiring a 4-foot height MSE wall (Figure 2) are attached. Slope stability analyses were performed on these sections using the computer program PCSTABL6. Except as modified in this Addendum, all recommendations from our previous report apply.

Front Slope

The revised front slope geometry has two terraces and a 10 foot embankment height increase. Based on our slope stability analysis, the currently proposed front slope geometry will not decrease the existing slope factor of safety.

Back Slope

The proposed back slope geometry is shown on Figure 1. Our analysis determined that the proposed back slope with basal tensile reinforcement (Tensar BX-1100) shown will have a Factor of Safety of

1.3 or greater. The basal reinforcement is in tension. Tensar rolls should be oriented perpendicular to the embankment toe stability berm. Tensar should be lapped a minimum of 3 feet along its length and a minimum of 6-inches along its sides.

Due to space constraints imposed by existing wetlands, we understand that a 4-foot height Mechanically Stabilized Earth (MSE) wall will be required. We recommend that the wall be located on the inside edge of the stability berm/road as shown on Figure 2. An additional layer of stability berm tensile reinforcement is recommended where the wall is required. MSE wall global stability analyses are typically performed by the MSE wall designer. Due to the adverse embankment foundation conditions, we have performed a global stability analysis of the proposed 4-foot height MSE wall. With the recommend stability berm and tensile reinforcement, we have determined a factor of safety of 1.3 or greater. Design of the MSE wall is by others.

Mechanically Stabilized Earth (MSE) Walls

On-site or off-site Select Sand Fill (USCS Classifications SW, SP-SW, SP) are recommended for use as reinforced backfill (backfill containing mechanical reinforcement) behind MSE walls. Note that coastal soils meeting these requirements are commonly fine sands with predominate particle sizes ranging from the #100 to the #200 sieve. The MSE wall design should consider appropriate filtering measures for fine sand material in the reinforced backfill zone. The design should also consider the 2 (horizontal) to 1 (vertical) embankment fill slope above the wall. We recommend the following soil parameters for MSE wall design:

MSE Wall Design Soil Parameters

Parameters	Reinforced Zone and Foundation Select Sand Fill	Retained Soil
Friction Angle, ϕ (degrees)	32	28
Cohesion (c)	0	0
Moist Unit Weight of Backfill	120	125

CLOSURE

S&ME appreciates the opportunity to provide geotechnical engineering services on this project. If you have any questions concerning information presented herein, or when we may be of further assistance, please contact us.

Sincerely,
S&ME, Inc.

J. Adam Browning, E.I.
Staff Professional

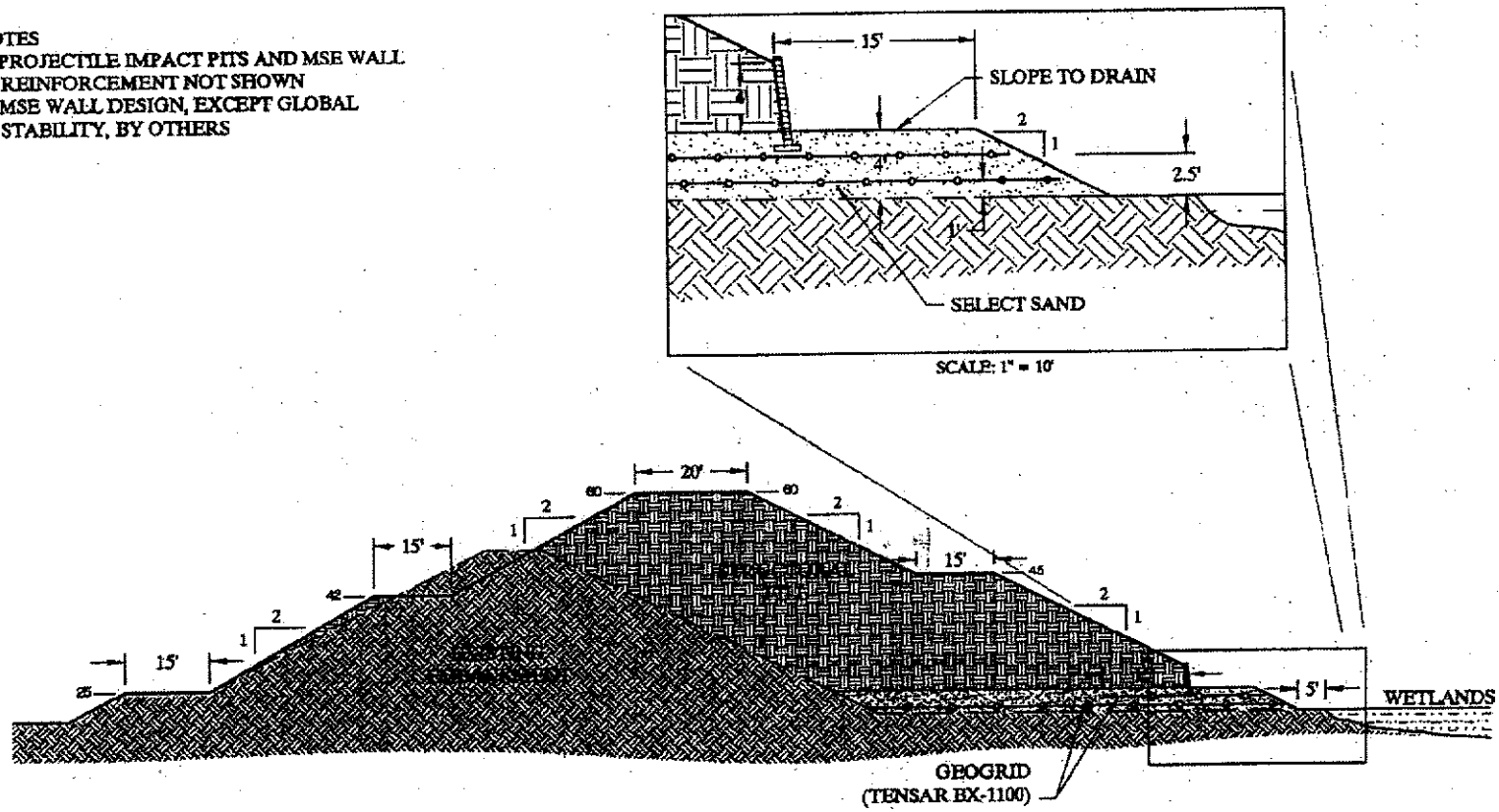
Scott Hancock, P.E.
Senior Engineer
N.C. Registration No. 12248

NORTH CAROLINA PROFESSIONAL SEAL 12248 ENGINEER SCOTT E. HANCOCK

Attachments: Figure 1 – Embankment Section – Without Wall
Figure 2 – Embankment section – With Wall

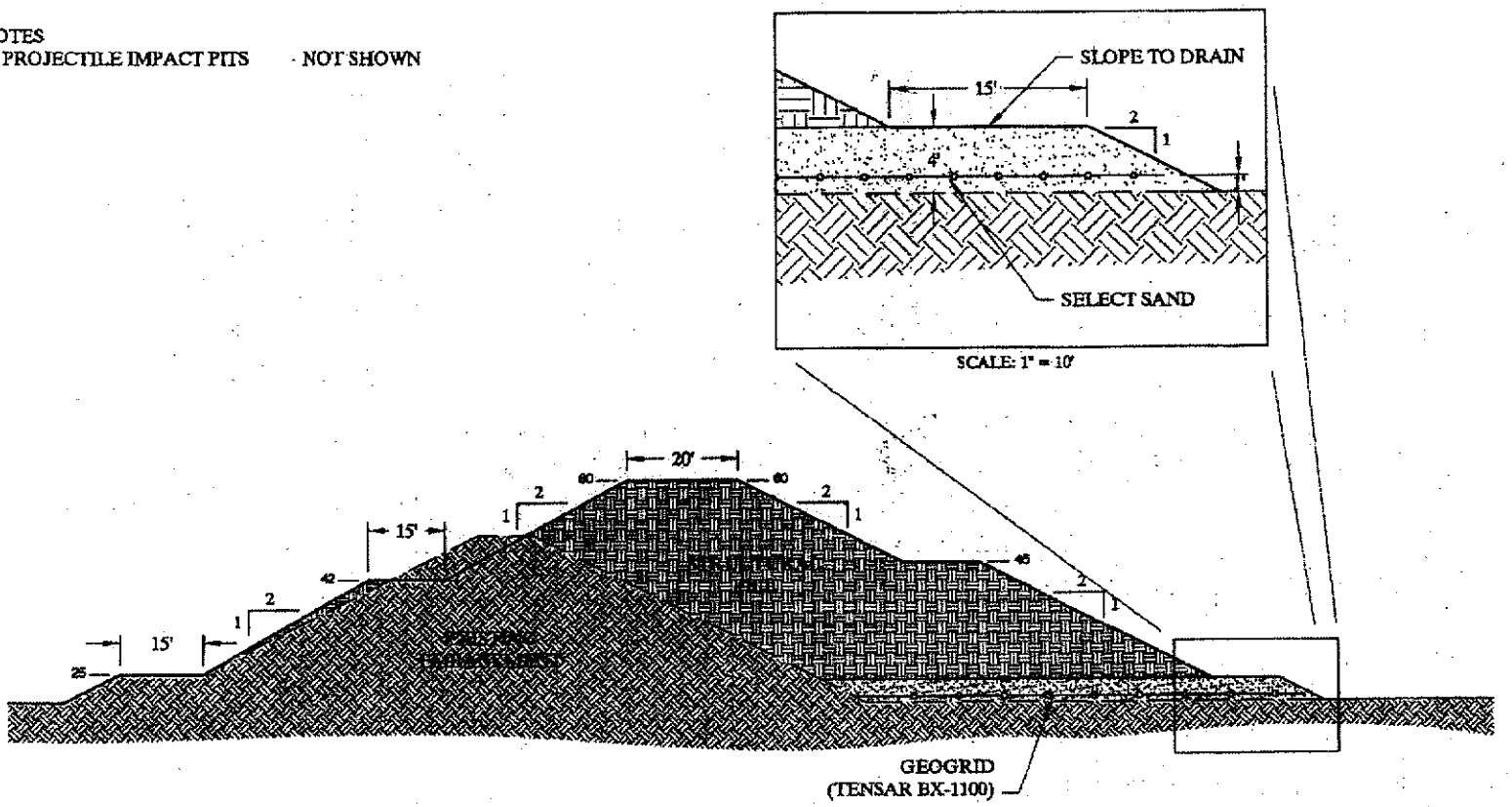
S:\PROJECTS\2006\06-439 Rifle Range Cherry Pt MCAS\Geotech\Revisions\439 Addendum Cherry Point Rifle Range.doc

NOTES
1. PROJECTILE IMPACT PITS AND MSE WALL REINFORCEMENT NOT SHOWN
2. MSE WALL DESIGN, EXCEPT GLOBAL STABILITY, BY OTHERS



SCALE: 1" = 30'	DATE: JULY 2007	S&ME 3718 OLD BATTLEGROUND ROAD GREENSBORO, NC 27410 PH. 336-288-7180 FAX. 336-288-8980 WWW.SMEINC.COM	EMBANKMENT SECTION WITH WALL CHERRY POINT RIFLE RANGE CHERRY POINT, NORTH CAROLINA	FIGURE NO. 2
PROJECT NO. 1051–06-439	DRAWN BY: RDM			
	CHECKED BY: SEH			

NOTES
1. PROJECTILE IMPACT PITS - NOT SHOWN



SCALE: 1" = 30'	DATE: JULY 2007	S&ME	3718 OLD BATTLEGROUND ROAD, GREENSBORO, NC 27410 PH. 336-288-7160 FAX. 336-288-8980 WWW.SMEINC.COM	EMBANKMENT SECTION WITHOUT WALL CHERRY POINT RIFLE RANGE CHERRY POINT, NORTH CAROLINA	FIGURE NO. 1
PROJECT NO. 1051-06-439	DRAWN BY: RDM				
	CHECKED BY: SEH				

SUBSURFACE EXPLORATION REPORT
PROPOSED RIFLE RANGE BERM MODIFICATIONS
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA
S&ME PROJECT NO. 1051-06-439

Prepared For:

Dewberry
2301 Rexwoods Drive, Suite 200
Raleigh, North Carolina 27607

Prepared By:

S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

February 2, 2007

February 2, 2007

Dewberry
2301 Rexwoods Drive, Suite 200
Raleigh, North Carolina 27607

Attention: Mr. Steve Harvey, P.E.

Reference: **Subsurface Exploration Report**
Proposed Rifle Range Berm Modifications
Projects CP99019M and CP0719R
Marine Corps Air Station
Cherry Point, North Carolina
S&ME Project No. 1051-06-439

Dear Mr. Harvey:

S&ME, Inc. is pleased to submit this subsurface exploration report for the above referenced project. The work was performed in general accordance with our Proposal No. P151-06E dated June 29, 2006. The exploration was performed to provide geotechnical recommendations with regard to the proposed rifle range berm modifications which include repair of the existing slope (Project CP99019M) and increasing the height of the berm (Project CP0719R). An Environmental Plan Report has been submitted by S&ME under different cover which includes the requirements and regulations of handling and disposal of lead impacted debris and soil. This report presents a brief description of our understanding of the project, results of the exploration, and our geotechnical conclusions and recommendations. A Boring Location Plan, Generalized Subsurface Profiles, Test Boring Records, Laboratory Test Results, Slope Stability Analysis Graphs, and site photographs are included in the Appendix.

PROJECT INFORMATION

We understand that the impact berm at the Marine Corps Air Station (MCAS) Rifle Range in Cherry Point, North Carolina is to be repaired (Project CP99019M). Proposed repairs will include the following:

- Removing the existing wooden retaining wall.
- Processing soil disturbed during earthwork and drainage repairs.
- Removing lead fragments from the impact area of the berm.
- Returning processed soil to berm as part of earthwork repairs.

There are several localized depressions or pockets in the existing slope that appear to have been caused by progressive loosening of soils from projectile impact and erosion. We understand that the MCAS would like to reduce localized erosion along the surface of the slope.

We also understand the height of the existing berm is to be raised an additional 20 feet by adding earthwork (Project CP0719R). Based on the Military Handbook (MIL-HDBK-1027/3B; 30 November 1992), the impact (front) slope may be no flatter than 1.5 (horizontal) to 1 (vertical). However, we understand that approval has been granted for constructing a 2 (horizontal) to 1 (vertical) front slope. The back slope may be constructed at any stable slope angle. Raising the existing embankment will widen its base. We understand that the base cannot be widened on the target side of the berm. As such, the base must be extended from the back slope. Extending the back slope will also require relocating an existing unpaved access road along the back side of the existing berm. Wetlands are present as close as approximately 80 feet from the toe of the existing back slope, and wetland impact (from the extended embankment and relocated road) is undesirable.

Once the impact berm has been raised, a steel brow, "eyebrow", will be placed along the length of the top of the new berm for ricochet protection. The eyebrow will consist of a 10 foot long steel

brow extending over the impact slope at an angle of 40 degrees. We assume the steel brow will be supported by a continuous footing.

EXISTING CONDITIONS

The rifle range is approximately 500 yards long from the farthest firing position to the impact berm. The target area is in front of the berm and consists of permanent targets that can be raised and lowered from behind a 10 foot high soil embankment with concrete retaining wall. Two small buildings exist behind the target line. The area is paved with concrete. A wooden retaining wall approximately 2 feet in height exists behind the concrete area. The toe of the impact berm front slope is located approximately 10 feet behind the wooden retaining wall.

Based on the survey information provided by Dewberry, the existing impact berm height is approximately 30 feet. The front slope of the existing berm is approximately 2 (horizontal) to 1 (vertical). An approximate 10 foot wide terrace is located approximately 10 feet from the toe of the existing slope. Depressions, which appear to have been caused by projectile impact and erosion, exist above the terrace. The depressions range in depth from 1 to 2 feet and are approximately 10 to 20 feet long along the length of the slope. The front slope is covered with small vegetation.

The top of the existing berm is relatively flat along the length of the bullet impact zone. The berm slopes on the northwestern and southeastern sides from approximate elevation of 50 to 21 feet. The top of the berm is covered with small vegetation and contains several small pine trees.

The inclination of the back slope ranges from approximately 1(H):1(V) along the northwestern portion to 2.3(H):1(V) near the center. Two areas along the top of the back slope show signs of soil erosion. The back slopes of the berm are wooded with mature pine trees.

EXPLORATION PROGRAM

The exploration program included a visual site reconnaissance by a representative of S&ME and performance of nine soil test borings. Three of the borings (B-1 through B-3) were performed to an approximate depth of 30 feet near the toe of the existing front slope. Three borings (B-4 through B-6) were performed to an approximate depth of 60 feet along the top of the existing berm. The remaining three borings (B-7 through B-9) were performed to an approximate depth of 30 feet near the toe of the existing back slope. Boring locations were selected and located in the field by S&ME personnel by estimating distances of existing site features. Approximate boring locations are shown on Figure 1 in the Appendix.

Borings were performed using 3-1/4 inch hollow stem auger and wash boring drilling procedures with a CME 750 drill rig. Within borings, samples of subsurface soils were taken at 2.5 foot intervals above a depth of 10 feet and at 5 foot intervals below 10 feet using a split-spoon sampler. Standard penetration testing was performed in conjunction with split-spoon sampling in general accordance with ASTM D 1586-99. Standard penetration tests (SPT) values, known as N-values, were conducted using an auto hammer. Reported SPT N-values on the Test Boring Records are actual recorded N-values and are uncorrected, however corrected N-values were used for classifying soils and for design. Bulk samples of existing berm fill soils were obtained from borings B-4 and B-6. Relatively undisturbed Shelby tube samples were obtained at various depths from borings B-4, B-5, B-6, B-7, and B-9.

Upon completion of the field exploration, groundwater depths were measured and boreholes were backfilled with auger cuttings up to the original ground surface. Representative portions of spilt-spoon, bulk, and Shelby tube samples were returned to our laboratory for visual classification and testing. Soils were visually classified in general accordance with Unified Soil Classification System (USCS) guidelines.

Generalized subsurface profiles (Figures 2A, 2B, and 2C) and Test Boring Records presenting subsurface information from the borings are included in the Appendix. Stratification lines shown

on Test Boring Records and profiles are intended to represent approximate depths of changes in soil types. Naturally, transitional changes in soil types are often gradual and cannot be defined at a particular depth. Ground surface elevations shown on Test Boring Records were interpolated from the provided site plan and should be considered approximate.

SUBSURFACE CONDITIONS

The following tables provide a general description of the typical subsurface conditions at the toe of the existing front slope, top of the existing berm, and toe of the existing back slope.

Typical Subsurface Conditions Encountered at the Toe of the Existing Front Slope

0 – 3	FILL: Medium Dense Clayey Fine SAND (SC), Moist to Wet	8 - 23
3 – 11	Very Soft to Firm Silty CLAY (CH), Wet	WOH[1] - 6
11 – 17	Medium Dense to Dense Fine SAND (SP), Saturated	18 - 70
17 – 28	Soft Fine Sandy CLAY (CL), Wet	2 - 5
28 – 30	Dense Clayey Medium SAND (SC), Saturated	10 - 35

[1] WOH = Weight of Hammer

Typical Subsurface Conditions Encountered at the Top of the Existing Berm

[illegible]	[illegible]	[illegible]
0 – 27	EMBANKMENT FILL: Medium Dense Clayey Fine SAND (SC), Moist	8 - 23
27 – 30	Medium Dense Clayey Fine SAND (SC), Moist to Wet	10 - 15
30 – 40	Firm Fine Sandy CLAY (CH), Wet	4 - 5
40 – 47	Medium Dense to Very Dense Medium to Fine SAND (SP), Saturated	12 - 49
47 – 57	Soft to Firm Fine Sandy CLAY (CL), Wet	WOH[1] - 5
57 – 60	Dense Clayey Medium SAND (SC), Saturated	27

Typical Subsurface Conditions Encountered at the Toe of the Existing Back Slope

[illegible]	[illegible]	[illegible]
0 – 3	EMBANKMENT FILL: Loose to Very Dense Silty Fine SAND (SM), Moist	8 - 43
3 – 8	Firm to Stiff Fine Sandy CLAY (CH), Moist to Wet	6 - 9
8 – 12	Loose Clayey Fine SAND (SC), Saturated	5 - 7
12 – 17	Medium Dense Medium SAND (SP), Saturated	12 - 20
17 – 28	Very Loose Clayey Fine SAND (SC), Saturated	WOH[1] - 3
28 – 30	Dense Medium SAND (SP), Saturated	26 - 33

Groundwater was observed in borings B-2 and B-3 at approximate depths of 4.5 to 8 feet, respectively, below the existing ground surface at the time of drilling completion. Borings caved at completion of drilling at approximate depths ranging from 3 to 12 feet below the existing ground surface. Borehole caving can indicate the presence of groundwater. Groundwater elevations can be expected to fluctuate due to seasonal variations in rainfall, evaporation, and other factors.

LABORATORY TESTING

Laboratory testing was performed on selected split-spoon soil samples, bulk soil samples, and relatively undisturbed Shelby tube soil samples. Laboratory testing included natural moisture content, Atterberg limits (plasticity index), grain size analysis, standard Proctor compaction, and remolded and relatively undisturbed triaxial shear tests.

Laboratory tests were conducted in general accordance with applicable ASTM test procedures. A tabular summary of laboratory testing is provided in the Appendix. Individual laboratory test data sheets are also provided.

CONCLUSIONS AND RECOMMENDATIONS

The subsurface exploration was performed to evaluate the subsurface conditions with respect to the following:

- Repairing the existing berm to preserve slope stability while reducing erosion and ricochet hazards (Project CP99019M).
- Increasing the height of the existing berm an additional 20 feet (Project CP0719R).

Our geotechnical recommendations regarding these projects are provided in the following sections.

Repairing Existing Berm (Project CP99019M)

The existing projectile impact areas are predominantly clayey sand soils. These materials tend to readily erode, do not lend themselves to projectile recovery, are difficult to rework, and are displaced by projectile impacts. We recommend that existing clayey sands in Projectile Impact Areas be replaced with clean, free draining sand. As compared to the existing clayey sands, these materials will:

- Allow vertical movement of moderate amounts of rainfall and overland surface drainage of water into the sands where it may be removed by a subsurface drainage system, rather than erode the surface soil,
- Lend themselves to screening to remove projectiles and re-use the sand, and
- May be readily reworked with hand tools to repair displacement due to projectile impact.

The sand may be placed in individual Projectile Impact Pits or as a triangular wedge encompassing the Projectile Impact Zone at an appropriate elevation. The triangular wedge of sand should have a sufficient horizontal width to contain the projectiles. A subsurface drainage system should be included in the bottom interior corner of the Projectile Impact sand and gravity discharge at the bottom of the embankment. The subdrain may consist of a 4-inch diameter perforated, corrugated plastic pipe with a filter fabric sock that gravity drains to a collection system. Maximum subdrain water collection travel distance to a discharge line should be on the order of 50 feet. The subdrain should be located a sufficient distance into the embankment that is will not be disturbed by projectiles or projectile recovery operations. Suggested geometry is shown on Figure 3.

The sand should be a free draining, non-plastic material such as ASTM C-33 gradation sand (concrete fine aggregate sand). Note that this type of material may be considered "excessively drained" relative to establishment of vegetation and will not readily support mowing equipment when placed at a 2:1 slope. We suggest that vegetation not be established in the projectile impact sand. The sand should be placed as structural fill in accordance with the recommendations contained within the "Structural Fill" section of this report.

The following are additional criteria and considerations from the Military Handbook (1027/3B; Change 1, 30 June 1995):

- The slope should be vegetated (note – inconsistent with above recommendations).
- The desired pH levels for the soil should be in the neutral range of 6 to 8, and if required, the pH level can be raised by adding hydrated, crushed, or pulverized limestone.

- The soil should not contain any rocks, sticks, or other material which may present a ricochet hazard.
- Projectile pockets in the berm should be reworked by adding soil and grass often.

The Military Handbook directs that surface water be diverted to a vegetated detention basin or infiltration area. The suitability of surface water from the subsurface collection system for discharge to surface or subsurface systems must be evaluated.

Increasing Existing Berm Height 20 Feet (Project CP99019M)

Based on the subsurface information and existing slope geometry, the existing berm height can be increased 20 feet with slopes of approximately 2 (horizontal) to 1 (vertical) using specialized methods. Specialized methods are required due to a relatively soft clay layer located about 3 to 11 feet below the embankment base. We recommend consideration be given to use of lightweight fill such as Expanded Polystyrene (EPS) Foam to construct a portion of the new embankment or use of soil mixing to improve the average strength of the clay layer near the embankment base. These alternatives along with our assumptions and procedure in reaching these conclusions are described in more detail below.

Slope Stability Analyses

Slope stability analyses were performed using a computer program entitled PCSTABL6. Soil strength parameters used in analyses for the in-situ soils were based on consolidated undrained (CU) triaxial testing, empirical correlations between N-values, and past experience with strength behavior of similar soils. Soil strength parameters used in the analyses for the proposed fill soils are based on anticipated strengths for the fill soils placed in accordance with this report (See Structural Fill section). Analyses were performed using both 2(H):1(V) and 3(H):1(V) slopes with an assumed top of berm width of ten feet. Graphical results of slope stability analyses for raising the berm with soil fill are presented in Figures 4, 5, and 6 in the Appendix.

Our slope stability analysis determined a factor of safety of less than one if the new portion of the embankment is constructed entirely of soil fill. It is our opinion that a factor of safety of at least 1.3 would be appropriate for this project. Methods to increase the factor of safety would be to either reduce the driving stresses (weight) of new embankment materials or increase the strength of embankment foundation soils. Suggested methods to increase the factor of safety are provided below.

Design Alternatives

Expanded Polystyrene (EPS) Foam Embankment Fill

EPS foam is a manufactured, inert, closed-cell expanded polystyrene material commonly available and trucked to sites in blocks commonly on the order of 2 by 4 by 8 feet. It can be used in place of soil to significantly reduce the weight required to achieve the required embankment height. EPS foam weighs on the order of 1 to 3 pounds per cubic foot and may be used to support loads of up to approximately 1,500 psf. Two companies familiar design using EPS foam are Advanced Engineering Services (435-867-1083) and GME Consultants, Inc. (800-795-8523). For this application, consideration should be given the amount of soil cover necessary to protect the EPS foam from projectile impact.

Soil Mixing

An alternative to decreasing the embankment weight is to increase the strength of the soft clay layer using soil mixing techniques. Soil mixing involves mechanically blending the in-situ soil with cementicious materials using a hollow stem auger and paddle arrangement. This design should be performed by a specialty contractor such as Hayward Baker (336-668-0884). Soil mixed columns should extend through the soft clay layer present from approximately 3 to 11 feet below the base of the existing berm. The horizontal extent of the improvement should extend from 20 feet in front of the toe of the existing slope to 20 feet behind the toe (or retaining wall) of the proposed back slope. We estimate that the average strength of the soft clay would need to increase to an undrained shear strength of at least 850 pounds per square foot (psf) in order to provide a factor of safety against undrained failure of 1.3. As previously mentioned, this method

would allow the new embankment to be constructed entirely of soil fill rather than a combination of EPS foam and fill soil.

Construction Considerations

Site Preparation

Initial site preparation for increasing the berm height should include clearing and grubbing of trees and removing any associated rootmat in areas where fill will be placed. The contractor should anticipate some surface sloughing with the removal of rootmat.

Site grading will be difficult during periods of extended rainfall and low temperatures that generally occur during the winter months. To reduce potential earthwork problems, site preparation and grading should be scheduled during the typically drier summer months, if possible. Heavy rubber-tired construction equipment should not be allowed to operate on wet or unstable subgrades at this site due to the potential for rutting and other damage to the soils. We recommend that exposed subgrades be sloped and sealed at the end of each day to promote runoff and reduce infiltration from rainfall.

After initial site preparation, areas that are to receive fill should be evaluated by a geotechnical engineer. To aid the engineer during this evaluation, the exposed subgrade should be proofrolled with a moderately loaded tandem axle dump truck or equivalent type of construction equipment. Proofrolling not only helps to reveal the presence of any unstable or otherwise unsuitable surface materials, but may densify the exposed subgrade for new fill placement. Any areas which are observed to rut, pump, or deflect excessively during the proofrolling process and fail to densify with continued rolling should be undercut to firm soils. As an alternative to undercutting, in-place repair of near surface soils, consisting of drying and recompacting subgrade soils, may be practical depending on field conditions at the time of grading. Drying of soils can typically be accomplished by discing and aerating soils during favorable weather conditions.

Structural Fill

Structural fill used to replace materials along the front of the existing slop should conform to the material requirements mentioned in the Repairing Existing Berm (Project CP99019M) section of this report. Structural fill soils used to increase the height of the existing berm slopes (excluding projectile impact sand) should consist of sands having a Unified Soil Classification of SP, SP-SM, SP-SC, SM, or SC. Highly plastic soils (plasticity index greater than 30) or soils containing greater than 5 percent organics should not be used as fill materials. Also due to bullet ricochet concerns gravel, cobbles or boulders should not be present in the fill. The maximum particle size for the structural fill should be less than 1/2 inch.

Structural fill should be placed in 8 to 10 inch loose horizontal lifts and should be compacted to at least 95 percent of the standard Proctor maximum dry density (ASTM D 698). The moisture content of fill should be maintained within three percent of the optimum moisture content. In-place testing during fill placement should be performed to confirm that the required degree of compaction is achieved. Past experience indicates that construction equipment has difficulty adequately compacting the face of slopes. In areas where new fill is to be placed adjacent to existing slopes, the existing slopes should be benched in order to key new fill into existing soils. The frequency of vertical spacing of the benches will be a function of the inclination of the existing slope and the depth of fill; however, the maximum vertical spacing of benches should not exceed about 4 feet. Material cut from the benches can be reused as fill material in the lower bench provided it is not otherwise unsuitable material. Erosion along slope surfaces must also be controlled during construction.

"Eyebrow" Recommendations

The proposed "eyebrow" structure may be supported on a shallow continuous footing bearing in properly compacted soil fill. The continuous footing may be designed for a maximum allowable soil bearing pressure of 2,000 pounds per square foot (psf). The continuous footing should be at least 18 inches wide. This recommendation is to help prevent localized or "punching" shear failure which can occur with very narrow footings. In addition, the continuous footing should be

embedded at least 36 inches below the top of the berm to provide adequate embedment against bearing capacity failure. At the foundation bearing depth, the foundation should be at least five feet horizontally from the face of the slope.

The geotechnical engineer or his representative should observe the foundation bearing conditions prior to placement of reinforcing steel and concrete. This evaluation should include probing, shallow hand auger borings, and dynamic cone penetrometer testing to confirm that suitable bearing soils exist. All excessively soft soils or other unsuitable materials should be undercut and replaced.

If groundwater or surface water runoff collects in any excavation, it should be removed promptly or drained with tail ditch drains or by pumping to prevent softening of foundation supporting soils. Care should be exercised during construction of foundations in order not to disturb bearing soils and reduce their strength. To further reduce the potential for deterioration of bearing soils, we recommend that foundation excavation and placement of concrete be conducted on the same day if practical.

Retaining Walls

Retaining walls may be required in some areas to prevent the berm from extending into wetlands. Convention segmental block retaining walls with soil backfill less than 10 feet in height will require special design measures that are wall location specific due to soft near surface soils. Convention segmental block retaining walls with soil backfill in excess of 10 feet in height are not recommended due to soft near surface soils. Use of EPS foam fill or deep soil mixing would be required in conjunction with retaining wall design. Additional analysis of specific wall configurations would be required.

Access Road

Borings were not performed in the anticipated location for the new access road behind the proposed embankment. Additional testing should be completed in order to provide access road recommendations.

QUALIFICATIONS OF REPORT

This report has been prepared in accordance with generally accepted engineering practice for specific application to this project. Any wetland, environmental, or contaminant assessment efforts are beyond the scope of this subsurface exploration; and therefore, those issues are not addressed in this subsurface exploration report. The recommendations contained in this report are based on the applicable standards of our profession at the time this report was prepared. No other warranty, express or implied, is made.

Conclusions and recommendations regarding site grading and soil parameters, submitted in this report are based, in part, upon the data obtained from the subsurface exploration. The nature and extent of variations between and outside of the borings may not become evident until construction. If variations appear evident, then it will be necessary to re-evaluate the recommendations of this report. In the event that any changes in the nature or design of the proposed construction are planned, the recommendations contained in this report should be reviewed and modified or verified in writing. We recommend that our firm be provided the opportunity for general review of final design specifications to confirm that our recommendations are properly interpreted and implemented.

Also, we would welcome the opportunity to provide geotechnical engineering and material testing services during construction of this project. This arrangement provides the continuity

between design and construction that is important to verify recommendations are followed, soil conditions are consistent with those presented in this report and to make sound field engineering decisions based on the knowledge gained from this exploration.

CLOSURE

S&ME appreciates the opportunity to provide geotechnical engineering services on this project. If you have any questions concerning information presented herein, or when we may be of further assistance, please contact us.

Sincerely,

S&ME, Inc.

J. Adam Browning, E.I.
Staff Professional

Scott Hancock, P.E.
Senior Engineer
N.C. Registration No. 12248

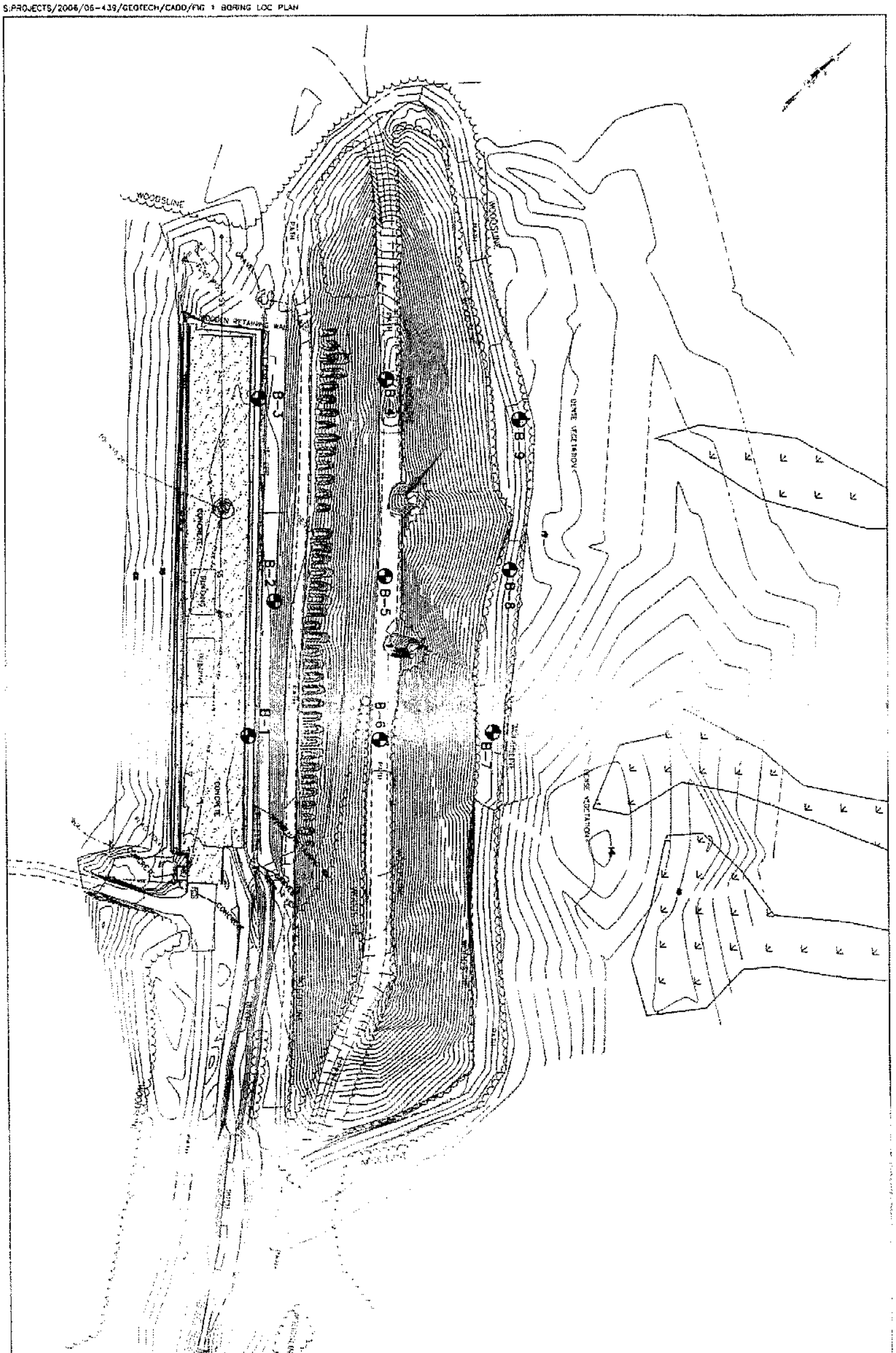
J. Nathan Reeves, P.E.
Geotechnical Department Manager
N.C. Registration No. 29383

NORTH CAROLINA PROFESSIONAL SEAL 029383 2/2/07 ENGINEER J. NATHAN REEVES

Attachments

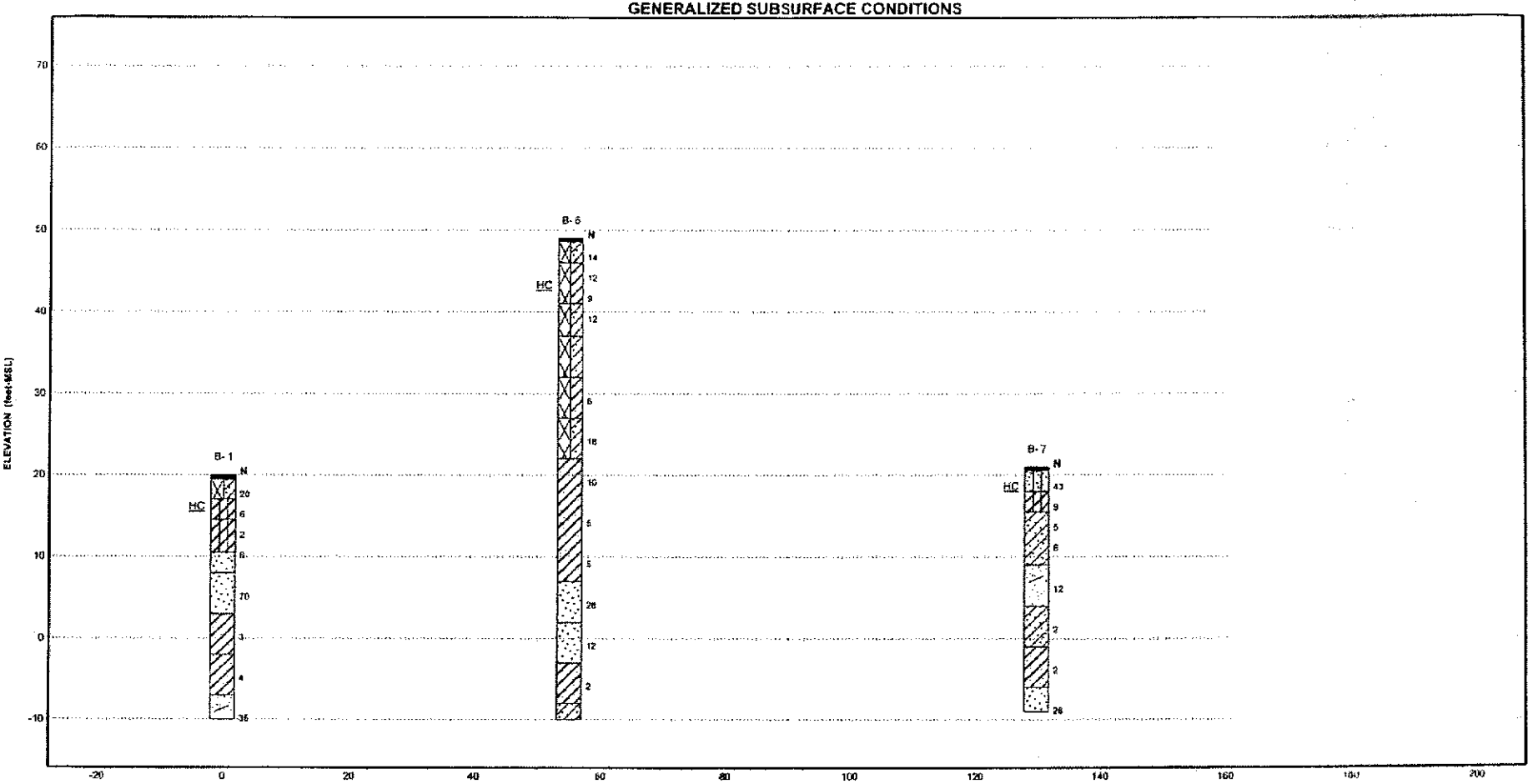
S:\PROJECTS\2006\06-439 Rifle Range Cherry Pt MCAS\Geotech\Report\439 rpt Cherry Point Rifle Range.doc

S:PROJECTS/2006/06-439/GEOTECH/CADD/FIG 1 BORING LOC PLAN



BORING LOCATION PLAN CHERRY POINT RIFLE RANGE CHERRY POINT, NORTH CAROLINA	S&ME ENVIRONMENTAL SERVICES ENGINEERING · TESTING	SCALE: 1" = 60'	APPROVED BY: JAB
		DATE: JANUARY 2007	DRAWN BY: TRP
		JOB NO. 1051-06-439	FIGURE 1

GENERALIZED SUBSURFACE CONDITIONS



N = Standard Penetration Test resistance value (blows per foot). The depicted stratigraphy is shown for illustrative purposes only. The actual subsurface conditions will vary between boring locations.

SCALE:	N.T.S.
CHECKED BY:	JAB
DATE:	1/23/2007
JOB NO:	1051-06-439

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Raleigh, NC 27616
(919) 872-2660
(919) 876-3958 fax
www.smeinc.com

GENERALIZED SUBSURFACE CONDITIONS

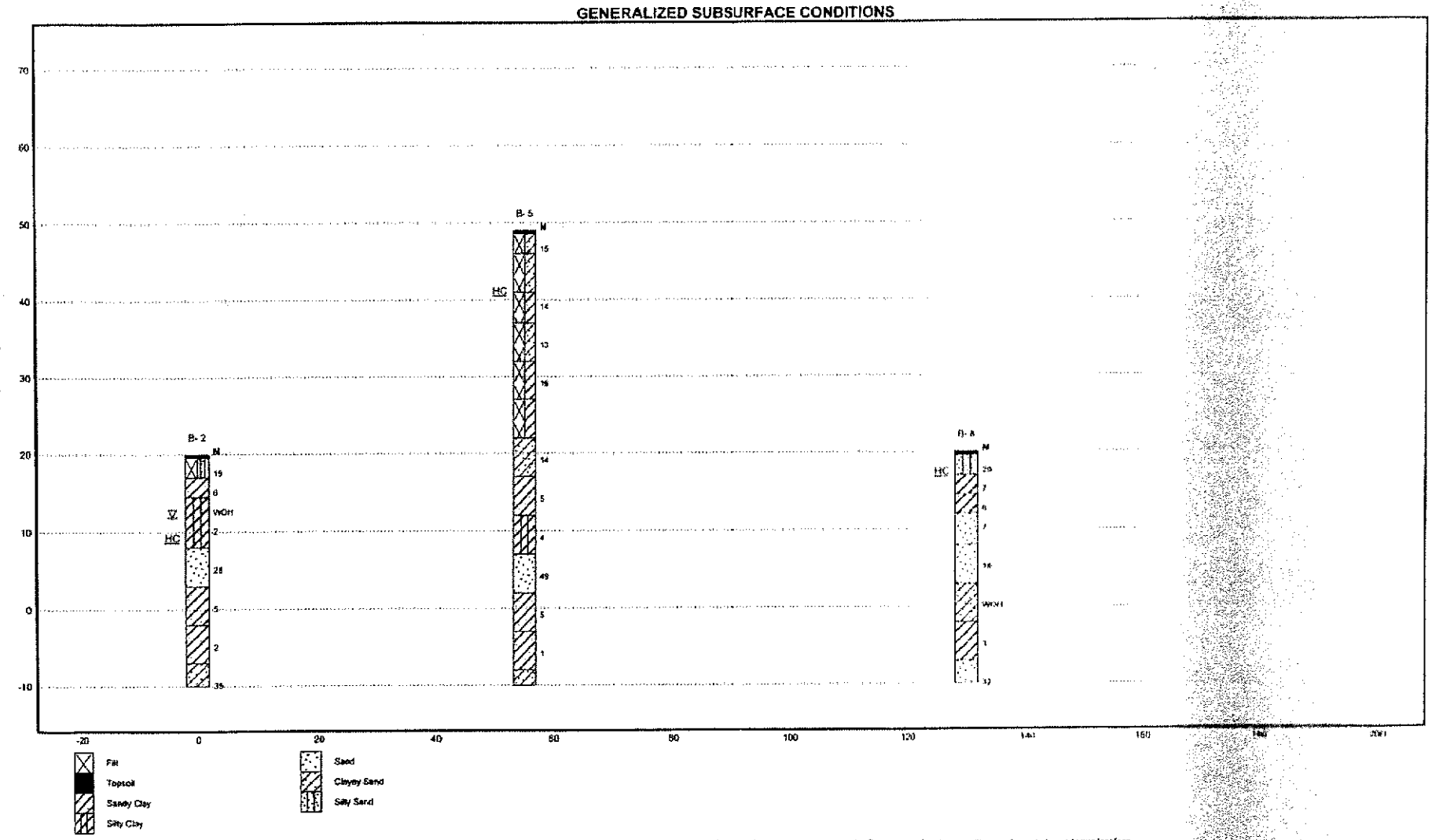
Cherry Point Rifle Range

Cherry Point, North Carolina

FIGURE NO.

