

SCOPE OF WORK

NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON

COOPERATIVE AGREEMENT

FOR CEDAR POINT SHORELINE STABILIZATION – SUBREACH 2 & 1

AT NAVAL AIR STATION PATUXENT RIVER – PATUXENT RIVER, MARYLAND

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1. BACKGROUND

The Naval Air Station Patuxent River (NAS PAX) occupies a 6,781-acre site on the western shore of the Chesapeake Bay at Patuxent River, in St. Mary's County, Maryland.

For this Cooperative Agreement, the NAS PAX shoreline is broken into subreaches, or phases. Subreach 1 shoreline begins west of Cedar Point southward for about 5,200 feet to the entrance of Goose Creek. Subreach 2 extends from the entrance of Goose Creek south for about 5,200 feet or to about where the existing beach ends against the old wood bulkhead.

PAX is located along the southeast shore overlooking the Chesapeake Bay, and is bounded by Cedar Point Road to the east, the Goose Creek Bridge to the south, Chesapeake Bay to the west and Goose Creek Campground to the north. Various buildings, roadways, and utilities are located in close proximity to the edge of the shore. Some rock has been placed in front of the existing wood bulkhead for support.

The project will implement 800 linear feet of shoreline stabilization within the Subreach 2 design extending the recent shoreline stabilization at the southern mouth of Goose Creek (Appendix 2). Prior to completion of construction, the Navy may, at its option pursue the implementation of an additional 3,407 linear feet of revetment adjacent to the revetment included within this Agreement. In addition, prior to completion of construction, the Navy may, at its option pursue the implementation of an additional 1,335 linear feet of breakwater within Subreach 1, adjacent to the revetment included within this Agreement.

If not implemented, the impacts to the mission of NAS PAX include further degradation of soils that could lead to stabilization impacts to surrounding structures, the potential for a large block failure resulting in damage to buildings, and possible loss of land. This effort supports the requirement of the Sikes Act and the Naval Air Station Patuxent River Integrated Natural Resources Management Plan (INRMP) to mitigate soil erosion. INRMPs offer a coordinated approach for incorporating ecosystem management efforts into the management of natural resources at DoD installations.

- a. Objective. The purpose of the Cooperative Agreement is to construct shoreline stabilization measures as provided in the existing design (Appendix 2) to provide stone revetment to restore the shoreline along the eastern shoreline of NAS PAX. These measures could include installing erosion control measures, debris removal and reworking existing broken concrete. Specifically, the work shall construct the Navy-approved and permitted final design for shoreline restoration (Appendix 2). In addition, the Cooperator shall maintain the necessary Federal and State permits with the U.S. Fish and Wildlife Services (U.S. FWS), Maryland State Historic Preservation Office (MD SHPO) and all other required regulatory agencies to facilitate the repair to the shoreline at NAS Patuxent River. All coordination with regulatory agencies must be coordinated through the technical point of contact (TPOC).

- b. Environmental Setting. The main shoreline that requires restoration is south of the mouth of Goose Creek (as shown in the provided design drawings) and is approximately 800 LF. Several Puritan tiger beetle (*Cicindela puritan*) colonies occur in the vicinity of the NAS Patuxent River; however, there are no Puritan tiger beetle colonies known to occur within the installation (environmental assessment (EA) attached). There are no known active Munitions Response Sites within the project area. Munitions and Explosives of Concern (MECs) have not been found and are not expected at these sites. However, if seen, the contractor should follow the three Rs: Recognize, Retreat, and Report.

A SITE VISIT BEFORE PROPOSAL SUBMISSION IS STRONGLY ENCOURAGED. The pre-award site visit will provide the opportunity to evaluate jobsite conditions, and to obtain clarification of project requirements.

2. POINTS OF CONTACT

Prior to agreement award, inquiries regarding the negotiation and other aspects of the project should be directed to the Contract Specialist. After agreement award, technical and contract inquiries shall be directed to the Technical Point of Contact.

Contract Specialist

TBD

NAVFAC Washington
1314 Harwood Street, SE Bldg. 212
Washington Navy Yard, DC 20374
Telephone: (202) 685-3306
Email: XXXXXX@navy.mil

Technical Point of Contact (TPOC)

Ms. Heather Huddle
NAVFAC Washington
1314 Harwood Street, SE Bldg. 212
Washington Navy Yard
Washington, D.C. 20374
Telephone: (202) 685-0262
Fax: (202) 685-0615
Email: heather.huddle@navy.mil

Installation/Station Point of Contact (SPOC):

Skip Simpson
Naval Air Station Patuxent River
22445 Peary Rd
Building 504

Patuxent River, MD 20670-1635
Telephone: (301) 757-4897
Email: charles.simpson@navy.mil

3. DURATION

The period covered by this Scope of Work (SOW) (including design preparations, report preparation, U.S. Navy review, U.S. Navy decision regarding Phase II work, Phase II work submittal of final invoice, final invoice payment, etc.) is 18 months from date of award of the Agreement.

4. GENERAL REQUIREMENTS

- a.** The Cooperator shall manage the total work effort and assure full and timely completion of services required under this Scope of Work. Included in this function shall be a full range of management duties including, but not limited to, planning, scheduling, inventory, analysis, and quality control.
- b.** The Cooperator shall prepare and submit all required permits to the Contracting Officer via the Technical Point of Contract (TPOC; copy to the SPOC) prior to the initiation of any fieldwork that requires permitting.
- c.** The Cooperator shall comply with all applicable laws and regulations pertaining to the provision of safe workplace and to provide a work environment free of harassment and intimidation for such party's own employees and third parties.
- d.** The Cooperator and its employees, contractors, subcontractors, etc., shall comply with all applicable federal and state laws, such as, but not limited to, the Sikes Act, the Clean Water Act, Coastal Zone Management Act, Endangered Species Act and the Migratory Bird and Treaty Act. In addition, the Cooperator ensures all staff or personnel working under the Agreement shall not violate the Archeological Resources Protection Act, National Historic Protection Act or the Endangered Species Act while completing work required under the Agreement. All required regulatory permits shall be maintained by the Cooperator which includes but is not limited to the U.S. Fish and Wildlife Services (US FWS), Maryland State Historic Preservation Office (MD SHPO) and all other required regulatory agencies. Any contact/discussion in regards to this project with regulatory agencies shall be initiated/conducted by the TPOC.
- e.** If applicable, the Cooperator shall conduct literature review, field investigations and interviews with experts and authorities as necessary to accomplish the work described within this Scope of Work. The Cooperator shall, in particular, attempt to contact and utilize information from the local U.S. Navy offices and other professionals who are experienced in technical requirements under this Scope of Work.

- f. Installation Permits.** In addition to any regulatory required permits, the Cooperator shall coordinate with the SPOC to obtain any installation specific permits (i.e., Hot Work, Utilities, Outages, etc.) required prior to the initiation of any field work. Please be aware that permits may take up to 14 days for approval and will be coordinated by the SPOC.
- g.** The Cooperator shall ensure that the data obtained under the Agreement be scientifically defensible and suitable for publication. Methods of data collection and/or analyses shall be provided in the Cooperator's required Work Plan under Section 8 of the SOW. The U.S. Navy, at its discretion, may subject work plans, draft reports or draft manuscripts to external peer review.
- h.** The Cooperator shall inform, in writing (via email), the Contracting Officer (via TPOC and cc SPOC) intent to publish or present any data or findings resulting from activities/research completed under this Agreement. In addition to approval from the Contracting Officer, permission from the installation Public Affairs Office must also be obtained prior to such publication or presentation. Communications will be via email unless specified otherwise. References to data include both paper documents and computer files. Electronic copies shall be sent via email unless specified otherwise.
- i.** The Cooperator shall inform the TPOC and cc the SPOC of any unusual activity observed while conducting surveys in the field (e.g., trespassers or person in unauthorized areas). Information should include location, date, time and detailed facts regarding the activity. In addition, information regarding trespassers should be reported to the Installation Security Office by telephone, as soon as possible via the SPOC. Unexploded ordnance (UXO) may be encountered while conducting fieldwork. The Cooperator shall not touch or attempt to pick-up any suspected ordnance. The Cooperator shall place flagging in the general area of the ordnance and notify the SPOC via telephone of the exact location of the ordnance as soon as possible.
- j.** The Cooperator shall allow, throughout the term of the Agreement, the TPOC and the SPOC the opportunity to periodically observe the Cooperator's field activities, to review computer or paper files of raw data, prepared data (such as data analyses, summaries, maps, figures, tables, etc.), or any record deemed appropriate by the Contracting Officer in establishing the Cooperator's performance in fulfilling the requirements of the Agreement.
- k.** The Contracting Officer, via the TPOC, may request updated data (presented on maps, figures and/or tables) whenever the U.S. Navy's need to obtain this information is before the next Monthly Report required under Section 8(c) of this SOW. The Cooperator shall forward the requested data electronically within ten (10) days from the date of request. If the requested data cannot be provided within this time frame, the Cooperator shall forward electronically the most updated raw

data to the Contracting officer, via the TPOC. The U.S. Navy understands that facilitating the requested most updated data may reduce the amount of work that would normally be accomplished during the period of time required to complete the request. The Cooperator shall document the amount of efforts and its translated cost estimate that would have been incurred by the Cooperator to complete the request for updated data. This document shall be electronically forwarded to the Contracting Officer (via TPOC) to review so that the U.S. Navy will have a good grasp on the amount of work displaced that would have normally been accomplished during the period of time required to complete the request.

- l.** The Government will not be responsible for the loss of or damage to property of the Cooperator, or for personal injuries to the Cooperator arising from or incident to the use of Government facilities or equipment.
- m.** The Cooperator shall indemnify and save harmless the Government, its officers, agents, servants and employees from all liability under the Federal Tort Claims Act (28 U.S.C. Sec 2671 et seq.) or otherwise, for death or injury to all persons, or loss or damage to the property of all persons resulting from the use of the premises by the Cooperator. This covenant shall survive the termination of the Agreement.
- n.** In the event of damage, including damage by contamination, to any Government property by the Cooperator, its officers, agents, servants, employees, or invitees, the Cooperator, at the election of the Government, shall promptly repair, replace, or make monetary compensation for the repair or replacement of such property to the satisfaction of the Government.
- o.** The Cooperator must obtain insurance. All insurance required by the Agreement shall be in such form, for such periods of time, and with such insurers as the Contracting Officer may require. A certificate of insurance or a certified copy of each policy of insurance taken out hereunder shall be provided to the Contracting Officer's local representative prior to use of the premises and facilities. The Cooperator agrees that not less than thirty (30) days prior to the expiration of any insurance required by the Agreement, it will deliver to the Contracting Officer's local representative a certificate of insurance or a certified copy of each renewal policy to cover the same risks. Cooperator shall furnish the insurance specified as follows and each policy of insurance covering bodily injuries and third party property damage shall contain an endorsement reading substantially as follows:
 - i.** The insurer waives any right of subrogation against the United States of America which might arise by reason of any payment made under this policy.
 - ii.** NAVFAC Washington shall be given thirty (30) days written notice prior to making any material change in or the cancellation of the policy.

