

Wetlands and Coastal Dune Board

Regular Session Agenda

June 1, 2016

4:00 P.M.

1. Call to Order; Roll Call
2. Invocation and Pledge of Allegiance
3. Consent Agenda
 - A. Approval of Agenda Format
 - B. Approval of Minutes
4. New Business
 - A. Review of previous Town beach sand management practices. (attachments A and B)
 - B. Beach sand management practices part of US Army Corps of Engineers federal harbor dredge project. (attachment C)
 - C. Next steps and proposed timetable.
 - D. June 15, 2016 public input meeting.
5. Old Business
 - A. None.
6. Announcements
7. Adjourn



DRAFT
Wetlands/Coastal Dune Board
Public Hearing & Meeting
Town Hall
December 18, 2013
4:00 p.m.

At 4:11 p.m. in the Town Hall, Chairwoman Ann Hayward Walker, having established a quorum, called to order the Wetlands/Coastal Dune Board Public Hearing and Meeting. Board members Russ Dunton and Bob Roche were in attendance. Board members Bruce Lindeman and Ray Salopek were not in attendance. Also present were Town Planner Rob Testerman, Assistant Town Clerk Amanda Hurley, Hank Badger of the Virginia Marine Resources Commission and Ellen Grimes of Coastal Resource Management, LLC. There were four members of the public in attendance.

CONSENT AGENDA

Ann Hayward Walker suggested adding a summary of the meeting Rob Testerman attended with Fish & Wildlife Service before item 3A.

Motion made by Russ Dunton, seconded by Bob Roche, to accept the agenda format as amended. The motion was unanimously approved.

The Board reviewed the minutes from the September 23, 2013 Public Hearing and Meeting.

Motion made by Russ Dunton, seconded by Bob Roche, to accept the minutes of the September 23, 2013 Public Hearing and Meeting as presented. The motion was unanimously approved.

BUSINESS

A. *Meeting with Fish & Wildlife Service*

Rob Testerman explained that he and Amanda Hurley met with Mike Drummond and Troy Andersen of Fish & Wildlife Service (FWS) on December 6. FWS gave an overview of the Northeastern Beach Tiger Beetle and previous projects. Once an applicant received permit approval from the Wetlands Board, they also needed approval from FWS and other applicable agencies. Rob Testerman stated that the approval letter from the Wetlands Board indicated that the applicant may need approval from other agencies which now included FWS.

B. *Bay Creek at Cape Charles Community Association, JPA #13-1723 – proposed stone inter-bay breakwater and beach nourishment*

Mr. Hank Badger gave an overview of Wetlands and Dunes Board jurisdictions.

Rob Testerman stated that the application received was to install a “back bay breakwater” and beach nourishment behind the existing breakwater structures. The structure was proposed to be 100 linear feet, with 774 cubic yards of nourishment. Rob Testerman stated the following about the project: i) There would be no vegetated wetlands to be impacted by the project; ii) No equipment would be working in the water; iii) Heavy equipment work would be done at times of low water; iv) No stock piling of materials would be done on the beach; v) Chesapeake Bay Preservation Act impacts would be compensated for if required by the Town and; vi) Beach vegetation would be

planted if necessary to stabilize the beach nourishment. One response had been received from an adjacent property owner who was opposed to the project.

Rob Testerman introduced Ms. Ellen Grimes of Coastal Resource Management, LLC (CRM). Ms. Grimes stated that she was a marine and wetlands consultant, biologist and shoreline erosion specialist for the Eastern Shore. Ms. Grimes gave a brief history of the existing breakwaters and explained the erosion concerns. The applicants were Bay Creek at Cape Charles Community Association and property owners of lots 1-5. The options for the staging area were limited to lot 4 and lot 5 or lot 1 and lot 2.

PUBLIC COMMENTS:

Ms. Kathleen Kurgan of 151 Sunset Blvd, Lot 6

Ms. Kurgan stated that there were only three choices on the adjacent property owner's acknowledgment which included no comment, no objection and objection and she clarified that she only wished to comment, but had to select objection as that was the only choice which allowed for that.

Ms. Kurgan stated that in 2005 and 2006, when the breakwaters were completed, they were described as a shoreline protection system which also included sand replenishment. Ms. Kurgan asked why they couldn't just replenish the beach.

Ann Hayward Walker stated that they were trying to install a system to protect property and went on to state that Cape Charles had a high energy wave environment. In this particular case, the applicant was asking for design enhancement on the existing breakwaters as they did not accomplish what was originally desired.

Russ Dunton commented that with just sand replenishment, there would be bulldozers and dump trucks hauling sand there every couple of years which would disturb the area.

Ms. Kurgan stated that Tom Langley had not replenished any sand and she wanted to know if sand could be replenished at any time.

Mr. Badger referred to 28.2-1403 of the Coastal Primary Sand Dune and Beach Ordinance and clarified that sand replenishment for nourishment above high water line was acceptable without a permit from the Wetlands Board.

There was much discussion regarding the shoreline as well as Cherrystone Aqua Farm's concern in the past about channel impacts.

Ms. Kurgan passed around photos of the eroding shoreline during Hurricane Sandy and expressed her concern about retaining the grasses behind the breakwater.

Ms. Grimes explained that their project was 75 feet – 175 feet away from the grasses and they did not intend to go near the grasses and went on to state that they hoped grasses would develop behind the new breakwater.

Ann Hayward Walker stated that the staging area was outside the jurisdiction of the Wetlands Board, but commented that the applicant needed to take into account the concerns of adjacent property owners and encouraged the applicant to have direct communication.

Ms. Grimes stated that they would consider planting beach grass once the fill had fallen into place after a few months.

Bob Roche asked what would happen to the Kurgan's objections. Ann Hayward Walker stated that the Kurgans had certain options on the form and their concerns registered as objections as that was their only option and went on to state that she felt that Ms. Kurgan understood the need, but questioned whether or not the breakwater was an appropriate strategy for the area, but based on the guidance they had, it seemed like it was the optimal strategy to protect the shorelines. Ms. Kurgan stated that that was clear now.

Mr. Badger stated that he thought the breakwater request was not unusual and that it was acceptable, however nourishment would be needed throughout. Ann Hayward Walker recommended that the Kurgans encourage the homeowner's association to nourish instead of remove sand.

Motion made by Russ Dunton, seconded by Bob Roche, to approve the permit as presented. The motion was unanimously approved.

Motion made by Ann Hayward Walker, seconded by Russ Dunton, and unanimously approved to adjourn the Wetlands/Coastal Dune Board Meeting.

Chairwoman Ann Hayward Walker

Asst. Town Clerk

Wetlands and Coastal Dune Board Staff Report

From: Larry DiRe 
Date: June 1, 2016
Item: 4A,B – Beach sand management plan
Attachments: Historic description of beach management practices 2008 to 2012: Moving and Demolition; proposed USACE beach dune management practices 2016

Background

Over the past several years the Town has taken various steps as part of an overall beach sand management practices strategy. These include gathering data on dune height and using the public works department to perform regular cleaning and maintenance of the beach. Attachments A and B are historic in nature, dating from 2012 and 2009 respectively. These documents present an approach to managing the beach sand and coastal dunes. Since March 2015 the Town beach has been the deposit site for approximately 80,000 cubic yards of dredge material as part of the US Army Corps of Engineers' federal harbor dredging project. The final phase in the current dredging cycle will begin shortly and as part of that project an additional several tens of thousands of cubic yards of dredge material will be located on the Town beach. Attachment C is the detail drawings and sand management scope of work from that federal project. Both fencing and sprigging are described as sand management practices following up on the dredge material placement.

Discussion

The Wetlands and Coastal Dune Board is meeting to study beach sand management practices in the wake of substantial beach sand wind erosion and accumulation on streets and residential properties along the beach front that occurred in spring 2016. A review of the past and currently employed beach sand management practices will allow the Board to make appropriate recommendations to Town Council and provide an opportunity for residents' input into the scale of the sand wind erosion problem and potential practices to mitigate future wind erosion events.

Recommendation

Following discussion provide direction to staff.

ATTACHMENT A – SEPTEMBER 2012

Town of Cape Charles

Beach Maintenance – Calendar of Events

Spring 2008 – VHB Beach rebuild with breakwaters

1. The breakwaters were built with sand addition to the beach and the “as built” drawings have become the baseline for beach maintenance.

Fall 2008 – Beach Survey

1. The beach dune has been building nicely and excess sand has moved into the residential area.
2. A new sand fence plan was developed for fall placement and spring removal.

Summer 2009 – Beach Survey

1. Sand fence slowed sand migration into the residential area and is building a good dune.

Fall 2009 – November Nor’easter and post storm Beach Survey

1. The storm beat the beach and bulkhead for four full tide cycles with little change in elevation. Sand was moved southward and westward, bulkhead was exposed and breached.
2. Sand fence was repaired for the remainder of the winter.

Spring 2010 – Beach Replenishment, Beach Sand Relocation (FEMA) and Survey

1. Sand was moved south to north on the beach per FEMA recommendation and additional sand was added to rebuild to the baseline elevation. New sand fence was installed along the entire length of the beach to better maintain the resulting dune.

Fall 2010 – Beach Survey

1. Sand fence was added for the winter months to control sand movement with the North winds of winter.

Spring 2011 – Beach Sand Replenishment and Survey

1. Winter sand fence was removed and beach grasses transplanted to help continue dune vegetation.
2. Good dune retention and some building in section AA.

Summer 2011 - Beach Survey

1. Annual July survey and beach is building nicely to breakwaters.

August 2011- Hurricane Irene and post storm Beach Survey

1. Stakes were placed on the beach to measure the highest water level. The greatest impact was during high tide and the eye passed east of town at the same time sending west winds and water to the top of the bulkhead. Waves broke over the bulkhead for a few hours.
2. The post storm survey showed lost sand but no structural damage to the bulkhead as the storm cycle was short lived. The storm was moving northward at over 15 MPH. See survey for 8-29-2011

Fall 2011 – Beach Survey

1. Winter sand fence has been installed. Some additional areas of sand have been moved northward per FEMA recommendations.
2. Survey not yet completed for fall.
3. Student beach grass transplanting planned for “good weather days” in December and January.

Spring 2012 – Beach Survey

1. After last August storm loss of beach sand the contractor provided replenishment April.
2. The beach survey was conducted in early May after sand placement.
3. Beach grass planted in late fall has sprouted and about 95% survival. We had a mild winter with few storms.
4. Winter sand fence was removed and sand distributed in areas required above the high tide mark.

ATTACHMENT A – SEPTEMBER 2012

Late Summer 2012 – Survey

1. Summer and early hurricane season was mild with above average wind. Summer fence is holding sand well and the dune is building nicely but not excessively.
2. Survey help completed the process on the Labor Day weekend.

