IFB W912BU25B00xx

US Army Corps
of Engineers
Philadelphia District

BEACH NOURISHMENT
INITIAL CONSTRUCTION

Hereford Inlet to Cape May Inlet
Cape May County, New Jersey

Construction Solicitation and Specifications

95% Review
12 September 2024

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INVITATION NO. W912BU25B00xx

PHILADELPHIA DISTRICT
CORPS OF ENGINEERS

INVITATION FOR BIDS
FOR

BEACH NOURISHMENT
INITIAL CONSTRUCTION

HEREFORD INLET TO CAPE MAY INLET
CAPE MAY COUNTY, NEW JERSEY

I. NOTE THE AFFIRMATIVE ACTION REQUIREMENT OF THE EQUAL OPPORTUNITY CLAUSE WHICH MAY APPLY TO THE CONTRACT RESULTING FROM THIS SOLICITATION.

II. BIDDERS ARE REQUIRED TO COMPLETE THE REPRESENTATION AND CERTIFICATIONS PORTION OF SECTION 00 45 00 OF THIS SOLICITATION AND SUBMIT THIS WITH THEIR BID.

III. THERE WILL NOT BE A GOVERNMENT CONDUCTED SITE VISIT FOR THIS PROJECT. THE PROSPECTIVE BIDDERS ARE ENCOURAGED TO VISIT THE SITE OF THE WORK AT THEIR CONVENIENCE IN ORDER TO ACQUAINT THEMSELVES WITH THE SITE CONDITIONS AND ANY PROBLEMS INCIDENT TO THE PROSECUTION OF THE WORK.

95% REVIEW
12 SEPTEMBER 2024

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BIDDING SCHEDULE

(To be attached to SF 1442)

Item No.	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
BASE BID:					
1.	Mobilization and Demobilization	1	JOB	LS	$_____
2.	Structures Monitoring	1	JOB	LS	$_____
3.	Surveying	1	JOB	LS	$_____
CITY OF NORTH WILDWOOD					
4.	Beachfill	1,700,000	CY	$_____	$_____
5.	Pedestrian Crossover	24,177	SF	$_____	$_____
6.	ADA Accessible Crossover	12,236	SF	$_____	$_____
7.	Berm Stabilization Mat	300	LF	$_____	$_____
8.	Vehicle Crossover	37,912	SF	$_____	$_____
9.	Sand Fence	7,003	LF	$_____	$_____
10.	Split Rail Fence	8,400	LF	$_____	$_____
11.	Post and Rail Fence	2,448	LF	$_____	$_____
12.	Dune Grass Planting 18” O.C.	46,933	SY	$_____	$_____
13.	Dune Grass Planting 24” O.C.	25,253	SY	$_____	$_____
14.	Name the State of New Jersey and North Wildwood City as “Additional Insured” under General Liability Insurance	1	JOB	LS	$_____
Storm Water Outfall Pipe Extension: Station 3+44 (3rd Ave)					
15.	Remove and Dispose of Existing Outfall Pipe and Pipe Supports	1	JOB	LS	$_____
16.	48-Inch Ductile Iron Pipe	480	LF	$_____	$_____
17.	Type “B” Pipe Support Units	57	EA	$_____	$_____
18.	Type “C” Pipe Support Units	16	EA	$_____	$_____
CITY OF WILDWOOD					
19.	Beachfill	270,000	CY	$_____	$_____
20.	Deployable Flood Barriers	1	JOB	LS	$_____
21.	Pedestrian Crossover	7,079	SF	$_____	$_____
22.	ADA Accessible Crossover	18,486	SF	$_____	$_____
23.	Berm Stabilization Mat	818	LF	$_____	$_____
24.	Vehicle Crossover	37,931	SF	$_____	$_____
25.	Sand Fence	7,418	LF	$_____	$_____
26.	Split Rail Fence	4,342	LF	$_____	$_____

27. Post and Rail Fence	3,696	LF	$_____	$_____
28. Dune Grass Planting 18" O.C.	56,399	SY	$_____	$_____
29. Dune Grass Planting 24" O.C.	36,294	SY	$_____	$_____
30. Name the State of New Jersey and the Wildwood City as "Additional Insured" under General Liability Insurance	1	JOB	LS	$_____
WILDWOOD CREST BORO				
31. Beachfill	190,000	CY	$_____	$_____
32. Pedestrian Crossover	54,453	SF	$_____	$_____
33. ADA Accessible Crossover	18,040	SF	$_____	$_____
34. Berm Stabilization Mat	493	LF	$_____	$_____
35. Vehicle Crossover	15,950	SF	$_____	$_____
36. Sand Fence	9,756	LF	$_____	$_____
37. Split Rail Fence	12,768	LF	$_____	$_____
38. Post and Rail Fence	3,588	LF	$_____	$_____
39. Type "A" Pipe Support Units	142	EA	$_____	$_____
40. Dune Grass Planting 18" O.C.	75,696	SY	$_____	$_____
41. Dune Grass Planting 24" O.C.	40,035	SY	$_____	$_____
42. Name the State of New Jersey and Wildwood Crest Boro as "Additional Insured" under General Liability Insurance	1	JOB	LS	$_____
LOWER TOWNSHIP				
43. Beachfill	30,000	CY	$_____	$_____
44. Pedestrian Crossover	7,259	SF	$_____	$_____
45. ADA Accessible Crossover	4,074	SF	$_____	$_____
46. Berm Stabilization Mat	75	LF	$_____	$_____
47. Vehicle Crossover	6,430	SF	$_____	$_____
48. Sand Fence	1,348	LF	$_____	$_____
49. Split Rail Fence	1,884	LF	$_____	$_____
50. Post and Rail Fence	748	LF	$_____	$_____
51. Dune Grass Planting 18" O.C.	9,816	SY	$_____	$_____
52. Dune Grass Planting 24" O.C.	3,340	SY	$_____	$_____
53. Name the State of New Jersey and Lower Township as "Additional Insured" under General Liability Insurance	1	JOB	LS	$_____
TOTAL BASE BID AMOUNT				$_____

OPTIONS

54. Option 1 – Relocation within the Borrow Area	1	EA	$_____	$_____

CITY OF NORTH WILDWOOD

55. Option 2 - Beachfill	375,000	CY	$_____	$_____
56. Option 3 - Beachfill	225,000	CY	$_____	$_____
57. Option 4 - Beachfill	150,000	CY	$_____	$_____

CITY OF WILDWOOD

58. Option 5 - Beachfill	100,000	CY	$_____	$_____
59. Option 6 - Beachfill	60,000	CY	$_____	$_____
60. Option 7 - Beachfill	40,000	CY	$_____	$_____
61. Option 8 – Outfall Demolition	1	JOB	LS	$_____

WILDWOOD CREST BORO

62. Option 9 - Beachfill	50,000	CY	$_____	$_____
63. Option 10 - Beachfill	30,000	CY	$_____	$_____
64. Option 11 - Beachfill	20,000	CY	$_____	$_____

LOWER TOWNSHIP

68. Option 12 - Beachfill	20,000	CY	$_____	$_____

TOTAL BASE BID AND ALL OPTIONS AMOUNT $_____

NOTES:

1. Bidders must bid on all items.

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SECTION 00 50 05

PRE-AWARD SURVEY SUBMITTAL REQUIREMENTS

PART 1 GENERAL

1.1 AWARD CRITERIA

Award of this Contract will be made as a whole to the lowest responsive and responsible Bidder whose bid conforms to all requirements of the specifications. Subsequent to the bid opening, the apparent low Bidder shall submit Pre-Award Survey Information that demonstrates compliance with the requirements set forth in this section as a precondition to receiving award.

1.2 GENERAL PRE-AWARD SURVEY INFORMATION

Complete the pre-award survey information sheets attached to this section, and submit to the Contracting Officer within 5 calendar days after bid opening.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

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US ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT
PRE-AWARD SURVEY

A. GENERAL INFORMATION

1) Name of Firm: _____

Address: _____

Phone: _____ Fax:_____

Email: _____

CAGE CODE:

If your company has more than one CAGE Code, please list all that apply.

2) Location where accounts are kept (if different than item 1 above): _____

3) Type of Firm (Please check one):

Sole Proprietorship [ ] Partnership [ ] Corporation [ ] Joint Venture [ ] Other

Date Organized: _____

Date Incorporated: _____

State of Incorporation: _____

4) Attach list of Name of Officers.

Please check "Yes" or "No" for each of the following:

Have current officers of your firm ever been indicted? Yes [ ] No [ ]

Are any of your officers currently under indictment? Yes [ ] No [ ]

If you have answered "Yes" to either of the above, please attach an explanation.

5) Has your firm been terminated for default on any contracts in the past six years? Yes [ ] No [ ]
(If yes, please attach an explanation)

B. PROPOSED SCHEDULE

Submit a preliminary schedule depicting your project plan from start to final completion. The schedule you submit will be used to determine your ability to successfully perform the project within the time frame stated in the specifications.

IAW FAR 52.236-15, Schedules for Construction Contracts, you will be required to submit a fully loaded schedule within five days after work commences on the awarded contract.

C. PERFORMANCE AND PAYMENT BOND INFORMATION

1) Performance & Payment Bonds will be furnished by:

Name of Company: _____

Phone No: _____

2) Firm's bonding capacity as authorized by your Insurance Company:

Single Project: _____

Aggregate Basis: _____

D. BANKING INFORMATION

Name of Bank: _____

Address: _____

Account Representative:_____

Phone No: _____ E-mail: _____

Authorized Credit Line: _____

If additional banks are utilized, please provide this information for each.

E. INSURANCE INFORMATION

Name of Insurance Company: _____

Type of Insurance Provided: _____

Insurance Agency: _____

Address: _____

Agent: _____

Phone No: _____ Email: _____

If more than one insurance company is utilized, please provide this formation for each.

F. FINANCIAL DATA

Please provide the last two certified public accountant's financial statements.

G. SAFETYDATA

Please check "Yes" or "No" for each of the following:

1. Does your firm have a Standard Operating Procedure for Safety?

Yes [ ] No [ ] If yes, please provide a copy.

Does your firm have a Policy Letter dealing with Safety?

Yes [ ] No [ ] If yes, please provide a copy.

2. What was your accident rate for last year? _____

3. What is your accident rate to date for this year? _____

H. QUALITY CONTROL DATA

Please check "Yes" or "No" for each of the following:

1. Does your firm have a Standard Operating Procedure for Quality Control?

Yes [ ] No [ ] If yes, please provide a copy.

2. Does your firm have a Policy Letter dealing with Quality Control?

Yes [ ] No [ ] If yes, please provide a copy.

I. EQUIPMENT DATA

Please provide the following data for **each piece of construction equipment (including equipment you will rent or lease),** intended to be used on the project. Do not include consumables.

Make	Year Mfg.
Description	Purchase Price (if equipment is owned)
Size	Book Value (if equipment is owned)
Model Number	Unpaid Balance (if equipment is owned)

J. EXPERIENCE DATA

1. Please provide the following data for all major projects in progress or completed with the past three years. Also, provide the same data for Corps of Engineer projects completed within the last five years. Those projects containing work similar in nature to that involved under this solicitation are to marked with an asterisk (*).

Name and Address of Owner
Point of Contact and Telephone Number
Project Location
Type of Work performed by your firm
Indicate whether you performed as a prime or subcontractor
Name of Architect/Engineer in charge for Owner
Address of Architect/Engineer
Contract or Subcontract Amount
Approximate date completed or, if not completed provide percent complete

Were time extensions necessary? Were penalties imposed? Were liens, claims or stop work orders filed?

2. How many years have you been in business as a contractor? _____

3. How many years experience in the type of work involved in the subject solicitation do you have

a) as prime contractor? _____

b) as a subcontractor? _____

K. KEY PROJECT PERSONNEL

Please provide resumes for each of the following key personnel to be assigned to this project:
Project Engineer, **Superintendent**, **Quality Control Manager/Technician**, **Safety Technician**, **Office Engineer**

_____
(Signature of Person Supplying Data)

_____
(Print or Type Name and Title of Person Supplying Data)

_____
(Phone No.)

_____
(Email Address)

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 SCOPE OF SECTION

This section presents a general description of the work to be accomplished under this contract on the 5 mile barrier island of The Wildwoods, between Hereford Inlet and Cape May Inlet, located in Cape May County, New Jersey.

1.2 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. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Health Requirements Manual

1.3 DESCRIPTION OF WORK

1.3.1 General

a. The contract work consists of a Base Bid for placement of approximately 2,190,000 cubic yards of beachfill material along the Atlantic Ocean shorefront between Station -11+18 and Station 252+00 in the City of North Wildwood, City of Wildwood, Wildwood Crest Boro, and Lower Township, Cape May County, New Jersey. Placement of material in North Wildwood is limited to hydraulic placement methods only. The base bid work is to dredge/excavate satisfactory beachfill material from Borrow Area A, located between Stations 78+50 and 234+76, nearshore Borrow Area B, located between Stations 137+28 and 234+78, and nearshore Borrow Area C, located between Stations 71+19 and 182+91 as indicated on the drawings, using a mobile submersible pump or eductor (jet pump), small hydraulic dredge, or other approved means to entrain the sand in conjunction with mobile booster pump(s) to transfer the material by pipeline and satisfactorily place the beachfill material in accordance with the elevations and slopes indicated on the drawings. See Section 35 31 00 BEACHFILL for requirements regarding placement of beachfill.

b. The Base Bid also includes, but is not limited to, the following: structures monitoring, bird monitoring, environmental species monitoring, the replacement of existing stormwater outfalls and drainage structures, construction of pipe support systems; construction of pedestrian, vehicle, and Americans with Disabilities Act (ADA) accessible dune crossovers; planting of dune grass; providing sand fence, split rail fence, and post and rail fence; and demolition of various existing structures to accommodate the new beachfill and dunes.

1.3.2 Options

The contract work also consists of options, if awarded, to place up to 1,070,000 cubic yards of additional beachfill material in locations within the Base

Bid area. Options also include outfall demolition, if awarded. Pre-placement condition surveys, as specified in Section 01 71 23 SURVEY REQUIREMENTS, will determine the exact location and quantity of beachfill material required within the limits indicated, and will be a determining factor in the award of options for additional quantities of beachfill. Where Options for additional beachfill material are awarded, the beachfill material shall be placed immediately after the initial Base Bid quantity has been placed in the area(s) to be covered by the awarded Option(s), unless otherwise shown. The intent is to complete the beachfill template in a given Base-plus-Option area, before proceeding with work further along the construction baseline.

1.4 REQUIRED ORDER OF WORK

Unless otherwise directed by the Contracting Officer, the Contractor must begin hydraulc beachfill material placement in North Wildwood. Once beachfill placement in North Wildwood has been initiated, the Contractor may place beachfill material in multiple locations simultaneously. Although the work may be conducted in separate locations simultaneously, each closed section of that location must be completed and accepted by the Contracting Officer or designated representative, prior to start of work in the subsequent section. In addition, work in each subsequent section shall begin immediately upon completion of work in the prior section. If utilizing more than one backpassing plant, work in concurrent sections shall begin immediately upon completion of work in the prior section(s).

1.5 CONTRACTOR ACCESS AND LIMITS OF WORK

1.5.1 General

Bidders are expected to examine the site of the work in accordance with Contract Clause: SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK to determine the conditions affecting their operations. The entire work site is designated as a hard hat area in accordance with EM 385-1-1.

1.5.2 Work Site Access

a. Access to the work site is available by land and water. Access to each beach, for land based equipment, shall only be at the locations indicated on the drawings. Access to each beach, for waterborne backpassing plant equipment, must be shallow draft equipment. The Contractor is forbidden to dredge a channel to access the borrow areas. The staging area is located as shown on the contract drawings and may be used for storing material and temporary construction facilities. The Contractor shall be responsible for all investigations necessary to establish the specific routes to be used for the contract work. Comply with all applicable Federal, State, County, and local regulations regarding weight limitations and other vehicle restrictions regarding the use of these routes.

b. Any materials required to establish or stabilize an access point for vehicle use shall be approved by the COR and provided and removed by the Contractor. Additional parking that the Contractor requires, outside the work limits, shall be coordinated directly with the appropriate local officials.

c. Document the original conditions of access areas and routes by taking detailed photographs of those areas prior to starting work. See Section 01 32 33 CONSTRUCTION PHOTOGRAPHY for additional requirements.

d. Damage to local roads due to truck traffic or other Contractor operations shall be repaired, subject to the Contracting Officer's approval, at no additional cost to the Government.

1.5.3 Contractor's Work Limit

The Contractor's work limit is as shown on the contract drawings. The Contractor is prohibited from operating landward of the Contractor's work limit. The Contractor shall not enter upon, affect, or damage, in any way, areas and structures outside that limit of work.

1.6 WORK HOURS

The Contractor may perform beachfill work 24 hours per day, 7 days per week, to complete the beachfill contract work. However, the Contractor shall be required to comply with local codes regarding noise at all times during the contract period. The Contractor shall be required to equip his land-based equipment with noise suppression equipment if so directed by the COR, at no additional cost to the Government. Perform crossover construction, fencing, planting, and outfall work, during daylight hours.

1.7 ENVIRONMENTAL RESTRICTIONS

See Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS for Piping Plover and Colonial Nesting Birds restrictions for beachfill operations.

1.8 EXISTING UTILITIES

The existing utility locations shown on the drawings are approximate and not complete. The Contractor is responsible for field verifying all existing utility locations, including those not shown on the drawings.

1.9 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 must be in a condition equal to or better than that which existed before new work started.

1.10 LOCATION OF UNDERGROUND UTILITIES

The existing utility locations shown on the drawings are approximate and may not be complete. Field verify all existing utility locations, including those not shown on the drawings, within area of work. Contact New Jersey One-Call utility locating service at 811 or 800-272-1000, or https://www.nj1-call.org/, a minimum of 3 days prior to excavating, to mark utilities, and within sufficient time required if work occurs on a Monday or after a Holiday.

1.10.1 Notification Prior to Dredging/Excavation

Notify the Contracting Officer at least 15 days prior to starting dredging/ excavation work.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

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. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements
EM 1110-2-1003	(2013) Hydrographic Surveying

1.2 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Evidence Of Insurance
Superintendent Qualifications; G,DO

SD-11 Closeout Submittals

Certified Payrolls

1.3 SUPERVISION

1.3.1 Superintendent Qualifications

Provide project superintendent with a minimum of 10 years experience in construction with at least 5 of those years as a superintendent on projects similar in size and complexity. 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. The individual must be capable of interpreting a critical path schedule and construction drawings. The qualification requirements for the alternate superintendent are the same as for the project superintendent. Submit superintendent's qualifications prior to mobilization to the work site.

1.3.2 Minimum Communication Requirements

Have at least one qualified superintendent, or competent alternate, capable of reading, writing, and conversing fluently in the English language, on the job-site at all times during the performance of Contract work.In addition, if a Quality Control (QC) representative is required on the Contract, then that individual must also have fluent English communication

skills.

1.3.3 Duties

The project superintendent is primarily responsible for managing subcontractors and coordinating day-to-day production and schedule adherence on the project. The superintendent is required to attend partnering meetings, and quality control meetings. The superintendent or qualified alternative must be on-site at all times during the performance of this contract until the work is completed and accepted.

1.3.4 Non-Compliance Actions

The Project Superintendent is subject to removal by the Contracting Officer for non-compliance with requirements specified in the contract and for failure to manage the project to ensure timely completion. Furthermore, 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 is acceptable as the subject of claim for extension of time for excess costs or damages by the Contractor.

1.4 PRECONSTRUCTION CONFERENCE

Immediately after award, coordinate with the Contracting Officer a time and place to meet for the Preconstruction Conference. The conference must take place after award of the contract, but prior to commencement of any work at the site. The purpose of this conference is to discuss and develop a mutual understanding of the administrative requirements of the Contract including but not limited to: daily reporting, invoicing, value engineering, safety, base-access, outage requests, hot work permits, schedule requirements, quality control, schedule of prices or earned value report, shop drawings, submittals, cybersecurity, prosecution of the work, government acceptance, final inspections and contract close-out, and the processes for joint risk management between the Contractor and Government. Contractor must present and discuss their basic approach to scheduling the construction work and any required phasing.

1.4.1 Attendees

Contractor attendees must include the Project Manager, Superintendent, Site Safety and Health Officer (SSHO), Quality Control Manager and major subcontractors.

1.5 PHYSICAL DATA (APR 1984)

Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor. (FAR 52.236-4)

a. The indications of physical conditions on the contract drawings are the result of site investigations by surveys. Samples of materials to be dredged for beachfill from the borrow areas were obtained by using vibrational core samplers.

b. Tide Data: The mean and spring ranges of tides in the vicinity of the work are 4.3 feet and 5.2 feet, respectively. Mean low water is approximately -3.0 feet North American Vertical Datum (NAVD 88).

c. Weather Conditions. The site of the work is in the open ocean and is exposed to storms. However, safe refuge from the ocean is available in Cape May Harbor which is immediately adjacent to the work site. It is believed that work can be performed during all seasons of the year except during winter months when ice and storm conditions may interfere with dredging operations. Complete weather records and reports may be obtained from the local U.S. Weather Bureau Office nearest to the work site. The Contractor shall satisfy himself as to the hazards likely to arise from weather conditions during the construction period.

d. Transportation Facilities. The work site is accessible from the New Jersey Garden State Parkway and U.S. Route 9. The Contractor shall be responsible for all investigations of load carrying capacities of bridges and roadways.

e. Location. The Hereford Inlet to Cape May Inlet project area is located on the Atlantic Ocean coast of New Jersey in Cape May County.

f. Laying of Submerged Pipelines and Obstruction of Channel. If it becomes necessary in the performance of this contract to use a submerged pipeline, the Contractor shall notify the Contracting Officer in advance of the schedule for placement of the pipeline. If the submerged line is to be placed across a navigable channel, the Contractor shall submit a request for approval at least ten working days (Sundays and holidays excluded) prior to the desired closure date, to the U.S. Coast Guard, MSO/Group Philadelphia, 1 Washington Avenue, Philadelphia, PA 19147-4395. A copy of each request shall be furnished to the Contracting Officer. This request shall contain the following information:

(1) Location (Channel Centerline Stationing) and depth (over the top of the pipeline) at which the submerged line will be placed;

(2) The desired length of time the channel is to be closed;

(3) The date and hour placement or removal will commence;

(4) The date and hour of anticipated completion; and

(5) The name and telephone number of the person to be contacted for information and response to any emergency condition.

g. Survey control description sheets are included as Appendix A30 of these specifications.

h. Magnitude of the Contract Work. The estimated value of the contract work is between $25,000,000 and $100,000,000.

i. Vibrational core sample logs representative of the material to be dredged under this contract are provided in Appendix B41 of these specifications. Associated sieve curves are included in Appendix B42 of these specifications.

j. Inspection of the Site. Prospective bidders are expected to visit the work site to acquaint themselves with the site conditions and any problems incident to the prosecution of the work.

k. The location of submarine cables and pipelines may be in proximity to the project limits of work. Use extreme caution when operating vessels and equipment in the locations where cables and pipelines exist. Comply with

all rules and regulations governing activities within the vicinity of submarine cables and pipelines. Coordinate the location of submarine cables and pipelines with the Department of Homeland Security and the U.S. Coast Guard. Preliminary locations of these structures are identified on NOAA nautical charts for the area. Nautical charts can be downloaded from NOAA's website: http://www.nauticalcharts.noaa.gov.

Be aware that additional uncharted submarine cable and submarine pipelines may exist within the area of work.

1.6 LAYOUT OF WORK (DEC 1996)

The Contractor shall lay out its work from Government-provided survey control points, furnished as part of each work assignment. The Contractor shall furnish, at its own expense, such stakes, templates, platforms, equipment, range markers and labor as may be required in laying out any part of the work, from the surveying benchmarks furnished by the Government and shall be responsible for all measurements in connection therewith. If any Government control is found disturbed or destroyed, this must be communicated to the Philadelphia District Surveys Branch through the COR before any control is re-established. The Contractor shall be responsible for executing the work to such lines and grades as may be established or indicated by the Contracting Officer. The Contractor shall have real time differential GPS positioning in accordance with the Corps surveying manual, EM 1110-2-1003, for class 1 survey requirements for dredge positioning. The Contractor shall provide real time positioning on a computer screen during dredging, and have the capability of playback in 15 minute intervals. The position must be recorded on disk every 15 minutes and submitted to the Contracting Officer on a daily basis. (CENAP)

1.7 CONTRACTOR SUPPLY AND USE OF ELECTRONIC SOFTWARE FOR PROCESSING DAVIS-BACON ACT CERTIFIED PAYROLLS

a. The contractor will use a commercially available electronic system to process and submit certified payrolls electronically to the Government. The Davis-Bacon Act establishes the requirements for preparing, processing, and providing certified labor payrolls.

b. The contractor shall be responsible for obtaining and providing access for all licenses and other services required to provide for receipt, processing, certifying, electronically transmitting to the Government, and storing weekly payrolls and other data required for the contractor to comply with Davis-Bacon Act and related statutes. When the contractor uses an electronic Davis-Bacon Act payroll service, it shall be used to prepare, process, and maintain the relevant payrolls and basic records for all work under the construction contract. The electronic payroll service shall be capable of preserving the payroll and related basic records for the required three years after contract completion. The contractor shall obtain and provide electronic system access including electronic review to the Government, as required to comply with the Davis- Bacon Act and related statutes through the duration of the construction contract.

c. The contractor's provision and use of an electronic payroll processing system shall meet the following basic functional criteria:

(1) commercially available;

(2) compliant with appropriate Davis-Bacon Act payroll provisions in the FAR;

(3) able to accommodate the required number of employees and subcontractors that will be employed under the contract;

(4) capable of producing an Excel spreadsheet-compatible electronic output of weekly payroll records for export into an Excel spreadsheet to be imported into the contractor's mode of Resident Management System 3.0;

(5) demonstrated security of data and data entry rights;

(6) able to produce contractor-certified electronic versions of weekly payroll data;

(7) able to identify erroneous entries and track the date/time of all versions of the certified Davis-Bacon Act payrolls submitted to the government over the life of the contract; and

(8) capable of generating a durable record copy in a Compact Disc (CD) or Digital Versatile Disc (DVD) and Portable Document Format (PDF) file record of data from the system database at the end of the contract closeout. This durable record copy of data from the electronic payroll processing system shall be provided to the Government during contract closeout.

d. All contractor-incurred costs related to the contractor's provision and use of an electronic payroll processing service shall be included in the contractor's price for the overall work under the contract. The costs for Davis-Bacon Act compliance using electronic payroll processing services shall not be a separately bid or reimbursed item under this contract.(UAI 3 Jun 2019; Update 2 - 30 Nov 2021)

1.8 DAMAGE TO WORK

The responsibility for damage to any part of the permanent work shall be as set forth in the clause of the contract entitled "Permits and Responsibilities". However, if, in the judgement of the Contracting Officer, any part of the permanent work performed by the Contractor is damaged by flood or hurricane, which damage is not due to the failure of the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the Contractor shall make the repairs as ordered by the Contracting Officer and full compensation for such repairs will be made at the applicable contract unit or lump sum prices as fixed and established in the contract. If, in the opinion of the Contracting Officer, there are no contract unit or lump sum prices applicable to any part of such work, and equitable adjustment pursuant to Contract Clause entitled "Changes," will be made as full compensation for the repairs of that part of the permanent work for which there are no applicable contract unit or lump sum prices. Except as herein provided, damages to all work (including temporary construction), utilities, materials, equipment and plant shall be repaired to the satisfaction of the Contracting Officer at the Contractor's expense regardless of the cause of such damage. (CENAP)

1.9 CERTIFICATES OF COMPLIANCE

Any certificates required for demonstrating proof of compliance of materials with specifications requirements shall be executed in triplicate copies. Each certificate shall be signed by an official authorized to

certify on behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements. (CENAP)

1.10 PERFORMANCE EVALUATION OF CONTRACTOR (MAR 2014)

a. As a minimum, the Contractor's performance will be evaluated upon final acceptance of the work for contracts less than one year in duration. Contracts in excess of one year will receive at a minimum, an annual interim evaluation in addition to the final evaluation. However, interim evaluation may be prepared at any time during contract performance when determined to be in the best interest of the Government. The evaluation will be entered into the Contractor Performance Assessment Reporting System (CPARS).

b. CPARS is a web-enabled application that supports the completion, distribution, and retrieval of construction contract performance evaluations. CPARS is for UNCLASSIFIED use only. An evaluation assesses Contractor performance and provides a record, both positive and negative, on a given contract. Each evaluation is based on objective facts and supported by contract management data, such as contract performance elements that evaluate quality, timely performance, effectiveness of management, and compliance with contract terms, labor standards, and safety requirements. The Contractor will be rated either outstanding, above average, satisfactory, marginal, or unsatisfactory in the areas of Contractor Quality Control, Timely Performance, Effectiveness of Management, Compliance with Labor Standards, and Compliance with Safety Standards. The Contractor will be advised of any unsatisfactory rating, either in an individual element or in the overall rating, prior to completing the evaluation, and all Contractor comments will be made a part of the official record. Performance Evaluation Reports will be available to all DOD Contracting offices for their future use in determining Contractor responsibility, in compliance with ER 415-1-17.

c. Upon successful award of the contract, the Contractor will be notified by CPARS via email that access has been granted to a contract within the system. The email will contain instructions of how to log into the system. (CENAP)

1.11 REQUIREMENT TO NOTIFY COAST GUARD OF RELEASE OF OBJECTS INTO THE NAVIGABLE WATERS OF THE UNITED STATES

a. Requirement: As soon as a person has knowledge of any release from a vessel or facility into the navigable waters of the United States of any object that creates an obstruction prohibited under section 403 of this title, such person shall notify the Secretary and the Secretary of the Army, and the Contracting Officer, of such release.

b. Restriction on use of notification: Any notification provided by an individual in accordance with subsection (a) of this section may not be used against such individual in any criminal case, except a prosecution for perjury or for giving a false statement.

(Pub. L. 92-340, §15, as added Pub. L. 109-241, title VI, §602, July 11, 2006, 120 Stat. 553.)

1.12 PARTNERING

To most effectively accomplish this Contract, the Contractor and Government must form a cohesive partnership with the common goal of drawing on the strength of each organization in an effort to achieve a successful project without safety mishaps, conforming to the Contract, within budget and on schedule. The partnering team must consist of personnel from both the Government and Contractor including project level and corporate level leadership positions. Key Personnel from the supported command, end user, Contractor, key subcontractors and the Designer of Record are required to participate in the Partnering process.

1.12.1 Team-Led (Informal) Partnering

a. The Contracting Officer will coordinate the initial Team-Led (Informal) Partnering Session with key personnel of the project team, including Contractor and Government personnel. The Partnering Session will be co-led by the Government Construction Manager and Contractor's Project Manager.

b. The Initial Team-led Partnering session may be held concurrently with the Pre-Construction meeting. Partnering sessions will be held at a location mutually agreed to by the Contracting Officer and the Contractor, typically at a conference room on-base or at the Contractor's temporary trailer.

c. The Initial Team-Led Partnering Session will be conducted and facilitated using electronic media (a video and accompanying forms) provided by Contracting Officer.

d. The Partners will determine the frequency of the follow-on sessions.

e. Participants will bear their own costs for meals, lodging and transportation associated with Partnering.

1.13 ELECTRONIC MAIL (E-MAIL) ADDRESS

Establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments as text files, pdf files, and other similar formats. Within 10 days after contract award, 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 email to notify the Contractor of base access conditions when emergency conditions warrant, such as hurricanes or terrorist threats. Multiple email addresses are not allowed.

It is the Contractor's responsibility to make timely distribution of all Contracting Officer initiated e-mail with its own organization including field office(s). Promptly notify the Contracting Officer, in writing, of any changes to this email address.

1.14 INSURANCE REQUIREMENTS

Evidence of Insurance: Evidence of the following insurance shall be

submitted to the Contracting Officer prior to commencement of work. Insurance shall be maintained throughout the period of performance:

a. General Liability Insurance (Comprehensive form of policy): Bodily Injury Liability - $500,000 per occurrence.

In addition, the Contractor shall name the State of New Jersey, North Wildwood, Wildwood, Wildwood Crest and Lower Township as additional insured under their General Liability Insurance. Any additional premiums incurred to accomplish this shall be included as Contract Line Item titled, "Name the State of New Jersey and North Wildwood, Wildwood, Wildwood Crest and Lower Township as additional insured under General Liability Insurance".

b. Automobile Liability Insurance (Comprehensive form of policy): Bodily Injury Liability - $200,000 per person and $500,000 per accident. Property Damage Liability - $20,000 per accident.

c. Workmen's Compensation and Employer's Liability Insurance: Compliance with applicable workmen's compensation and occupational disease statutes is required. Employer's liability coverage in the minimum amount of $100,000 is also required."

d. Applicable Marine Casualty and Marine Workmen's Compensation Insurance: As appropriate for this contract.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 MEASUREMENT AND PAYMENT

The work specified in this section will not be measured for payment and all costs in connection therewith shall be included in the costs of all the bid items.

-- End of Section --

SECTION 01 32 01

PROJECT SCHEDULE

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.

AACE INTERNATIONAL (AACE)

AACE 29R-03	(2011) Forensic Schedule Analysis
AACE 52R-06	(2006) Time Impact Analysis - As Applied in Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11	(2017) Administration -- Project Schedules

1.2 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Project Scheduler Qualifications; G,COR
Preliminary Project Schedule; G,COR
Initial Project Schedule; G,COR
Periodic Schedule Update; G,COR

1.3 PROJECT SCHEDULER QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative must have a minimum of 2-years experience scheduling construction projects similar in size and nature to this project with scheduling software that meets the requirements of this specification. Representative must have a comprehensive knowledge of CPM scheduling principles and application.

PART 2 PRODUCTS

2.1 SOFTWARE

The scheduling software utilized to produce and update the schedules required herein must be capable of meeting all requirements of this specification.

2.1.1 Government Default Software

The Government intends to use Primavera P6.

2.1.2 Contractor Software

Scheduling software used by the contractor must be commercially available from the software vendor for purchase with vendor software support agreements available. The software routine used to create the required sdef file must be created and supported by the software manufacturer.

2.1.2.1 Primavera

If Primavera P6 is selected for use, provide the "xer" export file in a version of P6 importable by the Government system.

2.1.2.2 Other Than Primavera

If the contractor chooses software other than Primavera P6, that is compliant with this specification, provide for the Government's use two licenses, two computers, and training for two Government employees in the use of the software. These computers will be stand-alone and not connected to Government network. Computers and licenses will be returned at project completion.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to FAR Clause 52.236-15 Schedules for Construction Contracts. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of work is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Subcontractors and suppliers working on the project must also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool. Use the Critical Path Method (CPM) of network calculation to generate all Project Schedules. Prepare each Project Schedule using the Precedence Diagram Method (PDM).

3.2 BASIS FOR PAYMENT AND COST LOADING

The schedule is the basis for determining contract earnings during each update period and therefore the amount of each progress payment. The aggregate value of all activities coded to a contract CLIN must equal the value of the CLIN.

3.2.1 Activity Cost Loading

Activity cost loading must be reasonable and without front-end loading. Provide additional documentation to demonstrate reasonableness if requested by the Contracting Officer.

3.2.2 Withholdings / Payment Rejection

Failure to meet the requirements of this specification may result in the disapproval of the preliminary, initial or periodic schedule updates and subsequent rejection of payment requests until compliance is met.

In the event that the Contracting Officer directs schedule revisions and those revisions have not been included in subsequent Project Schedule revisions or updates, the Contracting Officer may withhold 10 percent of pay request amount from each payment period until such revisions to the project schedule have been made.

3.3 PROJECT SCHEDULE DETAILED REQUIREMENTS

3.3.1 Level of Detail Required

Develop the Project Schedule to the appropriate level of detail to address major milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

3.3.2 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities may have Original Durations (OD) greater than 20 work days or 30 calendar days.

3.3.3 Procurement Activities

Include activities associated with the critical submittals and their approvals, procurement, fabrication, and delivery of long lead materials, equipment, fabricated assemblies, and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days.

3.3.4 Mandatory Tasks

Include the following activities/tasks in the initial project schedule and all updates.

a. Submission, review and acceptance of SD-01 Preconstruction Submittals (individual activity for each).

b. Long procurement activities.

c. Mobilization.

d. Pre-project Survey

e. Provision of Government field office.

f. Before-dredging survey of borrow area.

g. Pre-Placement condition surveys.

h. Beachfill operations and sequence.

i. Crossover repair/construction operations and sequence.

j. Planting of dune grass and fertilizing.

k. Installation of sand fence.

l. After-dredging survey of borrow area.

m. Post-placement condition surveys.

n. Post-project Survey

o. Submission and approval of as-built drawings.

p. Contractor's pre-final inspection.

q. Correction of punch list from Contractor's pre-final inspection.

r. Government's pre-final inspection.

s. Correction of punch list from Government's pre-final inspection.

t. Final inspection.

u. Demobilization.

Tasks that are site specific shall be clearly indicated as such.

3.3.5 Government Activities

Show Government and other agency activities that could impact progress. These activities include, but are not limited to: approvals, environmental permit approvals by State regulators, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

3.3.6 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11. This exact structure is mandatory. Develop and assign all Activity Codes to activities as detailed herein. A template SDEF compatible schedule backup file is available on the QCS web site: http://rms.usace.army.mil.

The SDEF format is as follows:

Field	Activity Code	Length	Description
1	WRKP	3	Workers per day
2	RESP	4	Responsible party
3	AREA	4	Area of work
4	MODF	6	Modification Number

Field	Activity Code	Length	Description
5	BIDI	6	Bid Item (CLIN)
6	PHAS	2	Phase of work
7	CATW	1	Category of work
8	FOW	20	Feature of work*

*Some systems require that FEATURE OF WORK values be placed in several activity code fields. The notation shown is for Primavera P6. Refer to the specific software guidelines with respect to the FEATURE OF WORK field requirements.

3.3.6.1 Workers Per Day (WRKP)

Assign Workers per Day for all field construction or direct work activities, if directed by the Contracting Officer. Workers per day is based on the average number of workers expected each day to perform a task for the duration of that activity.

3.3.6.2 Responsible Party Coding (RESP)

Assign responsibility code for all activities to the Prime Contractor, Subcontractor(s) or Government agency(ies) responsible for performing the activity.

a. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Property/Equipment (GFP) and Notice to Proceed (NTP) for phasing requirements.

b. Activities cannot have more than one Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical subcontractor); and GOVT (for USACE).

3.3.6.3 Area of Work Coding (AREA)

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities cannot have more than one Work Area Code.

Not all activities are required to be Work Area coded. A lack of Work Area coding indicates the activity is not resource or space constrained.

3.3.6.4 Modification Number (MODF)

Assign a Modification Number Code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved

by Contracting Officer. Key all Code values to the Government's modification numbering system. An activity can have only one Modification Number Code.

3.3.6.5 Bid Item Coding (BIDI)

Assign a Bid Item Code to all activities using the Contract Line Item Schedule (CLIN) to which the activity belongs, even when an activity is not cost loaded. An activity can have only one BIDI Code.

3.3.6.6 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities. Examples of phase of work are procurement phase and construction phase. Each activity can have only one Phase of Work code.

a. Code proposed fast track design and construction phases proposed to allow filtering and organizing the schedule by fast track design and construction packages.

b. If the contract specifies phasing with separately defined performance periods, identify a Phase Code to allow filtering and organizing the schedule accordingly.

3.3.6.7 Category of Work Coding (CATW)

Assign a Category of Work Code to all activities. Category of Work Codes include, but are not limited to construction submittal, procurement, fabrication, weather sensitive installation, non-weather sensitive installation, start-up, and testing activities. Each activity can have no more than one Category of Work Code.

3.3.6.8 Feature of Work Coding (FOW)

Assign a Feature of Work Code to appropriate activities based on the Definable Feature of Work to which the activity belongs based on the approved QC plan.

Definable Feature of Work (DFOW) is defined in Section 01 45 00 QUALITY CONTROL. An activity can have only one Feature of Work Code.

3.3.7 Contract Milestones and Constraints

Milestone activities are to be used for significant project events including, but not limited to, project phasing, project start and end activities, or interim completion dates. The use of artificial float constraints such as "zero free float" or "zero total float" are prohibited.

Mandatory constraints that ignore or effect network logic are prohibited. No constrained dates are allowed in the schedule other than those specified herein. Submit additional constraints to the Contracting Officer for approval on a case by case basis.

3.3.7.1 Project Start Date Milestone and Constraint

The first activity in the project schedule must be a start milestone titled "NTP Acknowledged," which must have a "Start On" constraint date equal to the date that the NTP is acknowledged.

3.3.7.2 End Project Finish Milestone and Constraint

The last activity in the schedule must be a finish milestone titled "End Project."

Constrain the project schedule to the Contract Completion Date in such a way that if the schedule calculates an early finish, then the float calculation for "End Project" milestone reflects positive float on the longest path. If the project schedule calculates a late finish, then the "End Project" milestone float calculation reflects negative float on the longest path. The Government is under no obligation to accelerate Government activities to support a Contractor's early completion.

3.3.7.3 Interim Completion Dates and Constraints

Constrain contractually specified interim completion dates to show negative float when the calculated late finish date of the last activity in that phase is later than the specified interim completion date.

3.3.7.3.1 Start Phase

Use a start milestone as the first activity for a project phase. Call the start milestone "Start Phase X" where "X" refers to the phase of work.

3.3.7.3.2 End Phase

Use a finish milestone as the last activity for a project phase. Call the finish milestone "End Phase X" where "X" refers to the phase of work.

3.3.8 Calendars

Schedule activities on a Calendar to which the activity logically belongs. Develop calendars to accommodate any contract defined work period such as a 7-day calendar for Government Acceptance activities, concrete cure times, etc. Develop the default Calendar to match the physical work plan with non-work periods identified including weekends and holidays. Develop Seasonal Calendar(s) and assign to seasonally affected activities as applicable.

3.3.9 Open Ended Logic

Only two open ended activities are allowed: the first activity "NTP Acknowledged" may have no predecessor logic, and the last activity -"End Project" may have no successor logic.

Predecessor open ended logic may be allowed in a time impact analyses upon the Contracting Officer's approval.

3.3.10 Default Progress Data Disallowed

Actual Start and Finish dates must not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features that calculate one of these parameters from the other. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process must match those dates provided in the Contractor Quality Control Reports. Failure to document the AS and AF dates in the Daily Quality Control report will result in disapproval of the Contractor's schedule.

3.3.11 Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule. Address out of sequence progress or logic changes in the Narrative Report and in the periodic schedule update meetings.

3.3.12 Added and Deleted Activities

Do not delete activities from the project schedule or add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and cannot be changed without Contracting Officer approval.

3.3.13 Original Durations

Activity Original Durations (OD) must be reasonable to perform the work item. OD changes are prohibited unless justification is provided and approved by the Contracting Officer.

3.3.14 Leads, Lags, and Start to Finish Relationships

Lags must be reasonable as determined by the Government and not used in place of realistic original durations, must not be in place to artificially absorb float, or to replace proper schedule logic.

a. Leads (negative lags) are prohibited.

b. Start to Finish (SF) relationships are prohibited.

3.3.15 Retained Logic

Schedule calculations must retain the logic between predecessors and successors ("retained logic" mode) even when the successor activity(s) starts and the predecessor activity(s) has not finished (out-of-sequence progress). Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") are not be allowed.

3.3.16 Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete , except for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete to allow for proper schedule management.

3.3.17 Remaining Duration

Update the remaining duration for each activity based on the number of estimated work days it will take to complete the activity. Remaining duration may not mathematically correlate with percentage found under paragraph entitled Percent Complete.

3.3.18 Cost Loading of Closeout Activities

Cost load the "Correction of punch list from Government pre-final inspection" activity(ies) not less than 1 percent of the present contract value. Activity(ies) may be declared 100 percent complete upon the Government's verification of completion and correction of all punch list work identified during Government pre-final inspection(s).

3.3.18.1 As-Built Drawings

If there is no separate contract line item (CLIN) for as-built drawings, cost load the "Submission and approval of as-built drawings" activity not less than $35,000 or 1 percent of the present contract value, which ever is greater, up to $200,000. Activity will be declared 100 percent complete upon the Government's approval.

3.3.19 Early Completion Schedule and the Right to Finish Early

An Early Completion Schedule is an Initial Project Schedule (IPS) that indicates all scope of the required contract work will be completed before the contractually required completion date.

a. No IPS indicating an Early Completion will be accepted without being fully resource-loaded (including crew sizes and manhours) and the Government agreeing that the schedule is reasonable and achievable.

b. The Government is under no obligation to accelerate work items it is responsible for to ensure that the early completion is met nor is it responsible to modify incremental funding (if applicable) for the project to meet the contractor's accelerated work.

3.4 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data CD/DVD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS. If the Contractor fails or refuses to furnish the information and schedule updates as set forth herein, then the Contractor will be deemed not to have provided an estimate upon which a progress payment can be made.

Review comments made by the Government on the schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents.

3.4.1 Preliminary Project Schedule Submission

Within 15 calendar days after the NTP is acknowledged submit the Preliminary Project Schedule defining the planned operations detailed for the first 90 calendar days for approval. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. The Preliminary Project Schedule may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required plan and program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, planned submissions of all early design packages, permitting

activities, design review conference activities, and other non-construction activities intended to occur within the first 90 calendar days. Government acceptance of the associated design package(s) and all other specified Program and Plan approvals must occur prior to any planned construction activities. Activity code any activities that are summary in nature after the first 90 calendar days with Bid Item (CLIN) code (BIDI), Responsibility Code (RESP) and Feature of Work code (FOW).

3.4.2 Initial Project Schedule Submission

Submit the Initial Project Schedule for approval at the preconstruction meeting. The schedule must demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. No payment will be made for work items not fully detailed in the Project Schedule.

3.4.3 Periodic Schedule Updates

Update the Project Schedule on a regular basis, monthly at a minimum. Provide a draft Periodic Schedule Update for review at the schedule update meetings as prescribed in the paragraph PERIODIC SCHEDULE UPDATE MEETINGS. These updates will enable the Government to assess Contractor's progress.

a. Update information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete is subject to the approval of the Government at the meeting.

b. AS and AF dates must match the date(s) reported on the Contractor's Quality Control Report for an activity start or finish.

3.5 SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:

3.5.1 Electronic Scheduling Data

Provide electronic scheduling data containing the current project schedule and all previously submitted schedules in the format of the scheduling software (e.g. .xer). Also include the Narrative Report and all required Schedule Reports. The electronic file must identify the type of schedule (Preliminary, Initial, Update), full contract number, Data Date and file name. Each schedule must have a unique file name and use project specific settings.

3.5.2 Narrative Report

Provide a Narrative Report with each schedule submission. The Narrative Report is expected to communicate to the Government the thorough analysis of the schedule output and the plans to compensate for any problems, either current or potential, which are revealed through that analysis. Include the following information as minimum in the Narrative Report:

a. Identify and discuss the work scheduled to start in the next update period.

b. A description of activities along the two most critical paths where the total float is less than or equal to 20 work days.

c. A description of current and anticipated problem areas or delaying factors and their impact and an explanation of corrective actions taken or required to be taken.

d. Identify and explain why activities based on their calculated late dates should have either started or finished during the update period but did not.

e. Identify and discuss all schedule changes by activity ID and activity name including what specifically was changed and why the change was needed. Include at a minimum new and deleted activities, logic changes, duration changes, calendar changes, lag changes, resource changes, and actual start and finish date changes.

f. Identify and discuss out-of-sequence work.

3.5.3 Schedule Reports

The format, filtering, organizing and sorting for each schedule report will be as directed by the Contracting Officer. Typically, reports contain Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. Provide the reports electronically in .pdf format. Provide 4 set(s) of hardcopy reports. The following lists typical reports that will be requested:

3.5.3.1 Activity Report

List of all activities sorted according to activity number.

3.5.3.2 Logic Report

List of detailed predecessor and successor activities for every activity in ascending order by activity number.

3.5.3.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.5.3.4 Earnings Report by CLIN

A compilation of the Total Earnings on the project from the NTP to the data date, which reflects the earnings of activities based on the agreements made in the schedule update meeting defined herein. Provided a complete schedule update has been furnished, this report serves as the basis of determining progress payments. Group activities by CLIN number and sort by activity number. Provide a total CLIN percent earned value, CLIN percent complete, and project percent complete. The printed report must contain the following for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Earnings to Date, Earnings this period, Total Quantity, Quantity to Date, and Percent Complete (based on cost).

3.5.3.5 Schedule Log

Provide a Scheduling/Leveling Report generated from the current project

schedule being submitted.

3.5.4 Network Diagram

The Network Diagram is required for the Preliminary, Initial and Periodic Updates. Depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.4.1 Continuous Flow

Show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.5.4.2 Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.4.3 Critical Path

Show all activities on the critical path. The critical path is defined as the longest path.

3.5.4.4 Banding

Organize activities using the WBS or as otherwise directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by major elements of work, category of work, work area and/or responsibility.

3.5.4.5 Cash Flow / Schedule Variance Control (SVC) Diagram

With each schedule submission, provide a SVC diagram showing 1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates, and 2) Earned Value to-date.

3.6 PERIODIC SCHEDULE UPDATE

3.6.1 Periodic Schedule Update Meetings

Contracting Officer's Representative (COR) may conduct periodic schedule update meetings for the purpose of reviewing the proposed Periodic Schedule Update, Narrative Report, Schedule Reports, and progress payment. Conduct meetings at least monthly within five days of the proposed schedule data date. Provide a computer with the scheduling software loaded and a projector which allows all meeting participants to view the proposed schedule during the meeting. The Contractor's authorized scheduler must organize, group, sort, filter, perform schedule revisions as needed and review functions as requested by the Contractor and/or Government. The meeting is a working interactive exchange which allows the Government and Contractor the opportunity to review the updated schedule on a real time and interactive basis. The meeting will last no longer than 8 hours. Provide a draft of the proposed narrative report and schedule data file to the Government a minimum of two workdays in advance of the meeting. The Contractor's Project Manager and scheduler must attend the meeting with the authorized representative of the Contracting Officer. Superintendents,

foremen and major subcontractors must attend the meeting as required to discuss the project schedule and work. Following the periodic schedule update meeting, make corrections to the draft submission. Include only those changes approved by the Government in the submission and invoice for payment.

3.6.2 Update Submission Following Progress Meeting

Submit the complete Periodic Schedule Update of the Project Schedule containing all approved progress, revisions, and adjustments, pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 work days after the periodic schedule update meeting.

3.7 WEEKLY PROGRESS MEETINGS

Conduct a weekly meeting with the Government (or as otherwise mutually agreed to) between the meetings described in paragraph entitled PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and to review planned activities for the upcoming two weeks. Use the current approved schedule update for the purposes of this meeting and for the production and review of reports. At the weekly progress meeting, address the status of RFIs, RFPs and Submittals.

3.8 REQUESTS FOR TIME EXTENSIONS

Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval within 10 days of a delay occurring. Also prepare a time impact analysis for each Government request for proposal (RFP) to justify time extensions.

3.8.1 Justification of Delay

Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify all schedule activities impacted. Show that the event that caused the delay/impact was the responsibility of the Government. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion date(s). Evaluate multiple impacts chronologically; each with its own justification of delay. With multiple impacts consider any concurrency of delay. A time extension and the schedule fragnet becomes part of the project schedule and all future schedule updates upon approval by the Contracting Officer.

3.8.2 Time Impact Analysis (Prospective Analysis)

Prepare a time impact analysis for approval by the Contracting Officer based on industry standard AACE 52R-06. Utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. If Contracting Officer determines the time frame between the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis. Unless approved by the Contracting Officer, no other changes may be incorporated into the schedule being used to justify the time impact.

3.8.3 Forensic Schedule Analysis (Retrospective Analysis)

Prepare an analysis for approval by the Contracting Officer based on industry standard AACE 29R-03.

3.8.4 Fragmentary Network (Fragnet)

Prepare a proposed fragnet for time impact analysis consisting of a sequence of new activities that are proposed to be added to the project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. Clearly show how the proposed fragnet is to be tied into the project schedule including all predecessors and successors to the fragnet activities. The proposed fragnet must be approved by the Contracting Officer prior to incorporation into the project schedule.

3.8.5 Time Extension

The Contracting Officer must approve the Justification of Delay including the time impact analysis before a time extension will be granted. No time extension will be granted unless the delay consumes all available Project Float and extends the projected finish date ("End Project" milestone) beyond the Contract Completion Date. The time extension will be in calendar days.

Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.8.6 Impact to Early Completion Schedule

No extended overhead will be paid for delay prior to the original Contract Completion Date for an Early Completion IPS unless the Contractor actually performed work in accordance with that Early Completion Schedule. The Contractor must show that an early completion was achievable had it not been for the impact.

3.9 FAILURE TO ACHIEVE PROGRESS

Should the progress fall behind the approved project schedule for reasons other than those that are excusable within the terms of the contract, the Contracting Officer may require provision of a written recovery plan for approval. The plan must detail how progress will be made-up to include which activities will be accelerated by adding additional crews, longer work hours, extra work days, etc.

3.9.1 Artificially Improving Progress

Artificially improving progress by means such as, but not limited to, revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited. Indicate assumptions made and the basis for any logic, constraint, duration and calendar changes used in the creation of the recovery plan. Any additional resources, manpower, or daily and weekly work hour changes proposed in the recovery plan must be evident at the work site and documented in the daily report along with the Schedule Narrative Report.

3.9.2 Failure to Perform

Failure to perform work and maintain progress in accordance with the supplemental recovery plan may result in an interim and final unsatisfactory performance rating and may result in corrective action

directed by the Contracting Officer pursuant to FAR 52.236-15 Schedules for Construction Contracts, FAR 52.249-10 Default (Fixed-Price Construction), and other contract provisions.

3.9.3 Recovery Schedule

Should the Contracting Officer find it necessary, submit a recovery schedule pursuant to FAR 52.236-15 Schedules for Construction Contracts.

3.10 OWNERSHIP OF FLOAT

Except for the provision given in the paragraph IMPACT TO EARLY COMPLETION SCHEDULE, float available in the schedule, at any time, may not be considered for the exclusive use of either the Government or the Contractor including activity and/or project float. Activity float is the number of work days that an activity can be delayed without causing a delay to the "End Project" finish milestone. Project float (if applicable) is the number of work days between the projected early finish and the contract completion date milestone.

3.11 TRANSFER OF SCHEDULE DATA INTO RMS/QCS

Import the schedule data into the Quality Control System (QCS) and export the QCS data to the Government. This data is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to FAR 52.232-27 Prompt Payment for Construction Contracts is contingent upon the Government receiving both acceptable and approvable hard copies and matching electronic export from QCS of the application for progress payment.

3.12 PRIMAVERA P6 MANDATORY REQUIREMENTS

If Primavera P6 is being used, request a backup file template (.xer) from the Government, if one is available, prior to building the schedule. The following settings are mandatory and required in all schedule submissions to the Government:

a. Activity Codes must be Project Level, not Global or EPS level.

b. Calendars must be Project Level, not Global or Resource level.

c. Activity Duration Types must be set to "Fixed Duration & Units".

d. Percent Complete Types must be set to "Physical".

e. Time Period Admin Preferences must remain the default "8.0 hr/day, 40 hr/week, 172 hr/month, 2000 hr/year". Set Calendar Work Hours/Day to 8.0 Hour days.

f. Set Schedule Option for defining Critical Activities to "Longest Path".

g. Set Schedule Option for defining progressed activities to "Retained Logic".

h. Set up cost loading using a single lump sum labor resource. The Price/Unit must be $1/hr, Default Units/Time must be "8h/d", and settings "Auto Compute Actuals" and "Calculate costs from units" selected.

i. Activity ID's must not exceed 10 characters.

j. Activity Names must have the most defining and detailed description within the first 30 characters.

3.13 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the costs of all the bid items.

-- End of Section --

SECTION 01 32 33

CONSTRUCTION PHOTOGRAPHY

PART 1 GENERAL

1.1 SCOPE OF SECTION

The work specified in this section includes: 1) construction photographs, 2) aerial obliques; and 3) geo-referenced aerial imagery. All items required to be submitted by this section shall be provided for unrestricted use by the Government.

1.2 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 Society for Photogrammetry and Remote Sensing (ASPRS)

ASPRS-PAS	(Ed. 1, Ver 1.0 Nov 2014) Positional Accuracy Standards for Digital Geospatial Data

Federal Geographic Data Committee (FGDC)

FGDC-STD-001	(1998) Content Standards for Digital Geospatial Metadata

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM-1110-1-1000	(APR 2015) Photogrammetric and LiDAR Mapping

1.3 SUBMITTALS

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

SD-01 Preconstruction Submittals

Aerial Photography Qualifications; G,DO
Construction Photography Plan; G,COR
Geo-referenced Aerial Imagery Mission and Capability Plan; G,COR
Pre-Construction Photographs; G,COR
Pre-Beachfill Geo-referenced Aerial Imagery; G,DO

SD-07 Certificates

Progress Construction Photographs; G,COR
Post-Construction Photographs; G,COR
Post-Beachfill Geo-referenced Aerial Imagery; G,DO
Aerial Obliques; G,COR

1.4 AERIAL PHOTOGRAPHY QUALIFICATIONS

Aerial photography, for both aerial obliques and geo-referenced aerial imagery, shall be performed by independent aerial photography companies, that have a minimum of 5 years documented experience in aerial photography, similar in nature to the aerial photography required under this Contract. Photography may be acquired by either the same company or separate companies, that meet the required qualifications. Submit aerial photographer qualifications prior to commencing aerial photography. Include aerial photography examples for aerial obliques and geo-referenced aerial imagery.

1.5 PHOTOGRAPHY PLANS

1.5.1 Construction Photography Plan

Prepare a photography plan which includes the following information: items to be photographed locations, and the time the images are to be taken.

1.5.2 Geo-referenced Aerial Imagery Mission and Capability Plan

a. Design and plan geo-referenced digital image acquisition missions to acquire, process, and deliver digitally rectified imagery in GeoTiff files (with associated world files) over the project area, prior to beachfill operations and post beachfill operations. Include in the mission and capability plan sensor types, flight heights, processing techniques, and delivery formats and media. The plan shall be implemented by a person assigned within the Contractor's organization who will be present during the times work is in progress, and will be responsible for assuring that all documents on the project have been coordinated. This individual shall possess extensive, verifiable photogrammetric experience. Competent, independent reviewers shall review all documents.

b. Include in the plan a tile naming scheme that will be used for the pre and post beachfill placement aerial imagery collections.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHY

Take digital images with a high quality digital camera using a minimum of 12,000,000 pixels (12 Megapixels). Identify images by number, and referenced to a listing containing the same identification information as used for the images. Photograph personnel, material, work methods, and equipment utilized during the entire contract period, as follows:

a. Pre-Construction Photographs: Prior to commencement of work, take a minimum of 25 photographs of pre-construction existing conditions, including beach structures, groins, outfall piping, supporting cribbage, timber support piles, Contractor access points, and lay down area. Take photographs as close as possible to the beginning of the work and with sufficient detail to accurately depict existing site conditions. Pre-construction photographs must include any structure including, but not limited to, groins, revetments, outfalls, jetties,

and piers, that the Contractor will use or place equipment on or across. This photographic documentation may require the Contractor to take more than the minimum number of photographs specified.

b. Progress Construction Photographs: During the progress of work, take a minimum of 15 photographs monthly of work activities. Photographs shall be of working personnel and equipment, depicting the work methods being utilized, taken during normal working hours. Photograph special events throughout the contract period as directed by the Contracting Officer. Photographs of the same pre-construction features of work shall be taken from the same locations, perspectives, and angles. Submit a reference plan sheet or map with the monthly construction photos, showing the locations and view of the photographs.

c. Post-Construction Photographs: After completion of work, take a minimum of 25 photographs from the same pre-construction and progress construction locations, perspectives, and angles. Photography shall be taken immediately after the end of construction work.

3.1.1 Data Submittal

Submit digital images of photographs in .jpg or .pdf format to the COR within 24 hours of when taken. Include the following identification information in the Metadata for each image: name and location of project, item/action being photographed, General Contractor, contract number, orientation of view, date and time of exposure, and name and address of photographer.

3.2 AERIAL OBLIQUES

Obtain aerial oblique photos of the entire project length prior to commencement of beachfill work, during the progress of work (monthly), and after completion of beachfill work from the same perspective and angles as the before photos. Take aerial photos with overlapping views to accurately record progress details of the project work. The photos shall exhibit good critical focus. An aerial oblique photo example is attached to this section. This example represents the altitude at which the photos should be taken (approximately 300 - 400 feet) as well as the level of detail and quality of those photos. In general, the horizon shall be approximately 1/5 down from the top of the frame with about a 2/3 land and a 1/3 water split, horizontally.

3.2.1 Data Submittal

Submit aerial obliques digital images within 10 days of when they are taken. Submit images in .jpg or .pdf format and include the following on the front of each image, as shown on the attached example: name and location of project, contract number, General Contractor, orientation of view, date and time of exposure, and name and address of photographer.

3.3 GEO-REFERENCED DIGITAL AERIAL IMAGERY ACQUISITION AND PROCESSING

Deploy airborne assets to acquire vertical, high resolution, 4-band aerial imagery at 3-inch pixel resolution over the entire project area to assess the pre and post beachfill construction condition of the project. After acquisition of aerial imagery, process the digital imagery into geo-referenced full-tile imagery.

3.3.1 Acquisition

a. Acquire the aerial imagery prior to the start of the placement of beachfill and post completion of the placement of beachfill.

b. Commence pre-beachfill aerial imagery no more than 21 calendar days prior to beachfill placement, subject to the approval of the COR.

c. Post-beachfill aerial imagery must be collected within 21 calendar days following the completion of beachfill placement.

d. Provide a flight crew, including aircraft and sensor, available and ready to mobilize to the project area, and able to begin acquisition within the required 21 day timeframe. It is the responsibilty of the Contractor for obtaining access to the airspace over these target locations.

e. The aerial imagery photo mission must be accomplished when favorable weather conditions are present. It is preferred that cloud cover and shadowing should be held to less than 10 percent for any single tile. Cloud shadows or overcast conditions allowing visibility of the ground are acceptable. Imagery shall only be collected at a sun angle of greater than 30 degrees. Collection of imagery is preferred to be completed as close as possible to low tide to maximize coverage of the inter-tidal zone.

f. Collect digital 4-band (RGB & NIR) imagery employing a large format digital mapping camera and airborne GNSS technology over the designated area. Flight lines and tiling schemes shall be planned such that no more than 40 percent of any single tile is water (ocean). Deliver the selected areas as full-tile digital imagery products. Propose a tiling scheme with (2500 feet X 2500 feet) image sizes.

g. The acquired imagery shall conform to ASPRS-PAS and EM-1110-1-1000, for a horizontal accuracy class of 12-inches/4 pixels for lower accuracy - visualization mapping.

h. Resolution and Accuracy: Acquire color, vertical aerial photography at 3-inch pixel resolution, meeting or exceeding ASPRS-PAS, for a horizontal accuracy of 12-inch for large scale maps.

i. Bands: Employ multiple wavelengths of aerial imagery obtained through use of a Digital Mapping Camera system to collect digital imagery for this project. Digital imagery to be collected during the flight mission shall be panchromatic (black and white); red, green and blue (R, G, B), and near infrared (NIR). Process all bands into 8 bit, 4-band product deliverables in TIFF & associated .TFW format.

j. Acquisition of aerial imagery shall also comply with the requirements specified in Appendix A, attached to this section.

3.3.2 Data Processing

a. Following data collection, deliver the imagery data frames to the Contractor's production facility. Download the imagery to a production workstation. Resolve the differential GNSS solution by incorporating the Airborne GNSS/IMU data with data collected by utilizing existing Continuous Operating Reference Systems (CORS) as base stations. Smart Base technology from Applanix software POSPac or similar process may be utilized. Apply this differential GNSS and IMU solution to the imagery to achieve direct geo-referencing. Reference the final adjusted geo-referenced imagery to

NAD 83 (2011), (New Jersey State Plane Coordinate System), with all units of measure in US Survey Feet. Accomplish radiometric correction to minimize the appearance of seams between image tile frames without appreciable loss of clarity of significant features.

b. Metadata shall comply with FGDC-STD-001. ESRI ArcCatalog may be used to create the Metadata records. These Metadata records shall be constructed with sufficient quality to pass through the USGS Metadata Compiler with less than three errors. All products generated must be identified in the metadata.

3.3.3 Data Submittal

Submit the following within 21 calendar days following the completion of imagery acquisition for each pre-beachfill geo-referenced aerial imagery and post-beachfill geo-referenced aerial imagery collected:

a. Submit final, full image tiles in 4-bands imagery in .TIF and .TFW format, 3-inch pixel resolution, in approved tiling scheme. Submit geo-referenced imagery in GeoTIFF format, using no compression. Include associated world files (.TFW) for each image tile submitted. Ortho-rectification of the acquired imagery is not required.

b. Submit overall Mr. Sid compression file (with .AUX file) at 20:1 ratio Generation 4 of the overall selected AOI. Null pixel values rendered in white.

c. Submit the finished products on USB 3.0 portable hard drives in the specified formats. Deliver all data and supplemental products on USB external hard drives using one of the following HDD models: Western Digital My Passport Ultra, Seagate Expansion or Seagate Backup Plus Slim or other approved equal. Hard drives shall not require an external power source. Hard drives shall become the property of the Government. No restrictions shall be placed on the data by the imagery/LiDAR provider. Submit 3 hard drives with the pre-beachfill imagery data, and another 3 for the post-beachfill imagery data. In addition, provide data via an electronic file sharing system as specified in Section 01 33 00 SUBMITTAL PROCEDURES, with email notification to the COR. Data collected and produced shall become the property of the Government.

3.4 PHOTOGRAPHIC DOCUMENTATION OF SURVEYS

The photographs specified in Section 01 71 23 SURVEY REQUIREMENTS, are in addition to those required in this section.

3.5 MEASUREMENT AND PAYMENT

a. With the exception of the work specified for digital aerial imagery, no No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the the cost of all the bid items.

b. The work specified in this section for digital aerial imagery will not be measured for payment and all costs in connection therewith shall be included in the contract lump sum price for the Bid Item titled "Digital Aerial Imagery.

3.6 APPENDIX A

GPS / IMU Data Collection

CORS Stations

1. The Contractor flight crew may utilize nearby CORS stations during data collection.

2. During data collection, the aircraft shall remain within 100-mile radius of the base station at all times.

PDOP

1. The decisions whether to fly during periods of high PDOP will be based on daily discussions between the Contractor project manager and flight operations. Check the predicted PDOP status prior to each flight.

2. The Contractor shall make every effort not to initialize during periods of PDOP greater than 2.5.

3. The PDOP should not exceed 5.0 during the airborne data collection.

4. If the decision to delay take-off due to high PDOP will impact the ability to complete the program, the collection team may choose to collect data during periods of high PDOP. Data shall be processed and quality checked in a timely manner after the flight, so any data issues will be promptly identified and a decision made on how to resolve any issues.

Flight

1. The elevation mask of all GPS receivers should be set to 10.

2. The GPS / IMU data collection requires an "initialization" period to allow satellite acquisition.

3. The aircraft shall be away from buildings, free of multi-path and should be at a complete stop during the initialization time.

4. During data collection, the aircraft shall not be banked more than 20 degrees to prevent loss of lock with GPS satellites during the mission.

5. The ground and airborne GPS receivers shall collect data for the duration of the flight. This increases the likelihood that the GPS data will be successfully processed in both the forward and reverse directions.

6. Procedural "S" turns shall be performed before entering and leaving the project area.

7. After landing and the plane is stationary, the GPS / IMU subsystem shall continue to collect data for 10 minutes. FCMS shall continue to run during the 10-minute hold.

8. The initialization and termination of the aircraft's data

collection shall occur as close to the airport base station as possible, but far enough from buildings to prevent multi-path.

Post Mission Procedures

1. Flight Logs shall be retained by the Contractor after each data collection.

2. GPS, IMU, and image data shall be downloaded the same day of data collection.

3. After system memory unit (MM40) download is complete, a preliminary quality control shall be performed on the raw images by the Contractor production team to ensure quality data collection. This quality control shall also be used to analyze any lines for clouds, cloud shadows, etc. requiring a re-fly.

4. A duplicate copy of the raw data shall be maintained by the Contractor. This duplicate copy can be maintained on the DMC system memory unit (MM40) or another hard drive device (PowerVault / GeoVault).

-- End of Section --

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Aerial Oblique Example



Name & Location of Project: Beach Nourishment
Barnegat Inlet to Manasquan Inlet, Ocean County New Jersey
Contract Number: W912BU23C00xx
General Contractor: XYZ Construction Co.
Photogragher: ABC Aerials, Inc. 123 1st Ave., Anywhere, NJ 08000

Looking West

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SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

1.1.1 Submittal Information

The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

Units of weights and measures used on all submittals are to be the same as those used in the contract drawings.

1.1.2 Project Type

The Contractor's Quality Control (CQC) System Manager are to check and approve all items before submittal and stamp, sign, and date indicating action taken. Proposed deviations from the contract requirements are to be clearly identified. Include within submittals 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.

1.1.3 Submission of Submittals

Schedule and provide submittals requiring Government approval before acquiring the material or equipment covered thereby. Pick up and dispose of samples not incorporated into the work in accordance with manufacturer's Safety Data Sheets (SDS) and in compliance with existing laws and regulations.

1.2 DEFINITIONS

1.2.1 Submittal Descriptions (SD)

Submittal requirements are specified in the technical sections. Examples and descriptions of submittals identified by the Submittal Description (SD) numbers and titles follow:

SD-01 Preconstruction Submittals

Submittals classified as "SD-01 Preconstruction Submittals" require approval prior to mobilization to the contract work site. All other submittals, classified as "SD-02" through "SD-11," require approval prior to commencing the particular task to which the submittal is associated.

Preconstruction Submittals include schedules and a tabular list of locations, features, and other pertinent information regarding products, materials, equipment, or components to be used in the work.

Certificates Of Insurance

Surety Bonds

List Of Proposed Subcontractors

List Of Proposed Products

Baseline Network Analysis Schedule (NAS)

Submittal Register

Schedule Of Prices Or Earned Value Report

Accident Prevention Plan (APP)

Work Plan

Quality Control (QC) plan

Environmental Protection Plan (EPP)

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-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards ensuring work can be judged. Includes assemblies or portions of assemblies that are to be incorporated into the project and those

that will be removed at conclusion of the 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. Unless specified in another section, testing must have been within one year of date of contract award for the project.

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

Report that 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 logs and checklists

Final acceptance test and operational test procedure

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that the 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 manufacturer, supplier, installer or Subcontractor through Contractor. The document purpose is to further promote the orderly progression of a portion of the work by documenting procedures, acceptability of methods, or personnel qualifications.

Confined space entry permits

Text of posted operating instructions

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and (SDS)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.

Submittals required for Guiding Principle Validation (GPV) or Third Party Certification (TPC).

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of

construction on a multi-phase contract.

1.2.2 Approving Authority

Office or designated person authorized to approve the submittal.

1.2.3 Work

As used in this section, on-site 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. In exception, excludes work to produce SD-01 submittals.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" or “S” classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Submittal Register; G,COR

1.4 SUBMITTAL CLASSIFICATION

1.4.1 Government Approved (G)

Government approval is required for extensions of design, critical materials, variations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Government.

Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, submittals are considered to be "shop drawings."

1.4.2 For Information Only

Submittals not requiring Government approval will be for information only. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are not considered to be "shop drawings."

1.5 PREPARATION

1.5.1 Transmittal Form

Use the ENG Form 4025-R transmittal form for submitting both Government-approved and information-only submittals. Submit in accordance with the instructions on the reverse side of the form. This form or similar forms is included in the RMS CM software that the Contractor is required to use for this contract. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the contract drawings pertinent to the data submitted for each item.

1.5.2 Submittal Format

1.5.2.1 Format of SD-01 Preconstruction Submittals

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

Provide data in the unit of measure used in the contract documents.

1.5.2.2 Format for SD-02 Shop Drawings

Provide shop drawings not less than 8 1/2 by 11 inches nor more than 30 by 42 inches, except for full-size patterns or templates. Prepare drawings to accurate size, with scale indicated, unless another form is required. Ensure drawings are suitable for reproduction and of a quality to produce clear, distinct lines and letters, with dark lines on a white background.

a. Include the nameplate data, size, and capacity on drawings. Also include applicable federal, military, industry, and technical society publication references.

b. Dimension drawings, except diagrams and schematic drawings. Prepare drawings demonstrating interface with other trades to scale. Use the same unit of measure for shop drawings as indicated on the contract drawings. Identify materials and products for work shown.

Submit an electronic copy of drawings in PDF format.

1.5.2.2.1 Drawing Identification

Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph IDENTIFYING SUBMITTALS.

Number drawings in a logical sequence. Each drawing is to bear the number of the submittal in a uniform location next to the title block. Place the Government contract number in the margin, immediately below the title block, for each drawing.

Reserve a blank space, no smaller than 3 x 4 inches on the right-hand side of each sheet for the Government disposition stamp.

1.5.2.3 Format of SD-03 Product Data

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

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

1.5.2.3.1 Product Information

Supplement product data with material prepared for the project to satisfy the submittal requirements where product data does not exist. Identify this material as developed specifically for the project, with information and format as required for submission of SD-07 Certificates.

Provide product data in units used in the Contract documents. Where product data are included in preprinted catalogs with another unit, submit the dimensions in contract document units, on a separate sheet.

1.5.2.3.2 Standards

Where equipment or materials are specified to conform to industry or technical-society reference standards of such organizations as the American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), or 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. State on the certificate 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.

1.5.2.3.3 Data Submission

Collect required data submittals for each specific material, product, unit of work, or system into a single submittal that is marked for choices, options, and portions applicable to the submittal. Mark each copy of the product data identically. Partial submittals will not be accepted.

Submit the manufacturer's instructions before installation.

1.5.2.4 Format of SD-04 Samples

1.5.2.4.1 Sample Characteristics

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

a. Sample of Equipment or Device: Full size.

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

c. 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.

d. 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.

e. Sample Volume of Nonsolid Materials: Pint. Examples of nonsolid materials are sand and paint.

f. Color Selection Samples: 2 by 4 inches. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified. Sizes and quantities of samples are to represent their respective standard unit.

g. Sample Panel: 4 by 4 feet.

h. Sample Installation: 100 square feet.

1.5.2.4.2 Sample Incorporation

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

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

1.5.2.4.3 Comparison Sample

Samples Showing Range of Variation: Where variations in color, finish, pattern, or texture are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range. Mark each unit to describe its relation to the range of the variation.

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

1.5.2.5 Format of SD-05 Design Data

Provide design data and certificates on 8 1/2 by 11 inch paper.

1.5.2.6 Format of SD-06 Test Reports

By prominent notation, indicate each report in the submittal. Indicate the specification number and paragraph number to which each report pertains.

1.5.2.7 Format of SD-07 Certificates

Provide design data and certificates on 8 1/2 by 11 inch paper.

1.5.2.8 Format of SD-08 Manufacturer's Instructions

Present manufacturer's instructions submittals for each section. Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also include applicable federal, military, industry, and technical-society publication references. If supplemental information is needed to clarify the manufacturer's data, submit it as specified for SD-07 Certificates.

Submit the manufacturer's instructions before installation.

1.5.2.8.1 Standards

Where equipment or materials are specified to conform to industry or technical-society reference standards of such organizations as the American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), or 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. State on the certificate 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.

1.5.2.9 Format of SD-09 Manufacturer's Field Reports

By prominent notation, indicate each report in the submittal. Indicate the specification number and paragraph number to which each report pertains.

1.5.2.10 Format of SD-11 Closeout Submittals

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

Provide data in the unit of measure used in the contract documents.

1.5.3 Source Drawings for Shop Drawings

1.5.3.1 Source Drawings

The entire set of source drawing files (DWG) will not be provided to the Contractor. Request the specific Drawing Number for the preparation of shop drawings. Only those drawings requested to prepare shop drawings will be provided. These drawings are provided only after award.

1.5.3.2 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse is at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim, and waives to the fullest extent permitted by law any claim or cause of action of any nature against the Government, its agents, or its subconsultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities, or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic source drawing files are not construction documents. Differences may exist between the source drawing files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic source drawing files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. The Contractor is responsible for determining if any conflict exists. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished source drawing files, the signed and sealed construction documents govern. Use of these source drawing files does not relieve the Contractor of the duty to fully comply with the contract documents, including and without limitation the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction data related to this

contract, remove all previous indication of ownership (seals, logos, signatures, initials and dates).

1.5.4 Electronic File Format

Provide submittals in electronic format, with the exception of material samples required for SD-04 Samples items. In addition to the electronic submittal, provide hard copies of the submittals in the quantities as specified in the paragraphs below. Compile the submittal file as a single, complete document, to include the Transmittal Form described within. Name the electronic submittal file specifically according to its contents, and coordinate the file naming convention with the Contracting Officer. Electronic files must be of sufficient quality that all information is legible. Use PDF as the electronic format, unless otherwise specified or directed by the Contracting Officer. Generate PDF files from original documents with bookmarks so that the text included in the PDF file is searchable and can be copied. If documents are scanned, optical character resolution (OCR) routines are required. Index and bookmark files exceeding 30 pages to allow efficient navigation of the file. When required, the electronic file must include a valid electronic signature or a scan of a signature. Maintain hard copies of approved submittals at the field locations (field office, site facilities, dredge, etc.) for use by Contractor and Government personnel. Submittal tracking and transmittal documents (Eng Form 4025) will continue to utilize RMS as specified in Section 01 45 05 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE(RMS CM).

E-mail electronic submittal documents smaller than 10MB to an e-mail address as directed by the Contracting Officer. Provide electronic documents over 10 MB on an optical disc or through an electronic file sharing system such as the DOD SAFE Web Application located at the following website: https://safe.apps.mil/.

1.6 QUANTITY OF SUBMITTALS

1.6.1 Number of SD-01 Preconstruction Submittal Copies

Unless otherwise specified, submit two sets of administrative submittals.

1.6.2 Number of SD-02 Shop Drawing Copies

Submit two copies of submittals to the COR of shop drawings requiring review and approval by a QC organization.

1.6.3 Number of SD-03 Product Data Copies

Submit in compliance with quantity requirements specified for shop drawings.

1.6.4 Number of SD-04 Samples

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

b. Submit one sample panel or provide one sample installation where directed. Include components listed in the technical section or as directed.

c. Submit one sample installation, where directed.

d. Submit one sample of nonsolid materials.

1.6.5 Number of SD-05 Design Data Copies

Submit in compliance with quantity requirements specified for shop drawings.

1.6.6 Number of SD-06 Test Report Copies

Submit in compliance with quantity and quality requirements specified for shop drawings, other than field test results that will be submitted with QC reports.

1.6.7 Number of SD-07 Certificate Copies

Submit in compliance with quantity requirements specified for shop drawings.

1.6.8 Number of SD-08 Manufacturer's Instructions Copies

Submit in compliance with quantity requirements specified for shop drawings.

1.6.9 Number of SD-09 Manufacturer's Field Report Copies

Submit in compliance with quantity and quality requirements specified for shop drawings other than field test results that will be submitted with QC reports.

1.6.10 Number of SD-11 Closeout Submittals Copies

Unless otherwise specified, submit two sets of administrative submittals.

1.7 INFORMATION ONLY SUBMITTALS

Submittals without a "G" designation must be certified by the QC manager and submitted to the Contracting Officer for information-only. Provide information-only submittals to the Contracting Officer a minimum of 14 calendar days prior to the Preparatory Meeting for the associated Definable Feature of Work (DFOW). Approval of the Contracting Officer is not required on information only submittals. The Contracting Officer will mark "receipt acknowledged" on submittals for information and will return only the transmittal cover sheet to the Contractor. Normally, submittals for information only will not be returned. However, the Government reserves the right to return unsatisfactory submittals and 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.

1.8 PROJECT SUBMITTAL REGISTER

A sample Project Submittal Register showing items of equipment and materials for when submittals are required by the specifications is provided at the end of this section.

1.8.1 Submittal Management

Prepare and maintain a submittal register, as the work progresses. Do not change data that is output in columns (c), (d), (e), and (f) as delivered by Government; retain data that is output in columns (a), (g), (h), and (i) as approved. As an attachment, provide 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. Maintain a submittal register for the project as specified herein and in accordance with Section 01 45 05 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE(RMS CM). The Government will provide the initial submittal register with 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 Number. and type, e.g., SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in each 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 the project requirements.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns and all dates on which submittals are received by and returned by the Government.

1.8.2 Preconstruction Use of Submittal Register

Submit the submittal register. Include the QC plan and the project schedule. Verify that all submittals required for the project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

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

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

Column (h) Contractor Approval Date: Date that Contractor needs approval of submittal.

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

1.8.3 Contractor Use of Submittal Register

Update the following fields with each submittal throughout the contract.

Column (b) Transmittal Number: List of consecutive, Contractor-assigned numbers.

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

Column (l) Date submittal transmitted.

Column (q) Date approval was received.

1.8.4 Approving Authority Use of Submittal Register

Update the following fields:

Column (b) Transmittal Number: List of consecutive, Contractor-assigned numbers.

Column (l) Date submittal was received.

Column (m) through (p) Dates of review actions.

Column (q) Date of return to Contractor.

1.8.5 Action Codes

1.8.5.1 Contractor Action Codes

DESIGN BID BUILD SUBMITTALS			
Submittal Classifications shown in UFGS Sections	Submittal Classification	Corresponding SpecsIntact Submittal Register Code which is populated in the SI Submittal Register. Software Limitations: (The software shows one character delineation in the SpecsIntact Submittal Register)	RMS – The following Submittal Classifications are populated in RMS when the SpecsIntact Submittal Data File is pulled into RMS)
G	Submittal requires Government	G	GA
BLANK	Submittal is For Information Only (FIO)	BLANK	FIO
S	Submittal is for documentation of Sustainable requirements	S	S/FIO

1.8.6 Delivery of Copies

Submit an updated electronic copy of the submittal register to the Contracting Officer with each invoice request. Provide an updated Submittal Register monthly regardless of whether an invoice is submitted.

1.9 VARIATIONS

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

1.9.1 Considering Variations

Discussion of variations with the Contracting Officer before submission will help ensure that functional and quality requirements are met and minimize rejections and resubmittals. For variations that include design changes or some material or product substitutions, the Government may require an evaluation and analysis by a licensed professional engineer hired by the contractor.

Specifically point out variations from contract requirements in a transmittal letter. Failure to point out variations may cause the Government to require rejection and removal of such work at no additional cost to the Government.

1.9.2 Proposing Variations

Check the column "variation" of ENG Form 4025 for submittals that include variations proposed by the Contractor. Set forth in writing the reason for any variations and note such variations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted variations.

1.9.3 Warranting that Variations are Compatible

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

1.9.4 Review Schedule Extension

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

1.10 SCHEDULING

Schedule and submit concurrently product data and shop drawings covering component items forming a system or items that are interrelated. Submit pertinent certifications at the same time. No delay damages or time extensions will be allowed for time lost in late submittals. Government review will be completed within 14 calendar days after the date of receipt of submission by the Government.

a. Coordinate scheduling, sequencing, preparing, and processing of submittals with performance of work so that work will not be delayed by submittal processing. The Contractor is responsible for additional time required for Government reviews resulting from required resubmittals. The review period for each resubmittal is the same as for the initial submittal.

b. Submittals required by the contract documents are listed on the submittal register. If a submittal is listed in the submittal register but does not pertain to the contract work, the Contractor is to include

the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but that have been omitted from the register or marked "N/A."

c. Resubmit the submittal register and annotate it monthly with actual submission and approval dates. When all items on the register have been fully approved, no further resubmittal is required.

d. Period of review for each resubmittal is the same as for initial submittal.

1.11 GOVERNMENT APPROVING AUTHORITY

When the approving authority is the Contracting Officer, the Government will:

a. Note the date on which the submittal was received.

b. Review submittals for approval within the 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 REVIEW NOTATIONS and with comments and markings appropriate for the action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date submittals. Electronic email will be sent from the Government to the Contractor with the Review Notation, as specified below. Hard copies of submittals will not be returned.

1.11.1 Review Notations

Submittals will be returned to the Contractor with the following notations:

a. Submittals marked "approved" or "accepted" authorize proceeding with the work covered.

b. Submittals marked "approved as noted" or "approved, except as noted, resubmittal not required," authorize proceeding with the work covered provided that the Contractor takes no exception to the corrections.

c. Submittals marked "not approved," "disapproved," or "revise and resubmit" indicate incomplete submittal or noncompliance with the contract requirements or design concept. Resubmit with appropriate changes. Do not proceed with work for this item until the resubmittal is approved.

d. Submittals marked "not reviewed" indicate that the 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.

e. Submittals marked "receipt acknowledged" indicate that submittals have been received by the Government. This applies only to

"information-only submittals" as previously defined.

1.12 DISAPPROVED SUBMITTALS

a. Make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications, give notice to the Contracting Officer as required under the FAR clause titled CHANGES. The Contractor is responsible for the dimensions and design of connection details and the construction of work. Failure to point out variations may cause the Government to require rejection and removal of such work at the Contractor's expense.

b. If changes are necessary to submittals, make such revisions and resubmit in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

c. The Contractor shall pay an administrative fee to the Government in the amount of $500 for each Contractor resubmittal required in excess of the initial submittal and one resubmittal for required corrections. The Contracting Officer will deduct any assessed administrative fees from the progress payments due the Contractor.

1.13 APPROVED SUBMITTALS

a. The Contracting Officer's approval of submittals is not to be construed as a complete check, and indicates only that

b. m Approval or acceptance by the Government for a submittal does not relieve the Contractor of the responsibility for meeting the contract requirements or for any error that may exist, because under the Quality Control (QC) requirements of this contract, the Contractor is responsible for ensuring information contained with in each submittal accurately conforms with the requirements of the contract documents.

c. After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.14 APPROVED SAMPLES

a. Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, provide assurance that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

b. Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those that may be damaged in testing, will be returned to the Contractor, at its expense, upon completion of the contract. Unapproved samples will also be returned to the Contractor at its expense, if so requested.

c. Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make as that material. The Government reserves the right

to disapprove any material or equipment that has previously proved unsatisfactory in service.

d. Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Replace such materials or equipment to meet contract requirements.

1.15 WITHHOLDING OF PAYMENT

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

1.16 CERTIFICATION OF SUBMITTAL DATA

Certify the submittal data as follows on Form ENG 4025: "I certify that the above submitted items had been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

_____NAME OF CONTRACTOR _____ SIGNATURE OF CONTRACTOR

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the costs of all the bid items.

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Backpassing Beachfill, Wildwood, NJ

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 30 00	SD-01 Preconstruction Submittals															
			Evidence Of Insurance	1.14	FIO													
			Superintendent Qualifications	1.3.1	G DO													
			SD-11 Closeout Submittals															
			Certified Payrolls	1.7	FIO													
		01 32 01	SD-01 Preconstruction Submittals															
			Project Scheduler Qualifications	1.3	G COR													
			Preliminary Project Schedule	3.4.1	G COR													
			Initial Project Schedule	3.4.2	G COR													
			Periodic Schedule Update	3.6.2	G COR													
		01 32 33	SD-01 Preconstruction Submittals															
			Aerial Photography Qualifications	1.4	G DO													
			Construction Photography Plan	1.5.1	G COR													
			Geo-referenced Aerial Imagery	1.5.2	G COR													
			Mission and Capability Plan															
			Pre-Construction Photographs	3.1	G COR													
			Pre-Beachfill Geo-referenced	3.3.3	G DO													
			Aerial Imagery															
			SD-07 Certificates															
			Progress Construction	3.1	G COR													
			Photographs															
			Post-Construction Photographs	3.1	G COR													
			Post-Beachfill Geo-referenced	3.3.3	G DO													
			Aerial Imagery															
			Aerial Obliques	3.2	G COR													
		01 33 00	SD-01 Preconstruction Submittals															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Backpassing Beachfill, Wildwood, NJ

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 33 00	Submittal Register	1.8	G COR												
		01 35 26	SD-01 Preconstruction Submittals														
			Accident Prevention Plan (APP)	1.8	G DO												
			Dive Operations Plan	1.16	G DO												
			SD-06 Test Reports														
			Accident Reports	1.12.2	G DO												
			LHE Inspection Reports	1.12.3	FIO												
			Monthly Exposure Reports	1.5	G												
			SD-07 Certificates														
			Activity Hazard Analysis (AHA)	1.9	G												
			Certificate of Compliance	1.12.4	FIO												
			Hot Work Permit	1.13	FIO												
			Hot Work Permit	1.13.1	FIO												
			License Certificates	1.14	FIO												
			Portable Gauge Operations Planning Worksheet	1.14.1	G DO												
			Radiography Operation Planning Work Sheet	1.14.1	G DO												
			Standard Lift Plan	1.12.4	G DO												
		01 35 43	SD-06 Test Reports														
			Full Monthly Engine Data	1.4.1	FIO												
			Dredge Engine Information	1.4.2	FIO												
			Support Vessels and Land Equipment Engine Information	1.4.3	FIO												
			Diesel Engines Information	1.4.4	FIO												
		01 35 50	SD-07 Certificates														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION: Backpassing Beachfill, Wildwood, NJ

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					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	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 35 50	Safe Practices Manual	1.5.1	G DO												
			Diving Operations Plan	1.5.2	G DO												
			Activity Hazard Analysis (AHA)	1.5.3	G DO												
			Emergency Management Plan	1.5.4	G DO												
			Decompression Plan	1.5.5	G DO												
			Dive Personnel Qualifications	1.5.6	G DO												
			Equipment/Air Quality	1.5.7	G DO												
			Certifications														
			Daily Logs	1.7.2	G DO												
		01 45 00	SD-01 Preconstruction Submittals														
			Contractor Quality Control (CQC)	3.2	G DO												
			Plan														
			Qualifications of Quality Control	3.2.1	G DO												
			Personnel														
			SD-06 Test Reports														
			Verification Statement (Daily	3.9.2	FIO												
			Reports)														
		01 50 00	SD-01 Preconstruction Submittals														
			Construction Site Plan	1.3	G COR												
			Traffic Control Plan	3.5.1	G COR												
			Haul Road Plan	2.2.1	G COR												
			Contractor Computer	1.7.1.4	G COR												
			Cybersecurity Compliance														
			Statements														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION: Backpassing Beachfill, Wildwood, NJ

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION G/O/R/A/E/V/W/R	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 50 00	Contractor Temporary Network	1.7.6	G COR												
			Cybersecurity Compliance														
			Statements														
			SD-02 Shop Drawings														
			Sign Legend Orders	2.1.2	G COR												
		01 57 19	SD-01 Preconstruction Submittals														
			Qualifications	3.4.2.2	G DO												
			Location of Storage Facilities	1.6.2	G COR												
			Monitor Qualifications	3.4.3	G DO												
			Preconstruction Visual Survey	1.6.1	FIO												
			Employee Training Records	1.6.4	G DO												
			Environmental Protection Plan	1.7	G COR												
			Environmental Protection Plan	1.7	G COR												
			Piping Plover Protection	3.4.2	G DO												
			Dirt and Dust Control Plan	1.7.1	G COR												
			Spill Prevention Control And	3.11.2	G DO												
			Countermeasure (SPCC) Plan														
			SD-06 Test Reports														
			Endangered Species Observer	3.4	G COR												
			Form														
			Endangered Species Incident	3.4.6	G COR												
			Report Form														
			Red Knot Monitoring Form	3.4.3.1	G COR												
			Final Report	3.4.3.4	G COR												
			SD-07 Certificates														
			Reports	3.4.2.6	FIO												

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		01 57 19	SD-11 Closeout Submittals																
			Records	3.4.2.7	FIO														
			Assembled Employee Training Records	1.6.4	G DO														
		01 71 23	SD-01 Preconstruction Submittals																
			Qualifications	1.9	G DO														
			Certified Lifeguards	1.7.1	G DO														
			Surveying Procedures and Equipment	1.8	G DO														
			SD-07 Certificates																
			Swimming Hazard Assessment	3.1	G DO														
			Location of Survey Lines	3.2.2	G DO														
			Pre-Project Survey	3.6.1	G DO														
			Pre-Placement/Borrow Condition Surveys	3.7.1	G DO														
			Before-Dredging/Excavation Borrow Area Surveys	3.10.1	G DO														
			After-Dredging/Excavation Borrow Area Surveys	3.10.1	G DO														
			Before-Beachfill Surveys	3.9.1	G DO														
			After-Beachfill Surveys	3.9.1	G DO														
			Borrow Area Monitoring Surveys	3.11.1	FIO														
			Post-Placement/Borrow Condition Surveys	3.7.2	G DO														
			Post-Project Survey	3.6.2	G DO														

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		01 71 23	Photographic Documentation of	3.8	FIO													
			Surveys															
			Survey Logs	3.4	FIO													
			Metadata	3.14	G DO													
		01 76 00	SD-01 Preconstruction Submittals															
			Qualifications	1.5	G DO													
			Letter to Owners	1.6	G DO													
			Structure Monitoring Plan	1.4	G DO													
			SD-07 Certificates															
			Monitoring Reports	3.2.1	G DO													
		01 78 00	SD-11 Closeout Submittals															
			As-Built Drawings	3.1	G DO													
			Record Drawings	3.3	G DO													
			Final Approved Shop Drawings	3.4	G DO													
		06 13 33	SD-01 Preconstruction Submittals															
			Detailed Work Plan	1.5	G DO													
			SD-02 Shop Drawings															
			Installation Drawings	1.9	G DO													
			Spliced Timber Strut Connections	1.8	G DO													
			SD-07 Certificates															
			Preservative Treated Timber	1.6.1	G DO													
			SDS and CIS	1.6.2	G DO													
			Pesticide Applicator	1.6.3	G DO													
			Equipment Description	2.2	G DO													
			Hardware	2.1.4	G DO													
			SD-11 Closeout Submittals															

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		06 13 33	Pile Installation Record	3.3.5	G	DO												
			Pile Installation Drawings	1.9	G	DO												
		31 05 19	SD-03 Product Data															
			Thread	2.1.2	G	DO												
			Manufacturing Quality Control	2.2	G	DO												
			Sampling and Testing															
			SD-07 Certificates															
			Geotextile	2.2.1	G	DO												
		32 15 00	SD-01 Preconstruction Submittals															
			Work Plan	1.4	G	DO												
			SD-03 Product Data															
			Materials	3.3	G	DO												
			Berm Stabilization Mats	2.6	G	DO												
			Post and Rail Fence	2.2.2	G	DO												
			Split Rail Fence	2.2.2	G	DO												
			Source for I-5 Material	2.1	G	COR												
			SD-04 Samples															
			I-5 Material	2.1	G	DO												
			Stabilization Mat Sample	2.6	FIO													
			SD-06 Test Reports															
			Grain Size Distribution Curves	2.1	G	DO												
			Testing Results	3.3.3.1	G	DO												
			SD-07 Certificates															
			SDS and CIS	1.5.2	G	DO												
			Pesticide Applicator	1.5.4	G	DO												

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		32 15 00	Best Management Practices	1.5.3	G DO														
			(BMPs)																
			Nuclear Gauges	3.3.3	G DO														
			SD-08 Manufacturer's Instructions																
			Stabilization Mat Maintenance	3.4	G DO														
		32 92 00	SD-03 Product Data																
			Fertilizer	2.2.3	FIO														
			SD-07 Certificates																
			Sand Fence	2.1	FIO														
			Plants	2.2.1	FIO														
		33 40 00	SD-01 Preconstruction Submittals																
			Detailed Work Plan	1.6.1	G DO														
			Shoring and Sheeting Plan	1.6.4	G DO														
			Dewatering Work Plan	1.6.5	FIO														
			SD-02 Shop Drawings																
			Outfall Pipe Modifications	1.6.2	G DO														
			Drawings	1.6.7	G DO														
			SD-03 Product Data																
			Ductile Iron Pipe and Fittings	2.1.1	G DO														
			Ductile Iron Pipe and Fittings	2.1.2	G DO														
			Universal Flexible Pipe Coupling	2.1.3	G DO														
			Elastomeric Sealant	2.1.2	G DO														
			Rubber Gaskets	2.1.1.1	G DO														
			Mechanical Joint Restraint	2.1.2	FIO														
			SD-07 Certificates																
			Ductile Iron Pipe and Fittings	2.1.1	G DO														

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		33 40 00	Ductile Iron Pipe and Fittings	2.1.2	G DO													
			Universal Flexible Pipe Coupling	2.1.3	G DO													
			Elastomeric Sealant	2.1.2	G DO													
			Rubber Gaskets	2.1.1.1	G COR													
			Outfall Pipe Repairs	1.6.3	FIO													
			SD-11 Closeout Submittals															
			As-Built Drawings	1.6.7	FIO													
		35 20 23.13	SD-07 Certificates															
			National Dredging Quality	1.3	G COR													
			Management Program															
			Certification															
		35 20 23.33	SD-07 Certificates															
			National Dredging Quality	1.3	G COR													
			Management Program															
			Certification															
		35 31 00	SD-01 Preconstruction Submittals															
			Borrow Area(s) Mapping	1.11.4	G DO													
			Debris Prevention Plan	1.17	G COR													
			Work Plan	1.5	G DO													
			Shoring and Sheeting Plan	1.6	G DO													
			Night Operation Lighting Plan	1.7	G COR													
			Pumpout Plan	3.6.4	G COR													
			Vessel and Equipment List	1.9	G COR													
			Grade Stake Recovery Plan	3.6.3	G COR													
			Grade Stake Recovery Plan	3.6.11	G COR													

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)		(q)	(r)
		35 31 00	Existing Feature Protection Work Plan	3.6.8	G DO														
			SD-06 Test Reports																
			Daily Report of Operations	3.7.1	G COR														
			Fuel Usage	1.10	FIO														
			Daily Dredge Pump Positioning Records	1.8	G COR														
			Gradation Test Results	3.7.2	G DO														
			Test Reports	3.7.4	G DO														
			SD-07 Certificates																
			Adjusted Construction Template Request	3.6.13	G DO														
			Backpassing Plant Position Map	1.11.5	FIO														

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS

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 SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ANSI/ASSP A10.34	(2021) Protection of the Public on or Adjacent to Construction Sites
ANSI/ASSP A10.44	(2020) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations

ASTM INTERNATIONAL (ASTM)

ASTM F855	(2020) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048	(2016) Guide for Protective Grounding of Power Lines
IEEE C2	(2023) National Electrical Safety Code

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ANSI/ISEA Z89.1	(2014; R 2019) American National Standard for Industrial Head Protection

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 51B	(2024) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2023; ERTA 4 2023; ERTA 5 2023; ERTA 6 2023) National Electrical Code
NFPA 70E	(2024) Standard for Electrical Safety in the Workplace
NFPA 241	(2022) Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 306	(2024) Standard for the Control of Gas Hazards on Vessels

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

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

10 CFR 20	Standards for Protection Against Radiation
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1926	Safety and Health Regulations for Construction
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

The following definitions are for the convenience of the reader. If there is a referenced document in the text of this specification section, that is the document that should define terms for that paragraph. If further clarification is needed, contact the Contracting Officer.

