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STORMWATER MANAGEMENT/ EROSION AND SEDIMENT CONTROL PLAN SITE 41
NSWC INDIAN HEAD
2/1/2010
TETRA TECH

REVISION 0
FEBRUARY 2010

**STORMWATER MANAGEMENT/
EROSION AND SEDIMENT CONTROL PLAN
FOR
SITE 41 – SCRAP YARD**

**NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARYLAND**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

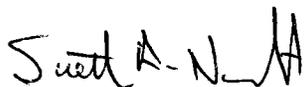
**Submitted to:
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**CONTRACT NUMBER N62472-03-D-0057
CONTRACT TASK ORDER 47**

FEBRUARY 2010

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ACRONYM LIST

ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
BMP	best management practice
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy
COMAR	Code of Maryland Regulations
Cpv	channel protection storage volume
CTO	Contract Task Order
E/A&H	ENSAFE/Allen & Hoshall
FS	Feasibility Study
HSG	hydrologic soil group
IR	Installation Restoration
LUC	land use control
MDE	Maryland Department of the Environment
NOI	notice of intent
NOT	notice of termination
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NSF-IH	Naval Support Facility Indian Head
PCB	polychlorinated biphenyl
PLS	pure live seed
SCS	Soil Conservation Service
SI	site inspection
SM/E&SCP	Stormwater Management / Erosion and Sediment Control Plan
TBC	to be considered
TP	total phosphorous
TSD	treatment, storage, and disposal
TSS	total suspended solids
TtNUS	Tetra Tech NUS, Inc.
RAC	Remedial Action Contractor
RI	remedial investigation
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
WQv	water quality volume

1.0 INTRODUCTION

This Stormwater Management/Erosion and Sediment Control Plan (SM/E&SCP) is for the Scrap Yard, Site 41, at the Naval Support Facility Indian Head (NSF-IH), in Indian Head, Maryland. It supports the Remedial Action Design submitted in August 2002 to be implemented Spring 2010. Following housekeeping activities within the limits of the Site 41 concrete pads, the Removal Action will be implemented. The removal action consists of excavating and off-site disposal of contaminated soil from areas surrounding the Site 41 concrete pads, implementing land use controls (LUCs) to prohibit residential development and groundwater usage, and monitoring shallow groundwater. Tetra Tech NUS, Inc. (TtNUS) has prepared this SM/E&SCP for submission to the Maryland Department of the Environment (MDE) under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, Contract No. N62472-03-D0057, Contract Task Order (CTO) 47.

This SM/E&SCP is being submitted to supplement the Removal Action Work Plan for Site 41 – Scrap Yard prepared by Shaw Environmental (provided under separate cover) to provide the steps that will be taken to prevent erosion, sedimentation, and non-stormwater discharges during implementation of the Removal Action. The SM/E&SCP presents a brief description of the activities to be performed during the Removal Action and the procedures and erosion and sediment control devices to be used to prevent migration of sediment from areas of disturbance during and after construction activities.

1.1 SITE DESCRIPTION

NSF-IH is located in northwestern Charles County, Maryland, approximately 25 miles southwest of Washington, D.C., as shown on Figure 1-1, and is a military facility consisting of the Main Area on Cornwallis Neck and the Annex on Stump Neck. The Main Area is bounded by the Potomac River to the northwest, west, and south, Mattawoman Creek to the south and east, and the Town of Indian Head to the northeast (Figure 1-2). Stump Neck Annex is located across Mattawoman Creek, is not contiguous with the Main Area, and is operated by a tenant.

The primary mission of NSF-IH is to provide services in energetics, ordnance devices and components, and other related ordnance engineering standards, including chemicals, propellants, and their propulsion systems, explosives, pyrotechnics, warheads, and simulators. The United States Environmental Protection Agency (USEPA) added NSF-IH to the National Priorities List (NPL) in September 1995 pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. Site 41 is one of the 48 Installation Restoration (IR) sites within the Main Area currently included in the NSF-IH IR Program. This Removal Action design is limited to Site 41 within the Main Area of NSF-IH.

Site 41 (Scrap Yard) is an active fenced scrap yard located west of Building 436. From the 1960s through 1988 the Scrap Yard was used to store polychlorinated biphenyls (PCB) and PCB-contaminated transformers. These transformers, some of them in poor condition, leaked PCB oil on the ground in the northwestern end of the scrap yard. The amount of PCB contaminated oil that leaked is unknown. A Site Inspection (SI) under the Navy Installation Restoration Program was conducted in 1992 and 1993 as recommended in the Preliminary Assessment to determine if contamination was actually present. Soil and groundwater samples along with sediment samples from Mattawoman Creek were collected and analyzed for target compound lists, target analyte lists, and total petroleum hydrocarbons. The SI was followed up with a Remedial Investigation (RI) which was completed in July 1999. The RI report determined that the chemicals of concern were arsenic, iron, lead and PCBs and that human health risk for non-residential scenarios were within acceptable limits, with the exception of the full-time worker. The document also identified a potential ecological risk in connection with surface soil contamination. The document recommended a feasibility study report to evaluate alternatives to address the full-time worker and ecological risks.

The feasibility study (FS) was completed in January 2001. The study developed potential remedial alternatives to address the unacceptable risk associated with the contamination within and adjacent to the scrap yard. Following finalizing the FS, a proposed plan was completed in February 2001. The preferred remedial alternative presented in the proposed plan provided for the removal of contaminated soil from areas adjacent to the Scrap Yard, and the removal of contaminated soil from within the Scrap Yard, all in combination with institutional controls. A public meeting was held on February 20, 2001 to present the Proposed Plan to the public, and the final design documents were completed in August 2002.

Due to unresolved issues related to Land Use Controls between the EPA and the Navy with respect to Records of Decision, an Engineering Evaluation and Cost Analysis was prepared in June 2002. On June 27, 2002 an Action Memorandum was signed describing a Removal Action to be performed at this site, which consists of removing contaminated material from within the Scrap Yard as well as contaminated soil from outside the Scrap Yard. Implementation of the Removal Action began in November 2002, but was halted due to an incident involving scrap metal at the site.

Due to the discovery of numerous ordnance and explosive items, the site was transferred to the Munitions Response Program in March 2004 and designated as site UXO 00032. The first phase of the Removal Action and remediation began in September 2006. Removal of all large potentially explosive items was completed in March 2007. Additional work is pending approval of an Explosive Safety Submission and a final endorsement/signature of a Memorandum of Agreement.