Fall 2012 – Survey

1. We thought we would escape the storms this season but Hurricane Sandy is on the way. Photos are taken just prior to the storm and survey is in the books.
2. Post storm survey reveals a new pattern of sand loss probably due to the speedy passing of the storm to the north of us rather than staying offshore like last year. Sand is lost fairly evenly over the full length of the beach not just on the north end. Loss is in the first 25' below the 9' elevation (0-0 on the survey).
3. Our beach nourishment plan has concentrated on the north end of the beach where sand loss is predominant. This storm took sand from the entire beach an average of approximately 4.5' at the 0-0 elevation out an average of 25' for the length of the beach (2200 lf). From this point seaward little change in the elevation can be detected. Additional survey points on the southern end of the beach will be added for future reference. Photos are attached.
4. The north section of the beach south through section A-A lost 2' in elevation out to 25' over a distance of 1247 lineal feet (Phase I and II of original design). This equals 1154 cubic yards of sand. The southern section of the beach from the jetty to the first breakwater, lost an average of 6' in elevation out 25' over a distance of 1082 lineal feet. This equals 3005 cubic yards of sand. This section of the beach has dunes of 12' and higher.
5. The total sand loss equals 4159 cubic yards over the entire beach. Replacement sand cost is expected to be \$12.25 per cubic yard installed (\$50,947.75).

**Town of Cape Charles
Public Beach Nourishment/Maintenance Project**

Introduction

The Town of Cape Charles is located on the Chesapeake Bay in Northampton County, Virginia. The dedicated public beach of the Town extends north-south adjacent to Bay Avenue, from Washington Avenue to Mason Avenue for a distance of approximately 2400 linear feet. The shoreline is directly exposed to the Chesapeake Bay. This beach is protected by five breakwaters totaling approximately 800 lineal feet of protection from the 25 mile fetch in the NW and SW directions.

Brief History

In recent years the Town of Cape Charles has installed groins and bulkheads (1985), and installed five breakwaters in two separate projects along with beach nourishment (2005). The 1985 project added about 300 feet of beach seaward of the bulkhead. Over 20 years this beach shifted due to wind erosion, NW storms and heavy wave action. In the four years since the construction of the breakwaters the beach has shifted again due to winds and unusual summer waves and tides. These two projects have established an excellent primary dune system along the entire beach.

The Cape Charles Public Beach is one of 19 of Virginia's Public Beach infrastructure. These public beaches provide splendid recreational opportunities and generate tourist dollars in the Commonwealth. The same beaches can protect individual landowner's property as well as state infrastructure such as roads.

Wind Rose Reference Charts

Copy of summary NOAA Wind Rose Charts is available here for reference purposes. These charts show the wind directions during months of the year and snow fence design, installation and removal is planned around these averages.

Shoreline Processes and Erosional Trends

VIMS has done extensive research on the long term result of breakwater installation. The observed long term effect is to establish a new beach line where the ratio of the distance between breakwaters is 1.65 times the distance from the breakwaters to the new beach. This has been observed in most areas of the Chesapeake Bay.

This was also the observed here in Cape Charles in the short term. During the second summer Cape Charles experienced an extended duration of NW winds and summer storms. The beach has severely eroded behind the breakwaters revealing the former groin system and threatening the breakwater. Much of the dune has been eroded away.

Studies at low tide have shown that the beach sand has moved offshore and the remaining beach is now very steep with a long shallow angle seaward. The sand used for the last beach nourishment was locally available sand and the grain size was small enough to be moved southward by the winter winds.

ATTACHMENT B – SEPTEMBER 2009

The southernmost portion of the dune has moved southward over the jetty and into the harbor carried there by the N and NW winds.

Final Design

The nourishment project is required in those years where the prevailing winds and storms move the sand and expose the groins. This movement disrupts the work of the breakwaters in establishing a more stable beach.

Regular Maintenance

The Town of Cape Charles provides regular maintenance of the beach. The maintenance is provided year around.

1. Summer Maintenance
 - a. Sand Fence design and installation for the protection of the dune and beach grass.
 - b. Installation and maintenance of the volleyball nets and area.
 - c. Beach cleaning in the bathing area.
 - d. Sign maintenance.
 - e. Beach Nourishment and/or sand relocation.
 - f. Transplanting of beach grasses is generally successful during April, May and June. Early transplanting is especially good once the grasses show new green shoots.
2. Fall Maintenance
 - a. Beach cleaning is halted for the season to allow maximum natural accumulation of sand. (September 15)
 - b. Sand fence installation for winter wind protection. (Month of October)
 - c. Review of beach fence installation. (November)
 - d. Mechanical disturbance of sand is held to emergency use only during this time of year.
 - e. Planting of beach grasses (dormant) during November is also successful.

Replacement Sand

The size and quality of sand to be added to the beach is important. The time of year for sand addition is also very important. There are oyster and clam leases all around the beach area such that the addition of sand during certain seasons turbulence should be kept to a minimum. The wind rose information is used to aid in the placement of sand fence, beach sand relocation and new sand placement.

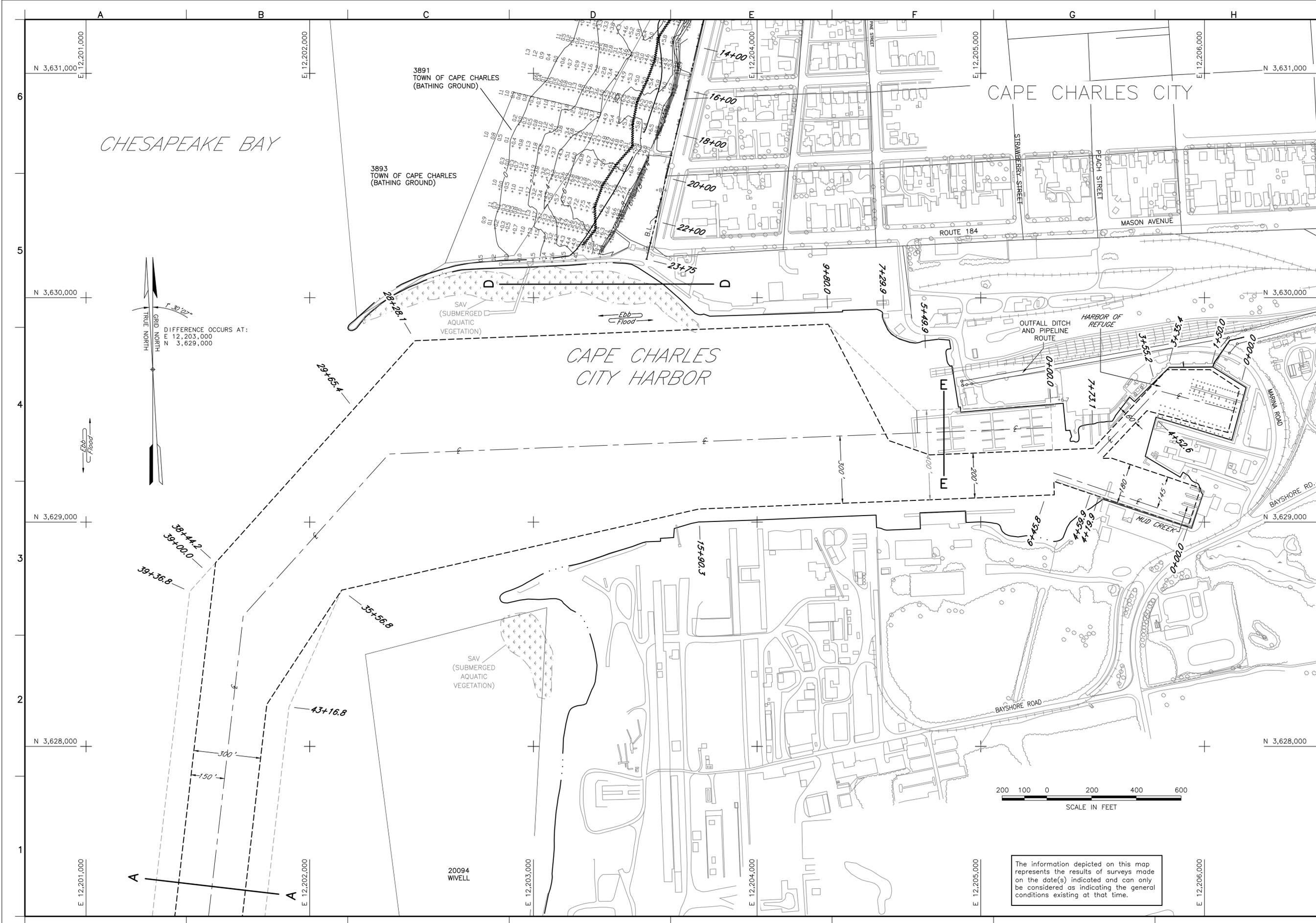
Sand grain size is important and sand above .25 is preferred. This sand is difficult to find on the Eastern Shore. The coarse sand that is available is usually mixed with some clay and is not acceptable.