2A

GENERALIZED SUBSURFACE CONDITIONS



N = Standard Penetration Test resistance value (blows per foot). The depicted stratigraphy is shown for illustrative purposes only. The actual subsurface conditions will vary between boring locations.

SCALE:	N.T.S.
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GENERALIZED SUBSURFACE CONDITIONS

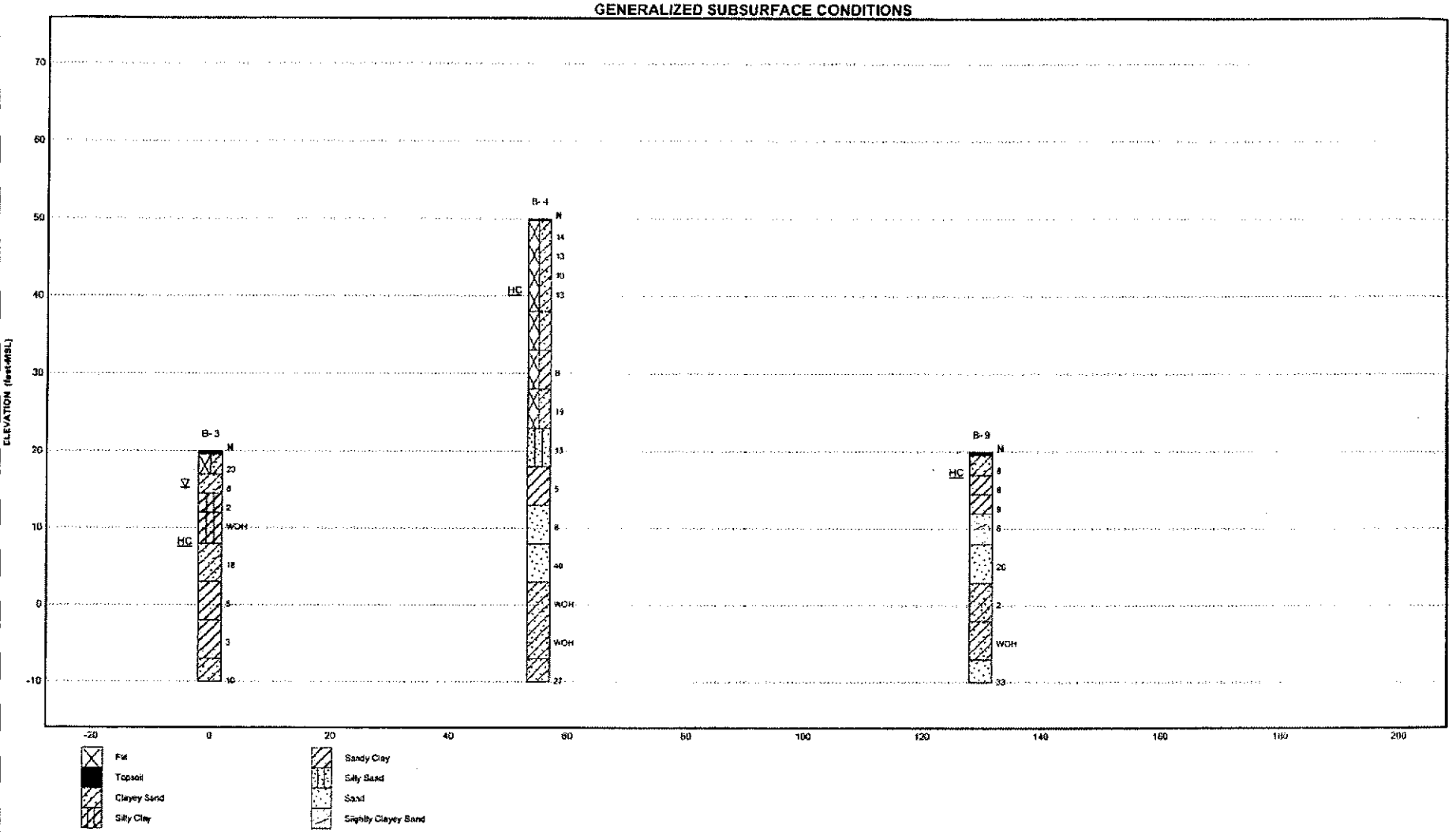
Cherry Point Rifle Range

Cherry Point, North Carolina

FIGURE NO.

2B

GENERALIZED SUBSURFACE CONDITIONS



N = Standard Penetration Test resistance value (blows per foot). The depicted stratigraphy is shown for illustrative purposes only. The actual subsurface conditions will vary between boring locations.

SCALE:	N.T.S.
CHECKED BY:	JAB
DATE:	1/23/2007
JOB NO:	1051-06-439

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GENERALIZED SUBSURFACE CONDITIONS

Cherry Point Rifle Range

Cherry Point, North Carolina

FIGURE NO.

2C

FIGURE 3

S&ME

JOB NO. 1051-06-439

SHEET NO. 1

DATE 2/2/07

JOB NAME CHERRY POINT RIFLE RANGE

COMPUTED BY A. BROWNING

SUBJECT SUGGESTED REPLACEMENT SOIL GEOMETRY

CHECKED BY

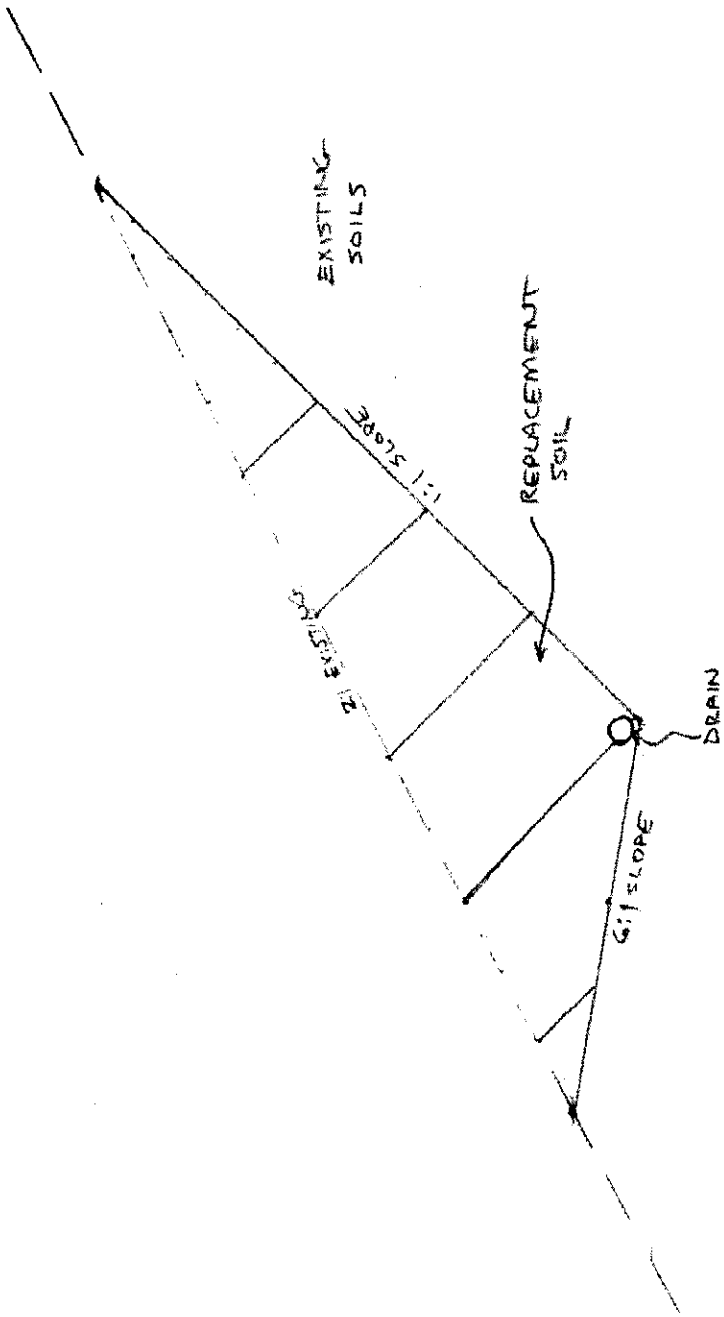
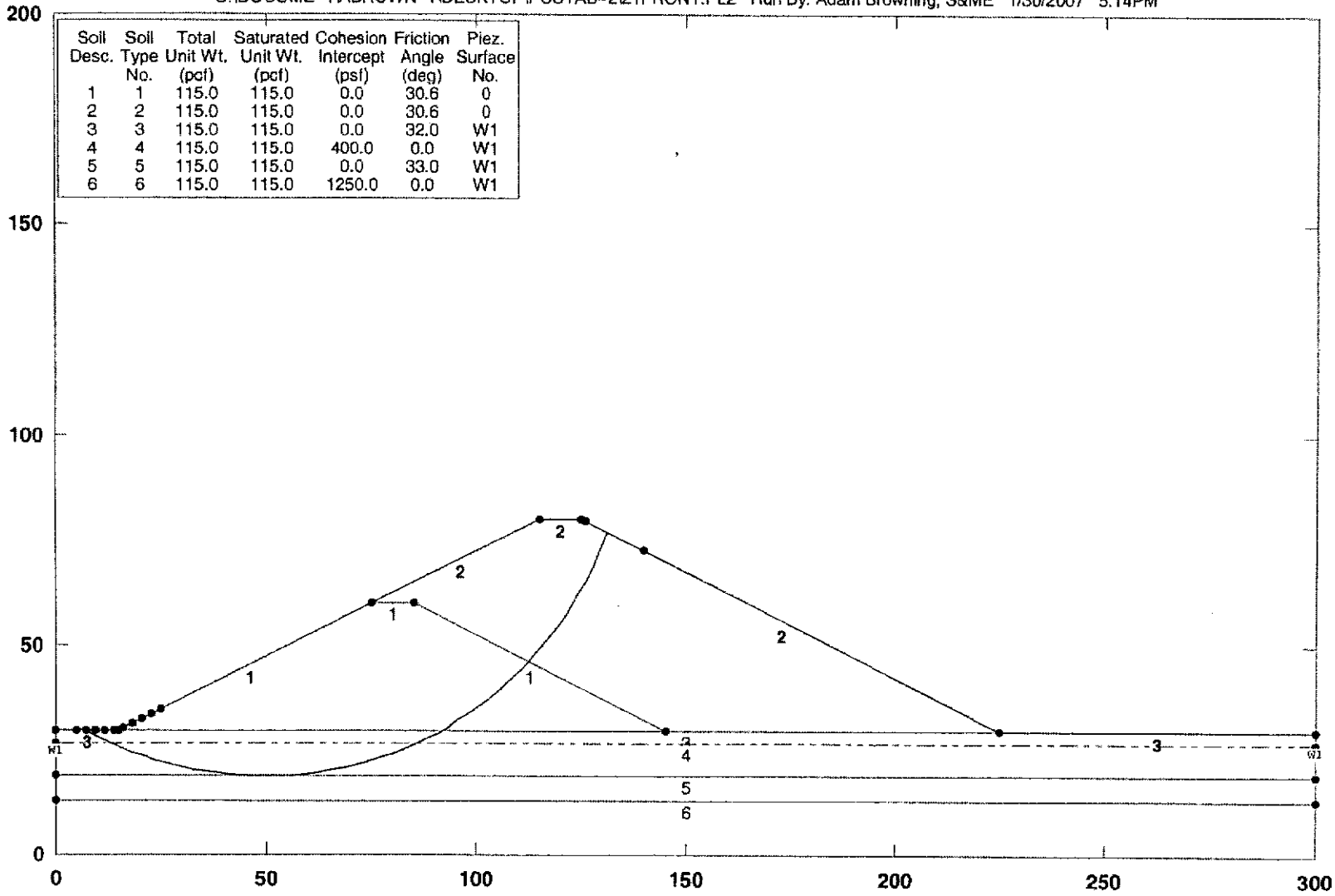


FIGURE 4

Cherry Point - 2:1 Front Slope 1051-06-439

C:\DOCUME~1\ABROWN~1\DESKTOP\PCSTAB~2\21FRONT.PL2 Run By: Adam Browning, S&ME 1/30/2007 5:14PM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	115.0	115.0	0.0	30.6	0
2	2	115.0	115.0	0.0	30.6	0
3	3	115.0	115.0	0.0	32.0	W1
4	4	115.0	115.0	400.0	0.0	W1
5	5	115.0	115.0	0.0	33.0	W1
6	6	115.0	115.0	1250.0	0.0	W1



STABL6H FSmin=0.94

Safety Factors Are Calculated By The Modified Bishop Method

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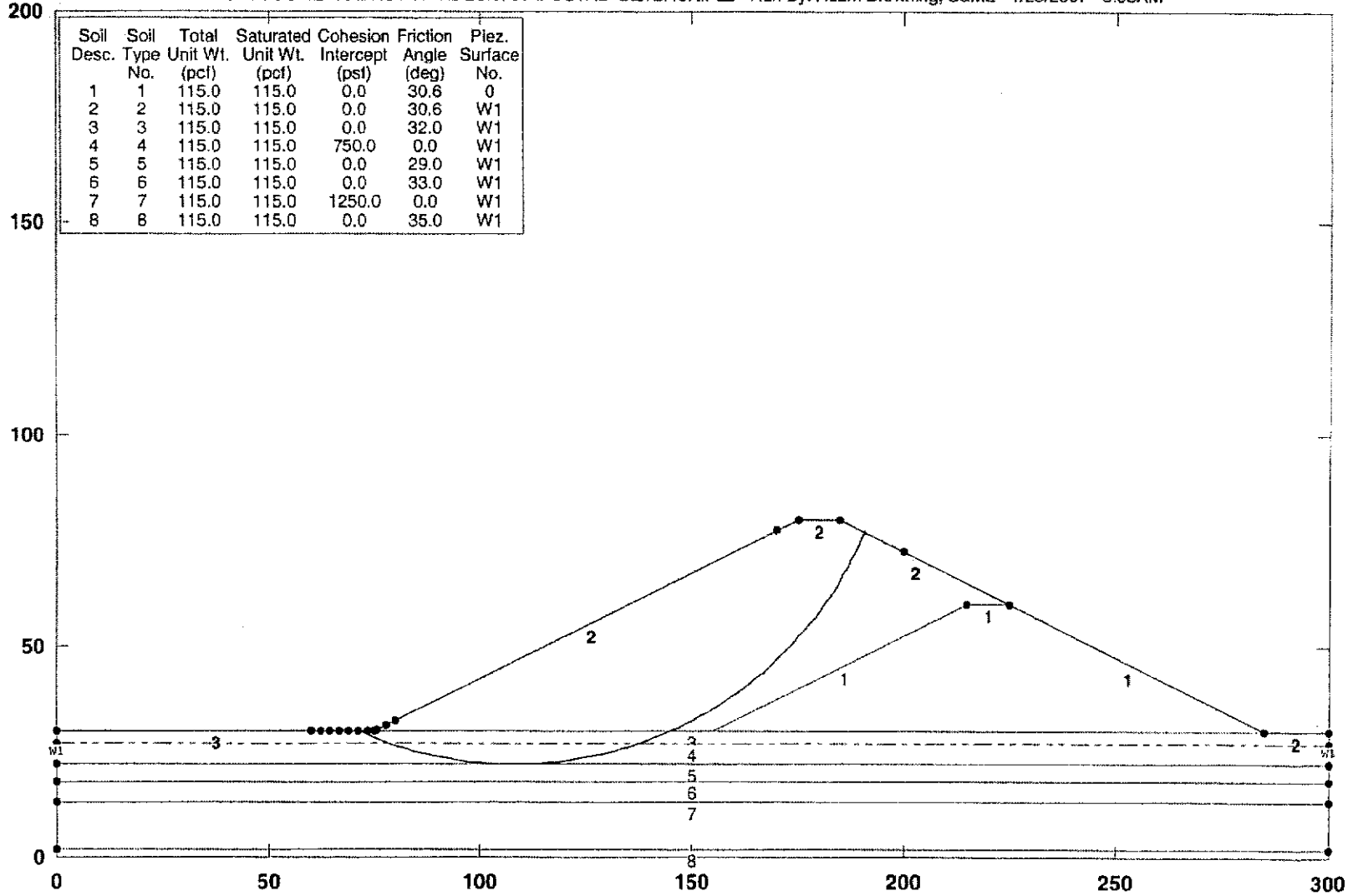
FIGURE 5

Cherry Point - 2:1 Back Slope 1051-06-439

C:\DOCUME~1\ABROWN~1\DESKTOP\PCSTAB~2\21BACK.PL2 Run By: Adam Browning, S&ME 1/25/2007 9:53AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	115.0	115.0	0.0	30.6	0
2	2	115.0	115.0	0.0	30.6	W1
3	3	115.0	115.0	0.0	32.0	W1
4	4	115.0	115.0	750.0	0.0	W1
5	5	115.0	115.0	0.0	29.0	W1
6	6	115.0	115.0	0.0	33.0	W1
7	7	115.0	115.0	1250.0	0.0	W1
8	8	115.0	115.0	0.0	35.0	W1



STABL6H FSmin=1.31

Safety Factors Are Calculated By The Modified Bishop Method

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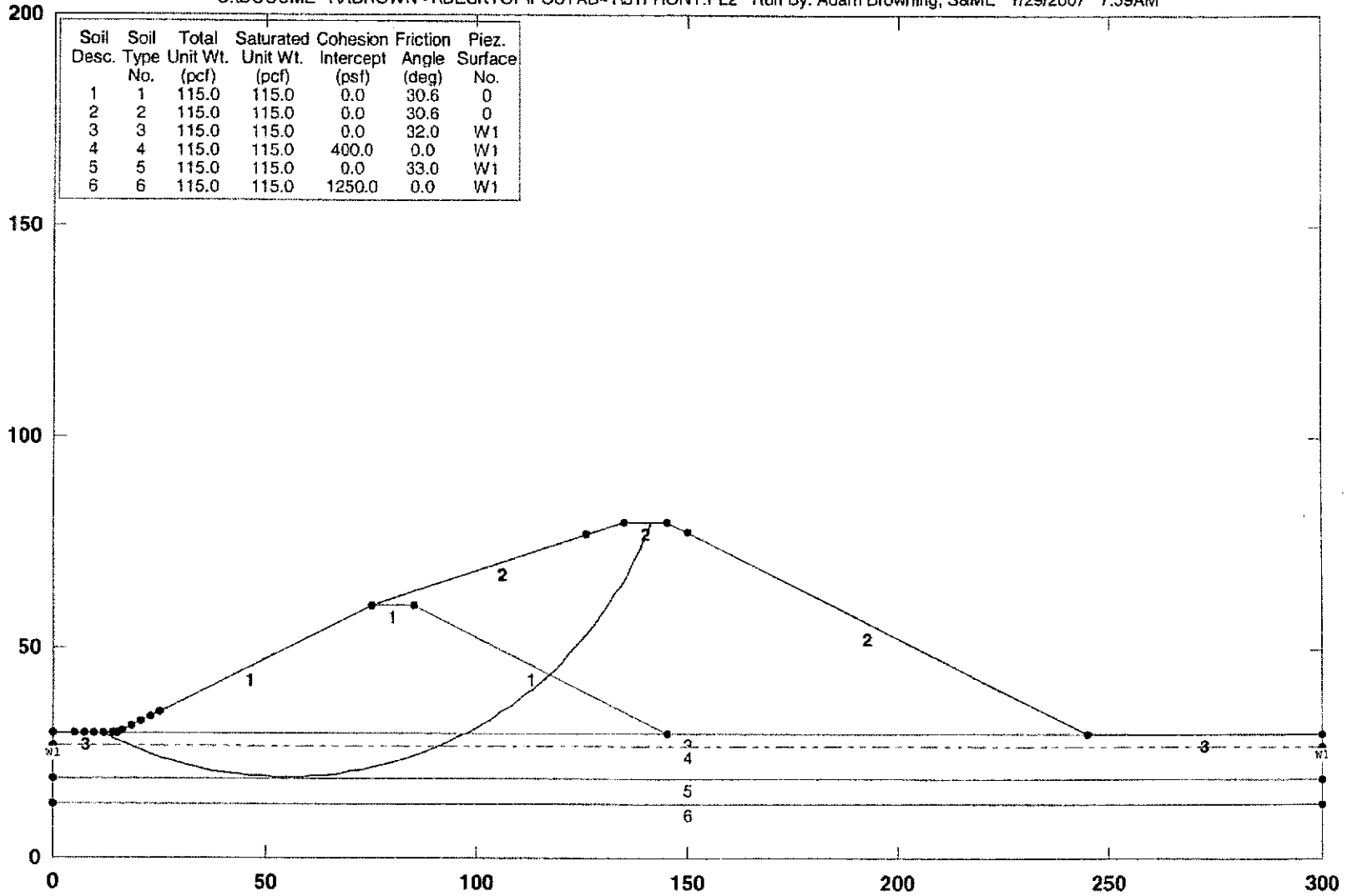
FIGURE 6

Cherry Point - 3:1 Front Slope 1051-06-439

C:\DOCUME~1\ABROWN~1\DESKTOP\PCSTAB~1\31FRONT.PL2 Run By: Adam Browning, S&ME 1/29/2007 7:59AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
1	1	115.0	115.0	0.0	30.6	0
2	2	115.0	115.0	0.0	30.6	0
3	3	115.0	115.0	0.0	32.0	W1
4	4	115.0	115.0	400.0	0.0	W1
5	5	115.0	115.0	0.0	33.0	W1
6	6	115.0	115.0	1250.0	0.0	W1



STABL6H FSmin=1.00

Safety Factors Are Calculated By The Modified Bishop Method

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LEGEND TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES

(Shown in Graphic Log)

- Fill
- Asphalt
- Concrete
- Topsoil
- Gravel
- Sand
- Silt
- Clay
- Organic
- Silty Sand
- Clayey Sand
- Sandy Silt
- Clayey Silt
- Sandy Clay
- Silty Clay
- Partially Weathered Rock
- Cored Rock

WATER LEVELS

(Shown in Water Level Column)

▽ = Water Level At Termination of Boring
▼ = Water Level Taken After 24 Hours
◄ = Loss of Drilling Water
HC = Hole Cave

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	STD. PENETRATION RESISTANCE BLOWS/FOOT
Very Soft	0 to 2
Soft	3 to 4
Firm	5 to 8
Stiff	9 to 15
Very Stiff	16 to 30
Hard	31 to 50
Very Hard	Over 50

RELATIVE DENSITY OF COHESIONLESS SOILS

RELATIVE DENSITY	STD. PENETRATION RESISTANCE BLOWS/FOOT
Very Loose	0 to 4
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	Over 50

SAMPLER TYPES

(Shown in Samples Column)

- Shelby Tube
- Split Spoon
- Rock Core
- No Recovery

TERMS

Standard Penetration Resistance - The Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in. I.D. Split Spoon Sampler 1 Foot. As Specified in ASTM D-1588.

REC - Total Length of Rock Recovered in the Core Barrel Divided by the Total Length of the Core Run Times 100%.

RQD - Total Length of Sound Rock Segments Recovered that are Longer Than or Equal to 4" (mechanical breaks excluded) Divided by the Total Length of the Core Run Times 100%.

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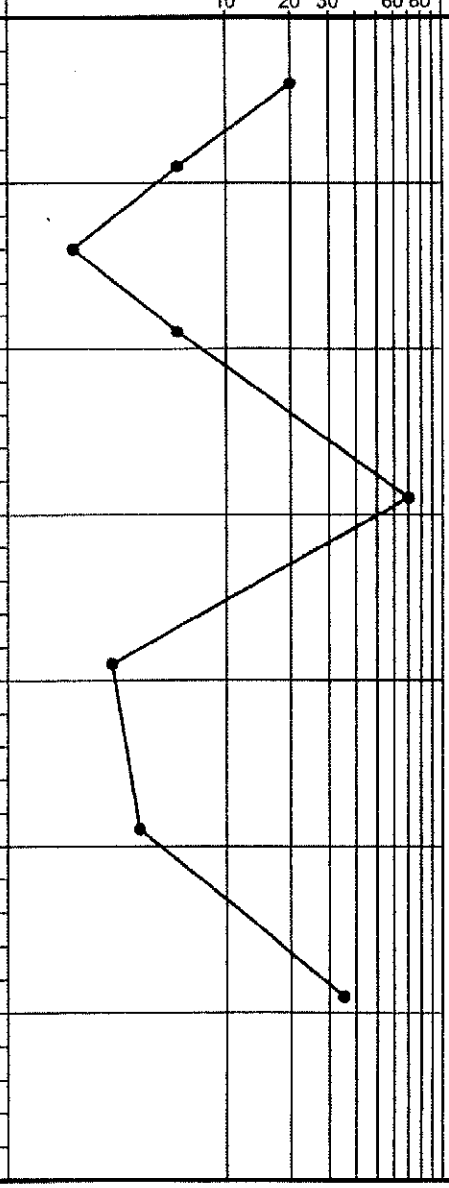
PROJECT: Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439	TEST BORING RECORD	B- 1

DATE DRILLED:	10/5/06	ELEVATION:	20.0 ft
DRILLING METHOD:	3-1/4" HSA	BORING DEPTH:	30.0 ft
LOGGED BY:	A. Browning	WATER LEVEL:	Cave @ 4.3'
DRILLER:	A. Martin	DRILL RIG:	CME-750

NOTES: **Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
		TOPSOIL (5 Inches)				
		FILL: Medium Dense Gray Silty Clayey Fine **SAND** (SC), Moist to Wet				20
		Firm Gray-Tan Silty **CLAY** (CH), Moist to Wet	HC			6
5		Very Soft Gray Silty **CLAY** (CH), Wet			15.0	2
						6
10		Loose Gray Fine **SAND** (SP), Wet			10.0	
		Very Dense Gray Medium to Fine **SAND** (SP), Wet				70
15					5.0	
		Soft Gray Fine Sandy **CLAY** (CL), Wet				3
20					0.0	
		Firm Gray Fine Sandy **CLAY** (CL) With Shell Hash, Wet				4
25					-5.0	
		Dense Gray Slightly Clayey Medium to Fine **SAND** (SP-SC) With Shell Hash, Wet				35
30		Boring terminated at 30 feet below existing ground surface. Borehole caved at 4.3 feet below existing ground surface. Borehole was observed dry at termination of boring.			-10.0	

STANDARD PENETRATION TEST DATA (blows/ft)



S&ME COMPANY STANDARD 51-439.GPJ S&ME.GDT 2/1/07

NOTES:

1. *THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.*
2. *BORING, SAMPLING AND PENETRATION TEST DATA IS IN GENERAL ACCORDANCE WITH ASTM D-1586.*
3. *PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.*
4. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
5. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

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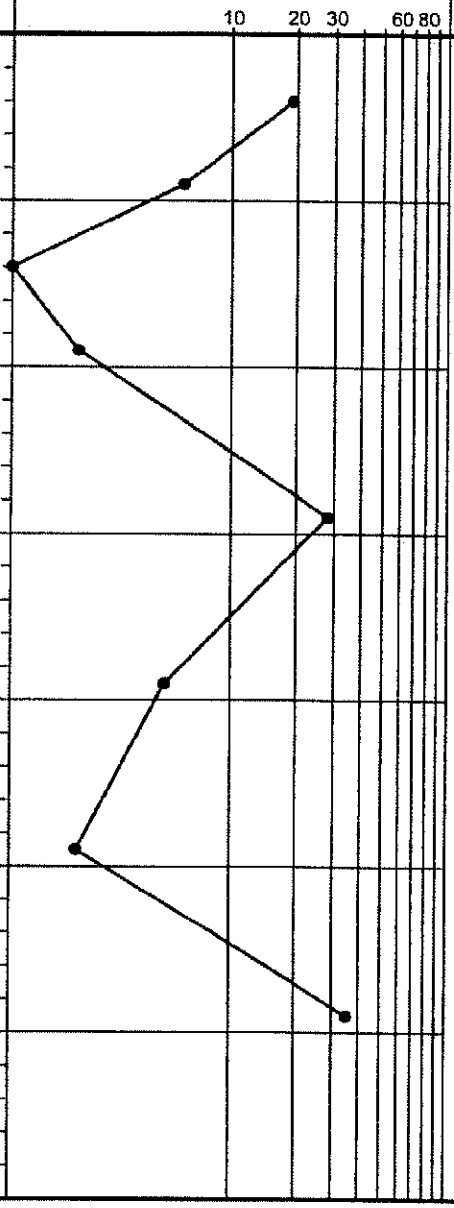
PROJECT: Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439		TEST BORING RECORD B- 2
DATE DRILLED: 10/5/06	ELEVATION: 20.0 ft	NOTES: Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.
DRILLING METHOD: Wash Boring	BORING DEPTH: 30.0 ft	
LOGGED BY: A. Browning	WATER LEVEL: 8.1' @ TOB	
DRILLER: A. Martin	DRILL RIG: CME-750	

DEPTH (feet)	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
	TOPSOIL (4 Inches)				
	FILL: Medium Dense Tan Silty Fine **SAND** (SM), Moist				19
	Firm Gray-Tan Fine Sandy **CLAY** (CL), Moist				6
5	Very Soft Tan to Gray Silty **CLAY** (CH), Wet		SS-3	15.0	WOH
10		HC		10.0	2
	Dense Gray Fine **SAND** (SP), Saturated			5.0	28
15					
	Firm Gray Fine Sandy **CLAY** (CL), Wet			0.0	5
20					
	Very Soft Gray Fine Sandy **CLAY** (CL) With Shell Hash, Wet			-5.0	2
25					
	Dense Gray Clayey Medium **SAND** (SC), Saturated			-10.0	35
30	Boring terminated at 30 feet below existing ground surface. Borehole caved at 11.2 feet below existing ground surface. Groundwater was observed in borehole at a depth of 8.1 feet at termination of boring.				

STANDARD PENETRATION TEST DATA (blows/ft)



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NOTES:

1. *THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.*
2. *BORING, SAMPLING AND PENETRATION TEST DATA IS IN GENERAL ACCORDANCE WITH ASTM D-1586.*
3. *PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.*
4. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
5. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

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Raleigh, NC 27616

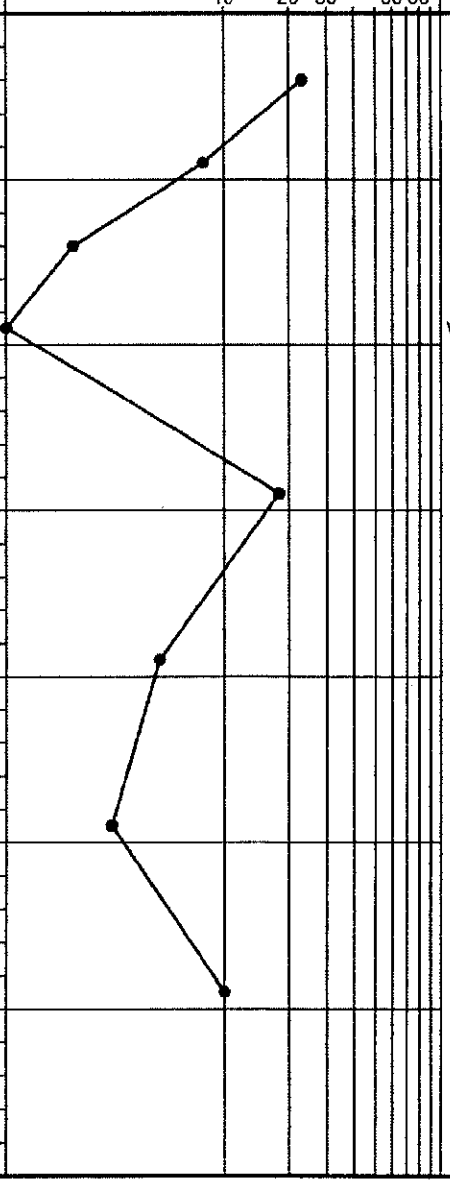
PROJECT:	Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439	TEST BORING RECORD	B- 3

DATE DRILLED:	10/5/06	ELEVATION:	20.0 ft
DRILLING METHOD:	Wash Boring	BORING DEPTH:	30.0 ft
LOGGED BY:	A. Browning	WATER LEVEL:	4.7' @ TOB
DRILLER:	A. Martin	DRILL RIG:	CME-750

NOTES: **Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
		TOPSOIL (4 Inches)				
		FILL: Medium Dense Tan Clayey Fine **SAND** (SC), Moist				23
		Loose Gray Clayey Fine **SAND** (SC), Moist				8
5		Very Soft Orange-Tan Silty **CLAY** (CH), Wet			15.0	2
		Very Soft Gray Fine Sandy Silty **CLAY** (CH), Wet		SS-4	10.0	WOH
10		Medium Dense Gray Clayey Medium **SAND** (SC) With Shell Hash, Saturated	HC			
15					5.0	18
		Firm Gray Fine Sandy **CLAY** (CL) With Shell Hash, Wet			0.0	5
20		Soft Gray Silty Fine Sandy **CLAY** (CL), Wet			-5.0	3
25		Medium Dense Gray Clayey Medium **SAND** (SC) With Shell Hash, Saturated			-10.0	10
30		Boring terminated at 30 feet below existing ground surface. Borehole caved at 12.2 feet below existing ground surface. Groundwater was observed in borehole at a depth of 4.7 feet at termination of boring.				

STANDARD PENETRATION TEST DATA (blows/ft)



S&ME COMPANY STANDARD 51-439.GPJ S&ME.GDT 2/1/07

NOTES:

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3. *PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.*
4. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
5. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

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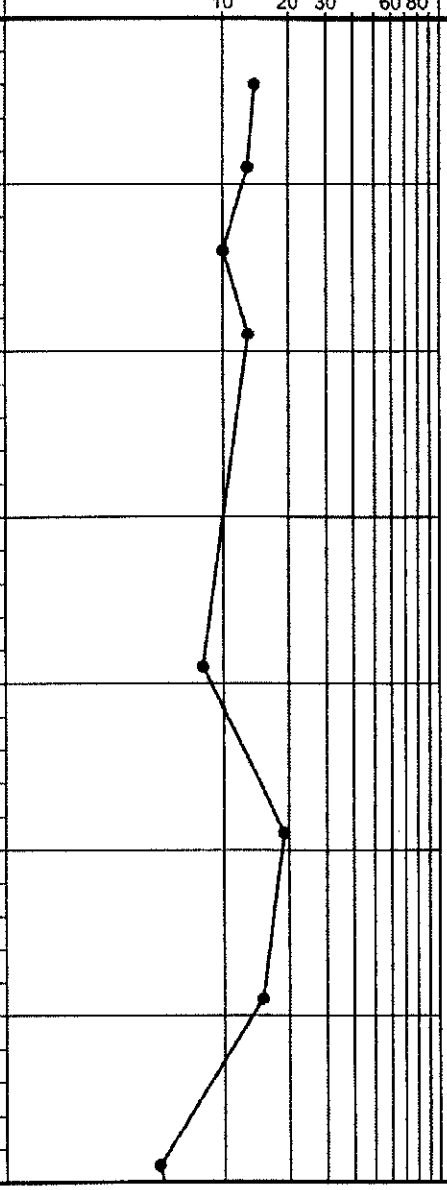
ENGINEERING • TESTING
ENVIRONMENTAL SERVICES
3201 Spring Forest Road
Raleigh, NC 27616

PROJECT: Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439	TEST BORING RECORD	B-4

DATE DRILLED:	10/11/06	ELEVATION:	50.0 ft
DRILLING METHOD:	Wash Boring	BORING DEPTH:	60.0 ft
LOGGED BY:	A. Browning	WATER LEVEL:	Cave @ 9.7'
DRILLER:	A. Martin	DRILL RIG:	CME-750

NOTES: **Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
		TOPSOIL (3 Inches)				
		FILL: Medium Dense Gray-Brown Clayey Fine **SAND** (SC), Moist				14, 13, 10, 13
5, 10			HC		45.0, 40.0	
		FILL: Tan-Brown Silty Clayey Fine **SAND** (SC), Moist				
15				UD-1	35.0	
		FILL: Stiff Gray Fine Sandy **CLAY** (CL), Moist				8
20					30.0	
		FILL: Medium Dense Black-Gray Clayey Fine **SAND** (SC) With Large Wood Fragments, Moist				19
25					25.0	
		Medium Dense Black-Gray Silty Fine **SAND** (SM), Moist				15
30					20.0	
		Firm Tan-Gray Fine Sandy **CLAY** (CL), Wet				5



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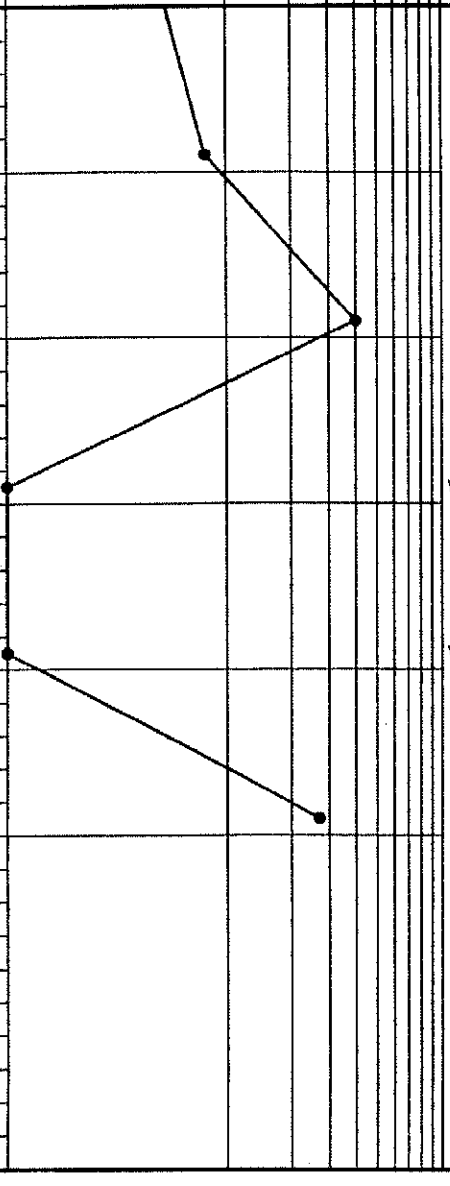
PROJECT:	Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439	TEST BORING RECORD	B- 4
DATE DRILLED: 10/11/06	ELEVATION: 50.0 ft	NOTES: Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.	
DRILLING METHOD: Wash Boring	BORING DEPTH: 60.0 ft		
LOGGED BY: A. Browning	WATER LEVEL: Cave @ 9.7'		
DRILLER: A. Martin	DRILL RIG: CME-750		

DEPTH (feet)	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
40	Loose Gray Medium to Fine **SAND** (SP), Saturated			10.0	8
45	Very Dense Gray Fine to Medium **SAND** (SP) With Shell Hash, Saturated			5.0	40
50	Very Soft Gray Clayey Fine **SAND** (SC), Saturated			0.0	WOH
55				-5.0	WOH
60	Dense Gray Clayey Medium **SAND** (SC) With Shell Material, Saturated Boring terminated at 60 feet below existing ground surface. Borehole caved at 9.7 feet below existing ground surface. Borehole was observed dry at termination of boring. * Bag sample obtained from 3 to 8 feet.			-10.0	27
65				-15.0	



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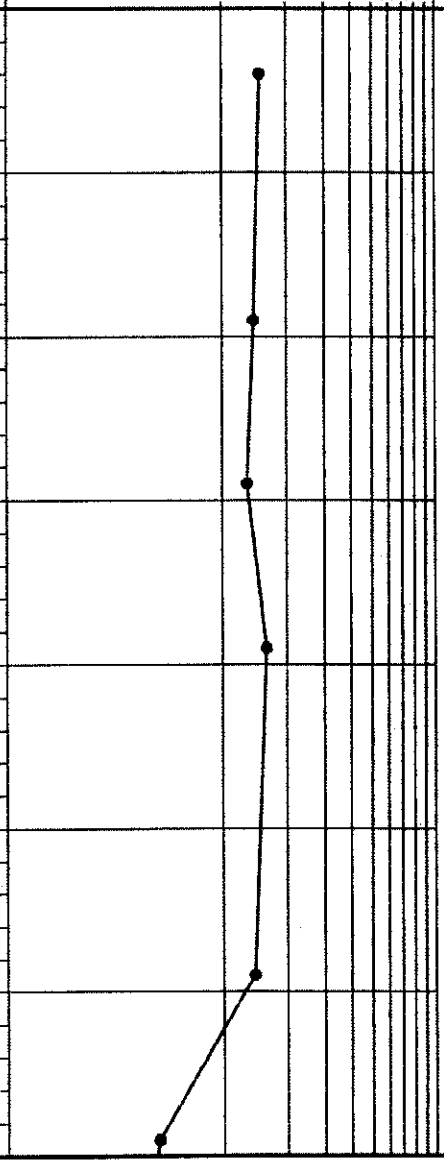
PROJECT:	Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439	TEST BORING RECORD	B- 5

DATE DRILLED:	10/10/06	ELEVATION:	49.0 ft
DRILLING METHOD:	Wash Boring	BORING DEPTH:	60.0 ft
LOGGED BY:	A. Browning	WATER LEVEL:	Cave @ 8.3'
DRILLER:	A. Martin	DRILL RIG:	CME-750

NOTES: **Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
		TOPSOIL (4 Inches)				
		FILL: Medium Dense Orange-Tan Clayey Fine **SAND** (SC), Moist				15
		FILL: Orange-Tan Clayey Fine **SAND** (SC), Moist				
5					44.0	
		FILL: Very Stiff Gray Fine Sandy **CLAY** (CL), Moist	HC			14
10					39.0	
		FILL: Medium Dense Gray Clayey Fine **SAND** (SC), Moist				13
15					34.0	
		FILL: Very Stiff Gray Fine Sandy **CLAY** (CL), Moist				16
20					29.0	
		FILL: Gray Fine Sandy **CLAY** (CL), Moist				
25					24.0	
		Medium Dense Black-Gray Clayey Fine **SAND** (SC), Moist				14
30					19.0	
		Firm Orange-Gray Fine Sandy **CLAY** (CH), Wet				5