1.2 PROJECT DESCRIPTION

The Removal Action that this document supports is a continuation of the first and final Removal Action for Site 41. The selected remedy is removing and disposing contaminated soil off site, cleaning the concrete pad, implementing LUCs, and monitoring. This document provides the erosion and sediment control and stormwater management activities associated with the removal of contaminated soil surrounding the Site 41 concrete pads.

1.3 SCOPE AND OBJECTIVES

The scope and objectives of this SM/E&SCP include providing a brief description of the Removal Action proposed work presented in the Final Removal Action Design and presenting the best management practices (BMPs), including erosion and sediment control devices, that will be implemented or installed during and following implementation of the removal action to prevent migration of sediment-laden stormwater from the areas of disturbance.

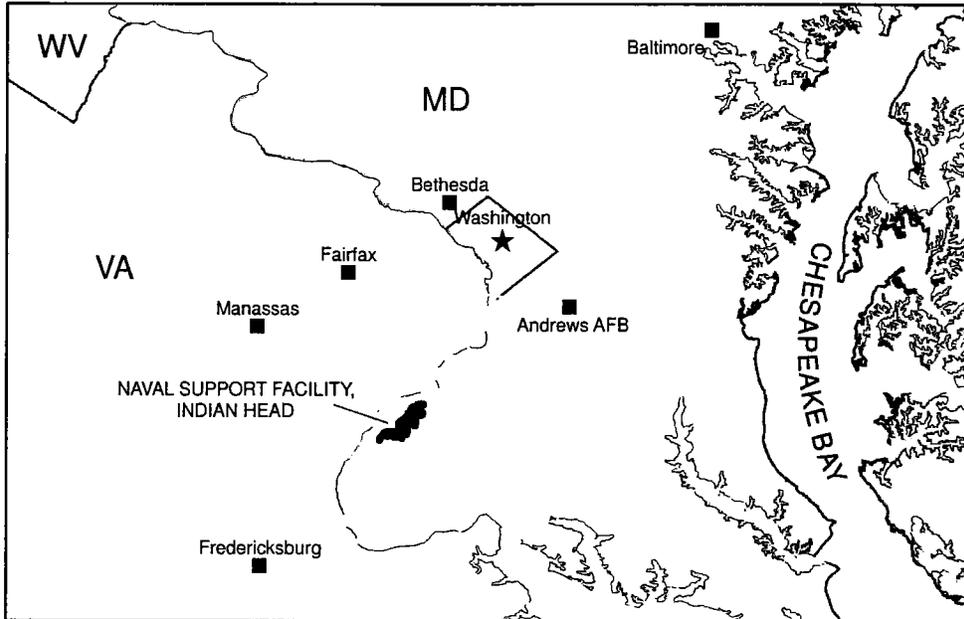
The following sections are included in this SM/E&SCP:

- Section 1.0 Presents a brief description of the project and presents the objectives of this SM/E&SCP.
- Section 2.0 Presents a description of erosion and sediment control measures to be implemented during the construction activities and the sequence of proposed construction activities.
- Section 3.0 Presents a generalized summary of state and local requirements for stormwater management.
- Section 4.0 Presents the inspection and maintenance program proposed for the stormwater related features of the project.
- Section 5.0 Presents a summary of non-stormwater discharges and pollution prevention measures to be employed during implementation of the project.
- Section 6.0 Contains the Pollution Prevention Plan Certification.
- Section 7.0 Contains the Contractors Certification.

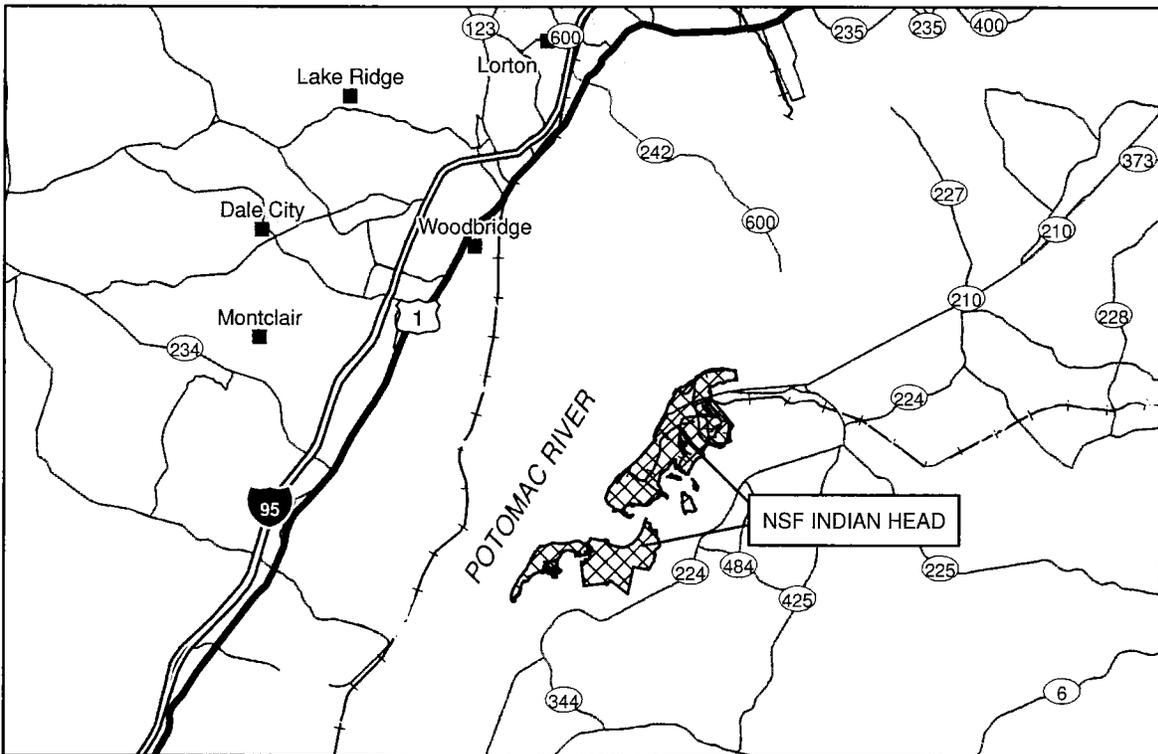
- Section 8.0 Contains the As-Built Certification
- Section 9.0 References

The following appendices are included in this SM/E&SCP:

- Appendix A Contains photographs of the site conditions.
- Appendix B Contains a copy of the MDE Stormwater Management Guidelines Checklist for Stormwater Pollution Prevention Plans.
- Appendix C Contains the certified Erosion and Sediment Control Plan drawings.
- Appendix D Contains MDE Standards and Specifications and Erosion and Sedimentation Evaluations for the planned erosion and sediment control devices to be used during and following implementation of the Removal Action.