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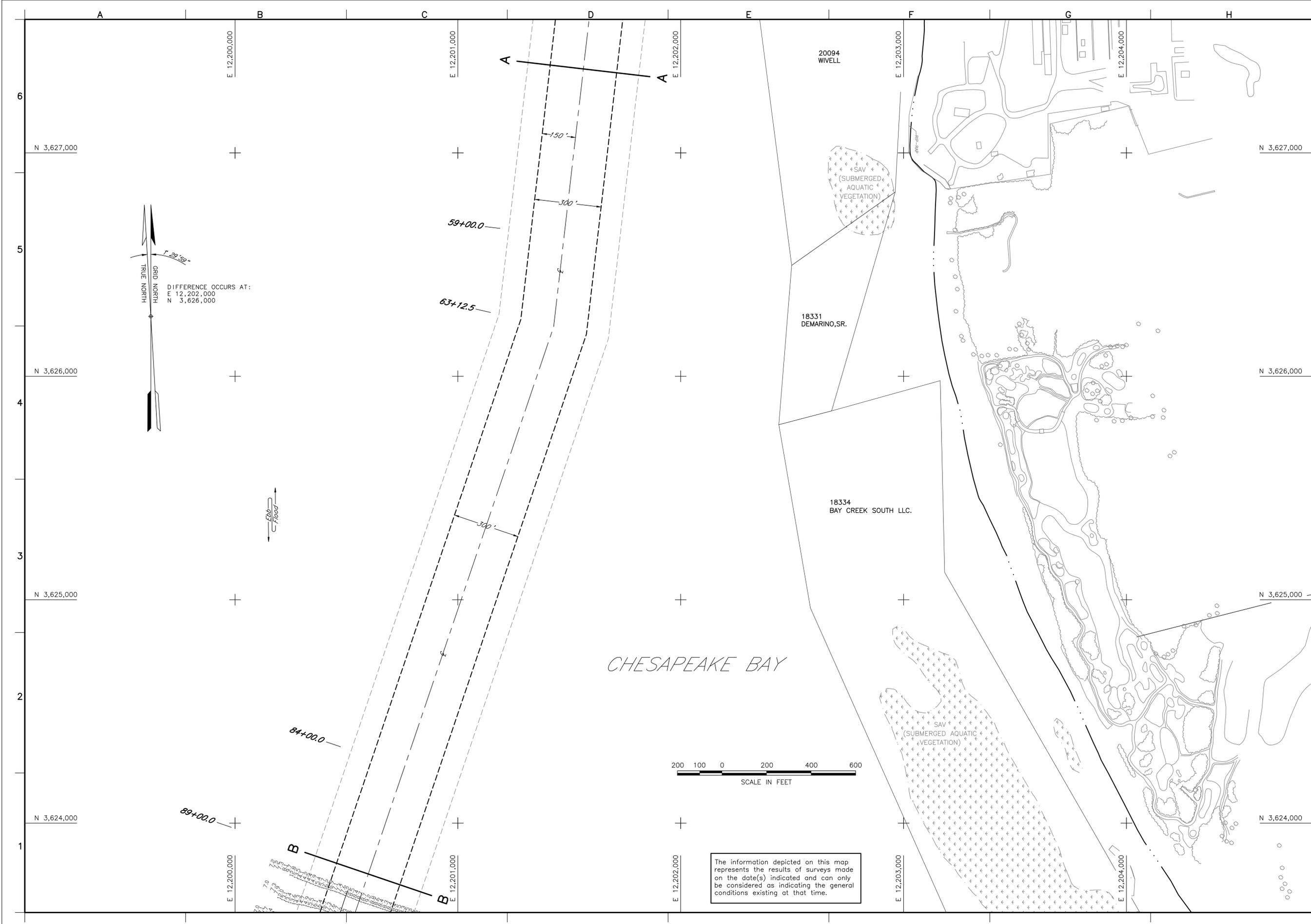
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DRAWN BY: J.K.W.	SUBMITTED BY: J.L.A.	SCALE: AS SHOWN
PROJECT NUMBER: ECH-2015-04-13.PS(2)		
DRAWING NO.:		
APPROVED BY: AMP.		

**CAPE CHARLES CITY HARBOR
PLANS FOR DREDGING
SURVEY OF APRIL 2015
CAPE CHARLES, VIRGINIA**



The information depicted on this map represents the results of surveys made on the date(s) indicated and can only be considered as indicating the general conditions existing at that time.

20094 WIVELL



GRID NORTH
 TRUE NORTH
 1° 20' 39"
 DIFFERENCE OCCURS AT:
 E 12,202,000
 N 3,626,000



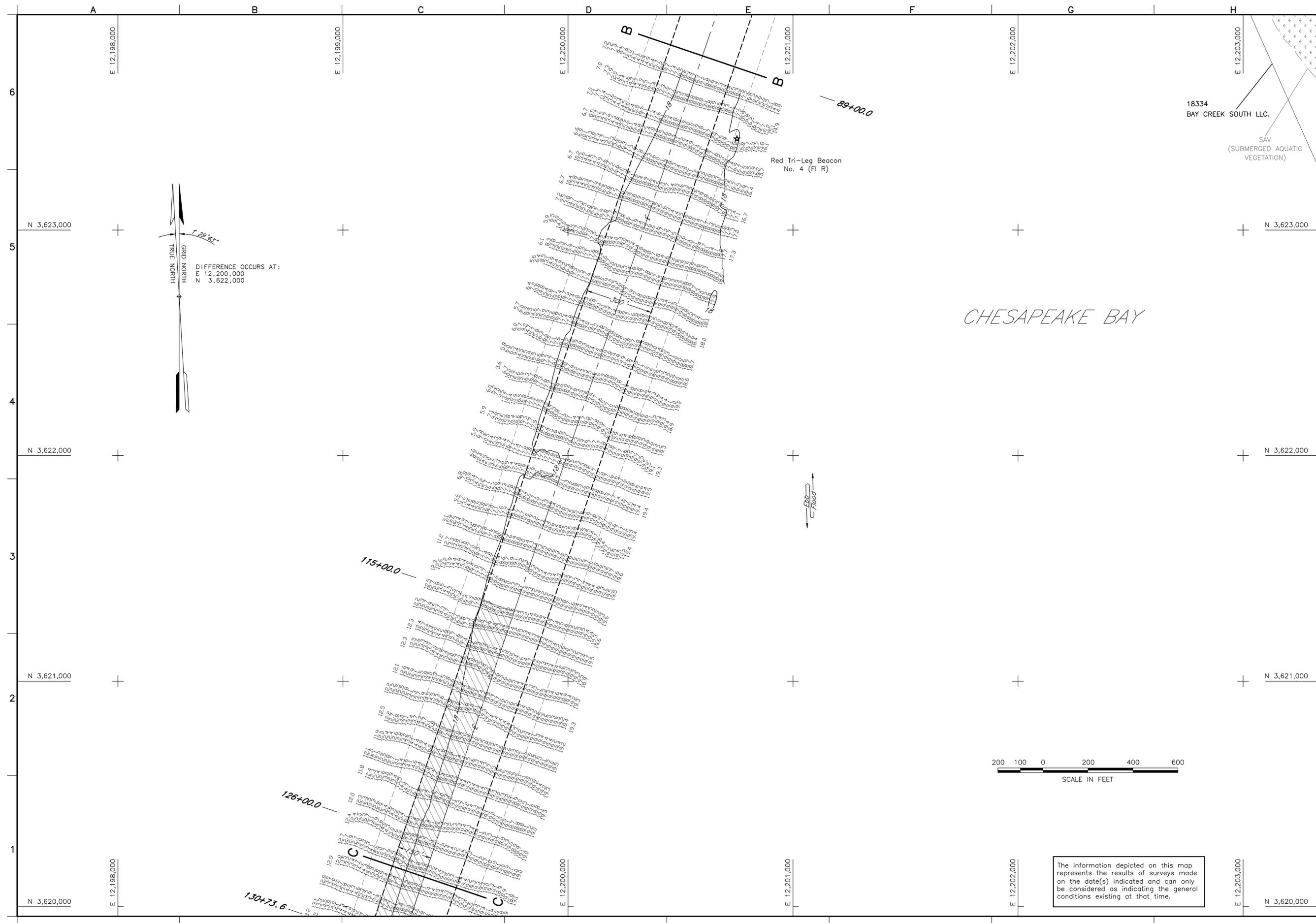
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PROJECT NUMBER: ECH-2015-04-13.PS(3)		
DRAWING NO.:		
APPROVED BY: A.M.P.		

CAPE CHARLES CITY HARBOR
PLANS FOR DREDGING
SURVEY OF APRIL 2015
CAPE CHARLES, VIRGINIA



GRID NORTH
 TRUE NORTH
 DIFFERENCE OCCURS AT:
 N 12,200,000
 N 3,622,000

CHESAPEAKE BAY



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REV.	DATE	DESCRIPTION	BY	APP.

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PROJECT NUMBER: CCH.2015-04-13.PS(4)		
DRAWING NO.:		
SUPPORTED BY: AMP.		

NORFOLK DISTRICT
 CORPS OF ENGINEERS
 NORFOLK, VIRGINIA

CAPE CHARLES CITY HARBOR
 PLANS FOR DREDGING
 SURVEY OF APRIL 2015
 CAPE CHARLES, VIRGINIA

18334
BAY CREEK SOUTH LLC.

SAV
(SUBMERGED AQUATIC
VEGETATION)

Red Tri-Leg Beacon
No. 4 (Fl R)

Sub
Flood

115+00.0

126+00.0

130+73.6

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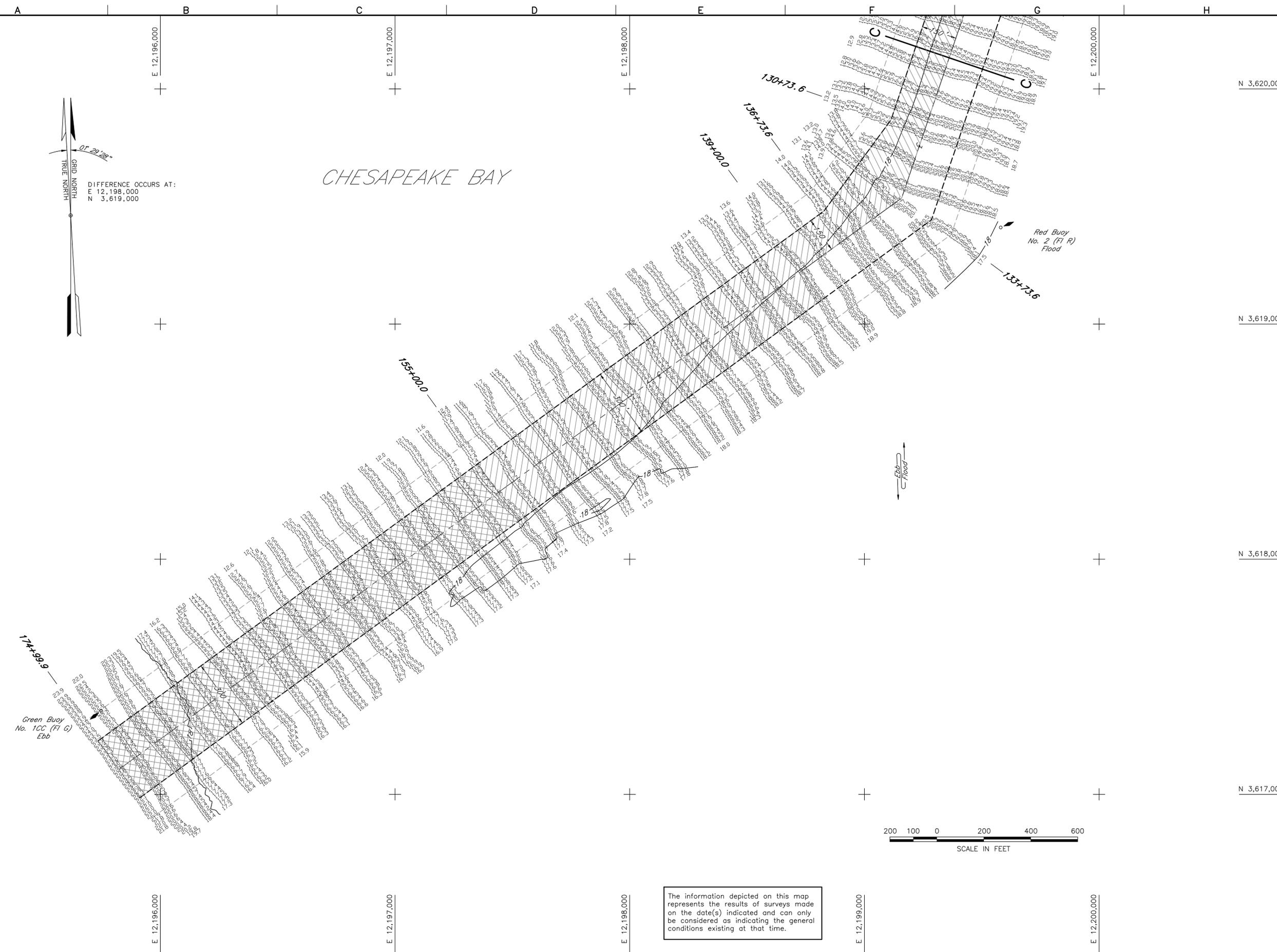
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N 3,620,000



