

BAA ANNOUNCEMENT NO. N40080-13-LTC-0003

BORAD AGENCY ANNOUNCEMENT (BAA)

“EXPANSION OF CONSTRUCTED WETLAND FOR HABITAT ENHANCEMENT AND SEDIMENT CONTROL” AT NAVAL SUPPORT FACILITY DAHLGREN, DAHLGREN, VIRGINIA

This publication constitutes a Broad Agency Announcement as contemplated in the DoD Grants and Agreement Regulations (DODGARS) 22.315. Additional information regarding this announcement will not be issued.

The issuing office will not issue paper copies of this announcement. The Naval Facilities Engineering Command Washington reserves the right to select and fund for award one proposal in response to this announcement. No funding shall be provided for direct reimbursement of proposal development costs. Technical and cost proposals (or any other material) submitted in response to this BAA will not be returned. All proposals will be treated as sensitive information. Their contents will only be disclosed for the purposes of evaluation.

It is anticipated that awards will take the form of a Cooperative Agreement. Therefore, all proposals submitted as a result of this announcement will fall under the purview of (a) the Federal statute authorizing this award, or any other Federal statutes directly affecting the performance of this Grant and (b) Department of Defense Grants and Agreements Regulations (DODGARS).

General Information

1. Agency Name

Technical:

Naval Facilities Engineering Command, Washington
1314 Harwood Street, SE
Building 212, Washington Navy Yard
Washington, DC 20374-5018

Issuing Grants Office:

Naval Facilities Engineering Command, Washington
1314 Harwood Street, SE
Building 212, Washington Navy Yard
Washington, DC 20374-5018

2. Program Name

Natural Resources Management

3. Opportunity Title

“Expansion of Constructed Wetland for Habitat Enhancement and Sediment Control” at Naval Support Facility Dahlgren, Dahlgren, VA

4. BAA Number

N40080-13-LTC-0003

5. Response Dates

Full proposals are due no later than 2:00PM EST on 05 September 2013.

6. Opportunity Description

a. Background / Program Purpose and Plan

Awarded in 2010, the objective of Cooperative Agreement (CA) N40080-10-LTC-0006 was to design and construct a wetland cell to provide habitat improvement and treatment of storm water from an approximate 162 acre watershed at Naval Support Facility Dahlgren (NSFDL). Calculations for the final design indicate it should achieve 40-50% of the treatment volume for the watershed.

Subsequently in 2012, CA N40080-12-LTC-0005 was awarded to provide supplementary survey, design and construction services related to the construction of the first cell, and to design a complementary, second constructed wetland treatment cell. The goal for the second cell design was to fully integrate with and supplement the initial cell to achieve 100% of the recommended treatment volume for the watershed.

This Agreement is for the construction of the final design for the second treatment cell to achieve the storm water treatment capacity needed for the watershed. The overall proposed project will provide both habitat enhancements and water quality benefits for a significant amount of untreated storm water. This project implements, in part, Naval Facilities Engineering Command, Washington’s (NAVFAC Wash) responsibilities pursuant to the Sikes Act Improvement Act (16 USC 670 et seq) and is in support of Executive Order 13508 – Chesapeake Bay Protection and Restoration.

b. Sources of Funding

Operations & Maintenance (O&M).

7. Point of Contact

Questions shall be directed to the individual, as specified below, who will direct technical questions to the appropriate technical representative.

Allison Silver
allison.silver@navy.mil

8. Instrument Type

It is anticipated that the award resulting from this announcement will be a cooperative agreement.

9. Additional Information

This BAA is soliciting proposals for Fiscal Year 2013.

Award Information

1. Anticipated Award Information

Fiscal Year 2013.

2. Number of Awards

Approximately one (1).

3. Award Type

Cooperative Agreement.

4. Anticipated Period of Performance

The period covered by this scope of work is twenty-four (24) months from date of award of the Agreement.

5. Range of Approval/Disapproval Time

Form proposals are reviewed and selected within six months from submission. Subsequent awards are usually made within three months from notification. This information is only an approximate estimate and does not obligate the US Government in any way. Estimated funding amounts may increase or decrease at any time based on current and future appropriations.

Eligibility Information

All responsible sources from academia, industry, and non-governmental organization may submit proposal under this BAA. This includes all non-profits, universities, state and local governments.

Application and Submission Information

1. Application and Submission Process

Full Proposal shall consist of three sections: (I) Technical Approach, (II) Qualifications and (III) Cost. The details for each section are described below. The due date for receipt of proposals is 2:00pm EST on 05 September 2013. It is anticipated that final selection will be made on or about before the end of Fiscal Year 2013. As soon as the final proposal evaluation process is completed, the respondent will be notified via e-mail of its selection or non-selection for award.

Respondents shall state that their full proposal is valid for 90 days from the submission deadline.

2. Address for the Submission of Full Proposals

Respondents to this solicitation must provide one electronic copy of the application Full Proposal. All applications shall be submitted via Grants.gov (see instruction below) with a copy emails to the following address:

Allison Silver
allison.silver@navy.mil

Submission of Proposals through Grants.gov:

Registration Requirements for Grants.gov:

There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g. obtain a Dun and Bradstreet Universal Numbering System (DUNS) number, register with the Central Contact Registry (CCR), register with the credential provider, and register with Grants.gov). See www.grant.gov/GetStarted to begin this process. Use the Grants.gov Organization Registration Checklist at www.grants.gov/assets/OrganizationRegCheck.doc to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

Questions: Questions relating to the registration process, system requirement, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov.

Application forms and instruction are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select "Apply for Grants", and then select "Download Application Package". Enter the CFDA for the respective agency to which are directing the application; Naval Facilities Engineering Command uses 12.300. The funding opportunity number is N40080-13-LTC-0003.

3. Format and Content of Full proposals

Proposal submissions will be protected from unauthorized disclosure in accordance with application law, and DoD/DoN regulations. Respondents are expected to appropriately mark each page of their submission that contains proprietary information. Proposals shall be submitted electronically within the following guidelines:

a. Full Proposal Format

- i. Paper size – 8.5 x 11 inch paper
- ii. Font size - no less than 10 point font
- iii. Margins – 1 inch
- iv. Spacing – single or double-spaced
- v. Copies – one (1) electronic copy containing all of the required sections
- vi. Number of pages – Sections I and II are limited to no more than 25 pages single sided. Section III has no page limit. The cover page and table of contents are excluded from the page limitations.

b. Full Proposal Content

i. Cover Page

1. BAA Number
2. Title of Proposal
3. Identify of Prime Respondent and complete list of subcontractors if applicable.
4. Technical Contact (name, address phone, fax and e-mail)
5. Administrative/Business Contact (name, address phone, fax and e-mail)

ii. Table of Contents

1. Section
2. Title
3. Page numbers

Signed Standard Form 424, 424A and 424b as applicable. Form can be found at <http://www.gsa.gov/Portal/gsa/ep/formslibrary.do?formType-SF>.

- c. Technical Approach
 - i. Goals and Objectives. The proposal should clearly state the overall goal(s) of the project and have specific, measureable objectives.

**SCOPE OF WORK
NAVAL FACILITIES ENGINEERING COMMAND, WASHINGTON
FOR
EXPANSION OF CONSTRUCTED WETLAND FOR HABITAT ENHANCEMENT AND
SEDIMENT CONTROL
AT NAVAL SUPPORT FACILITY DAHLGREN, DAHLGREN, VIRGINIA**

August 1, 2013

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ATTACHMENT 1 – Project Site Figure

ATTACHMENT 2 – Naval District Washington Standards for Geographic Information
System (GIS) Deliverables

ATTACHMENT 3 –Design

1. BACKGROUND

Awarded in 2010, the objective of Cooperative Agreement (CA) N40080-10-LTC-0006 was to design and construct a wetland cell to provide habitat improvement and treatment of storm water from an approximate 162 acre watershed at Naval Support Facility Dahlgren (NSFDL). Calculations for the final design indicate it should achieve 40-50% of the treatment volume for the watershed. Subsequently in 2012, CA N40080-12-LTC-0005 was awarded to provide supplementary survey, design and construction services related to the construction of the first cell, and to design a complementary, second constructed wetland treatment cell. The goal for the second cell design was to fully integrate with and supplement the initial cell to achieve 100% of the recommended treatment volume for the watershed.

This Agreement is for the construction of the final design for the second treatment cell to achieve the storm water treatment capacity needed for the watershed. The overall proposed project will provide both habitat enhancements and water quality benefits for a significant amount of untreated storm water. This project implements, in part, Naval Facilities Engineering Command, Washington's (NAVFAC Wash) responsibilities pursuant to the Sikes Act Improvement Act (16 USC 670 et seq) and is in support of Executive Order 13508 – Chesapeake Bay Protection and Restoration.

Environmental Setting. The existing setting is an approximate 6.3 acre lawn area with a few scattered trees north of Sampson Road near the small craft docks on the Upper Machodoc Creek. Storm water pipes transverse the site buried beneath grass lawn surfaces with a few subsurface connection structures/boxes. The site is a former golf course, currently used for disc golf.

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

Allison Silver
NAVFAC Washington
1314 Harwood Street, SE Bldg. 212
Washington Navy Yard, DC 20374
Telephone: 202-685-3162
Email: allison.silver@navy.mil

Technical Point of Contact (TPOC)

Ms. Tara Meadows
NAVFAC Washington
1314 Harwood Street, SE Bldg. 212
Washington Navy Yard
Washington, D.C. 20374

Telephone: (202) 685-8415
Fax: (202) 685-0615
Email: tara.meadows@navy.mil

3. DURATION

The period covered by this scope of work (including permit acquirement, construction, submittal of final invoice, final invoice payment, etc.) is twenty-four (24) 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 Station Point of Contract (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.** 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.
- e.** The Cooperator 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.
- f.** 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 Agreement. The US Navy, at its discretion, may subject work plans, draft reports or draft manuscripts to external peer review.
- g.** The Cooperator shall inform, in writing (via email), the Contracting Officer (via TPOC and copy to 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.

- h.** The Cooperator shall inform, in writing (via e-mail) the SPOC (copy TPOC) 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 as soon as possible via SPOC.
- i.** 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.
- j.** The Contracting Officer, via the TPOC (and copy to SPOC), may request updated data (presented on maps, figures and/or tables) whenever the US Navy's need to obtain this information is before the next Monthly Report required under Section 8(c) of this Agreement. 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 US 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 US 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.
- k.** 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.
- l.** 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.
- m.** 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.

- n.** The Cooperator will be required to 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 or approve. 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.
- o.** The Cooperator shall coordinate the work to be accomplished with the TPOC and SPOC in the specified work area. 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.
- p.** Unexploded ordnance 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 of the exact location of the ordnance as soon as possible.
- q.** 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.

- r. 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.
- s. Access. The Cooperator (including subcontracted personnel as appropriate) will be required to obtain Rapid Gate Passes that will remain active for the duration of the project or daily visitor badges. Costs associated with Rapid Gate passes will be at the expense of the Cooperator. 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 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 will have to be requested at least one day in advance and requires the presence of the SPOC or TPOC to remain on site.
- t. 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 US citizens. Please note that large vehicle/equipment access is restricted to Gate B at this installation.
- u. Installation Permits. In addition to any regulatory required permits, the Cooperator shall coordinate with the SPOC to obtain any installation specific permits (i.e. Comprehensive Work Approval Permit (CWAP)) required prior to the initiation of any field work. Please be aware that CWAPs may take up to 14 days for approval and will be coordinated by the SPOC.
- v. 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.

- w. Any contact/discussion in regards to this project with regulatory agencies shall be initiated/conducted by the TPOC and SPOC.

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 Government.

6. SPECIFIC REQUIREMENTS

- a. Work Area: The primary area of work consists of an approximate 6.3 acre mowed grass lawn located north of Sampson Road as shown in Figure 1 – Project Site (attached).
- b. Task Definition:
 - i. Construction of the final design for the shallow water habitat design (Attachment 3) previously completed under CA N40080-12-LTC-0005. Construction services include the preparation of permit packages and acquisition of all relevant permits, insurance, etc. as described under Section 4 of this Agreement, oversight and construction of the Navy-approved final design, and deliverables including safety plans, work plans, as-builts, etc., as discussed in Section 8 of this Agreement. Please note the construction entrance shown on the plans is conceptual and an alternate location should be considered as a historic brick sidewalk is present parallel to Welsh Road in this area. If entrance off Welsh Road is necessary, the historic brick sidewalk will need to either be protected or removed and reinstalled.
 - ii. The Cooperator shall prepare all draft and final permit application packages for the final design. All permit packages shall be submitted to the Contracting Officer via the TPOC (copy to SPOC) for review, comment and Navy signature routing (as appropriate), prior to finalization.
 - iii. 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 or unless a stockpile location is identified at the installation, is to be taken off the base and disposed properly. It is the Navy's intent to reuse excavated material as much as appropriate within the design. At its discretion, the Navy may designate stockpile locations at the installation either Mainside or the Explosives Experimental Area (commonly referred to as "Pumpkin Neck"). The decision regarding the use of stockpile areas will be made at kickoff. With regard to excavated material handling, the Cooperator's proposal should include pricing for both offsite disposal and transportation to designated on-installation stockpiles.
- c. Meetings

- i. Pre-Proposal Conference: A pre-proposal conference will be held on 19 August 2013 at 10:00am EST. In order to be granted access to the base, all potential attendees must email allison.silver@navy.mil no later than 09 August 2013 at 2:00pm EST with the following information: Full Name, Social Security #, Date of Birth, City of Birth, Country of Birth. Attendees who email their information by the due date/time will be given instructions on where to meet the day of the conference.
- ii. Kick-off Meeting: A kick-off meeting between the Cooperator, Contracting Officer, the TPOC, the SPOC should be arranged by the Cooperator within fifteen (15) days (or earlier) from the date of award of the Agreement. The meeting shall primarily discuss the requirements of the Agreement, including the Safety Plan and Work Plan, as stipulated in Section 6d. Additionally, the Cooperator shall provide a preliminary construction sequence/schedule at the kickoff meeting for discussion at the meeting.
- iii. Site Visits: Site visits shall be arranged by the Cooperator as needed to complete the tasks under the Agreement, or as requested by the TPOC and/or SPOC.
- iv. Progress Meetings: The Cooperator shall be available throughout the Agreement period to the TPOC and/or SPOC in such matters regarding the tasks to be completed under the Agreement. At a minimum, the Cooperator will submit monthly status reports, via e-mail, to the TPOC/SPOC.

d. Schedule and Submittals

- i. Safety Plan: The Cooperator shall submit one (1) hardcopy and one (1) electronic copy (via e-mail) to the SPOC (copy to the TPOC) within sixty (60) days or less of the kickoff meeting 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. A final approved safety plan will be provided by the Cooperator within 120 days from award. 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. However, the Safety Plan may include personal protective equipment (PPE) requirements, installation emergency POC and any conditions that would require an immediate work stoppage and a site evaluation by installation safety personnel.
- ii. Work Plan/Schedules: The Cooperator shall submit a draft work plan (via e-mail) to the TPOC and SPOC within 120 days or less of the Award. The Navy will review and return comments within 15 days. Following Navy comment receipt, the Cooperator will provide a final work plan within thirty (30) days. In addition to the initial construction sequence/schedule provided at the kickoff meeting, schedules shall be updated and submitted by the Cooperator electronically (via e-

mail) to the TPOC and SPOC monthly (submission as part of the monthly progress report is permitted) or on request from the TPOC.

- iii. **Monthly Reports:** Two (2) electronic copies of a monthly progress report are due by the seventh (7th) 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. Electronic copies of these reports shall be concurrently submitted to the TPOC and the SPOC via e-mail. The progress report shall include, at a minimum, Agreement number, report date, report period, project name, names of investigators, meeting minutes (minutes shall be taken by the Cooperator and shall include the date/time/location the meeting was held, attendees, relevant discussion notes, etc.), work performed during 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.
 - a) **Meeting minutes** – Please note Cooperator shall submit draft meeting minutes electronically only to the TPOC and SPOC within two (2) weeks of the meeting occurrence. The TPOC and SPOC will provide comment within two (2) weeks of receipt of draft minutes. Final meeting minutes may be included in the next monthly progress report submittal.
- iv. **Schedule Summary:** Project tasks shall be completed in accordance with the following schedule.

Submittal	Due Date
Agreement Award	Cooperative Agreement Award (CAA)
Kick Off Meeting/Preliminary Schedule	CAA + 15 days
Draft Work/Safety Plan	CAA + 120 days
Final Work/Safety Plan	CAA + 120 days
Construction Start	CAA + 10 months (or sooner)
Final/As Builts	CAA + 24 months (or sooner)

- e. **Data:** All databases containing raw data and all associated electronic data summary and analytical files shall be formatted in Excel, Word, or any compatible Microsoft database software and submitted to the TPOC and SPOC (via CD-ROM). Microsoft ACCESS files shall include all queries, reports, tables etc.
- f. **GIS Data:** See Attachment 2

- g. 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 Virginia North State Plane NAD_FIPS_4501_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.

7. 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 Government will provide a map or information indicating areas of special concern, i.e. areas that may contain protected cultural resources, if available.
- c. The Government 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.

8. 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 (more than or equal to \$100) purchased using Agreement funds remains the property of the Navy at the completion of the Agreement. The final deliverable shall include an inventory of all equipment purchased less than or equal to \$100, with the name of make, model, serial number, and maintenance records.

9. 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 (via the Contracting Officer) 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 (copy provided to the SPOC and TPOC via e-mail) explaining what information is to be disclosed or used, the reason for the disclosure or purpose for which information or data will be used and to whom the information will be disclosed. Within thirty (30) days from receipt of the request, the SPOC will issue a written recommendation to the TPOC, who will then forward the recommendation to the Contracting Officer for a decision. If no action is taken within thirty (30) days from receipt of the request, the request will be forwarded to the higher management levels of the NAVFACENGCOM Washington for resolution.
- 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 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) hardcopies of published manuscripts, and at least one (1) electronic copy slides and/or poster presentation 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/or SPOC in the development of the Agreement’s Scope of Work; its goals, objectives, experimental sampling design, data interpretation, review of technical reports etc. 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 join authors of the manuscript and technical presentation. Appropriateness of

joint authorship is to be determined by references 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 Agreement.

10. 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 laws and regulations.

11. 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 a 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 of 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. Advances in excess of expenses incurred must be returned once all work specified in the agreement is complete. Advances must be returned with the Contractor Release Form at the end of the Agreement.
- e. 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.
- f. 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 Sec 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.

- g. 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.
- h. 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.
- i. 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.
- j. 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.
- k. 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 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.

12. GEOGRAPHIC INFORMATION SYSTEM (GIS) DELIVERABLES

- a. Mapping requirements:
 - i. All GIS data must adhere to the standards in Appendix 1 and the requirements listed herein.
 - ii. Construction drawing deliverables shall be reviewed for accuracy and completeness by a NFWASH 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 be delivered on disc (CD-ROM or DVD) to the government for Quality Assurance (QA), and the government will have two (2) weeks to QA the data and then the Cooperator will have two (2) 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.

ATTACHMENT 1 – Project Site Figure



Attachment 2: Naval District Washington Standards for Geographic Information System (GIS) Deliverables.

All GIS deliverables will be created and submitted in accordance with the current NAVFAC GIS Data Guide GIS Data Deliverable Specifications (attached herein). All data collection should conform to Field Collection grade Digitizing/Conversion collection procedures as specified by task or the project as a whole.

GIS Data Deliverable Specifications
(see contract SOW)

1. Overview:

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

2. Deliverable Requirements:

A Note About CAD: All CAD drawings should conform to AEC CAD Standards as well as any specific standards set forth in NAVFAC's Engineering Design Guidelines. CAD drawings may be accepted as GIS deliverables provided that the drawings adhere to the following requirements regarding the coordinate system, metadata, and data integrity:

3. Projected Coordinate System

All geospatial data stored by the GRC resides in the appropriate State Plane coordinate system and Zone for the area of interest, NAD83datum, Feet units. The Region's geospatial data collection is comprised of data from Maryland, Virginia, and the District of Columbia.

4. Metadata

The Cooperator will turn over, at a minimum, metadata for each feature class in XML format. The following elements of the FGDC Content Standard for Digital Geospatial Data (CSDGM) that must be included as part of the deliverable. Feature-level metadata may be required at the discretion of the government. Details on the standard can be found at <http://www.fgdc.gov/metadata/geospatial-metadata-standards>.

- a. Contact Details
 - i. Contact information for the data steward
 - 1. Person

2. Organization
 3. Position
 4. Telephone
 5. Email
 - ii. Description – characterization of the data
 1. Abstract
 2. Purpose
 - iii. Time Period - explains how current the dataset is
 1. Currentness Reference
 2. Date
 - iv. Keywords – word/phrase descriptors of the data
- b. Data Quality
 - i. Positional Accuracy – accuracy assessment of the data
 1. Horizontal Accuracy Report
 2. Vertical Accuracy Report (if applicable)
 - ii. Source Information – list of sources and a short citation of each
 1. Source Citation (Details)
 - a. Title
 - b. Originator
 - c. Publication Date
 2. Process Step – an explanation of how/when the data was created
 - a. Process Description
 - b. Process Date
- c. Spatial Reference
 - i. Horizontal Coordinate System
 - ii. Vertical Coordinate System (if applicable) – vertical datum information
 1. Datum Name
 2. Distance Units

5. Data Integrity

Data accuracy standards for all deliverables will be in accordance with those set forth in the section entitled 'Data Collection Procedures'. All deliverables should include an accuracy report in the metadata.

The Cooperator shall employ appropriate QA/QC standards to ensure that data is topologically correct, accurate and complete (to include):

- No erroneous overshoots, undershoots, dangles or intersections in the line work
- Point and line features will be snapped together where appropriate to support networks. For example, do not break linear features for labeling or other aesthetic purposes.
- Lines should be continuous and point features should be digitized as points. For example, point features, such as manholes, should not be drawn using only a circle (polygon) to represent its location. Preferably, use an attribute block symbol that has an insertion point in the center of the manhole.
- No sliver polygons

- Digital representation of the common boundaries for all graphic features must be coincident, regardless of feature layer
- Geometric network connectivity must be maintained for utility networks.