- Legend**
- City
 - Limited Access
 - Highway
 - Major Road
 - Local Road
 - Rivers
 - Railroads



DRAWN BY DATE
K. MOORE 3/20/09

CHECKED BY DATE
D. WILSON 12/9/09

COST/SCHEDULE-AREA

SCALE
AS NOTED



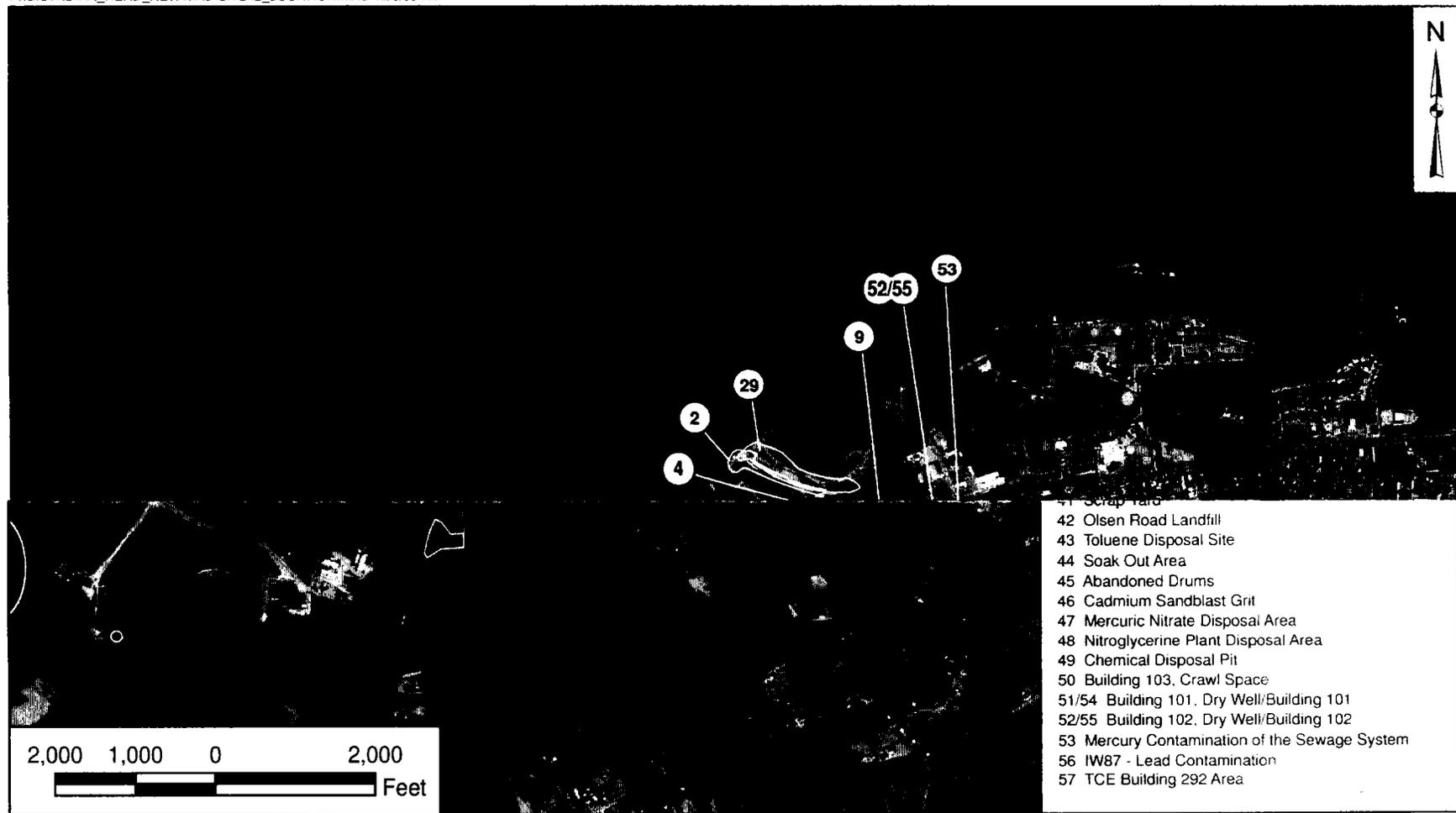
VICINITY MAP
SITE 41 - SCRAP YARD
NSF-IH
INDIAN HEAD, MARYLAND

CONTRACT NUMBER
CTO 047

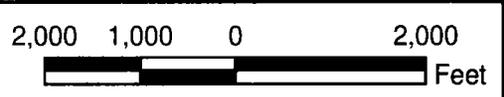
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FIGURE NO. REV
FIGURE 1-1 0



- 41 Scrap Yard
- 42 Olsen Road Landfill
- 43 Toluene Disposal Site
- 44 Soak Out Area
- 45 Abandoned Drums
- 46 Cadmium Sandblast Grit
- 47 Mercuric Nitrate Disposal Area
- 48 Nitroglycerine Plant Disposal Area
- 49 Chemical Disposal Pit
- 50 Building 103, Crawl Space
- 51/54 Building 101, Dry Well/Building 101
- 52/55 Building 102, Dry Well/Building 102
- 53 Mercury Contamination of the Sewage System
- 56 IW87 - Lead Contamination
- 57 TCE Building 292 Area



DRAWN BY	DATE
K. MOORE	12/4/09
CHECKED BY	DATE
D. WILSON	12/9/09
REVISED BY	DATE
SCALE AS NOTED	



SITE LOCATION MAP
SITE 41 - SCRAP YARD
NSF-IH
INDIAN HEAD, MARYLAND

CONTRACT NUMBER CTO 047	
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FIGURE NO. FIGURE 1-2	REV 0

2.0 INTRODUCTION

This section presents a description of stormwater controls, including erosion and sedimentation controls, proposed for the excavation of contaminated soil at Site 41. The Construction/Implementation and Final Stabilization/Termination Checklists and MDE checklists for SM/E&SCP are provided in Appendix B. The checklist for SM/E&SCP contents was obtained from the Maryland Stormwater Management Guidelines dated July 2001. Requirements specified in these checklists and document are incorporated into this SM/E&SCP.