GRID NORTH
 TRUE NORTH
 01° 23' 28"

DIFFERENCE OCCURS AT:
 E 12,198,000
 N 3,619,000

CHESAPEAKE BAY

Ebb
Flood

Red Buoy
No. 2 (Fl R)
Flood

Green Buoy
No. 1CC (Fl G)
Ebb



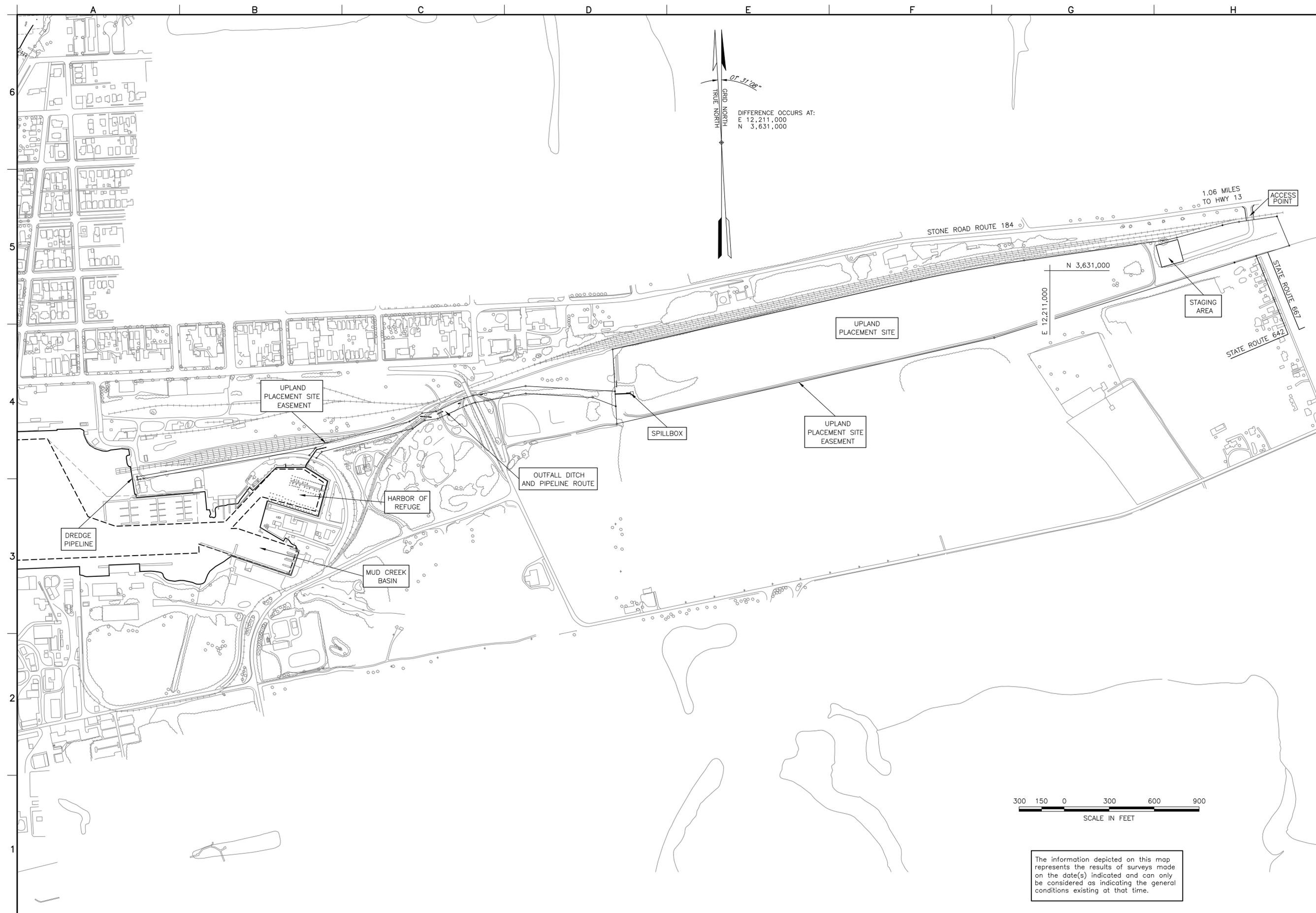
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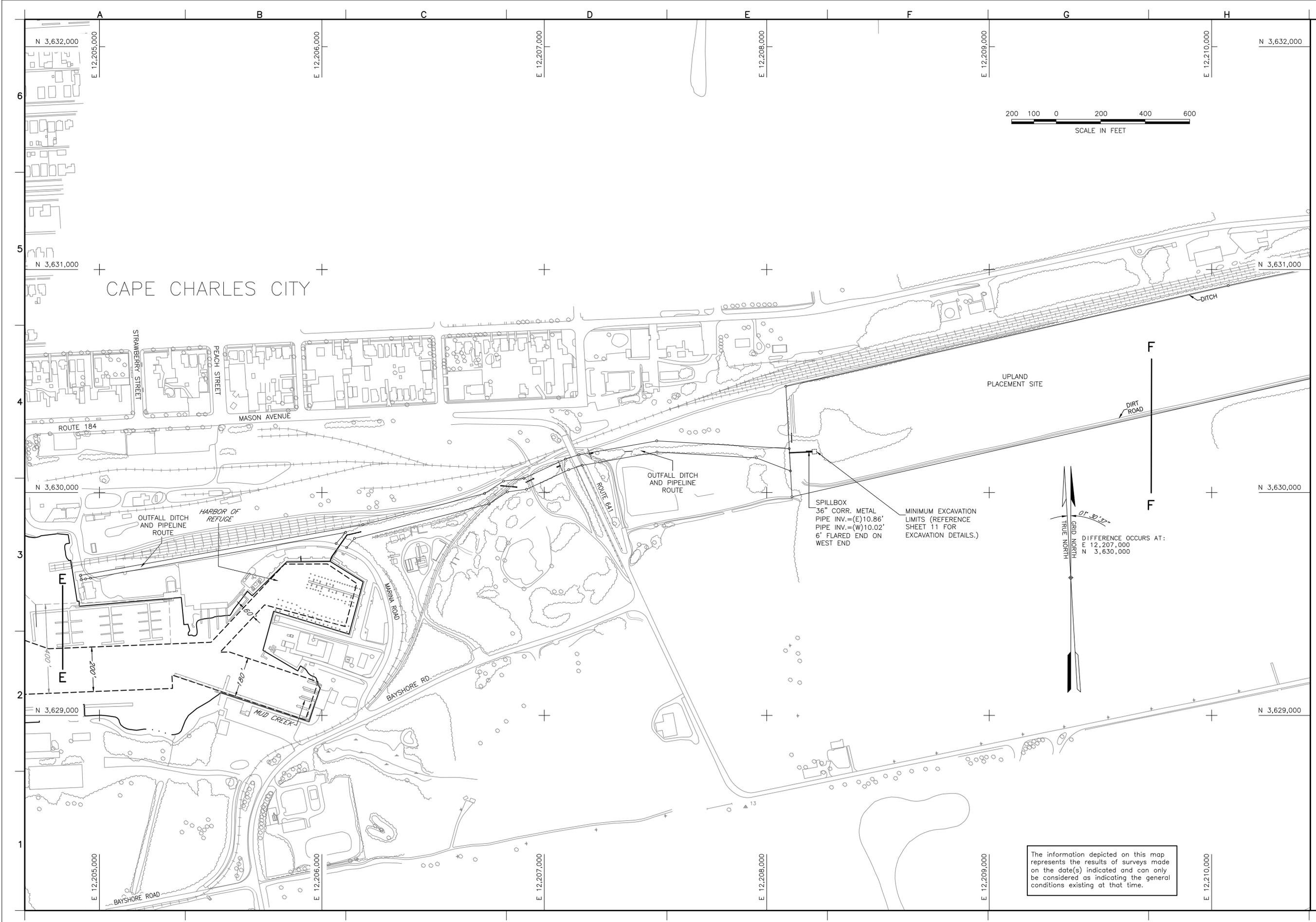
CAPE CHARLES CITY HARBOR
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DRAWING NO.:					
SUPPORTED BY:	A.M.P.				