A summary of the methods used to correct inconsistencies and any remaining errors by case should be included in the metadata under the 'Logical Consistency Report' and 'Completeness Report' sections.

6. Data Model

The geodatabase schema shall follow the GIS Data Guide implementation of the SDSFIE data model and data layers will be captured accordingly. Information on the SDSFIE data model can be found at: <https://sdsfie.org>.

If new data is being created the Cooperator must 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, MS Word, PDF. Local attributes (meeting SDS experienced level) will require precise schema definitions.

7. Government Furnished Materials

The Government will provide the Cooperator access to necessary geospatial data, reports, schematics, or other pertinent information either through the regional NAVFAC GRC, or a data copy upon completion of the appropriate request forms and/or security information. All Cooperators are required to request an account from the regional GRC at the start of the contract.

The Cooperator must verify with the GRC that they are working with the most recent version of the dataset at the beginning of each contract and must delete any copies of data in their possession at the end of each contract.

When requesting data from the GRC, the Cooperator will identify the current SDSFIE data layer names or know which data layers they require. The government POC will be contacted prior to the release of any information to verify requirements. A non-disclosure agreement may need to be completed prior to the release of any data.

8. Data Collection Procedures

All data collection must include:

Feature Attributes: The Cooperator shall identify the classification, type, location, ID number, and any other necessary attributes (specified by the Government) for all new/updated/edited features first by field verification and then by existing sources.

Metadata must include an accuracy statement at the 90% or 95% confidence interval. Accuracy statements should include the method of determination, preferably from a recognized standard

such as National Standard for Spatial Data Accuracy (NSSDA) (as outlined in “Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy,” published by the Federal Geographic Data Committee (FGDC), dated July 1998).

9. Field Collection

Where field data collection is stipulated in the contract, the Cooperator 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).

At a minimum, the Cooperator shall provide, resource grade GPS collection at an accuracy level of $\pm < 1\text{m}$ and shall use differential correction to target accuracies of $\pm .5\text{ m}$.

Where appropriate (as stipulated in the contract or as otherwise determined by the Government), the Cooperator shall use survey grade GPS, at an accuracy level of $\pm 20\text{cm}$. 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.

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 should 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 will be collected at every vertex of the feature and processed as a polygon.

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.

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.

Digitizing/Conversion

Where Digitizing/Conversion is stipulated in the contract, the Cooperator 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

10. Government Review

The Government shall review the submitted data and documentation upon completion of all stated work. Missing or incomplete items will be documented and forwarded to the Cooperator for completion. Failure to adhere to any of the stated delivery specifications could result in rejection of deliverables and nonpayment. Cooperators should, at a minimum, submit data and documentation samples at 25% and 75% project completion to avoid the rejection of final deliverables.

ATTACHMENT 3 – DESIGN
<<<SEE NEXT PAGE>>>

UPPER MACHODOC CREEK PHASE II STORMWATER RETROFIT

DESIGN DEVELOPMENT PLANS

NAVAL SUPPORT FACILITY DAHLGREN

KING GEORGE COUNTY, VIRGINIA

OWNER/DEVELOPER

NAVAL SUPPORT FACILITY - DAHLGREN
NPDES ID # VA0021067
ATTENTION: DR. THOMAS WRAY OR MS. TARA MEADOWS

BASE TOPOGRAPHY

BASE TOPOGRAPHY AND UTILITIES PROVIDED BY LANDTECH RESOURCES, INC.
205-E BULIFANT BLVD.
WILLIAMSBURG, VIRGINIA 23188
PHONE: (757) 565-1677
FAX: (757) 565-0782
ATTENTION: MATT CONNOLLY, L.S.

ENVIRONMENTAL ENGINEER

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
5209 CENTER STREET
WILLIAMSBURG, VIRGINIA 23188
PHONE: (757) 220-6869
FAX: (757) 229-4507
ATTENTION: SCOTT BLOSSOM, P.E.

IN COORDINATION WITH

TIDEWATER RESOURCE CONSERVATION & DEVELOPMENT COUNCIL (RC&D)
ATTENTION: MR. MAURICE LYNCH

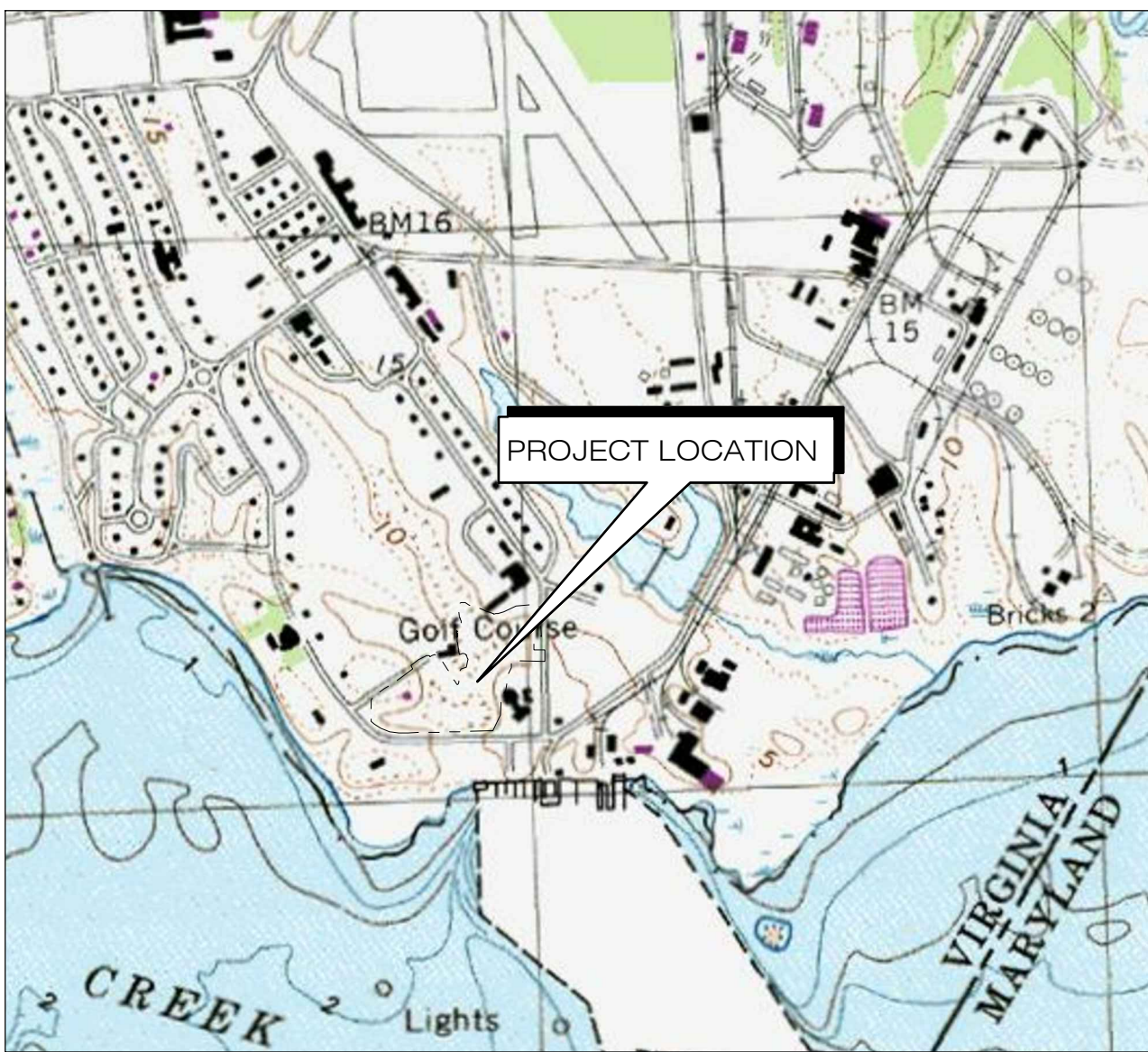
STATISTICAL DATA

PHASE II PROJECT AREA: 9.53 ACRES
LIMITS OF DISTURBANCE: 9.53 ACRES
AREA OF GRADING: 6.63 ACRES

SHEET INDEX:

- 1.) COVER & EXISTING CONDITIONS
- 2.) PROPOSED STORMWATER RETROFIT
- 3.) PLANTING AND STABILIZATION PLAN
- 4.) EROSION AND SEDIMENT CONTROL PLAN
- 5.) NOTES AND DETAILS (AND DEMOLITION PLAN)

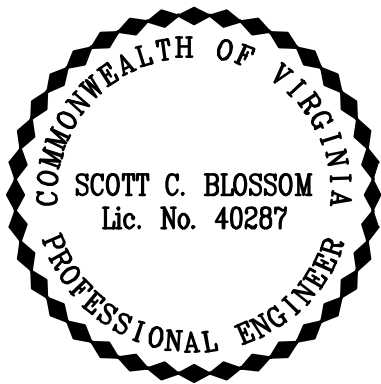
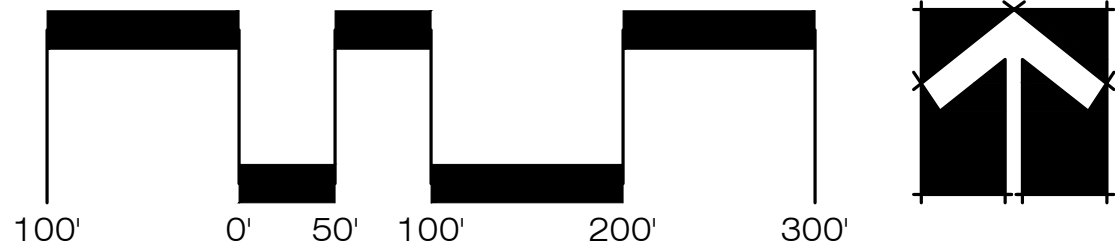
VICINITY MAP: 1" = 1000'



USGS 7.5 MINUTE SERIES TOPOGRAPHIC MAP, DAHLGREN, VA QUADRANGLE,
1968 (REV 1983)
LATITUDE - 38° 19' 16.06" N
LONGITUDE - 77° 02' 14.28" W



CONTOUR INTERVAL = 1 FOOT



DATE: 7/03/13
FIRST SUBMITTAL

REVISIONS:

DATE	REVISIONS	DATE
7/31/13	REVISED PER	
	NAVY COMMENTS	

PROJECT NARRATIVE:

THIS PLAN PRESENTS PROPOSED PHASE II CONSTRUCTED STORMWATER WETLAND AND ASSOCIATED HABITAT IMPROVEMENTS AT NAVAL SUPPORT FACILITY DAHLGREN, KING GEORGE COUNTY, VIRGINIA. THE DESIGN IS PREPARED UNDER THE ASSUMPTION THAT THE PROPOSED STORMWATER RETROFIT IS A VOLUNTARY IMPROVEMENT BY THE NAVAL FACILITY TO IMPROVE THE WATER QUALITY OF STORMWATER RUNOFF FROM THE CONTRIBUTING 161-ACRE DEVELOPED WATERSHED. THE COMBINED STORAGE VOLUME OF PHASES I AND II MEET THE FULL TREATMENT VOLUME (TV) REQUIRED PER STATE STANDARDS FOR LEVEL 1 CONSTRUCTED STORMWATER WETLAND DESIGN.

EXISTING CONDITIONS:

THE EXISTING SITE IS CHARACTERIZED BY MAINTAINED TURF GRASS ADJACENT TO SAMPSON ROAD TO THE SOUTH, EXISTING BUILDINGS TO THE EAST AND NORTH, AND EXISTING PARKING LOT TO THE NORTHWEST. ALTHOUGH MULTIPLE CULVERTS AND DROP INLETS EXIST ON-SITE, THE MAJORITY OF THE CONTRIBUTING WATERSHED APPEARS TO DRAIN THROUGH AN EXISTING 54 INCH X 36 INCH CULVERT.

PROPOSED CONDITIONS:

HYDROLOGIC ANALYSIS OF THE CONTRIBUTING WATERSHED WAS COMPLETED IN ORDER TO EVALUATE PROJECTED PEAK DISCHARGE RATES AND VOLUMES FOR SIZING OF THE PROPOSED WETLAND AND ASSOCIATED OUTFALL STRUCTURE. THE EXISTING STORMWATER SEWER WILL BE RETROFITTED BY DAYLIGHTING TWO (2) CULVERTS INTO RIPRAP OUTFALL / ENERGY DISSIPATORS PRIOR TO DISCHARGE TO THE PROPOSED STORMWATER WETLAND. A CIRCUITOUS FLOW PATH THROUGHOUT THE PROPOSED MULTI CELL WETLAND WILL INCLUDE DEEP POOLS OF 2.5 TO 4.5 FT DEPTHS AND HIGH MARSH BENCHING TO PROVIDE MAXIMUM TREATMENT CAPACITY WITHIN THE GIVEN SITE CONSTRAINTS.

THE COMBINATION OF THE FOREBAY AND MULTIPLE DEEP WATER CELLS ALONG THE FLOW PATHS WILL PROVIDE STORAGE FOR SETTLED PARTICLES AND THEIR ASSOCIATED POLLUTANTS, WHILE NATIVE VEGETATIVE UPTAKE INTEGRATED WITH AQUATIC BENCHING WILL PROVIDE AN ADDITIONAL LEVEL OF TREATMENT. THIS WETLAND DESIGN WILL PROVIDE THE SHALLOW WATER DEPTHS NECESSARY FOR WETLAND VEGETATION, WHILE PROVIDING THE WATER TREATMENT VOLUME NECESSARY FOR STORMWATER TREATMENT. (SEE STORMWATER CALCULATIONS SHEET 2) THE PROPOSED OUTFALL CONSISTS OF A MODIFIED EXISTING 8' X 10' INLET BOX USING TWO EXISTING CULVERTS BENEATH SAMPSON ROAD AS THE PRIMARY OUTFALL. BASED ON MODELING, RUNOFF IS EXPECTED TO INUNDATE EXISTING STORM DRAIN PIPES DURING LARGE EVENTS BUT IS EXPECTED TO DEWATER WITHOUT SURCHARGING DROP INLETS AT THE SURFACE IN THE UPSTREAM WATERSHED.

THE EXISTING DISC GOLF COURSE IS INTEGRATED INTO THE PROPOSED DESIGN AROUND THE PERIMETER OF THE PROPOSED WETLAND IN ORDER TO PROVIDE AN OPPORTUNITY TO MONITOR AND UNDERSTAND THE SITE SPECIFIC WETLAND ECOLOGY AS IT DEVELOPS.

THESE PHASE II IMPROVEMENTS UP SLOPE OF SAMPSON ROAD WILL FUNCTION IN CONJUNCTION WITH PHASE I CURRENTLY UNDER CONSTRUCTION DOWNSTREAM.

GENERAL NOTES:

1. SEE SHEET 5 FOR SUMMARY OF EXISTING CONDITIONS AND PROPOSED INFRASTRUCTURE RETROFIT PLAN.

2. DURING THE NOVEMBER 16, 2012 ONSITE EVALUATION, WATER TABLE ELEVATIONS WERE GENERALLY ENCOUNTERED BETWEEN 6" TO 24" DEEP. SEASONAL VARIATION IS EXPECTED, WITH WATER TABLE ELEVATIONS EXCEEDING 60" DURING SUMMER MONTHS. SOIL TEXTURES ONSITE ARE VARIABLE DUE TO THE DISTURBANCE HISTORY OF THE SITE.

3. SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT TIME OF CONSTRUCTION TO ENSURE THEIR INTENDED PURPOSE IS ACCOMPLISHED. DIVISION OF CODE COMPLIANCE APPROVAL WILL BE REQUIRED FOR OTHER DEVIATIONS FROM THE APPROVED PLANS.

4. THE CONTRACTOR SHALL PLACE SOIL STOCKPILES AT THE LOCATIONS SHOWN ON THIS PLAN OR AS DIRECTED BY THE OWNER. SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES.

5. THE CONTRACTOR SHALL COMPLETE INFRASTRUCTURE RETROFITS AFTER INITIAL STABILIZATION IS ACHIEVED. OUTFALL DITCHES FROM DRAINAGE STRUCTURES SHALL BE STABILIZED IMMEDIATELY AFTER CONSTRUCTION OF SAME. THIS INCLUDES INSTALLATION OF EROSION CONTROL MEASURES.

6. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

7. IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY, OR FEBRUARY, STABILIZATION SHALL CONSIST OF TEMPORARY SEEDING AND MULCHING IN ACCORDANCE WITH VESCH SPECIFICATIONS 3.31 AND 3.35. A 50/50 MIX OF ANNUAL RYEGRASS AND WINTER RYE SHALL SERVE AS THE TEMPORARY SEED MIX UNTIL THE PERMANENT PLANTING PLAN CAN BE INSTALLED.

8. THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION, ON THIS PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE GRASS COVER FROM A PROPERLY PREPARED SEEDBED CONTAINING THE SPECIFIED AMOUNTS OF SEED, LIME, AND FERTILIZER IN ACCORDANCE WITH VESCH SPECIFICATION 3.32. PERMANENT SEEDING, IRRIGATION SHALL BE PROVIDED AS NECESSARY TO ENSURE ESTABLISHMENT OF GRASS COVER. USE OF FACILITY WATER FOR IRRIGATION IS TO BE APPROVED BY NAVFAC UEM BRANCH. BACKFLOW DEVICES MUST BE APPROVED BY THE UEM BRANCH. WATER METERING MAY BE REQUIRED.

9. ALL SLOPES STEEPER THAN 3:1 SHALL REQUIRE THE USE OF EROSION CONTROL BLANKETS SUCH AS JUTE MATTING TO AID IN THE ESTABLISHMENT OF A VEGETATIVE COVER. INSTALLATION SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND MANUFACTURER'S INSTRUCTIONS. NO SLOPES SHALL BE CREATED STEEPER THAN 2:1.

10. INLET PROTECTION IN ACCORDANCE WITH SPECIFICATION 3.07 SHALL BE PROVIDED FOR ALL STORM DRAIN INLETS AS DEEMED APPLICABLE BY THE OWNER.

11. TEMPORARY EROSION CONTROL MEASURES ARE NOT TO BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED AND THE OWNER OR RESPONSIBLE E&S INSPECTOR DEEMS THE PROJECT COMPLETED FROM AN E&S PERSPECTIVE. AFTER STABILIZATION IS COMPLETED AND AFTER APPROVAL, ALL MEASURES SHALL BE REMOVED WITHIN 30 DAYS. TRAPPED SEDIMENT SHALL BE SPREAD AND SEEDDED.

12. MINOR MODIFICATIONS TO OUTFALL CONFIGURATIONS MAY BE REQUIRED IN FIELD TO MATCH SEASONAL WATER TABLE TO INTENDED WETLAND ELEVATIONS.