2.1 EXISTING SITE CONDITIONS

2.1.1 Site 41

Site 41 occupies an area approximately 750 feet long and varies from 75 to 100 feet wide (1.5 acres) within a watershed that is approximately 6.14 acres in size. Site features are shown on Figure 2-1, and Site 41 watershed features are presented on Figure 2-2. The scrap yard is enclosed with a 10-foot-high chain-link fence. A gravel road access road and abandoned railroad tracks are located between the southern portion of the site and Mattawoman Creek. The area north of the site is steeply sloped and wooded. Runoff from this area flows toward the scrap yard and Mattawoman Creek. The area south of the scrap yard is flat, and surface runoff tends to pond and infiltrate. In some areas, runoff flows toward Mattawoman Creek. The site is currently an active scrap yard that is used to store materials that will be recycled or reused. Photographs of the site are contained in Appendix A.

Subsurface soil conditions at the site were investigated via installation of soil borings and monitoring wells during the SI. Subsurface materials generally consist of clayey sand interlayered with clayey gravel and sand lenses underlain by green-gray clay or brown sandy clay. The clay was encountered at depths of approximately 15 feet below ground surface (bgs) and extended to the depths of the borings. Layers of slag and coal from 2 to 5 feet thick were encountered at the ground surface outside the fenced area. The slag and coal did not extend into the fenced portion of the site.

Shallow groundwater beneath the site occurs under unconfined conditions and flows toward and discharges into Mattawoman Creek. However, this creek is tidal and, during high tide, losing stream conditions may occur, which may cause the water table to be slightly elevated near the creek and may change the groundwater flow pattern. Groundwater is primarily recharged by downward migration of precipitation through the unsaturated zone to the water table. The depth to the water table ranges from 2 to 4 feet bgs. Groundwater from the shallow aquifer is not used as a potable water supply; drinking water is obtained from a deeper aquifer (190 to 240 feet bgs). There is no known hydrogeological

connection or communication between the shallow water-table aquifer and the deeper aquifer used for drinking water. The clay underlying the site at a depth of approximately 15 feet bgs would act to impede the downward migration of the shallow groundwater to deeper aquifers. The closest supply well is located approximately 400 feet northwest and upgradient of Site 41 (Figure 2-2).

There are no areas of archaeological or historical importance at Site 41 (USEPA et al., 2001).

2.1.2 Off-Site Areas

Off-site areas are areas outside the Site 41 limits of disturbance that may be impacted by actions performed at Site 41. Off-site areas include the wooded areas north of Site 41, Mattawoman Creek south of Site 41, and the borrow area(s) from which soil for site restoration may be obtained. Each of these areas, with the exception of the borrow area(s), are adjacent to the limits of disturbance for this removal design; therefore, the erosion and sediment control devices required to protect these areas are described in this report.

The borrow area(s) will be selected by the Remedial Action Contractor (RAC) and will not be located within the limits of disturbance of this Removal Action. Therefore, the RAC will submit a supplemental erosion and sediment control plan addressing any and all off-site source(s) if an approved erosion and sediment control plan for the off-site source(s) does not exist.

2.2 SOIL TYPES AND CRITICAL AREAS

The following text describes the soil types and critical erosion areas within and adjacent to the limits of disturbance.

2.2.1 Soil Types

A soils map of the site from the United States Department of Agriculture (USDA) Soil Survey (1974) is provided as Figure 2-3. The approximate location of the site is indicated on the figure. The soil types present at Site 41 include:

- Cu – Cut and Fill Land
- KpB2 – Keyport Silt Loam
- AuD2 – Aura Gravelly Sandy Loam

Cut and Fill Land: Cut and Fill Land consists, in part, of land areas where the soil has been cut away by grading and similar operations. Most of the remaining areas are filled with soil and other materials to a

depth of many feet, but other areas are filled only to a depth of 1 or 2 feet. Cut and fill land is never farmed. Where used, it is chiefly for commercial or residential purposes. It is so variable in nature that the suitability of any area for a specific use must be determined by on-site investigation. According to boring logs, Cut and Fill Land soils at Site 41 consist of layers of slag and coal 2 to 5 feet thick at the surface, with subsurface soil consisting of clayey sand interlayered with clayey gravel and sand lenses, which in turn is underlain by green-gray clay or brown sandy clay. The clay was encountered at a depth of approximately 15 feet bgs. According to Soil Conservation Service (SCS) Urban Hydrology for Small Watersheds (USDA, 1986), the hydrologic soil group (HSG) Cut and Fill Land is undefined. Based on the soil investigation described in the RI and considering surrounding soils, the HSG for the Cut and Fill Land at Site 41 is assumed to be C.

Keyport Silt Loam: This soil is found on 2- to 5- percent slopes and is moderately eroded. The soil is representative of the Keyport series except that the remaining silt loam surface layer is thinner. The soil is suited to cultivated crops, pasture, and trees. The hazard of further erosion is moderate. This soil is moderately well drained with a surface layer consisting of friable silt loam underlain by a thin layer of heavy silt loam that is friable to firm. Below this layer is a firm layer of silty clay. The soil is slowly permeable with a high moisture capacity and has strong to very strong acidity. According to SCS Urban Hydrology for Small Watersheds (USDA, 1986), the HSG for Keyport Silt Loam is C.

Aura Gravelly Sandy Loam: This soil is found on 10- to 15- percent slopes and is moderately eroded. Most of this soil was formerly cultivated but now a large majority is in woodlands. The soil is suited to most farm uses, but if cultivated, the hazard of further erosion is severe. At the surface, this soil consists of gravelly sandy loam or gravelly loam to sandy clay loam underlain by very firm to massive gravelly loam or gravelly sandy clay loam. Worked areas have a spotted or marbled to bright-colored appearance. The subsoil is moderately slowly permeable to slowly permeable. The soil has low to moderate available moisture capacity and is very strongly or extremely acidic. According to the SCS Urban Hydrology for Small Watersheds (USDA, 1986), the HSG for Aura Gravelly Sandy Loam (10- to 15-percent slopes, moderately eroded) is B.