- iii. The United States of America (Dept. of the Navy) is added as an additional insured in operations of the policy holder at or from premises designated under the Agreement and owned by the United States.
- iv. This insurance certificate is for use of facilities under the Agreement.
- v. Loss, if any, under this policy shall be adjusted with the Cooperator and the proceeds, at the direction of the Government, shall be payable to the Cooperator, and proceeds not paid to the Cooperator shall be payable to the Treasurer of the United States of America.
- p. The Cooperator shall guarantee that an 85% survival rate of the plantings one year after the initial planting. This survival rate will be reviewed and approved of by the TPOC and SPOC prior to completion of this task order and issuance of final payment.
- q. The Cooperator shall coordinate the work to be accomplished with the TPOC in the specified work area.
- r. If archeological resources or potential archeological resources are inadvertently discovered, the contractors must **STOP WORK** and contact Mike Smolek via telephone at (301) 757-4774 and the TPOC and cc the SPOC.
- s. The Cooperator shall comply with all security rules, regulations, requirements, and day-to-day operational changes thereto. Unannounced changes to day-to-day operational procedures may, at times, prohibit the Cooperator access to the project area. The primary use of the Installation is for its military mission. Without prior notice, designated areas may become closed to the activities of the Cooperator. In some cases, due to operations or other circumstances, it may be necessary to deny the Cooperator access to the Installation for short periods of time. In such cases, the Cooperator will reschedule this work to the maximum extent possible. Should the U.S. Navy require the Cooperator to leave the Installation, for a period greater than thirty (30) days (such as in the case of a national emergency), the Agreement may be terminated by either party unless an alternative agreement is reached between the Cooperator and the U.S. Navy through a formal amendment of the Agreement. If the Agreement is terminated, the Cooperator shall not bill for work not completed subsequent to the termination date of the Agreement.
- t. Photography is restricted on the Installation. The Cooperator is required to obtain permission from the U.S. Navy prior to taking any photographs on the Installation. Only photographs of Agreement related activities will be permitted.
- u. Access. The Cooperator (with the assistance of the Government) must to obtain Rapid Gate Passes or long-term badges that will remain active for the duration of the project. If Rapid Gate is not used to gain access, the Cooperator must complete and submit a vetting form for all that will access the base to the SPOC

- and cc the TPOC at least one week prior to the kick-off meeting and field activities, as applicable, for base Security review and approval. If approved, a daily visitor pass will be issued which will have to be renewed each subsequent day that the cooperator is on site. Failure to do so will result in denial of base access. After-hours access must have to be requested at least one day in advance and requires the presence of the TPOC or SPOC to remain on site. The Rapid Gate Passes will be obtained at the expense of the Cooperator.
- v. In order for personnel to access U.S. Government property in an automobile, a valid driver's license, vehicle registration and proof of insurance are required. Copies of these documents shall be provided to the installation Security Office. All employees assigned to this job must be U.S. citizens.
 - w. Utilities. In addition to using any government or utility company locating services available (i.e., Miss Utility), the Cooperator shall utilize a qualified private utility locating service company to locate all underground utilities in the work area. Any markings made during the utility investigation must be maintained throughout the duration of the field work. The Cooperator must physically verify underground utility locations by hand digging using wood or fiberglass handled tools when any adjacent exploration, excavation or construction work is expected to come within three (3) feet of the utility. SPOC will provide current GIS data for utilities, however, these are not guaranteed and additional survey work required as described above. Utility relocation may be necessary to accomplish the work. Utilities that require relocation shall be done so using the above installation permits and utility locating services. Relocation design and calculations will be provided for approval prior to relocation. All work will be in accordance with all Federal and State regulations.
 - x. Any contact/discussion in regards to this project with regulatory agencies shall be initiated/conducted by the TPOC.

5. SECURITY

No classified information shall be presented in any document prepared under this Task Agreement. The Cooperator shall not release any information regarding the project, particularly the results developed under this Task Agreement, to any Federal, State or local (public or private) agencies or organizations without permission of the U.S. Navy.

6. SPECIFIC REQUIREMENTS

SLOPE STABILIZATION

a. Goal

- a. The goal for shoreline stabilization is to design and construct shoreline stabilization measures as provided in the existing design (Appendix 2) to

provide stone revetment to restore the shoreline along the eastern shoreline of NAS PAX. These measures could include installing erosion control measures, debris removal and reworking existing broken concrete. Specifically, the work shall construct the Navy-approved and permitted final design for shoreline restoration. Native plantings shall be used to establish erosion controls and provide a natural look to the completed shoreline. In addition, the Cooperator shall maintain the necessary Federal and State permits and coordinate with the U.S. Fish and Wildlife Services (U.S. FWS), Maryland State Historic Preservation Office (MD SHPO) and all other required regulatory agencies to facilitate the repair to the shoreline at NAS Patuxent River.

b. Phase 1 - CONSTRUCTION

i. Task Definition.

- a) At the discretion of the Navy, the Cooperator will maintain relevant permits, insurance, etc., as described under Section 4 of this SOW, oversight and construction of Navy-approved final design, and deliverables including safety plans, work plans, as-builts, etc., as discussed in Section 8 of this SOW. The Cooperator shall field verify existing site conditions with the design drawings.
- b) The Cooperator will be responsible for removal of all debris generated during the project. All debris, including excavated materials with the exception of what is planned for reuse within the design, is to be taken off the base and disposed properly.
- c) Should the Navy exercise the option prior to the beginning of construction to pursue additional revetment, the contractor shall implement an additional 3,407 linear feet of revetment adjacent to the revetment included within this Agreement. The cooperator shall provide this option within the proposal.
- d) In addition, prior to completion of construction, the Navy may, at its option pursue the implementation of an additional 1,335 linear feet of breakwater within Subreach 1, adjacent to the revetment included within this Agreement. The cooperator shall provide this option within the proposal.

7. MEETINGS

- a. Kick-off Meeting.** A Kick-off Meeting between the Cooperator, Contracting Officer, the TPOC, and the SPOC shall be arranged by the Cooperator within fifteen (15) days (or earlier) from the date of award of this Agreement. A Phase 1

- pre-construction meeting shall be arranged by the Cooperator within thirty (30) days of Navy notification to proceed. The meeting shall primarily discuss the requirements of this Agreement, including the Work Plan, as stipulated in Section 8 of this SOW.
- b. Site Visits.** Site visits shall be arranged by the Cooperator as needed to complete the tasks under this Agreement, or as requested by the TPOC. Due to the location of the sites within restricted access areas, site visits must be closely coordinated with the SPOC and may require the Rapid Gate passes. Refer to Section 4(s) for additional information.
 - c. Progress Meetings.** The Cooperator shall be available throughout the Agreement period to the TPOC in matters regarding the tasks to be completed under this Agreement.

8. SCHEDULE AND SUBMITTALS

- a. Safety Plan:** All field work, including investigations and construction, requires a safety plan. The Cooperator shall submit two (2) hardcopies and one (1) electronic copy to the TPOC within thirty (30) days or less of Agreement award and at least three weeks prior to the projected start of any field activities. The Safety Plan must be approved by the Installation Safety Office prior to the start of any fieldwork (review time averages a week). The SPOC will provide the Cooperator with specific information on the required format and content of the Safety Plan; this may include an EM-385 compliant Safety Plan. The Safety Plan may also include personal protective equipment (PPE) requirements, installation emergency Point of Contact (POC) and any conditions that would require an immediate work stoppage and a site evaluation by installation safety personnel (e.g., UXO).
- b. Work Plan/Work Schedules:** The Cooperator shall provide a preliminary project schedule at the kick-off meeting, and a draft work plan concurrent with the draft and final design packages for Phases 1 and 2. The work plan should include general information about staging, construction methodology, equipment to be used, project schedule, etc. Comments from the Navy will be submitted to the Cooperator within two weeks of receipt of the work plan/schedule. The Cooperator shall submit a final work plan to the TPOC within thirty (30) days of Navy comment receipt. If the TPOC and SPOC do not have comments, suggestions, or edits on the Draft Work Plan, it shall become the Final Work Plan of the Cooperator under the Agreement. Work schedules shall be updated and submitted by the Cooperator electronically to the TPOC monthly (as part of the monthly report deliverable) or on request from the TPOC for all field activities.
- c. Monthly Reports:** Monthly progress reports are due to the TPOC by the seventh (7th) day of the following month or the next workday if the 7th falls on a weekend, for work performed the previous month, for the duration of the

- Agreement. The progress report shall include, at a minimum, the Agreement number, report date, report period, project name, names of investigators, meeting minutes (minutes shall include the date/time/location the meeting was held, attendees, relevant discussion notes, etc.), work performed during the reporting period, including areas surveyed, problems encountered and recommendations to resolve issues, work anticipated for the next reporting periods and project status. Small maps (8.5" x 11") may be used to show locations.
- i. Meeting minutes – Please note Cooperator shall submit draft meeting minutes to the TPOC within seven (7) days of the meeting occurrence. The TPOC will provide comments within seven (7) days of receipt of draft minutes. Final meeting minutes may be included in the monthly progress report submittal.
 - d. **Finalized Construction Sequence (Phase 1):** Two (2) hardcopies and two (2) electronic copies (via CDs) of the Final Construction Sequence and permitting package, including text, tables, figures, and color photos (as appropriate), in a format readable by Microsoft Word, to the TPOC within 30 days from the date of award of the Agreement. All electronic source files for tables and figures shall be labeled and submitted. All digital photographs shall be labeled with at least the following information: (1) subject/activity, (2) location (specific place), (3) date, and (4) name of photographer.
 - e. **Final/As-Builts (Phase 1).** Two (2) hardcopies and two (2) electronic copies (via CDs) of the Final documents, including text, tables, figures, color photos, and the as-builts, shall be concurrently submitted, in a format readable by Microsoft Word, to the TPOC within 18 months from the date of award of the Agreement. The TPOC will submit comments, if applicable, on the Draft Final documents to the Cooperator within fifteen (15) days (or earlier) upon receipt of the Draft Final documents. The Cooperator shall incorporate any comments and concurrently submit one (1) hardcopy and one (1) electronic copy (via CD-ROM) of the Final documents to the TPOC within 15 days from the receipt of comments. All electronic source files for tables and figures shall be labeled and submitted. All digital photographs shall be labeled with at least the following information: (1) subject/activity, (2) location (specific place), (3) date, and (4) name of photographer. As-builts must meet Navy GIS data standards.
 - f. **Schedule Summary.** The options that will be pursued will be provided to the contractor prior to the commencement of construction. Project tasks shall be completed in accordance with the following schedule:

Submittal	Due Date
Cooperative Agreement (CA) Award	CAA

Kick-off Meeting/ Schedule CAA + 15 days

Phase 1 (Construction)

Safety Plan	CAA + 30 days
Draft Work Plan/Schedule	CAA + 30 days
Finalized Construction Sequence	CAA + 60 days
Final Work Plan	CAA + 60 days
As-Builts/Final Topo	CAA + 18 months

g. Data. All databases containing raw data and all associated electronic data summary and analytical files shall be formatted in Excel, Word, Dbase IV, or any compatible Microsoft database software and submitted to the TPOC (via CD-ROM). Microsoft ACCESS files shall include all queries, reports, tables, etc.

h. GIS Data. See Appendix 1.

i. Maps. All maps created under the Agreement shall be incorporated in the draft and final versions of the Final Report. All maps shall be printed on 8.5 x 11-inch paper or 11 x 17-inch paper folded to match the size of the report(s). Unless otherwise indicated, all maps shall be printed at an acceptable scale using Maryland StatePlane_FIPS_1900_feet, North American Datum 1983. Electronic copies of all maps shall also be provided. All maps created for the Agreement shall contain the following information: title, scale bar, legend, date, north arrow and author of the map.

9. GOVERNMENT FURNISHED INFORMATION AND MATERIALS

a. The government will provide the following supporting materials in order to assist the Cooperator with the tasks associated with the Agreement.

- i. Information, strategies or protocols that may apply
- ii. GIS data and maps, if available
- iii. Aerial photographs, if available
- iv. Topographical maps, if available

b. The U.S. Navy will provide a map or information indicating areas of special concern, i.e., areas that may contain protected cultural resources, if available.

- c. The U.S. Navy will provide real estate maps and facility information needed to complete the tasks.
- d. Weather, illness, and other factors may cause some variation in the proposed schedule.

10. COOPERATOR FURNISHED ITEMS

The Cooperator shall provide all equipment (unless otherwise stated) and analyses necessary to complete the work described within this Scope of Work. All equipment (greater than or equal to \$100) purchased using Agreement funds remains the property of the Navy at the completion of the Agreement. The final report shall include an inventory of all equipment purchased greater than or equal to \$100, with the name of make, model, serial number, and maintenance records.

11. DATA AND PUBLICATIONS

- a. The Cooperator acknowledges that information and data gathered or received pursuant to the Agreement may have regulatory and national security significance and that the unauthorized dissemination or use of this information might prejudice the interests of the U.S. Navy and Department of Defense. Therefore, the Cooperator agrees not to disclose or use any information or data directly or indirectly acquired through activities associated with the Agreement to any person, organization or entity who is not a party to the Agreement, and to prohibit disclosure or use of the same by the Cooperator's personnel, representative, agents or associates unless disclosure is compelled by process of law, or the Navy authorizes disclosure or use in accordance with this Section of the Agreement. The terms "data", "information", "use", and "disclose" (and its forms and derivatives) will be interpreted very broadly. Limitations on disclosure encompass all forms of dissemination including the spoken word, written word and electronic media. "Use" includes, but is not limited to, inclusion in academic papers, professional presentations and incorporation in other research not associated with the Agreement. All products, reports, filed notes, filed data forms, photographs or other information or other records or documents, including slide presentations produced using any information obtained under the Agreement are the property of the Department of the Navy
- b. The Cooperator may disclose or use data and information only with the prior written approval of the U.S. Navy and per the terms of that approval. The Cooperator will submit a written request to disclose or use information or data to the Contracting Officer (cc TPOC) explaining what information is to be disclosed or used, the reason for the disclosure or purpose for which the information or data will be used and to whom the information will be disclosed.

- c. The U.S. Navy recognizes that the Cooperator may want to use information and data acquired through the Agreement in professional and academic manuscripts, publications and presentations and that such use may benefit not only those with an academic or professional interest in the information or data, but the general public as well. If authorization is given for such use, the Navy retains the right to review any manuscripts, publication or presentation in advance of publication or presentation for the purpose of ensuring the accuracy and releasability of the information or data presented. The Cooperator agrees that any manuscript, publication or presentation will include a statement as to the origin of the information or data obtained through the Agreement. Authorization for the use of information or data in one context is not to be construed as authorization for subsequent uses or purposes. The Cooperator shall submit at least two (2) hard copies of published manuscripts, and at least one (1) electronic copy of slides, and/or slide or poster presentations to the Navy, at no extra cost to the Navy.
- d. Recognizing the significant technical contributions of the Cooperator and U.S. Navy TPOC and SPOC in the development of the Agreement's scope of work, its goals, objectives, experimental sampling design, data interpretation, review of technical reports, etc., the U.S. Navy TPOC and/or SPOC shall be accorded, if appropriate, joint-authorship credit for any publication of manuscript and technical presentation that is based upon the full use or partial use of the technical information, data, or interpretation of data produced under the Agreement. Appropriate joint-authorship credit means credit commensurate with the amount of work and technical contributions provided by the U.S. Navy TPOC and/or SPOC, and fair with reference to credit given by the primary author (Cooperator) to other joint authors of the manuscript and technical presentation. Appropriateness of joint authorship is to be determined by reference to applicable authority, for example, the code of ethics, rules, regulations, or guidance set forth by institutions or other recognized venues on the publication of manuscripts and technical presentations.
- e. The Cooperator shall be responsible for ensuring all personnel, representatives, agents and associates participating in activities under the Agreement have read and acknowledged the provisions of this Section of the SOW.

12. RELEASE OF PUBLIC INFORMATION

The Cooperator shall not respond to any third party inquiries concerning the Agreement or concerning data and information obtained under the Agreement. All third party inquiries received by the Cooperator shall be directed to the Contracting Officer (via the TPOC) for response in accordance with applicable law and regulations and will require PAO review/approval.

13. PAYMENTS

- a. The Cooperator shall request reimbursement on a monthly basis.

- b. Advance payments may be requested by the Cooperator. Requests for advance payment shall be submitted on SF-270, "Request for Advance or Reimbursement." The form can be downloaded from the internet at <http://www.whitehouse.gov/omb/grants/sf270.pdf>.
- c. The Cooperator shall maintain advances of Federal funds in an interest bearing account. The Cooperator shall remit, at least quarterly, to the Navy interest earned on advances. The Cooperator may keep interest amounts up to \$100 per year for administrative expenses. The Cooperator shall submit a SF-272 "Federal Cash Transactions Report" along with interest earned. The form can be downloaded from the internet at <http://www.whitehouse.gov/omb/grants/sf272.pdf>.
- d. Partial payments equal to the amount of work accomplished may be made monthly from date of award. An amount not to exceed ten (10) percent of the total Agreement funds will be withheld until the final report, electronic data, and photographic information have been received (via the TPOC) and approved by the Contracting Officer.
- e. Any requirement for the payment or obligation of funds, under the terms of the Agreement, shall be subject to the availability of appropriated funds, and no provision herein shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. §1341 *et seq.* Nothing in the Agreement shall be construed, as implying that Congress will, at a later time, appropriate funds sufficient to meet deficiencies.
- f. The provisions of this Cooperative Agreement, including the requirement to remit interest earned on advances, shall be applied to sub-recipients/sub-grantees performing substantive work under the Cooperative Agreement. Sub-recipients and sub-grantees are defined below:
 - i. A Sub-recipient is the legal entity to which a sub-award is made and which is accountable to the recipient for the use of the funds provided.
 - ii. A Sub-grantee is the government or other legal entity to which a sub-grant is awarded and which is accountable to the grantee for the use of the funds provided.
 - iii. A sub-award is an award of financial assistance in the form of money, or property in lieu of money, made under an award by a recipient to an eligible sub-recipient or by a sub-recipient to a lower tier sub-recipient. The term includes financial assistance when provided by any legal agreement, even if the agreement is called a contract. It should be noted that sub-awards are for the performance of substantive work under awards, and are distinct from contracts for procuring goods and services.
 - iv. A sub-grant is an award of financial assistance in the form of money, or property in lieu of money, made under a grant by a grantee to an eligible sub-grantee. The term includes financial assistance when provided by any legal

agreement, even if the agreement is called a contract. It should be noted that sub-grants are for the performance of substantive work under awards, and are distinct from contracts for procuring goods and services.

14. GEOGRAPHIC INFORMATION SYSTEM (GIS) DELIVERABLES

a. Mapping requirements:

- i. All GIS data must adhere to the standards in Appendix 1 and the requirements listed here.
- ii. Construction drawing deliverables shall be reviewed for accuracy and completeness by a (NAVFAC Washington) GIS POC before acceptance.
- iii. Where possible, the Cooperator will utilize source GIS data provided by NAVFAC Washington.
 - a) A completed NAVFAC Washington GIS data release form is required.
 - b) The Cooperator shall be provided a copy of any GIS data required meeting mapping deliverables in ESRI format (TBD shapefile or Personal Geodatabase). That data shall be structured according to the current version of the Spatial Data Standards (SDSFIE) in use by NAVFAC (version 2.6 as of October 010), and all data shall be returned in this format and structure.
 - c) The GIS data provided shall be extracted from the Navy's GIS data Maintenance and Analysis (M&A) environment. This copy of the data will include existing populated layers, and non-populated layers. The non-populated layers are provided to ensure the data is returned in the required NAVFAC Washington GIS data model structure.
- iv. The Cooperator shall consult with the government GIS POC before populating the attribute tables to ensure the population matches the current NDW interpretation of the SDSFIE. Layer-level metadata updates are required for all updated or new layer deliverables and the Cooperator shall consult with the government GIS POC to identify the specific metadata content requirements.

b. GIS Deliverable Requirements:

- i. Format is to be determined by the government project manager and the Cooperator project manager.
 - a) The GIS deliverable shall delivered on disc (CD-ROM or DVD) to the government for Quality Assurance (QA), and the government will have two weeks to QA the data and then the Cooperator will have two weeks to make any corrections and produce the final deliverable.

or:

- b) The Cooperator will be required to deliver a copy of all data into the appropriate geodatabase schema within the NDW GeoRepository, located in the Maintenance and Analysis environment (accessible via web access and Citrix). All data will be placed into a geodatabase editing version for government review, before acceptance and publishing. All completed and published data will be recorded in the NDW tracking table located in the M&A environment.
- ii. Reporting: The Cooperator shall provide a document (Microsoft Word format) that lists all layers developed or updated for the task.
- iii. Maps: In addition to any hardcopy or softcopy maps delivered, all source map files (ESRI ArcGIS (mxd)) for these maps shall be provided to the government.