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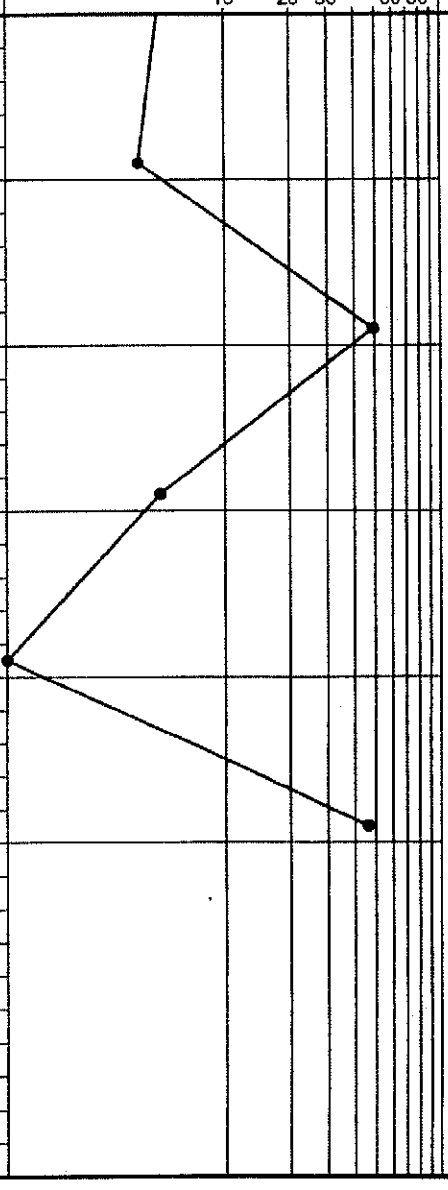
PROJECT: Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439		TEST BORING RECORD	B- 5
DATE DRILLED: 10/10/06	ELEVATION: 49.0 ft	NOTES: Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.	
DRILLING METHOD: Wash Boring	BORING DEPTH: 60.0 ft		
LOGGED BY: A. Browning	WATER LEVEL: Cave @ 8.3'		
DRILLER: A. Martin	DRILL RIG: CME-750		

DEPTH (feet)	MATERIAL DESCRIPTION	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
40	Firm Orange-Gray Silty **CLAY** (CH), Wet	SS-8	9.0	4
45	Very Dense Gray Fine **SAND** (SP), Saturated		4.0	49
50	Firm Gray Fine Sandy **CLAY** (CL), Wet		-1.0	5
55	Very Soft Gray Fine Sandy **CLAY** (CL) With Shell Material, Wet		-6.0	1
60	Very Dense Gray Clayey Medium **SAND** (SC) With Shell Hash, Saturated		-11.0	46
65	Boring terminated at 60 feet below existing ground surface. Borehole caved at 8.3 feet below existing ground surface. Borehole was observed dry at termination of boring.		-16.0	



WATER LEVEL

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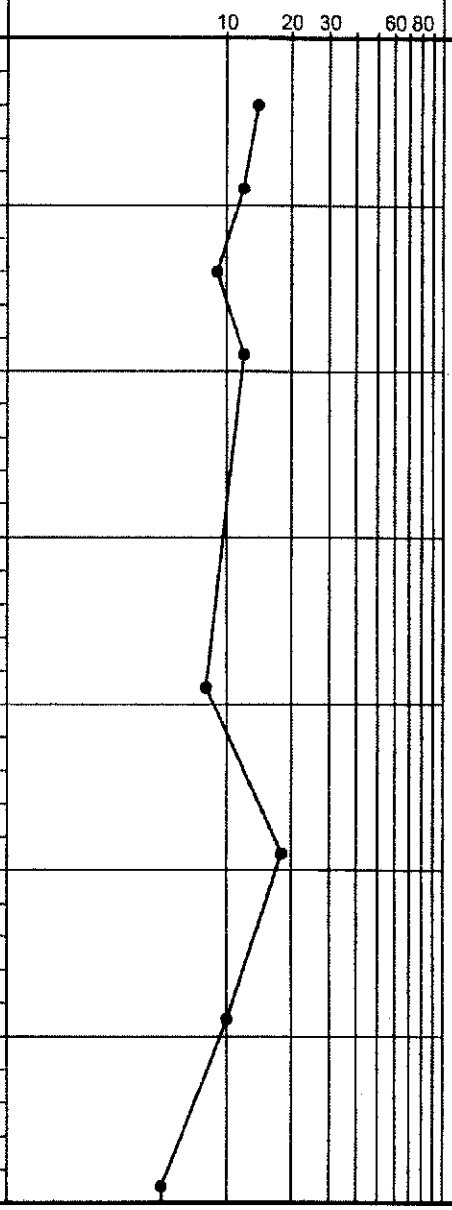
PROJECT: Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439		TEST BORING RECORD	B- 6
DATE DRILLED: 10/10/06	ELEVATION: 49.0 ft	NOTES: Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.	
DRILLING METHOD: Wash Boring	BORING DEPTH: 60.0 ft		
LOGGED BY: A. Browning	WATER LEVEL: Cave @ 6.2'		
DRILLER: A. Martin	DRILL RIG: CME-750		

DEPTH (feet)	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
	TOPSOIL (4 Inches)				
	FILL: Medium Dense Orange-Gray Clayey Fine **SAND** (SC), Moist				14
	FILL: Stiff Orange-Brown Fine Sandy **CLAY** (CL), Moist				12
5		HC		44.0	9
	FILL: Medium Dense Gray-Tan Clayey Fine **SAND** (SC), Moist				12
10				39.0	
	FILL: Tan-Gray Clayey Fine **SAND** (SC), Moist				
15			UD-2	34.0	
	FILL: Stiff Gray-Brown Fine Sandy **CLAY** (CL), Moist				8
20				29.0	
	FILL: Medium Dense Gray Clayey Fine **SAND** (SC), Wet				18
25				24.0	
	Stiff to Firm Gray Fine Sandy **CLAY** (CL), Wet				10
30				19.0	5

STANDARD PENETRATION TEST DATA (blows/ft)



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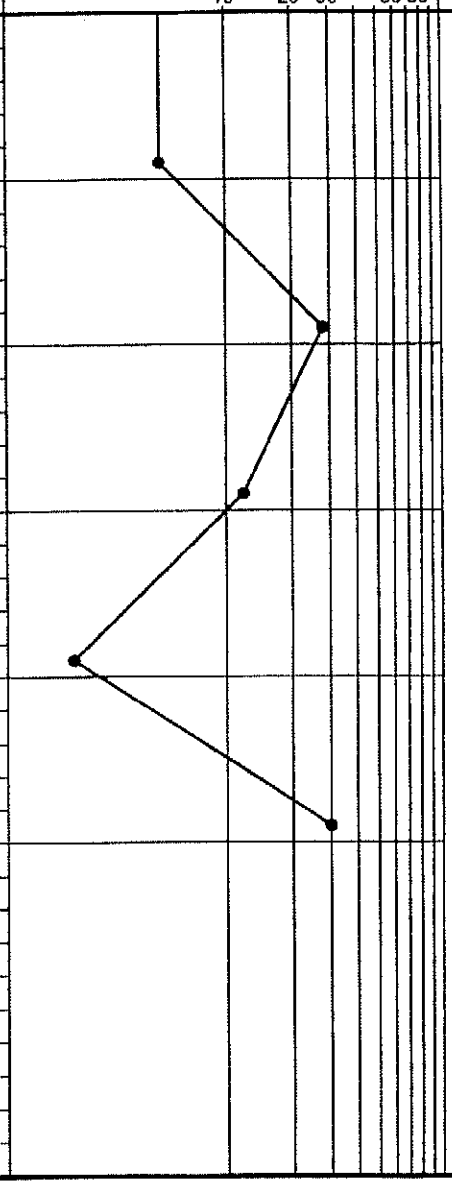
PROJECT: Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439		TEST BORING RECORD	B- 6
DATE DRILLED: 10/10/06	ELEVATION: 49.0 ft	NOTES: Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.	
DRILLING METHOD: Wash Boring	BORING DEPTH: 60.0 ft		
LOGGED BY: A. Browning	WATER LEVEL: Cave @ 6.2'		
DRILLER: A. Martin	DRILL RIG: CME-750		

DEPTH (feet)	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
40				9.0	5
45	Dense Gray Medium to Fine **SAND** (SP), Saturated			4.0	28
50	Medium Dense Gray Medium to Fine **SAND** (SP) With Shell Hash, Saturated			-1.0	12
55	Very Soft Gray Fine Sandy **CLAY** (CL) With Shell Hash, Wet			-6.0	2
60	Very Dense Gray Clayey Fine to Medium **SAND** (SC) With Shell Material, Saturated			-11.0	30
65	Boring terminated at 60 feet below existing ground surface. Borehole caved at 6.2 feet below existing ground surface. Borehole was observed dry at termination of boring. *Bag sample obtained from 3 to 8 feet.			-16.0	

STANDARD PENETRATION TEST DATA (blows/ft)



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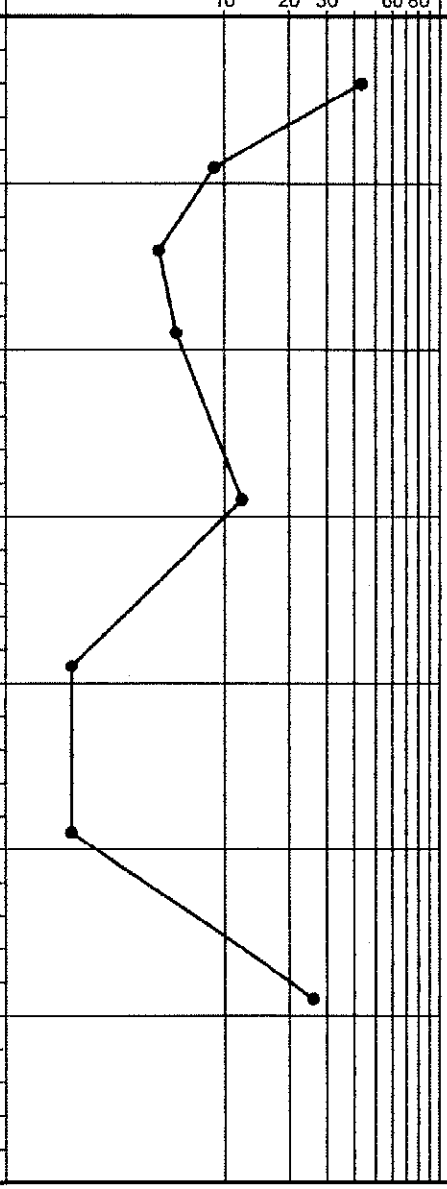
PROJECT: Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439		TEST BORING RECORD B-7
DATE DRILLED: 10/6/06	ELEVATION: 21.0 ft	NOTES: **Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.**
DRILLING METHOD: 3-1/4" HSA	BORING DEPTH: 30.0 ft	
LOGGED BY: A. Browning	WATER LEVEL: Cave @ 2.8'	
DRILLER: A. Martin	DRILL RIG: CME-750	

DEPTH (feet)	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
	TOPSOIL (4 Inches)				
	Very Dense Gray Silty Fine **SAND** (SM), Moist	HC			43
	Stiff Gray-Tan Fine Sandy Silty **CLAY** (CH), Moist		UD-3		9
5				16.0	
	Loose Gray-Tan Clayey Fine **SAND** (SC), Moist to Saturated				5
10				11.0	6
	Medium Dense Gray-Tan Slightly Clayey Fine to Medium **SAND** (SP-SC), Saturated				12
15				6.0	
	Very Loose Gray Clayey Fine **SAND** (SC), Saturated				2
20				1.0	
	Very Soft Gray Fine Sandy **CLAY** (CL) With Shell Hash, Wet				2
25				-4.0	
	Dense Gray Medium **SAND** (SP) With Shell Hash, Saturated				26
30				-9.0	
	Boring terminated at 30 feet below existing ground surface. Borehole caved at 2.8 feet below existing ground surface. Borehole was observed dry at termination of boring.				

STANDARD PENETRATION TEST DATA (blows/ft)



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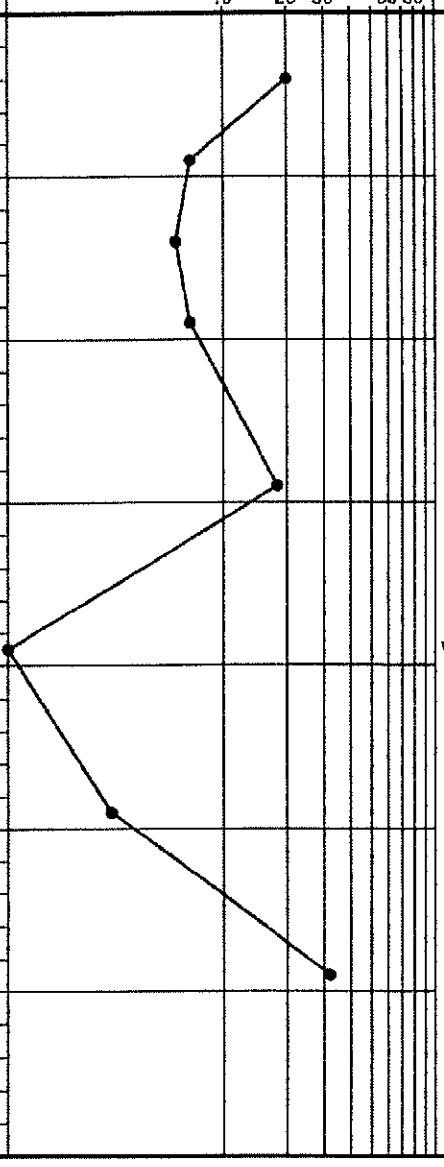
PROJECT:	Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439	TEST BORING RECORD	B- 8

DATE DRILLED:	10/6/06	ELEVATION:	20.0 ft
DRILLING METHOD:	Wash Boring	BORING DEPTH:	30.0 ft
LOGGED BY:	A. Browning	WATER LEVEL:	Cave @ 3.0'
DRILLER:	A. Martin	DRILL RIG:	CME-750

NOTES: **Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.**

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
		TOPSOIL (4 Inches)				
		Medium Dense Tan-Gray Silty Fine **SAND** (SM) With Rock and Wood Fragments, Moist				20
		Stiff Gray-Tan Fine Sandy **CLAY** (CH), Moist	HC			7
5		Firm Gray-Tan Fine Sandy **CLAY** (CL), Moist			15.0	6
		Loose Gray-Tan Fine **SAND** (SP), Saturated				7
10					10.0	
		Medium Dense Gray-Tan Medium **SAND** (SP), Saturated				18
15					5.0	
		Very Loose Gray Clayey Fine **SAND** (SC), Saturated				WOH
20					0.0	
		Soft Gray Fine Sandy **CLAY** (CL) With Shell Hash, Wet				3
25					-5.0	
		Dense Gray Medium **SAND** (SP) With Shell Hash, Saturated				32
30		Boring terminated at 30 feet below existing ground surface. Borehole caved at 3 feet below existing ground surface. Borehole was observed dry at termination of boring.			-10.0	

STANDARD PENETRATION TEST DATA (blows/ft)



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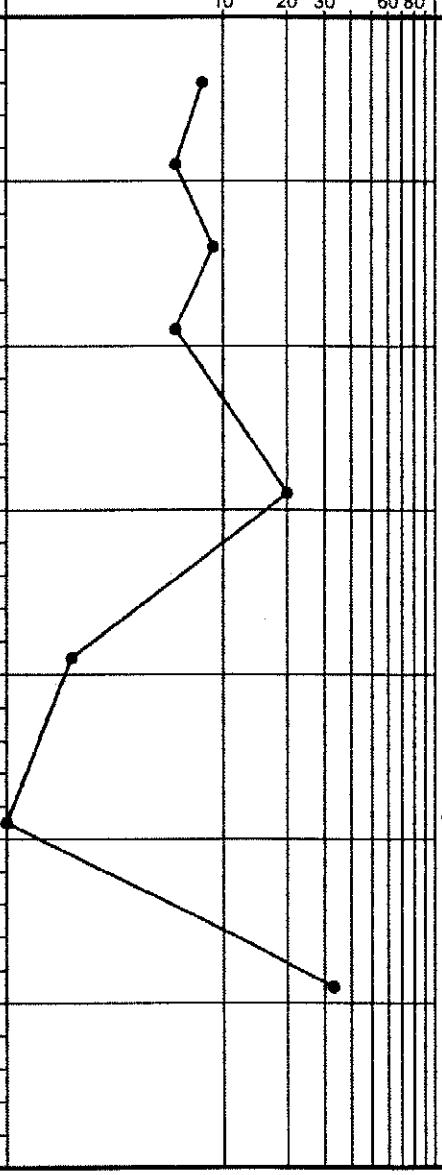
PROJECT:	Cherry Point Rifle Range Cherry Point, North Carolina 1051-06-439	TEST BORING RECORD	B- 9
DATE DRILLED: 10/6/06	ELEVATION: 20.0 ft	NOTES: Boring location is approximate. Standard penetration testing (SPT) performed with autohammer. Reported SPT results are uncorrected.	
DRILLING METHOD: Wash Boring	BORING DEPTH: 30.0 ft		
LOGGED BY: A. Browning	WATER LEVEL: Cave @ 3.1'		
DRILLER: A. Martin	DRILL RIG: CME-750		

DEPTH (feet)	MATERIAL DESCRIPTION	WATER LEVEL	SAMPLE NO/TYPE	ELEVATION (feet)	N-Value
	TOPSOIL (4 inches)				
	Loose Tan-Gray Silty Clayey Fine **SAND** (SC), Moist				8
	Firm Gray-Tan Fine Sandy **CLAY** (CH), Moist	HC			6
5				15.0	
	Stiff Gray-Tan Fine Sandy **CLAY** (CH) With Wood Fragments, Wet				9
	Loose Tan Slightly Clayey Fine **SAND** (SP-SC), Saturated				6
10				10.0	
	Medium Dense Gray-Tan Fine **SAND** (SP), Saturated				20
15				5.0	
	Very Loose Gray Clayey Fine **SAND** (SC), Saturated		UD-4 SS-6		2
20				0.0	
	Very Loose Gray Silty Clayey Fine **SAND** (SC), Saturated				WOH
25				-5.0	
	Dense Gray Medium **SAND** (SP) With Shell Hash, Saturated				33
30	Boring terminated at 30 feet below existing ground surface. Borehole caved at 3.1 feet below existing ground surface. Borehole was observed dry at termination of boring.			-10.0	

STANDARD PENETRATION TEST DATA (blows/ft)



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S&ME

Cherry Point Rifle Range
Cherry Point, North Carolina
S&ME Project Number 1051-06-439

TABLE 1
Summary of Laboratory Test Results
Natural Moisture Content, Grain Size Analysis, USCS Classification, Standard Proctor

BORING	SAMPLE DEPTH (FT.)	NATURAL MOISTURE CONTENT (%)	GRAIN SIZE ANALYSIS		Atterberg Limits		USCS CLASSIFICATION	STANDARD PROCTOR TEST RESULTS	
			% sand	% silt/clay	Liquid Limit (LL)	Plastic Index (PI)		Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-2	6.0	62.6	-	-	61	36	(CH)	-	-
B-3	8.5	64.8	-	-	53	25	(CH)	-	-
B-4	3 - 8	12.0	71.2	28.8	-	-	(SC)	121.5	11.5
B-5	38.5	* 49.9	-	-	51	25	(CH)	-	-
B-9	18.5	33.1	71.2	28.8	-	-	(SC)	-	-

TABLE 2
Summary of Laboratory Test Results
Bulk Density and Consolidated Undrained (CU) Triaxial Tests

BORING	SAMPLE DEPTH (FT.)	SAMPLE DENSITY (pcf)		CU TRIAXIAL TESTS			USCS CLASSIFICATION
		γ_{wet}	γ_d	Initial Confining Pressures (psi)	Effective Cohesion (psi)	Effective Friction Angle (degrees)	
B-4*	3 - 8	129.0	115.6	4.5, 8.9, 16.1	56	34.2	(SC)
B-4	14 - 16	116.9	103.4	14.5, 28.3, 45.5	151	30.7	(SC)
B-6	14 - 16	131.3	117.4	14.7, 29.0, 44.7	75	30.6	(SC)
B-7	3 - 5	118.2	104.9	29.1, 63.4	294	29.7	(CH)
B-9	18 - 20	126.3	98.6	9.3, 29.5, 49.5	390	28.9	(SC)

1) -- indicates test not performed
2) USCS classification: (MH) = visual classification
3) % silt/clay in Table 1 indicates percent passing the no. 200 sieve
* Remolded to 95% of the standard Proctor maximum dry density

Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

S&ME

Project #: **1051-06-439** Report Date: 10/19/2006

Project Name: Cherry Point Rifle Range Test Date(s): 10/12 - 10/13/2006

Client Name:

Client Address:

Sample by: Sample Dates: 10/10/2006

Sampling Method: Drill Rig :

Boring #	Sample #	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Wt.	Percent Moisture
		ft. or m.		grams	grams	grams	grams	%
B-2	SS-3	- 6.0'	16A	9.61	64.52	43.38	21.14	**62.6%**
B-3	SS-4	- 8.5'	133	6.50	62.06	40.22	21.84	**64.8%**
B-4	Bag	- 3.0' - 8.0'	019	117.05	363.93	337.56	26.37	**12.0%**
B-5	SS-8	- 38.5'	107	6.84	43.09	31.02	12.07	**49.9%**
B-9	SS-6	- 18.5'	013	85.11	329.19	268.48	60.71	**33.1%**

Notes:

References: ASTM D2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
AASHTO T 265: Laboratory Determination of Moisture Content of Soils

Technician Name: Chana Savanapridi

Certification #

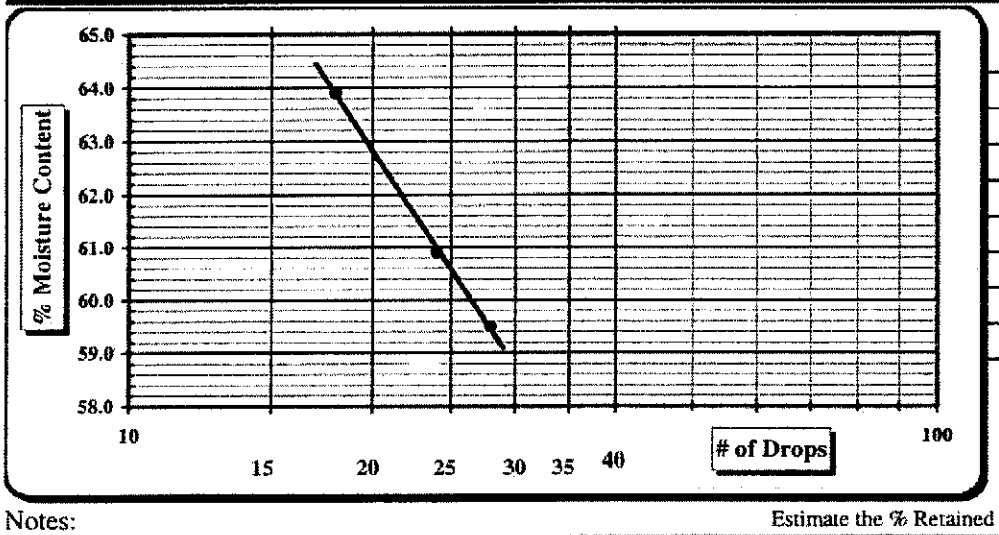
Technical Responsibility: Mal Krajan *Signature* Lab Supervisor *Position*

Liquid Limit, Plastic Limit, and Plastic Index

S&ME

Project #: **1051-06-439** Report Date: 10/19/2006
Project Name: Cherry Point Rifle Range Test Date(s): 10/12 - 10/13/2006
Client Name:
Client Address:
Boring #: B-2 Sample #: SS-3 Sample Date: 10/10/2006
Location: Site-Borehole Offset: N/A Depth (ft): 6.0'
Sample Description: Tan-Gray Silty CLAY (Visual)

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	0	54	32				44	49	
A	Tare Weight	18.43	18.61	18.40				20.96	8.51	
B	Wet Soil Weight + A	32.29	31.90	30.86				29.05	25.30	
C	Dry Soil Weight + A	27.12	26.87	26.00				27.41	22.01	
D	Water Weight (B-C)	5.17	5.03	4.86				1.64	3.29	
E	Dry Soil Weight (C-A)	8.69	8.26	7.60				6.45	13.50	
F	% Moisture Content (D/E)*100	59.5%	60.9%	63.9%				25.4%	24.4%	
N	# OF DROPS	28	24	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = F * FACTOR									
Ave.	Average							24.9%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes: Estimate the % Retained on the #40 Sieve

Special Sampling Methods:

Sample Preparation:	Wet Preparation ☐	Dry Preparation ☐	Air Dried ☒	NP, Non-Plastic	☐
Liquid limit Test:	Multipoint Method ☒	One-point Method ☐		Liquid Limit	61
Classification:	ASTM D 2487 ☒	AASHTO M 145 ☐		Plastic Limit	25
Liquid limit Test:	ASTM D 4318 ☒	AASHTO T 89 ☐		Plastic Index	36
Plastic limit Test:	ASTM D 4318 ☒	AASHTO T 90 ☐		Group Symbol	

Technician Name: Chana Savanapridi NICET 116132
Certification #

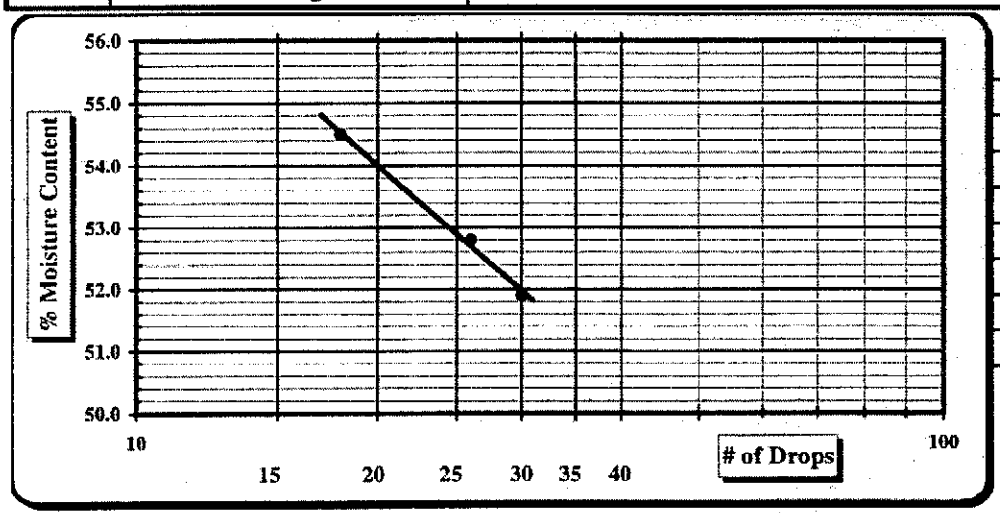
Technical Responsibility: Mal Krajan _____ Laboratory Supervisor
Signature *Position*

Liquid Limit, Plastic Limit, and Plastic Index

S&ME

Project #: **1051-06-439** Report Date: 10/19/2006
Project Name: Cherry Point Rifle Range Test Date(s): 10/12 - 10/13/2006
Client Name:
Client Address:
Boring #: B-3 Sample #: SS-4 Sample Date: 10/10/2006
Location: Site-Borehole Offset: N/A Depth (ft): 8.5'
Sample Description: Gray Fine Sandy Silty CLAY (Visual)

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	32	7	57				49	7	
A	Tare Weight	18.41	15.40	18.57				20.98	8.51	
B	Wet Soil Weight + A	32.57	26.54	25.65				28.80	25.30	
C	Dry Soil Weight + A	27.68	22.61	23.23				27.03	21.76	
D	Water Weight (B-C)	4.89	3.93	2.42				1.77	3.54	
E	Dry Soil Weight (C-A)	9.27	7.21	4.66				6.05	13.25	
F	% Moisture Content (D/E)*100	52.8%	54.5%	51.9%				29.3%	26.7%	
N	# OF DROPS	26	18	30				*Moisture Contents determined by ASTM D 2216*		
LL	LL = F * FACTOR									
Ave.	Average							28.0%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes: Estimate the % Retained on the #40 Sieve

Special Sampling Methods:

Sample Preparation:	Wet Preparation	☐	Dry Preparation	☐	Air Dried ☒	NP, Non-Plastic	☐
Liquid limit Test:	Multipoint Method	☒	One-point Method	☐		Liquid Limit	53
Classification:	ASTM D 2487	☒	AASHTO M 145	☐		Plastic Limit	28
Liquid limit Test:	ASTM D 4318	☒	AASHTO T 89	☐		Plastic Index	25
Plastic limit Test:	ASTM D 4318	☒	AASHTO T 90	☐		Group Symbol	

Technician Name: Chana Savanapridi NICET 116132
Certification #

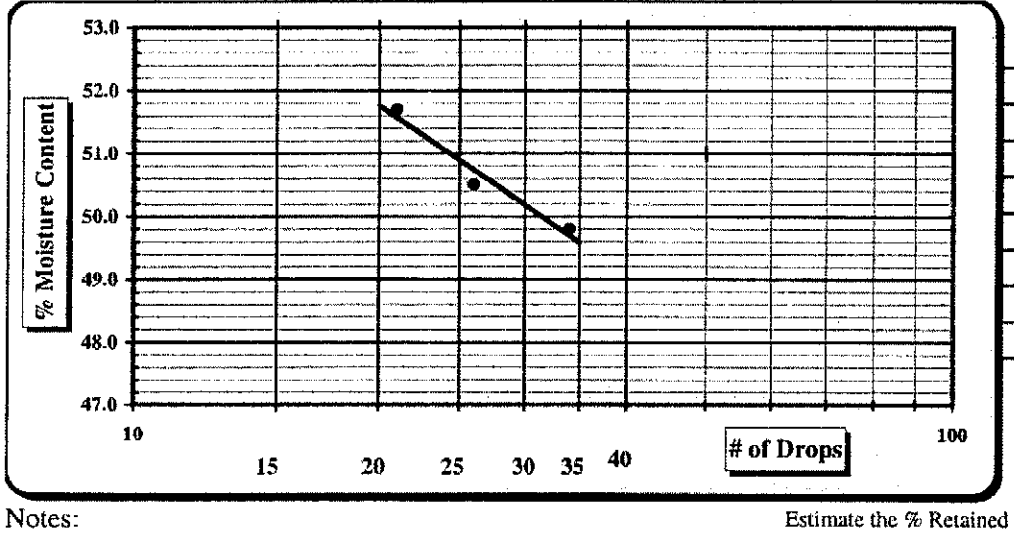
Technical Responsibility: Mal Krajan _____ Laboratory Supervisor
Signature *Position*

Liquid Limit, Plastic Limit, and Plastic Index

S&ME

Project #: **1051-06-439** Report Date: 10/19/2006
Project Name: Cherry Point Rifle Range Test Date(s): 10/12 - 10/13/2006
Client Name:
Client Address:
Boring #: B-5 Sample #: SS-8 Sample Date: 10/10/2006
Location: Site-Borehole Offset: N/A Depth (ft): 38.5'
Sample Description: Orange-Gray Silty CLAY (Visual)

Pan #		Liquid Limit						Plastic Limit		
	Test #	1	2	3	4	5	6	1	2	3
	Tare #	2	16	32				22	9	
A	Tare Weight	15.33	18.49	15.40				21.14	8.51	
B	Wet Soil Weight + A	27.75	34.42	26.54				28.08	25.30	
C	Dry Soil Weight + A	23.62	28.99	22.80				26.73	21.76	
D	Water Weight (B-C)	4.13	5.43	3.74				1.35	3.54	
E	Dry Soil Weight (C-A)	8.29	10.50	7.40				5.59	13.25	
F	% Moisture Content (D/E)*100	49.8%	51.7%	50.5%				24.2%	26.7%	
N	# OF DROPS	34	21	26				*Moisture Contents determined by ASTM D 2216*		
LL	LL = F * FACTOR									
Ave.	Average							25.5%		



One Point Liquid Limit			
N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.990	29	1.018
24	0.995	30	1.022
25	1.000		

Notes: Estimate the % Retained on the #40 Sieve

Special Sampling Methods:

Sample Preparation:	Wet Preparation ☐	Dry Preparation ☐	Air Dried ☒	NP, Non-Plastic	☐
Liquid limit Test:	Multipoint Method ☒	One-point Method ☐		Liquid Limit	51
Classification:	ASTM D 2487 ☒	AASHTO M 145 ☐		Plastic Limit	26
Liquid limit Test:	ASTM D 4318 ☒	AASHTO T 89 ☐		Plastic Index	25
Plastic limit Test:	ASTM D 4318 ☒	AASHTO T 90 ☐		Group Symbol	

Technician Name: Chana Savanapridi NICET 116132
Certification #

Technical Responsibility: Mal Krajan _____ Laboratory Supervisor
Signature *Position*

Particle Size Analysis of Soils

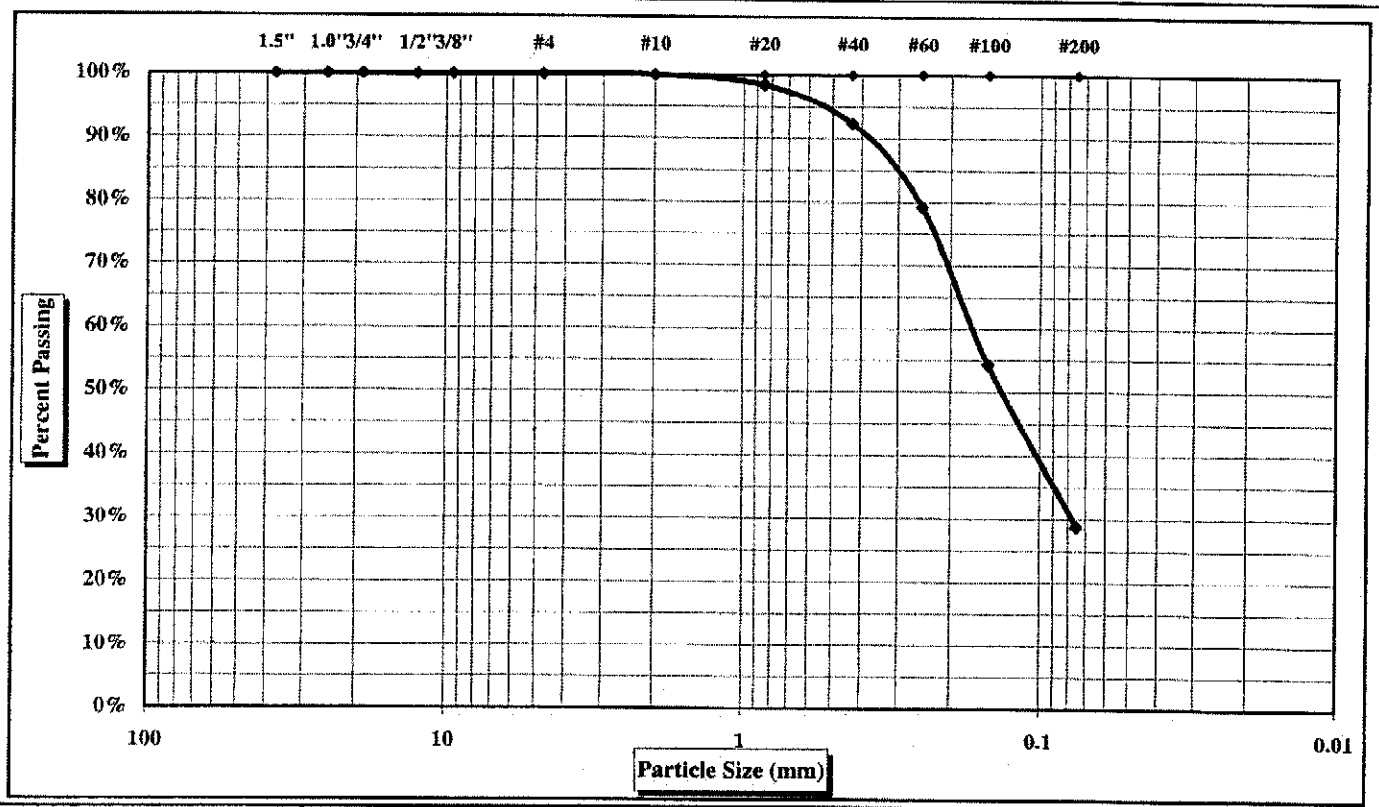
ASTM D 422

S&ME

S&ME Project #: **1051-06-439**
Project Name: **Cherry Point Rifle Range**
Client Name:
Client Address:

Report Date: 10/19/2006
Test Date(s): 10/11 - 10/13/2006

Boring #:	B-4	Sample #:	Bag	Sample Date:	10/10/2006
Location:	Site Borehole			Depth (ft):	3.0' - 8.0'
Sample Description:	Gray-Brown Clayey Fine SAND (Visual)				



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	#4	Gravel	0%	Medium Sand	8%
Silt & Clay (% Passing #200)	28.8%	Coarse Sand	0%	Fine Sand	64%
Apparent Relative Density	ND	Moisture Content	12.0%	Organic Content	ND
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

ND=Not determined

Description of Sand & Gravel

Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

References: ASTM D 422: Particle Size Analysis of Soils *Hydrometer portion of test method not utilized.*
ASTM D 421: Dry Preparation of Soil Samples ASTM D 854: Specific Gravity of Soils
ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils
ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

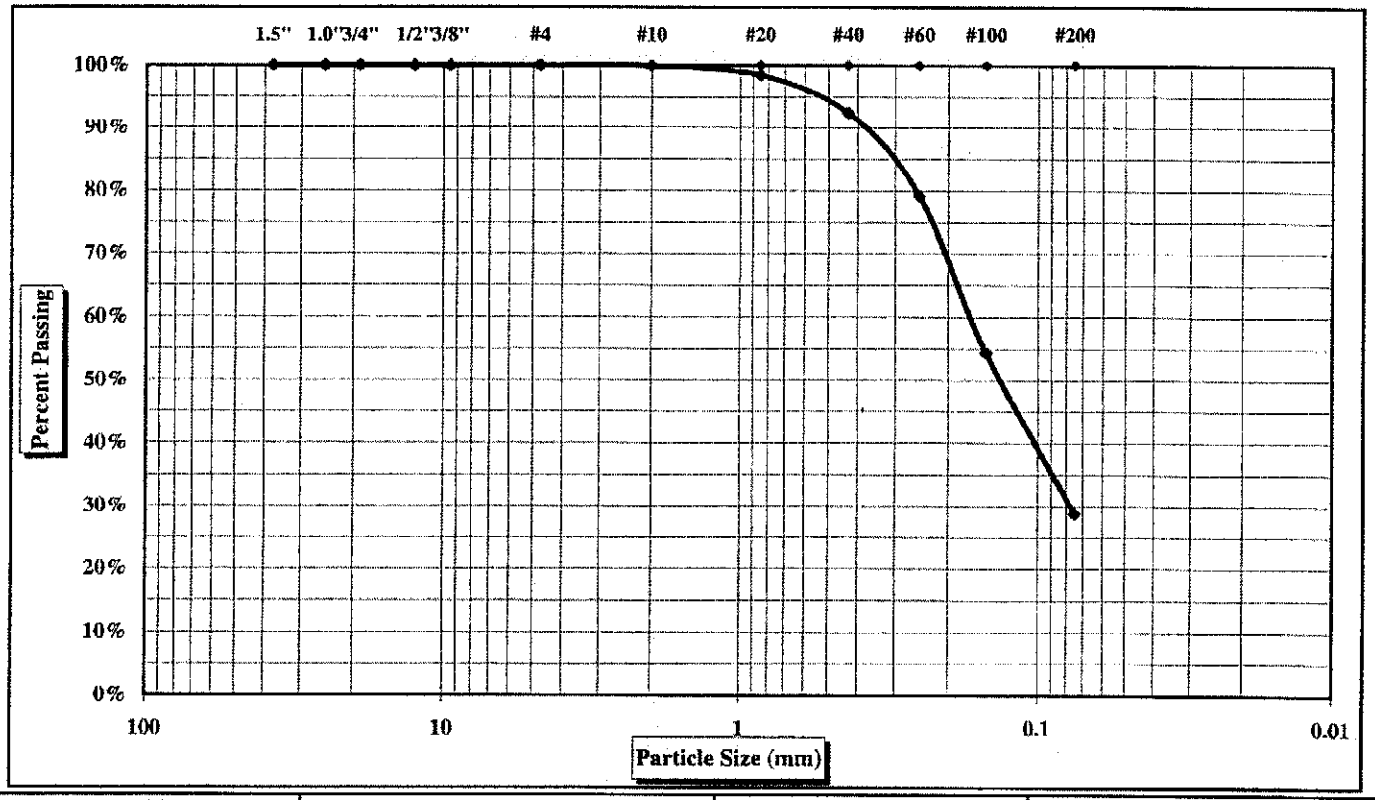
Technical Responsibility: Mal Krajan _____ Laboratory Supervisor
Signature *Position*

Particle Size Analysis of Soils

ASTM D 422

S&ME Project #: **1051-06-439** Report Date: 10/19/2006
Project Name: **Cherry Point Rifle Range** Test Date(s): 10/11 - 10/13/2006
Client Name:
Client Address:

Boring #:	B-9	Sample #:	SS-6	Sample Date:	10/10/2006
Location:	Site Borehole			Depth (ft):	18.5'
Sample Description:	Gray Clayey Fine SAND (Visual)				



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	#4	Gravel	0%	Medium Sand	8%
Silt & Clay (% Passing #200)	28.8%	Coarse Sand	0%	Fine Sand	64%
Apparent Relative Density	ND	Moisture Content	12.0%	Organic Content	ND
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

ND=Not determined

Description of Sand & Gravel

Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

References: ASTM D 422: Particle Size Analysis of Soils *Hydrometer portion of test method not utilized.*
ASTM D 421: Dry Preparation of Soil Samples ASTM D 854: Specific Gravity of Soils
ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils
ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Technical Responsibility: Mal Krajan _____ Laboratory Supervisor
Signature *Position*