5209 Center Street
Williamsburg, Virginia 23188
(757) 220-6869

1011 Boulder Springs Drive, Suite 225
Richmond, Virginia 23225
(804) 267-3474

150 Riverside Parkway, Suite 301
Fredericksburg, Virginia 22406
(540) 785-5544

Environmental Consultants

W:\WIBGcad\4400s\4486 - Machodoc Creek Stormwater Analysis\Site Plans\Phase II\4486 - Machodoc Creek Site Plans Phase II (7-30-13).dwg

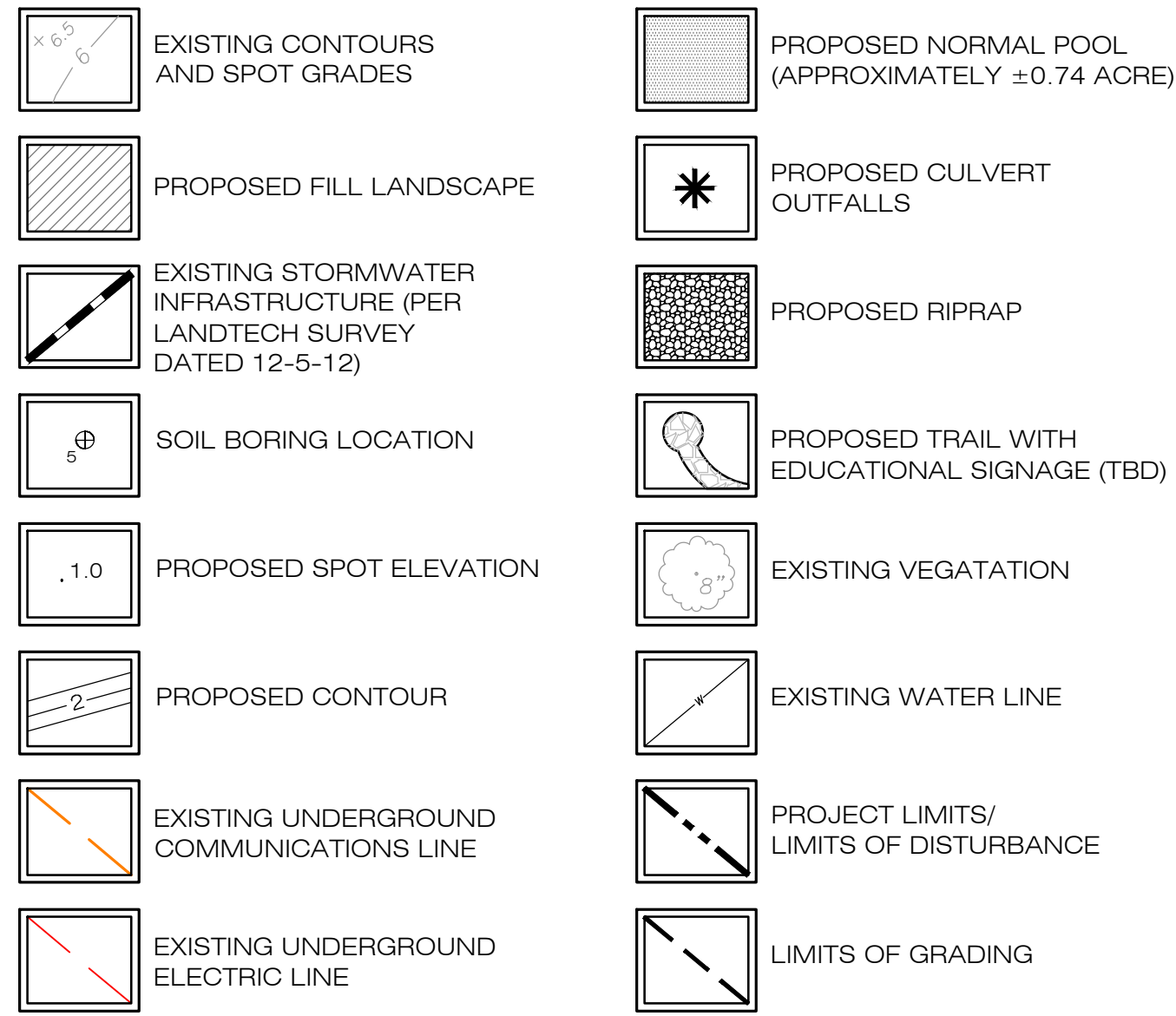
STORMWATER MANAGEMENT CALCULATIONS

1.) DRAINAGE AREA			
TOTAL AREA = 161 AC, CN = 85, Tc = 1.2 HR			
• FOREST = 5.89 AC			
• MANAGED TURF = 113.11 AC			
• CONNECTED IMPERVIOUS COVER = 31.60 AC			
• DISCONNECTED IMPERVIOUS COVER = 10.40 AC			
2.) WATER QUALITY VOLUME OBJECTIVE			
(A.) 1998 REGULATORY OBJECTIVES			
WQV = (31.60 AC) X (0.5 IN) X (1 FT/12 IN) = 57,354 CF			
2 WQV = 114,708 CF			
(B.) 2011 REGULATORY OBJECTIVES			
TV = 236,022 CF			
3.) INTERNAL DESIGN GEOMETRY			
DEEP POOLS: (>1.5 FT DEPTH) =	PHASE II	% OF TOTAL AREA	PHASE I
LOW MARSH: (0.5 TO 1.5 FT DEPTH) =	21,506 SF	24%	8,959 SF
HIGH MARSH: (<0.5 TO 0.5 FT HEIGHT) =	12,590 SF	14%	6,177 SF
TOTAL SURFACE AREA =	55,410 SF	62%	15,109 SF
FLOW PATH LENGTH (APPROXIMATE) =	89,506 SF		30,245 SF
	265 FT DURING HIGH FLOWS		250 FT DURING HIGH FLOWS
	460 FT DURING LOW FLOWS		500 FT DURING LOW FLOWS
4.) STORAGE CAPACITY			
WET STORAGE VOLUME PROVIDED (BELOW POOL SURFACE) =	PHASE II	PHASE I	TOTAL
EXTENDED DETENTION VOLUME PROVIDED (1 FT ABOVE POOL SURFACE) =	133,991 CF	29,550 CF	163,541 CF
	116,279 CF	30,887 CF	147,166 CF
TOTAL STORAGE =	250,270 CF	60,437 CF	310,707 CF
	5.745 AC-FT	1.387 AC-FT	7.132 AC-FT
5.) REMOVAL EFFICIENCIES (VIRGINIA RUNOFF REDUCTION METHOD)			
EXISTING PHOSPHORUS REMOVAL BY 10.40 AC OF IMPERVIOUS DISCONNECT = 13.87 LB/YR			
EXISTING NITROGEN REMOVAL BY 10.40 AC OF IMPERVIOUS DISCONNECT = 102.85 LB/YR			
EXISTING TOTAL SUSPENDED SOLIDS REMOVAL (50%) BY 10.40 AC OF IMPERVIOUS DISCONNECT = 1,688 LB/YR			
EXPECTED REMOVAL BY LEVEL 1 WETLAND WITH VOLUME OF 236,022 CF			
PHOSPHORUS = 62.54 LB/YR			
NITROGEN = 178.96 LB/YR			
TOTAL SUSPENDED SOLIDS (85%) = 15,948 LB/YR			
PHOSPHORUS REMOVAL BY PROPOSED PHASE II = 62.54 LB/YR X (250,270/236,022) = 66.32 LB/YR			
NITROGEN REMOVAL BY PROPOSED PHASE II = 178.96 LB/YR X (250,270/236,022) = 189.76 LB/YR			
TOTAL SUSPENDED SOLIDS REMOVAL (85%) BY PROPOSED PHASE II = 15,948 LB/YR X (250,270/236,022) = 16,911 LB/YR			
PHOSPHORUS REMOVAL BY PROPOSED PHASE I = 62.54 LB/YR X (60,437/236,022) = 16.01 LB/YR			
NITROGEN REMOVAL BY PROPOSED PHASE I = 178.96 LB/YR X (60,437/236,022) = 45.83 LB/YR			
TOTAL SUSPENDED SOLIDS REMOVAL (85%) BY PROPOSED PHASE I = 15,948 LB/YR X (60,437/236,022) = 4,084 LB/YR			
PHOSPHORUS REMOVAL BY COMBINED WETLANDS = 82.33 LB/YR			
NITROGEN REMOVAL BY COMBINED WETLANDS = 235.59 LB/YR			
SUSPENDED SOLIDS REMOVAL BY COMBINED WETLANDS = 20,995 LB/YR			
6.) REMOVAL EFFICIENCIES (CENTER FOR WATERSHED PROTECTION)			
PHASE II RUNOFF DEPTH CAPTURED = (12 INCH/FT X 5.745 AC-FT OF STORAGE) / 42.0 AC OF IMPERVIOUS = 1.64"			
FROM CWP CHARTS, 60% PHOSPHORUS REMOVAL AND 38% NITROGEN REMOVAL IS EXPECTED FOR PHASE II			
PHOSPHORUS REMOVAL BY PROPOSED PHASE II = 148.29 LB/YR LOAD X (0.60 REMOVAL) = 88.97 LB/YR			
NITROGEN REMOVAL BY PROPOSED PHASE II = 1060.86 LB/YR LOAD X (0.38 REMOVAL) = 403.13 LB/YR			
PHASE I RUNOFF DEPTH CAPTURED = (12 INCH/FT X 1.387 AC-FT OF STORAGE) / 42.0 AC OF IMPERVIOUS = 0.396"			
FROM CWP CHARTS, 37% PHOSPHORUS REMOVAL AND 23% NITROGEN REMOVAL IS EXPECTED FOR PHASE I			
PHOSPHORUS REMOVAL BY PROPOSED PHASE I = 148.29 LB/YR LOAD X (0.37 REMOVAL) = 54.87 LB/YR			
NITROGEN REMOVAL BY PROPOSED PHASE I = 1060.86 LB/YR LOAD X (0.23 REMOVAL) = 244.00 LB/YR			
TOTAL RUNOFF DEPTH CAPTURED = (12 INCH/FT X 7.132 AC-FT OF STORAGE) / 42.0 AC OF IMPERVIOUS = 2.04"			
FROM CWP CHARTS, 63% PHOSPHORUS REMOVAL AND 40% NITROGEN REMOVAL IS EXPECTED FOR THE TOTAL			
PHOSPHORUS REMOVAL BY COMBINED WETLANDS = 148.29 LB/YR LOAD X (0.63 REMOVAL) = 93.42 LB/YR			
NITROGEN REMOVAL BY COMBINED WETLANDS = 1060.86 LB/YR LOAD X (0.40 REMOVAL) = 424.34 LB/YR			
7.) WATER QUALITY ORIFICE DESIGN			
HYDROGRAPH VOLUME (FROM BENTLEY'S PONDPACK, TR-55) = 12,736 AC-FT = 554,780 CF			
FLOW AVERAGE = 554,780 CF / 24 HR = 6.42 CFS			
FLOW MAX = 2 X (6.42 CFS) = 12.84 CFS			
HYDRAULIC HEAD MAX = 1.0 FT			
ORIFICE AREA = Q/(C X SQRT (2GH)) = 12.84 / (0.6 X SQRT(2 X 32.2 X 1.00)) = 2.67 SF			
8.) ROUTED WATER SURFACE ELEVATIONS			
RETURN EVENT	PHASE II	CELL 1 (UPPER)	CELL 2 (LOWER)
1-YR	2.85 FT NAVD88	1.98 FT NAVD88	1.91 FT NAVD88
2-YR	3.21 FT NAVD88	2.21 FT NAVD88	2.14 FT NAVD88
10-YR	3.59 FT NAVD88	2.44 FT NAVD88	2.34 FT NAVD88
100-YR	5.36 FT NAVD88	2.78 FT NAVD88	2.66 FT NAVD88
9.) ROUTED FLOWS (CFS)			
RETURN EVENT	DA 1	DA 2	DA 3
1-YR	40.60	1.81	1.96
2-YR	50.07	2.32	2.62
10-YR	95.09	4.42	4.35
100-YR	193.02	9.81	6.88
PHASE I			
CELL 1	22.23	22.31	21.53
CELL 2 (SPILLWAY)	21.53	32.66	32.66
CELL 2 (EMERGENCY)	0.00	3.99	3.99
1-YR	40.60	1.81	1.96
2-YR	50.07	2.32	2.62
10-YR	95.09	4.42	4.35
100-YR	193.02	9.81	6.88

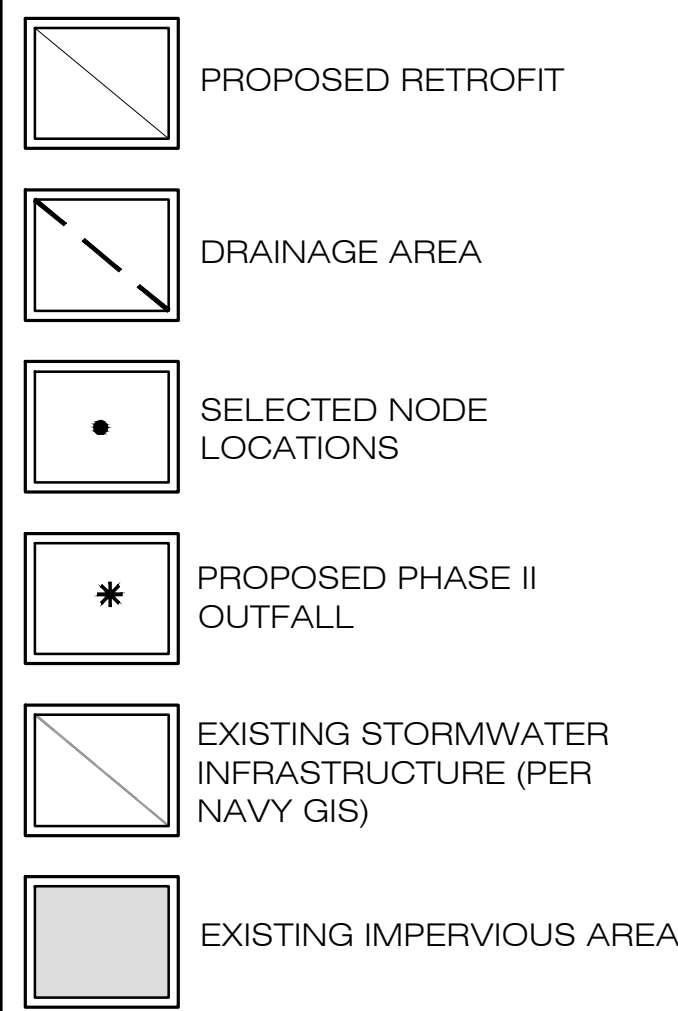
NOTE:

HYDROLOGIC AND
HYDRAULIC ROUTINGS
PREPARED WITH BENTLEY'S
PONDPACK USING STANDARD
TR-55 METHODOLOGY.

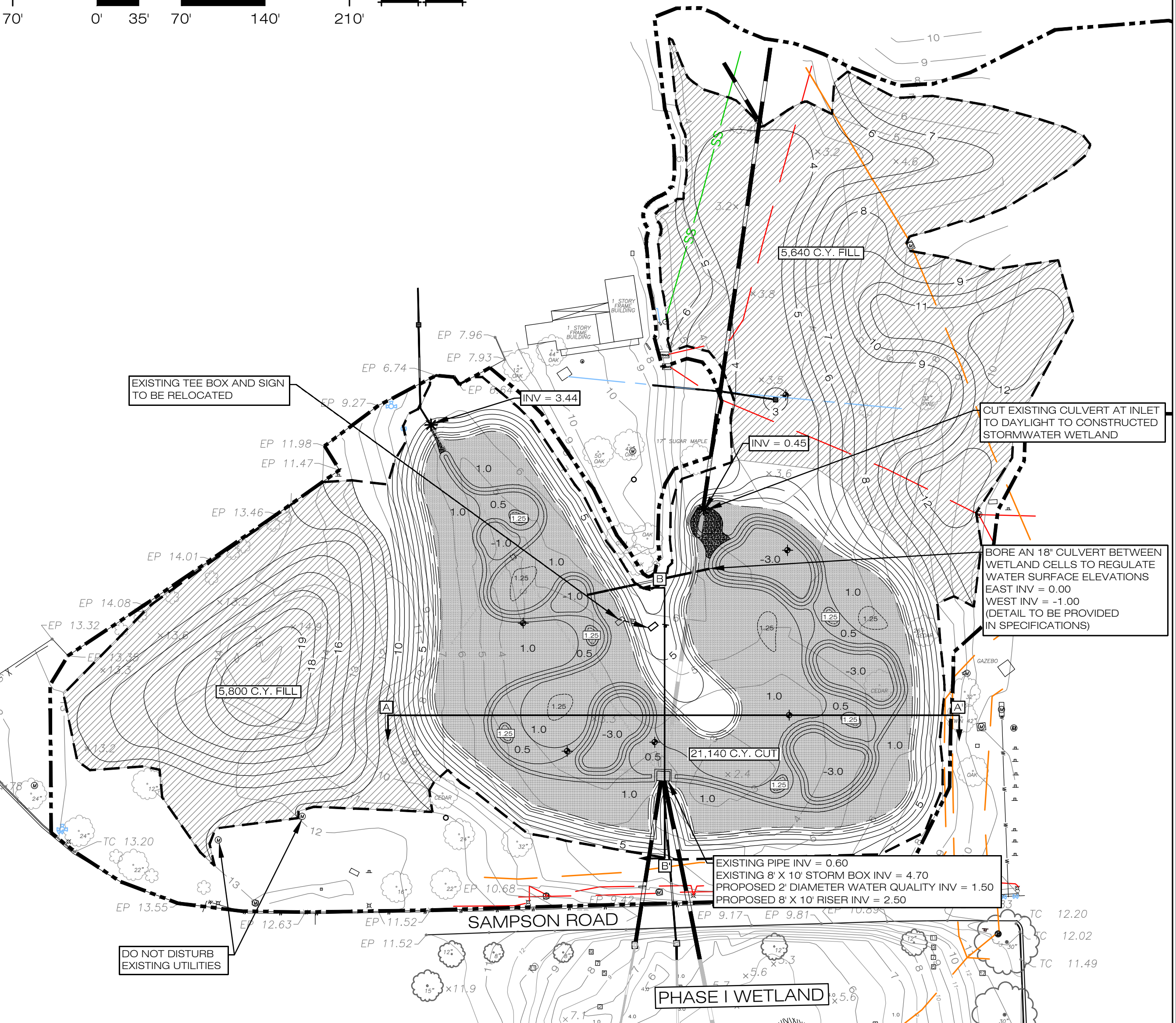
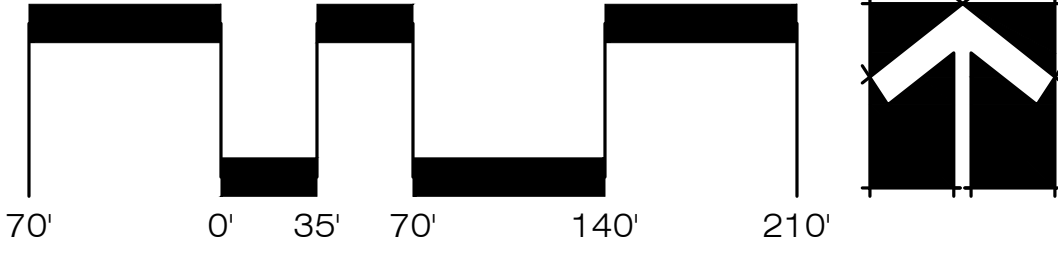
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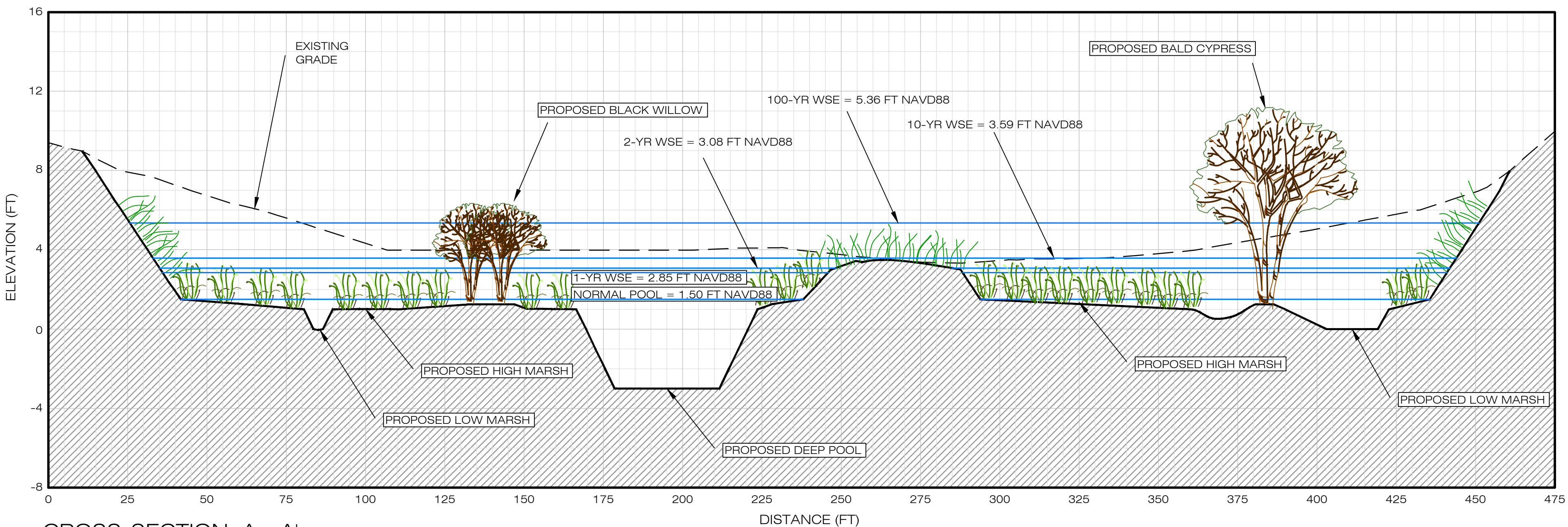
DRAINAGE AREA MAP



CONTOUR INTERVAL = 1 FOOT



A

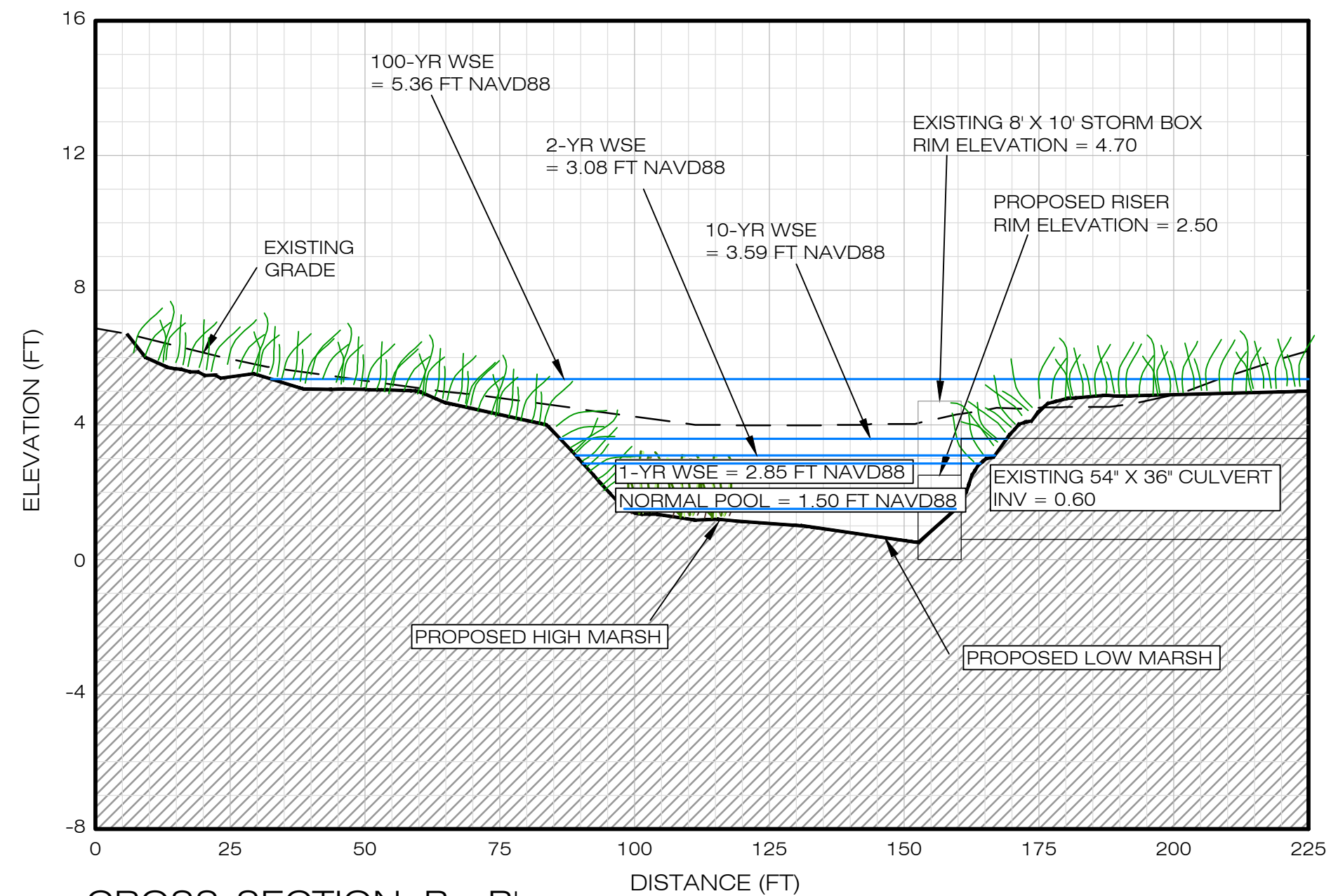


CROSS-SECTION: A - A'