1.2.1 Site Safety and Health Officer (SSHO)

A Contractor Employee that is responsible for overseeing and ensuring implementation of the prime Contractor's Safety and Occupational Health (SOH) program according to the Contract, EM 385-1-1, applicable federal, state, and local requirements.

1.2.1.1 Level One SSHO

A designated employee with full-time SOH responsibility that meets and follows the requirements of EM 385-1-1.

1.2.1.2 Level Two SSHO

A designated employee with Level Two SSHO responsibility that meets and follows the requirements of EM 385-1-1. Level Two SSHOs cannot be assigned to projects that have a residual Risk Assessment Code (RAC) of high or extremely high.

1.2.1.3 Level Three SSHO

A designated Qualified Person or Competent Person with SOH responsibility that meets and follows the requirements of EM 385-1-1. Level 3 SSHOs cannot be assigned to projects that have a residual RAC of high or extremely high.

1.2.1.4 Alternate SSHO

An employee that meets the definition of the contract-required level SSHO, but is not the primary SSHO.

1.2.2 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing existing and predictable hazards in the working environment or working conditions that are unsanitary, hazardous, or dangerous to personnel, and who has authorization to take prompt corrective measures to eliminate them.

1.2.3 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

1.3 SUBMITTALS

Government Acceptance or Approval does not remove responsibility from the Contractors for their actions or liability.

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G,DO

Dive Operations Plan; G,DO

SD-06 Test Reports

Accident Reports; G,DO

LHE Inspection Reports

Monthly Exposure Reports; G

SD-07 Certificates

Activity Hazard Analysis (AHA); G

Certificate of Compliance

Hot Work Permit

License Certificates

Portable Gauge Operations Planning Worksheet; G,DO

Radiography Operation Planning Work Sheet; G,DO

Standard Lift Plan; G,DO

1.4 PUBLIC HEALTH EMERGENCIES

In the event of a declared public health emergency, follow safety precautions as required by the Occupational Safety and Health Administration (OSHA) www.osha.gov, the Centers for Disease Control and Prevention (CDC) www.cdc.gov, and as required by federal, state and local requirements.

1.5 MONTHLY EXPOSURE REPORTS

Provide a Monthly Exposure Report by the fifth of each month. This report is a compilation of employee-hours worked each month for all site workers, both Prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the progress payment.

1.6 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this Contract, comply with the most recent edition of USACE EM 385-1-1, and the following federal, state, and local laws, ordinances, criteria, rules and regulations at the date of the Solicitation for this Contract. 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 govern.

1.7 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.7.1 Site Safety and Health Officer (SSHO)

1.7.1.1 Qualifications of SSHO

All SSHOs will have met the training, experience requirements identified in the EM 385-1-1 and this Contract.

1.7.1.2 Duties of SSHO

All SSHOs will carry out the roles and responsibilities as identified in this Contract and the EM 385-1-1. All SSHOs will be designated on an ENG Form 6282, provided by the Contracting Officer. Superintendent, QC Manager, and SSHO are subject to dismissal if their required duties are not being effectively carried out. If either the Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out.

1.7.1.3 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors at the project location. The SSHO, supervisors, or foremen must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s)

who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

1.7.2 Roles and Responsibilities of Prime Contractor and SSHO

The Prime Contractor and SSHO must ensure that the requirements of all applicable OSHA and EM 385-1-1 are met for the project. The Prime Contractor must ensure an SSHO or an equally qualified Alternate SSHO(s) is at the worksite at all times to implement and administer the Contractor's safety program and Government accepted Accident Prevention Plan. If the required SSHO has to temporarily (that is, up to 24 hours / 1 day) leave the site of work due to unforeseen or emergency situations, a Level One, Two, or Three SSHO may be used in the interim and must be on the site of work at all times when work is being performed.

If the SSHO must be off-site for a period longer than 24 hours / 1 day, a qualified alternate that meets the contract requirements must be onsite.

a. Prime contractor must ensure all SSHOs will:

(1) Are designated on an ENG Form 6282.

(2) Meet minimum training and experience requirements identified in EM 385-1-1.

(3) Execute roles and responsibilities identified in EM 385-1-1.

1.7.3 Contract Site Safety And Health Officer(s)(SSHOs) Minimum Requirements

Provide a minimum of one Level One SSHO that meets the requirements of EM 385-1-1 for this project.

1.7.4 Competent Person for Confined Space Entry

Provide a CP for Confined Space Entry who meets the requirements of EM 385-1-1 and herein. The CP for Confined Space Entry must supervise the entry into each confined space in accordance with EM 385-1-1.

Since this work involves operations that handle combustible or hazardous materials, this person must have the ability to understand and follow through on the air sampling, Personal Protective Equipment (PPE), and instructions of a Marine Chemist, Coast Guard authorized persons, or Certified Industrial Hygienist. Confined space and enclosed space work must comply with NFPA 306, 29 CFR 1915, "Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment," or as applicable in 29 CFR 1910 for general industry, 29 CFR 1926 for construction.

1.7.5 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health Officer, quality control manager, 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).

b. 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 and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays. The creation of the APP and Schedule will be created after being given Notice to Proceed.

c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin until an APP is established that is acceptable to the Contracting Officer.

1.8 ACCIDENT PREVENTION PLAN (APP)

1.8.1 Accident Prevention Plan (APP)

Submit the Accident Prevention Plan (APP) for review and acceptance by the Government at least 15 calendar days prior to the start, after being given Notice to Proceed. A competent person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, ENG Form 6293, and herein. An editable version of the form can be downloaded from the website listed in EM 385-1-1, Chapter 2-10.d. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and occupational health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling employer" for all worksite 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 must be signed in accordance with the APP and ENG Form 6293 Accident Prevention Plan Worksheet. The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer within 30 calendar days of Contract award and not less than 10 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and 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 is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as necessary, throughout the life of the Contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager. Incorporate unusual or high-hazard activities not identified in the original APP as they are

discovered. Should any severe hazard exposure (i.e., imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ANSI/ASSP A10.34), and the environment.

1.8.2 Names and Qualifications

Provide plans in accordance with the requirements outlined in EM 385-1-1, including the following:

a. Names and qualifications (resumes including education, training, experience and certifications) of 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. Specify the duties of each position.

b. As a minimum, designate and submit qualifications of Competent Persons (CP) 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; and personal protective equipment and clothing to include selection, use and maintenance. Designate and submit qualifications for additional CPs as applicable to the work performed under this Contract.

1.9 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFOW. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

1.9.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures, scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

1.9.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFOW must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

1.10 SITE SAFETY REFERENCE MATERIALS

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

1.11 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment in accordance with EM 385-1-1. The Government has no responsibility to provide emergency medical treatment.

1.12 NOTIFICATIONS AND REPORTS

1.12.1 Accident Notification

Notify the Contracting Officer in accordance with the EM 385-1-1 Accident Reporting Timeline.

Table
Accident Reporting Required Timeline

Accident Type	**Notify KO or COR**	**Complete Final Accident Report on ENG 3394 and provide to KO or COR**
Fatality, in-patient hospitalization, amputation, eye loss, or property damage over $600,000.	Immediately, no later than (NLT) 8 Hours	Within 7 Days
All other accidents and near misses	Immediately, no later than (NLT) 24 Hours	Within 7 Days

Within notification 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 (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any accident or near miss.

1.12.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and

illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. All accidents are reportable, regardless of whether or not it is recordable. Complete the applicable USACE Accident Report, ENG Form 3394, and provide the report to the Contracting Officer within 7 calendar days of the accident. The Contracting Officer will provide copies of any required or special forms. All accidents are reportable, regardless of whether or not it is recordable.

b. Near Misses: Report all "Near Misses" to the Contracting Officer, using local accident reporting procedures, within 24 hours. The Contracting Officer will provide the Contractor the required forms. Near miss reports are considered positive and proactive Contractor safety management actions.

1.12.3 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.12.4 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a Certificate of Compliance for LHE entering an activity under this Contract and in accordance with EM 385-1-1 using ENG Form 6209 Certificate of Compliance for Load Handling Equipment and Rigging. An editable version of ENG Form 6209 can be downloaded from the website listed in EM 385-1-1, Chapter 16-10.b. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1 and using Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.13 HOT WORK PERMIT

1.13.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e., welding or cutting) or operating other flame-producing/spark producing devices, from the Contractor's designated permit authorizing individual. Use DA Form 5383 Hot-Work Permit. An editable version of the form can be downloaded from https://armypubs.army.mil/pub/eforms/DR_a/pdf/DA%20FORM%205383.pdf. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. Contractors are required to meet all criteria before a permit is issued. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an 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 must be trained in accordance with NFPA 51B and remain on-site for a minimum of 1 hour after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency local Fire Department phone number. Report any fire, no matter how small, to the responsible local Fire Department immediately.

1.13.2 Work Around Flammable Materials

Obtain permit approval from a NFPA Certified Marine Chemist, or Certified Industrial Hygienist for "Hot Work" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1.

1.14 RADIATION SAFETY REQUIREMENTS

Submit License Certificates, employee training records, and Leak Test Reports for radiation materials and equipment to the Contracting Officer and Radiation Safety Office (RSO) for all specialized and licensed material and equipment proposed for use on the construction project (excludes portable machine sources of ionizing radiation including moisture density and X-Ray Fluorescence (XRF)). Maintain on-site records whenever licensed radiological materials or ionizing equipment are on Government property.

Protect workers from radiation exposure in accordance with 10 CFR 20, ensuring any personnel exposures are maintained As Low As Reasonably Achievable.

1.14.1 Radiography Operation Planning Work Sheet

Submit a Gamma and X-Ray Radiography Operation Planning Work Sheet to Contracting Officer 14 days prior to commencement of operations involving radioactive materials or radiation generating devices. For portable machine sources of ionizing radiation, including moisture density and XRF, use and submit the Portable Gauge Operations Planning Worksheet instead. The Contracting Officer will review the submitted worksheet and provide questions and comments.

Contractors must use primary dosimeters process by a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory.

1.14.2 Site Access and Security

Coordinate site access and security requirements with the Contracting Officer for all radiological materials and equipment containing ionizing radiation that are proposed for use on a government facility.

Provide a copy of all calibration records, and utilization records for radiological operations performed on the site.

1.14.3 Loss or Release and Unplanned Personnel Exposure

Loss or release of radioactive materials, and unplanned personnel exposures must be reported immediately to the Contracting Officer.

1.14.4 Site Demarcation and Barricade

Properly demark and barricade an area surrounding radiological operations to preclude personnel entrance, in accordance with EM 385-1-1, Nuclear Regulatory Commission, and Applicable State regulations and license requirements, and in accordance with requirements established in the accepted Radiography Operation Planning Work Sheet.

Do not close or obstruct streets, walks, and other facilities occupied and used by the Government without written permission from the Contracting Officer.

1.14.5 Security of Material and Equipment

Properly secure the radiological material and ionizing radiation equipment at all times, including keeping the devices in a properly marked and locked container, and secondarily locking the container to a secure point in the Contractor's vehicle or other approved storage location during transportation and while not in use. While in use, maintain a continuous visual observation on the radiological material and ionizing radiation equipment. In instances where radiography is scheduled near or adjacent to buildings or areas having limited access or one-way doors, make no assumptions as to building occupancy. Where necessary, the Contracting Officer will direct the Contractor to conduct an actual building entry, search, and alert. Where removal of personnel from such a building cannot be accomplished and it is otherwise safe to proceed with the radiography, position a fully instructed employee inside the building or area to prevent exiting while external radiographic operations are in process.

1.14.6 Transportation of Material

Comply with 49 CFR 173 for Transportation of Regulated Amounts of Radioactive Material. Notify Local Fire authorities and the Contracting Officer of any Radioactive Material use.

1.14.7 Schedule for Exposure or Unshielding

Actual exposure of the radiographic film or unshielding the source must not be initiated until after 5 p.m. on weekdays.

1.14.8 Transmitter Requirements

Adhere to the base policy concerning the use of transmitters, such as radios and cell phones. Obey Emissions control (EMCON) restrictions.

1.15 CONFINED SPACE ENTRY REQUIREMENTS

Confined space entry must comply with EM 385-1-1, 29 CFR 1926, 29 CFR 1910, and Directive CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used.

1.15.1 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

1.16 DIVE SAFETY REQUIREMENTS

Develop a Dive Operations Plan, AHA, emergency management plan, and personnel list that includes qualifications, for each separate diving operation. See Section 01 35 50 DIVING SERVICES for additional requirements. Submit these documents to the District Dive Coordinator (DDC) via the Contracting Officer, for review and approval at least 15 working days prior to commencement of diving operations. These documents must be at the diving location at all times. Provide each of these documents as a part of the project file.

1.17 SEVERE STORM PLAN FOR MARINE ACTIVITIES (SWPMA)

In the event of a severe storm warning, the Contractor must comply with the applicable Storm Plan and:

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.

b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes:

a. Head Protection that meets ANSI/ISEA Z89.1.

b. Long Pants.

c. Appropriate Safety Footwear.

d. Appropriate Class Reflective Vests.

e. Appropriate Safety Eyewear.

3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily

within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. Develop an employee check-in/check-out communication procedure to ensure employee safety.

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 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-isocyanates, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Contracting Officer prior to excepted items of radioactive material and devices being brought on base.

3.1.3 Unforeseen Hazardous Material

Contract documents identify materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e., 29 CFR Part 1910.1000). If material(s) that may be hazardous to human health upon disturbance are encountered during demolition, repair, renovation, or construction operations. 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.

3.2 UTILITY OUTAGE REQUIREMENTS

Apply for utility outages at least 14 days in advance. At a minimum, the written request must include the location of the outage, utilities being affected, duration of outage, any necessary sketches, and a description of the means to fulfill energy isolation requirements in accordance with EM 385-1-1. In accordance with EM 385-1-1, where outages involve Government or Utility personnel, coordinate with the Government on all activities involving the control of hazardous energy.

These activities include, but are not limited to, a review of Hazardous Energy Control Program (HECP) and HEC procedures, as well as applicable Activity Hazard Analyses (AHAs). In accordance with EM 385-1-1 and NFPA 70E, work on energized electrical circuits must not be performed without prior Government authorization. Government permission is considered through the permit process and submission of a detailed AHA. Energized work permits are considered only when de-energizing introduces additional or increased hazard or when de-energizing is infeasible.

3.3 OUTAGE COORDINATION MEETING

After the utility outage request is approved and prior to beginning work on the utility system requiring shut-down, conduct a pre-outage coordination meeting in accordance with EM 385-1-1. This meeting must include the Prime Contractor, the Prime and subcontractors performing the work, the

Contracting Officer, and the Public Utilities representative. All parties must fully coordinate HEC activities with one another. During the coordination meeting, all parties must discuss and coordinate on the scope of work, HEC procedures (specifically, the lock-out/tag-out procedures for worker and utility protection), the AHA, assurance of trade personnel qualifications, identification of competent persons, and compliance with HECP training in accordance with EM 385-1-1. Clarify when personal protective equipment is required during switching operations, inspection, and verification.

3.4 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1, 29 CFR 1910, 29 CFR 1915, ANSI/ASSP A10.44, NFPA 70E.

3.4.1 Safety Preparatory Inspection Coordination Meeting with the Government or Utility

For electrical distribution equipment that is to be operated by Government or Utility personnel, the Prime Contractor and the subcontractor performing the work must attend the safety preparatory inspection coordination meeting, which will also be attended by the Contracting Officer's Representative, and required by EM 385-1-1. The meeting will occur immediately preceding the start of work and following the completion of the outage coordination meeting. Both the safety preparatory inspection coordination meeting and the outage coordination meeting must occur prior to conducting the outage and commencing with lockout/tagout procedures.

3.4.2 Lockout/Tagout Isolation

Where the Government or Utility performs equipment isolation and lockout/tagout, the Contractor must place their own locks and tags on each energy-isolating device and proceed in accordance with the HECP. Before any work begins, both the Contractor and the Government or Utility must perform energy isolation verification testing while wearing required PPE detailed in the Contractor's AHA and required by EM 385-1-1. Install personal protective grounds, with tags, to eliminate the potential for induced voltage in accordance with EM 385-1-1.

3.4.3 Lockout/Tagout Removal

Upon completion of work, conduct lockout/tagout removal procedure in accordance with the HECP. In accordance with EM 385-1-1, each lock and tag must be removed from each energy isolating device by the authorized individual or systems operator who applied the device. Provide formal notification to the Government (by completing the Government form if provided by Contracting Officer's Representative), confirming that steps of de-energization and lockout/tagout removal procedure have been conducted and certified through inspection and verification. Government or Utility locks and tags used to support the Contractor's work will not be removed until the authorized Government employee receives the formal notification.

3.5 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and

evacuation procedures in accordance with EM 385-1-1.

3.5.1 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 and 29 CFR 1926.

3.5.1.1 Additional Personal Fall Protection Measures

In addition to the required fall protection systems, other protective measures such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.5.1.2 Personal Fall Protection Equipment

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabineers must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. Equip all full body harnesses with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1.

3.6 EQUIPMENT

3.6.1 Use of Explosives

Explosives must not be used or brought to the project site.

3.7 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1.

3.7.1 Electrical Work

As described in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases obtain an energized work permit from the

Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator is allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety footwear, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.

3.7.2 Qualifications

Electrical work must be performed by QP with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State, Local requirements applicable to where work is being performed.

3.7.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.7.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

3.7.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI)

protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

3.8 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the costs of all the bid items.

-- End of Section --

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SECTION 01 35 43

AIR EMISSIONS REQUIREMENTS

PART 1 GENERAL

1.1 BACKGROUND

The work covered by this section consists of the measuring and recording of data related to the air emissions produced by the combustion of fossil fuels.

1.2 DEFINITIONS

3 Nautical Mile Line: The 3 mile maritime limit as established by NOAA's Office of Coast Survey.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Full Monthly Engine Data
Dredge Engine Information
Support Vessels and Land Equipment Engine Information
Diesel Engines Information

1.4 NOx EMISSIONS CALCULATOR SPREADSHEET DATA

The Government will provide the NOx Emissions Calculator Spreadsheet to use for this section.

1.4.1 Full Monthly Engine Data

Submit completed NOx Emissions Calculator Spreadsheet within the first 10 days of each month, for the previous month. The submitted NOx Emissions Calculator Spreadsheet shall be in Microsoft Excel format. Include monthly operating hours for engines on dredges, support vessels, and land equipment.

1.4.2 Dredge Engine Information

Submit information as required by the NOx Emissions Calculator Spreadsheet.

1.4.3 Support Vessels and Land Equipment Engine Information

Submit information as required by the NOx Emissions Calculator.

1.4.4 Diesel Engines Information

Submit a list of equipment with diesel engines for all dredges, support vessels, and land equipment. Include the diesel engine make, model and

size, and other data as needed to complete the NOx Emissions Calculator Spreadsheet.

PART 2 PRODUCTS - (Not Applicable)

PART 3 EXECUTION

3.1 OPERATIONAL MONITORING, RECORDKEEPING AND REPORTING

a. Measure and record the parameters included in the NOx Emissions Calculator Spreadsheet when operating diesel-powered engines onboard a dredge, support vessel, and land equipment within the 3 Nautical Mile Line. Parameters to be recorded are listed in the instructions in the NOx Emissions Calculator Spreadsheet. Obtain this information from official daily project and vessel operational logs and/or hour meters associated with each engine. Update the NOx Emissions Calculator Spreadsheet daily and submit it monthly within the timeframe as specified above, until the project is completed.

b. The Government reserves the right to require the Contractor to manually obtain daily records of engines when electronic engine management systems are not functioning properly.

3.2 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the cost of all the bid items.

-- End of Section --

SECTION 01 35 50

DIVING SERVICES

PART 1 GENERAL

1.1 SCOPE OF SECTION

The work specified in this section includes the development and enforcement of a diving services plan.

NOTE: Though diving services are not required as part of the general scope of work for this project, it is Philadelphia District policy to include a section covering commercial diving operations for all construction projects that are conducted on, or near, the water. The reasoning for this is the fact that unforeseen circumstances (such as lost equipment recovery, unknown sunken object investigation/removal, emergency floating plant repairs, etc.) may require the need for commercial diving services. In the event the need for this type of operation occurs, including a commercial diving section in the contract specifications helps to ensure that the Contractor is aware of the requirements for conducting commercial diving operations on USACE Philadelphia District projects.

1.2 GENERAL REQUIREMENTS

a. All diving performed under this contract shall be in strict accordance with the rules and regulations prescribed by EM 385-1-1 - Chapter 30; ER 385-1-31; 0910-LP-115-1921; 29 CFR 1910 - Subpart T; 29 CFR 1915; and the Association of Diving Contractors International (ADCI) Consensus Standards.

b. A Contracting Officer's Representative, will be designated by the Contracting Officer at the Post Award Conference, to act for the Contracting Officer for all submissions, directions and/or acceptance(s) required under the specifications. There will also be an individual designated as the Philadelphia District Designated Dive Coordinator (DDC). Do not schedule or engage in diving operations without the acceptance of the Contracting Officer and the DDC. Contact the DDC, Derek Burleigh, at 215-656-6615 (office) or 215-964-8647 (mobile), to obtain a list of emergency contact information for the Philadelphia District Dive Safety Program, prior to conducting dive operations.

1.2.1 Underwater Work

Provide necessary services and equipment to perform underwater inspections and repair tasks. All diving operations shall be considered incidental to the work specified elsewhere in these specifications. No separate payment for diving work will be made.

1.2.2 Types of Diving Operations

The Surface Supplied Air (SSA) mode of diving shall be used for all underwater work.

1.3 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.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Health Requirements Manual
ER 385-1-31	(2009; R2016) The Control of Hazardous Energy

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

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment

U.S. NAVAL SEA SYSTEMS COMMAND (NAVSEA)

0910-LP-115-1921	(2016; R2018) U.S. Navy Diving Manual, Revision 7, Change A

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The acceptance of submittals shall not be construed as a complete check, but will indicate only that the submittal generally complies with regulatory requirements. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Safe Practices Manual; G, DO
Diving Operations Plan; G,DO
Activity Hazard Analysis (AHA); G,DO
Emergency Management Plan; G,DO
Decompression Plan; G, DO
Dive Personnel Qualifications; G,DO
Equipment/Air Quality Certifications; G,DO

Submit the above as a complete dive submittal package.

Daily Logs; G,DO

1.5 DIVE SUBMITTAL PACKAGE

The DDC may request submittals in addition to those listed when deemed necessary to adequately describe the work covered in the particular work order. 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) representative and shall be stamped, signed, and dated by the CQC representative certifying that the submittal complies with the contract requirements. Proposed deviations from the contract requirements shall be clearly identified.

1.5.1 Safe Practices Manual

Develop and maintain a safe practices manual. The manual shall contain all of the information required by 29 CFR 1910, encompass the Contractor's entire diving program, and shall include the items listed in EM 385-1-1, Chapter 30-7.b. Complete and submit with the manual the Safe Practices Manual Review Checklist, which is attached to the end of this section. The manual shall be available at all times at the dive location to each dive team member and the Government Dive Safety Inspector (DSI).

1.5.2 Diving Operations Plan

Develop a site specific diving operations plan for each separate diving operation. At a minimum, the plan shall contain the information required by EM 385-1-1, Chapter 30-7.c. For medical requirements, see EM 385-1-1, Chapter 30-3.e. Complete and submit with the plan the Dive Operations Plan Review Checklist, which is attached to the end of this section. Submit the plan for review and acceptance, prior to commencement of diving operations. The accepted plan shall be at the diving location at all times and be made available to the Government DSI upon request.

1.5.3 Activity Hazard Analysis (AHA)

Prepare a job-specific AHA that addresses the risk to personnel and property for each phase of work, addresses the hazards for each activity performed, and presents the procedures and safeguards necessary to eliminate the hazards or reduce the risk to an acceptable level. The suggested format for the analysis is ENG Form 6206 Activity Hazard Analysis (AHA); see Chapter 1-10.b of EM 385-1-1. Attach to the AHA a copy of clearances to be issued that deal with identified hazards. At a minimum, comply with EM 385-1-1, Chapter 30-6. Complete and submit with the analysis the Activity Hazards Analysis Review Checklist, which is attached to the end of this section. Submit the AHA for review and acceptance prior to the commencement of diving operations. The accepted AHA shall be at the diving location at all times and be made available to the Government DSI upon request.

1.5.4 Emergency Management Plan

Prepare a site-specific Emergency Management Plan for each dive operation, which includes information and procedures developed to deal with accidents after they occur. At a minimum the plan shall contain the information required by EM 385-1-1, Chapter 30-7.d. Complete and submit with the plan the Emergency Management Plan Review Checklist, which is attached to the end of this section. Submit the plan for review and acceptance prior to the commencement of diving operations. The accepted plan shall be at the diving location at all times and be made available to the Government DSI upon request.

1.5.5 Decompression Plan

If the use of Saturation, Surface Decompression with Oxygen (Sur-D-O2) or in-water decompression is planned, prepare a project specific Decompression Plan for each dive operation, which includes information, procedures and

decompression methodology. At a minimum the plan shall contain the information required by EM 385-1-1, Chapter 30-8.d. Submit the plan for review and acceptance prior to the commencement of diving operations. The plan shall be at the diving location at all times and be made available to the Government DSI upon request.

1.5.6 Dive Personnel Qualifications

Submit evidence that each dive team member has the training and experience consistent with the performance requirements for diving operations that may be necessary for work under this contract. Verification of dive team qualifications and experience includes divers, diving supervisor, and tenders. Dive team members must demonstrate similar dive work experience as required by the contract; examples include but are not limited to Sur-D-O2, NITROX (enriched air), mixed gas, deep, saturation, penetration, HazMat and/or contaminated water diving. At a minimum the qualifications shall contain the information required by EM 385-1-1, Chapter 30-3. The Contractor conducting dive operations shall have no dive related serious, willful, or repeat State or Federal OSHA safety citations within the 12 months preceding the commencement of dive operations. Submit evidence that each dive team member has current certification in cardiopulmonary resuscitation (CPR), first aid and diver specific Oxygen Provider. Complete and submit the Dive Personnel Qualifications form, which is attached to the end of this section. A lack of experience or qualifications to perform the tasks stated in the scope of work will be cause for rejection or cessation of operations.

1.5.7 Equipment/Air Quality Certifications

Provide certifications and testing results for all equipment and air sources to be used in dive operations that include the information required by EM 385-1-1, Chapter 30-8.f. Certifications and test results shall be available at all times at the dive location to each dive team member and the Government Dive Safety Inspector (DSI).

1.6 REGULATORY REQUIREMENTS

The Government may elect to implement and enforce more stringent diving requirements than those stated herein, but under no circumstances shall the operational requirements be less than those specified.

1.6.1 Policy

Conduct all diving operations in a prudent manner that will provide for maximum efficiency and minimize the potential for personal injury, loss of life, occupational illness and/or property damage. Do not utilize divers if the objective can be more safely and efficiently accomplished by another means, e.g., using remote controlled television systems in lieu of divers.

1.6.2 Diving Inspection and Monitoring

The DDC or designated representative will inspect or monitor all diving operations. Diving shall not be permitted unless a DSI is present on-site, unless the DDC has granted permission for off-site monitoring. Off-site monitoring will only be granted after an initial on-site inspection to verify compliance with EM 385-1-1, Chapter 30. Dive operation monitoring consists of occasional telephone contact with the Contractor's on-site dive supervisor and occasional site inspections. Failure to adhere to these requirements will be considered a serious violation of this contract and

cause for an immediate stop-work order issued by the Contracting Officer.

1.7 DIVE PLAN, SCHEDULE AND REPORTING

The Dive Operations Plan and Schedule shall detail dive locations and shall be flexible enough to accommodate conflicts with site operations. If the dive plan is altered in mission, depth, personnel, or equipment, contact the DDC for review and acceptance of the alteration prior to actual operation. Conduct all briefings and pre-dive checks in accordance with EM 385-1-1, Chapter 30-8.

1.7.1 Scheduling Individual Dives

a. Notify the DDC and CO in writing a minimum of 7 calendar days in advance of each scheduled dive. Failure to give the full 7 days notice may result in delays to the work if an on-site DSI is not available. The Government is not liable for delays if the Contractor fails to give the required written notice.

b. In the event it becomes necessary to cancel or reschedule a dive, notify the Government during normal business hours at least 2 work days prior to the first day of the scheduled dive. Failure to provide such notification will make the Contractor liable for daily rate for the DSI from the date of the cancellation until the dive commences. The Contractor will not be charged for more than 7 days delay for each dive cancellation, however, each time a dive is cancelled or rescheduled, it is treated as a new dive for purposes of scheduling DSI's and determining delay costs. When computing delay costs, a partial day is considered a full day. Delay costs will be permanently deducted from the Contractor's pay at the minimum rate of $1,000.00 per day.

1.7.2 Daily Logs

Submit each day, fully completed copies of the previous day's Diving Log Sheets and other work sheets prepared in conjunction with the Diving Log Sheets. For each diver and dive, the dive log information shall be in compliance with EM 385-1-1, Chapter 30-8.a(13).

1.8 RESOLUTION OF CONFLICT

EM 385-1-1 and, if applicable, a supplemental waiver or Memorandum of Agreement (MOA) shall be the controlling authority(s) for implementation of all contract diving policy.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 EMERGENCY MEDICAL TREATMENT

Arrange with local authorities for emergency dive medical response, treatment and evacuation to medical facility and nearest hyperbaric chamber. Provide map with route directions to nearest hospital and hyperbaric chamber in dive plan Emergency Management Plan required by EM 385-1-1.

3.2 DIVE TEAM COMPOSITION AND DIVE EQUIPMENT

Meet the requirements of EM 385-1-1, Chapter 30 for minimum team staffing, unless a waiver is approved by the DDC. Any use of breathing gas with oxygen content more than 21 percent is considered mixed gas diving. At a minimum, provide a 6-man crew for all mixed gas diving. In addition to the dive team personnel addressed in the above references, provide required certified chamber crew personnel as diving operations dictate. If a crane is used, provide a certified crane operator who is not a dive-team member, and is exclusively dedicated to crane operations. Use SSA diving equipment with 2-way voice communication, by divers and standby divers. An independent reserve air system (30 cubic foot/3000 PSI bailout bottle or larger) for each diver is required. At a minimum, all high pressure and low pressure air supply compressors supplying breathing air, tanks, helmets and other related equipment must comply with the requirements of EM 385-1-1, 29 CFR 1910 Subpart T, 0910-LP-115-1921 and all other prevailing regulations. All dive team members must meet the requirements listed in this section.

3.3 CONTRACTOR-PROVIDED SPECIAL UNDERWATER EQUIPMENT

Furnish all appropriate tools, equipment, and materials needed to accomplish the tasks as stated in this contract.

3.4 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the the cost of all the bid items.

-- End of Section --

DIVE SUBMITTAL REVIEW CHECKLIST

SAFE PRACTICES MANUAL REVIEW

PROJECT NAME:	SPM SUBMITTAL NO.:
CONTRACT NO.:	SPM SUBMITTAL DATE:
DIVE CONTRACTOR NAME:	
DIVE CONTRACTOR ADDRESS:	
DIVE CONTRACTOR PHONE:	
PRIME CONTRACTOR NAME:	
PRIME CONTRACTOR ADDRESS:	
PRIME CONTRACTOR PHONE:	

USACE REVIEWER:	REVIEW DATE:

ITEM	EM 385-1-1 Chapter 30-7.b	Description	Pg.	USACE REVIEW
1	1	Dive safety procedures and checklists.		
2	2	Assignments and responsibilities of dive team members		
3	3	Equipment certifications, procedures, and inspection checkllists		
4	4	Emergency procedures for fire, equipment failure, adverse weather conditions, and medical illness or injury specific for the following.		
5	4(a)	Entrapped or fouled dive including fouled umbilical (suction and entanglement / debris)		
6	4(b)	Actions upon loss of vital support equipment.		
7	4(c)	Actions upon loss of gas supply.		
8	4(d)	Action upon loss of communication.		
9	4(e)	Lost diver plan (SCUBA operations only)		
10	4(f)	Injured diver plan.		
11	4(g)	Actions upon discovery of fire		
12	4(h)	Diver blow up or rapid ascent.		
13	4(i)	Diver loss of consciousness.		
14	4(j)	Injury or illness of surface crew with a diver in the water.		
15	5	Procedures for internal safety inspections (for example,frequency, checklists, etc.)		
16	6	A complete copy of OSHA 29 CFR 1910 Subpart T, and a satement of employer's policy for ensuring compliance with the standard.		
17	7	Appropriate U.S. Navy Diving Manual, SS512-AG-PRO-010 table(s), including as a minimum		
18	7(a)	No-Decompression Limits and Repetitie Group Designation for No-Decompression Air Dive Tables.		
19	7(b)	Residual Nitrogen Timetables for Repetative Air Dives.		
20	7(c)	Standard Air Decompression Table.		
21	8	A sample of the diving log sheets to be used.		

If the checklist is not completely filled in by the Contractor, USACE may reject the dive package submittal and/or the review may be delayed.

DIVE SUBMITTAL REVIEW CHECKLIST

22	9	Sample of repetitive dive worksheets or equivalent (dive profile method) to be used.		
23	10	Outline of the fitness for duty, including medical, requirements for dive team members.		
24	11	Outline of administrative and record-keeping procedures.		

Commets:

If the checklist is not completely filled in by the Contractor, USACE may reject the dive package submittal and/or the review may be delayed.

DIVE SUBMITTAL REVIEW CHECKLIST

DIVE OPERATIONS PLAN REVIEW

PROJECT NAME:	SPM SUBMITTAL NO.:
CONTRACT NO.:	SPM SUBMITTAL DATE:
DIVE CONTRACTOR NAME:	
DIVE CONTRACTOR ADDRESS:	
DIVE CONTRACTOR PHONE:	
PRIME CONTRACTOR NAME:	
PRIME CONTRACTOR ADDRESS:	
PRIME CONTRACTOR PHONE:	

USACE REVIEWER:	REVIEW DATE:

ITEM	EM 385-1-1 Chapter 30-7.c	Description	Pg.	USACE REVIEW
1	1	Date of dive plan submission.		
2	2	Name and contact information for diving supervisor (DS) preparing the dive plan.		
3	3	Names and duties of on-site dive team members, including dive supervisors		
4	4	List of diving equipment to be used.		
5	5	Type of diving platform to be used		
6	6	Detailed description of the mission. Identify if and how work will be divided into separate tasks of phases.		
7	7	Date(s), Time(s), Duration, and Location of Operation.		
8	8	Diving mode used (SCUBA, SSA, Ect.) including a description of back-up air supply as required.		
9	9	Diving methodology (for example, mixed-gas, surface decompression using oxygen(SUR-D-O2))		
10	10	Nature of work to be preformed by the divers, including tools used and materials to be handled or installed.		
11	11	Anticipated surface and underwater conditions, to include visibility, temperature, currents, etc., and as appropriate, thermal protection.		
12	12	Maximun single dive bottom time for the planned depth of dive for each diver. Calculated altitude adjustments to dive tables for dives made at altitudes of 1000 feet (308 meters) or more above sea level.		
13	13	Identification of topside assistance of support to the dive team (for example, crane operator, lock operator, ect.)		
14	14	Means of direct communication between the dive site ans the DDC, Project Office, Lockmaster of USACE PM, and the COR (if applicable).		
15	15	Discription of the anticipated hazards of concerns and the control measures that will be implemented to control to an acceptable leve to include but not limited to the following:		

If the checklist is not completely filled in by the Contractor, USACE may reject the dive package submittal and/or the review may be delayed.

DIVE SUBMITTAL REVIEW CHECKLIST

16	15(a)	For diving operation conducted in areas where pressure differentials may exist, the plan must be developed in coordination with the facility operator and address the following;		
17	15(a-1)	Identification of all potential exposure points (for example, gate sills, valve openings, holes).		
18	15(a-2)	Means for identifying whether control structures and mechanisms are fully in place (for example, measurements of stop gates and openings, valve indicators).		
19	15(a-3)	Methods for checking pressure differential opening (for example, observing current/flow, remote testing of opening area with objects such as rope, sandbags, cinders).		
20	15(a-4)	Route the dive will take from staging area to work area. Include specific mitigations designed to prevent diver and umbilical from running into uncontrolled pressure differential openings.		
21	15(a-5)	Procedured for immediate emergency pressure equalization or reduction, if possible.		
22	15(a-6)	Procedures for emergency diver extraction or rescue due to pressure differential exposure, including standby diver deployment precautions.		
23	15(b)	For diving operations conducted in contaminated water, the plan must specifically address the areas below according to SS521-AJ-PRO-010:		
24	15(b-1)	Types of contaminants and comtaminated water categories (CAT 1, 2, 3, 4).		
25	15(b-2)	Levels of protection and protective equipment required.		
26	15(b-3)	Contaminated water diver and topside personnel training and qualifications.		
27	15(b-4)	Sources of information used to determine water quality.		
28	15(b-5)	Dive Station Decontamination Procedures for Divers and Topside Personnel.		
29	15(b-6)	Medical evaluation support and post dive monitoring.		
30	15(b-7)	Hazardous water minimization and disposal		
31	15(c)	For diving operations involving surface decompressions with oxygen (SUR-D-O2) and/or 100% oxygen, the plan must include oxygen-specific decompression procedures and schedule.		
32	16	Plans submitted for Contractor operations must also include the name of contractor (and diving subcontractor if applicable), contract number, and names and contact information for key personnel.		
33	Note	Include the following statement in the Dive Operations Plan: "If for any reason the dive plan is altered in mission, depth, personnel, or equipment, the DDC must be contacted in order to review and accept the alteration prior to actual opertion."		

If the checklist is not completely filled in by the Contractor, USACE may reject the dive package submittal and/or the review may be delayed.

DIVE SUBMITTAL REVIEW CHECKLIST

EMERGENCY MANAGEMENT PLAN REVIEW

PROJECT NAME:	SUBMITTAL NO.:
CONTRACT NO.:	SUBMITTAL DATE:
DIVE CONTRACTOR NAME:	
DIVE CONTRACTOR ADDRESS:	
DIVE CONTRACTOR PHONE:	
PRIME CONTRACTOR NAME:	
PRIME CONTRACTOR ADDRESS:	
PRIME CONTRACTOR PHONE:	

USACE REVIEWER:	REVIEW DATE:

ITEM	EM 385-1-1 Chapter 30-7.d	Description	Pg.	USACE REVIEW
1	1	Location and phone number of nearest operational recompression chamber, if not located at the dive site, and the Divers Alert Network (DAN) emergency hotline number (919-684-9111).		
2	2	Location, directions to, and phone number(s) of nearest hospital(s) or available physicians capable of treating dive injuries.		
3	3	Location and phone number of nearest USCG Rescue Coordination Center, where appropriate.		
4	4	Emergency victim transport procedures including phone numbers of appropriate emergency transport services.		
5	5	Procedures and phone numbers of other means of communications to activate emergency services at the facility where the work is being performed.		
6	6	Diver rescue procedures conducted by dive team, including responsibilites of team members, best location(s) where injured divers may be removed from the water, and best location(s) for performing first aid and stabilization prior to emergency medical support arrival.		

Comments:

If the checklist is not completely filled in by the Contractor, USACE may reject the dive package submittal and/or the review may be delayed.

DIVE SUBMITTAL REVIEW CHECKLIST

ACTIVITY HAZARDS ANALYSIS REVIEW

PROJECT NAME:	SUBMITTAL NO.:
CONTRACT NO.:	SUBMITTAL DATE:
DIVE CONTRACTOR NAME:	
DIVE CONTRACTOR ADDRESS:	
DIVE CONTRACTOR PHONE:	
PRIME CONTRACTOR NAME:	
PRIME CONTRACTOR ADDRESS:	
PRIME CONTRACTOR PHONE:	

USACE REVIEWER:	REVIEW DATE:

ITEM	EM 385-1-1	Description	Pg.	USACE REVIEW
1	Chapter 30-6	Develop AHAs according to paragraphs 1-6 or 2-6 as applicable. When diving opertions require the control of hazardous energy see paragraph 12-6.		
2	Chapter 2-6	The requirements of this chapter apply to all AHAs required by this manual. Specific AHA requirements are identified in paragraph 6 of each chapter in this manual.		
3	d.	AHA Minimum Requirements		
4	d.(1)	AHA s must be prepared and documented for all field, laboratory, industrial, and maintencance activities performed. Before beginning each work activity, task, or DFOW, an initial AHA must be prepared to ensure minimum safety requirements are adequately addressed.		
5	d.(2)	AHAs must be provided to and reviewed by all involved employees prior to starting the task. Each employee must document their review with a signature on the AHA or an additional signature sheet. Provide coopies of signed AHAs to the KO or COR upon request.		
6	d.(3)	AHAs must be readily available onsite (for example, office trailer) and accessible onsite by all employees for a period of 12 months, or for contracted work, the length of the contract. Workers/crews must have in their possession the current AHA that reflects courrent onsite conditions, personnel. equipment, control measures, ect. while the work is being performed.		
7	d.(4)	AHAs must include the following:		
8	d.(4)(a)	Identify the activity/task/DFOW name, contractor name contact number, project location, date of AHA development, name and title of AHA preparer, and name oand title of AHA acceptance authority.		

If the checklist is not completely filled in by the Contractor, USACE may reject the dive package submittal and/or the review may be delayed.

DIVE SUBMITTAL REVIEW CHECKLIST

9	d.(4)(b)	Define the steps to be performed for the activity/task/DFOW and the work sequences (for example, how the part will be installed or removed, anticipated voltages, quanties of chemical utilized, equipment utilized to accomplish the task, heights being accessded or trenched).		
10	d.(4)(c)	List all potential hazards associated with each specific job step.		
11	d.(4)(d)	List all controls required to mitigate hazards according to paragraph 2-6.a. If one layer of control cannot fully eliminate or reduce hazards to an acceptable level, put additional controls in place to reduce risk to an acceptable level (that is, low or medium where possible).		
12	d.(4)(e)	Assign a RAC to each job step to identify the residual risk that remains after controls have been pplied.		
13	d.(4)(f)	Assign an overall RAC to the AHA. The overall RAC must not be lower than the highest job step RAC on the AHA.		
14	d.(4)(g)	Identify the equipment needed, traininmg requirements needed of involved personnel, and any inpsection requirements necessary for the activity/task/DFOW. Employer will designate, in writing (for example, certification, company letter) any required CP(s) and QP(s) by name for a particular activity (for example, excavation, confined space, scaffolding, fall protection, lead removal, asbestos abatement, otherr activities as specified by OSHA and this manual), and provied proof oc competency/qualification.		
15	d.(4)(h)	Risk acceptance according to paragraph 2-6.b. Activities that require an AHA muct not begin until the AHA with RAC has been reviewed and accepted by the proper acceptance authority.		
16	Chapter 12-6.a	When the activity requires the control of hazardous energy, a HIP for the activity being performed must be attached to and referenced in the AHA. An AHA by itself will not be considered a HIP. For AHAs that have been previously accepted by the KO or COR, the HIP alone must be submitted for review.		
17	b.	When preparing the AHA, the HIP must also be reviewed by an Authorized Individual to ensure it is still valid and that there have been no changes in the configuration that would require a change to the HIP.		
18	c.	The AHA and the HIP must be provided to and accepted by the KO or COR prior ro performing these activities.		
19	Chapter 12-7.a.	When a contractor SSECP is required for work on or near any system that produces, uses, or stores hazardous energy, the SSECP must be site-specific and developed according to figure 12-1 and ANSI Z244.4, and when electricty is a potential energy source, the plan must also include the required elements of NFPA 70E. THe plan must clearly and specifically outline the scope, purpose, authourization, role and responsibilities, and techniques to be used.		

If the checklist is not completely filled in by the Contractor, USACE may reject the dive package submittal and/or the review may be delayed.

DIVE SUBMITTAL REVIEW CHECKLIST

DIVE PERSONNEL QUALIFICATIONS REVIEW

PROJECT NAME:	SUBMITTAL NO.:
CONTRACT NO.:	SUBMITTAL DATE:
DIVE CONTRACTOR NAME:	
DIVE CONTRACTOR ADDRESS:	
DIVE CONTRACTOR PHONE:	
PRIME CONTRACTOR NAME:	
PRIME CONTRACTOR ADDRESS:	
PRIME CONTRACTOR PHONE:	

USACE REVIEWER: REVIEW DATE:

385-1-1 References			30-3 with parts a, b, c				30-3-d. and special note - Little Rock District Requirement - O_2 certifications will be refreshed every 2 yrs even if no expiration date is listed.				30-3-e.(3)		30-8-a.(23)(d)		16-3-i	
			Dive Training and Experience				Emergency Treatment Certifications				Dive Physical Date signed and signature stamped by D or DO)		Rigger cert. exp. meets requirements in Chapter 15-3")		Signal Person Qualifications	
			Commercial Dive School Diploma or Cert	Diving Exp.(=<12 months in position)	4 Similar Dives, 1 in last months, Dive Logs	USACE Review	CPR	First Aid	Emer. O_2	USACE Review						
Item	Name	Role	Page #	Page #	Page #		Comp. Date	Comp. Date	Comp. Date		Date	USACE Review	Page#	USACE Review	Page #	USACE Review
1																
2																
3																
4																
5																
6																

If the checklist is not completely filled in by the Contractor, USACE may reject the dive package submittal and/or the review may be delayed.

DIVE SUBMITTAL REVIEW CHECKLIST

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14																
15																
Comments:																

If the checklist is not completely filled in by the Contractor, USACE may reject the dive package submittal and/or the review may be delayed.

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SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS

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 B564 Standard Specification for 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.

AACE INTERNATIONAL (AACE)
1265 Suncrest Towne Centre Drive
Morgantown, WV 26505-1876 USA
Ph: 304-296-8444
Fax: 304-291-5728
Internet: https://web.aacei.org/

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
Two Park Avenue
New York, NY 10016-5990
Ph: 800-843-2763
Fax: 973-882-1717
E-mail: customercare@asme.org
Internet: https://www.asme.org/

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)
520 N. Northwest Highway
Park Ridge, IL 60068
Ph: 847-699-2929
E-mail: customerservice@assp.org
Internet: https://www.assp.org/

AMERICAN WATER WORKS ASSOCIATION (AWWA)
6666 W. Quincy Avenue
Denver, CO 80235 USA
Ph: 303-794-7711 or 800-926-7337
Fax: 303-347-0804
Internet: https://www.awwa.org/

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)
P.O. Box 361784
Birmingham, AL 35236-1784
Ph: 205-733-4077

Fax: 205-733-4075
Internet: http://www.awpa.com

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
E-mail: service@astm.org
Internet: https://www.astm.org/

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
445 and 501 Hoes Lane
Piscataway, NJ 08854-4141
Ph: 732-981-0060 or 800-701-4333
Fax: 732-981-9667
E-mail: onlinesupport@ieee.org
Internet: https://www.ieee.org/

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)
1901 North Moore Street
Arlington, VA 22209-1762
Ph: 703-525-1695
Fax: 703-528-2148
Internet: https://safetyequipment.org/

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 800-344-3555
Fax: 800-593-6372
Internet: https://www.nfpa.org

SOCIETY FOR PROTECTIVE COATINGS (SSPC)
800 Trumbull Drive
Pittsburgh, PA 15205
Ph: 877-281-7772 or 412-281-2331
Fax: 412-444-3591
E-mail: customerservice@sspc.org
Internet: http://www.sspc.org

SOUTHERN PINE INSPECTION BUREAU (SPIB)
P.O. Box 10915
Pensacola, FL 32524-0915
Ph: 850-434-2611 or 800-995-7742
Fax: 850-434-1290
E-mail: spib@spib.org
Internet: https://www.spib.org/

U.S. ARMY CORPS OF ENGINEERS (USACE)
CRD-C DOCUMENTS available on Internet:
http://www.wbdg.org/ffc/army-coe/standards
Order Other Documents from:
Official Publications of the Headquarters, USACE
E-mail: hqpublications@usace.army.mil
Internet: http://www.publications.usace.army.mil/
or

https://www.hnc.usace.army.mil/Missions/Engineering-Directorate/TECHINFO/

U.S. DEPARTMENT OF DEFENSE (DOD)
Order DOD Documents from:
Room 3A750-The Pentagon
1400 Defense Pentagon
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Commander Naval Sea Systems Command
1333 Isaac Hull Ave., SE
Washington Navy Yard, DC 20376
Ph: 202-781-0000
Internet: https://www.navsea.navy.mil/

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-- End of Section --

SECTION 01 45 00

QUALITY CONTROL

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 D3740	(2019) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E329	(2021) Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

1.2 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Quality Control (CQC) Plan; G,DO
Qualifications of Quality Control Personnel; G,DO

SD-06 Test Reports

Verification Statement (Daily Reports)

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system that complies with FAR 52.246-12 Inspection of Construction. QC consist of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The QC system covers all contract operations, both onsite and offsite, and shall be keyed to the proposed work sequence. The project superintendent will be held

responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the Contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production is the project superintendent. The project superintendent maintains a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN

Submit in both paper and electronic format (CD/PDF), no later than 10 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements FAR 52.246-12 Inspection of Construction. Work will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the accepted interim plan will not be permitted to begin until acceptance of a CQC Plan containing the additional work.

3.2.1 Content of the CQC Plan

Include, as a minimum, the following to cover all work, both onsite and offsite, including work by subcontractors fabricators, suppliers and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three phase control system for all aspects of the work specified. Include a CQC System Manager that reports directly to the corporate home office of the prime contractor and who shall not be subordinated to the project superintendent or project manager.

b. The name, qualifications of quality control personnel (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the Contract. Letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities will be issued by the CQC System Manager. Furnish copies of these letters to the Contracting Officer.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures must be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer are required to be used.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including

documentation.

g. Procedures for tracking work deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and is identified by different trades or disciplines, or it is work by the same trade in a different environment. Although each section of the specifications can generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of work. Acceptance is conditional and will be predicated on satisfactory performance during the work. The Government reserves the right to require the Contractor to make changes in the Contractor Quality Control(CQC) Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the final CQC Plan, meet with the Contracting Officer and discuss the Contractor's quality control system. Submit the CQC Plan a minimum of 10 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details must be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting will be prepared by the Government, signed by both the Contractor and the Contracting Officer and will become a part of the contract file. There can be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings or address deficiencies in the CQC system or procedures which can require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a Site Safety and Health Officer (SSHO), CQC System Manager (CQCSM), and sufficient number of additional qualified personnel to ensure safety and Contract compliance. The Site Safety and Health Officer reports directly to a senior project (or corporate) official independent from the CQC System Manager. The Site Safety and Health Officer will also serve as a member of the CQC Staff.

Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff maintains a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure Contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization is responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager (CQCSM)

Identify as CQC System Manager an individual within the onsite work organization that is responsible for overall management of CQC and has the authority to act in all CQC matters for the Contractor. The CQC System Manager is required to be a construction person with a minimum of 5 years in related work. This CQC System Manager is on the site at all times during the performance of work and is employed by the prime Contractor. The CQC System Manager is assigned no other duties in addition to quality control. Identify in the plan an alternate to serve in the event of the CQC System Manager's absence. The requirements for the alternate are the same as the CQC System Manager. The CQC System Manager is a full time position and the CQCSM or designated representative or alternate shall be on the site at all times during work activities.

3.4.3 CQC Designated Representative

In addition to CQC personnel specified elsewhere in the contract, provide as part of the CQC organization, a sufficient number of qualified individual(s) to serve as the CQC System Manager's Designated Representative to cover construction activities at all individual site locations (beach, dredge, floating plant, etc.) for continuous 24 hour coverage. These individuals may be employees of the prime or subcontractor and shall:

a. be responsible to the CQC System Manager;

b. be physically present at the project site when work is being performed;

c. be a construction person with a minimum of 2 years of construction management experience on projects similar to this contract.

d. perform CQC program tasks as designated by the CQCSM and report all findings to the CQCSM / Alternate CQCSM. The Designated Representative shall document results of quality inspection findings and provide information for inclusion in the CQC reports.

These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. Designated Representative(s) shall not be positions requiring continuous mechanical or equipment operations, such as equipment operators. The CQC Designated Representative shall not be the same person as the SSHO Designated Representative.

3.4.4 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: structural, environmental, materials technician. These individuals or specialized technical companies are employees of the prime or subcontractor; be responsible to the CQC System Manager; be physically present at the construction site during work on the specialized personnel's areas of responsibility; have the necessary education or experience in accordance with the experience matrix listed herein. These individuals can perform other duties but need to be allowed sufficient time to perform the specialized personnel's assigned quality control duties as described in the Quality Control Plan. A single person can cover more than one area provided that the single person is qualified to perform quality control activities in each designated and that workload allows.

Experience Matrix	
Area	Qualifications
Structural	Graduate Civil Engineer (with Structural Track or Focus) or Construction Manager with 2 years experience or person 5 years of experience supervising structural features of work in the field with a construction company
Environmental	Graduate Environmental Engineer with 3 years experience
Concrete, Pavements and Soils	Materials Technician with 2 years experience for the appropriate area

3.4.5 Additional Requirement

In addition to the above experience and education requirements, the Contractor Quality Control(CQC) System Manager and Alternate CQC System Manager are required to have completed the Construction Quality Management (CQM) for Contractors course. If the CQC System Manager does not have a current certification, obtain the CQM for Contractors course certification within 90 days of Contract award. All costs for the course shall be borne by the Contractor. This course is periodically offered by individual Army Corps of Engineers Districts. Contact the Contracting Officer for information on the next scheduled class.

The Construction Quality Management Training certificate expires after 5 years. If the CQC System Manager's certificate has expired, retake the course to remain current.

3.4.6 Organizational Changes

Maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals must comply with the requirements in Section 01 33 00 SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.6 CONTROL

CQC is the means by which the Contractor ensures that the work performed, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control are required to be conducted by the CQC System Manager for each definable feature of the construction work as follows:

3.6.1 Preparatory Phase

This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

a. A review of each paragraph of applicable specifications, reference codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain and make available in the field for use by Government personnel until final acceptance of the work.

b. Review of the Contract drawings.

c. Check to assure that all materials and equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the Contract.

f. Examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. Review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. Notify the Government at least 72 hours in advance of beginning the preparatory control phase. Include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel

(as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attach to the daily CQC report. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase is accomplished at the beginning of a definable feature of work, but after the preparatory control meeting for this DFOW. Accomplish the following:

a. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing are in compliance with the contract.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. Notify the Government at least 24 hours in advance of beginning the initial phase for definable feature of work. Prepare separate minutes of this phase by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of initial phase for definable feature of work for future reference and comparison with follow-up phases.

g. The initial phase for each definable feature of work is repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work. All work for the current definable feature of work shall meet the contract requirements prior to performing additional features of work which build upon this current DFOW.

3.6.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and acceptance tests when specified. Procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. Perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Record results of all tests taken, both passing and failing on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports are submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated results in nonpayment for related work performed and disapproval of the test facility for this Contract.

3.7.2 Testing Laboratories

All testing laboratories must be validated by the USACE Material Testing Center (MTC) for the tests to be performed. Information on the USACE MTC with web-links to both a list of validated testing laboratories and for the laboratory inspection request for can be found at: https://mtc.erdc.dren.mil/.

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel is required to meet criteria detailed in ASTM D3740 and ASTM E329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of $1,500.00 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the Contract amount

due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC System Manager near the end of the work, or any increment of the work established by a time stated in FAR 52.211-10 Commencement, Prosecution, and Completion of Work, or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the approved drawings and specifications, as required by paragraph DOCUMENTATION. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the work is complete. A Government Pre-Final Punch List may be developed as a result of this inspection. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. These inspections and any deficiency corrections required by this paragraph need to be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative is required to be in attendance at the final acceptance inspection. Additional Government personnel may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all 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 in accordance FAR 52.246-12 Inspection of Construction.

3.9 DOCUMENTATION

3.9.1 Quality Control Activities

Maintain current records providing factual evidence that required quality control activities and tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

a. The name and area of responsibility of the Contractor/Subcontractor.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with Contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and specifications.

3.9.2 Verification Statement (Daily Reports)

Submit reports as their incidence occurs, in accordance with the requirements of the Paragraph titled, DOCUMENTATION. Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the Contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work period. All calendar days need to be accounted for throughout the life of the contract. The first report submitted following a day of no work will be for that day only. Submitted reports must be signed and dated by the Contractor Quality Control(CQC) System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

3.10 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer can 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 will be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.12 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the cost of all the bid items.

-- End of Section --

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CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE

REPORT NO

PHASE | CONTRACT NO | CONTRACT TITLE

PREPARATORY

WAS PREPARATORY PHASE WORK PERFORMED TODAY? YES ☐ NO ☐

IF YES, FILL OUT AND ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST.

Schedule Activity No.	Definable Feature of Work	Index #

INITIAL

WAS INITIAL PHASE WORK PERFORMED TODAY? YES ☐ NO ☐

IF YES, FILL OUT AND ATTACH SUPPLEMENTAL INITIAL PHASE CHECKLIST.

Schedule Activity No.	Definable Feature of Work	Index #

FOLLOW-UP

WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE? YES ☐ NO ☐

WORK COMPLIES WITH SAFETY REQUIREMENTS? YES ☐ NO ☐

Schedule Activity No.	Description of Work, Testing Performed & By Whom, Definable Feature of Work, Specification Section, Location and List of Personnel Present

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)

Schedule Activity No.	Description

REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)

Schedule Activity No.	Description

REMARKS (Also Explain Any Follow-Up Phase Checklist Item From Above That Was Answered "NO"), Manuf. Rep On-Site, etc.

Schedule Activity No.	Description

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.

AUTHORIZED QC MANAGER AT SITE DATE

GOVERNMENT QUALITY ASSURANCE REPORT

DATE

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT

GOVERNMENT QUALITY ASSURANCE MANAGER DATE

4296/2 (9/98) SHEET OF

CONTRACTOR QUALITY CONTROL REPORT

(CONTINUATION SHEET)

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE

REPORT NO.

PHASE | CONTRACT NO | CONTRACT TITLE

WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE? YES ☐ NO ☐

WORK COMPLIES WITH SAFETY REQUIREMENTS? YES ☐ NO ☐

FOLLOW-UP

Schedule Activity No.	Description of Work, Testing Performed & By Whom, Definable Feature of Work, Specification Section, Location and List of Personnel Present

CONTRACTOR PRODUCTION REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE

CONTRACT NO	TITLE AND LOCATION	REPORT NO
CONTRACTOR	SUPERINTENDENT	
AM WEATHER	PM WEATHER	MAX TEMP F / MIN TEMP F

WORK PERFORMED TODAY

Schedule Activity No.	WORK LOCATION AND DESCRIPTION	EMPLOYER	NUMBER	TRADE	HRS

JOB SAFETY

WAS A JOB SAFETY MEETING HELD THIS DATE? ☐ YES ☐ NO
(If YES attach copy of the meeting minutes)

WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? ☐ YES ☐ NO
(If YES attach copy of completed OSHA report)

WAS CRANE/MANLIFT/TRENCHING/SCAFFOLD/HV ELEC/HIGH WORK/ HAZMAT WORK DONE? ☐ YES ☐ NO
(If YES attach statement or checklist showing inspection performed.)

WAS HAZARDOUS MATERIAL/WASTE RELEASED INTO THE ENVIRONMENT? ☐ YES ☐ NO
(If YES attach description of incident and proposed action.)

TOTAL WORK HOURS ON JOB SITE, THIS DATE, INCL CON'T SHEETS	
CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	
TOTAL WORK HOURS FROM START OF CONSTRUCTION	

Schedule Activity No.	LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED

☐ SAFETY REQUIREMENTS HAVE BEEN MET.

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB (INDICATE SCHEDULE ACTIVITY NUMBER)

Schedule Activity No.	Submittal #	Description of Equipment/Material Received

CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY. INDICATE HOURS USED AND SCHEDULE ACTIVITY NUMBER.

Schedule Activity No.	Owner	Description of Construction Equipment Used Today (incl Make and Model)	Hours Used

Schedule Activity No.	REMARKS

CONTRACTOR/SUPERINTENDENT DATE

4296/1 (9/98) SHEET OF

CONTRACTOR PRODUCTION REPORT

(CONTINUATION SHEET)

DATE

CONTRACT NO | TITLE AND LOCATION | REPORT NO

WORK PERFORMED TODAY

Schedule Activity No.	WORK LOCATION AND DESCRIPTION	EMPLOYER	NUMBER	TRADE	HRS

Schedule Activity No.	LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB (INDICATE SCHEDULE ACTIVITY NUMBER)

Schedule Activity No.	Submittal #	Description of Equipment/Material Received

CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY. INDICATE HOURS USED AND SCHEDULE ACTIVITY NUMBER.

Schedule Activity No.	Owner	Description of Construction Equipment Used Today (incl Make and Model)	Hours Used

Schedule Activity No.	REMARKS

INCLUDE ALL PERSONNEL WORK HOURS IN THE WORK PERFORMED SECTION ON THIS SHEET
INTO THE FRONT CONTRACTOR PRODUCTION REPORT

4296/1A (9/98) SHEET OF

SECTION 01 45 05

RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Health Requirements Manual

1.2 CONTRACT ADMINISTRATION

The Government will use the Resident Management System (RMS) to assist in its monitoring and administration of this contract. The Government accesses the system using the Government Mode of RMS (RMS GM) and the Contractor accesses the system using the Contractor Mode (RMS CM). The term RMS will be used in the remainder of this section for both RMS GM and RMS CM. The joint Government-Contractor use of RMS facilitates electronic exchange of information and overall management of the contract. The Contractor accesses RMS to record, maintain, input, track, and electronically share information with the Government throughout the contract period in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Closeout
Import/Export of Data

1.2.1 Correspondence and Electronic Communications

For ease and speed of communications, exchange correspondence and other documents in electronic format to the maximum extent feasible. Some correspondence, including pay requests and payrolls, are also to be provided in paper format with original signatures. Paper documents will govern, in the event of discrepancy with the electronic version.

1.2.2 Other Factors

Other portions of this document have a direct relationship to the reporting accomplished through RMS. Particular attention is directed to FAR 52.236-15 Schedules for Construction Contracts; FAR 52.232-27 Prompt Payment for Construction Contracts; FAR 52.232-5 Payments Under Fixed-Priced Construction Contracts; Section 01 32 01 PROJECT SCHEDULE; Section 01 33 00 SUBMITTAL PROCEDURES; Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS; and Section 01 45 00 QUALITY CONTROL.

1.3 RMS SOFTWARE

RMS is a web based application. Download, install and be able to utilize the latest version of RMS within 7 calendar days of receipt of the Notice to Proceed. RMS software, user manuals, access and installation instructions, program updates and training information are available from the RMS website (https://rms.usace.army.mil). The Government and the Contractor will have different access authorities to the same contract database through RMS. The common database will be updated automatically each time a user finalizes an entry or change.

1.4 CONTRACT DATABASE - GOVERNMENT

The Government will enter the basic contract award data in RMS prior to granting the Contractor access. The Government entries into RMS will generally be related to submittal reviews, correspondence status, and Quality Assurance(QA)comments, as well as other miscellaneous administrative information.

1.5 CONTRACT DATABASE - CONTRACTOR

Contractor entries into RMS establish, maintain, and update data throughout the duration of the contract. Contractor entries generally include prime and subcontractor information, daily reports, submittals, RFI's, schedule updates and payment requests. RMS includes the ability to import attachments and export reports in many of the modules, including submittals. The Contractor responsibilities for entries in RMS typically include the following items:

1.5.1 Administration

1.5.1.1 Contractor Information

Enter all current Contractor administrative data and information into RMS within 7 calendar days of receiving access to the contract in RMS. This includes, but is not limited to, Contractor's name, address, telephone numbers, management staff, and other required items.

1.5.1.2 Subcontractor Information

Enter all missing subcontractor administrative data and information into RMS CM within 7 calendar days of receiving access to the contract in RMS or within 7 calendar days of the signing of the subcontractor agreement for agreements signed at a later date. This includes name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor is listed separately for each trade to be performed.

1.5.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters are numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C" or "RFP".

1.5.1.4 Equipment

Enter and maintain a current list of equipment planned for use or being

used on the jobsite, including the most recent and planned equipment inspection dates.

1.5.1.5 Reports

Track the status of the project utilizing the reports available in RMS. The value of these reports is reflective of the quality of the data input. These reports include the Progress Payment Request worksheet, Quality Control (QC) comments, Submittal Register Status, and Three-Phase Control worksheets.

1.5.1.6 Request For Information (RFI)

Create and track all Requests For Information (RFI) in the RMS Administration Module for Government review and response.

1.5.2 Finances

1.5.2.1 Pay Activity Data

Develop and enter a list of pay activities in conjunction with the project schedule. The sum of pay activities equals the total contract amount, including modifications. Each pay activity must be assigned to a Contract Line Item Number (CLIN). The sum of the activities assigned to a CLIN equals the amount of each CLIN.

1.5.2.2 Payment Requests

Prepare all progress payment requests using RMS. Update the work completed under the contract at least monthly, measured as percent or as specific quantities. After the update, generate a payment request and prompt payment certification using RMS. Submit the signed prompt payment certification and payment request as well as supporting data either electronically or by hard copy. Unless waived by the Contracting Officer, a signed paper copy of the approved payment certification and request is also required and will govern in the event of discrepancy with the electronic version.

1.5.3 Quality Control (QC)

Enter and track implementation of the 3-phase QC Control System, QC testing, transferred and installed property and warranties in RMS. Prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements in RMS. Maintain all data on a daily basis. Insure that RMS reflects all quality control methods, tests and actions contained within the Contractor Quality Control (CQC) Plan and Government review comments of same within 7 calendar days of Government acceptance of the CQC Plan.

1.5.3.1 Quality Control (QC) Reports

The Contractor's Quality Control (QC) Daily Report in RMS is the official report. The Contractor can use other supplemental formats to record QC data, but information from any supplemental formats are to be consolidated and entered into the RMS QC Daily Report. Any supplemental information may be entered into RMS as an attachment to the report. QC Daily Reports must be finalized and signed in RMS within 24 hours after the date covered by the report. Provide the Government a printed signed copy of the QC Daily Report, unless waived by the Contracting Officer.

1.5.3.2 Deficiency Tracking.

Use the QC Daily Report Module to enter and track deficiencies. Deficiencies identified and entered into RMS by the Contractor or the Government will be sequentially numbered with a QC or QA prefix for tracking purposes. Enter each deficiency into RMS the same day that the deficiency is identified. Monitor, track and resolve all QC and QA entered deficiencies. A deficiency is not considered to be corrected until the Government indicates concurrence in RMS.

1.5.3.3 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS. Worksheets for the three-phase control meetings are generated within RMS.

1.5.3.4 Labor and Equipment Hours

Enter labor and equipment exposure hours on a daily basis. Roll up the labor and equipment exposure data into a monthly exposure report.

1.5.3.5 Accident/Safety Reporting

Both the Contractor and the Government enter safety related comments in RMS as a deficiency. The Contractor must monitor, track and show resolution for safety issues in the QC Daily Report area of the RMS QC Module. In addition, follow all reporting requirements for accidents and incidents as required in EM 385-1-1, Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS and as required by any other applicable Federal, State or local agencies.

1.5.3.6 Definable Features of Work

Enter each feature of work, as defined in the approved CQC Plan, into the RMS QC Module. A feature of work may be associated with a single or multiple pay activities, however a pay activity is only to be linked to a single feature of work.

1.5.3.7 Activity Hazard Analysis

Import activity hazard analysis electronic document files into the RMS QC Module utilizing the document package manager.

1.5.4 Submittal Management

Enter all current submittal register data and information into RMS within 7 calendar days of receiving access to the contract in RMS. The information shown on the submittal register following the specification Section 01 33 00 SUBMITTAL PROCEDURES will already be entered into the RMS database when access is granted. Group electronic submittal documents into transmittal packages to send to the Government, except very large electronic files, samples, spare parts, mock ups, color boards, or where hard copies are specifically required. Track transmittals and update the submittal register in RMS on a daily basis throughout the duration of the contract. Submit hard copies of all submittals unless waived by the Contracting Officer.

1.5.5 Schedule

Enter and update the contract project schedule in RMS by either manually entering all schedule data or by importing the Standard Data Exchange Format (SDEF) file, based on the requirements in Section 01 32 01 PROJECT SCHEDULE.

1.5.6 Closeout

Closeout documents, processes and forms are managed and tracked in RMS by both the Contractor and the Government. Ensure that all closeout documents are entered, completed and documented within RMS.

1.6 IMPLEMENTATION

Use of RMS as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain contract data within the RMS system. RMS is an integral part of the Contractor's required management of quality control.

1.7 NOTIFICATION OF NONCOMPLIANCE

Take corrective action within 7 calendar days after receipt of notice of RMS non-compliance by the Contracting Officer.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 MEASUREMENT AND PAYMENT

The work specified in this section will not be measured for payment and all costs in connection therewith shall be included in the costs of all the bid items.

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SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS

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.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2022; ERTA 1 2021) Standard for Portable Fire Extinguishers
NFPA 70	(2023; ERTA 4 2023; ERTA 5 2023; ERTA 6 2023) National Electrical Code
NFPA 241	(2022) Standard for Safeguarding Construction, Alteration, and Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Health Requirements Manual
EP 310-1-6a	(2006; 2019 Change 2) Project Operation -- Sign Standards Manual, VOL 1
EP 310-1-6b	(2006) Sign Standards Manual, VOL 2, Appendices

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 70/7460-1	(2016; Rev L; Change 2) Obstruction Marking and Lighting

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2009; Rev 2012) Manual on Uniform Traffic Control Devices

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Site Plan; G,COR

Traffic Control Plan; G,COR
Haul Road Plan; G,COR
Contractor Computer Cybersecurity Compliance Statements; G,COR
Contractor Temporary Network Cybersecurity Compliance Statements; G, COR

SD-02 Shop Drawings

Sign Legend Orders; G,COR

1.3 CONSTRUCTION SITE PLAN

Prior to the start of work, submit for Government approval a site plan showing the locations and dimensions of temporary facilities (including layouts and details, equipment and material storage area (onsite and offsite), and access and haul routes, avenues of ingress/egress to the fenced area and details of the fence installation. Identify any areas which may have to be graveled to prevent the tracking of mud. Indicate if the use of a supplemental or other staging area is desired. Show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas.

1.4 PUBLIC ACCESS

The Contractor shall provide the public with access to all private and commercial properties.

1.5 CONTRACTOR ACCESS

Access to the work areas is only permitted at the locations shown. Provide materials required to establish or stabilize access points for vehicle use and remove upon project completion. Protect all existing structures from damage throughout the entire contract, and maintain all access points in accordance with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

1.6 LOCAL POLICE NOTIFICATION

Notify the local police department at least 24 hours prior to starting work to obtain approval for temporary parking and placement of any required signs.

1.7 CYBERSECURITY DURING CONSTRUCTION

Meet the following requirements throughout the construction process.

1.7.1 Contractor Computer Equipment

Contractor owned computers may be used for construction. When used, contractor computers must meet the following requirements:

1.7.1.1 Operating System

The operating system must be an operating system currently supported by the manufacturer of the operating system. The operating system must be current on security patches and operating system manufacturer required updates.

1.7.1.2 Anti-Malware Software

The computer must run anti-malware software from a reputable software

manufacturer. Anti-malware software must be a version currently supported by the software manufacturer, must be current on all patches and updates, and must use the latest definitions file. All computers used on this project must be scanned using the installed software at least once per day.

1.7.1.3 Passwords and Passphrases

The passwords and passphrases for all computers must be changed from their default values. Passwords must be a minimum of eight characters with a minimum of one uppercase letter, one lowercase letter, one number and one special character.

1.7.1.4 Contractor Computer Cybersecurity Compliance Statements

Provide a single submittal containing completed Contractor Computer Cybersecurity Compliance Statements for each company using contractor owned computers. Contractor Computer Cybersecurity Compliance Statements must use the template published at http://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs/forms-graphics-tables. Each Statement must be signed by a cybersecurity representative for the relevant company.

1.7.2 Temporary IP Networks

Temporary contractor-installed IP networks may be used during construction. When used, temporary contractor-installed IP networks must meet the following requirements:

1.7.2.1 Network Boundaries and Connections

The network must not extend outside the project site and must not connect to any IP network other than IP networks provided under this project or Government furnished IP networks provided for this purpose. Any and all network access from outside the project site is prohibited.

1.7.3 Government Access to Network

Government personnel, as defined, prescribed, and identified by the Contracting Officer, must be allowed to have complete and immediate access to the network at any time in order to verify compliance with this specification. Or if there is a Government agency that's responsible, identify that agency.

1.7.4 Temporary Wireless IP Networks

In addition to the other requirements on temporary IP networks, temporary wireless IP (WiFi) networks must not interfere with existing wireless network and must use WPA2 security. Network names (SSID) for wireless networks must be changed from their default values.

1.7.5 Passwords and Passphrases

The passwords and passphrases for all network devices and network access must be changed from their default values. Passwords must be a minimum 8 characters with a minimum of one uppercase letter, one lowercase letter, one number and one special character.

1.7.6 Contractor Temporary Network Cybersecurity Compliance Statements

Provide a single submittal containing completed Contractor Temporary

Network Cybersecurity Compliance Statements for each company implementing a temporary IP network. Contractor Temporary Network Cybersecurity Compliance Statements must use the template published at http://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs/forms-graphics-tables. Each Statement must be signed by a cybersecurity representative for the relevant company. If no temporary IP networks will be used, provide a single copy of the Statement indicating this.

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

2.1.1 Bulletin Board

Within one calendar day of mobilization on site and prior to the commencement of work activities, provide a clear weatherproof covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the Contract, Wage Rate Information poster, Safety and Health Information as required by EM 385-1-1 Section 01 and other information approved by the Contracting Officer. Coordinate requirements herein with 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, and in location as approved by the Contracting Officer.

2.1.2 Project Identification Signs

a. The construction project sign package consists of two signs:

(1) Project Identification Sign.
(2) On-the-job safety performance of the Contractor sign.

The package shall conform to the requirements of EP 310-1-6a and EP 310-1-6b, specifically Section 16 (attached to this section). Submit the sign legend orders as described in Section 16 of EP 310-1-6a prior to erecting the signs.

b. Additional Project Identification sign requirements:

(1) Include the Army Star as shown on the attached sheets.

(2) Include the following on the project sign: Include "The State of New Jersey" and the "NJDEP Office of Coastal Engineering" as the project sponsors. In addition, include the Philadelphia District's website address on the project sign, list the respective city officials, and state that part of the funding for the project is being provided for by the respective city, all in a manner as directed by the Contracting Officer.

2.1.3 Warning Signs

Post temporary signs, tags, and labels to give workers and the public adequate warning and caution of construction hazards according to the EM 385-1-1 Section 04. Attach signs to the perimeter fencing every 150 feet warning the public of the presence of construction hazards. Signs must require unauthorized persons to keep out of the construction site. Correct the data required by safety signs daily. Post signs at all points of entry designating the construction site as a hard hat area.

2.2 TEMPORARY TRAFFIC CONTROL

2.2.1 Haul Roads

Construct access and haul roads necessary for proper prosecution of the work under this Contract in accordance with EM 385-1-1 Section 04. Construct with suitable grades and widths; avoid sharp curves, blind corners, and dangerous cross traffic. Submit haul road plan for approval. Provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, must be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and haul roads are subject to approval by the Contracting Officer. Lighting must be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations.

2.2.2 Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. Barricades are required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

2.3 FENCING

Provide fencing along the construction site and at all open excavations and tunnels to control access by unauthorized personnel. Safety fencing must be highly visible to be seen by pedestrians and vehicular traffic. All fencing must meet the requirements of EM 385-1-1. Remove the fence upon completion and acceptance of the work.

2.3.1 Polyethylene Mesh Safety Fencing

Temporary safety fencing must be a high visibility orange colored, high density polyethylene grid, a minimum of 48 inches high and maximum mesh size of 2 inches. Fencing must extend from the grade to a minimum of 48 inches above the grade and be tightly secured to T-posts spaced as necessary to maintain a rigid and taut fence. Fencing must remain rigid and taut with a minimum of 200 pounds of force exerted on it from any direction with less than 4 inches of deflection.

2.3.2 Chain Link Panel Fencing

Temporary panel fencing must be galvanized steel chain link panels 8 feet high. Multiple fencing panels may be linked together at the bases to form long spans as needed. Each panel base must be weighted down using sand bags or other suitable materials in order for the fencing to withstand anticipated winds while remaining upright. Fencing must remain rigid and taut with a minimum of 200 pounds of force exerted on it from any direction with less than 4 inches of deflection. Include plastic strip inserts, colored green or brown, so that visibility through the fence is obstructed.

2.4 TEMPORARY WIRING

Provide temporary wiring in accordance with EM 385-1-1 Section 11, NFPA 241

and NFPA 70. Include monthly inspection and testing of all equipment and apparatus.

2.5 GOVERNMENT FIELD OFFICE

Provide a Government project office for the length of the contract. The office shall be a rented office, storefront or residence space with a minimum floor area of 550 square feet, with two separate offices, a conference room, and partitioned restroom facilities with flushing toilets and running water with prior approval by the Contracting Officer. The office shall have sufficient lighting to supply 150 foot-candles at the desk top level and shall be supplied with 110 volt and 220 volt electrical outlets as required for heating, air conditioning, lighting, water cooler, office equipment, and other accessories. Provide either a heater and air conditioner or a heat pump sufficient to maintain comfortable conditions. Provide a door with a cylinder lock and windows with locking hardware. The exterior of the office shall be equipped with flood lights to provide adequate security lighting during hours of darkness. Weekly janitorial services shall be supplied during normal working hours. Provide potable water (hot and cold), provide for treatment of sewage, and provide permanent electric service, all in accordance with applicable local municipal, county and State codes.

2.5.1 Trailer-Type Mobile Office

The Contractor may furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and provide a minimum 10 foot wide by 60 foot long trailer, with the facilities specified above. If a trailer is provided, it shall be new or recently renovated to a like-new condition subject to the approval of the Contracting Officer. Securely anchor the trailer to the ground at all four corners to guard against movement during high winds.

2.5.2 Office Equipment

Provide the following office equipment for the Government field office:

a. Two desks having 60-inch by 30-inch tops, with lockable drawers, two swivel chairs, and two tables with 60-inch by 30-inch laminated tops;

b. One 96-inch by 48-inch conference table with ten chairs;

c. One free-standing full-size drafting table, minimum 37-1/2 inch by 60 inch top, and drafting chair;

d. Two lockable, fire-resistant, letter-size, two-drawer 36 inch-wide steel lateral filing cabinets set up for side-by-side filing with ball-bearing suspensions for full-drawer extensions;

e. A magnet-compatible white dry erase board, minimum 2 feet high by 3 feet wide in size, whose surface does not require cleaners. In addition, the contractor shall provide 4 non-toxic dry erase chisel-tip markers in black, blue, red and green and appropriate eraser;

f. One battery-powered quartz round wall clock, 8-1/2 inch minimum diameter, constructed of a plastic case and lens, having a white dial with Arabic numbers and black hour, minute and second hands shall be provided in the conference area;

g. Shelf set, two shelves high, each measuring 12-inch deep by 3-feet long, one per desk;

h. Three waste baskets;

i. Electric water cooler;

j. Vertical filing plan rack for two sets of 30-inch by 42-inch plans each rack;

k. Two portable two-way marine radios with chargers capable of operating on the Contractor's working frequencies;

l. Countertop microwave oven, with digital display, interior light, and a minimum 0.6 cubic feet capacity;

m. Compact refrigerator, with 1.58 cubic foot capacity, and ice tray;

n. Fabricate a large sign, minimum 3 feet in each dimension, made of stiff plastic or aluminum, to be attached to a free-standing post securely founded in the ground or attached directly to the Corps' trailer, as directed by the Contracting Officer. The sign shall provide the U. S. Army Corps of Engineers, Philadelphia District name and logo as shown on the attached sheets for the project signs; and

o. One plastic wall-mounted exterior mailbox with closing lid, (similar to that used by realtors at homes for sale to hold brochures) and capable of holding several 8-1/2 inch by 11 inch sheets of paper vertically.

p. A fire extinguisher. Placement and size shall meet NFPA 10.

NOTE: All office equipment shall be in new or like new condition.

PART 3 EXECUTION

3.1 EMPLOYEE PARKING

Construction Contract employees must park privately owned vehicles in an area designated by the Contracting Officer. Employee parking must not interfere with existing and established parking requirements of the Government installation.

3.2 TEMPORARY BULLETIN BOARD

Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer.

3.3 PROJECT IDENTIFICATION SIGNS INSTALLATION

a. Provide and erect one project identification sign and one safety performance sign, at the locations designated by the Contracting Officer. Install signs within 15 calendar days after receipt of the Notice to Proceed.

b. Maintain signs in good condition throughout the contract period. Update the information contained on the face of the safety performance sign

regarding the Contractor's safety record on a daily basis throughout the contract period.

c. Remove and relocate the signs as the project progresses, if and where requested by the COR. Upon completion of the contract work, remove the signs from the work site and backfill all resulting holes.

3.4 AVAILABILITY AND USE OF UTILITY SERVICES

3.4.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.4.2 Sanitation

Provide and maintain within the construction area minimum field-type sanitary facilities in accordance with EM 385-1-1 Section 02. Locate the facilities behind the construction fence or out of the public view. Clean units and empty wastes at least once a week or more frequently into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Obtain approval from the system owner prior to discharge into a municipal, district, or commercial sanitary sewer system. Penalties or fines associated with improper discharge will be the responsibility of the Contractor. Coordinate with the Contracting Officer and follow station regulations and procedures when discharging into the station sanitary sewer system. Maintain these conveniences at all times. Include provisions for pest control and elimination of odors. Government toilet facilities will not be available to Contractor's personnel.

3.4.3 Telephone

Make arrangements and pay all costs for telephone facilities desired.

3.4.4 Obstruction Lighting of Cranes

Provide a minimum of 2 aviation red or high intensity white obstruction lights on temporary structures (including cranes) over 100 feet above ground level. Light construction and installation must comply with FAA AC 70/7460-1. Lights must be operational during periods of reduced visibility, darkness, and as directed by the Contracting Officer.

3.4.5 Fire Protection

Provide temporary fire protection equipment for the protection of personnel and property during construction. Remove debris and flammable materials daily to minimize potential hazards.

3.5 TRAFFIC PROVISIONS

3.5.1 Maintenance of Traffic

a. Conduct operations in a manner that will not close a thoroughfare or interfere with traffic on railways or highways except with written permission of the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan for Government approval detailing the proposed controls to traffic movement for approval. The plan must be in accordance with State and

local regulations, the MUTCD, Part VI, and EM 385-1-1. Contractor may move oversized and slow-moving vehicles to the worksite provided requirements of the highway authority have been met.

b. Conduct work so as to minimize obstruction of traffic, and maintain traffic on at least half of the roadway width at all times. Obtain approval from the Contracting Officer prior to starting any activity that will obstruct traffic.

c. Provide, erect, and maintain, at Contractor's expense, lights, barriers, signals, passageways, detours, and other items, that may be required by the Life Safety Signage, overhead protection authority having jurisdiction.

d. 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.

3.5.2 Protection of Traffic

Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment the work, and the erection and maintenance of adequate warning, danger, and direction signs, will be as required by the State and local authorities having jurisdiction. Provide self-illuminated (lighted) barricades during hours of darkness. Brightly-colored (orange) vests are required for all personnel working in roadways. Protect the traveling public from damage to person and property. Minimize the interference with public traffic on roads selected for hauling material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. Contractor is responsible for the repair of damage to roads caused by construction operations.

3.5.3 Dust Control

Dust control methods and procedures must be approved by the Contracting Officer. Coordinate dust control methods with 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

3.6 CONTRACTOR'S TEMPORARY FACILITIES

Contractor is responsible for security of their property. Provide adequate outside security lighting at the temporary facilities. Trailers must be anchored to resist high winds and meet applicable state or local standards for anchoring mobile trailers. Coordinate anchoring with EM 385-1-1 Section 04. The Contract Clause entitled "FAR 52.236-10, Operations and Storage Areas" and the following apply:

3.6.1 Administrative Field Offices

Provide and maintain administrative field office facilities within the construction area at the designated site. Equip and staff the office to efficiently conduct the work under this contract and provide essential information to the Contracting Officer or authorized representative. Keep at all times a copy of all drawings, specifications, and other pertinent

information, and allow access to these documents by the Contracting Officer or authorized representative. The office shall be clean and equipped, at a minimum, with a conference table, twelve chairs, a desk and chair, copying machine, laser printer, and telephone facilities which shall be available for use by the Contracting Officer. Government office and warehouse facilities will not be available to the Contractor's personnel.

3.6.2 Staging and Material Storage Areas

Do not place or store trailers, materials, or equipment outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer, away from the vicinity of the construction site but within the project work limits. Trailers, equipment, or materials must not be open to public view with the exception of those items which are in support of ongoing work on the current day. Do not stockpile materials outside the fence in preparation for the next day's work. Park mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment within the fenced area at the end of each work day. Staging areas and material storage areas are limited to those shown on the contract drawings. Contractor equipment and material shall only be stored and staged in approved Contractor storage areas or on the beach berm.

3.6.3 Maintenance of Material Storage Area

Keep fencing in a state of good repair and proper alignment. Grassed or unpaved areas, which are not established roadways, and will be traversed with construction equipment or other vehicles, will be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways, should the Contractor elect to traverse them with construction equipment or other vehicles. Mow and maintain grass located within the boundaries of the construction site for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers must be edged or trimmed neatly.

3.6.4 Appearance of Trailers

a. Trailers which are rusted, have peeling paint or are otherwise in need of repair will not be allowed. Trailers must present a clean and neat exterior appearance and be in a state of good repair.

b. Maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal.

3.6.5 Security Provisions

Provide adequate outside security lighting at the Contractor's temporary facilities. The Contractor is responsible for the security of its own equipment.

3.6.6 Safety Systems

Protect the integrity of all installed safety systems or personnel safety devices. Obtain prior approval from the Contracting Officer if entrance into systems serving safety devices is required. If it is temporarily necessary to remove or disable personnel safety devices in order to accomplish Contract requirements, provide alternative means of protection prior to removing or disabling any permanently installed safety devices or equipment and obtain approval from the Contracting Officer.

3.6.7 Weather Protection of Temporary Facilities and Stored Materials

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday. Ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

3.6.7.1 Building and 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 must 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. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

3.7 GOVERNMENT FIELD OFFICE

Provide and maintain a field office for the sole use of the Contracting Officer's representatives at the location indicated on the contract drawings or as directed by the Contracting Officer. The field office shall be complete and ready for occupancy not later than 15 days after receipt of notice to proceed, or prior to the transport of any equipment on site, with the exception of the equipment required to conduct the pre-placement condition surveys. The Government field office shall be available for use 24 hours per day, 7 days per week, and shall remain in place 30 days after the final demobilization. Provide the following for the life of the contract:

a. Utilities: Provide hot and cold potable water, provide for treatment of sewage, and provide electric service, all in accordance with applicable local municipal, county and state codes. All utility costs arising from the use of the office shall be borne by the Contractor.

b. The trailer shall be placed on concrete block supports, leveled and tied down to withstand wind loads. A corrugated metal curtain shall be installed around the perimeter of the trailer from floor level to the ground. The curtain shall be firmly attached to withstand appropriate wind loads. All water piping and all waste piping shall be adequately supported and insulated.

c. Janitorial Services: Provide all janitorial supplies and services for the office facilities to include as a minimum, weekly sweeping, dusting, emptying of waste baskets, trash collection, servicing of toilets, mopping of all floors, sterilization of toilet seats and monthly waxing of all tile floors and washing of windows. Provide for snow plowing of the parking area, shoveling of walkways, and major maintenance to the office and its utilities.

3.8 PLANT COMMUNICATIONS

Whenever the individual elements of the plant are located so that operation by normal voice between these elements is not satisfactory, install a satisfactory means of communication, such as telephone or other suitable

devices and make available for use by Government personnel.

3.9 SECURITY FENCE

Erect a security fence to enclose the Contractor`s project office, the Government field office if a trailer is used, and the Contractor's staging and storage area(s). The Contractor's staging area(s) and shall be lighted during hours of darkness. This fence shall enclose a Government parking area for approximately 5 cars and shall include appropriate gates with locks for both vehicles and employees. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Posts shall be installed at maximum 10-foot intervals in the ground. Installation of all security fencing materials shall be in accordance with the fence manufacturer's printed instructions.

3.10 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, furnish and erect temporary project safety fencing at the work site. Maintain the safety fencing during the life of the Contract and, upon completion and acceptance of the work, remove from the work site.

3.11 CLEANUP

Remove construction debris, waste materials, packaging material and the like from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways must be cleaned away. Store all salvageable materials resulting from demolition activities within the fenced area described above or at the supplemental storage area. Neatly stack stored materials not in trailers, whether new or salvaged.

3.12 RESTORATION OF STORAGE AREA

Upon completion of the project remove the bulletin board, signs, barricades, haul roads, and all other temporary products from the site. After removal of trailers, materials, and equipment from within the fenced area, remove the fence. Restore areas used during the performance of the Contract to the original or better condition. Remove gravel used to traverse grassed areas and restore the area to its original condition, including top soil and seeding as necessary.

3.13 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the the cost of all the bid items.

-- End of Section --

The use of signs to identify Corps managed or supervised design, construction, and rehabilitation projects - both for military and civil works - is an important part of efforts to keep the public informed of Corps work. For this purpose, a construction project sign package has been adopted. This package consists of two signs: one for project identification and the other to show on-the-job safety performance of the contractor.

These two signs are to be displayed side by side and mounted for reading by passing viewers. Exact placement location will be designated by the contracting officer's representative.

The panel sizes and graphic formats have been standardized for visual consistency throughout all Corps operations.

Panels are fabricated using HDO plywood or aluminum with dimensional lumber uprights and bracing. The sign faces are nonreflective vinyl.

All legends are to be die-cut or computer-cut in the sizes and typefaces specified and applied to the white panel background following the graphic formats shown on pages 16-2 and 16-3. The Communication Red panel on the left side of the construction project sign with Corps Signature (reverse version) is screen-printed onto the white background.

A display of these two signs is shown on the following two pages. Mounting and fabrication details are provided on page 16-4.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Below are two samples of the Construction Project Identification sign showing how this panel is adaptable for use to identify either military (top) or civil works projects (bottom). The graphic format for this 4'x 6' sign panel follows the legend guidelines and layout as specified below. The large 4'x 4' section of the panel on the right is to be white with black legend. The 2'x 4' section of the sign on the left with the full Corps Signature (reverse version) is to be screen-printed Communication Red on the white background The designation of a sponsor in the area indicated is optional with Military or Civil Works construction signs. Signs may list one sponsoring entity. If agreement on a sponsor designation cannot be achieved, the area should be left blank.