Appendix 1: Naval District Washington Standards for Geographic Information System (GIS) Deliverables.

1. Overview:

The GeoReadiness Center (GRC) is the single, authoritative source and distribution point for all geospatial shore installation data within the NDW region. The GRC houses the most current geospatial information for the entire NDW region and provides access to the comprehensive data set and analysis tools to Regional and DOD decision makers/managers, sponsored contractors, and other sponsored individuals via a secure government Internet site.

2. Basic Requirements:

- a. Submittals, Government Review and Acceptance:
 - i. All submittals shall be reviewed for accuracy, structure and completeness by a NAVFAC Washington before acceptance.
 - ii. The government shall have two weeks to assess the submittal; the contractor shall then have two weeks to make any corrections and submit the final deliverable.
 - iii. All source code (ex. Python scripts, html files) and map files (ESRI ArcGIS (mxd)) shall be provided to the government.
 - iv. Failure to adhere to any of the stated delivery specifications could result in rejection of deliverables and nonpayment.
 - v. Contractors should, at a minimum, submit data and documentation samples at 25% and 75% project completion to avoid the rejection of final deliverables.
- b. Data Retention: All data (electronic and paper formats) must be removed from the contractor's site and returned to the government at the end of the task order period of performance and before the final invoice is approved.
- c. Data Structure:
 - i. Unless specifically directed otherwise, all data shall be structured according to the current version of the Spatial Data Standards (SDSFIE) in use by NAVFAC. **This is version 3.01 as of April 2014.** Information on the SDSFIE data model can be found at: <https://sdsfie.org>, and a copy of the current data model implementation shall be provided to the contractor.
 - ii. If new data is being created and the corresponding SDSFIE data structure exists, the government shall provide unpopulated layers to the contractor structured per current NAVFAC standards.
 - iii. If new data is being created and the corresponding data structure does NOT yet exist, the contractor shall provide the GRC with a data dictionary identifying all of the SDSFIE Entity Types, attributes, and/or domain values associated with the new feature(s), the geographic area(s) covered by the data and Spatial extent information prior to the creation/editing of GIS data. Acceptable formats: MS Excel or MS Word. (Adobe PDF is not an acceptable format. New non-SDS compliant attributes (meeting SDSFIE criteria) will require precise schema definitions.
- d. Government Source Data: The contractor shall be provided a copy of any GIS data required for the project from the government repository in an ESRI format. All data shall be returned in this format and structure unless the government specifies otherwise. A

completed NAVFAC Washington GIS Data Release form is required prior to data being released to the contractor.

- e. **Attribute Population:**
 - i. The contractor shall consult with the government GIS POC before populating attribute tables to ensure the results match the current NFWASH interpretation of the SDSFIE.
 - ii. The contractor shall identify the classification, type, location, ID number, and any other necessary attributes (specified by the Government) for all new/updated/edited features.
- f. **GIS Data Format:** NAVFAC's GIS data is ERSI Geodatabase format, **version 10.1 as of May 2014**. All ESRI format data submittals must also be in version 10.1. Submittal format shall be determined by the government project manager and the contractor project manager.

3. CAD Format Deliverables:

- a. CAD drawings may be accepted as GIS deliverables, if the government project manager approves.
- b. All files must be accurately georeferenced and adhere to the requirements regarding the coordinate system, metadata, and the specified data Quality Control and Quality Assurance requirements.
- c. The government shall specify whether files are to adhere to either the SDSFIE or A/E/C CAD standard.

4. Coordinate System:

All geospatial data, unless specified otherwise, shall be in the Geographic Coordinate System: GCS_WGS_1984, Datum: D_WGS_1984.

5. Metadata:

- a. **Feature Level Metadata:** Feature-level (record level) attribute metadata is required to be populated for each GIS feature/record, per the current SDSFIE version. Attributes for version 3.01 are:

- i. **Name: editor**

- 1. **Description:** Contractor or person that edited the feature attribution or geometry from its original or previous value. Last Name of the person and first initial. For example, Jane Smith would be attributed as SmithJ.

- 2. **Data Type:** String (20)

- ii. **Name: dateEdited**

- 1. **Description:** Date that the feature was edited from its original or previous value.

- 2. **Data Type:** Date

- iii. **Name: collectionSource**

- 1. **Description:** Describes how the data was collected and verified. (Example: GPS Field Collected – Mapping Grade).

- 2. **Data Type:** String (75)

- 3. **Domain:** CollectionSource

- iv. **Name: locAccy**

- 1. **Description:** Describes the location accuracy of the data that was collected and verified.

2. **Data Type:** String (50)
- v. **Name:** metaNotes (** use only if needed)
 1. **Description:** Describes other details about what was created or edited and why.
 2. **Data Type:** String (255)
- b. **Layer Level Metadata:** Layer level metadata is required for all deliverables, structured according to the FGDC Content Standard for Digital Geospatial Data (CSDGM). Details on the standard can be found at <http://www.fgdc.gov/metadata/geospatial-metadata-standards>.

These elements are to be populated:

- i. **Title of Content:** Current SDS version layer name
- ii. **Origin:** Contract #, Task Order Title, Company Name
- iii. **Publication Date:** Final deliverable date, after gov't QA & Acceptance
- iv. **Abstract:** SDS 3.0 layer definition
- v. **Supplemental Information:** List the SDS 3.0 subtypes
- vi. **Theme Keywords:** Common feature name, current version SDS Layer name and Data Set name.
- vii. **Place Keywords:** Region, NAVFAC Washington, all applicable site names.
Example; Naval District Washington, NAVFAC Washington, Indian Head, Stump Neck
- viii. **Use Constraints:** "For Official Use Only"
- ix. **Process Description:** Describe briefly in simple terms, methods used to acquire the data and populate the GIS layer.
 1. Example: "This data was received in various formats which included ESRI Shapefile, ESRI Coverage, and AutoCAD format. The data was converted to ESRI Personal Geodatabase format for the analysis, translation, and QA processes, and copied into an ESRI Enterprise Geodatabase (Oracle) as the final step.
 2. Example: "Wetlands Delineation collected via GPS, imported to an ESRI File GeoDatabase where additional attributes were populated"
- x. **Logical Consistency Report:** Populate if applicable (ex. LIDAR data); this is an explanation of the fidelity of relationships in the data set and tests used.
- xi. **Completeness Report:** Populate if applicable for derived data; information about omissions, selection criteria, generalization, definitions used, and other rules used to derive the data set.

6. Quality Control and Quality Assurance:

The contractor shall take all appropriate and needed QA/QC measures to ensure that data is complete, topologically correct, accurate, structured correctly, and formatted correctly per the scope of work and complete (to include):

- a. **All data shall be visually inspected before submittal to the government.**
- b. The numbers of records for all joined tables shall match, or the specific unmatched records shall be identified and explained to the satisfaction of the government.
- c. All required attributes (per SDSFIE version 3.01) shall be populated.
- d. All domain constraints shall be adhered to, unless approved by the government, prior to submittal.
- e. No erroneous overshoots, undershoots, dangles or intersections in the line work.
- f. All area type features shall be closed polygons.
- g. Line features shall be snapped together where appropriate to support networks. For example, do not break linear features for labeling or other aesthetic purposes.

- h. Lines shall be continuous and point features shall be digitized as points. For example, point features, such as manholes, shall not be drawn using only a circle (polygon) to represent its location.
- i. No sliver polygons
- j. Digital representation of the common boundaries for all graphic features must be coincident, regardless of feature layer
- k. Geometric network connectivity shall be maintained for utility networks, where specified by the scope of work.

7. Field Collection

- a. Where field data collection is stipulated in the contract, the contractor shall utilize conventional and other methods, such as a total station, or Global Positioning System (GPS) in accordance with the applicable Geospatial Positioning Accuracy Standards published by the Federal Geographic Data Committee (FGDC).
- b. At a minimum, the contractor shall provide, resource grade GPS collection at an accuracy level of $\pm < 1\text{m}$ and shall use differential correction to target accuracies of $\pm .5\text{ m}$.
- c. Where appropriate (as stipulated in the contract or as otherwise determined by the Government), the contractor shall use survey grade GPS, at an accuracy level of $\pm 2\text{ cm}$. Global Positioning System (GPS) data collection activities will be based on a post-processed environment using an accurately sighted base station. Base station files for post processing acquired locally (off-site CORS Continuous Operating Reference Station) will be verified for accuracy.
- d. GPS data on the location of utility lines and other features shall be captured at a minimum every 50ft and at each turn or bend in the line and processed as a line feature type. GPS data on the location of utility points and other features shall be captured at the centroid of the feature unless signal obstruction or access prohibits; otherwise points will be captured at a uniform distance and direction from the centroid and the offset captured in the metadata for that feature. Data on polygon features shall be collected at every vertex of the feature and processed as a polygon.
- e. All survey-grade data collected shall be provided to the Government in a digital format with an attached Survey Report identifying survey method, equipment list, calibration documentation, survey layout, description of control points, control diagrams, quality control report and field survey data.
- f. A digital Survey Control Database (consisting of a survey marker database and a survey traverse database) will be produced for all survey control points established under this contract, including the horizontal and vertical order and coordinate location of each point.
- g. Digitizing/Conversion: Where Digitizing/Conversion is stipulated in the contract, the contractor shall digitize/convert features from designated sources (including remotely sensed data, hardcopy scans and vector data) to support various GIS applications. Digitizing/conversion routines will insure that 90 percent of all features will measure within 0.01 inches when reproduced at the scale of original imagery or data source

APPENDIX B: Specifications for GIS Layers and Attributes

The contractor shall consult with the government points of contact to ensure data is placed into the appropriate layer.

This section lists:

- **SDSFIE Required Global Attributes**: These must be populated for each record in all layers
- **SDSFIE Required Global Metadata Attributes**: These must be populated for each record in all layers

1. SDSFIE Required Global Attributes

These attributes must be populated in each record in all layers.

Name: sdsID

Description: A unique identifier for all features and objects in the SDSFIE. The sdsID field enables an organization to identify records that represent the same feature.