2.2.2 Critical Areas

Critical areas are those that have potentially serious erosion problems due to the presence of steep slopes, poor vegetative cover, drainage channels, surface water, floodplains, or areas identified as wetlands. These areas are to be protected to the maximum extent possible during construction activities. The critical areas associated with Site 41 include the slopes approaching the site (north of the site) and Mattawoman Creek. No other critical areas have been identified on or adjacent to Site 41. However, during construction, other areas may require temporary protection while portions of the site are unvegetated. The following sections present the erosion and sediment control devices proposed for the

protection of the critical areas and areas that will require temporary protection. Section 2.3 describes the erosion and sediment control devices proposed for protection of these critical areas. Certified Drawing 1 (provided in Appendix C) illustrates the locations of the selected erosion and sediment control devices.

2.3 EROSION AND SEDIMENT CONTROL MEASURES

Erosion and sediment control measures will be implemented, installed, and maintained according to the standards and specifications in the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control Manual unless otherwise noted in this plan or the construction documents. Design specifications for erosion and sediment control structures have been obtained from the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control Manual. Details and construction requirements for these erosion and sediment control devices are provided in Appendix D.

Definitions, purposes, and requirements of the erosion and sediment control devices described below are as indicated in the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control. The required erosion and sediment control measures are shown on Certified Drawing 2 provided in Appendix C and include:

- A stabilized construction entrance will be provided along the eastern site limit, as identified on Drawing 2 (Appendix C), to loosen and remove dirt from the tires of construction vehicles as they traverse the stabilized construction entrance to avoid tracking site materials onto NSF-IH or public roads. The stabilized construction entrance will be constructed prior to construction or placement of any other on-site erosion and sediment control device. The location of the proposed stabilized construction entrance is subject to approval by the Contracting Officer and MDE.
- A silt fence will be placed along the northern side of the newly constructed gravel road following the backfilling of the excavation. The proposed location where silt fence will be installed is identified on Drawing 2 (Appendix C) and is subject to approval by the Contracting Officer and MDE.
- Permanent and temporary seeding will be used throughout the construction process to stabilize disturbed areas. Seeding will occur as work progresses and areas are brought back to final grade (i.e., staged seeding). Temporary seeding is to be used on prepared grades when established grades will be exposed for longer than 14 days, or longer than 7 days for steep slopes (i.e., if permanent seeding is not scheduled to occur within the times indicated, temporary seeding will be used on established grades). Permanent seeding will be performed as soon as possible after final grades are established. Establishment of permanent stabilization is subject to approval by the Contracting Officer and MDE.

- Portable sediment tanks will be used to remove sediment from decontamination water and water generated during excavation dewatering, material dewatering, and rinsing activities. The location of the proposed portable sediment tanks are subject to approval by the Contracting Officer and MDE.
- Super silt fence (silt fence supported by wire fence) will be placed along the southern extent of excavation to protect the shoreline of Mattawoman Creek during excavation activities. Super silt fence will also be placed on the western side of the recommended drainage channel located on the eastern side of Site 41. The super silt fence will be placed prior to clearing and grubbing and will be removed following acceptance of final stabilization within the areas of disturbance. The proposed locations where super silt fences are to be installed are identified on Drawing 2 (Appendix C) and are subject to approval by the Contracting Officer and MDE.

2.3.1 Structural Practices

The following structural practices will be used during and/or following construction activities at Site 41 to control erosion and sedimentation. The number listed with each practice, if any, references the section of the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control that discusses the particular erosion and sediment control device.

Sediment Tank - 14.0. A sediment tank is a compartmented tank/container through which sediment-laden water is pumped to trap and retain the sediment. Sediment tanks will be used to remove sediment from decontamination water and from water generated during dewatering activities. Sediment collected in the sediment tanks will be stockpiled with the contaminated soil to be disposed off site. Water from the decontamination pads and dewatering pads will be stored in temporary holding tanks for characterization and proper disposal at an approved off-site treatment, storage, and disposal (TSD) facility. Sediment tanks for filtering this water will be located near the decontamination pad. The placement and construction of the sediment tanks will conform to Section 14.0 of the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control. Proposed sediment tank locations are shown on Drawing 2 (Appendix C), and a construction detail is provided in Appendix D.

Stabilized Construction Entrance - 17.0. A stabilized construction entrance is a stabilized layer of aggregate underlain with geotextile. A temporary stabilized construction entrance will be installed to provide access to Site 41 via the road east of Site 41. The construction of a stabilized construction entrance will conform to Section 17.0 of the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control. The stabilized construction entrance will be installed where indicated on Drawing 2 (Appendix C), and a construction detail is provided in Appendix D.

Temporary Seeding - 20.0. Temporary seeding involves providing vegetation consisting of annual grass or grain to provide cover on disturbed areas for up to 12 months. Temporary seeding will be performed on all regraded areas that will be left dormant for extended periods of time (14 days for gently to moderately sloped areas, 7 days for steeply sloped areas). Temporary seed will be fast-germinating vegetation placed immediately following grading and will be performed with annual rye grass. Site preparation and seeding methods will conform to the standards presented in Section 20.0 of the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control. Temporary seeding requirements are provided in Appendix D.

Permanent Seeding - 20.0. Permanent seeding involves providing vegetation consisting of grass and legumes to establish ground cover for a minimum period of 1 year on disturbed areas generally receiving low maintenance. Permanent seeding will occur as soon as possible following the establishment of final grades. Permanent seed mixtures are mixtures of annual and perennial seeds that will minimize erosion and provide suitable cover for wildlife. Site preparation and seeding methods will conform to the standards presented in Section 20.0 of the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control. Permanent seeding requirements are provided in Appendix D. The permanent seed mixture proposed for this project is presented in Section 2.5 of this SM/E&SCP.

Mulching - 20.0. All areas receiving permanent seeding will be mulched with an organic material to prevent erosion by protecting the soil surface from raindrop impact and to reduce the velocity of overland flow. Mulching will be performed in accordance with Section 20.0 of the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control. Mulching requirements are provided in Appendix D.

Silt Fence - 15.0. A silt fence is a temporary barrier of geotextile fabric used to intercept sediment-laden runoff from small drainage areas. The placement of the silt fence will conform to Section 15.0 of the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control. The silt fence will be installed where indicated on Drawing 2 (Appendix C). Silt fence construction requirements are presented in Appendix D. An evaluation of the use of silt fence compared to super silt fence is also provided in Appendix D. The silt fence will not be removed until all disturbed areas are stabilized.

Surface Roughening. The surfaces of regraded areas will be roughened to reduce runoff velocity and to aid in the establishment of vegetative cover. Surface roughening will be performed when rain storms are anticipated.

Super Silt Fence. Super silt fence will be installed along the southern extent of excavation to protect the shoreline of Mattawoman Creek during excavation activities. Although silt fence would be adequate for

these areas, super silt fencing is suggested due to the tidal action of Mattawoman Creek. A silt fence evaluation is provided in Appendix D.