This sign is to be placed with the Safety Performance sign shown on the following page. Mounting and fabrication details are provided on page 16-4.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Legend Group 1: One- to two-line description of Corps relationship to project.
Color: White
Typeface: 1.25" Helvetica Regular
Maximum line length: 19"

Legend Group 2: Division or District Name (optional). Placed below 10.5" reverse Signature (6" Castle).
Color: White
Typeface: 1.25" Helvetica Regular

Legend Group 2a: One- to three-line identification of Military or Civil Works sponsor (optional). Place below Corps Signature to cross-align with Group 5a-b.
Color: White
Typeface: 1.25" Helvetica Regular
Maximum line length: 19"

Legend Group 3: One- to three-line project title legend describes the work being done under this contract.
Color: Black
Typeface: 3" Helvetica Bold
Maximum line length: 42"

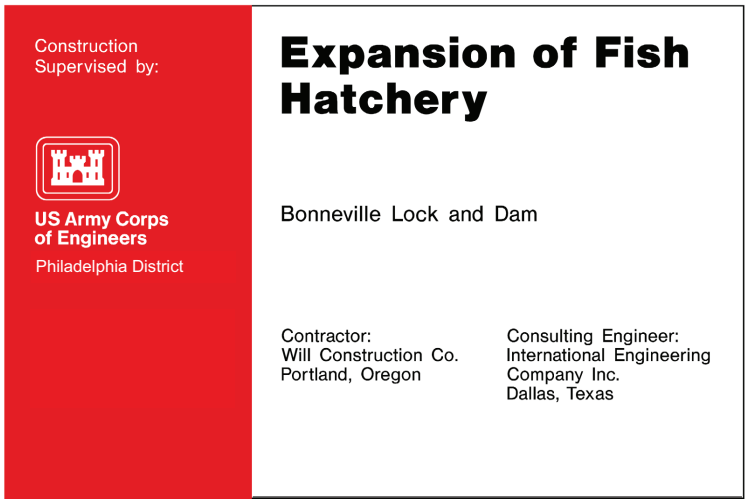
Legend Group 4: One- to two-line identification of project or facility (civil works) or name of sponsoring department (military).
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Cross-align the first line of Legend Group 4 with the first line of the Corps Signature (US Army Corps) as shown.

Legend Groups 5a-b: One- to five-line identification of prime contractors including: type (architect, general contractor, etc.), corporate or firm name, city, state. Use of Legend Group 5 is optional.
Color: Black
Typeface: 1.25" Helvetica Regular
Maximum line length: 21"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.





Sign Type	Legend Size (A)	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-01	various	4'x6'	4"x4"	HDO-3	48"	WH-RD/BK

Each contractor's safety record is to be posted on Corps managed or supervised construction projects and mounted with the Construction Project Identification sign specified on page 16-2.

The graphic format, color, size and typefaces used on the sign are to be reproduced exactly as specified below. The title with First Aid logo in the top section of the sign, and the performance record captions are standard for all signs of this type. Legend groups 2 and 3 below identify the project and the contractor and are to be placed on the sign as shown.

Safety record numbers are mounted on individual metal plates and are screw-mounted to the background to allow for daily revisions to posted safety performance record.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Legend Group 1: Standard two-line title "Safety is a Job Requirement" with 8" (outside diameter) Safety Green first aid logo.
Color: To match Pantone system 347
Typeface: 3" Helvetica Bold
Color: Black

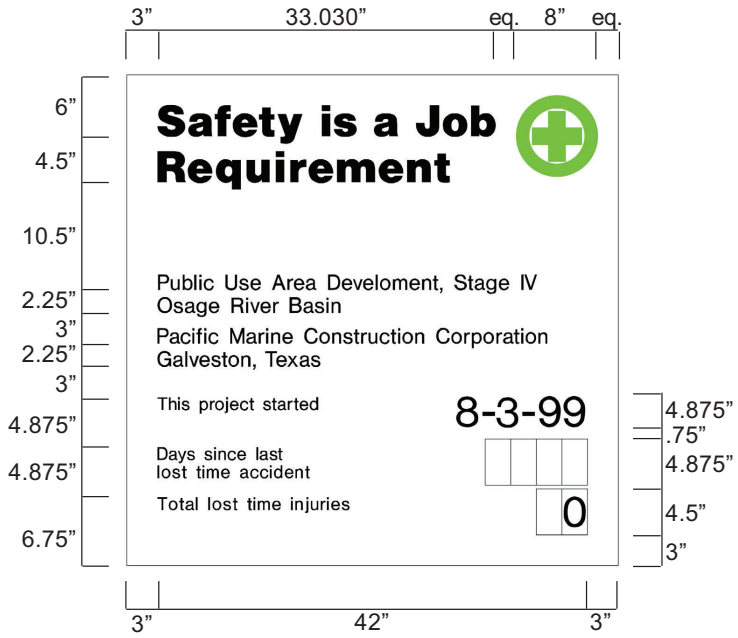
Legend Group 2: One- to two-line project title legend describes the work being done under this contract and name of host project.
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Legend Group 3: One- to two-line identification: name of prime contractor and city, state address. Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

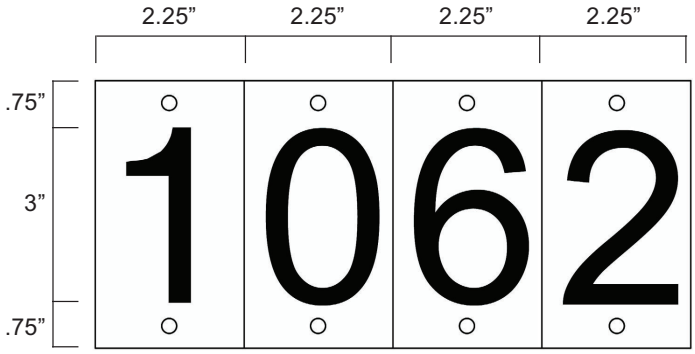
Legend Group 4: Standard safety record captions as shown.
Color: Black
Typeface: 1.25" Helvetica Regular

Replaceable numbers are to be mounted on white .060 aluminum plates and screw-mounted to background.
Color: Black
Typeface: 3" Helvetica Regular
Plate size: 2.5" x 4.5"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.



Sign Type	Legend Size (A)	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-02	various	4'x4'	4"x4"	HDO-3	48"	WH/BK-SG



16-3

All Construction Project Identification signs and Safety Performance signs are to be fabricated and installed as described below. The signs are to be erected at a location designated by the contracting officer representative and shall conform to the size, format, and typographic standards shown on pages16-2 and 16-3. Detailed specifications for HDO plywood panel preparation are provided in Appendix B.

Shown below the mounting diagram is a panel layout grid with spaces provided for project information. Photocopy this page and use as a worksheet when preparing sign legend orders.

For additional information on the proper method to prepare sign panel graphics, contact the district Sign Program Manager.

The sign panels are to be fabricated from .75" High Density Overlay Plywood. Panel preparation to follow HDO specifications provided in Appendix B.

Sign graphics to be prepared on a white nonreflective vinyl film with positionable adhesive backing.

All graphics except for the Communication Red background with Corps Signature on the project sign are to be die-cut or computer-cut nonreflective vinyl, prespaced legends prepared in the sizes and typefaces specified and applied to the background panel following the graphic formats shown on pages 16-2 and 16-3.

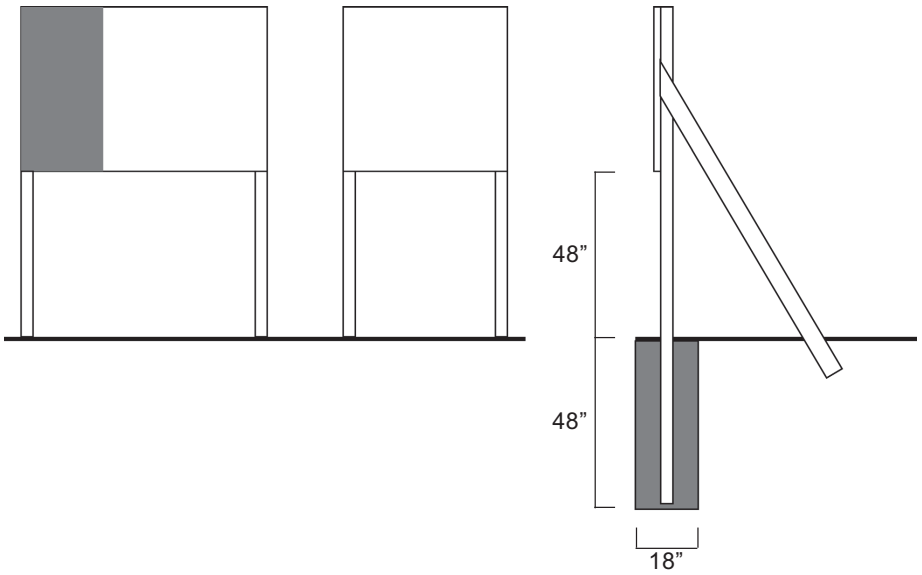
The 2'x 4' Communication Red panel (to match Pantone system 032) with full Corps Signature (reverse version) is to be screen-printed on the white background. Identification of the district or division may be applied under the signature with white cut vinyl letters prepared to Corps standards.

Drill and insert six (6) .375" T-nuts from the front face of the HDO sign panel. Position holes as shown. Flange of T-nut to be flush with sign face.

Apply graphic panel to prepared HDO plywood panel following manufacturers' instructions.

Sign uprights to be structural grade 4" x 4" treated Douglas Fir or Southern Yellow Pine, No.1 or better. Post to be 12' long. Drill six (6) .375" mounting holes in uprights to align with T-nuts in sign panel. Countersink (.5") back of hole to accept socket head cap screw (4" x .375").

Assemble sign panel and uprights. Imbed assembled sign panel and uprights in 4' hole. Local soil conditions and/or wind loading may require bolting additional 2" x 4" struts on inside face of uprights to reinforce installation as shown.



Construction Project Identification Sign
Legend Group 1: Corps Relationship

1. _____
2. _____

Legend Group 2: Division/District Name

1. _____
2. _____

Legend Group 2a: Military/Civil Works Sponsor

1. _____
2. _____

Legend Group 3: Project Title

1. _____
2. _____
3. _____

Legend Group 4: Facility Name

1. _____
2. _____

Legend Group 5: Contractor/A&E

1. _____
2. _____
3. _____
4. _____
5. _____

Legend Group 5b: Contractor/A&E

1. _____
2. _____
3. _____
4. _____
5. _____

Safety Performance Sign
Legend Group 2: Project Title

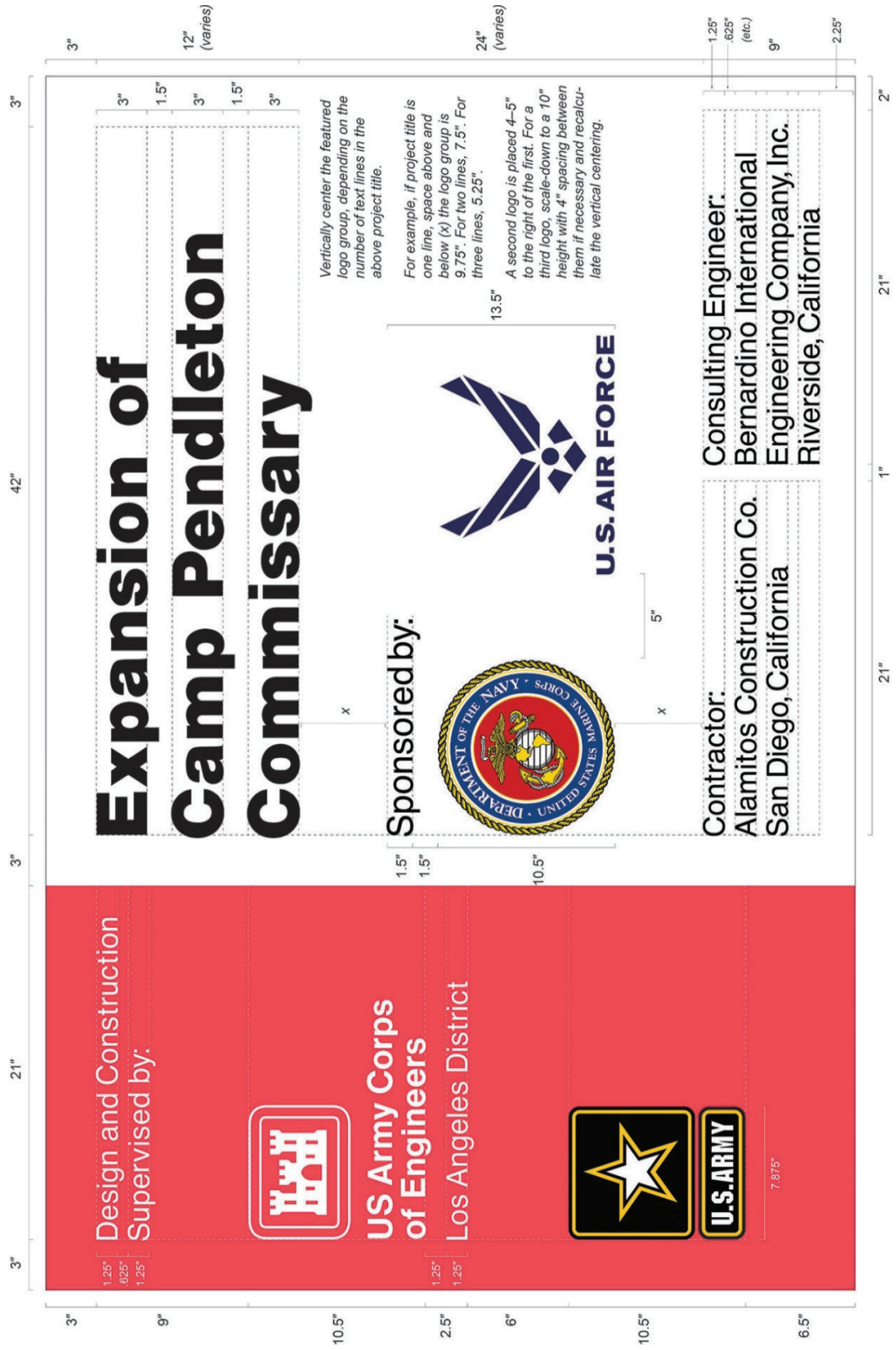
1. _____
2. _____

Legend Group 3: Contractor/A&E

1. _____
2. _____

ECB No. 2020-1
SUBJECT: USACE Construction Project Signs and Use of the Army Star

ATTACHMENT A: Example Graphic of Signage with Dimensions for MILCON Project



ECB No. 2020-1
SUBJECT: USACE Construction Project Signs and Use of the Army Star

ATTACHMENT B: Example Graphic of Signage with Dimensions for Civil Works Project



SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.1 SUMMARY

This section covers the furnishing of all labor, material and equipment and performing all work required for the protection of the environment during dredging and beachfill operations, except for those measures set forth in other sections of these specifications.

1.2 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. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Health Requirements Manual

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

29 CFR 1910.1200	Hazard Communication
40 CFR 50	National Primary and Secondary Ambient Air Quality Standards
40 CFR 64	Compliance Assurance Monitoring
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 112	Oil Pollution Prevention
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 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 300.125	National Oil and Hazardous Substances Pollution Contingency Plan - Notification and Communications
40 CFR 302	Designation, Reportable Quantities, and Notification

40 CFR 355	Emergency Planning and Notification
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 Packagings

1.3 DEFINITIONS

1.3.1 Contractor Generated Hazardous Waste

Contractor generated hazardous waste is materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e., methyl ethyl ketone, toluene), waste thinners, excess paints, excess solvents, waste solvents, excess pesticides, and contaminated pesticide equipment rinse water.

1.3.2 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally or historically.

1.3.3 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. For the purpose of this specification, environmental protection is further defined as the retention of the environment in its natural state, to the greatest extent possible, during all construction operations and to enhance the natural appearance in its final condition. Environmental protection requires consideration of air, water, and land resources and involves noise, solid waste-management and management of other pollutants. In order to prevent, and to provide for abatement and control of any environmental pollution arising from beachfill activities in performance of this contract, the Contractor and his subcontractors shall comply with all applicable Federal, state, and local laws and regulations and shall obtain all necessary permits required by same.

1.3.4 Hazardous Materials

Hazardous material is any material that: Is defined in 49 CFR 171, listed in 49 CFR 172, regulated as a hazardous material in accordance with 49 CFR 173; or requires a Safety Data Sheet (SDS) in accordance with 29 CFR 1910.1200; or during end use, treatment, handling, packaging, storage, transportation, 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 sections or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this section for "control" purposes. Such material includes 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).

1.3.5 Hazardous Waste

Hazardous Waste is any material that meets the definition of a solid waste and exhibits a hazardous characteristic (ignitability, corrosivity, reactivity, or toxicity) as specified in 40 CFR 261, Subpart C, or contains a listed hazardous waste as identified in 40 CFR 261, Subpart D, or meets a state, local, or host nation definition of a hazardous waste.

1.3.6 Oily Waste

Oily waste are those materials that are, or were, mixed with Petroleum, Oils, and Lubricants (POLs) and have become separated from that POLs. 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, POLs 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: It is not prohibited in other state regulations or local ordinances; the amount generated is "de minimus" (a small amount); it is the result of minor leaks or spills resulting from normal process operations; and free-flowing oil has been removed to the practicable 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, perform a hazardous waste determination 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.

1.3.7 Regulated Waste

Regulated waste are solid wastes that have specific additional federal, state, or local controls for handling, storage, or disposal.

1.3.8 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.3.9 Solid Waste

Solid waste is a solid, liquid, semi-solid or contained gaseous waste. A solid waste can be a hazardous waste, non-hazardous waste, or non-Resource Conservation and Recovery Act (RCRA) regulated waste. Types of solid waste typically generated at construction sites may include:

1.3.9.1 Debris

Debris is non-hazardous solid material generated during the construction, demolition, or renovation of a structure that exceeds 2.5-inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (for example, cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. 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.

1.3.9.2 Green Waste

Green waste is 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.

1.3.9.3 Material Not Regulated As Solid Waste

Material not regulated as solid waste is 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.

1.3.9.4 Non-Hazardous Waste

Non-hazardous waste is waste that is excluded from, or does not meet, hazardous waste criteria in accordance with 40 CFR 261.

1.3.9.5 Surplus Soil

Surplus soil is 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 and must be managed in accordance with paragraph HAZARDOUS MATERIAL MANAGEMENT.

1.3.10 Surface Discharge

Surface discharge means discharge of water into drainage ditches, storm sewers, or creeks meeting the definition of "waters of the United States". Surface discharges from construction sites are discrete, identifiable sources and require a permit from the governing agency. Comply with federal, state, and local laws and regulations.

1.3.11 Wastewater

Wastewater is the used water and solids that flow through a sanitary sewer to a treatment plant.

1.3.11.1 Stormwater

Stormwater is any precipitation in an urban or suburban area that does not evaporate or soak into the ground, but instead collects and flows into storm drains, rivers, and streams.

1.3.12 Waters of the United States

Waters of the United States means Federally jurisdictional waters, including wetlands, that are subject to regulation under Section 404 of the Clean Water Act or navigable waters, as defined under the Rivers and Harbors Act.

1.3.13 Wetlands

Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Qualifications; G,DO
Location of Storage Facilities; G,COR
Monitor Qualifications; G,DO
Preconstruction Visual Survey
Employee Training Records; G,DO
Environmental Protection Plan; G,COR
Piping Plover Protection Plan; G,DO
Dirt and Dust Control Plan; G,COR
Spill Prevention Control And Countermeasure (SPCC) Plan; G,DO

SD-06 Test Reports

Endangered Species Observer Form; G,COR
Endangered Species Incident Report Form; G,COR
Red Knot Monitoring Form; G,COR
Final Report; G,COR

SD-07 Certificates

Reports

SD-11 Closeout Submittals

Records
Assembled Employee Training Records; G,DO

1.5 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 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. Protect the

environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this Contract. 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.

Tests and procedures assessing whether construction operations comply with Applicable Environmental Laws may be required. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.6 QUALITY ASSURANCE

1.6.1 Preconstruction Survey and Protection of Features

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, perform a Preconstruction VisualSurvey 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. Include in the report a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. The Contractor and the Contracting Officer will sign this survey report upon mutual agreement regarding its accuracy and completeness. Protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference that their preservation may cause to the work under the Contract.

1.6.2 Location of Storage Facilities

Submit plans showing storage and other construction facilities for approval.

1.6.3 Environmental Brief

Prior to initiating any work on site, meet with the Contracting Officer and installation Environmental Office to discuss the proposed Environmental Protection Plan (EPP) or equipment local requirement. Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural and cultural resources, required reports, required permits, permit requirements (such as mitigation measures), and other measures to be taken.

1.6.4 Employee Training Records

a. Prepare and submit Employee Training Records throughout the term of the contract meeting applicable 40 CFR requirements and maintain throughout the term of the contract. Provide Employee Training Records in the Environmental Records Binder. Submit these Assembled Employee Training Records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

b. Train personnel to meet EPA and state requirements. Conduct environmental protection/pollution control meetings for personnel prior to commencing construction activities. Conduct additional meetings for new personnel and when site conditions change. Include in the training and

meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, waters of the United States, and endangered species and their habitat that are known to be in the area.

1.6.5 Non-Compliance Notifications

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with federal, state or local environmental laws or regulations, permits, and other elements of the Contractor's EPP. After receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. FAR 52.242-14 Suspension of Work provides that a suspension, delay, or interruption of work due to the fault or negligence of the Contractor allows for no adjustments to the contract for time extensions or equitable adjustments. In addition to a suspension of work, the Contracting Officer may use additional authorities under the contract or law.

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing work, submit an Environmental Protection Plan (EPP) for review and approval by the Contracting Officer. The purpose of the EPP is to present an overview of known or potential environmental issues which the Contractor must consider and address during the performance of work. Incorporate construction related objectives and targets from the installation's EMS into the EPP. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Meet with the Contracting Officer or Contracting Officer Representative to discuss the EPP and develop a mutual understanding relative to the details for environmental protection including measures for protecting natural resources, required reports, and other measures to be taken. Issues of concern must be defined within the Environmental Protection Plan as outlined in this section. Address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but are considered necessary, must be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, meet with the Contracting Officer for the purpose of discussing the implementation of the Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. Submit the EPP within 15 days after notice to proceed and not less than 10 days before the preconstruction meeting. Revise the EPP throughout the project to include any reporting requirements, changes in site conditions, or contract modifications that change the project scope of work in a way that could have an environmental impact. No requirement in this section will relieve the Contractor of any applicable federal, state, and local environmental protection laws and regulations. During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

The EPP includes, but is not limited to, the following elements:

1.7.1 Contents

Include in the environmental protection plan, but not limit it to the following:

a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. Drawings showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

f. Traffic control plans including coordination of Contractor vehicle and equipment access with public accessways, measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Include in the plan measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

g. Work area plan showing the proposed activity in each portion of the project area and identifying the areas of limited use or nonuse. Include in the plan measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

h. Drawing showing the location of the borrow area(s).

i. Include in the Spill Control Plan the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1. Include in this plan, as a minimum:

(1) The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. Include in the plan a list of the required reporting channels and telephone numbers.

(2) The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

(3) Training requirements for Contractor's personnel and methods of

accomplishing the training.

(4) A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

(5) The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

(6) The methods and procedures to be used for expeditious contaminant cleanup.

j. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris and schedules for disposal.

k. A historical, archaeological, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources, and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. Include in the plan methods to assure the protection of known or discovered resources, identifying lines of communication between Contractor personnel and the Contracting Officer.

l. Submit truck and material haul routes along with a Dirt and Dust Control Plan for controlling dirt, debris, and dust on Installation 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.

1.7.2 Appendix

Attach to the Environmental Protection Plan, as an appendix, copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents.

1.8 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Deviations from the drawings, plans and specifications, requested by the Contractor and which may have an environmental impact, shall be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's responsibility.

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 that is consistent with the requirements of the Installation Environmental Office or as otherwise specified. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Erosion and Sediment Controls

Providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations is the Contractor's responsibility. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of construction activities.

3.1.2 Flow Ways

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 specified and permitted.

3.1.3 Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy vegetation 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 is responsible for any resultant damage.

3.1.4 Vegetation on Dunes

Except in those locations where contract work requires the covering of existing vegetation, the Contractor shall take extra precautions to protect vegetation on existing dunes from damage.

3.1.5 Landscape

Except in areas indicated on the plans or specified to be cleared, the Contractor shall not deface, injure, or destroy existing vegetation without the authority of the Contracting Officer. Ropes, cables, or guys shall not be fastened to or attached to any existing nearby trees for anchorages unless specifically authorized. Where such special emergency use is permitted, it shall be performed in such a manner as to avoid damage to the trees. The Contractor shall in any event be responsible for any damage resulting from such use. Where the possibility exists that trees may be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment or operations, the Contractor shall adequately protect such trees. Stone, earth or other material that is displaced into uncleared areas shall be removed. Monuments and markers shall be protected before

construction operations commence.

3.1.6 Restoration of Landscape Damage

Dune grassed areas or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored to a condition that appears natural; that will not detract from the appearance of the area; and that is satisfactory to the Contracting Officer. Disturbed dune grassed areas shall be replanted as directed by the Contracting Officer. The area shall be restored to near natural conditions which will permit the growth of vegetation thereon.

3.1.7 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved.

3.2 ENVIRONMENTAL PERMITS AND COMMITMENTS

Obtaining and complying with all environmental permits and commitments required by Federal, State, Regional, and local environmental laws and regulations is the Contractor's responsibility.

3.3 PROTECTION OF HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

3.3.1 Archaeological Resources

Existing archaeological resources within the work area are shown on the drawings. Protect these resources and be responsible for avoiding impacts within these areas to ensure their protection throughout the life of the Contract. If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, activities that may damage or alter such resources will be suspended. Resources covered by this paragraph include, but are not limited to: submerged or buried maritime vessels; submerged or buried aircraft; any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, submerged or buried structures such as foundations, paving, walls or other constructed features; pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources. The Government retains ownership and control over archaeological resources.

3.3.2 General

Both the Corps and the Contractor's quality control personnel shall regularly examine newly deposited beachfill material for items of potential historical or archaeological interest. Upon discovering any item of interest, the Contractor shall immediately notify the COR. Upon discovering an item of interest, or upon receiving notification from the Contractor that an item of interest has been discovered, the COR shall

immediately notify Nikki Minnichbach of the Philadelphia District Environmental Resources Branch at (215) 656-6556 or cell (215) 834-1065. If possible, digital images of the discovered items shall be taken and forwarded to the Environmental Resources Branch to expedite their archaeological evaluation.

3.3.3 Recording and Preserving Historical and Archaeological Finds

If, during dredging or beachfill activities, any previously unidentified or unanticipated historical, archaeological or cultural resources are discovered or found, all activities that might damage or alter such resources shall be temporarily suspended. The area where the find was discovered shall be cordoned off by the Contractor to preserve the find; the Contractor will be directed to immediately move within the borrow area to avoid any further disturbance of the source of the find. If the Contractor cannot move within the designated borrow area, all pumping shall cease until directed otherwise by the Contracting Officer. Any material stockpiled on the dredge, originating from the possible source of the find, shall not be placed on the beach without prior approval by the CO.

3.3.4 Archaeological Monitoring

The Contractor's CQC System Manager and any approved alternate CQC System Managers must attend a Corp of Engineers facilitated 1 day training class, or to view the training course (consisting of 3 YouTube videos) on archaeological monitoring. A person trained in archaeological monitoring shall be on the site at all times during construction and shall be employed by the prime contractor. Certificates valid for two years will be issued to those completing the archaeological monitoring class. If viewing the training course videos on archaeological monitoring, please email Nikki Minnichbach (nicole.c.minnichbach@usace.army.mil) for links to the YouTube videos and also notify Ms. Minnichbach upon completion of the course. Ms. Minnichbach will keep this information on file for two years.

3.4 BIOLOGICAL RESOURCES

a. Perform all work and take such steps as required to minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. Do not alter water flows or otherwise disturb native habitat adjacent to any disposal area which, in the opinion of the Contracting Officer, are critical to fish and wildlife. The protection of threatened and endangered animal and plant species, including their habitat, is the Contractor's responsibility in accordance with Federal, State, Regional, and local laws and regulations.

b. Record observation data of threatened and endangered animal and plant species on the attached Endangered Species Observer form and submit with the Quality Control report to the COR on a daily basis.

3.4.1 Seabeach Amaranth

Take all necessary actions to ensure protection of the seabeach amaranth plant, which is a Federally threatened species. The seabeach amaranth growing season runs from May through November. Ensure that all employees are aware of the potential presence of a threatened species and provide sufficient information describing the seabeach amaranth. Immediately notify the COR if any seabeach amaranth plants are located within the project area. State/Federal personnel will conduct amaranth surveys and delineate any plant locations within the project area prior to construction

activities. If plants are found in the footprint of the proposed activity, the Contractor shall establish a minimum 10-foot buffer around each plant, delineated with string-and-post fencing. Sand fencing must not be used for this purpose. There shall be no entry into the fenced area(s), and no staging or stockpiling of sand adjacent to the fencing. Construction activities shall avoid delineated locations of seabeach amaranth until the plant dies back or can be relocated by the appropriate agency. Construction activities are defined as, but not limited to; surveys; the movement of equipment and vehicles; and the placement/storage of materials. Take additional action, as directed by the Contracting Officer, to ensure adequate protection of the seabeach amaranth. A picture of seabeach amaranth has been attached at the end of this section for detail.

3.4.2 Piping Plover Protection

a. Take all necessary actions to ensure protection of the piping plover bird, which is a Federally threatened species, and beach nesting birds consisting of one or more of the following state rare species: least tern, American oystercatcher, common tern, royal tern, and black skimmer. The nesting season begins approximately on 01 March and ends approximately on 30 August. Ensure that all employees are aware of the potential presence of these species, and provide sufficient information describing them. Submit a plan for the protection and safeguarding of threatened species as specified herein. Immediately notify the COR if any piping plovers and/or beach nesting birds are sighted in the vicinity of the project area. Piping plovers have historically nested in North Wildwood. No construction activities are allowed between 15 March and 15 August in North Wildwood during the nesting season. If construction activities occur in other areas of the project area during the nesting season, provide a piping plover monitor and ensure that the monitor is on site to observe construction activities. During the nesting season, establish a buffer zone of up to 1,000 meters between all construction activities and piping plover nests. If necessary, the buffer zone may be expanded if the 1,000-meter buffer zone is found to be inadequate. For species other than piping plovers (i.e. least terns, American oystercatcher, black skimmer, etc.), establish, at a minimum, a 100 meter buffer zone during the nesting season. This buffer area may increase once chicks have hatched and become mobile. The New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program (ENSP) and the plover monitor will evaluate nesting situations to determine if the 100 meter buffer is sufficient or needs to be increased.

b. Construction activities are defined as, but not limited to, the movement of equipment and vehicles, dredging operations, surveys, and the placement/storage of materials. Delineate the buffer zones by erecting orange plastic fencing. Contractor personnel, vehicles and equipment shall remain outside the buffer zones. Absolutely no access is permitted within these zones. Take additional action, as directed by the COR, to ensure adequate protection of the nests and chicks. Piping plovers and other beach nesting birds have the potential to nest anywhere within the contract limits. Be prepared to take all necessary action to ensure protection of these species, regardless of the nesting location within the contract limits or overlapping buffer zone if outside of contract limits, in accordance with the specifications herein. If piping plover nesting occurs, a 1,000 meter buffer zone shall be required. Prior to the nesting season(s), ENSP will delineate the portions of the project area that contain highly suitable nesting habitat. These are the areas, as well as existing nesting areas, that require monitoring during the nesting season. Monitoring of these areas shall begin a minimum of 2 weeks prior to

construction activities within the suitable nesting habitat.

3.4.2.1 Monitoring Requirements

The primary role of the piping plover monitor shall be to ensure that no previously undetected piping plover nest or broods are located within the construction area and to monitor movements of unfledged chicks from adjacent known nesting areas that may disperse into the construction area. The plover monitor shall also detect any territorial or breeding behavior exhibited by any plovers discovered outside of historic nesting areas. A secondary role of the piping plover monitor shall be to ensure that appropriate protective buffer areas are established and maintained surrounding historical nesting (which includes courting and territorial) and chick foraging areas. The plover monitor shall coordinate with New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program (ENSP) to become familiar with the locations of highly suitable nesting habitat, known or suspected territorial pairs, nest sites, and chick foraging areas. The plover monitor shall notify the ENSP immediately if any territorial or breeding activity is observed or any new nests found and the ENSP shall assist in fencing off nesting or foraging areas and erecting predator exclosures. There shall be no entrance of these fenced areas by the piping plover monitor or any other contractor personnel unless authorized by the ENSP or the U.S. Fish and Wildlife Service (USFWS). Piping Plover monitoring shall begin on 01 March and continue until all chicks from adjacent nesting sites have fledged or construction related activities have terminated. With written concurrence from USFWS and the ENSP, work greater than 1,000 meters from a known nesting area may proceed in non-nesting portions of the project area after 1 July, provided no piping plover activity has been observed within the remaining construction area after 8 alternate days of monitoring over the previous 2-week period. If these conditions are met, no further monitoring will be required.

3.4.2.2 Qualifications

Provide qualified piping plover monitors and support staff that have been approved by the U.S. Fish and Wildlife Service for construction monitoring. All monitors used shall be qualified avian biologists with a minimum of 2 years experience in the type of work being performed on this project or person(s) with a minimum of 5 years related experience that have the necessary education and/or experience in accordance with the requirements listed herein. Submit qualifications of the proposed USFWS approved plover monitors with the EPP for approval, prior to commencement of construction activities. The piping plover monitor may be the same person(s) conducting the red knot monitoring.

3.4.2.3 Monitoring Schedule

a. The monitor must be present on the beach, in the area of active construction, a minimum of every other day, to include weekends, weather permitting, for a minimum of 2 hours per day in order to determine the arrival and use of the area by piping plovers. Vary monitoring times in order to cover the full tidal cycle. If plovers are (or become) present in the area, behavioral observations with regard to establishing territories and initiating nesting shall be observed and documented. In the event that plovers establish active nests in the construction areas, further coordination between the Corps, USFWS, and ENSP shall be required to document nests and establish buffer areas. Monitoring frequency must be increased from every other day initially to several times daily in the

event that breeding and/or nesting activity is observed within the monitored activity area in order to determine if impacts from construction activities are occurring.

b. Monitoring activities shall take place in and around the immediate construction disturbance area (vehicle staging, sand placement, sand stockpiling, grading, nearshore dredging operations, etc.), the area to where the construction will be progressing, and the buffer areas around the historical nesting area.

3.4.2.4 Establishing Buffer Areas

If a piping plover is observed during the nesting season, in a previously unoccupied area within the contract limits, the plover monitor must immediately notify the project biologist, ENSP and USFWS through the COR, to determine necessary protective actions, and establish a temporary buffer. These contact numbers will be provided after contract award. Prior to 15 May, establish a temporary buffer of 300 meters around areas newly occupied by foraging adult plovers and plovers displaying territorial behavior. From 15 May to 15 August, the temporary buffer shall be 1,000 meters. If nesting behavior (i.e. active scrapes, courtship or copulation) is confirmed, or if nests or chicks are found, establish a buffer sufficient in size to prevent disturbance to nesting birds and/or to protect unfledged broods, based on site-specific conditions, and shall remain in effect until the conclusion of breeding activity. If birds are not displaying any signs of nesting behavior (i.e., are likely to be non-nesting birds or spring migrants) or are no longer sighted after observations are conducted over one week, remove the temporary buffers. Once piping plover nests have hatched and chicks are mobile (possibly as early as approximately 15 May), no construction shall take place within 1,000 meters of chick foraging areas until after the chicks have fledged. Use the same procedures to establish the 100 meter buffer area required for other beach nesting birds (least tern, black skimmer, American oystercatcher, and other tern species). All construction related activities (e.g., vehicle use, surveying, framing, equipment set-up, etc.) shall adhere to the appropriate buffer area restrictions. Buffer areas shall extend from the water's edge landward to the furthest seaward extent of the natural or manmade feature which would prohibit piping plover chicks from traversing the area (e.g., dunes, boardwalk or bulkhead).

3.4.2.5 Surveying Operations

When conducting beach profile surveys, be cognizant of nesting areas, and do not enter any fenced-off areas for any reason unless authorized by the ENSP or the USFWS. If a sled is being used during the survey efforts, it shall remain below the water line at all times. Notify the Contracting Officer if a sled will be used during the surveying operations, prior to the start of survey operations.

3.4.2.6 Reports

Prepare daily field monitoring reports, with detailed observations of breeding behavior, nesting piping plovers and other beach nesting birds previously discussed, survey results, weather and other environmental conditions, any disturbances of nesting birds, and construction activities. Submit daily field monitoring reports weekly to the COR throughout the monitoring period.

3.4.2.7 Records

The plover monitor shall maintain complete contemporaneous field notes and complete daily field reports with detailed observations of nesting piping plovers and other beach nesting birds, survey results, weather and other environmental conditions, any disturbances of any birds exhibiting breeding or nesting behavior, and construction activities. The monitor shall provide these notes to USFWS and the ENSP through the COR upon request. The monitor shall provide weekly summary updates of construction activity and nesting in a timely manner by e-mail to the COR, USFWS, ENSP and appropriate municipal officials as directed by the Contracting Officer. If breeding and/or nesting behavior is observed, daily reports must be provided to the COR, the USACE project biologist, USFWS and ENSP within 24 hours of the observed behavior. Continue daily reporting until the nest and buffer areas have been established or the breeding behavior has been discontinued and verified by ENSP. Within 10 calendar days of the completion of the nesting season and/or construction activities, submit complete copies of all field notes to the Corps, USFWS and ENSP.

3.4.3 Red Knot Monitoring Requirements

Monitor and document any disturbance to red knot foraging, resting, or roosting activities within the project area. A qualified avian biologist familiar with red knots shall perform red knot monitoring according to the schedule as specified below, for all work activities which occur between July 15 and November 30. The red knot monitor may be the same person(s) conducting the piping plover monitoring. Submit monitor qualifications of proposed USFWS approved Red Knot monitors with the EPP for approval prior to commencing any dredging work.

3.4.3.1 Project Monitoring

Project monitoring shall consist of two, 2-hour periods at a low-tide stage and a high-tide stage of each day. The low-tide stage shall begin at a projected low-tide time and proceed for 2 hours of the rising tide. The high-tide stage shall begin at a projected high-tide time and proceed for 2 hours of the falling tide. All observations shall be recorded on the Red Knot Monitoring Form, attached at the end of this section, and submitted to the COR. Submit daily project monitoring reports weekly to the COR throughout the monitoring period.

3.4.3.2 Baseline Monitoring

The baseline project monitoring shall take place prior to any construction activities, including surveys, staging, etc. The project area shall be monitored for 3 consecutive days prior to commencement of construction activities.

3.4.3.3 Initial Project Monitoring

a. Project monitoring will begin on the day that construction begins and shall continue for 3 consecutive days. If, after the baseline and initial project monitoring, no red knots have been observed, then monitoring shall be reduced to 1 observation period per week for the duration of the project. If, at any point in time during the subsequent monitoring, red knots are observed to be present in the area of active construction or within 500 feet from active construction, then the monitor shall perform the daily monitoring for an additional 3 consecutive days. If red knots are observed during the initial project monitoring, monitoring must occur a

minimum of 4 days a week. If no red knots are observed after September 30, monitoring may be reduced to 1 day per week for the remaining duration of the project.

b. If, at any point in time the birds appear distressed or harmed by the construction activities, as determined by the monitor, work shall be halted immediately and the monitor shall contact Fish and Wildlife Service for guidance.

3.4.3.4 Reporting

a. Record observations on the attached Red Knot Monitoring form and submit with the Quality Control report to the COR on a daily basis.

b. Prepare and submit a final report within 30 days of completion of all construction activities. The report shall consist of copies of all Red Knot Monitoring Forms, an overall summary of the observations, and if possible, a conclusion as to whether the project activities reached the threshold of "harm". A copy of the final report shall be provided to the COR and forwarded to the USACE Philadelphia District Environmental Resources Branch for distribution to the resource agencies.

3.4.4 Whale Monitoring

3.4.4.1 Monitoring

Monitor for the presence of whales during all dredging activities in this contract. The presence of any whales shall be recorded on the Daily Report of Operations form. Immediately notify the Contracting Officer following the sighting of a whale.

3.4.4.2 Avoidance

Dredges and vessels shall not intentionally approach whales closer than 100 yards when in transit. If listed species are present within a distance equal to 500 yards, reduce speed to 4 knots or less unless precluded by safety considerations. Unless positively identified as another whale species, any large whale shall be considered a suspected right whale, especially if one has been recently sighted by the vessel, or if the vessel is in an area where right whales could be present.

3.4.5 Sea Turtle and Atlantic Sturgeon Requirements

3.4.5.1 Protection and Inspection

a. Take all necessary actions to ensure protection of sea turtles and Atlantic sturgeon. Ensure that all employees are aware of the potential presence of protected species. The Government will provide the Contractor with pamphlets and ID cards to aid in the identification of sea turtles or Atlantic sturgeon that may be encountered during contract activities.

b. Dredges and vessels shall not intentionally approach sea turtles closer than 100 yards when in transit. If listed species are present within a distance equal to 500 yards, reduce speed to 4 knots or less unless precluded by safety considerations. Do not operate Dragarms of hopper dredges while in the water column, to minimize potential impacts to sea turtles and Atlantic sturgeon. Operation should begin when the dragarm reaches the sediment and end before the dragarm is removed from the sediment. Inspect the dragarm for impinged sea turtles or Atlantic

sturgeons by someone familiar with identifying these species each time the dragarm is brought to the surface. Notify the COR immediately if a sea turtle or Atlantic sturgeon is observed during dredging or found to be impinged on the dragarm. Remove the impinged animal and place it in cold storage until further direction is received from the Government and NMFS.

c. In order to prevent sea turtles or Atlantic sturgeon from becoming entrained in the dredge, install screens with openings not to exceed 4-inches by 4-inches on dredge water intake ports that do not have MEC screens.

3.4.6 Endangered Species Incident Report Form

Record observation data on the attached Endangered Species Incident Report form and submit with the Quality Control report to the COR on a daily basis.

3.5 AIR RESOURCES

Equipment operation, activities, or processes must be in accordance with 40 CFR 64 and state air emission and performance laws and standards.

3.5.1 Burning

Burning is prohibited under this contract..

3.5.2 Dust Control

Keep dust down at all times, including during nonworking periods.

3.5.2.1 Particulates

Dust particles, aerosols and gaseous by-products from construction activities must be controlled at all times, including weekends, holidays, and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates that would exceed 40 CFR 50, state, and local air pollution standards or that would cause a hazard or a nuisance. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with state and local visibility regulations.

3.6 WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the EPP. Obtain a copy of the installation's Pollution Prevention/Hazardous Waste Minimization Plan for reference material when preparing this part of the EPP. If no written plan exists, obtain information by contacting the Contracting Officer. Describe the anticipated types of the hazardous materials to be used in the construction when requesting information.

3.7 WASTE MANAGEMENT AND DISPOSAL

3.7.1 Solid Wastes

Place solid wastes (excluding clearing debris) in containers which are emptied on a regular schedule. Handling, storage, and disposal must be

conducted to prevent contamination. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with solid waste. Comply with Federal, State, and local laws and regulations pertaining to the use of landfill areas.

3.7.2 Disposal of Debris

Do not dispose of debris resulting from the contract work and any wastes, effluents, trash, garbage, oil, grease, chemicals, etc., in or adjacent to the work area. If waste material is dumped in unauthorized areas, the Contractor shall remove the material and restore the area to its original condition. If necessary, contaminated ground shall be excavated, disposed of as directed by the Contracting Officer, replaced with suitable fill material, compacted and finished with topsoil, and planted as required to reestablish vegetation.

3.7.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. At a minimum, manage and store hazardous waste in compliance with 40 CFR 262. Take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. Segregate hazardous waste from other materials and wastes, protect it from the weather by placing it in a safe covered location, and take precautionary measures such as berming or other appropriate measures against accidental spillage. Storage, describing, packaging, labeling, marking, placarding, and transporting of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations is the Contractor's responsibility. Transport Contractor generated hazardous waste within 60 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. Dispose of hazardous waste in compliance with Federal, State and local laws and regulations. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility.

3.7.4 Releases/Spills of Oil and Hazardous Substances

3.7.4.1 Response and Notifications

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 in accordance with 40 CFR 300. 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 Installation Fire Department, the Installation Command Duty Officer, the Installation Environmental Office, the Contracting Officer and the state or local authority.

Submit verbal and written notifications as required by the federal (40 CFR 300.125 and 40 CFR 355), state, local regulations and instructions. Provide copies of the written notification and documentation that a verbal notification was made within 20 days. Spill response must be in accordance with 40 CFR 300 and applicable state and local regulations. Contain and clean up these spills without cost to the Government.

3.7.4.2 Disposal of Debris

Do not dispose of any debris resulting from the contract work and any wastes, effluents, trash, garbage, oil, grease, chemicals, etc., in or adjacent to the work area. If any waste material is dumped in unauthorized areas, the Contractor shall remove the material and restore the area to its original condition, at no additional cost to the Government. If necessary, contaminated ground shall be excavated, disposed of as directed by the Contracting Officer, replaced with suitable fill material, compacted and finished with topsoil, and planted as required to reestablish vegetation.

3.7.4.3 Clean Up

Clean up hazardous and non-hazardous waste spills. Reimburse the Government for costs incurred including sample analysis materials, clothing, equipment, and labor if the Government will initiate its own spill cleanup procedures, for Contractor- responsible spills, when: Spill cleanup procedures have not begun within one hour of spill discovery/occurrence; or, in the Government's judgment, spill cleanup is inadequate and the spill remains a threat to human health or the environment.

3.8 HAZARDOUS MATERIAL MANAGEMENT

Include hazardous material control procedures in the Safety Plan, in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Do not bring hazardous material onto the worksite that does not directly relate to requirements for the performance of this contract. Submit an SDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on the worksite. Typical materials requiring SDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. Use hazardous materials in a manner that minimizes the amount of hazardous waste generated. Containers of hazardous materials must have National Fire Protection Association labels or their equivalent. Certify that hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste, in accordance with 40 CFR 261 and state requirements.

3.9 PREVIOUSLY USED EQUIPMENT

Clean previously used construction equipment prior to bringing it onto the project site. Equipment must be free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the U.S. Department of Agriculture jurisdictional office for additional cleaning requirements.

3.10 MILITARY MUNITIONS

In the event military munitions, as defined in 40 CFR 260, are discovered or uncovered, immediately stop work in that area and immediately inform the Contracting Officer.

3.11 PETROLEUM, OIL, LUBRICANT (POL) STORAGE AND FUELING

POL products include flammable or combustible liquids, such as gasoline, diesel, lubricating oil, used engine oil, hydraulic oil, mineral oil, and

cooking oil. Store POL products and fuel equipment and motor vehicles in a manner that affords the maximum protection against spills into the environment. Manage and store POL products in accordance with EPA 40 CFR 112, and other federal, state, regional, and local laws and regulations. Use secondary containments, dikes, curbs, and other barriers, to prevent POL products from spilling and entering the ground, storm or sewer drains, stormwater ditches or canals, or navigable waters of the United States. Describe in the EPP (see paragraph ENVIRONMENTAL PROTECTION PLAN) how POL tanks and containers must be stored, managed, and inspected and what protections must be provided. Storage of fuel on the project site must be in accordance with EPA, state, and local laws and regulations and paragraph OIL STORAGE INCLUDING FUEL TANKS.

3.11.1 Used Oil Management

Manage used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while onsite exhibits a characteristic of hazardous waste. Used oil containing 1,000 parts per million of solvents is considered a hazardous waste and disposed of at the Contractor's expense. Used oil mixed with a hazardous waste is also considered a hazardous waste. Dispose in accordance with paragraph HAZARDOUS WASTE DISPOSAL.

3.11.2 Oil Storage Including Fuel Tanks

Provide secondary containment and overfill protection for oil storage tanks. A berm used to provide secondary containment must be of sufficient size and strength to contain the contents of the tanks plus 5 inches freeboard for precipitation. Construct the berm to be impervious to oil for 72 hours that no discharge will permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Use drip pans during oil transfer operations; adequate absorbent material must be onsite to clean up any spills and prevent releases to the environment. Cover tanks and drip pans during inclement weather. Provide procedures and equipment to prevent overfilling of tanks. If tanks and containers with an aggregate aboveground capacity greater than 1320 gallons will be used onsite (only containers with a capacity of 55 gallons or greater are counted), provide and implement a Spill Prevention Control and Countermeasure (SPCC) plan meeting the requirements of 40 CFR 112. Do not bring underground storage tanks to the installation for Contractor use during a project. Submit the SPCC plan to the Contracting Officer for approval.

Monitor and remove any rainwater that accumulates in open containment dikes or berms. Inspect the accumulated rainwater prior to draining from a containment dike to the environment, to determine there is no oil sheen present.

3.12 INADVERTENT DISCOVERY OF PETROLEUM-CONTAMINATED SOIL OR HAZARDOUS WASTES

If petroleum-contaminated soil, or suspected hazardous waste is found during construction that was not identified in the Contract documents, immediately notify the Contracting Officer. Do not disturb this material until authorized by the Contracting Officer.

3.13 SOUND INTRUSION

Keep construction activities under surveillance and control to minimize environment damage by noise. Make the maximum use of low-noise emission

products, as certified by the EPA. Comply with the provisions of the State of New Jersey and all local ordinances, whichever are more stringent.

3.14 POST CONSTRUCTION CLEANUP

Clean up areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, remove traces of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade parking area and similar temporarily used areas to conform with surrounding contours. Mill and repave damaged parking areas, lay down areas, and similar temporarily used areas to conform with preexisting conditions. Grade, fill, and seed disturbed area(s) and restore the area to near natural conditions which will allow the growth of vegetation thereon, unless otherwise indicated or directed by the Contracting Officer.

3.15 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the costs of all the bid items. Payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor, and payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations are solely the Contractor's responsibility.

-- End of Section --

APPENDIX A

SPECIFICATIONS FOR HOPPER DREDGES

A Draghead

The draghead of the dredge shall remain on the bottom **at all times** during a pumping operation, except when:

1) the dredge is not in a pumping operation, and the suction pumps are turned completely off;
2) the dredge is being re-oriented to the next dredge line during borrow activities; and
3) the vessel's safety is at risk (i.e., the dragarm is trailing too far under the ship's hull).

At initiation of dredging, the draghead shall be placed on the bottom during priming of the suction pump. If the draghead and/or dragarm become clogged during dredging activity, the pump shall be shut down, the dragarms raised, whereby the draghead and/or dragarm can be flushed out by trailing the dragarm along side the ship. If plugging conditions persist, the draghead shall be placed on deck, whereby sufficient numbers of water ports can be opened on the draghead to prevent future plugging.

Upon completion of a dredge track line, the drag tender shall:

1) throttle back on the RPMs of the suction pump engine to an idling speed (e.g., generally less than 100 RPMs) **prior to** raising the draghead off the bottom, so that no flow of material is coming through the pipe into the dredge hopper. Before the draghead is raised, the vacuum gauge on the pipe should read zero, so that no suction exists both in the dragarm and draghead, and no suction force exists that can impinge a turtle on the draghead grate;
2) hold the draghead firmly on the bottom with no flow conditions for approximately 10 to 15 seconds before raising the draghead; then, raise the draghead quickly off the bottom and up to a mid-water column level, to further reduce the potential for any adverse interaction with nearby turtles;
3) re-orient the dredge quickly to the next dredge line; and
4) re-position the draghead firmly on the bottom prior to bringing the dredge pump to normal pumping speed, and re-starting dredging activity.

B. Intervals between dredging

Sufficient time must be allotted between each dredging cycle to inspect the draghead and UXO screening for biological material. All biological material must be documented.

C. Sea Turtle or Sturgeon or their Parts

If any whole (alive or dead) or turtle parts are taken incidental to the project(s), NMFS Protected Resources Division must be contacted by phone (978-281-9328) and e-mail (incidental.take@noaa.gov) within 24 hours of the take. An incident report for sea turtle/shortnose sturgeon take shall also be completed by the observer and sent via FAX (978) 281-9394 or e-mail (incidental.take@noaa.gov) within 24 hours of the take. Incident reports shall be completed for every take regardless of the state of decomposition. NMFS will determine if the take should be attributed to the incidental take level, after the incident report is received. Every incidental take (alive or dead, decomposed or fresh) should be photographed, and photographs shall be sent to NMFS either electronically (incidental.take@noaa.gov) or through the mail. Weekly reports, including all completed load sheets, photographs, and relevant incident reports, as well as a final report, shall be submitted to NMFS NER, Protected Resources Division, 55 Great Republic Drive, Gloucester, MA 01930-2298.

Information to be Collected

For each sighting of any endangered or threatened marine species (including whales as well as sea turtles), record the following information on the Endangered Species Observation Form (Appendix E):

1) Date, time, coordinates of vessel
2) Visibility, weather, sea state
3) Vector of sighting (distance, bearing)
4) Duration of sighting
5) Species and number of animals
6) Observed behaviors (feeding, diving, breaching, etc.)
7) Description of interaction with the operation

Disposition of Parts

If any whole turtles or sturgeon (alive or dead, decomposed or fresh) or turtle or shortnose sturgeon parts are taken incidental to the project(s), NMFS Protected Resources must be contacted within 24 hours of the take (phone: 978-281-9328 or e-mail (incidental.take@noaa.gov). All whole dead sea turtles or sturgeon, or turtle or shortnose sturgeon parts, must be photographed and described in detail on the Incident Report of Sea Turtle Mortality (Appendix E). The photographs and reports should be submitted by email (incidental.take@noaa.gov) or mail (Attn: Section 7 Coodinator, NMFS, Protected Resources Division, 55 Great Republic Drive, Gloucester, MA 01930-2298). After NMFS is notified of the take, it may instruct the observer to save the animal for future analysis if there is freezer space. Disposition of dead sea turtles/ sturgeon will be determined by NMFS at the time of the take notification. If the species is unidentifiable or if there are entrails that may have come from a turtle, the subject should be photographed, placed in plastic bags, labeled with location, load number, date and time taken, and placed in cold storage.

Live turtles (both injured and uninjured) should be held onboard the dredge until transported as soon as possible to the appropriate stranding network personnel for rehabilitation. No live turtles

should be released back into the water without first being checked by a qualified veterinarian or a rehabilitation facility. The NMFS Stranding Network Coordinator ((978) 282-8470) should also be contacted immediately for any marine mammal injuries or mortalities.

APPENDIX B

Procedure for obtaining fin clips from sturgeon for genetic analysis

Obtaining Sample

1. Wash hands and use disposable gloves. Ensure that any knife, scalpel or scissors used for sampling has been thoroughly cleaned and wiped with alcohol to minimize the risk of contamination.

2. For any sturgeon, after the specimen has been measured and photographed, take a one-cm square clip from the pelvic fin.

3. Each fin clip should be placed into a vial of 95% non-denatured ethanol and the vial should be labeled with the species name, date, name of project and the fork length and total length of the fish along with a note identifying the fish to the appropriate observer report. All vials should be sealed with a lid and further secured with tape Please use permanent marker and cover any markings with tape to minimize the chance of smearing or erasure.

Storage of Sample

1. If possible, place the vial on ice for the first 24 hours. If ice is not available, please refrigerate the vial. Send as soon as possible as instructed below.

Sending of Sample

1. Vials should be placed into Ziploc or similar resealable plastic bags. Vials should be then wrapped in bubble wrap or newspaper (to prevent breakage) and sent to:

Julie Carter NOAA/NOS – Marine Forensics
219 Fort Johnson Road Charleston, SC 29412-9110
Phone: 843-762-8547

Prior to sending the sample, contact NMFS Protected Resources Division (978-281-9328) to report that a sample is being sent and to discuss proper shipping procedures.

Certification, Identification and Chain of Custody Form for Submitting Sturgeon Genetic Tissue Samples.[1],[2]

(A) CERTIFICATION OF SPECIES (Collector)

I, _____, **hereby certify that I have positively identified the**
Full Name

fish or fishes sampled in this shipment as: Δ**shortnose sturgeon;** Δ**Atlantic sturgeon;** Δ **other** Δ **unknown**
based on my knowledge and experience as a _____.
Position Job Title

Signature: _____ **Date Identified**:
Address: _____
_____
Phone Number: _____

(B) SAMPLE IDENTIFICATION

Species Identification: Δ**shortnose sturgeon;** Δ**Atlantic sturgeon;** Δ**unknown**
Unique ID No: _____; **Tissue Type:** _____; **Preservative:** _____;
Location: **(River:** _____; **River-km**: _____; **Lat/Long:** _____;
River Location Description: _____);
Total Length (TL) of Specimen (mm): _____ **Weight of Specimen (g):** ; **Sex (if known)**

Specific comments on take:

Δ **Check here if multiple samples are submitted and use *Field Collection Report* (Appendix 3b) with the data fields listed in this section.**

(C) EVIDENCE OF CHAIN OF CUSTODY

1.

Release Signature	**NMFS Permit No.**	**Method of Transfer**	**Date**
Receipt Signature	**NMFS Permit No.**		**Date**

2.

Release Signature	**NMFS Permit No.**	**Method of Transfer**	**Date**
Receipt Signature	**NMFS Permit No.**		**Date**

3.

Release Signature	**NMFS Permit No.**	**Method of Transfer**	**Date**
Receipt Signature	**NMFS Permit No.**		**Date**

[1] Instructions on next page.
[2] If multiple samples are shipped, attach summary sheet in Appendix 3b.

Instructions: Collecting, Certifying, Identifying &Shipping Tissue Samples Collected from Sturgeon.

1. Species Certification:
For each shipment a "*Certification of Species Identification*" (Section A) must be provided. This form documents the collector has identified the fish or fishes sampled in the shipment as either a shortnose or Atlantic sturgeon. If there is any doubt about the identity of a sample, then mark unknown and include comments on the take.

2. Sample Identification:
Assign a unique number identifying each individual fish captured and subsequently sampled. This number must be recorded in Section B and on the collection vial for each sample taken. Record tissue type; preservative used; date of capture; location of capture (river & description, lat/long, river km, and nearest city); length of specimen; weight; and sex, if known. Check the box provided if you are submitting multiple samples, and provide a hard- copy and/or email a copy of the sample spreadsheet with information for each of the data fields listed above.

3. Tissue Sampling Instructions:

a. Cleanliness of Samples: Cross contamination should be avoided. For each fish, use a clean cutting tool, syringe, etc. for collecting and handling samples.

b. Preserving & Packaging Samples:

i. Label vial with fish's unique ID number.
ii. Place a 1-2 cm^2 section of pelvic fin clip in vial with preservative (95% absolute ETOH (un-denatured), recommended).
iii. Seal individual vials or containers with leak proof positive measure (e.g., tape).
iv. Package vials and absorbent within a double sealed container (e.g., zip lock baggie).
v. Label air package properly identifying ETOH warning label (**See Appendix 3c**).

c. Shipping Instructions:
When shipping samples, place separately Appendix 3a, 3b and 3c (Sample ID and Chain of Custody Forms and Shipping Training Form) in container and seal the shipping box to maintain the chain of custody. (Note: A copy of the ESA permit authorizing the collection of the sample(s) must also accompany the sample(s)).

Important Notice: You must be certified before shipping tissue samples preserved with 95% ETOH in "excepted quantities" (A Class 3 Hazardous Material Due to Flammable Nature). See Appendix 3c: "NMFS Guidelines for Air-Shipment of Excepted Quantities of Ethanol Solutions" to comply with the DOT/IATA federal regulations.

4. Chain of Custody Instructions:
The "*Chain of Custody"* (Section C) should be maintained for each shipment of tissue samples and must accompany the sample(s) at all times. To maintain the chain of custody, when sample(s) are transferred, the sample(s) and the documentation should be packaged and sealed together to ensure that no tampering has occurred. All subsequent handlers breaking the seal must also sign and document the chain of custody section.

5. Contact Information:

A. NMFS, Office of Protected Resources:

i. Primary Contact: **(Northeast)** Shortnose Sturgeon Recovery Coordinator (Jessica Pruden, jessica.pruden@noaa.gov, 978/282-8482); Atlantic Sturgeon Recovery Coordinator (Lynn Lankshear, lynn.lankshear@noaa.gov, 978/282-8473)

ii. Primary Contact: (Southeast) Shortnose Sturgeon Recovery Coordinator (Stephania Bolden stephania.bolden@noaa.gov ,727/824-5312); Atlantic Sturgeon Recovery Coordinator (Kelly Shotts, kelly.shotts@noaa.gov, 727/551-5603)

i. Secondary Contact: Malcolm Mohead (malcolm.mohead@noaa.gov) Phone: 301/713-2289

ii. Secondary Contact: Colette Cairns (colette.cairns@noaa.gov) Phone: 301/713-2289

B. NOS Archive:

i. Primary Contact: Julie Carter (julie.carter@noaa.gov) Phone: 843/762-8547

Summary Sheet for Genetic Tissue Samples Collected[1,2]

Date	Species	Unique ID No.	Genetic Tissue Type	Preservative	Location: (River)	Location (River-km)	Location (Lat/Long)	Total Length (mm)	Weight (g)	Sex	Comments

1. Please coordinate with NMFS to receive a file copy of this appendix in spreadsheet format and include file on disk with shipment.
2. If multiple samples are shipped, attach this form to supplement Appendix 3a.

The U.S. Department of Transportation (DOT: 49 CFR 173.4) and the International Air Transport Association (IATA: 2007 Dangerous Goods Regulations, Sec. 2.7) regulate shipments of ethanol (ETOH) in *excepted quantities*. As a result, specific procedures must be followed as well as certifying proper training of individuals prior to packaging and shipping specimens preserved in ETOH. These guidelines will inform proper shipping and also satisfy certifying requirements. Failure to meet such requirements could result in regulatory fines and/or imprisonment.

Therefore, prior to submitting ETOH preserved samples and appropriate documentation (*e.g.*, a FedEx Airbill) to a carrier, please read, initial and sign this document, affirming you have understood the requirements as outlined. Please include this document in the shipping package and retain a copy for your records.

1) Packages and documents submitted to a carrier must not contain any materials other than those described in this document (*i.e.* containers holding ethanol-preserved specimens and related absorbent and packaging materials). Also, laboratory or sampling equipment, *unrelated documents*, or other goods must be packaged and shipped in separate boxes. (Note: ETOH solutions are not permitted to be transported in checked baggage, carry-on baggage, or airmail.) **I understand (_____)**

2) Please read the manufacturer's Material Safety Data Sheet (MSDS) for ETOH recognizing ETOH (55 - 100%) is classed as hazardous flammable material (NFPA Rating = 3). Note also, its vapor is capable of traveling a considerable distance to an ignition source causing "flashback." Properly packaging and labeling shipments of ethanol solutions will minimize the chance of leakage, and would also communicate the potential hazard to transport workers in the event of a leak. **I understand (_____)**

a) _____ Small quantities (inner container less than 30 ml, with a maximum net quantity of 500 ml for the entire package) of ETOH can be shipped with "Excepted Quantities" labels without completion of a Dangerous Goods Declaration. (e.g., If shipping vials having a maximum volume of 10 ml each, you may put up to 50 vials in one box.) **I understand (_____)**

b) _____

i. ***Inner (primary) packaging (e.g., vial, tube, jar, etc.)*:** Do not completely fill inner packaging; allow 10% head-space for liquid expansion. Liquids must not completely fill inner packaging at a temperature of 55ºC (130ºF). Closures of inner packaging (e.g., vials with tops) must be held securely in place with tape or other positive means. **I understand (_____)**

ii. ***Intermediate (secondary) packaging (e.g. Ziplock or other plastic bag)*:** Place inner container(s) (*e.g.,* vials with ETOH) into a high-quality plastic bag. Then add an absorbent material cable of absorbing any spillage without reacting with the ethanol. Seal the first bag tightly and then tape the locking seals. Next, seal the inner bag within a second bag for added safety. **I understand (_____)**

iii. ***Outer packaging (e.g., cardboard box)*:** Ethanol solutions may not be shipped in envelopes, Tyvek® sleaves, or other non-rigid mailers. The dimensions of the outer box must be at least 100 mm (~4 inches) on two sides. Any space between the inner packing containers placed in the outer packaging should be eliminated with additional filler. **I understand (_____)**

c) _____

i. *Dangerous Goods in Excepted Quantities Label* **(Figure 1.):** The label must display a "3" as the ethanol hazard class number using a black marker. You may obtain self-adhesive labels from NMFS, or else, order online. **I understand (_____)**

i. *Name and Address:* The outer container must display the name and address of the shipper and consignee. When re- using shipping boxes, completely remove or black out all unnecessary labels or marks. **I understand (_____)**

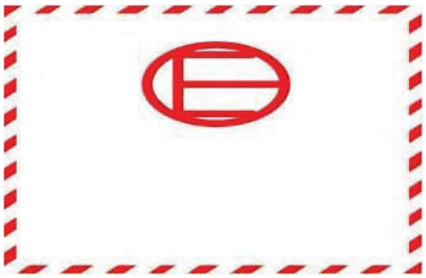


Figure 1. Dangerous Goods in Excepted Quantities label

Package

A representative example of packaging used for excepted quantities of ethanol solutions must pass a drop test and compressive load test without any breakage or leakage of any inner packaging and without any significant reduction in package effectiveness. Perform the following tests on a representative example of your packaging and keep a record of the results.

ii. ***Drop Test***: Drop a representative package from a height of 1.8 m (5.9 feet) directly onto a solid unyielding surface:

Test Results

a. One drop flat on the base; One (_____)
b. drop flat on top; (_____)
c. One drop flat on the longest side; (_____)
d. One drop flat on the shortest side; and (_____)
e. One drop on a corner. (_____)

iii. ***Compressive Load Test***: Apply a force to the top surface of a representative package for a duration of 24 hours, equivalent to the total weight of identical packages if stacked to a height of 3 meters. (_____)

d)

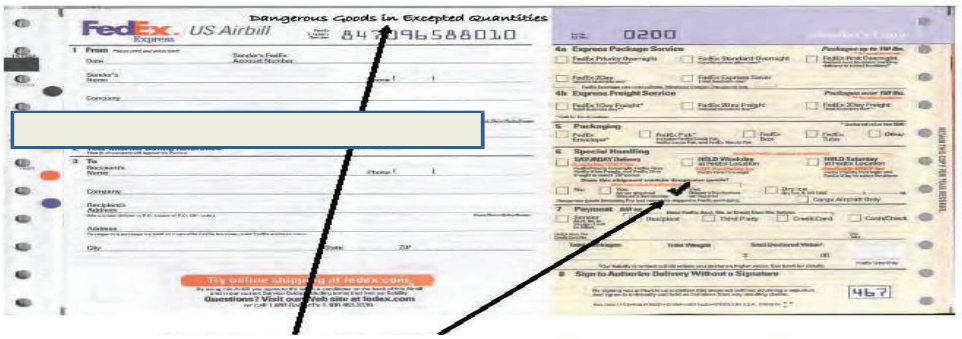
Proper documentation is required for all shipments of hazardous materials. Incorrect documentation is the most common cause for package refusal. If using documentation for couriers other than FedEx, UPS and DHL, please contact NMFS for assistance.

i. ***FedEx***: For domestic shipments with FedEx Express, fill out the standard US Airbill. Fill out the form completely including the following information:

a. In Section 6, Special Handling, check the box "Yes, Shipper's Declaration not required."
b. On the top of the form above the FedEx tracking number, include the statement, "***Dangerous Goods in Excepted Quantities***" See example in **Figure 2.** **I understand (_____)**

ii. ***DHL***: The "*Nature and Quantity of Goods*" box of the air waybill must include "**Dangerous Goods in Excepted Quantities."** **I understand (_____)**

Figure 2. Exan



nclude this sta

By signing this document, I affirm I understand the hazards associated with ethanol and the shipping requirements for ethanol solutions, as outlined in this guide. I also understand I am required to include a copy of this document in the package and that it should be appended to an ESA permit (if listed samples are shipped).

Print Name:		**Signature:**	
Employer:		**Employer Address:**	
Date:			**Phone:**

APPENDIX C
Protocol for Collecting Tissue from Sea Turtles for Genetic Analysis

Materials for Collecting Genetic Tissue Samples
<surgical gloves
<alcohol swabs
<betadine swabs
<sterile disposable biopsy punches
<sterile disposable scalpels
<permanent marker to externally label the vials
<scotch tape to protect external labels on the vials
<pencil to write on internal waterproof label
<waterproof label, 1/4" x 4"
<screw-cap vial of saturated NaCl with 20% DMSO*, wrapped in parafilm
<piece of parafilm to wrap the cap of the vial after sample is taken
<vial storage box

* The 20% DMSO buffer within the vials is nontoxic and nonflammable. Handling the buffer without gloves may result in exposure to DMSO. This substance soaks into skin very rapidly and is commonly used to alleviate muscle aches. DMSO will produce a garlic/oyster taste in the mouth along with breath odor. The protocol requires that you wear gloves each time you collect a sample and handle the buffer vials. DO **NOT** store the buffer where it will experience extreme heat. The buffer must be stored at room temperature or cooler, such as in a refrigerator.

Please collect two small pieces of muscle tissue from all live, comatose, and dead stranded loggerhead, green, leatherback, and hybrid sea turtles (and any hawksbills, although this would be a rare incident). A muscle sample can be obtained no matter what stage of decomposition a carcass is in. Please utilize the equipment in these kits for genetic sampling of **turtles only** and contact the NMFS sea turtle stranding coordinator when you need additional biopsy supplies.

Sampling Protocol for Dead Turtles

1. Put on a pair of surgical gloves. The best place to obtain the muscle sample is on the ventral side where the front flippers insert near the plastron. It is not necessary to cut very deeply to get muscle tissue.

2. Using a new (sterile and disposable) scalpel cut out two pieces of muscle of a size that will fit in the vial.

3. Transfer both samples directly from the scalpel to a single vial of 20% DMSO saturated with salt.

4. Use the pencil to write the stranding ID, date, species ID and SCL on the waterproof label and place it in the vial with the samples.

5. Label the outside of the vial using the permanent marker with stranding ID, date, species ID and SCL .

6. Apply a piece of clear scotch tape over the what you have written on the outside of the vial to protect the label from being erased or smeared.

7. Wrap parafilm around the cap of the vial by stretching as you wrap.

8. Place the vial in the vial storage box.

9. Complete the Sea Turtle Biopsy Sample Collection Log.

10. Attach a copy of the STSSN form to the Collection Log - be sure to indicate on the STSSN form that a genetic sample was taken.

11. Dispose of the used scalpel and gloves. It is very important to use a new scalpel for each animal to avoid cross contamination.

At the end of the calendar year submit all genetic samples to:
Sea Turtle Stranding Coordinator
NMFS Protected Resources
Division 55 Great Republic Drive
Gloucester, MA 01930
(978)281-9328

APPENDIX D

Incident Report of Sturgeon Take

Photographs should be taken and the following information should be collected from all sturgeon (alive and dead)

Date _____ Time (specimen found) _____

Geographic Site_____

Location: Lat/Long_____

Dredge Vessel Name _____

Disposal Site _____

Begin dredge time _____

End dredge time_____

HOPPER ☐ MECHANICAL ☐ CUTTERHEAD ☐
Time of last disposal site inspection: _____

Location where specimen recovered _____

Weather conditions_

Water temp (at dredge site) : Surface
Bottom (if known)

Species ID: _____

Fill out "Sturgeon Data Collection Form" and Return to NMFS within 24 hours via email (incidental.take@noaa.gov) or fax (978-281-9394)

Comments/other (include justification on how species was identified)

Inspector/Observer's
Name

Signature

STURGEON DATA COLLECTION FORM

For use in documenting interactions with listed sturgeon resulting from Federal actions that have undergone sec 7 consultation

REPORTER'S CONTACT INFORMATION
Name: First _____ Last _____
Agency Affiliation _____ Email_____
Address _____
_____
Area code/Phone number _____

UNIQUE IDENTIFIER (Assigned by NMFS)

DATE REPORTED:
Month ☐☐ Day☐☐ Year 20☐☐
DATE EXAMINED:
Month ☐☐ Day☐☐ Year 20☐☐

SPECIES: (check one)
☐ shortnose sturgeon
☐ Atlantic sturgeon
☐ Unidentified *Acipenser* species
Check "Unidentified" if uncertain **.**
See reverse side of this form for aid in identification.

LOCATION FOUND: ☐Offshore (Atlantic or Gulf beach) ☐Inshore (bay, river, sound, inlet, etc)
River/Body of Water_____ City_____ State ____
Descriptive location (be specific)_____
_____
_____
Latitude _____N (Dec. Degrees) Longitude _____ W (Dec. Degrees)

CARCASS CONDITION at time examined: (check one)
☐ 1 = Fresh dead
☐ 2 = Moderately decomposed
☐ 3 = Severely decomposed
☐ 4 = Dried carcass
☐ 5 = Skeletal, scutes & cartilage

SEX:
☐ Undetermined
☐ Female ☐ Male
How was sex determined?
☐ Necropsy
☐ Eggs/milt present when pressed
☐ Borescope

MEASUREMENTS: **Circle unit**
Fork length _____ cm / in
Total length _____ cm / in
Length ☐ actual ☐ estimate
Mouth width (inside lips, see reverse side) _____ cm / in
Interorbital width (see reverse side) _____ cm / in
Weight ☐ actual ☐ estimate _____ kg / lb

TAGS PRESENT? **Examined for external tags including fin clips?** ☐ **Yes** ☐ **No** **Scanned for PIT tags?** ☐ **Yes** ☐ **No**

Tag #	Tag Type	Location of tag on carcass
_____	_____	_____
_____	_____	_____

CARCASS DISPOSITION: (check one or more)
☐1 = Left where found
☐2 = Buried
☐3 = Collected for necropsy/salvage
☐4 = Frozen for later examination
☐5 = Other (describe) _____

Carcass Necropsied?
☐Yes ☐No
Date Necropsied:_____
Necropsy Lead:
_____

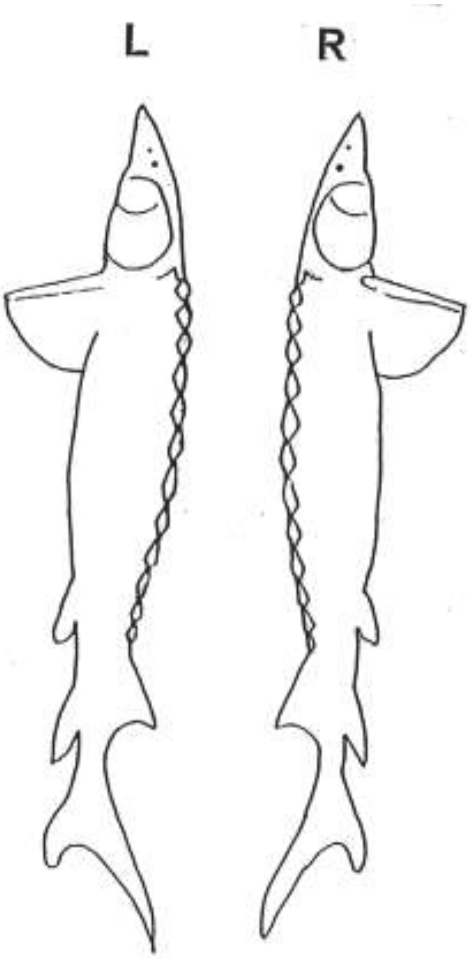
PHOTODOCUMENTATION:
Photos/vide taken? ☐ Yes ☐ No
Disposition of Photos/Video:_____
_____
_____

SAMPLES COLLECTED? ☐ **Yes** ☐ **No**

Sample	How preserved	Disposition (person, affiliation, use)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Comments:
_____
_____
_____

Draw wounds, abnormalities, tag locations on diagram and briefly describe below



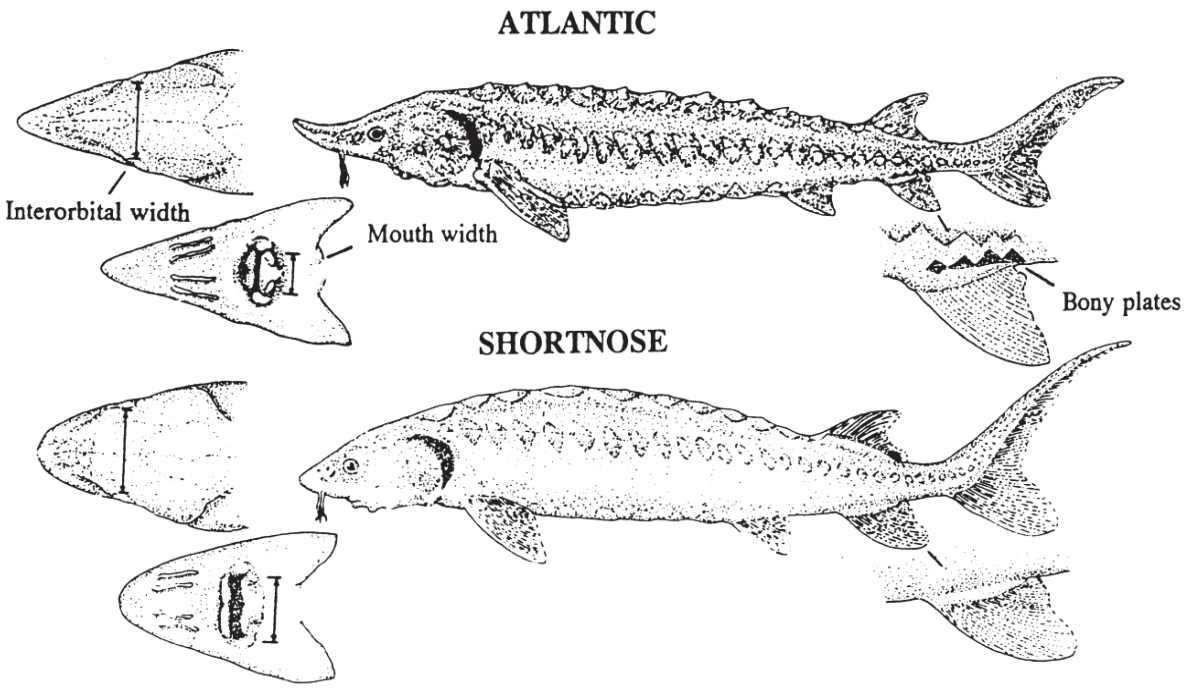
Describe any wounds / abnormalities (note tar or oil, gear or debris entanglement, propeller damage, etc.). **Please note if no wounds / abnormalities are found.**

Submit completed forms (within 24 hours of observation of fish): by email to Incidental.Take@noaa.gov or by fax (978-281-9394). Questions can be directed to NMFS Protected Resources Division at 978-281-9328.

Data Access Policy: Upon written request, information submitted to National Marine Fisheries Service (NOAA Fisheries) on this form will be released to the requestor provided that the requestor credit the collector of the information and NOAA Fisheries. NOAA isheries will notify the collector that these data have been requested and the intent of their use.

Characteristic	Atlantic Sturgeon, *Acipenser oxyrinchus*	Shortnose Sturgeon, *Acipenser brevirostrum*
Maximum length	> 9 feet/ 274 cm	4 feet/ 122 cm
Mouth bony interorbital width	Football shaped and small. Width inside lips < 55% of	Wide and oval in shape. Width inside lips > 62% of bony interorbital width
*Pre-anal plates anal fin.	Paired plates posterior to the rectum & anterior to the	1-3 pre-anal plates almost always occurring as median structures (occurring singly)
Plates along the anal fin	Rhombic, bony plates found along the lateral base of the anal fin (see diagram below)	No plates along the base of anal fin
Habitat/Range marine existence	Anadromous; spawn in freshwater but primarily lead a	Freshwater amphidromous; found primarily in fresh water but does make some coastal migrations

* From Vecsei and Peterson, 2004



APPENDIX F

Incident Report of Sea Turtle Take

Date_____Time (specimen found) _____

Species _____

Geographic Site _____
Location: Lat/Long _____
Vessel Name _____ Load # _____
Begin load time_____End load time_____
Begin dump time_____End dump time _____

Condition of screening _____
Location where specimen recovered_____

Draghead deflector used? YES NO Rigid deflector draghead? YES NO

Condition of deflector _____

Weather conditions_

Water temp: Surface Below midwater (if known)

Species Information: *(please designate cm/m or inches.)*
Head width _____ Plastron length _____
Straight carapace length _____ Straight carapace width_____
Curved carapace length _____ Curved carapace width _____

Condition of specimen/description of animal (please complete attached diagram)

Turtle Decomposed: NO SLIGHTLY MODERATELY SEVERELY

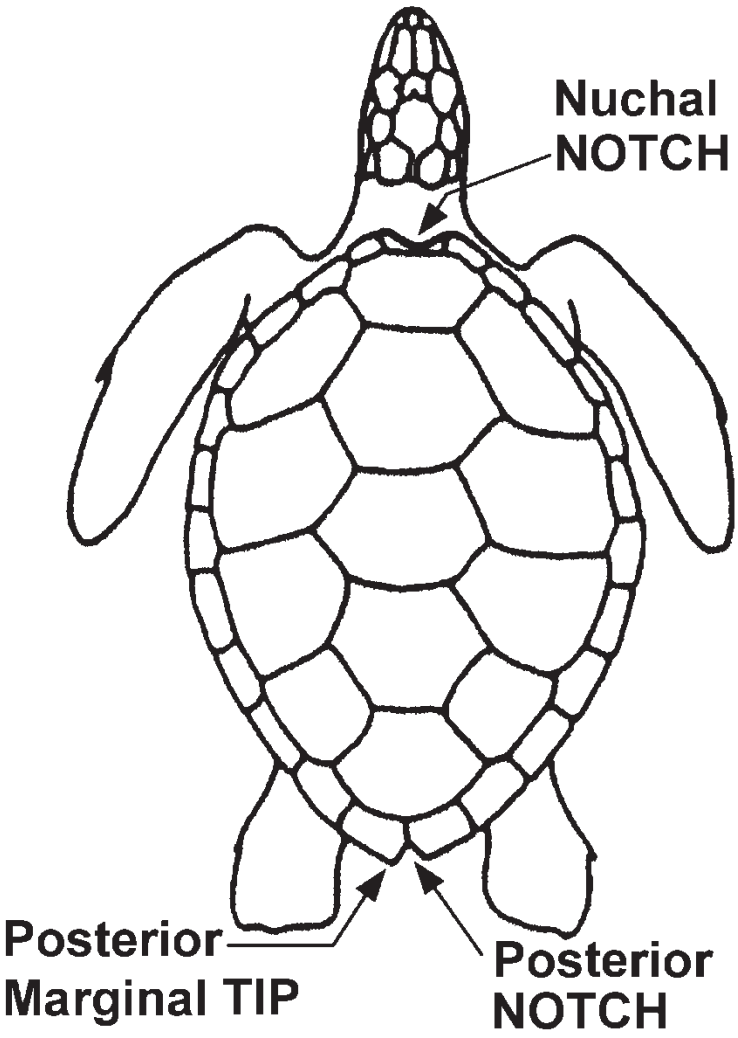
Turtle tagged: YES NO *Please record all tag numbers.* Tag # _____
Genetic sample taken: YES NO
Photograph emailed to NMFS: YES NO

Comments/other (include justification on how species was identified) _____

Observer's Name Observer's Signature

Incident Report of Sea Turtle Take

Draw wounds, abnormalities, tag locations on diagram and briefly describe below.



Description of animal:

APPENDIX G

ENDANGERED SPECIES INCIDENT REPORT FORM

Date: _____

Dredge Vessel Name _____

Hopper ☐ Cutterhead ☐

Incident Location: On Board Dredge ☐ Disposal Site ☐

Borrow Area being Dredged:_____

Disposal Site: _____

Dredge Location: Lat/Long _____

Weather conditions:_____

Water temperature: Surface Below midwater (if known)

Condition of screening apparatus:

Comments (type of material, biological specimens, unusual circumstances, etc:)

Reporter's Name:

Signature:

Species	# of Sightings	# of Animals	Comments

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Typical Seabeach Amaranth Plant

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Red Knot Monitoring Form

Date: _____ Weather Conditions: _____

_____

Tide Stage	Time Period (2 hour)	# of Red Knots	Location	Bird Activity (foraging, resting, roosting)	Project Activity (Pumping, grading, etc.)	Disturbance/Reaction	Harm (Y or N)	Notes
Low and Rising								
High and Falling								

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SECTION 01 71 23

SURVEY REQUIREMENTS

PART 1 GENERAL

1.1 SCOPE OF SECTION

The work covered by this section consists of furnishing all labor, materials, plant and equipment, and performing all operations required in conducting staking and flagging, pre-placement and post-placement condition surveys, before- and after-beachfill placement surveys, before- and after-dredging/excavation surveys of the borrow areas, and monitoring surveys for the borrow areas. For the purposes of survey requirements, with the exception of the pre-project and post-project surveys, this contract shall be considered as 4 separate areas; City of North Wildwood, City of Wildwood, Wildwood Crest Boro, and Lower Township, Cape May County, New Jersey. All timeline requirements specified shall apply to each of these areas individually.

1.2 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.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 1110-2-1003	(2013) Hydrographic Surveying
EM 1110-1-1005	(2007) Engineering and Design - Control and Topographic Surveying
ER 1110-2-8164	(2017) Engineering and Design - Policies, Guidance, and Requirements for Hydrographic Surveying and Mapping Digital Products

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Qualifications; G,DO
Certified Lifeguards; G,DO
Surveying Procedures and Equipment; G,DO

SD-07 Certificates

Swimming Hazard Assessment; G,DO
Location of Survey Lines; G,DO
Pre-Project Survey; G,DO
Pre-Placement/Borrow Condition Surveys; G,DO

Before-Dredging/Excavation Borrow Area Surveys; G,DO
After-Dredging/Excavation Borrow Area Surveys; G,DO
Before-Beachfill Surveys; G,DO
After-Beachfill Surveys; G,DO
Borrow Area Monitoring Surveys
Post-Placement/Borrow Condition Surveys; G,DO
Post-Project Survey; G,DO
Photographic Documentation of Surveys
Survey Logs
Metadata; G,DO

1.4 SURVEY CONTROL

Survey control description sheets are included in Appendix A30 of these specifications. Additional survey control may be found at https://usmart.sec.usace.army.mil/w/ but should be verified with the survey section. Additional horizontal and vertical control may be established by the Philadelphia District Corps of Engineers Survey Section in the vicinity of the project, after contract award and in coordination with the Contractor. Contact the Philadelphia District Survey Section at least 10 business days prior to the start of Contractor survey and/or layout operations, to determine the best locations for additional control points based on project requirements. The District Survey Section may establish project control points in locations that are mutually agreed upon by the Contractor and the Surveys Section. The points of contact in the District Survey Section are Jason Gray Jason.m.gray@usace.army.mil, Stephen Farrell Stephen.a.farrell@usace.army.mil and Angelica DeHoyos angelica.dehoyosmolina@usace.army.mil.

1.5 HYDROGRAPHIC SURVEYS

Conduct hydrographic surveys in accordance with USACE Performance Standards as defined in the Hydrographic Surveying Manual EM 1110-2-1003. Perform surveys using single transducer sounding techniques, multi-beam sweep type surveys or both. Obtain bottom soundings using a single beam fathometer operating at a frequency ranging from 190 to 210 Khz. When utilizing multi-beam technology, the operating frequency shall range from 180 to 250 Khz. Calibrate all fathometers in accordance with the procedures outlined in EM 1110-2-1003. Include raw data with submittals.

1.6 TOPOGRAPHIC SURVEYS

a. Perform all topographic surveys in accordance with EM 1110-1-1005. Conduct all topographic and wading surveys utilizing real time kinematic GPS or an electronic total station with a data collector. Record a three-dimensional raw electronic position for each data point. Include raw data with submittals.

b. A minimum of 2 personnel shall be present while conducting topographic surveys in the active work zone to ensure a proper lookout for moving equipment.

1.7 SURVEYING RESTRICTIONS

1.7.1 Swimming

a. Swimming is an acceptable survey method in the surf zone for this contract provided the following conditions are met:

(1) No swimmer shall enter the water if the wave heights exceeding 6 feet or any other condition or combination of conditions exist that the certified lifeguard, SSHO, COR or Survey POC deem unsafe.

(2) Two certified lifeguards (certified by the Red Cross or United States Lifesaving Association) with experience in coastal environments shall be present for all data acquisition by a swimmer. One lifeguard shall swim to acquire survey data and the other lifeguard shall serve as an observer. The survey swimmer shall enter the water with a survey rod or light survey equipment and the other swimmer (observing lifeguard) shall remain onshore, directing the survey swimmer and observing them at all times for signs of distress or danger. The standby swimmer shall be equipped for immediate entry into the water and shall move parallel to shore and maintain visible contact with the survey swimmer to ensure the shortest distance to the survey swimmer at all times.

(3) Methods "c.(1)(b)" and "c.(1)(c)" in Section 5 of ER 1110-2-8164 will not be permitted for volume computation (AD/BD) or pre-placement or post-placement surveys.

b. Submit qualifications of the certified lifeguards with experience in coastal environments to the District Safety Office, prior to commencing survey work. This shall include First Aid/CPR certifications. The certifications shall be producible to the GDA at all times.

1.7.2 Surf Zone Data Collection

In order to ensure proper data overlap and full profiles without the use of swimmers, a device may be used for the surf zone data collection such as a sea sled or CRAB. The device shall utilize direct measurement with real time kinematic GPS or an electronic total station/prism with data collector. The device will be considered a method of hydrographic surveying and will be held to the same time restraints and tolerances.

1.8 SURVEYING PROCEDURES AND EQUIPMENT

Submit all surveying procedures, methods, and equipment for topographic surveys, hydrographic surveys, and tidal monitoring, to the Government Survey Point of Contact, prior to the start of any surveying work. All survey equipment, including vessels, shall be owned or leased by an independent survey company, unless otherwise approved by the Government.

1.9 QUALIFICATIONS

Perform all surveys using an independent survey company, and all surveys (topographic, wading and hydrographic) shall be performed by the same company. Perform all topographic surveys under the direction and supervision of a Professional Licensed Surveyor with a minimum 5 years current experience in beach profiling. Conduct all hydrographic surveys under the direction and supervision of an NSPS-THSOA Certified Hydrographer, or by a Professional Licensed Surveyor with a minimum of 5 years documented experience in a hydrographic surveying environment similar in nature to the surveys required under this Contract. Surveyors shall be State of New Jersey licensed surveyors. The licensed surveyors shall be onsite a minimum of 10 percent of the onsite survey time. Submit qualifications of the independent licensed surveyor(s) for topographic and hydrographic surveying to the Government Survey Point of Contact prior to commencing any survey work.

1.10 QUALITY ASSURANCE

Quality assurance will be conducted by the District Survey Office on a minimum of 10 percent of the Contractor's survey work. To accomplish this, the District survey office will either re-survey areas or observe the Contractor in conducting their surveys or inspect submitted raw and processed data.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 SWIMMING HAZARD ASSESSMENT

When swimming is required, perform a swimming hazard assessment by a minimum of the SSHO, swimmers, and the Contractor's survey supervisor. After all are in agreement that conditions are safe, swimming surveys may be performed. Record the swimming hazard assessment and submit with the daily QC report. Include in the assessment existing water conditions, hand signals, and emergency procedures.

3.2 GENERAL SURVEY REQUIREMENTS

Conduct all surveys required to demonstrate that the construction is in compliance with the specified placement tolerances and the lines, grades, and elevations shown on the drawings. Conduct all surveys for payment purposes as specified in Contract Clause "QUANTITY SURVEYS".

Submit data in the formats specified herein. Include the photographic documentation of the surveys, as specified herein.

3.2.1 Hydrographic Surveying Techniques

Survey hydrographic or offshore portions of beach profile lines using a towed sea sled, direct measurement methodologies, or hydrographic techniques with Real Time Kinematic capabilities. If a towed sea sled method is used, obtain horizontal and vertical positioning utilizing RTK/GPS capabilities to obtain orthometric heights in the required datum, NAVD88. Use the latest NGS separation model to ensure accuracy levels are met. Update rates from the GPS receiver to the data collection processor, shall be collected at a minimum interval of 5 Hz. to a maximum interval of 20 Hz, to minimize the latency error. Augment RTK data with heave information to smooth the vertical position in the post-processing of the data. Locate the GPS base station within 6.2 miles (10 km) of the hydrographic line being surveyed. Conduct topographic and hydrographic portions of the survey at tidal stages to ensure overlap is obtained.

3.2.2 Location of Survey Lines

Submit the locations of the survey lines, in .lnw and .dxf format, prior to any data collection for before- and after-dredging borrow area surveys and before- and after-beachfill surveys.

3.2.3 Vertical and Horizontal Datums

Utilize North American Vertical Datum (NAVD) 1988 Geoid 12b as the vertical

datum for elevation and depth references for all surveys. Utilize New Jersey's State Plane Coordinate System (NAD 1983) as the horizontal reference datum.

3.2.4 Tolerances

Conduct topographic surveys utilizing procedures and methodology that meet or exceed accuracy tolerances of +/- 0.20 feet in the vertical and +/- 1.0 feet in the horizontal. Conduct hydrographic surveys utilizing procedures and methodology that meet or exceed accuracy tolerances of +/- 0.20 feet in the vertical and +/- 3.0 feet in the horizontal. Horizontally, keep the vessel within +/- 25 ft of the profile line. Take complete notes in areas where obstructions are present, explaining the offset.

3.2.5 Overlap of Survey Techniques

Survey lines requiring multiple collection methods shall have a minimum of 25 feet of overlap and 10 points recorded in each method recorded. Include all recorded points in the final submittal with attributes indicating the recording method attached. Survey points shall be within 25 feet lateral distance of the planned profile line and overlap points shall be within 25 feet lateral distance of the adjoining overlap point.

3.2.5.1 Pre-Project and Post-Project Surveys

The Pre-project and post-project surveys have the same timing requirements as the pre-placement/borrow and post-placement/borrow condition surveys specified in paragraph PRE-PLACEMENT AND POST-PLACEMENT CONDITION SURVEYS, for the entire project.

3.2.5.2 Pre-Placement and Post-Placement Condition Surveys

Schedule the hydrographic/wading/topographic portions of the survey profiles so that a minimum amount of time transpires between data collection of each portion of the survey lines. Survey the hydrographic and wading segments within a maximum time period of 2 days for each profile line. If topographic surveys of the upper beach profile are performed separate from the nearshore wading surveys, survey topographic and wading segments within a maximum time period of 5 days for each profile line. For the purpose of this contract, the "Upper Beach" is defined as +6 feet NAVD88 and above. If topographic surveys are performed separate from wading surveys, develop the composite profile from the wading survey in the region of overlap. If significant differences in elevation between survey segments are observed at locations where segments overlap, submit such information to the District Office for assessment, while still at the site. Significant differences between segments shall be defined as elevation differences greater than 1 foot over a distance of 10 feet or greater along a profile line, and occurring on two or more adjacent profile lines.

3.2.5.3 Before- and After-Beachfill Surveys

Schedule the hydrographic/wading/topographic portions of the survey cross sections so that a minimum amount of time transpires between data collection of each portion of the survey lines. Survey the hydrographic, wading and topographic segments within a maximum time period of 48 hours for each line. If topographic surveys are performed separate from wading surveys, develop the composite profile from the wading survey in the region of overlap. If significant differences in elevation between survey

segments are observed at locations where segments overlap, submit such information to the District Office for assessment, while still at the site. Significant differences between segments shall be defined as elevation differences greater than 1 foot over a distance of 10 feet or greater along a profile line, and occurring on two or more adjacent profile lines.