Moisture - Density Report

S&ME

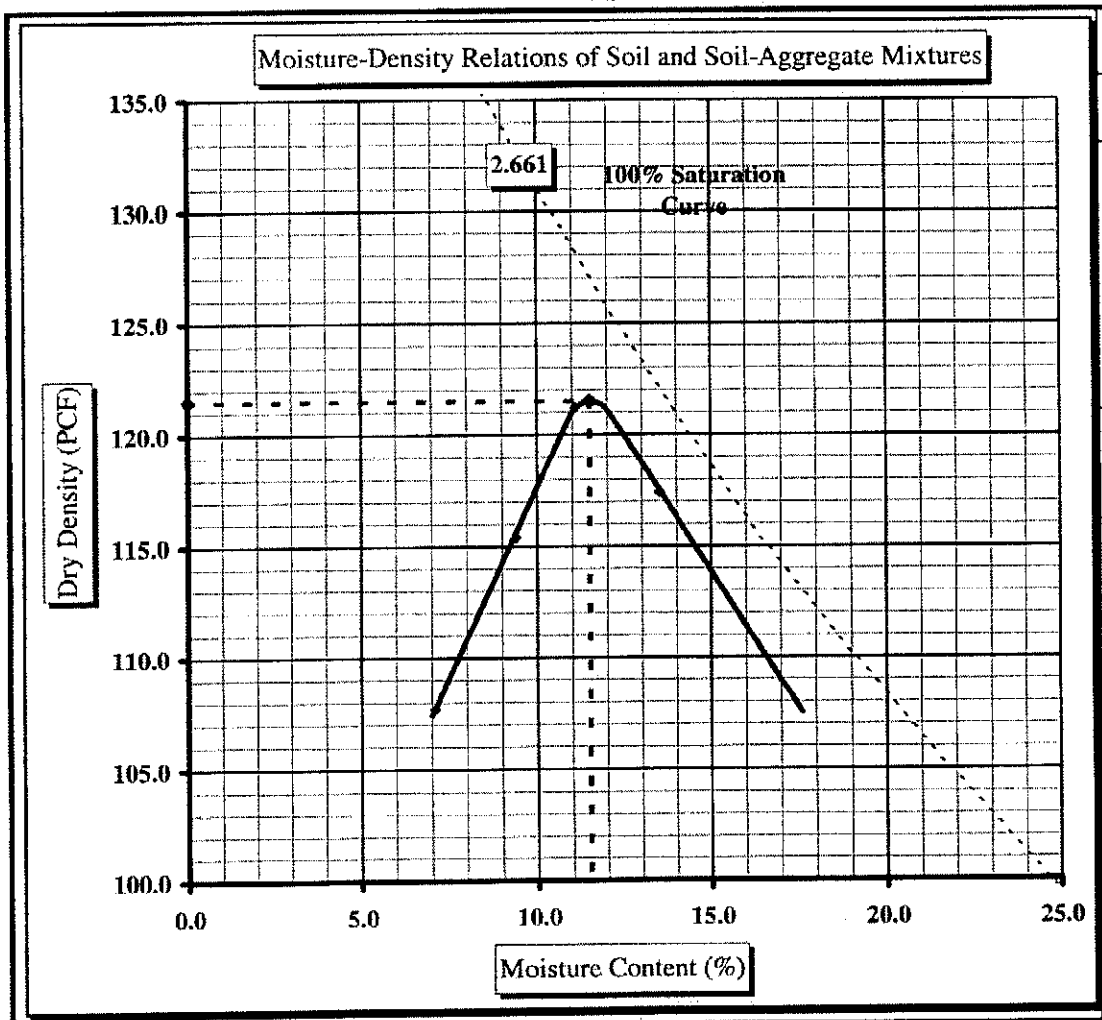
S&ME Project #: **1051-06-439**
Project Name: **Cherry Point Rifle Range**
Client Name:
Client Address:

Report Date: October 19, 2006
Test Date(s): 10/12 - 10/13/2006

Boring #:	B-4	Sample #:	Bag	Sample Date:	October 11, 2006
Location:	Site Borehole	Offset:	N/A	Depth (ft):	3.0' - 8.0'
Sample Description:	Gray-Brown Clayey Fine SAND (Visual)				

Maximum Dry Density **121.5** **PCF.** **Optimum Moisture Content** **11.5** **%**

ASTM D 698 Method A



Soil Properties

Natural Moisture Content:	12.0%
Liquid Limit:	ND
Plastic Limit:	ND
Plastic Index:	ND
Specific Gravity:	2.661

% Passing	
#4	100.0

Oversize Fraction

Bulk Sp. Gravity
% Moisture
Oversize Fraction
MDD
Opt. MC

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐
Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐
Mechanical Hammer ☐ Manual Hammer ☒ Moist Preparation ☒ Dry Preparation ☐

References: ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort
ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D 422: Particle Size Analysis of Soils ASTM D 854: Specific Gravity of Soils

ND=Not Determined

Technical Responsibility: Mal Krajan *DRAFT* Laboratory Supervisor
Signature Position

Effective Stress Triaxial Compression

Consolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth	3 - 8 ft.
Description:	Gray-Brown Clayey Fine SAND (SC)

	Specimen 1	Specimen 2	Specimen 3
Type	Remolded	Remolded	Remolded
Height H_0 (in)	5.802	5.835	5.816
Diameter D_0 (in)	2.884	2.884	2.896
Weight W_0 (gr)	1275.9	1296.5	1300
Bulk Density ρ (PCF)	128.24	129.58	129.27
Particle Density ρ_s	2.661 (measured)	2.661 (measured)	2.661 (measured)

Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure σ_3 (lbf/in2)	76.0	79.0	86.6
Pore Pressure u (lbf/in2)	71.5	70.1	70.5
Machine Speed d_r(in/min)	0.015	0.015	0.015
No. of Membranes	1	0	1
Total Thickness (in)	0.011	0	0.011
Strain Channel	1798	1798	1798
Load Channel	1776	1776	1776
Pore P. Channel	1779	1779	1779
Volume Channel	Volume Chang	Volume Chang	Volume Chang
Moisture Content w_0%	11.6	11.6	11.6
Dry Density ρ_{d0} (PCF)	114.87	116.06	115.79
Voids Ratio e_0	0.45	0.43	0.43
Deg of Saturation S_0%	69.55	71.95	71.39
Final B Value	0.96	0.96	0.97

Final Conditions

	Specimen 1	Specimen 2	Specimen 3
Moisture Content w_f%	15.5	15.6	15.0
Dry Density ρ_d (PCF)	115.83	117.41	117.66
Voids Ratio e_f	0.43	0.41	0.41
Deg of Saturation S_f%	94.89	100.00	97.04
Failure Criteria	25.0	36.0	55.0
Axial Strain ε_f%	1.8	2.8	5.6
Corr Dev Stress $(\sigma_1 - \sigma_3)f$ (lbf/in2)	24.9	36.3	54.5
Minor Stress σ_{3f} (lbf/in2)	8.5	13.9	19.3
Major Stress σ_{1f} (lbf/in2)	33.4	50.2	73.8
Stress Ratio $(\sigma_1/\sigma_3)_f$	3.9	3.6	3.8

Notes: Test specimens compacted 95% at opt. moisture (ASTM D-698)

Failure Sketch

Sp 1 Sp 2

Sp 3

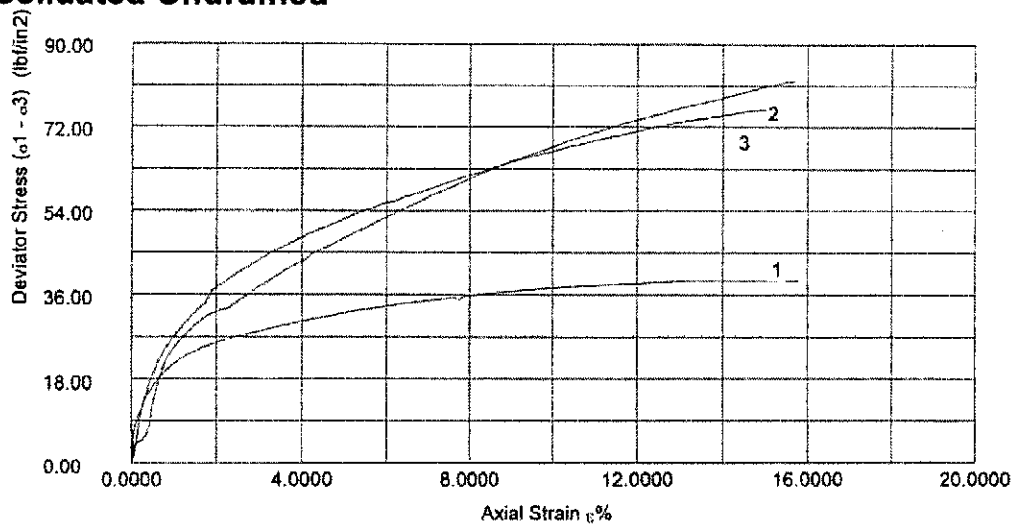
Surface Inclination

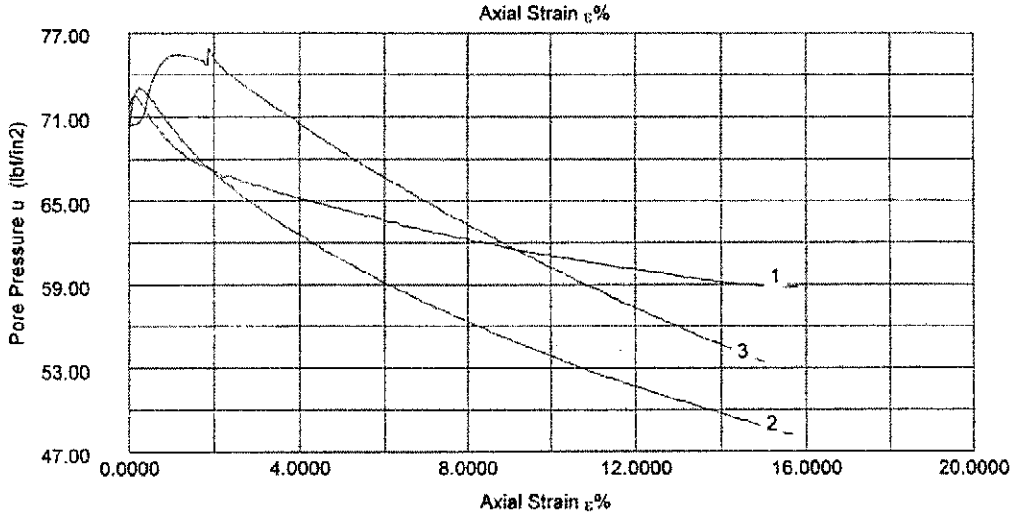
S&ME

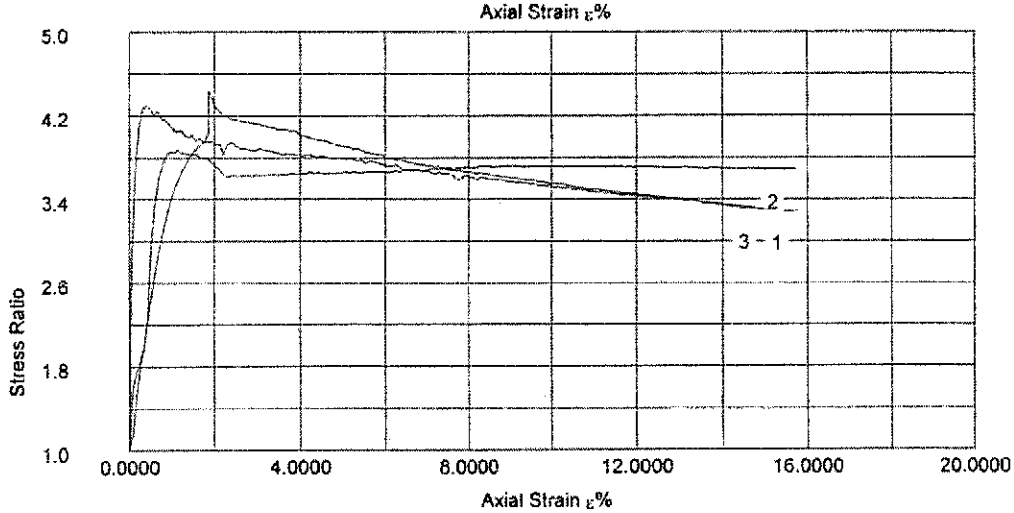
Test Method: ASTM D4767-95		Test name	Triaxial (SS, MS)
		Date of Test:	10-21-06
Site Reference:	Cherry Point Rifle Range	Sample:	Bulk Bag
Jobfile:	S:\CONSTRUC\ENGLISH\05106439.J	Borehole:	B-4
Operator:	*Checked:*	*Approved:*	

Effective Stress Triaxial Compression

Consolidated Undrained



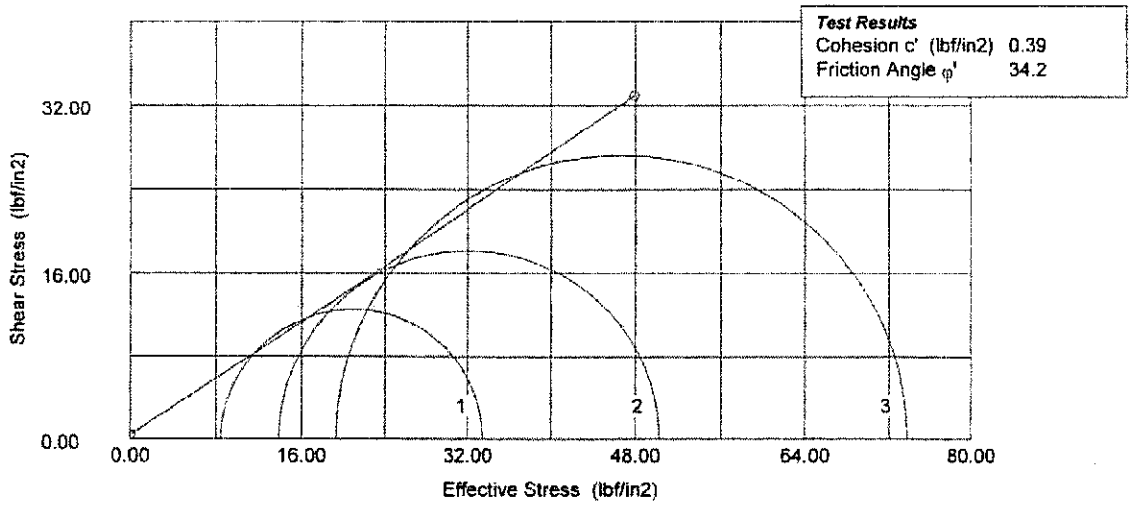


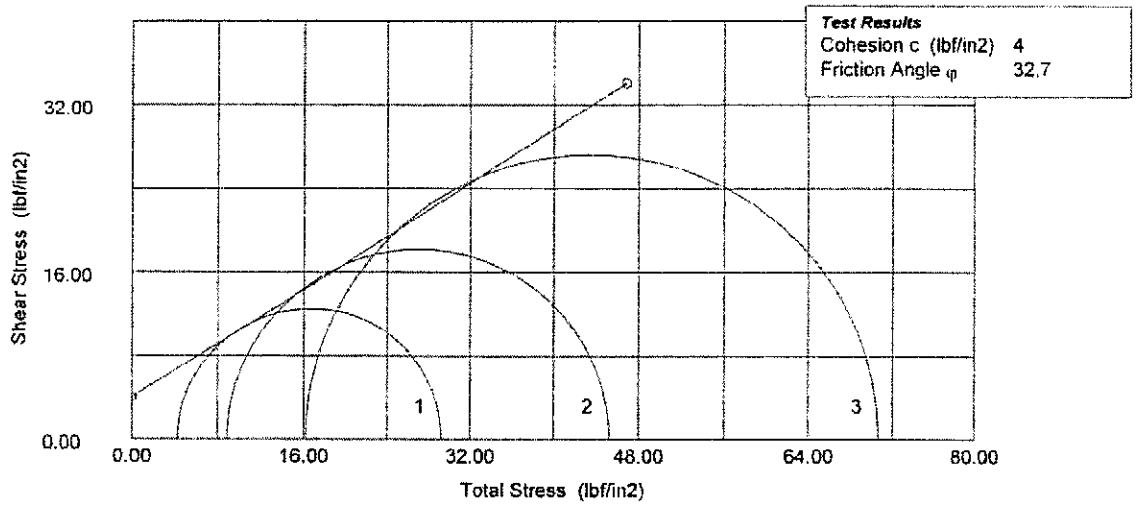


S&ME	Test Method: ASTM D4767-95	Test name Date of Test:	Triaxial (SS, MS) 10-21-06
	Site Reference: Cherry Point Rifle Range Jobfile: S:\CONSTRUC\ENGLISH\05106439.J	Sample: Borehole:	Bulk Bag B-4
	Operator:	Checked:	Approved:

Effective Stress Triaxial Compression

Consolidated Undrained

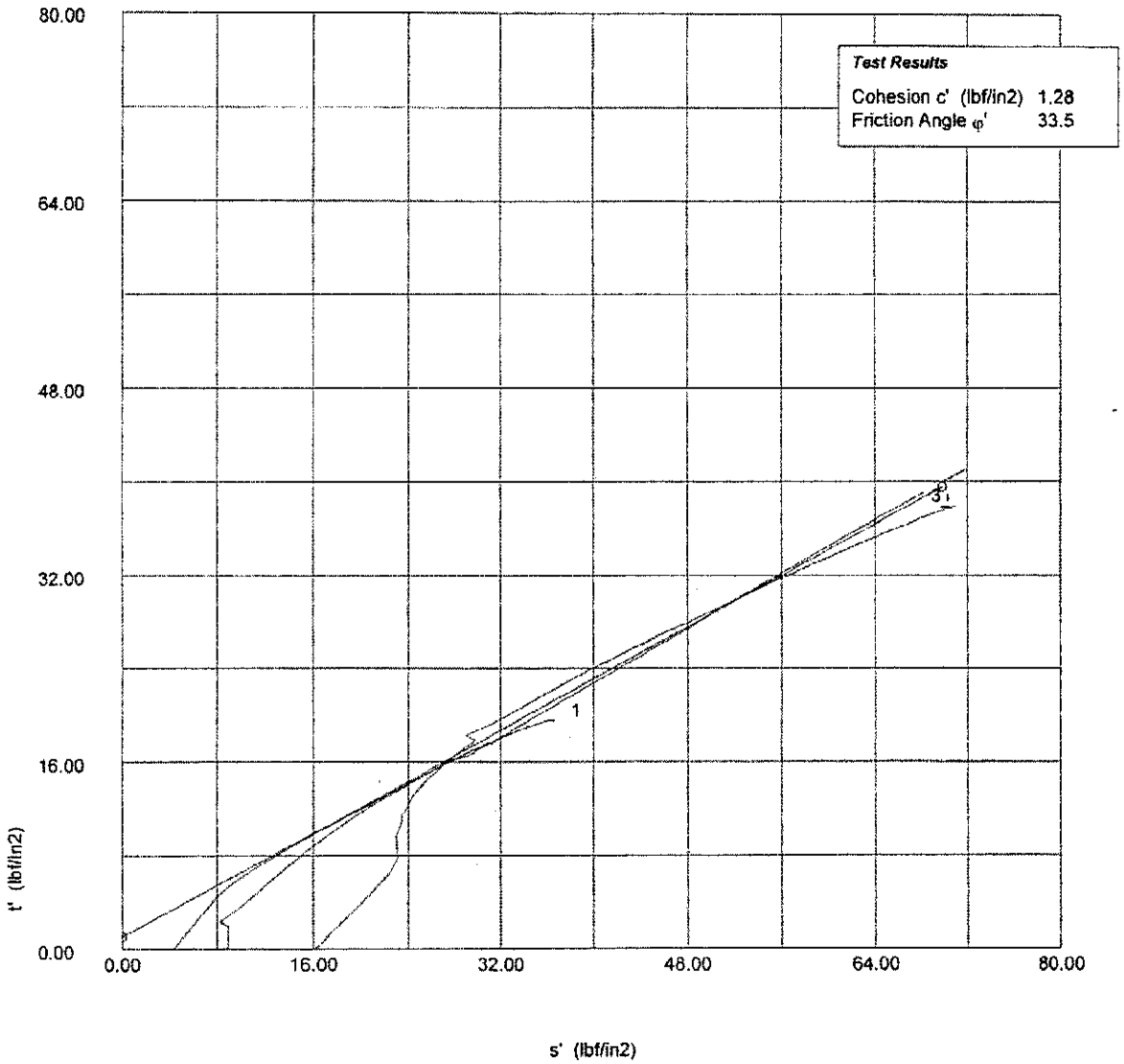




S&ME	Test Method: ASTM D4767-95	Test name	Triaxial (SS, MS)
		Date of Test:	10-21-06
	Site Reference: Cherry Point Rifle Range	Sample:	Bulk Bag
	Jobfile: S:\CONSTRUC\ENGLISH\05106439.U	Borehole:	B-4
	Operator:	Checked:	Approved:

Effective Stress Triaxial Compression

Consolidated Undrained



S&ME	Test Method: ASTM D4767-95	Test name Date of Test:	Triaxial (SS, MS) 10-21-06
	Site Reference: Cherry Point Rifle Range Jobfile: S:\CONSTRUC\ENGLISH\05106439.U	Sample: Borehole:	Bulk Bag B-4
	Operator:	Checked:	Approved:

Effective Stress Triaxial Compression

Consolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth	14 - 16 ft.		
Description:	Tan-Brown Silty Clayey Fine SAND (Visual)		
	Specimen 1	Specimen 2	Specimen 3
Type	Undisturbed	Undisturbed	Undisturbed
Height H_0 (in)	5.67	5.266	5.716
Diameter D_0 (in)	2.865	2.862	2.839
Weight W_0 (gr)	1085.6	1029.6	1156
Bulk Density ρ (PCF)	113.14	115.78	121.71
Particle Density ρ_s	2.635 (measured)	2.635 (measured)	2.635 (measured)

Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure σ_3 (lbf/in2)	85.0	98.9	115.8
Pore Pressure u (lbf/in2)	70.4	70.6	70.3
Machine Speed d_r(in/min)	0.015	0.015	0.015
No. of Membranes	1	1	1
Total Thickness (in)	0.011	0.011	0.011
Strain Channel	1798	1798	1798
Load Channel	1776	1776	1776
Pore P. Channel	1779	1779	1779
Volume Channel	Volume Chang	Volume Chang	Volume Chang
Moisture Content w_0%	15.9	16.2	17.2
Dry Density ρ_{d0} (PCF)	97.59	99.67	103.86
Voids Ratio e_0	0.68	0.65	0.58
Deg of Saturation S_0%	61.31	65.56	77.65
Final B Value	0.98	0.95	0.98

Final Conditions

	Specimen 1	Specimen 2	Specimen 3
Moisture Content w_f%	23.7	21.4	18.7
Dry Density ρ_d (PCF)	99.80	103.78	110.36
Voids Ratio e_f	0.65	0.58	0.49
Deg of Saturation S_f%	96.66	96.71	100.00
Failure Criteria	7.9	22.8	42.1
Axial Strain ε_f%	3.2	2.2	4.1
Corr Dev Stress $(\sigma_1 - \sigma_3)f$ (lbf/in2)	7.6	22.7	41.7
Minor Stress σ_{3f} (lbf/in2)	1.1	9.7	17.5
Major Stress σ_{1f} (lbf/in2)	8.7	32.4	59.2
Stress Ratio $(\sigma_1/\sigma_3)_f$	7.9	3.3	3.4

Notes:

Failure Sketch

Sp 1 Sp 2

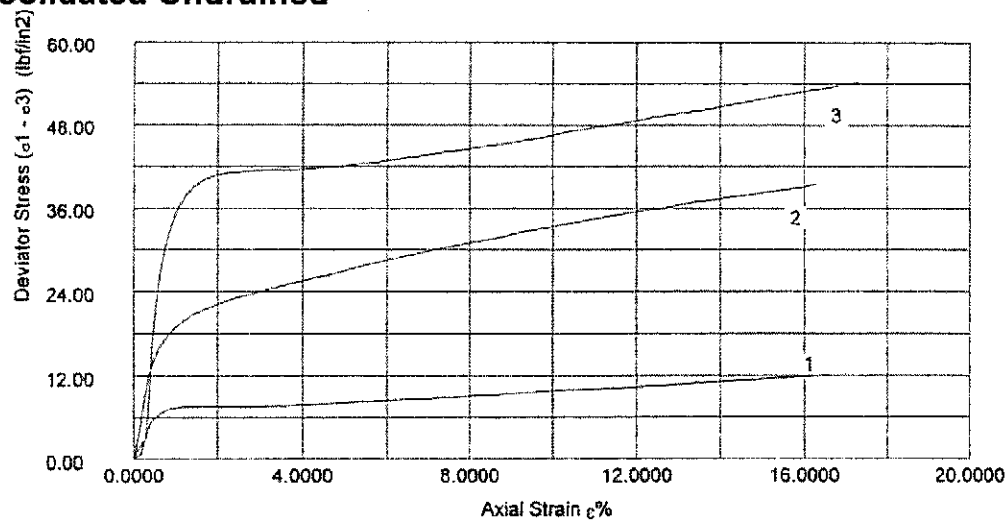
Sp 3

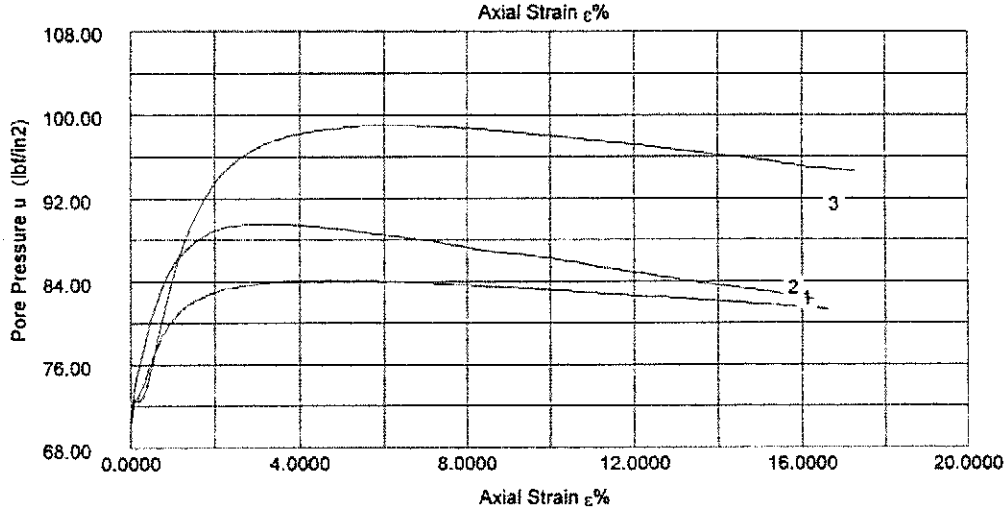
Surface Inclination

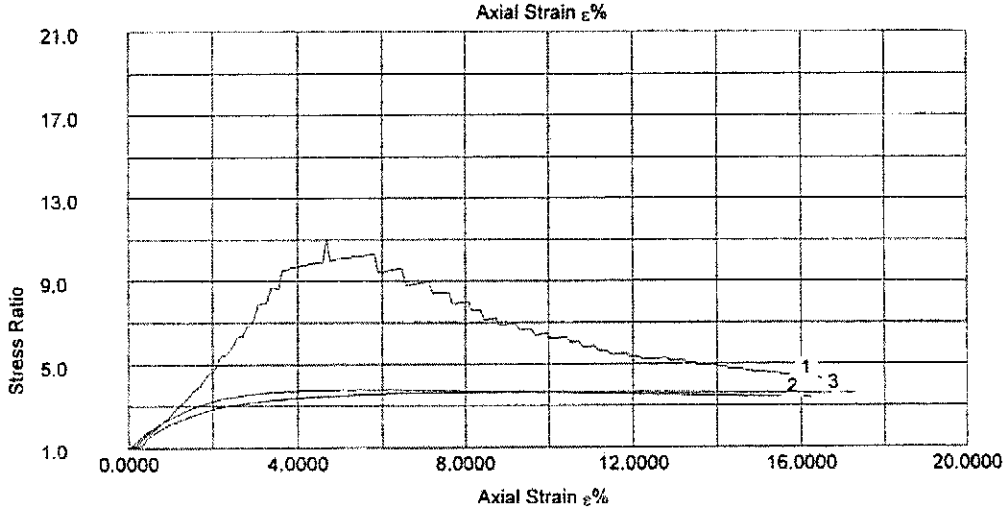
S&ME	Test Method: ASTM D4767-95	Test name	Triaxial (SS, MS)
		Date of Test:	10-21-06
	Site Reference: Cherry Point Rifle Range	Sample:	UD-1
	Jobfile: S:\CONSTRUC\ENGLISH\05106439.J	Borehole:	B-4
	Operator:	*Checked:*	*Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained



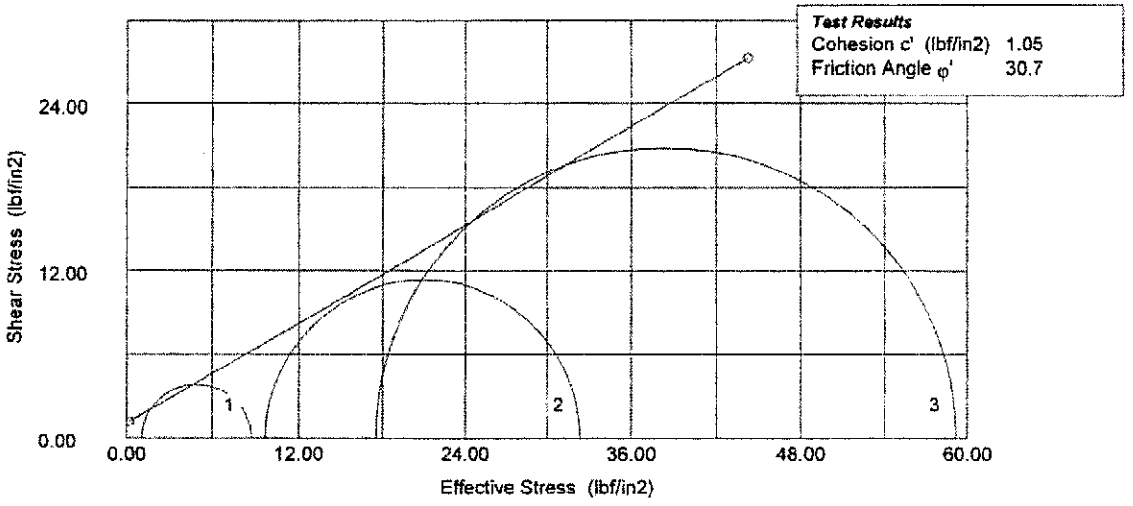


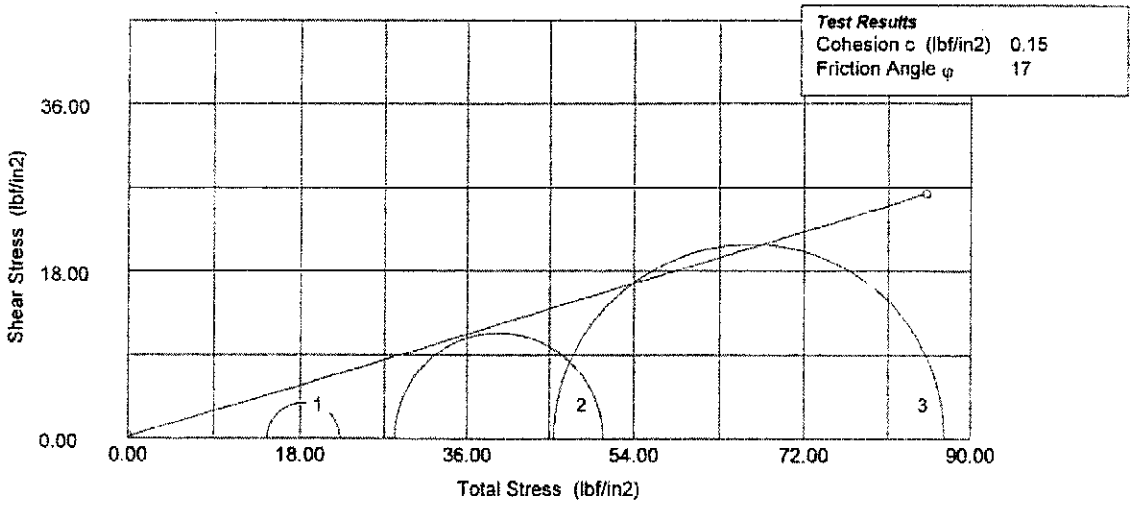


S&ME	Test Method: ASTM D4767-95	Test name	Triaxial (SS, MS)
		Date of Test:	10-21-06
	Site Reference: Cherry Point Rifle Range	Sample:	UD-1
	Jobfile: S:\CONSTRUC\ENGLISH\05106439.J	Borehole:	B-4
	Operator:	Checked:	Approved:

Effective Stress Triaxial Compression

Consolidated Undrained

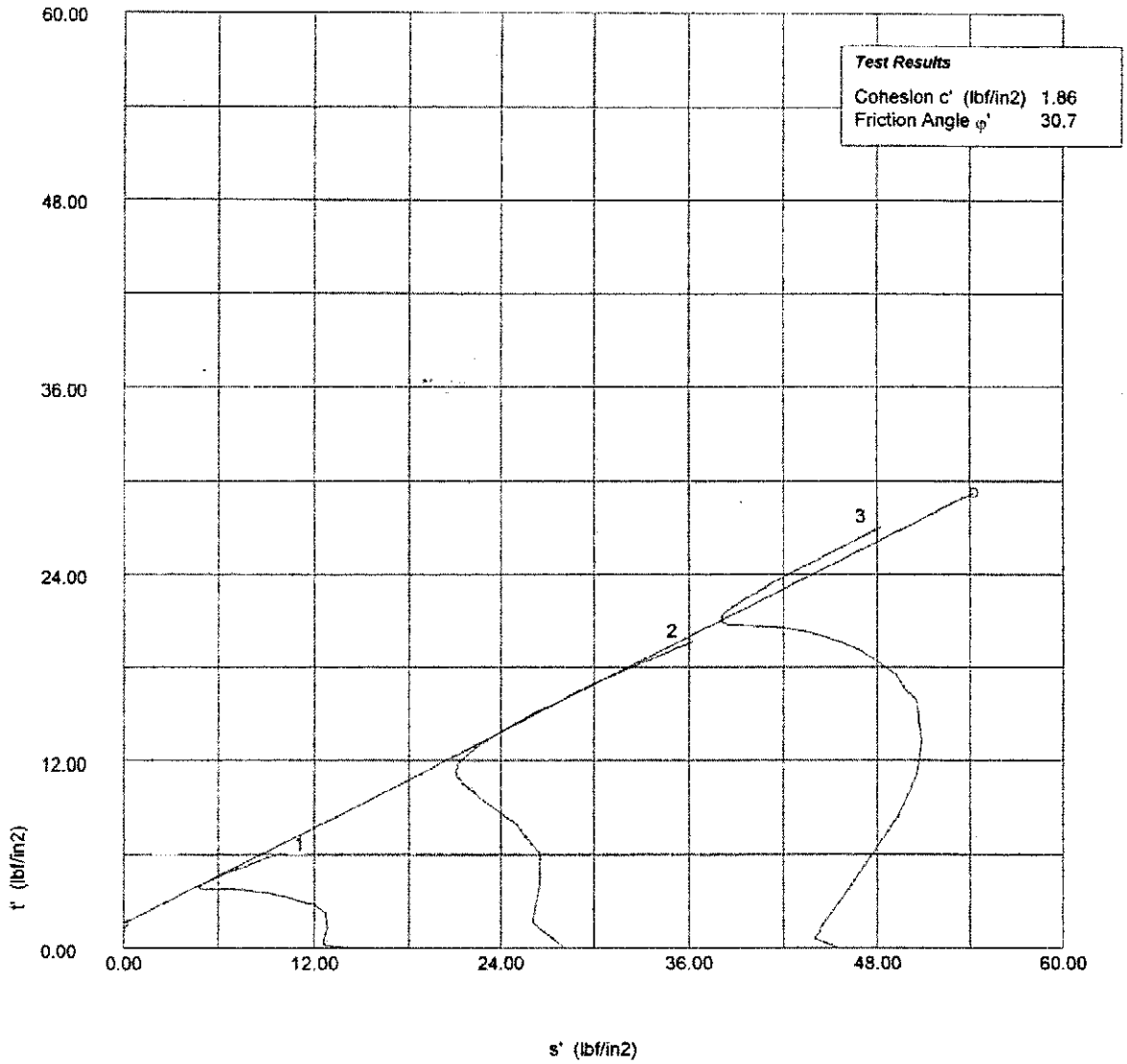




S&ME	Test Method: ASTM D4767-95	Test name Date of Test:	Triaxial (SS, MS) 10-21-06
	Site Reference: Cherry Point Rifle Range Jobfile: S:\CONSTRUC\ENGLISH\05106439.	Sample: Borehole:	UD-1 B-4
	Operator:	*Checked:*	*Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained



S&ME	Test Method: ASTM D4767-95	Test name Date of Test:	Triaxial (SS, MS) 10-21-06
	Site Reference: Cherry Point Rifle Range Jobfile: S:\CONSTRUC\ENGLISH\05106439.	Sample: Borehole:	UD-1 B-4
	Operator:	Checked:	Approved:

Effective Stress Triaxial Compression

Consolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth	14 - 16 ft.
Description:	Tan-Gray Clayey Fine SAND (Visual)

	Specimen 1	Specimen 2	Specimen 3
Type	Undisturbed	Undisturbed	Undisturbed
Height H_0 (in)	5.657	5.807	5.793
Diameter D_0 (in)	2.884	2.878	2.882
Weight W_0 (gr)	1299.6	1289.8	1289.3
Bulk Density ρ (PCF)	133.97	130.07	129.97
Particle Density ρ_s	2.655 (measured)	2.655 (measured)	2.655 (measured)

Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure σ_3 (lbf/in2)	85.0	99.3	114.5
Pore Pressure u (lbf/in2)	70.3	70.3	69.8
Machine Speed d_r(in/min)	0.015	0.015	0.015
No. of Membranes	1	1	1
Total Thickness (in)	0.011	0.011	0.011
Strain Channel	1798	1798	1798
Load Channel	1776	1776	1776
Pore P. Channel	1779	1779	1779
Volume Channel	Volume Chang	Volume Chang	Volume Chang
Moisture Content w_0%	12.4	11.6	11.6
Dry Density ρ_{d0} (PCF)	119.19	116.52	116.43
Voids Ratio e_0	0.39	0.42	0.42
Deg of Saturation S_0%	84.45	73.18	73.00
Final B Value	0.95	0.95	0.98

Final Conditions

	Specimen 1	Specimen 2	Specimen 3
Moisture Content w_f%	16.2	14.8	15.1
Dry Density ρ_d (PCF)	117.39	120.34	122.60
Voids Ratio e_f	0.41	0.38	0.35
Deg of Saturation S_f%	100.00	100.00	100.00
Failure Criteria	10.2	23.8	48.8
Axial Strain ε_f%	3.0	2.7	2.4
Corr Dev Stress $(\sigma_1 - \sigma_3)f$ (lbf/in2)	9.9	23.7	49.4
Minor Stress σ_{3f} (lbf/in2)	3.6	10.7	23.1
Major Stress σ_{1f} (lbf/in2)	13.5	34.4	72.5
Stress Ratio $(\sigma_1/\sigma_3)_f$	3.7	3.2	3.1

Notes:

Failure Sketch

Sp 1 Sp 2

Sp 3

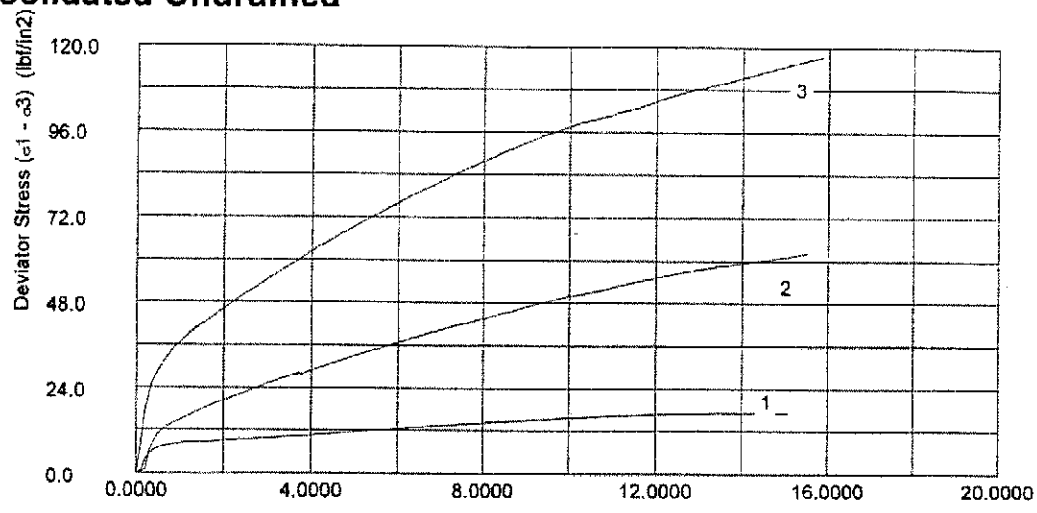
Surface Inclination

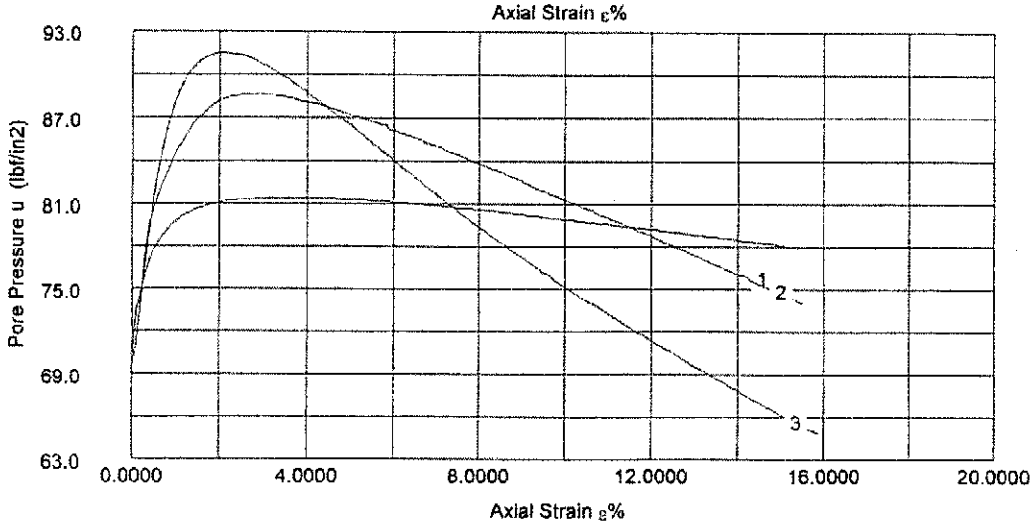
S&ME

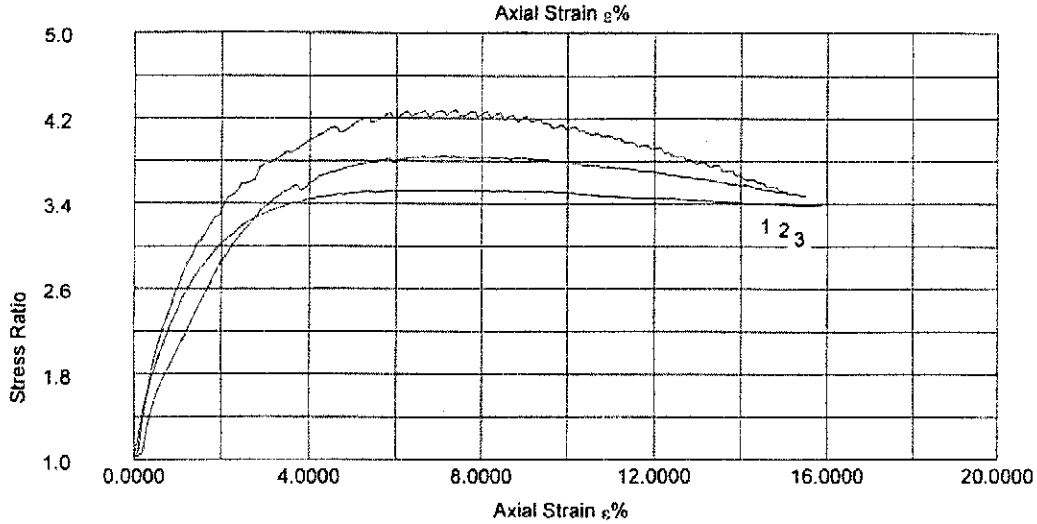
Test Method: ASTM D4767-95		Test name	Triaxial (SS, MS)
		Date of Test:	10-23-06
Site Reference:	Cherry Point Rifle Range	Sample:	UD-2
Jobfile:	S:\CONSTRUC\ENGLISH\05106439.J	Borehole:	B-6
Operator:	*Checked:*	*Approved:*	