VERTICAL SCALE: 1"=4' HORIZONTAL SCALE: 1"=25'

A'

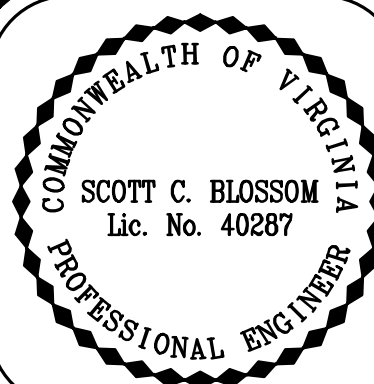
B



CROSS-SECTION: B - B'

VERTICAL SCALE: 1"=4' HORIZONTAL SCALE: 1"=25'

PROPOSED STORMWATER RETROFIT CONCEPT, PHASE II UPPER MACHODOC CREEK KING GEORGE COUNTY, VIRGINIA



REVISIONS:	
DATE:	
7/31/13	REVISED PER NAVY COMMENTS

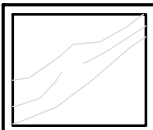
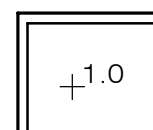
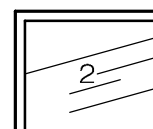
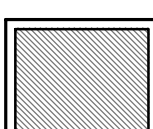
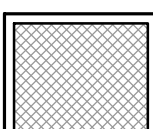
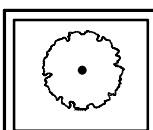
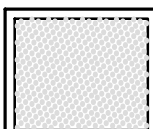
DRAWN BY:
DPT / AWI
DATE:
7/03/13
SCALE:
1"=40' FEET
SHEET:
JOB#: 4486

DESIGNED BY:
DPT/SCB
CHECKED BY:
SCB/CCK
SHEET:
2

5209 Center Street
Williamsburg, Virginia 23188
(757) 220-0609
1011 Boulder Springs Drive, Suite 225
Fredericksburg, Virginia 22405
(804) 267-3474
150 Riverside Parkway, Suite 301
Fredericksburg, Virginia 22406
(540) 785-5544
Environmental Consultants



LEGEND:

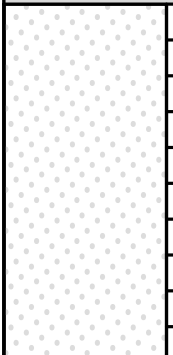
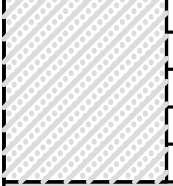
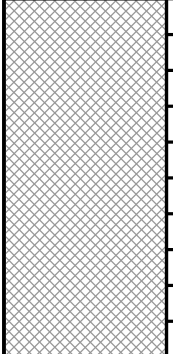
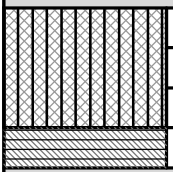
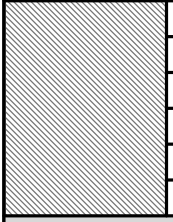
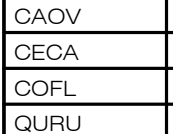
-  EXISTING CONTOURS
-  PROPOSED SPOT ELEVATION
-  PROPOSED CONTOUR
-  PROPOSED LOW MARSH
(±0.23 ACRE)
-  PROPOSED HIGH MARSH
(±1.25 ACRE)
-  PROPOSED UPLAND
PLANTING (±0.17 ACRE)
-  PROPOSED SEEDING
(±2.76 ACRE)

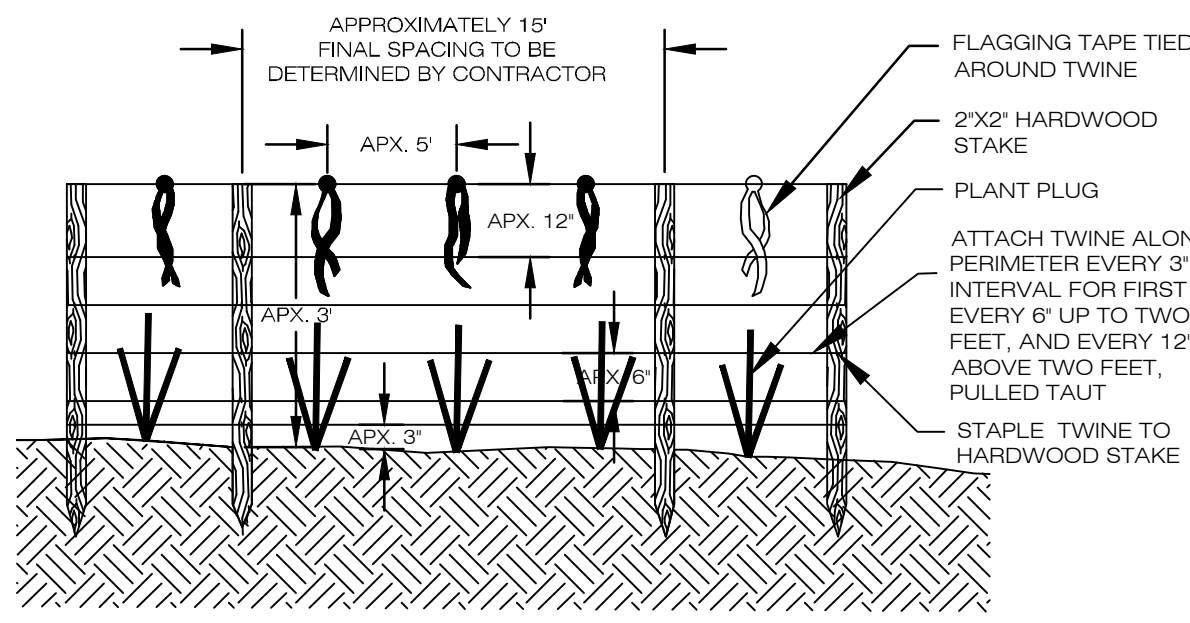


SHRUB AND TREE INSTALLATION NOTES:

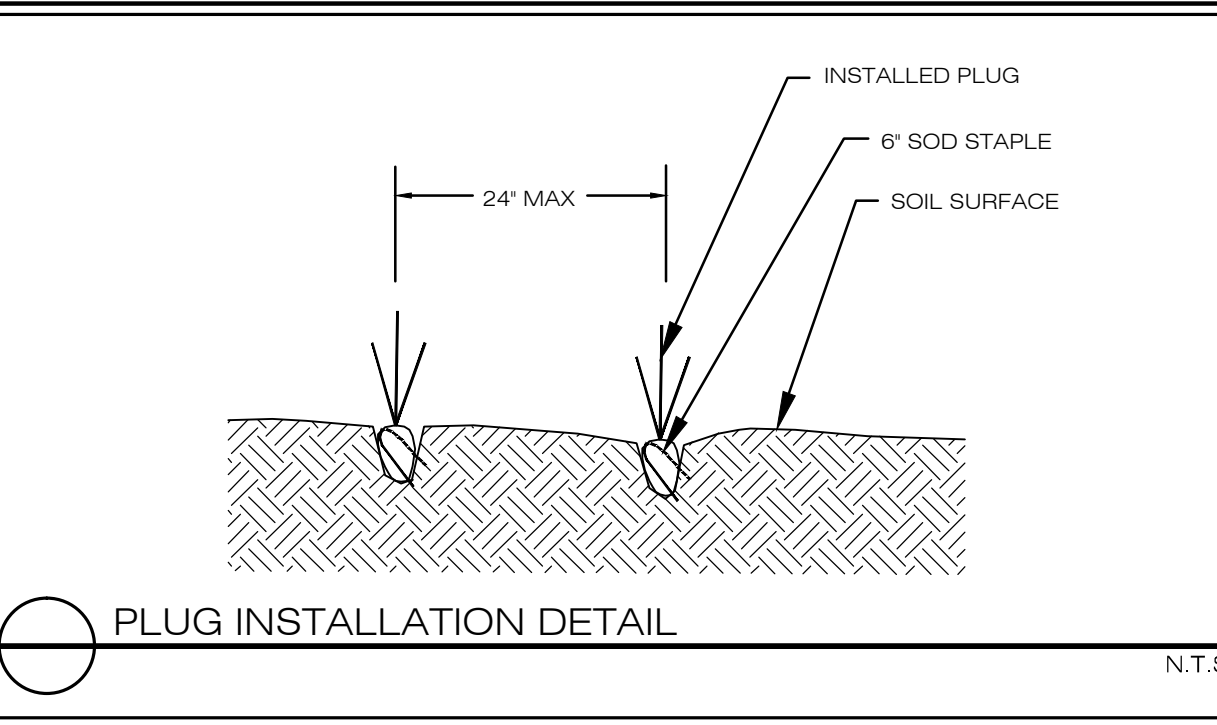
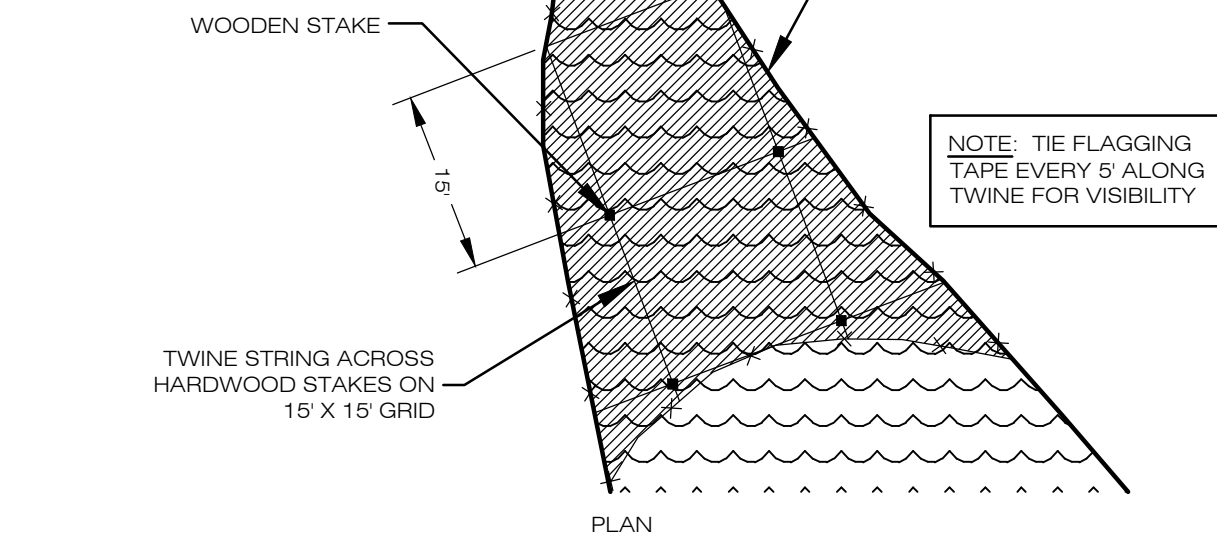
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS OF ALL EXISTING UTILITIES WITHIN THE PROJECT AREA PRIOR TO THE COMMENCEMENT OF PLANTING OPERATIONS.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT OF ALL WORK COVERED UNDER THESE PLANS.
 - ALL PLANT MATERIAL, UNLESS OTHERWISE SPECIFIED, SHALL BE UNIFORMLY BRANCHED AND HAVE A VIGOROUS ROOT SYSTEM. PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, AND FREE FROM DEFECTS, DECAY, DISEASES, INSECT PEST EGGS, AND ALL FORMS OF INFESTATION. ALL PLANT MATERIAL SHALL BE FRESH, FREE FROM TRANSPLANT SHOCK OR VISIBLE WILT. PLANTS DEEMED UNHEALTHY WILL BE REJECTED.
 - ALL PLANT MATERIAL SHALL MEET THE MINIMUM SPECIFICATIONS AND STANDARDS DESCRIBED IN THE CURRENT ISSUE OF "THE AMERICAN STANDARD FOR NURSERY STOCK", PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, 1250 I STREET, N.W., SUITE 500, WASHINGTON, D.C. 20005.
 - ALL CONTAINER STOCK SHALL HAVE BEEN PROPAGATED IN A CONTAINER LONG ENOUGH FOR THE ROOT SYSTEM TO HAVE DEVELOPED SUFFICIENTLY TO HOLD ITS SOIL. CONTAINER STOCK WITH POORLY DEVELOPED ROOT SYSTEMS WILL NOT BE ACCEPTED.
 - PLANTS WILL BE PREPARED FOR SHIPMENT IN A MANNER THAT WILL NOT CAUSE DAMAGE TO THE BARK, BUDS, BRANCHES, STEMS, OR OVERALL SHAPE OF THE STOCK. CONTAINER GROWN PLANTS WILL BE TRANSPORTED IN THE CONTAINERS IN WHICH THEY HAVE BEEN GROWN.
 - PLANTS NOT INSTALLED ON THE DAY OF ARRIVAL, ONSITE SHALL BE STORED AND PROTECTED BY THE CONTRACTOR. OUTSIDE STORAGE AREAS WILL BE SHADED AND PROTECTED FROM THE WIND AND SUN. PLANTS STORED ONSITE SHALL BE PROTECTED FROM ANY DRYING AT ALL TIMES BY COVERING THE BALLS OR ROOTS WITH MOIST SAWDUST, WET BURLAP, WOODCHIPS, SHREDDED BARK, PEAT MOSS, OR OTHER SIMILAR MULCHING MATERIAL.
 - NO SUBSTITUTIONS IN SIZE OR VARIETY OF PLANT MATERIAL WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.
 - VERIFY ALL DIMENSIONS IN THE FIELD. NOTIFY THE ENGINEER OF ANY VARIANCE FROM PLAN.
 - NO PLANTING IS TO OCCUR WHEN THE SOIL IS FROZEN.
 - WOODY HIGH MARSH PLANTINGS SHALL BE IN MINIMUM GROUPS OF FIVE BY SPECIES. THE CONTRACTOR MAY BE RESPONSIBLE FOR REPLANTING ANY PLANT MATERIAL INSTALLED WITHOUT APPROVAL BY THE ENGINEER.
 - HOLES FOR INDIVIDUAL PLANTINGS SHALL BE EXCAVATED TO PRODUCE VERTICAL SIDES AND FLAT BOTTOMS. ALL PLANTING HOLES SHALL HAVE ROUGHED, SCARIFIED SIDES AND BOTTOMS.
 - B&B OR CONTAINERIZED UPLAND PLANTS SHALL BE SET IN THE PLANTING PIT AT THE PROPER DEPTH ON TAMPED SOIL. SOIL REMOVED FROM THE PLANTING PIT AND AMENDED, BY THE ADDITION OF 1 GALLON OF COMPOST PER HOLE, SHALL THEN BE FILLED AROUND THE ROOTS AND TAMPED.
 - DURING PLANTING THE CONTRACTOR SHALL WATER EACH CONTAINERIZED PLANT INSTALLED WITH A MINIMUM OF 1 GALLON OF WATER, UNLESS OTHERWISE DIRECTED BY THE ENGINEER DUE TO EXISTING SITE CONDITIONS AND SATURATIONS.
 - APPLY SLOW RELEASE FERTILIZER TO ALL WOODY PLANTS OUTSIDE STORMWATER WETLAND AS PER MANUFACTURERS DIRECTIONS ON LABEL AT PLANTING.
 - THE CONTRACTOR SHALL RESTORE DISTURBED AREAS TO INDICATED FINAL GRADES IF DISTURBED BY THE INSTALLATION OF SHRUBS AND TREES.
 - ALL DISTURBED AREAS OUTSIDE THE HIGH AND LOW MARSHES SHALL BE STABILIZED WITH GENERAL STABILIZATION SEED MIX.
- PROJECT MAINTENANCE AND WARRANTY:
- CONTRACTOR SHALL MAINTAIN ALL SEEDED AREAS AND INSTALLED SHRUBS AND TREES WITHIN THE PROJECT LIMITS UNTIL FINAL ACCEPTANCE OF THE PROJECT BY THE ENGINEER.
 - CONTRACTOR SHALL PROVIDE A ONE (1) YEAR 100% SURVIVAL WARRANTY FOR ALL WOODY PLANT MATERIAL. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PROVIDING A GUARANTEE OF 80% COVERAGE IN ALL SEEDED AREAS AND HERBACEOUS PLANTING AREAS. IF AT THE END OF ONE (1) YEAR THERE IS NOT A MINIMUM OF 80% COVERAGE IN THE SEEDED/PLANTED AREAS THE CONTRACTOR SHALL INSTALL ADDITIONAL MATERIAL, AT NO COST TO THE OWNER, TO ACHIEVE THE MINIMUM COVERAGE. THE OWNER RESERVES THE RIGHT TO ASSES COVERAGE OF SURVIVING PLANT MATERIAL IN SEGMENTS RATHER THAN THE SITE AS A WHOLE.

PROPOSED PLANT PALETTE

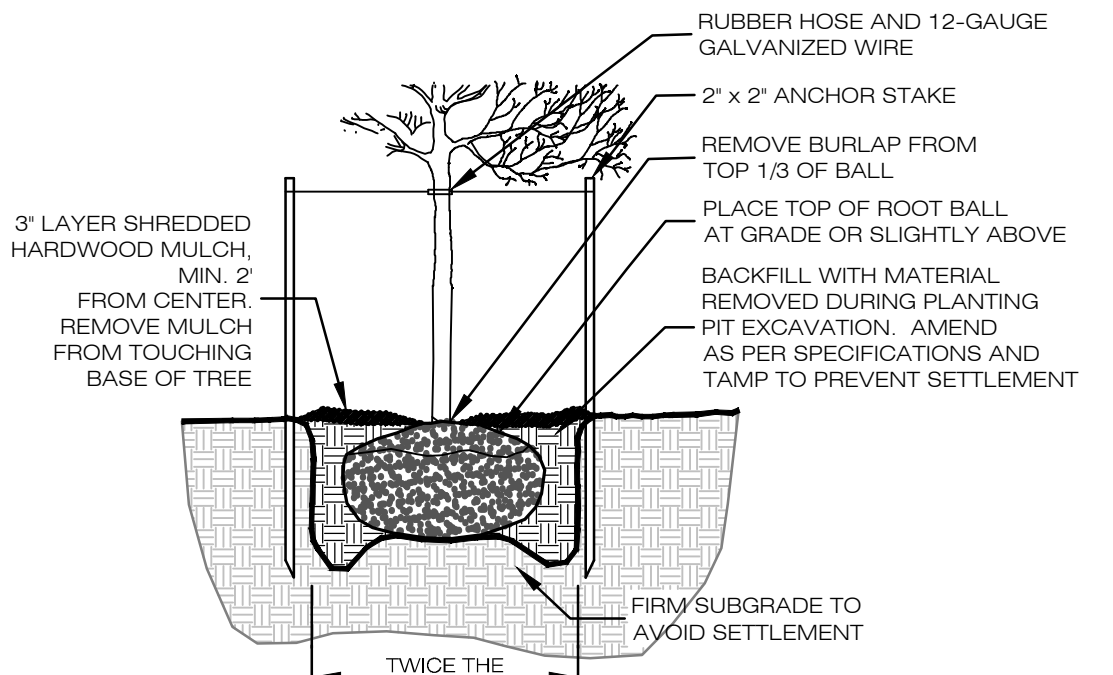
LEGEND	QUANTITY	BOTANICAL NAME	COMMON NAME	SPECIFICATION	INDICATOR	NOTES
GENERAL STABILIZATION MIX (0.53 AC +/-) (BIODEGRADABLE EC-2 (JUTE) MATTING)						
	3%	ANDROPOGON VIRGINICUS	BROOMSEEDGE BLUESTEM	SEED	FACU	CONTRACTOR SHALL SEED ALL DISTURBED AREAS AT 30 LB/AC AND USE TACKIFIED STRAW MULCH AT 2000 LB/AC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ACTUAL AMOUNT OF DISTURBED AREA.
	3%	CHAMAECRISTA FASCICULATA	PARTRIDGE PEA	SEED	FACU	
	25%	ELYMUS VIRGINICUS	VIRGINIA WILD RYE	SEED	FACW-	
	34%	LOLIUM MULTIFLORUM	ANNUAL RYEGRASS	SEED	NI	
	5%	PANICUM AMARUM	ATLANTIC COASTAL GRASS	SEED	FACU-	
	8%	PANICUM VIRGATUM	SWITCHGRASS	SEED	FAC	
	0.5%	RUDBECKIA HIRTA	BLACKEYED SUSAN	SEED	FACU	
	8%	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	SEED	FACU-	
	0.5%	SOLIDAGO NEMORALIS	GRAY GOLDENROD	SEED	NI	
13%	SORGHASTRUM NUTANS	INDIAN GRASS	SEED	UPL		
MINIMUM CARE LAWN MIX (4.09 AC +/-) (BIODEGRADABLE EC-2 (JUTE) MATTING)						
	30%	CREEPING RED FESCUE	FESTUCA RUBRA	SEED	FACU	CONTRACTOR SHALL SEED ALL DISTURBED AREAS AT 30 LB/AC AND USE TACKIFIED STRAW MULCH AT 2000 LB/AC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ACTUAL AMOUNT OF DISTURBED AREA.
	25%	KENTUCKY BLUEGRASS, 'CORSAIR'	POA PRATENSIS, 'CORSAIR'	SEED	FACU	
	25%	KENTUCKY BLUEGRASS, 'ALLEY CAT'	POA PRATENSIS, 'ALLEY CAT'	SEED	FACU	
	10%	PERENNIAL RYEGRASS 'CONFETTI III' (TURF TYPE)	LOLIUM PERENNE 'CONFETTI III'	SEED	FACU	
	10%	ANNUAL RYEGRASS	LOLIUM MULTIFLORUM	SEED	NI	
HIGH MARSH PLANT PALETTE (1.25 AC +/-)						
	1362	DISTICHLIS SPICATA	SALTGRASS	PLUG	FACW+	HERBACEOUS PLANTS SHALL BE LOCATED ACCORDING TO INDICATOR STATUS AND PLACED IN MINIMUM GROUPINGS OF TEN BY SPECIES.
	1362	IRIS VIRGINICA	VIRGINIA IRIS	PLUG	OBL	
	1362	JUNCUS CANADENSIS	CANADA RUSH	PLUG	OBL	
	1362	JUNCUS ROEMERIANUS	NEEDLEGRASS RUSH	PLUG	OBL	
	1362	KOSTELETZKYA VIRGINICA	SALT MARSH MALLOW	PLUG	OBL	
	1362	PELTANDRA VIRGINICA	ARROW ARUM	PLUG	OBL	
	1362	PONTEDERIA CORDATA	PICKERELWEED	PLUG	OBL	
	1362	SPARTINA CYNOSUROIDES	BIG CORDGRASS	PLUG	OBL	
	1362	SCHENOPECTOLUS PUNGENS	COMMON THREE-SQUARE	PLUG	OBL	
	1362	ZIZANIA AQUATICA	WILDRICE	PLUG	OBL	
HIGH MARSH WOODY ZONE PLANT PALETTE (0.03 AC +/-)						
	10	SALIX NIGRA	BLACK WILLOW	3' STAKE	FACW+	SHRUBS AND LIVE STAKES SHALL BE PLANTED AT 8' O.C.
	5	VIBURNUM NUDUM	POSSUMHAW	#1 CONTAINER	FACW	
	5	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	#1 CONTAINER	OBL	SHRUBS SHALL BE LOCATED IN AREAS WITH LESS THAN 3" INUNDATION.
	18	TAXODIUM DISTICHUM	BALD CYPRESS	#3 CONTAINER	OBL	
LOW MARSH PLANT PALETTE (0.31 AC +/-)						
	556	PELTANDRA VIRGINICA	ARROW ARUM	PLUG	OBL	PLANTS SHALL BE SPACED AT 24" O.C. HERBACEOUS PLANTS SHALL BE LOCATED ACCORDING TO INUNDATION TOLERANCE THRESHOLDS AND PLACED IN MINIMUM GROUPINGS OF TEN BY SPECIES.
	556	PONTEDERIA CORDATA	PICKERELWEED	PLUG	OBL	
	556	SAGITTARIA LATIFOLIA	BROADLEAF ARROWHEAD	PLUG	OBL	
	556	SAURURUS CERNUUS	LIZARD'S TAIL	PLUG	OBL	
	556	SCHENOPECTOLUS VALIDUS	SOFT STEM BULLRUSH	PLUG	OBL	
	556	SPARGANUM AMERICANUM	AMERICAN BUR-REED	PLUG	OBL	
UPLAND LANDSCAPE (0.12 AC +/-)						
	5	CARYA OVATA	SHAGBARK HICKORY	2" CAL	FACU	TREES SHALL BE PLANTED AS SHOWN ON PLAN
	3	CERCIS CANADENSIS 'FOREST PANSY'	REDBUD	1-1/2" CAL	UPL	
	9	AMELANCHIER ARBOREA	DOWNY SERVICEBERRY	MULTI-STEM 6-8"	FACU	
	1	QUERCUS RUBRA	NORTHERN RED OAK	3" CAL	FACU	