3.3 SURVEY CONTROL

a. Survey control descriptions are provided in Appendix A30 and https://usmart.sec.usace.army.mil. Survey the control network utilizing surveying procedures and methodology that meet or exceed accuracy tolerances of +/- 0.10 feet in the vertical and +/- 0.10 feet in the horizontal.

b. USACE-NAP survey control networks are periodically adjusted and updated. This process results in changes to control monuments and coordinates. It does not change the coordinates of the survey baseline. The survey baseline coordinates and the coordinates of the physical monument may vary. It should be assumed that the survey control network and the survey baseline are independent entities. The physical monument may or may not be on the survey baseline. Establish the relationship between the supplied physical monumentation and the survey baseline.

c. If the name of the survey control point includes stationing or numbers of any kind, the station name should not be assumed to be exact stationing on the survey baselines or profile lines. Coordinates shown on the Survey Control Sheets (DA Form 1959) will govern. Station naming often refers to historic project information and standard calculations must be performed based on coordinates in order to derive the specific relationship between the control point and the survey baseline.

d. Stake and flag all temporary bench marks or control points set within the work limits and clearly label the elevation of the point on the stake.

3.4 SURVEY LOGS

Prepare survey logs in spreadsheet form describing all survey progress and activity for pre- and post-placement condition surveys and for before- and after-dredging surveys. The spreadsheet shall be an ongoing log describing all survey lines that have been started as well as completed. Submit survey logs daily to the District Survey Point of Contact and COR.

3.5 STAKING AND FLAGGING

3.5.1 Contractor Work Limit

Stake and flag, every 50 feet, the Contractor's landward work limit, subject to Government approval.

3.5.2 Construction Baseline

Stake and flag, every 100 feet, a survey baseline, located such that it provides easy reference by QA and QC personnel. The location of the survey baseline is subject to the approval of the COR. The survey baseline is shown on the contract drawings.

3.5.3 Groins and Outfalls

Stake and flag the limits of existing groins, outfalls and other structures, subject to the approval of the COR.

3.6 PRE-PROJECT AND POST-PROJECT SURVEYS

Submit data in the formats specified. Include the photographic documentation of the surveys, as specified herein.

3.6.1 Pre-Project Survey

a. NJDEP and ENSP coordination is required prior to pre-project surveys. Obtain pre-project survey profiles of the entire project area and submit for review. The pre-project survey may be used for the pre-placement condition survey in the initial placement location.

3.6.2 Post-Project Survey

Obtain post-project survey profiles and submit for review not later than 30 calendar days after acceptance of final beachfill. The post-placement survey may be used for the post-project survey if the timing requirements are met.

3.6.3 Locations of Survey Lines

Take pre-project and post-project surveys at the same locations as the pre- and post-placement condition survey lines, as shown on drawings.

3.6.4 Description of Required Survey Lines

The survey profiles shall be long lines, and shall extend from the survey baseline to a depth of -30 feet NAVD88 or 5,000 feet seaward, whichever occurs first. In addition, extend the survey profiles to the landward limit of work. The origin of the new profile lines shall be the survey baseline, as shown on sections on the contract drawings.

3.6.5 Intervals Required

Take elevations along the profiles at a maximum of 10 foot intervals, and take additional elevations at breaks in grade and as necessary to describe all hydrographic and topographic features.

3.6.6 Quality Control

Data from previous surveys will be provided to the Contractor in advance of the pre-project survey. Overlay the previous surveys with pre-project survey as a quality control measure. If previous surveys are not available, this requirement will be waived.

3.7 PRE-PLACEMENT/BORROW AND POST-PLACEMENT/BORROW CONDITION SURVEYS

3.7.1 Pre-Placement/Borrow Condition Surveys

The beachfill area conditions are dynamic in nature. Conditions existing during the preparation of this contract may not be an accurate representation of the beachfill area conditions existing at the commencement of beachfill operations. Consequently, the Contractor must

obtain and submit pre-placement/borrow condition survey profiles, in accordance with Section 01 71 23 SURVEY REQUIREMENTS. Upon receipt of pre-placement condition surveys, the Government will issue revised drawings indicating adjusted beachfill locations, template, profiles and sections. Commence beachfill work after pre-placement surveys have been submitted and approved, and revised drawings have been issued for each work area.

3.7.2 Post-Placement/Borrow Condition Surveys

Complete post-placement/borrow condition surveys and submit for Government review not later than 30 calendar days after acceptance of final beachfill. Obtain post-placement/borrow condition survey profiles, as specified herein.

3.7.3 Completion Time Requirements

a. Commence beachfill operations no more than 21 calendar days after completion of pre-placement condition surveys, subject to the approval of these surveys. Prior to commencement of beachfill operations, allow the Government a maximum of 14 calendar days for review and approval of these surveys, and potential revisions to the contract drawings. Re-collect pre-placement condition surveys in the event beachfill operations are not started within the time specified above. The Government will consider Before-Beachfill Surveys as part of beachfill operations.

b. Complete and submit for Government review, post-placement/borrow condition surveys not later than 30 calendar days after acceptance of final beachfill. Submit data in the formats specified herein. Include the photographic documentation of the surveys, as specified herein.

3.7.4 Locations of Survey Lines

Take pre-placement/borrow and post-placement/borrow condition surveys at the locations of the profiles shown on the drawings.

3.7.5 Description of Required Survey Lines

The survey profiles shall be long lines, and shall extend from the survey baseline to a depth of -30 feet NAVD88 or 5,000 feet seaward, whichever occurs first. In addition, extend the survey profiles to the landward limit of work. The origin of the new profile lines shall be the survey baseline, as shown on sections on the contract drawings.

3.7.6 Intervals Required

Take elevations along the profiles at a maximum of 10 foot intervals, and take additional elevations at breaks in grade and as necessary to describe all hydrographic and topographic features.

3.7.7 Quality Control

Data from previous surveys will be provided to the Contractor in advance of the pre-placement surveys. Overlay the previous surveys with pre-placement surveys as a quality control measure. If previous surveys are not available, this requirement will be waived.

3.8 PHOTOGRAPHIC DOCUMENTATION OF SURVEYS

a. During the completion of the pre-project and pre-placement/borrow

condition surveys, take digital color photographs at each profile line to provide visual documentation of the beach. Take digital photographs from a point on the profile line located approximately halfway between the water line and the seaward toe of the existing dune. Take the photographs in three directions. Take the first photograph facing perpendicular to the profile line azimuth. The direction of the first photograph shall be defined by facing the ocean while standing on the profile line, then turning counterclockwise approximately 90 degrees (generally facing a northeasterly direction along the coast of New Jersey. Take the second parallel to the profile line azimuth and facing seaward. Take the third parallel to the profile line azimuth and facing landward. Document any obstructions along the profile line azimuth which preclude collection of data with additional digital photographs.

b. Submit digital files and a brief report documenting the surveys, weather conditions, beach conditions and field notes.

3.9 BEFORE- AND AFTER-BEACHFILL SURVEYS

3.9.1 Completion Time Requirements

a. See time requirements specified under Paragraph "PRE-PLACEMENT AND POST-PLACEMENT CONDITION SURVEYS" for commencement of beachfill operations.

b. Complete after-beachfill surveys of a particular survey line no more than 14 calendar days after the commencement of the before-beachfill surveys. (14-day max performance period)

c. Upon agreement between the COR, vessel operator, and SSHO, that the sea conditions are too rough to safely operate the hydrographic survey vessel to obtain the after-beachfill surveys, a time extension may be granted until the sea conditions improve.

3.9.2 Locations of Survey Lines

Take survey profiles at 100-foot intervals. Survey lines for quantity surveys shall be perpendicular to the seaward edge of berm referenced to the survey baseline. Submit locations of survey lines prior to any data collection.

3.9.3 Description of Required Survey Lines

Extend survey profiles 1,200 feet from the survey baseline or the seaward work limit, whichever is further seaward. In addition, extend the survey profiles to the landward limit of work.

3.9.4 Intervals Required

Take elevations along the profiles at a maximum of 10 foot intervals, and take additional elevations at breaks in grade and as necessary to describe all hydrographic and topographic features.

3.10 BEFORE- AND AFTER-DREDGING/EXCAVATION SURVEYS OF THE BORROW AREAS

3.10.1 Completion Time Requirements

Commence dredging/excavation operations in the borrow areas not more than

15 calendar days after approval of before-dredging/excavation borrow area surveys. Conduct after-dredging/excavation borrow area surveys not more than 10 calendar days after completion of dredging the borrow areas. Submit Before- and After-dredging/excavation survey data of the borrow areas within 5 business days after completion of each survey performed.

3.10.2 Locations of Survey Lines

Take before- and after-excavation survey cross section lines of all borrow areas, including the areas that are not available for dredging, at intervals of 100 feet. Extend lines to 200 feet outside the limits of the borrow areas. In addition, take before- and after-dredging/excavation survey quality control lines perpendicular to and through all of the cross section lines, at intervals of 100 feet and extending 200 feet outside the limits of the borrow areas. Submit locations of survey lines prior to any data collection.

3.10.3 Intervals Required

Take elevations along the cross-section at maximum intervals of 10 feet, and take additional elevations at breaks in grade and as necessary to describe all hydrographic features.

3.11 BORROW AREA MONITORING SURVEYS

3.11.1 Completion Time Requirements

When after-dredging/excavation borrow area surveys are accepted for each survey line, conduct monitoring surveys of each accepted survey line every 7 days in order for the Government to determine when to reopen the closed sections of borrow areas. Submit Borrow Area Monitoring Surveys data of the borrow area sections within 5 business days after completion of each survey performed. If excavation work is restarted in a previously closed section, re-collect the before- and after-dredging/excavation surveys in accordance with the completion time requirements as specified in the Section titled "BEFORE- AND AFTER-DREDGING/EXCAVATION SURVEYS OF THE BORROW AREAS".

USACE will re-open the beach when an approved monitoring survey shows a beach slope 20H:1V or shallower. Once the beach is re-opened conduct monitoring surveys of each accepted survey line every 28 days for the contract duration.

3.11.2 Locations of Survey Lines

Take monitoring survey cross section lines of all borrow areas, including the areas that are not available for dredging, at intervals of 100 feet. Extend lines to 200 feet outside the limits of the borrow areas. Submit locations of survey lines prior to any data collection.

3.11.3 Intervals Required

Take elevations along the cross-section at maximum intervals of 10 feet, and take additional elevations at breaks in grade and as necessary to describe all hydrographic features.

3.12 DATA SUBMISSION

Provide all survey data via DoD SAFE or other ftp online file transfer

service. Include project name, transmittal no., survey type (e.g., before beachfill), station, and date in file names or a txt file. Prepare the CAD drawing files in AutoCAD Civil 3D Release 2021 format compatible with a Windows 10 operating system.

3.12.1 General

Submit survey data in each of the following formats:

3.12.1.1 Pre- and Post-Project Surveys

a. Nine-column XYZ Format, as shown on the attached sheets.

b. BMAP Free Format: ASCII files using distances offset from the baseline (X) and elevation (Z1), as shown on attached sheets.

c. Plotted and electronic profile drawings in AutoCAD for each profile survey taken. These profiles shall be overlaid on the contract drawing profiles for comparison purposes. The grid spacing shall be 5 feet in the vertical and 50 feet in the horizontal. Each drawn profile shall show the station that it was taken from. Submit electronic files in both AutoCAD and Portable Document Format (PDF).

3.12.1.2 Pre- and Post-Placement Condition Surveys:

a. Nine-column XYZ Format, as shown on the attached sheets.

b. BMAP Free Format: ASCII files using distances offset from the baseline (X) and elevation (Z1), as shown on attached sheets.

c. Plotted and electronic profile drawings in AutoCAD for each profile survey taken. These profiles shall be overlaid on the contract drawing profiles for comparison purposes. The grid spacing shall be 5 feet in the vertical and 50 feet in the horizontal. Each drawn profile shall show the station that it was taken from. Submit electronic files in both AutoCAD and Portable Document Format (PDF).

3.12.1.3 Before- and After-Beachfill Surveys and Beachfill Template Data:

a. Nine-column XYZ Format, as shown on the attached sheets.

b. One ASCII file containing the following for all profile lines: date, profile ID, survey origin, and grid azimuth with respect to the horizontal reference coordinate system.

c. BMAP Free Format: ASCII files using distances offset from the baseline (X) and elevation (Z1), as shown on attached sheets.

d. Plotted and electronic cross section drawings in AutoCAD for each cross section survey taken. Overlay these cross sections on the contract drawing cross sections and include the specified beachfill template for that location. Each drawn cross section shall show the station that it was taken from. The grid spacing shall be 5 feet in the vertical and 50 feet in the horizontal. Submit electronic files in AutoCAD, ESRI ArcGIS 10.x shapefile format (.shp), including all components and extensions, and PDF formats.

e. Plotted plan view drawings that show topographic and hydrographic survey data points with tick marks at each shot collected and color coded

by survey type (hydro, wading, topo). Plotted cross section drawings that show topographic and hydrographic survey data that are color coded by survey type. Use the data in the Nine-column XYZ format to derive these drawings.

f. Compile all survey data previously submitted with each new before/after beachfill survey submittal.

3.12.1.4 Before- and After-Excavation Borrow Area Surveys:

a. Nine-column XYZ format: as shown on attached sheets. Include Before -Excavation Data in a single file and After-Excavation data in a single file.

b. One ASCII file containing the following for all profile lines: date, profile ID, survey origin, and grid azimuth with respect to the horizontal reference coordinate system.

c. BMAP Free Format: ASCII files using distances offset from the baseline (X) and elevation (Z1), as shown on attached sheets.

d. Plotted and electronic cross section drawings in AutoCAD for each cross section survey taken. Overlay these cross sections on the contract drawing cross sections and include the specified beachfill template for that location. Each drawn cross section shall show the station that it was taken from. The grid spacing shall be 5 feet in the vertical and 50 feet in the horizontal. Submit electronic files in AutoCAD, ESRI ArcGIS 10.x shapefile format (.shp), including all components and extensions, and PDF formats.

e. Plotted plan view drawings that show topographic and hydrographic survey data points with tick marks at each shot collected and color coded by survey type (hydro, wading, topo). Plotted cross section drawings that show topographic and hydrographic survey data that are color coded by survey type. Use the data in the Nine-column XYZ format to derive these drawings.

f. Compile all survey data previously submitted with each new before/after beachfill survey submittal.

g. Plotted and electronic drawings of the survey lines and 2-foot-interval contour lines representing the bathymetric surface with the limits of the borrow area delineated in AutoCAD. The contour surface shall be a TIN (Triangulated Irregular Network) surface that is elevation referenced within the drawing. Include surveys of the entire borrow area that extend beyond the borrow area perimeter as specified in paragraph above titled "BEFORE- AND AFTER-EXCAVATION SURVEYS OF THE BORROW AREAS," sub-paragraph "Locations of Survey Lines," for both the before and after surveys. Submit electronic files in AutoCAD, ESRI ArcGIS 10.x shapefile format (.shp), including all components and extensions, and PDF formats.

3.12.1.5 Monitoring Surveys of Borrow Area(s)

a. Nine-column XYZ format: as shown on attached sheets.

b. One ASCII file containing the following for all profile lines: date, profile ID, survey origin, and grid azimuth with respect to the horizontal reference coordinate system.

c. BMAP Free Format: ASCII files using distances offset from the baseline (X) and elevation (Z1), as shown on attached sheets.

d. Plotted and electronic cross section drawings in AutoCAD for each cross section survey taken. Overlay these cross sections on the contract drawing cross sections and include the specified beachfill template for that location. Each drawn cross section shall show the station that it was taken from. The grid spacing shall be 5 feet in the vertical and 50 feet in the horizontal. Submit electronic files in AutoCAD, ESRI ArcGIS 10.x shapefile format (.shp), including all components and extensions, and PDF formats.

e. Plotted plan view drawings that show topographic and hydrographic survey data points with tick marks at each shot collected and color coded by survey type (hydro, wading, topo). Plotted cross section drawings that show topographic and hydrographic survey data that are color coded by survey type. Use the data in the Nine-column XYZ format to derive these drawings.

f. Compile all survey data previously submitted with each new before/after beachfill survey submittal.

g. Plotted and electronic drawings of the survey lines and 2-foot-interval contour lines representing the bathymetric surface with the limits of the borrow area delineated in AutoCAD. The contour surface shall be a TIN (Triangulated Irregular Network) surface that is elevation referenced within the drawing. Submit electronic files in AutoCAD, ESRI ArcGIS 10.x shapefile format (.shp), including all components and extensions, and PDF formats.

3.13 DISCREPANCIES

In the event of any discrepancies that cannot be resolved by the District Office quality assurance review of the Contractor's data, the COR may request an additional survey be performed by the Philadelphia District Survey Section. The results of the Government survey will be considered in the final determination made by the Contracting Officer to resolve any conflicts.

3.14 METADATA SUBMISSION

a. Provide metadata file(s) for all geospatial data produced under this Contract that are compatible with ESRI ArcGIS applications. (Information on ESRI ArcGIS is available at the following link: http://www.esri.com.) The metadata file(s) must comply with Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata Version 2.0 or higher. If another metadata generation tool is used, the ".txt" or ".doc" file types will be sufficient, however the ".xml" alternative file type would be preferred.

b. Geospatial data is defined as information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth, which also includes aerial photography. Geospatial data affected by these requirements are those generated for use in a: Geographic Information System (GIS); Land Information System (LIS); remote Sensing or Image processing system; Computer-Aided Design and Drafting (CADD) system; Automated Mapping/Facilities Management (AM/FM) system and other computer systems that employ or reference data using either absolute, relative or assumed coordinates.

c. Provide digital FGDC compliant metadata file(s) for each deliverable product and data set outlined in these specifications.

d. Metadata standards can be found at http://www.fgdc.gov/metadata.

e. Submit metadata within 14 business days after completion of beachfill placement operations.

3.15 MEASUREMENT AND PAYMENT

a. With the exception of the option bid items titled "Beachfill", the work specified in this section will not be measured for payment and all costs in connection therewith shall be included in the contract lump sum price for the Base Bid Item titled, "Surveying".

b. The work specified in this section for surveying associated with Option Beachfill bid items will not be measured for payment and all additional costs for surveying shall be be included in the costs of the Option Bid Items titled, "Beachfill".

SURVEY DATA FORMATS

a. Nine-column XYZ Format

One ASCII file containing all data points for all profiles and having a descriptive header at the top of the file followed by a record of nine comma delimited fields for each data point including the following information: Profile ID, Date, Time, Point Number, Easting (X), Northing (Y), Elevation (Z), survey type (TOPO, WADING, or HYDRO), and description (as appropriate). The following is a sample data file format:

(DESCRIPTIVE HEADER)
CAPE MAY POINT, NEW JERSEY
BEACH PROFILE DATA
July 2012
VERTICAL DATA REFERENCED TO NAVD88, U.S. SURVEY FOOT
HORIZONTAL DATA REFERENCED TO NAD83, NEW JERSEY MERCATOR - ZONE 2900, U.S. SURVEY FOOT

DESCRIPTION LEGEND (SAMPLE):
STREET = STREET OR SHOULDER
ROAD_BED = GRASSY SHOULDER OR EDGE OF ROAD
PK_NAIL = ON STATION, RANGE 0.0, PK NAIL MARKER
SEAWALL = CONCRETE EXTENT
BASE_DUNE = WINDWARD/SEAWARD TOE OF DUNE
VEG_DUNE = VEGETATION AND/OR DUNE SLOPE
TOP_DUNE = CREST OF DUNE
THICK_VEG = MODERATE TO EXTREMELY DENSE VEGETATION
VEG_G = SPARSE TO MODERATE VEGETATION
FENCE = TYPICAL WIRE AND WOOD BEACH FENCE
G = SPARSE TO NIL VEGETATION, GRAVEL OR SAND
RIPRAP = EDGE TO EDGE, EXTENT OF ROCK
BERM = NOTICEABLE HIGH TIDE LIMIT
BEACH_FACE = BETWEEN BERM AND SWASH ZONE
SWASH_ZONE = WAVE BREAK AREA, TIDE DURING COLLECTION

DATA TYPE LEGEND
TOPO = RTK TOPOGRAPHIC DATA COLLECTION
WADING = WADING CONVENTIONAL LEVEL DATA COLLECTION
HYDRO= RTK ECHO SOUNDER COLLECTION (ELEVATION)

PROFILE ID, DATE, TIME (EST), POINT #, EASTING (X), NORTHING (Y), ELEVATION (Z), TYPE, DESCRIPTION
(START OF DATA)
V020, 20040417, 1107, 10001, 385926.7, 40466.0, 10.9, TOPO, THICK_VEG
V020, 20040417, 1108, 10002, 385931.4, 40457.2, 10.8, TOPO, VEG_DUNE
....
....
V021, 20040417, 1037, 9801, 384943.2, 40330.6, -8.3, HYDRO, SOUNDING
V021, 20040417, 1038, 9802, 384946.7, 40320.6, -8.2, HYDRO, SOUNDING
Etc.

b. BMAP Free Format. One ASCII file containing all data points for all profiles. For each profile, format includes:

1. One profile header line including three fields separated by a space:
(a) Profile ID;
(b) Date of data collection in "YYYY_MM_DD" format;
(c) Survey descriptor: "Preplacement"; "BD"; "AD"; or "Postplacement".

Note: Use Profile IDs listed in drawings for pre/post placement surveys; Use station in "xxx+xx" format as Profile ID for BD/AD profile surveys.

2. One line listing the integer number of points "N" in the profile.

3. "N" lines including two fields separated by a space:
(a) distance from baseline (positive offshore, in ft);
(b) elevation (relative to NAVD 88, ft).

Note: Points shall be sorted such that distances from baseline are listed in ascending order; No two points may have the same distance from baseline (adjacent points shall be separated by distance of at least 0.1 ft).

The following is a sample data file format: OC003 2015_05_12 Preplacement 5 827.4 9.62 840.3 8.61 848.6 6.60 859.7 5.49 871.4 4.29 OC005 2015_05_12 Preplacement 6 635.0 7.48 640.3 8.75 649.3 7.33 657.2 6.94 663.8 6.51 671.9 6.36

-- End of Section --

SECTION 01 76 00

STRUCTURES MONITORING

PART 1 GENERAL

1.1 SCOPE OF SECTION

The work specified in this section consists of furnishing all labor, materials and equipment, and performing all operations required to monitor structures for potential effects of the contract work.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Qualifications; G,DO
Letter to Owners; G,DO
Structure Monitoring Plan; G,DO

SD-07 Certificates

Monitoring Reports; G,DO

1.3 OBJECTIVE

Monitor structures during this contract for vibration. The objective of this monitoring is to predict and prevent damage to the structures from the Contractor's work operations. Any damage to the structures as a result of the Contractor's work operations shall be the responsibility of the Contractor, and shall be repaired, at no additional cost to the Government.

1.4 STRUCTURE MONITORING PLAN

Submit a structure monitoring plan describing the personnel, materials, equipment and methods to be utilized to monitor the effects of the contract operations on existing structures. The Plan should include at a minimum, but not be limited to the following: threshold values, i.e. vibration levels that indicate vibration is approaching max vibration levels, procedures for notification of alerts, recommended course of action if threshold values are met or exceeded, etc. In addition, include qualifications of the personnel developing the monitoring plan; qualifications of personnel performing the monitoring; frequency of monitoring during each phase of the construction; maximum acceptable vibration level; and contingency plan if that vibration level is approached.

1.5 QUALIFICATIONS

Develop the proposed monitoring plan using a professional engineer that has experience with a minimum of 2 current monitoring projects similar in type and scope to this monitoring work. Submit qualifications of the professional engineer proposed to develop and conduct the structure

monitoring, including a copy of their license.

1.6 COORDINATION

After approval of the monitoring plan by the Government and before work begins at the site, draft a letter to owners of all the beachfront structures to inform them of the methods of construction to be used for this contract, the hours of operation, and the content of the monitoring plan. In addition, explain to the owners that people may "experience" vibrations at levels much lower than vibration levels that would damage structures. Submit the proposed letter and upon approval of this letter by the Government, the Contractor shall disseminate the letter to the owners of the monitored structures. Attend a public meeting which will be coordinated, planned, and conducted by the Government.

1.7 PHOTOGRAPHY

Conduct photography as specified in Section 01 32 33 CONSTRUCTION PHOTOGRAPHY. All videography shall be digital.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 DESCRIPTION OF STRUCTURES

Monitor beachfront residential and commercial structures. In addition, monitor in-ground pools within the monitoring limits. The type of structures include residential homes, attached decks and commercial buildings and shops. Monitoring of sheds and detached garages in not required.

3.2 MONITORING

a. Monitoring shall include the daily use of a seismograph during the entire construction period. Monitor vibrations a minimum of 7 days prior to any construction operations to establish a base line of ambient vibration levels at representative beachfront structures only. Monitor representative beachfront structures within 500 feet of where contract operations with large and/or heavy equipment are actively working. Place seismographs at locations on or at the base of the beachfront structures to obtain the highest peak particle velocities. Representative structures shall be defined as one of each foundation type (pile foundation, masonry, concrete, slab on grade). Monitor no less than three structures within the 500 feet of the active work area.

b. Determine the maximum acceptable vibration level from the chart attached at the end of this section, published by the United States Bureau of Mines Report of Investigation 8507, dated 1980.

3.2.1 Monitoring Reports

Submit the vibration monitoring reports on a weekly basis following the monitoring, and include details of where and when the monitoring was performed, the frequency and peak particle velocities of the vibrations, the limiting criteria and any relevant notes.

3.3 EXCEEDING ACCEPTABLE VIBRATION LEVELS

Do not continue any activity that results in peak particle velocities greater than the maximum acceptable vibration level. In the event construction activities impact a structure, the aforementioned engineer shall reinspect the structure(s) and report the findings, including digital images, to the Contracting Officer via compact disk no later than one day following the reinspection.

3.4 MEASUREMENT AND PAYMENT

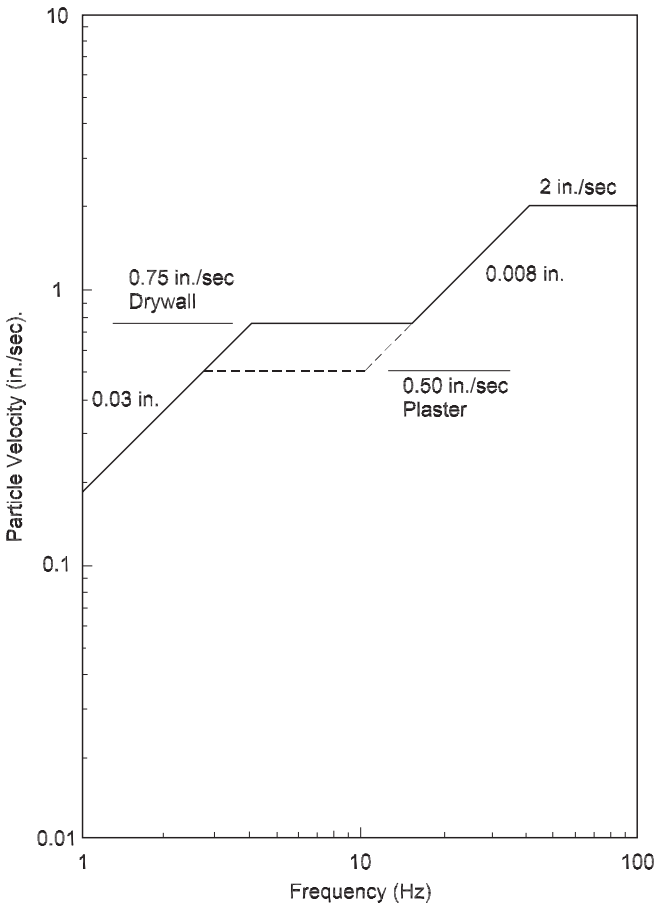
a. With the exception of the option bid items titled "Beachfill", no separate measurement or payment will be made for the base bid work specified in this section and all costs in connection therewith shall be included in the lump sum price for the Base Bid Item titled, "Structures Monitoring".

b. No separate measurement or payment will be made for the work specified in this section for option work and all costs in connection therewith shall be included in the contract unit price for the Option Bid Items titled, "Beachfill".

-- End of Section --

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Maximum Acceptable Vibration Level



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SECTION 01 78 00

CLOSEOUT SUBMITTALS

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. ARMY CORPS OF ENGINEERS (USACE)

ERDC/ITL TR-19-6	(2019) A/E/C Graphics Standard, Release 2.1
ERDC/ITL TR-19-7	(2019) A/E/C CAD Standard - Release 6.1

1.2 DEFINITIONS

1.2.1 As-Built Drawings

As-built drawings are the marked-up drawings, maintained by the Contractor on-site, that depict actual conditions and deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to submitted Requests for Information (RFI's); direction from the Contracting Officer; design that is the responsibility of the Contractor, and differing site conditions. Maintain the as-builts throughout construction as red-lined PDF files. These files serve as the basis for the creation of the record drawings.

1.2.2 Record Drawings

The record drawings are the final compilation of actual conditions reflected in the as-built drawings.

1.3 SOURCE DRAWING FILES

Request the full set of electronic drawings, in the source format, for Record Drawing preparation, after award and at least 30 days prior to required use.

1.3.1 Terms and Conditions

a. Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction drawings and data for the referenced project. Any other use or reuse is at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

b. These electronic CAD drawing files are not construction documents. Differences may exist between the CAD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CAD files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished Source drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction drawings and data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.4 RECORD DRAWINGS

The Government will provide pdf and or program files at the preconstruction conference that contains one set of "as-designed" electronic CAD files in the specified software and format revised to reflect all amendments and the final contract PDF drawings. The CAD files are provided to enable preparation of as-built or as-constructed drawings. If discrepancies exist between the CAD files and the contract PDF drawings, correct the CAD files to show the contract PDF drawings.

1.4.1 Variation with Contract Drawings

The electronic files provided are not part of the contract documents. If there is any discrepancy between the electronic files and the contract drawings, the contract drawings govern. The Government has no responsibility to modify any GFM due to changes in the design that occur after award.

Evaluate the content and quality of the GFM upon receipt. If major discrepancies or omissions occur in the GFM, notify the Contracting Officer and indicate the nature of such variations.

1.4.2 Data Loss, Corruption, and Error

Transfer of GFM files may result in corrupted files resulting in data loss and errors. Use of GFM files at own risk. Verify data integrity upon receipt and request a replacement if necessary. Make any adjustment in file structure, format, or software version as needed to make GFM compatible with computer systems and/or software to meet the requirements of the contract.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

As-Built Drawings; G,DO
Record Drawings; G,DO
Final Approved Shop Drawings; G,DO

1.6 QUALITY CONTROL

Additions and corrections to the contract drawings must be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols must conform to ERDC/ITL TR-19-7.

PART 2 PRODUCTS

2.1 RECORD DRAWINGS

Prepare the CAD drawing files in AutoCAD Civil 3D Release 2019 format compatible with a Windows 10 operating system.

2.1.1 Additional Drawings

If additional drawings are required, prepare them using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings.

2.1.1.1 Sheet Numbers and File Names

If a sheet needs to be added between two sequential sheets, append a Supplemental Drawing Designator in accordance with ERDC/ITL TR-19-7 Adding a drawing sheet, and ERDC/ITL TR-19-6 Adding or deleting drawing sheets and index sheet procedures.

2.2 PDF AS-BUILT FILES

Provide electronic PDF "plots" of all contract drawings sheets associated with the as-built drawing submittal. Compile and organize the PDF set to match the contract drawings. Bookmark and label the pages of the PDF file.

2.3 REDLINES AND MARKUPS

Provide PDFs of the current working redlines and/or markups complying with the as-builts drawing and markup requirements contained in this specification.

2.4 AS-BUILT RE-SUBMISSION REQUIREMENTS

If elements of an as-built submittal are rejected, provide the following for each re-submission, in addition to any information required in Section 01 33 00 SUBMITTAL PROCEDURES:

a. Re-submit all components required under paragraph As-Builts, including updated content in response to Government comments.

b. Provide a copy of all Government review comments.

c. Provide a disposition/response to each Government review comment for a back-check of the re-submission deliverable.

PART 3 EXECUTION

3.1 AS-BUILT DRAWINGS

Provide and maintain two black line print copies of the PDF contract drawings for As-Built Drawings. Maintain the as-builts throughout construction as red-lined hard copies on site and red-lined PDF files. Submit As-Built Drawings 30 days prior to Contract Completion Date.

3.1.1 Markup Guidelines

Make comments and markup the drawings complete without reference to letters, memos, or materials that are not part of the As-Built drawing. Show what was changed, how it was changed, where item(s) were relocated and change related details. These working as-built markup prints must be neat, legible and accurate as follows:

a. Use base colors of red, green, and blue. Color code for changes as follows:

   (1) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes.

   (2) Deletions (Red) - Over-strike deleted graphic items (lines), lettering in notes and leaders.

   (3) Additions (Green) - Added items, lettering in notes and leaders.

b. Provide a legend if colors other than the "base" colors of red, green, and blue are used.

c. Add and denote any additional equipment or material facilities, service lines, incorporated under As-Built Revisions if not already shown in legend.

d. Use frequent written explanations on markup drawings to describe changes. Do not totally rely on graphic means to convey the revision.

e. Use legible lettering and precise and clear digital values when marking prints. Clarify ambiguities concerning the nature and application of change involved.

f. Wherever a revision is made, also make changes to related section views, details, legend, profiles, plans and elevation views, schedules, notes and call out designations, and mark accordingly to avoid conflicting data on all other sheets.

g. For deletions, cross out all features, data and captions that relate to that revision.

h. For changes on small-scale drawings and in restricted areas, provide large-scale inserts, with leaders to the applicable location.

i. Indicate one of the following when attaching a print or sketch to a markup print:

   1) Add an entire drawing to contract drawings

2) Change the contract drawing to show changes on the drawing.

3) Provided for reference only to further detail the initial design.

j. Incorporate all shop and fabrication drawings into the markup drawings.

3.1.2 As-Built Drawings Content

Revise As-Built Drawings and red-lined PDF files in accordance with ERDC/ITL TR-19-6 and ERDC/ITL TR-19-7. Keep these working as-built markup drawings current on a weekly basis and at least one set available on the jobsite at all times. Changes from the contract drawings which are made during construction or additional information which might be uncovered in the course of construction must be accurately and neatly recorded as they occur by means of details and notes. Submit the working as-built markup drawings for approval prior to submission of each monthly pay estimate. For failure to maintain the working and final record drawings as specified herein, the Contracting Officer will withhold 10 percent of the monthly progress payment until approval of updated drawings. Show on the as-built drawings, but not limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.

b. The location and dimensions of any changes within the building structure.

c. Layout and schematic drawings of electrical circuits and piping.

d. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

e. Changes in details of design or additional information obtained from working drawings specified to be prepared or furnished by the Contractor; including but not limited to shop drawings, fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment, and foundations.

f. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

g. Changes or Revisions which result from the final inspection.

h. Where contract drawings or specifications present options, show only the option selected for construction on the working as-built markup drawings.

i. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, furnish a contour map of the final borrow pit/spoil area elevations.

j. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

k. Changes in location of equipment and architectural features.

l. Modifications.

m. Actual location of anchors, construction and control joints, etc., in concrete.

n. Unusual or uncharted obstructions that are encountered in the contract work area during construction.

o. Location, extent, thickness, and size of stone protection particularly where it will be normally submerged by water.

3.2 RECORD DRAWING FILES

If additional drawings are required, prepare them using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings. Accomplish additions and corrections to the contract drawings using CAD files. Provide all program files and hardware necessary to prepare final PDF record drawings. The Contracting Officer will review final PDF record drawings for accuracy and return them to the Contractor for required corrections, changes, additions, and deletions.

3.2.1 CAD Drawing files

No file names or folder names on AutoCAD drawing files (DWG) shall be revised from those provided by the Government.

a. For AutoCAD files (DWG), enter all as-built delta changes and notations on the AS-BUILT layer. Use separate layers for features of work with "Asbuilt-" prefix.

b. Provide the company title block as a separate AutoCAD file, as well as the title of any surveying company performing survey work on the project.

c. Within 20 days after Government approval of all of the working record drawings for a phase of work, prepare the final CAD record drawings for that phase of work and submit PDF drawing files and two sets of prints for review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 10 days revise the CAD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 20 days of substantial completion of all phases of work, submit the final record drawing package for the entire project. Submit one set of electronic CAD files, and one set of the approved working record PDF and or program files on three optical discs with two sets of prints. The CAD files must be complete in all details and identical in form and function to the CAD drawing files supplied by the Government. Prepare AutoCAD files for transmittal using e-Transmit. Compile a zip file of a complete set of project as-built CAD files using the e-transmittal tool in AutoCAD Civil 3D 2019, utilizing the following e-transmittal sub-settings:

(1) Purge drawing, on.
(2) Bind drawing, on
(3) Insert setting, on.

d. Include all survey data within each appropriate CAD file. Data surveyed on different days shall be included in separate point groups clearly labeled by date. Turn on all survey points in the drawing for review. Include any surfaces generated in the drawing file; make adjustments as necessary to accomplish this. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CAD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final record PDF drawing files, CAD files and marked prints as specified will be cause for withholding any payment due under this contract. Approval and acceptance of final record drawings must be accomplished before final payment is made.

3.3 RECORD DRAWINGS

Prepare final record drawings after the completion of each definable feature of work as listed in the Contractor Quality Control Plan. Transfer the changes from the approved working as-built markup drawings to the original electronic CAD drawing files. Modify the as-built CAD drawing files to correctly show the features of the project as-built by bringing the working CAD drawing set into agreement with approved working as-built markup drawings, and adding such additional drawings as may be necessary. Refer to ERDC/ITL TR-19-6. Jointly review the working as-built markup drawings with printouts from working as-built CAD drawing PDF files for accuracy and completeness. Monthly review of working as-built CAD drawing PDF file printouts must cover all sheets revised since the previous review. These PDF drawing files are part of the permanent records of this project. Any drawings damaged or lost must be satisfactorily replaced at no expense to the Government.

Drawing revisions (include within change order price the cost to change working and final record drawings to reflect revisions) and compliance with the following procedures.

a. Follow directions in the revision for posting descriptive changes.

b. The revision delta size must be 5/16 inch unless the area where the delta is to be placed is crowded. Use a smaller size delta for crowded areas.

c. Place a revision delta at the location of each deletion.

d. For new details or sections which are added to a drawing, place a revision delta by the detail or section title.

e. For minor changes, place a revision delta by the area changed on the drawing (each location).

f. For major changes to a drawing, place a revision delta by the title of the affected plan, section, or detail at each location.

g. For changes to schedules or drawings, place a revision delta either by the schedule heading or by the change in the schedule.

3.3.1 Final Record Drawing Package

Submit the final record PDF and CAD drawings package for the entire project within 20 days of substantial completion of all phases of work. Submit one set of ANSI D size PDF and CAD files, two sets of ANSI D size prints and one set of the approved working record drawings. The package must be complete in all details and identical in form and function to the contract drawing files supplied by the Government.

3.4 FINAL APPROVED SHOP DRAWINGS

Submit final approved project shop drawings within 30 days of contract completion.

3.5 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the costs of all the bid items.

-- End of Section --

SECTION 06 13 33

OUTFALL PIPE SUPPORTS

PART 1 GENERAL

1.1 SCOPE

The work covered by this section consists of furnishing all labor, materials, plant and equipment, and performing all operations required for installing and/or repairing stormwater outfall pipe support systems, as specified herein and as shown on the drawings.

1.2 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 A48/A48M	(2003; R 2021) Standard Specification for Gray Iron Castings
ASTM A123/A123M	(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A153/A153M	(2023) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A307	(2021) Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
ASTM A563	(2021; E 2022a) Standard Specification for Carbon and Alloy Steel Nuts
ASTM D25	(2012; R 2017) Standard Specification for Round Timber Piles

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA M1	(2021) Standard for the Purchase of Treated Wood Products
AWPA M2	(2019) Standard for the Inspection of Preservative Treated Wood Products for Industrial Use
AWPA M3	(2016) Standard for the Quality Control of Preservative Treated Products for Industrial Use

AWPA M4	(2023) Standard for the Care of Preservative-Treated Wood Products
AWPA M6	(2013) Brands Used on Preservative Treated Materials
AWPA T1	(2023) Use Category System: Processing and Treatment Standard
AWPA U1	(2023) Use Category System: User Specification for Treated Wood

U.S. DEPARTMENT OF DEFENSE (DOD)

MIL-P-21035	(1991; Rev B; Notice 2 2003; Notice 3 2021) Paint, High Zinc Dust Content, Galvanizing Repair (Metric)

SOUTHERN PINE INSPECTION BUREAU (SPIB)

SPIB 1003	(2014) Standard Grading Rules for Southern Pine Lumber

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS MM-L-751	(Rev H) Lumber; Softwood

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

40 CFR 171	Certification of Pesticide Applicators

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Detailed Work Plan; G, DO

SD-02 Shop Drawings

Installation Drawings; G, DO

Spliced Timber Strut Connections; G, DO

SD-07 Certificates

Preservative Treated Timber; G, DO

SDS and CIS; G, DO

Pesticide Applicator; G, DO

Equipment Description; G, DO

Hardware; G, DO

SD-11 Closeout Submittals

Pile Installation Record; G, DO

Pile Installation Drawings; G, DO

1.4 DELIVERY, HANDLING, AND STORAGE

Inspect materials delivered to the site for damage, and unload and store with a minimum of handling. Do not store materials directly on the ground. Close-stack treated timber and lumber material in a manner that will prevent material from sagging or becoming crooked. Keep ground under and within 5 feet of such piles free of weeds, rubbish, and combustible materials. Protect materials from weather. Handle treated timber with ropes or chain slings without dropping, breaking outer fibers, bruising, or penetrating surface with tools. Do not use cant dogs, peaveys, hooks, or pike poles. Protect timber and hardware from damage. Handle materials in such a manner as to ensure delivery to the location of installation in a sound, undamaged condition.

1.5 Detailed Work Plan

Prior to performing the work in this section, submit a detailed work plan for transporting, storing, inspecting, repairing, recording, and installing all materials. Include the means that will be taken to ensure that all pipe joints are located within a timber pile support system as shown. Include detailed drawings or sketches of templates or guides that will be used to properly locate the piles prior to installation.

1.6 QUALITY ASSURANCE

The producer must brand each treated pile, in accordance with AWPA M1, AWPA M2, AWPA M6, AWPA T1 and AWPA U1.

1.6.1 Preservative Treated Timber

Be responsible for the quality of treated wood products. Submit an inspection report of an independent inspection agency approved by the Contracting Officer, that offers products that comply with applicable AWPA standards, and that the plant conforms to AWPA M3. Identify treatment on each piece by the quality mark of an agency accredited by the Board of Review of the American Lumber Standard Committee. Inspect all preservative-treated wood visually to ensure there are no excessive residual materials or preservative deposits. Materials shall be clean and dry or it will be rejected because of environmental concerns. If Contracting Officer has reason to believe the preservative treatment of timber is of insufficient quality the Contractor may be required to test the timber in accordance with AWPA M2.

1.6.2 SDS and CIS

Provide Safety Data Sheets (SDS) and Consumer Information Sheets (CIS) associated with timber preservative treatment. Comply with all safety precautions indicated on SDS and CIS.

1.6.3 Pesticide Applicators

Provide certifications for all individuals (applicators) who will be working with regulated wood preservative products on site. All applicators shall be certified by the State or Environmental Protection Agency (EPA) (under the provisions of 40 CFR 171) to use wood preservatives, and have completed an approved EPA training program on the use of wood preservative products.

1.6.4 Delivery Inspection

Provide the necessary facilities at the work site for the proper inspection of new timber piles or cribbing upon delivery. Material inspected and found not to meet this specification shall be removed from the site and replaced at no additional cost to the Government. Do not incorporate materials damaged in transport from plant to site. Inspect all preservative-treated wood, visually to ensure there are no excessive residual materials or preservative deposits. Material shall be clean and dry or it will be rejected due to environmental concerns. Any material damaged after inspection may be subsequently rejected if damage is deemed sufficient for rejection by the Contracting Officer.

1.7 PLANT INSPECTION

The Government, at its discretion, reserves the right to inspect the treating process. Notify the Contracting Officer at least 3 weeks prior to beginning the treatment, stating where preservative treatment will be done. Allow Government inspector access to all parts of the plant. Allow inspection of all facets of the treating process.

1.8 SPLICED TIMBER STRUT CONNECTIONS

a. The Contractor is responsible for the design of all spliced timber connections. Design splices to provide a capacity equal to the larger of the tensile or compression capacity of the members being spliced. The ends of the members being spliced shall be cut to create a butt type connection before the splice is assembled, with no overlapping of members permitted. Submit drawings and calculations, certified by a registered professional engineer, describing the methods for splicing and attachment to timber pile supports.

Submit drawings of timber showing dimensions of cut, framed, or bored timbers. Submit drawings and calculations, certified by a registered professional engineer, describing the methods for splicing and attachment of bracing for timber pile supports and cribbing. Drawings shall include material sizes and types, arrangement of members, and the sequence and method of installation. Calculations shall include data and references used.

1.9 PILE INSTALLATION DRAWINGS

Prepare record drawings that indicate pile locations with surveyed coordinates, and are fully coordinated with the pile driving records as the work progresses. Submit final Installation Drawings within 15 calendar days prior to project closeout.

1.10 RESTRICTIONS ON WORK

All work on timber cribbing shall only be performed during daylight hours.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Timber Piles

a. Provide pressure treated Douglas fir or southern pine clean-peeled piles conforming to ASTM D25, except pile dimensions shall be as specified herein. Piles shall be pressure-preservative treated for marine piles as specified herein. Piles shall be in one piece. Splices are not permitted.

b. The nominal butt circumference measured 3 feet from the butt, shall be as shown on the drawings. Mark each pile at 1 foot intervals starting from the tip to the butt with a lumber crayon. The butt and tip of the piles shall be cut square with the long axis of the piles. Chamfering or shaving of the pile tips shall not be permitted.

2.1.2 Timber Cribbing

Timber cribbing, including bracing, spacers, shims and struts shall be Southern Yellow Pine, Stress Grade No. 1, and shall conform to SPIB 1003 and the applicable requirements of FS MM-L-751, and identified by the grade mark of a recognized association or independent inspection agency using the specific grading requirements of an association recognized as covering the species used. The association or independent inspection agency shall be certified by the Board of Review, American Lumber Standards Committee, to grade the species used. Cribbing shall be surfaced four sides and shall be pressure-preservative treated as specified herein.

2.1.2.1 Pipe Supports

Timber cribbing shall be shop cut prior to preservative treatment. Cut each top, bottom and side timber cribbing pipe support conforming to the outside circumference of the outfall pipe as shown. After the preservative treatment and drying process of the cribbing, the tolerance of the cut conforming to the outside circumference of the pipe shall be plus or minus 1/8-inch. Cribbing not within specified tolerances shall be cause for rejection.

2.1.2.2 Spacers

Fabricate timber cribbing spacers using either: one piece of timber ripped to the exact width between the cribbing members, or using two pieces of timber ripped to equal dimensions, such that when adjoined they form a composite piece of the exact width. Glue and nail adjoined pieces, using exterior grade wood glue and galvanized nails. The nail pattern shall be such so that it does not interfere with the bolt pattern.

2.1.3 Preservative Treatment

Fabricate timbers before preservative treatment. Each piece of treated timber shall be branded, by the producer, in accordance with AWPA M6. Treat wood to a uniform minimum net retention of 2.50 pounds per cubic foot using Ammoniacal Copper Zinc Arsenate (ACZA), or Chromated Copper Arsenate (CCA) in accordance with AWPA T1 and for use as specified in AWPA U1 for UCS category UC5B, except CCA shall not be used for Douglas Fir wood. All wood shall be air or kiln dried after treatment. Do not incise surfaces of

lumber that will be exposed. Brush coat areas that are cut or drilled after treatment with either the same preservative used in the treatment or with a 2 percent Copper Naphthenate solution in accordance with AWPA M4.

2.1.4 Hardware

a. Provide bolts with necessary nuts and ogee washers, timber connectors, drift pins, dowels, nails, screws, spikes, and other fastenings. Bolts and nuts shall conform to ASTM A307, Grade A, hot-dipped galvanized. Ogee washers and nuts shall be hot-dipped galvanized conforming to ASTM A48/A48M and ASTM A563, respectively. Provide bolts with ogee washers under nut and head. Provide timber connectors and other metal fastenings of type and size shown, sized to length required to minimize field cutting.

b. Submit a statement signed by an official authorized to certify on behalf of the manufacturer of the product, system, or material, attesting that the product, system or material meets specified requirements. The statement must be dated after the award of the contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements which are being certified.

2.1.4.1 Zinc-Coating

Galvanize steel by the hot-dip process in accordance with ASTM A123/A123M or ASTM A153/A153M, as applicable.

2.2 PILE DRIVING EQUIPMENT

Prior to commencement of pile installation, submit a detailed equipment description of all pile driving and jetting equipment to be used. Include sketches, details, and descriptions of the driving hammer, power plant, leads, driving cap and cushion material, collars, jetting nozzle, water supply system, and other appurtenances.

2.2.1 Pile Driving Hammers

Pile driving hammers shall be steam, air or diesel drop or single-acting, double-acting type. The size and capacity of hammers shall be as recommended by the manufacturer for the pile weights and soil formation to be penetrated. The pile hammer shall be of sufficient weight and energy to install the specified pile without damage into the soils as indicated. The minimum driving energy of hammers shall be 8,700 foot-pounds. The maximum driving energy of hammers shall be 15,000 foot-pounds for piles of any length. Diesel powered hammers shall be operated at the rate recommended by the manufacturer throughout the entire driving period. Sufficient pressure shall be maintained at the hammer so that:

a. For double-acting hammers, the number of blows per minute during and at the completion of driving of a pile is equal approximately to that at which the hammer is rated.

b. For single-acting hammers, there is a full upward stroke of the ram.

2.2.2 Driving Cap or Helmet and Cushion Block

Driving cap or helmet shall be an approved design and shall be capable of protecting pile heads, minimizing energy absorption, and transmitting hammer energy uniformly and consistently to piles. Place driving helmet or cap and cushion block combination between top of pile and the ram. Driving

caps shall be of an approved design and shall be capable of protecting pile heads, minimizing energy absorption, and transmitting hammer energy uniformly and consistently to the piles. Driving cap shall fit snugly on the top of piles and shall employ a cushion block to prevent impact damage to piles. The cushion block may be a solid or laminated softwood block with the grain parallel to the pile axis and enclosed in a close-fitting steel housing. The thickness of the block shall be suitable for the length of pile to be driven and the character of subsurface material to be encountered. Generally, thicker blocks are required for longer piles and softer subsurface material. If block is damaged, split, highly compressed, charred or burned, or has become spongy or deteriorated, replace with new block. Under no circumstances will the use of small wood blocks, wood chips, rope, or other material permitting excessive loss of hammer energy be permitted.

2.2.3 Pile Collars

Collars or bands for protecting pile butts against splitting, brooming, and other damage while being driven shall be of an approved design.

2.2.4 Jetting Equipment

Equipment shall be designed so that the discharge volume and pressure are sufficient to freely erode the material under and adjacent to the piles.

PART 3 EXECUTION

3.1 GENERAL

a. While the means, methods and sequence of construction under this contract are the responsibility of the Contractor, unless otherwise specified, it is assumed that the Contractor will install the outfall pipe supports and pipe in conjunction with the placement of the beachfill. Additional beachfill, sheet piling or other materials or methods required due to erosion after the placement of beachfill material shall be provided by the Contractor, at no additional cost to the Government.

b. Cut, bevel, and face timbers prior to plant preservative treatment. In addition to the contract clause entitled "Accident Prevention" provide protective equipment for personnel fabricating, field treating, or handling treated materials. Refer to paragraph entitled "SDS and CIS."

3.2 REMOVALS

Existing piles and cribbing shall be completely removed as shown on the drawings and disposed of off-site.

3.3 PILE INSTALLATION

Install piles in accordance with the approved work plan utilizing approved methods, equipment and materials. Select piles of uniform size for each bent. After inspection of each pile upon delivery and prior to use, inspect each pile in the leads prior to installation. Repair damaged piles in accordance with AWPA M4, unless the pile is damaged to such extent that it is rejected. Support piles laterally during driving, but do not unduly restrain from rotation in the leads. Place pile collars or bands around the pile butt to prevent brooming. Install piles to the minimum tip elevations shown on the drawings. Cutting of piles, if required, shall be with pneumatic tools, sawing, or other means approved by the Contracting

Officer. Bolt holes as indicated on the drawings shall be of the size that will insure a driving fit.

3.3.1 Pile Location

Accurately place piles at the locations and alignments both laterally and vertically to ensure that the pipe joints will be located within a support system as shown. Maintain correct location of piles by the use of templates, guides, or by other approved means. Pull and replace piles incorrectly placed at no additional cost to the Government.

3.3.2 Driving of Piles

Drive piles without interruption to the depth indicated on the contract drawings. During driving, operate pile driving hammers at the rate and conditions recommended by the hammer manufacturer.

a. Hammer Pressure: Maintain sufficient pressure at the hammer so that: (1) for double-acting hammer, the number of blows per minute during and at the completion of driving of a pile is approximately equal to that at which the hammer is rated; and (2) for single-acting hammer, there is a full upward stroke of the ram. Replace the driving cap or cushion block whenever they become damaged, split, highly compressed, charred or burned, or have become spongy or deteriorated in any manner. Under no circumstances will the use of small wood blocks, wood chips, rope, or other material permitting excessive loss of hammer energy be permitted.

3.3.3 Jetting of Piles

Jetting may be used for placement of the piles. During the jetting operation, take all necessary precautions to ensure that the jetting nozzle does not advance ahead of the pile being jetted. Discontinue jetting when the pile tip is 3 feet above the indicated pile tip elevation, and drive the pile to the final penetration tip elevation, or to the maximum of 5-10 blows per inch (after the pile has advanced a minimum of 1-inch), whichever occurs first. Drive piles within 36 hours of jetting and as specified in Paragraph "Driving of Piles".

3.3.4 Tolerances For Installing Piles

A variation of not more than 0.25 inch per foot of pile length from the vertical for plumb piles or more than 0.50 inch per foot of pile length from the required angle for batter piles is permitted. The center of butts must be within 4 inches of the location indicated. Manipulation of piles is not permitted. Redrive heaved piles to the required tip elevation. Remove and replace with new piles those damaged, misplaced, driven below the design cutoff, or driven out of alignment, or provide additional piles, driven as directed at no additional cost to the Government.

3.3.5 Pile Installation Record

Keep a complete and accurate record of each pile installed. Indicate pile location, deviations from design location, tip and butt circumference, original length, mudline elevation, tip elevation, cutoff elevation, penetration in blows per 5 foot interval for the initial 20 foot length of penetration, then penetration in blows per foot for the remaining penetration length, hammer data including rate of operation, make, and size, and unusual pile behavior or circumstances experienced during driving

such as redriving, heaving, weaving, obstructions, spudding, predrilling, and unanticipated interruptions. Preprinted forms for recording pile driving data are attached at the end of this section. Make pile driving records available to the Contracting Officer at the job site, a minimum of 24 hours after each day of pile driving. Include in the construction records the wood species, preservative type, retention, and producer of installed treated piles.

Submit records within 15 calendar days after completion of pile installation.

3.4 TIMBER CRIBBING AND STRUTS

Treated piles shall not be cut to permit fitting of cribbing or bracing. Cut and frame cribbing and struts so that joints will fit over contact surface. Open joints are unacceptable. Shimming is not allowed, unless otherwise shown. Secure cribbing, struts and piles in alignment. Nailing of cribbing and struts to the piles prior to drilling holes for thru bolts will only be permitted through the vertical face of the cribbing. If necessary, use treated filler blocks to fill out between piles and cribbing. Drill bolt holes not more than 1/16 inch larger than diameter of bolt shank. Attach cribbing to piles using thru bolts, ogee washers, and nuts as shown. Holes shall not be drilled nor spikes driven into piles to support scaffolding.

3.5 BRACING

Align bents before bracing is placed. Provide bracing of sufficient length to provide a minimum distance of 8 inches between outside bolt and end of brace. Bracing shall bear firmly against piles or cribbing to which secured. Place fillers to avoid bending the bracing or cribbing more than one inch out of line when bolts or other fastenings are drawn tight. Make filler a single piece of the same treated lumber as that in the brace, with a width of at least 6 inches and a length of at least 12 inches. Bolt ends of bracing through pile, post, or cap with a bolt of at least the indicated diameter.

3.6 FASTENING

Install bolts, ogee washers and nuts at the locations shown. Retighten bolts immediately prior to final acceptance of the contract. Bolts shall have sufficient additional threading to provide at least 3/8 inch per foot thickness of timber for future retightening.

3.7 FIELD TREATMENT

3.7.1 Timberwork

Field treat cuts, bevels, notches, refacing and abrasions made in the field in treated piles or timbers in accordance with AWPA M4, SDS and CIS. Timber subject to water spray or inundation shall be treated immediately after they are cut and before cut surface has been wetted. Wood preservatives are restricted use pesticides and shall be applied by a person certified through an EPA approved training program for the application of wood treatment products in accordance with 40 CFR 171, regulated under 7 U.S.C.A. Sections 136 to 136y, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and applicable standards. Trim cuts and abrasions before field treatment. Treat depressions or openings around bolt holes, joints, or gaps including recesses formed by

counterboring, with several heavy applications of the same preservative used to treat the lumber or timber; and after bolt or screw is in place.

3.7.2 Piling and Post Protection

In accordance with AWPA M4, immediately after pile tops are cut off, protect pile top with several heavy applications of the same preservative used to treat the pile, or copper naphthenate containing a minimum of 2 percent copper metal. Seal ends with a heavy application of coal-tar pitch or other appropriate sealer.

3.7.3 Galvanized Surfaces

Repair and recoat zinc coating which has been field or shop cut, burned by welding, abraded, or otherwise damaged to such an extent as to expose the base metal. Thoroughly clean the damaged area by wire brushing and remove traces of welding flux and loose or cracked zinc coating prior to painting. Paint cleaned area with two coats of zinc oxide-zinc dust paint conforming to MIL-P-21035. Compound paint with a suitable vehicle shall be in a ratio of one part zinc oxide to four parts zinc dust by weight.

3.8 MEASUREMENT AND PAYMENT

The work specified in this section for providing new pipe support systems will be measured for payment by the number of pipe support units installed. All costs in connection therewith shall be included in the contract unit prices for the Bid Items titled "Type A Pipe Support Units" and "Type B Pipe Support Units" and "Type C Pipe Support Units". The contract unit price shall constitute full compensation to the Contractor for excavating, backfilling, grading the beach around the pipe support units, and removing and disposing of existing piles and cribbing offsite.

3.9 PILE DRIVING LOG

The following log is a preprinted form for recording pile driving data.

PILE DRIVING LOG

CONTRACT NO._____ CONTRACT NAME_____
CONTRACTOR_____ TYPE OF PILE_____
PILE NUMBER_____ PILE SIZE: BUTT/TIP: _____ LENGTH_____
GROUND ELEVATION_____ CUT OFF ELEVATION_____
PILE TIP ELEVATION_____ VERTICAL (_____) BATTER 1 ON (_____)
SPLICES ELEVATION_____ COMPANY_____

HAMMER: MAKE & MODEL_____ WT. RAM_____
STROKE_____ RAM RATED ENERGY_____
DESCRIPTION & DIMENSIONS OF DRIVING CAP_____
CUSHION MATERIALS & THICKNESS_____

INSPECTOR_____

TIME: START DRIVING_____ FINISH DRIVING_____ DRIVING TIME_____
INTERRUPTIONS (TIME, TIP ELEV. & REASON)_____
JET PRESSURE & ELEVATIONS_____

DRIVING RESISTANCE

DEPTH FT.	NO. OF BLOWS	DEPTH FT.	NO. OF BLOWS	DEPTH FT.	NO. OF BLOWS	DEPTH FT.	NO. OF BLOWS	DEPTH FT.	NO. OF BLOWS
0	_____	18	_____	36	_____	54	_____	72	_____
1	_____	19	_____	37	_____	55	_____	73	_____
2	_____	20	_____	38	_____	56	_____	74	_____
3	_____	21	_____	39	_____	57	_____	75	_____
4	_____	22	_____	40	_____	58	_____	76	_____
5	_____	23	_____	41	_____	59	_____	77	_____
6	_____	24	_____	42	_____	60	_____	78	_____
7	_____	25	_____	43	_____	61	_____	79	_____
8	_____	26	_____	44	_____	62	_____	80	_____
9	_____	27	_____	45	_____	63	_____	81	_____
10	_____	28	_____	46	_____	64	_____	82	_____
11	_____	29	_____	47	_____	65	_____	83	_____
12	_____	30	_____	48	_____	66	_____	84	_____
13	_____	31	_____	49	_____	67	_____	85	_____
14	_____	32	_____	50	_____	68	_____	86	_____
15	_____	33	_____	51	_____	69	_____	87	_____
16	_____	34	_____	52	_____	70	_____	88	_____
17	_____	35	_____	53	_____	71	_____	89	_____

CUT OFF ELEVATION: FROM DRAWING _____

TIP ELEVATION = GROUND ELEVATION - DRIVEN DEPTH = _____

CUT OFF LENGTH = PILE LENGTH - DRIVEN LENGTH = _____

REMARKS_____

-- End of Section --

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SECTION 31 05 19

GEOTEXTILE

PART 1 GENERAL

1.1 SCOPE OF SECTION

The work covered by this section consists of furnishing all labor, material, and equipment, and performing all operations required for providing geotextile under the dune crossovers as indicated on the contract drawings.

1.2 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 D4354	(2012; R 2020) Sampling of Geosynthetics for Testing
ASTM D4355/D4355M	(2014) Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4491/D4491M	(2017) Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4533/D4533M	(2015) Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632/D4632M	(2015a) Grab Breaking Load and Elongation of Geotextiles
ASTM D4751	(2020) Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D4759	(2011; R 2018) Standard Practice for Determining the Specification Conformance of Geosynthetics
ASTM D4873/D4873M	(2017) Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
ASTM D6241	(2014) Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Thread; G,DO
Manufacturing Quality Control Sampling and Testing; G,DO

SD-04 Samples

Geotextile; G,DO

SD-07 Certificates

Geotextile; G,DO

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver, store, and handle geotextile in accordance with ASTM D4873/D4873M.

1.4.1 Delivery

Notify the Contracting Officer a minimum of 24 hours prior to delivery and unloading of geotextile rolls packaged in an opaque, waterproof, protective plastic wrapping. The plastic wrapping shall not be removed until deployment. If quality assurance samples are collected, immediately rewrap rolls with the plastic wrapping. Geotextile or plastic wrapping damaged during storage or handling shall be repaired or replaced, as directed. Label each roll with the manufacturer's name, geotextile type, roll number, roll dimensions (length, width, gross weight), and date manufactured.

1.4.2 Storage

Protect rolls of geotextile from construction equipment, chemicals, sparks and flames, temperatures in excess of 160 degrees F, or any other environmental condition that may damage the physical properties of the geotextile. To protect geotextile from becoming saturated, either elevate rolls off the ground or place them on a sacrificial sheet of plastic in an area where water will not accumulate.

1.4.3 Handling

Handle and unload geotextile rolls with load carrying straps, a fork lift with a stinger bar, or an axial bar assembly. Rolls shall not be dragged along the ground, lifted by one end, or dropped to the ground.

PART 2 PRODUCTS

2.1 RAW MATERIALS

A minimum of 7 days prior to scheduled use, submit manufacturer's certificate of compliance stating that the geotextile meets the requirements of this section. For needle punched geotextiles, the

manufacturer shall also certify that the geotextile has been continuously inspected using permanent on-line full-width metal detectors and does not contain any needles which could damage other geosynthetic layers. The certificate of compliance shall be attested to by a person having legal authority to bind the geotextile manufacturer. Certificate shall be a statement signed by an official authorized to certify on behalf of the manufacturer of the geotextile, attesting that the product meets specified requirements. The statement must be dated after the award of the contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements which are being certified.

2.1.1 Geotextile

Provide geotextile that is a nonwoven pervious sheet of polymeric material consisting of long-chain synthetic polymers composed of at least 95 percent by weight polyolefins, polyesters, or polyamides. The use of woven slit film geotextiles (i.e. geotextiles made from yarns of a flat, tape-like character) will not be allowed. Add stabilizers and/or inhibitors to the base polymer, as needed, to make the filaments resistant to deterioration by ultraviolet light, oxidation, and heat exposure. Regrind material, which consists of edge trimmings and other scraps that have never reached the consumer, may be used to produce the geotextile. Post-consumer recycled material may also be used. Geotextile shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the edges. Geotextiles shall meet the requirements specified in Table 1. Where applicable, Table 1 property values represent minimum average roll values (MARV) in the weakest principal direction. Values for AOS represent maximum average roll values.

TABLE 1
MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE

PROPERTY	UNITS	ACCEPTABLE VALUES	TEST METHOD
GRAB STRENGTH	LBS	250	ASTM D4632/D4632M
SEAM STRENGTH	LBS	200	ASTM D4632/D4632M
PUNCTURE	LBS	150	ASTM D6241
TRAPEZOID TEAR	LBS	100	ASTM D4533/D4533M
APPARENT OPENING SIZE	U.S. SIEVE	70-100	ASTM D4751
PERMITTIVITY	SEC -1	0.7	ASTM D4491/D4491M
ULTRAVIOLET DEGRADATION	PERCENT	50 AT 500 HRS	ASTM D4355/D4355M

2.1.2 Thread

A minimum of 7 days prior to scheduled use, submit proposed thread type for sewn seams along with data sheets showing the physical properties of the thread. Construct sewn seams with high-strength polyester, nylon, or other approved thread type. Thread shall have ultraviolet light stability equivalent to the geotextile and the color shall contrast with the geotextile.

2.2 MANUFACTURING QUALITY CONTROL SAMPLING AND TESTING

The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the specification. A minimum of 7 days prior to scheduled use, submit manufacturer's quality control manual. Documentation describing the quality control program shall be made available upon request. Perform manufacturing quality control sampling and testing in accordance with the manufacturer's approved quality control manual. As a minimum, geotextiles shall be randomly sampled for testing in accordance with ASTM D4354, Procedure A. Acceptance of geotextile shall be in accordance with ASTM D4759. Tests not meeting the specified requirements will result in the rejection of applicable rolls.

2.2.1 Certificate Of Compliance

Submt a manufacturer's certificate of compliance stating that the geotextile meets the requirements of this section. For needle punched geotextiles, the manufacturer shall also certify that the geotextile has been continuously inspected using permanent on-line full-width metal detectors and does not contain any needles which could damage other geosynthetic layers. The certificate of compliance shall be attested to by a person having legal authority to bind the geotextile manufacturer.

2.2.2 Samples

If requested by the Contracting Officer, the Contractor shall provide to the Government geotextile samples for testing to determine compliance with any or all the requirements in this specification. Samples shall be submitted at least 10 days prior to beginning installation. All samples provided shall be from the same production lot as will be supplied for the contract, and shall be the full manufactured width. Samples submitted for testing shall be identified by manufacturers lot designation.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

The surface underlying the geotextile shall be smooth and free of ruts or protrusions which could damage the geotextile. Remove irregularities so as to ensure continuous, intimate contact of the geotextile with the surface. Remove loose material, soft or low density pockets of material; erosion features such as rills, gullies, etc. must be graded out of the surface before geotextile placement.

3.2 INSTALLATION

3.2.1 Placement

Notify the Contracting Officer a minimum of 24 hours prior to installation

of geotextile. Geotextile rolls which are damaged or contain imperfections shall be repaired or replaced as directed. The geotextile shall be laid flat and smooth so that it is in direct contact with the subgrade. The geotextile shall also be free of tensile stresses, folds, and wrinkles. Place the geotextile with the long dimension parallel to the crossover centerline and shall be laid smooth and free of tension, stress, folds, wrinkles or creases. The placement procedures require that the length of the geotextile be slightly greater than the dune cross-over length. Carry the geotextile up the sides of the soil aggregate materials and tuck the extra geotextile down and cover with sand.

3.3 SEAMS

3.3.1 Overlap Seams

Continuously overlap geotextile panels a minimum of 24 inches at all longitudinal and transverse joints. Where seams must be oriented across the slope, lap the upper panel over the lower panel. If approved, sewn seams may be used instead of overlapped seams.

3.3.2 Sewn Seams

Factory and field seams shall be continuously sewn. The stitch type used shall be a 401 locking chain stitch or as recommended by the manufacturer. Provide Quality Assurance seam samples to the Government at the request of the Contracting Officer. Seam strength shall meet the minimum requirements specified in Table 1. The thread at the end of each seam run shall be tied off to prevent unraveling. Skipped stitches or discontinuities shall be sewn with an extra line of stitching with a minimum of 18 inches of overlap.

3.4 PROTECTION

Protect the geotextile during installation from clogging, tears, and other damage. Damaged geotextile shall be repaired or replaced as directed. Use adequate ballast (e.g. sand bags) to prevent uplift by wind. The geotextile shall not be left uncovered for more than 4 hours after installation.

3.5 REPAIRS

Repair torn or damaged geotextile. Clogged areas of geotextile shall be removed. Perform repairs by placing a patch of the same type of geotextile over the damaged area. The patch shall extend a minimum of 12 inches beyond the edge of the damaged area. Patch nonwoven geotextile by either sewing, using one row of a two-thread chain stitch, or by tack welding the patch to the surrounding undamaged geotextile using a hot-air tack-welding tool such that the patch does not move while backfilling over the geotextile. Patches shall be continuously fastened using approved methods. The machine direction of the patch shall be aligned with the machine direction of the geotextile being repaired. Remove and replace geotextile rolls which cannot be repaired. Repairs shall be performed at no additional cost to the Government

3.6 COVERING

Do not cover geotextile prior to inspection and approval by the Contracting Officer. Place cover materials in a manner that prevents materials from entering the geotextile overlap zone, prevents tensile stress from being mobilized in the geotextile, and prevents wrinkles from folding over onto

themselves. No equipment shall be operated directly on top of the geotextile without approval of the Contracting Officer. Cover material type, compaction, and testing requirements are described in Section 32 15 00 DUNE CROSSOVERS. Protect the geotextile from damage during the placement of overlying materials primarily by limiting the height of drop of materials to no greater than 1-foot unless otherwise approved by the Contracting Officer. Any damage to the geotextile during placement of the overlying materials shall be repaired or replaced by the Contractor at no additional cost to the Government.

3.7 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the work specified in this section. All costs in connection with providing and installing geotextile shall be included in the contract prices of those items for which the geotextile is incidental.

-- End of Section --

SECTION 32 15 00

DUNE CROSSOVERS

PART 1 GENERAL

1.1 SCOPE OF SECTION

The work covered by this section consists of furnishing all labor, materials, and equipment, and performing all operations required for the construction of pedestrian, vehicle and Americans with Disabilities Act (ADA) accessible dune crossovers, as specified herein and shown on the drawings.

1.2 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM A153/A153M	(2023) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A307	(2021) Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
ASTM A563	(2021; E 2022a) Standard Specification for Carbon and Alloy Steel Nuts
ASTM D1556/D1556M	(2015; E 2016) Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
ASTM D1557	(2012; E 2015) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) (2700 kN-m/m3)
ASTM D6112	(2013) Compressive and Flexural Creep and Creep-Rupture of Plastic Lumber and Shapes
ASTM D6913/D6913M	(2017) Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
ASTM D6938	(2017a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B18.21.1	(2009; R 2016) Washers: Helical Spring-Lock, Tooth Lock, and Plain Washers

(Inch Series)

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA A2	(2015) Standard Methods for Analysis of Waterborne Preservatives and Fire-Retardant Formulations
AWPA M4	(2023) Standard for the Care of Preservative-Treated Wood Products
AWPA P5	(2015) Standard for Waterborne Preservatives
AWPA U1	(2023) Use Category System: User Specification for Treated Wood

NEW JERSEY DEPARTMENT OF TRANSPORTATION (NJDOT)

NJDOT Specifications	(2007) Standard Specifications for Road and Bridge Construction

SOUTHERN PINE INSPECTION BUREAU (SPIB)

SPIB 1003	(2014) Standard Grading Rules for Southern Pine Lumber

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

36 CFR 1191	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines
40 CFR 171	Certification of Pesticide Applicators

1.3 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Work Plan; G,DO

SD-03 Product Data

Materials; G,DO
Berm Stabilization Mats; G,DO
Post and Rail Fence; G,DO
Split Rail Fence; G,DO
Source for I-5 Material; G,COR

SD-04 Samples

I-5 Material; G,DO

Stabilization Mat Sample; G,DO

SD-06 Test Reports

Grain Size Distribution Curves; G,DO
Testing Results; G,DO

SD-07 Certificates

SDS and CIS; G,DO
Pesticide Applicator; G,DO
Best Management Practices (BMPs); G,DO
Nuclear Gauges; G,DO

SD-08 Manufacturer's Instructions

Stabilization Mat Maintenance; G,DO

1.4 WORK PLAN

Submit a detailed work plan for the construction of indicated ADA accessible, pedestrian, and vehicle crossovers. Include in the work plan the labor, equipment, and methods to be used to construct ADA accessible, pedestrian, and vehicle crossovers, and demonstrate how the Contractor intends to comply with Paragraph "SEQUENCING AND SCHEDULING".

1.5 QUALITY ASSURANCE

1.5.1 Preservative Treated Wood Products

The Contractor is responsible for the quality of treated wood products. Provide the Contracting Officer's Representative (COR) with the inspection report of an independent inspection agency, approved by the Contracting Officer, that offered products comply with applicable AWPA standards. Identify treatment on each piece by the quality mark of an agency accredited by the Board of Review of the American Lumber Standard Committee. Inspect all preservative-treated wood visually to ensure there are no excessive residual materials or preservative deposits. Provide clean and dry material or it will be rejected because of environmental concerns.

1.5.2 SDS and CIS

Provide material Safety Data Sheets (SDS) and Consumer Information Sheets (CIS) associated with preservative treatment. The Contractor must comply with all safety precautions indicated on SDS and CIS.

1.5.3 Best Management Practices (BMPs)

The producer of the treated wood products shall provide certification that Best Management Practices (BMPs) for the use of Treated Wood in Aquatic Environments were utilized including a written description and appropriate documentation of the BMPs utilized.

1.5.4 Pesticide Applicator

Provide certifications for all individuals (applicators) who will be working with wood preservative products on site. Applicators must be certified by the State of New Jersey or Environmental Protection Agency

(EPA) (under the provisions of 40 CFR 171) to use wood preservatives, and have completed an approved EPA training program on the use of wood preservative products.

1.6 DELIVERY, STORAGE, AND HANDLING

Handle and store wood products in accordance with AWPA M4. Comply with paragraph titled "SDS and CIS". Special care shall be taken in supporting materials to prevent excessive bending stresses. Materials shall be carefully handled without dropping, breaking of outer fibers, and penetrating the surface with tools. Peaveys, cant hooks, pikes, and other pointed tools shall not be used in handling treated wood products.

1.7 SEQUENCING AND SCHEDULING

Reasonable public access to the beach must be provided during the course of construction of the project. Typically, portions of areas receiving beachfill are not accessible to the public until the completion of dune crossovers. In order to ensure reasonable public access, complete each crossover not later than 14 calendar days after completion of beachfill in each area of a crossover. The Contracting Officer reserves the right to temporarily stop beachfill operations if the completion of dune crossovers exceeds this time period, at no additional cost to the Government. Coordinate street lane closures with the COR, the local Fire Department, and the local Police Department a minimum of 7 calendar days prior to the needed closure. Costs associated with such closures, shall be at no additional cost to the Government.

PART 2 PRODUCTS

2.1 I-5 MATERIAL

a. Prior to purchase, submit the proposed Source for I-5 Material. The Government may visit the selected quarry to inspect the I-5 material.

b. I-5 Material conforming to the composition and gradation requirements of Subsection 901.11 of the NJDOT Specifications. Minimize angular aggregate to provide a comfortable walking surface. Provide I-5 material of similar color of the new beachfill material. Recycled materials are not acceptable.

c. Submit a sample of the soil aggregate material to confirm the color is similar to the beachfill material and to ensure the material includes non-angular aggregate.

d. Submit grain size distribution curves in accordance with ASTM D6913/D6913M from the source of the I-5 material. At a minimum, include the following sieves from the NJDOT Specifications: 2 inch, 0.75 inch, #4, #50, and #200. Percent passing the #200 sieve must be determined by washing.

e. The Contracting Officer reserves the right to reject any materials, which in their opinion, does not meet the requirements specified, or that contains organic material or debris in quantities which are considered objectionable. Material which is frozen at the time of placement may also be rejected.

2.2 LUMBER AND TIMBERS

2.2.1 Decking, Structural Lumber and Timbers

Lumber and timbers shall be Southern Yellow Pine, grade "dense standard decking" per SPIB 1003. Lumber and timbers shall be preservative treated as specified herein.

2.2.2 Fence Lumber And Timber Edge Boards

a. Post and rail fence lumber and timber edge boards shall be Southern Yellow Pine, Grade No. 1 in accordance with SPIB 1003. Split rail fence (posts and rails) shall be Southern Yellow Pine, Grade No. 1 in accordance with SPIB 1003, or No. 1 cedar. Preservative treat Southern Yellow Pine lumber as specified below.

b. Submit information describing the quality and performance of the materials proposed for construction of post and rail fence, split rail fence and ADA compliant handrail system with product data sheets and manufacturers installation instructions.

2.2.3 Preservative Treatment

a. Treat Southern Yellow Pine lumber and timbers with Copper Azole (CA-C), or Chromated Copper Arsenate (CCA) in accordance with AWPA A2 and AWPA P5 and the preservative retention requirements of AWPA U1, Use Category UC3B for lumber and timber installed above ground, and use category UC4A for posts, lumber and timber intended for ground contact.

b. Treated wood shall be air or kiln dried after treatment. Specific treatments shall be verified by the report of an approved independent inspection agency, or the AWPA Quality Mark on each piece. Do not incise surfaces of lumber that will be exposed. Brush coat areas that are cut or drilled after treatment as specified in AWPA M4.

2.2.4 Wood-polymer Side Rails and Top Rails

Lumber used for the upper side rails and top rails of post and rail fence shall be wood-polymer composite lumber, as shown on the drawings. The product shall meet the structural integrity test requirements, ASTM D6112. Furnish new and clean materials. Color shall be light gray.

2.3 HANDRAILS

Provide secondary handrail system, constructed of 1.25 inch to 2.0 inch round, aluminum reinforced vinyl or PVC tubing, meeting ADA Standards in accordance with 36 CFR 1191. The materials shall be new and clean and shall be the standard product of a manufacturer regularly engaged in the manufacture of ADA compliant secondary handrail systems.

2.4 FASTENERS

Fasteners shall be ASTM A307, Grade A, hot-dipped galvanized. Washers and nuts shall be hot-dipped galvanized conforming to ASME B18.21.1 and ASTM A563, respectively. Hot-dip galvanizing shall be in accordance with ASTM A153/A153M. Deck screws shall be weather guard-coated steel.

2.5 GEOTEXTILE

Geotextile shall be as specified in Section 31 05 19 GEOTEXTILE.

2.6 BERM STABILIZATION MATS

Stabilization mats shall be ADA compliant and shall provide a firm and slip resistant, flexible surface for wheelchair and pedestrian beach access with the following features:

a. Continuous roll width of 5 feet and minimum roll length of 30 feet..

b. Minimum weight not less than 0.24 lbs/sf and individual rolls shall be of such size and weight that they may be manageably moved by two people.

c. Manufactured from durable, UV stabilized material that is rot-proof and rust-proof in material and construction, and able to withstand extensive pedestrian and wheelchair traffic.

d. Material shall have a flat, open weave structure and finished edges to accommodate the anchoring devices required for installation.

e. Manufactured to provide a slip resistant surface in wet conditions and a non-angular comfortable walking surface for bare foot usage.

f. All components shall arrive fully factory fabricated and ready for field installation.

g. Color to be selected by Contracting Officer from manufacturer's standard colors.

Submit information describing the quality and performance of the materials proposed with product data sheets. Submit a stabilization mat sample of the stabilization mat material to confirm the material includes a non-angular, slip-resistant surface.

2.6.1 Connectors

Furnish stabilization mats with an integral connector strip on each end and side of the mat with predefined, reinforced holes in the mat connector strip. Connectors shall provide a factory manufactured method to seamlessly connect mats together.

2.6.2 Anchoring

Provide U-shaped galvanized or plastic pins to facilitate the installation and anchoring of the stabilization mats. Anchors shall be approximately six inches wide and a minimum 16 inches deep.

2.7 SAND FENCE

Sand fence shall be as specified in Section 32 92 00 SAND FENCE AND DUNE GRASS.

PART 3 EXECUTION

3.1 RESTRICTIONS ON CROSSOVER CONSTRUCTION

Do not construct two adjacent crossovers concurrently. Complete the post and rail fencing associated with each crossover concurrently with the construction of each crossover.

3.2 SITE PREPARATION

Crossover construction may require excavation of portions of the dune. Excavation of the dune shall be performed only to the extent necessary for the installation of crossovers. Additional sand material may be required for crossover construction and may be temporarily stockpiled from beachfill operations at each crossover location prior to actual construction of the crossover.

3.2.1 Demolition

Demolition shall be conducted to the extent and limit of the construction, as shown on the drawings. Demolish existing wooden crossover structures, existing outfalls, including pipes, piles and bent support structures, to the extent shown on the drawings and dispose offsite. Remove existing post and rail fencing, I-5 material, and geotextile to the extent and limit of the construction, as shown on the drawings.

3.2.2 Excavation

Minimize excavation of dunes. Dune crest shall not be lowered to facilitate crossover construction. Dispose of unsatisfactory excavated material off-site. Stockpile remaining material for reuse in restoring dune to preconstruction configuration.

3.3 CONSTRUCTION OF DUNE CROSSOVERS

Submit information describing the quality and performance of the materials proposed for construction of all crossovers. Include a certified test assay analysis from an approved testing organization attesting that preservative treated lumber to be used in the work meets the requirment of this section.

3.3.1 General

Construct dune crossovers including observation areas at the locations and in the manner indicated on the drawings and in accordance with the approved work plan utilizing a soil aggregate consisting of I-5 material. Construct pedestrian crossovers, vehicle crossovers, and ADA accessible crossovers utilizing a soil aggregate, consisting of I-5 material, as shown on the contract drawings.

3.3.2 Placement of I-5 Material

Prior to placement of I-5 material, place geotextile in accordance with Section 31 05 19 GEOTEXTILE. Place I-5 material in maximum 12 inch lifts and compact to at least 90 percent laboratory maximum dry density as determined by the Modified Proctor test procedure as specified in ASTM D1557.

Remove, replace or dry materials that are too wet to facilitate proper compaction, by any method approved by the Contracting Officer. Place materials to the lines and grades shown and compact by the controlled use

of the hauling and spreading equipment. Movement of the equipment shall be distributed as much as practicable over the surface to provide uniform compaction and complete coverage of the fill.

3.3.3 Testing

Furnish materials meeting the requirements specified herein, for placing the materials within the limits of moisture suitable for proper compaction, and for compacting the materials in accordance with the requirements of this section. Perform laboratory tests as required to control the work and demonstrate compliance with material specifications. Perform testing by a Corps of Engineers approved laboratory as specified in Section 01 45 00 QUALITY CONTROL. Determine field in-place moisture/density in accordance with ASTM D6938. All nuclear gauges proposed for use on site shall have been laboratory calibrated within 12 months of their actual use on site. Submit the type/model of each proposed nuclear gauge and its latest laboratory calibration certificate. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, remove, replace and recompact the material to meet specification requirements. Perform tests on recompacted areas to determine conformance with specification requirements. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

a. Perform not less than one gradation test on material placed in each vehicular and ADA accessible crossover and not less than one test for every fifth pedestrian crossover unless otherwise directed or approved by the Contracting Officer. The Contracting Officer may require additional tests, whenever materials are questionable, at no additional cost to the Government. During the course of construction, if the source or appearance or performance of the crossover materials noticeably changes, in the opinion of the Contracting Officer, repeat the appropriate index testing as described herein, of the materials to ensure compliance and reestablish moisture/density relationships for compaction, at no additional cost to the Government.

b. Generate a compaction curve from a modified Proctor test in accordance with ASTM D1557 for each type of material used and for any change in appearance or composition of each material source as determined by the Contracting Officer. Perform tests, in accordance with ASTM D1557, to determine the respective material's optimum moisture and laboratory maximum density value at the following frequency: one test on sample obtained from quarry within 30 days of placement activities, and 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 1,000 cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

c. Perform three in-place nuclear density tests per lift of material placed at each crossover.

d. Check in-place densities using ASTM D1556/D1556M once for every 5 vehicular or pedestrian crossovers constructed and once for each ADA accessible crossover constructed. Additional checks shall be performed as requested by the Contracting Officer, at no additional cost to the Government.

3.3.3.1 Testing Results

Submit within one week of conclusion of physical tests, including gradation tests, proctor tests and nuclear density tests, three copies of test results, including calibration curves and results of calibration tests. Reports shall indicate the location of the sample/test, the test data, and a statement of compliance or non-compliance, where applicable.

3.3.3.2 Action Required for Non-Compliance

Whenever test results indicate material non-compliance, remove such material, at no additional cost to the Government. Perform additional tests as directed by the Contracting Officer, to identify the limits of unsuitable material, at no additional cost to the Government.

3.3.4 Timber Edge Boards

Construct timber edge boards as indicated on the drawings. Set edge boards plumb and to tolerances specified below. Backfill shall be compacted with hand tampers or other approved method.

a. Tolerances: the finish grade between abutting boards shall not vary by more than 0.125-inch; the horizontal alignment of abutting boards shall not vary by more than 0.25-inch; and the gap between abutting ends shall be no more than 0.25-inch, unless otherwise approved or directed by the Contracting Officer.

3.4 STABILIZATION MAT MAINTENANCE

a. Submit stabilization mat manufacturer's field repair, cleaning, and maintenance instructions.

b. Prepare the surface where the stabilization mats will be placed by raking the beach. Remove debris and foreign objects from the area. The surface should be as smooth and flat as possible to ensure optimal wheelchair accessibility.

c. Unroll the stabilization mat fully. Install the mat with the walking surface facing up.

d. Where the stabilization mat meets permanent crossover structures, the mat end shall be placed with no gap. Set the mat flush or just below the permanent path to eliminate a tripping hazard. Dig a one to two inch trench and tuck the end of the mat into this trench and cover end of mat with beach sand.

e. Anchor the mat end using U-shaped pin anchors across the connector strip. Install the pins in the predefined holes in the mat connector strip, which shall be integral to each end of the stabilization mat.

f. Anchor the beach end of the mat by digging a three inch trench. Fold the end of the mat into the trench firmly securing this end with four anchor pins inserted through the predefined holes in the mat connector strip.

g. Rake sand over the trench covering the end of the mat to prevent a tripping hazard.

3.4.1 Connecting Stabilization Mats

a. Install the successive mats by overlapping the connector strips, ensuring that the anchoring holes are lined up so that the anchor pins anchor both mats securely together.

b. Secure the mats with four U-shaped pins at each seam or as recommended by the mat manufacturer.

c. Continue connecting mat sections for the length of the access route. Complete the installation by securing the end of the final stabilization mat section as specified above or per manufacturer's instructions.

3.5 INSTALLATION OF POST AND RAIL, AND SPLIT RAIL FENCING

Construct fencing as indicated on the drawings. Excavate to the depths indicated for posts. Remove debris encountered during excavation. Set posts plumb and in proper alignment. Backfill shall be compacted with hand tampers or other approved method. Pre-drill holes for screws to prevent splitting. Replace items that split at no additional cost to the Government. Treat pressure treated lumber immediately after cutting, notching and drilling all lumber, as specified in AWPA M4.

3.5.1 Handrail Installation

Install handrails on post and rail fence for handicaped crossovers. Fit handrail sections and fittings together to form tight joints, except as necessary for expansion in accordance with the manufacturer's recommended installation instructions. Handrail shall be ADA compliant and installed such that handrails maintain uniform height above grade and are installed at the same slope of the ramp, as shown on the drawings. Unless otherwise shown on the drawings, install handrails not less than 34 inches nor more than 38 inches above grade.

3.6 SAND FENCE

The sand fence shall be constructed as indicated on the contract drawings and in the manner specified in Section 32 92 00 SAND FENCE AND DUNE GRASS.

3.7 MEASUREMENT AND PAYMENT

3.7.1 Pedestrian Dune Crossovers

The work specified in this section for the construction of I-5 material for pedestrian dune crossovers will be measured for payment by the square footage (measured along the centerline of the crossover) of pedestrian dune crossovers satisfactorily constructed and accepted. Payment will be made at the contract price per unit for the Base Bid Item titled "Pedestrian Crossovers", and shall include all costs associated with this item, including demolition, excavation, geotextile, and additional beachfill material, which are considered incidental to this item.

3.7.2 ADA Accessible Dune Crossovers

The work specified in this section for the construction of I-5 material for ADA accessible dune crossovers will be measured for payment by the square footage of ADA accessible dune crossovers satisfactorily constructed and accepted. Payment will be made at the contract price per unit for the Base Bid Item titled "ADA Accessible Crossovers", and shall include all costs

associated with this item, including demolition, excavation, geotextile, and additional beachfill material, which are considered incidental to this item.

3.7.3 Vehicle Dune Crossovers

The work specified in this section for the construction of vehicle dune crossovers will be measured for payment by the square footage of vehicle dune crossovers satisfactorily constructed and accepted. Payment will be made at the contract price per unit for the Base Bid Item titled "Vehicle Crossover", and shall include all costs associated with this item, including demolition, excavation, timber edge boards, geotextile, and additional beachfill material, which are considered incidental to this item.

3.7.4 Berm Stabilization Mats

The work specified in this section for the installation of stabilization mats on the berm will be measured for payment by the linear foot of stabilization mats satisfactorily installed and accepted on the berm. All costs in connection therewith shall be included in the contract unit price for the Bid Items titled, "Berm Stabilization Mat".

3.7.5 Split Rail Fence

The work specified in this section for the construction of split rail fence will be measured for payment by the linear footage of fence satisfactorily installed and accepted. Fencing on each side of crossover(s) shall be measured separately. Payment will be made at the contract price per unit for the Bid Item titled "Split Rail Fence".

3.7.6 Sand Fence

The work specified in this section for the installation of sand fence will be measured for payment as specified in Section 32 92 00 SAND FENCE AND DUNE GRASS.

3.7.7 Post and Rail Fence

The work specified in this section for the construction of the post and rail fencing will be measured for payment by the linear footage of fence satisfactorily installed and accepted. Fencing on each side of crossover(s) shall be measured separately. Payment will be made at the contract price per unit for the Bid Item titled "Post and Rail Fence", and shall include all costs associated with providing handrails incidental to this item.

-- End of Section --

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SECTION 32 92 00

SAND FENCE AND DUNE GRASS

PART 1 GENERAL

1.1 SCOPE OF SECTION

The work covered by this section consists of furnishing all labor, materials and equipment, and performing all operations required for the erection of sand fence and the planting of dune grass, as specified herein and shown on the drawings.

1.2 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.

ASTM INTERNATIONAL (ASTM)

ASTM A641/A641M	(2019) Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
ASTM F537	(2001; R 2019) Standard Specification for Design, Fabrication, and Installation of Fences Constructed of Wood and Related Materials

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. See Section 01 33 00 SUBMITTAL PROCEDURES for all procedures related to the submission of submittals.

The following shall be submitted:

SD-03 Product Data

Fertilizer

SD-07 Certificates

Sand Fence
Dune Grass Plants

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery

1.4.1.1 Dune Grass Plants

Protect materials from damage and contamination during delivery, on-site storage, and handling.

1.4.1.2 Fertilizer

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 may be furnished in bulk with certificate indicating the above information.

1.4.1.3 Sand Fence

Deliver products to the project site in undamaged condition.

1.4.2 Storage

1.4.2.1 Fertilizer

Store in cool, dry locations away from contaminants.

1.4.2.2 Plant Storage and Protection

Store and protect plants not planted on the day of arrival at the site as follows:

a. Shade and protect plants in outside storage areas from the wind and direct sunlight until planted.

b. Heel-in bare root plants.

c. Protect balled and burlapped plants from freezing or drying out by covering the balls or roots with moist burlap, sawdust, wood chips, shredded bark, peat moss, or other approved material. Provide covering which allows air circulation.

d. Keep plants in a moist condition until planted by watering with a fine mist spray.

e. Do not store plant material directly on concrete or bituminous surfaces.

1.4.2.3 Sand Fence

Store products out of contact with the ground, and protect against damage.

1.4.3 Handling

Do not drop or dump materials from vehicles. Avoid damaging plants being moved from nursery or storage area to planting site. Handle plants carefully to avoid damaging or breaking the earth ball or root structure. Do not handle plants by the trunk or stem. Remove damaged plants from the site.

1.5 GUARANTEE

a. Dune grass in planted areas shall be guaranteed for a minimum of one year or one full growing season, beginning on the date of inspection by the Contracting Officer to commence the plant establishment period, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by the Government or by weather conditions unusual for the warranty period.

b. At end of the warranty period, planted areas having less than an 80

percent survival rate shall be replanted and fertilized by the Contractor.

PART 2 PRODUCTS

2.1 SAND FENCE

2.1.1 Fence

Fence shall be ASTM F537, Type III, wire-bound wood picket fence. Slats shall be No. 1 White Cedar, Aspen, Douglas Fir or Spruce; minimum 3/8 inches thick; 1-1/2 inches wide; 48 inches long, square cut both ends; substantially free from excessive wane, knots, short slats and unsquare ends. Fence shall be free of decay, broken wire, and missing or broken pickets/slats. Fence binding wire shall be minimum 14 gauge galvanized wire. Fence shall be stretched after weaving to ensure the slats are tightly bound by the wire. Fence shall be furnished in minimum 50 foot lengths and shall be unpainted.

2.1.2 Fence Posts

Fence posts shall be a minimum of 3 inch diameter cedar.

2.1.3 Post Binding Wire

Wire for attaching the fence to the posts shall be ASTM A641/A641M, soft temper, galvanized, 14 gauge minimum.

2.2 DUNE GRASS

2.2.1 Dune Grass Plants

Submit statement signed by an official authorized to certify on behalf of the manufacturer of a product, system or material, attesting that the product, system or material meets specified requirements. The statement must be dated after the award of the contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements which are being certified.

2.2.1.1 American Beachgrass

Provide the Cape variety of American Beachgrass *(Ammophila breviligulata).* Each plant shall consist of 2 or more healthy culms. Care shall be taken to protect plant root system. Plants which are damaged will not be accepted. Deliver each plant to the planting site in a dormant state and cut to length as shown on the drawings, prior to planting.

2.2.1.2 Spartina Patens

Provide the Avalon variety of Spartina Patens (Salt Meadow Cordgrass). The plants shall come from the nursery as live plugs. Each plant shall consist of 1 live plug. Plants which are damaged will not be accepted.

2.2.2 Seed

Seed shall be the Atlantic variety of coastal panicgrass *(Panicum amarum).*

2.2.3 Fertilizer

Fertilizer shall be 10-10-10 grade. Fertilizer shall be uniform in composition, free-flowing, and suitable for application with approved equipment. Submit physical characteristics and recommendations.