Data Type: GUID

Default Value: null

Domain: NA

Key: NA

Name: sdsFeatureName

Description: The common name of the feature.

Data Type: String (80)

Default Value: null

Domain: NA

Key: NA

Name: sdsFeatureDescription

Description: A narrative describing the feature.

Data Type: vChar (MAX)

Default Value: null

Domain: NA

Key: NA

Name: sdsMetadataID

Description: The foreign key to a metadata record.

Data Type: String (80)

Default Value: null

Domain: NA

Key: Foreign

2. SDSFIE Required Global Metadata Attributes

These attributes must be populated in each record in all layers.

Name: editor

Description: Contractor or person that edited the feature attribution or geometry from its original or previous value. Last Name of the person and first initial. For example, Jane Smith would be attributed as SmithJ.

Data Type: String (20)

Default Value: null

Domain: NA

Key: NA

Name: dateEdited

Description: Date that the feature was edited from its original or previous value.

Data Type: Date

Default Value: null

Domain: NA

Key: NA

Name: collectionSource

Description: Describes how the data was collected and verified. (Example: GPS Field Collected - Mapping Grade).

Data Type: String (75)

Default Value: null

Domain: CollectionSource

Key: NA

Name: locAccy

Description: Describes the location accuracy of the data that was collected and verified.

Data Type: String (50)

Default Value: null

Domain: NA

Key: NA

Name: metaNotes (** use only if needed)

Description: Describes other details about what was created or edited and why.

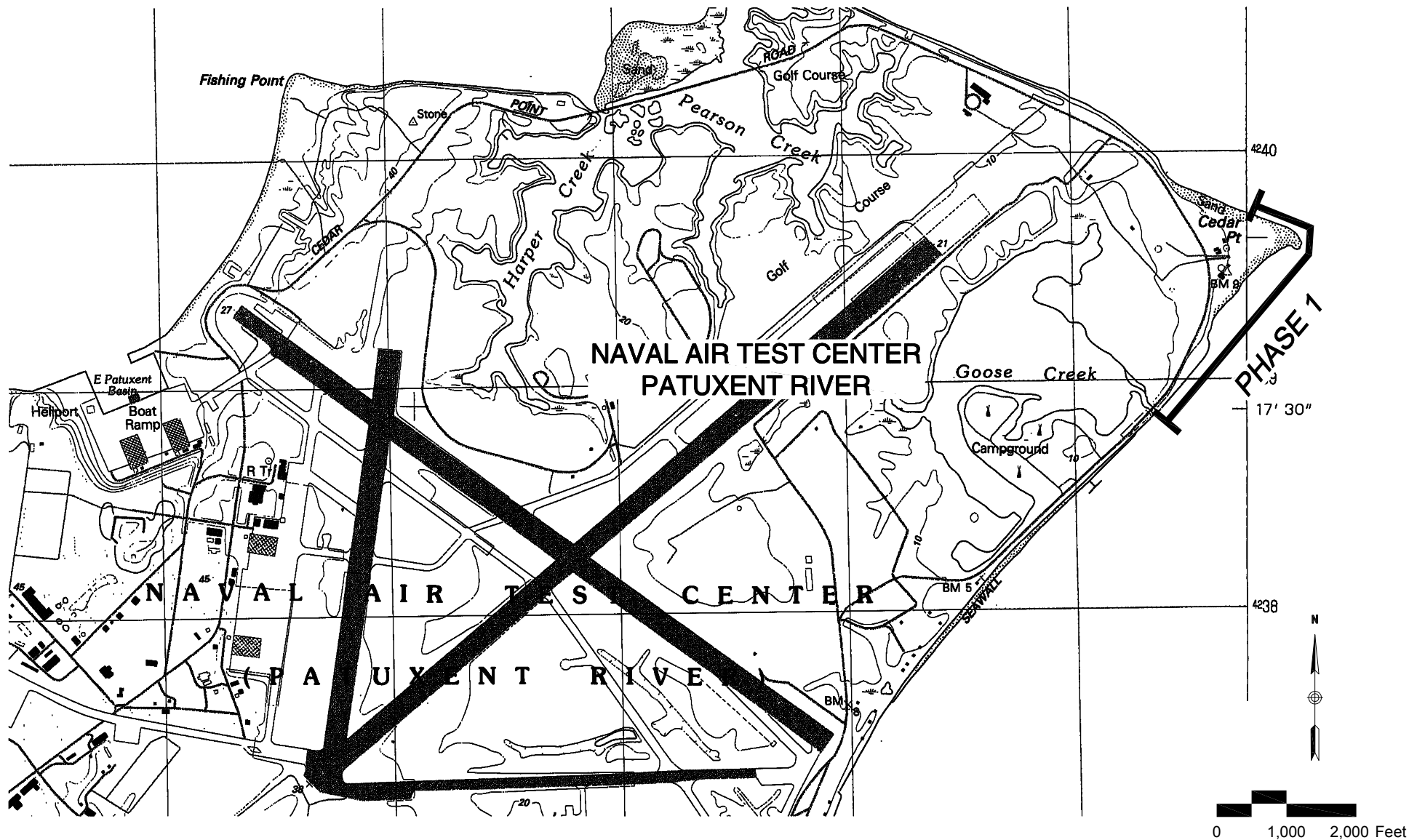
Data Type: String (255)

Default Value: null

Domain: NA

Key: NA

Appendix 2: Final Design Drawings.



COASTLINE DESIGN, P.C.


P.O. BOX 157
ACHILLES, VIRGINIA 23001
(804) 642-2158

**ADJACENT PROPERTY
OWNERS:**

- 1.
- 2.

DATUM: MEAN LOW WATER

CHESAPEAKE SHORE PATUXENT RIVER PHASE 1 LOCATION MAP

**AT: N.A.S. PATUXENT RIVER
CHESAPEAKE SHORE**
IN: St. MARY'S COUNTY, MARYLAND

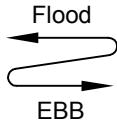
PURPOSE: SHORELINE RESTORATION

**APPLICATION BY:
NAVAL AIR STATION
PATUXENT RIVER**

**REVISED: DECEMBER 2012
DATE: FEBRUARY, 2009**

SHEET: 1 OF 10

Chesapeake Bay

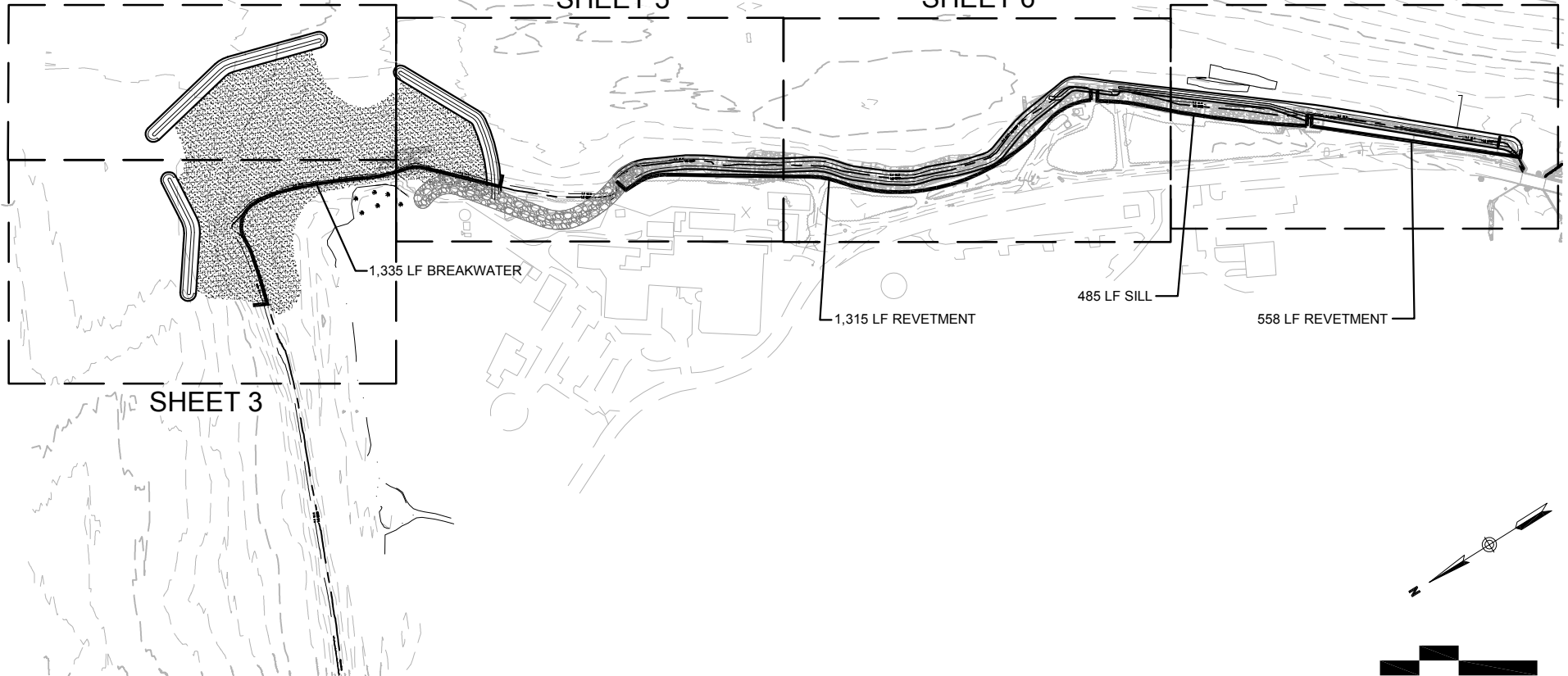


SHEET 4

SHEET 5

SHEET 6

SHEET 7



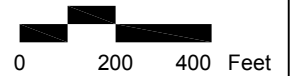
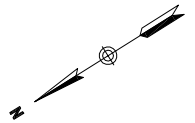
SHEET 3

1,335 LF BREAKWATER

1,315 LF REVETMENT

485 LF SILL

558 LF REVETMENT



COASTLINE DESIGN, P.C.



P.O. BOX 157
ACHILLES, VIRGINIA 23001
(804) 642-2158

ADJACENT PROPERTY
OWNERS:

- 1.
- 2.