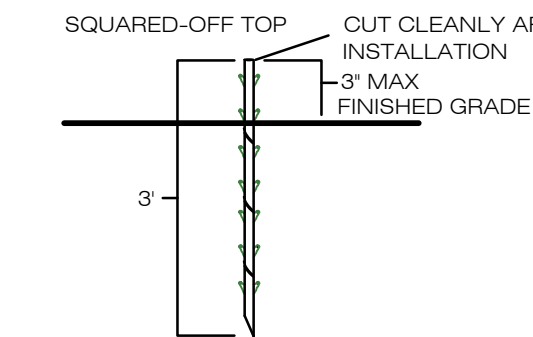
NOTE:
1. GOOSE PROTECTION SHALL BE INCLUDED IN ALL PLANTING AREAS WHERE PLUGS ARE INSTALLED.



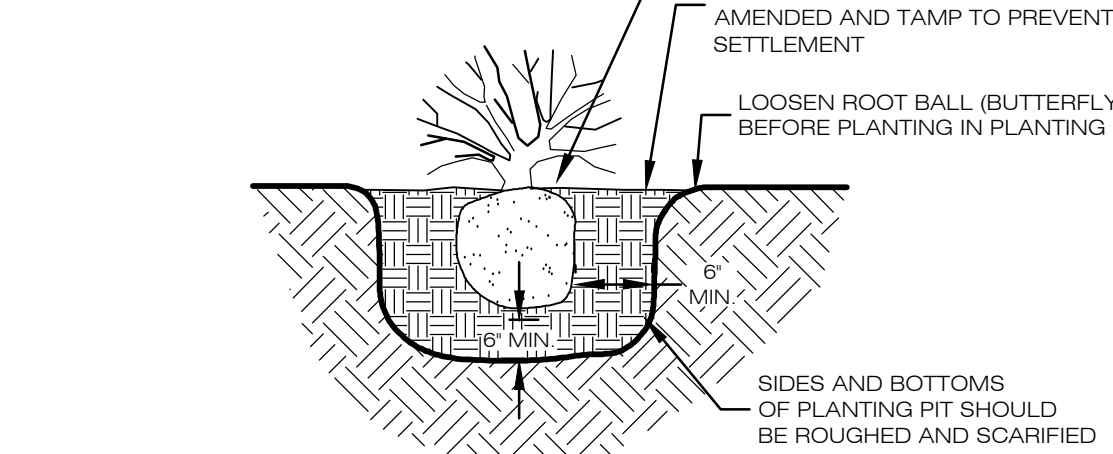
- NOTES:
- PLANTING HOLE SHALL BE OF SUFFICIENT SIZE AS NOT TO CRAMP THE ROOTS.
 - AGRIFORM FERTILIZER TABLETS SHALL BE PLACED AT THE BOTTOM OF EACH HOLE AS PER MANUFACTURERS RECOMMENDATIONS.
 - EACH COMPLETED PLANTING SHALL BE MANUALLY TAMPED TO SECURE PLANT MATERIAL IN SOIL.
 - COMPLETED PLANTING SHALL BE FIRMLY STAKED INTO SOIL.



- NOTES:
- BASAL END SHOULD BE CUT CLEANLY AT AN ANGLE (30-45 DEGREE) TO FACILITATE INSERTION INTO SOIL.
 - INSTALL WITH BUDS POINTED UPWARDS
 - LIVE STAKE CUTTING 3 FOOT LENGTH
 - TAP 4/5 OF LENGTH INTO GROUND ANGLE DOWNSTREAM
 - AFTER INSTALLATION, CLEANLY CUT EXPOSED STAKE TO APPROXIMATELY 3" IN LENGTH
 - LIVE STAKES SHALL BE RED-OSIER DOGWOOD, OR BLACK WILLOW



- NOTES:
- PLANTING HOLE SHALL BE OF SUFFICIENT SIZE AS NOT TO CRAMP THE ROOTS.
 - AGRIFORM FERTILIZER TABLET SHALL BE PLACED AT THE BOTTOM OF EACH HOLE AS PER MFR RECOMMENDATIONS
 - PLANTING HOLE SHALL BE TAMPED WITH FOOT TO SECURE PLANT MATERIAL IN SOIL.



PROPOSED STORMWATER
RETROFIT CONCEPT, PHASE II
UPPER MACHODOC CREEK
KING GEORGE COUNTY, VIRGINIA



REVISIONS:

DATE	REVISION
7/31/13	REVISED PER NAVY COMMENTS

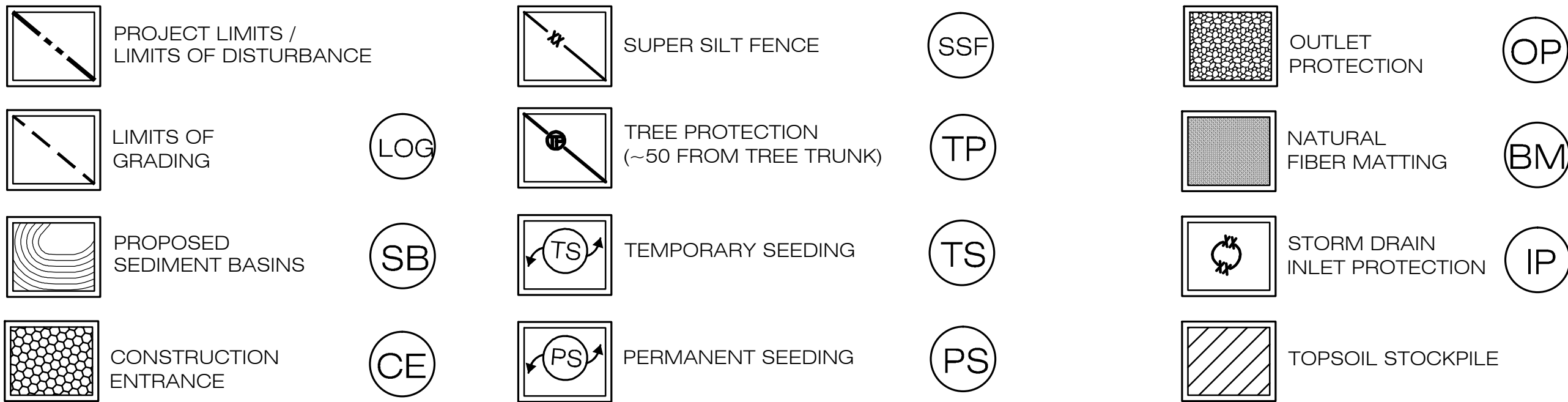
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DATE: 07/03/13
SCALE: 1"=60 FEET
SHEET: 3
JOB#: 4486

DESIGNED BY: DPT/GBH
CHECKED BY: SCB/DLM

5209 Center Street
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150 Riverside Parkway, Suite 301
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(540) 785-5544
Environmental Consultants
WEG
WILLIAMSBURG
ENVIRONMENTAL
GROUP, INC.



LEGEND:



CONSTRUCTION SEQUENCE

- PHASE 1:**
1. INSTALL CONSTRUCTION ACCESS TO THE PROJECT AREA IN PRE-APPROVED LOCATION.
 2. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION, 1992, AS SHOWN ON THIS SHEET. THESE MEASURES SHALL BE IMPLEMENTED PRIOR TO THE COMMENCEMENT OF ANY EARTHWORK ACTIVITIES ON-SITE.
 3. INSTALL TREE PROTECTION FENCE AROUND DRIPLINE OF TREES TO BE PRESERVED (SEE DETAIL, SHEET 5).
 4. REMOVE TREES AS SHOWN IN PLAN VIEW AND CLEAR AND GRUB WHERE NECESSARY.
 5. FUNCTIONING 12" AND 36" PIPELINES SHALL REMAIN IN PLACE TO ACT AS STORMWATER BYPASS DURING CONSTRUCTION.
 6. INSTALL TEMPORARY SEDIMENT BASINS WITHIN THE FOOTPRINTS OF PROPOSED WETLAND POOLS AS SHOWN ON THIS SHEET. OUTFALL THE RISER STRUCTURES TO THE EXISTING 8" OPENINGS OF THE EXISTING 8'X10' INLET BASIN.
- SEDIMENT BASIN SIZING (ASSUMING NORMAL POOL OF 1.5 FT):**
- EAST BASIN DRAINAGE AREA = ~2 ACRES
REQUIRED WET STORAGE = 2 ACRES X 67 CY/ACRE = 134 CY
REQUIRED DRY STORAGE = 2 ACRES X 67 CY/ACRE = 134 CY
WET STORAGE SHOWN = 559 CY
DRY STORAGE SHOWN = 338 CY
Q25 = C₁A = 0.20 X 7.81 X 2 = 3.124 CFS
C = 0.20 HEAVY SOIL WITH SLOPE OF 2-7%
i = 7.81 ATLAS 14 FOR T_c OF 5 MINUTES
RISER DIAMETER = 10 INCHES
VESCH PLATE 3.14-8, Q = 3.124, H = 1.5
- WEST BASIN DRAINAGE AREA = ~4 ACRES
REQUIRED WET STORAGE = 4 ACRES X 67 CY/ACRE = 268 CY
REQUIRED DRY STORAGE = 4 ACRES X 67 CY/ACRE = 268 CY
WET STORAGE SHOWN = 476 CY
DRY STORAGE SHOWN = 299 CY
Q25 = C₁A = 0.20 X 7.18 X 4 = 6.248 CFS
C = 0.20 HEAVY SOIL WITH SLOPE OF 2-7%
i = 7.81 ATLAS 14 FOR T_c OF 5 MINUTES
RISER DIAMETER = 10 INCHES
VESCH PLATE 3.14-8, Q = 6.248, H = 1.5
7. ROUGH GRADING OPERATIONS SHALL COMMENCE FOR THE PROJECT AS SHOWN ON SHEET 2 OF THE PLANS. ROUGH GRADING SHALL INCLUDE THE STRIPPING AND STOCKPILING OF SIX (6) INCHES OF TOPSOIL FROM WETLAND AND FILL PILE AREAS (SEE SHEETS 2 AND 3). TOPSOIL IS TO BE STOCKPILED IN THE LOCATION SHOWN IN PLAN VIEW ON THIS SHEET. FILL PILE MATERIAL TO BE DEWATERED AND COMPACTED IN 6 INCH LIFTS.
8. WORK AROUND FUNCTIONING 12" AND 36" PIPELINES DURING EARLY EXCAVATION AND GRADING OF PROPOSED CONTOURS. OTHER PIPE NETWORKS AND DROP INLETS MAY BE REMOVED AS NEEDED DURING GRADING.
9. FINE GRADING ACTIVITIES SHALL COMMENCE. THIS OPERATION SHALL INCLUDE THE FOLLOWING ACTIVITIES: COMPLETION OF RE-SPREADING OF STOCKPILED TOPSOIL AND INSTALLATION OF THE EARTHEN STRUCTURES (CONVERSION OF MODIFIED SEDIMENT TRAP OUTFALLS TO FINAL EARTHEN WATER CONTROL STRUCTURES).
10. PRIOR TO THE COMPLETION OF FINE GRADING OPERATIONS, THE CONTRACTOR SHALL NOTIFY THE DESIGNER IN ORDER TO SCHEDULE AND COMPLETE AN AS-BUILT SURVEY OF THE SITE.
11. SOIL AND SEEDBED PREPARATION SHALL COMMENCE AND BE COMPLETED AS SPECIFIED ON THIS SHEET AND IN THE SPECIFICATIONS.
12. SEEDING OPERATIONS SHALL COMMENCE AND BE COMPLETED AS SPECIFIED ON SHEET 3.
13. SEEDING AREAS SHALL BE INSPECTED BY THE ENGINEER AT THE COMPLETION OF THE SEEDING OPERATIONS AND ACCEPTED SUBJECT TO COMPLIANCE WITH MATERIALS AND INSTALLATION REQUIREMENTS SPECIFIED ON THIS SHEET. INITIAL ACCEPTANCE OF SEEDING DOES NOT RELEASE CONTRACTOR FROM WARRANTY RESPONSIBILITY.

AFTER STABILIZATION HAS BEEN ACHIEVED, COMMENCE PHASE 2 ACTIVITIES:

- PHASE 2:**
14. CUT FUNCTIONING 12" AND 36" PIPELINES AT INLETS OF WETLAND AND INSTALL STANDARD VDOT ENDWALLS EW-1 WITH OUTFALL PROTECTION (SEE SPECIFICATIONS FOR ADDITIONAL DETAIL).
 15. REMOVE DISCONNECTED SECTIONS OF 12" AND 36" PIPELINES AND COMPLETE EXCAVATION AND GRADING OF PROPOSED CONTOURS.
 16. RETROFIT EXISTING 8'X10' INLET BOX AS SHOWN IN DETAIL ON SHEET 5.
 17. FINISH PERMANENT SEEDING AND PLANTING.
 18. THE OWNER SHALL PERFORM A FINAL SITE INSPECTION. ALL COMMENTS RECEIVED BY THE CONTRACTOR SHALL BE ADDRESSED PRIOR TO THE COMMENCEMENT OF CLEANUP ACTIVITIES.
 19. THE CONTRACTOR SHALL COMMENCE WITH THE FINAL CLEANUP OF THE PROJECT SITE. REMOVAL OF EROSION AND SEDIMENT CONTROL MEASURES AND DEMOBILIZATION TASKS SHALL BE PERFORMED ONCE THE VEGETATED GRASS COVER IS ESTABLISHED AND THE OWNER OR RESPONSIBLE E&S INSPECTOR DEEMS THE PROJECT COMPLETED FROM AN E&S PERSPECTIVE.

EROSION AND SEDIMENT CONTROL NOTES

PROJECT SUMMARY

THIS PLAN PRESENTS A PROPOSED CONSTRUCTED STORMWATER WETLAND AND ASSOCIATED HABITAT IMPROVEMENTS AT NAVAL SUPPORT FACILITY DAHLGREN, KING GEORGE COUNTY, VIRGINIA. THE DESIGN IS PREPARED UNDER THE ASSUMPTION THAT PROPOSED STORMWATER RETROFIT IS A VOLUNTARY IMPROVEMENT BY THE NAVAL FACILITY TO IMPROVE THE WATER QUALITY OF STORMWATER RUNOFF FROM THE CONTRIBUTING 161-ACRE DEVELOPED WATERSHED.

EXISTING VEGETATION & ADJACENT PROPERTY

THE PROJECT AREA IS CHARACTERIZED BY MAINTAINED TURF GRASS ADJACENT TO UPPER MACHODOC CREEK. ALTHOUGH MULTIPLE CULVERTS EXIST, THE MAJORITY OF THE CONTRIBUTING WATERSHED APPEARS TO DRAIN THROUGH AN EXISTING 36 INCH CULVERT, WHILE THE OTHERS APPEAR TO BE ABANDONED. SURROUNDING PROPERTY LAND USE CONSISTS MAINLY OF RESIDENTIAL YARDS AND NAVAL FACILITIES ASSOCIATED WITH BASE OPERATION.

EXISTING SOILS

DURING THE ON-SITE EVALUATION, WATER TABLE ELEVATIONS WERE GENERALLY ENCOUNTERED BETWEEN 12" TO 18" DEEP. SEASONAL VARIATION IS EXPECTED, WITH HIGH WATER TABLE ELEVATIONS DURING SUMMER MONTHS. SOIL TEXTURES ON-SITE ARE QUITE VARIABLE DUE TO THE DISTURBANCE HISTORY OF THE SITE. HOWEVER, THERE APPEARS TO BE SUFFICIENT CLAY MATERIAL TO CREATE AN IMPERMEABLE LAYER. THE CONTRACTOR SHALL ENSURE THAT THE PROPER MATERIAL IS USED FOR COMPACTION PURPOSES. EXISTING TOPSOIL SHOULD ALSO BE AMENDED WITH LIMESTONE, TRIPLE SUPERPHOSPHATE, AND MURIATE OF POTASH TO CREATE A PROPER GROWING MEDIUM.

OFF-SITE AREAS

ON-SITE DEPOSITION OF EXCAVATED MATERIAL IN PRE-APPROVED DISPOSAL LOCATIONS IS DESIRED AND LIKELY BUT NOT ABSOLUTE. OFF-SITE DEPOSITION, IF NECESSARY, WILL REQUIRE SEPARATE E&S PLAN(S) AND APPROVAL. NOTE THAT THE NATURE OF FILL IS UNKNOWN AND SHALL BE ADDRESSED WITH CAUTION.

CRITICAL EROSION AREAS

ADJACENT WETLANDS AND WATER BODIES SHOULD BE DELINEATED AND CLEARLY IDENTIFIED IN THE FIELD. STEEP SLOPES SHOULD BE AVOIDED TO THE GREATEST EXTENT POSSIBLE AND AREAS OF DISTURBANCE WILL RECEIVE STABILIZATION MEASURES TO REDUCE THE AMOUNT OF EROSION. ALL OTHER AREAS WITHIN THE PROJECT SITE CONSISTS OF GENTLE SLOPES WITH SOILS THAT HAVE SLIGHT TO MODERATE ERODIBILITY.

PROPOSED GRADING

THE PROPOSED GRADING PLAN ENTAILS CREATING TWO WETLAND CHANNELS. THE EASTERN CHANNEL RECEIVES THE MAJORITY OF THE RUNOFF AND WILL REQUIRE THE INSTALLATION OF AN ENERGY DISSIPATOR AT THE PROPOSED OUTFALL. THE WESTERN CHANNEL RECEIVES A SMALL FLOW VOLUME AND ONLY REQUIRES A ROCK LINED CHANNEL FROM THE PROPOSED OUTFALL TO THE EDGE OF NORMAL POOL. AQUATIC BENCHES ARE DESIGNED TO SUPPORT A MIXED WETLAND ECOSYSTEM. EMERGENT WETLAND POCKETS HAVE BEEN PROPOSED THROUGHOUT TO INCREASE DIVERSITY AND HABITAT.