PART 3 EXECUTION

3.1 REQUIRED ORDER OF WORK

To avoid damaging the beachgrass and panicgrass, the sand fence must be installed prior to the beachgrass and panicgrass planting in a particular location.

3.2 SAND FENCE

Erect fence at the locations and along the lines shown on the drawings. Set posts and pickets/slats vertical, including on slope. Debris may be encountered when excavating to install posts. Excavation may be required at an adjacent location to avoid the debris encountered. Set posts plumb, in proper alignment, at intervals not exceeding 10 feet, and placed so that the top of the post is even with the top of the pickets/slats. Moisten backfill to optimum condition and compact with hand tampers. Set posts such that the number of protrusions, i.e. knots, are minimized on the side to which the fence is to be attached. Place sand fence on alternating sides of posts as shown on the drawings and attach to the posts by pulling fence taut and securely wrap with minimum 14 gauge galvanized wire around fence post and picket, and subsequently twist wire ends together to secure fence picket to post at each of the locations as the picket bindings. Splice fence by overlapping a minimum of two pickets/slats and wrapping with wire at each of the locations as the fence picket bindings and twisting ends securely. Tuck all wire ends in at all locations to prevent injury to workers and the public.

3.3 DUNE GRASS

3.3.1 General

The new dunes shall be fertilized, planted with beachgrass, and seeded with panicgrass after construction of the dune and associated sand fence installation has been completed.

3.3.2 Surface Preparation

Grade surfaces to be planted with no sharp depressions greater than 2 inches in depth.

3.3.3 Planting Method

3.3.3.1 American Beachgrass

Plant beachgrass from 15 October to 1 April only. Plant one beachgrass plant per hole. Space the plants as shown on the drawings. Insert the dune grass into a preformed hole to a depth as indicated.

3.3.3.2 Panicgrass

Panicgrass seeds shall only be planted between 01 November and 15 April,

under nonfrozen soil conditions. The new dunes shall subsequently be overseeded into the stands of Beachgrass with panicgrass. The panicgrass shall be seeded at a rate of 8 - 12 pounds of seed per acre. Seeds shall be planted 1.5 to 2 inches deep either by hand or by a mechanically operated drill or seeder.

3.3.3.3 Spartina Patens

Plant spartina patens between 1 September and 1 October, or between 1 March and 31 May. Space the plants as shown on the drawings. Each plant shall consist of 1 live plug. Plant 1 plug per hole. Plant each plant a minimum of 4 to 6 inches deep.

Where the landward slope of dune is completely stabilized with existing growth, Spartina Patens shall only be added where feasible and approved by the COR along adjacent areas, but no further seaward than the area designated on the contract drawings.

3.3.3.4 Fertilizer

Once the Spartina patens has been planted and the American beachgrass plants break dormancy, as determined by the COR, execute the initial application of fertilizer at the rate of 20 pounds of nitrogen per acre. This initial application shall be performed within the first 30 days of the beachgrass breaking dormancy. Between 1 July and 1 August, after the initial planting, execute a second application of fertilizer at a rate of 20 pounds of nitrogen per acre. Make both applications of fertilizer via an approved broadcast methodology, demonstrated in the field to apply the product at the specified rate. Do not apply fertilizer without prior approval from the COR and do not apply when wind speeds are more than 10 miles per hour.

3.3.4 Care and Protection

Perform proper care and protection of all planted areas. At least 80 percent plant survival is required in planted areas at the end of the warranty period specified in the paragraph titled "GUARANTEE". Replant and fertilize areas having less than an 80 percent survival rate.

3.4 MEASUREMENT AND PAYMENT

3.4.1 Dune Grass

The work specified in this section for planting, seeding, and fertilizing of dune grass (American beachgrass, Spartina patens, and panicgrass), will be measured for payment by the square yard of dune grass successfully planted, seeded, fertilized, and accepted. All costs in connection therewith shall be included in the contract unit prices for the respective Bid Items titled "Dune Grass Planting 18" O.C." and "Dune Grass Planting 24" O.C.".

3.4.2 Sand Fence

The work specified in this section for sand fence will be measured for payment by the linear footage of sand fence installed. Payment for this work will be made at the contract unit prices for the Bid Items titled "Sand Fence".

-- End of Section --

SECTION 33 40 00

STORMWATER OUTFALL PIPES

PART 1 GENERAL

The work covered by this section consists of furnishing all labor, materials, plant and equipment, and performing all operations required for extending and/or repairing stormwater outfall pipes as specified herein and as shown on the contract drawings.

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 C564	(2020a) Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings
ASTM C920	(2018) Standard Specification for Elastomeric Joint Sealants

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C110/A21.10	(2021) Ductile-Iron and Gray-Iron Fittings
AWWA C111/A21.11	(2017) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C151/A21.51	(2017) Ductile-Iron Pipe, Centrifugally Cast
AWWA C153/A21.53	(2019) Ductile-Iron Compact Fittings for Water Service
AWWA C600	(2017) Installation of Ductile-Iron Mains and Their Appurtenances
AWWA C606	(2022) Grooved and Shouldered Joints

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Health Requirements Manual

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC SP 2	(2018) Hand Tool Cleaning

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation;

submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Detailed Work Plan; G,DO
Shoring and Sheeting Plan; G,DO
Dewatering Work Plan

SD-02 Shop Drawings

Outfall Pipe Modifications; G,DO
Drawings; G,DO

SD-03 Product Data

Ductile Iron Pipe and Fittings; G,DO
Universal Flexible Pipe Coupling; G,DO
Elastomeric Sealant; G,DO
Rubber Gaskets; G,DO
Mechanical Joint Restraint

SD-07 Certificates

Ductile Iron Pipe and Fittings; G,DO
Universal Flexible Pipe Coupling; G,DO
Elastomeric Sealant; G,DO
Rubber Gaskets; G,COR
Outfall Pipe Repairs

SD-11 Closeout Submittals

As-Built Drawings

1.3 QUALITY ASSURANCE

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Do not store materials directly on the ground. Keep the inside of pipes and fittings free of dirt and debris. Before, during, and after installation, protect the pipe and fittings from any environment that would result in damage or deterioration to the material. Keep a copy of the manufacturer's instructions available at the construction site at all times and follow these instructions unless directed otherwise by the Contracting Officer. Store solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install pipe, in accordance with the manufacturer's recommendations. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.4.2 Handling

Handle pipe and accessories to ensure delivery to the timber pipe support systems in sound, undamaged condition. Carry pipe into position without

dragging. Use of pinch bars and tongs for aligning or turning pipe will be permitted. Thoroughly clean the interior of pipe and accessories of foreign matter before being placed on the timber pile supports and keep the pipe clean during installation by plugging or other approved method. Before installation, inspect the pipe for defects. Replace material found to be defective before or after installation with sound material at no additional cost to the Government. Store rubber gaskets that are not to be installed immediately in a cool, dark place.

1.5 SITE CONDITIONS

Bidders are expected to examine the site of the work in accordance with Contract Clause: SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK to determine the conditions affecting their operations. The entire work site is designated as a hard hat area in accordance with EM 385-1-1.

1.6 QUALITY ASSURANCE

1.6.1 Detailed Work Plan

Submit for approval, prior to performing the work in this section, a detailed work plan for transporting, storing, inspecting, repairing, recording, and installing all materials specified in this section.

1.6.2 Outfall Pipe Modifications

Submit a separate shop drawing for each outfall repair location. Drawings shall show invert elevations, slopes of the pipes and number of supports. Pipe and pipe support systems shall be detailed.

1.6.3 Outfall Pipe Repairs

Submit a complete and accurate record of each outfall pipe repair within three days of completion of pipe installation. The record shall indicate the outfall number and station, the pile spacings, pipe sizes and lengths, member sizes, and materials used.

1.6.4 Shoring and Sheeting Plan

If sheeting is used for the excavation work, submit a shoring and bracing work plan at least 10 days prior to shoring and sheeting activities. Submit drawings and calculations, certified by a registered professional engineer, describing the methods for shoring and sheeting of excavations. Drawings shall include material sizes and types, arrangement of members, and the sequence and method of installation and removal. Calculations shall include data and references used.

1.6.5 Dewatering Work Plan

Submit procedures for accomplishing dewatering work.

1.6.6 Utilities

Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. Excavate by hand when adjacent to or for excavations exposing a utility or other buried obstruction. 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.

1.6.7 Drawings

a. Submit stormwater outfall system installation drawings showing complete detail, both plan and side view details with proper layout and elevations. Submit separate shop drawings for each outfall location and outfall system constructed. Drawings shall show invert elevations, slopes of the pipes and number of supports. Junction boxes and lids, grates, covers, manholes, pipe and pipe support systems shall be detailed.

b. Submit As-Built Drawingsfor each stormwater outfall system constructed showing complete details with all dimensions, both above and below grade, including invert elevations.

PART 2 PRODUCTS

2.1 STORMWATER OUTFALL MATERIALS

2.1.1 Ductile Iron Pipe and Fittings (DIP)

a. Pipe: AWWA C151/A21.51, Thickness Class 52.

b. Fittings: AWWA C110/A21.10 or AWWA C153/A21.53; fittings with push-on joint ends conforming to the same requirements as fittings with mechanical-joint ends, except that the bell design shall be modified, as approved, for push-on joint. Fittings shall have pressure rating at least equivalent to that of the pipe. Ends of pipe and fittings shall be suitable for the specified joints. Shape of pipe ends and fitting ends, gaskets, and lubricant for joint assembly, AWWA C111/A21.11 and the pipe manufacturer's recommendations.

2.1.1.1 Flexible Watertight Pipe Joints and Jointing Material

Joints for pipe and fittings shall be push-on joints unless otherwise indicated. Shape of pipe ends and fitting ends, rubber gaskets, and lubricant for joint assembly, AWWA C111/A21.11 and the pipe manufacturer's recommendations.

2.1.2 Mechanical Joint Restraint

a. Provide mechanical joint restraint as shown on the plans. Mechanical joint restraint shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of AWWA C110/A21.10.

b. Submit manufacturer's data and installation instructions for the flexible coupling, elastomeric sealant, ductile iron pipe and fittings, and joint restraint, prior to installation.

2.1.3 Universal Flexible Pipe Coupling

Provide sleeve-type, universal flexible pipe coupling, manufactured of elastomeric polyvinyl chloride (PVC), and shall be designed to fit the outside diameter of the new ductile iron pipe. Coupling shall meet the applicable requirements of ASTM C564 and shall be furnished with stainless steel clamps for compression of the coupling to the pipes. Coupling

material shall include an ultraviolet sunscreen, a fungicide preventative, and shall be resistant to ozone.

2.1.4 Elastomeric Sealant

Elastomeric sealant shall be a 2-component, premium grade, polyurethane-base in accordance with ASTM C920. Sealant primer and surface conditions shall be in accordance with the sealant manufacturer`s recommendation.

PART 3 EXECUTION

3.1 RESTRICTIONS ON WORK

a. Existing stormwater outfall pipes to be modified or removed, shall remain in service at all times, unless otherwise directed by the Contracting Officer.

b. All work shall be performed during daylight hours.

3.2 DEMOLITION/DECONSTRUCTION

Remove existing stormwater outfall pipes at the locations, and to the extent, as indicated on the contract drawings, and dispose of off-site. Existing stormwater outfall pipes and portions of existing pipe support systems shall be removed, repaired, and modified at the locations, and to the extent, as indicated on the contract drawings and as specified in Section 06 13 33 OUTFALL PIPE SUPPORTS.

3.3 OUTFALL PIPE SUPPORTS

Construct new pipe support systems as specified in Section 06 13 33 OUTFALL PIPE SUPPORTS, and as indicated to support the new outfall pipe sections. Dispose of generated construction debris off-site in accordance with State and Federal regulations.

3.4 PROTECTION

3.4.1 Shoring

Provide shoring including sheet piling, and install it as necessary to protect workmen and adjacent structures and utilities. Shoring, bracing, and sheeting shall be designed and sealed by a licensed professional engineer. Shoring, bracing, and sheeting shall be removed as excavations are backfilled, in a manner to prevent caving.

3.4.2 Drainage and Dewatering

Establish and maintain the drainage of modified outfall pipes associated with this contract at all times throughout the entire contract. Any excavation associated with the installation of the new pipes shall be graded to provide stable embankment slopes or sheeted and shored as specified herein. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary in accordance with the approved dewatering plan.

3.4.3 Underground Utilities

Location of the existing utilities indicated is approximate. The Contractor shall physically verify the location and elevation of the existing utilities indicated prior to starting construction.

3.4.4 Machinery and Equipment

Movement of construction machinery and equipment over pipes during construction shall be at the Contractor's risk. A minimum of 5-foot of beachfill cover over outfalls shall be placed prior to the use of equipment across these structures. Repair damage to existing outfalls due to the work operations at no additional cost to the Government.

3.5 EXCAVATION

Excavation will be unclassified regardless of the nature of the material encountered and shall be performed to the lines, grades, and elevation indicated.

During excavation, stockpile material satisfactory for backfilling trenches in an orderly manner and at a distance from the edges of trench equal to at least one-half the depth of excavation, but in no case closer than 2 feet. Remove from the site all other excavated material not required or not satisfactory for backfill and disposed of properly at no additional cost to the Government. Grade as necessary to prevent surface water from flowing into the excavation, and remove water accumulating therein to maintain the stability of the bottom and sides of the excavation. Determination of elevations and measurements of approved overdepth excavation of unsatisfactory material below grades indicated shall be done under the direction of the Contracting Officer.

3.5.1 Pipe Trenches

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. Trenches 3 feet deep or more shall be shored, cut back to a stable slope, or provided with equivalent means of protection for workers who may be exposed to moving earth or cave-ins. Vertical trench walls more than 5 feet high shall be shored in accordance with paragraph "Shoring". 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.

3.5.1.1 Bottom Preparation

Accurately grade the bottoms of trenches to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Remove stones of 1-inch or greater in any dimension to avoid point bearing.

3.5.2 Excavated Materials

Place satisfactory excavated material required for fill or backfill in the proper portion of the permanent work or stockpile the material if it cannot be readily placed.

3.5.3 Stockpiles

Stockpiles shall be kept in a neat and well drained condition, giving due consideration to drainage at all times.

3.6 PLACING PIPE

Examine each pipe thoroughly examined before being laid; defective or damaged pipe shall not be used. Install pipes and other fittings on the timber cribbing to the lines, slopes, and inverts shown on the contract drawings. Ensure that all pipe joints will be located within pipe support systems as shown on the contract drawings. Provide proper equipment for lowering sections of pipe into trenches. Do not lay pipe in water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Provide diversion of drainage or dewatering of trenches during construction as necessary to accomplish the work.

3.6.1 Ductile Iron Pipe (DIP)

Furnish 48-inch diameter ductile iron pipes in 20 foot nominal lengths, except as noted on the contract drawings. Be aware that the pipes supplied by the manufacturer may vary in length. Select the length of pipe to ensure the pipe joints are located within a pipe support system. Cutting of pipes to locate pipe joints within a pipe support system will not be permitted unless approved by the Contracting Officer.

3.6.1.1 Placing and Laying

Place pipe and accessories carefully onto the pipe support systems by means of derrick, ropes, belt slings, or other authorized equipment. Except where necessary in making connections with other lines or as approved by the Contracting Officer, pipe shall be laid with the bells facing in the direction of laying. The pipe shall be supported at all joints, at the discharge end, and at the connection to the existing discharge pipe. Remove and reinstall pipe that has the grade or joint disturbed after installation. Repair damaged coating or lining in a satisfactory manner and in accordance with manufacturers recommendations, at no additional cost to the Government.

3.6.1.2 Jointing

a. Locate pipe joints within the timber pile pipe supports as indicated. Install push-on type joints in accordance with AWWA C600 for buried lines or AWWA C606 above ground. One piece rubber gaskets shall be handled, lubricated where necessary, and installed in accordance with the pipe manufacturer's recommendations.

b. Connect new ductile iron outfall pipe section to existing pipe, using a universal flexible pipe coupling as shown on the contract drawings and as specified herein. Field modification may be required. Prior to installing the universal flexible coupling, clean new and existing pipes in accordance with SSPC SP 2 to produce a surface that is free of dirt, dust, loose rust or loose mill scale. Install flexible coupling and torque the clamps in accordance with the coupling manufacturer's instructions. Seal the couplings using elastomeric sealant as shown on the contract drawings.

3.6.1.2.1 Flexible Watertight, Gasketed Joints

Install gaskets in accordance with the manufacturer recommendations for use

with lubricants and other special installation requirements. Place the universal flexible pipe coupling over one end of a section of pipe for half the width of the coupling. The other half shall be doubled over the end of the same pipe. When the adjoining section of pipe is in place, the doubled-over half of the gasket shall then be rolled over the adjoining section. Correct unevenness in overlap so that the gasket covers the end of pipe sections equally. Center connecting bands over adjoining sections of pipe; place rods or bolts in position; and tighten the nuts.

3.6.1.2.2 Flexible Watertight Joints

Gaskets and jointing materials shall be as recommended by the joint material manufacturer in regard to use of lubricants, cements, adhesives, and other special installation requirements. Surfaces to receive lubricants, cements, or adhesives must be clean and dry. Affix gaskets and jointing materials to the pipe not more than 24 hours prior to the installation of the pipe, and protect from the sun, blowing dust, and other deleterious agents at all times. Inspect gaskets and jointing materials before installing the pipe; remove and replace any loose or improperly affixed gaskets and jointing materials. Align the pipe with the previously installed pipe, and push the joint to seat. If, while the joint is being made the gasket becomes visibly dislocated, remove the pipe and remake the joint.

3.6.1.2.3 Band Tightening

Tighten the connecting band evenly with even tension being kept on the rods or bolts, and the gasket; and seat the gasket properly in the corrugations. Watertight joints shall remain uncovered for a period of time designated, and before being covered, tightness of the nuts shall be measured with a torque wrench. If the nut has tended to loosen its grip on the bolts or rods, the nut shall be retightened with a torque wrench and remain uncovered until a tight, permanent joint is assured.

3.6.1.3 Mechanical Joint Restraint

Locate two mechanical joint restraints on each stormwater outfall system constructed, at the respective outfall pipe section, as indicated. Ensure joint restraint is positioned uniformly against timber cribbing prior to tightening joint restraint onto pipe.

3.7 BACKFILLING

3.7.1 Backfilling Pipe in Trenches

Notify the Contracting Officer's Representative prior to backfilling over outfall pipes and support systems. The COR will inspect the outfall extensions and support systems and determine if they are in compliance with the contract requirements. Any work determined not in compliance, shall be reworked and reinspected prior to backfilling over the pipes and support systems. After the pipe has been properly placed and supported, hand-place selected material from excavation or borrow under and 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. Thoroughly compact fill under the haunches of the pipe. Thoroughly compact each layer with mechanical tampers or rammers. Continue this method of filling and compacting until the fill has reached an elevation of at least one half the diameter of the pipe. Backfill the remainder of the trench around the outfall pipes and support systems to meet the beachfill

template, as specified in Section 35 31 00 BEACHFILL. Placement or grading of beachfill material around outfall pipes that have been removed and replaced and support systems that have been modified shall be done in a manner that minimizes the ponding of water. Protect the outfall pipes and support systems from damage during placement or grading of beachfill material.

Repair or replace damage that occurs to the outfall pipes or the piping support system caused by contract operations at no additional cost to the Government. Backfill shall be satisfactory materials selected from the required excavated beachfill materials or from satisfactory materials obtained from the borrow source as specified in Section 35 31 00, "BEACHFILL", to the extent shown on the drawings.

3.8 CLEANUP

Upon completion of the outfall work, remove debris and surplus materials resulting from the work and dispose of properly.

3.9 MEASUREMENT AND PAYMENT

a. The work specified in this section for providing outfall pipes will be measured for payment by the installed linear foot of pipe. The length of pipe will be determined by measuring along the centerline of the overall installed outfall pipe. All associated costs in connection therewith shall be included in the respective contract unit prices for the Bid Items titled "48-Inch Ductile Iron Pipe". Payment shall include excavating and trenching pipe, furnishing and installing new pipe, and backfilling.

b. The work specified in this section for the removal and disposal of existing pipe and pipe support systems will not be measured for payment. All costs associated with the removal and disposal of the pipe and pipe support systems, shall be included in the contract lump sum price for the Bid Item titled "Remove and Dispose of Existing Pipe and Pipe Supports".

-- End of Section --

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SECTION 35 20 23.13

NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM - SCOW MONITORING PROFILE

PART 1 GENERAL

1.1 DESCRIPTION

The work under this contract requires use of the National Dredging Quality Management Program (DQM)to monitor the dredge's status at all times during the contract and to manage data history. For the purpose of these specifications, a scow is defined as any non-self-propelled vessel used to transport dredged material. This includes, but is not limited to, split-hull scows, pocket scows, hopper barges, and deck barges.

This performance-based specification section identifies the minimum required output and the precision and instrumentation requirements. The requirements may be satisfied using equipment and technical procedures selected by the Contractor.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

National Dredging Quality Management Program Certification; G,COR

1.3 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION

1.3.1 Certification

The Contractor is required to have a current certification from DQM for the scow instrumentation system to be used under this contract. Criteria for certification is based on the most recent specification posted on the DQM website http://dqm.usace.army.mil/Specifications/Index.aspx, Verify compliance with these criteria by onsite quality assurance (QA) checks conducted by the DQM Support Center Data Acquisition and Analysis Team and by periodic review of the transmitted data. If a system is installed specifically for this contract, in order to ensure that it is capable of transmitting quality data to the DQM database, the QA checks should take place either prior to the start of the contract or, with prior approval of the local USACE District, as soon as practical after dredging commences. DQM Certification is valid for one year from the date of certification and is contingent upon the system's ability to meet the performance requirements as outlined in paragraph PERFORMANCE REQUIREMENTS. If issues with data quality are not corrected within 48 hours, the system certification will be revoked and additional QA checks by the Data Acquisition and Analysis Team may be necessary. Annual DQM Certification must be based on the following:

A series of QA checks as outlined on the DQM website https://dqm.usace.army.mil/Certifications/Index.aspx

Verification of data acquisition and transfer as described in paragraph PERFORMANCE REQUIREMENTS

Review of the Dredge Plant Instrumentation Plan (DPIP) as described in paragraph DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

1.3.2 Quality Assurance (QA)

The Dredging Contractor must have personnel who are familiar with the system instrumentation and who have the ability to recalibrate the sensors on site during the QA process. The Dredging Contractor must coordinate pickup times and locations and provide transportation to and from any platform with a DQM system to team personnel in a timely manner. The Dredging Contractor must also have on site for the QA checks a tug capable of towing the scow. As a general rule, DQM Data Acquisition and Analysis Team personnel will come with personal protective equipment (PPE) consisting of hardhats, steel toe boots, and life jackets. If additional safety equipment is needed, such as eye protection, safety harnesses, work gloves, or personal location beacons, provide these items to the team while on site. Submit a test data package to the DQM database from the system on each scow and have it accepted by the DQM Support Center prior to scow compliance checks. Also submit data collected during the QA Checks from the scow monitoring system to the DQM database and the Data Acquisition and Analysis Team personnel while on site. It is the Dredging Contractor's obligation to inform the QA team if the location designated for the QA checks has any site-specific safety concerns prior to their arrival on site.

The owner or operator of the scow must contact DQM at DQM-AnnualQA@rpsgroup.com on an annual basis, or at least three weeks prior to the proposed beginning of dredging, to schedule QA checks. This notification is meant to make the Data Acquisition and Analysis Team aware of a target date and the contract on which the plant will be used. At least one week prior to the target date, the Dredging Contractor must contact the Data Acquisition and Analysis Team and verbally coordinate a specific date and location. The Contractor must then follow up this conversation with a written email confirmation. The owner/operator must coordinate the QA checks with all local authorities including, but not limited to, the local USACE Contracting Officer's Representative (COR).

1.3.3 Recertification

Recertification is required for any yard work which produces modification to displacement (for example, a change in scow lines, or repositioning or repainting hull marks), modification to bin volume (change in bin dimensions or addition or subtraction of structure), or changes in sensor type or location; report these changes in the sensor log section of the DPIP. A system does not have to be transmitting data between jobs; however, in order to retain certification during this period, the system sensors or hardware should not be disconnected or removed from the scow. If the system is powered down, retain calibration coefficients.

1.4 DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

The Contractor must have a digital copy of the DPIP on file with the DQM Support Center. While working on site, the Contractor must also maintain on the dredge a copy of the DPIP which is easily accessible to Government personnel at all times. This document must describe the sensors used, configuration of the system, how sensor data will be collected, how quality

control on the data will be performed, and how sensors/data reporting equipment will be calibrated and repaired if they fail. A description of computed scow-specific data and how the sensor data will be transmitted to the DQM database must also be included. The Contractor must submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to start of work.

A complete list of the required DPIP contents is provided on the DQM website https://dqm.usace.army.mil/Certifications/Index.aspx. Submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to the start of work. Any changes to the computation methods must be approved by the DQM Support Center prior to their implementation.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 REQUIREMENTS FOR REPORTED DATA

Provide, operate, and maintain all hardware and software to meet these specifications. The Contractor is responsible for replacement, repair, and calibration of sensors and other necessary data acquisition equipment needed to supply the required data. Complete repairs within 48 hours of any sensor failure. Notify the Contracting Officer's Representative (COR) upon completion of a repair, replacement, installation, modification, or calibration. The COR may request recalibration of sensors or other hardware components at any time during the contract as deemed necessary.

Keep a log of sensor repair, replacement, installation, modification, and calibration in the onsite copy of the DPIP. The log must contain a three-year history of sensor maintenance, including the time of sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of sensor replacements, and the time that backup sensor systems were initiated to provide the required data. It must also contain the name of the person responsible for the sensor work. Install sensors that are capable of collecting parameters within specified accuracies and resolutions indicated in the following subparagraphs.

With the exception of position and any value calculated, reported sensor values should represent a weighted average with the highest and lowest values not included in the calculated average for the given interval. The averaging routine used should be consistent across all event triggers. This information should be documented in the DPIP sections that say "Calculations done external to the instrumentation." These data-reporting requirements cover the collection of electronic data on a scow through the entire dredging cycle. Disposal events can consist of both open-water disposal and offloading. Open-water disposal is the placement of material via bottom doors or split hull. Offloading is the placement of material via either hydraulic or mechanical means.

3.1.1 Scow Name

Assign a unique name for each scow that will remain constant from one dredging operation to the next.

3.1.2 Contract Number

The USACE-assigned contract number for the project will be reported.

3.1.3 Load Number

A DQM load number must document the end of a disposal event for a given scow.

3.1.4 Horizontal Positioning

Record horizontal positioning as the geographic coordinates of the vessel as indicated by the location of the Global Positioning System (GPS) antenna. Obtain all locations using a positioning system operating with a minimum accuracy level of 3 to 10 feet horizontal Circular Error Probable (CEP). Report positions as Latitude/Longitude WGS 84 in decimal degrees. West Longitude and South Latitude values are reported as negative.

3.1.5 Date and Time

Report the date and time to the nearest second and referenced to Universal Time Coordinated (UTC) based on a 24-hour format: yyyy-mm-dd hh:mm:ss.

3.1.6 Hull Status

Hull status is meant to reflect a condition when material could be removed or released from the scow. For this contract, hull status must register closed prior to leaving the disposal area.

3.1.6.1 Open-Water Disposal

Indicate an open split hull or open bottom door of a scow by reporting an "OPEN" value. Indicate a closed split hull or closed bottom door of a scow by reporting a "CLOSED" value. An open status must be indicated as the bin starts to open, and a closed status must be indicated only once the bin is fully closed. For pocket scows, the open/closed status must correspond to the compartment which is first to open and last to close.

3.1.7 Offloading

Offloading occurs when the scow is being unloaded, either by hydraulic or mechanical means. When offloading is occurring, a value of "true" must be reported; otherwise, a "false" value must be reported. The only permissible values are "true" and "false".

3.1.8 Course

Provide scow course-over-ground (COG) using industry-standard equipment. Provide scow course-over-ground (to the nearest whole degree) with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

3.1.9 Speed

Provide scow speed-over-ground in knots using industry-standard equipment with a minimum accuracy of 1.0 knot and resolution to the nearest 0.1 knot.

3.1.10 Heading

Provide scow heading using industry-standard equipment. The scow heading must be accurate to within 5 degrees and reported to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

3.1.11 Draft

Report all draft measurements in feet, tenths, and hundredths with an accuracy of plus or minus 0.1 foot relative to observed physical draft readings. Report the measurements at a resolution of two decimal places (hundredths of a foot). The reported forward draft value must be equal to the sum of the visual forward port and starboard draft mark readings divided by two. The reported aft draft value must be equal to the sum of the visual aft port and starboard draft mark readings divided by two. Forward draft, aft draft, and average draft will be reported. Place sensors at an optimum location on the scow to be reflective of observed physical draft mark readings at any trim or list. Minimum accuracies are conditional to relatively calm water. The reported sensor value is an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average draft is calculated for the purpose of determining displacement, maintain significant digits for average draft such that if forward draft were 0.15 and aft draft were 0.1, then the average draft would be 0.125.

3.1.12 Displacement

Report scow displacement in long tons, based on the most accurate method available for the scow. The minimum standard of accuracy for displacement is interpolation from the displacement table, based on the average draft. For this contract the density of water used to calculate displacement is _____* lbs/cubic foot and is used for an additional interpolation between the fresh and salt water tables.

*The water density used is project-/location-specific. Enter the appropriate water density in the blank:

Fresh Water: 62.43 lbs/cubic foot
Salt Water: 64.11 - 64.30 lbs/cubic foot

3.2 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIREMENTS

The Contractor's DQM system must be capable of collecting, displaying, and transmitting information to the DQM database. The parameters which must be reported to the DQM database include trip number, date and time, hull status, offloading status, scow course, scow speed, scow heading, draft, displacement. Provide an easily accessible, permanent visual display on the scow to show in real time the parameters collected by the system in the same units as the data submitted to the DQM database. In the event a reported parameter is calculated based on multiple sensors, the sensor values as used in the equation must be able to be viewed in addition to the required parameter. If a hardware problem occurs, or if a part of the system is physically damaged, the Contractor is be responsible for repairing it within 48 hours of determination of the condition.

3.2.1 Telemetry

The Contractor may select any commercial satellite, cellular phone, or other data communications systems available, as long as it is capable of transmitting real-time data as well as enough additional bandwidth to clear historically queued data when a connection is reobtained. If connectivity is lost, que and transmit unsent data upon restoration of connectivity. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.

The data transmission process from the scow to the DQM database must be automated. The data may be sent from the scow directly to the DQM database or to a shore-based system. Data transmitted to the DQM database should be raw data; use repeatable automated software or programming routine to process any shoreside data. Include a description of this process in the DPIP.

3.2.2 Data Reporting Frequency

Log disposal activities with high temporal and spatial resolution. Log data as a series of events. Each set of measurements (time, position, etc.) will be considered an event. Collect any required information in paragraph REQUIREMENTS FOR REPORTED DATA, that is not an averaged variable (that is, draft and ullage) within 1 second of the reported time. Measure data with sufficient frequency by the scow system to resolve the events to the accuracy specified in the following table. Any averaged variable must be collected and computed within this sampling interval. Reporting intervals must be consistent and not change for the data collected on a given scow. This interval should be documented by the Contractor in the DPIP.

Event Type	**Event Trigger Descriptions**	**Event Time Resolution**	**Event Position Resolution**
Loading	**No change in position with hull status closed** An elapsed time of 1 hour since the last event. NONCLOSURE In the event a scow has completed an open water disposal and transited back to a holding station without closing the hull, the sampling must be changed to once per hour.	1 minute	N/A
Sailing	**Change in position with hull status closed** Time from the last sample equals 1 minute.	1 second	plus or minus 10 ft

Event Type	Event Trigger Descriptions	Event Time Resolution	Event Position Resolution
Offloading	**Offloading material, hull status reported as open** A position must be recorded within 1 minute arrival at the offload location and within one secnd of the material starting to be removed from scow. The time from the last sample equals 1 minute. STANDBY OFFLOADING In the even a scow is not being actively offloaded at the offload location for a time equal to one hour, the sampling interval must be equal to once an hour.	1 second 1 minute	plus or minus 10 ft
Open Water Disposal	**Hull status open** A data point must be recorded within 1 second of the hull status going from closed to open and again within 1 second of the hull status going from open to closed. Between these events, report the data at equal interval from 6 to 12 seconds. This interval must always remain consistent for the dredge plant.	1 second	plus or minus 10 ft

Example: The scow is stationary for 1 hour and 15 minutes, and then it sails to the disposal area. You should have a "Loading/Stationary" event at time 0, time 1 hour, and time 1 hour and 15 minutes. Then, for "Sailing," within 1 second of an elapsed time of 1 minute from the 1 hour and 15 minutes event, another event occurs.

3.2.3 Data Transmission to the Web Service

Use a Simple Object Access Protocol (SOAP) web service to report sensor data to the DQM database. Transmit data as it is collected in real time and pushed to the DQM web service. If the web service is not available or returns an error message, store the data in a queue and transmit upon re-establishment of the connection, starting with the oldest data in the queue and continuing until real-time transmission is restored. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.

Contact dqm-support@usace.army.mil to obtain the web service URL and the appropriate key credentials and communication protocol.

The data transmission method call takes two arguments: a string containing the plant identifier assigned by the DQM Support Center and a second string containing the XML-formatted sensor data. The method returns the string "OK" if the data is received. If the data is not received, either the web service or the client application throws an error.

3.2.4 XML-Formatted Sensor Data String

Pass each scow event as a string on one continuous line of data. The example below is broken up by variable for ease of reading:

```
<?xml version="1.0"?>
<SCOW_DREDGING_DATA version="2.5">
   <SCOW_NAME>AU1994</SCOW_NAME>
   <PLANT_IDENTIFIER>1999</PLANT_IDENTIFIER>
   <CONTRACT>W123BA-09-D-0087_RL01</CONTRACT>
   <TRIP_NUMBER>34</TRIP_NUMBER>
   <X_POSITION>-81.670632</X_POSITION>
   <Y_POSITION>41.528987</Y_POSITION>
   <DATE_TIME>2010-08-14 10:50:15</DATE_TIME>
   <SCOW_SPEED>0.0</SCOW_SPEED>
   <SCOW_COURSE>0.0</SCOW_COURSE>
   <HULL_STATUS>OPEN</HULL_STATUS>
   <OFFLOADING>FALSE</OFFLOADING>
   <SCOW_HEADING></SCOW_HEADING>
   <SCOW_FWD_DRAFT></SCOW_FWD_DRAFT>
   <SCOW_AFT_DRAFT></SCOW_AFT_DRAFT>
   <SCOW_AVG_DRAFT></SCOW_AVG_DRAFT>
   <ULLAGE_FWD></ULLAGE_FWD>
   <ULLAGE_AFT></ULLAGE_AFT>
   <ULLAGE_AVG></ULLAGE_AVG>
   <SCOW_BIN_VOLUME></SCOW_BIN_VOLUME>
   <SCOW_DISPLACEMENT></SCOW_DISPLACEMENT>
   <ADDITIONAL_DATA>Some more scow info, if needed</ADDITIONAL_DATA>
</SCOW_DREDGING_DATA>
```

Format DATE_TIME values as YYYY-MM-DD HH:MM:SS, as shown above. If, for any reason, a field has no value, the enclosing XML tags should be sent with nothing between them (for example, <DRAFT_AFT></DRAFT_AFT>). The web service cannot handle a "null" value or any other indicators of no value collected.

3.2.5 Contractor Data Backup

Maintain an archive of all data sent to the DQM database during the dredging contract. The Contracting Officer's Representative (COR) may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. Provide the data in the HTML format which would have been transmitted to the DQM database. Submit data via storage medium acceptable to the COR.

At the end of the dredging contact, contact the DQM Support Center prior to discarding the data. The DQM Support Center will verify that all data has been received and appropriately archived before giving the Contractor discard permission. Record in a separate section at the end of the scow's

onsite copy of the DPIP the following information:

Person who made the call
Date of the call
DQM representative who gave permission to discard

3.3 PERFORMANCE REQUIREMENTS

The Contractor's DQM system must be fully operational at the start of dredging operations and fully certified prior to moving dredge material on the contract (see paragraph NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION). To meet contract requirements for operability, in addition to certification, the Contractor's system must provide a data string with values for all parameters while operating, as described within the specifications. Additionally, all hardware must be compliant with DPIP requirements (see paragraph DREDGE PLANT INSTRUMENTATION PLAN (DPIP)). Quality data strings are considered to be those providing values for all parameters reported when operating according to the specification. Make repairs necessary to restore data return compliance within 48 hours. Failure by the Contractor to report the required data within the specified time window for scow measurements (see paragraph DATA REPORTING FREQUENCY, and paragraph DATA TRANSMISSION TO THE WEB SERVICE) and failure to receive DQM certification prior to dredging will result in withholding of up to 10 percent of the contract progress payment.

3.4 LIST OF ITEMS TO BE PROVIDED BY THE CONTRACTOR

DPIP - https://dqm.usace.army.mil
https://dqm.usace.army.mil/Certifications/Index.aspx

DQM SYSTEM
Sensor instrumentation - Paragraph REQUIREMENTS FOR REPORTED DATA

SCOW DATA
Event documentation - Paragraph DATA REPORTING FREQUENCY
Data reports - Paragraph DATA TRANSMISSION TO THE WEB SERVICE

QA EQUIPMENT ON THE DREDGE
Clear and accurate draft marks

3.5 MEASUREMENT AND PAYMENT

No separate measurement or payment shall be made for installation, operation, and maintenance of the DQM-certified system as specified herein for the duration of the dredging operations; all costs in connection therewith shall be considered a subsidiary obligation of the Contractor and covered under the contract unit prices for "Beachfill" in the bidding schedule.

-- End of Section --

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SECTION 35 20 23.33

NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM - PIPELINE HYDRAULIC DREDGE

PART 1 GENERAL

1.1 DESCRIPTION

The work under this contract requires use of the National Dredging Quality Management Program (DQM)to monitor the dredge's status at all times during the contract and to manage data history.

This performance-based specification section identifies the minimum required output and the precision and instrumentation requirements. The requirements may be satisfied using equipment and technical procedures selected by the Contractor.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

National Dredging Quality Management Program Certification; G,COR

1.3 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION

The Contractor is required to have a current certification from the DQM Program for the cutter/suction head hydraulic dredge instrumentation system to be used under this contract. Standard Operating Procedures (SOP) and criteria for certification are presented on the DQM website at https://dqm.usace.army.mil.

1.4 DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

The Contractor must have a digital copy of the Dredge Plant Instrumentation Plan (DPIP) on file with the DQM Support Center. While working on site, the Contractor must also maintain on the dredge a copy of the DPIP, which is easily accessible to Government personnel at all times. This document must accurately describe the sensors used, the configuration of the system, how sensor data will be collected, how quality control on the data will be performed, and how the sensors/data-reporting equipment will be calibrated and repaired if it fails. A description of the computed dredge-specific data and how the sensor data will be transmitted to the DQM database will also be included. Prior to the start of work, the Contractor must submit to the DQM Support Center any addendum or modifications made to the plan subsequent to its original submission. Requirements and a template for the DPIP are available on the DQM website at https://dqm.usace.army.mil.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 REQUIREMENTS FOR REPORTED DATA

Provide, operate, and maintain all hardware and software to meet these specifications. The Contractor is also responsible for the replacement, repair, and calibration of the sensors and other necessary data acquisition equipment needed to supply the required data. Document and complete the procedure to complete a repair as soon as practical. If repair is not possible within two business days of any sensor failure, submit a plan and timeline to complete the repair. Upon completion of a repair, replacement, installation, modification, or calibration, notify the Contracting Officer's Representative (COR). The COR may request recalibration of the sensors or other hardware components at any time during the contract as deemed necessary.

Keep a log of sensor repair, replacement, installation, modification, and calibration in the dredge's onboard copy of the DPIP. The log must contain a three-year history of sensor maintenance, including the time of the sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of sensor replacements, and the time that backup sensor systems were initiated to provide the required data. It must also contain the name of the person responsible for the sensor work. Install sensors that are capable of collecting parameters within the specified accuracies and resolutions indicated in the following subparagraphs and transmit these parameters to the DQM database. Transmit all data in JSON message bundles. Each bundle can contain multiple message types. Transmit sensor data as work event messages, and transmit data which relates to the operational state of the dredge or its sensors as state event messages. (See paragraph PARAMETER TRANSMISSION TO THE WEB SERVICE.)

3.1.1 Message Bundle Data

Every message bundle must contain descriptive data that relates the message to a given dredge plant and date/time. Identify the start of a message bundle by the tag "DQM_data".

3.1.1.1 Messages

Messages contain operational data that populates the DQM database for a dredge plant. A message must consist of an event type and its associated data (as defined in paragraph DREDGE EVENTS - WORK EVENT and paragraph DREDGE EVENTS - STATE EVENT), a date/time stamp indicating when the event occurred or started, and a comment providing clarification or metadata about the situation. There are multiple event types, but they all fall into one of two categories - work events and state events.

3.1.1.1.1 Message Time

In a work event message, message time is the date and time that the data is collected from the sensors; in a state event message, message time is the date and time that the state event begins. Report and reference the message time to the nearest second and to Coordinated Universal Time (UTC) time based on a 24-hour format (*YYYY-MM-DD HH:MM:SS*). In order to ensure accuracy and reliability, synchronize the time stamp to UTC format from an accurate, unchangeable source (for example, a GPS National Marine Electronics Association (NMEA) datastring). Identify message time by the

tag "msg_time".

3.1.1.1.2 Comment

Comments concerning the work event or state event messages being transmitted provide descriptive information that relates to the data. An example of a comment for work event data is information about a sensor issue; an example of a comment for state event data is a description of operations. Identify a comment by the introductory tag "comment", and the comment must not consist of more than 250 characters.ext

3.1.1.2 Dredge Events - Work Event

There are two types of dredge event messages - work event messages and state event messages. Work event messages contain data that are instantaneously collected or calculated from sensors and are logged as a series of events. Work events are triggered by a time interval change (as described in paragraph WORK EVENT MESSAGES). Initiate all work event messages by the header tag "work_event".

3.1.1.2.1 Vertical Correction

Obtain the variation of the water level from the vertical datum for the river stage or tidal gage described in the state events using appropriate equipment to give the water level with an accuracy of plus or minus 0.1 ft. Enter vertical correction values above project datum described in the dredging specification with a positive sign and those below with a negative sign. The tag for vertical correction is "vert_correction".

3.1.1.2.2 Cutter/Suction Head Location and Movement

Monitor the X, Y, and Z components of the cutter/suction head location. Additional calculations made from the observed values determine the rates of movement to track the progress of the dredge.

3.1.1.2.2.1 Cutter/Suction Head Horizontal Position

Obtain the forwardmost point of the cutter/suction head using a positioning system operating with a minimum accuracy level of 3-10 feet horizontal Circular Error Probable (CEP). Report it as Latitude/Longitude WGS 84 in decimal degrees with West Longitude and South Latitude values reported as negative. Identify position values by the tags "ch_latitude" and "ch_longitude".

3.1.1.2.2.2 Cutter/Suction Invert Depth

Cutter/suction invert depth is the depth of the invert of the suction mouth relative to the surface of the water. Instrumentation must be capable of reporting to an accuracy of plus or minus 0.5 foot and a resolution to the nearest 0.1 foot with no tidal adjustments. Minimum accuracies are conditional to relatively calm water. Use the tag "ch_depth" to identify the cutter/suction head depth.

3.1.1.2.2.3 Cutter/Suction Head Heading

The cutter/suction head heading is the angle of the centerline of the cutter/suction head and dredge ladder measured relative to true north. Provide all headings using industry-standard equipment. The heading must be accurate to within 5 degrees and reported to the nearest whole degree

with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention. Use the tag "ch_heading" to identify the cutter/suction head heading.

3.1.1.2.3 Dredge Activity

Monitor dredge activity using a combination of the following parameters.

3.1.1.2.3.1 Slurry Velocity

Use a flow-metering device, calibrated according to the manufacturer's specifications, to record the slurry velocity to the nearest 0.01 fps with an accuracy of plus 0.5 fps. If the manufacturer does not specify a frequency of recalibration, conduct calibration prior to the commencement of work. Measure the slurry velocity for the same pipeline inside diameter as that used for the slurry density measurement. Associate the tag "slurry_velocity" with this value.

3.1.1.2.3.2 Slurry Density

Use a density-metering device, calibrated according to the manufacturer's specifications, to record the slurry density to the nearest 0.01 g/cc. It is understood that the accuracy of this sensor can vary based on several factors, including the type of material, the magnitude of the cut, and the length of time since calibration. If the manufacturer does not specify a frequency of recalibration, conduct calibration prior to the commencement of work. Continuous monitoring of this sensor ensures that drift and other factors inherent in the dredging process can be accounted for in monitoring dredge activity. Associate the tag "slurry_density" with this value.

3.1.1.2.3.3 Pump RPM

The pump rpm is the number of revolutions per minute measured for the slurry pump shaft. Measure the shaft revolution rate (rev/min) with the highest level of accuracy that is standard on the vessel's operational displays either at the bridge or in the engine room. Identify this value by the tag "rpm".

3.1.1.2.3.4 Pump Vacuum

Measure the vacuum pressure of the dredge pump(s) (inches of mercury) as near to the eye as practicable in the pump's suction pipe with the highest level of accuracy that is standard on the vessel's operational displays either at the leverman's controls or in the engine room. Identify vacuum pressure by the tag "vacuum".

3.1.1.2.3.5 Pump Outlet Pressure

Measure the pump outlet pressure in the discharge line on the pump side of the flap valve in terms of pounds per square inch (psi) on a gauge. Identify pump outlet pressure by the tag "outlet_psi".

3.1.1.2.4 Outfall Information (Open Water/Spill Barge Disposal)

Monitor the X and Y position of the terminal end of the outfall pipe continuously and report the position as part of the work event string.

3.1.1.2.4.1 Discharge Horizontal Position

Obtain the horizontal position of the outfall end of the discharge pipe using a positioning system operating with a minimum accuracy level of 3-10 feet horizontal Circular Error Probable (CEP). Report it as Latitude/Longitude WGS 84 in decimal degrees with West Longitude and South Latitude values being reported as negative. Identify position values by the tags "outfall_latitude" and "outfall_longitude".

3.1.1.3 Dredge Events - State Event

There are two types of dredge event messages - work event messages and state event messages. State event messages provide information about the current state of the dredge equipment or operations. They are created and sent only when a state changes. Since state events often cannot be collected in real time, state events are tagged with a date time stamp (referenced to Coordinated Universal Time (UTC) that indicates when the state change happened relative to the work event message tag. This data is considered to be "true" until another state event tag of the same type is received. Indicate each type of state event message by a specific header tag as enumerated in the following subparagraphs. State events can be transmitted along with work event message bundles directly by the contractor using the indicated format, or they can be entered on the "State" tab in the DQM-provided software. However, they should be sent only if the state value changes.

3.1.1.3.1 Message Time

The state event time is the date and time that the event starts. Enter the leverman's time to the nearest second as local time and automatically convert to and report in UTC based on a 24-hour format (YYYY-MM-DD HH:MM:SS). Identify message time by the tag "msg_time".

3.1.1.3.2 Contract Event

Report information concerning the contract under which dredging is being performed at the start and completion of each contract using the header tag "contract_event".

3.1.1.3.2.1 Contract Number

Report the USACE-assigned contract number for the project using the tag "contract_number".

3.1.1.3.2.2 Contract Start and End

Report the start and end of a contract using the tag "event_type" with the appropriate value of "start" or "end".

3.1.1.3.3 Tide Station/River Stage Gage Event

Group together properties associated with the vertical correction (see paragraph VERTICAL CORRECTION) for the tide station/river stage gage under the header tag "station_event". This information must be sent at the start of the contract and each time the dredge has moved enough to change the station being used.

3.1.1.3.3.1 Station Name

The station name is a concise name defining the tide station/river stage gage begin referred to. It must be introduced by the tag "station_name", and it must not consist of a descriptor of more than 25 characters.

3.1.1.3.4 Length of Pipe Event

Report the leverman's estimate of the length of pipe downflow from the dredge pump, measured to the nearest whole foot, under the header tag "pipe_length_event". This information must be sent at the start of the contract and at the completion of each 24-hour period ending at midnight local time.

3.1.1.3.4.1 Floating Pipe

Report the total length of floating pipe with the tag "length_floating".

3.1.1.3.4.2 Submerged Pipe

Report the total length of floating pipe with the tag "length_submerged".

3.1.1.3.4.3 Shore Pipe

Report the total length of shore pipe with the tag "length_land".

3.1.1.3.5 Booster Pump

Include information concerning the booster pumps being used under the header tag "booster_pump_event". A message must be sent to indicate any change in the status of the booster pumps being used.

3.1.1.3.5.1 Number of Booster Pumps

Upon the addition or removal of a booster pump, report the total number of booster pumps being used with the tag "booster_total".

3.1.1.3.6 Dredge Advance

Measure the dredge advance, the total forward progress of the dredge relative to the centerline of the cut, to the nearest whole foot and cumulatively calculate over a 24-hour period from midnight to midnight local time. Identify it by the tag "advance_daily". Report in Greenwich Mean Time (GMT)the msg_time associated with this tag as the first timestamp of the following 24-hour period (based on the local time) rather than as midnight of the day for which the value was calculated.

3.1.1.3.7 Outfall Information

Monitor and send the X and Y position of the terminal end of the outfall pipe at the start of the contract and thereafter according to the following table. Discharge Heading and Pipe Elevation may be omitted if the dredge is not discharging into an upland disposal site. For beach nourishment, the horizontal X and Y position of the outfall must be sent at the start of the contract and at the completion of each 24-hour period ending at midnight local time.

Discharge Location	Horizontal Position	Discharge Pipe Elevation	Discharge Outfall Heading
Open Water	Continuous Work Event	N/A	N/A
Scow	Upon Change	N/A	N/A
Beach	Every 24 Hours	N/A	N/A
Upland	Upon Change	Upon Change	Upon Change

3.1.1.3.7.1 Discharge Location

Report information on where the slurry is being discharged with the tag "outfall_location". Acceptable values include "upland", "open water", "beach", and "scow".

3.1.1.3.7.2 Discharge Horizontal Position

Obtain the horizontal position of the outfall end of the discharge pipe using a positioning system operating with a minimum accuracy level of 3-10 feet horizontal Circular Error Probable (CEP). Report it as Latitude/Longitude WGS 84 in decimal degrees with West Longitude and South Latitude values being reported as negative. Identify position values by the tags "outfall_latitude" and "outfall_longitude".

3.1.1.3.7.3 Discharge Outfall Heading

The discharge outfall heading is the angle relative to true north measured from the centerline of the pipe in the direction of discharge. Provide all headings using industry-standard equipment. They must be accurate to within 5 degrees and report to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention. Identify the discharge heading by the tag "outfall_heading".

3.1.1.3.7.4 Discharge Pipe Elevation

The discharge pipe elevation is the height of the outfall measured in feet and tenths of a foot relative to the project datum. The required accuracy is contingent upon contract requirements. Use the tag "outfall_elevation" to identify this elevation.

3.1.1.3.8 Non-effective Work Event

Report delays and dredge downtime at the conclusion of the event. Submit the reason for the non-effective work time under the header tag "non_eff_event" within 24 hours of the event.

3.1.1.3.8.1 Non-effective Work Interval

Report the start and end times for the non-effective work event using the tags "msg_start_time" and "msg_end_time".

3.1.1.3.8.2 Dredge Function Code

Transmit the dredge operator indication of production delays, as listed on Form 4267, at the end of the non-effective interval. Identify dredge function event messages by the tag "function_code" consisting of one of the

following standardized entries to indicate the operation:

AGV	Assisting Grounded Vessels
CCH	Change Cutterhead
CCSH	Clear Cutter Suction
CLPJ	Change Location Bar
COLL	Collision
CPPL	Clear Pump Pipeline
CPR	Change Impeller
DR	Dike Repair
FBD	Fire Boat Drills
HPL	Handling Pipe Line
HSL	Handling Swing Line
HSP	Handling Shore Pipe
LDNE	Loss Due to Natural Elements
LDPV	Loss Due to Passing Vessel
LNL	Transfer to New Location
MISC	Miscellaneous
MOB	Mobilization & Demobilization
MSC	Miscellaneous/Non-pay
OC	Out of Commission
OR	Operating Repairs
P	Preparation
PREP	Preparation & Making Up Tow
RPL	Repair Pipeline
SB	Sounding & Buoying
SBT	Stand-By Time as Directed
SH	Sundays-Holidays
TFS	Taking on Fuel & Supplies
TOW	Time on Tow
WAP	Waiting Attendant Plant

3.1.1.3.8.3 Additional Comments

Use the "comment" tag to provide additional explanation for the noted delays or downtimes. For example, when the code "LDPV" (Loss Due to Passing Vessel) is indicated, list the name of the vessel and the number of tows with the "comment" tag.

3.2 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIREMENTS

The Contractor's DQM system must be capable of collecting and transmitting information to the DQM system. Record the applicable parameters from paragraph REQUIREMENTS FOR REPORTED DATA as local events and transmit continuously to the DQM database anytime an Internet connection is available. To accomplish this transmission, there are two options. The first option is to equip the vessel with a DQM computer system consisting of a computer, monitor, keyboard, mouse, data modem, Universal Power Supply (UPS), and network hub. Provide a standalone computer system, exclusive to the DQM monitoring system, with USACE DQM software installed on it. If a hardware problem occurs, or if a part of the system is physically damaged, the Contractor is responsible for repairing it within two business days of the determination of the condition or submitting a plan and timeline for repair if the repair will take more than two business days.

The second option is to send data directly to DQM's web endpoint as outlined in paragraph DIRECT DATA TRANSMISSION.

3.2.1 Computer Requirements

Provide a dedicated onboard computer for use by the Dredging Quality Management system. This computer must run the USACE DQM software and receive data from the Contractor's data-reporting interface. This computer must meet or exceed the following performance specifications:

CPU:	Intel or AMD processor with a (non-overclocked) clock speed of at least 1.6 gigahertz (GHz)
Hard drive:	250 gigabytes (GB); internal
RAM:	4 gigabytes (GB)
Ethernet adapter:	Internal network card with an RJ-45 connector
Ports:	1 free serial port with standard 9-pin connectors; 1 free USB port
Other hardware:	Keyboard, mouse, monitor

Install a fully licensed copy of Windows 10 Professional Operating System or higher on the computer specified above. Also install any necessary manufacturer-provided drivers for the installed hardware.

Locate and orient this computer to allow data entry and data viewing as well as to provide access to data ports for connection of external hardware.

3.2.2 Software

The DQM computer's primary function is to transmit data to the DQM shoreside database. Do not install software which conflicts with this function on this computer. The DQM computer must have the USACE-provided Dredging Quality Management Onboard Software (DQMOBS) installed on it by DQM personnel.

3.2.3 UPS

Supply an Uninterruptible Power Supply (UPS) for the computer and networking equipment. It must interface with the DQM computer to communicate UPS status, and it must provide backup power at 1 kVA for a minimum of 10 minutes. Ensure that sufficient power outlets are available to run all specified equipment.

3.2.4 Direct Data Transmissions

Option 2: Direct Data Transmissions to the DQM Web Service - Use the web service to report sensor data to the DQM database. Data must be transmitted as it is collected in real time and pushed to the DQM web service. If the web service is not available or returns an error message, the data must be stored in a queue and transmitted upon re-establishment of the connection, starting with the oldest data in the queue and continuing until real-time transmission is restored.

Contact dqm-support@usace.army.mil to obtain the web service URL and the appropriate key credentials and communication protocol. If this option is chosen, a display of the raw data being transmitted to DQM must be easily accessible and visible onboard the dredge

3.2.5 Internet Access

Maintain an Internet connection capable of transmitting real-time data to the DQM server as well as enough additional bandwidth to clear historically queued data when a connection is re-established. If connectivity is lost, que and transmit unsent data upon restoration of connectivity. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.

Acquire and install all necessary hardware and software to make the Internet connection available for data transmission to the DQM web service. Configure the hardware and software to allow the DQM Support Center remote access to this computer, and the telemetry system must be capable of meeting these minimum reporting requirements in all operating conditions.

In areas with poor cellular service and at the local District's discretion, it may be required to manually download the data on a daily basis using the protocol for retrieving and submitting backup files provided by the DQM Support Center. This method of data transmission should be used only if Internet connectivity is unavailable at the dredging site, and it should be considered a temporary measure.

3.2.6 Data Routing Requirements

Onboard sensors continually monitor dredge conditions, operations, and efficiency and route this information to the shipboard dredge-specific system (DSS) computer to assist in guiding dredge operations. Portions of this Contractor-collected information, as described in this specification, must be routed to the DQM computer on a real-time basis utilizing one of the two options outlined in this section. Use an RS-232 serial interface with a baud rate of 9600 or 19200 bps to send standard sensor data to the DQM computer. Configure the serial interface as 8 bits, no parity, and no flow control.

Digitally log and transmit information regarding changes in the state of the dredge as close to the time of the occurrence as possible. These events can either be included in a separate message bundle going to the DQM onboard computer, or they can be entered on the "State" tab in the DQM Pipeline Software, or entered online in the DQM State Data Tool.

3.3 DREDGE MONITORING DATA

3.3.1 General

Onboard sensors continuously collect dredging data in support of the dredge Contractor's operations. Portions of this Contractor-collected information, as described in this specification, and store and transmit calculations based on them to the DQM database on a near real-time basis. Additionally, digitally log and transmit information regarding the state of the dredge.

3.3.2 Data Measurement Frequency

The frequency of data transmission is dependent on the type of message being sent. Work Event messages contain data that are instantaneously collected or calculated from sensors and are logged as a series of events.

State event messages are activated by a change in the dredge state.

3.3.2.1 Work Event Messages

Log data as a series of events. Each event must consist of a dataset containing dredge information (as defined in paragraph REQUIREMENTS FOR REPORTED DATA). Consider each set of measurements (for example, time and position) an event with a 6-12 second interval between work events. This interval must remain consistent across event types for the dredge plant.

Record a standard data string within one second of an event trigger with the time stamp and all parameters reflecting when the event happened.

3.3.2.2 State Event Messages

Consider a set of descriptive information (event name, time, description, comment) a state event. Record these events within 24 hours of a change in state with the time stamp reflecting when the event happened.

3.3.3 Parameter Transmission to the Web Service

Format the data as JSON (JavaScript Object Notation, as defined at http://www.json.org) strings of arbitrary length. These JSON strings represent a hierarchical data structure consisting of a message bundle which may contain 0-3 automatic data messages and any number of manual data messages.

A tag/parameter is reported only when it contains a value. Do not include "Null" value strings in a message bundle.

```
**************************
Message bundle
**************************

{
  "DQM_Data": {
      "plant_identifier": <integer value 0000-9999>,
      " transmission_time": <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
    "messages": [
      {
        "work_event": {
        "msg_time":             <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
          "vert_correction":    <floating point 100th decimal place>,
          "ch_latitude":        <decimal to 6 decimal places>,
          "ch_longitude":       <decimal to 6 decimal places>,
          "ch_depth":           <floating point 100th decimal place>,
          "ch_heading":         <integer value 000-359>,
          "slurry_velocity":    <floating point 100th decimal place>,
          "slurry_density":     <floating point 100th decimal place>,
          "pump_rpm":           <integer>,
          "vacuum":             <floating point 100th decimal place>,
          "outlet_psi":         <floating point 100th decimal place>,
          "comment":            <string>},
        }
      },
      {
        "contract_event": {
          "msg_time":           <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
          "contract_number":    <string>,
```

```
                "event_type":        <string - "start" or "end">,
                "comment":           <string>
              }
            },
            {
              "station_event": {
                "msg_time":          <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
                "station_name":      <string>,
                "comment":           <string>
              }
            },
            {
              "pipe_length_event": {
                "msg_time":          <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
                "length_floating":   <integer>,
                "length_submerged":  <integer>,
                "length_land":       <integer>,
                "comment":           <string>
              }
            },
            {
              "booster_pump_event": {
                "msg_time":          <24-hour UTC time YYYY-MM-DDHH:MM:SS>,
                "booster_total":     <integer>,
                "comment":           <string>
              }
            },
            {
              "advance_Event": {
                "msg_time":          <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
                "advance_daily":     <integer>,
                "comment":           <string>
              }
            },
            {
              "outfall_position": {
                "msg_time":          <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
                "outfall_location":  <string-"upland", "beach", "scow", "open
      water">
                "outfall_latitude":  <decimal to 6 decimal places>,
                "outfall_longitude": <decimal to 6 decimal places>,
                "outfall_heading":   <integer value 000-359>,
                "outfall_elevation": <floating point 10th decimal place>,
                "comment":           <string>
              }
            },
            {
              "non_eff_event": {
                "msg_start_time":    <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
                "msg_end_time":      <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
                "function_code":     <string - 1 to 4 characters>,
                "comment":           <string>

              }
            }
        ]
      }
    }
```

3.3.4 Contractor Data Backup

Maintain an archive of all data sent to the DQM computer during the dredging contract. The COR may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. Provide the data in the same JSON format as would have been transmitted to the DQM computer. There must be no line breaks between the parameters, and each record string must be on separate line. The naming convention for the files must be <*dredgename*>_<*StartYYYYMMddhhmmss*>_<*EndYYYYMMddhhmmss*>.txt.
Data submission must be via a storage medium acceptable to the COR.

At the end of the dredging contact, call the National DQM Support Center prior to discarding the data. The DQM Support Center will verify that all data has been received and appropriately archived before giving the Contractor discard permission. Record the following information in a separate section at the end of the dredge's onboard copy of the DPIP:

Person who called the National DQM Support Center
Date of the call
DQM representative who gave permission to discard the data

3.4 PERFORMANCE REQUIREMENTS

The Contractor's National Dredging Quality Management Program's data transmission must be fully operational at the start of dredging operations. To meet contract requirements for operability, the Contractor's system must provide an accurate data string return and be compliant with hardware requirements. Data string return is defined as the number of quality records within an event or state tag sent by the contractor's system to the DQM database. Quality data strings are considered to be those providing accurate values for all parameters reported when operating according to the specification. Make repairs necessary to restore data return compliance within two business days, or submit a plan and timeline for repair if the repair will take more than two business days. Failure by the Contractor to report quality data within the specified time window for dredge measurements as stated in the specifications (see paragraph INTERNET ACCESS, paragraph DATA MEASUREMENT FREQUENCY, and paragraph PARAMETER TRANSMISSION TO THE WEB SERVICE, will result in withholding of up to 10 percent of the contract progress payment.

3.5 LIST OF ITEMS TO BE PROVIDED BY THE CONTRACTOR

DPIP
https://dqm.usace.army.mil

DQM System
Paragraph 3.2 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIREMENTS, including all subparagraphs

Dredge Data
Paragraph DREDGING MONITORING DATA

3.6 MEASUREMENT AND PAYMENT

No separate measurement or payment shall be made for installation, operation, and maintenance of the DQM-certified system as specified herein for the duration of the dredging operations; all costs in connection therewith shall be considered a subsidiary obligation of the Contractor and

covered under the contract unit prices for "Beachfill" in the bidding schedule.

-- End of Section --

SECTION 35 31 00

BEACHFILL

PART 1 GENERAL

1.1 SCOPE OF SECTION

The work covered by this section consists of furnishing all labor, materials, plant, and equipment, and performing all operations required for dredging/excavating the beachfill material from the borrow areas as indicated and placing the material on the beach within the construction template, as shown on the drawings.

1.2 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D2487	(2017; E 2020) Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D6913/D6913M	(2017) Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Health Requirements Manual

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

33 CFR 156	(2010) Navigation and Navigable Waters, Oil and Hazardous Material Transfer Operations

1.3 DEFINITIONS

1.3.1 Dredging

Removal of beachfill material from the borrow areas below MLW.

1.3.2 Excavation

Removal of beachfill material from the borrow areas above MLW.

1.3.3 Dredge Pump

The intake location for the selected method of dredging. i.e. hopper draghead, clamshell bucket, hydraulic cutterhead, submersible dredge pump.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Borrow Area(s) Mapping; G,DO
Debris Prevention Plan; G,COR
Work Plan; G,DO
Shoring and Sheeting Plan; G,DO
Night Operation Lighting Plan; G,COR
Pumpout Plan; G,COR
Vessel and Equipment List; G,COR
Grade Stake Recovery Plan; G,COR
Existing Feature Protection Work Plan; G,DO

SD-06 Test Reports

Daily Report of Operations; G,COR
Fuel Usage
Daily Dredge Pump Positioning Records; G,COR
Gradation Test Results; G,DO
Test Reports; G,DO

SD-07 Certificates

Adjusted Construction Template Request; G,DO
Backpassing Plant Position Map

1.5 WORK PLAN

Submit a detailed plan for the means and methods of removing the material from the borrow areas and placing it in the areas shown on the drawings, including equipment proposed for use. Show in the plan the pipeline layout, safety fence locations, personnel to be used to patrol closed beach and borrow areas, signage, and include the surveying procedures, methods, and equipment for topographic surveys, hydrographic surveys, and tidal monitoring, as specified in Section 01 71 23 SURVEY REQUIREMENTS. Include in the work plan the means and methods for dune construction, and include the surveying procedures, work methods, and equipment proposed for use. In addition, include in the plan the safe working wave height limits for daily work procedures, the proposed method of excavating material adjacent to and from the end of the existing outfall pipes.

1.6 SHORING AND SHEETING PLAN

If shoring and sheeting are proposed for use, submit drawings and calculations, certified by a registered professional engineer, describing the methods for shoring and sheeting of excavations a minimum of 15 days prior to starting work. Drawings shall include material sizes and types, arrangement of members, and the sequence and method of installation and removal. Calculations shall include data and references used.

1.7 NIGHT OPERATION LIGHTING PLAN

If work is to be performed at night, develop and submit a night operation lighting plan in conformance with EM 385-1-1 to ensure that all activities, areas, and operations are adequately illuminated to perform work safely and that adequate lighting is provided for the full duration of the night operation. Include with the plan the proposed methods and equipment to be used for night operation.

1.8 DAILY DREDGE PUMP POSITIONING RECORDS

For all dredging and for dredging equipment employed under this Contract, utilize a computerized positioning system capable of representing the horizontal and vertical position of the dredge pump at any given time throughout the dredging cycle. Record horizontal and vertical positioning at intervals not greater than one minute in duration. Submit horizontal and vertical (x,y,z) positions of the dredge pump, draghead, bucket, or cutterhead, in an approved electronic format. Commercially available systems such as those offered by companies under the registered trademarks of Dredgepak, Winops, or similar proprietary systems developed by the Contractor would be considered satisfactory. The system shall produce a record of the working locations, horizontal and vertical, of the dredge pump in a continual display and in a submittal satisfactory to the COR. Submit this information daily with the Daily Operations Report.

1.9 VESSEL AND EQUIPMENT LIST

Submit a complete list of all vessels and equipment to be used during the contract, including all backpassing plants, supporting vessels, and equipment. Include the types, the numbers of each, the draft of each, and all other pertinent information. Include the capacity of all scows, if used. List the survey vessel, survey crew, type of survey equipment, and software that may be used.

1.10 FUEL USAGE

Submit reports, to be received on or before the last day of each month, listing the totals of fuels consumed by the dredging plant and supporting vessels. Separately list on each report the quantities of each type of fuel used. The reports shall cover the period from the 25th of the preceding month to the 25th of the current month.

1.11 BORROW MATERIAL

1.11.1 Location of Borrow Material

a. The location of the borrow areas and the limit to which removal of material is permitted is shown on the drawings.

b. The borrow source for all beachfill work under this contract are Borrow Areas A, B and C.

c. Remove at least 85 percent of available material from the combined full limits of Borrow Areas A and B before proceeding to Borrow Area C. The 85 percent requirement only applies to locations where the surveys indicate the available cut volume is greater than 25 cy/lf. Volume is determined using the surveyed section lines.

d. Recent grab samples indicate that the beachfill material meets

ASTM D2487. The Contractor shall relocate within the borrow area as directed by the Contracting Officer, if the Government determines that unsuitable material is encountered. Manmade materials encountered in the borrow area or in the beachfill placement area shall be removed and disposed of at no additional cost to the Government.

1.11.2 Maximum Allowable Depth for Removal of Borrow Material

The maximum allowable depths for removal of material from the borrow areas are as indicated on the drawings. To cover the inaccuracies of the dredging process the Contractor may remove material in the borrow areas to a depth of not more than 1-foot below the maximum allowable depth. Limits of removal are as shown on the drawings. No payment will be made for material removed from below the maximum allowable depth plus 1-foot overdepth or from outside the approved borrow areas limits, as indicated on the drawings.

1.11.3 Nature of Borrow Areas

The surveys of the borrow areas shown on the drawings are the most recent surveys available. Borrow area conditions are dynamic in nature. Therefore the information shown on the drawings may not be an accurate representation of the conditions and elevations existing at the commencement of work under this contract.

1.11.4 Borrow Area(s) Mapping

Submit hard copies of maps of the borrow areas, plotted to scale, with Contractor-assigned stationing and range information, furnished in printed form and the following three electronic formats:

a. ESRI ArcGIS 10.x Shapefile format (.shp), including all components and extensions, or in a Spatial Data Standard compliant geodatabase;

b. Portable Document Format (PDF) files containing PDF layer maps; and ;

c. AutoCAD (.dwg) drawing files, in AutoCAD Civil 3D 2021.

1.11.5 Backpassing Plant Position Map

After every 7 days of dredging and excavating, submit a map of the borrow areas, to scale, with the Contractor-assigned stationing and range information, along with the positioning data indicating the location of the dredge pump and the time period associated with a set of daily recorded positions, furnished in printed form and Portable Document Format (PDF) files containing PDF layer maps.

1.11.6 Before- and After-Dredging/Excavating Surveys

Before- and after-dredging/excavating surveys of the borrow areas shall be conducted as specified in Section 01 71 23 SURVEY REQUIREMENTS and Contract Clause: QUANTITY SURVEYS.

1.12 SITE CONDITIONS

1.12.1 General

There are numerous obstructions in the project area(s), which may include, but are not limited to: existing bulkheads, dunes, stairs, groins (which

may be visible or hidden), piers, boardwalk, stone revetment, piles, and outfalls,which may effect placement of the beachfill. Bidders are expected to examine the site of the work in accordance with Contract Clause: SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK to determine the conditions affecting their operations. The entire work site is designated as a hard hat area in accordance with EM 385-1-1. If vessels are utilized as part of the dredging operations the Contractor shall maintain close coordination with the U.S. Coast Guard.

1.12.2 Access and Limits of Work

Access to the beachfill sites is available only at the locations shown on the contract drawings. The limits of work shall be as shown on the contract drawings. Restrict contract work and equipment to within these limits. The staging area is located as shown on the contract drawings and may be used for storing material and temporary construction facilities. In the areas where boardwalk is located within the Contractor's Work Limit, there shall be no staging of equipment or stockpiling of material on the boardwalk. Movement between the borrow area and adjacent fill areas shall be done in marked corridors per the approved work plan.

1.13 RESTRICTIONS ON BEACHFILL AND BORROW AREA OPERATIONS

1.13.1 Beach Closings

Close the beach in the active Beachfill construction area, utilizing temporary fencing, barricades, and signage, in maximum 1,000-foot sections to allow placement of beachfill material. Do not advance the closed section of beach until acceptance of a section by the Contracting Officer. Do not construct two adjacent beachfill areas concurrently. If multiple work areas are adjacent, there must be a minimum of 1,500 feet of useable/accessible beach between the two work areas to remain open to the public at all times. All other sections of the beach, except storage areas, are to remain open to the public. Coordinate all beach closings with the respective City and Borough Beach Patrol(s) and Fire Department(s) to ensure access by emergency vehicles. In addition, erect signage at the corresponding intersections when beach access is closed so that people accessing the beach can move along to the next street to where the beach is open.

1.13.2 Borrow Area Closings

Close the borrow area in the active construction zone, utilizing temporary fencing, barricades, and signage, in maximum 1,000-foot sections to allow dredging/excavation of beachfill material. Do not advance the closed sections of borrow area until acceptance of after-dredging/excavation borrow area surveys. Maintain a 500 foot safety buffer outside each end of the active borrow area. When multiple work areas are permitted, there must be a minimum of 1,500 feet of useable/accessible beach between adjacent work areas to remain open to the public at all times. All other sections of the beach, except storage areas, are to remain open to the public. Coordinate all beach closings with the respective City and Borough Beach Patrol(s) and Fire Department(s) to ensure access by emergency vehicles. In addition, erect signage at the corresponding intersections when beach access is closed so that people accessing the beach can move along to the next street to where the beach is open.

1.13.3 Pipeline Ramps

Provide ramps over the pipeline at all street ends and pedestrian, vehicle and ADA accessible crossover access points to allow safe public access to the ocean. Provide ramps 6 feet wide (measured along the pipeline), with 3:1 slopes and one foot minimum of cover over the pipeline. Ensure that any movement of pipeline or equipment is done with recognition to the public presence, in accordance with the approved Accident Prevention Plan.

1.14 DEDICATED PUBLIC SAFETY PERSONNEL

Provide a minimum of one public safety person to patrol the perimeter of each closed beach area and each closed borrow area and direct the public to not enter the construction area. A dedicated public safety person shall be provided at all times during active construction operations and shall have no other responsibilities.

1.15 OUTFALL MAINTENANCE

Once beachfill operations come within 1,000 feet of an existing outfall not being modified, the Contractor shall establish, if necessary, and maintain drainage at each outfall within the 1,000 foot active construction area. Maintain the drainage for any modified outfalls associated with this contract throughout the entire contract.

1.16 OUTFALL PROTECTION

In order to protect outfalls and other existing structures from damage during borrow area excavation, excavation of beachfill material within the buffer distance shown on the drawings is prohibited.

1.17 DEBRIS PREVENTION

Submit for approval, a Debris Prevention Plan to ensure that debris is not deposited upon the beach and buried by beachfill material. Include a proposed monitoring program, using Contractor personnel, to monitor the proposed debris-prevention method's results. Debris includes cobbles, clay balls, and man-made trash and materials.

1.18 FUEL OIL HANDLING

Ensure that all fuel oil transfer operations to or from his plant and equipment comply with all applicable Federal, State, and municipal laws, codes, and regulations. The Contractor shall incorporate in his accident prevention plan, required under Paragraph "Accident Prevention Plan", sufficient information to demonstrate compliance with 33 CFR 156 and all other applicable laws, codes, and regulations.

1.19 SEQUENCING AND SCHEDULING

See Section 32 15 00 DUNE CROSSOVERS for sequencing and scheduling requirements of dune crossover work with the placement of beachfill material.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

a. Placement operations, once started in an area, must be continuously conducted until all work in that area is completed.

b. Hydraulically place all berm material between Station -10+00 to Station 66+00.

c. Maintain a minimum production rate of 10,000 cubic yards per day for beachfill placement.

d. Begin dredging/excavation in Borrow Area A in Wildwood Crest prior to moving to other areas.

3.2 CLEARING, GRUBBING, DEMOLITION AND EXCAVATION

a. Beachfill construction work shall require clearing and grubbing of beach vegetation, removal of existing sand fence and posts, removal and disposal of existing wooden crossover structures at 7th Avenue and 20th Avenue, and removal and disposal of existing outfall pipes to the limits shown on the drawings. Clearing and grubbing shall be done only to the extent necessary for the beachfill construction.

b. Prior to commencing beachfill work, remove existing debris and miscellaneous items, including, but not limited to, sand fence, wood posts, and man-made trash and materials, from the existing beach, and dispose of offsite at no additional cost to the Government. Do not bury debris or miscellaneous items of any kind with the new beachfill.

3.2.1 Clearing

Clearing shall consist of the satisfactory removal and disposal of vegetation, including snags, brush, and rubbish occurring within the areas to be cleared as necessary for the beachfill construction. Stumps, roots, brush, and other vegetation in areas to be cleared shall be removed in their entirety. Cleared material shall be disposed of off-site.

3.2.2 Grubbing

Grubbing shall consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots. Material to be grubbed, shall be removed to a depth of not less than 18 inches below the original surface level of the ground. 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. Grubbed material shall be disposed of off-site.

3.2.3 Demolition

Demolition shall be conducted to the extent and limit of the construction, as shown on the drawings. Demolish existing wooden crossover structures, existing outfalls, including pipes, piles and bent support structures, to the extent shown on the drawings and dispose offsite.

3.2.4 Excavation

Unsatisfactory material uncovered shall be disposed of off-site, at no additional cost to the Government.

3.3 SURVEY REQUIREMENTS

See Section 01 71 23 SURVEY REQUIREMENTS for all qualification, equipment, performance and submittal requirements associated with project surveys, including, but not limited to, the establishment of baselines, staking and flagging, pre- and post-placement condition surveys, before- and after-dredging/excavation surveys, and before- and after-beachfill surveys.

3.4 MONITORING SURVEYS OF BORROW AREA(S) AFTER REMOVAL OF BEACHFILL MATERIAL

a. After dredging/excavation is performed by the Contractor and accepted by the Government for each closed borrow area section, the borrow area section must remain closed and shall be monitored by the Contractor with monitoring surveys. See Section 01 71 23 SURVEY REQUIREMENTS for borrow area monitoring survey requirements and criteria for re-opening sections of beach.

b. As the beachfill material is removed from each successively closed borrow area section and accepted by the Government, include the additional closed sections to the periodic monitoring surveys performed. Conduct monitoring surveys at the intervals specified in Section 01 71 23 SURVEY REQUIREMENTS.

3.5 SAND DREDGING/EXCAVATION

3.5.1 Dredged/Excavated Sand Removal

Dredge/excavate sand from the borrow areas as shown on the drawings. Material shall be free of debris prior to placement on the berm. After dredging/excavation, grade landward edge, seaward edge, and lateral edge, of dredging/excavation as shown on the drawings, to tie into adjacent existing elevations. There shall be no pronounced ridges or wash holes in the final grades and slopes, unless otherwise indicated. Borrow area lines and grades shall extend linearly between survey sections. Slopes/grades between survey sections are subject to the same requirements as verified by USACE visual inspection and USACE QC surveys.

3.5.2 Tolerances

A vertical tolerance of plus 0.5 feet and minus 0 feet will be permitted on the leading landward edge and seaward edge of the borrow area cut. See drawings for slope requirements. Slopes cannot be steeper than what is as shown on the drawings.

3.6 PLACEMENT OF BEACHFILL MATERIAL

3.6.1 General

a. Place and shape beachfill material to the beachfill template lines, grades, slopes, and elevations shown on the contract drawings. There shall be no pronounced ridges or wash holes in the final grades and slopes unless otherwise indicated. Beachfill lines and grades shall extend linearly between payment sections with no scallops in planform contours.

b. Conduct work operations so that no areas landward of the work limits shown on the contract drawings are disturbed. Use land-based equipment for grading the beachfill material.

c. If the beachfill material is stockpiled and subsequently moved to the final postion using land-based equipment, wait 24 hours after placement of beachfill before conducting after-beachfill surveys of an area.

d. Ensure beachfill material is free of clay lenses, rock or silt pockets. Remove such material remaining in the beachfill material and dispose of at no additional expense to the Government. Protect any existing signs, buoys or other structures within the work lines and/or remove and later replace as directed.

3.6.2 Removal of Debris

During the operation of placing beachfill material, remove from the work site, debris resulting from construction operations and dispose of at no additional cost to the Government. Such disposal shall comply with all applicable Federal, state, and local laws. Remove such materials from the work site prior to contract completion date.

3.6.3 Grade Stake Recovery Plan

Submit a plan describing the procedures that will be used to ensure that all grade stakes placed on the beach during construction are subsequently removed. Grade stake removals and lost stakes shall be included with the Quality Control Report.

3.6.4 Pumpout Plan

If a hopper dredge, scow, or booster pump, is used for the contract work, submit a plan for pumpout of excavated material from the dredge, scow, or booster pump, to the beachfill area. Include in the plan the description, dimensions, and location of the proposed facility. Include in the Plan detailed descriptions of the personnel, materials, equipment and methods proposed to be utilized to complete this task.

3.6.5 Dune Construction

a. Construct dunes to the elevation and slope in the areas shown on the drawings. Unless indicated otherwise, remove vegetation and other items that would interfere with dune construction operations.

b. Conduct work operations so that no areas landward of the work limits shown on the drawings are disturbed.

c. Incorporate material excavated from the existing dunes, as shown on the drawings, into the dune template. Grading of existing dunes is limited to those areas shown on the drawings.

d. Existing dune excavation and dune placement operations, once started in an area, must be continuously conducted until all work in that area is completed.

e. Except for existing dune excavation on the landward side of the dune template as required for the maintainance corridor, maintain the existing dune at its current elevation to the maximum extent practicable.

3.6.6 Placement of Beachfill Material Beneath Existing Beach Structures

Place and grade beachfill material by hand beneath existing beach structures, e.g. houses, decks, and docks. Protect the existing beach structures from damage. Place beachfill material beneath structures in a manner that minimizes the ponding of water. If ponded areas are created due to the work operations, pump these areas dry, at no additional cost to the Government. Repair or replace structures damaged in a manner as determined and directed by the Contracting Officer, at no additional cost of the Government.

3.6.7 Beachfill Material Placement on Stone Revetment

Cover stone revetment with beachfill material at the locations indicated on the drawings and work into place between stones with vibrating tampers or approved alternative. Fill voids completely with beachfill material and monitor for 3 days. Refill voids if settling of material occurs.

3.6.8 Existing Feature Protection

a. Submit an Existing Feature Protection Work Plan prior to the start of work. Detail methods for constructing temporary protection for existing features such as existing outfall pipes, groins, jetty, piers, pavilions, bulkheads, and stone seaward bulkhead. Include details of personnel, equipment, materials, and methods, to protect the existing features.

b. Place no less than a minimum of 5 feet of beachfill cover over groins, piles, revetments, and outfalls prior to the use of equipment across these structures, to minimize damage to these structures during beachfill operations. Repair damage to these structures as a result of work operations, at no additional cost to the Government.

c. The use of construction mats or other approved method of protection prior to the use of equipment on or across these structures, to minimize damage to these structures during beachfill operations, is mandatory. Provide in the work plan the proposed methods to prevent damage to these structures by Contractor equipment. Repair damage to these structures as a result of work operations, at no additional cost to the Government. Document the original conditions of these structures prior to equipment operations by taking detailed photographs of these structures prior to starting work and on completion of work. See Section 01 32 33 CONSTRUCTION PHOTOGRAPHY for additional requirements.

3.6.9 Pipelines

Keep pipelines used with hydraulic dredging in good condition at all times, and promptly repair leaks or breaks. Load material excavated by hopper dredging into bins or hoppers and pump directly to the beachfill area by a means which prevents the loss of any material into the ocean. Take special care to ensure that hoppers do not leak during all phases of the contract work.

3.6.10 Marking of Pipeline

Provide barricades, warning signs and lights, subject to the approval of the Contracting Officer, as part of the accident prevention plan, for the protection and safety of the public using the adjacent beach areas. Clearly mark the beachfill dredge pipe with buoy signs or other signage approved by the Contracting Officer, 200 feet seaward of the low water

line, at all locations that the dredge pipe is landed. This signage shall warn the public of the location and danger of the submerged pipe. Install barricades, warning signs, and lights prior to the start of work. Notify the Coast Guard for issuance of a "Notice to Mariners" in accordance with Section 01 30 00 ADMINISTRATIVE REQUIREMENTS.

3.6.11 Removal of Stakes and Markers

Remove stakes, markers, temporary fencing, burlap, piping, or other items used in the construction of the beach within 24 hours after completion and before approval of an acceptance section, in accordance with the approved grade stake recovery plan, or as otherwise directed by the Contracting Officer. Remove stakes, markers, temporary fencing, burlap, piping, or other items used in the construction that become uncovered after approval of the acceptance section, within 24 hours of their detection. Report grade stake removals and lost stakes weekly to the COR.

3.6.12 Template Quantity

The required template placement quantity of sand between survey lines will be determined by the average-end-area method using the difference in cross-sectional area between (1) the profile surveys obtained by the Contractor before the beachfill operations in accordance with Section 01 71 23 SURVEY REQUIREMENTS and (2) the template lines shown on the drawings.

3.6.13 Placement Tolerances

a. A vertical tolerance of plus 0.5 feet and minus 0 will be permitted on the berm portion of the beach and a vertical tolerance of plus 0.2 feet and minus 0 will be permitted on the dune portion of the beach.

b. Adjusted Construction Template Request: Submit documentation describing why the specified foreshore slope cannot be achieved in an area, and requesting permission to adjust the construction template, as specified herein. Documentation shall include the location, by project site and range of survey baseline stations, for which the request is being made.

c. Adjusted Construction Template: Place beachfill material to the minimum seaward edge of berm and to the foreshore slope indicated on the drawings, however, with Contracting Officer approval, the Contractor may adjust the construction template by advancing the edge of berm seaward (at the same elevation) and modifying the foreshore slope to achieve the required placement quantity within the footprint of the beachfill template shown on the drawings. An example of an adjusted construction template is attached to this section.

d. In the event that the dune elevation, berm elevation, the minimum seaward edge of berm or the required placement quantities are not met, recommence beachfill operations until the requirements are met. The Contractor will not be required to recommence beachfill operations in the event of erosion and/or storm damage in areas where beachfill has been completed and the survey data demonstrates compliance with the contract requirements.

3.6.14 Payment Tolerances

For payment, there will be no vertical tolerance permitted on the berm or dune portion of the beach. Payment will be made for placement, only to the

lines and grades shown on the contract drawings (see Measurement and Payment paragraph below). In the event the Contractor adjusts the construction template as specified herein, payment will be made for measured quantity, not exceeding the required placement quantity. Payment will not be made for material placed above the required dune or berm elevation or placed seaward of the toe of slope. The toe of slope shall be defined as the point of intersection of the template as shown on the drawings with the before-placement survey profile.

3.7 CONTRACTOR QUALITY CONTROL

3.7.1 Contractor Reports

Prepare and maintain Daily Report of Operations forms and submit signed copies thereof with the daily Quality Control Records required in Section 01 45 00 QUALITY CONTROL. Complete Daily Report of Operations forms in the RMS system and submit daily to the COR. Copies of the Daily Report of Operations forms to be used are included at the end of this Section. Indicate on the daily forms, the location and depth of dredging in the borrow area. Include a map showing the location of the borrow area. Submittals for the Daily Report of Operations are available to the public.

3.7.2 Samples and Testing

a. Obtain samples of beachfill material from the finished beach at each project profile line following placement and final grading of beachfill and have them tested for grain size distribution in accordance with ASTM D6913/D6913M; percent passing the No. 200 sieve must be determined by washing. Perform testing by a Corps of Engineers approved laboratory as specified in Section 01 45 00 QUALITY CONTROL. At each project profile line, obtain 4 samples:

   (1) At the uppermost placed berm,

   (2) At the berm edge,

   (3) At mean high water elevation on the foreshore slope,

   (4) At mean low water elevation on the foreshore slope.

b. Record beachfill material gradation test results on ENG Form 2087, a copy of which is included in Appendix F90. Also record on ENG Form 2087 the location of the dredge within the borrow area and the depth of dredging at the time of placement of the sand sampled. Submit beachfill material gradation test results not more than 14 days after the sample locations are final graded.

3.7.3 Form Preparation

Instructions regarding the preparation of all required forms will be provided at the Contractor Quality Control Coordination Meeting.

3.7.4 Test Reports

Submit copies of all laboratory and field test reports within one week after completion of each test.

3.8 MEASUREMENT AND PAYMENT

3.8.1 Mobilization and Demobilization

All costs connected with the mobilization and demobilization of the Contractor's plant and equipment for dredging/excavation and beachfill operations will be paid for at the contract lump sum price for Base Bid Item titled, "Mobilization and Demobilization". Sixty percent of the lump sum price will be paid to the Contractor upon completion of his mobilization at the work site. The remaining forty percent will be paid to the Contractor upon completion of demobilization. Mobilization and demobilization costs for other work under this contract (ex. crossover, outfalls, etc.) shall be included in the costs of the bid items to which the mobilization and demobilization is incidental.

a. Mobilization: include all costs for operations accomplished prior to commencement of actual beachfill placement; that is transfer of all plant and equipment to the work site, initial installation of pipelines, and all other incidentals in advance of beachfill placement operations.

b. Demobilization: include general preparation for transfer of the plant and equipment to the Contractor's home or standby base, removal of pipelines, cleanup, and the transfer of plant and equipment to the home or standby base.

All costs in connection with any additional mobilization and demobilization of the Contractor's plant and equipment between the work areas, shall be included in the respective contract unit prices for the Base Bid Items titled, "Beachfill".

3.8.1.1 Contractor Furnished Cost Data

In the event the Contracting Officer considers that the amount in this item (sixty percent) which represents mobilization, does not bear a reasonable relation to the cost of the work in this contract, the Contracting Officer may require the Contractor to furnish cost data to justify this portion of the bid price. Failure to justify such price to the satisfaction of the Contracting Officer will result in the payment of actual mobilization costs, as determined by the Contracting Officer, at the completion of mobilization, and the payment of the remainder of this item will be included in the final payment under the contract. The determination of the Contracting Officer in these circumstances is not subject to appeal.

3.8.1.2 Mobilization and Demobilization Costs for Options

All costs in connection with any additional mobilization and demobilization of the Contractor's plant and equipment in connection with Option Bid Items, shall be included in the contract unit price for the respective Option Bid Items.

3.8.2 Relocation within the Borrow Area

The work specified in this section for relocating within the borrow as directed by the Contracting Officer, due to encountering unsuitable material, will be measurement for payment by the number of relocations. All costs in connection therewith shall be included in the cost of the Option Bid Item titled, "Relocation within the Borrow Area".

3.8.3 Placement of Beachfill Material

The work specified in this section for placing and grading of beachfill material in the designated areas and to the lines and grades shown on the drawings, within the payment tolerances specified herein, will be measured for payment by the cubic yard of beachfill material in place on the beach and dune. Payment will be made at the contract unit prices per cubic yard for the Base Bid and Option Items listed on the Bidding Schedule titled "Beachfill". Payment for these Bid Items shall also include full compensation to the Contractor for removing existing debris (including fencing, posts, wood and other miscellaneous items) placing beachfill material beneath beach structures; placing beachfill material on stone revetment; providing public safety personnel; and performing material testing required. If the Contractor fails to remove boulders, cobbles, gravel, clay, clay balls, peat, or other debris from the beach, that completed fill section will not be accepted for payment.

a. The total number of cubic yards placed will be computed by the average-end-area method from cross-section surveys obtained by the Contractor before and after the beachfill operations as specified in Section 01 71 23 SURVEY REQUIREMENTS.

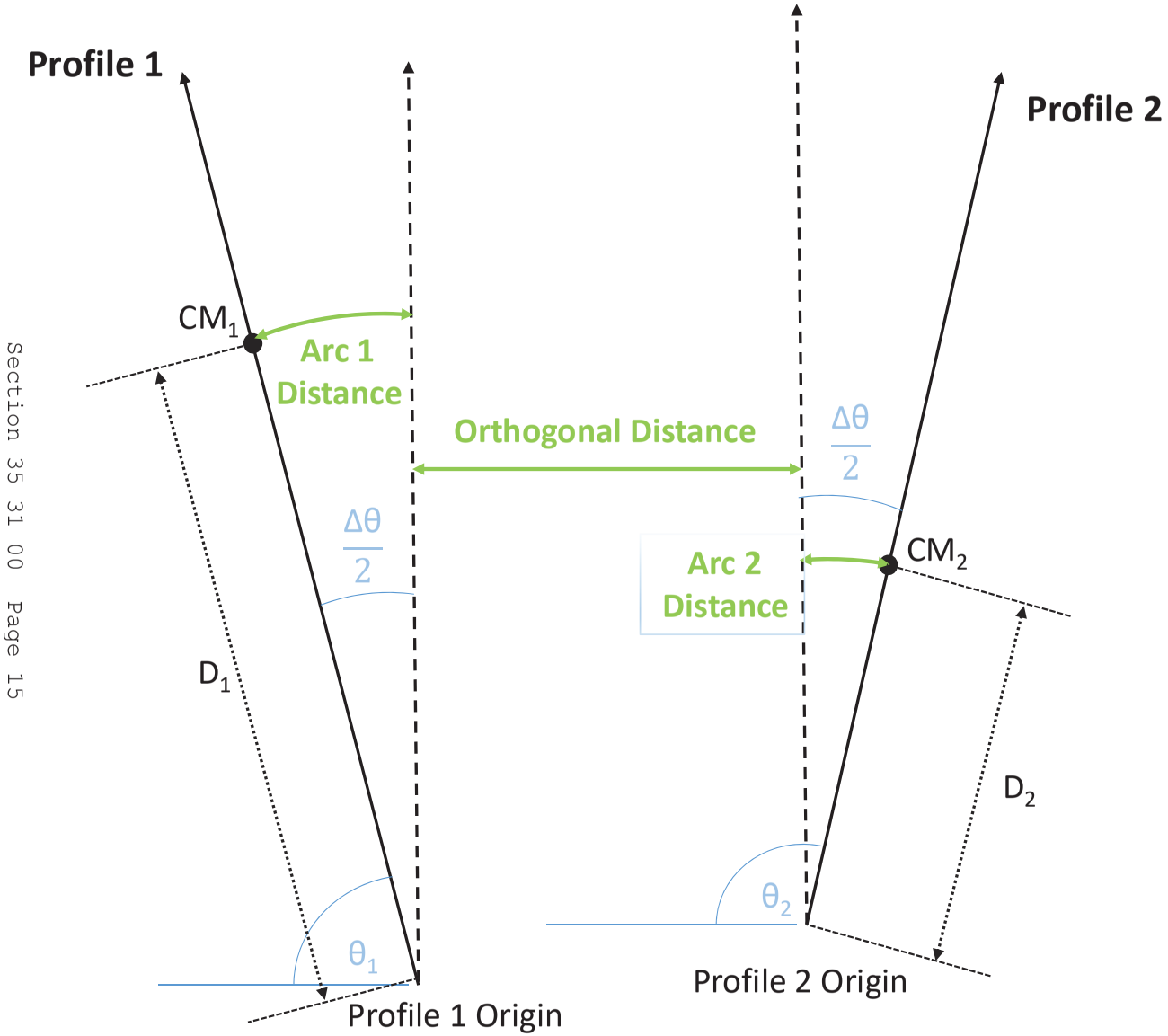
(1) For instances where adjacent line azimuths are not parallel, volumes are determined by computing the average-end-area method using the orthogonal distance between adjacent line origins and then adding (if azimuths diverge) or subtracting (if azimuths converge) a representative wedge volume. The representative wedge volume is determined by calculating the average area along the profile and multiplying by the arc distance defined by rotating the center of mass of the profile area about the profile origin (see attached AEA_Wedge_volumes_standard_method).

(2) The volume so computed, up to a quantity not to exceed the bid quantity, will be the pay quantity for the contract. A deduction of one cubic yard will be made from the pay quantity for every cubic yard of material removed from below the maximum allowable elevation indicated for the borrow areas (i.e., the maximum allowable depth plus 1 foot overdepth), or from outside the borrow area limits shown, or in excess of the maximum allowable quantity from the borrow areas. Any deductions will be based on before-dredging surveys conducted prior to dredging the borrow areas and after-dredging surveys conducted following dredging of the borrow areas as specified in Section 01 71 23SURVEY REQUIREMENTS.