2.3.2 Management Strategies

The following management strategies will be employed during excavation activities at Site 41:

- Unstabilized disturbed areas will be minimized, and construction activities will be staged.
- Seeding or other stabilization measures will be conducted in a staged manner immediately after final grade establishment (i.e., as final grades are established over a portion of the site, that portion will be stabilized).
- Areas that are not to be disturbed will be clearly marked by flags, signs, etc.
- The Contractor's superintendent will be responsible for ensuring the correct installation and maintenance of all erosion and sediment control features.
- Erosion and sediment control features will be installed and/or constructed before the start of any earth-disturbance activities.
- Erosion and sediment control features will remain in place until permanent vegetation is established over disturbed surfaces and is approved by the Contracting Officer and MDE.
- Erosion and sediment control features will be inspected daily and after each runoff-producing rainfall event.

2.4 SEQUENCE OF CONSTRUCTION

The sequence of construction is provided on Drawing 3 (provided in Appendix C). The sequence does not detail specific excavation processes, but identifies timing in the establishment of erosion and sediment controls, soil removal, and site restoration.

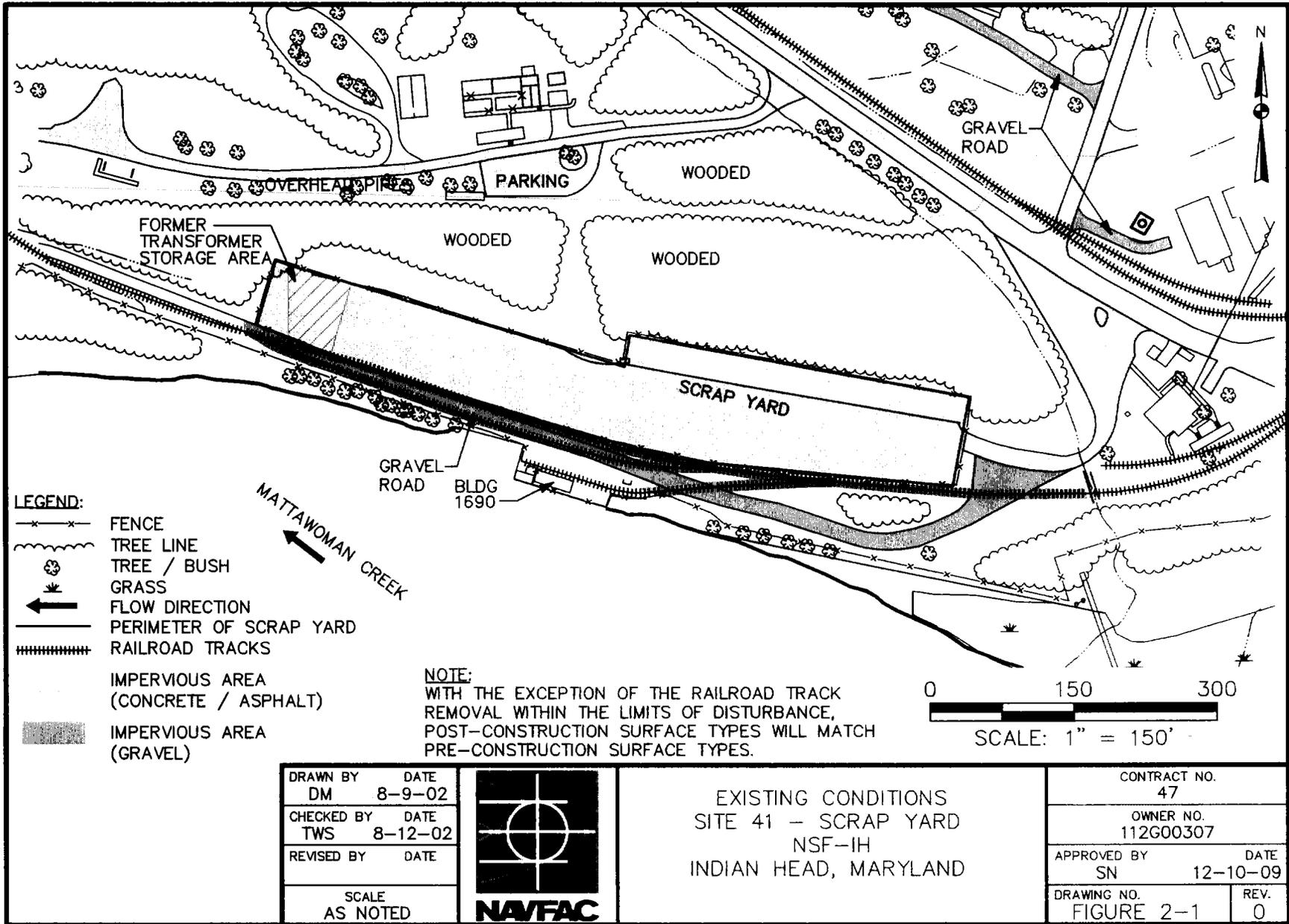
2.5 PERMANENT STABILIZATION

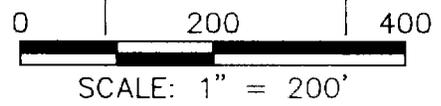
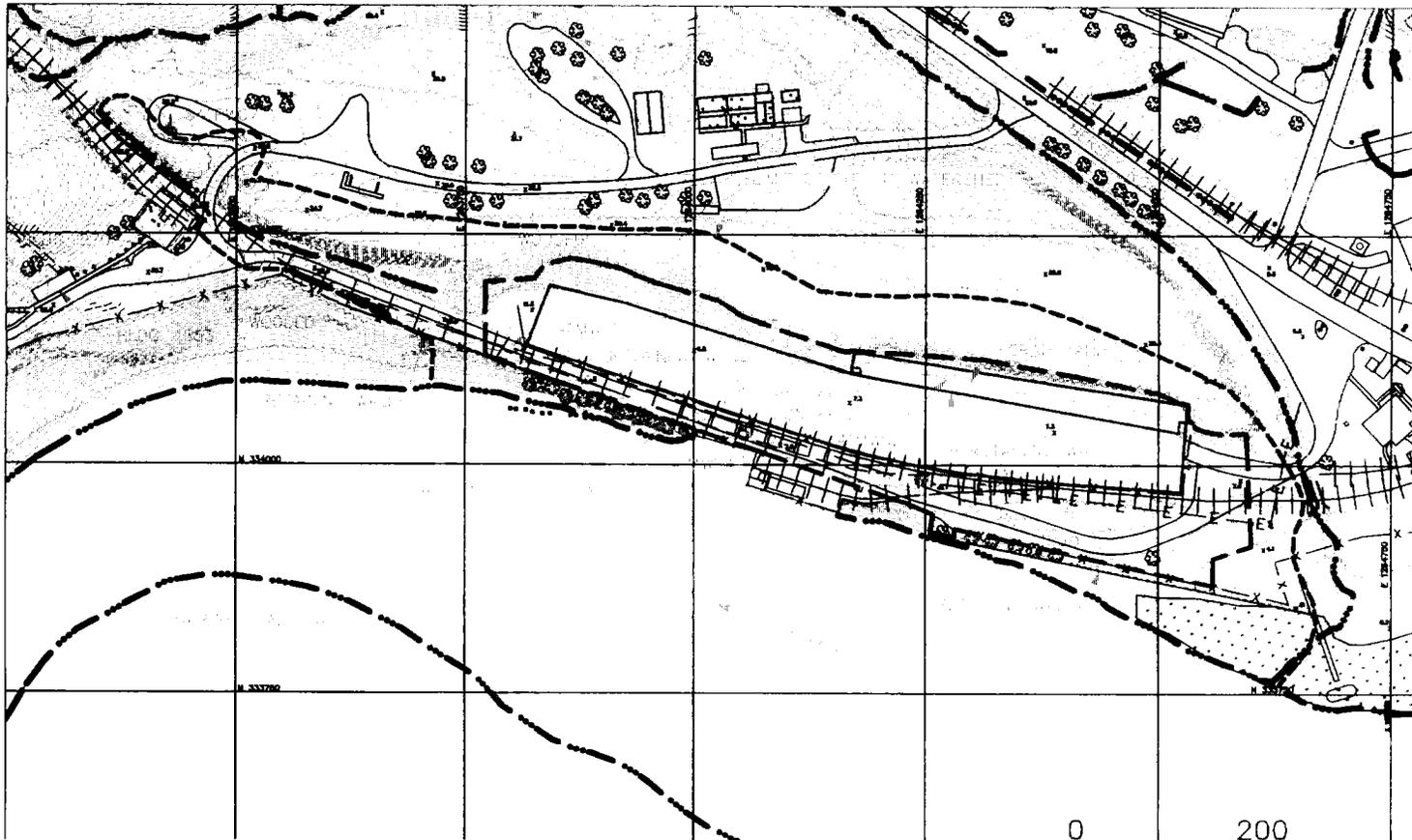
All areas disturbed by the Removal Action activities will be stabilized with a permanent seed mixture as soon as possible following final grading but no later than 7 to 14 days (as noted on the Certified Drawings). If permanent seeding will not be possible prior to 7 to 14 days from establishing final grades,