SITE PREPARATION

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS OF ALL EXISTING UTILITIES WITHIN THE PROJECT AREA PRIOR TO COMMENCEMENT OF CONSTRUCTION OPERATIONS.
2. THE CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN ON SHEET 4. THE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND CONSTRUCTED PRIOR TO THE COMMENCEMENT OF ANY EARTHWORK ACTIVITIES ON-SITE. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED BY THE CONTRACTOR IN ACCORDANCE WITH THESE PLANS AND THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION, 1992.
3. THE CONTRACTOR IS RESPONSIBLE FOR LAYOUT AND STAKE-OUT OF ALL WORK COVERED UNDER THESE PLANS.
4. ALL CONSTRUCTION AND DEMOLITION ACTIVITIES ASSOCIATED WITH THIS PROJECT SHALL BE ACCOMPLISHED IN SUCH A MANNER THAT CONSTRUCTION AND/OR WASTE MATERIALS DO NOT ENTER STATE WATERS.

MAINTENANCE OF THE PROJECT SITE

1. THE CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS AND DISPOSE OF OFF-SITE IN ACCORDANCE WITH ALL LOCAL AND STATE LAWS AND REGULATIONS.
2. ALL EQUIPMENT AND SUPPLIES SHALL BE STORED WITHIN THE CONSTRUCTION STAGING AREA WHILE CONSTRUCTION ACTIVITIES HAVE CEASED FOR THE DAY.
3. THE CONTRACTOR SHALL PROVIDE ALL PROTECTION MEASURES AND DEVICES NECESSARY TO PROTECT THE PROPERTY, ADJACENT PROPERTY, EMPLOYEES, AND THE GENERAL PUBLIC FOR THE DURATION OF THE PROJECT AND COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
4. ALL EXISTING SITE IMPROVEMENTS TO REMAIN SHALL BE PROTECTED FROM DAMAGE. ANY DAMAGE CAUSED BY THE CONTRACTOR DURING CONSTRUCTION OPERATIONS UNDER THIS CONTRACT SHALL BE REPAIRED AND/OR REPLACED TO ORIGINAL CONDITION BY THE CONTRACTOR AT HIS OWN EXPENSE.
5. THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING OR PROTECTING EQUIPMENT DURING FLOOD EVENTS.

TOPSOIL STRIPPING

1. THE CONTRACTOR SHALL CAREFULLY STRIP THE EXISTING TOPSOIL FROM THE PROPOSED MITIGATION AREAS TO AN APPROXIMATE DEPTH OF SIX (6) INCHES AND STOCKPILE ON-SITE FOR RE-USE.
2. ALL EXCESS EXCAVATED MATERIAL SHALL BE STOCKPILED WITHIN THE AREA PERVIOUSLY APPROVED BY THE NAVY. APPROXIMATE TEMPORARY STOCKPILE LOCATIONS ARE SHOWN FOR PLANNING PURPOSES ONLY.

EARTHWORK

1. THE CONTRACTOR SHALL PERFORM ALL ROUGH AND FINE GRADING EARTHWORK OPERATIONS IN ACCORDANCE WITH THE FINAL GRADES INDICATED ON SHEET 2 AND THE FOLLOWING TECHNICAL SPECIFICATIONS.
2. PROPER SITE DRAINAGE SHALL BE MAINTAINED BY THE CONTRACTOR DURING ALL EARTHWORK OPERATIONS. DURING CONSTRUCTION OF THE WETLAND AREA, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PUMPING OF ANY PONDED WATER THAT MAY IMPEDE THE CONSTRUCTION PROCESS. VESCH 3.26 PRACTICES SHALL BE FOLLOWED FOR DEWATERING OPERATIONS.

EARTHWORK SEQUENCE

1. STRIP 6" TOPSOIL AND RETAIN ON-SITE FOR REINTRODUCTION AFTER ROUGH GRADING ACTIVITIES. TOPSOIL SHALL ONLY BE STRIPPED FROM AREAS REQUIRING FOUR (4) INCHES OR MORE OF CUT.
2. REPLACE TOPSOIL TO BRING FINAL GRADES TO WITHIN 1/10 FOOT OF GRADES SPECIFIED ON SHEET 2.
3. BROADCAST FERTILIZER (10-10-10) AT A RATE OF 150 LBS/AC.
4. FINISH DISK TOPSOIL TO CREATE FINAL SEEDING AND PLANT INSTALLATION SURFACE.

FINE GRADING

1. ALL FINE GRADING SHALL BE ACCOMPLISHED BY THE CONTRACTOR UTILIZING A LASER LEVEL. FINAL GRADES SHALL BE WITHIN 1/10 FOOT OF THE PROPOSED FINAL GRADES AS INDICATED ON SHEET 2.
2. THE CONTRACTOR SHALL PROTECT NEWLY GRADED AREAS FROM CONSTRUCTION TRAFFIC, EROSION, AND SETTLEMENT THAT MAY OCCUR, AND SHALL REPAIR AND RE-ESTABLISH DAMAGED FINAL GRADED AREAS AT NO ADDITIONAL EXPENSE TO THE OWNER.
3. THE ENGINEER WILL CONDUCT A SITE INSPECTION AND AN AS-BUILT REVIEW AT THE COMPLETION OF FINE GRADING OPERATIONS AND NOTIFY THE CONTRACTOR OF ACCEPTANCE PRIOR TO THE COMMENCEMENT OF SOIL AND SEEDBED PREPARATION AND SEEDING OPERATIONS.

SOIL AND SEEDBED PREPARATION

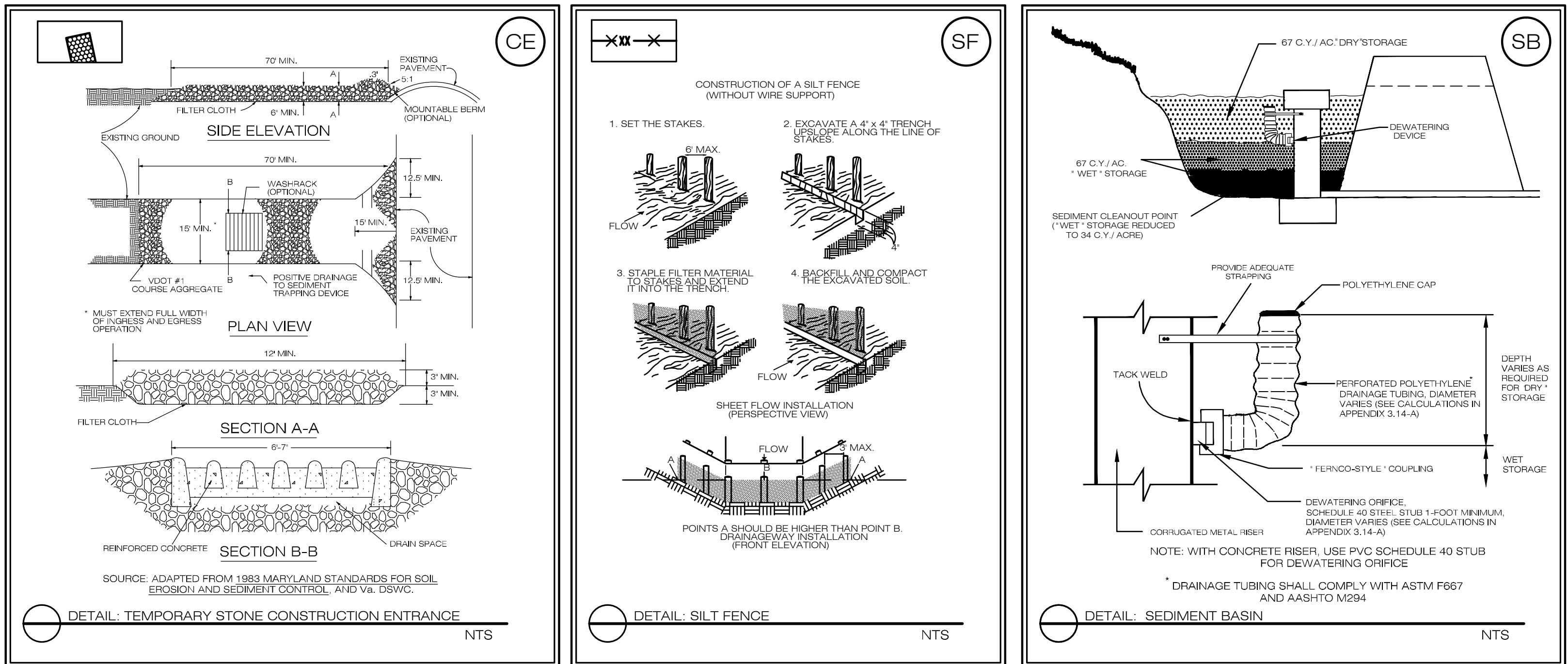
IN GENERAL, THE SOILS WITHIN THE PROPOSED 1.97 ACRES OF WETLAND CREATION WILL BE AMENDED WITH FERTILIZER TO CREATE THE PROPER ENVIRONMENT FOR THE PROPAGATION OF DIVERSE WETLAND SPECIES. THE AMENDMENT WILL BE INCORPORATED BY DISKING TO DECREASE COMPACTION IN THE SOIL SURFACE, SPEED THE DEVELOPMENT OF WETLAND SOIL CHARACTERISTICS, IMPROVE WATER HOLDING CAPACITY, AND INCREASE NUTRIENT AVAILABILITY. THE OVERALL EFFECTS OF FERTILIZER WILL IMPROVE SOIL QUALITY AND ENSURE THE SUCCESSFUL ESTABLISHMENT OF DIVERSE WETLAND SPECIES.

SEEDING

1. SEEDING OPERATIONS SHALL IMMEDIATELY FOLLOW SEEDBED PREPARATION AND SHALL BE COMPLETED AND STABILIZED WITHIN SEVEN (7) DAYS OF REACHING FINAL GRADE.
2. SEED MIXES ARE PROPOSED FOR APPLICATION WITHIN THE PROJECT LIMITS. SEE SHEET 3 FOR THE SEED MIX SPECIFICATIONS AND APPLICATION RATES. THE GENERAL STABILIZATION SEED MIX SHALL BE USED TO STABILIZE ALL DISTURBED AREAS. THIS INCLUDES ALL SIDE SLOPES, BERMS, STAGING AREAS AND STOCKPILE AREAS (AS NEEDED).
3. CONTRACTOR SHALL NOT PERFORM SEEDING APPLICATION WHEN THE SOIL IS FROZEN.
4. CONTRACTOR SHALL SOW THE SEED MIX AT THE RATES AS SHOWN IN THE STABILIZATION SEED MIX LIST AS SHOWN ON SHEET 3.
5. SEEDING AREAS SHALL BE INSPECTED BY THE ENGINEER AT THE COMPLETION OF THE SEEDING OPERATIONS AND ACCEPTED SUBJECT TO COMPLIANCE WITH SPECIFIED MATERIALS AND INSTALLATION REQUIREMENTS.

SEDIMENT TRAP

THE LAST DEEP POOL CELL OF EACH WETLAND BRANCH SHALL BE USED AS A SEDIMENT BASIN DURING CONSTRUCTION. REFER TO VESCH DETAIL CHAPTER 3.13 FOR OUTFALL SPECIFICATIONS TO BE INCORPORATED AT EACH RESPECTIVE RISER LOCATION.



PROPOSED STORMWATER RETROFIT CONCEPT, PHASE II UPPER MACHODOC CREEK KING GEORGE COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
PROFESSIONAL ENGINEER

REVISIONS:	
DATE:	
7/31/13	REVISED PER NAVY COMMENTS

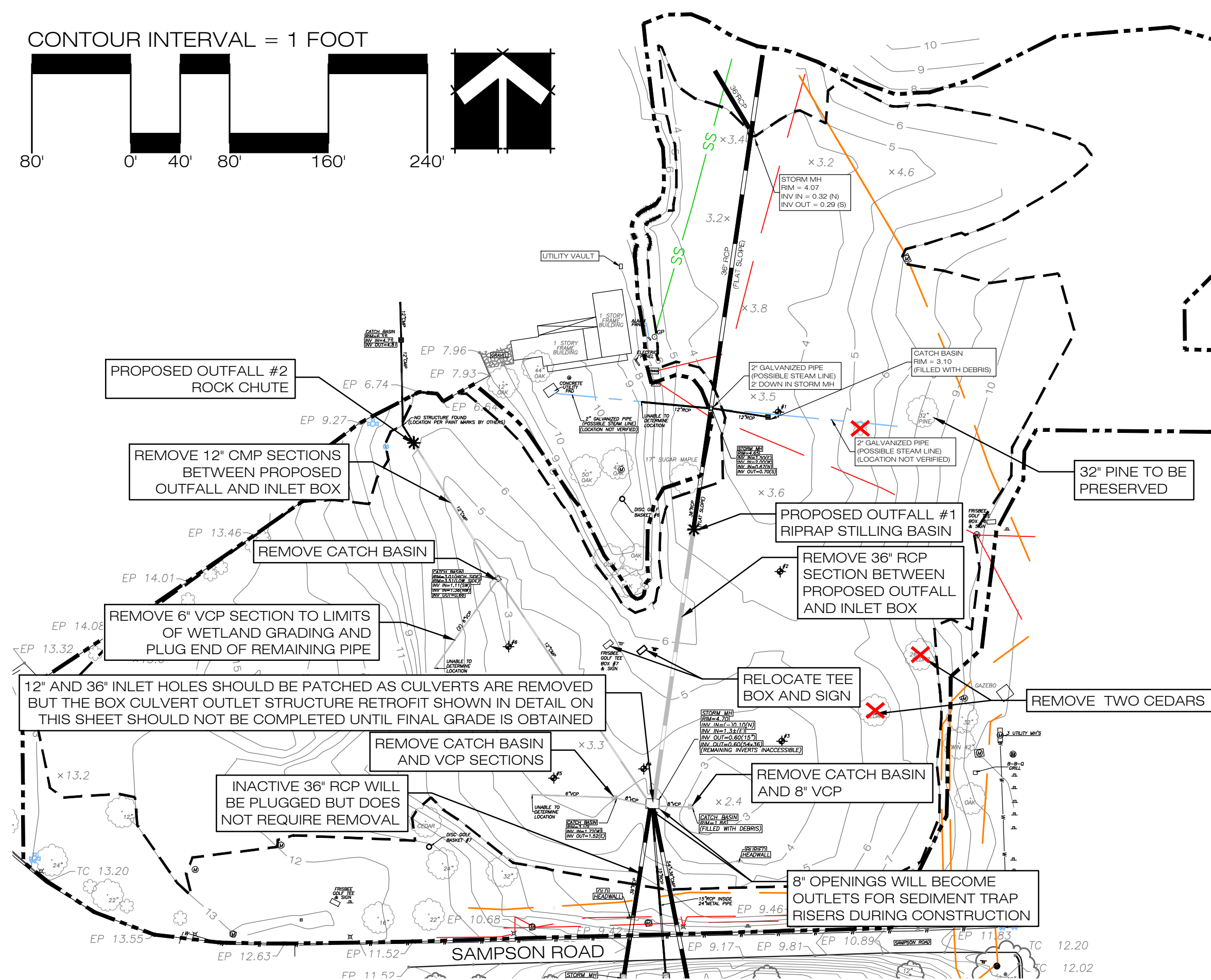
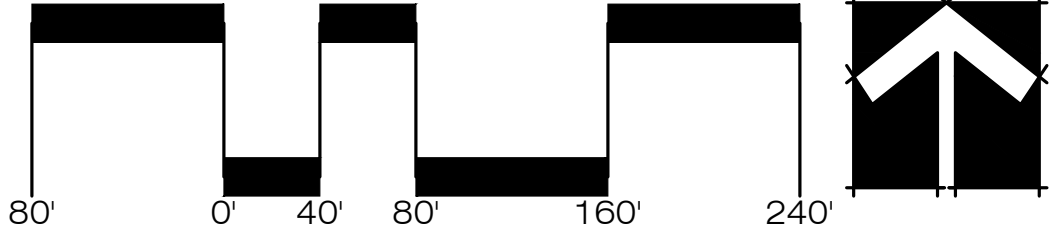
DRAWN BY: DPT
DATE: 7/30/13
SCALE: 1 INCH = 80 FEET
SHEET: 4
JOB#: 4486

DESIGNED BY: DPT
CHECKED BY: SOBCK

5209 Center Street
Williamsburg, Virginia 23188
(757) 220-6869
1011 Boulder Springs Drive, Suite 225
Richmond, Virginia 23225
(804) 287-2474
150 Riverside Parkway, Suite 301
Norfolk, Virginia 23406
(540) 786-5544
Environmental Consultants



CONTOUR INTERVAL = 1 FOOT



EXISTING CONDITIONS & DEMOLITION PLAN

SCALE: 1 INCH = 80 FEET

LEGEND:

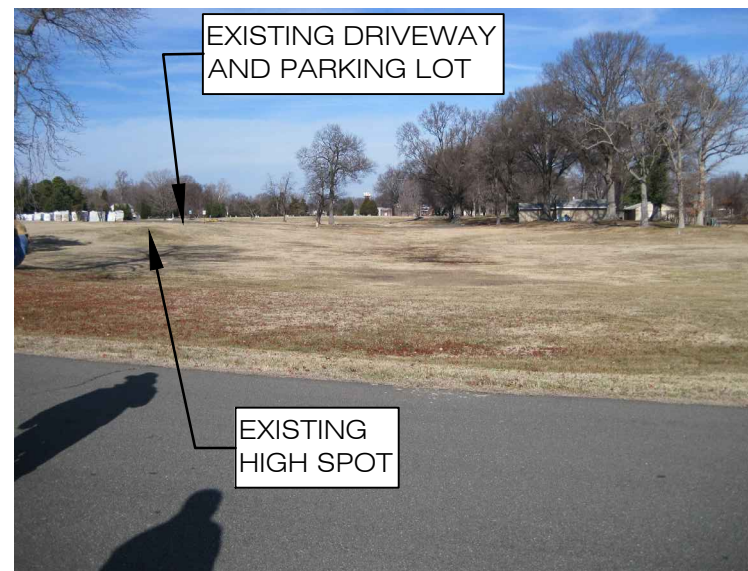
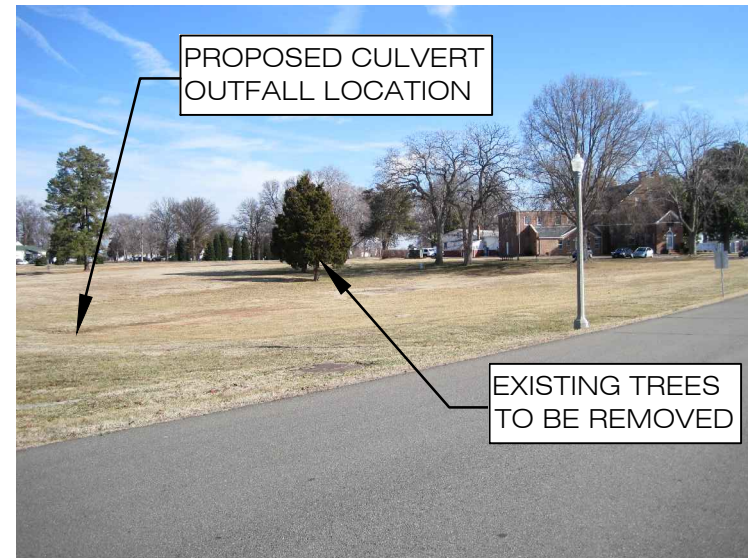
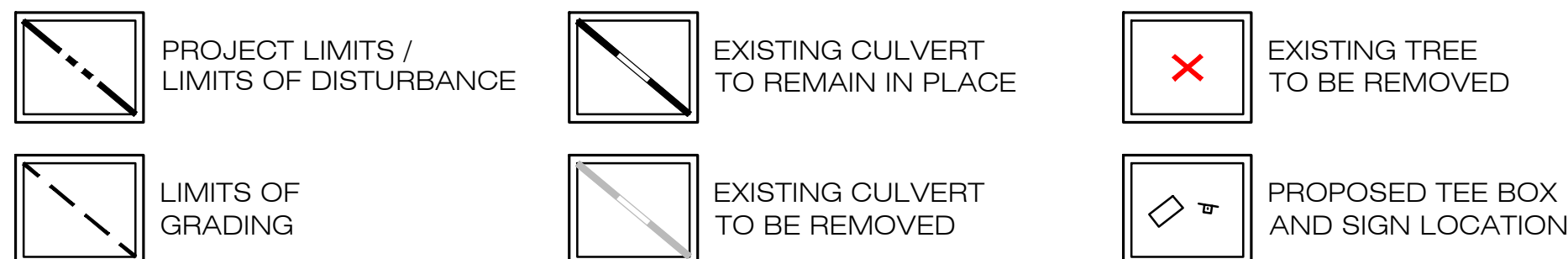
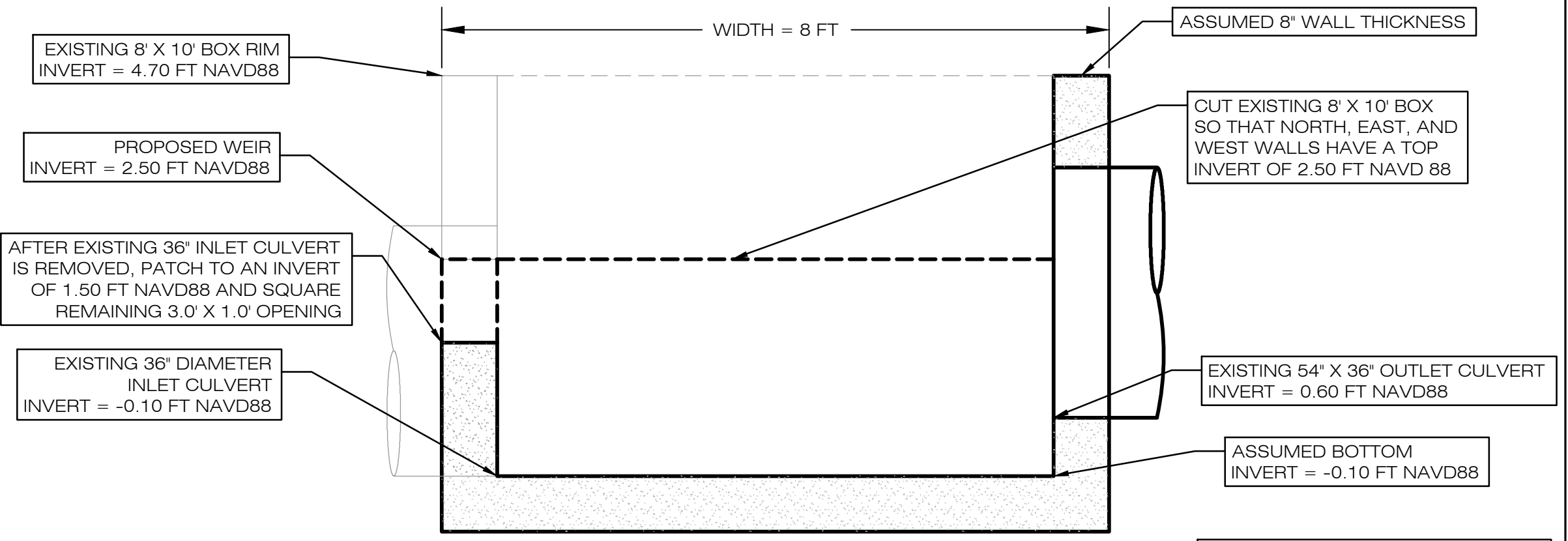
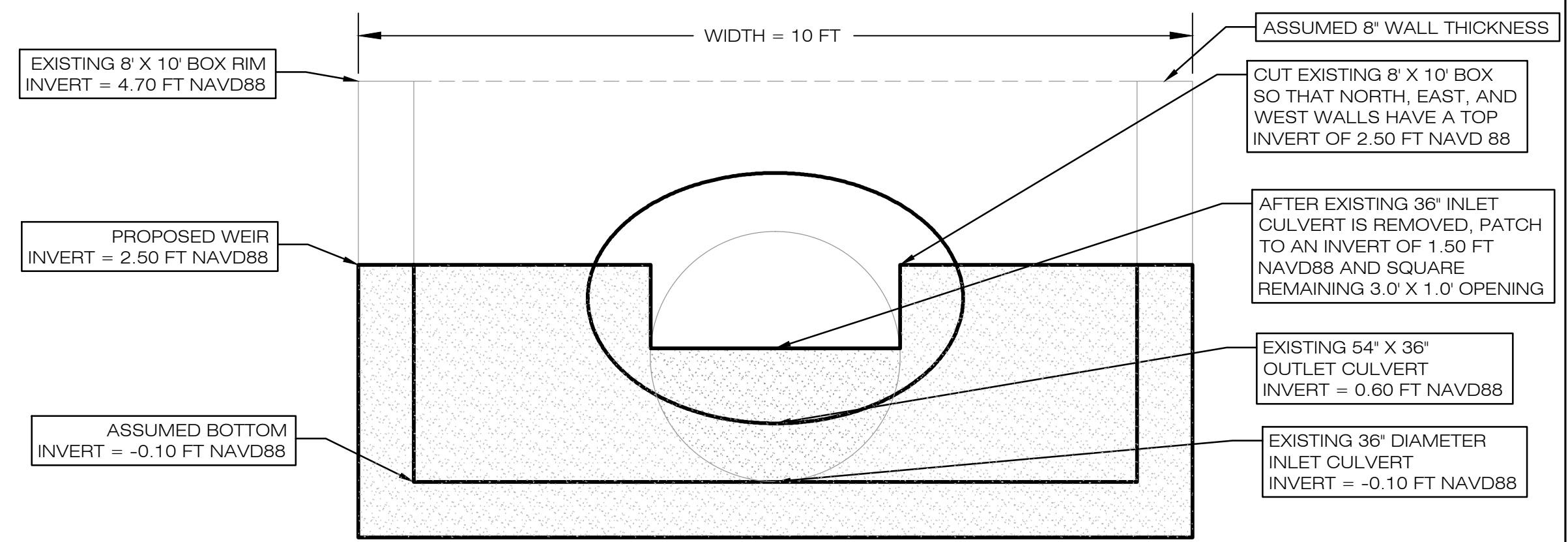