3.8.4 Outfall Demolition

No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the costs of the Option Bid Item titled, "Outfall Demolition".

-- End of Section --



A1 = Profile 1 Cross-section Area
A2 = Profile 2 Cross-section Area

$\Delta\theta = \theta_2 - \theta_1$

Arc 1 Distance = $D1 * \frac{\Delta\theta}{2}$

Arc 2 Distance = $D2 * \frac{\Delta\theta}{2}$

Volume Calculation:

Vol = (A1+A2)/2* Orthogonal Distance

\+ A1 * Arc 1 Distance

\+ A2 * Arc 2 Distance

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DAILY REPORT OF OPERATIONS

CONTRACT NO.		DATE	RCS ENGKW-31 [Feeder]
DREDGE	CONTRACTOR		
LOCATION OF WORK (Range, Stationing, Longitudinal Position)			CHARACTER OF WORK [ ] Maintenance [ ] New
DISPOSAL AREA OR REHANDLING BASIN	LENGTH OF DISCHARGE OF PIPELINE: Pontoon Ft. Shore Ft. Total Length Submerged Ft.		Ft.
CHARACTER OF MATERIAL AND PERCENTAGE OF EACH Gravel			
AVERAGE DEPTH (Feet and Tenths) Before Dredging After Dredging Payment Depth			WEATHER
NUMBER OF MEN	MAN HOURS		MAN HOURS TO DATE

WORK PERFORMED

ITEM	UNIT	AMOUNT GROSS	AMOUNT NET
Av. width of cut	Feet		
Area dredged	Sq. Ft.		
Distance advanced this period	Feet		
Distance advanced previously	Feet		
Distance advanced to date	Feet		
Amt. dredged this period	Cu. Yds.		
Amt. dredged previously	Cu. Yds.		
Total amt. dredged to date	Cu. Yds.		

ATTENDANT PLANT

ITEM	NAME	HOURS
Tugboat		
Tugboat		
Launch		
Barges		
Barges		
Scows		
Derrick		

COMMODITIES CONSUMED

ITEM	UNIT	QUANTITY
Fuel oil	Gals.	
Lubricants	Gals.	
Lubricants	Pounds	
Water	Gals.	

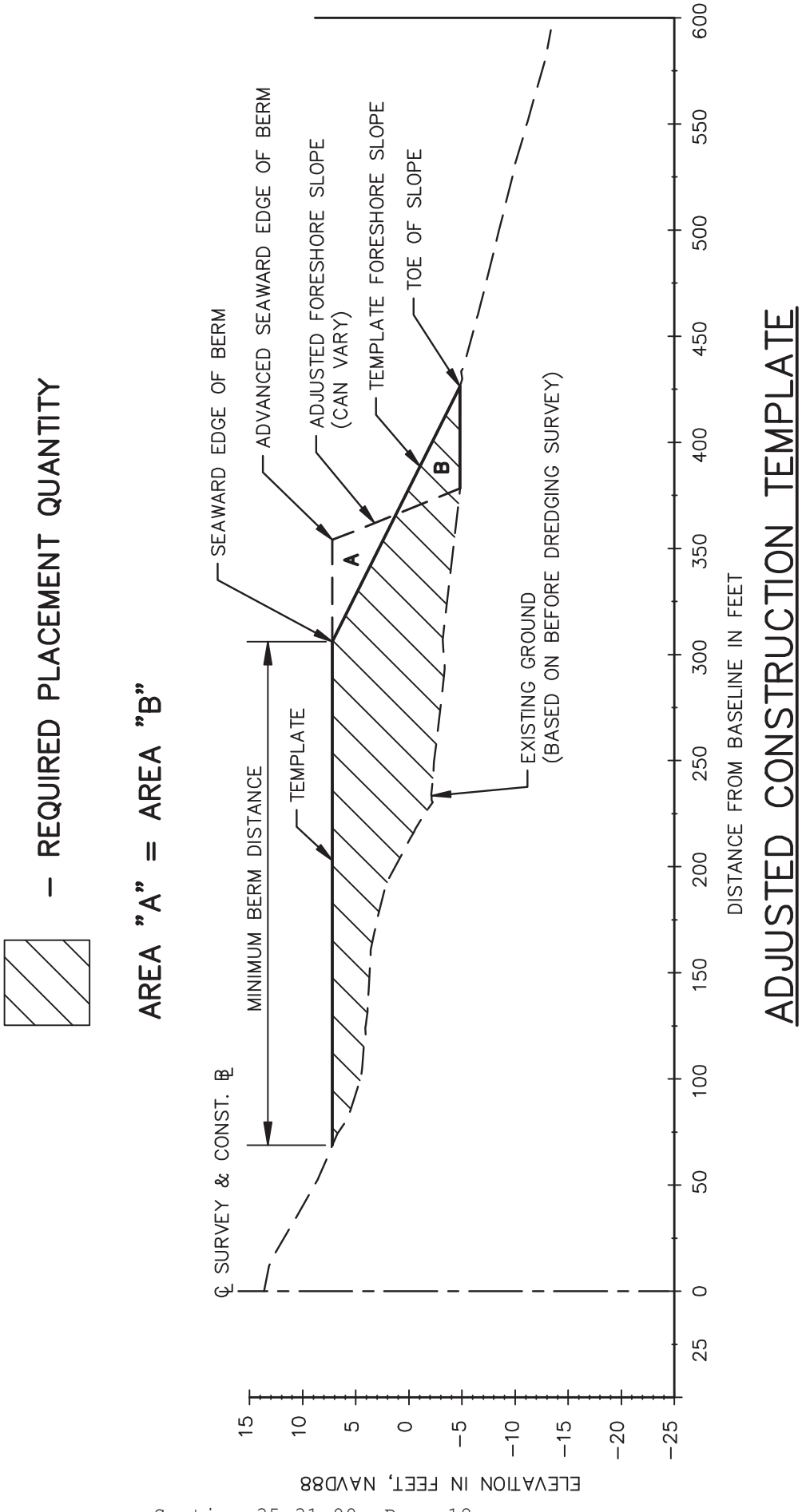
DISTRIBUTION OF TIME

EFFECTIVE WORKING TIME	HOURS	MINUTES
Dredging		
Percentage of total time		
NON- EFFECTIVE TIME		
Handling pipe lines		
Handling swinging lines		
Clearing pump and pipe line		
Clearing cutter or suction head		
Changing location of plant on job		
Loss due to opposing natural elements <8hr		
Loss due to opposing natural elements >8hr		
Loss due to passing vessals		
Minor operating repairs <4hr		
Secure for weekend		
Miscelaneous (Explain in remarks)		
Total Non-effective Time		
LOST TIME NOT CHARGEABLE		
Loss due to repairs >4hr		
Loss due to laying /relaying submerged line		
Lay time off shift		
Sundays and Holidays		
Waiting for equipment plant		
Collisions		
TOTAL TIME IN PERIOD		

No. of Supervisory Inspections: By field personnel By office personnel

REMARKS (Attach additional aheet, if necesary)

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– REQUIRED PLACEMENT QUANTITY
AREA "A" = AREA "B"
℄ SURVEY & CONST. ℄
MINIMUM BERM DISTANCE
TEMPLATE
SEAWARD EDGE OF BERM
ADVANCED SEAWARD EDGE OF BERM
ADJUSTED FORESHORE SLOPE
(CAN VARY)
TEMPLATE FORESHORE SLOPE
TOE OF SLOPE
A
B
EXISTING GROUND
(BASED ON BEFORE DREDGING SURVEY)
ELEVATION IN FEET, NAVD88
15
10
5
0
−5
−10
−15
−20
−25
25
0
50
100
150
200
250
300
350
400
450
500
550
600
DISTANCE FROM BASELINE IN FEET
ADJUSTED CONSTRUCTION TEMPLATE

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TABLE OF CONTENTS

APPENDICES

A30	SURVEY CONTROL DESCRIPTION SHEETS
B41	VIBRATIONAL CORE SAMPLE LOGS
B42	VIBRATIONAL CORE SAMPLE GRAIN SIZE DISTRIBUTION CURVES
F90	ENG FORM 2087 - GRADATION CURVE WORKSHEET

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APPENDIX A30

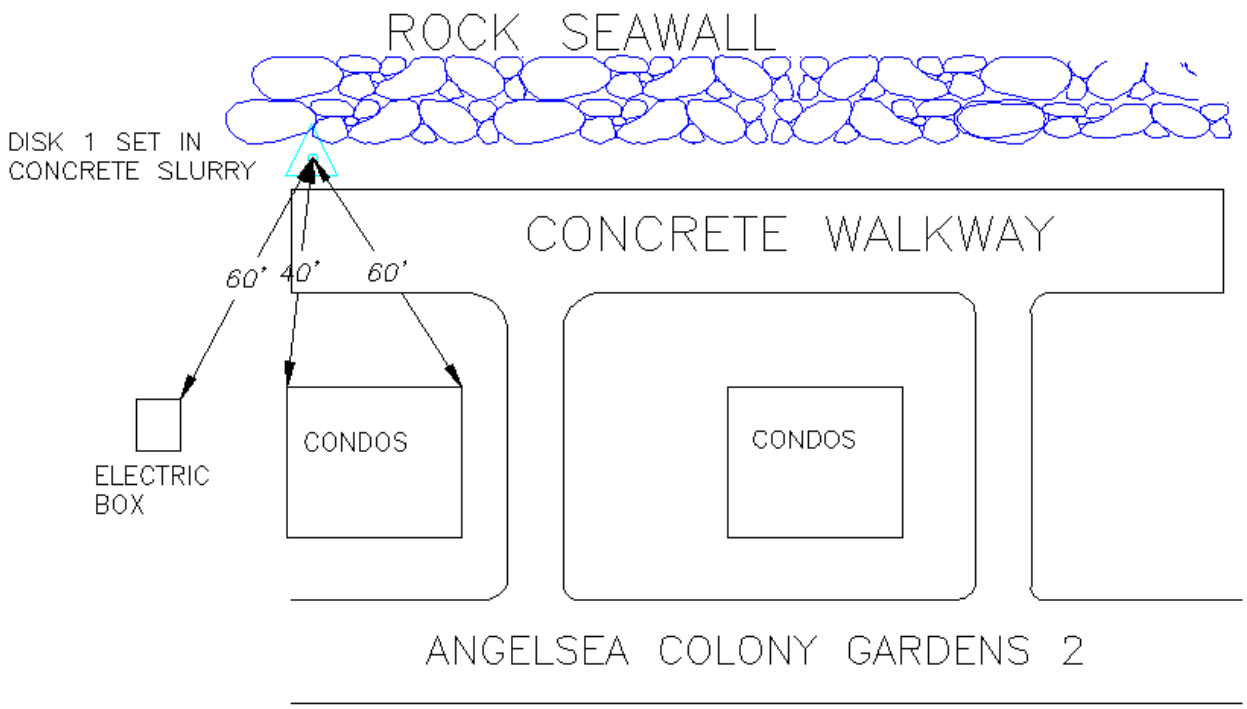
SURVEY CONTROL DATA

COUNTRY ***USA***	TYPE OF MARK DISK	STATION DISK 1	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 6.680 (M)
LATITUDE 39.02232745	LONGITUDE -74.79513357	DATUM NAD 83	DATUM NAVD 88
(NORTHING) **(FT)** 68964.285 (M)	**(EASTING)** **(FT)** 408280.709 (M)	GRID AND ZONE NJ 2900	ESTABLISHED BY (AGENCY) USACE AC
(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE 11Feb2020 / ORDER

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC) ° ' "	BACK AZIMUTH ° ' "	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



SKETCH

DA FORM 1 OCT 64 **1959** REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

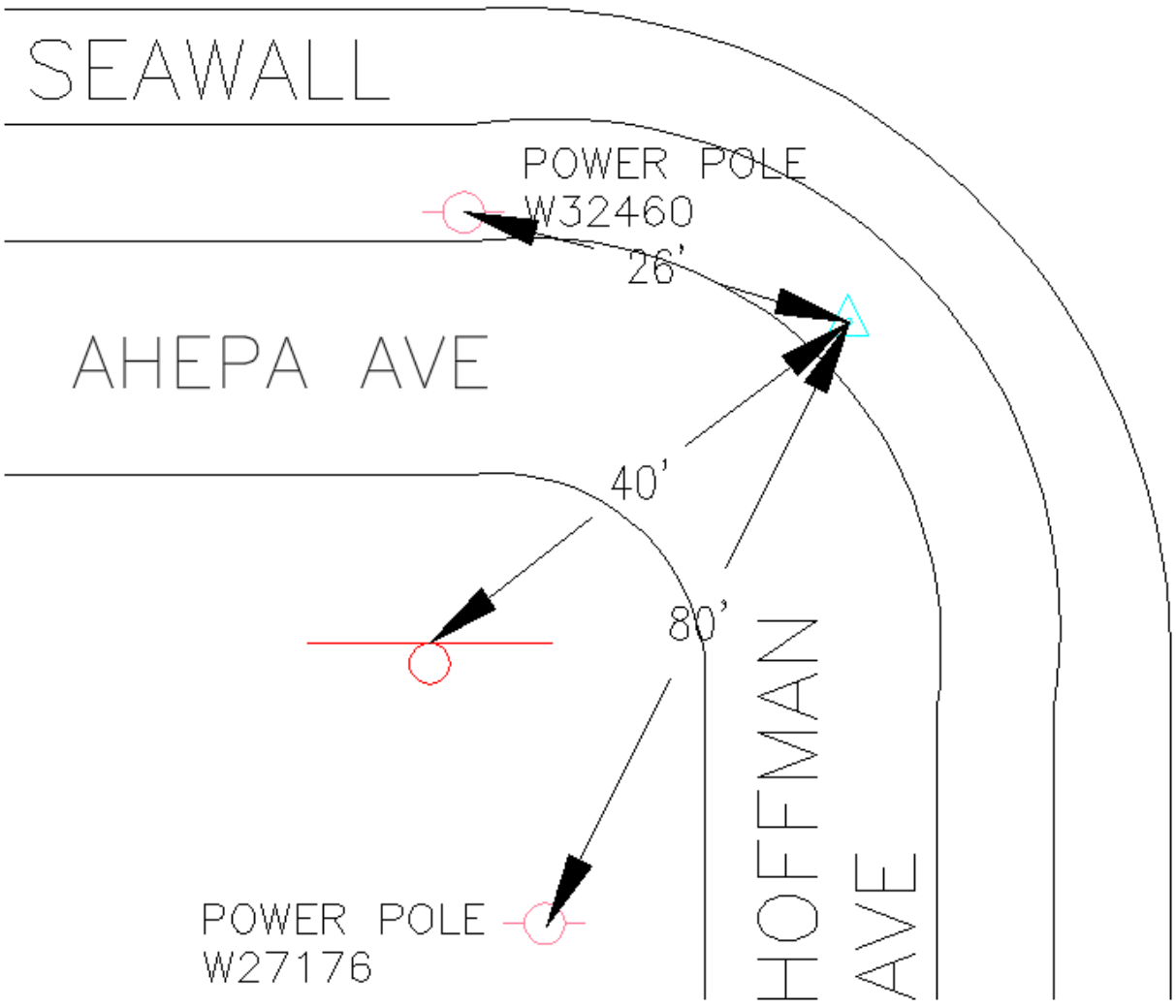
For use of this form, see TM 5-237; the proponent agnecy is TRADOC.

COUNTRY ***USA***	TYPE OF MARK DISK	STATION DISK 2- Hoffman Ave	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 5.810 (M)
LATITUDE 39.0125518	LONGITUDE -74.79288462	DATUM NAD 83	DATUM NAVD 88
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(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE: 11Feb2020 / ORDER:

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC)	BACK AZIMUTH	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

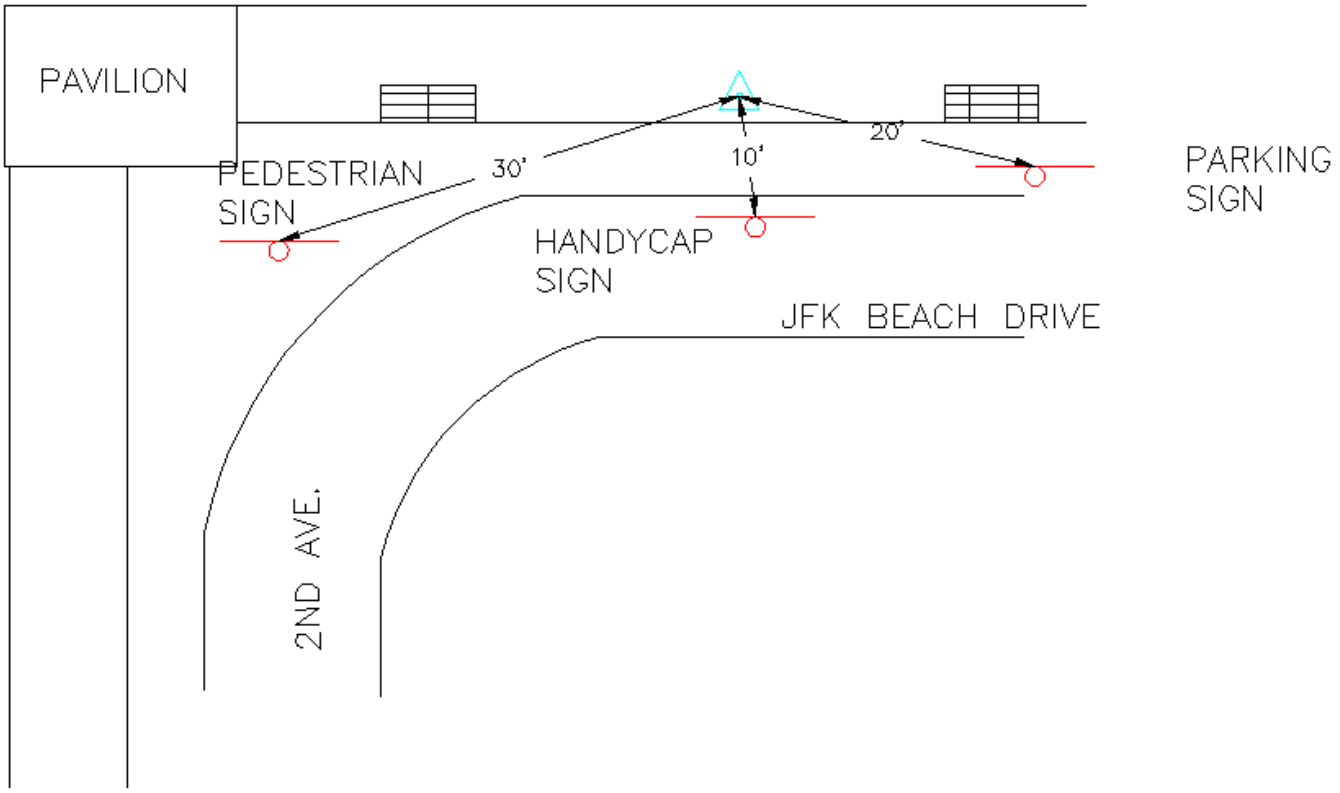
For use of this form, see TM 5-237; the proponent agency is TRADOC.

COUNTRY	TYPE OF MARK	STATION	
USA	DISK	DISK 3- 2nd Ave	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 10.607 (M)
LATITUDE 39.00150676	LONGITUDE -74.78689122	DATUM NAD 83	DATUM NAVD 88
(NORTHING) **(FT)** 61374.139 (M)	**(EASTING)** **(FT)** 410598.378 (M)	GRID AND ZONE NJ 2900	ESTABLISHED BY (AGENCY) USACE AC
(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE: 11Feb2020 / ORDER:

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC) ° ' "	BACK AZIMUTH ° ' "	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

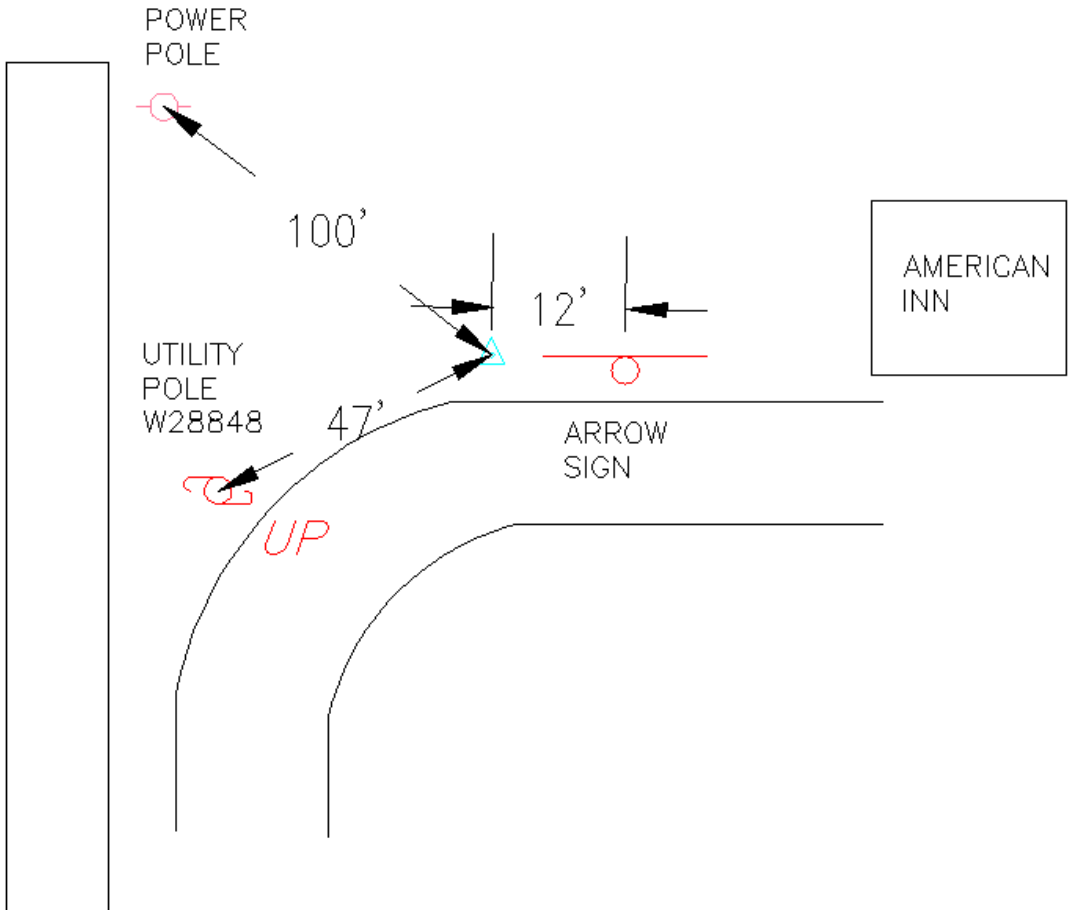
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

COUNTRY	TYPE OF MARK	STATION	
USA	DISK	DISK 4- 13th Ave	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 8.100 (M)
LATITUDE 38.99590717	LONGITUDE -74.79439925	DATUM NAD 83	DATUM NAVD 88
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(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE: 12Feb2020 / ORDER:

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC) ° ' "	BACK AZIMUTH ° ' "	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

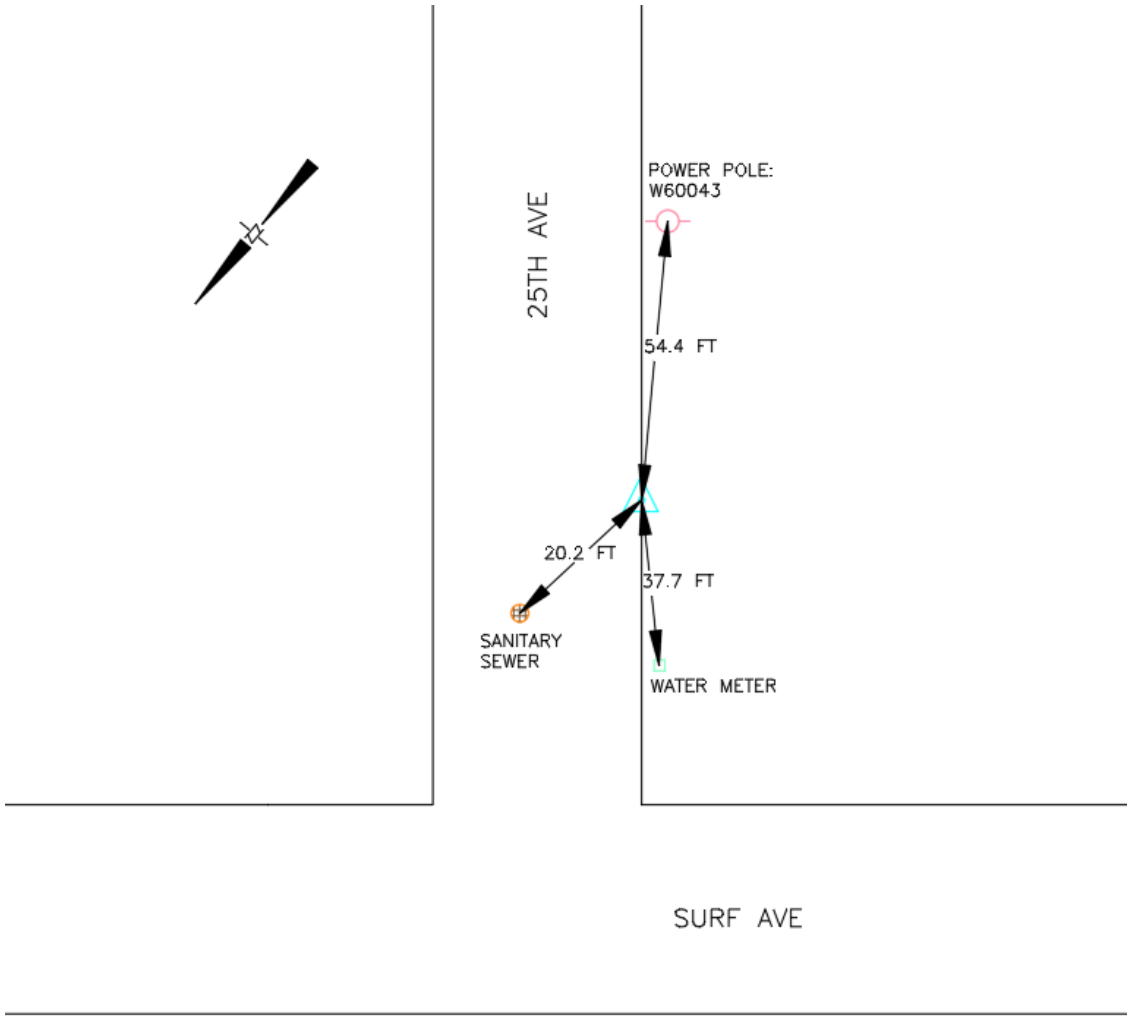
For use of this form, see TM 5-237; the proponent agnecy is TRADOC.

COUNTRY	TYPE OF MARK	STATION	
USA	DISK	DISK 5- 25th Ave	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 6.637 (M)
LATITUDE 38.99095414	LONGITUDE -74.80422092	DATUM NAD 83	DATUM NAVD 88
(NORTHING) **(FT)** 57546.995 (M)	**(EASTING)** **(FT)** 405660.901 (M)	GRID AND ZONE NJ 2900	ESTABLISHED BY (AGENCY) USACE AC
(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE: 27Feb2020 / ORDER:

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC) ° ' "	BACK AZIMUTH ° ' "	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

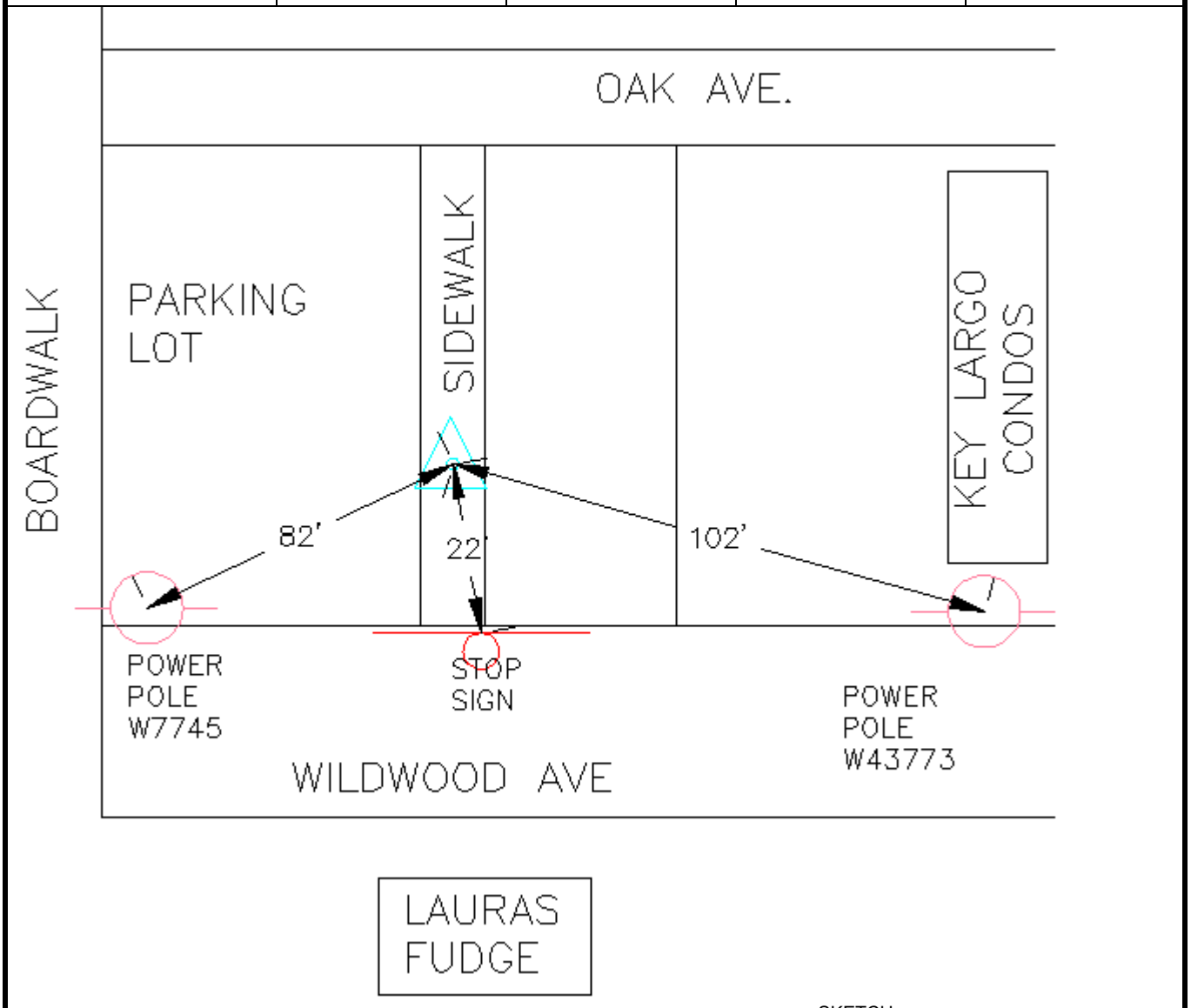
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agnecy is TRADOC.

COUNTRY ***USA***	TYPE OF MARK DISK	STATION DISK 6- Wildwood Ave	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 7.871 (M)
LATITUDE 38.98808597	LONGITUDE -74.80982723	DATUM NAD 83	DATUM NAVD 88
(NORTHING) **(FT)** 56507.814 (M)	**(EASTING)** **(FT)** 404063.949 (M)	GRID AND ZONE NJ 2900	ESTABLISHED BY (AGENCY) USACE AC
(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE: 12Feb2020 / ORDER

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC) ° ' "	BACK AZIMUTH ° ' "	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

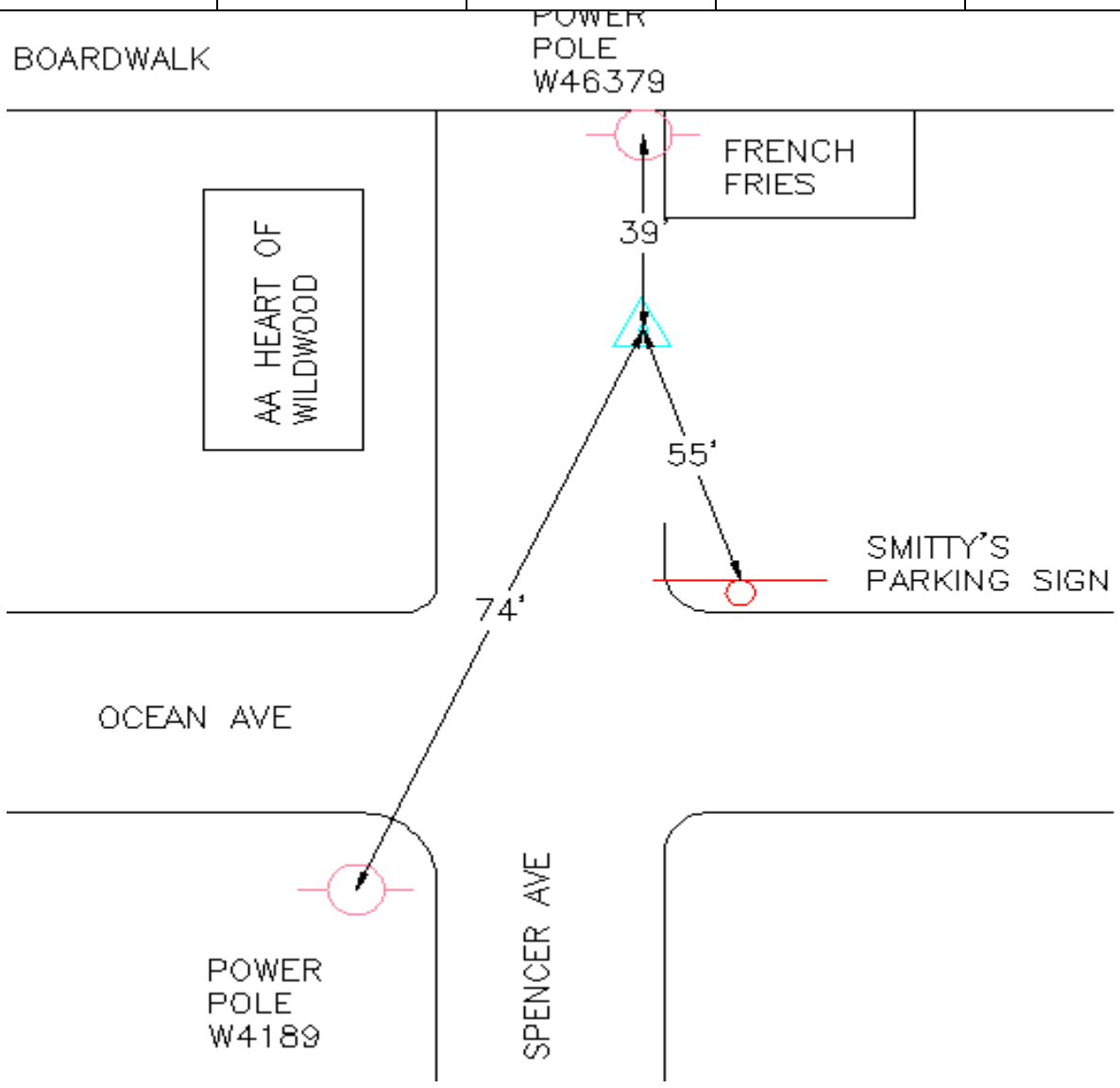
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

COUNTRY ***USA***	TYPE OF MARK DISK	STATION DISK 7- Spencer Ave	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 7.149 (M)
LATITUDE 38.98474014	LONGITUDE -74.81428163	DATUM NAD 83	DATUM NAVD 88
(NORTHING) **(FT)** 55293.643 (M)	**(EASTING)** **(FT)** 402793.683 (M)	GRID AND ZONE NJ 2900	ESTABLISHED BY (AGENCY) USACE AC
(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE 12Feb2020 / ORDER

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC) ° ' "	BACK AZIMUTH ° ' "	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



SKETCH

DA FORM 1 OCT 64 **1959** REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

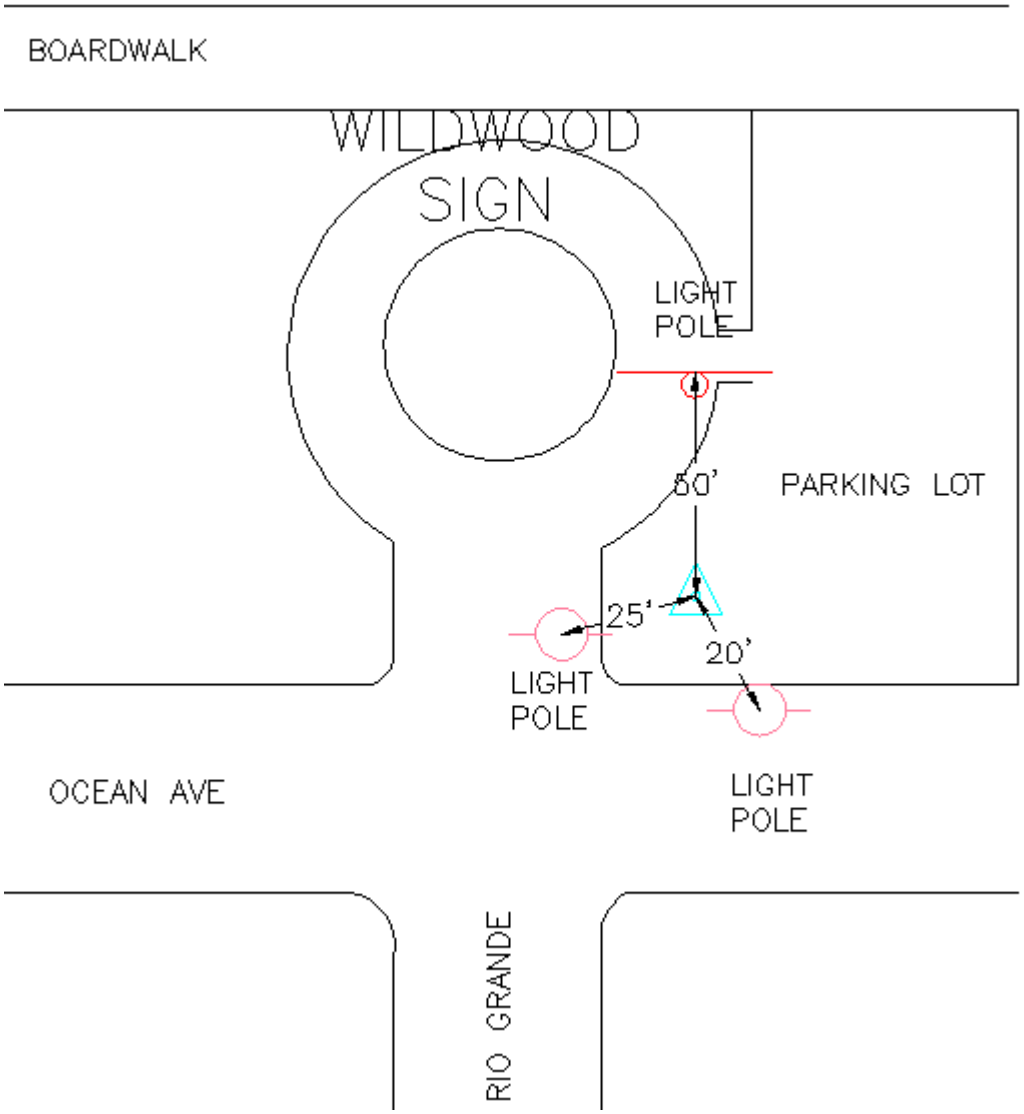
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agnecy is TRADOC.

COUNTRY	TYPE OF MARK	STATION	
USA	DISK	DISK 8- Rio Grande Ave	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 8.087 (M)
LATITUDE 38.98029615	LONGITUDE -74.82049583	DATUM NAD 83	DATUM NAVD 88
(NORTHING) **(FT)** 53681.356 (M)	**(EASTING)** **(FT)** 401021.662 (M)	GRID AND ZONE NJ 2900	ESTABLISHED BY (AGENCY) USACE AC
(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE: 13Feb2020 / ORDER

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC) ° ' "	BACK AZIMUTH ° ' "	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

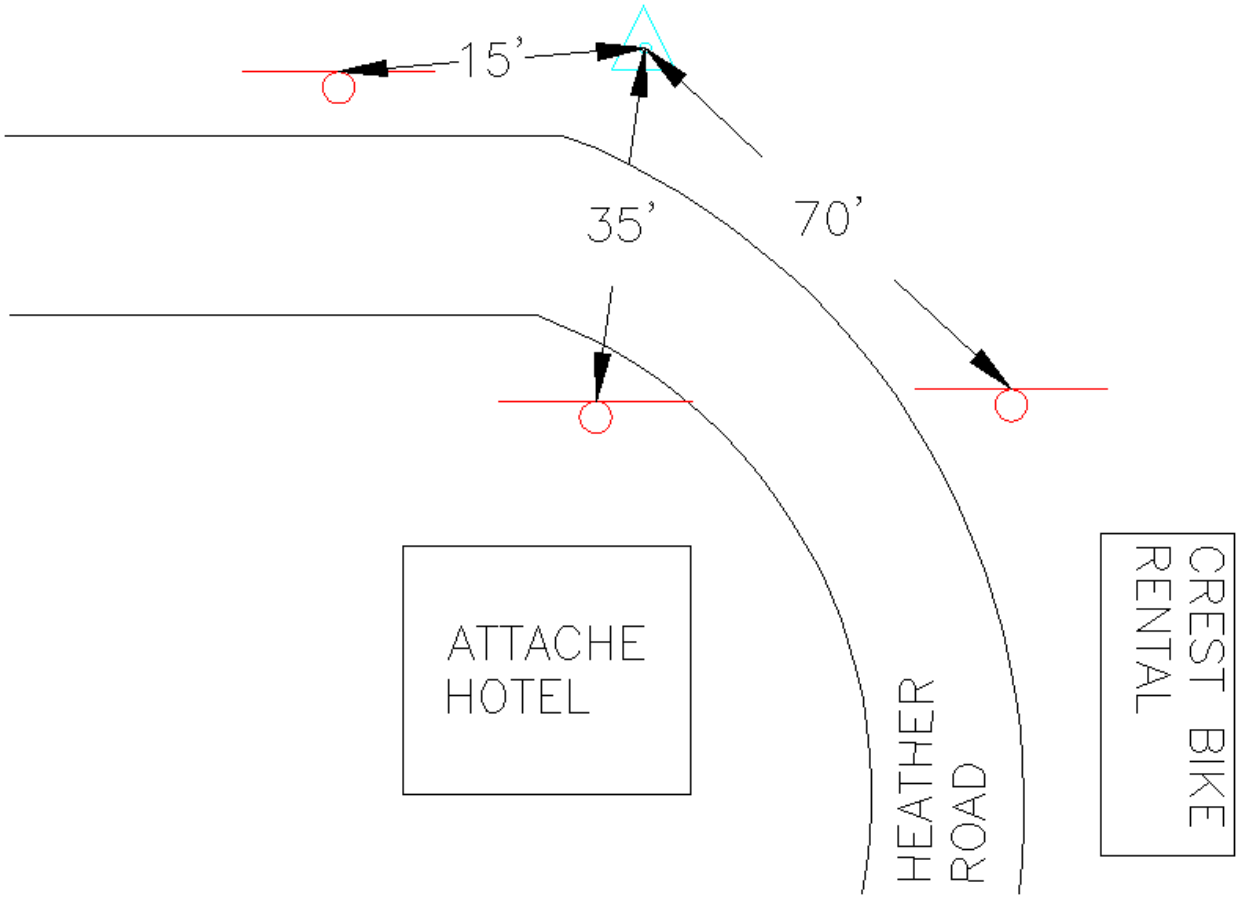
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

COUNTRY ***USA***	TYPE OF MARK DISK	STATION DISK 9- Heather Rd	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 10.420 (M)
LATITUDE 38.97569662	LONGITUDE -74.8255948	DATUM NAD 83	DATUM NAVD 88
(NORTHING) **(FT)** 52011.409 (M)	**(EASTING)** **(FT)** 399566.248 (M)	GRID AND ZONE NJ 2900	ESTABLISHED BY (AGENCY) USACE AC
(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE: 13Feb2020 / ORDER:

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC) ° ' "	BACK AZIMUTH ° ' "	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

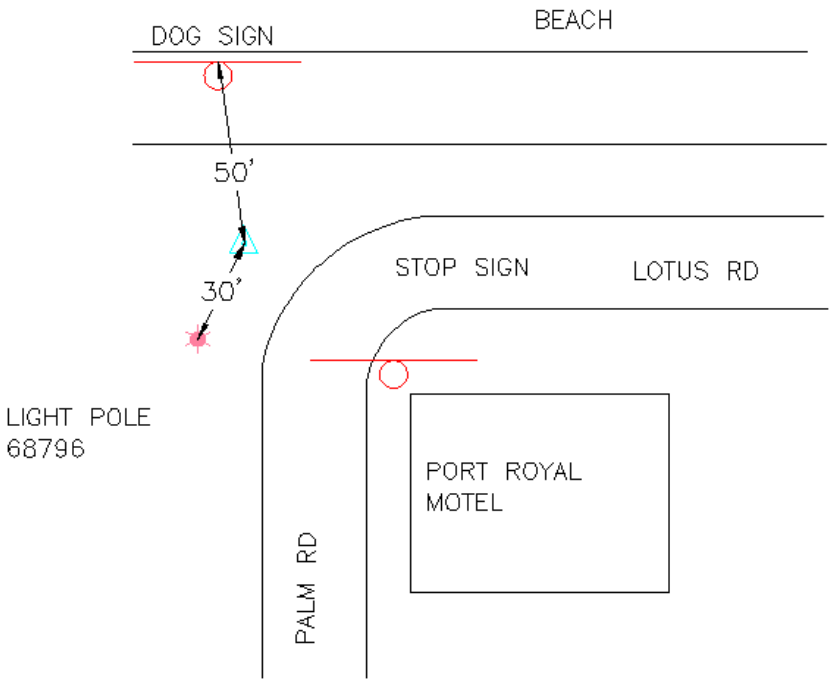
For use of this form, see TM 5-237; the proponent agnecy is TRADOC.

COUNTRY	TYPE OF MARK	STATION	
USA	DISK	DISK 10- Palm Rd	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 11.657 (M)
LATITUDE 38.97096254	LONGITUDE -74.83225053	DATUM NAD 83	DATUM NAVD 88
(NORTHING) **(FT)** 50294.155 (M)	**(EASTING)** **(FT)** 397667.892 (M)	GRID AND ZONE NJ 2900	ESTABLISHED BY (AGENCY) USACE AC
(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE: 13Feb2020 / ORDER

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC) ° ' "	BACK AZIMUTH ° ' "	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

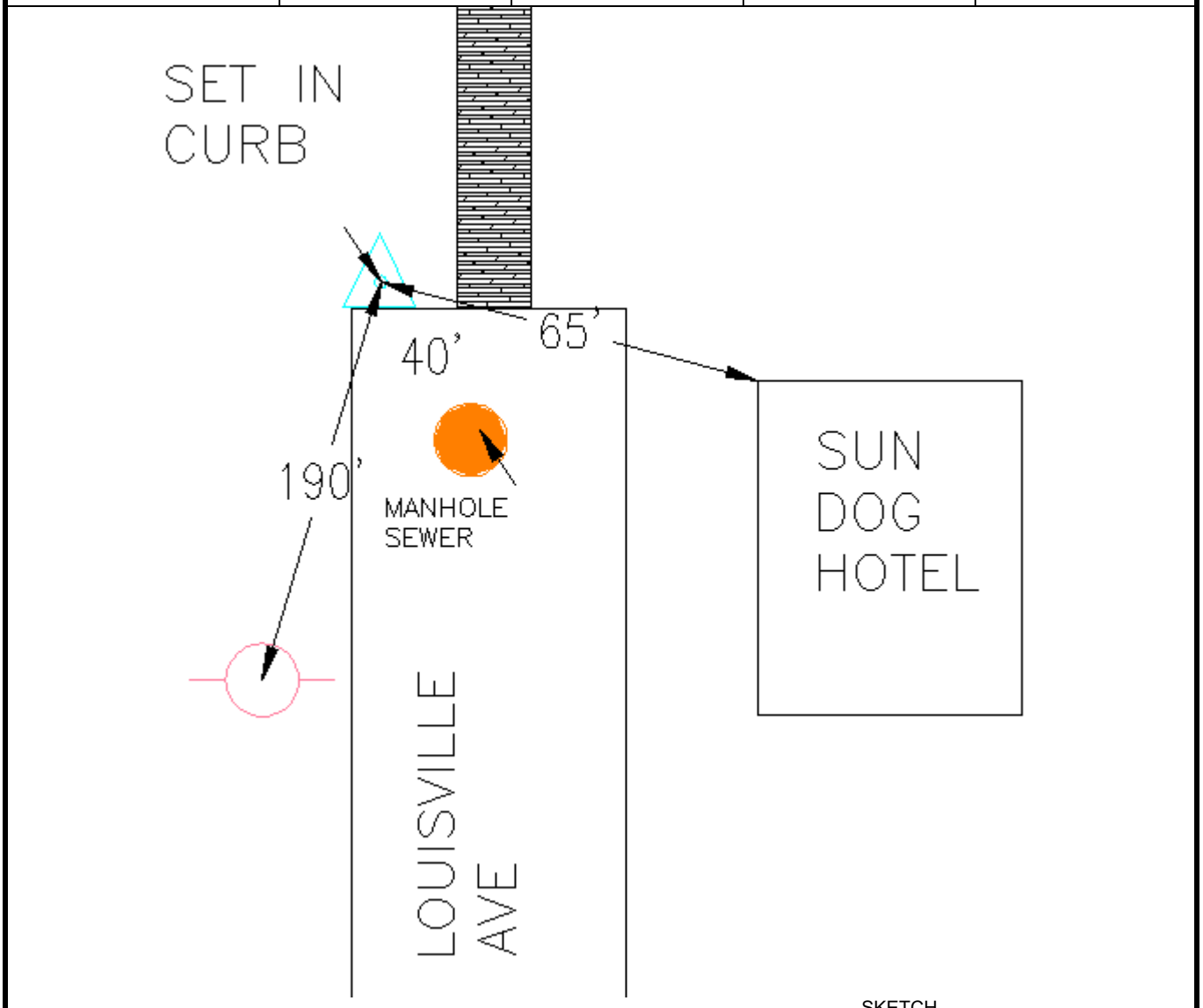
For use of this form, see TM 5-237; the proponent agnecy is TRADOC.

COUNTRY	TYPE OF MARK	STATION	
USA	DISK	DISK 11- Louisville Ave	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 10.016 (M)
LATITUDE 38.9653267	LONGITUDE -74.83878641	DATUM NAD 83	DATUM NAVD 88
(NORTHING) **(FT)** 48248.503 (M)	**(EASTING)** **(FT)** 395802.138 (M)	GRID AND ZONE NJ 2900	ESTABLISHED BY (AGENCY) USACE AC
(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE: 13Feb2020 / ORDER

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC)	BACK AZIMUTH	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

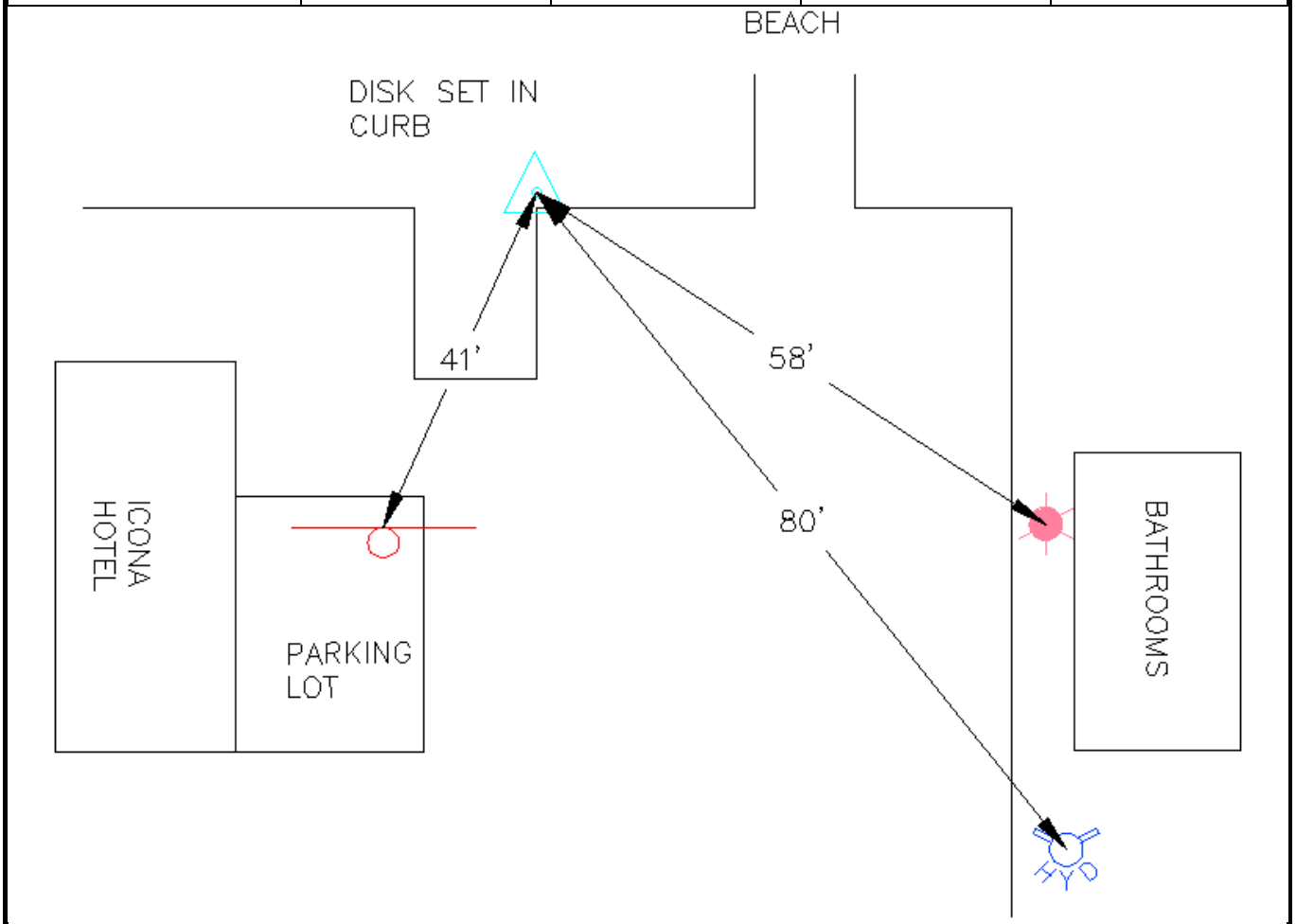
For use of this form, see TM 5-237; the proponent agency is TRADOC.

COUNTRY ***USA***	TYPE OF MARK DISK	STATION DISK 13- Memphis Ave	
LOCALITY Wildwood, NJ	STAMPING ON MARK	AGENCY (CAST IN MARKS) ***Corps of Engineers***	ELEVATION **(FT)** 9.705 (M)
LATITUDE 38.95709471	LONGITUDE -74.84875547	DATUM NAD 83	DATUM NAVD 88
(NORTHING) **(FT)** 45261.222 (M)	**(EASTING)** **(FT)** 392956.281 (M)	GRID AND ZONE NJ 2900	ESTABLISHED BY (AGENCY) USACE AC
(NORTHING) **(FT)** (M)	**(EASTING)** **(FT)** (M)	GRID AND ZONE	DATE: 14Feb2020 / ORDER

GEOID MODEL (GPS OBS ONLY): GEOID12B

TO OBTAIN GRID AZ. (ADD) (SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC) ° ' "	BACK AZIMUTH ° ' "	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



SKETCH

DA FORM 1 OCT 64 **1959** REPLACES DA FORMS 1959 AND 1960, 1FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agnecy is TRADOC.

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APPENDIX B41

HAND AUGER LOGS
EXPLORATION LOGS
VIBRATIONAL CORE LOGS

TEST BORING VIBRACORE AND HAND AUGER LOCATIONS

TEST BORINGS (NADV88)

Name	Northing	Easting	Elevation
NVB-01	61295.07	410830.38	0.4
NVB-02	59576.25	409339.35	2.1
NVB-03	57935.47	407874.82	-1.9
NVB-04	58066.27	407645.86	3.7
NVB-05	54610.76	404659.00	-0.2
NVB-06	55046.86	404214.86	5.7
NVB-07	51813.89	400956.91	3.7
NVB-08	52217.67	400527.27	4.4
NVB-09	48916.76	397341.46	4
NVB-10	49148.83	397069.07	4.7
NVB-11	45875.39	394274.79	3.9
NVB-12	46133.53	393984.02	5.5

VIBRACORES (NADV88)

Name	Northing	Easting	Elevation
NJV-748	53892.3	405393.48	-11.4
NJV-749	51168.61	401717.23	-12.8
NJV-750	48312.43	398256.01	-14
NJV-751R2	45291.31	395027.92	-10.1

HAND AUGERS (NADV88)

Name	Northing	Easting	Elevation
NVH-1	50074.33	398604.53	4
NVH-2	49871.17	398890.66	0
NVH-3	51239.50	400049.20	4
NVH-4	51005.70	400298.01	0
NVH-5	52175.80	401344.61	2
NVH-6	51911.73	401515.03	0
NVH-7	52884.78	402104.96	4

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-01
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: W. LIGHTNER
Drilling Method: 3¼" HSA, SAFETY HAMMER
Drilling Equipment: MOBILE B-47 TRACK RIG
Schnabel Representative: W. BRADFIELD
Dates Started: 2/12/07 **Finished:** 2/12/07
Location: 61295.07 N; 410830.38 E

Ground Surface Elevation: 0.4 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	2/12	12:50	1.1'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO MEDIUM POORLY GRADED SAND, MOIST, LIGHT GRAY ▽	SP				3+5+6+7 N = 11	w=21.8%	
	DO, CONTAINS SHELL FRAGMENTS, WET, CONTAINS MICA					7+8+10+11 N = 18		
					5	8+11+22+28 N = 33	w=22.3%	
						10+20+21+23 N = 41		
						7+10+24+43 N = 34	w=22.3%	
					10	24+28+41+47 N = 69		
12.0	FINE TO COARSE SILTY SAND, CONTAINS SHELL FRAGMENTS, WET, GRAY	SM	-11.6			16+15+20+16 N = 35	w=20.2%	
						15+15+15+20 N = 30		
16.0	FINE TO MEDIUM POORLY GRADED SAND, CONTAINS SHELL FRAGMENTS, WET, GRAY	SP	-15.6		15	13+16+17+24 N = 33	w=20.1%	
						16+17+16+20 N = 33		
20.0	FINE TO MEDIUM SILTY SAND, WET, GRAY	SM	-19.6		20	16+30+45 +50/4" N = 75	w=23.5%	
						16+9+27+35 N = 36		
					25	9+17+19+22 N = 36		
26.0	BOTTOM OF BORING @ 26.0 FT.		-25.6					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-02
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: W. LIGHTNER
Drilling Method: 3¼" HSA, SAFETY HAMMER
Drilling Equipment: MOBILE B-47 TRACK RIG
Schnabel Representative: W. BRADFIELD
Dates Started: 2/15/07 **Finished:** 2/15/07
Location: 59576.25 N; 409339.35 E

Ground Surface Elevation: 2.1 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	2/15	9:45	1.0'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO MEDIUM POORLY GRADED, CONTAINS SHELL FRAGMENTS, WET, LIGHT GRAY ▽	SP				9+7+9+16 N = 16	w=26.7%	
	DO, GRAY					9+16+21+32 N = 37		
	DO, FINE TO COARSE				5	8+49+50/3" N = 50/3"	w=21.7%	
						7+23+25+38 N = 48		
						25+15+16+25 N = 31	w=22.3%	
					10	9+25+41+50 N = 66		
	DO, FINE TO MEDIUM					20+34+50/5" N = 50/5"	w=23.2%	
					15	8+15+18 +50/5" N = 33		
16.0	FINE TO MEDIUM POORLY GRADED SAND WITH SILT, CONTAINS SHELL FRAGMENTS, WET, GRAY	SP-SM	-13.9			29+32+40 +50/4" N = 72	w=23.0%	Slight organic odor @ 15.7 ft. Moderate organic odor @ 16 ft.
						10+14+18+14 N = 32		
	DO, FINE TO COARSE				20	12+30+50/5" N = 50/5"	w=26.2%	
						10+8+7+13 N = 15		Strong organic odor @ 22 ft.
					25	7+15+16+11 N = 31		
26.0	BOTTOM OF BORING @ 26.0 FT.		-23.9					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-03
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: W. LIGHTNER
Drilling Method: 3¼" HSA, SAFETY HAMMER
Drilling Equipment: MOBILE B-47 TRACK RIG
Schnabel Representative: W. BRADFIELD
Dates Started: 2/16/07 **Finished:** 2/16/07
Location: 57935.47 N; 407874.82 E
Ground Surface Elevation: -1.9 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	2/16	10:31	0.3'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO COARSE POORLY GRADED SAND, CONTAINS SHELL FRAGMENTS, WET, LIGHT GRAY	SP				5+5+6+8 N = 11	w=22.3%	
	DO, GRAY					10+12+15+19 N = 27		
4.0	FINETO COARSE POORLY GRADED SAND WITH SILT, WET, GRAY	SP-SM	-5.9		5	15+28+31+34 N = 59	w=21.7%	
						18+21+29+30 N = 50		
						9+21+31+29 N = 52	w=23.2%	Slight organic odor @ 8 ft.
	DO, CONTAINS SHELL FRAGMENTS				10	16+21+32+43 N = 53		
	DO, FINE TO MEDIUM					30+35+48+50 N = 83	w=23.9%	Moderate organic odor @ 11.9 ft. Slight organic odor @ 12 ft.
					15	17+25+43 +50/4" N = 68		Moderate organic odor @ 14 ft.
						21+38+50/3" N = 50/3"	w=21.8%	
	DO, NO SHELL FRAGMENTS					23+48+50/4" N = 50/4"		
					20	18+23+28+35 N = 51	w=23.9%	Moderate organic odor @ 20 ft.
	DO, CONTAINS SHELL FRAGMENTS					18+23+28+35 N = 51		Strong organic odor @ 22 ft.
					25	12+18+21+29 N = 39		
26.0	BOTTOM OF BORING @ 26.0 FT.		-27.9					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-04
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: G. ANDERSON
Drilling Method: 4¼" HSA, SAFETY HAMMER
Drilling Equipment: ACKER RUBBER TIRE ATV RIG
Schnabel Representative: J. BEIDEMAN
Dates Started: 3/5/07 **Finished:** 3/5/07
Location: 58066.27 N; 407645.86 E

Ground Surface Elevation: 3.7 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	3/5	9:00	0.0'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO MEDIUM POORLY GRADED SAND, WET, LIGHT GRAY	SP				3+8+10+11 N = 18	w=22.1%	
	DO, GRAY					12+16+21+19 N = 37		
	DO, CONTAINS SHELL FRAGMENTS				5	10+17+21+24 N = 38	w=22.0%	
	DO, NO SHELL FRAGMENTS					25+15+19+19 N = 34		
8.0	FINE TO MEDIUM POORLY GRADED SAND WITH SILT, CONTAINS SHELL FRAGMENTS, WET, GRAY	SP-SM	-4.3			6+8+12+23 N = 20	w=24.3%	
					10	5+11+21+27 N = 32		
12.0	FINE TO MEDIUM POORLY GRADED SAND, WET, DARK GRAY	SP	-8.3			10+16+21+38 N = 37	w=23.9%	Organic odor @ 12 ft.
	DO, CONTAINS SHELL FRAGMENTS, GRAY				15	9+13+28+50 N = 41		
16.0	FINE TO COARSE POORLY GRADED SAND WITH SILT, CONTAINS SHELL FRAGMENTS, WET, GRAY	SP-SM	-12.3			14+17+40 +50/5" N = 57	w=23.5%	
						15+22+23+30 N = 45		Organic odor @ 18 ft.
					20	5+18+25+46 N = 43	w=23.0%	
						21+39+43+44 N = 82		
					25	5+16+18+21 N = 34		
26.0	BOTTOM OF BORING @ 26.0 FT.		-22.3					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-05
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: G. ANDERSON
Drilling Method: 4¼" HSA, SAFETY HAMMER
Drilling Equipment: ACKER RUBBER TIRE ATV RIG
Schnabel Representative: J. BEIDEMAN
Dates Started: 3/5/07 **Finished:** 3/5/07
Location: 54610.76 N; 404659.00

Ground Surface Elevation: -0.2 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	3/5	11:45	0.0'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO COARSE POORLY GRADED SAND, WET, LIGHT GRAY	SP				4+5+8+10 N = 13	w=22.8%	
	DO, GRAY					12+12+15+14 N = 27		
	DO, CONTAINS SHELL FRAGMENTS				5	11+16+22+21 N = 38	w=21.6%	
						7+16+24+32 N = 40		
						8+8+18+30 N = 26	w=22.2%	
					10	10+10+16+29 N = 26		
	DO, DARK GRAY							
12.0	FINE TO MEDIUM POORLY GRADED SAND WITH SILT, WET, DARK GRAY	SP-SM	-12.2			13+18+31+48 N = 49	w=23.4%	
	DO, CONTAINS SHELL FRAGMENTS, GRAY				15	7+15+27+41 N = 42		
						14+30+50 N = 80	w=23.3%	
						5+16+35+43 N = 51		
	DO, FINE TO COARSE				20	8+17+17+27 N = 34	w=25.9%	
	DO, NO SHELL FRAGMENTS					9+17+14+24 N = 31		Organic odor @ 22 ft.
	DO, CONTAINS SHELL FRAGMENTS, COAL, ORGANIC SILT POCKETS				25	2+2+8+15 N = 10		Organic odor @ 24 ft.
26.0	BOTTOM OF BORING @ 26.0 FT.		-26.2					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-06
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: G. ANDERSON
Drilling Method: 4¼" HSA, SAFETY HAMMER
Drilling Equipment: ACKER RUBBER TIRE ATV RIG
Schnabel Representative: J. BEIDEMAN
Dates Started: 3/1/07 **Finished:** 3/1/07
Location: 55046.86 N; 404214.86 E

Ground Surface Elevation: 5.7 (feet)

Groundwater Observations

Date	Time	Depth	Casing	Caved

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO MEDIUM POORLY GRADED SAND, MOIST, LIGHT GRAY	SP				3+8+12+10 N = 20	w=19.5%	
	DO, CONTAINS SHELL FRAGMENTS, WET, GRAY					13+17+26+33 N = 43		
	DO, NO SHELL FRAGMENTS, FINE TO COARSE				5	12+25+40+29 N = 65	w=22.7%	
	DO, FINE TO COARSE, CONTAINS SHELL FRAGMENTS					14+19+29+37 N = 48		
8.0	FINE TO MEDIUM POORLY GRADED SAND WITH SILT, CONTAINS SHELL FRAGMENTS, WET, GRAY	SP-SM	-2.3			12+15+21+30 N = 36	w=23.4%	
					10	12+12+17+30 N = 29		
	DO, FINE TO COARSE					17+38+47 +50/4" N = 85	w=24.9%	
						3+3+10+23 N = 13		
16.0	FINE TO MEDIUM POORLY GRADED SAND, CONTAINS SHELL FRAGMENTS, WET, GRAY	SP	-10.3		15	7+11+20+45 N = 31	w=23.2%	
						22+25+50 +50/3" N = 75		
20.0	FINE TO COARSE POORLY GRADED SAND WITH SILT, WET, GRAY	SP-SM	-14.3		20	16+46+50/4" N = 50/4"	w=24.7%	
						18+15+18+22 N = 33		
	DO, CONTAINS SHELL FRAGMENTS				25	5+10+15+21 N = 25		
26.0	BOTTOM OF BORING @ 26.0 FT.		-20.3					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-07
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: G. ANDERSON
Drilling Method: 4¼" HSA, SAFETY HAMMER
Drilling Equipment: ACKER RUBBER TIRE ATV RIG
Schnabel Representative: J. BEIDEMAN
Dates Started: 3/1/07 **Finished:** 3/1/07
Location: 51813.89 N; 400956.91 E

Ground Surface Elevation: 3.7 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	3/1	8:55	0.0'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO MEDIUM POORLY GRADED SAND, WET, LIGHT GRAY	SP				2+7+10+12 N = 17	w=22.4%	
						10+19+22+21 N = 41		
	DO, GRAY							
	DO, FINE TO COARSE, CONTAINS SHELL FRAGMENTS				5	7+13+20+20 N = 33	w=22.8%	
						10+19+29+32 N = 48		
						5+9+15+23 N = 24	w=23.0%	
	DO, NO SHELL FRAGMENTS				10	5+12+27+31 N = 39		
	DO, FINE TO MEDIUM, CONTAINS SHELL FRAGMENTS, DARK GRAY					8+8+39+74 N = 47	w=22.8%	
						9+19+32+60 N = 51		
	DO, FINE TO COARSE				15	13+35+67 +117 N = 102	w=23.8%	
						10+17+39 +50/4" N = 56		
20.0	FINE TO COARSE POORLY GRADED SAND WITH SILT, WET, GRAY	SP-SM	-16.3		20	15+36+50+50 N = 86	w=23.8%	
	DO, CONTAINS SHELL FRAGMENTS					9+19+40+48 N = 59		
					25	15+21+24+20 N = 45		
26.0	BOTTOM OF BORING @ 26.0 FT.		-22.3					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-08
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: G. ANDERSON
Drilling Method: 4¼" HSA, SAFETY HAMMER
Drilling Equipment: ACKER RUBBER TIRE ATV RIG
Schnabel Representative: J. BEIDEMAN
Dates Started: 2/28/07 **Finished:** 2/28/07
Location: 52217.67 N; 400527.27 E

Ground Surface Elevation: 4.4 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	2/28	2:15	2.0'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO MEDIUM POORLY GRADED SAND, MOIST, LIGHT GRAY	SP				3+5+9+12 N = 14	w=22.5%	
	▽ DO, WET					11+18+25+28 N = 43		
					5	10+18+25+23 N = 43	w=23.7%	
	DO, GRAY					8+20+28+43 N = 48		
	DO, FINE TO COARSE, CONTAINS SHELL FRAGMENTS					6+9+16+27 N = 25	w=23.7%	
					10	6+8+18+35 N = 26		
						11+20+30+42 N = 50	w=23.4%	
					15	8+20+50+73 N = 70		
						10+24+48+67 N = 72	w=23.6%	Organic odor @ 16 ft.
						11+21+39+60 N = 60		
20.0	FINE TO COARSE POORLY GRADED SAND WITH SILT, CONTAINS SHELL FRAGMENTS, WET, GRAY	SP-SM	-15.6		20	10+21+42+47 N = 63	w=23.6%	
						13+21+25+22 N = 46		
						6+11+18+16 N = 29		Slight organic odor @ 24 ft.
					25			
26.0	BOTTOM OF BORING @ 26.0 FT.		-21.6					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-09
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: G. ANDERSON
Drilling Method: 4¼" HSA, SAFETY HAMMER
Drilling Equipment: ACKER RUBBER TIRE ATV RIG
Schnabel Representative: J. BEIDEMAN
Dates Started: 2/28/07 **Finished:** 2/28/07
Location: 48916.76 N; 397341.46 E

Ground Surface Elevation: 4.0 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	2/28	11:15	1.0'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO MEDIUM POORLY GRADED SAND, MOIST, LIGHT GRAY ▽	SP				1+2+5+7 N = 7	w=21.1%	
	DO, WET					11+15+20+20 N = 35		
	DO, FINE TO COARSE, GRAY				5	11+17+22+22 N = 39	w=22.5%	
	DO, CONTAINS SHELL FRAGMENTS					7+13+20+33 N = 33		
						3+7+15+23 N = 22	w=21.6%	
	DO, DARK GRAY				10	9+15+33+41 N = 48		Organic odor @ 10 ft.
12.0	FINE TO COARSE POORLY GRADED SAND WITH SILT, CONTAINS SHELL FRAGMENTS, WET, GRAY	SP-SM	-8.0			12+14+26+47 N = 40	w=23.1%	
	DO, NO SHELL FRAGMENTS				15	9+16+31+44 N = 47		
16.0	FINE TO MEDIUM POORLY GRADED SAND, CONTAINS SHELL FRAGMENTS, WET, GRAY	SP	-12.0			11+21+32+52 N = 53	w=23.1%	
	DO, NO SHELL FRAGMENTS					10+19+38+48 N = 57		
20.0	FINE TO COARSE POORLY GRADED SAND WITH SILT, WET, GRAY	SP-SM	-16.0		20	16+19+23+28 N = 42	w=23.6%	
						10+14+30+47 N = 44		
	DO, CONTAINS SHELL FRAGMENTS				25	19+19+23+25 N = 42		
26.0	BOTTOM OF BORING @ 26.0 FT.		-22.0					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-10
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: G. ANDERSON
Drilling Method: 4¼" HSA, SAFETY HAMMER
Drilling Equipment: ACKER RUBBER TIRE ATV RIG
Schnabel Representative: J. BEIDEMAN
Dates Started: 2/28/07 **Finished:** 2/28/07
Location: 49148.83 N; 397069.07 E

Ground Surface Elevation: 4.7 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	2/28	8:55	1.0'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO MEDIUM SILTY SAND, MOIST, LIGHT GRAY ▽	SM				5+8+15+15 N = 23	w=24.0%	
	DO, WET					20+22+24+24 N = 46		
4.0	FINE TO COARSE POORLY GRADED SAND, WET, LIGHT GRAY	SP	0.7		5	12+16+17+19 N = 33	w=24.3%	Slight organic odor @ 5 ft.
	DO, DARK GRAY							
	DO, CONTAINS GLASS					6+12+25+33 N = 37		
	DO, CONTAINS SHELL FRAGMENTS, NO GLASS					7+15+24+28 N = 39	w=23.2%	
					10	9+8+21+29 N = 29		
	DO, FINE TO MEDIUM					7+9+25+57 N = 34	w=24.6%	
						7+7+27+54 N = 34		
					15			
	DO, NO SHELL FRAGMENTS					11+14+36+57 N = 50	w=25.4%	
	DO, CONTAINS SHELL FRAGMENTS					7+14+20+35 N = 34		
	DO, FINE TO COARSE				20	10+12+23+34 N = 35	w=21.3%	
						20+21+40+67 N = 61		
	DO, LIGHT GRAY TO BROWN					8+8+15+24 N = 23		
					25			
26.0	BOTTOM OF BORING @ 26.0 FT.		-21.3					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-11
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: G. ANDERSON
Drilling Method: 4¼" HSA, SAFETY HAMMER
Drilling Equipment: ACKER RUBBER TIRE ATV RIG
Schnabel Representative: J. BEIDEMAN
Dates Started: 2/27/07 **Finished:** 2/27/07
Location: 45875.39 N; 394274.79 E

Ground Surface Elevation: 3.9 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	2/27	11:25	1.0'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO MEDIUM POORLY GRADED SAND, MOIST, LIGHT GRAY ▽	SP				1+2+2+4 N = 4	w=21.3%	
	DO, WET					11+17+16+21 N = 33		
					5	6+13+20+21 N = 33	w=23.6%	
						10+7+11+12 N = 18		
	DO, DARK GRAY TO BLACK							
	DO, FINE TO COARSE, CONTAINS SHELL FRAGMENTS, GRAY					6+9+14+25 N = 23	w=24.8%	
					10	5+10+16+23 N = 26		
	DO, FINE TO MEDIUM					11+20+32+41 N = 52	w=20.5%	
						8+13+20+45 N = 33		
16.0	FINE TO COARSE POORLY GRADED SAND WITH SILT, CONTAINS SHELL FRAGMENTS, WET, GRAY	SP-SM	-12.1		15	13+24+27+35 N = 51	w=22.3%	
	DO, NO SHELL FRAGMENTS					11+11+30+46 N = 41		
20.0	FINE TO COARSE POORLY GRADED SAND, CONTAINS SHELL FRAGMENTS	SP	-16.1		20	13+13+27+40 N = 40	w=21.8%	
						5+18+34+54 N = 52		Organic odor @ 23 ft.
	DO, CONTAINS ORGANIC SILT POCKETS, DARK GRAY							
					25	10+21+33+41 N = 54		
26.0	BOTTOM OF BORING @ 26.0 FT.		-22.1					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: WILDWOOD BEACH INVESTIGATION
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NVB-12
Contract Number: 04151127.15
Sheet: 1 of 1

Boring Contractor: TABASCO DRILLING
MOUNT LAUREL, NEW JERSEY
Boring Foreman: G. ANDERSON
Drilling Method: 4¼" HSA, SAFETY HAMMER
Drilling Equipment: ACKER RUBBER TIRE ATV RIG
Schnabel Representative: J. BEIDEMAN
Dates Started: 2/23/07 **Finished:** 2/23/07
Location: 46133.53 N; 393984.02 E

Ground Surface Elevation: 5.5 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	2/23	8:45	2.0'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO MEDIUM POORLY GRADED SAND, DRY, LIGHT GRAY	SP				1+5+9+13 N = 14	w=9.6%	
	DO, WET					19+20+29+30 N = 49		
	DO, FINE TO COARSE, CONTAINS SHELL FRAGMENTS				5	8+12+15+18 N = 27	w=20.4%	
						22+15+19+25 N = 34		
8.0	FINE TO COARSE POORLY GRADED SAND WITH SILT, CONTAINS SHELL FRAGMENTS WET, DARK GRAY	SP-SM	-2.5			19+10+19+20 N = 29	w=21.8%	
	DO, NO SHELL FRAGMENTS				10	10+10+20+25 N = 30		
12.0	FINE TO COARSE POORLY GRADED SAND, CONTAINS SHELL FRAGMENTS, WET, GRAY	SP	-6.5			18+17+35+33 N = 52	w=21.9%	
					15	11+11+16+30 N = 27		
16.0	FINE TO COARSE POORLY GRADED SAND WITH SILT, CONTAINS SHELL FRAGMENTS, WET, DARK GRAY	SP-SM	-10.5			17+15+22+27 N = 37	w=21.8%	
	DO, NO SHELL FRAGMENTS					12+8+18+27 N = 26		
20.0	FINE TO COARSE POORLY GRADED SAND, WET, GRAY	SP	-14.5		20	14+13+21+29 N = 34	w=21.4%	
						10+15+25+25 N = 40		
	DO, CONTAINS WOOD AND SHELL FRAGMENTS				25	4+10+20+24 N = 30		
26.0	BOTTOM OF BORING @ 26.0 FT.		-20.5					

TEST BORING LOG 04151127.15 BORING LOGS.GPJ SCHNABEL.GDT 4/16/07

Comments:
1. BACKFILLED UPON COMPLETION.
2. BENTONITE DRILLING MUD WAS UTILIZED TO STABILIZE THE BOREHOLE.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: VIBRATIONAL CORING
WILDWOOD TO HEREFORD INLET
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NJV-748
Contract Number: 04151127.11
Sheet: 1 of 1

Boring Contractor: ALPINE OCEAN SEISMIC SURVEY
NORWOOD, NEW JERSEY
Boring Foreman: C. DILL
Drilling Method: VIBRACORE
Drilling Equipment: 271B ALPINE PNEUMATIC VIBRACORE
Schnabel Representative: M PENZONE
Dates Started: 4/14/06 **Finished:** 4/14/06
Location: 53892.3 N; 405393.48 E
Ground Surface Elevation: -11.4± (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Raw (see Note 2)	4/14	1:40	8.9'	N/A	N/A
Corrected	4/14	1:40	11.4'	N/A	N/A

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	POORLY GRADED SAND, CONTAINS GRAVEL AND SHELL FRAGMENTS, WET - DARK GRAY	SP					SIEVE	(0.0 to 5.0 ft)
5.0	POORLY GRADED SAND, CONTAINS SHELL FRAGMENTS, WET - DARK GRAY	SP	-16.4		5		SIEVE	(5.0 to 10.0 ft)
10.0	POORLY GRADED SAND WITH SILT, WET - GRAY ORGANIC SILT SEAM AT 10.5 FT 2 IN THICK COARSE SAND LAYER AT 11.5 FT SHELL FRAGMENTS AT 14.0 FT	SP-SM	-21.4		10		SIEVE	(10.0 to 15.0 ft)
15.0	POORLY GRADED SAND WITH SILT CONTAINS SHELL FRAGMENTS, WET - DARK GRAY	SP-SM	-26.4		15		SIEVE	(15.0 to 16.2 ft)
16.2	BOTTOM OF BORING @ 16.2 FT.		-27.6					Recovery = 81%

TEST BORING LOG 04151127.11VIBRACORE_WILDWOOD-HEREFORD.GPJ SCHNABEL.GDT 6/27/06

Comments:
1. VISUAL DESCRIPTIONS WERE MADE DURING CORE OPENING PROCEDURES BY ASTM D2487 AND CLASSICATION BY ASTM D422.
2. FOR DEPTH TO MUDLINE NOMENCLATURE, REFER TO THE GENERAL NOTES.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: VIBRATIONAL CORING
WILDWOOD TO HEREFORD INLET
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NJV-749
Contract Number: 04151127.11
Sheet: 1 of 1

Boring Contractor: ALPINE OCEAN SEISMIC SURVEY
NORWOOD, NEW JERSEY
Boring Foreman: C. DILL
Drilling Method: VIBRACORE
Drilling Equipment: 271B ALPINE PNEUMATIC VIBRACORE
Schnabel Representative: M PENZONE
Dates Started: 4/14/06 **Finished:** 4/14/06
Location: 51168.61 N; 401717.23 E
Ground Surface Elevation: -12.8± (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Raw (see Note 2)	4/14	2:29	10.8'	N/A	N/A
Corrected	4/14	2:29	12.8'	N/A	N/A

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	POORLY GRADED SAND, CONTAINS MICA AND SHELL FRAGMENTS, WET - GRAY	SP					SIEVE	(0.0 to 5.0 ft)
5.0	POORLY GRADED SAND WITH SILT, CONTAINS ORGANICS, MICA AND SHELL FRAGMENTS, WET, DARK GRAY	SP-SM	-17.8		5		SIEVE	(5.0 to 10.0 ft)
10.0	POORLY GRADED SAND WITH SILT, CONTAINS ORGANICS, MICA AND SHELL FRAGMENTS, WET, DARK GRAY GAP IN SAMPLE RECOVERY AT 10.9 FT	SP-SM	-22.8		10		SIEVE	(10.0 to 15.0 ft)
15.0	SILTY SAND, CONTAINS SHELL FRAGMENTS AND MICA WET - DARK GRAY	SM	-27.8		15		SIEVE	(15.0 to 15.9 ft)
15.9	SILTY SAND, CONTAINS GRAVEL, SHELL FRAGMENTS AND MICA, WET - DARK GRAY	SM	-28.7				SIEVE	(15.9 to 18.2 ft)
18.2	SILTY SAND, CONTAINS GRAVEL, ORGANICS, SHELL FRAGMENTS AND MICA, WET - DARK GRAY	SM	-31.0				SIEVE	(18.2 to 19.4 ft)
19.4	BOTTOM OF BORING @ 19.4 FT.		-32.2					Recovery = 97%

TEST BORING LOG 04151127.11VIBRACORE_WILDWOOD-HEREFORD.GPJ SCHNABEL.GDT 6/27/06

Comments:
1. VISUAL DESCRIPTIONS WERE MADE DURING CORE OPENING PROCEDURES BY ASTM D2487 AND CLASSICATION BY ASTM D422.
2. FOR DEPTH TO MUDLINE NOMENCLATURE, REFER TO THE GENERAL NOTES.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: VIBRATIONAL CORING
WILDWOOD TO HEREFORD INLET
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NJV-750
Contract Number: 04151127.11
Sheet: 1 of 1

Boring Contractor: ALPINE OCEAN SEISMIC SURVEY
NORWOOD, NEW JERSEY
Boring Foreman: C. DILL
Drilling Method: VIBRACORE
Drilling Equipment: 271B ALPINE PNEUMATIC VIBRACORE
Schnabel Representative: M PENZONE
Dates Started: 4/14/06 **Finished:** 4/14/06
Location: 48312.43 N; 398256.01 E
Ground Surface Elevation: -14.0± (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Raw (see Note 2)	4/14	3:04	12.5'	N/A	N/A
Corrected	4/14	3:04	14.0'	N/A	N/A

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	POORLY GRADED SAND, CONTAINS MICA AND SHELL FRAGMENTS, WET - DARK GRAY	SP					SIEVE	(0.0 to 5.0 ft)
5.0	POORLY GRADED SAND, CONTAINS MICA AND SHELL FRAGMENTS, WET - DARK GRAY 2.5 IN SHELL FRAGMENT LAYER AT 7.5 FT	SP	-19.0		5		SIEVE	(5.0 to 9.3 ft)
9.3	SANDY ORGANIC SILT, CONTAINS MICA, WET - DARK GRAY	OL	-23.3				SIEVE	(9.3 to 10.0 ft)
10.0	SILTY SAND, CONTAINS SHELL FRAGMENTS, WET - GRAY	SM	-24.0		10		SIEVE	(10.0 to 11.2 ft)
11.2	POORLY GRADED SAND, CONTAINS SHELL FRAGMENTS, WET - DARK GRAY	SP	-25.2				SIEVE	(11.2 to 15.0 ft)
15.0	POORLY GRADED SAND, CONTAINS SHELL FRAGMENTS, WET - DARK GRAY	SP	-29.0		15		SIEVE	(15.0 to 19.0 ft)
19.0	BOTTOM OF BORING @ 19.0 FT.		-33.0					Recovery = 95%

TEST BORING LOG 04151127.11VIBRACORE_WILDWOOD-HEREFORD.GPJ SCHNABEL.GDT 6/27/06

Comments:
1. VISUAL DESCRIPTIONS WERE MADE DURING CORE OPENING PROCEDURES BY ASTM D2487 AND CLASSICATION BY ASTM D422.
2. FOR DEPTH TO MUDLINE NOMENCLATURE, REFER TO THE GENERAL NOTES.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Schnabel Engineering

TEST BORING LOG

Project: VIBRATIONAL CORING
WILDWOOD TO HEREFORD INLET
CAPE MAY COUNTY, NEW JERSEY

Boring Number: NJV-751R2
Contract Number: 04151127.11
Sheet: 1 of 1

Boring Contractor: ALPINE OCEAN SEISMIC SURVEY
NORWOOD, NEW JERSEY
Boring Foreman: C. DILL
Drilling Method: VIBRACORE
Drilling Equipment: 271B ALPINE PNEUMATIC VIBRACORE
Schnabel Representative: M PENZONE
Dates Started: 4/14/06 **Finished:** 4/14/06
Location: 45291.31 N; 395027.92 E
Ground Surface Elevation: -10.1± (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Raw (see Note 2)	4/14	4:08	9.5'	N/A	N/A
Corrected	4/14	4:08	10.1'	N/A	N/A

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRA-TUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	POORLY GRADED SAND, CONTAINS ORGANICS AND SHELL FRAGMENTS, WET - DARK GRAY	SP					SIEVE	(0.0 to 5.0 ft)
5.0	POORLY GRADED SAND, CONTAINS ORGANICS AND SHELL FRAGMENTS, WET - DARK GRAY SILT SEAM AT 6.4 FT	SP	-15.1		5		SIEVE	(5.0 to 10.0 ft)
10.0	POORLY GRADED SAND, CONTAINS ORGANICS AND SHELL FRAGMENTS, WET - GRAY	SP	-20.1		10		SIEVE	(10.0 to 15.0 ft)
15.0	POORLY GRADED SAND, CONTAINS SHELL FRAGMENTS, WET - GRAY	SP	-25.1		15		SIEVE	(15.0 to 18.2 ft)
18.2	BOTTOM OF BORING @ 18.2 FT.		-28.3					Recovery = 91%

TEST BORING LOG 04151127.11VIBRACORE_WILDWOOD-HEREFORD.GPJ SCHNABEL.GDT 6/27/06

Comments:
1. VISUAL DESCRIPTIONS WERE MADE DURING CORE OPENING PROCEDURES BY ASTM D2487 AND CLASSICATION BY ASTM D422.
2. FOR DEPTH TO MUDLINE NOMENCLATURE, REFER TO THE GENERAL NOTES.
3. NORTHING & EASTINGS REFERENCE NAD83, NJ STATE PLANE COORDINATE SYSTEM.
4. ELEVATIONS REFERENCE NAVD88 DATUM.