temporary seed will be installed immediately after establishing final grades. The permanent seed mixture was selected from the list of Maryland standard seed mixtures in Section 20.0 of the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control. The seed mixture was selected based on the applicable hardiness zone, level of maintenance, erosion resistance, and ecological function.

The permanent seed mixture, based on Mixture 5 in Table 25 (page G-20-18) of the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control, includes perennial ryegrass (*Lolium perenne*) seeded at a rate of 20 pounds of pure live seed (PLS) per acre and flatpea (*Lathyrus sylvestris*) seeded at a rate of 20 pounds of PLS per acre. Although these two species are not regionally indigenous and do not provide superior food or cover for wildlife, they are effective at providing effective erosion control and are not as invasive as many of the other species in the seed mixtures recommended by MDE. Mixture 5 is suited for Plant Hardiness Zone 7a, in which Site 41 is located, is suited for moist to dry site conditions is a low-maintenance mixture, and quickly produces a thick permanent groundcover.

The recommended planting dates for this seed mixture are March 1 through May 15 and August 15 through November 15. The seeding rates, surface preparation, and suggested fertilization/soil amendments are discussed in Appendix D.

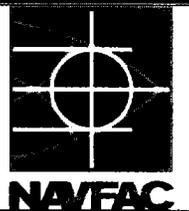




LEGEND:

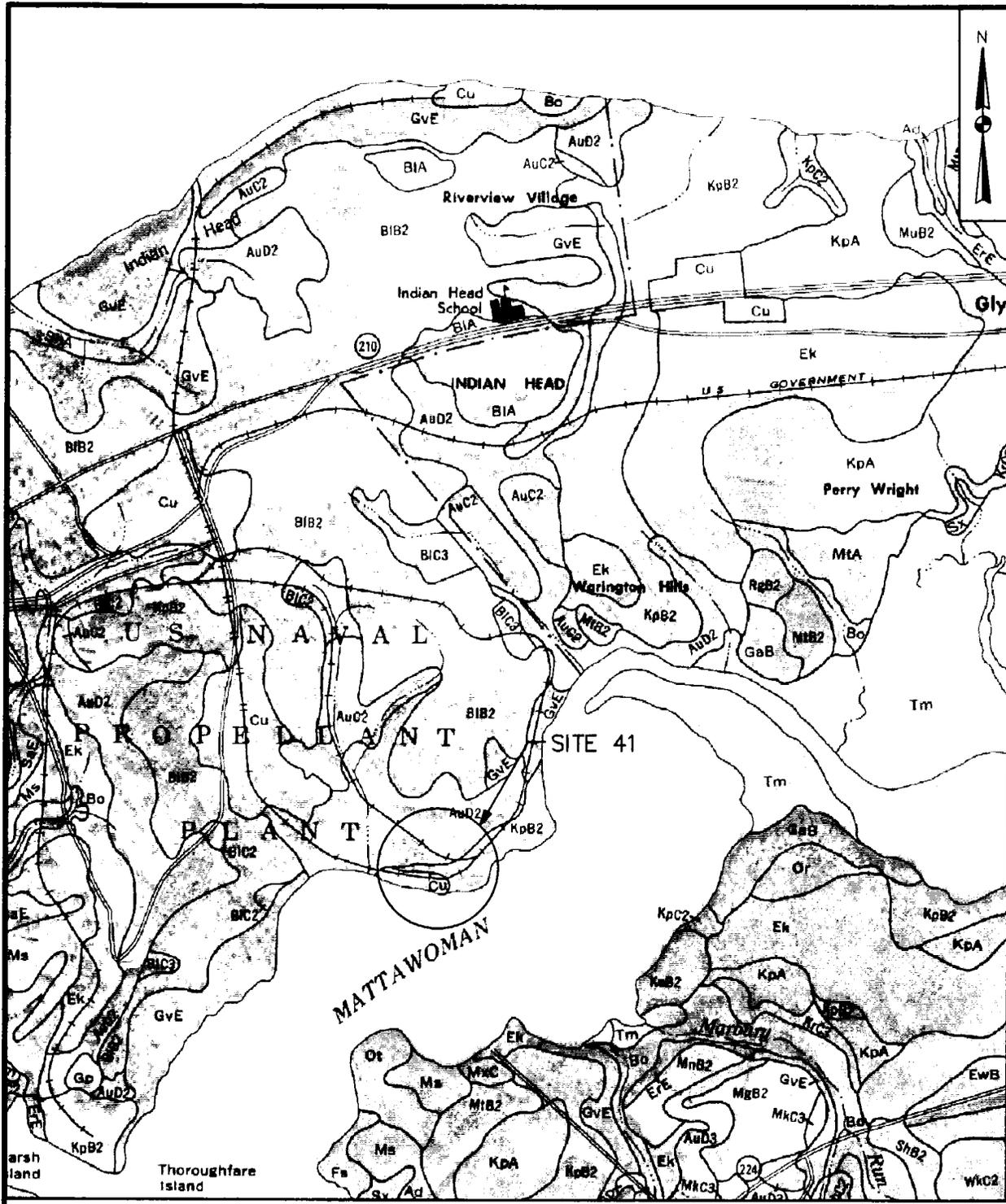
☞ EXISTING MONITORING WELL
(TO BE ABANDONED)