DATUM: MEAN LOW WATER

CHESAPEAKE SHORE PATUXENT RIVER PHASE 1

SHEET INDEX

AT: N.A.S. PATUXENT RIVER
CHESAPEAKE SHORE

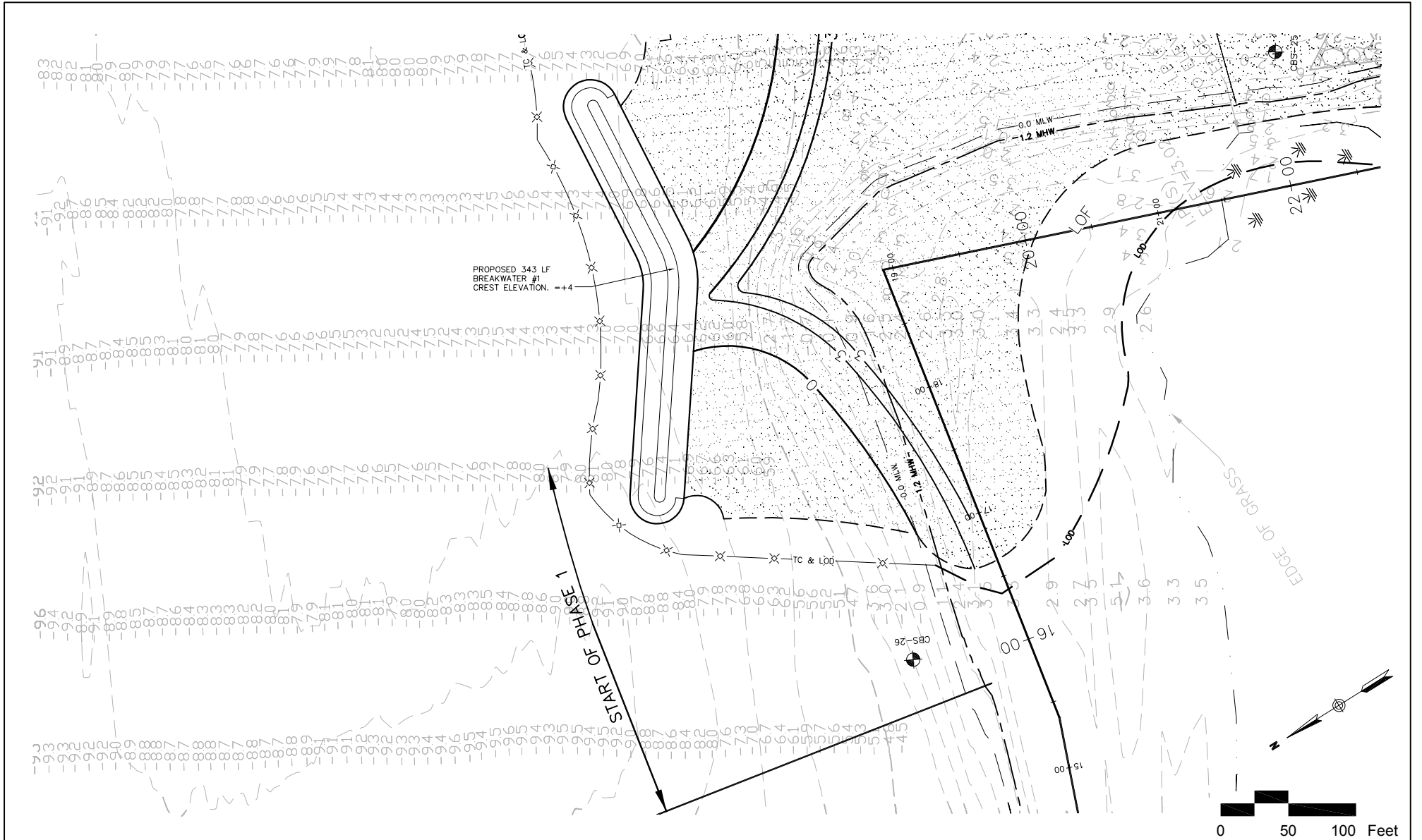
IN: St. MARY'S COUNTY, MARYLAND

PURPOSE: SHORELINE RESTORATION

APPLICATION BY:
NAVAL AIR STATION
PATUXENT RIVER

REVISED: DECEMBER 2012
DATE: FEBRUARY, 2009

SHEET: 2 OF 10



COASTLINE DESIGN, P.C.  P.O. BOX 157 ACHILLES, VIRGINIA 23001 (804) 642-2158	ADJACENT PROPERTY OWNERS: 1. 2. DATUM: MEAN LOW WATER	CHESAPEAKE SHORE PATUXENT RIVER PHASE 1 LAYOUT PLAN	APPLICATION BY: NAVAL AIR STATION PATUXENT RIVER REVISED: DECEMBER 2012 DATE: FEBRUARY, 2009 SHEET: 3 OF 10
		AT: N.A.S. PATUXENT RIVER CHESAPEAKE SHORE IN: St. MARY'S COUNTY, MARYLAND	

RECLAMATION AREA IMPACTS

SAND FILL AREA <MHW 222,887 SF, 39,889 CUYD.
TOTAL SAND FILL AREA 269,253 SF, 42,926 CUYD.
TOTAL BREAKWATER AREA 49,534 SF.
TOTAL BREAKWATER LENGTH 1,335 LF.

Chesapeake Bay



PROPOSED 539 LF. BREAKWATER #2
CREST ELEVATION: 9+4

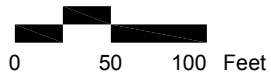
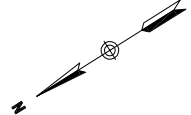
37' MAXIMUM
BREAKWATER WIDTH

368 MAXIMUM BREAKWATER
CHANNELWARD EXTENT

BAY B

BAY A

SAND FILL



COASTLINE DESIGN, P.C.



P.O. BOX 157
ACHILLES, VIRGINIA 23001
(804) 642-2158

ADJACENT PROPERTY OWNERS:

- 1.
- 2.