Boring Designation **NVH-1**

DRILLING LOG

DIVISION: North Atlantic

INSTALLATION:

Sheet 1 of 1

1. PROJECT	Hereford Inlet to Cape May Inlet North Wildwood, NJ
2. HOLE NUMBER	NVH-1
3. DRILLING AGENCY	
4. NAME OF DRILLER	Austin Beyer
5. EQUIPMENT	
6. DIRECTION OF BORING	DEG FROM VERTICAL: BEARING:
7. THICKNESS OF OVERBURDEN	3.0'
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF BORING	3.0'
10. COORDINATE SYSTEM	NAD 1983 StatePlane New Jersey FIPS 2900 Feet VERTICAL: NAVD88
LOCATION COORDINATES	N: 50074.33 E: 398604.53 LOCATION METHOD:
11. DATE BORING	STARTED: Apr 10 2024 COMPLETED: Apr 10 2024
12. HAMMER TYPE	EFFICIENCY (%)
13. SIZE AND TYPE OF BIT	
14. ELEVATION SURFACE	4.0'
15. ELEVATION GROUND WATER	
16. TOTAL NUMBER CORE BOXES	
17. SIGNATURE AND TITLE OF INSPECTOR	Melinda Eason, PE

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	REMARKS
			POORLY GRADED SAND (SP) gray, trace shell fragments			Location method and elevation surface were obtained from Google Earth.
					NVH-1A	
					NVH-1B	
1.00	3.00					
			Borehole finished at 3.0			

Boring Designation **NVH-2**

DRILLING LOG

DIVISION: North Atlantic

INSTALLATION:

Sheet 1 of 1

1. PROJECT	Hereford Inlet to Cape May Inlet North Wildwood, NJ
2. HOLE NUMBER	NVH-2
3. DRILLING AGENCY	
4. NAME OF DRILLER	Austin Beyer
5. EQUIPMENT	
6. DIRECTION OF BORING	DEG FROM VERTICAL: BEARING:
7. THICKNESS OF OVERBURDEN	3.0'
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF BORING	3.0'
10. COORDINATE SYSTEM	NAD 1983 StatePlane New Jersey FIPS 2900 Feet VERTICAL: NAVD88
LOCATION COORDINATES	N: 49871.17 E: 398890.66 LOCATION METHOD:
11. DATE BORING	STARTED: Apr 10 2024 COMPLETED: Apr 10 2024
12. HAMMER TYPE	EFFICIENCY (%)
13. SIZE AND TYPE OF BIT	
14. ELEVATION SURFACE	0.0'
15. ELEVATION GROUND WATER	
16. TOTAL NUMBER CORE BOXES	
17. SIGNATURE AND TITLE OF INSPECTOR	Melinda Eason, PE

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	REMARKS
			POORLY GRADED SAND (SP) gray, trace shell fragments		NVH-2A	Location method and elevation surface were obtained from Google Earth.
-3.00	3.00				NVH-2B	
			Borehole finished at 3.0			

-5

-10

-15

Boring Designation **NVH-3**

DRILLING LOG

DIVISION: North Atlantic

INSTALLATION:

Sheet 1 of 1

1. PROJECT	Hereford Inlet to Cape May Inlet North Wildwood, NJ
10. COORDINATE SYSTEM	NAD 1983 StatePlane New Jersey FIPS 2900 Feet
VERTICAL	NAVD88
LOCATION COORDINATES	N: 51239.50 E: 400049.20
LOCATION METHOD:	
2. HOLE NUMBER	NVH-3
3. DRILLING AGENCY	
11. DATE BORING STARTED	Apr 10 2024
11. DATE BORING COMPLETED	Apr 10 2024
4. NAME OF DRILLER	Austin Beyer
12. HAMMER TYPE	
EFFICIENCY (%)	
5. EQUIPMENT	
13. SIZE AND TYPE OF BIT	
6. DIRECTION OF BORING	
DEG FROM VERTICAL	
BEARING	
14. ELEVATION SURFACE	4.0'
15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN	2.5'
16. TOTAL NUMBER CORE BOXES	
8. DEPTH DRILLED INTO ROCK	
17. SIGNATURE AND TITLE OF INSPECTOR	Melinda Eason, PE
9. TOTAL DEPTH OF BORING	2.5'

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	REMARKS
			POORLY GRADED SAND (SP) gray, trace shell fragments			Location method and elevation surface were obtained from Google Earth.
					NVH-3A	
					NVH-3B	
1.50	2.50					
			Borehole finished at 2.5			

Boring Designation **NVH-4**

DRILLING LOG

DIVISION: North Atlantic

INSTALLATION:

Sheet 1 of 1

1. PROJECT	Hereford Inlet to Cape May Inlet North Wildwood, NJ
2. HOLE NUMBER	NVH-4
3. DRILLING AGENCY	
4. NAME OF DRILLER	Austin Beyer
5. EQUIPMENT	
6. DIRECTION OF BORING	DEG FROM VERTICAL: BEARING:
7. THICKNESS OF OVERBURDEN	3.0'
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF BORING	3.0'
10. COORDINATE SYSTEM	NAD 1983 StatePlane New Jersey FIPS 2900 Feet VERTICAL: NAVD88
LOCATION COORDINATES	N: 51005.70 E: 400298.01 LOCATION METHOD:
11. DATE BORING	STARTED: Apr 10 2024 COMPLETED: Apr 10 2024
12. HAMMER TYPE	EFFICIENCY (%)
13. SIZE AND TYPE OF BIT	
14. ELEVATION SURFACE	0.0'
15. ELEVATION GROUND WATER	
16. TOTAL NUMBER CORE BOXES	
17. SIGNATURE AND TITLE OF INSPECTOR	Melinda Eason, PE

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	REMARKS
			POORLY GRADED SAND (SP) gray, trace shell fragments			Location method and elevation surface were obtained from Google Earth.
					NVH-4A	
					NVH-4B	
-3.00	3.00		Borehole finished at 3.0			

Boring Designation NVH-5

DRILLING LOG

DIVISION: North Atlantic

INSTALLATION:

Sheet 1 of 1

1. PROJECT	Hereford Inlet to Cape May Inlet North Wildwood, NJ
2. HOLE NUMBER	NVH-5
3. DRILLING AGENCY	
4. NAME OF DRILLER	Austin Beyer
5. EQUIPMENT	
6. DIRECTION OF BORING	DEG FROM VERTICAL: BEARING:
7. THICKNESS OF OVERBURDEN	2.5'
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF BORING	2.5'
10. COORDINATE SYSTEM	NAD 1983 StatePlane New Jersey FIPS 2900 Feet VERTICAL: NAVD88
LOCATION COORDINATES	N: 52175.80 E: 401344.61 LOCATION METHOD:
11. DATE BORING	STARTED: Apr 10 2024 COMPLETED: Apr 10 2024
12. HAMMER TYPE	EFFICIENCY (%)
13. SIZE AND TYPE OF BIT	
14. ELEVATION SURFACE	2.0'
15. ELEVATION GROUND WATER	
16. TOTAL NUMBER CORE BOXES	
17. SIGNATURE AND TITLE OF INSPECTOR	Melinda Eason, PE

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	REMARKS
			POORLY GRADED SAND (SP) gray, trace shell fragments			Location method and elevation surface were obtained from Google Earth.
					NVH-5A	
					NVH-5B	
-0.50	2.50					
			Borehole finished at 2.5			

Boring Designation **NVH-6**

DRILLING LOG

DIVISION: North Atlantic

INSTALLATION:

Sheet 1 of 1

1. PROJECT	Hereford Inlet to Cape May Inlet North Wildwood, NJ
2. HOLE NUMBER	NVH-6
3. DRILLING AGENCY	
4. NAME OF DRILLER	Austin Beyer
5. EQUIPMENT	
6. DIRECTION OF BORING	
DEG FROM VERTICAL	
BEARING	
7. THICKNESS OF OVERBURDEN	1.5'
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF BORING	1.5'
10. COORDINATE SYSTEM	NAD 1983 StatePlane New Jersey FIPS 2900 Feet
VERTICAL	NAVD88
LOCATION COORDINATES	N: 51911.73 E: 401515.03
LOCATION METHOD:	
11. DATE BORING STARTED	Apr 10 2024
COMPLETED	Apr 10 2024
12. HAMMER TYPE	
EFFICIENCY (%)	
13. SIZE AND TYPE OF BIT	
14. ELEVATION SURFACE	0.0'
15. ELEVATION GROUND WATER	
16. TOTAL NUMBER CORE BOXES	
17. SIGNATURE AND TITLE OF INSPECTOR	Melinda Eason, PE

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	REMARKS
			POORLY GRADED SAND (SP) gray, trace shell fragments			Location method and elevation surface were obtained from Google Earth.
					NVH-6A	
-1.50	1.50					
			Borehole finished at 1.5			

Boring Designation NVH-7

DRILLING LOG

DIVISION: North Atlantic

INSTALLATION:

Sheet 1 of 1

1. PROJECT	Hereford Inlet to Cape May Inlet North Wildwood, NJ
2. HOLE NUMBER	NVH-7
3. DRILLING AGENCY	
4. NAME OF DRILLER	Austin Beyer
5. EQUIPMENT	
6. DIRECTION OF BORING	DEG FROM VERTICAL: BEARING:
7. THICKNESS OF OVERBURDEN	2.5'
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF BORING	2.5'
10. COORDINATE SYSTEM	NAD 1983 StatePlane New Jersey FIPS 2900 Feet
VERTICAL	NAVD88
LOCATION COORDINATES	N: 52884.78 E: 402104.96
LOCATION METHOD:	
11. DATE BORING	STARTED: Apr 10 2024 COMPLETED: Apr 10 2024
12. HAMMER TYPE	EFFICIENCY (%)
13. SIZE AND TYPE OF BIT	
14. ELEVATION SURFACE	4.0'
15. ELEVATION GROUND WATER	
16. TOTAL NUMBER CORE BOXES	
17. SIGNATURE AND TITLE OF INSPECTOR	Melinda Eason, PE

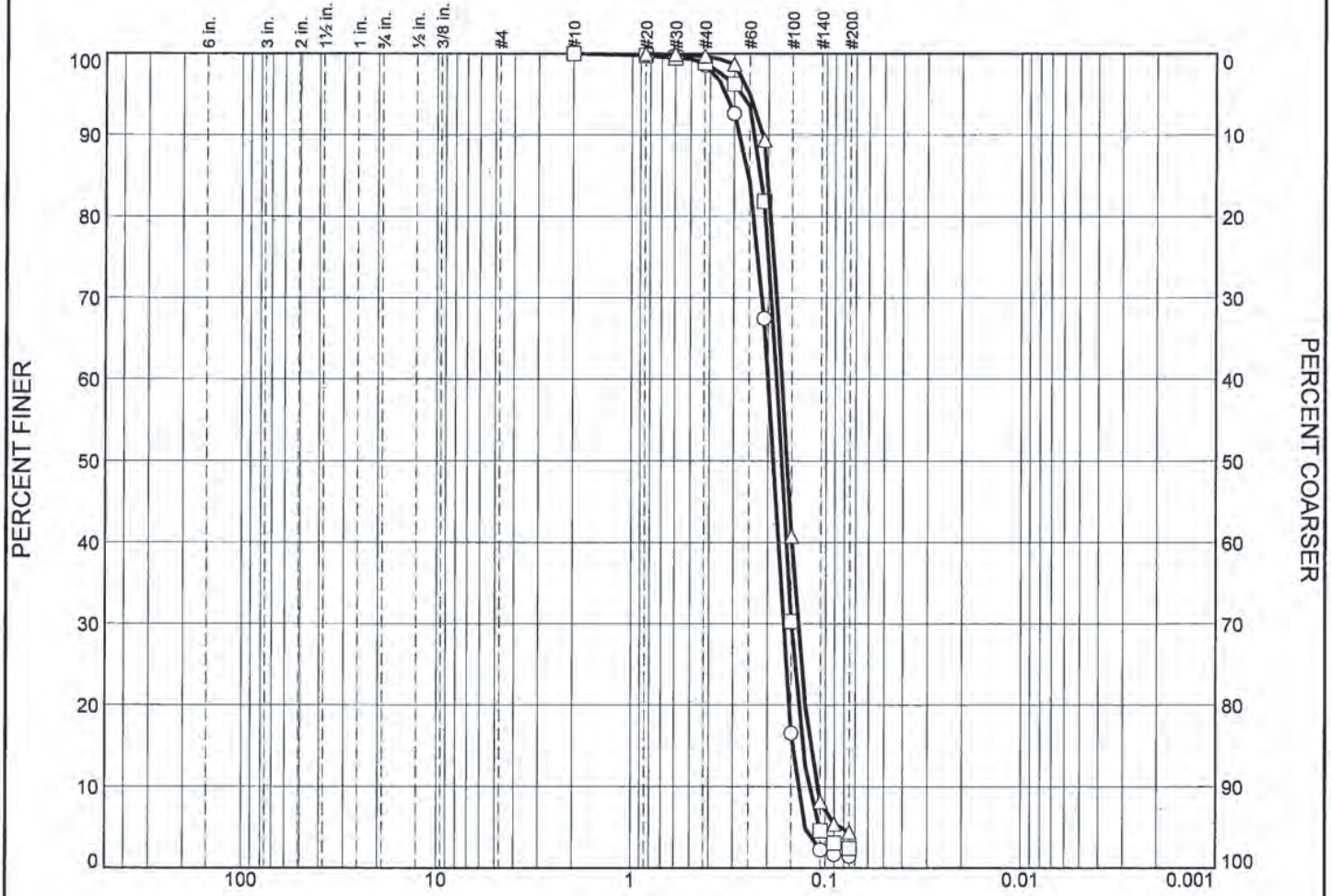
ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	REMARKS
			POORLY GRADED SAND (SP) gray, trace shell fragments			Location method and elevation surface were obtained from Google Earth.
					NVH-7A	
					NVH-7B	
1.50	2.50					
			Borehole finished at 2.5			

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APPENDIX B42
GRAIN SIZE DISTRIBUTION CURVES

HAND AUGER SAMPLES
EXPLORATION SAMPLES
VIBRATIONAL CORE SAMPLES

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.4	97.1	1.5	
□	0.0	0.0	0.0	0.0	1.1	96.5	2.4	
△	0.0	0.0	0.0	0.0	0.3	95.3	4.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2525	0.1993	0.1872	0.1657	0.1478	0.1395	0.99	1.43
□			0.2166	0.1805	0.1700	0.1497	0.1305	0.1215	1.02	1.48
△			0.2014	0.1695	0.1593	0.1385	0.1195	0.1106	1.02	1.53

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand	SP	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-1 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-1 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-1 **Depth:** 8.0-12.0

Remarks:

○ Moisture Content - 21.8%

□ Moisture Content - 22.3%

△ Moisture Content - 22.3%

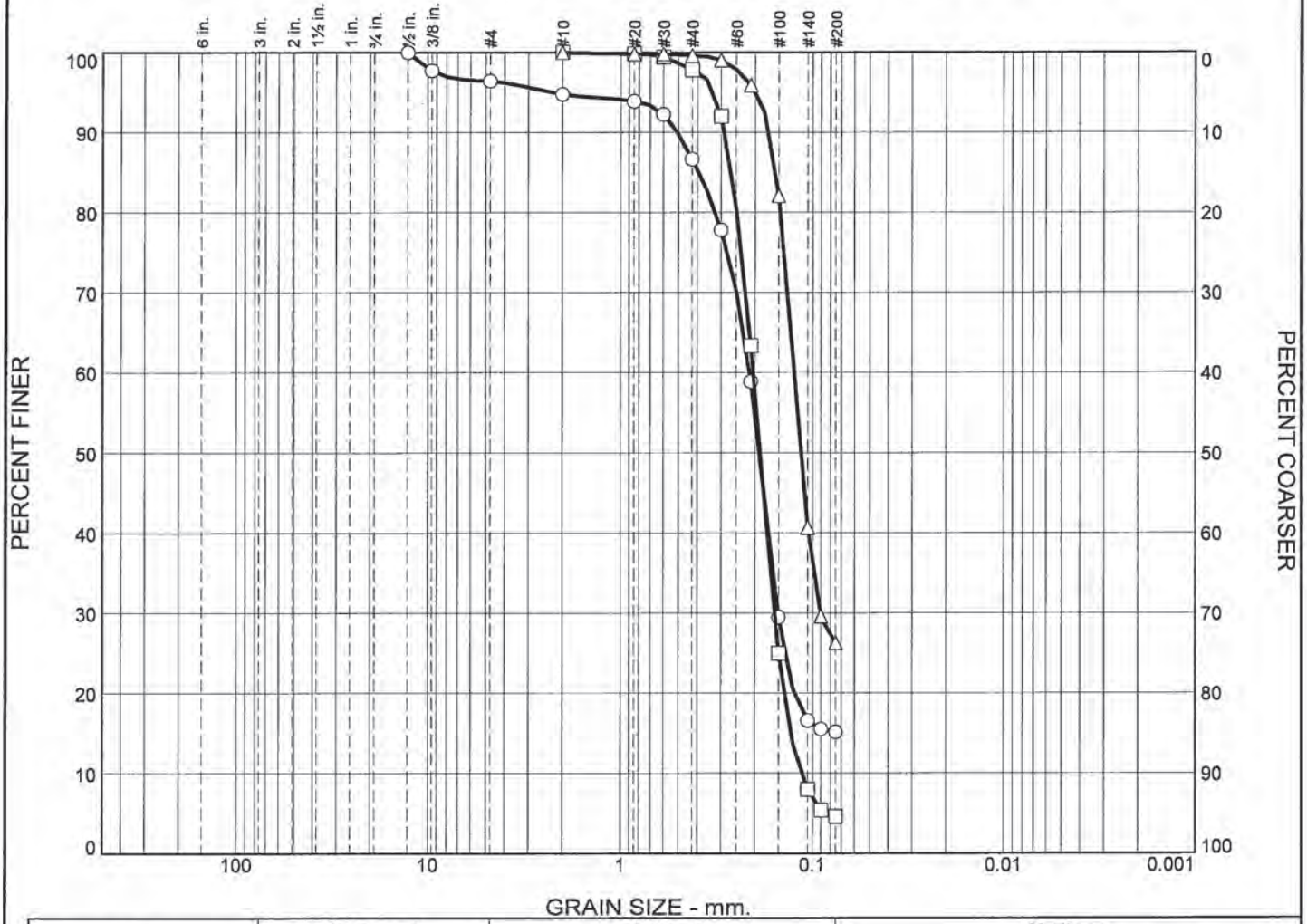
GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Plate

Tested By: □ A. Allen △ D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	3.6	1.6	8.1	71.5	15.2	
□	0.0	0.0	0.0	0.0	2.2	93.2	4.6	
△	0.0	0.0	0.0	0.0	0.4	73.3	26.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NV	NP	0.3924	0.2130	0.1896	0.1511				
□			0.2652	0.2040	0.1878	0.1581	0.1299	0.1147	1.07	1.78
△			0.1553	0.1245	0.1152	0.0909				

Material Description	USCS	AASHTO
○ Gray silty sand	SM	A-2-4(0)
□ Gray poorly graded sand	SP	
△ Gray silty sand	SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-1 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-1 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-1 **Depth:** 20.0-26.0

Remarks:

○ Moisture Content - 20.2%

□ Moisture Content - 20.1%

△ Moisture Content - 23.5%

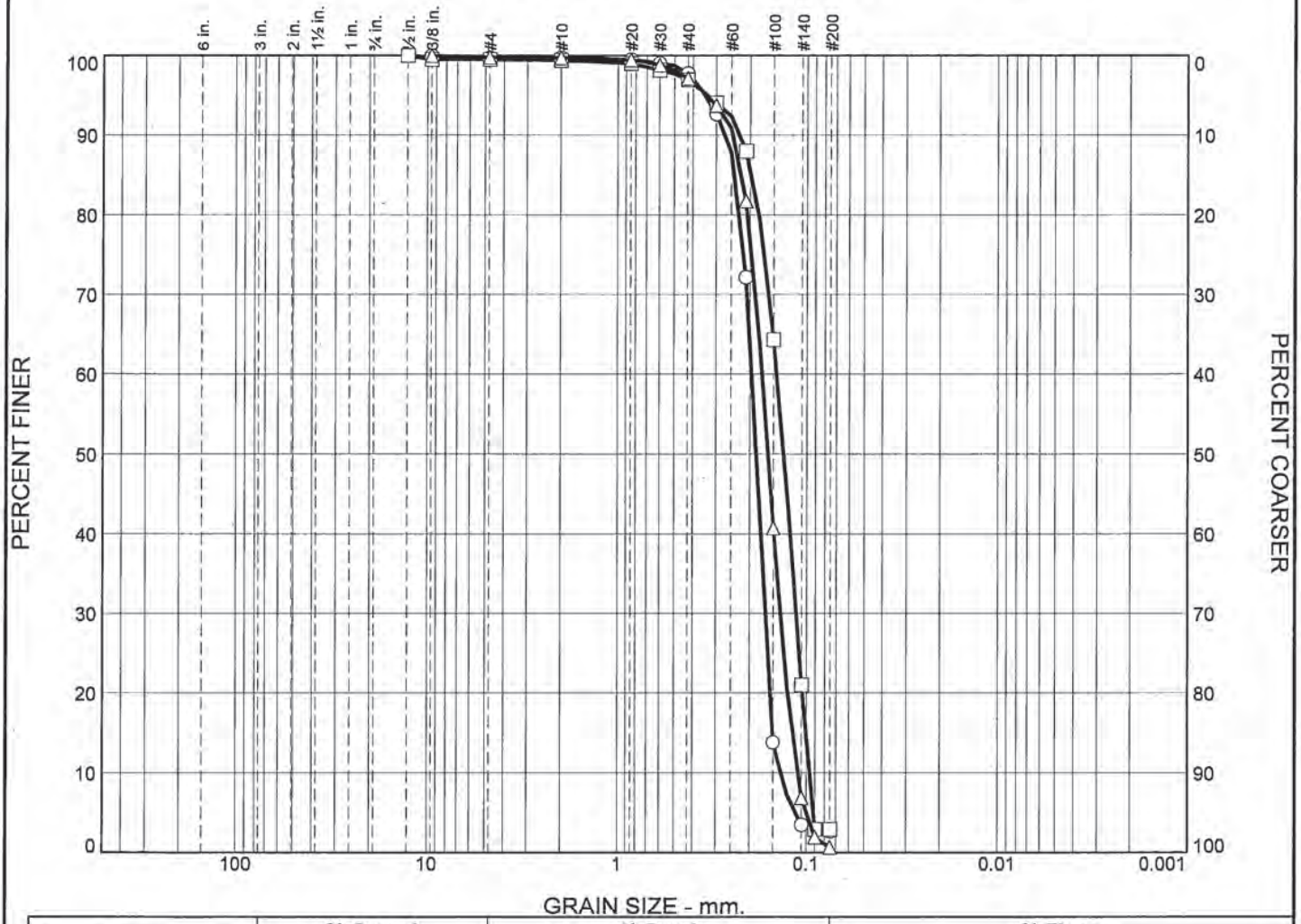
GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	0.0	1.9	95.1	2.7	
□	0.0	0.0	0.5	0.1	2.5	94.0	2.9	
△	0.0	0.0	0.2	0.1	2.6	96.5	0.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2381	0.1949	0.1848	0.1665	0.1514	0.1371	1.04	1.42
□			0.1963	0.1440	0.1322	0.1133	0.1014	0.0974	0.91	1.48
△			0.2195	0.1731	0.1607	0.1377	0.1191	0.1117	0.98	1.55

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gary poorly graded sand	SP	
△ Gray poorly graded sand	SP	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-2 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-2 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-2 **Depth:** 8.0-12.0

Remarks:

○ Moisture Content - 26.7%

□ Moisture Content - 21.7%

△ Moisture Content - 22.3%

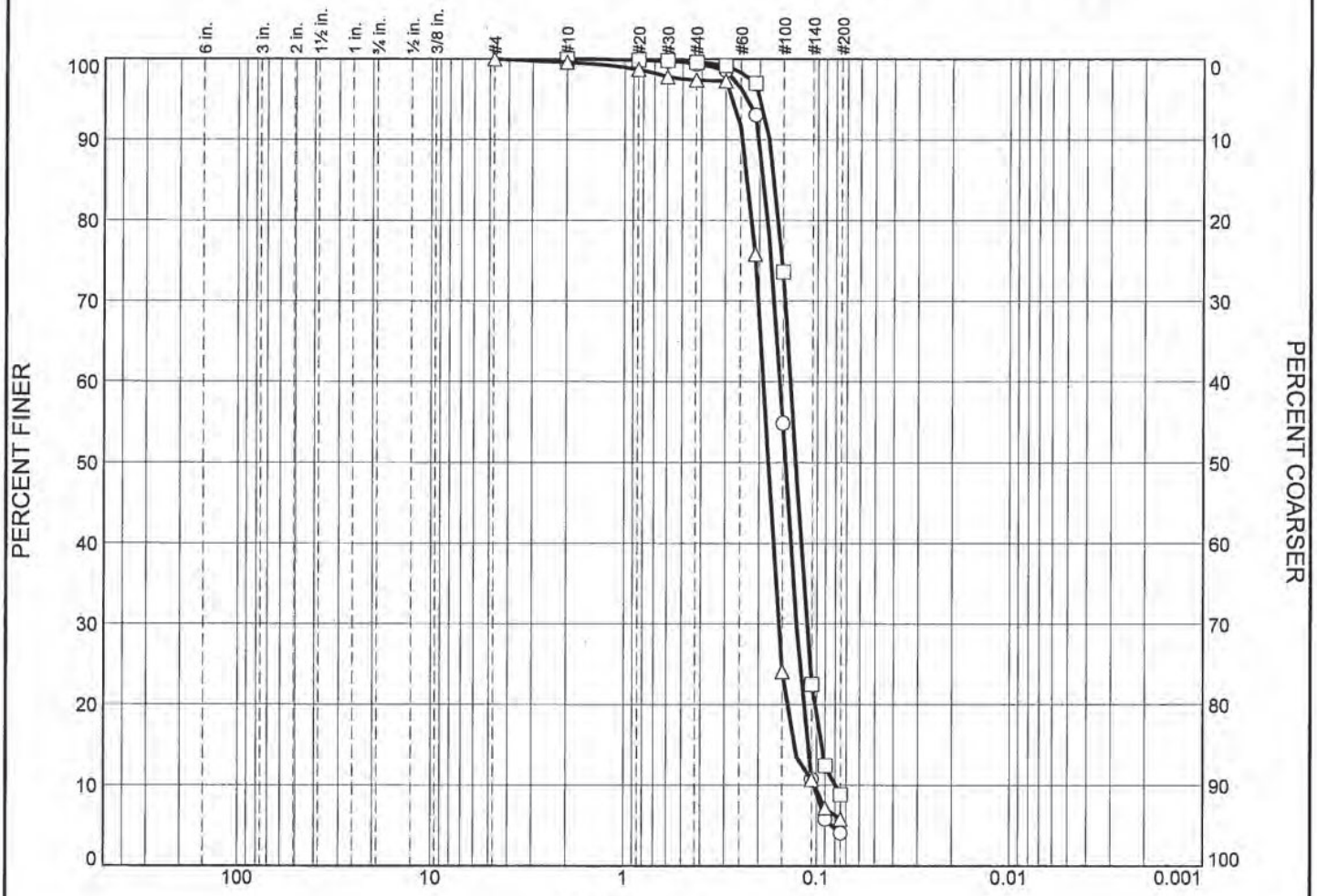
GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.6	95.3	4.1	
□	0.0	0.0	0.0	0.0	0.4	90.8	8.8	
△	0.0	0.0	0.0	0.4	2.2	91.6	5.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1899	0.1553	0.1452	0.1269	0.1118	0.1046	0.99	1.48
□			0.1667	0.1367	0.1286	0.1129	0.0958	0.0813	1.15	1.68
△			0.2282	0.1894	0.1786	0.1574	0.1320	0.1023	1.28	1.85

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand with silt	SP-SM	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-2 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-2 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-2 **Depth:** 20.0-26.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○Moisture Content - 23.2%

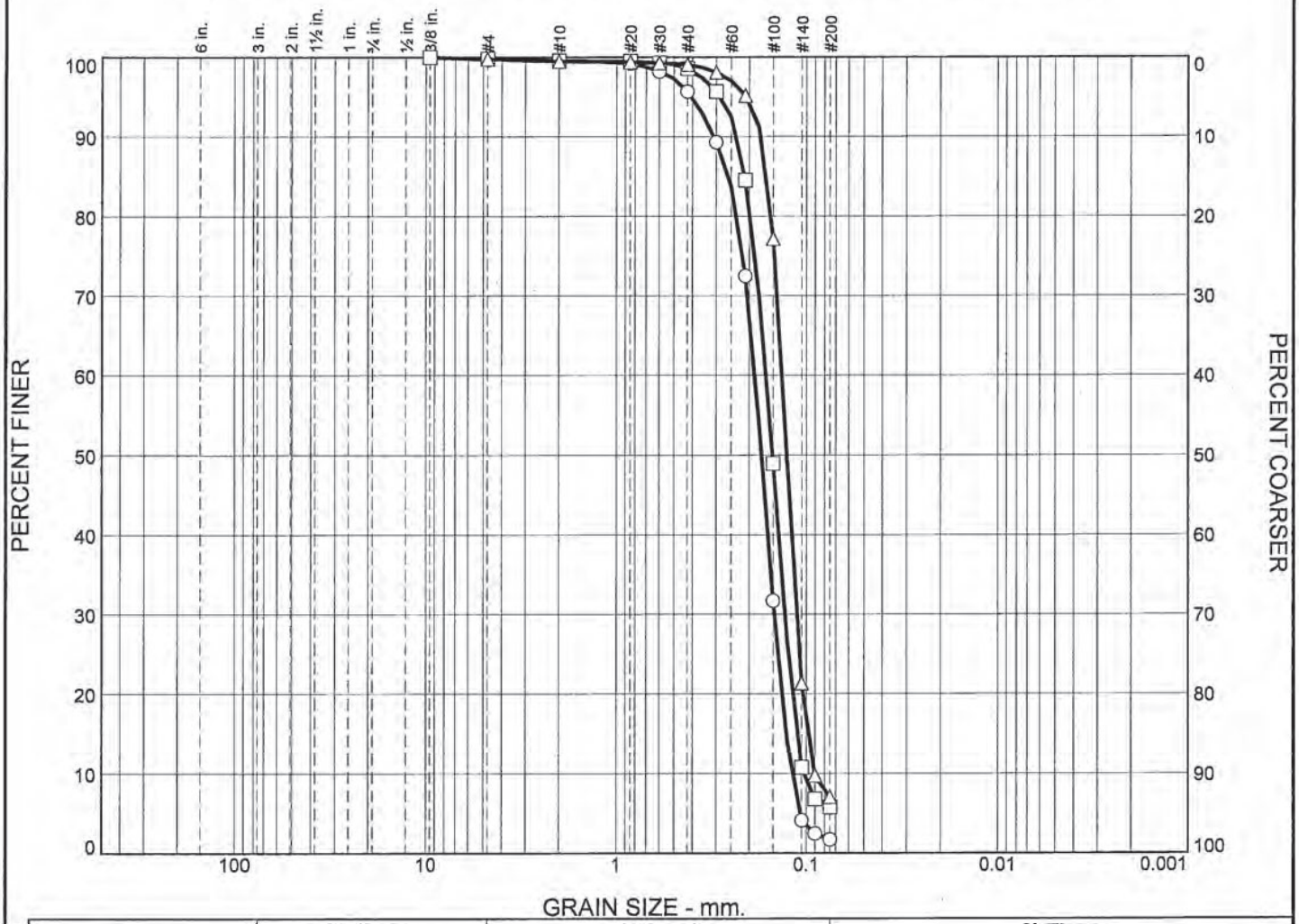
□Moisture Content - 23.0%

△Moisture Content - 26.2%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	0.1	3.9	94.0	1.7	
□	0.0	0.0	0.2	0.2	1.0	92.8	5.8	
△				0.3	0.4	92.0	7.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2577	0.1871	0.1729	0.1478	0.1277	0.1196	0.98	1.56
□			0.2114	0.1636	0.1512	0.1298	0.1127	0.1044	0.99	1.57
△			0.1616	0.1342	0.1269	0.1129	0.0992	0.0906	1.05	1.48

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand with silt	SP-SM	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-3 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-3 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-3 **Depth:** 8.0-12.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○ Moisture Content - 22.3%

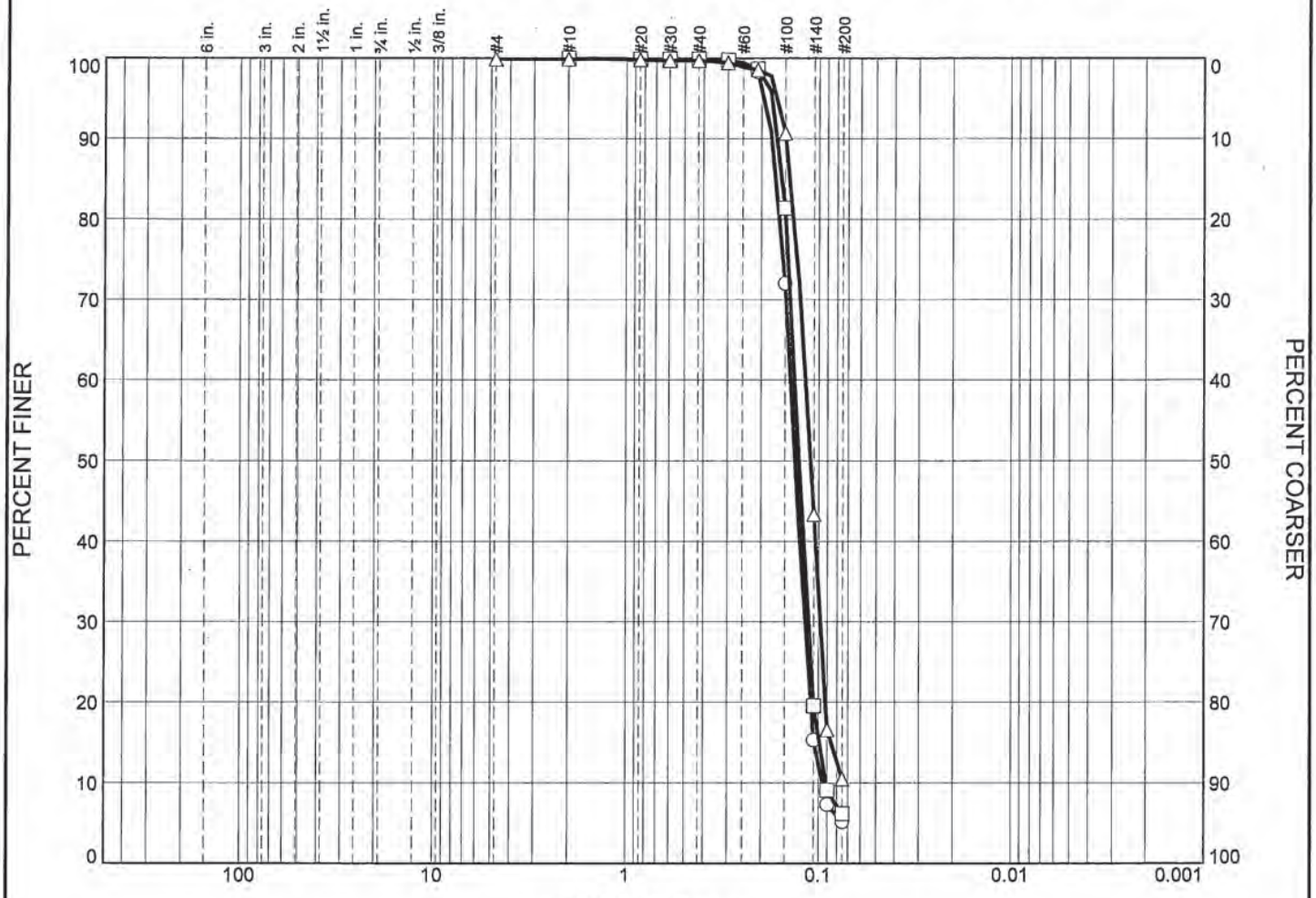
□ Moisture Content - 21.7%

△ Moisture Content - 23.2%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.3	94.5	5.2	
□	0.0	0.0	0.0	0.0	0.1	93.7	6.2	
△				0.0	0.2	89.2	10.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1666	0.1395	0.1320	0.1181	0.1056	0.0983	1.02	1.42
□			0.1543	0.1328	0.1264	0.1138	0.1012	0.0926	1.05	1.43
△			0.1405	0.1166	0.1099	0.0986	0.0858			

Material Description	USCS	AASHTO
○ Gray poorly graded sand with silt	SP-SM	
□ Gray poorly graded sand with silt	SP-SM	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-3 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-3 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-3 **Depth:** 20.0-26.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○ Moisture Content - 23.9%

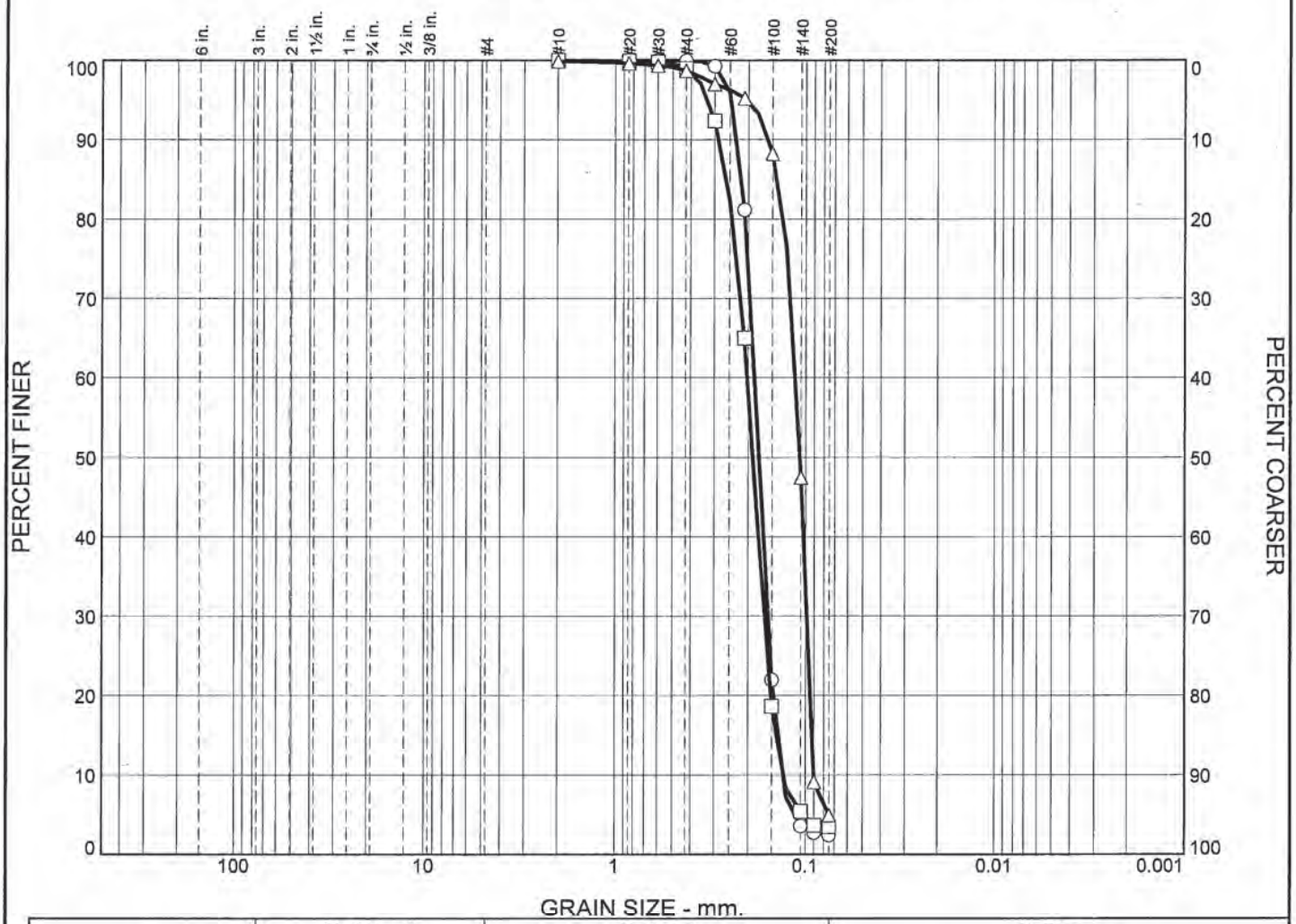
□ Moisture Content - 21.8%

△ Moisture Content - 23.9%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	97.5	2.4	
□	0.0	0.0	0.0	0.0	1.0	95.5	3.5	
△					1.2	93.7	5.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2165	0.1853	0.1760	0.1581	0.1413	0.1328	1.02	1.40
□			0.2595	0.2023	0.1889	0.1650	0.1438	0.1322	1.02	1.53
△			0.1404	0.1125	0.1071	0.0990	0.0930	0.0905	0.96	1.24

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-4 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-4 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-4 **Depth:** 8.0-12.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○Moisture Content - 22.1%

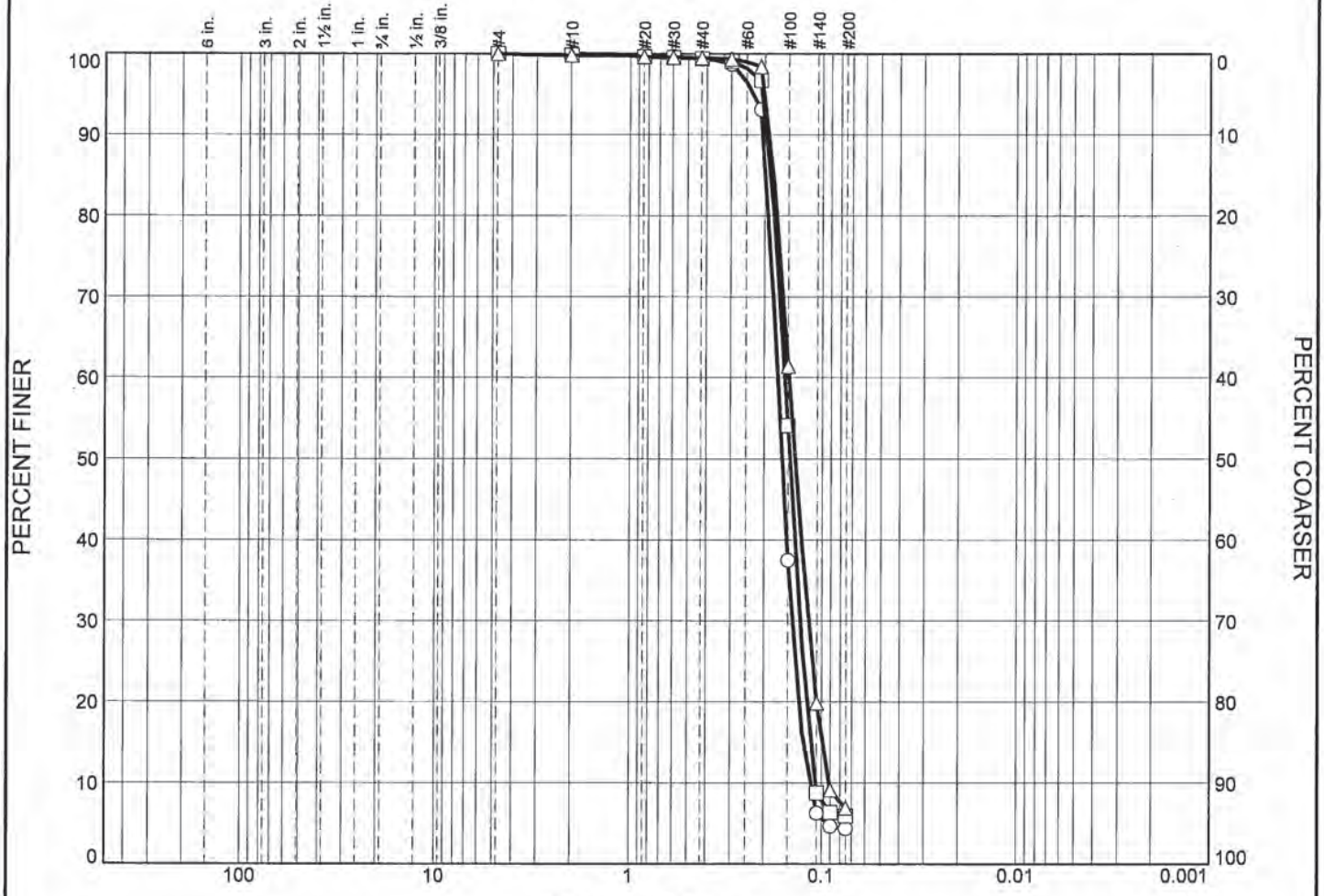
□Moisture Content - 22.0%

△Moisture Content - 24.3%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.5	95.1	4.4	
□	0.0	0.0	0.0	0.2	0.4	93.5	5.9	
△	0.0	0.0	0.0	0.2	0.3	92.6	6.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1967	0.1702	0.1612	0.1426	0.1244	0.1158	1.03	1.47
□			0.1851	0.1555	0.1463	0.1291	0.1148	0.1082	0.99	1.44
△			0.1801	0.1485	0.1378	0.1172	0.0999	0.0920	1.01	1.61

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand with silt	SP-SM	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-4 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-4 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-4 **Depth:** 20.0-26.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○ Moisture Content - 23.9%

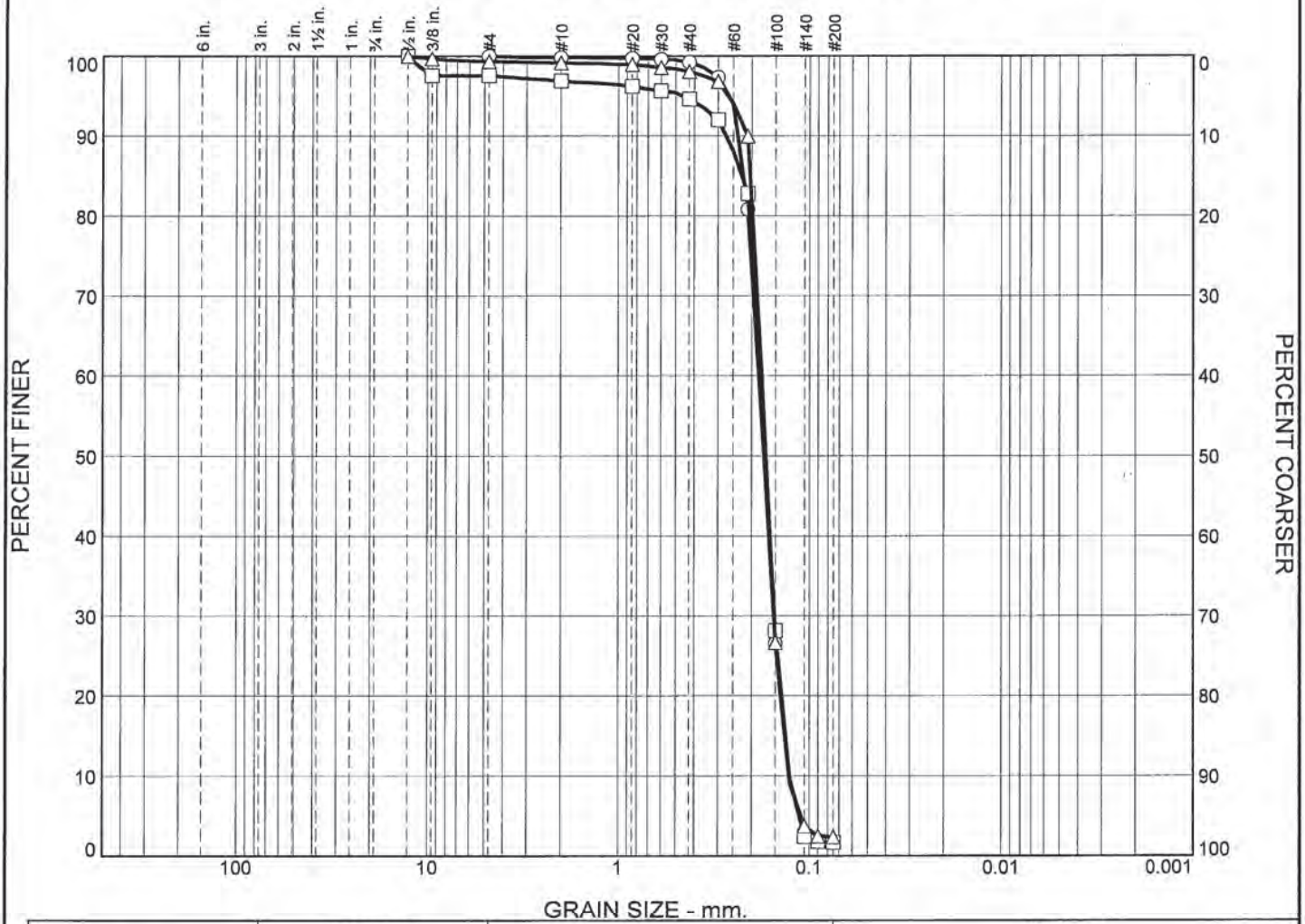
□ Moisture Content - 23.5%

△ Moisture Content - 23.0%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	0.5	97.5	1.8	
□	0.0	0.0	2.4	0.7	2.3	92.9	1.7	
△	0.0	0.0	0.6	0.2	1.1	95.7	2.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2181	0.1832	0.1731	0.1536	0.1355	0.1271	1.01	1.44
□			0.2243	0.1803	0.1706	0.1518	0.1345	0.1268	1.01	1.42
△			0.2026	0.1776	0.1695	0.1530	0.1366	0.1283	1.03	1.38

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand	SP	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-5 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-5 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-5 **Depth:** 8.0-12.0

Remarks:

○ Moisture Content - 22.8%

□ Moisture Content - 21.6%

△ Moisture Content - 22.2%

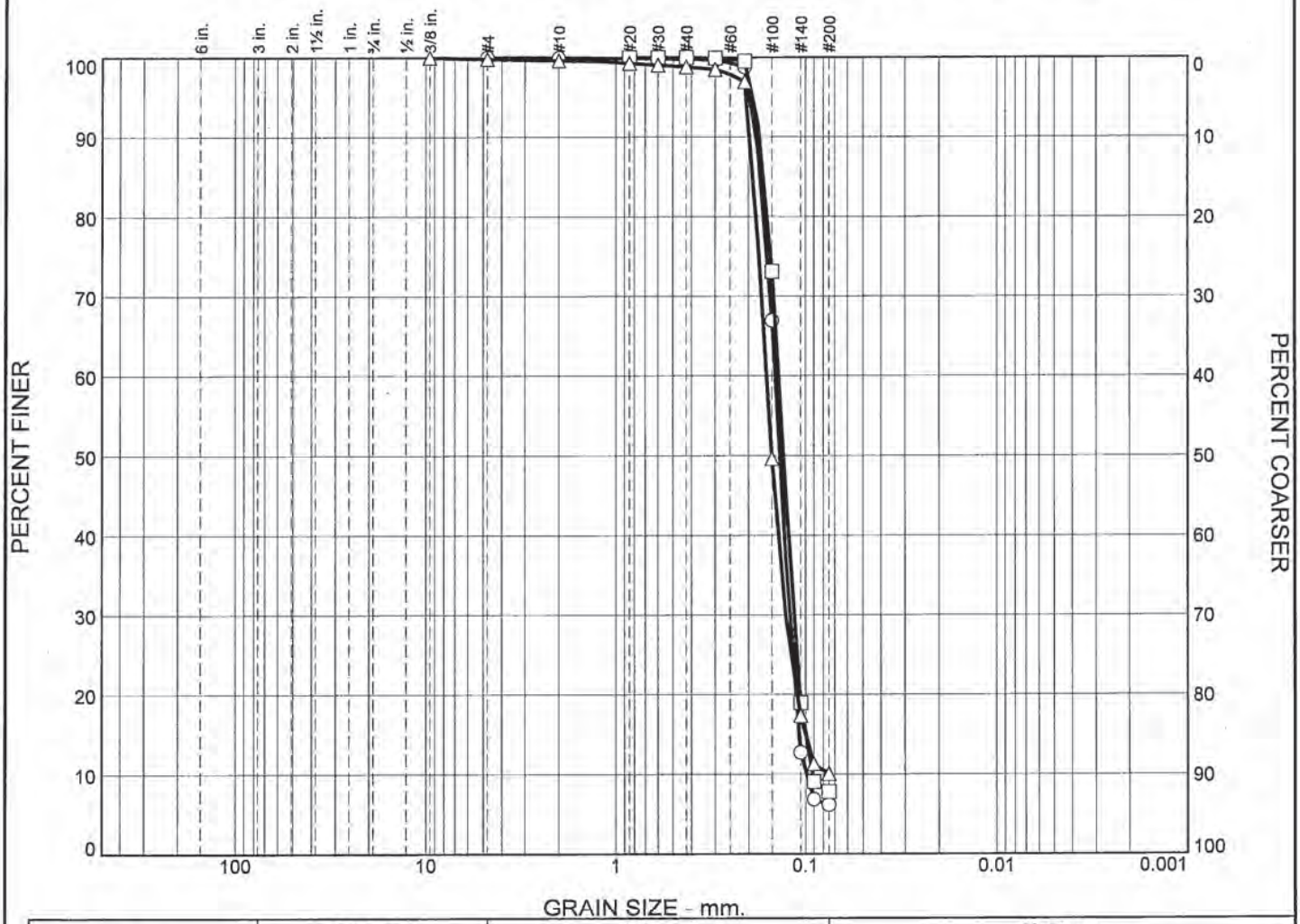
GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.2	93.6	6.2	
□	0.0	0.0	0.0	0.0	0.0	92.2	7.8	
△	0.0	0.0	0.2	0.2	0.8	88.7	10.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1722	0.1438	0.1359	0.1212	0.1086	0.1018	1.00	1.41
□			0.1654	0.1380	0.1302	0.1154	0.1015	0.0928	1.04	1.49
△			0.1887	0.1606	0.1504	0.1267	0.1010			

Material Description	USCS	AASHTO
○ Gray poorly graded sand with silt	SP-SM	
□ Gray poorly graded sand with silt	SP-SM	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-5 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-5 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-5 **Depth:** 20.0-26.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○ Moisture Content - 23.4%

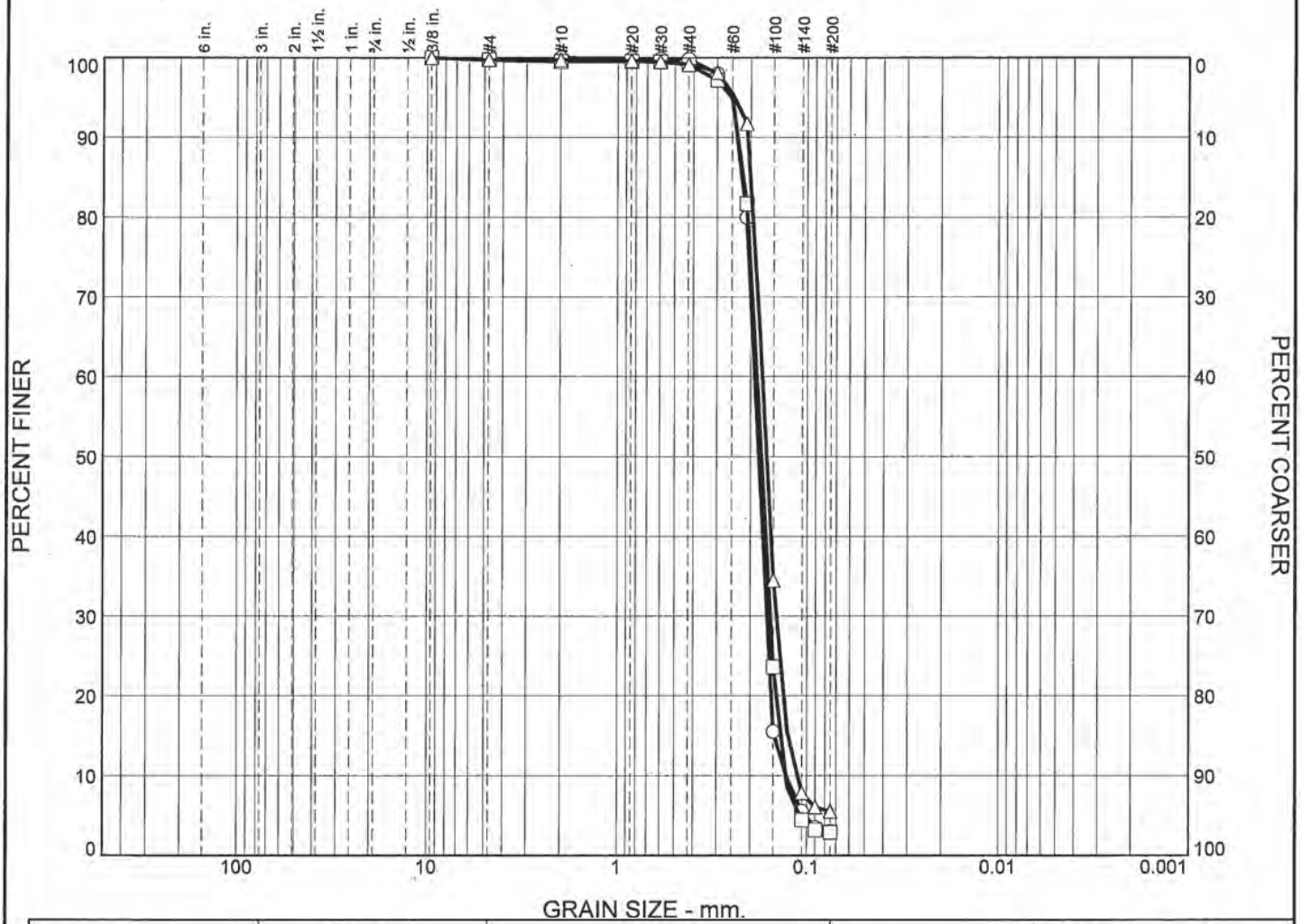
□ Moisture Content - 23.3%

△ Moisture Content - 25.9%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.2	96.8	3.0	
□	0.0	0.0	0.3	0.2	0.4	96.2	2.9	
△	0.0	0.0	0.2	0.0	0.6	93.7	5.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2179	0.1886	0.1801	0.1637	0.1478	0.1278	1.11	1.48
□			0.2160	0.1841	0.1747	0.1565	0.1389	0.1296	1.03	1.42
△			0.1992	0.1729	0.1640	0.1454	0.1252	0.1139	1.07	1.52

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-6 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-6 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-6 **Depth:** 8.0-12.0

Remarks:

○ Moisture Content - 19.5%

□ Moisture Content - 22.7%

△ Moisture Content - 23.4%

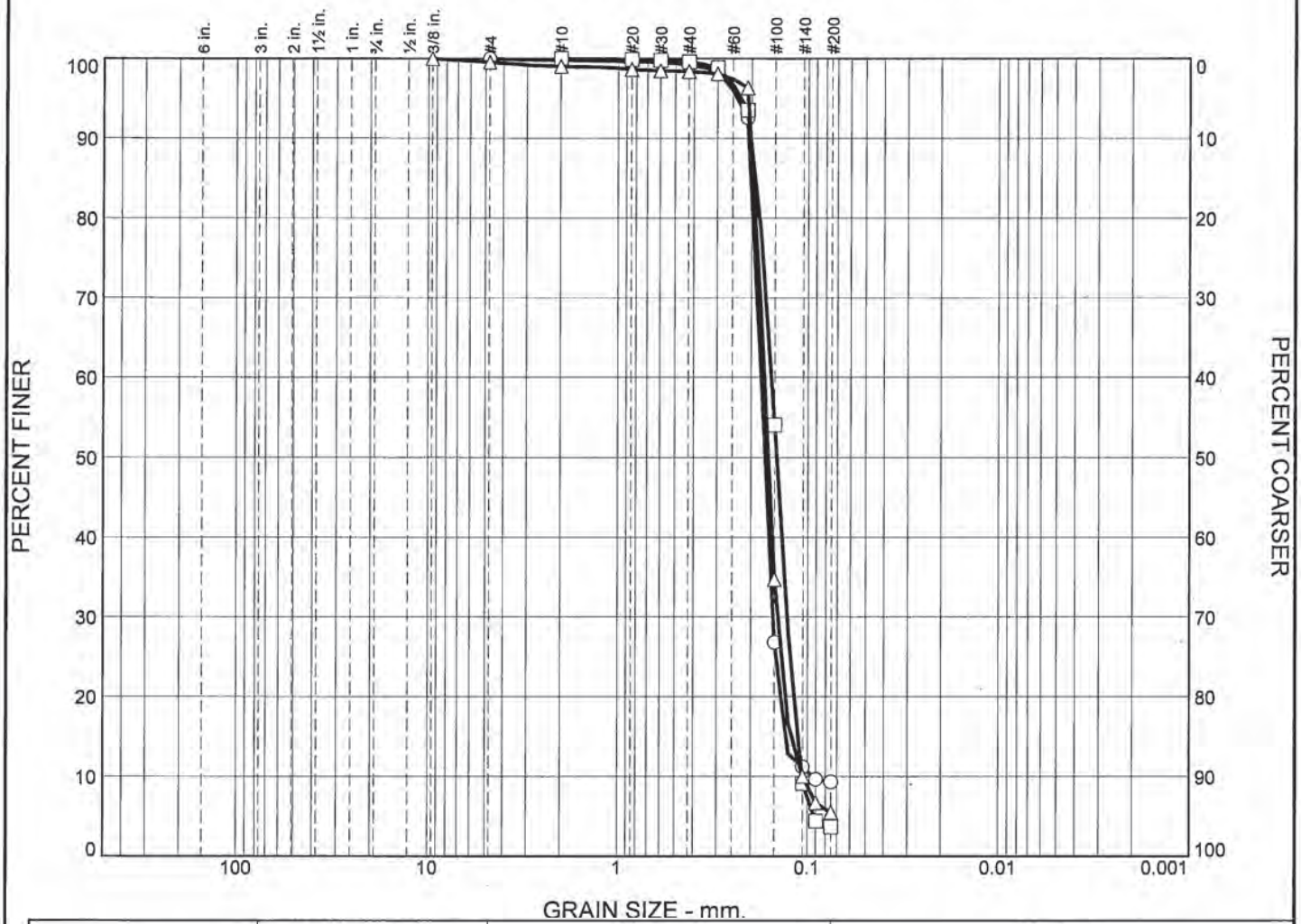
GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	0.6	89.8	9.4	
□	0.0	0.0	0.0	0.0	0.4	95.9	3.7	
△	0.0	0.0	0.5	0.5	0.6	92.9	5.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1999	0.1771	0.1693	0.1530	0.1329	0.0934	1.42	1.90
□			0.1895	0.1560	0.1461	0.1281	0.1137	0.1074	0.98	1.45
△			0.1942	0.1712	0.1631	0.1453	0.1226	0.1059	1.16	1.62

Material Description	USCS	AASHTO
○ Gray poorly graded sand with silt	SP-SM	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-6 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-6 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-6 **Depth:** 20.0-26.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○ Moisture Content - 24.9%

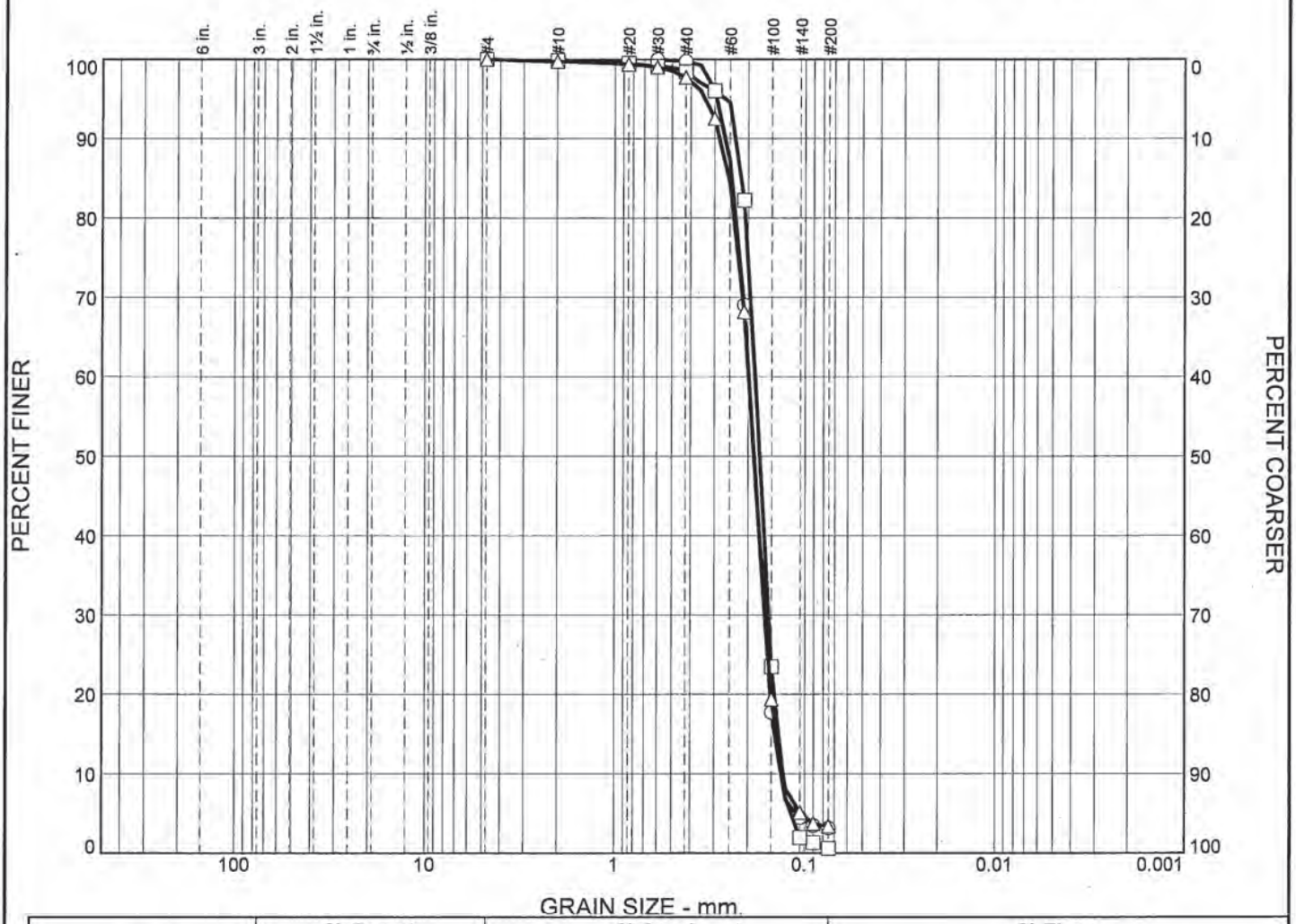
□ Moisture Content - 23.2%

△ Moisture Content - 24.7%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.2	96.6	3.2	
□	0.0	0.0	0.0	0.1	1.5	97.8	0.6	
△	0.0	0.0	0.0	0.3	2.0	94.3	3.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2432	0.1976	0.1860	0.1646	0.1459	0.1364	1.01	1.45
□			0.2150	0.1834	0.1742	0.1564	0.1400	0.1323	1.01	1.39
△			0.2519	0.1979	0.1856	0.1631	0.1431	0.1323	1.02	1.50

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand	SP	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-7 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-7 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-7 **Depth:** 8.0-12.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○ Moisture Content - 22.4%

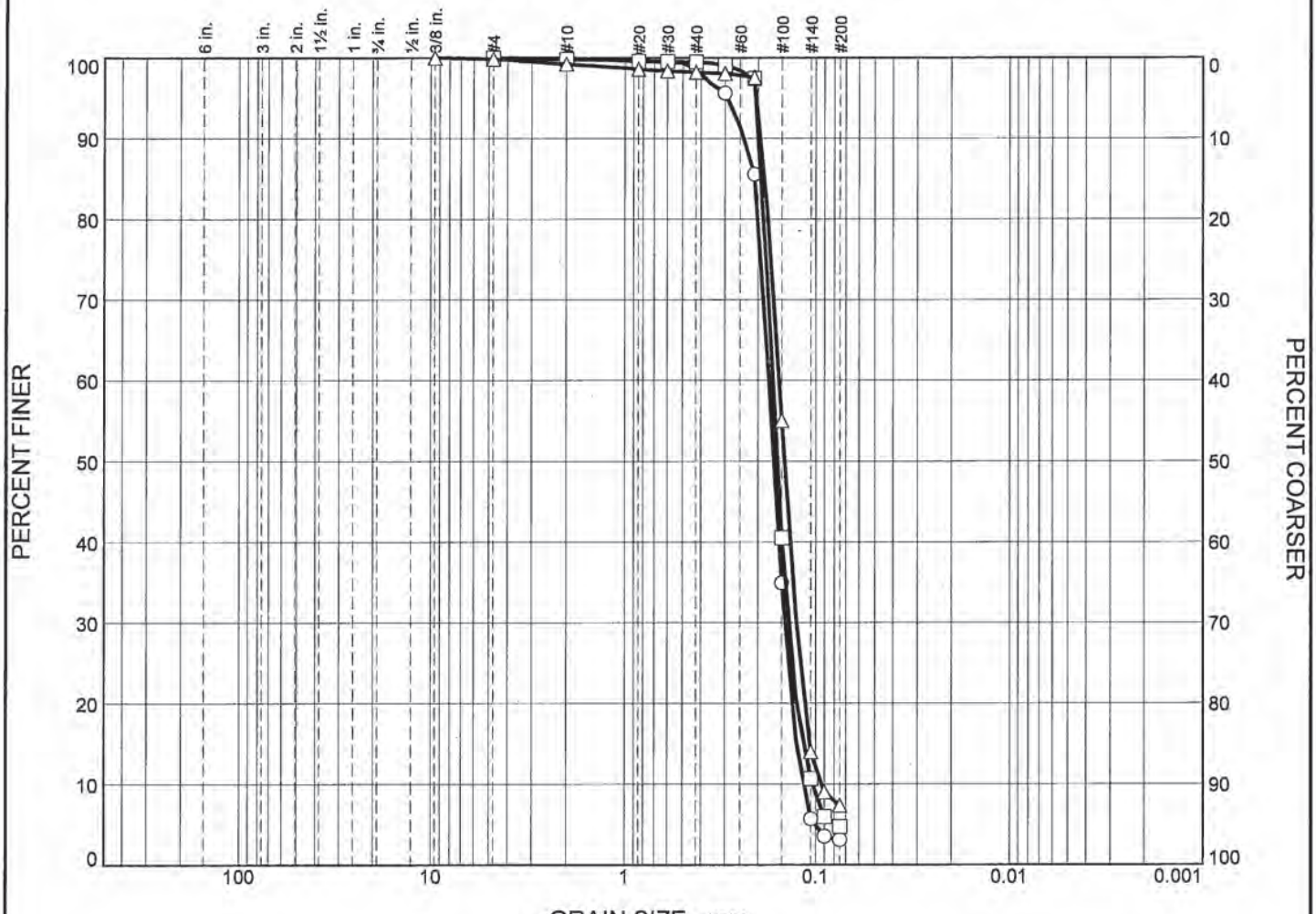
□ Moisture Content - 22.8%

△ Moisture Content - 23.0%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.4	95.5	3.1	
□	0.0	0.0	0.0	0.2	0.3	94.8	4.7	
△	0.0	0.0	0.1	0.7	1.0	90.8	7.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2088	0.1752	0.1650	0.1447	0.1256	0.1169	1.02	1.50
□			0.1914	0.1672	0.1586	0.1389	0.1163	0.1042	1.11	1.60
△			0.1843	0.1549	0.1451	0.1256	0.1077	0.0954	1.07	1.62

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-7 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-7 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-7 **Depth:** 20.0-26.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○Moisture Content - 22.8%

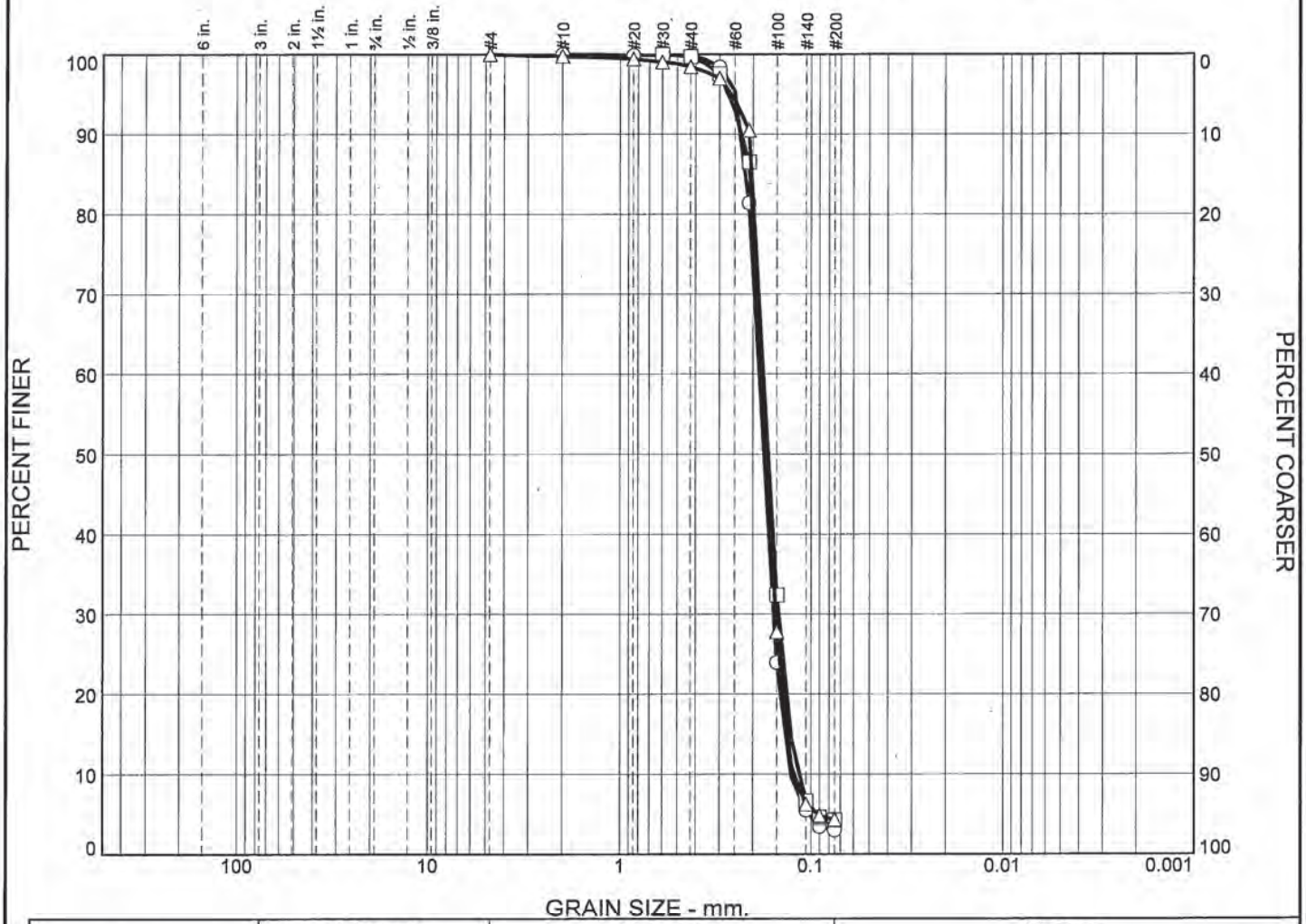
□Moisture Content - 23.8%

△Moisture Content - 23.8%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	96.9	3.0	
□	0.0	0.0	0.0	0.0	0.3	95.4	4.3	
△	0.0	0.0	0.0	0.2	1.4	94.1	4.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2163	0.1844	0.1749	0.1563	0.1378	0.1273	1.04	1.45
□			0.2072	0.1766	0.1670	0.1474	0.1273	0.1169	1.05	1.51
△			0.2019	0.1770	0.1688	0.1521	0.1343	0.1238	1.05	1.43

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand	SP	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-8 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-8 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-8 **Depth:** 8.0-12.0

Remarks:

○ Moisture Content - 22.5%

□ Moisture Content - 23.7%

△ Moisture Content - 23.7%

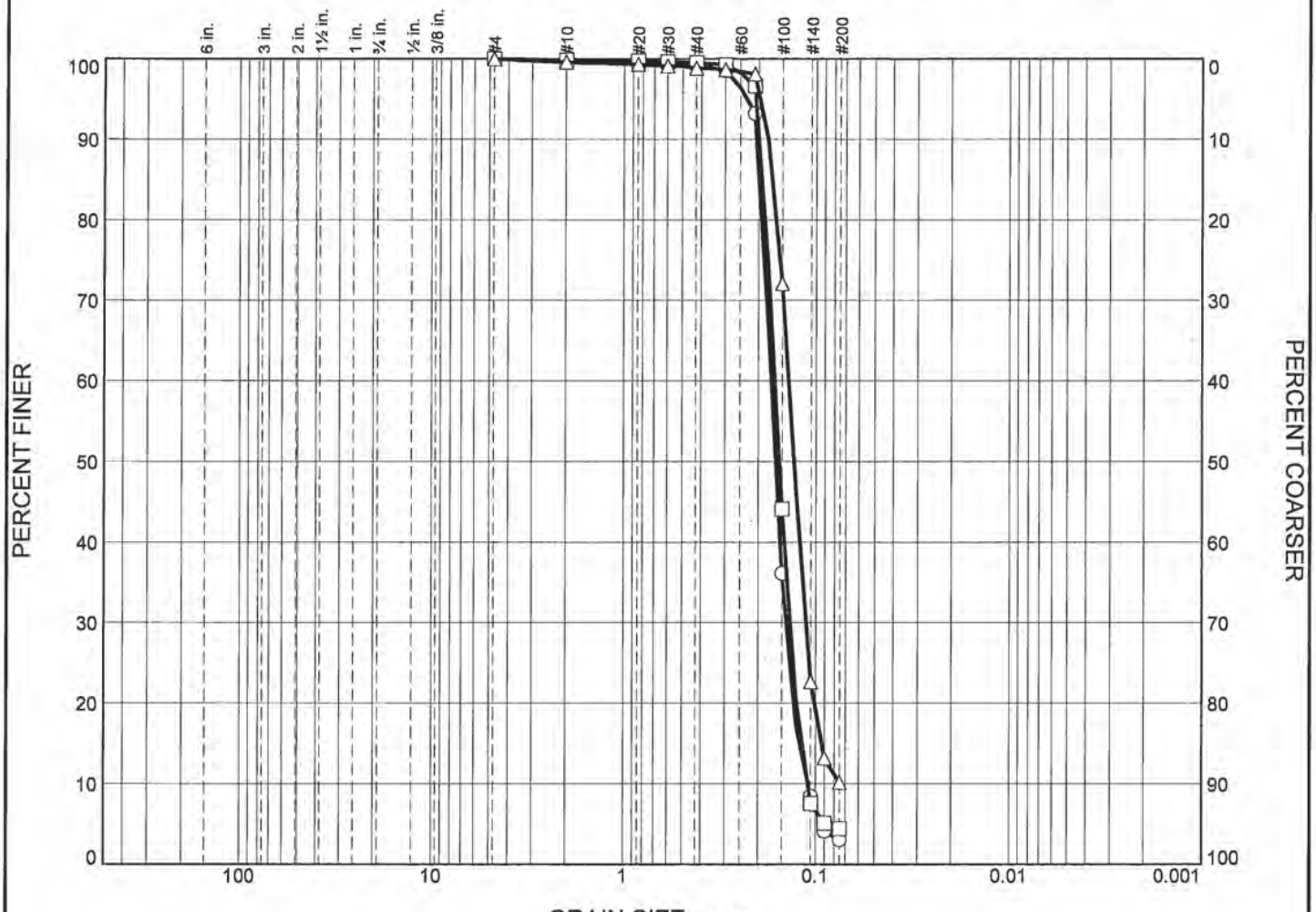
GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.3	0.5	96.1	3.1	
□	0.0	0.0	0.0	0.1	0.4	95.1	4.4	
△	0.0	0.0	0.0	0.4	0.7	88.7	10.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1971	0.1714	0.1626	0.1435	0.1219	0.1103	1.09	1.55
□			0.1905	0.1643	0.1553	0.1366	0.1194	0.1115	1.02	1.47
△			0.1682	0.1381	0.1296	0.1131	0.0946			

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-8 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-8 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-8 **Depth:** 20.0-26.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○ Moisture Content - 23.4%

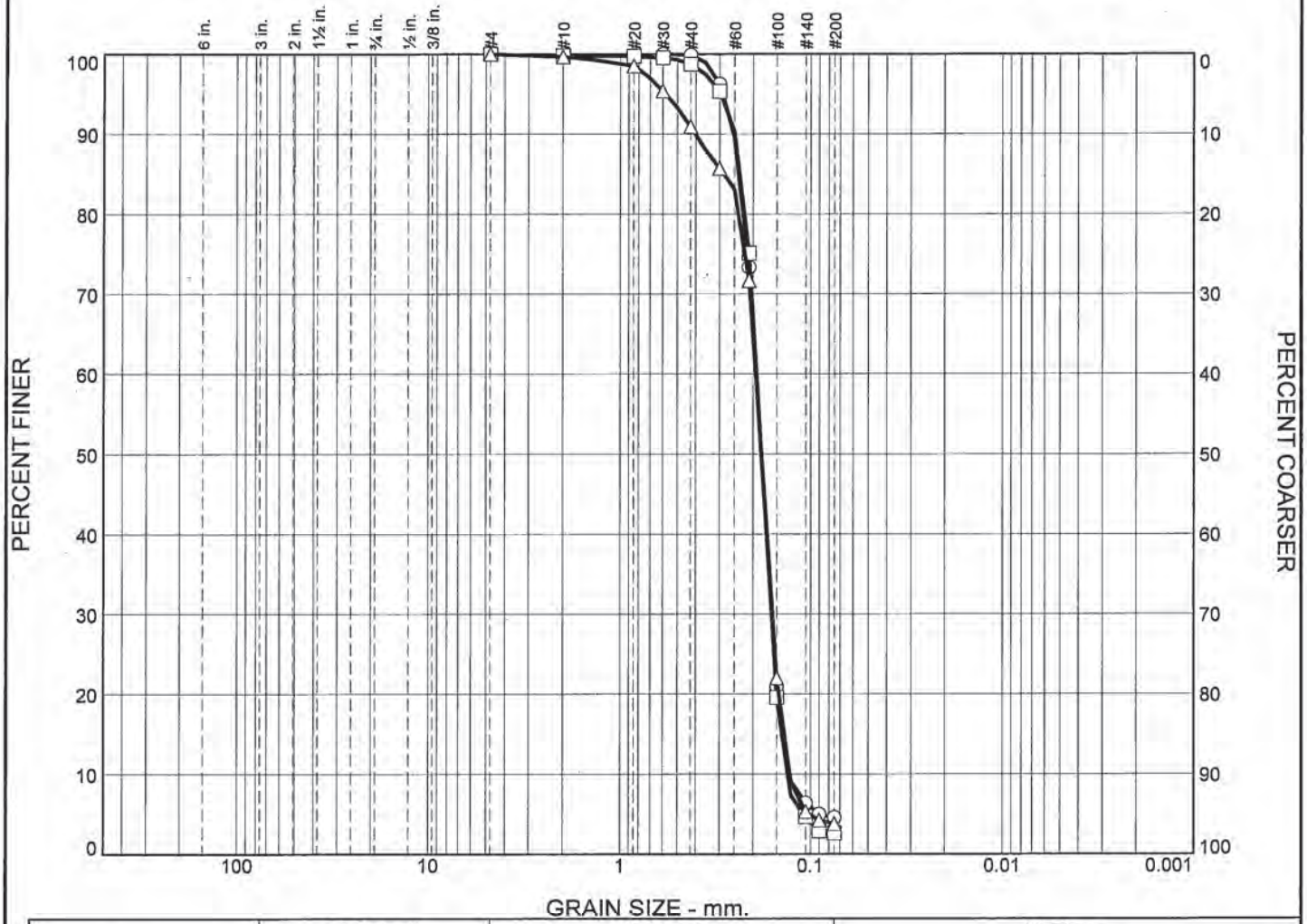
□ Moisture Content - 23.6%

△ Moisture Content - 23.6%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	95.3	4.6	
□	0.0	0.0	0.0	0.2	1.1	96.1	2.6	
△	0.0	0.0	0.0	0.3	8.8	87.1	3.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2344	0.1922	0.1812	0.1606	0.1409	0.1293	1.04	1.49
□			0.2304	0.1909	0.1806	0.1613	0.1437	0.1342	1.02	1.42
△			0.2765	0.1923	0.1806	0.1593	0.1397	0.1291	1.02	1.49

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand	SP	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-9 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-9 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-9 **Depth:** 8.0-12.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○ Moisture Content - 21.1%

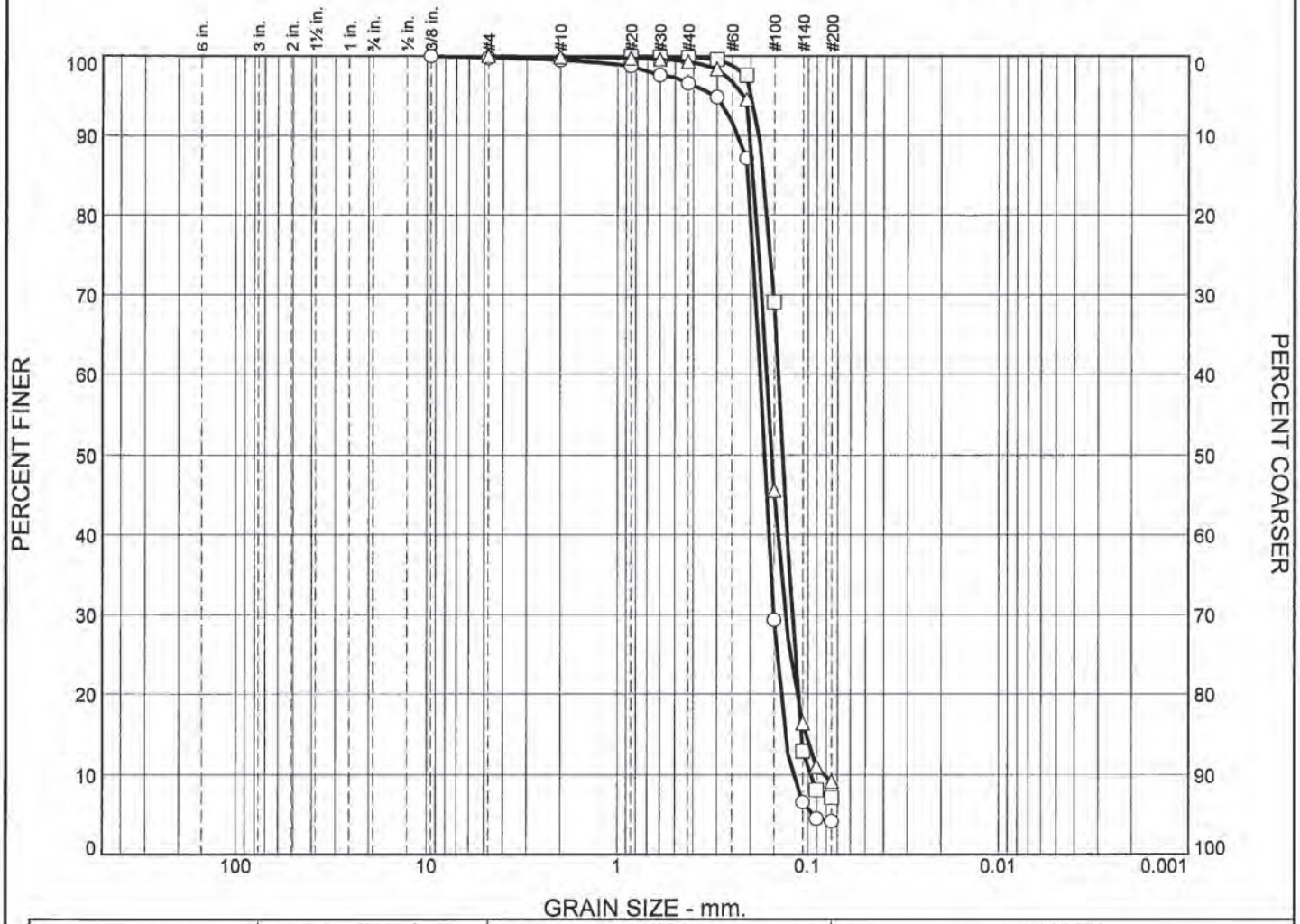
□ Moisture Content - 22.5%

△ Moisture Content - 21.6%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	0.2	2.9	92.4	4.2	
□	0.0	0.0	0.0	0.0	0.2	92.6	7.2	
△	0.0	0.0	0.0	0.2	0.5	90.1	9.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2063	0.1778	0.1689	0.1507	0.1311	0.1199	1.07	1.48
□			0.1703	0.1421	0.1346	0.1207	0.1084	0.1009	1.02	1.41
△			0.1931	0.1647	0.1546	0.1308	0.1025	0.0843	1.23	1.95

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand with silt	SP-SM	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-9 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-9 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-9 **Depth:** 20.0-26.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○ Moisture Content - 23.1%

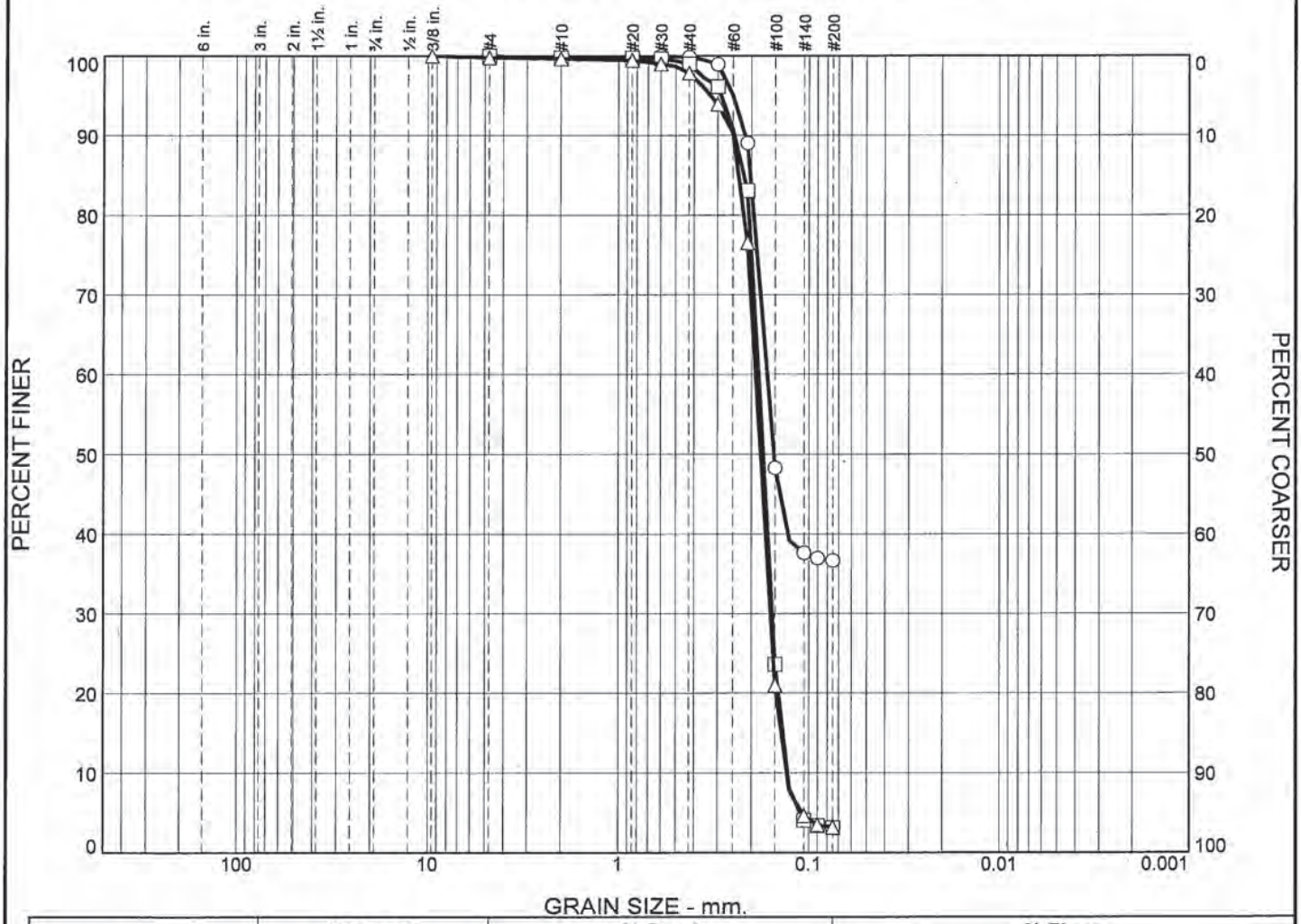
□ Moisture Content - 23.1%

△ Moisture Content - 23.6%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.2	63.1	36.7	
□	0.0	0.0	0.0	0.3	0.7	95.9	3.1	
△	0.0	0.0	0.2	0.1	1.8	94.7	3.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2016	0.1663	0.1526					
□			0.2183	0.1830	0.1739	0.1563	0.1394	0.1307	1.02	1.40
△			0.2282	0.1889	0.1787	0.1596	0.1419	0.1325	1.02	1.43

Material Description	USCS	AASHTO
○ Gray silty sand	SM	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand	SP	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-10 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-10 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-10 **Depth:** 8.0-12.0

Remarks:

○Moisture Content - 24.0%

□Moisture Content - 24.3%

△Moisture Content - 23.2%

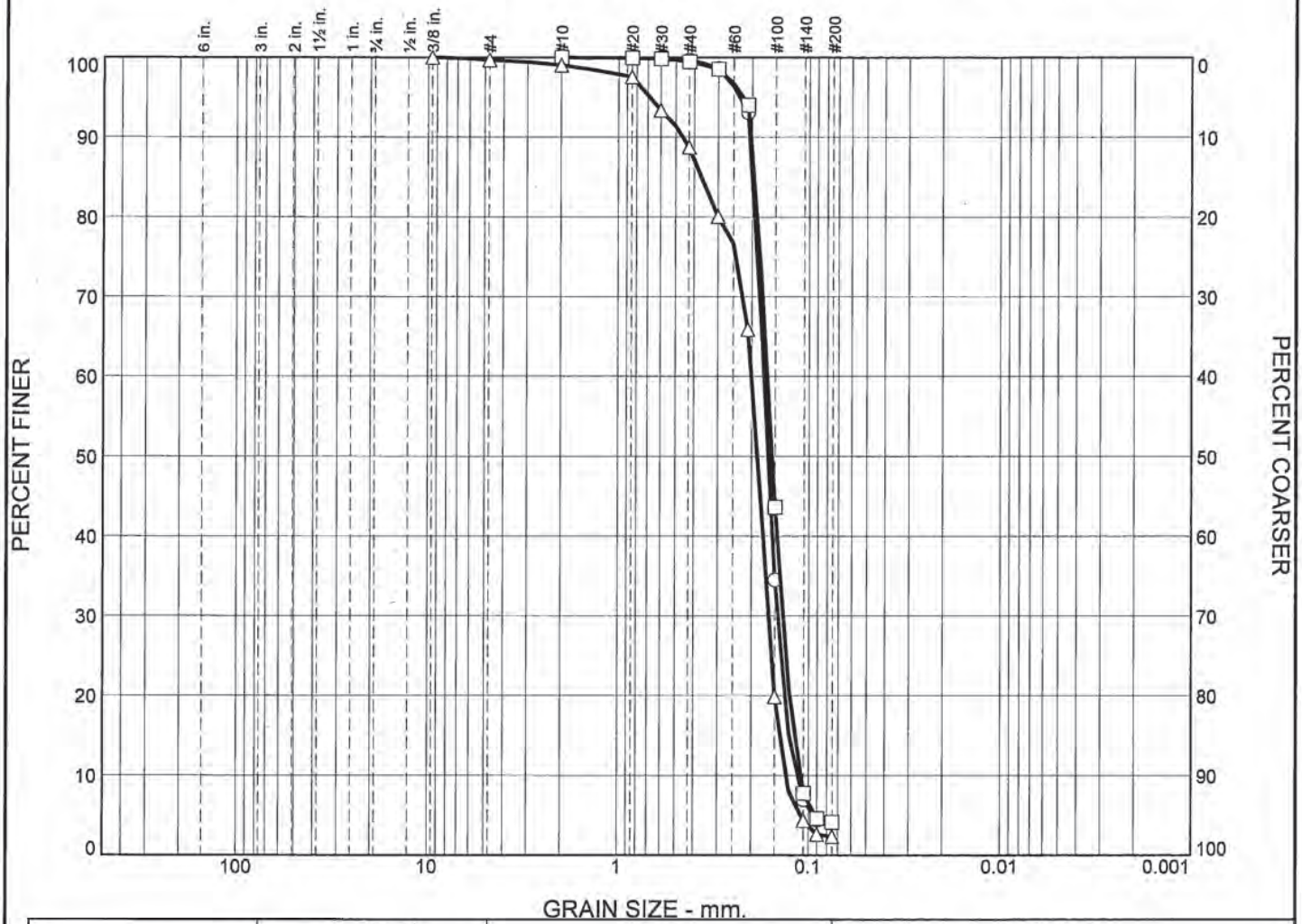
GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.3	95.6	4.1	
□	0.0	0.0	0.0	0.0	0.5	95.4	4.1	
△	0.0	0.0	0.3	0.7	10.2	86.5	2.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1976	0.1723	0.1637	0.1455	0.1259	0.1155	1.06	1.49
□			0.1937	0.1654	0.1560	0.1365	0.1188	0.1108	1.02	1.49
△			0.3668	0.1996	0.1858	0.1625	0.1425	0.1321	1.00	1.51

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand	SP	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-10 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-10 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-10 **Depth:** 20.0-26.0

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Remarks:

○ Moisture Content - 24.6%

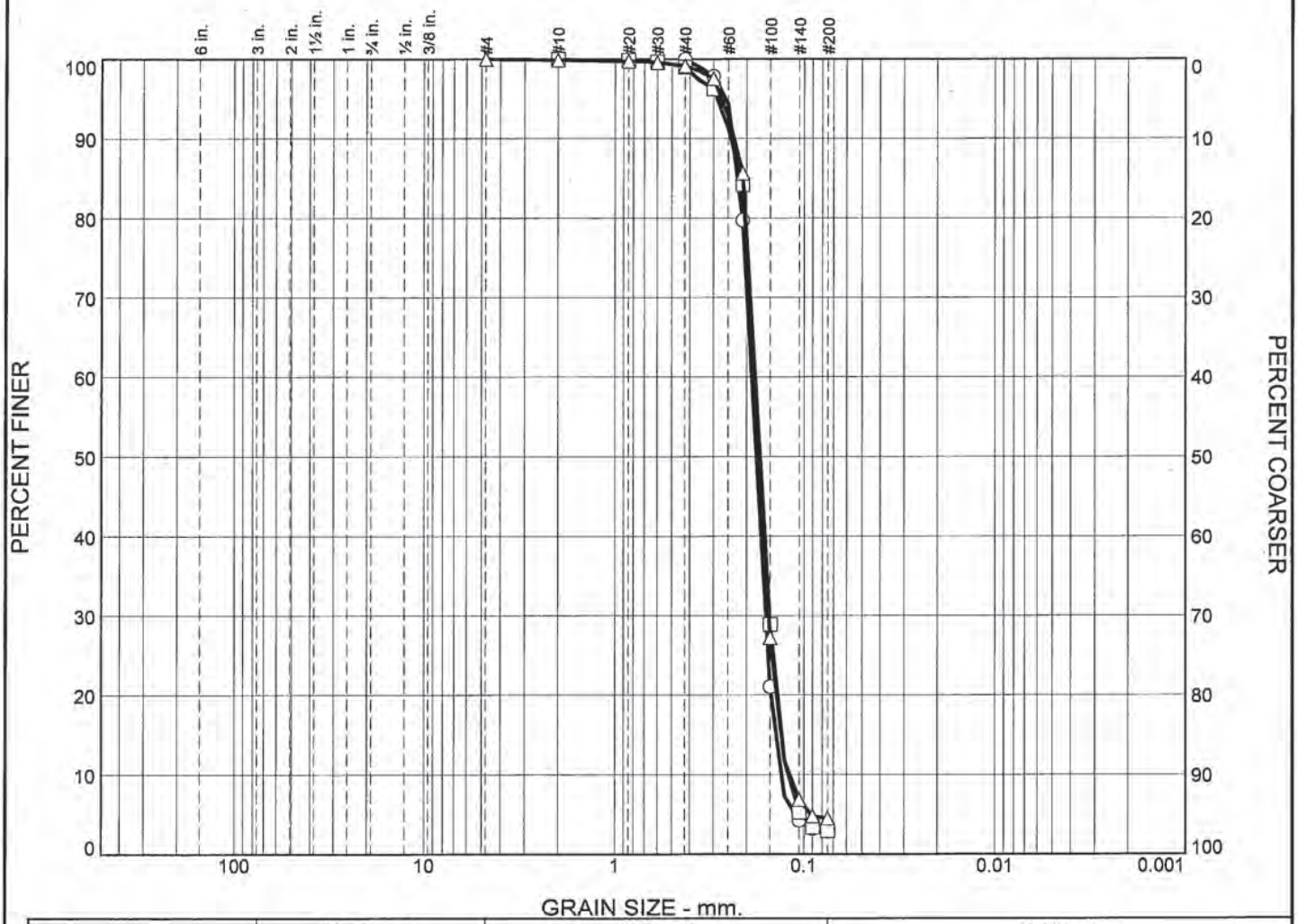
□ Moisture Content - 25.4%

△ Moisture Content - 21.3%

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.0	96.9	3.1	
□	0.0	0.0	0.0	0.0	1.0	96.0	3.0	
△	0.0	0.0	0.0	0.1	0.7	94.7	4.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2194	0.1867	0.1772	0.1591	0.1422	0.1333	1.02	1.40
□			0.2135	0.1798	0.1702	0.1512	0.1320	0.1221	1.04	1.47
△			0.2089	0.1801	0.1711	0.1528	0.1333	0.1212	1.07	1.49