Effective Stress Triaxial Compression

Consolidated Undrained



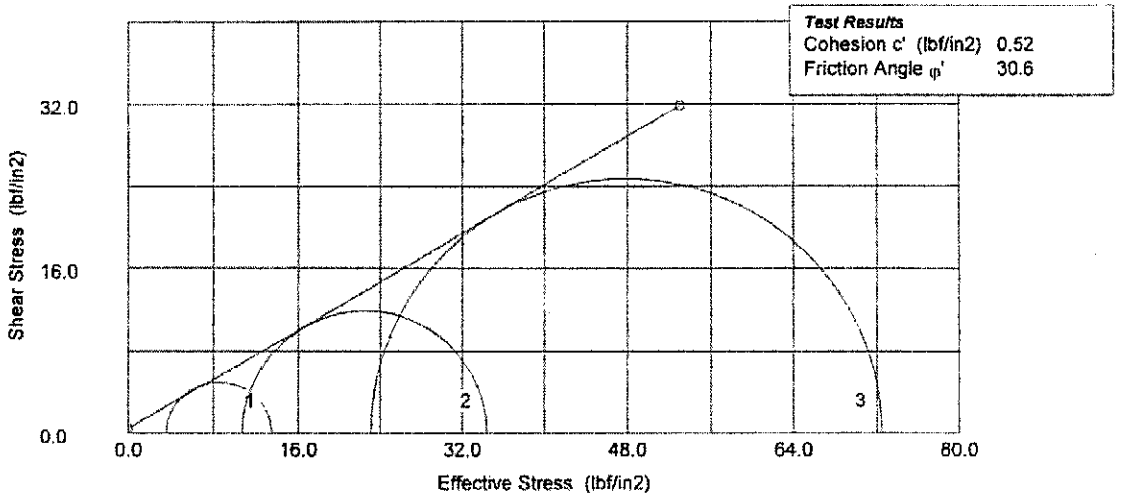


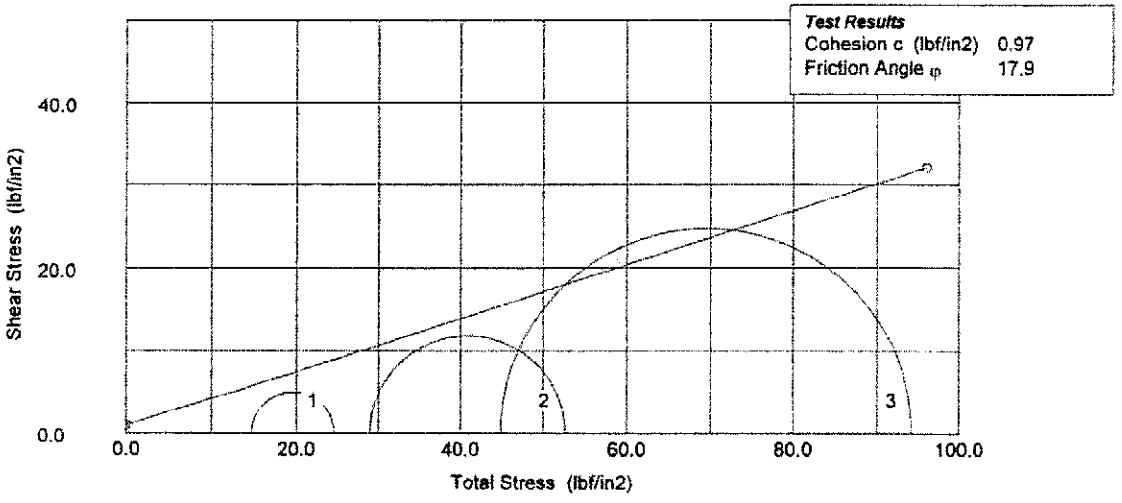


S&ME	Test Method: ASTM D4767-95	Test name: Triaxial (SS, MS) Date of Test: 10-23-06	
	Site Reference: Cherry Point Rifle Range Jobfile: S:\CONSTRUC\ENGLISH\05106439.	Sample: UD-2 Borehole: B-6	
	Operator:	*Checked:*	*Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained





S&ME	Test Method: ASTM D4767-95	Test name	Triaxial (SS, MS)
		Date of Test:	10-23-06
	Site Reference: Cherry Point Rifle Range	Sample:	UD-2
	Jobfile: S:\CONSTRUC\ENGLISH\05106439.J	Borehole:	B-6
	Operator:	Checked:	Approved:

Effective Stress Triaxial Compression

Consolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth	3 - 5 ft.	
Description:	Gray-Tan Fine Sandy Silty CLAY (Visual)	
	Specimen 1	Specimen 2
Type	Undisturbed	Undisturbed
Height H_0 (in)	5.627	5.909
Diameter D_0 (in)	2.834	2.827
Weight W_0 (gr)	1106.8	1144.2
Bulk Density ρ (PCF)	118.79	117.52
Particle Density ρ_s	2.652 (measured)	2.652 (measured)

Initial Conditions

	Specimen 1	Specimen 2
Cell Pressure σ_3 (lbf/in2)	100.0	134.2
Pore Pressure u (lbf/in2)	70.9	70.8
Machine Speed d_r(in/min)	0.015	0.015
No. of Membranes	1	1
Total Thickness (in)	0.011	0.011
Strain Channel	1798	1798
Load Channel	1776	1776
Pore P. Channel	1779	1779
Volume Channel	Volume Chang	Volume Chang
Moisture Content w_0%	12.6	12.6
Dry Density ρ_{d0} (PCF)	105.45	104.33
Voids Ratio e_0	0.57	0.59
Deg of Saturation S_0%	58.91	57.21
Final B Value	0.96	0.95

Final Conditions

	Specimen 1	Specimen 2
Moisture Content w_f%	17.7	18.5
Dry Density ρ_d (PCF)	110.84	110.81
Voids Ratio e_f	0.49	0.49
Deg of Saturation S_f%	95.25	99.20
Failure Criteria	48.6	112.0
Axial Strain ε_f%	1.6	2.2
Corr Dev Stress $(\sigma_1 - \sigma_3)f$ (lbf/in2)	49.0	113.3
Minor Stress σ_{3f} (lbf/in2)	20.8	54.9
Major Stress σ_{1f} (lbf/in2)	69.8	168.2
Stress Ratio $(\sigma_1/\sigma_3)_f$	3.4	3.1

Notes:

Failure Sketch

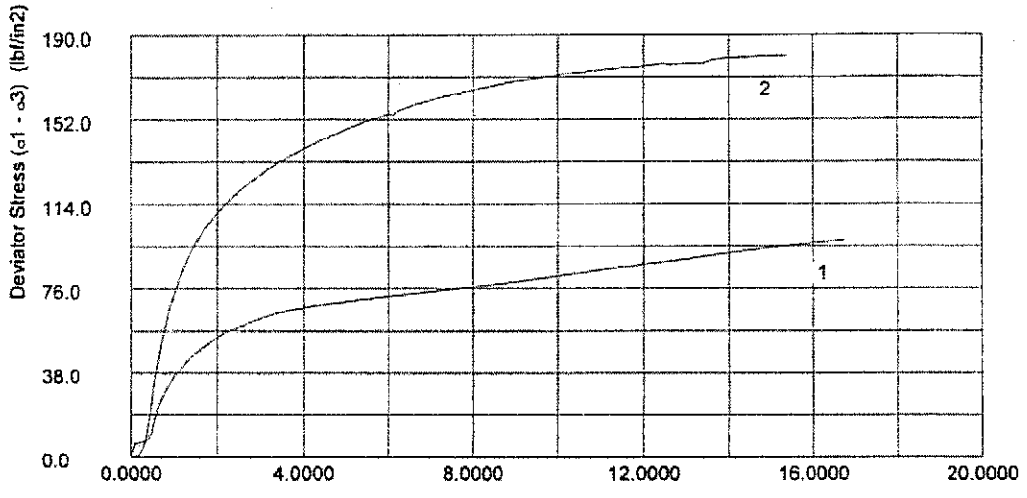
Sp 1 Sp 2

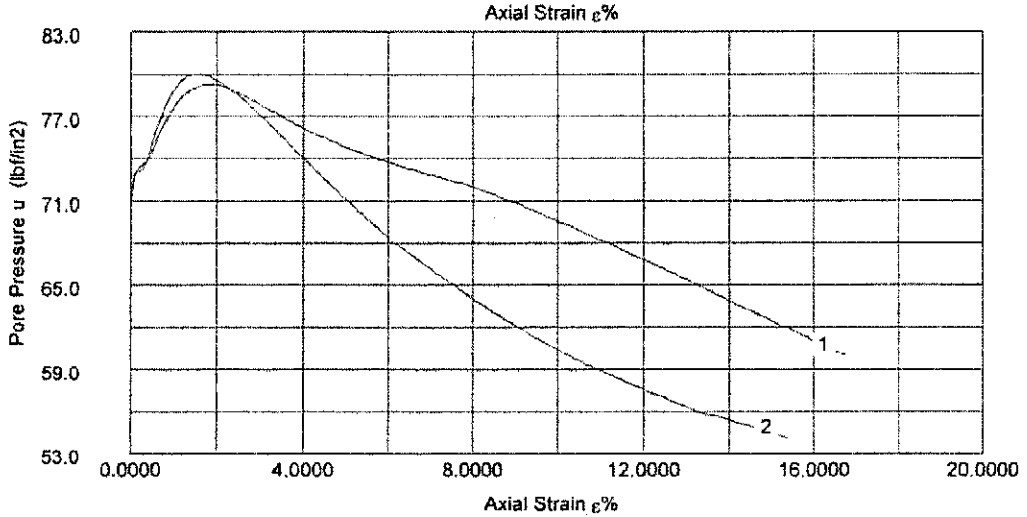
Surface Inclination

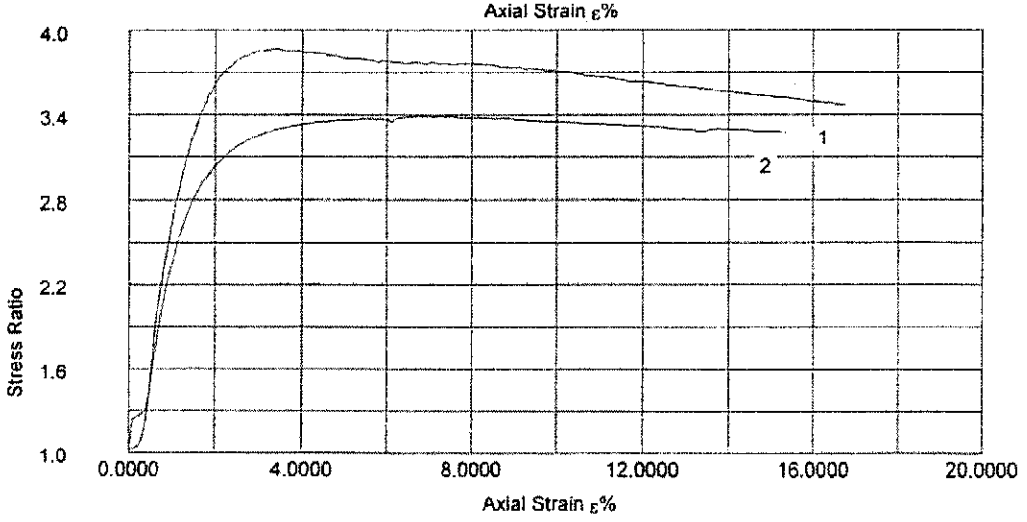
S&ME	Test Method: ASTM D4767-95	Test name	Triaxial (SS, MS)
		Date of Test:	10-21-06
	Site Reference: Cherry Point Rifle Range	Sample:	UD-3
	Jobfile: S:\CONSTRUC\ENGLISH\05106439.J	Borehole:	B-7
	Operator:	*Checked:*	*Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained



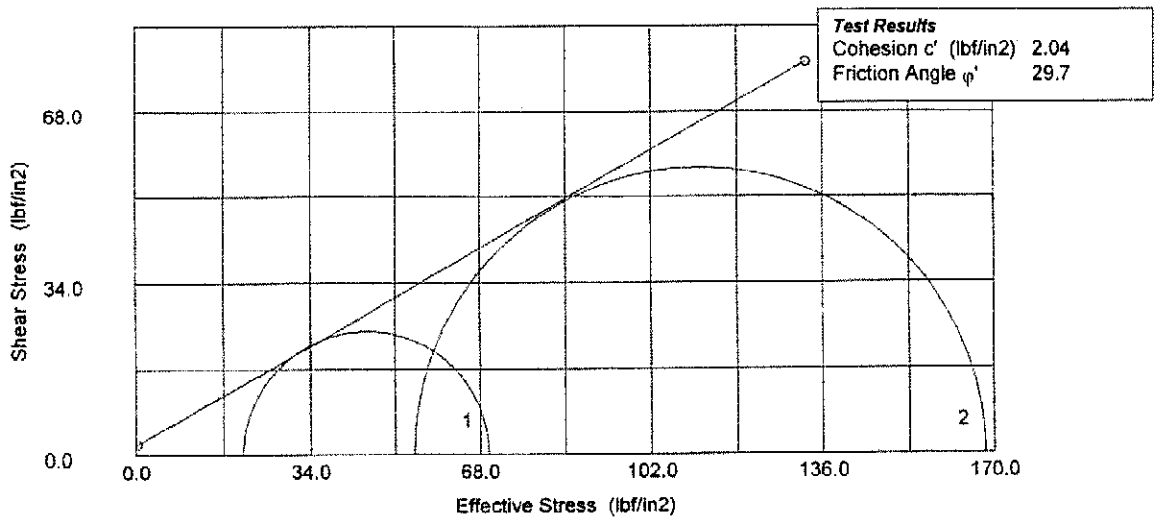


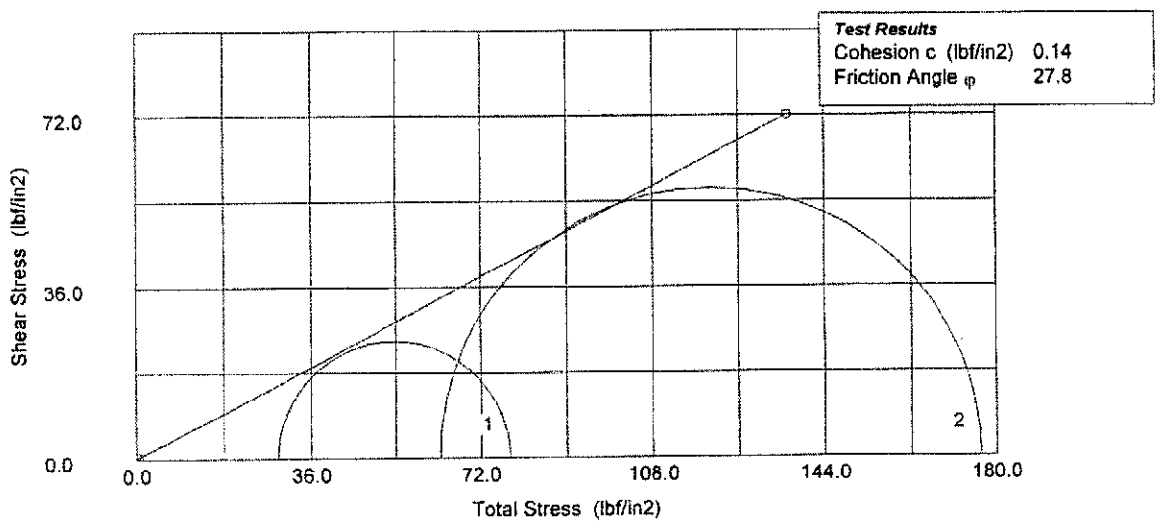


S&ME	Test Method: ASTM D4767-95	Test name	Triaxial (SS, MS)
		Date of Test:	10-21-06
	Site Reference: Cherry Point Rifle Range	Sample:	UD-3
	Jobfile: S:\CONSTRUC\ENGLISH\05106439.	Borehole:	B-7
	Operator:	*Checked:*	*Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained

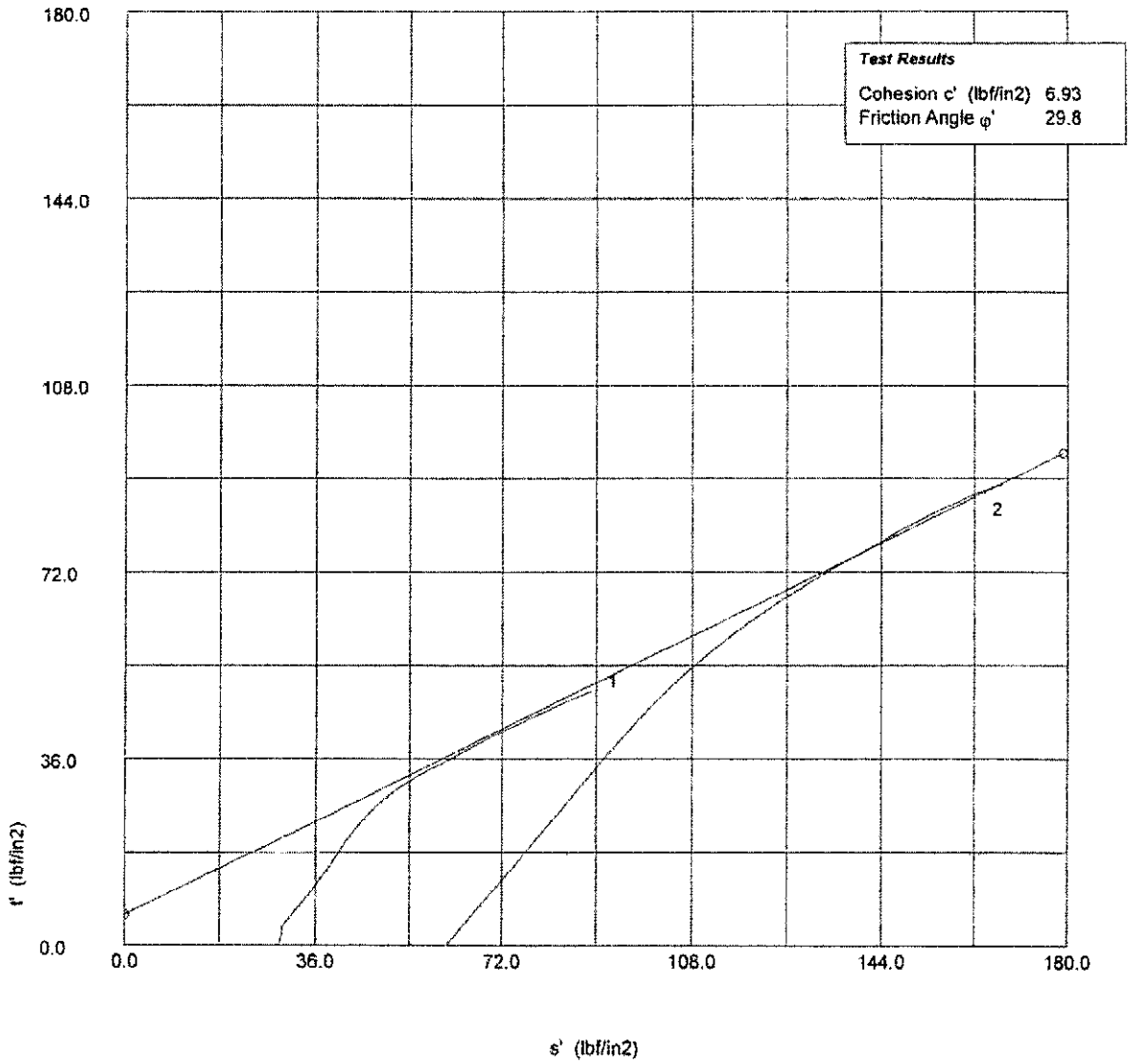




S&ME	Test Method: ASTM D4767-95	Test name	Triaxial (SS, MS)
		Date of Test:	10-21-06
	Site Reference: Cherry Point Rifle Range	Sample:	UD-3
	Jobfile: S:\CONSTRUC\ENGLISH\05106439.	Borehole:	B-7
	Operator:	Checked:	Approved:

Effective Stress Triaxial Compression

Consolidated Undrained



S&ME	Test Method: ASTM D4767-95	Test name	Triaxial (SS, MS)
		Date of Test:	10-21-06
	Site Reference: Cherry Point Rifle Range	Sample:	UD-3
	Jobfile: S:\CONSTRUC\ENGLISH\05106439.J	Borehole:	B-7
	Operator:	Checked:	Approved:

Effective Stress Triaxial Compression

Consolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth	18 - 20 ft.		
Description:	Gray Clayey Fine SAND (Visual)		
	Specimen 1	Specimen 2	Specimen 3
Type	Undisturbed	Undisturbed	Undisturbed
Height H_0 (in)	5.866	5.834	5.991
Diameter D_0 (in)	2.797	2.893	2.897
Weight W_0 (gr)	1200	1241	1336.3
Bulk Density ρ (PCF)	126.83	123.28	128.91
Particle Density ρ_s	2.633 (measured)	2.633 (measured)	2.633 (measured)

Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure σ_3 (lbf/in2)	80.1	100.0	130.0
Pore Pressure u (lbf/in2)	70.8	70.5	80.5
Machine Speed d_r(in/min)	0.015	0.015	0.015
No. of Membranes	1	1	1
Total Thickness (in)	0.011	0.011	0.011
Strain Channel	1798	1798	1798
Load Channel	1776	1776	1776
Pore P. Channel	1779	1779	1779
Volume Channel	Volume Chang	Volume Chang	Volume Chang
Moisture Content w_0%	28.0	28.2	28.2
Dry Density ρ_{d0} (PCF)	99.12	96.18	100.57
Voids Ratio e_0	0.66	0.71	0.63
Deg of Saturation S_0%	100.00	100.00	100.00
Final B Value	0.95	0.96	0.95

Final Conditions

	Specimen 1	Specimen 2	Specimen 3
Moisture Content w_f%	28.2	26.5	25.9
Dry Density ρ_d (PCF)	92.11	98.04	100.55
Voids Ratio e_f	0.78	0.68	0.63
Deg of Saturation S_f%	94.88	100.00	100.00
Failure Criteria	Mx Stress Ratio	Mx Stress Ratio	Mx Stress Ratio
Axial Strain ε_f%	6.4	5.0	4.8
Corr Dev Stress $(\sigma_1 - \sigma_3)f$ (lbf/in2)	11.0	28.1	37.1
Minor Stress σ_{3f} (lbf/in2)	0.3	10.6	14.7
Major Stress σ_{1f} (lbf/in2)	11.3	38.7	51.8
Stress Ratio $(\sigma_1/\sigma_3)_f$	37.6	3.6	3.5

Notes:

Failure Sketch

Sp 1 Sp 2

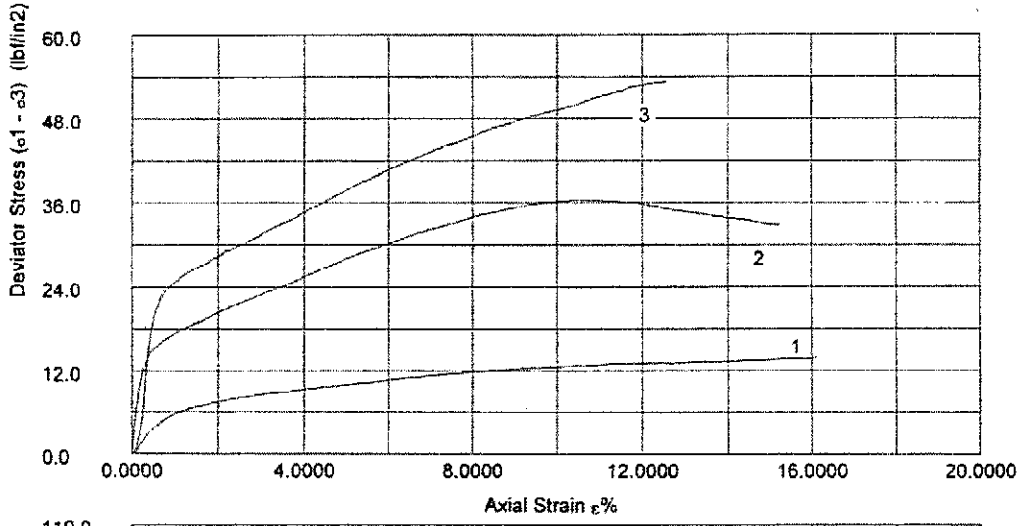
Sp 3

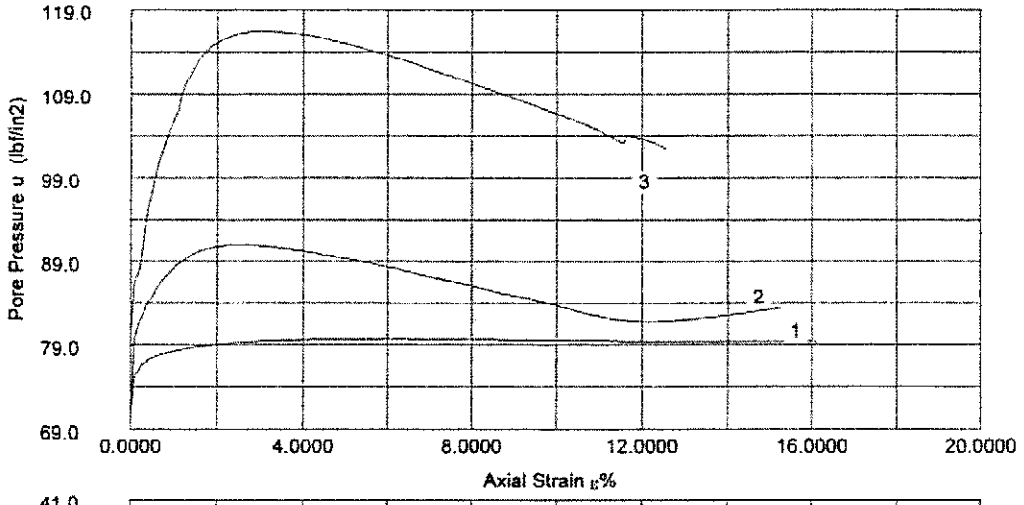
Surface Inclination

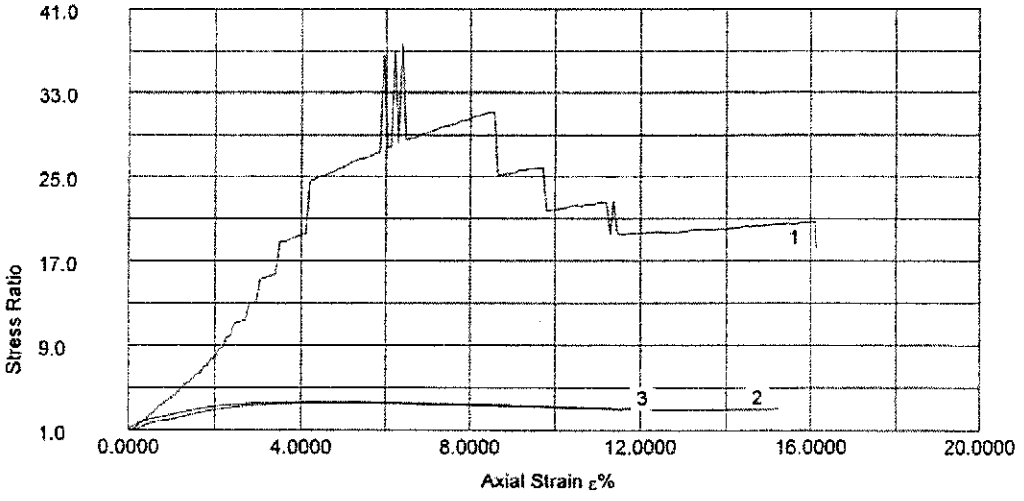
S&ME	Test Method: ASTM D4767-95	Test name	Triaxial (SS, MS)
		Date of Test:	10-24-06
	Site Reference: Cherry Point Rifle Range	Sample:	UD-4
	Jobfile: S:\CONSTRUC\ENGLISH\05106439.U	Borehole:	B-9
	Operator:	Checked:	Approved:

Effective Stress Triaxial Compression

Consolidated Undrained



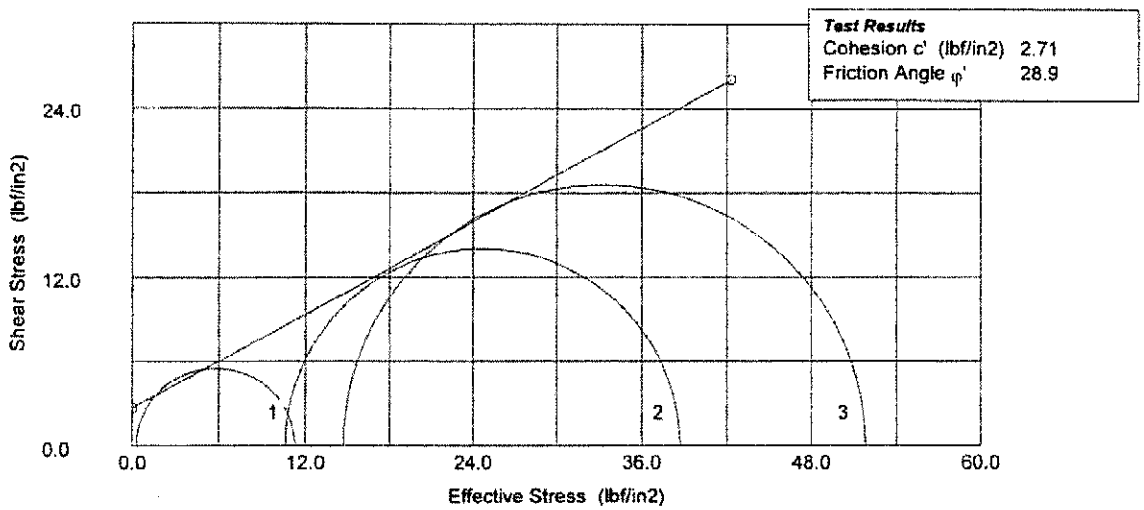


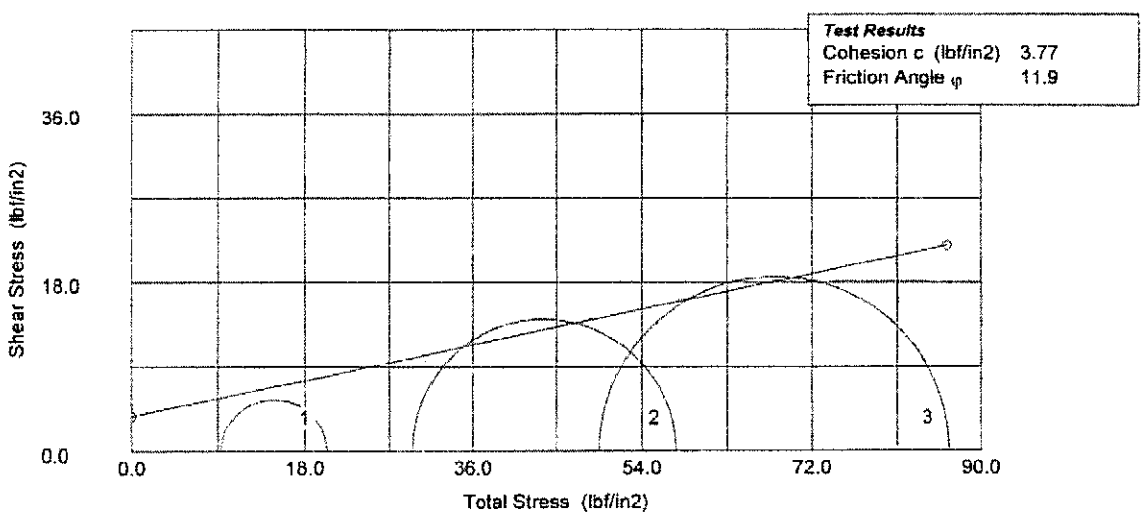


S&ME	Test Method: ASTM D4767-95	Test name	Triaxial (SS, MS)
		Date of Test:	10-24-06
	Site Reference: Cherry Point Rifle Range	Sample:	UD-4
	Jobfile: S:\CONSTRUC\ENGLISH\05106439.	Borehole:	B-9
	Operator:	*Checked:*	*Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained

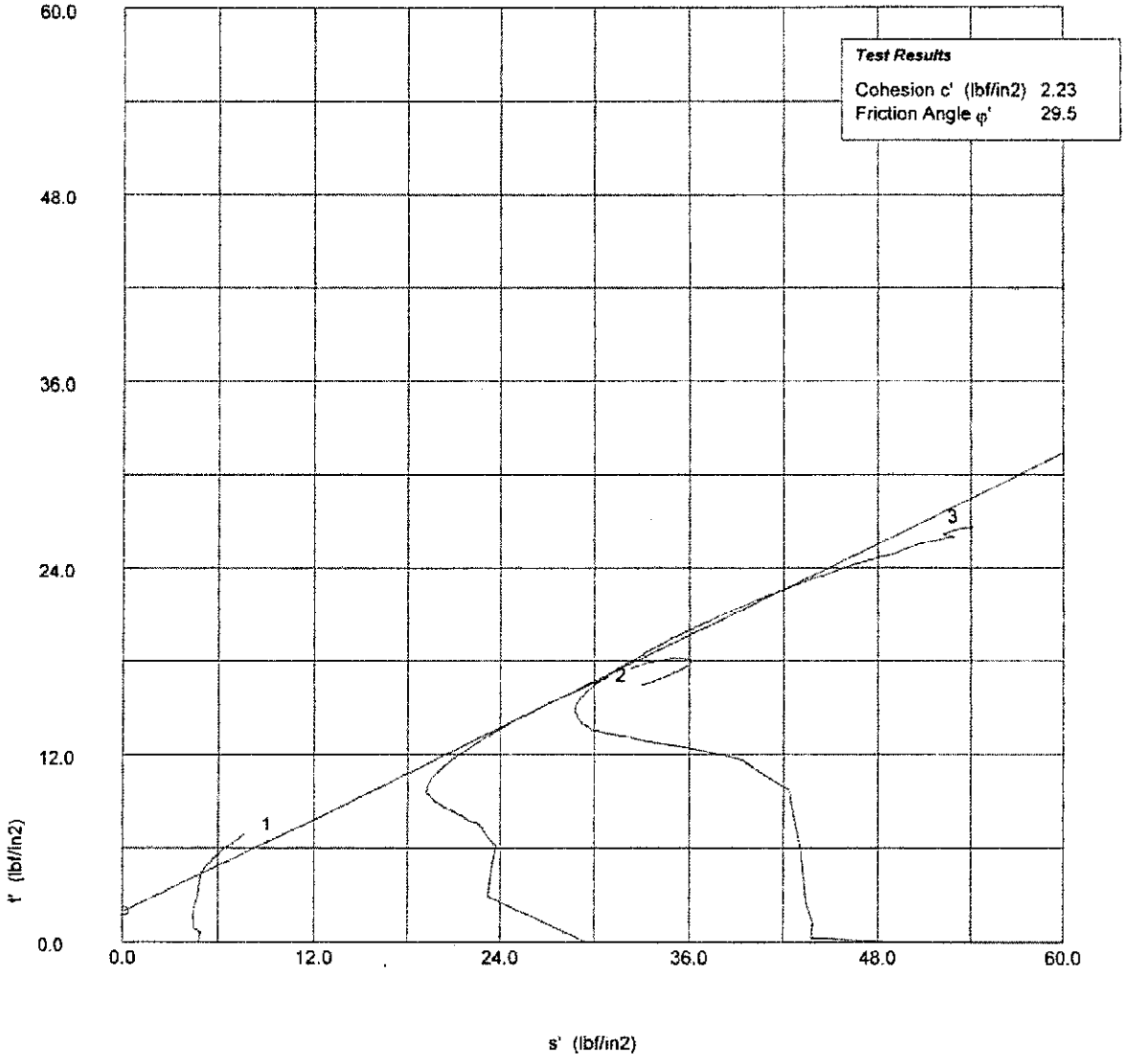




S&ME	Test Method: ASTM D4767-95	Test name Date of Test:	Triaxial (SS, MS) 10-24-06
	Site Reference: Cherry Point Rifle Range Jobfile: S:\CONSTRUC\ENGLISH\05106439.0	Sample: Borehole:	UD-4 B-9
	Operator:	Checked:	Approved

Effective Stress Triaxial Compression

Consolidated Undrained



S&ME	Test Method: ASTM D4767-95	Test name Triaxial (SS, MS) Date of Test: 10-24-06	
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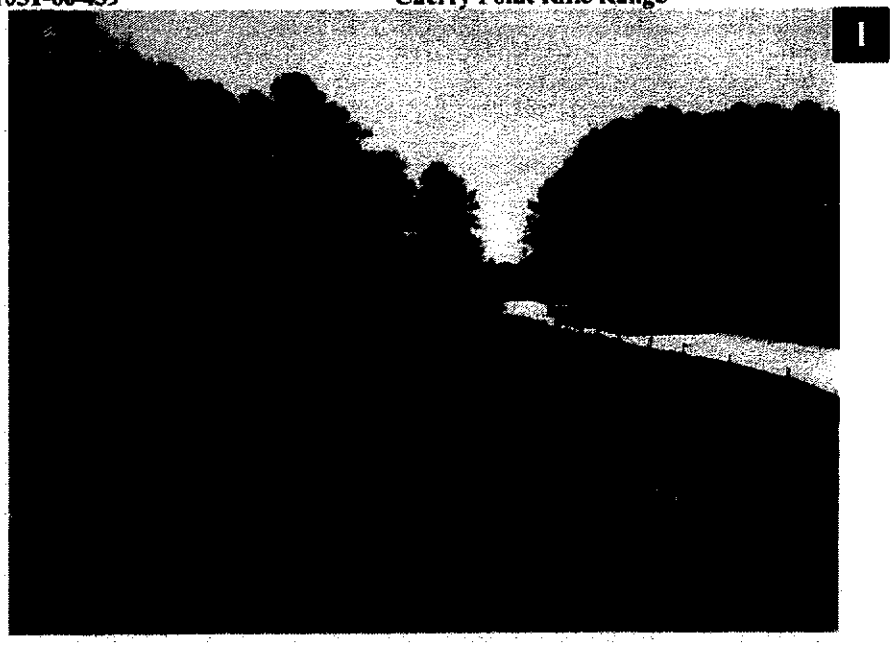
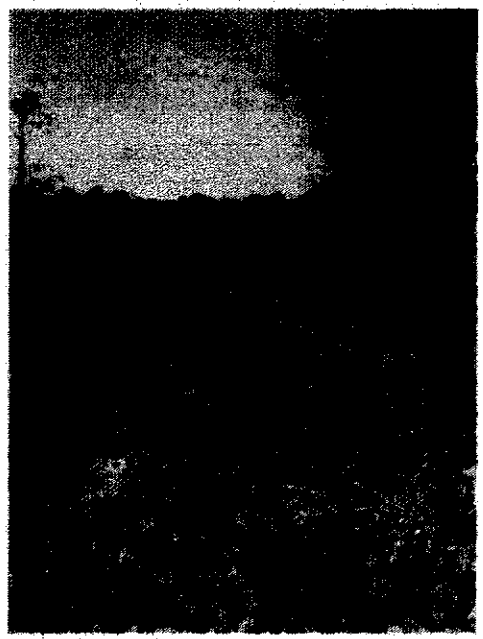
	Operator:	Checked:	Approved:



Front slope of existing berm

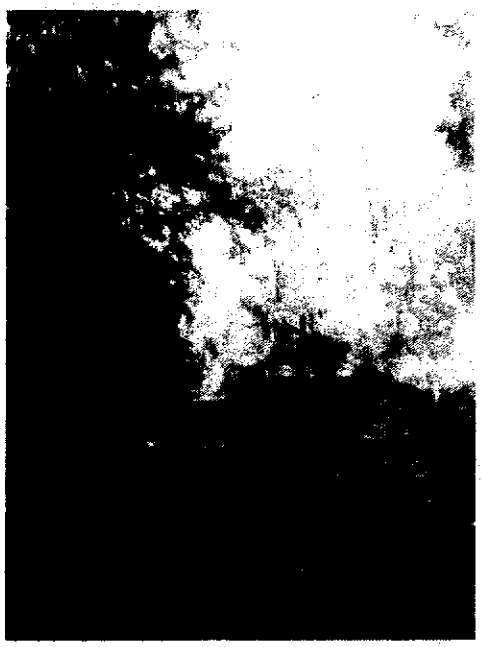


Top of existing berm

View of shooting range from top of existing berm

Wooden retaining wall at toe of existing berm

Typical projectile pocket in existing berm



Access path behind existing berm

View of back slope from top of the existing berm

Wooded area behind existing berm

ENVIRONMENTAL SAMPLING AND ANALYSIS PLAN
PROPOSED RIFLE RANGE BERM MODIFICATIONS
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA
S&ME PROJECT NO. 1051-06-439

Prepared For:

Dewberry
2301 Rexwoods Drive, Suite 200
Raleigh, North Carolina 27607

Prepared By:

S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

February 2, 2007

February 2, 2007

Dewberry
2301 Rexwoods Drive, Suite 200
Raleigh, North Carolina 27607

Attention: Mr. Steve Harvey, P.E.

Reference: **Environmental Sampling and Analysis Plan**
Proposed Rifle Range Berm Modifications
Marine Corps Air Station
Cherry Point, North Carolina
S&ME Project No. 1051-06-439

Dear Mr. Harvey:

S&ME, Inc. is pleased to submit this Environmental Sampling and Analysis Plan for the above referenced project. The work plan is written in general accordance with our Proposal No. P151-06E dated June 29, 2006. The plan was prepared to provide materials handling and disposal and/or recycling options for the potentially lead-impacted wooden retaining wall and for lead-impacted soil that may be disturbed during the earthwork. The plan includes a description of the requirements and regulations of handling and disposal of lead impacted debris and soil. Disposal and recycling options of lead-impacted materials is also presented. Health and safety requirements, as regulated by OSHA, are referenced in this plan.

SITE AND PROJECT INFORMATION

We understand that the Rifle Range impact berm at the Marine Corps Air Station (MCAS) in Cherry Point, North Carolina is to be repaired (Project CP99019M). Repairs will include the following:

- Removing the existing wooden retaining wall
- Processing soil disturbed during earthwork and drainage repairs

- Removing lead fragments and sending lead to commercial recycler
- Returning processed soil to berm as part of earthwork repairs

Based on the site plan showing existing topography that you have provided, the impact berm is approximately 30 feet tall with front and back slopes of approximately 2 (horizontal) to 1 (vertical). The bullet impact zone along the front face of the impact berm is approximately 350 feet in length. The existing wooden retaining wall is approximately 2 feet tall.

MATERIALS HANDLING AND DISPOSAL/RECYCLING

Presented below are materials handling and disposal and/or recycling plans for the potentially lead impacted wooden retaining wall and for lead impacted soil that may be disturbed during the earthwork. Disposal and/or recycling options of lead impacted materials will also be presented. Health and safety references, as regulated by OSHA, will be included in these plans. Process flowcharts for soil analysis, handling and disposal/recycling of soil and the wooden retaining wall, are attached as Figure 1 through Figure 3.

Soil Sampling and Analysis

S&ME understands that the rifle range impact soil berm is the collection accumulation area for lead shot during range operations. Portions of the rifle range including the wooden retaining wall and up to approximately 2,600 cubic yards of soil from the berm are to be removed. These materials must be sampled, classified, and then properly handled according to North Carolina Department of Environment and Natural Resources (NCDENR) rules and guidelines.

The NCDENR Division of Water Quality guidelines use a 200 cubic yard composite sampling guide for sampling for disposal of soil. The volume of soil to be removed is estimated to be 2,600 cubic yards. Therefore, approximately 14 composite soil samples will be collected along the face of the soil berm in the area to be excavated. Composite soil samples will be collected on a 33.5 foot by 50 foot grid to a depth of approximately 3 feet. The Proposed Environmental Sampling and Analysis Program is attached as Table 1. The approximate composite soil sample location areas are shown on Figure 4.