**CAPE CHARLES CITY HARBOR
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CAPE CHARLES, VIRGINIA**



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CHECKED: D.M.L. SUBMITTED: J.L.A. DESIGNED: M.L.A. DRAWN: J.K.W. NORFOLK DISTRICT CORPS OF ENGINEERS NORFOLK, VIRGINIA	DATE: 04 FEB 16 SCALE: AS SHOWN PROJECT NUMBER: ECH-2015-04-13.PS(8) DRAWING NO.: SUPPORTED BY: AMP.
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CAPE CHARLES CITY HARBOR
 PLANS FOR DREDGING
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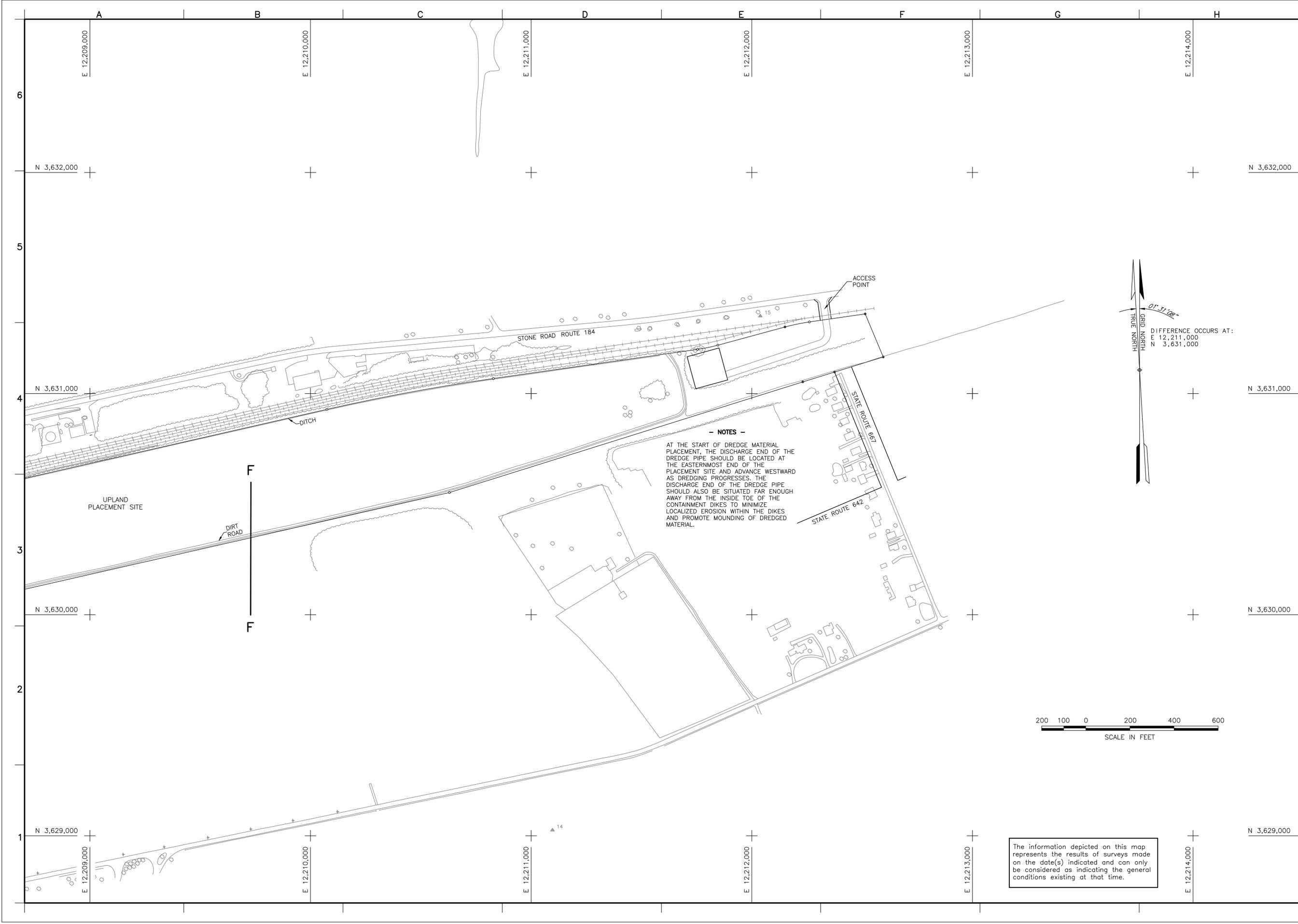
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CAPE CHARLES CITY HARBOR
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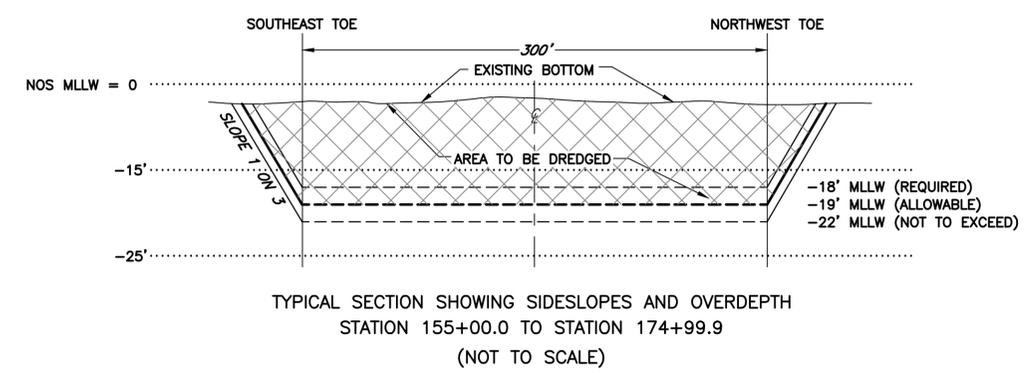
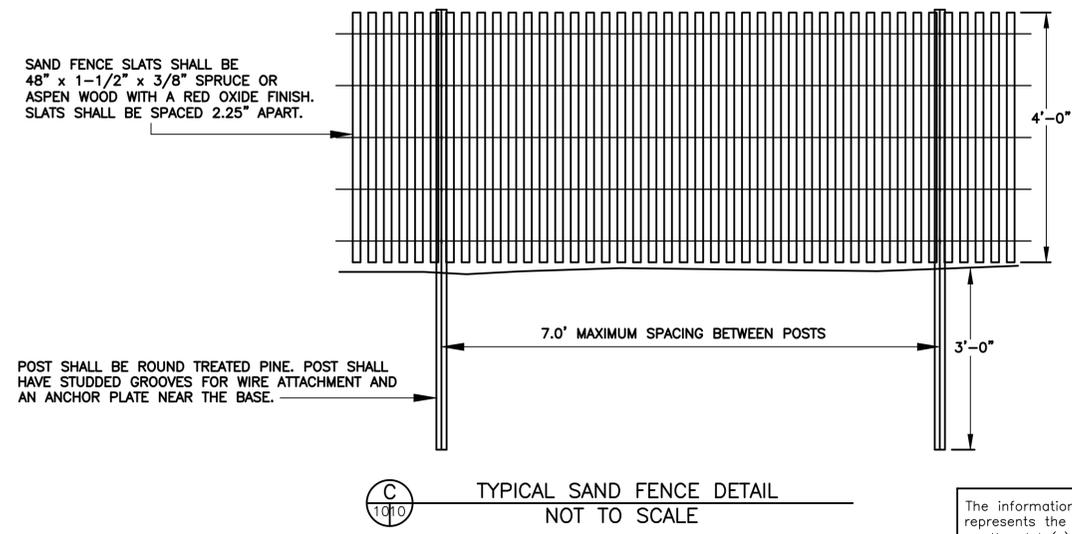
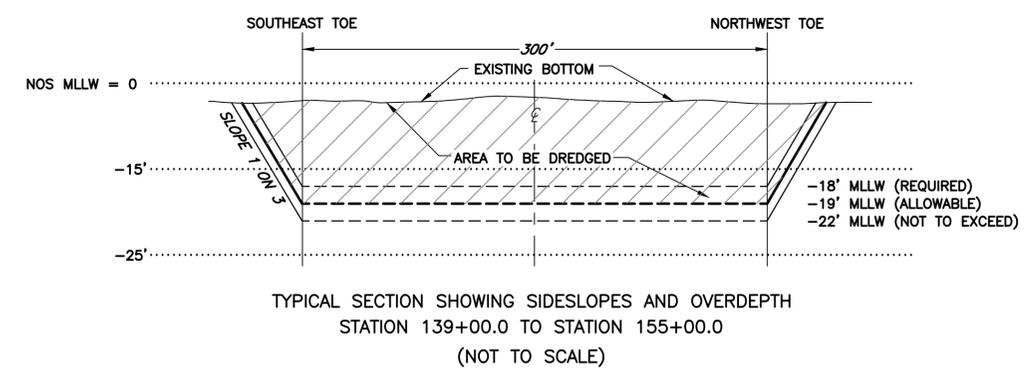
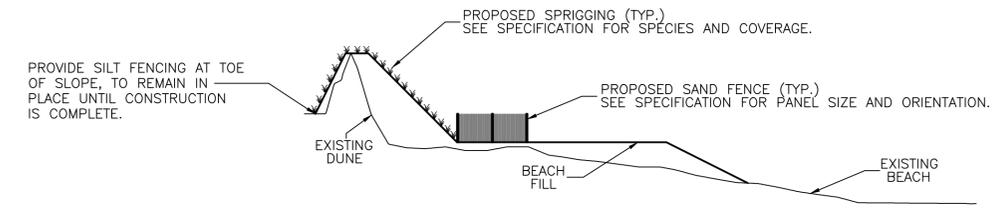
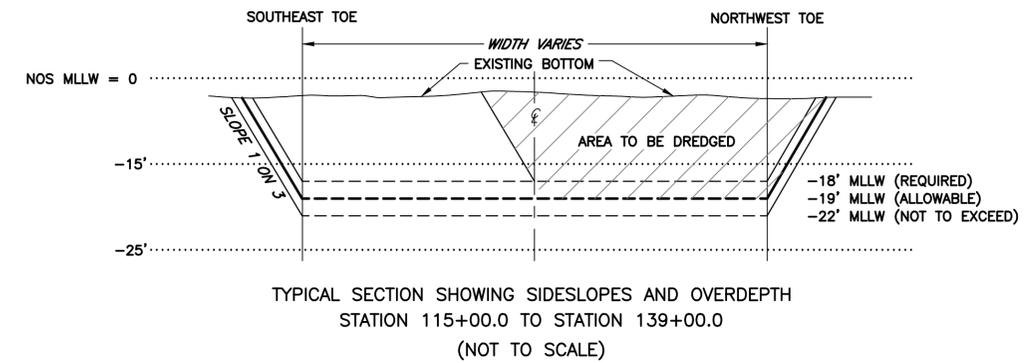
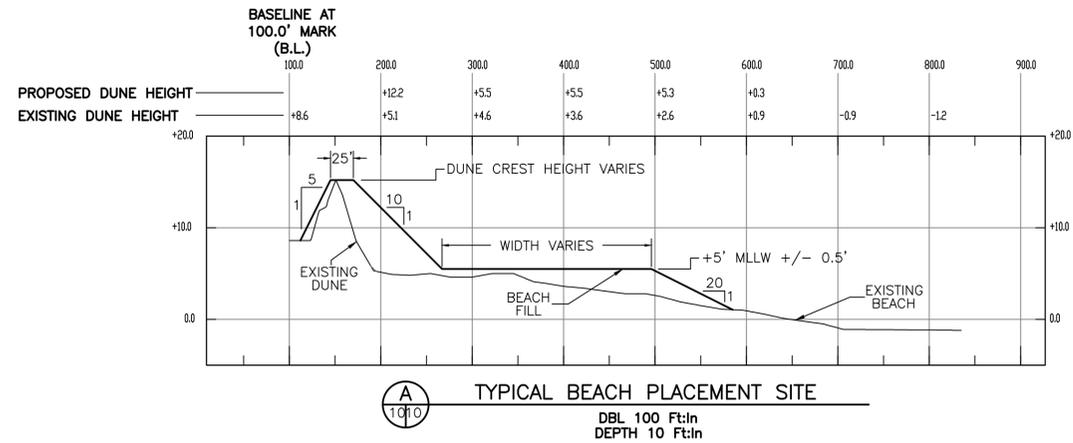
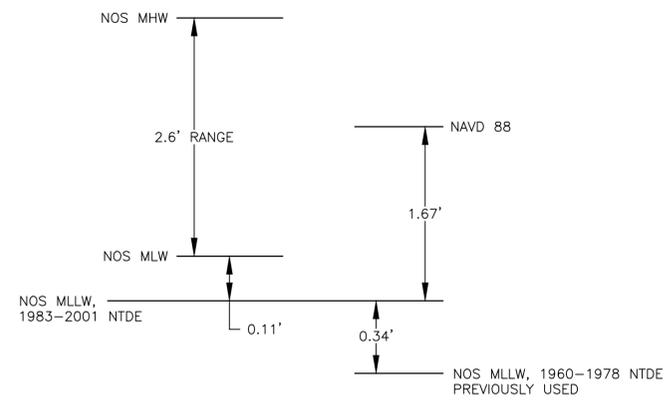