DATUM: MEAN LOW WATER

CHESAPEAKE SHORE PATUXENT RIVER PHASE 1 LAYOUT PLAN

AT: N.A.S. PATUXENT RIVER
CHESAPEAKE SHORE

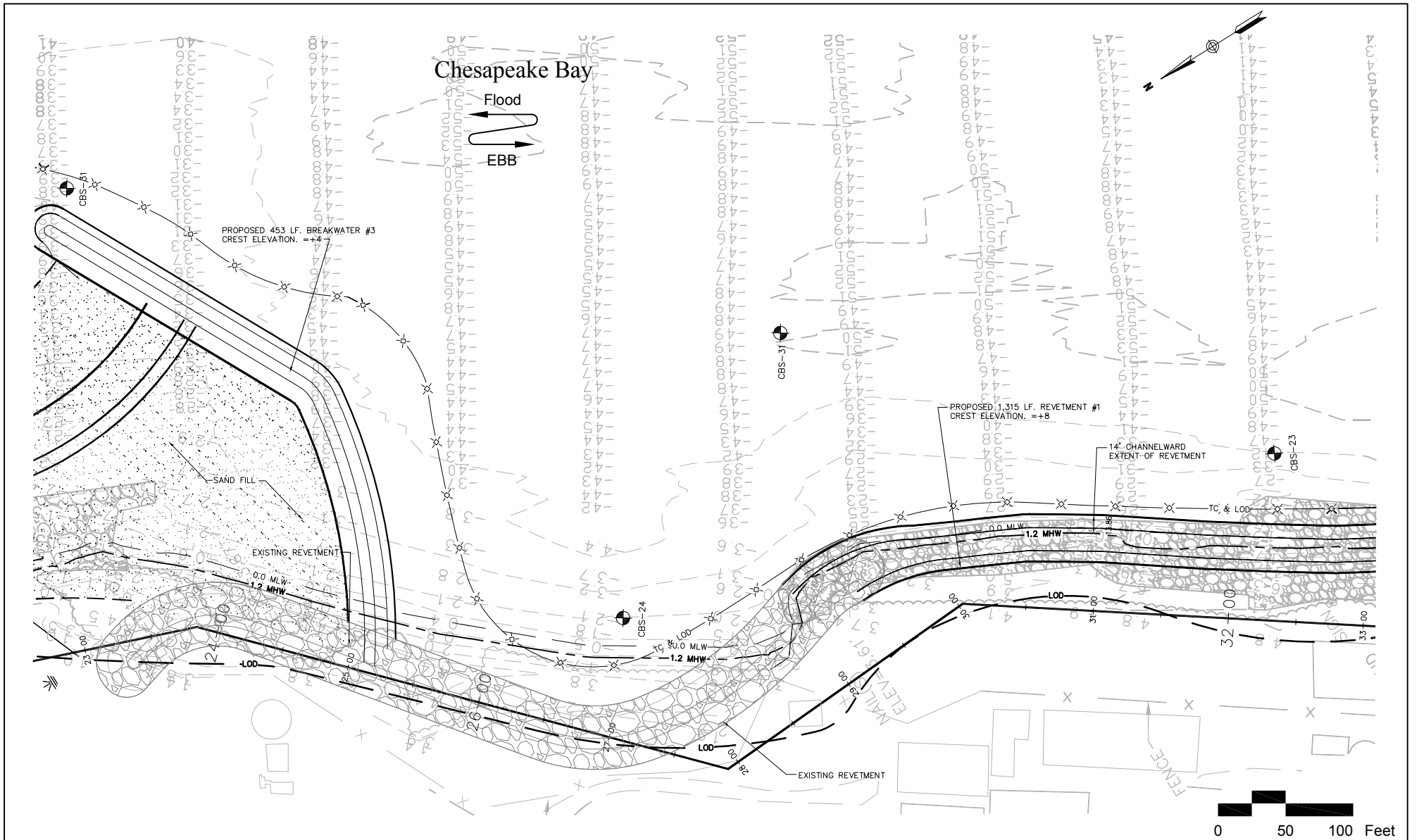
IN: St. MARY'S COUNTY, MARYLAND

PURPOSE: SHORELINE RESTORATION

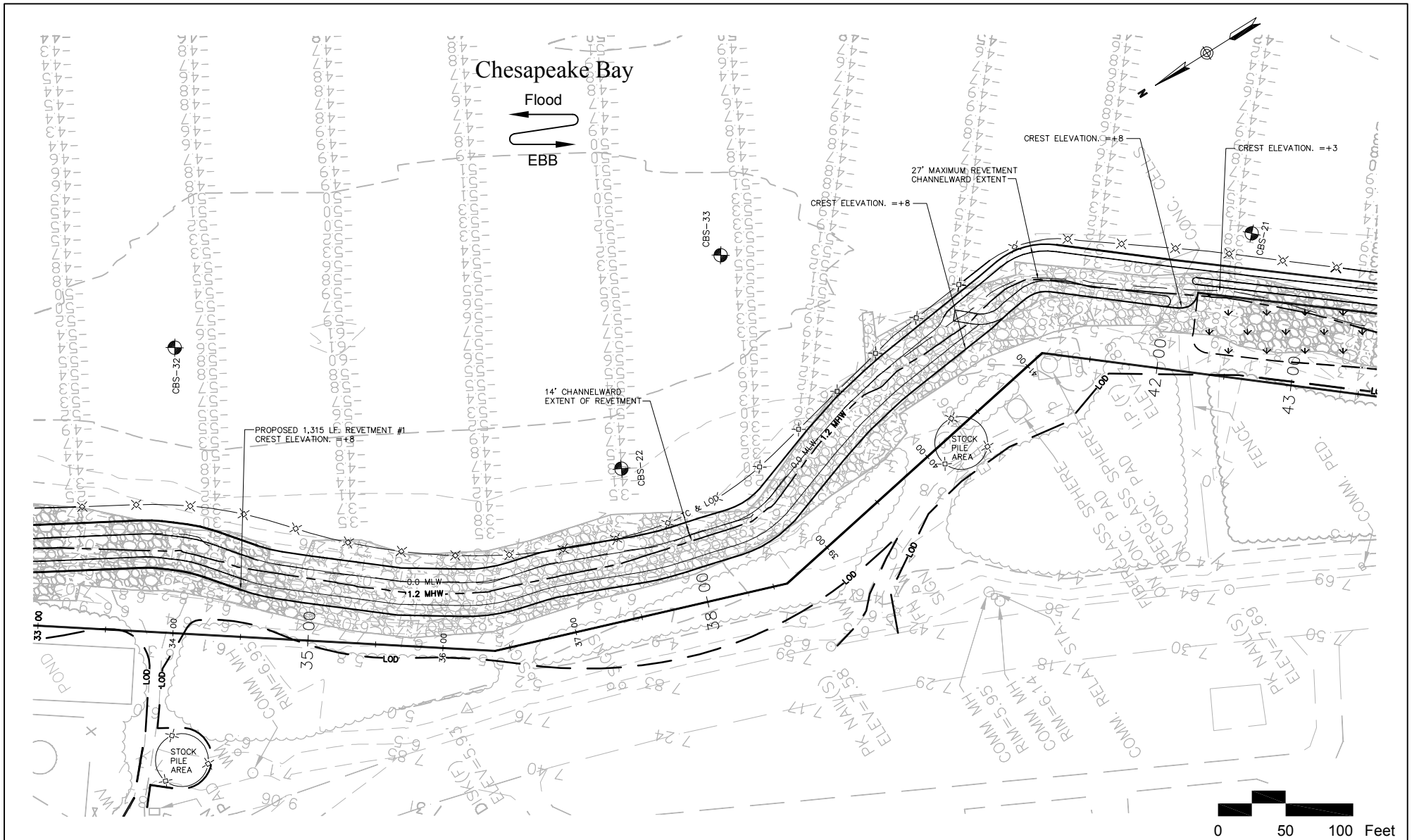
APPLICATION BY:
NAVAL AIR STATION
PATUXENT RIVER

REVISED: DECEMBER 2012
DATE: FEBRUARY, 2009

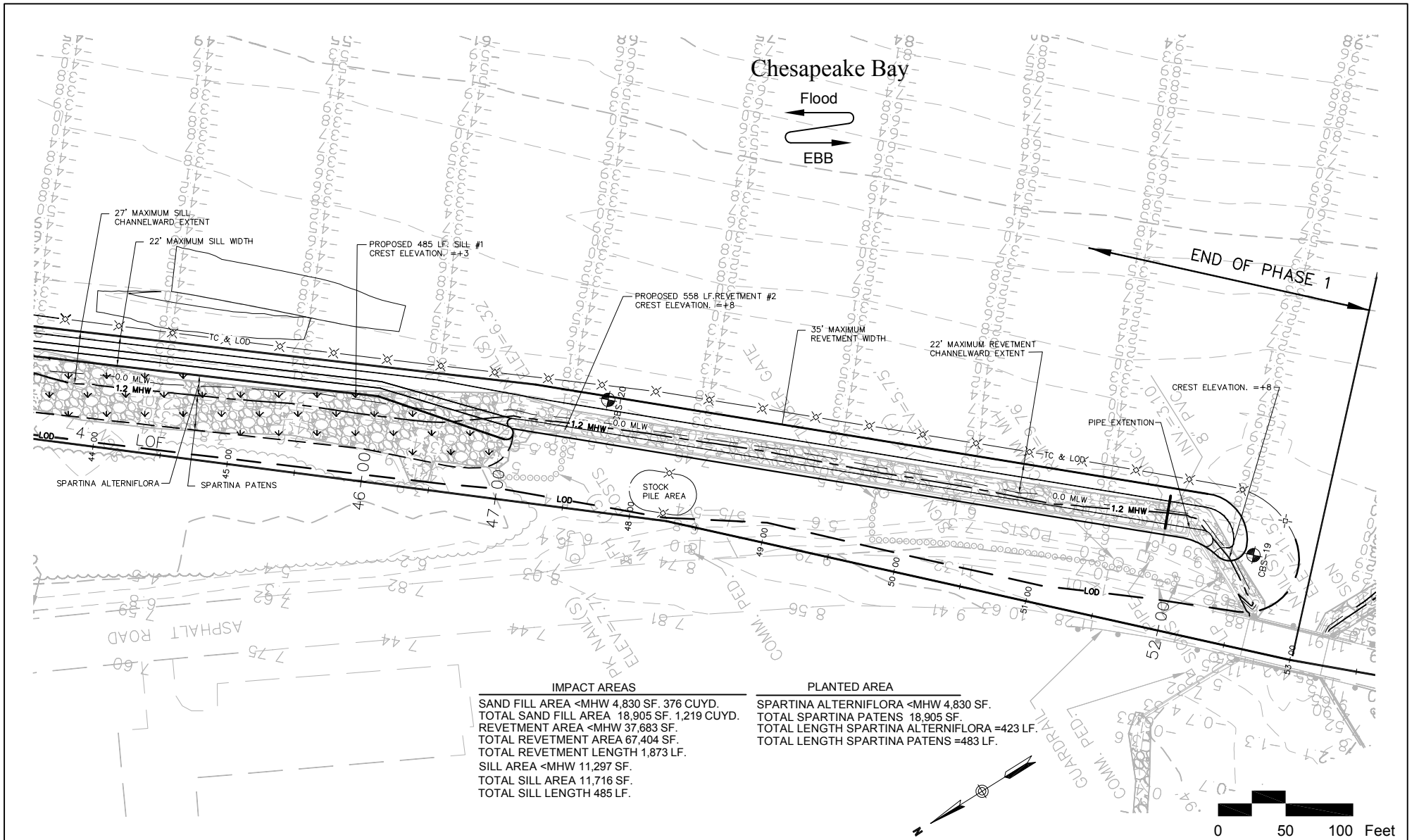
SHEET: 4 OF 10



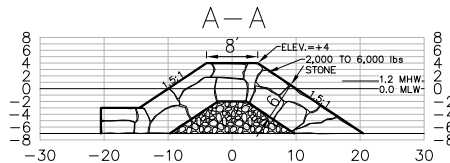
COASTLINE DESIGN, P.C.  P.O. BOX 157 ACHILLES, VIRGINIA 23001 (804) 642-2158	ADJACENT PROPERTY OWNERS: 1. 2. DATUM: MEAN LOW WATER	CHESAPEAKE SHORE PATUXENT RIVER PHASE 1 LAYOUT PLAN AT: N.A.S. PATUXENT RIVER CHESAPEAKE SHORE IN: St. MARY'S COUNTY, MARYLAND		APPLICATION BY: NAVAL AIR STATION PATUXENT RIVER REVISED: DECEMBER 2012 DATE: FEBRUARY, 2009 SHEET: 5 OF 10
		PURPOSE: SHORELINE RESTORATION		



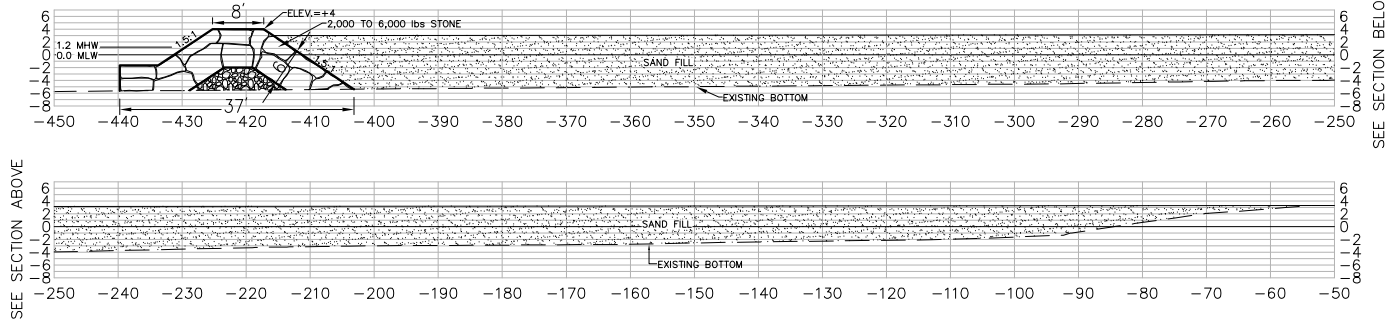
COASTLINE DESIGN, P.C.  P.O. BOX 157 ACHILLES, VIRGINIA 23001 (804) 642-2158	ADJACENT PROPERTY OWNERS: 1. 2. DATUM: MEAN LOW WATER	CHESAPEAKE SHORE PATUXENT RIVER PHASE 1 LAYOUT PLAN AT: N.A.S. PATUXENT RIVER CHESAPEAKE SHORE IN: St. MARY'S COUNTY, MARYLAND		APPLICATION BY: NAVAL AIR STATION PATUXENT RIVER REVISED: DECEMBER 2012 DATE: FEBRUARY, 2009 SHEET: 6 OF 10
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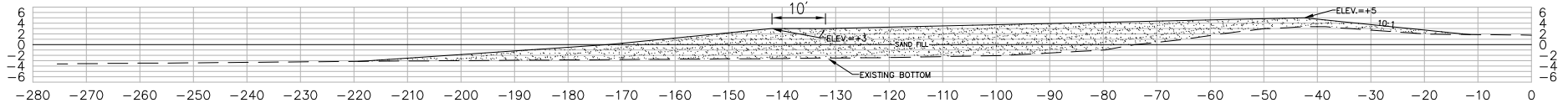
COASTLINE DESIGN, P.C.  P.O. BOX 157 ACHILLES, VIRGINIA 23001 (804) 642-2158	ADJACENT PROPERTY OWNERS: 1. 2.	CHESAPEAKE SHORE PATUXENT RIVER PHASE 1 LAYOUT PLAN		APPLICATION BY: NAVAL AIR STATION PATUXENT RIVER
		AT: N.A.S. PATUXENT RIVER CHESAPEAKE SHORE IN: St. MARY'S COUNTY, MARYLAND	PURPOSE: SHORELINE RESTORATION	REVISED: DECEMBER 2012 DATE: FEBRUARY, 2009
	DATUM: MEAN LOW WATER			SHEET: 7 OF 10