The soil samples will be collected in the following manner. Using a clean stainless steel hand auger, composite soil samples would be formed by combining grid soil samples from six individual sampling points within each of the fourteen grid areas at varying depths of between 0.5 and 3 feet below the ground surface. The soil from the individual sampling points would be combined into one sample and passed through a screen to separate the soil from the lead shot. The soil would then be composited into a single sample and placed in a clean resealable bag. The composite soil samples would be placed into laboratory supplied containers, stored on ice and labeled with the time, date, location, and depth at which the sample was collected. The samples would be sent to a North Carolina certified laboratory. The soil samples would be analyzed using EPA Method 6010/7470 for toxicity characteristic leaching procedure (TLCP) of lead. Approximately 25% of the samples would be analyzed for RCRA Metals by EPA Method 6010B.

If the analytical results from the soil samples are below the NCDENR Division of Water Quality (DWQ) Soil-to-Water Maximum Contaminant Concentration of 270 mg/kg for total lead as referenced in the *Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater,* the soil within that grid area may be left and reused on site. If the analytical results from the soil samples are above the NCDENR DWQ Soil-to-Water Maximum Contaminant Concentration of 270 mg/kg for total lead and below the NCDENR Maximum Concentration of Contaminants for Toxicity Characteristic of 5 mg/l for lead as also referenced in the *Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater* the soil from that grid area can be disposed in a Subtitle D lined Municipal Solid Waste Landfill (MSWL). If analytical results from the soil samples are above the NCDENR Maximum Concentration of Contaminants for Toxicity Characteristic of 5 mg/l for lead, the soil from within that grid area will be classified as a hazardous waste and is subject to RCRA program disposal and permitting requirements.

Soil with Lead Shot

Following analytical determination of whether the soil with lead shot will remain on site or disposed of off site, procedures for handling of the soil may be determined. Below are options for both handling the soil with lead shot on site and disposing of the soil with lead shot off site.

If the laboratory analytical results from the soil determine that the soil can remain on site, an option would be to add lime or phosphate. According to the *EPA BMP for Lead at Outdoor Shooting Ranges,* the addition of either lime or phosphate may be added to the soil at specified amounts in order to decrease the potential for lead to leach and migrate by bringing the pH of the soil between 6.5 and 8.5.

If the lead is to be physically screened from the soil, then a professional reclamation/recycling company may be subcontracted to physically separate the material through a screening process. The remaining lead shot may then either be disposed of as a hazardous material or recycled as "scrap metal" pursuant to Federal Regulations (CFR) 261.6(a)(3)(ii) and exempt from RCRA regulation. If the lead shot is recycled, it is not subject to the RCRA program and permitting, but is subject to those requirements, if it is disposed of, according the *EPA BMP for Lead at Outdoor Shooting Ranges.*

Wood Retaining Wall

The site is developed with a wooden retaining wall at the foot of the front face of the soil impact berm. The wooden retaining wall is to be demolished and removed from the site. There appears to be a minimal potential for impact by the lead shot. If there is minimal visual impact, the wood could be disposed of at a construction and demolition landfill.

Health and Safety

The OHSA standard for lead has specific requirements such that any concentration of lead present in the substrate, in this case the soil, invokes certain requirements of 29 CFR 1926.62, Lead

Exposure In Construction; Interim Final Rule – Inspection and Compliance Procedures. These requirements apply independently of the criteria for soil disposal options described above.

While working with materials that contain detectable amounts of lead, workers are to be protected during the exposure assessment. If high levels of lead are found in the air, they must continue to wear personal protective equipment and use engineering controls to reduce the airborne lead levels. The employer must demonstrate that worker exposure is below the action level of 30 $\mu g/m^3$ eight-hour time weighted average action level to eliminate further exposure assessment of a specific task. The action level means employee exposure, without regard to the use of respirators. The Occupational Safety and Health Administration (OSHA) permissible exposure limits (PEL) for lead is 50 $\mu g/m^3$. If levels reach 50 $\mu g/m^3$ of lead or above, respirators would be required.

The determination of employee exposure can be accomplished by one of three methods: 1) the employer conducts an exposure assessment on a worker(s) during an activity that would likely represent the highest potential for exposure to the lead containing substrate; 2) the employer may use previous data where the employer has previously monitored similar work for lead exposures, and the data were obtained within the past 12 months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations. If such data are available, the employer may rely on such earlier monitoring results to satisfy the requirements of the standard; or, 3) where the employer has objective data, he may demonstrate that a particular product or material containing lead or a specific process, operation or activity involving lead cannot result in employee exposure to lead at or above the action level during processing, use, or handling, the employer may rely upon such data instead of implementing initial monitoring.

Additional safe work practices are recommended for the construction workers who will perform wooden wall and soil removal at the Cherry Point Rifle Range site.

- Workers should avoid eating, drinking, smoking, chewing gum or tobacco in the work area.

- Hands, forearms, and face should be washed with soap, rinsed and dried upon leaving the work area.
- Contact with the soil should be minimized or avoided – do not walk through puddles, pools, mud, etc. Whenever possible, avoid kneeling or sitting on the ground.

If any unexpected environmental conditions are encountered, additional health and safety measures should be considered as necessary.

CLOSURE

S&ME appreciates the opportunity to provide environmental consulting services on this project. If you have any questions concerning information presented herein, or when we may be of further assistance, please contact us.

Sincerely,

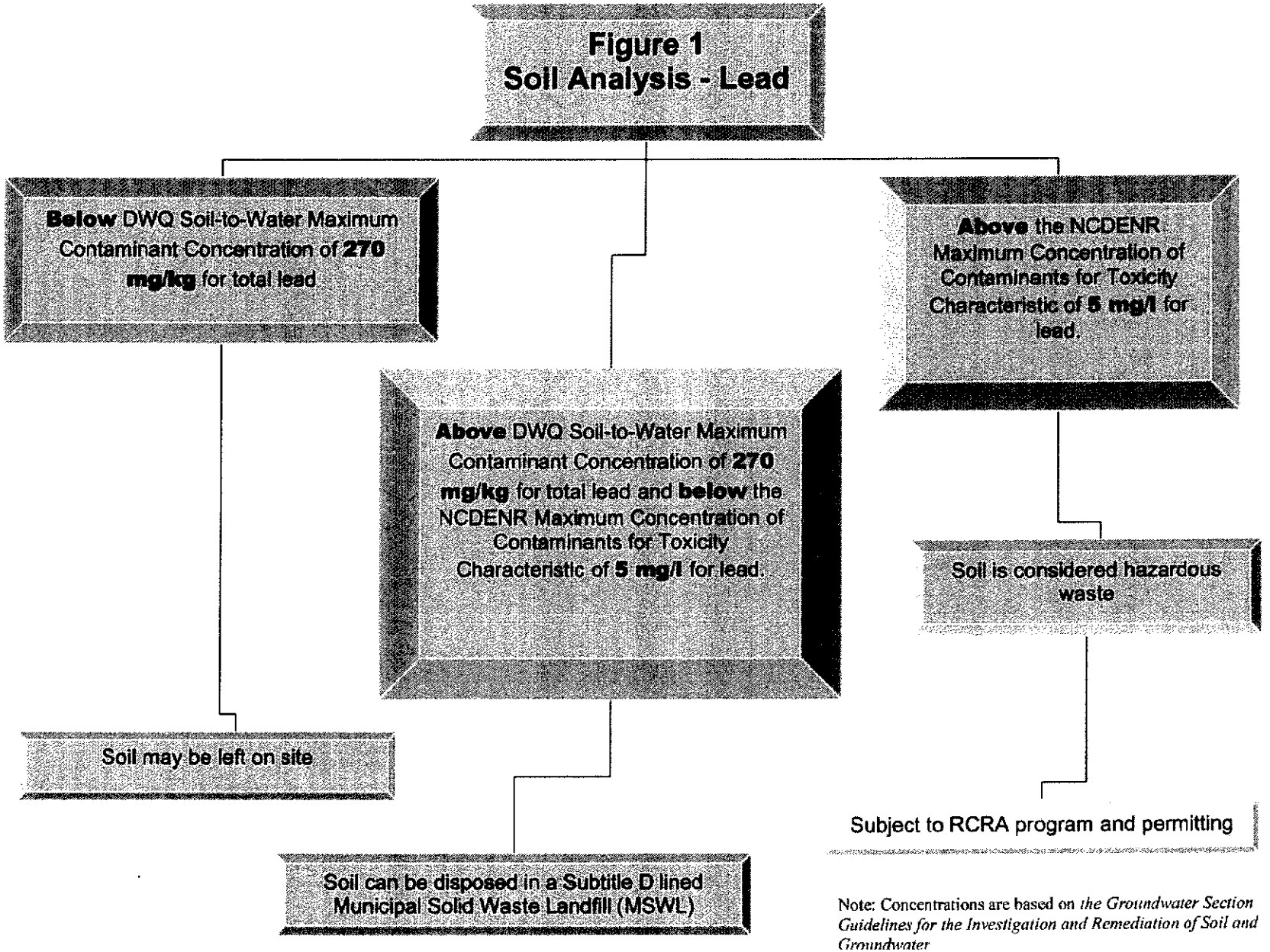
S&ME, Inc.

Lisa Ennis
Staff Professional

Tom Raymond, P.E., RSM
Project Manager

Attachments
Figure 1 – Soil Analysis Diagram
Figure 2 – Soil with Lead Shot Diagram
Figure 3 – Wood Retaining Wall Diagram
Figure 4 – Proposed Sampling Locations
Table 1– Proposed Environmental Sampling and Analysis Program

Figure 1
Soil Analysis - Lead



Note: Concentrations are based on *the Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater*

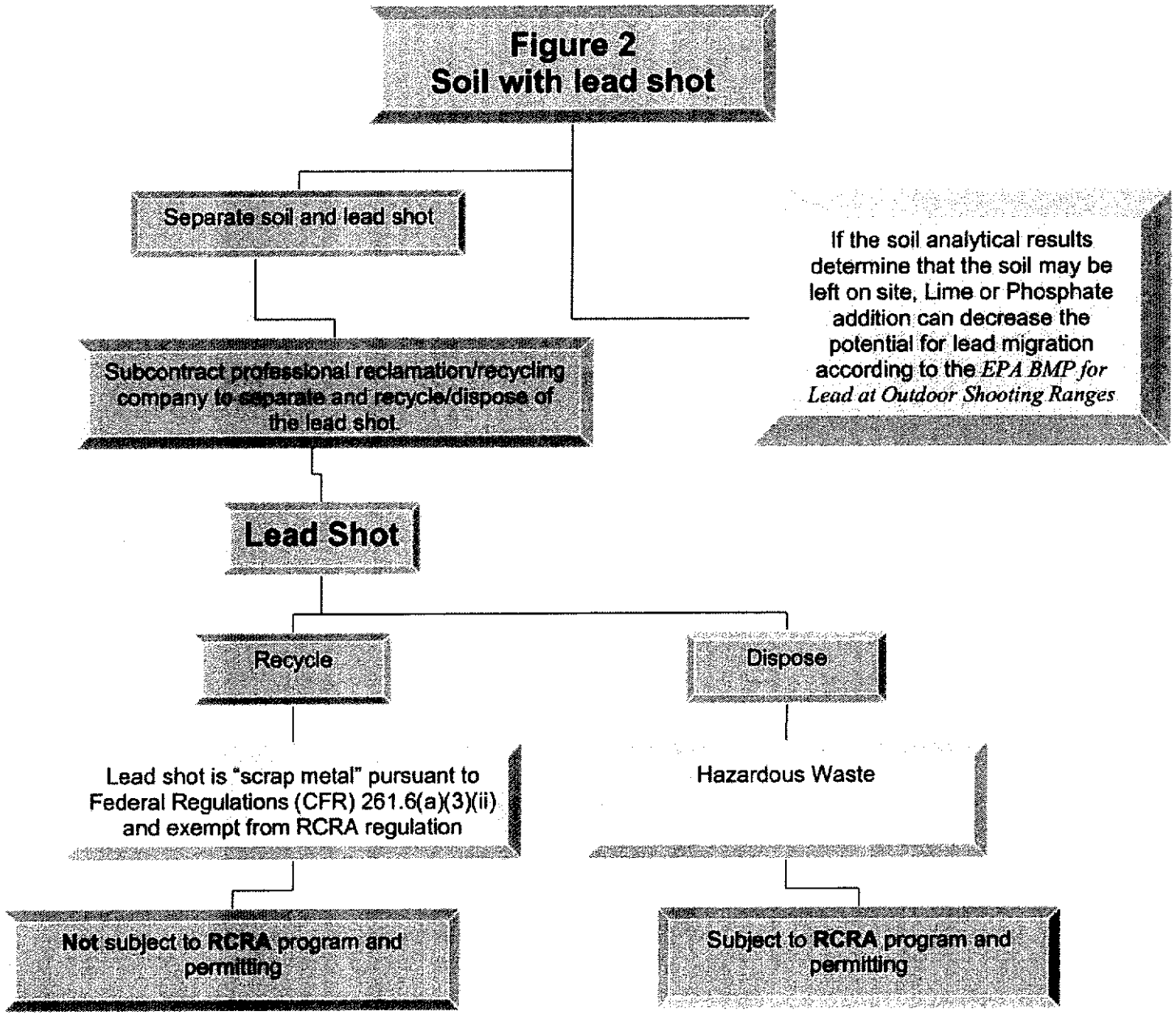


Figure 2
Soil with lead shot
Separate soil and lead shot
If the soil analytical results determine that the soil may be left on site, Lime or Phosphate addition can decrease the potential for lead migration according to the EPA BMP for Lead at Outdoor Shooting Ranges
Subcontract professional reclamation/recycling company to separate and recycle/dispose of the lead shot
Lead Shot
Recycle
Dispose
Lead shot is "scrap metal" pursuant to Federal Regulations (CFR) 261.6(a)(3)(ii) and exempt from RCRA regulation
Hazardous Waste
Not subject to RCRA program and permitting
Subject to RCRA program and permitting

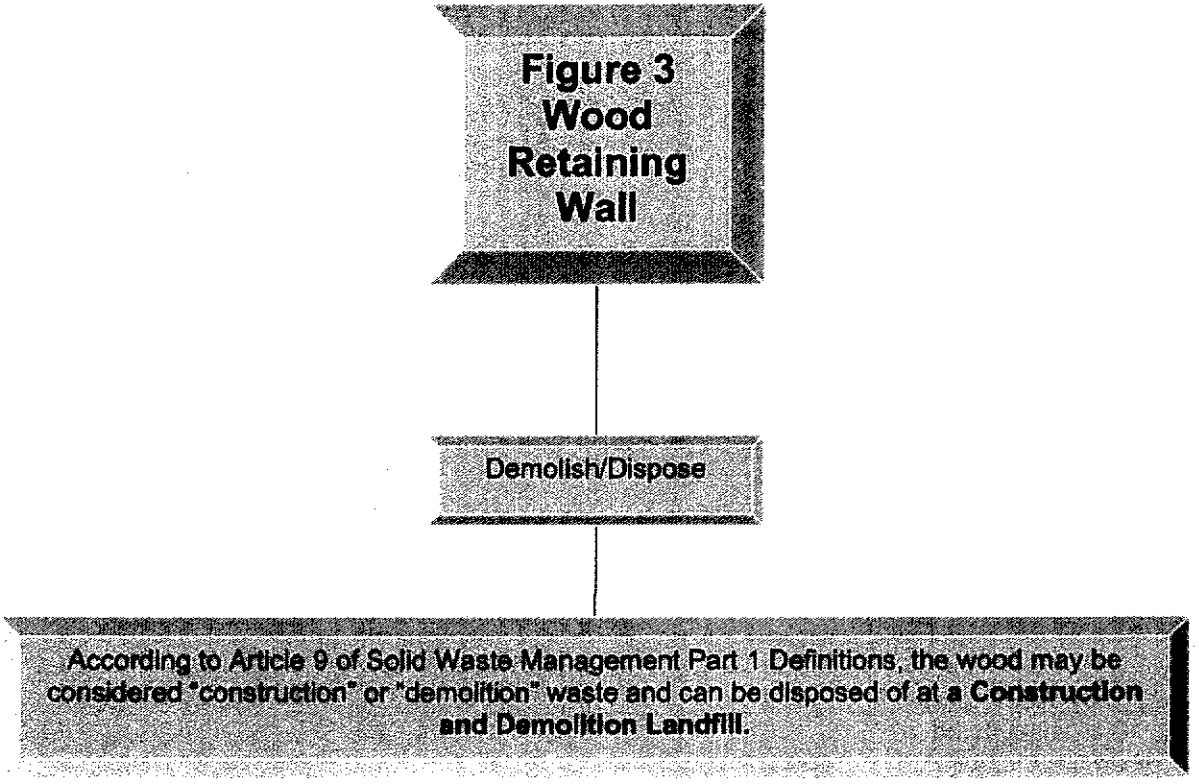
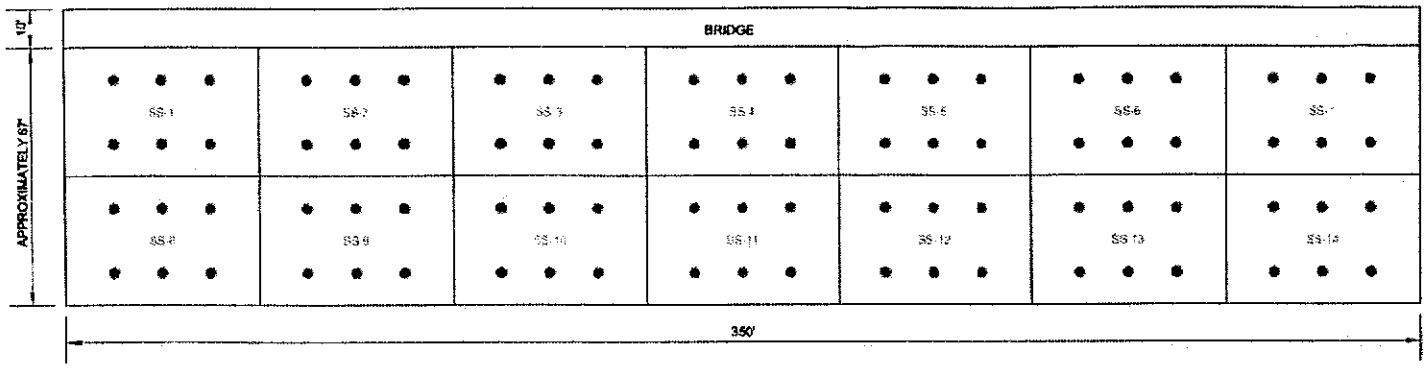
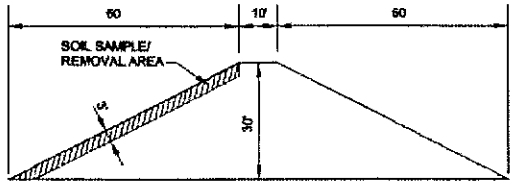


Figure 3
Wood
Retaining
Wall
Demolish/Dispose
According to Article 9 of Solid Waste Management Part 1 Definitions, the wood may be considered "construction" or "demolition" waste and can be disposed of at a Construction and Demolition Landfill.



FACE OF BERM TO BE REMOVED



CROSS SECTION OF BERM

NOTE

1. ALL DIMENSIONS ARE APPROXIMATE.
2. SIX INDIVIDUAL SOIL SAMPLES ARE TO BE COLLECTED FROM WITHINEACH OF THE FOURTEEN COMPOSITE GRID AREAS (SS-1 TO SS-14).
3. THE INDIVIDUAL SAMPLES WILL BE COLLECTED FROM APPROXIMATELY 6-INCHES UP TO 3 FEET BELOW GROUND SURFACE.
4. THE SIX SAMPLES FROM EACH COMPOSITE GRID AREA SHALL BE SCREENED TO SEPARATE LEAD SHOT FROM SOIL AND THEN COMBINED TO FORM ONE REPRESENTATIVE COMPOSITE SOIL SAMPLE FOR EACH OF THE FOURTEEN COMPOSITE GRID AREAS. THERE WILL BE A TOTAL OF FOURTEEN SAMPLES PREPARED AND SUBMITTED TO A CERTIFIED LABORATORY FOR ANALYSIS.

LEGEND

SS-1	COMPOSITE SAMPLE AREA
●	SAMPLE POINT LOCATION

30 0 30

GRAPHIC SCALE IN FEET

SCALE:	DATE:			FIGURE NO.
AS SHOWN	JANUARY 2007	S&ME ENVIRONMENTAL SERVICES · ENGINEERING TESTING	PROPOSED SAMPLING LOCATIONS CHERRY POINT RIFLE RANGE CHERRY POINT, NORTH CAROLINA	4
PROJECT NO. 1051-06-439	DRAWN BY: JCJ			
	CHECKED BY:			

Table 1
PROPOSED ENVIRONMENTAL SAMPLING AND ANALYSIS PROGRAM
PROPOSED RIFLE RANGE BERM MODIFICATIONS
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA
S&ME PROJECT NO. 1051-06-439

Sample Identification	Type	Matrix	Analysis Parameter/Method	Number of Samples
SS-1	Composite	Soil	TCLP-Lead	One sample from six primary samples
SS-2	Composite	Soil	TCLP-Lead	One sample from six primary samples
SS-3	Composite	Soil	TCLP-Lead/RCRA Metals	One sample from six primary samples
SS-4	Composite	Soil	TCLP-Lead	One sample from six primary samples
SS-5	Composite	Soil	TCLP-Lead	One sample from six primary samples
SS-6	Composite	Soil	TCLP-Lead/RCRA Metals	One sample from six primary samples
SS-7	Composite	Soil	TCLP-Lead	One sample from six primary samples
SS-8	Composite	Soil	TCLP-Lead	One sample from six primary samples
SS-9	Composite	Soil	TCLP-Lead/RCRA Metals	One sample from six primary samples
SS-10	Composite	Soil	TCLP-Lead	One sample from six primary samples
SS-11	Composite	Soil	TCLP-Lead	One sample from six primary samples
SS-12	Composite	Soil	TCLP-Lead/RCRA Metals	One sample from six primary samples
SS-13	Composite	Soil	TCLP-Lead	One sample from six primary samples
SS-14	Composite	Soil	TCLP-Lead	One sample from six primary samples

Note: Refer to Figure 4 for composite sampling locations

SECTION 02 83 13.00 20

LEAD IN CONSTRUCTION
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z88.2	(1992) Respiratory Protection

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.21	Safety Training and Education
29 CFR 1926.33	Access to Employee Exposure and Medical Records
29 CFR 1926.55	Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.59	Hazard Communication
29 CFR 1926.62	Lead
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

49 CFR 178 Specifications for Packaging

1.2 DEFINITIONS

1.2.1 Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period.

1.2.2 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations and has the authority to take prompt corrective actions to control the lead hazard. A Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene or a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals is the best choice.

1.2.3 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps. Excludes other forms of organic lead compounds.

1.2.4 Lead Permissible Exposure Limit (PEL)

Fifty micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a work day, the PEL shall be determined by the following formula:

PEL (micrograms/cubic meter of air) = 400/No. hrs worked per day

1.2.5 Material Containing Lead/Paint with Lead (MCL/PWL)

Any material, including paint, which contains lead as determined by the testing laboratory using a valid test method. The requirements of this section does not apply if no detectable levels of lead are found using a quantitative method for analyzing paint or MCL using laboratory instruments with specified limits of detection (usually 0.01%). An X-Ray Fluorescence (XRF) instrument is not considered a valid test method.

1.2.6 Personal Sampling

Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8 hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employees' work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of and centered at the nose or mouth of an employee.

1.2.7 Physical Boundary

Area physically roped or partitioned off around lead control area to limit unauthorized entry of personnel.

1.3 DESCRIPTION

1.3.1 Description of Work

Construction activities impacting PWL or material containing lead which are covered by this specification include the demolition and/or removal of soil at proposed Rifle Range. See soil sampling within the S&ME Sampling plan attached to Section 01 80 00 REPORTS.

1.3.2 Coordination with Other Work

The contractor shall coordinate with work being performed in adjacent areas. Coordination procedures shall be explained in the Plan and shall describe how the Contractor will prevent lead exposure to other contractors and/or Government personnel performing work unrelated to lead activities.

1.4 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Occupational and Environmental Assessment Data Report (if objective data is used to justify excluding the initial occupational exposure assessment); G

Lead Compliance Plan including CP approval (signature, date, and certification number); G

Competent Person qualifications; G

Training Certification of workers and supervisors; G

written evidence that TSD is approved for lead disposal; G

Certification of Medical Examinations; G

SD-06 Test Reports

sampling results; G

SD-07 Certificates

Testing laboratory qualifications; G

Third party consultant qualifications; G

Clearance Certification; G

SD-11 Closeout Submittals

Completed and signed hazardous waste manifest from treatment or disposal facility; G

Waste turn-in documents or weight tickets for non-hazardous wastes that are disposed of at sanitary or construction and demolition landfills; G

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

1.5.1.1 Competent Person (CP)

Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide documented construction project-related experience with implementation of OSHA's Lead in Construction standard (29 CFR 1926.62) which shows ability to assess occupational and environmental exposure to lead, experience with the use of respirators, personal protective equipment and other exposure reduction methods to protect employee health. Submit proper documentation that the CP is trained in accordance with Federal, State and local laws.

1.5.1.2 Training Certification

Submit a certificate for each worker and supervisor, signed and dated by the training provider, stating that the employee has received the required lead training specified in 29 CFR 1926.62(l).

1.5.1.3 Testing Laboratory

Submit the name, address, and telephone number of the testing laboratory selected to perform the air analysis, testing, and reporting of airborne concentrations of lead. Use a laboratory participating in the EPA National Lead Laboratory Accreditation Program (NLLAP) by being accredited by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis. Laboratories selected to perform blood lead analysis shall be OSHA approved.

1.5.1.4 Third Party Consultant Qualifications

Submit the name, address and telephone number of the third party consultant selected to perform the wipe sampling for determining concentrations of lead in dust. Submit proper documentation that the consultant is trained and certified as an inspector technician or inspector/risk assessor by the USEPA authorized State (or local) certification and accreditation program.

1.5.2 Requirements

1.5.2.1 Competent Person (CP) Responsibilities

a. Verify training meets all federal, State, and local requirements.

b. Review and approve Lead Compliance Plan for conformance to the applicable referenced standards.

c. Continuously inspect PWL or MCL work for conformance with the approved plan.

d. Perform (or oversee performance of) air sampling. Recommend upgrades or downgrades (whichever is appropriate based on exposure) on the use of PPE (respirators included) and engineering controls.

e. Ensure work is performed in strict accordance with specifications at all times.

f. Control work to prevent hazardous exposure to human beings and to the environment at all times.

g. Supervise final cleaning of the lead control area, take clearance wipe samples if necessary; review clearance sample results and make recommendations for further cleaning.

h. Certify the conditions of the work as called for elsewhere in this specification.

1.5.2.2 Lead Compliance Plan

Reference the S&ME Soil Sampling Plan attached to Section 01 80 00 REPORTS.

1.5.2.3 Occupational and Environmental Assessment Data Report

If initial monitoring is necessary, submit occupational and environmental sampling results to the Contracting Officer within three working days of collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.

1.5.2.4 Medical Examinations

Initial medical surveillance as required by 29 CFR 1926.62 shall be made available to all employees exposed to lead at any time (1 day) above the action level. Full medical surveillance shall be made available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by 29 CFR 1926.62. Adequate records shall show that employees meet the medical surveillance requirements of 29 CFR 1926.33, 29 CFR 1926.62 and 29 CFR 1926.103. Provide medical surveillance to all personnel exposed to lead as indicated in 29 CFR 1926.62. Maintain complete and accurate medical records of employees for the duration of employment plus 30 years.

1.5.2.5 Training

Train each employee performing work that disturbs lead, who performs MCL/PWL disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with 29 CFR 1926.21, 29 CFR 1926.62, and State and local regulations where appropriate.

1.5.2.6 Respiratory Protection Program

a. Provide each employee required to wear a respirator a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62.

b. Establish and implement a respiratory protection program as required by ANSI Z88.2, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

1.5.2.7 Hazard Communication Program

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

1.5.2.8 Environmental, Safety and Health Compliance

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, State, and local authorities regarding lead. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply.

1.5.3 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer to discuss in detail the S&ME Sampling Plan attached to Section 01 80 00 REPORTS, including procedures and precautions for the work.

1.6 EQUIPMENT

1.6.1 Respirators

Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust, fume and mist. Respirators shall comply with the requirements of 29 CFR 1926.62.

1.6.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with proper disposable protective whole body clothing, head covering, gloves, eye, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.6.3 Rental Equipment Notification

If rental equipment is to be used during PWL or MCL handling and disposal, notify the rental agency in writing concerning the intended use of the equipment.

1.6.4 Equipment for Government Personnel

Furnish the Contracting Officer with two complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the lead removal work within the lead controlled area. Personal protective equipment shall include disposable whole body covering, including appropriate foot, head, eye, and hand protection. PPE shall remain the property of the Contractor. The Government will provide respiratory protection for the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Notification

a. Notify the Contracting Officer 20 days prior to the start of any lead work.

3.1.1.2 Lead Control Area

a. Physical Boundary - Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that lead will not escape outside of the lead control area.

b. Warning Signs - Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

3.1.1.3 Decontamination Shower Facility

Provide clean and contaminated change rooms and shower facilities in accordance with this specification and 29 CFR 1926.62.

3.1.1.4 Eye Wash Station

Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.

3.1.1.5 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been appropriately trained and provided with protective equipment.

3.2 ERECTION

3.2.1 Lead Control Area Requirements

Establish a lead control area by completely establishing barriers and physical boundaries around the area or structure where PWL or MCL removal operations will be performed.

3.3 APPLICATION

3.3.1 Lead Work

Perform lead work in accordance with approved Lead Compliance Plan. Use procedures and equipment required to limit occupational exposure and environmental contamination with lead when the work is performed in accordance with 29 CFR 1926.62, and as specified herein. Dispose of all PWL

or MCL and associated waste in compliance with Federal, State, and local requirements.

3.3.2 Personnel Exiting Procedures

Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn in the control area:

a. Vacuum all clothing before entering the contaminated change room.

b. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.

c. Wash hands and face at the site, don appropriate disposable or uncontaminated reusable clothing, move to an appropriate shower facility, shower.

d. Change to clean clothes prior to leaving the clean clothes storage area.

3.4 FIELD QUALITY CONTROL

3.4.1 Tests

3.4.1.1 Air and Wipe Sampling

Conduct sampling for lead in accordance with 29 CFR 1926.62 and as specified herein.

a. Collect personal air samples on employees who are anticipated to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least twenty-five percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.

b. Submit results of air samples, signed by the CP, within 72 hours after the air samples are taken.

c. Conduct area air sampling daily, on each shift in which lead-based paint removal operations are performed, in areas immediately adjacent to the lead control area. Sufficient area monitoring shall be conducted to ensure unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the conditions(s) causing the increased levels. Notify the Contracting Officer immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after the CP and the Contracting Officer give approval.

3.4.1.2 Sampling After Removal

Reference the S&ME Soil Sampling Plan attached to Section 01 80 00 REPORTS.

3.4.1.3 Testing of Material Containing Lead Residue

Test residue in accordance with 40 CFR 261 for hazardous waste.

3.5 CLEANING AND DISPOSAL

3.5.1 Clearance Certification

For exterior work, soil samples taken at the exterior of the work site shall be used to determine if soil lead levels had increased at a statistically significant level (significant at the 95 percent confidence limit) from the soil lead levels prior to the operation. If soil lead levels either show a statistically significant increase above soil lead levels prior to work or soil lead levels above any applicable federal or state standard for lead in soil, the soil shall be remediated.

3.5.2 Disposal

Reference the S&ME Soil Sampling Plan attached to Section 01 80 00 REPORTS.

a. All material, whether hazardous or non-hazardous shall be disposed in accordance with all laws and provisions and all federal, State or local regulations. Ensure all waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements.

b. Contractor is responsible for segregation of waste. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing that may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 261.

c. Dispose of lead-contaminated material classified as hazardous waste at an EPA or State approved hazardous waste treatment, storage, or disposal facility off Government property.

d. Store waste materials in U.S. Department of Transportation (49 CFR 178) approved 55 gallon drums. Properly label each drum to identify the type of waste (49 CFR 172) and the date the drum was filled. For hazardous waste, the collection drum requires marking/labeling in accordance with 40 CFR 262 during the accumulation/collection timeframe. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.

e. Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.

3.5.2.1 Disposal Documentation

Submit written evidence to demonstrate the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA, State or local regulatory agencies. Submit one copy of the completed hazardous waste manifest, signed and dated by the initial transporter in accordance with 40 CFR 262. Contractor shall provide a certificate that the waste was accepted by the disposal facility. Provide turn-in documents or weight tickets for non-hazardous waste disposal.

3.5.2.2 Payment for Hazardous Waste

Payment for disposal of hazardous and non-hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials or non-hazardous waste delivered is returned and a copy is furnished to the Government.

-- End of Section --

SECTION 03 30 00.00 20

CAST-IN-PLACE CONCRETE
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ACI INTERNATIONAL (ACI)

ACI 117	(1990; R 2002) Standard Tolerances for Concrete Construction and Materials & Commentary
ACI 211.1	(1991; R 2002) Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 301	(2005) Specifications for Structural Concrete for Buildings
ACI 302.1R	(2004) Guide for Concrete Floor and Slab Construction
ACI 304.2R	(1996) Placing Concrete by Pumping Methods
ACI 304R	(2000) Guide for Measuring, Mixing, Transporting, and Placing Concrete
ACI 305R	(1999) Hot Weather Concreting
ACI 306.1	(1990; R 2002) Standard Specification for Cold Weather Concreting
ACI 318M/318RM	(2002) Metric Building Code Requirements for Structural Concrete and Commentary
ACI 347R	(2003) Guide to Formwork for Concrete
ACI SP-66	(2004) ACI Detailing Manual

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 182	(2005) Burlap Cloth Made from Jute or Kenaf

AMERICAN HARDBOARD ASSOCIATION (AHA)

AHA A135.4	(1995) Basic Hardboard

AMERICAN WELDING SOCIETY (AWS)

AWS D1.4	(1998) Structural Welding Code -

Reinforcing Steel

ASTM INTERNATIONAL (ASTM)

ASTM A 185	(2002) Steel Welded Wire Reinforcement, Plain, for Concrete
ASTM A 496	(2002) Steel Wire, Deformed, for Concrete Reinforcement
ASTM A 497	(2002) Steel Welded Wire Reinforcement, Deformed, for Concrete
ASTM A 615/A 615M	(2005a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 617/A 617M	(1996a) Axle-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 82	(2005) Steel Wire, Plain, for Concrete Reinforcement
ASTM C 1017/C 1017M	(2003) Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C 1107	(2005) Packaged Dry, Hydraulic-Cement Grout(Nonshrink)
ASTM C 143/C 143M	(2005) Slump of Hydraulic Cement Concrete
ASTM C 150	(2005) Portland Cement
ASTM C 171	(2003) Sheet Materials for Curing Concrete
ASTM C 172	(2004) Sampling Freshly Mixed Concrete
ASTM C 173/C 173M	(2001e1) Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C 192/C 192M	(2005) Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 227	(2003) Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
ASTM C 231	(2004) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(2001) Air-Entraining Admixtures for Concrete
ASTM C 295	(2003) Petrographic Examination of Aggregates for Concrete
ASTM C 309	(2003) Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 31/C 31M	(2003a) Making and Curing Concrete Test

	Specimens in the Field
ASTM C 33	(2003) Concrete Aggregates
ASTM C 39	(1993a) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 42/C 42M	(2004) Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 494/C 494M	(2005) Chemical Admixtures for Concrete
ASTM C 59/C 59M5	(2000; Rev A) Blended Hydraulic Cements
ASTM C 618	(2005) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 881	(1999) Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C 94/C 94M	(2004a) Ready-Mixed Concrete
ASTM C 989	(2005) Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
ASTM D 1751	(2004) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D 1752	(2004a) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

U.S. DEPARTMENT OF COMMERCE (DOC)

PS1	(1995) Construction and Industrial Plywood (APA V995)

1.2 DEFINITIONS

a. "Cementitious material" as used herein shall include all portland cement, pozzolan, fly ash, and ground iron blast-furnace slag.

b. "Exposed to public view" means situated so that it can be seen from eye level from a public location after completion of the building. A public location is accessible to persons not responsible for operation or maintenance of the building.

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Reinforcing steel

Reproductions of contract drawings are unacceptable.

SD-03 Product Data

Materials for curing concrete

Joint filler

Epoxy bonding compound

SD-05 Design Data

Concrete mix design

Thirty days minimum prior to concrete placement, submit a mix design for each strength and type of concrete. Submit a complete list of materials including type; brand; source and amount of cement, fly ash, pozzolans, ground slag, and admixtures; and applicable reference specifications. Provide mix proportion data using at least three different water-cement ratios for each type of mixture, which will produce a range of strength encompassing those required for each class and type of concrete required. If source material changes, resubmit mix proportion data using revised source material. No material shall be provided unless proven by trial mix studies to meet the requirements of this specification, unless otherwise approved in writing by the Contracting Officer. The submittal shall clearly indicate where each mix design will be used when more than one mix design is submitted. Submit additional data regarding concrete aggregates if the source of aggregate changes. In addition, copies of the fly ash, and pozzolan test results shall be submitted. The approval of fly ash, and pozzolan test results shall have been within 6 months of submittal date. Obtain acknowledgement of receipt prior to concrete placement.

SD-06 Test Reports

Concrete mix design

Fly ash

Pozzolan

Ground iron blast-furnace slag

Aggregates

Compressive strength tests

1.4 MODIFICATION OF REFERENCES

Accomplish work in accordance with ACI publications except as modified herein. Consider the advisory or recommended provisions to be mandatory, as though the word "shall" had been substituted for the words "should" or "could" or "may," wherever they appear. Interpret reference to the "Building Official," the "Structural Engineer," and the "Architect/Engineer" to mean the Contracting Officer.

1.5 DELIVERY, STORAGE, AND HANDLING

Do not deliver concrete until vapor barrier, forms, reinforcement, embedded items, and chamfer strips are in place and ready for concrete placement. ACI 301 for job site storage of materials. Protect materials from contaminants such as grease, oil, and dirt. Ensure materials can be accurately identified after bundles are broken and tags removed.

1.5.1 Reinforcement

Store reinforcement of different sizes and shapes in separate piles or racks raised above the ground to avoid excessive rusting. Protect from contaminants such as grease, oil, and dirt. Ensure bar sizes can be accurately identified after bundles are broken and tags removed.

1.6 Quality Assurance

1.6.1 Design Data

1.6.2 Drawings

1.6.2.1 Reinforcing Steel

ACI SP-66. Indicate bending diagrams, assembly diagrams, splicing and laps of bars, shapes, dimensions, and details of bar reinforcing, accessories, and concrete cover. Do not scale dimensions from structural drawings to determine lengths of reinforcing bars.

1.6.3 Control Submittals

1.6.4 Test Reports

1.6.4.1 Concrete Mix Design

Submit copies of laboratory test reports showing that the mix has been successfully tested to produce concrete with the properties specified and that mix will be suitable for the job conditions. The laboratory test reports shall include mill test and all other test for cement, aggregates, and admixtures. Provide maximum nominal aggregate size, gradation analysis, percentage retained and passing sieve, and a graph of percentage retained verses sieve size. Test reports shall be submitted along with the concrete mix design. Obtain approval before concrete placement.

1.6.4.2 Fly Ash and Pozzolan

Submit test results in accordance with ASTM C 618 for fly ash and pozzolan. Submit test results performed within 6 months of submittal date.

1.6.4.3 Ground Iron Blast-Furnace Slag

Submit test results in accordance with ASTM C 989 for ground iron blast-furnace slag. Submit test results performed within 6 months of submittal date.

1.6.4.4 Aggregates

ASTM C 227 for potential alkali-silica reactions, ASTM C 295 for petrographic analysis.

PART 2 PRODUCTS

2.1 MATERIALS FOR FORMS

Provide wood, plywood, or steel. Use plywood or steel forms where a smooth form finish is required. Lumber shall be square edged or tongue-and-groove boards, free of raised grain, knotholes, or other surface defects. Plywood: PS1, B-B concrete form panels or better or AHA A135.4, hardboard for smooth form lining. Steel form surfaces shall not contain irregularities, dents, or sags.

2.2 FORM TIES AND ACCESSORIES

The use of wire alone is prohibited. Form ties and accessories shall not reduce the effective cover of the reinforcement.

2.3 CONCRETE

2.3.1 Contractor-Furnished Mix Design

ACI 211.1, ACI 301, ACI 318M/318RM and ACI 304.2R except as otherwise specified. The compressive strength (f'c) of the concrete for each portion of the structure(s) shall be as indicated and as specified below.

Location	f'c (Min. 28-Day Comp. Strength) (psi)	ASTM C 33 Maximum Nominal Aggregate (Size No.)	Range of Slump (inches)	Maximum Water-Cement Ratio (by weight)	Air Entr. (percent)
All Concrete	4000	57	2-4	0.50	6

Maximum slump shown above may be increased 1 inch for methods of consolidation other than vibration. Slump may be increased to 8 inches when superplasticizers are used. Provide air entrainment using air-entraining admixture. Air entrainment shall be within plus or minus 1.5 percent of the value specified. The water soluble chloride ion concentrations in hardened concrete at ages from 28 to 42 days shall not exceed 0.30.

2.3.1.1 Mix Proportions for Normal Weight Concrete

Trial design batches, mixture proportioning studies, and testing requirements for various classes and types of concrete specified shall be the responsibility of the Contractor. Mixture proportions shall be based on compressive strength as determined by test specimens fabricated in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 39. Samples of all materials used in mixture proportioning studies shall be representative of those proposed for use in the project and shall be accompanied by the manufacturer's or producer's test report indicating compliance with these specifications. Trial mixtures having proportions, consistencies, and air content suitable for the work shall be made based on methodology described in ACI 211.1. The trial mixture shall use at least three different water-cement ratios for each type of mixture, which will produce a range of strength encompassing those required for each class and type of concrete required on the project. The maximum water-cement ratio required will be based on equivalent water-cement ratio calculations as

determined by the conversion from the weight ratio of water to cement plus pozzolan, and ground granulated blast-furnace slag by weight equivalency method. Laboratory trial mixture shall be designed for maximum permitted slump and air content. Each combination of material proposed for use shall have separate trial mixture, except for accelerator or retarder use can be provided without separate trial mixture. The temperature of concrete in each trial batch shall be reported. For each water-cement ratio, at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 39 for 7 and 28 days. From these results, a curve shall be plotted showing the relationship between water-cement ratio and strength for each set of trial mix studies. In addition a curve shall be plotted showing the relationship between 7 and 28 day strengths.

2.3.1.2 Required Average Strength of Mix Design

The selected mixture shall produce an average compressive strength exceeding the specified strength by the amount indicated in ACI 301. When a concrete production facility has a record of at least 15 consecutive tests, the standard deviation shall be calculated and the required average compressive strength shall be determined in accordance with ACI 301. When a concrete production facility does not have a suitable record of tests to establish a standard deviation, the required average strength shall be as follows:

a. For f'c less than 3000 psi, 1000 psi plus f'c.

b. For f'c between 3000 and 5000 psi, 1200 psi plus f'c.

c. For f'c over 5000 psi, 1400 psi plus f'c.

2.4 MATERIALS

2.4.1 Cement

ASTM C 150, Type I or II or ASTM C 59/C 59M5, Type IP(MS) or IS(MS) blended cement except as modified herein. The blended cement shall consist of a mixture of ASTM C 150, Type II, cement and one of the following materials: ASTM C 618 pozzolan or fly ash, ASTM C 989 ground iron blast-furnace slag. The pozzolan or fly ash content shall not exceed 25 percent by weight of the total cementitious material. The ground iron blast-furnace slag shall not exceed 50 percent by weight of total cementitious material. For exposed concrete, use one manufacturer for each type of cement, ground slag, fly ash, and pozzolan.