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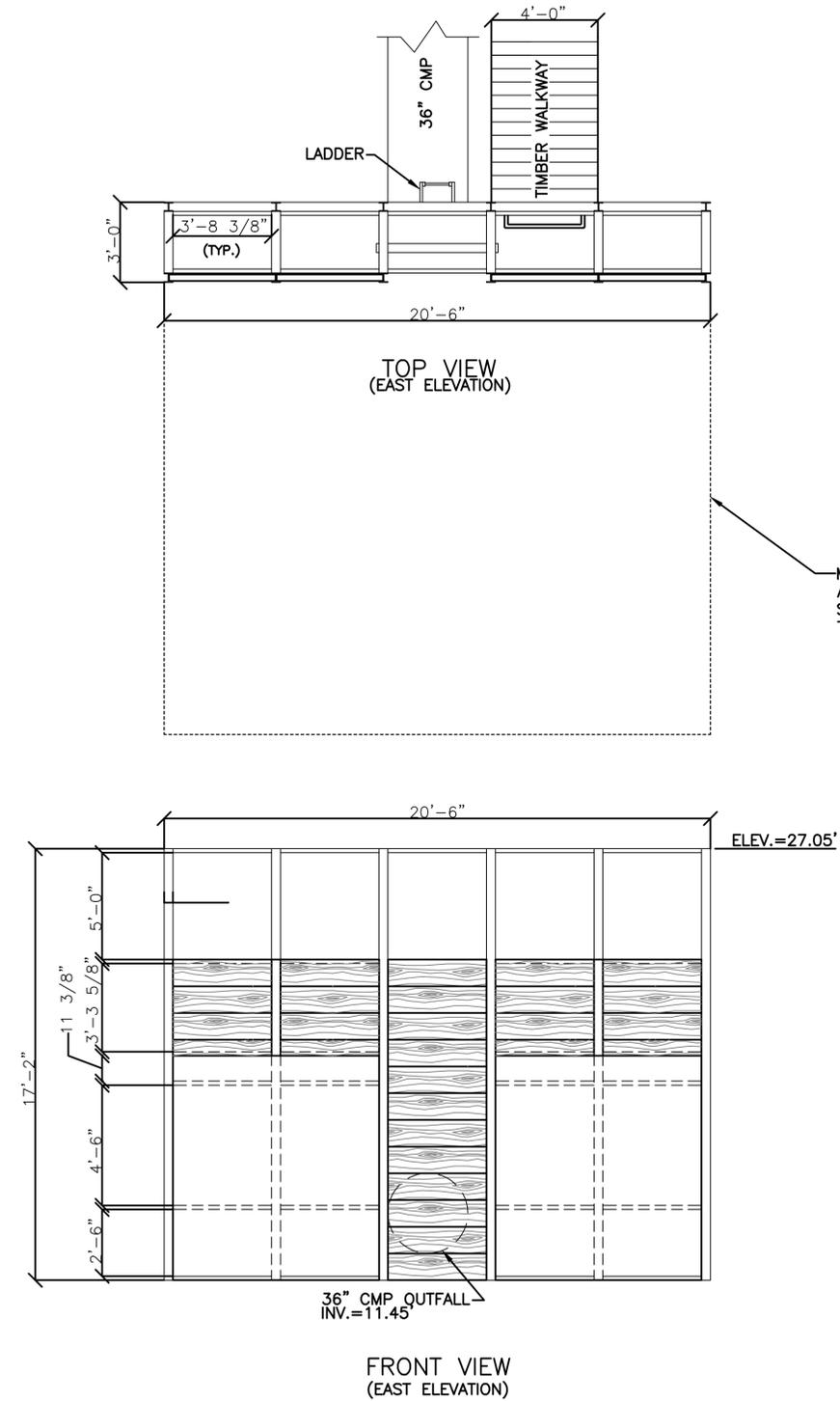
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PROJECT NUMBER: ECH2015-04-13.PS (10)		
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CAPE CHARLES CITY HARBOR
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CAPE CHARLES, VIRGINIA

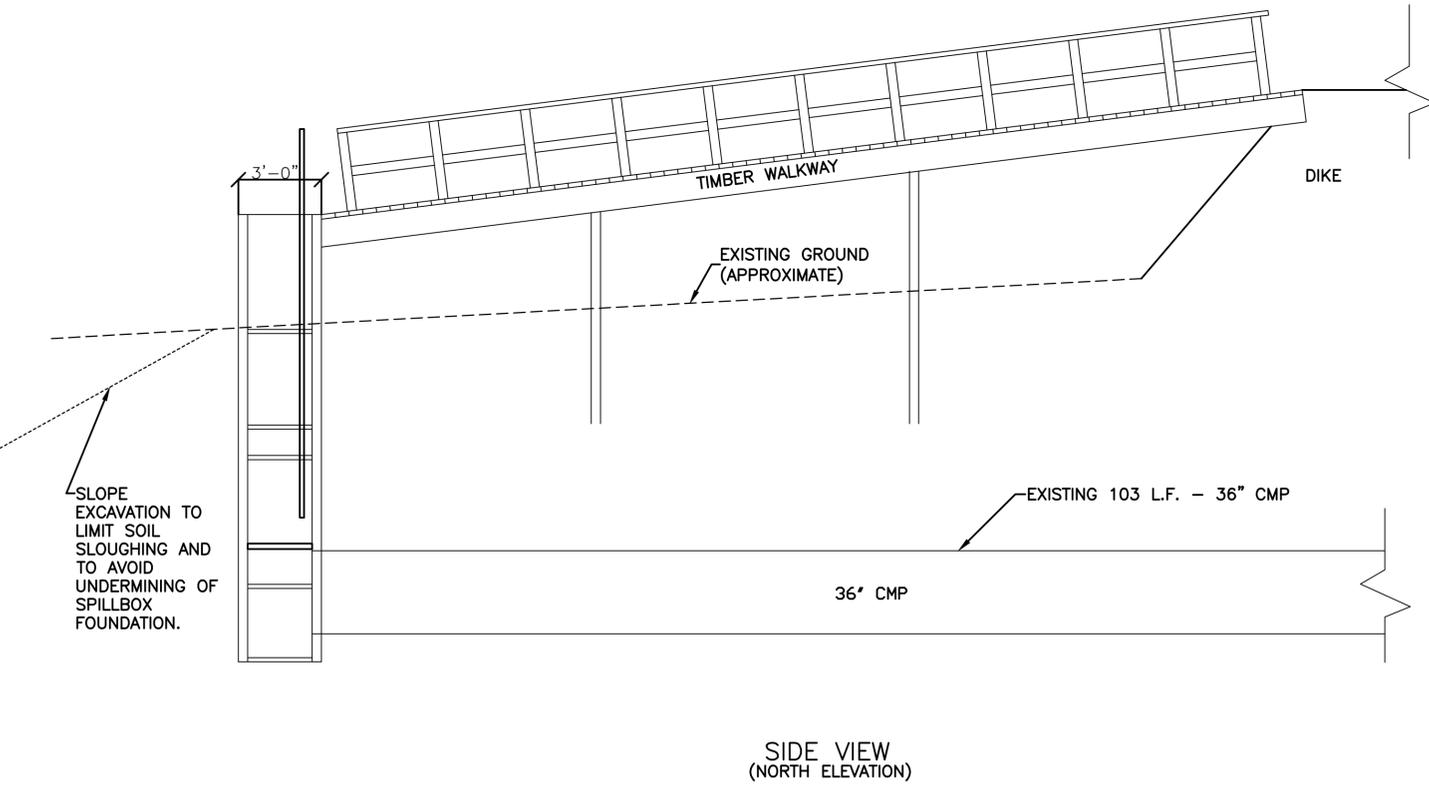
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A B C D E F G H

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MINIMUM EXCAVATION LIMITS, MAY BE EXPANDED AS NEEDED TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS FOR SPILLBOX DISCHARGE TO MEET WATER QUALITY STANDARDS.



D
11/11 SPILLBOX
NOT TO SCALE

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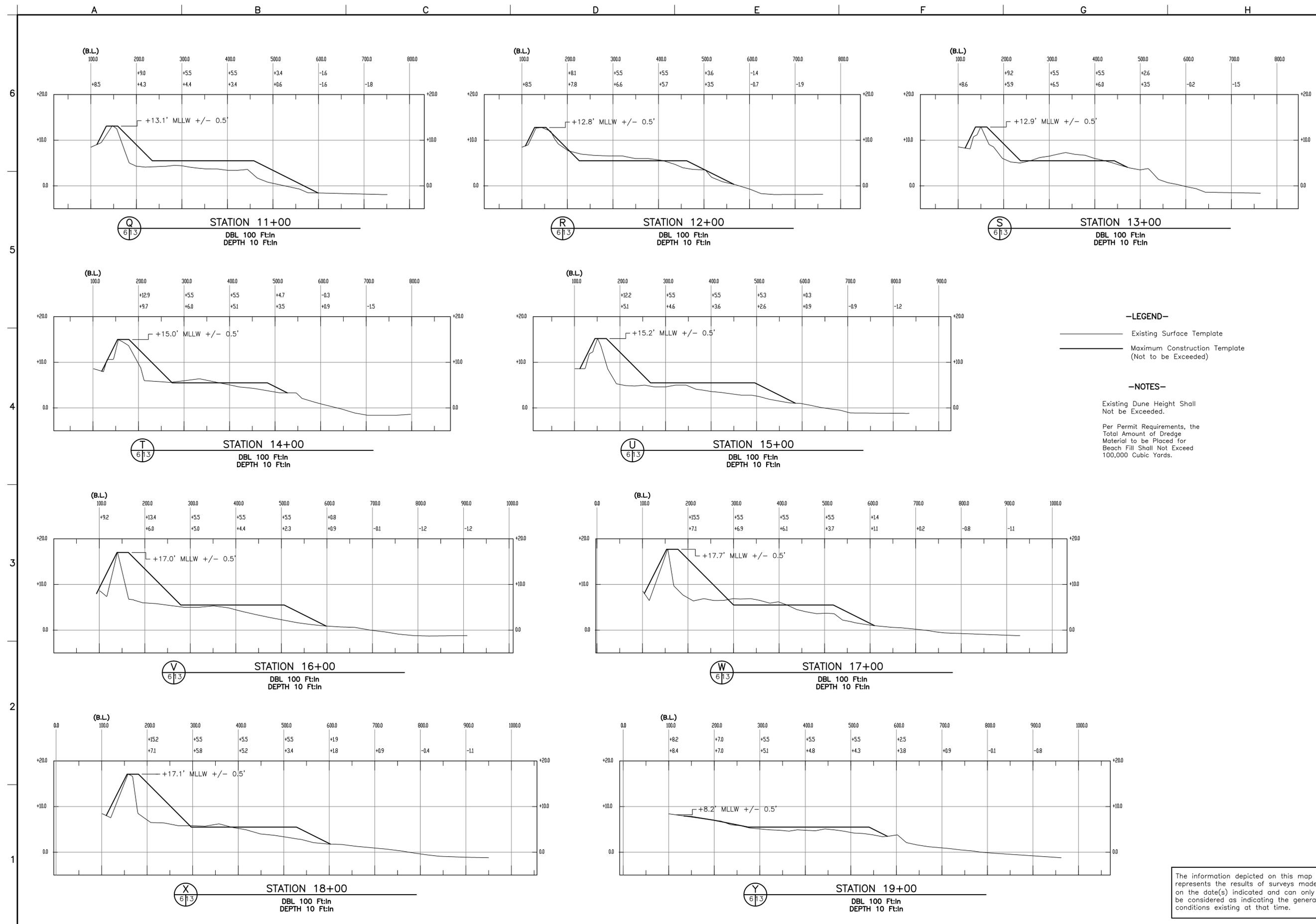
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CAPE CHARLES CITY HARBOR
PLANS FOR DREDGING
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CAPE CHARLES, VIRGINIA