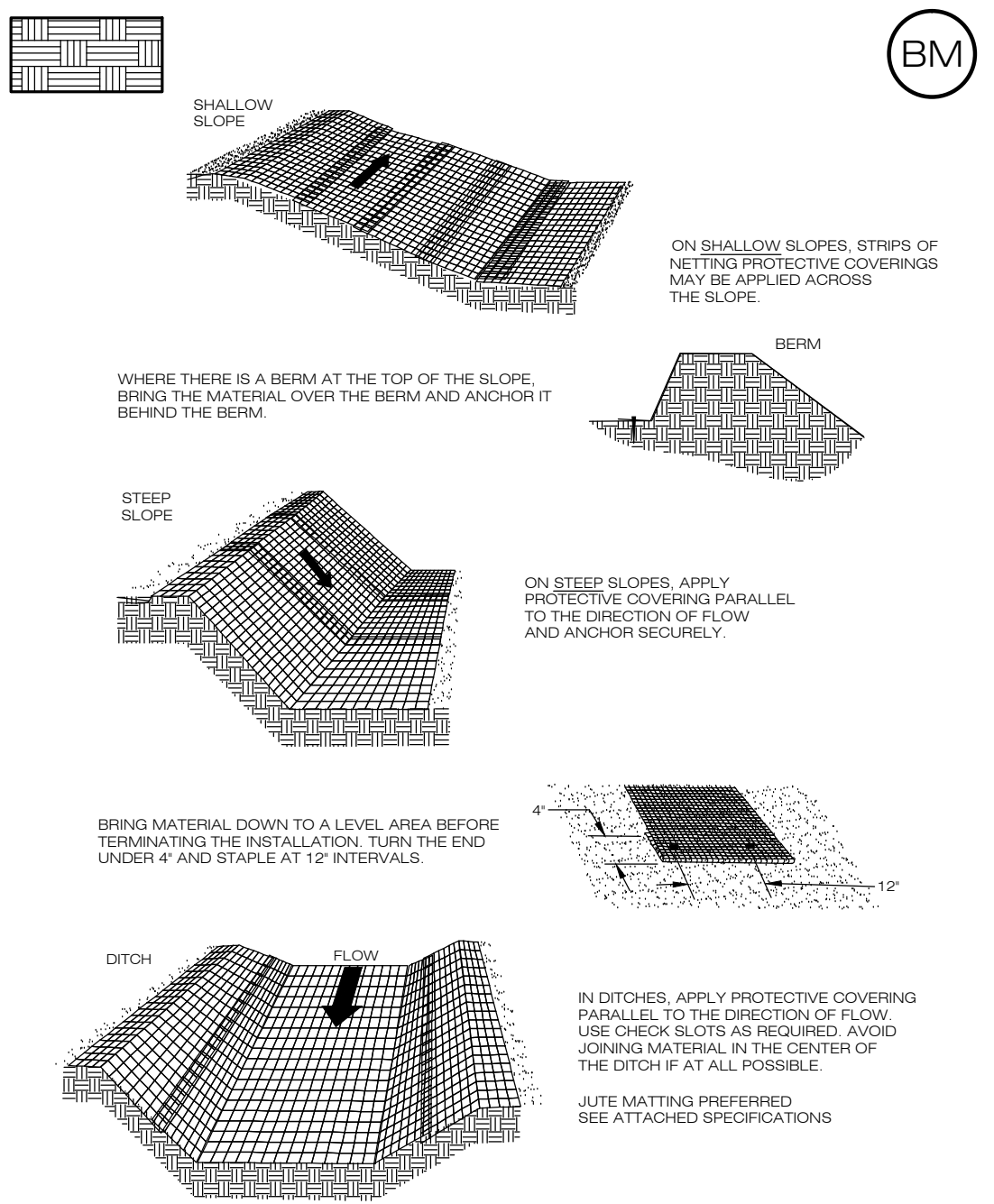
PHOTO #3: LOOKING AT PROPOSED WESTERN BRANCH OF CONSTRUCTED WETLAND SITE FROM EXISTING ROAD. NOTE EXISTING PARKING LOT IN BACKGROUND. PROPOSED FILL MOUNDS WILL BE AT THE SAME ELEVATION AS THE EXISTING HIGH SPOT IN FRONT OF PALLETS TO THE LEFT.



DETAIL: BOX CULVERT OUTLET STRUCTURE RETROFIT

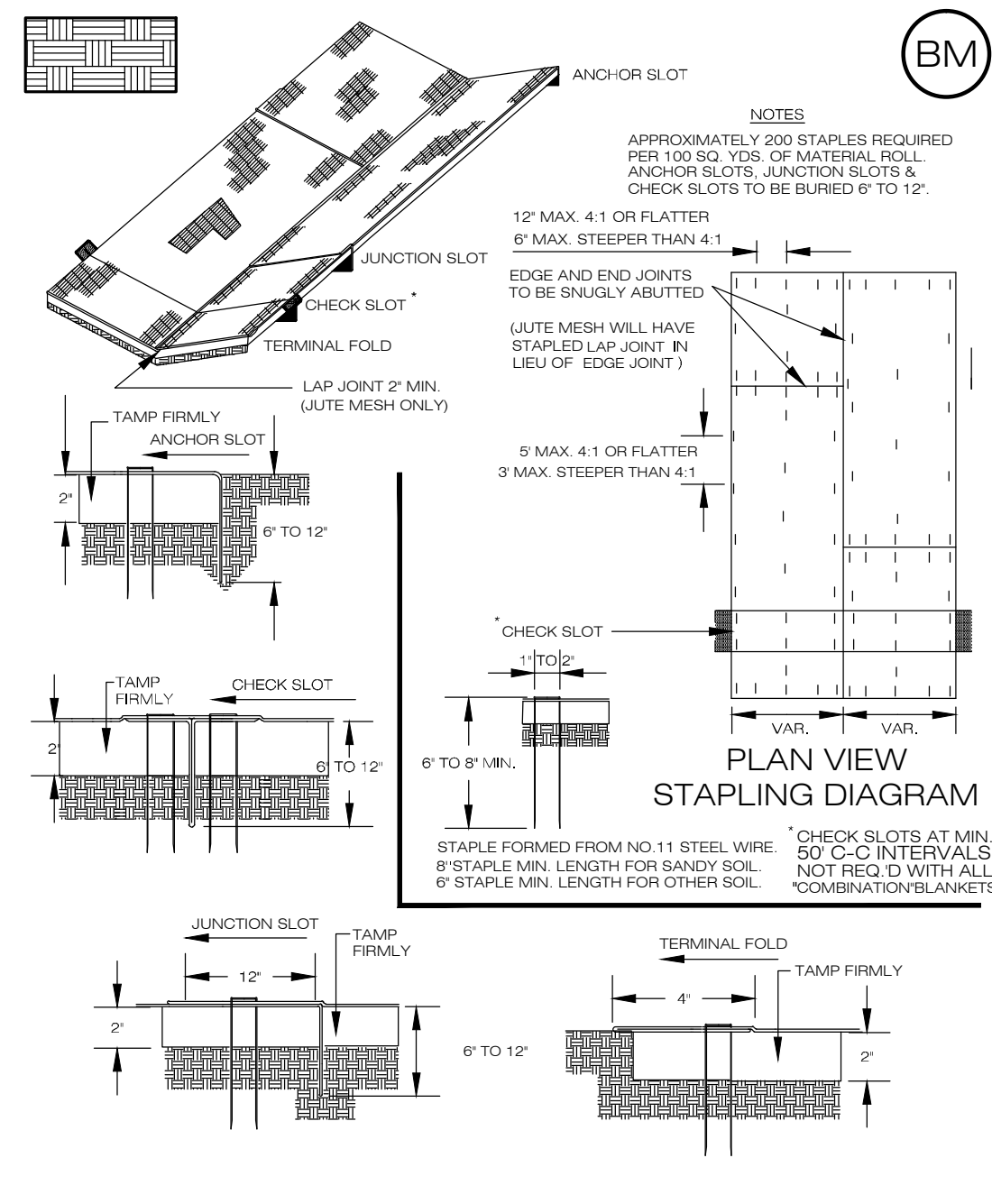
1 INCH = 1.5 FEET

NOTE:
THERE ARE MULTIPLE OPENINGS NOT SHOWN (1-12" INLET, 2-8" INLETS, AND 1-36" OUTLET) THAT WILL ALSO REQUIRE PATCHING / PLUGGING. THE 15" OUTLET (NOT SHOWN) WILL LIKELY REMAIN OPEN FOR FLOW.



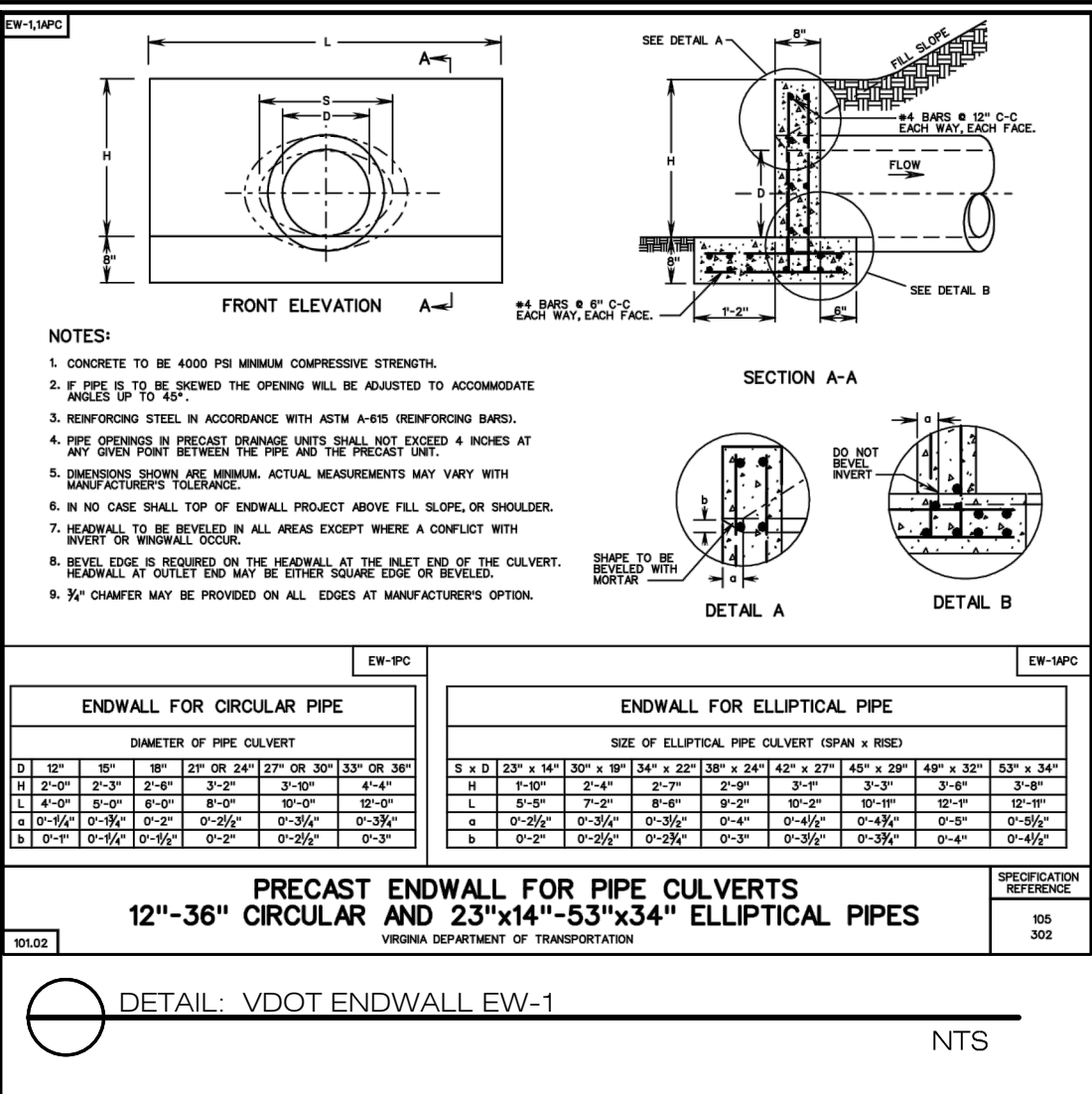
DETAIL: E&S CONTROL BLANKET INSTALLATION (COIR 700 OR APPROVED ALTERNATE)

NTS



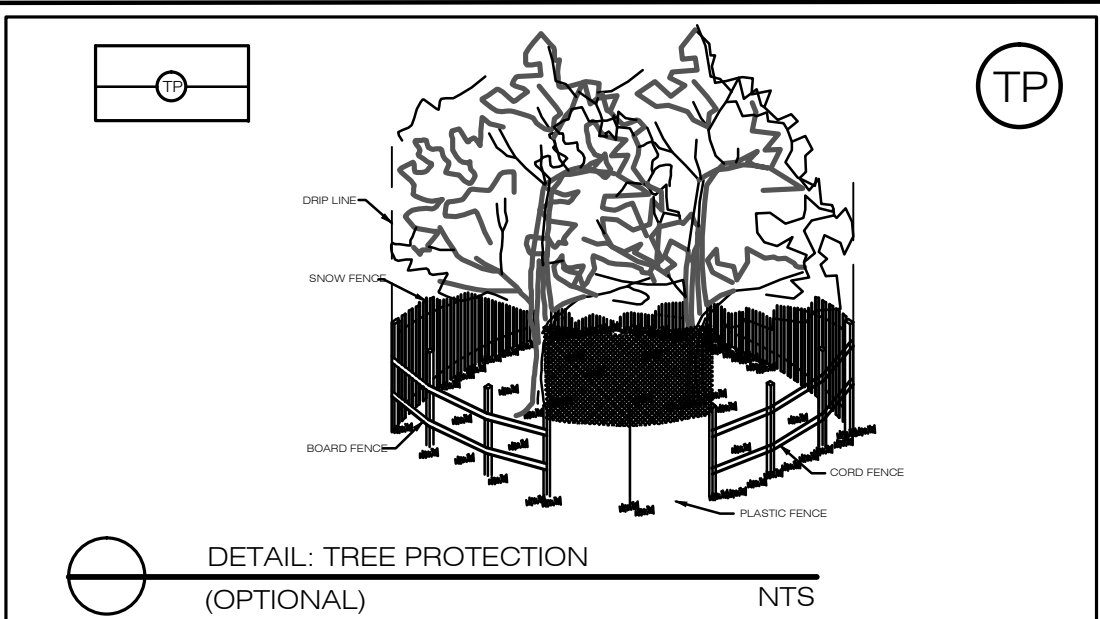
DETAIL: E&S CONTROL STAPLING DETAIL

NTS



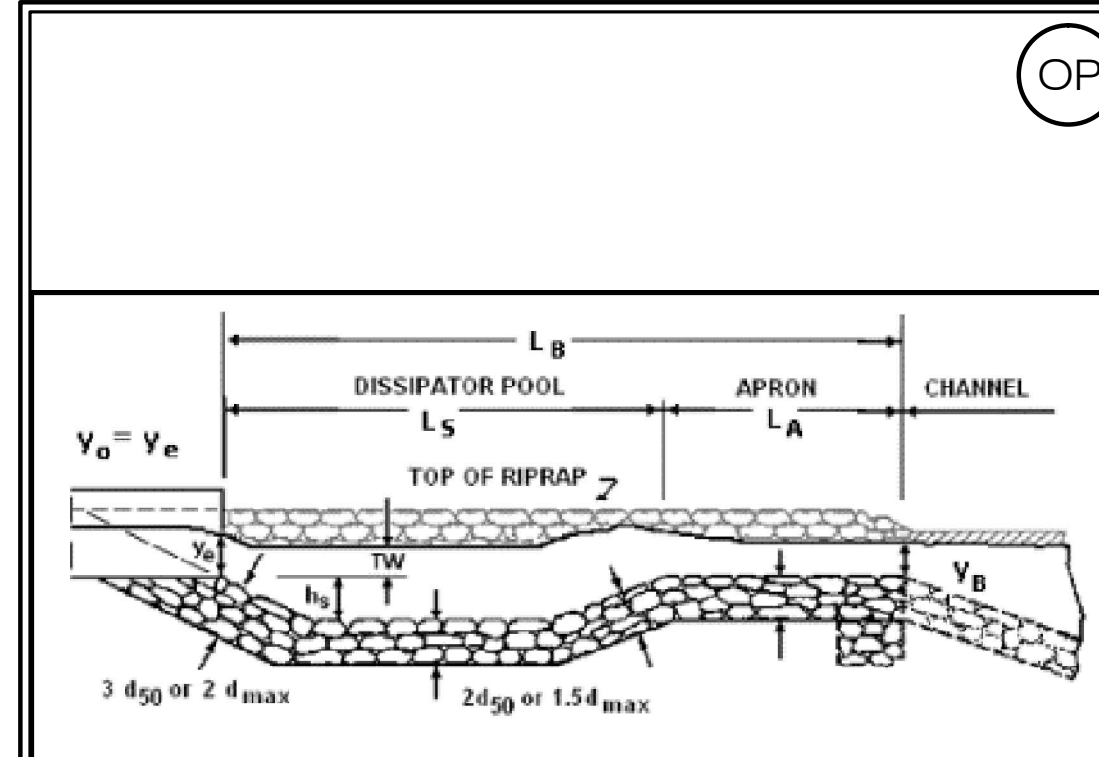
DETAIL: VDOT ENDWALL EW-1

NTS



DETAIL: TREE PROTECTION (OPTIONAL)