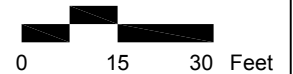
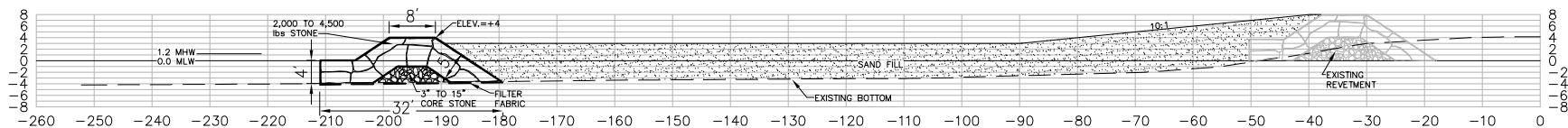
TYPICAL CEDAR PT. 20+00



TYPICAL BAY BEACH 22+00



TYPICAL BREAK WATER-TOMBOLO-DUNE WITH ROCK CORE 24+00



COASTLINE DESIGN, P.C.



P.O. BOX 157
ACHILLES, VIRGINIA 23001
(804) 642-2158

ADJACENT PROPERTY OWNERS:

- 1.
- 2.

DATUM: MEAN LOW WATER

CHESAPEAKE SHORE PATUXENT RIVER PHASE 1 SECTIONS

AT: N.A.S. PATUXENT RIVER
CHESAPEAKE SHORE

IN: St. MARY'S COUNTY, MARYLAND

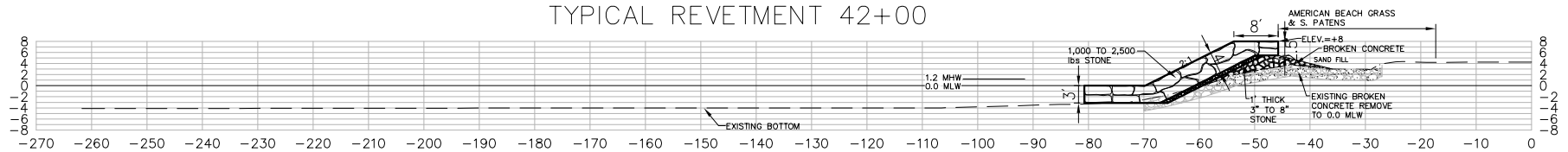
PURPOSE: SHORELINE RESTORATION

APPLICATION BY:
NAVAL AIR STATION
PATUXENT RIVER

REVISED: DECEMBER 2012
DATE: FEBRUARY, 2009

SHEET: 8 OF 10

TYPICAL REVETMENT 42+00



COASTLINE DESIGN, P.C.


P.O. BOX 157
ACHILLES, VIRGINIA 23001
(804) 642-2158

ADJACENT PROPERTY OWNERS:

- 1.
- 2.

DATUM: MEAN LOW WATER

CHESAPEAKE SHORE PATUXENT RIVER PHASE 1 SECTIONS

AT: N.A.S. PATUXENT RIVER
CHESAPEAKE SHORE
IN: St. MARY'S COUNTY, MARYLAND

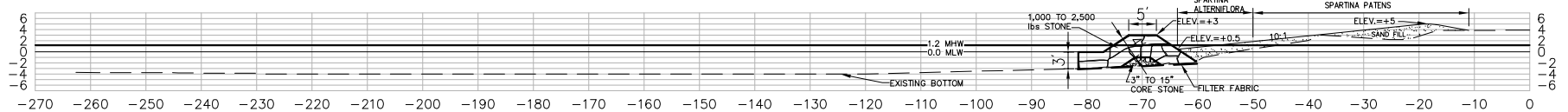
PURPOSE: SHORELINE RESTORATION

APPLICATION BY:
NAVAL AIR STATION
PATUXENT RIVER

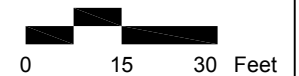
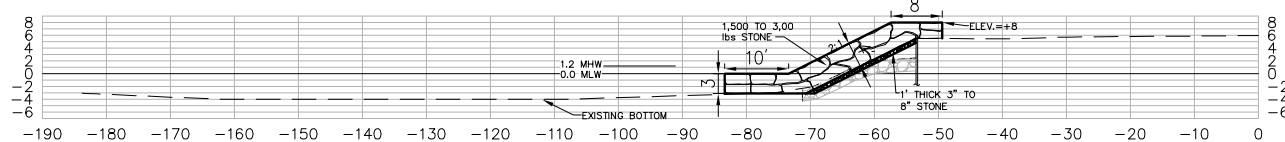
REVISED: DECEMBER 2012
DATE: FEBRUARY, 2009

SHEET: 9 OF 10

TYPICAL SILL 43+00 TO 46+00



TYPICAL REVETMENT 47+00 TO 52+00



COASTLINE DESIGN, P.C.



P.O. BOX 157
ACHILLES, VIRGINIA 23001
(804) 642-2158

ADJACENT PROPERTY OWNERS:

- 1.
- 2.

DATUM: MEAN LOW WATER

CHESAPEAKE SHORE PATUXENT RIVER PHASE 1 SECTIONS

AT: N.A.S. PATUXENT RIVER
CHESAPEAKE SHORE

IN: St. MARY'S COUNTY, MARYLAND

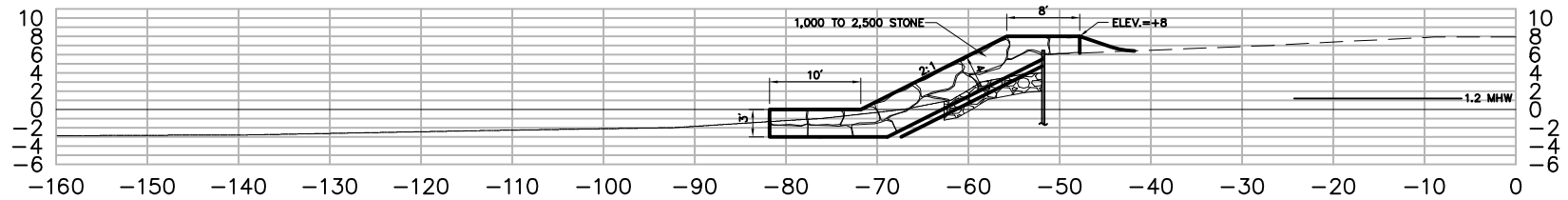
PURPOSE: SHORELINE RESTORATION

APPLICATION BY:
NAVAL AIR STATION
PATUXENT RIVER

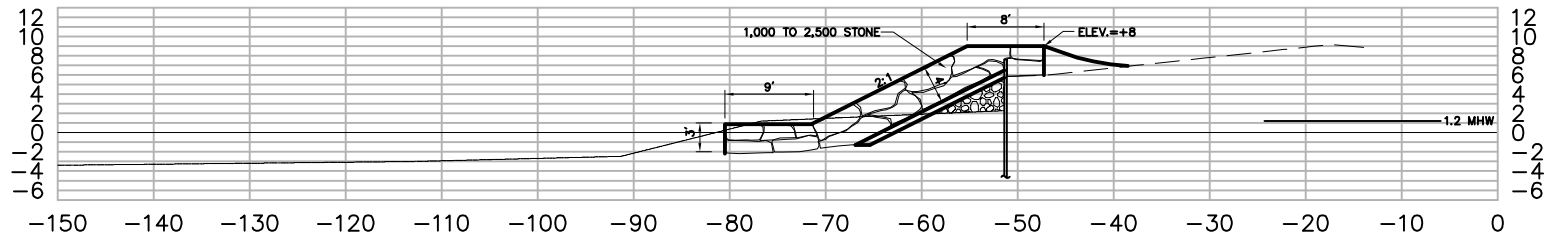
REVISED: DECEMBER 2012
DATE: FEBRUARY, 2009

SHEET: 10 OF 10

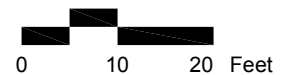
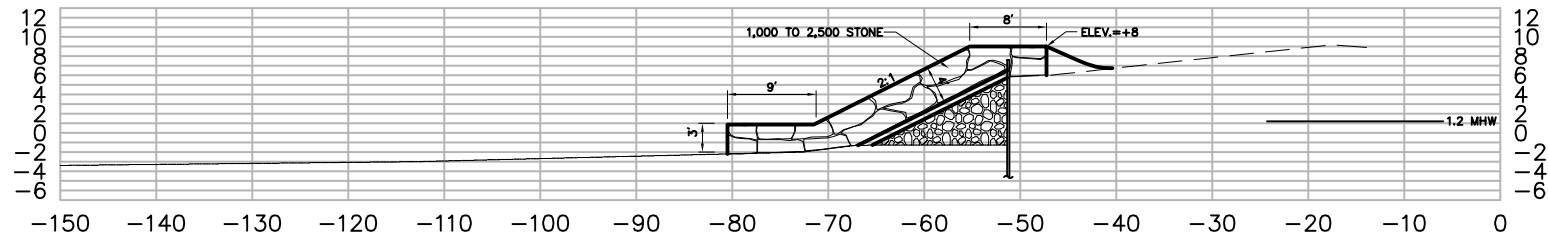
TYPICAL 53+50 TO 66+20



TYPICAL 66+20 TO 82+00



TYPICAL 91+00 TO 108+00



COASTLINE DESIGN, P.C.


P.O. BOX 157
ACHILLES, VIRGINIA 23001
(804) 642-2158

DATUM: MEAN LOW WATER

CHESAPEAKE SHORE PATUXENT RIVER SHORELINE RESTORATION PHASE 2 SECTIONS

AT: PATUXENT RIVER
IN: St. MARY'S COUNTY, MARYLAND

PURPOSE: SHORELINE RESTORATION

APPLICATION BY:
NAVAL AIR TEST CENTER
PATUXENT RIVER

REVISED: DECEMBER, 2012
DATE: AUGUST, 2008

SHEET 13 OF 15