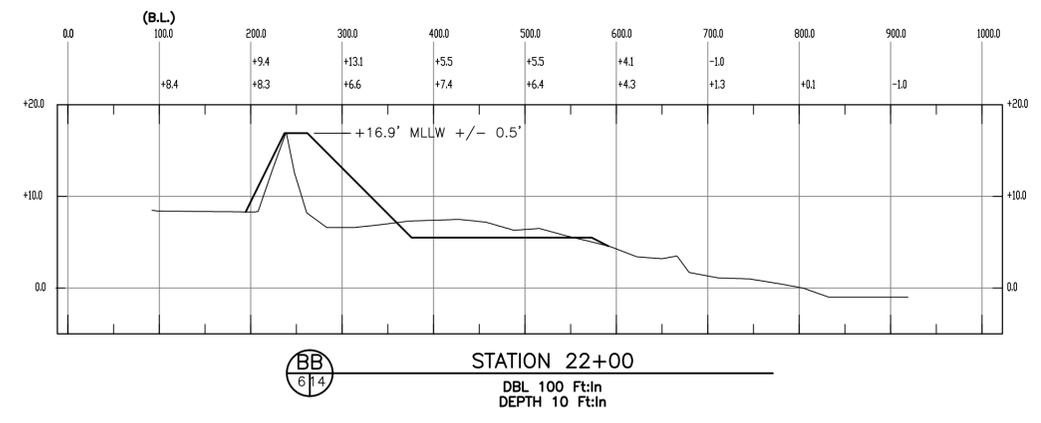
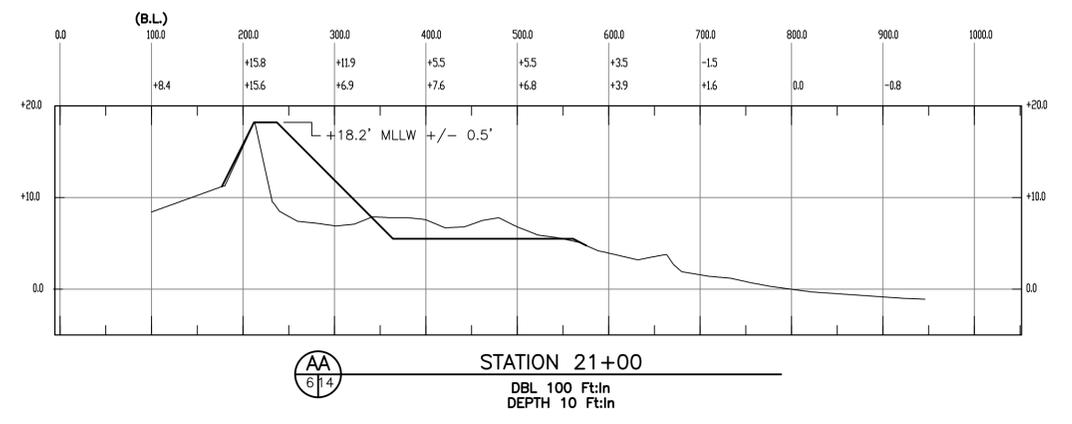
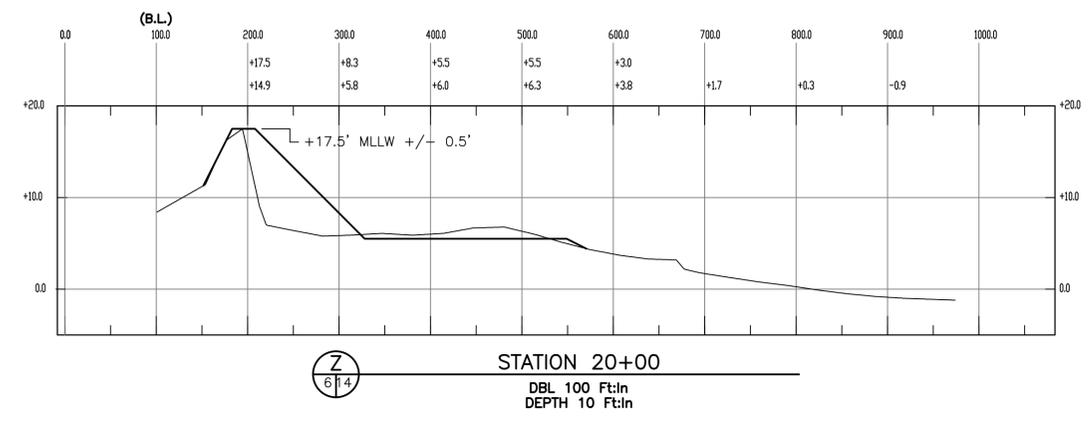
The information depicted on this map represents the results of surveys made on the date(s) indicated and can only be considered as indicating the general conditions existing at that time.



REV.	DATE	DESCRIPTION	BY	APP.

DESIGNED: M.L.A.	CHECKED: D.M.L.	DATE: 04 FEB 16
DRAWN: J.K.W.	SUBMITTED: J.L.A.	SCALE: AS SHOWN
PROJECT NUMBER: ECH2015-04-13.PS(14)		
DRAWN BY: AMP		

CAPE CHARLES CITY HARBOR
 PLANS FOR DREDGING
 SURVEY OF APRIL 2015
 CAPE CHARLES, VIRGINIA



-LEGEND-

- Existing Surface Template
- Maximum Construction Template (Not to be Exceeded)

-NOTES-

Existing Dune Height Shall Not be Exceeded.

Per Permit Requirements, the Total Amount of Dredge Material to be Placed for Beach Fill Shall Not Exceed 100,000 Cubic Yards.

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satisfaction of the Contracting Officer will result in payment of actual mobilization costs, as determined by the Contracting Officer, at the completion of mobilization, and actual demobilization costs, as determined by the Contracting Officer, at the completion of demobilization. The determination of the Contracting Officer is not subject to appeal.

1.4.1.1 Mobilization

Mobilization shall include all costs for operations accomplished prior to commencement of actual construction operations. This shall include as a minimum the following:

- a. Transportation of personnel, equipment, and materials to the job site.
- b. Any required labor and materials to set up working operations (i.e. administrative, electricity, telephone, lay down area preparations, etc.)
- c. Construction of access to construction area.
- d. All costs for any other associated work that is necessary in advance of the actual project.

1.4.1.2 Demobilization

Demobilization shall include general preparation for closeout of project including, but not limited to Transportation of personnel, equipment, and materials from the job site, decommissioning of temporary facilities, etc.

1.4.2 Payment Item No. 0004 SAND FENCE AND DUNE SPRIGGING CAPE AMERICAN BEACH GRASS, COMPLETE, INCLUDING ALL ASSOCIATED WORK AS SHOWN ON THE DRAWINGS AND SPECIFIED.

This item shall be all inclusive of work performed to establish the stand of Cape American Beach Grass and install the sand fence as specified and on the plans. The Contractor shall provide a warranty for the planted vegetation as noted in Section 32 92 26 "Sprigging".

1.5 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

SECTION 32 32 23

SAND FENCE
09/15

PART 1 GENERAL

1.1 SCOPE

The work covered by this section consists of furnishing all plant, labor, equipment, and materials, and performing all operations in connection with the installation of the sand fence in accordance with these specifications, as shown on the drawings or as directed by the Contracting Officer.

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 and represent the latest edition in force when this contract is awarded.

Federal Specifications (Fed. Spec.)

FF-N-105B Nails, Brads, Staples and Spikes: Wire, Cut and Wrought

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA C2 (2003) Lumber, Timber, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes

AWPA M6 (1996) Brands Used on Forest Products

AWPA P5 (2005) Standard for Waterborne Preservatives

ASTM INTERNATIONAL (ASTM)

ASTM A 641/A 641M (2009a) Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire

ASTM A 307 (2007b) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

ASTM F 537 Design, Fabrication, and Installation of Fences Constructed of Wood and Related Materials

1.3 SUBMITTALS

Government approval is required for submittals marked 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-02 Drawings

Fencing Details, G

Drawings shall show fencing details; post and post setting details; details of attachment of fencing to support members; splicing details; and any other details required to erect the fence along the lines and grades indicated. The Contractor may salvage sand fencing from the proposed placement area to the extent practicable, however, responsible for installing sand fencing per plans and specifications.

PART 2 PRODUCTS

2.1 MATERIALS

Materials shall conform to the following requirements.

2.1.1 Wire-Bound Picket Fencing

ASTM F 537, Type III. Fencing shall be fabricated with 2.25-inch maximum spacing between pickets. Wire shall be zinc-coated having a maximum coated diameter of 0.099 inches and a minimum coating of 0.30 ounces per square foot in accordance with ASTM A 641/A 641M, Class 1 coating. The pickets shall be 48-inches in length and made of spruce or aspen wood with red oxide finish, air dried and rough sawn.

2.2 FENCE POSTS

2.2.1 Solid Sawn

Provide solid sawn timber posts 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. Posts shall be Grade No. 1 SR minimum, surfaced on four (S4S) sides.