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand	SP	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-11 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-11 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-11 **Depth:** 8.0-12.0

Remarks:

○ Moisture Content - 21.3%

□ Moisture Content - 23.6%

△ Moisture Content - 24.8%

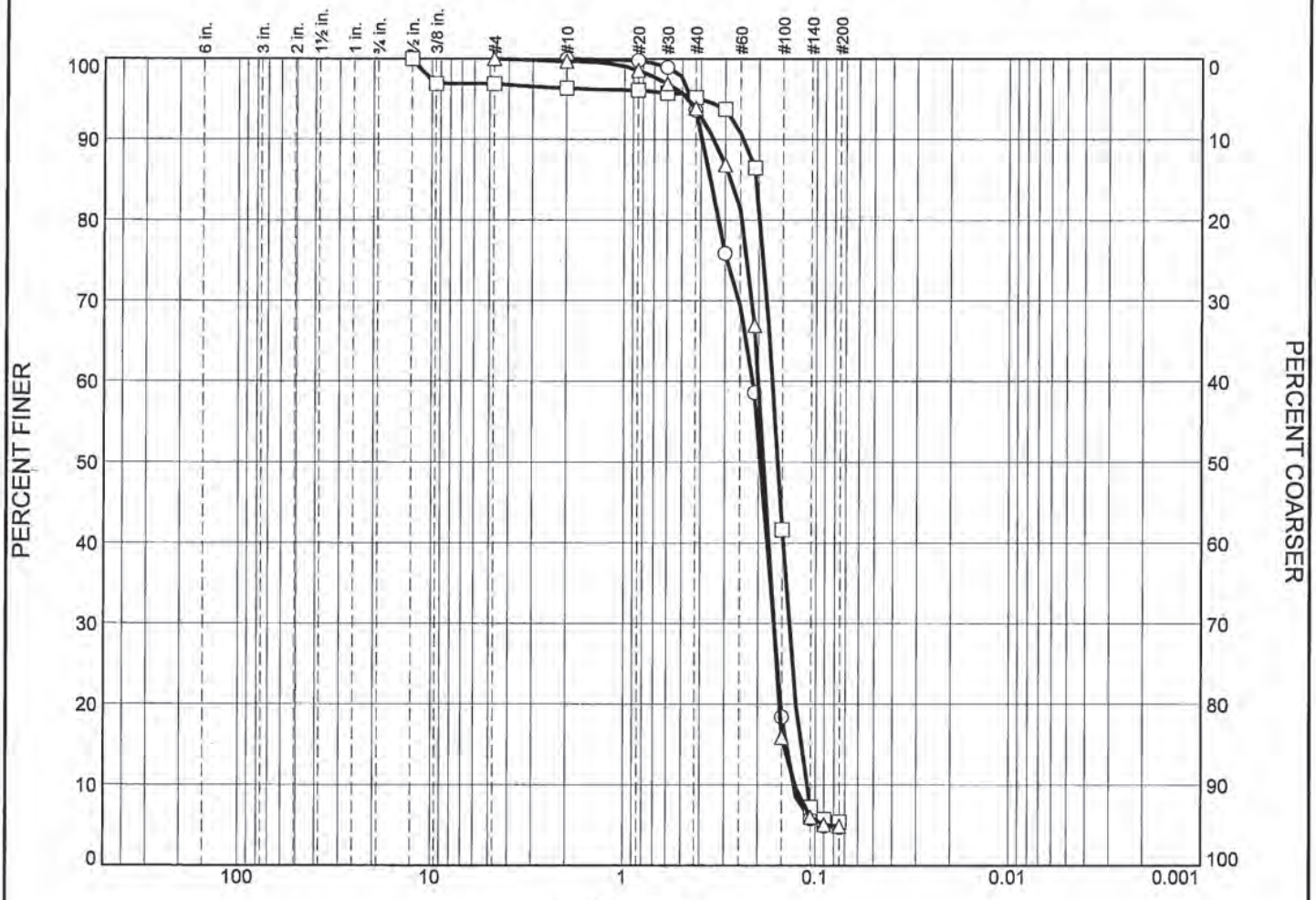
GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	6.4	88.9	4.7	
□	0.0	0.0	3.1	0.5	1.2	89.8	5.4	
△	0.0	0.0	0.0	0.3	5.8	89.0	4.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3576	0.2133	0.1941	0.1664	0.1439	0.1317	0.98	1.62
□			0.2064	0.1695	0.1587	0.1379	0.1202	0.1124	1.00	1.51
△			0.2770	0.1997	0.1877	0.1665	0.1469	0.1279	1.09	1.56

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand with silt	SP-SM	
△ Gray poorly graded sand	SP	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-11 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-11 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-11 **Depth:** 20.0-26.0

Remarks:

○ Moisture Content - 20.5%

□ Moisture Content - 22.3%

△ Moisture Content - 21.8%

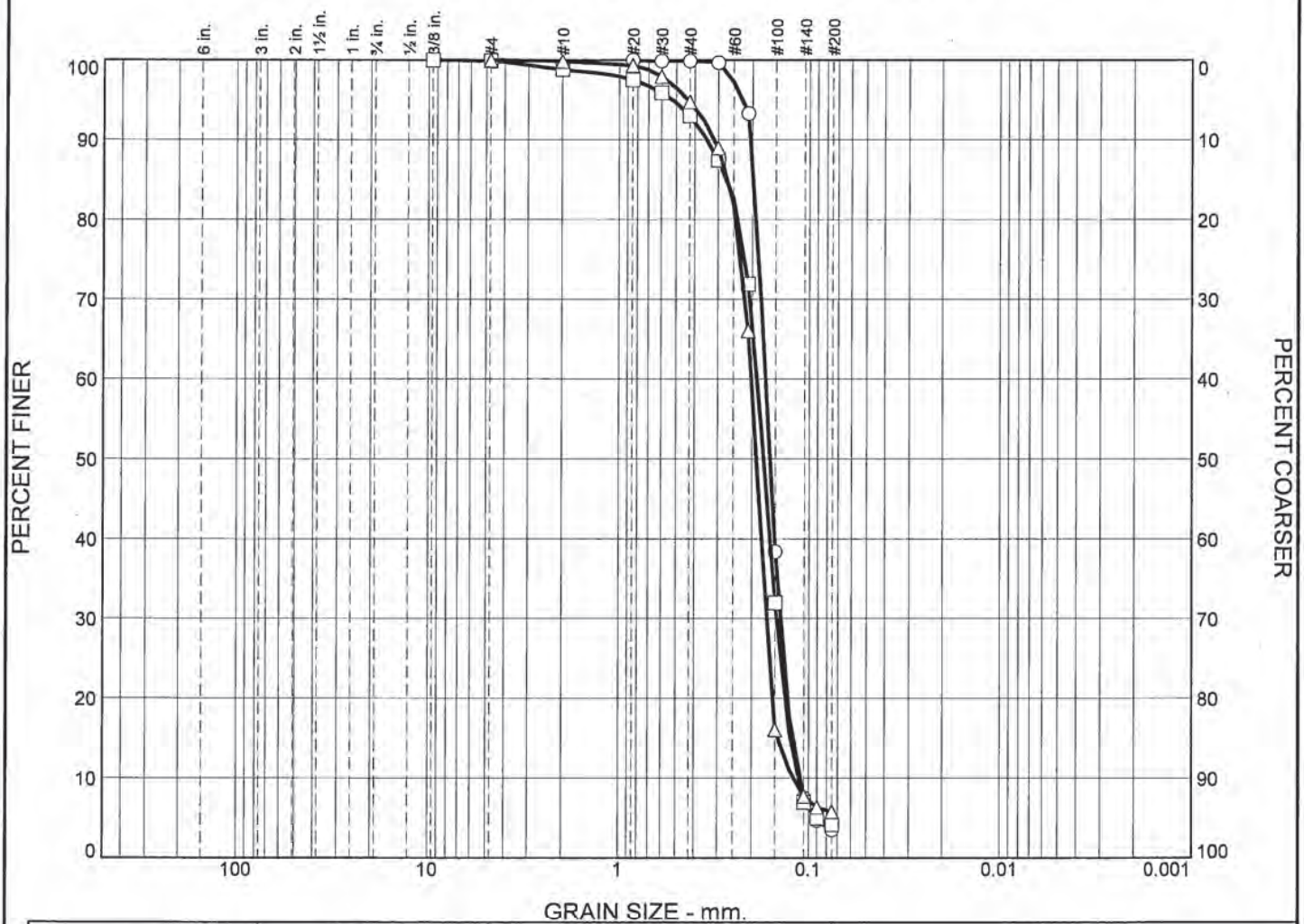
GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	96.4	3.5	
□	0.0	0.0	0.1	1.1	5.8	88.8	4.2	
△	0.0	0.0	0.0	0.2	5.0	89.0	5.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1965	0.1697	0.1607	0.1415	0.1221	0.1127	1.05	1.51
□			0.2684	0.1878	0.1734	0.1474	0.1248	0.1148	1.01	1.64
△			0.2655	0.2011	0.1888	0.1671	0.1453	0.1207	1.15	1.67

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand	SP	
△ Gray poorly graded sand with silt	SP-SM	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-12 **Depth:** 0.0-4.0

□ **Source of Sample:** NVB-12 **Depth:** 4.0-8.0

△ **Source of Sample:** NVB-12 **Depth:** 8.0-12.0

Remarks:

○Moisture Content - 9.6%

□Moisture Content - 20.4%

△Moisture Content - 21.8%

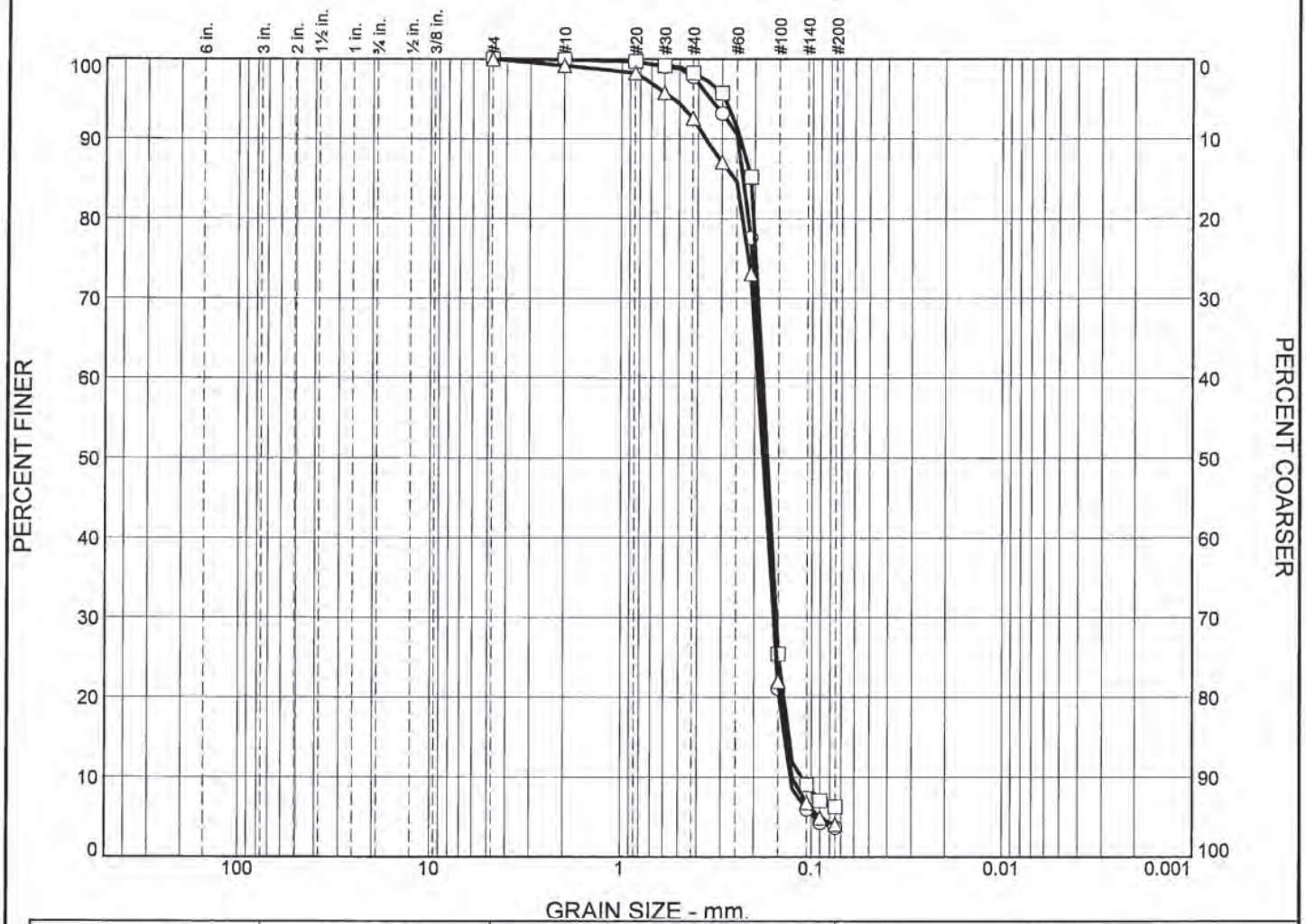
GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Plate

Tested By: D. Allen **Checked By:** K. Nordeng

Particle Size Distribution Report ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	2.1	94.1	3.7	
□	0.0	0.0	0.0	0.1	1.6	92.0	6.3	
△	0.0	0.0	0.0	0.8	6.6	88.5	4.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2257	0.1880	0.1781	0.1594	0.1415	0.1311	1.03	1.43
□			0.2096	0.1812	0.1724	0.1547	0.1348	0.1166	1.13	1.55
△			0.2533	0.1911	0.1799	0.1593	0.1393	0.1268	1.05	1.51

Material Description	USCS	AASHTO
○ Gray poorly graded sand	SP	
□ Gray poorly graded sand with silt	SP-SM	
△ Gray poorly graded sand	SP	

Project No. 2007G734 **Client:** Schnabel Engineering

Project: Wildwood Beach Investigation

Wildwood, NJ

○ **Source of Sample:** NVB-12 **Depth:** 12.0-16.0

□ **Source of Sample:** NVB-12 **Depth:** 16.0-20.0

△ **Source of Sample:** NVB-12 **Depth:** 20.0-26.0

Remarks:

○ Moisture Content - 21.9%

□ Moisture Content - 21.8%

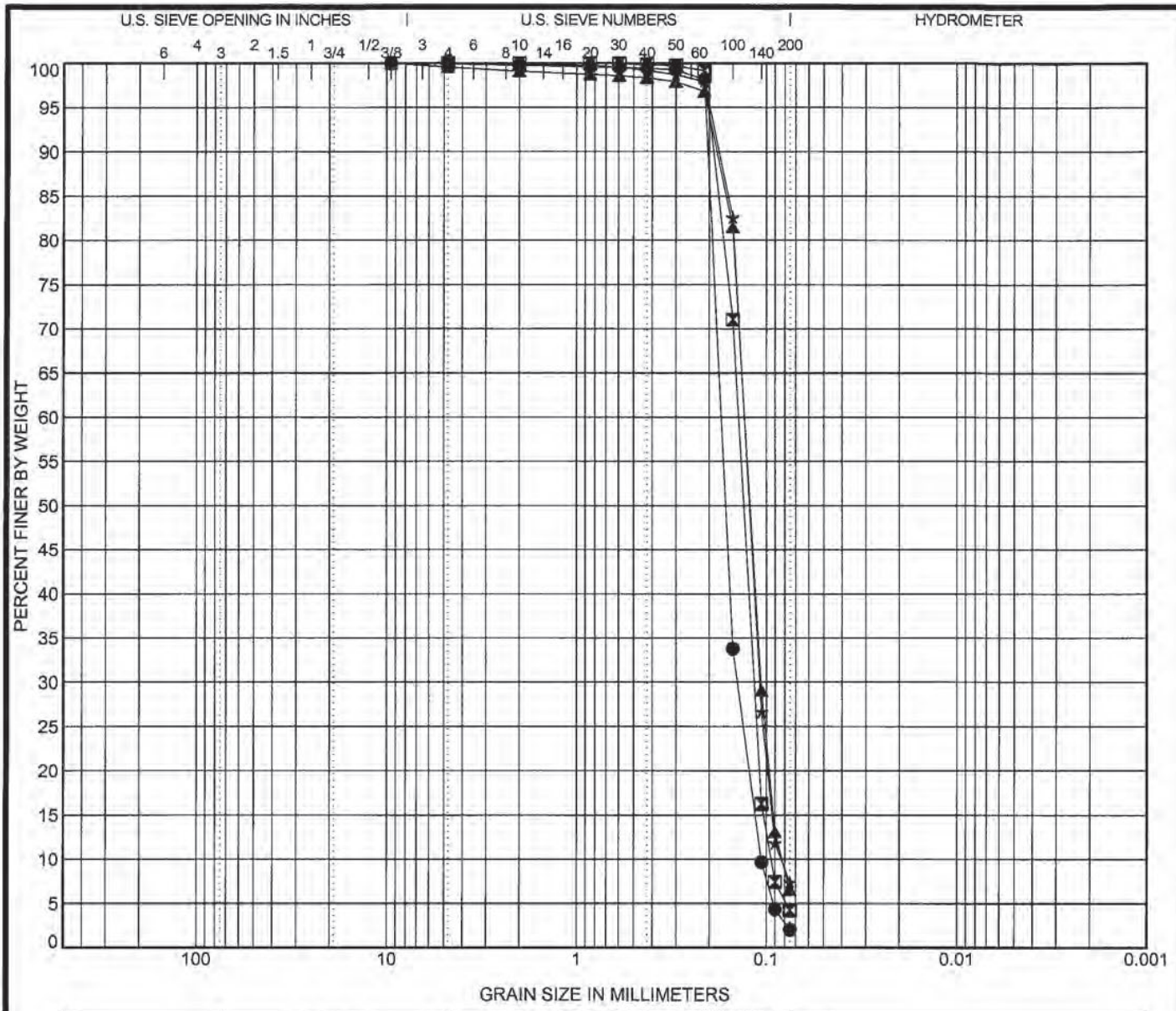
△ Moisture Content - 21.4%

GeoSystems Consultants, Inc.

Fort Washington, Pennsylvania

Plate

Tested By: D. Allen **Checked By:** K. Nordeng



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen	Classification	LL	PL	PI	Cc	Cu
●	NJV-748 0.0 ft	Poorly graded SAND, contains gravel and shell fragments - dark gray (SP)				1.10	1.62
⊠	NJV-748 5.0 ft	Poorly graded SAND, contains shell fragments - dark gray (SP)				1.01	1.48
▲	NJV-748 10.0 ft	Poorly graded SAND WITH SILT - gray (SP-SM)				1.06	1.58
★	NJV-748 15.0 ft	Poorly graded SAND WITH SILT, contains shell fragments - dark gray (SP-SM)				1.08	1.56

	Specimen	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	NJV-748 0.0 ft	9.5	0.173	0.142	0.107	0.1	97.9	2.0	
⊠	NJV-748 5.0 ft	4.75	0.14	0.116	0.094	0.0	95.7	4.3	
▲	NJV-748 10.0 ft	9.5	0.13	0.107	0.083	0.4	93.0	6.5	
★	NJV-748 15.0 ft	9.5	0.13	0.108	0.083	0.1	92.5	7.4	

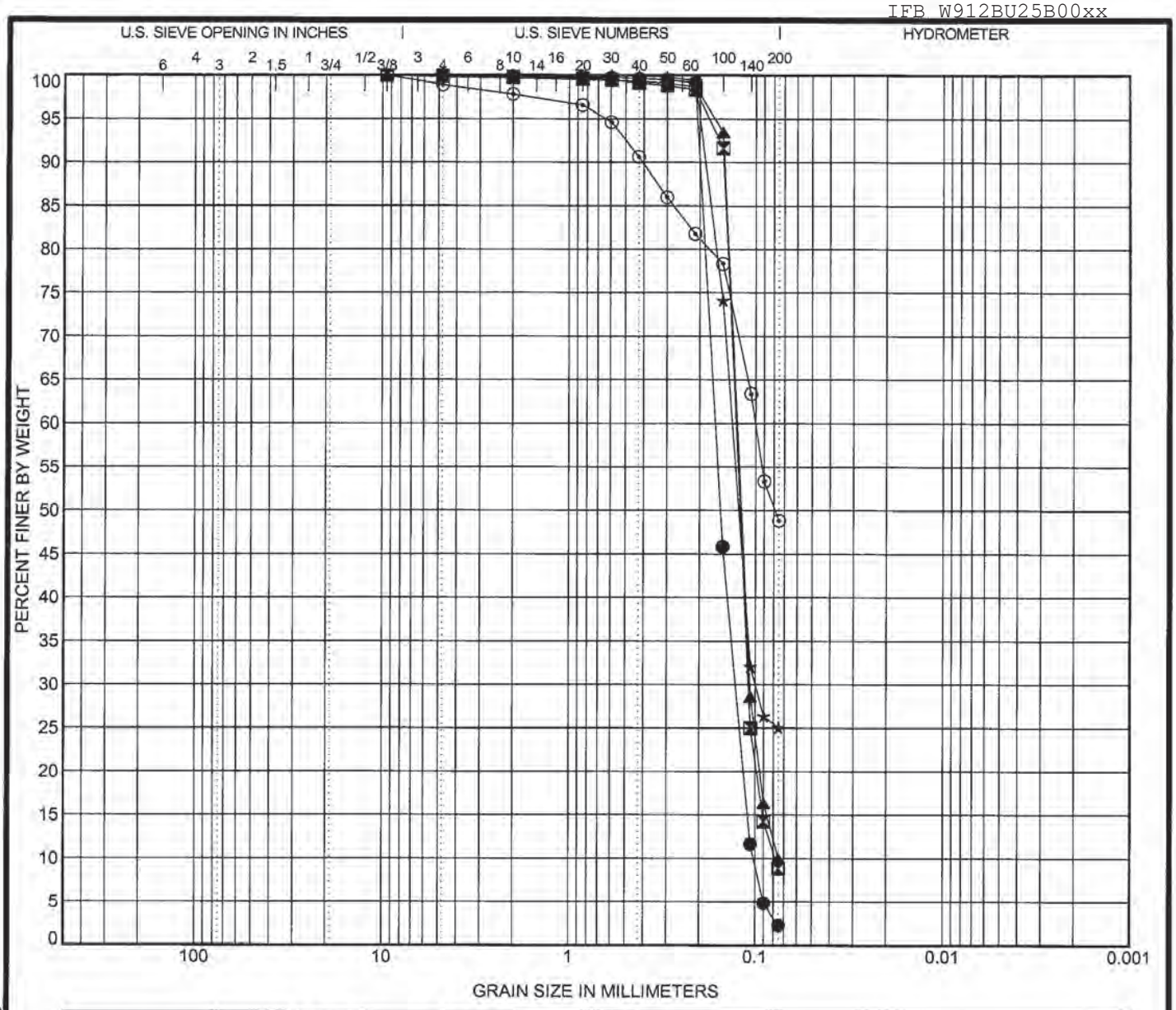
Schnabel Engineering

GRADATION CURVES

Project: VIBRATIONAL CORING
WILDWOOD TO HEREFORD INLET
CAPE MAY COUNTY, NEW JERSEY

Contract: 04151127.11

US_GRAIN_SIZE_04151127.11VIBRACORE_WILDWOOD-HEREFORD.GPJ_SCHNABEL.GDT_8/30/06



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen	Classification	LL	PL	PI	Cc	Cu
● NJV-749 0.0 ft	Poorly graded SAND, contains mica and shell fragments - gray (SP)				0.97	1.61
⊠ NJV-749 5.0 ft	Poorly graded SAND WITH SILT, contains mica, organics and shell fragments - dark gray (SP-SM)				1.19	1.63
▲ NJV-749 10.0 ft	Poorly graded SAND WITH SILT, contains mica, organics and shell fragments - dark gray (SP-SM)				1.21	1.67
★ NJV-749 15.9 ft	SILTY SAND, contains shell fragments and mica - dark gray (SM)					
⊙ NJV-749 15.9 ft	SILTY SAND, contains gravel, shell fragments and mica - dark gray (SM)					

Specimen	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● NJV-749 0.0 ft	4.75	0.164	0.128	0.102	0.0	97.7	2.3	
⊠ NJV-749 5.0 ft	9.5	0.127	0.109	0.078	0.1	91.1	8.8	
▲ NJV-749 10.0 ft	9.5	0.125	0.107	0.075	0.2	89.8	10.0	
★ NJV-749 15.0 ft	4.75	0.133	0.1		0.0	75.0	25.0	
⊙ NJV-749 15.9 ft	9.5	0.1			1.1	50.1	48.9	

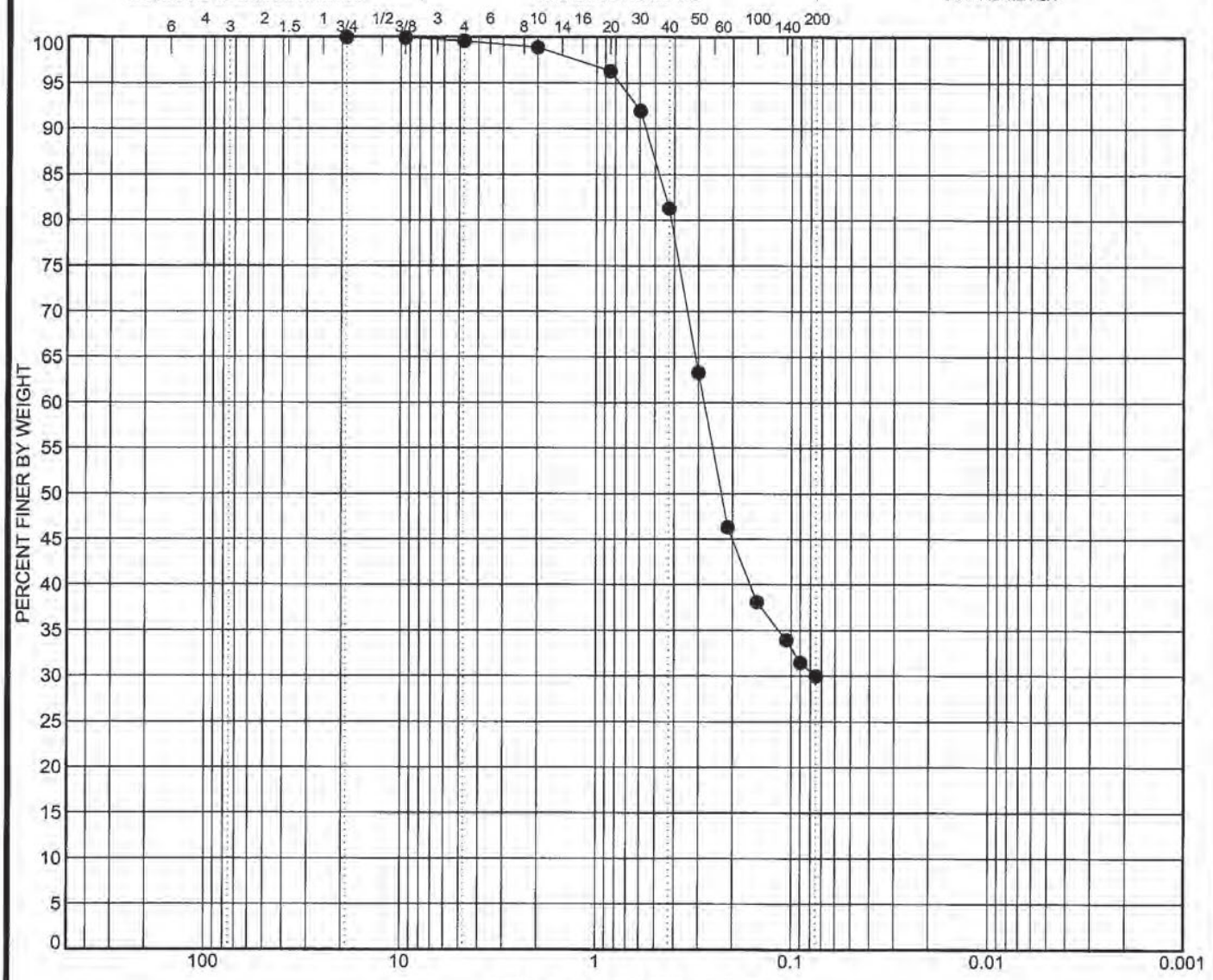
Schnabel Engineering

GRADATION CURVES

Project: VIBRATIONAL CORING
WILDWOOD TO HEREFORD INLET
CAPE MAY COUNTY, NEW JERSEY

Contract: 04151127.11

US GRAIN SIZE 04151127.11VIBRACORE WILDWOOD-HEREFORD.GPJ SCHNABEL.GDT 6/30/06



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen	Classification	LL	PL	PI	Cc	Cu
●	NJV-749 18.2 ft	SILTY SAND, contains gravel, organics, shell fragments and mica - dark gray (SM)					

	Specimen	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	NJV-749 18.2 ft	19	0.28	0.075		0.4	69.6	30.0	

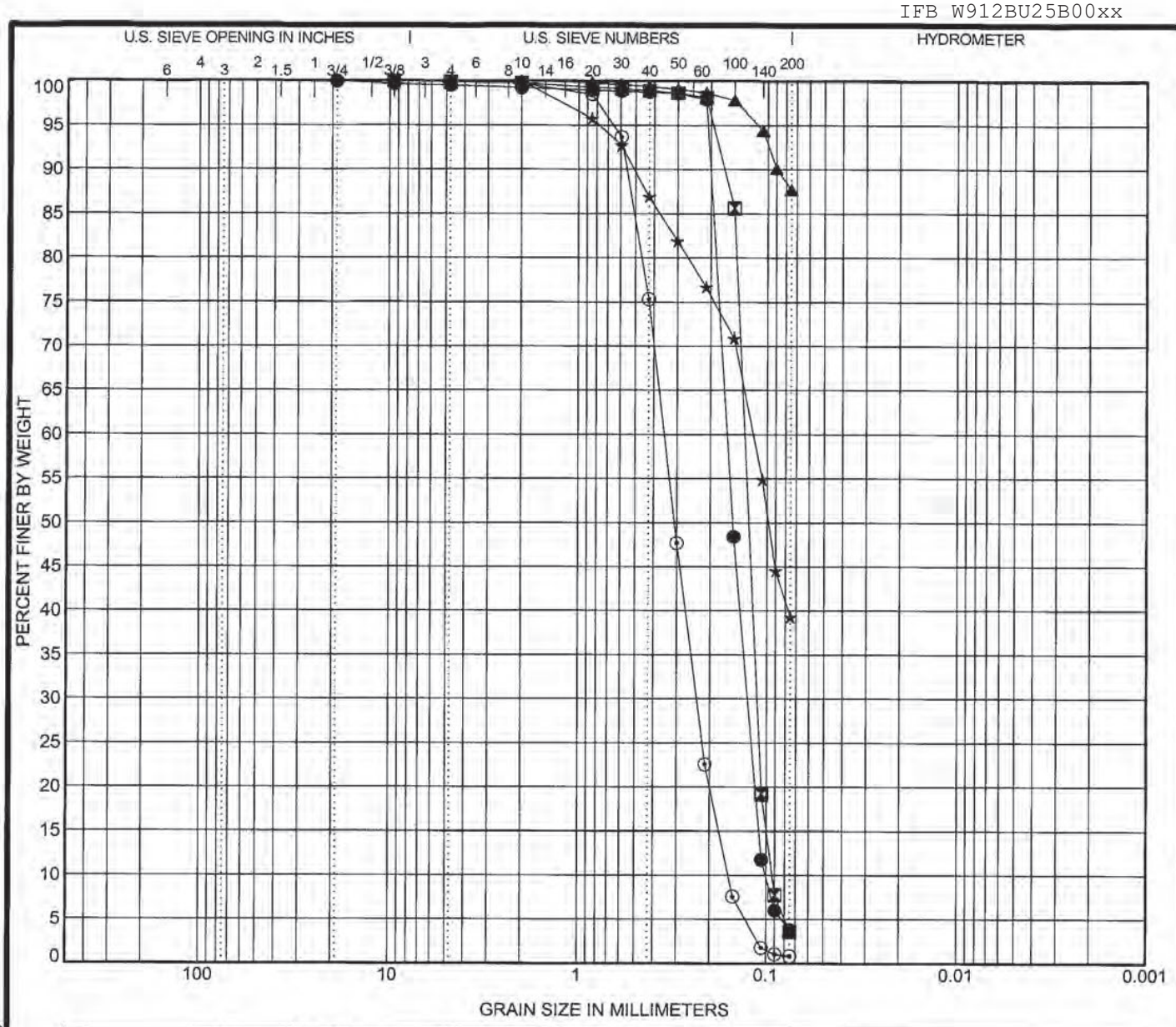
Schnabel Engineering

GRADATION CURVES

Project: VIBRATIONAL CORING
WILDWOOD TO HEREFORD INLET
CAPE MAY COUNTY, NEW JERSEY

Contract: 04151127.11

US GRAIN SIZE 04151127.11VIBRACORE WILDWOOD-HEREFORD.GPJ SCHNABEL.GDT 6/30/06



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen	Classification	LL	PL	PI	Cc	Cu
● NJV-750 0.0 ft	Poorly graded SAND, contains mica and shell fragments - dark gray (SP)				0.97	1.61
⊠ NJV-750 5.0 ft	Poorly graded SAND, contains mica and shell fragments - dark gray (SP)				1.03	1.41
▲ NJV-750 9.3 ft	SANDY ORGANIC SILT, contains mica - dark gray (OL)					
★ NJV-750 10.0 ft	SILTY SAND, contains shell fragments - dark gray (SM)					
⊙ NJV-750 11.2 ft	Poorly graded SAND, contains shell fragments - dark gray (SP)				0.99	2.21

Specimen	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● NJV-750 0.0 ft	19	0.163	0.126	0.101	0.4	95.8	3.8	
⊠ NJV-750 5.0 ft	9.5	0.131	0.112	0.093	0.1	96.3	3.6	
▲ NJV-750 9.3 ft	2				0.0	12.3	87.7	
★ NJV-750 10.0 ft	4.75	0.118			0.0	60.7	39.3	
⊙ NJV-750 11.2 ft	19	0.35	0.235	0.159	0.1	99.0	0.8	

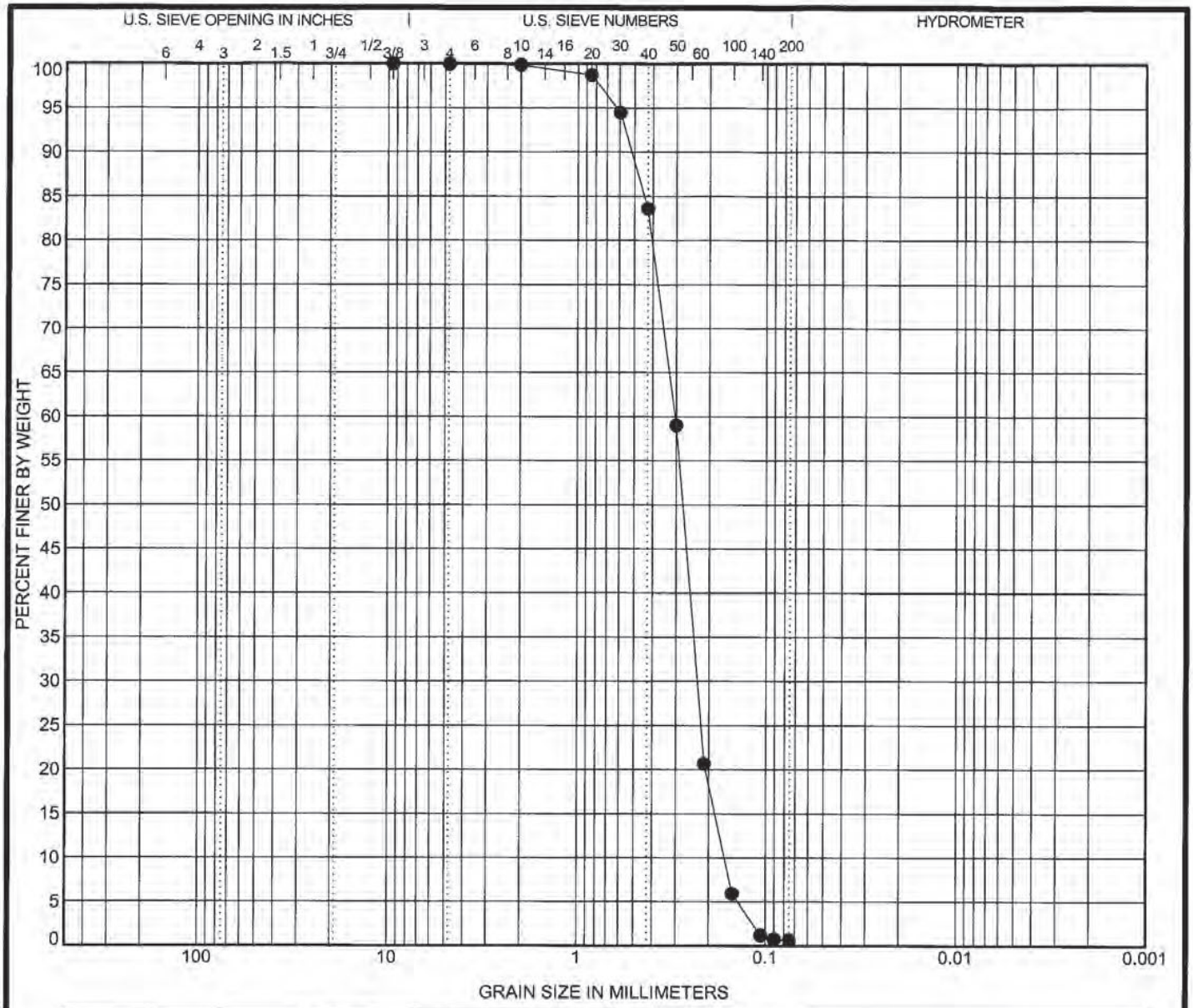
Schnabel Engineering

GRADATION CURVES

Project: VIBRATIONAL CORING
WILDWOOD TO HEREFORD INLET
CAPE MAY COUNTY, NEW JERSEY

Contract: 04151127.11

US GRAIN SIZE 04151127.11VIBRACORE WILDWOOD-HEREFORD.GPJ SCHNABEL.GDT 6/29/06



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen	Classification	LL	PL	PI	Cc	Cu
●	NJV-750 15.0 ft	Poorly graded SAND, contains shell fragments - dark gray (SP)				1.06	1.84

	Specimen	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	NJV-750 15.0 ft	9.5	0.304	0.231	0.165	0.0	99.3	0.6	

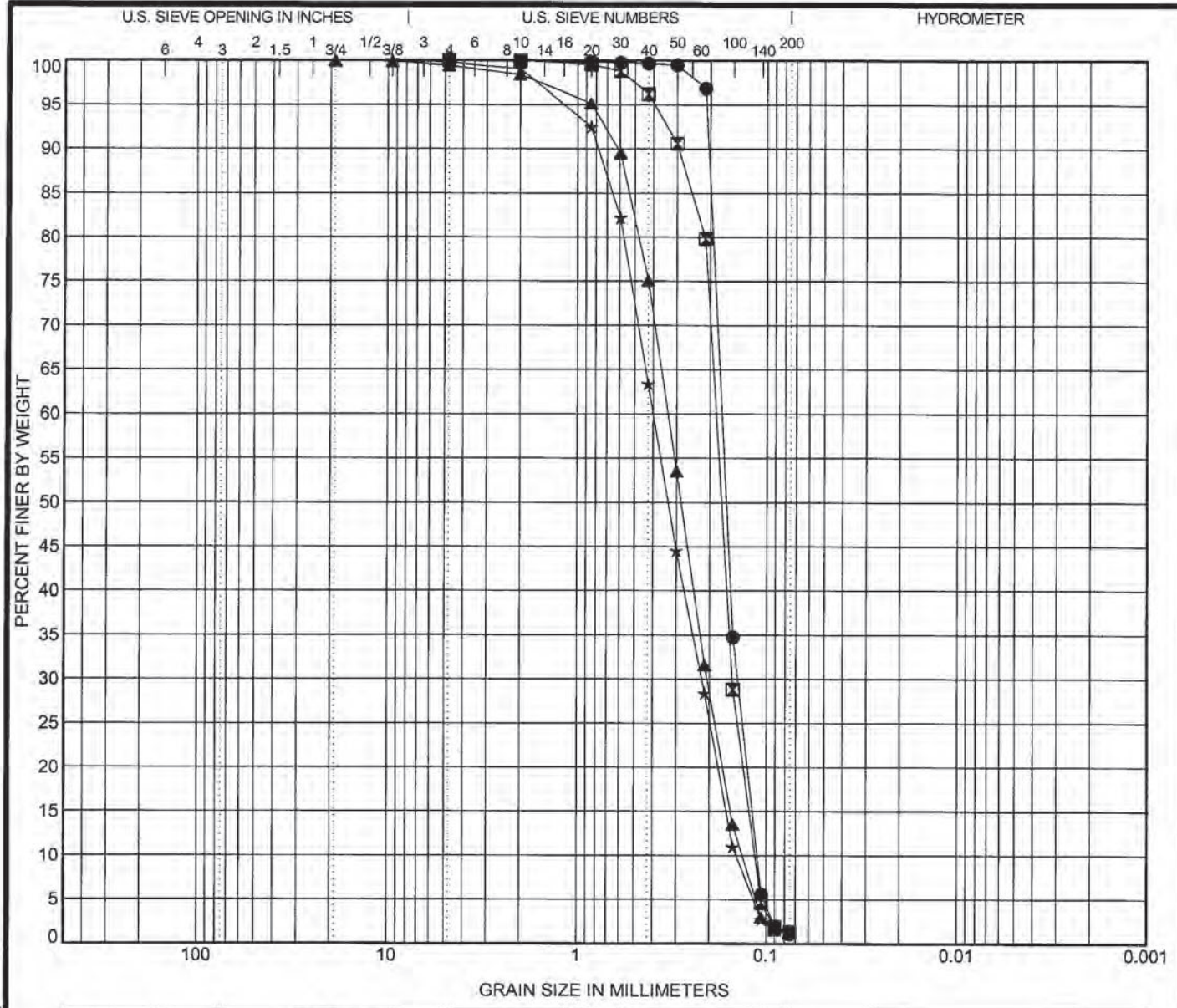
Schnabel Engineering

GRADATION CURVES

Project: VIBRATIONAL CORING
WILDWOOD TO HEREFORD INLET
CAPE MAY COUNTY, NEW JERSEY

Contract: 04151127.11

US GRAIN SIZE 04151127.11VIBRACORE WILDWOOD-HEREFORD.GPJ SCHNABEL.GDT 6/29/06



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen	Classification	LL	PL	PI	Cc	Cu
●	NJV-751R2 0.0 ft	Poorly graded SAND, contains organics and shell fragments - gray (SP)				1.04	1.55
⊠	NJV-751R2 5.0 ft	Poorly graded SAND, contains organics and shell fragments - gray (SP)				1.08	1.62
▲	NJV-751R2 10.0 ft	Poorly graded SAND, contains organics and shell fragments - gray (SP)				0.95	2.50
★	NJV-751R2 15.0 ft	Poorly graded SAND, contains shell fragments - gray (SP)				0.84	2.78

	Specimen	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	NJV-751R2 0.0 ft	4.75	0.173	0.142	0.112	0.0	98.9	1.1	
⊠	NJV-751R2 5.0 ft	4.75	0.185	0.151	0.114	0.0	98.7	1.3	
▲	NJV-751R2 10.0 ft	19	0.333	0.206	0.133	0.5	98.3	1.2	
★	NJV-751R2 15.0 ft	9.5	0.399	0.219	0.144	0.2	98.6	1.2	

Schnabel Engineering

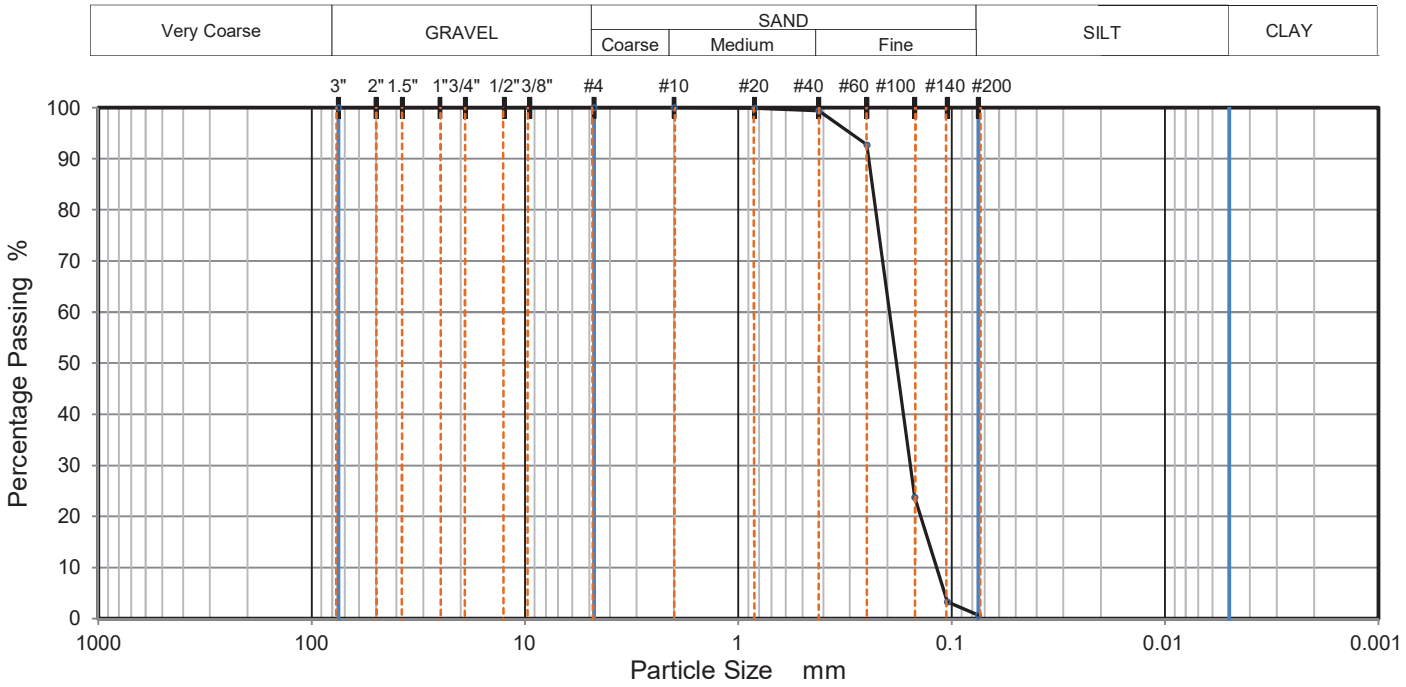
GRADATION CURVES

Project: VIBRATIONAL CORING
WILDWOOD TO HEREFORD INLET
CAPE MAY COUNTY, NEW JERSEY

Contract: 04151127.11

US GRAIN SIZE 04151127.11VIBRACORE WILDWOOD-HEREFORD.GPJ SCHNABEL.GDT 6/30/06

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-1
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-1A
Soil Description	Gray Fine Sand with shell fragments			Depth	1.50 ft
Specimen Ref.	1	Specimen Depth	2.00 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-202404221



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.4		
#60	92.7		
#100	23.8		
#140	3.3		
#200	0.7		

Dry Mass of sample, g: 430.1

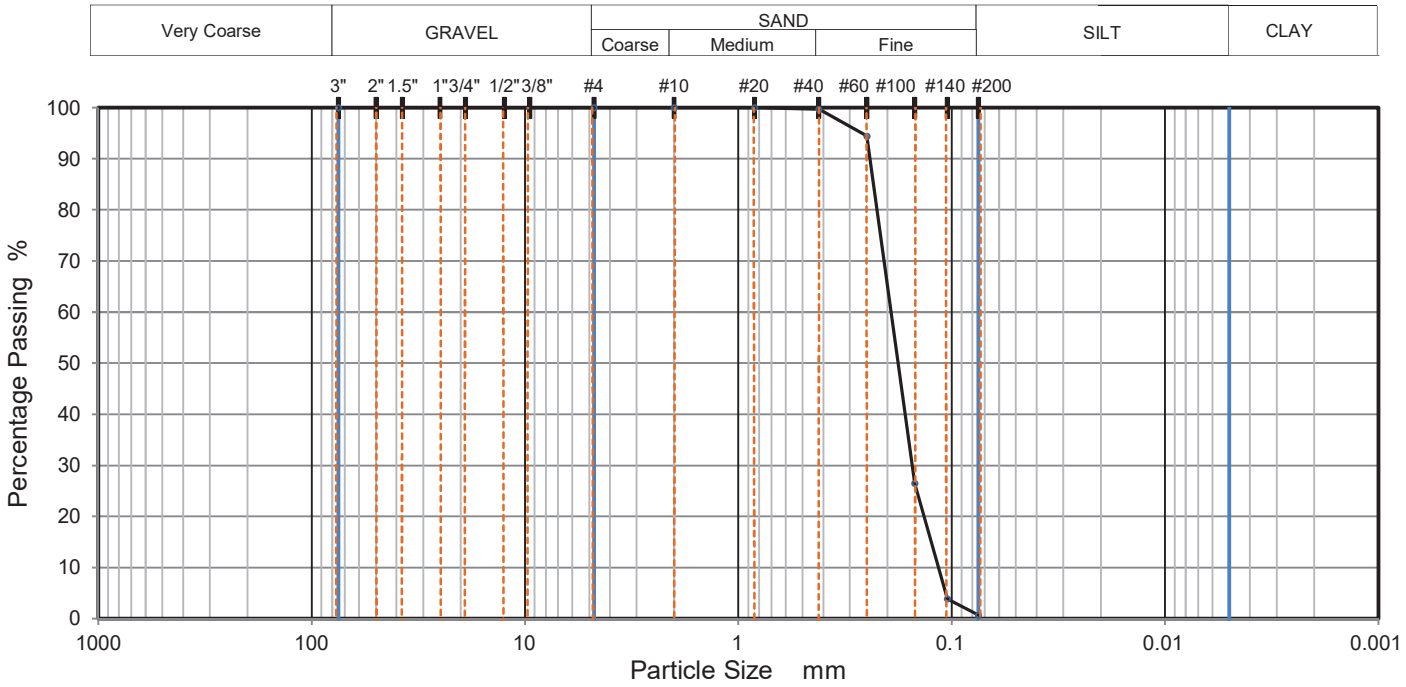
Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	0.6
Fine Sand, #40 to #200	98.7
Fines <#200	0.7

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

PARTICLE SIZE DISTRIBUTION

Job Ref	Hereford Inlet to Cape May Inlet				
Borehole / Pit No	NVH-1				
Site Name	Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ			Sample No	NVH-1B
Soil Description	Gray Fine Sand			Depth	2.50 ft
Specimen Ref.	1	Specimen Depth	3.00 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-202404222



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.7		
#60	94.4		
#100	26.5		
#140	3.9		
#200	0.7		

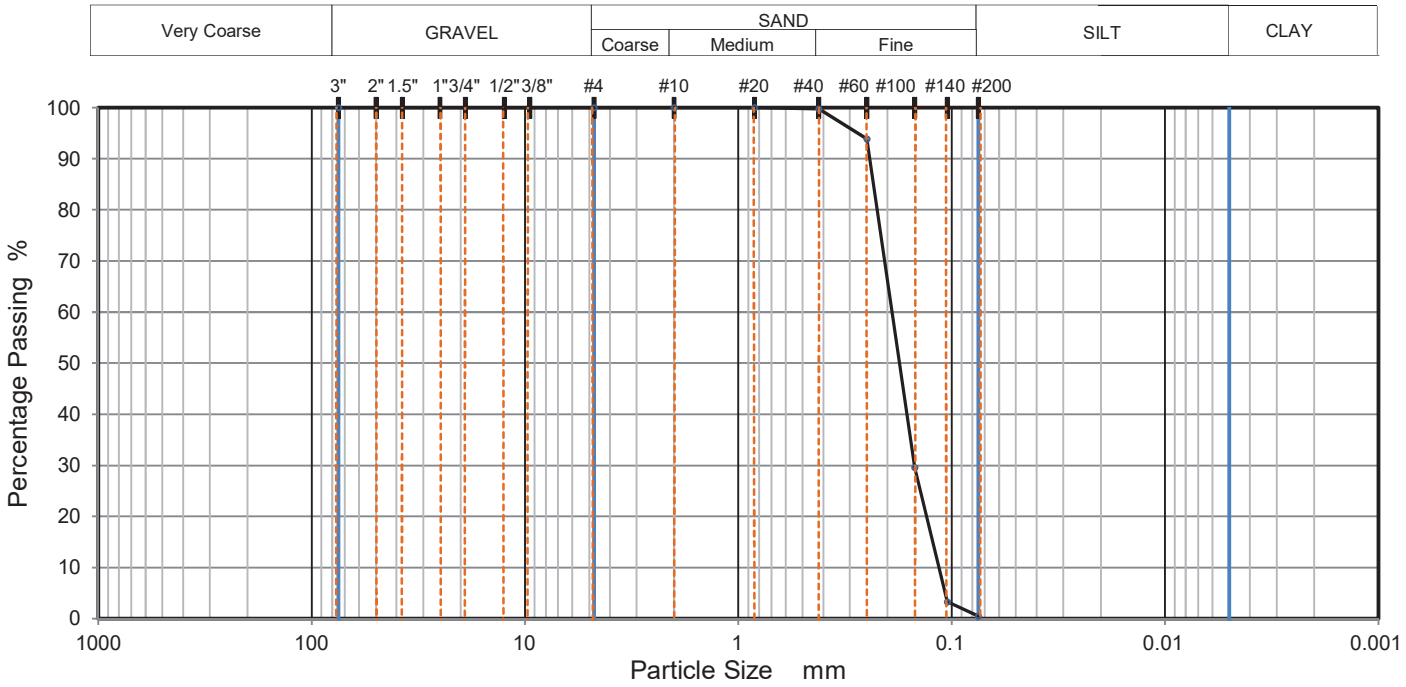
Dry Mass of sample, g: 403.4

Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	0.3
Fine Sand, #40 to #200	99.0
Fines <#200	0.7

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-2
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-2A
Soil Description	Gray Fine Sand			Depth	1.50 ft
Specimen Ref.	1	Specimen Depth	2.00 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-202404223



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.8		
#60	93.9		
#100	29.6		
#140	3.3		
#200	0.5		

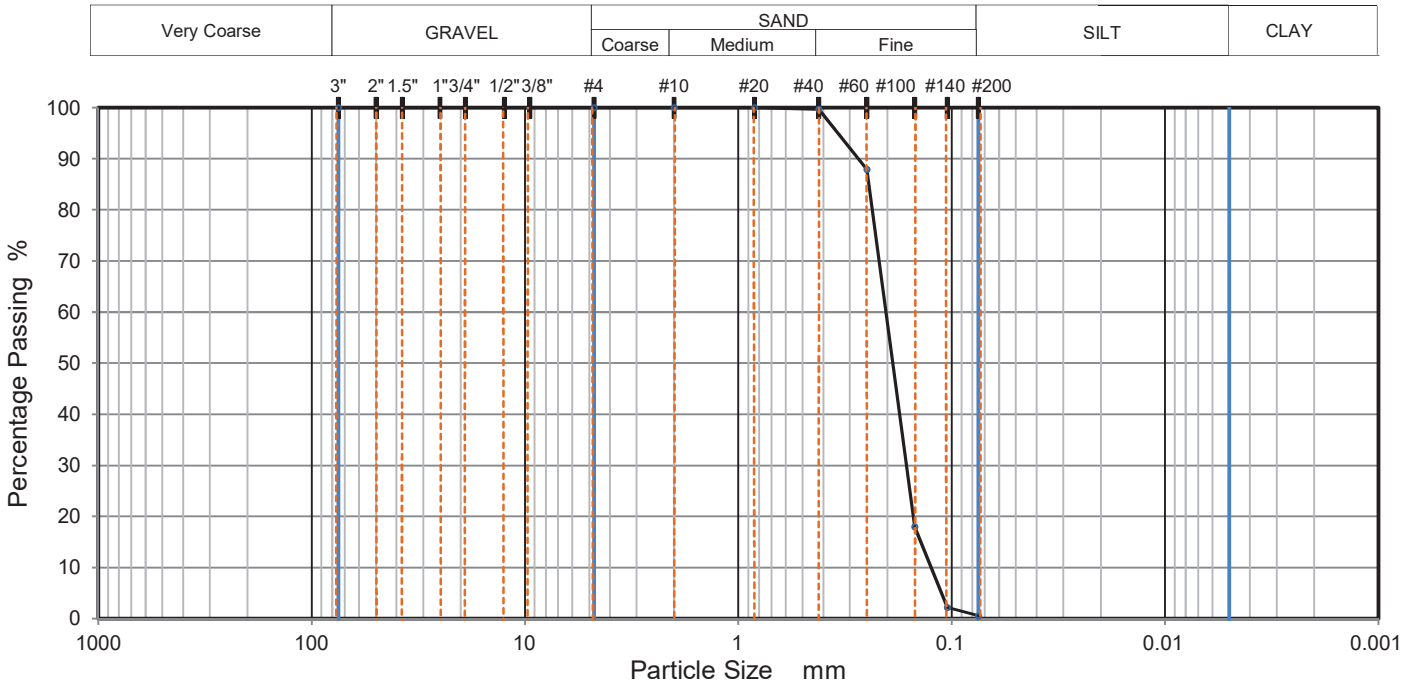
Dry Mass of sample, g: 405.2

Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	0.2
Fine Sand, #40 to #200	99.3
Fines <#200	0.5

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-2
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-2B
Soil Description	Gray Fine Sand			Depth	2.50 ft
Specimen Ref.	1	Specimen Depth	3.00 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-202404224



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.7		
#60	87.9		
#100	18.0		
#140	2.2		
#200	0.6		

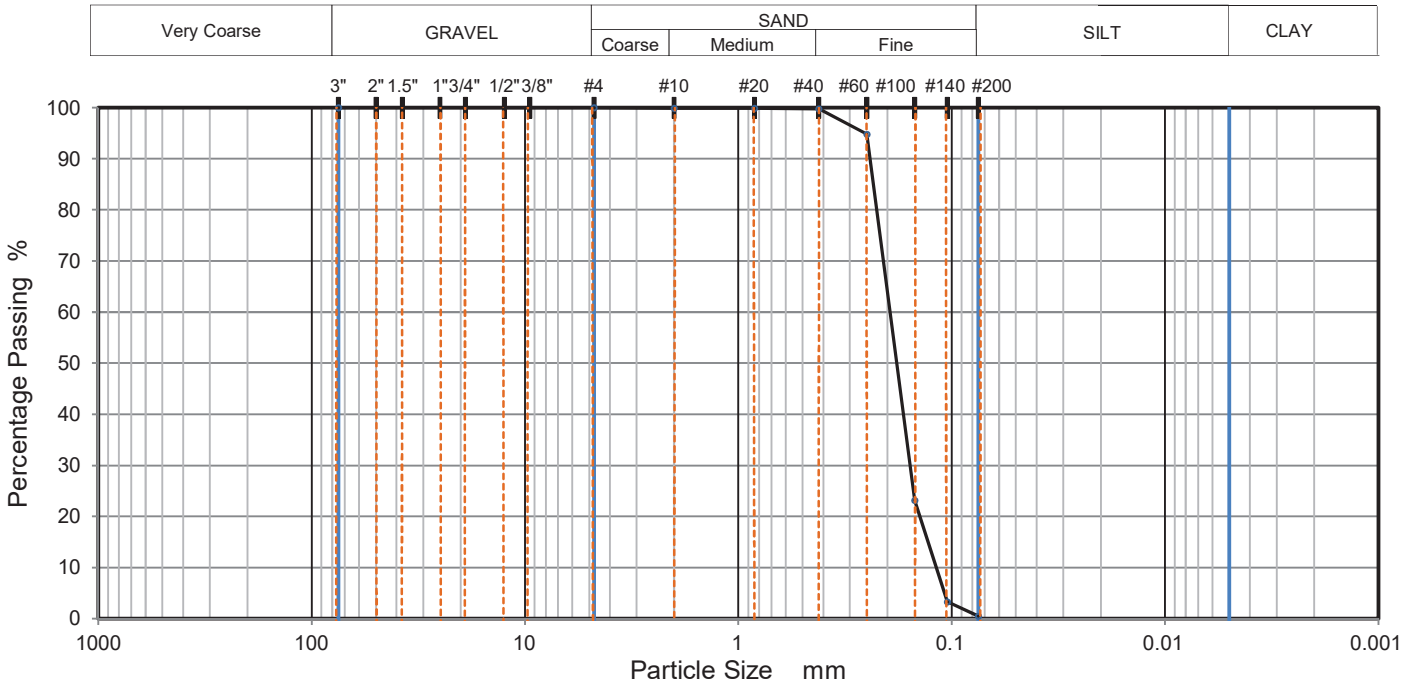
Dry Mass of sample, g: 408.3

Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	0.3
Fine Sand, #40 to #200	99.1
Fines <#200	0.6

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-3
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-3A
Soil Description	Gray Fine Sand			Depth	1.50 ft
Specimen Ref.	1	Specimen Depth	2.00 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-202404225



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	99.9		
#20	99.9		
#40	99.8		
#60	94.8		
#100	23.2		
#140	3.3		
#200	0.5		

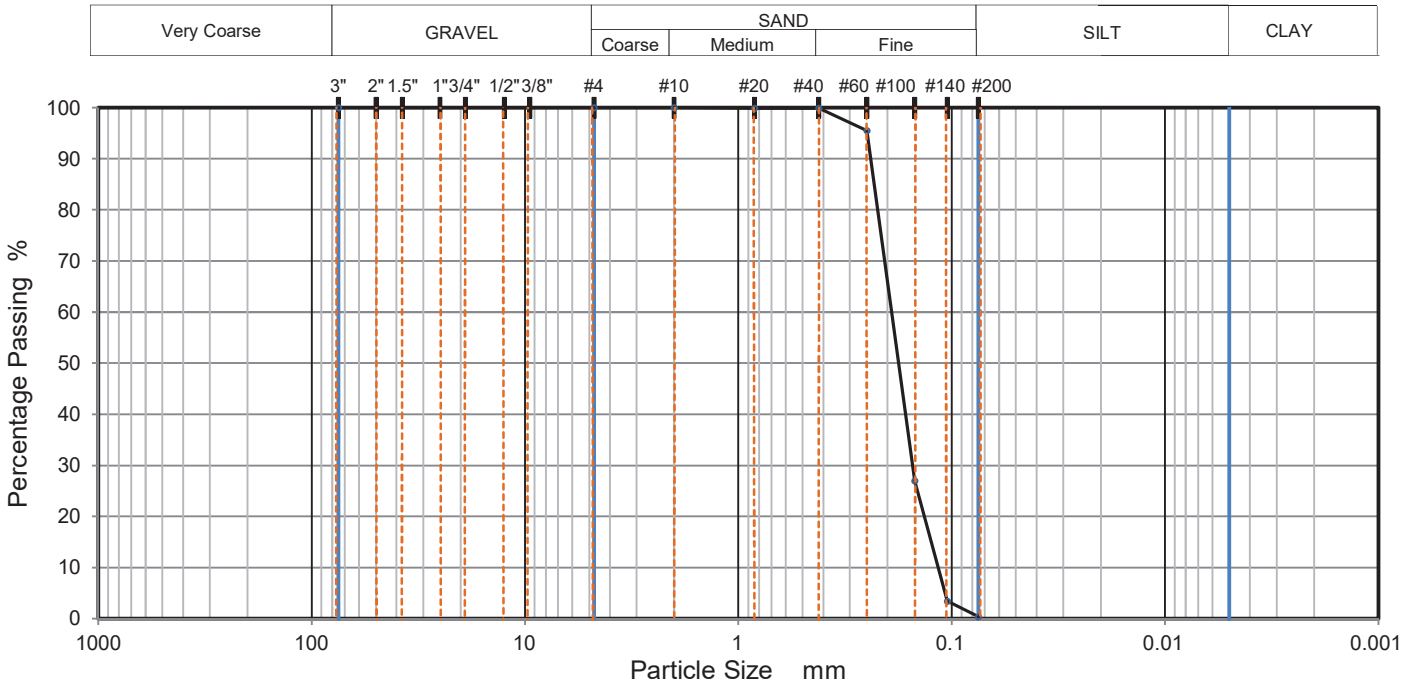
Dry Mass of sample, g: 406.6

Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.1
Medium Sand, #10 to #40	0.1
Fine Sand, #40 to #200	99.3
Fines <#200	0.5

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-3
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-3B
Soil Description	Gray Fine Sand			Depth	2.00 ft
Specimen Ref.	1	Specimen Depth	2.50 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-202404226



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.9		
#60	95.5		
#100	27.0		
#140	3.4		
#200	0.4		

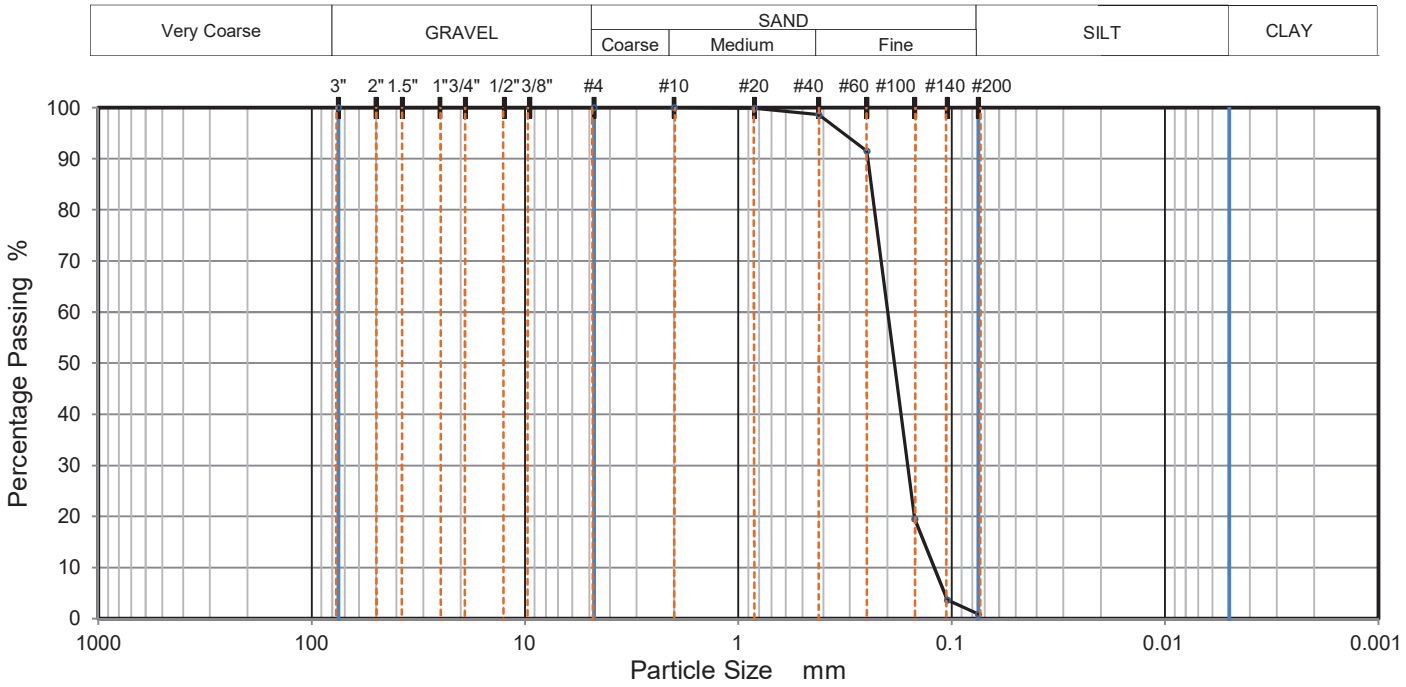
Dry Mass of sample, g: 409.8

Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	0.1
Fine Sand, #40 to #200	99.5
Fines <#200	0.4

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-4
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-4A
Soil Description	Gray Fine Sand			Depth	1.50 ft
Specimen Ref.	1	Specimen Depth	2.00 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-202404227



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.6		
#60	91.5		
#100	19.5		
#140	3.7		
#200	0.9		

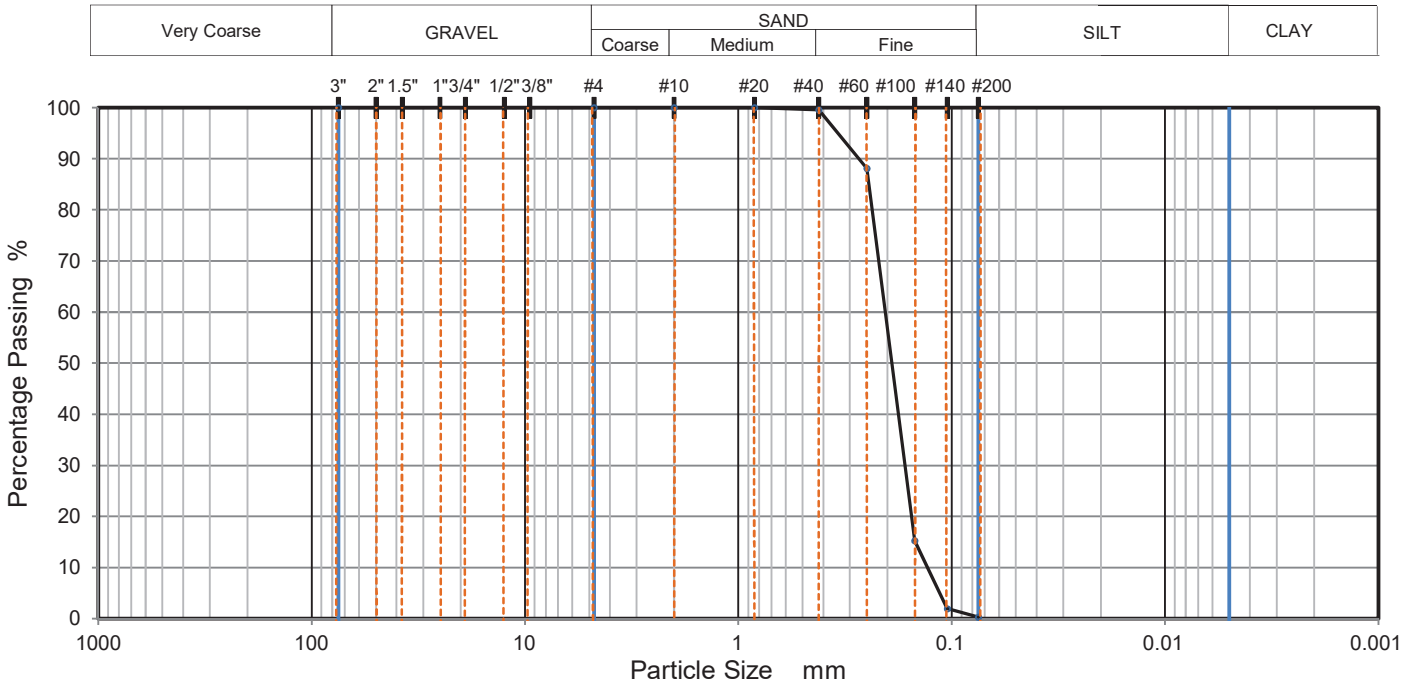
Dry Mass of sample, g: 401.3

Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	1.4
Fine Sand, #40 to #200	97.7
Fines <#200	0.9

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-4
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-4B
Soil Description	Gray Fine Sand			Depth	2.50 ft
Specimen Ref.	1	Specimen Depth	3.00 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-202404228



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.6		
#60	88.1		
#100	15.3		
#140	2.0		
#200	0.3		

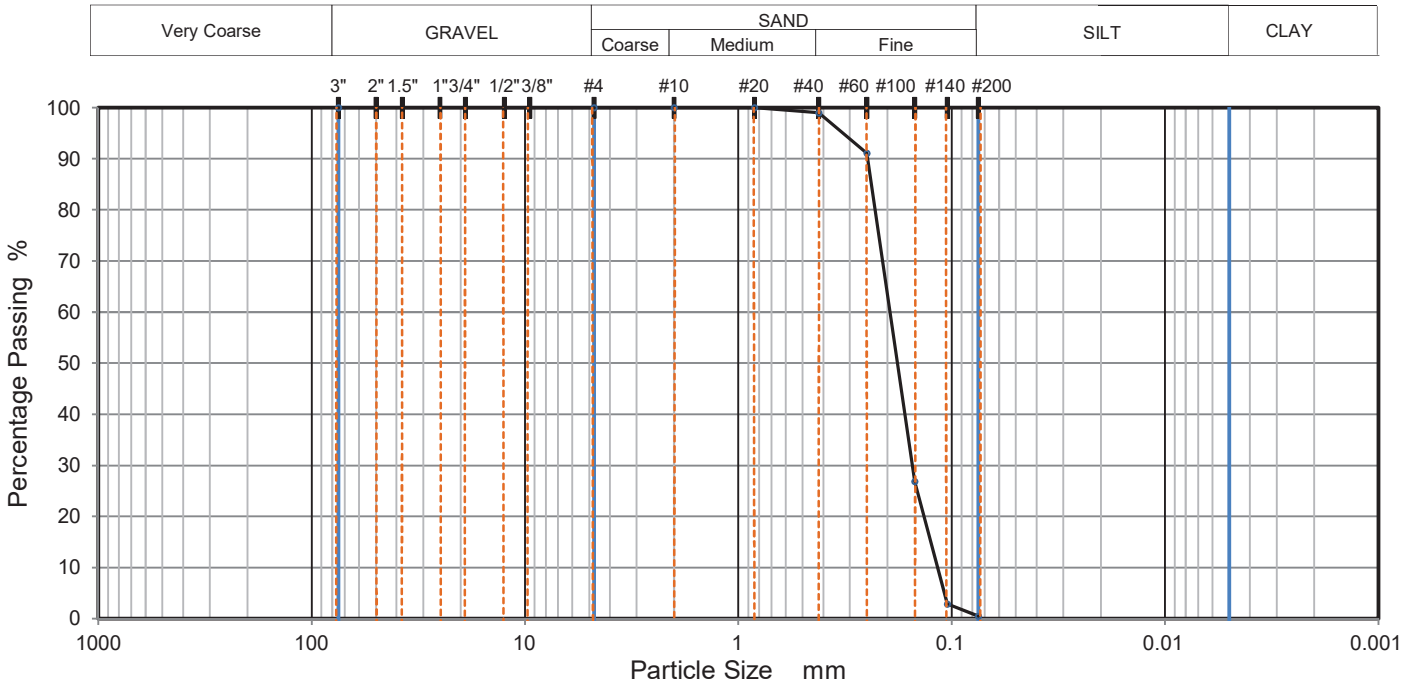
Dry Mass of sample, g: 430.2

Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	0.4
Fine Sand, #40 to #200	99.3
Fines <#200	0.3

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-5
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-5A
Soil Description	Gray Fine Sand			Depth	1.50 ft
Specimen Ref.	1	Specimen Depth	2.00 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-202404229



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.0		
#60	91.1		
#100	26.9		
#140	2.9		
#200	0.5		

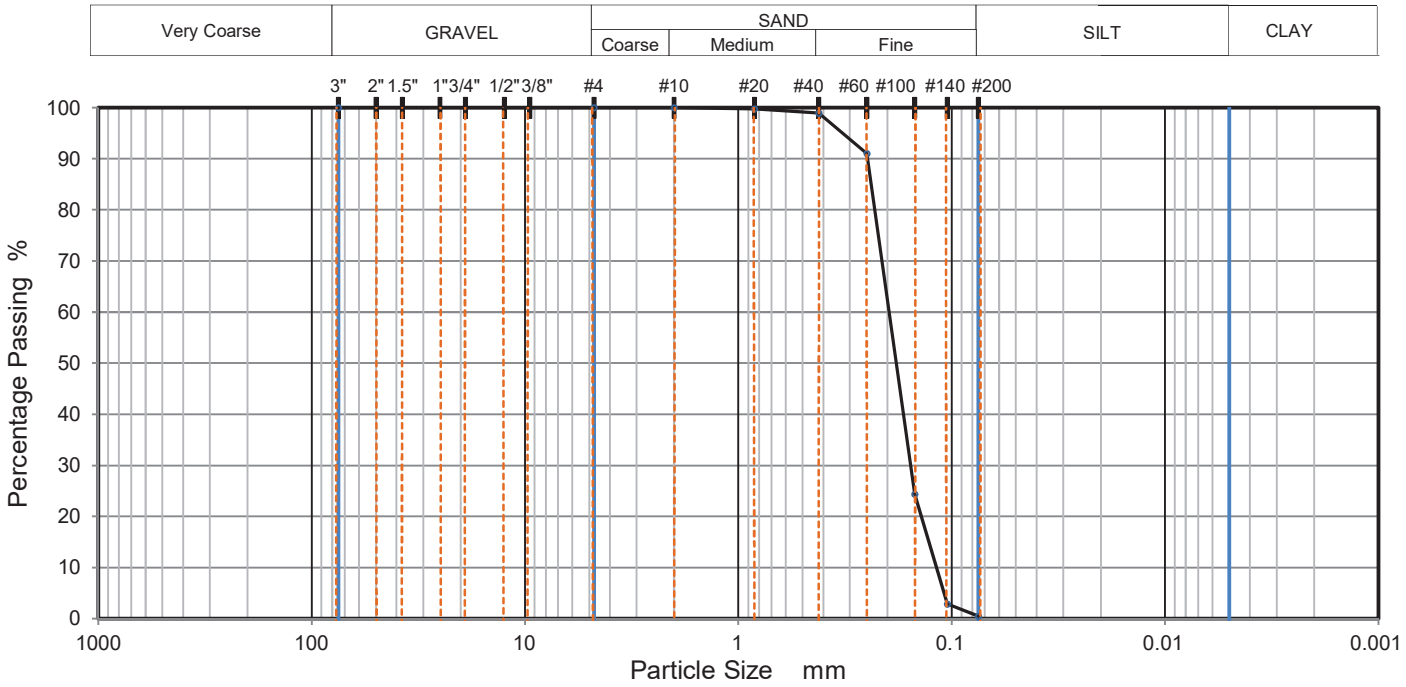
Dry Mass of sample, g: 403.5

Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	1.0
Fine Sand, #40 to #200	98.5
Fines <#200	0.5

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-5
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-5B
Soil Description	Gray Fine Sand			Depth	2.00 ft
Specimen Ref.	1	Specimen Depth	2.50 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-2024042210



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	99.8		
#40	98.9		
#60	91.0		
#100	24.4		
#140	2.9		
#200	0.5		

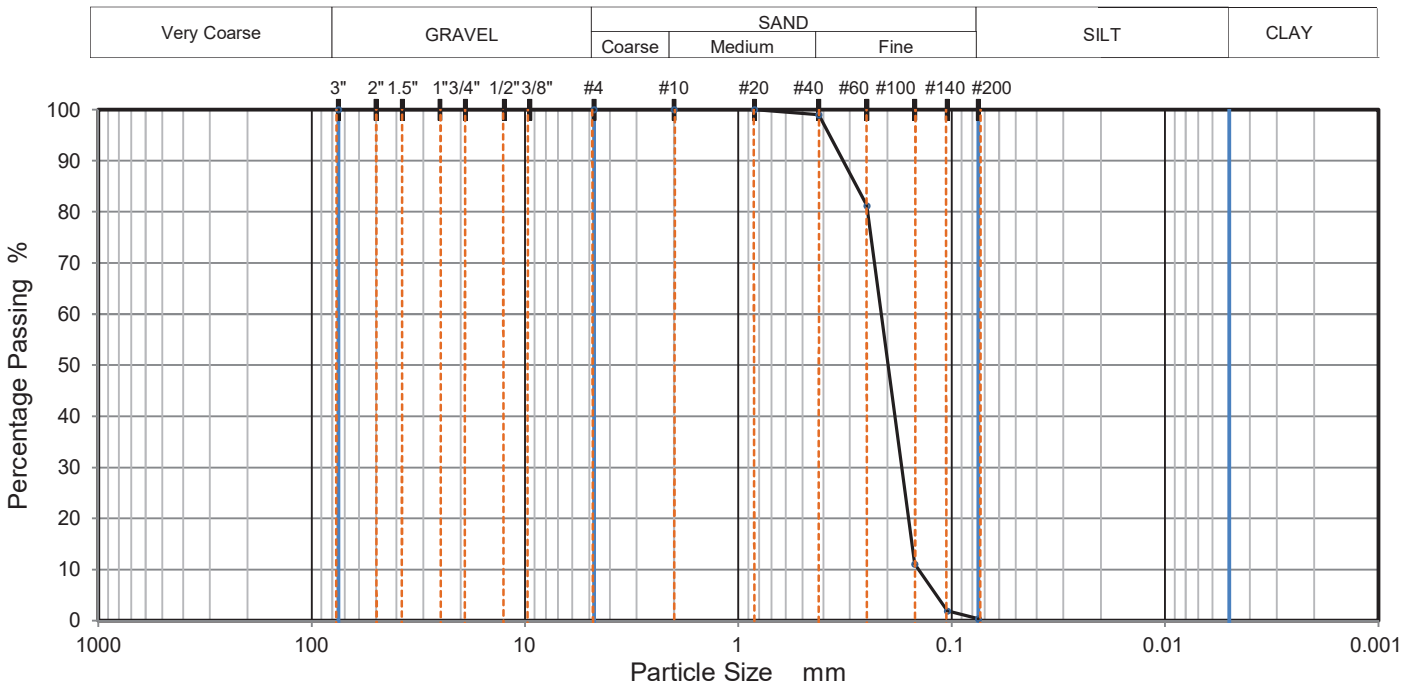
Dry Mass of sample, g: 429.5

Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	1.1
Fine Sand, #40 to #200	98.4
Fines <#200	0.5

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-6
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-6A
Soil Description	Gray Fine Sand			Depth	1.00 ft
Specimen Ref.	1	Specimen Depth	1.50 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-2024042211



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.0		
#60	81.2		
#100	11.1		
#140	1.9		
#200	0.4		

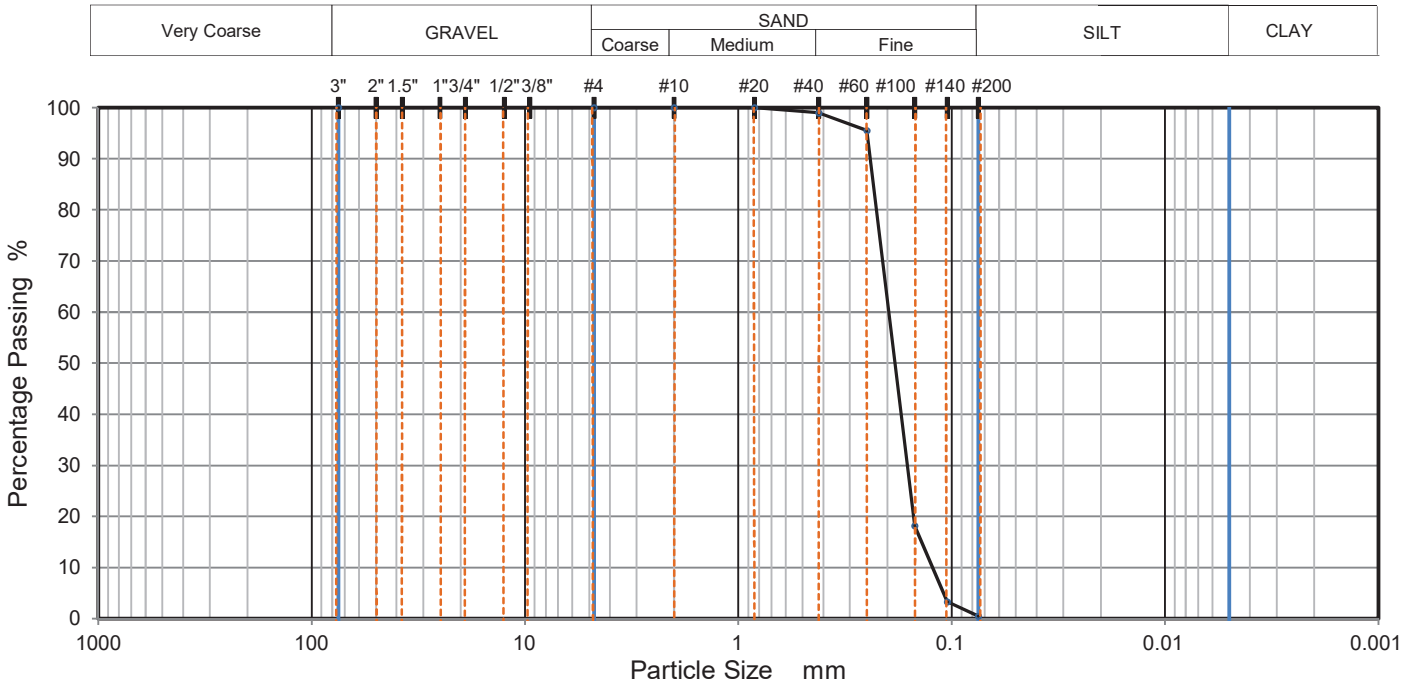
Dry Mass of sample, g: 427.4

Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	1.0
Fine Sand, #40 to #200	98.6
Fines <#200	0.4

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-7
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-7A
Soil Description	Gray Fine Sand			Depth	1.50 ft
Specimen Ref.	1	Specimen Depth	2.00 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-2024042212



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.0		
#60	95.5		
#100	18.2		
#140	3.3		
#200	0.5		

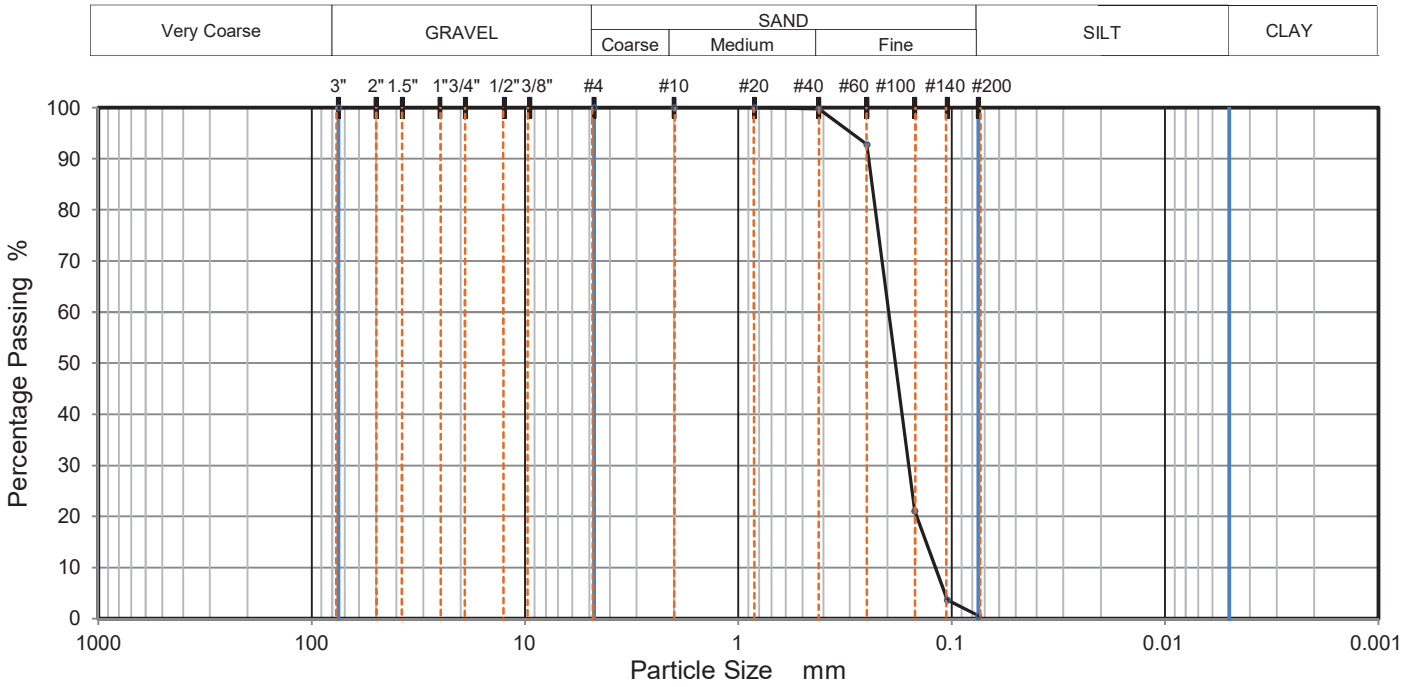
Dry Mass of sample, g: 406.2

Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	1.0
Fine Sand, #40 to #200	98.5
Fines <#200	0.5

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

	PARTICLE SIZE DISTRIBUTION			Job Ref	**Hereford Inlet to Cape May Inlet**
				Borehole / Pit No	NVH-7
Site Name	**Hereford Inlet to Cape May Inlet, Wildwood Crest, NJ**			Sample No	NVH-7B
Soil Description	Gray Fine Sand			Depth	2.00 ft
Specimen Ref.	1	Specimen Depth	2.50 ft	Sample Type	HAND AUGER
Test Method	ASTM D6913			Keylab ID	SAS-2024042213



TEST RESULTS ()

Sieving		Hydrometer Sedimentation	
Particle Size	% Passing	Particle Size mm	% Passing
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.8		
#60	92.8		
#100	21.1		
#140	3.7		
#200	0.6		

Dry Mass of sample, g: 417.1

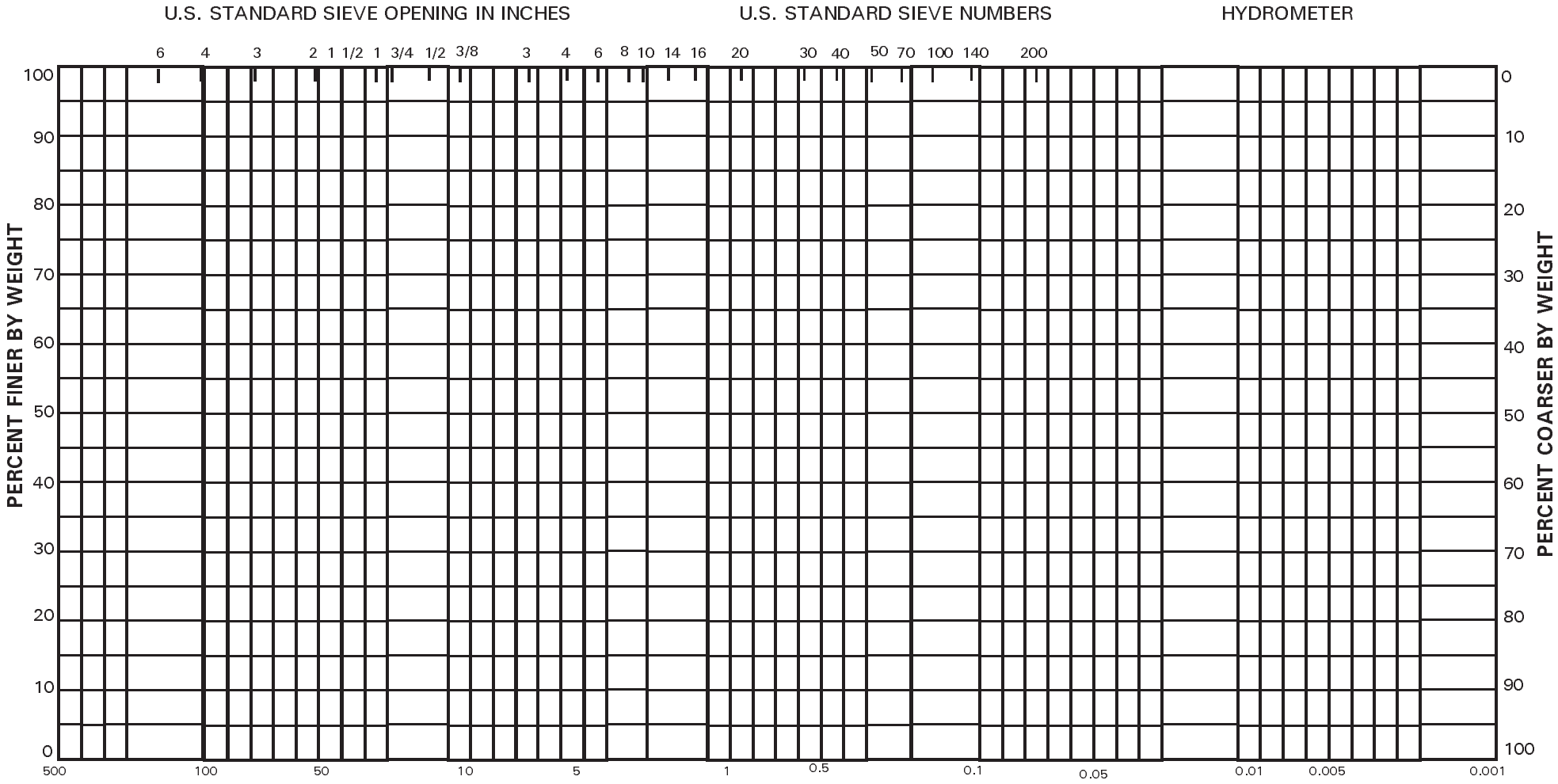
Sample Proportions	% dry mass
Very coarse, >3" sieve	
Gravel, 3" to # 4 sieve	
Coarse Sand, #4 to #10 sieve	0.0
Medium Sand, #10 to #40	0.2
Fine Sand, #40 to #200	99.2
Fines <#200	0.6

USCS		Liquid Limit		D_{90}		D_{50}		D_{10}	
AASHTO		Plastic Limit		D_{85}		D_{30}		C_u	
USCS Group Name		Plasticity Index		D_{60}		D_{15}		C_c	

Operator	Checked	Approved	Remarks	Figure No.
ME/ADB	TTF	Administrator		Sheet 1 of 1

APPENDIX F90

GRADATION CURVE WORKSHEET



	GRAVEL		SAND			
COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY

Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI

GRADATION CURVES

Project

Area

Boring

Date

IFB W912BU25B00xx

ENG FORM 2087, 1 MAY 63 (EM 1110-2-1906) (Proponent: CECW-EG)