NTS



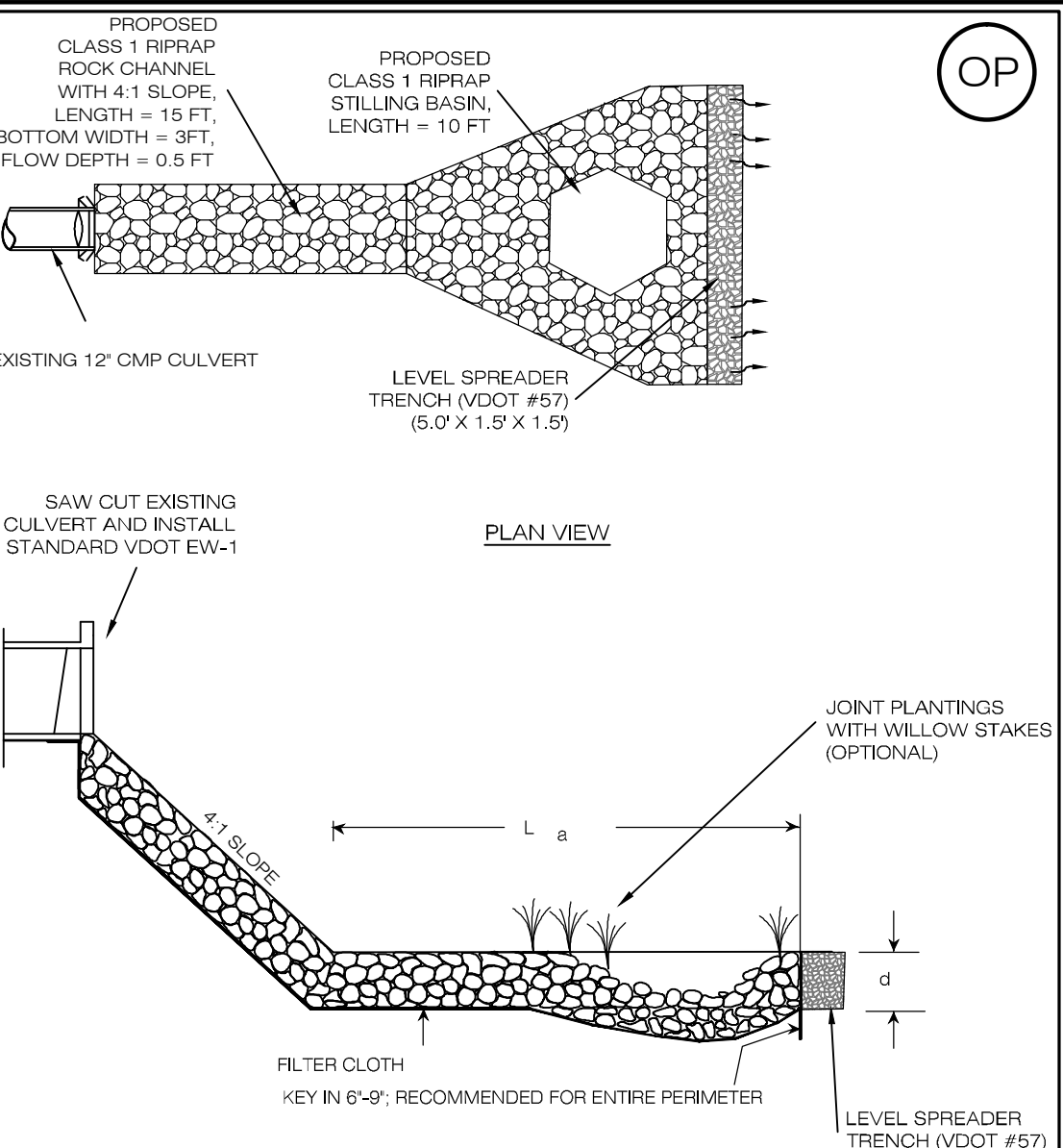
STRUCTURE	CULVERT INVERT (FT. NAVD88)	TAILWATER ELEVATION (FT. NAVD88)	OUTLET VELOCITY (FT/S)	OUTLET DEPTH (FT)	BASEIN LENGTH (FT)	BASEIN WIDTH (FT)	APRON LENGTH (FT)	POOL LENGTH (FT)	POOL DEPTH (FT)	RRAP D50
OUTFALL #1 (RRAP STILLING BASIN)	0.45	1.50	9.16	1.752	13.21	11.81	4.21	9.00	0.84	0.43

NOTE:

VALUES SHOWN IN TABLE ARE FOR MINIMUM DIMENSIONS ONLY. PROPOSED RIPRAP STILLING BASIN HAS A BASIN LENGTH OF 34.0 FT, POOL LENGTH OF 23.5 FT, POOL DEPTH OF 1.0 FT, AND RIPRAP D50 OF 6 INCHES.

DETAIL: OUTFALL #1 RIPRAP STILLING BASIN (HEC 14, FIGURE 10.1)

NTS



NOTE:
1. APRON LINING SHALL BE CLASS A1 RIP RAP OR APPROVED ALTERNATIVE.
2. L_a SPECIFIED ABOVE AS 10 FEET
3. d = 18 INCHES MIN.
4. LEVEL SPREADER TRENCH TO BE INSTALLED PARALLEL TO CONTOUR AND TO MATCH THE PROPOSED GRADE. TOP LIP ELEVATION TO BE UNIFORM TO WITHIN 1".

STRUCTURE	WIDTH (FT)	10-YR DEPTH (FT)	SLOPE (FT/FT)	10-YR FLOW (CFS)	10-YR VELOCITY (FT/S)	SHEAR STRESS (LB/SQFT)	OUTFALL PROTECTION	DO	LA	W	D
OUTFALL #2	3	0.15	0.25	0.82	2.34	12 INCH RIPRAP	1	10	5	18	

DETAIL: OUTFALL #2 RIPRAP CHANNEL / ENERGY DISSIPATOR

NTS

NOTES AND DETAILS, PHASE II UPPER MACHODOC CREEK KING GEORGE COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
PROFESSIONAL ENGINEER

REVISIONS:
DATE: 7/31/13
REVISOR: PER NAVY COMMENTS

DRAWN BY: DPT
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Norfolk, Virginia 23406
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Environmental Consultants



TECHINICAL/MANAGEMENT EVALUATION

The proposal shall be evaluated on the **Technical Merit** of the proposed work, the **Experience and Qualifications** of the team completing the work, and the **Value** of the work proposed work. The following are the factors to be used for the evaluation of technical merit.

Excellent - Proposal/factor demonstrates thorough and detailed understanding of requirements. Technical approach and capabilities significantly exceed performance and capability standards. Proposal/factor offers one or more strengths. Strengths significantly outweigh weaknesses, if any. The proposal/factor represents a high probability of success with no apparent risk in meeting the Government's requirements.

Good - Proposal/factor demonstrates good understanding of requirements. Technical approach and capabilities exceed performance and capability standards. Proposal/factor offers one or more strengths. Strengths outweigh any weaknesses. The proposal/factor represents a strong probability of success with overall low degree of risk in meeting the Government's requirements.

Satisfactory - Proposal/factor demonstrates acceptable understanding of requirements. Technical approach and capabilities meet performance and capability standards. Proposal/factor offers no strengths, or, if there are any strengths, these strengths are offset by weaknesses. The proposal/factor represents a reasonable probability of success with overall moderate degree of risk in meeting the Government's requirements.

Marginal - Proposal/factor demonstrates a limited understanding of requirements. Technical approach and capabilities are questionable as to whether or not they meet performance and capability standards necessary for acceptable contract performance. Proposal/factor contains weaknesses and offers no strengths, or, if there are any strengths, these strengths are outweighed by weaknesses. The proposal/factor represents a low probability of success with overall high degree of risk in meeting the Government's requirements. Proposal/factor might be made satisfactory with additional information and without a major revision of the proposal.

Poor - Proposal/factor demonstrates a lack of understanding of requirements. Technical approach and capabilities do not meet performance and capability standards necessary for acceptable contract performance. Proposal/factor contains major errors, omissions, significant weaknesses and/or deficiencies. The proposal/factor represents a very low probability of success with an extremely high degree of risk in meeting the Government's requirements. Proposal/factor could only be made satisfactory with major revision of proposal.

COOPERATIVE AGREEMENT TERMS AND CONDITIONS
(SEPT 2006 Rev 2)
5 June 2008

DoDGARs Part 22:

http://www.dtic.mil/whs/directives/corres/pd32106r_041398/part22.pdf

DoDGARs Part 33:

http://www.dtic.mil/whs/directives/corres/pdf/32106r_041398/part33.pdf

DoDGARs Part 32:

http://www.dtic.mil/whs/directives/corres/pdf/32106r_041398/part32.pdf

OMB Circulars:

<http://www.whitehouse.gov/omb/circulars>

ARTICLES

1. Order of Precedence
2. Statutes and Regulations
3. Cost Principles and Audit *
4. Record Retention and Access Requirements *
5. Modification of Cooperative Agreement
6. Prior Approvals and Changes
7. Allowable Costs *
8. Unexpended Balance
9. Overpayment and Earned Interest
10. Future Funding
11. Subagreements *
12. Officials Not to Benefit *
13. Hatch Act *
14. Lobbying *
15. Environmental Standards *
16. Nondiscrimination *
17. Cargo Preference *
18. Preference for U. S. Flag Air Carriers *
19. Profit or Fee *
20. Claims, Disputes, and Appeals *
21. Controlled Unclassified Information
22. Debarment and Suspension *
23. Drug Free Workplace *
24. Standards for Financial Management Systems *
25. Payment *
26. Procurement *
27. Property *
28. Reports *
29. Termination and Enforcement *
30. After-Award Requirements *
31. Cost Share or Match *
32. Resource Conservation and Recovery Act

* Refer to DoDGARS, Part 22, appendices A-C for applicable modifications and requirements.

1. Order of Precedence

This Cooperative Agreement is subject to the laws and regulations of the United States. Any inconsistency or conflict in the terms and conditions specified in this Cooperative Agreement shall be resolved according to the following order of precedence:

- (a) The Federal statute authorizing this award, or any other Federal statutes directly affecting performance of this Cooperative Agreement.
- (b) Department of Defense Grant and Assistance Regulations (DoDGARs) 32 CFR Part 32, Administrative Requirements for Grants and Agreements With Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.
- (c) These General Terms and Conditions.
- (d) Other terms and conditions contained within this Cooperative Agreement and any attached schedules.

2. Statutes and Regulations

This Cooperative Agreement is subject to the laws and regulations of the United States that apply to assistance instruments including Chapter 63 of U.S. Code Title 31. DoDGARs Part 32 is hereby incorporated into this Cooperative Agreement by reference. The following OMB circulars, as appropriate, are also incorporated by reference into this Cooperative Agreement:

- (a) A-21, "Cost Principles for Educational Institutions"
- (b) A-110, "Grants and Cooperative Agreements for Institutions of Higher Learning"
- (c) A-133, "Audits of State, Local Governments, and Non-Profit Organizations"

3. Cost Principles and Audit

DoDGARS Part 32, Uniform Administrative Requirements for Grants and Cooperative Agreements with Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations and the OMB Circulars below apply specifically to the Cooperator. The Cooperative Agreement shall be consistent with these authorities:

- (a) A-21, "Cost Principles for Educational Institutions"
- (b) A-133 "Audits of States, Local Governments, and Non-Profit Organizations"

Cooperator shall submit a copy of OMB Circular A-133 audit reports to the agency Inspector General (IG) and to DoD (IG).

4. Record Retention and Access Requirements

All financial and programmatic records, supporting documents, statistical records, and other records of cooperators or sub-cooperators which are:

- (a) Required to be maintained by the terms of this part. program regulations or the cooperative agreement, or
- (b) Otherwise reasonably considered as pertinent to program regulations or the cooperative agreement.

5. Modification of Cooperative Agreement

The only method by which this Cooperative Agreement can be modified is by a formal, written and signed modification. Administrative modification(s) to the Cooperative Agreement may be accomplished unilaterally by the signature of designated Cooperative Agreement Administrative Representative or Awarding Officer. Changes to the express clauses or terms of the Cooperative Agreement affecting price, quality, quantity or delivery of the Cooperator's duties shall be the subject of a bilaterally executed modification. No other communications, whether oral or in writing, shall modify this Cooperative Agreement.

6. Prior Approvals and Changes

Any program changes to the approved project must comply with DoDGARS Subpart 32.25, Revision of Budget and Program Plans, for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

7. Allowable Costs

Cooperative agreement funds may be applied only to those costs allowed under DoDGARS Subpart 32.27, Allowable Costs, for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations and, for Institutions of Higher Education only, OMB Circular A-21.

8. Unexpended Balance

In the absence of any specific notice to the contrary, cooperators are authorized to carry forward unexpended balances of funds received to subsequent funding periods.

9. Overpayment and Earned Interest

Overpayment. Within ninety (90) days after the end date of the Cooperative Agreement, any overpayment of funds shall be remitted to the Administrative Grants Officer (AGO) at the Administrative Office on the Award/Modification document, by check made payable to the Naval Facilities Engineering Command. An overpayment represents the difference between allowable actual expenditures and total disbursements received by the Cooperator.

Advances and Earned Interest. Interest earned on any account holding funds advanced under this Cooperative Agreement shall be remitted at least quarterly to the Naval Facilities Engineering Command, by check made payable to the Treasury of the United States.

10. Future Funding

The Government's legal funding obligation is limited to the amount shown as the "Total Obligated on Award," section of the Cooperative Agreement document.

11. Subagreements

Cooperator shall comply with DoDGARS Subpart 32.5, Subawards, for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

12. Officials Not to Benefit

No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this Cooperative Agreement, or to any benefit arising from it, in accordance with 41 U.S.C. 22.

13. Hatch Act

The cooperator, Research Faculty and Graduate Research Assistance within the Department of Environmental Science and Policy agree to comply with the Hatch Act (5 U.S.C. 1501-1508 and 7324 - 7328), as implemented by the Office of Personnel Management at 5 CFR part 151, which limits political activity of employees or officers of State or local governments whose employment is connected to an activity financed in whole or part with Federal funds.

14. Lobbying

By signing and submitting this proposal, the cooperator is providing the certification at Appendix A to 32 CFR Part 28 regarding lobbying.

15. Environmental Standards

By accepting funds under this Cooperative Agreement, the cooperator assures that it will:

- (a) Comply with applicable provisions of the Clean Air Act (42 U.S.C. 7401, et seq.) and Clean Water Act (33 U.S.C. 1251, et. seq.), as implemented by Executive Order 11738 [3 CFR, 1971-1975 comp., p. 799] and Environmental Protection Agency (EPA) rules at Subpart J of 40 CFR Part 32.
- (b) Identify to the cooperator agency any impact that this agreement may have on:
 - (1) The quality of the human environment, and provide help the agency may need to comply with the National Environmental Policy Act (NEPA, at 42 U.S.C. 4321, et seq.) and to prepare Environmental Impact Statements or other required environmental documentation. In such cases, the cooperator agrees to take no action that will have an adverse environmental impact (e.g., physical disturbance of a site such as breaking of ground) until the agency provides written notification of compliance with the environmental impact analysis process.
 - (2) Coastal barriers, and provide help the agency may need to comply with the Coastal Barriers Resource Act (16 U.S.C. 3501, et seq.), concerning preservation of barrier resources.
 - (3) Any existing or proposed component of the National Wild and Scenic Rivers system, and provide help the agency may need to comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271, et seq.).

16. Nondiscrimination

By accepting funds under this Cooperative Agreement, the cooperator assures that it will comply with applicable provisions of the following national policies prohibiting discrimination:

- (a) On the basis of race, color, or national origin, in Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d, et seq.), as implemented by DoD regulations at 32 CFR Part 195

- (b) On the basis of race, color, religion, sex, or national origin, in Executive Order 11246 [3 CFR, 1964-1%5 Comp., p.339], as implemented by Department of Labor regulations at 41 CFR part 60.
- (c) On the basis of sex or blindness, in Title IX of the Education Amendments of 1972 (20 U.S.C. 1681, et seq.).
- (d) On the basis of age, in the Age Discrimination Act of 1975 (42 U.S.C. 6101, et seq.) as implemented by Department of Health and Human Services regulations at 45 CFR Part 90.
- (e) On the basis of handicap, in Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794), as implemented by Department of Justice regulations at 28 CFR Part 41 and DoD regulations at 32 CFR Part 56.

17. Cargo Preference

The cooperator agrees that it will comply with the Cargo Preference Act of 1954 (46 U.S.C. 1241), as implemented by Department of Transportation regulations at 46 CFR 381.7, which require that at least 50 percent of equipment, materials or commodities procured or otherwise obtained with U.S. Government funds under this cooperative agreement, and which may be transported by ocean vessel, shall be transported on privately owned U.S.-flag commercial vessels, if available.

18. Preference for U. S. Flag Air Carriers

Travel supported by U.S. Government funds under this cooperative agreement shall use U.S.-flag air carriers (air carriers holding certificates under 49 U.S.C. 41102) for international air transportation of people and property to the extent that such service is available, in accordance with the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. 40118) and the interpretative guidelines issued by the Comptroller General of the United States in the March 31, 1981, amendment to Comptroller General Decision BI38942.

19. Profit or Fee

In accordance with 32 CFR 22.205(b), no fee or profit may be charged to this cooperative agreement.

20. Claims, Disputes, and Appeals

(a) Cooperator Claims.

Per 32 CFR 22.815, any claims arising out of this agreement must be:

- (1) Submitted in writing to the Grants Officer;
- (2) Specify the nature and basis for the relief requested, and;
- (3) Include all data and relevant facts in support of the claim.

(b) DOD Component Claims.

Claims by a DOD Component shall be the subject of a written decision by the Grants Officer.

(c) Alternative Dispute Resolution (ADR).

The Parties shall use ADR to the maximum extent practicable, and comply with 32 CFR 22.815 ADR policies and procedures. It is hereby noted, however, that this particular Cooperator, has expressed that its business policy is not to enter into arbitration as the selected ADR method.

(d) Grants Officer Decisions.

(1) Within 60 calendar days after receipt of a written claim, the Grants Officer shall:

(a) Prepare a written decision, which shall include: the reasons for the decision; the relevant facts on which the decision is based; and the identity and mailing address of the cognizant Appeal Authority, and; shall be included in the award file, or

(b) Notify the Cooperator of a date when the written decision will be rendered. The notice shall address why additional time is needed.

(2) The Grants Officer's decision is final, unless appealed. In the event of an appeal, the Parties shall endeavor to use ADR procedures to the maximum extent practicable.

(e) Formal Administrative Appeals.

All formal administrative appeals shall comply with the applicable provisions of 32 CFR 22.815(e), Claims, disputes, and appeals.

(1) Appeal Authority. The Assistant Commander for Acquisition is the Appeal Authority to decide formal, administrative appeals under this Grant.

(f) Non-exclusivity of remedies.

Nothing in this section is intended to limit a cooperator's right to any remedy under the law.

21. Controlled Unclassified Information

The parties understand that information and materials provided pursuant to or resulting from this cooperative agreement may be export controlled, sensitive, for official use only, or otherwise protected by law, executive order or regulation. The cooperator is responsible for compliance with all applicable laws and regulations. Nothing in this cooperative agreement shall be construed to permit any disclosure in violation of those restrictions.

22. Debarment and Suspension

Cooperators shall comply with the requirements of DoDGARS Part 25, Subpart C, "Government-Wide Suspension and Debarment (Nonprocurement)", 32 CFR Part 25, Subpart C. The cooperator shall also include a similar term or condition in any lower-tier covered transactions, as required by DoDGARS Part 25, Subpart B, 32 CFR Part 25 (2004).

23. Drug Free Workplace

By accepting funds under this Cooperative Agreement, the cooperator agrees to comply with the "Government -Wide Drug-Free Workplace (Grants)" requirements specified by DoDGARS Part 26,

Subpart B (or Subpart C, if the cooperator is an individual) of 32 CFR Part 26 (2004), which implements Secs. 5151-5160 of the Drug-Free Workplace Act of 1988 (41 U.S.C. 701, et. seq.).

24. Standards for Financial Management Systems

By accepting funds under this cooperative agreement, the cooperator agrees to maintain a financial management system that complies with DoDGARS Subpart 32.21, for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

25. Payment

Cooperator shall submit any request for payment in accordance with 32 CFR 32.22, Payment, for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations. Payment will be made in accordance with 32 CFR 32.22 for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

For any advance payment the cooperator must maintain or demonstrate the willingness to maintain the conditions set forth at 33 CFR 33.21 (c). Cooperator is authorized to be paid in advance under the conditions set forth at 33CFR 32.22(b)-(d), for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

Reimbursement is the preferred method when the requirements in 32 CFR 33.22(d) cannot be met. The Cooperator is authorized reimbursements under the conditions set forth at 22 CFR. 33.32.22(e)-(j) for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

The Government shall pay the Cooperator the price as provided in this agreement. The Government shall make progress payments monthly as the work proceeds, or at more frequent intervals as determined by the Agreements Officer, on estimates of work accomplished which meets the standard of quality established under the agreement, as approved by the Agreements Officer.

The Cooperator's request for progress payments shall include the following substantiation:

- (a) An itemization of the amounts requested, related to the various elements of work required by the agreement covered by the payment requested.
- (b) Additional supporting data in a form and detail required by the Agreements Officer.

26. Procurement

Cooperator's system for acquiring goods and services under this Cooperative Agreement shall comply with 32 CFR 32.40-32.48, for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

27. Property

Title shall vest in, and cooperator shall manage, property under this cooperative agreement in accordance with 32 CFR 32.2, and 32.30-32.37, for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

28. Reports

Cooperator shall maintain and submit reports in accordance with 32 CFR 32.50-32.53, for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

29. Termination and Enforcement

This award is subject to 32 CFR 32.61, Termination, and 32.62, Enforcement, for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

30. After-Award Requirements

Closeouts, subsequent adjustments, continuing responsibilities, and collection of amounts due are subject to the requirements in CFR 32.71 -32.73, for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

31. Cost Share or Match

Any cost share or cost match agreements shall comply with 32.23, for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations.

32. Resource Recovery and Conservation Act

Cooperator shall comply with the requirements contained in 32 CFR 32.49.

[End of Items]