2.4.1.1 Fly Ash and Pozzolan

ASTM C 618, Type N, F, or C, except that the maximum allowable loss on ignition shall be 6 percent for Types N and F. Add with cement.

2.4.1.2 Ground Iron Blast-Furnace Slag

ASTM C 989, Grade 120.

2.4.2 Water

Water shall be fresh, clean, and potable; free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances deleterious to concrete.

2.4.3 Aggregates

ASTM C 33, except as modified herein. Furnish aggregates for exposed concrete surfaces from one source. Aggregates shall not contain any substance which may be deleteriously reactive with the alkalies in the cement. Aggregates shall show expansions less than 0.10 percent at 6 months when tested in accordance with ASTM C 227 using a cement with an alkali content above 0.8 percent (expressed as sodium oxide), and shall not possess properties or constituents that are known to have specific unfavorable effects in concrete when tested in accordance with ASTM C 295.

2.4.3.1 Aggregrates/Combined Aggregrate Gradation (Floor Slabs Only)

ASTM C 33, uniformly graded and as follows: Nominal maximum aggregrate size of 1 inch. A combined sieve analysis shall indicate a well graded aggregrate from coarsest to finest with not more than 18 percent and not less than 8 percent retained on an individual sieve, except that less than 8 percent may be retained on coarsest sieve and on No. 50 (0.3mm) sieve, and less than 8 percent may be retained on sieves finer than No. 50 (0.3mm). Sand shall be at least 50 percent natural sand.

2.4.4 Nonshrink Grout

ASTM C 1107.

2.4.5 Admixtures

ASTM C 494/C 494M: Type A, water reducing; Type B, retarding; Type C, accelerating; Type D, water-reducing and retarding; and Type E, water-reducing and accelerating admixture. Do not use calcium chloride admixtures.

2.4.5.1 Air-Entraining

ASTM C 260.

2.4.5.2 High Range Water Reducer (HRWR) (Superplasticizers)

ASTM C 494/C 494M, Type F and Type G (HRWR retarding admixture)and ASTM C 1017/C 1017M.

2.4.6 Materials for Curing Concrete

2.4.6.1 Impervious Sheeting

ASTM C 171; waterproof paper, clear or white polyethylene sheeting, or polyethylene-coated burlap.

2.4.6.2 Pervious Sheeting

AASHTO M 182.

2.4.6.3 Liquid Membrane-Forming Compound

ASTM C 309, white-pigmented, Type 2, Class B.

2.4.7 Liquid Chemical Sealer-Hardener Compound

Compound shall be magnesium fluosilicate which when mixed with water seals and hardens the surface of the concrete. Do not use on exterior slabs exposed to freezing conditions. Compound shall not reduce the adhesion of resilient flooring, tile, paint, roofing, waterproofing, or other material applied to concrete.

2.4.8 Expansion/Contraction Joint Filler

ASTM D 1751, ASTM D 1752, or 100% recycled material meeting ASTM D 1752 (subparagraphs 5.1 to 5.4). Material shall be 1/2 inch thick, unless otherwise indicated.

2.4.9 Epoxy Bonding Compound

ASTM C 881. Provide Type I for bonding hardened concrete to hardened concrete; Type II for bonding freshly mixed concrete to hardened concrete; and Type III as a binder in epoxy mortar or concrete, or for use in bonding skid-resistant materials to hardened concrete. Provide Grade 1 or 2 for horizontal surfaces and Grade 3 for vertical surfaces. Provide Class A if placement temperature is below 40 degrees F; Class B if placement temperature is between 40 and 60 degrees F; or Class C if placement temperature is above 60 degrees F.

2.4.10 Biodegradable Form Release Agent

Form release agent shall be biodegradable with a maximum of 350 grams/liter (g/l) volatile organic compounds (VOCs). Product shall not bond with, stain, or adversely affect concrete surfaces and shall not impair subsequent treatments of concrete surfaces. The form release agent shall not contain diesel fuel, petroleum-based lubricating oils, waxes, or kerosene.

2.5 REINFORCEMENT

2.5.1 Reinforcing Bars

ACI 301 unless otherwise specified. ASTM A 615/A 615M and ASTM A 617/A 617M with the bars marked A, S, W, Grade 60.

2.5.2 Mechanical Reinforcing Bar Connectors

ACI 301. Provide 125 percent minimum yield strength of the reinforcement bar.

2.5.3 Welded Wire Fabric

ASTM A 185 or ASTM A 497. Provide flat sheets of welded wire fabric for slabs and toppings.

2.5.4 Wire

ASTM A 82 or ASTM A 496.

2.5.5 Reinforcing Bar Supports

Provide bar ties and supports of coated or non corrodible material.

PART 3 EXECUTION

3.1 FORMS

ACI 301. Provide forms, shoring, and scaffolding for concrete placement. Set forms mortar-tight and true to line and grade. Chamfer above grade exposed joints, edges, and external corners of concrete 0.75 inch unless otherwise indicated. Provide formwork with clean-out openings to permit inspection and removal of debris. Forms submerged in water shall be watertight.

3.1.1 Coating

Before concrete placement, coat the contact surfaces of forms with a nonstaining mineral oil, nonstaining form coating compound, or two coats of nitrocellulose lacquer. Do not use mineral oil on forms for surfaces to which adhesive, paint, or other finish material is to be applied.

3.1.2 Removal of Forms and Supports

After placing concrete, forms shall remain in place for the time periods specified in ACI 347R. Prevent concrete damage during form removal.

3.1.2.1 Special Requirements for Reduced Time Period

Forms may be removed earlier than specified if ASTM C 39 test results of field-cured samples from a representative portion of the structure indicate that the concrete has reached a minimum of 85 percent of the design strength.

3.2 Formed Surfaces

3.2.1 Tolerances

ACI 347R and as indicated.

3.2.2 As-Cast Form

Provide form facing material producing a smooth, hard, uniform texture on the concrete. Arrange facing material in an orderly and symmetrical manner and keep seams to a practical minimum. Support forms as necessary to meet required tolerances. Material with raised grain, torn surfaces, worn edges, patches, dents, or other defects which will impair the texture of the concrete surface shall not be used.

3.3 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS

ACI 301. Provide bars, wire fabric, wire ties, supports, and other devices necessary to install and secure reinforcement. Reinforcement shall not have rust, scale, oil, grease, clay, or foreign substances that would reduce the bond. Rusting of reinforcement is a basis of rejection if the effective cross-sectional area or the nominal weight per unit length has been reduced. Remove loose rust prior to placing steel. Tack welding is prohibited.

3.3.1 Reinforcement Supports

Place reinforcement and secure with galvanized or non corrodible chairs, spacers, or metal hangers. For supporting reinforcement on the ground, use

concrete or other non corrodible material, having a compressive strength equal to or greater than the concrete being placed.

3.3.2 Splicing

As indicated. For splices not indicated ACI 301. Do not splice at points of maximum stress. Overlap welded wire fabric the spacing of the cross wires, plus 2 inches. AWS D1.4. Welded splices shall be approved prior to use.

3.3.3 Future Bonding

Plug exposed, threaded, mechanical reinforcement bar connectors with a greased bolt. Bolt threads shall match the connector. Countersink the connector in the concrete. Calk the depression after the bolt is installed.

3.3.4 Cover

ACI 301 for minimum coverage, unless otherwise indicated.

3.3.5 Setting Miscellaneous Material

Place and secure anchors and bolts, pipe sleeves, conduits, and other such items in position before concrete placement. Plumb anchor bolts and check location and elevation. Temporarily fill voids in sleeves with readily removable material to prevent the entry of concrete.

3.3.6 Construction Joints

Locate joints to least impair strength. Continue reinforcement across joints unless otherwise indicated.

3.3.7 Expansion Joints and Contraction Joints

Make expansion joints 1/2 inch wide unless indicated otherwise. Completely fill joints exposed to weather with joint filler material and joint sealant. Do not extend reinforcement or other embedded metal items bonded to the concrete through any expansion joint unless an expansion sleeve is used. Provide contraction joints, either formed or saw cut or cut with a jointing tool, to the indicated depth after the surface has been finished. Sawed joints shall be completed within 4 to 12 hours after concrete placement. Protect joints from intrusion of foreign matter.

3.4 BATCHING, MEASURING, MIXING, AND TRANSPORTING CONCRETE

ASTM C 94/C 94M, ACI 301, ACI 302.1R, and ACI 304R, except as modified herein. Batching equipment shall be such that the concrete ingredients are consistently measured within the following tolerances: 1 percent for cement and water, 2 percent for aggregate, and 3 percent for admixtures. Furnish mandatory batch ticket information for each load of ready mix concrete.

3.4.1 Measuring

Make measurements at intervals as specified in paragraphs entitled "Sampling" and "Testing."

3.4.2 Mixing

ASTM C 94/C 94M and ACI 301. Machine mix concrete. Begin mixing within 30

minutes after the cement has been added to the aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates if the air temperature is less than 85 degrees F. Reduce mixing time and place concrete within 60 minutes if the air temperature is greater than 85 degrees F except as follows: if set retarding admixture is used and slump requirements can be met, limit for placing concrete may remain at 90 minutes. Additional water may be added, provided that both the specified maximum slump and water-cement ratio are not exceeded. When additional water is added, an additional 30 revolutions of the mixer at mixing speed is required. If the entrained air content falls below the specified limit, add a sufficient quantity of admixture to bring the entrained air content within the specified limits. Dissolve admixtures in the mixing water and mix in the drum to uniformly distribute the admixture throughout the batch.

3.4.3 Transporting

Transport concrete from the mixer to the forms as rapidly as practicable. Prevent segregation or loss of ingredients. Clean transporting equipment thoroughly before each batch. Do not use aluminum pipe or chutes. Remove concrete which has segregated in transporting and dispose of as directed.

3.5 PLACING CONCRETE

Place concrete as soon as practicable after the forms and the reinforcement have been inspected and approved. Do not place concrete when weather conditions prevent proper placement and consolidation; in uncovered areas during periods of precipitation; or in standing water. Prior to placing concrete, remove dirt, construction debris, water, snow, and ice from within the forms. Deposit concrete as close as practicable to the final position in the forms. Do not exceed a free vertical drop of 3 feet from the point of discharge. Place concrete in one continuous operation from one end of the structure towards the other. Position grade stakes on 10 foot centers maximum in each direction when pouring interior slabs and on 20 foot centers maximum for exterior slabs.

3.5.1 Footing Placement

Concrete for footings may be placed in excavations without forms upon inspection and approval by the Contracting Officer. Excavation width shall be a minimum of 4 inches greater than indicated.

3.5.2 Vibration

ACI 301. Furnish a spare, working, vibrator on the job site whenever concrete is placed. Consolidate concrete slabs greater than 4 inches in depth with high frequency mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 4 inches or less in depth by wood tampers, spading, and settling with a heavy leveling straightedge. Operate internal vibrators with vibratory element submerged in the concrete, with a minimum frequency of not less than 6000 impulses per minute when submerged. Do not use vibrators to transport the concrete in the forms. Insert and withdraw vibrators approximately 18 inches apart. Penetrate the previously placed lift with the vibrator when more than one lift is required. Place concrete in 18 inch maximum vertical lifts. External vibrators shall be used on the exterior surface of the forms when internal vibrators do not provide adequate consolidation of the concrete.

3.5.3 Application of Epoxy Bonding Compound

Apply a thin coat of compound to dry, clean surfaces. Scrub compound into the surface with a stiff-bristle brush. Place concrete while compound is stringy. Do not permit compound to harden prior to concrete placement. Follow manufacturer's instructions regarding safety and health precautions when working with epoxy resins.

3.5.4 Pumping

ACI 304R and ACI 304.2R. Pumping shall not result in separation or loss of materials nor cause interruptions sufficient to permit loss of plasticity between successive increments. Loss of slump in pumping equipment shall not exceed 2 inches. Concrete shall not be conveyed through pipe made of aluminum or aluminum alloy. Rapid changes in pipe sizes shall be avoided. Maximum size of course aggregate shall be limited to 33 percent of the diameter of the pipe. Maximum size of well rounded aggregate shall be limited to 40 percent of the pipe diameter. Samples for testing shall be taken at both the point of delivery to the pump and at the discharge end.

3.5.5 Cold Weather

ACI 306.1. Do not allow concrete temperature to decrease below 50 degrees F Obtain approval prior to placing concrete when the ambient temperature is below 40 degrees F or when concrete is likely to be subjected to freezing temperatures within 24 hours. Cover concrete and provide sufficient heat to maintain 50 degrees F minimum adjacent to both the formwork and the structure while curing. Limit the rate of cooling to 5 degrees F in any 1 hour and 50 degrees F per 24 hours after heat application.

3.5.6 Hot Weather

ACI 305R. Maintain required concrete temperature using Figure 2.1.5 in ACI 305R to prevent the evaporation rate from exceeding 0.2 pound of water per square foot of exposed concrete per hour. Cool ingredients before mixing or use other suitable means to control concrete temperature and prevent rapid drying of newly placed concrete. Shade the fresh concrete as soon as possible after placing. Start curing when the surface of the fresh concrete is sufficiently hard to permit curing without damage. Provide water hoses, pipes, spraying equipment, and water hauling equipment, where job site is remote to water source, to maintain a moist concrete surface throughout the curing period. Provide burlap cover or other suitable, permeable material with fog spray or continuous wetting of the concrete when weather conditions prevent the use of either liquid membrane curing compound or impervious sheets. For vertical surfaces, protect forms from direct sunlight and add water to top of structure once concrete is set.

3.6 SURFACE FINISHES

3.6.1 Defects

Repair formed surfaces by removing minor honeycombs, pits greater than 1 square inch surface area or 0.25 inchmaximum depth, or otherwise defective areas. Provide edges perpendicular to the surface and patch with nonshrink grout. Patch tie holes and defects when the forms are removed. Concrete with extensive honeycomb including exposed steel reinforcement, cold joints, entrapped debris, separated aggregate, or other defects which affect the serviceability or structural strength will be rejected, unless correction of defects is approved. Obtain approval of corrective action

prior to repair. The surface of the concrete shall not vary more than the allowable tolerances of ACI 347R. Exposed surfaces shall be uniform in appearance and finished to a smooth form finish unless otherwise specified.

3.6.2 Not Against Forms (Top of Walls)

Surfaces not otherwise specified shall be finished with wood floats to even surfaces. Finish shall match adjacent finishes.

3.6.3 Formed Surfaces

3.6.3.1 Tolerances

ACI 117 and as indicated.

3.6.3.2 As-Cast Rough Form

Provide for surfaces not exposed to public view. Patch this holes and defects and level abrupt irregularities. Remove or rub off fins and other projections exceeding 0.25 inch in height.

3.7 CURING AND PROTECTION

ACI 301 unless otherwise specified. Begin curing immediately following form removal. Avoid damage to concrete from vibration created by blasting, pile driving, movement of equipment in the vicinity, disturbance of formwork or protruding reinforcement, and any other activity resulting in ground vibrations. Protect concrete from injurious action by sun, rain, flowing water, frost, mechanical injury, tire marks, and oil stains. Do not allow concrete to dry out from time of placement until the expiration of the specified curing period. Do not use membrane-forming compound on surfaces where appearance would be objectionable, on any surface to be painted, where coverings are to be bonded to the concrete, or on concrete to which other concrete is to be bonded. If forms are removed prior to the expiration of the curing period, provide another curing procedure specified herein for the remaining portion of the curing period. Provide moist curing for those areas receiving liquid chemical sealer-hardener or epoxy coating.

3.7.1 Moist Curing

Remove water without erosion or damage to the structure.

3.7.1.1 Ponding or Immersion

Continually immerse the concrete throughout the curing period. Water shall not be more than 20 degrees F less than the temperature of the concrete. For temperatures between 40 and 50 degrees F, increase the curing period by 50 percent.

3.7.1.2 Fog Spraying or Sprinkling

Apply water uniformly and continuously throughout the curing period. For temperatures between 40 and 50 degrees F, increase the curing period by 50 percent.

3.7.1.3 Pervious Sheeting

Completely cover surface and edges of the concrete with two thicknesses of

wet sheeting. Overlap sheeting 6 inches over adjacent sheeting. Sheeting shall be at least as long as the width of the surface to be cured. During application, do not drag the sheeting over the finished concrete nor over sheeting already placed. Wet sheeting thoroughly and keep continuously wet throughout the curing period.

3.7.1.4 Impervious Sheeting

Wet the entire exposed surface of the concrete thoroughly with a fine spray of water and cover with impervious sheeting throughout the curing period. Lay sheeting directly on the concrete surface and overlap edges 12 inches minimum. Provide sheeting not less than 18 inches wider than the concrete surface to be cured. Secure edges and transverse laps to form closed joints. Repair torn or damaged sheeting or provide new sheeting. Cover or wrap columns, walls, and other vertical structural elements from the top down with impervious sheeting; overlap and continuously tape sheeting joints; and introduce sufficient water to soak the entire surface prior to completely enclosing.

3.7.2 Liquid Membrane-Forming Curing Compound

Seal or cover joint openings prior to application of curing compound. Prevent curing compound from entering the joint. Apply in accordance with the recommendations of the manufacturer immediately after any water sheen which may develop after finishing has disappeared from the concrete surface. Provide and maintain compound on the concrete surface throughout the curing period. Do not use this method of curing where the use of Figure 2.1.5 in ACI 305R indicates that hot weather conditions will cause an evaporation rate exceeding 0.2 pound of water per square foot per hour.

3.7.2.1 Application

Unless the manufacturer recommends otherwise, apply compound immediately after the surface loses its water sheen and has a dull appearance, and before joints are sawed. Mechanically agitate curing compound thoroughly during use. Use approved power-spraying equipment to uniformly apply two coats of compound in a continuous operation. The total coverage for the two coats shall be 200 square feet maximum per gallon of undiluted compound unless otherwise recommended by the manufacturer's written instructions. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel. Immediately apply an additional coat of compound to areas where the film is defective. Re-spray concrete surfaces subjected to rainfall within 3 hours after the curing compound application.

3.7.2.2 Protection of Treated Surfaces

Prohibit pedestrian and vehicular traffic and other sources of abrasion at least 72 hours after compound application. Maintain continuity of the coating for the entire curing period and immediately repair any damage.

3.7.3 Liquid Chemical Sealer-Hardener

Apply sealer-hardener to interior floors not receiving floor covering and floors located under access flooring. Apply the sealer-hardener in accordance with manufacturer's recommendations. Seal or cover joints and openings in which joint sealant is to be applied as required by the joint sealant manufacturer. The sealer-hardener shall not be applied until the concrete has been moist cured and has aged for a minimum of 30 days. Apply a minimum of two coats of sealer-hardener.

3.7.4 Curing Periods

ACI 301 except 10 days for retaining walls, pavement or chimneys, 21 days for concrete that will be in full-time or intermittent contact with seawater, salt spray, alkali soil or waters. Begin curing immediately after placement. Protect concrete from premature drying, excessively hot temperatures, and mechanical injury; and maintain minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete. The materials and methods of curing shall be subject to approval by the Contracting Officer.

3.8 FIELD QUALITY CONTROL

3.8.1 Sampling

ASTM C 172. Collect samples of fresh concrete to perform tests specified. ASTM C 31/C 31M for making test specimens.

3.8.2 Testing

3.8.2.1 Slump Tests

ASTM C 143/C 143M. Take concrete samples during concrete placement. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cement ratio is not exceeded. Perform tests at commencement of concrete placement, when test cylinders are made, and for each batch (minimum) or every 20 cubic yards (maximum) of concrete.

3.8.2.2 Temperature Tests

Test the concrete delivered and the concrete in the forms. Perform tests in hot or cold weather conditions (below 50 degrees F and above 80 degrees F) for each batch (minimum) or every 20 cubic yards (maximum) of concrete, until the specified temperature is obtained, and whenever test cylinders and slump tests are made.

3.8.2.3 Compressive Strength Tests

ASTM C 39. Make five test cylinders for each set of tests in accordance with ASTM C 31/C 31M. Precautions shall be taken to prevent evaporation and loss of water from the specimen. Test two cylinders at 7 days, two cylinders at 28 days, and hold one cylinder in reserve. Samples for strength tests of each mix design of concrete placed each day shall be taken not less than once a day, nor less than once for each 100 cubic yards of concrete, nor less than once for each 5000 square feet of surface area for slabs or walls. For the entire project, take no less than five sets of samples and perform strength tests for each mix design of concrete placed. Each strength test result shall be the average of two cylinders from the same concrete sample tested at 28 days. If the average of any three consecutive strength test results is less than f'c or if any strength test result falls below f'c by more than 500 psi, take a minimum of three ASTM C 42/C 42M core samples from the in-place work represented by the low test cylinder results and test. Concrete represented by core test shall be considered structurally adequate if the average of three cores is equal to at least 85 percent of f'c and if no single core is less than 75 percent of f'c. Locations represented by erratic core strengths shall be retested. Remove concrete not meeting strength criteria and provide new acceptable

concrete. Repair core holes with nonshrink grout. Match color and finish of adjacent concrete.

3.8.2.4 Air Content

ASTM C 173/C 173M or ASTM C 231 for normal weight concrete. Test air-entrained concrete for air content at the same frequency as specified for slump tests.

-- End of Section --

SECTION 31 00 00

EARTHWORK
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO T 180	(2001; R 2004) Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop
AASHTO T 224	(2001) Standard Method of Test for Correction for Coarse Particles in the Soil Compaction Test

ASTM INTERNATIONAL (ASTM)

ASTM C 136	(2005) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C 33	(2003) Concrete Aggregates
ASTM D 1140	(2000) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D 1556	(2000) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(2002e1) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))
ASTM D 2167	(1994; R 2001) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2434	(1968; R 2000) Permeability of Granular Soils (Constant Head)
ASTM D 2487	(2000) Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(2004) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 422	(1963; R 2002) Particle-Size Analysis of Soils

ASTM D 4318	(2000) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 698	(2000ae1) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))

1.2 DEFINITIONS

1.2.1 Satisfactory Materials

Satisfactory materials shall comprise any materials classified by ASTM D 2487 as SP, SP-SM, SP-SC, SM, SC, SW, SP-SW.

1.2.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills; trash; refuse; backfills from previous construction; and material classified as satisfactory which contains root and other organic matter or frozen material. The Contracting Officer shall be notified of any contaminated materials.

1.2.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic. Testing required for classifying materials shall be in accordance with ASTM D 4318, ASTM C 136, ASTM D 422, and ASTM D 1140.

1.2.4 Degree of Compaction

Degree of compaction required, except as noted in the second sentence, is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated as a percent of laboratory maximum density. Since ASTM D 1557 applies only to soils that have 30 percent or less by weight of their particles retained on the 3/4 inch sieve, the degree of compaction for material having more than 30 percent by weight of their particles retained on the 3/4 inch sieve shall be expressed as a percentage of the maximum density in accordance with AASHTO T 180 Method D and corrected with AASHTO T 224. To maintain the same percentage of coarse material, the "remove and replace" procedure as described in the NOTE 8 in Paragraph 7.2 of AASHTO T 180 shall be used.

1.2.5 Topsoil

Material suitable for topsoils obtained from offsite areas is defined as: Natural, friable soil representative of productive, well-drained soils in the area, free of subsoil, stumps, brush, weeds, toxic substances, and other material detrimental to plant growth. Amend topsoil pH range to obtain a pH of 6.5 to 8.5.

1.2.6 Hard/Unyielding Materials

Weathered rock, dense consolidated deposits, or conglomerate materials

which are not included in the definition of "rock" with stones greater than 3 inches in any dimension or as defined by the pipe manufacturer, whichever is smaller. These materials usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

1.2.7 Rock

Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 1/2 cubic yard in volume. Removal of hard material will not be considered rock excavation because of intermittent drilling and blasting that is performed merely to increase production.

1.2.8 Unstable Material

Unstable material shall consist of materials too wet to properly support the utility pipe, conduit, or appurtenant structure.

1.2.9 Select Granular Material

1.2.9.1 General Requirements

Select granular material shall consist of materials classified as GW, GP, SW, SP by ASTM D 2487 where indicated. The liquid limit of such material shall not exceed 35 percent when tested in accordance with ASTM D 4318. The plasticity index shall not be greater than 12 percent when tested in accordance with ASTM D 4318, and not more than 35 percent by weight shall be finer than No. 200 sieve when tested in accordance with ASTM D 1140. Coefficient of permeability shall be a minimum of 0.002 feet per minute when tested in accordance with ASTM D 2434.

1.2.10 Initial Backfill Material

Initial backfill shall consist of select granular material or satisfactory materials free from rocks 3 inches or larger in any dimension or free from rocks of such size as recommended by the pipe manufacturer, whichever is smaller. When the pipe is coated or wrapped for corrosion protection, the initial backfill material shall be free of stones larger than 3 inches in any dimension or as recommended by the pipe manufacturer, whichever is smaller.

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Shoring

SD-03 Product Data

Utilization of Excavated Materials
Rock Excavation
Opening of any Excavation or Borrow Pit

Procedure and location for disposal of unused satisfactory material. Proposed source of borrow material. Notification of encountering rock in the project. Advance notice on the opening of excavation or borrow areas.

SD-06 Test Reports

Testing

Within 24 hours of conclusion of physical tests, 5 copies of test results, including calibration curves and results of calibration tests. Results of testing at the borrow site.

SD-07 Certificates

Testing

Qualifications of the Corps validated commercial testing laboratory or the Contractor's validated testing facilities.

1.4 SUBSURFACE DATA

Subsurface soil boring logs are shown on the drawings. The subsoil investigation report is included with these specifications. These data represent the best subsurface information available; however, variations may exist in the subsurface between boring locations.

1.5 CLASSIFICATION OF EXCAVATION

Excavation specified shall be done on a classified basis, in accordance with the following designations and classifications.

1.5.1 Common Excavation

Common excavation shall include the satisfactory removal and disposal of all materials not classified as rock excavation.

1.5.2 Rock Excavation

Rock excavation shall include blasting, excavating, grading, and disposing of material classified as rock and shall include the satisfactory removal and disposal of boulders 1/2 cubic yard or more in volume; solid rock; rock material that is in ledges, bedded deposits, and unstratified masses, which cannot be removed without systematic drilling and blasting; firmly cemented conglomerate deposits possessing the characteristics of solid rock impossible to remove without systematic drilling and blasting; and hard materials (see Definitions). The removal of any concrete or masonry structures, except pavements, exceeding 1/2 cubic yard in volume that may be encountered in the work shall be included in this classification. If at any time during excavation, including excavation from borrow areas, the Contractor encounters material that may be classified as rock excavation, such material shall be uncovered and the Contracting Officer notified by the Contractor. The Contractor shall not proceed with the excavation of this material until the Contracting Officer has classified the materials as common excavation or rock excavation and has taken cross sections as required. Failure on the part of the Contractor to uncover such material, notify the Contracting Officer, and allow ample time for classification and cross sectioning of the undisturbed surface of such material will cause the

forfeiture of the Contractor's right of claim to any classification or volume of material to be paid for other than that allowed by the Contracting Officer for the areas of work in which such deposits occur.

1.6 CRITERIA FOR BIDDING

Base bids on the following criteria:

a. Surface elevations are as indicated.

b. Pipes or other artificial obstructions, except those indicated, will not be encountered.

c. Ground water elevations indicated by the boring log were those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction.

d. Material character is indicated by the boring logs.

e. Hard materials and rock are not anticipated to be encountered in the excavation.

f. Soil containing lead bullets will be encountered at the site.

PART 2 PRODUCTS

2.1 REQUIREMENTS FOR OFFSITE SOILS

Contractor shall not furnish or transport soils onto MCAS Cherry Point when such act would violate the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) or the General Statutes of North Carolina.

Contractor shall provide certification that all soil furnished under the contract contains no petroleum or hazardous or toxic materials as defined in DOD Instruction 4715.6, which implements 10 U.S.C. 2692. The following methods shall be used to determine if soil meets this standard:

If the total amount of soil to be brought onto MCAS Cherry Point for a single contract is less than 200 cubic yards, the Contractor shall certify the soil meets the standard by inspecting for "Apparent Contamination" (visual or other indications of contamination including abnormal or unnatural color, chemical or petroleum odors, or saturation with a chemical or petroleum). Soil which is contaminated, as determined by inspecting for "Apparent Contamination," shall not be utilized on MCAS Cherry Point or outlying fields.

If the total amount of soil to be brought onto MCAS Cherry Point for a single contract is greater than 200 cubic yards, the Contractor shall provide certification that the soil meets the standard by analytical testing performed by a laboratory holding current certification from the North Carolina Department of Environment and Natural Resources, Division of Water Quality. The Contractor shall collect one representative sample of the soil to be used for each 200 cubic yards or fraction thereof, and analyze for Gasoline Range Organics, Diesel Range Organics, Oil and Grease, and 8 RCRA Metals (Totals). If any of the test results are greater than the Method Detection Limits for petroleum, the soil from which the sample was taken shall not be certified as meeting the standard. If any test

results are greater than the following North Carolina soil-to-groundwater target concentrations for the 8 RCRA metals, the soil from which the sample was taken shall not be certified as meeting the standard. All units are mg/kg (ppm): Arsenic 26.2; Barium 848; Cadmium 2.72; Chromium 27.2; Lead 270.06; Mercury 0.0154; Selenium 12.2; and Silver 0.223.

2.2 MATERIAL FOR RIP-RAP

Provide filter fabric and rock conforming to NCDOT Standard for construction indicated.

2.2.1 Bedding Material

Consisting of sand, gravel, or crushed rock, well graded, with a maximum particle size of 2 inches. Material shall be composed of tough, durable particles. Fines passing the No. 200 standard sieve shall have a plasticity index less than six.

2.2.2 Rock

Rock fragments sufficiently durable to ensure permanence in the structure and the environment in which it is to be used. Rock fragments shall be free from cracks, seams, and other defects that would increase the risk of deterioration from natural causes. The size of the fragments shall be such that no individual fragment exceeds a weight of 150 pounds and that no more than 10 percent of the mixture, by weight, consists of fragments weighing 2 pounds or less each. Specific gravity of the rock shall be a minimum of 2.50. The inclusion of more than trace 1 percent quantities of dirt, sand, clay, and rock fines will not be permitted.

2.3 SELECT SAND LAYER

Consisting of less than 10 percent fines (silt/clay) with USCS Classifications SW, SP-SM, SP, or SP-SC.

2.4 BULLET IMPACT ZONE

Consisting of ASTM C 33 fine sand with the following gradation:

SIEVE SIZE	% PASSING
3/8 inch	100
No. 4	85 to 100
No. 8	10 to 40
No. 16	0 to 10
No. 50	0 to 5

2.5 STRUCTURAL FILL FOR IMPACT BERM

Consisting of sands having USCS Classifications of SP, SP-SM, SP-SC, SM or SC, containing less than 5 percent organics and no stones, sticks or other inclusion greater than 3/8 inch in diameter.

2.6 SELECT FILL BEHIND RETAINING WALL

Consisting of select sand fill with USCS Classifications of SW, SP-SW, or SP.

PART 3 EXECUTION

3.1 STRIPPING OF TOPSOIL

Where indicated or directed, topsoil shall be stripped to a depth of 4 to 5 inches. Topsoil shall be spread on areas already graded and prepared for topsoil, or transported and deposited in stockpiles convenient to areas that are to receive application of the topsoil later, or at locations indicated or specified. Topsoil shall be kept separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 2 inches in diameter, and other materials that would interfere with planting and maintenance operations. Any surplus of topsoil from excavations and grading shall be removed from the site.

3.2 GENERAL EXCAVATION

The Contractor shall perform excavation of every type of material encountered within the limits of the project to the lines, grades, and elevations indicated and as specified. Grading shall be in conformity with the typical sections shown and the tolerances specified in paragraph FINISHING. Satisfactory excavated materials shall be transported to and placed in fill or embankment within the limits of the work. Unsatisfactory materials encountered within the limits of the work shall be excavated below grade and replaced with satisfactory materials as directed. Such excavated material and the satisfactory material ordered as replacement shall be included in excavation. Surplus satisfactory excavated material not required for fill or embankment shall be disposed of in areas approved for surplus material storage or designated waste areas. Unsatisfactory excavated material shall be disposed of in designated waste or spoil areas. During construction, excavation and fill shall be performed in a manner and sequence that will provide proper drainage at all times. Material required for fill or embankment in excess of that produced by excavation within the grading limits shall be excavated from the borrow areas indicated or from other approved areas selected by the Contractor as specified.

All excavated soil may be re-utilized as backfill at the same location from which it was removed providing it meets specified criteria. Excavated soil for reutilization shall be stockpiled in a location approved by the Contracting Officer.

3.2.1 Ditches, Gutters, and Channel Changes

Excavation of ditches, gutters, and channel changes shall be accomplished by cutting accurately to the cross sections, grades, and elevations shown. Ditches and gutters shall not be excavated below grades shown. Excessive open ditch or gutter excavation shall be backfilled with satisfactory, thoroughly compacted, material or with suitable stone or cobble to grades shown. Material excavated shall be disposed of as shown or as directed, except that in no case shall material be deposited less than 4 feet from the edge of a ditch. The Contractor shall maintain excavations free from detrimental quantities of leaves, brush, sticks, trash, and other debris until final acceptance of the work.

3.2.2 Drainage Structures

Excavations shall be made to the lines, grades, and elevations shown, or as directed. Trenches and foundation pits shall be of sufficient size to permit the placement and removal of forms for the full length and width of

structure footings and foundations as shown. Rock or other hard foundation material shall be cleaned of loose debris and cut to a firm, level, stepped, or serrated surface. Loose disintegrated rock and thin strata shall be removed. When concrete or masonry is to be placed in an excavated area, the bottom of the excavation shall not be disturbed. Excavation to the final grade level shall not be made until just before the concrete or masonry is to be placed.

3.2.3 Drainage

Provide for the collection and disposal of surface and subsurface water encountered during construction. Completely drain construction site during periods of construction to keep soil materials sufficiently dry. The Contractor shall establish/construct storm drainage features (ponds/basins) at the earliest stages of site development, and throughout construction grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed.

3.2.4 Dewatering

Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be permitted within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is open, the water level shall be maintained continuously, at least 2 feet below the working level.

3.2.4.1 Dewatering Contaminated Areas

In contaminated areas, if dewatering is required during excavation, all water must be containerized. The groundwater cannot be discharged to the ground surface, storm sewer etc. prior to sampling and analysis due to the potential contamination from migrating plumes. FACENG/ROICC may make arrangements with the IWTP for disposal of contaminated groundwater. If groundwater is accepted for disposal by the IWTP, then sampling may not be required (water disposed of at the IWTP, historically has not required testing). A chit must be obtained from EAD (Glenn Hartzog 466-4789) prior to sending contaminated water to the IWTP.

3.2.5 Trench Excavation Requirements

The trench shall be excavated as recommended by the manufacturer of the pipe to be installed. Trench walls below the top of the pipe shall be sloped, or made vertical, and of such width as recommended in the manufacturer's installation manual. Where no manufacturer's installation manual is available, trench walls shall be made vertical. Trench walls more than 4 feet high shall be shored, cut back to a stable slope, or

provided with equivalent means of protection for employees who may be exposed to moving ground or cave in. Vertical trench walls more than 4 feet high shall be shored. Trench walls which are cut back shall be excavated to at least the angle of repose of the soil. Special attention shall be given to slopes which may be adversely affected by weather or moisture content. The trench width below the top of pipe shall not exceed 24 inches plus pipe outside diameter (O.D.) for pipes of less than 24 inches inside diameter, and shall not exceed 36 inches plus pipe outside diameter for sizes larger than 24 inches inside diameter. Where recommended trench widths are exceeded, redesign, stronger pipe, or special installation procedures shall be utilized by the Contractor. The cost of redesign, stronger pipe, or special installation procedures shall be borne by the Contractor without any additional cost to the Government.

3.2.5.1 Bottom Preparation

The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Bell holes shall be excavated to the necessary size at each joint or coupling to eliminate point bearing. Stones of 3 inches or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, shall be removed to avoid point bearing.

3.2.5.2 Removal of Unyielding Material

Where overdepth is not indicated and unyielding material is encountered in the bottom of the trench, such material shall be removed 4 inches below the required grade and replaced with suitable materials as provided in paragraph BACKFILLING AND COMPACTION.

3.2.5.3 Removal of Unstable Material

Where unstable material is encountered in the bottom of the trench, such material shall be removed to the depth directed and replaced to the proper grade with select granular material as provided in paragraph BACKFILLING AND COMPACTION. When removal of unstable material is required due to the Contractor's fault or neglect in performing the work, the resulting material shall be excavated and replaced by the Contractor without additional cost to the Government.

3.2.5.4 Excavation for Appurtenances

Excavation for manholes, catch-basins, inlets, or similar structures shall be sufficient to leave at least 12 inches clear between the outer structure surfaces and the face of the excavation or support members. Rock shall be cleaned of loose debris and cut to a firm surface either level, stepped, or serrated, as shown or as directed. Loose disintegrated rock and thin strata shall be removed. Removal of unstable material shall be as specified above. When concrete or masonry is to be placed in an excavated area, special care shall be taken not to disturb the bottom of the excavation. Excavation to the final grade level shall not be made until just before the concrete or masonry is to be placed.

3.2.6 Underground Utilities

Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. Perform work adjacent to non-Government utilities as indicated in accordance with procedures outlined by utility company. Excavation made with power-driven

equipment is not permitted within two feet of known Government-owned utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the contract excavation until approval for backfill is granted by the Contracting Officer. Report damage to utility lines or subsurface construction immediately to the Contracting Officer.

3.3 SELECTION OF BORROW MATERIAL

Borrow material shall be selected to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Borrow material shall be obtained from the borrow areas from approved private sources. Unless otherwise provided in the contract, the Contractor shall obtain from the owners the right to procure material, pay royalties and other charges involved, and bear the expense of developing the sources, including rights-of-way for hauling. Borrow material from approved sources on Government-controlled land may be obtained without payment of royalties. Unless specifically provided, no borrow shall be obtained within the limits of the project site without prior written approval. Necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon shall be considered related operations to the borrow excavation.

3.4 OPENING AND DRAINAGE OF EXCAVATION AND BORROW PITS

The Contractor shall notify the Contracting Officer sufficiently in advance of the opening of any excavation or borrow pit to permit elevations and measurements of the undisturbed ground surface to be taken. Except as otherwise permitted, borrow pits and other excavation areas shall be excavated providing adequate drainage. Overburden and other spoil material shall be transported to designated spoil areas or otherwise disposed of as directed. Borrow pits shall be neatly trimmed and drained after the excavation is completed. The Contractor shall ensure that excavation of any area, operation of borrow pits, or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.5 SHORING

3.5.1 General Requirements

Submit a Shoring and Sheeting plan for approval 15 days prior to starting work. Submit drawings and calculations, certified by a registered professional engineer, describing the methods for shoring and sheeting of excavations. Finish shoring, including sheet piling, and install as necessary to protect workmen, banks, adjacent paving, structures, and utilities. Remove shoring, bracing, and sheeting as excavations are backfilled, in a manner to prevent caving.

3.5.2 Geotechnical Engineer

The Contractor is required to hire a Professional Geotechnical Engineer to provide inspection of excavations and soil/groundwater conditions throughout construction. The Geotechnical Engineer is responsible for performing pre-construction and periodic site visits throughout construction to assess site conditions. The Geotechnical Engineer is responsible for updating the excavation, sheeting and dewatering plans as

construction progresses to reflect changing conditions and submit an updated plan if necessary. Submit a monthly written report, informing the Contractor and Contracting Officer of the status of the plan and an accounting of the Contractor's adherence to the plan addressing any present or potential problems. The Contracting Officer is responsible for arranging meetings with the Geotechnical Engineer at any time throughout the contract duration.

3.6 GRADING AREAS

Where indicated, work will be divided into grading areas within which satisfactory excavated material shall be placed in embankments, fills, and required backfills. The Contractor shall not haul satisfactory material excavated in one grading area to another grading area except when so directed in writing. Stockpiles of satisfactory, unsatisfactory and wasted materials shall be placed and graded as specified. Stockpiles shall be kept in a neat and well drained condition, giving due consideration to drainage at all times. The ground surface at stockpile locations shall be cleared, grubbed, and sealed by rubber-tired equipment, excavated satisfactory and unsatisfactory materials shall be separately stockpiled. Stockpiles of satisfactory materials shall be protected from contamination which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, such material shall be removed and replaced with satisfactory material from approved sources.

3.7 GROUND SURFACE PREPARATION

3.7.1 General Requirements

Unsatisfactory material in surfaces to receive fill or in excavated areas shall be removed and replaced with satisfactory materials as directed by the Contracting Officer. The surface shall be scarified to a depth of 6 inches before the fill is started. Sloped surfaces steeper than 1 vertical to 4 horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When subgrades are less than the specified density, the ground surface shall be broken up to a minimum depth of 6 inches, pulverized, and compacted to the specified density. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches and compacted as specified for the adjacent fill.

3.7.2 Frozen Material

Material shall not be placed on surfaces that are muddy, frozen, or contain frost. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Minimum subgrade density shall be as specified in paragraph TESTING.

3.8 UTILIZATION OF EXCAVATED MATERIALS

Unsatisfactory materials removed from excavations shall be disposed of in designated waste disposal or spoil areas. Satisfactory material removed from excavations shall be used, insofar as practicable, in the construction of fills, embankments, subgrades, shoulders, bedding (as backfill), and for similar purposes. No satisfactory excavated material shall be wasted

without specific written authorization. Satisfactory material authorized to be wasted shall be disposed of in designated areas approved for surplus material storage or designated waste areas as directed. Newly designated waste areas on Government-controlled land shall be cleared and grubbed before disposal of waste material thereon. Coarse rock from excavations shall be stockpiled and used for constructing slopes or embankments adjacent to streams, or sides and bottoms of channels and for protecting against erosion. No excavated material shall be disposed of to obstruct the flow of any stream, endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed work in any way.

3.9 BACKFILLING AND COMPACTION

Backfill adjacent to any and all types of structures shall be placed and compacted to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials to prevent wedging action or eccentric loading upon or against the structure. Ground surface on which backfill is to be placed shall be prepared as specified in paragraph GROUND SURFACE PREPARATION. Compaction requirements for backfill materials shall also conform to the applicable portions of paragraphs GROUND SURFACE PREPARATION, EMBANKMENTS, and SUBGRADE PREPARATION, and Section 33 40 01 STORM DRAINAGE. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.9.1 Trench Backfill

Trenches shall be backfilled to the grade shown.

3.9.1.1 Replacement of Unyielding Material

Unyielding material removed from the bottom of the trench shall be replaced with select granular material or initial backfill material.

3.9.1.2 Replacement of Unstable Material

Unstable material removed from the bottom of the trench or excavation shall be replaced with select granular material placed in layers not exceeding 6 inches loose thickness.

3.9.1.3 Initial Backfill

Initial backfill material shall be placed and compacted with approved tampers to a height of at least one foot above the utility pipe or conduit. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe. Backfill to top of pipe shall be compacted to 95 percent of ASTM D 698 maximum density. Provide materials as follows:

a. Class I: Angular, 0.25 to 1.5 inches, graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shells.

b. Class II: Coarse sands and gravels with maximum particle size of 1.5 inches, including various graded sands and gravels containing small percentages of fines, generally granular and noncohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in

this class as specified in ASTM D 2487.

3.9.1.4 Final Backfill

The remainder of the trench shall be filled with satisfactory material. Backfill material shall be placed and compacted as follows:

a. Miscellaneous Areas: Backfill shall be deposited in layers of a maximum of 12 inch loose thickness, and compacted to 85 percent maximum density for cohesive soils and 90 percent maximum density for cohesionless soils. Compaction by water flooding or jetting will not be permitted. This requirement shall also apply to all other areas not specifically designated above.