2.2.2 Preservative Treatment

Fabricate posts before preservative treatment. Each treated post shall be branded, by the producer, in accordance with AWPA M6. Treatment shall be in accordance with AWPA C2 (For Above Ground, Soil Contact or Fresh Water Use) with water-borne preservative (AWPA P5) to a final net retention of not less than 0.24 per cubic foot of wood MCA- Micronized Copper Azole. The Contractor shall be responsible for the quality of treated wood products.

2.3 Fastenings

FF-N-105B. Staples shall be Type III, Style 3 having a minimum length of 1 1/2 inches and stainless steel conforming to ASTM A 307.

PART 3 EXECUTION

3.1 INSTALLATION

All sand fence shall be installed within an acceptance reach, as defined in paragraph "Final Acceptance of the Beach/Dune Fill Placement Area" of SECTION 35 20 24 BEACHFILL, no later than 10 days following approval of final surveys for an acceptance reach that allows for continuous fence installation as the beachfill operations progress. Fence installation shall be in accordance with the fence manufacturer's written installation instructions except as modified herein.

3.2 POSTS

Posts shall be driven plumb, in proper alignment, spaced equidistant between changes in alignment at intervals not exceeding 7 feet, and placed so that the top of the post is even with the top of the pickets.

3.3 FENCING

Fencing shall be installed on the waterward side of the posts. Fencing shall be stretched to the proper tension and securely fastened to the posts so that the bottom of the pickets are set even with the finished grade. Five wire fasteners shall fasten the fence to the post. Individual sections of sand fencing shall be 10' in length placed at a 45 degree angle to the shoreline facing the predominate wind direction and spaced 7 feet apart (parallel to each other) as shown on the drawings. Sand Fencing shall be placed in accordance to the locations shown on the drawings.

3.4 MEASUREMENT AND PAYMENT

3.4.1 General

Measurement and payment shall be in accordance with Section 01 22 00, MEASUREMENT AND PAYMENT.

-- End of Section --

SECTION 32 92 26

SPRIGGING
09/15

PART 1 GENERAL

1.1 DESCRIPTION

The work covered by this section consists of furnishing all labor, materials, equipment and incidentals required to complete the dune planting in strict accordance with the Specifications and applicable drawings. Dune restoration (except to the extent necessary for access purposes) is not in this Contract

1.2 SUBMITTALS

Government approval is required for submittals marked 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-03 Product Data**Chemical Treatment Material**

Manufacturer's literature, including physical characteristics, application and installation instructions for equipment and chemical treatment material.

Equipment; G

A listing of equipment to be used for the sprigging operation.

Delivery; G

Delivery schedule.

Finished Grade;

Finished grade status.

Quantity Check; G

Bag count or bulk weight measurements of material used compared with area covered to determine the application rate and quantity installed. The quantity of sprigs used shall be compared against the total area installed.

Sprig Establishment Period;

Calendar time period for the sprig establishment period. When there is more than 1 sprig establishment period, the boundaries of

the sprigged area covered for each period shall be described.

Maintenance Record; G

Submit written reports of each site visit describing maintenance work performed, area repaired or reinstalled, diagnosis for unsatisfactory stand of grass plants.

SD-04 Samples

Soil Amendments; G

A 10 pound sample.

SD-06 Test Reports

Equipment Calibration; G

Certification of calibration tests conducted on the equipment used in the sprigging operation.

SD-07 Certificates

Sprigs; G

Fertilizer; G

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

- a. Sprigs. Cultivar name, genetic purity and field location.
- b. Fertilizer. Chemical analysis and composition percent.

Sprigging Warranty

SD-11 Closeout Submittals

Sprig Establishment Report; G

Submit a written report stating that the area requirements for the vegetation's success has been met.

1.3 SOURCE INSPECTION

The sources of sprig material shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.4.1.1 Sprigs

Sprigs shall be protected during delivery to prevent desiccation, internal

heat buildup, or contamination.

1.4.1.2 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.4.2 Inspection

Sprigs shall be inspected upon arrival at the jobsite for conformity to cultivar and genetic purity. Sprigs shall have attached roots with 2 to 3 nodes and shall be 18 inches in length, with no adhering soil, weed stems, or roots. Sprigs that have been exposed to heat or excessive drying shall be rejected. The following shall be rejected: open soil amendment containers or wet soil amendments. Unacceptable materials shall be removed from the job site.

1.4.3 Storage

1.4.3.1 Sprigs

Sprigs shall be stored in designated areas and covered with moist burlap, straw, or other covering. Covering shall allow air to circulate preventing internal heat from building up. Sprigs shall be protected from exposure to wind, and direct sunlight until installed.

1.4.3.2 Other Material Storage

Materials shall be stored in designated areas. Fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with plant material or other materials.

1.4.4 Handling

Sprigs shall not be damaged during handling. Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

1.5 EXPERIENCE

The subcontractor shall provide evidence of at least three (3) successful planting projects during the past six (6) years in the Mid-Atlantic States, preferably in a marine environment.

PART 2 PRODUCTS

2.1 SPRIGS

2.1.1 Sprig Cultivar

The cultivar of "Cape" American Beach Grass (*Ammophila breviligulata*) shall be healthy living stems, stolons, or rhizomes. Each bare root plant shall be of recent origin and shall have 1 to 3 culms (stem) and shall be a minimum of 18 inches in height.

2.1.2 Quality

Sprigs shall be grown under climatic conditions similar to those in the locality of the project. Sprigs shall have no adhering soil, weed stems, or roots. Sprigs shall be obtained from heavy and dense sod, and shall be free from material detrimental to a healthy stand of grass plants. Sprigs that have been exposed to heat or excessive drying shall be rejected.

2.2 SUBSTITUTIONS

Substitutions will not be allowed without written request and approval from the Contracting Officer.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of fertilizer meeting the following requirements. Vermiculite shall not be used.

2.3.1 Fertilizer

The nutrients ratio shall be 19 percent nitrogen, 6 percent phosphorus, and 12 percent potassium. Fertilizer shall be controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio. The fertilizer shall be derived from sulphur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

PART 3 EXECUTION

3.1 INSTALLING SPRIGS TIME AND CONDITIONS

3.1.1 Sprigging Conditions

Sprigging operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the sprigging operations, proposed alternate times shall be submitted for approval.

3.1.2 Equipment Calibration

Immediately prior to the commencement of sprigging operations, calibration tests shall be conducted on the [equipment](#) to be used. These tests shall confirm that the equipment is operating within the manufacturer's specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation. Provide the calibration test results within 1 week of testing.

3.2 PLANT SITE PREPARATION

3.2.1 Finished Grade

Prior to the commencement of sprigging operation, the Contractor shall verify that finished grades are as indicated on drawings, and the smooth grading and compaction requirements have been completed in accordance with Section 35 20 24 BEACH FILL. Placement of sprigs shall not commence until restoration of the dune system has been approved by the Contracting Officer.

3.2.2 Existing Sprigs

The contractor shall protect and maintain, from damage, all existing sprigs.

3.2.3 Application of Soil Amendments

3.2.3.1 Applying Fertilizer

Immediately before planting holes, furrows or trenches - approximately 8 inches deep shall be cut approximately parallel to the shoreline at 1.5 feet spacing. Upon completion of digging holes, furrows or trenches, the fertilizer shall be applied in the hole, furrow, or trench at an application of 1 ounce per plant site. The fertilizer shall be worked into the soil immediately surrounding the plant site before plants are placed in the hole, furrow, or trench.

3.3 PLANT INSTALLATION

Prior to installing sprigs, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph PLANT SITE PREPARATION. Areas shall be sprigged as indicated.

3.3.1 Installing Sprigs

The sprigging method shall be Row Sprigging. Sprigging procedure shall ensure even coverage. The bare root plants shall be planted so that each plant site has a minimum of two 2 healthy culms or stems. As a result of this requirement, more than one plant may be needed at each plant site, depending upon the number of culms or stems on each plant.

3.3.1.1 Row Sprigging

Sprigs shall be planted in rows spaced a maximum of 18 inches apart and to a minimum 8 inches depth, with mechanical sprig planter or other methods. Sprigs shall be placed in the rows a maximum 18 inches distance apart.

3.4 QUANTITY CHECK

For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of the material used shall be compared with the total area covered to determine the rate of application used. The quantity of sprigs used shall be compared against the total area established with sprigs. Differences between the quantity applied and the quantity specified shall be adjusted as directed.

3.5 RESTORATION AND CLEAN UP

3.5.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the sprigging operation shall be restored to original condition at Contractor's expense.

3.5.2 Clean Up

Excess and waste material shall be removed from the sprigged areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

3.6 SPRIG ESTABLISHMENT PERIOD

3.6.1 Commencement

The sprig establishment period to obtain a healthy stand of grass plants shall begin on the first day of work under this contract and shall end 1 year after the last day of sprigging operations. Written calendar time period shall be furnished for the sprig establishment period. When there is more than 1 sprig establishment period, the boundaries of the sprigged area covered for each period shall be described. The sprig establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

3.6.2 Sprigging Warranty

The Contractor shall submit a one-year warranty for the sustainment of established sprigging. The warranty shall be submitted as "[Sprigging Warranty](#)" and shall be approved by the Government. The warranty shall warrant that the contract requirements relating to sprig survival shall be enforced for one year after initial sprigging has occurred.

3.6.3 Satisfactory Stand of Grass Plants

Grass plants shall be evaluated for cultivar and health after the Sprig Establishment Period. A satisfactory stand of grass plants from the sprigging operation shall be a minimum acceptable density of surviving 85 percent of area planted.

3.6.3.1 [Sprig Establishment Report](#)

The Contractor shall provide a written sprig establishment report with photographs detailing the percent of cover, species diversity, percent of exotic vegetation, survival rate of planted vegetation, natural vegetation recruitment and plant vigor as measured by evidence of reproduction.

3.6.4 Maintenance During Establishment Period

Maintenance of the sprigged areas shall include eradicating weeds, insects, and diseases; protecting embankments from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic; and post-fertilization.

3.6.4.1 Post-Fertilization

A maximum [1/2 pound per 1000 square feet](#) of actual available nitrogen shall be provided to the grass plants. The application shall be made without burning the installed grass plants.

3.6.4.2 Repair

Unsatisfactory stand of grass plants shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with paragraph SITE PREPARATION.

3.6.4.3 Maintenance Record

A written report of each site visit shall be furnished describing the maintenance work performed; areas repaired or reinstalled; and diagnosis for unsatisfactory stand of grass plants.

3.7 MEASUREMENT AND PAYMENT

3.7.1 General

Measurement and payment shall be in accordance with Section 01 22 00, MEASUREMENT AND PAYMENT.

-- End of Section --