3.9.2 Backfill for Appurtenances

After the manhole, catchbasin, inlet, or similar structure has been constructed backfill shall be placed in such a manner that the structure will not be damaged by the shock of falling earth. The backfill material shall be deposited and compacted as specified for final backfill, and shall be brought up evenly on all sides of the structure to prevent eccentric loading and excessive stress.

3.10 SPECIAL REQUIREMENTS

Special requirements for both excavation and backfill relating to the specific utilities are as follows:

3.10.1 Rip-Rap Construction

Construct rip-rap on filter fabric in accordance with NCDOT Standard. Trim and dress indicated areas to conform to cross sections, lines and grades shown within a tolerance of 0.1 foot.

3.10.1.1 Bedding Placement

Spread filter fabric bedding material uniformly to a thickness of at least 3 inches on prepared subgrade as indicated. Compaction of bedding is not required. Finish bedding to present even surface free from mounds and windrows.

3.10.1.2 Stone Placement

Place rock for rip-rap on prepared bedding material to produce a well graded mass with the minimum practicable percentage of voids in conformance with lines and grades indicated. Distribute larger rock fragments, with dimensions extending the full depth of the rip-rap throughout the entire mass and eliminate "pockets" of small rock fragments. Rearrange individual pieces by mechanical equipment or by hand as necessary to obtain the distribution of fragment sizes specified above.

3.11 EMBANKMENTS

3.11.1 Earth Embankments

Construct earth embankments from satisfactory materials as specified. Place the material in successive horizontal layers of loose material not more than 12 inches in depth. Spread each layer uniformly on a soil surface that has been moistened or aerated as necessary, and scarified or

otherwise broken up so that the fill will bond with the surface on which it is placed. After spreading, plow, disk, or otherwise brake up each layer; moisten or aerate as necessary; thoroughly mix; and compact to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials. Compaction requirements for the upper portion of earth embankments forming subgrade for pavements are identical with those requirements specified in paragraph SUBGRADE PREPARATION. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.12 SUBGRADE PREPARATION

3.12.1 Proof Rolling

Proof rolling shall be done on an exposed subgrade free of surface water (wet conditions resulting from rainfall) which would promote degradation of an otherwise acceptable subgrade. After stripping, proof roll the existing subgrade with six passes of a dump truck loaded with 4 cubic yards of soil. Operate the truck in a systematic manner to ensure the number of passes over all areas, and at speeds between 2 1/2 to 3 1/2 mph. Notify the Contracting Officer a minimum of 3 days prior to proof rolling. Proof rolling shall be performed in the presence of the Contracting Officer. Rutting or pumping of material shall be undercut as directed by the Contracting Officer to a depth specified by a qualified engineering firm and replaced with fill material. Prepare bids on replacing approximately 500 square yards, with an average depth of 1 to 2 feet at various locations.

3.12.2 Construction

Subgrade shall be shaped to line, grade, and cross section, and compacted as specified. Exposed subgrades shall be sloped and sealed at the end of each day to promote runoff and reduce infiltration. This operation shall include plowing, disking, and any moistening or aerating required to obtain specified compaction. Soft or otherwise unsatisfactory material shall be removed and replaced with satisfactory excavated material or other approved material as directed. Rock encountered in the cut section shall be excavated to a depth of 6 inches below finished grade for the subgrade. Low areas resulting from removal of unsatisfactory material or excavation of rock shall be brought up to required grade with satisfactory materials, and the entire subgrade shall be shaped to line, grade, and cross section and compacted as specified. After rolling, the surface of the subgrade for roadways shall not show deviations greater than 1/2 inch when tested with a 12-foot straightedge applied both parallel and at right angles to the centerline of the area. The elevation of the finish subgrade shall not vary more than 0.05 foot from the established grade and cross section.

3.12.3 Compaction

Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.12.3.1 Subgrade for Access Road

Subgrade for pavements shall be compacted to at least 98 percentage laboratory maximum density for the depth (at minimum 12" below)the surface shown and at least 95 percentage laboratory maximum density for next lifts (maximum 10"). When more than one soil classification is present in the

subgrade, the top 12 inches of subgrade shall be scarified, windrowed, thoroughly blended, reshaped, and compacted.

3.13 FINISHING

The surface of excavations, embankments, and subgrades shall be finished to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. The degree of finish for graded areas shall be within 0.1 foot of the grades and elevations indicated except that the degree of finish for subgrades shall be specified in paragraph SUBGRADE PREPARATION. Ditches shall be finished in a manner that will result in effective drainage. The surface of areas to be turfed shall be finished to a smoothness suitable for the application of turfing materials. Settlement or washing that occurs in graded, topsoiled, or backfilled areas prior to acceptance of the work, shall be repaired and grades re-established to the required elevations and slopes.

3.13.1 Subgrade and Embankments

During construction, embankments and excavations shall be kept shaped, sealed and drained at the end of each day. Ditches and drains along subgrade shall be maintained to drain effectively at all times. The finished subgrade shall not be disturbed by traffic or other operation and shall be protected and maintained by the Contractor in a satisfactory condition until ballast, subbase, base, or pavement is placed. The storage or stockpiling of materials on the finished subgrade will not be permitted. No subbase, base course, ballast, or pavement shall be laid until the subgrade has been checked and approved, and in no case shall subbase, base, surfacing, pavement, or ballast be placed on a muddy, spongy, or frozen subgrade.

3.14 PLACING TOPSOIL

On areas to receive topsoil, the compacted subgrade soil shall be scarified to a 2 inch depth for bonding of topsoil with subsoil. Topsoil then shall be spread evenly to a thickness of 4 inches and graded to the elevations and slopes shown. Topsoil shall not be spread when frozen or excessively wet or dry. Material required for topsoil in excess of that produced by excavation within the grading limits shall be obtained from offsite areas.

3.15 TESTING

Testing shall be performed by a Corps validated commercial testing laboratory or the Contractor's validated testing facility. If the Contractor elects to establish testing facilities, no work requiring testing will be permitted until the Contractor's facilities have been inspected, Corps validated and approved by the Contracting Officer. Field in-place density shall be determined in accordance with ASTM D 1556 and ASTM D 2167. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, the material shall be removed, replaced and recompacted to meet specification requirements. Tests on recompacted areas shall be performed to determine conformance with specification requirements. Inspections and test results shall be certified by a registered professional civil engineer. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

3.15.1 Fill and Backfill Material Gradation

One test per 100 cubic yards stockpiled or in-place source material. Gradation of fill and backfill material shall be determined in accordance with ASTM C 136.

3.15.2 In-Place Densities

a. One test per 10,000 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by other than hand-operated machines.

b. One test per 100 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by hand-operated machines.

3.15.3 Check Tests on In-Place Densities

If ASTM D 2922 is used, in-place densities shall be checked by ASTM D 1556 as follows:

a. One check test per lift for each 10,000 square feet, or fraction thereof, of each lift of fill or backfill compacted by other than hand-operated machines.

b. One check test per lift for each 100 square feet, of fill or backfill areas compacted by hand-operated machines.

3.15.4 Moisture Contents

In the stockpile, excavation, or borrow areas, a minimum of two tests per day per type of material or source of material being placed during stable weather conditions shall be performed. During unstable weather, tests shall be made as dictated by local conditions and approved by the Contracting Officer.

3.15.5 Optimum Moisture and Laboratory Maximum Density

Tests shall be made for each type material or source of material including borrow material to determine the optimum moisture and laboratory maximum density values. One representative test per 100 cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

3.15.6 Tolerance Tests for Subgrades

Continuous checks on the degree of finish specified in paragraph SUBGRADE PREPARATION shall be made during construction of the subgrades.

3.16 DISPOSITION OF SURPLUS MATERIAL

Surplus material or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber shall be removed from Government property as directed by the Contracting Officer.

-- End of Section --

SECTION 31 11 00

CLEARING AND GRUBBING
04/06

PART 1 GENERAL

1.1 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Nonsaleable Materials

Written permission to dispose of such products on private property shall be filed with the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Roads and Walks

Keep roads and walks free of dirt and debris at all times.

3.1.2 Trees, Shrubs, and Existing Facilities

Protection shall be in accordance with Section 01 57 19.00 20, TEMPORARY ENVIRONMENTAL CONTROLS. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.

3.1.3 Utility Lines

Protect existing utility lines that are indicated to remain from damage. Notify the Contracting Officer immediately of damage to or an encounter with an unknown existing utility line. The Contractor shall be responsible for the repairs of damage to existing utility lines that are indicated or made known to the Contractor prior to start of clearing and grubbing operations. When utility lines which are to be removed are encountered within the area of operations, the Contractor shall notify the Contracting Officer in ample time to minimize interruption of the service. Refer to Section 01 30 00, ADMINISTRATIVE REQUIREMENTS and Section 01 57 19.00 20, TEMPORARY ENVIRONMENTAL CONTROLS for additional utility protection.

3.2 CLEARING

Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish

occurring within the areas to be cleared. Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be cut off flush with or below the original ground surface.

3.3 TREE REMOVAL

Where indicated or directed, trees and stumps that are designated as trees shall be removed from areas outside those areas designated for clearing and grubbing. This work shall include the felling of such trees and the removal of their stumps and roots as specified in paragraph GRUBBING. Trees shall be disposed of as specified in paragraph DISPOSAL OF MATERIALS.

3.4 GRUBBING

Grubbing shall consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots from the designated grubbing areas. Material to be grubbed, together with logs and other organic or metallic debris not suitable for foundation purposes, shall be removed to a depth of not less than 18 inches below the original surface level of the ground in areas indicated to be grubbed and in areas indicated as construction areas under this contract, such as areas for buildings, and areas to be paved. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform with the original adjacent surface of the ground.

3.5 DISPOSAL OF MATERIALS

3.5.1 Saleable Timber

All timber on the project site noted for clearing and grubbing shall become the property of the Contractor, and shall be removed from the project site and disposed of off stations.

3.5.2 Nonsaleable Materials

Logs, stumps, roots, brush, rotten wood, and other refuse from the clearing and grubbing operations, except for salable timber, shall be disposed of outside the limits of Government-controlled land at the Contractor's responsibility, except when otherwise directed in writing. Such directive will state the conditions covering the disposal of such products and will also state the areas in which they may be placed.

-- End of Section --

SECTION 31 32 11

SOIL SURFACE EROSION CONTROL

04/06

PART 1 GENERAL

1.1 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Erosion Control Plan

Scale drawings defining areas to receive recommended materials as required by federal, state or local regulations.

Maintenance Record

Record of maintenance work performed, of measurements and findings for product failure, recommendations for repair, and products replaced.

SD-03 Product Data

Equipment

A listing of equipment to be used for the application of erosion control materials.

Condition of finish grade status prior to installation; location of underground utilities and facilities.

Finished Grade

1.2 DESCRIPTION OF WORK

The work shall consist of furnishing and installing soil surface erosion control materials, including fine grading, blanketing, stapling, mulching and miscellaneous related work, within project limits and in areas outside the project limits where the soil surface is disturbed from work under this contract at the designated locations. This work shall include all necessary materials, labor, supervision and equipment for installation of a complete system. This section shall be coordinated with the requirements of Section 31 00 00 EARTHWORK.

1.3 DELIVERY, INSPECTION, STORAGE, AND HANDLING

Materials shall be stored in designated areas and as recommended by the manufacturer protected from the elements, direct exposure, and damage. Containers shall not be dropped from trucks. Material shall be free of defects that would void required performance or warranty.

a. Erosion control blankets and geotextile fabric shall be furnished in rolls with suitable wrapping to protect against moisture and extended ultraviolet exposure prior to placement. Erosion control blanket and geotextile fabric rolls shall be labeled to provide identification sufficient for inventory and quality control purposes.

1.4 SUBSTITUTIONS

Substitutions will not be allowed without written request and approval from the Contracting Officer.

1.5 INSTALLER'S QUALIFICATION

The installer shall be certified by the manufacturer for training and experience installing the material.

1.6 WARRANTY

Erosion control material shall have a warranty for use and durable condition for project specific installations. Temporary erosion control materials shall carry a minimum eighteen month warranty. Permanent erosion control materials shall carry a minimum three year warranty.

PART 2 PRODUCTS

2.1 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

2.2 SEDIMENT FENCING

Wood or burlap.

2.3 WATER

Unless otherwise directed, water shall be the responsibility of the Contractor. Water shall be potable or supplied by an existing irrigation system.

PART 3 EXECUTION

3.1 CONDITIONS

The Contractor shall submit a construction work sequence schedule, with the approved erosion control plan a minimum of 30 days prior to start of construction. The work schedule shall coordinate the timing of land disturbing activities with the provision of erosion control measures. Erosion control operations shall be performed under favorable weather conditions; when excessive moisture, frozen ground or other unsatisfactory conditions prevail, the work shall be stopped as directed. When special conditions warrant a variance to earthwork operations, a revised construction schedule shall be submitted for approval. Erosion control materials shall not be applied in adverse weather conditions which could affect their performance.

3.1.1 Finished Grade

The Contractor shall verify that finished grades are as indicated on the drawings; finish grading and compaction shall be completed in accordance with Section 31 00 00 EARTHWORK, prior to the commencement of the work.

3.2 SITE PREPARATION

3.2.1 Layout

Erosion control material locations may be adjusted to meet field conditions. Diversion ditches shall be located as shown on the drawings.

3.2.2 Protecting Existing Vegetation

When there are established lawns in the work area, the turf shall be covered and/or protected or replaced after construction operations. Existing trees, shrubs, and plant beds that are to be preserved shall be barricaded along the dripline. Damage to existing trees shall be mitigated by the Contractor at no additional cost to the Government. Damage shall be assessed by a state certified arborist or other approved professional using the National Arborist Association's tree valuation guideline.

3.3 INSTALLATION

3.3.1 Construction Entrance

Provide as indicated on drawings, a minimum of 6 inches thick, at points of vehicular ingress and egress on the construction site. Construction entrances shall be cleared and grubbed, and then excavated a minimum of 3 inches prior to placement of the filter fabric and aggregate. The aggregate shall be placed in a manner that will prevent damage and movement of the fabric. Place fabric in one piece, where possible. Overlap fabric joints a minimum of 12 inches.

3.3.2 Seeding

When seeding is required prior to installing mulch on synthetic grid systems the Contractor shall verify that seeding will be completed in accordance with Sections 31 00 00 EARTHWORK.

3.3.3 Mulch Installation

Mulch shall be installed in the areas indicated. Mulch shall be applied evenly at the rate shown on the construction drawings.

3.3.4 Sediment Fencing

Install posts at the spacing indicated on drawings and at an angle between 2 degrees and 20 degrees towards the potential silt load area. Sediment fence height shall be approximately 16 inches. Do not attach filter fabric to existing trees. Secure filter fabric to the post and wire fabric using staples, tie wire, or hot rings. Imbed the filter fabric into the ground as indicated on drawings. Splice filter fabric at support pole using a 6 inch overlap and securely seal.

3.3.5 Articulating Cellular Concrete Block System Installation

3.3.5.1 Seeding, Fertilizing, Mulching

Seed shall be installed in accordance with State regulations at the rates shown on the construction drawings.

3.4 CLEAN-UP

Excess material, debris, and waste materials shall be disposed offsite at an approved landfill or recycling center. Adjacent paved areas shall be cleared. Immediately upon completion of the installation in an area, the area shall be protected against traffic or other use by erecting barricades and providing signage as required, or as directed.

3.5 WATERING SEED

Water shall be applied to supplement rainfall at a sufficient rate to ensure moist soil conditions to a minimum 1 inch depth. Run-off and puddling shall be prevented. Watering trucks shall not be driven over turf areas, unless otherwise directed. Watering of other adjacent areas or plant material shall be prevented.

3.6 MAINTENANCE RECORD

A record shall be furnished describing the maintenance work performed, record of measurements and findings for product failure, recommendations for repair, and products replaced.

3.6.1 Maintenance

Maintenance shall include eradicating weeds; protecting embankments and ditches from surface erosion; maintaining the performance of the erosion control materials and mulch; protecting installed areas from traffic.

3.6.1.1 Maintenance Instructions

Written instructions containing drawings and other necessary information shall be furnished, describing the care of the installed material; including, when and where maintenance should occur, and the procedures for material replacement.

3.6.1.2 Patching and Replacement

Unless otherwise directed, material shall be placed, seamed or patched as recommended by the manufacturer. Material not meeting the required performance as a result of placement, seaming or patching shall be removed from the site. The Contractor shall replace the unacceptable material at no additional cost to the Government.

-- End of Section --

SECTION 32 11 23

AGGREGATE BASE COURSE
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO T 180	(2001; R 2004) Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop
AASHTO T 224	(2001) Standard Method of Test for Correction for Coarse Particles in the Soil Compaction Test

ASTM INTERNATIONAL (ASTM)

ASTM C 117	(2004) Materials Finer Than 75 micrometer (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 136	(2005) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D 4318	(2000) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 75	(2003) Sampling Aggregates
ASTM E 11	(2004) Wire Cloth and Sieves for Testing Purposes

1.2 DEFINITIONS

For the purposes of this specification, the following definitions apply.

1.2.1 Aggregate Base Course

Aggregate base course (ABC) is well graded, durable aggregate uniformly moistened and mechanically stabilized by compaction.

1.2.2 Degree of Compaction

Degree of compaction required shall be expressed as a percentage of the laboratory maximum dry density in accordance with AASHTO T 180 Method D and corrected with AASHTO T 224.

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Plant, Equipment, and Tools

List of proposed equipment to be used in performance of construction work, including descriptive data.

Waybills and Delivery Tickets

Copies of waybills and delivery tickets during the progress of the work.

SD-06 Test Reports

Sampling and Testing
Field Density Tests

Certified copies of test results for approval not less than 30 days before material is required for the work.

Calibration curves and related test results prior to using the device or equipment being calibrated.

Copies of field test results within 24 hours after the tests are performed.

1.4 SAMPLING AND TESTING

Sampling and testing shall be the responsibility of the Contractor. Work requiring testing will not be permitted until the testing laboratory has been inspected and approved. The materials shall be tested to establish compliance with the specified requirements; testing shall be performed at the specified frequency. The Contracting Officer may specify the time and location of the tests. Copies of test results shall be furnished to the Contracting Officer within 24 hours of completion of the tests.

1.4.1 Sampling

Samples for laboratory testing shall be taken in conformance with ASTM D 75. When deemed necessary, the sampling will be observed by the Contracting Officer.

1.4.2 Tests

The following tests shall be performed in conformance with the applicable standards listed.

1.4.2.1 Sieve Analysis

Sieve analysis shall be made in conformance with ASTM C 117 and ASTM C 136. Sieves shall conform to ASTM E 11.

1.4.2.2 Liquid Limit and Plasticity Index

Liquid limit and plasticity index shall be determined in accordance with ASTM D 4318.

1.4.2.3 Moisture-Density Determinations

The laboratory maximum dry density and optimum moisture content shall be determined in accordance with AASHTO T 180.

1.4.2.4 Field Density Tests

Density shall be field measured in accordance with AASHTO T 180.

1.4.3 Testing Frequency

1.4.3.1 Initial Tests

One of each of the following tests shall be performed on the proposed material prior to commencing construction to demonstrate that the proposed material meets all specified requirements when furnished. If materials from more than one source are going to be utilized, this testing shall be completed for each source.

a. Sieve Analysis.

b. Liquid limit and plasticity index.

c. Moisture-density relationship.

1.4.3.2 In Place Tests

Each of the following tests shall be performed on samples taken from the placed and compacted ABC. Samples shall be taken and tested at the rates indicated.

a. Density tests shall be performed on every lift of material placed and at a frequency of one set of tests for every 250 square yards, or portion thereof, of completed area.

b. Sieve Analysis shall be performed on every lift of material placed and at a frequency of one sieve analysis for every 500 square yards, or portion thereof, of material placed.

c. Liquid limit and plasticity index tests shall be performed at the same frequency as the sieve analysis.

d. The total thickness of the base course shall be measured at intervals in such a manner as to ensure one measurement for each 500 square yards of base course. Measurements shall be made in 3 inch diameter test holes penetrating the base course.

1.4.4 Approval of Material

The source of the material shall be selected 30 days prior to the time the material will be required in the work. Tentative approval of material will be based on initial test results. Final approval of the materials will be based on sieve analysis, liquid limit, and plasticity index tests performed on samples taken from the completed and fully compacted course(s).

1.5 WEATHER LIMITATIONS

Construction shall be done when the atmospheric temperature is above 35 degrees F. When the temperature falls below 35 degrees F, the Contractor shall protect all completed areas by approved methods against detrimental effects of freezing. Completed areas damaged by freezing, rainfall, or other weather conditions shall be corrected to meet specified requirements.

1.6 PLANT, EQUIPMENT, AND TOOLS

All plant, equipment, and tools used in the performance of the work shall be subject to approval before the work is started and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate and shall have the capability of producing the required compaction, meeting grade controls, thickness control, and smoothness requirements as set forth herein.

1.7 WAYBILLS AND DELIVERY TICKETS

Before the final statement is allowed, the Contractor shall file certified waybills and certified delivery tickets for all aggregates actually used, as specified in the Submittals paragraph.

PART 2 PRODUCTS

2.1 AGGREGATES

All materials shall meet the requirements of NCDOT Section 520, Aggregate Base Course.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

When the ABC is constructed in more than one layer, the previously constructed layer shall be cleaned of loose and foreign matter by sweeping with power sweepers or power brooms, except that hand brooms may be used in areas where power cleaning is not practicable. Adequate drainage shall be provided during the entire period of construction to prevent water from collecting or standing on the working area. Line and grade stakes shall be provided as necessary for control. Grade stakes shall be in lines parallel to the centerline of the area under construction and suitably spaced for string lining.

3.2 OPERATION OF AGGREGATE SOURCES

Clearing, stripping, and excavating shall be the responsibility of the Contractor. The aggregate sources shall be operated to produce the quantity and quality of materials meeting these specifications requirements in the specified time limit. Aggregate sources on private lands shall be conditioned in agreement with local laws or authorities.

3.3 STOCKPILING MATERIAL

Prior to stockpiling of material, storage sites shall be cleared and leveled by the Contractor. All materials, including approved material available from excavation and grading, shall be stockpiled in the manner and at the locations designated. Aggregates shall be stockpiled on the

cleared and leveled areas designated by the Contracting Officer to prevent segregation. Materials obtained from different sources shall be stockpiled separately.

3.4 PREPARATION OF UNDERLYING COURSE

The surface of the underlying subgrade shall meet specified compaction and surface tolerances. The underlying course shall conform to Section 31 00 00 EARTHWORK. Ruts or soft yielding spots in the underlying courses, areas having inadequate compaction, and deviations of the surface from the requirements set forth herein shall be corrected by loosening and removing soft or unsatisfactory material and by adding approved material, reshaping to line and grade, and recompacting to specified density requirements. The finished underlying course shall not be disturbed by traffic or other operations and shall be maintained by the Contractor in a satisfactory condition until the base course is placed.

3.5 INSTALLATION

Installation shall meet the requirement of NCDOT.

3.6 MAINTENANCE

The base course shall be maintained in a satisfactory condition. Maintenance shall include immediate repairs to any defects and shall be repeated as often as necessary to keep the area intact. Any area of base course that is damaged shall be reworked or replaced as necessary to comply with this specification.

3.7 DISPOSAL OF UNSATISFACTORY MATERIALS

Any unsuitable materials that must be removed shall be disposed of outside the limits of Government-controlled land. No additional payments will be made for materials that must be replaced.

-- End of Section --

SECTION 32 92 19

SEEDING
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C 602	(1995a; R 2001) Agricultural Liming Materials

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act	(1940; R 1988; R 1998) Federal Seed Act
DOA SSIR 42	(1996) Soil Survey Investigation Report No. 42, Soil Survey Laboratory Methods Manual, Version 3.0

1.2 DEFINITIONS

1.2.1 Stand of Turf

95 percent ground cover of the established species.

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Fertilizer

Include physical characteristics, and recommendations.

SD-06 Test Reports

Topsoil composition tests (reports and recommendations).

SD-07 Certificates

State certification and approval for seed

SD-08 Manufacturer's Instructions

Erosion Control Materials

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery

1.4.1.1 Seed Protection

Protect from drying out and from contamination during delivery, on-site storage, and handling.

1.4.1.2 Fertilizer and Lime Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance to state and federal laws. Instead of containers, fertilizer and lime may be furnished in bulk with certificate indicating the above information.

1.4.2 Storage

1.4.2.1 Seed, Fertilizer and Lime Storage

Store in cool, dry locations away from contaminants.

1.4.2.2 Topsoil

Prior to stockpiling topsoil, treat growing vegetation with application of appropriate specified non-selective herbicide. Clear and grub existing vegetation three to four weeks prior to stockpiling topsoil.

1.4.2.3 Handling

Do not drop or dump materials from vehicles.

1.5 TIME RESTRICTIONS AND PLANTING CONDITIONS

1.5.1 Restrictions

Do not plant when the ground is frozen, snow covered, muddy, or when air temperature exceeds 90 degrees Fahrenheit.

1.6 TIME LIMITATIONS

1.6.1 Seed

Apply seed within twenty four hours after seed bed preparation.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Classification

Provide State-certified seed of the latest season's crop delivered in original sealed packages, bearing producer's guaranteed analysis for percentages of mixtures, purity, germination, weedseed content, and inert material. Label in conformance with AMS Seed Act and applicable state seed laws. Wet, moldy, or otherwise damaged seed will be rejected. Field mixes will be acceptable when field mix is performed on site in the presence of the Contracting Officer.

2.1.2 Planting Dates

Planting Season	Planting Dates
Temporary Seeding Season(s)	Refer to Construction Drawings
Permanent Seeding Season(s)	Refer to construction Drawings

2.1.3 Seed Mixture by Weight

Planting Season	Variety	Percent (by Weight)
Temporary Seeding Season(s)	Refer to Construction Drawings for Variety	Refer to Construction Drawings for Percent
Permanent Seeding Season(s)	Refer to Construction Drawings for Variety	Refer to Construction Drawings for Percent

Proportion seed mixtures by weight. Temporary seeding must later be replaced by a permanent stand of grass. The same requirements of turf establishment for Temporary Seeding Season(s) apply for permanent seeding.

2.2 TOPSOIL

2.2.1 On-Site Topsoil

Surface soil stripped and stockpiled on site and modified as necessary to meet the requirements specified for topsoil in paragraph entitled "Composition." When available topsoil shall be existing surface soil stripped and stockpiled on-site in accordance with Section 31 00 00 EARTHWORK.

2.2.2 Off-Site Topsoil

Conform to requirements specified in paragraph entitled "Composition." Additional topsoil shall be furnished by the Contractor.

2.2.3 Composition

Containing from 5 to 10 percent organic matter as determined by the topsoil composition tests of the Organic Carbon, 6A, Chemical Analysis Method described in DOA SSIR 42. Topsoil shall be free of sticks, stones, roots, and other debris and objectionable materials.

2.3 SOIL CONDITIONERS

Add conditioners to topsoil as required to bring into compliance with "composition" standard for topsoil as specified herein.

2.3.1 Lime

Commercial grade limestone containing a calcium carbonate equivalent

(C.C.E.) as specified in ASTM C 602 of not less than 80 percent.

2.4 FERTILIZER

2.4.1 Granular Fertilizer

Granular controlled release fertilizer containing the following minimum percentages, by weight, of plant food nutrients:

10 percent available nitrogen
10 percent available phosphorus
10 percent available potassium

2.5 MULCH

Mulch shall be free from noxious weeds, mold, and other deleterious materials.

2.5.1 Straw

Stalks from oats, wheat, rye, barley, or rice. Furnish in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Straw shall contain no fertile seed.

2.6 WATER

Source of water shall be approved by Contracting Officer and of suitable quality for irrigation, containing no elements toxic to plant life.

2.7 EROSION CONTROL MATERIALS

Erosion control material shall conform to the following:

2.7.1 Erosion Control Blanket

100 percent agricultural straw stitched with a degradable nettings, designed to degrade within 12 months.

2.7.2 Erosion Control Fabric

Fabric shall be knitted construction of polypropylene yarn with uniform mesh openings 3/4 to 1 inch square with strips of biodegradable paper. Filler paper strips shall have a minimum life of 6 months.

2.7.3 Erosion Control Net

Net shall be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately 1 inch square.

2.7.4 Hydrophilic Colloids

Hydrophilic colloids shall be physiologically harmless to plant and animal life without phytotoxic agents. Colloids shall be naturally occurring, silicate powder based, and shall form a water insoluble membrane after curing. Colloids shall resist mold growth.

2.7.5 Erosion Control Material Anchors

Erosion control anchors shall be as recommended by the manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 EXTENT OF WORK

Provide soil preparation (including soil conditioners as required), fertilizing, seeding, and surface topdressing of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

3.1.1.1 Topsoil

Provide 4 inches of off-site topsoil to meet finish grade. After areas have been brought to finish grade, incorporate fertilizer and soil conditioners into soil a minimum depth of 4 inches by disking, harrowing, tilling or other method approved by the Contracting Officer. Remove debris and stones larger than 3/4 inch in any dimension remaining on the surface after finish grading. Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

3.1.1.2 Soil Conditioner Application Rates

Apply soil conditioners at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rates for the following:

Lime 3,000 pounds per acre

3.1.1.3 Fertilizer Application Rates

Apply fertilizer at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rates for the following:

Granular Fertilizer 1,000 pounds per acre

3.2 SEEDING

3.2.1 Seed Application Seasons and Conditions

Immediately before seeding, restore soil to proper grade. Do not seed when ground is muddy frozen, snow covered or in an unsatisfactory condition for seeding. If special conditions exist that may warrant a variance in the above seeding dates or conditions, submit a written request to the Contracting Officer stating the special conditions and proposed variance. Apply seed within twenty four hours after seedbed preparation. Sow seed by approved sowing equipment. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing.

3.2.2 Seed Application Method

Seeding method shall be broadcasted, dropped, or hydroseeded.

3.2.2.1 Broadcast and Drop Seeding

Seed shall be uniformly broadcast at the rate shown on drawings. Use broadcast or drop seeders. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing. Cover seed uniformly to a maximum depth of 1/4 inch in clay soils and 1/2 inch in sandy soils by means of spike-tooth harrow, cultipacker, raking or other approved devices.

3.2.2.2 Hydroseeding

First, mix water and fiber. Wood cellulose fiber, paper fiber, or recycled paper shall be applied as part of the hydroseeding operation. Fiber shall be added at 1,000 pounds, dry weight, per acre. Then add and mix seed and fertilizer to produce a homogeneous slurry. Seed shall be mixed to ensure broadcasting at the rate shown on drawings. When hydraulically sprayed on the ground, material shall form a blotter like cover impregnated uniformly with grass seed. Spread with one application with no second application of mulch.

3.2.3 Mulching

3.2.3.1 Straw Mulch

Straw mulch shall be spread uniformly at the rate of 2 tons per acre. Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading with liquid asphalt at 0.10 gallons per square yard (10 gal/1,000 sq. ft.).

3.2.4 Rolling

Immediately after seeding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width.

3.2.5 Erosion Control Material

Install in accordance with manufacturer's instructions, where indicated or as directed by the Contracting Officer.

3.2.6 Watering

Start watering areas seeded as required by temperature and wind conditions. Apply water at a rate sufficient to insure thorough wetting of soil to a depth of 2 inches without run off. During the germination process, seed is to be kept actively growing and not allowed to dry out.

3.3 PROTECTION OF TURF AREAS

Immediately after turfing, protect area against traffic and other use.

3.4 RESTORATION

Restore to original condition existing turf areas which have been damaged

during turf installation operations at the Contractor's expense. Keep clean at all times at least one paved pedestrian access route and one paved vehicular access route to each building. Clean other paving when work in adjacent areas is complete.

-- End of Section --

SECTION 33 40 01

STORM DRAINAGE
04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO HB-17	(2002; Errata 2003; Errata 2005) Standard Specifications for Highway Bridges
AASHTO M 252	(2006) Corrugated Polyethylene Drainage Pipe
AASHTO M 294	(2006) Corrugated Polyethylene Pipe, 300- to 1200-mm Diameter

ASTM INTERNATIONAL (ASTM)

ASTM A 48/A 48M	(2003) Gray Iron Castings
ASTM A 536	(1984; R 2004) Ductile Iron Castings
ASTM A 929/A 929M	(2001) Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe
ASTM B 26/B 26M	(2005) Aluminum-Alloy Sand Castings
ASTM C 231	(2004) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 270	(2005a) Mortar for Unit Masonry
ASTM C 478	(2003a) Precast Reinforced Concrete Manhole Sections
ASTM D 1557	(2002e1) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))
ASTM D 1751	(2004) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D 1752	(2004a) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

ASTM D 2167	(1994; R 2001) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2321	(2005) Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D 2922	(2004) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(2004) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 3350	(2006) Polyethylene Plastics Pipe and Fittings Materials
ASTM F 477	(2002e1) Elastomeric Seals (Gaskets) for Joining Plastic Pipe

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Placing Pipe

Printed copies of the manufacturer's recommendations for installation procedures of the material being placed, prior to installation.

SD-07 Certificates

Frame and Cover for Gratings

Certified copies of test reports demonstrating conformance to applicable pipe specifications, before pipe is installed. Certification on the ability of frame and cover or gratings to carry the imposed live load.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install plastic pipe shall be stored in accordance with the manufacturer's recommendations and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is

exceeded.

1.3.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

PART 2 PRODUCTS

2.1 PIPE FOR CULVERTS AND STORM DRAINS

Pipe for culverts and storm drains shall be of the sizes indicated and shall conform to the requirements specified.

2.1.1 PE Pipe

The pipe manufacturer's resin certification indicating the cell classification of PE used to manufacture the pipe shall be submitted prior to installation of the pipe. The minimum cell classification for polyethylene plastic shall apply to each of the seven primary properties of the cell classification limits in accordance with ASTM D 3350.

2.1.1.1 Corrugated PE Pipe and Fittings 10" and Smaller

Corrugated PE pipe and fittings 10" and smaller shall conform to AASHTO M 252C, Type "S", with smooth waterway for coupling joints.

Soil tight couplings and AASHTO M 252C, corrugated, matching tube and fittings.

2.1.1.2 Corrugated PE Pipe and Fittings 12" and Larger

Corrugated PE Pipe and fittings 12" and larger shall conform to AASHTO M 294 C, Type "S", with smooth waterway for coupling joints.

Soil tight couplings, AASHTO M 294C, corrugated matching pipe and fittings.

2.2 DRAINAGE STRUCTURES

2.2.1 Precast Reinforced Concrete Box

Boxes subjected to highway loadings shall conform to NCDOT standards.

2.2.2 Flared End Sections

Sections shall be of a standard design fabricated from zinc coated steel sheets meeting requirements of ASTM A 929/A 929M.

2.3 MISCELLANEOUS MATERIALS

2.3.1 Concrete

Unless otherwise specified, concrete and reinforced concrete shall conform to the requirements for 3,000 psi concrete. The concrete mixture shall have air content by volume of concrete, based on measurements made immediately after discharge from the mixer, of 5 to 7 percent when maximum size of coarse aggregate exceeds 1-1/2 inches. Air content shall be determined in accordance with ASTM C 231. The concrete covering over steel

reinforcing shall not be less than 1 inch thick for covers and not less than 1-1/2 inches thick for walls and flooring. Concrete covering deposited directly against the ground shall have a thickness of at least 3 inches between steel and ground. Expansion-joint filler material shall conform to ASTM D 1751, or ASTM D 1752, or shall be resin-impregnated fiberboard conforming to the physical requirements of ASTM D 1752.

2.3.2 Mortar

Mortar for pipe joints, connections to other drainage structures, and brick or block construction shall conform to ASTM C 270, Type M, except that the maximum placement time shall be 1 hour. The quantity of water in the mixture shall be sufficient to produce a stiff workable mortar but in no case shall exceed 5 gallons of water per sack of cement. Water shall be clean and free of harmful acids, alkalies, and organic impurities. The mortar shall be used within 30 minutes after the ingredients are mixed with water. The inside of the joint shall be wiped clean and finished smooth. The mortar head on the outside shall be protected from air and sun with a proper covering until satisfactorily cured.

2.3.3 Brick

Brick shall conform to NCDOT standards.

2.3.4 Precast Reinforced Concrete Manholes

Precast reinforced concrete manholes shall conform to ASTM C 478. Joints between precast concrete risers and tops shall be made with flexible watertight, rubber-type gaskets meeting the requirements of paragraph JOINTS.

2.3.5 Frame and Cover for Gratings

Frame and cover for gratings shall be cast gray iron, ASTM A 48/A 48M, Class 35B; cast ductile iron, ASTM A 536, Grade 65-45-12; or cast aluminum, ASTM B 26/B 26M, Alloy 356.0T6. Weight, shape, size, and waterway openings for grates shall be as indicated on the plans.

2.3.6 Corrugated PE Plastic Pipe

Soil tight joints shall conform to the requirements in AASHTO HB-17, Division II, Section 26.4.2.4(c) for soil tightness and shall be as recommended by the pipe manufacturer.

2.4 EROSION CONTROL RIPRAP

Erosion control riprap shall be granite based. Shall meet the requirements of NCDOT.

PART 3 EXECUTION

3.1 EXCAVATION FOR PIPE CULVERTS, STORM DRAINS, AND DRAINAGE STRUCTURES

Excavation of trenches, and for appurtenances and backfilling for culverts and storm drains, shall be in accordance with the applicable portions of Section 31 00 00 EARTHWORK and the requirements specified below.

3.1.1 Trenching

The width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus 24 inches to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. Sheeting and bracing, where required, shall be placed within the trench width as specified. Contractor shall not overexcavate. Where trench widths are exceeded, redesign with a resultant increase in cost of stronger pipe or special installation procedures will be necessary. Cost of this redesign and increased cost of pipe or installation shall be borne by the Contractor without additional cost to the Government.

3.1.2 Removal of Rock

Rock in either ledge or boulder formation shall be replaced with suitable materials to provide a compacted earth cushion having a thickness between unremoved rock and the pipe of at least 8 inches or 1/2 inch for each foot of fill over the top of the pipe, whichever is greater, but not more than three-fourths the nominal diameter of the pipe. Where bell-and-spigot pipe is used, the cushion shall be maintained under the bell as well as under the straight portion of the pipe.

3.1.3 Removal of Unstable Material

Where wet or otherwise unstable soil incapable of properly supporting the pipe, as determined by the Contracting Officer, is unexpectedly encountered in the bottom of a trench, such material shall be removed to the depth required and replaced to the proper grade with select granular material, compacted as provided in paragraph BACKFILLING. When removal of unstable material is due to the fault or neglect of the Contractor while performing shoring and sheeting, water removal, or other specified requirements, such removal and replacement shall be performed at no additional cost to the Government.

3.2 BEDDING

The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe.

3.2.1 Plastic Pipe

Bedding for PE pipe shall meet the requirements of ASTM D 2321. Bedding, haunching, and initial backfill shall be either Class IB or II material.

3.3 PLACING PIPE

Each pipe shall be thoroughly examined before being laid; defective or damaged pipe shall not be used. Plastic pipe shall be protected from exposure to direct sunlight prior to laying, if necessary to maintain adequate pipe stiffness and meet installation deflection requirements. Pipelines shall be laid to the grades and alignment indicated. Proper facilities shall be provided for lowering sections of pipe into trenches. Pipe shall not be laid in water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary.

3.3.1 Corrugated PE Pipe

Laying shall be with the separate sections joined firmly on a bed shaped to line and grade and shall follow manufacturer's recommendations.

3.4 JOINTING

3.4.1 Corrugated PE Pipe

Pipe shall be joined using a bell & spigot joint meeting AASHTO M 252 or AASHTO M 294. The joint shall be soil tight and gaskets, when applicable, shall met the requirements of ASTM F 477. Gaskets shall be covered with a removable wrap to ensure the gasket is free from debris. A joint lubricant supplied by the manufacturer shall be used on the gasket and bell during assembly. Bell and spigot connections shall utilize a spun-on or welded bell and valley or saddle gasket meeting the soil-tight performance requirements of AASHTO M 252 or AASHTO M 294. Soil tight joints shall conform to the requirements in AASHTO HB-17, Division II, Section 26.4.2.4 (e) for soil tightness and shall be as recommended by the pipe manufacturer.

3.5 DRAINAGE STRUCTURES

3.5.1 Manholes and Inlets

Construction shall be of reinforced concrete, plain concrete, brick, precast reinforced concrete, precast concrete segmental blocks, complete with frames and covers or gratings.

3.5.2 Walls and Headwalls

Construction shall be as indicated.

3.6 BACKFILLING

3.6.1 Backfilling Pipe in Trenches

After the pipe has been properly bedded, selected material from excavation or borrow, at a moisture content that will facilitate compaction, shall be placed along both sides of pipe in layers not exceeding 6 inches in compacted depth. The backfill shall be brought up evenly on both sides of pipe for the full length of pipe. The fill shall be thoroughly compacted under the haunches of the pipe. Each layer shall be thoroughly compacted with mechanical tampers or rammers. This method of filling and compacting shall continue until the fill has reached an elevation of at least 12 inches above the top of the pipe. The remainder of the trench shall be backfilled and compacted by spreading and rolling or compacted by mechanical rammers or tampers. Tests for density shall be made as necessary to ensure conformance to the compaction requirements specified below. Where it is necessary, in the opinion of the Contracting Officer, that sheeting or portions of bracing used be left in place, the contract will be adjusted accordingly. Untreated sheeting shall not be left in place beneath structures or pavements.

3.6.2 Backfilling Pipe in Fill Sections

For pipe placed in fill sections, backfill material and the placement and compaction procedures shall be as specified below. The fill material shall be uniformly spread in layers longitudinally on both sides of the pipe, not exceeding 6 inches in compacted depth, and shall be compacted by rolling

parallel with pipe or by mechanical tamping or ramming. Prior to commencing normal filling operations, the crown width of the fill at a height of 12 inches above the top of the pipe shall extend a distance of not less than twice the outside pipe diameter on each side of the pipe or 12 feet, whichever is less. After the backfill has reached at least 12 inches above the top of the pipe, the remainder of the fill shall be placed and thoroughly compacted.

3.6.3 Movement of Construction Machinery

When compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Movement of construction machinery over a culvert or storm drain at any stage of construction shall be at the Contractor's risk. Any damaged pipe shall be repaired or replaced.

3.6.4 Compaction

3.6.4.1 General Requirements

Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands. Cohesive materials include clayey and silty gravels, gravel-silt mixtures, clayey and silty sands, sand-clay mixtures, clays, silts, and very fine sands. When results of compaction tests for moisture-density relations are recorded on graphs, cohesionless soils will show straight lines or reverse-shaped moisture-density curves, and cohesive soils will show normal moisture-density curves.

3.6.4.2 Minimum Density

Backfill over and around the pipe and backfill around and adjacent to drainage structures shall be compacted at the approved moisture content to the following applicable minimum density, which will be determined as specified below.

a. Under unpaved or turfed traffic areas, density shall not be less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material.

b. Under nontraffic areas, density shall be not less than that of the surrounding material.

3.6.5 Determination of Density

Testing shall be the responsibility of the Contractor and performed at no additional cost to the Government. Testing shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. Tests shall be performed in sufficient number to ensure that specified density is being obtained. Laboratory tests for moisture-density relations shall be made in accordance with ASTM D 1557 except that mechanical tampers may be used provided the results are correlated with those obtained with the specified hand tamper. Field density tests shall be determined in accordance with ASTM D 2167 or ASTM D 2922. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted, if necessary, using the sand cone method as described in paragraph Calibration of the referenced publications. ASTM D 2922 results in a wet unit weight of soil and when using this method ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density

calibration checks as described in ASTM D 3017 or ASTM D 2922. Test results shall be furnished the Contracting Officer. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job on each different type of material encountered and at intervals as directed.

-- End of Section --