DRAWN BY DM	DATE 8-9-02
CHECKED BY TWS	DATE 8-12-02
REVISED BY ---	DATE ---
SCALE AS NOTED	



SITE 41 WATERSHED
SITE 41 - SCRAP YARD
IHDIV-NSF
INDIAN HEAD, MARYLAND

CONTRACT NO. 0047	
OWNER NO.	
APPROVED BY ---	DATE ---
DRAWING NO. FIGURE 2-2	REV. 0



SOURCE: SOIL SURVEY OF CHARLES COUNTY, MARYLAND, 1960, JULY 1974

DRAWN BY DM	DATE 8-9-02
CHECKED BY TWS	DATE 8-12-02
REVISED BY ---	DATE ---
SCALE NOT-TO-SCALE	



SOILS MAP
SITE 41 - SCRAP YARD
INDIV-NSF
INDIAN HEAD, MARYLAND

CONTRACT NO. 0047	
OWNER NO.	
APPROVED BY ---	DATE ---
DRAWING NO. FIGURE 2-3	REV. 0

3.0 STATE AND LOCAL REQUIREMENTS

This SM/E&SCP was prepared in accordance with the 2000 Maryland Stormwater Design Manual Volumes I and II prepared by the MDE Waste Management Administration. In accordance with Maryland Environmental Regulations [Code of Maryland Regulations (COMAR) 26.17.01.06], a trained and certified "responsible person" must be on site during construction. The purpose of the responsible person will be to train field personnel on techniques and standards associated with field implementation of erosion and sediment controls.

3.1 STORMWATER RUNOFF CONSIDERATIONS

Any development or construction activity disturbing 5,000 square feet or more of earth must comply with the general performance standards for stormwater management described in Section 1.2 of the 2000 Maryland Stormwater Design Manual. Because the removal action at Site 41 will disturb more than 5,000 square feet, the construction activity will address and incorporate these general performance standards. The 14 general performance standards are cited below as they appear in the 2000 Maryland Stormwater Design Manual, followed by the steps that will be taken to ensure compliance.

1. *Site designs shall minimize the generation of stormwater and maximize pervious area for stormwater treatment.* The Removal Action involves excavation of approximately 137,100 square feet of contaminated soil. Following excavation, the disturbed area will be backfilled to meet pre-construction grades and elevations. Surface types will be restored to reduce the impervious areas by the required 20 percent. This dirt road will be upgraded to a gravel paved road. Because of the reduction in impervious areas and the restoration to pre-construction grades and elevations, permanent stormwater management controls are not required for this site. In addition, the area will be revegetated. No impervious surface creation is included in this Removal Action; therefore, pre- and post-construction runoff calculations were not generated.
2. *Stormwater runoff generated from development and discharged directly into a jurisdictional wetland or waters of the State of Maryland shall be adequately treated.* The design indicates that pre- and post-construction conditions will be the same with the exception of the impervious well reduction. Therefore, overland runoff is not expected to contain sediment or increase in quantity (pre- and post-construction stormwater runoff calculations were not prepared for this design).
3. *Annual groundwater recharge rates shall be maintained by promoting infiltration through the use of structural and non-structural methods. At a minimum, the annual recharge from post-development site conditions shall mimic the annual recharge from pre-development site*

conditions. Post-construction hydrology conditions will differ from pre-construction hydraulic condition because of the decrease in impervious areas. As a result, more water will infiltrate to the groundwater table following construction. Therefore, no pre- and post-construction runoff calculations were prepared for this Removal Action.

4. *Water quality management shall be provided through the use of structural and/or non-structural practices.* During construction, the erosion and sediment control structures described in Section 2.3 of this report will be used to prevent sedimentation of Mattawoman Creek downgradient of the site. Following construction activities, site features (vegetation and shallow grades) will prevent erosion and transportation of silt to the downgradient waterway.
5. *Structural best management practices (BMPs) used for new development shall be designed to remove 80% of the average annual post development total suspended solids load (TSS) and 40% of the average annual post development total phosphorous load (TP). It is presumed that a BMP complies with this performance standards if it is; sized to capture the prescribed water quality volume (WQv); designed according to the specific performance criteria outlined in the 2000 Maryland Stormwater Design Manual; constructed properly; and maintained regularly.* The proposed Removal Action does not include any site development. Restoration of the site (grading and vegetation) to the pre-construction grades and elevations will not produce an increase in TSS load; therefore, no BMPs are required to reduce suspended solids in site runoff.
6. *On the Eastern Shore the post development peak discharge rate shall not exceed the predevelopment peak discharge rate for the two-year frequency storm event. On the Western Shore, local authorities may require that the post development ten-year peak discharge not exceed the predevelopment peak discharge if the channel protection storage volume (Cpv) is provided (see standard 7). In addition, safe conveyance of the 100-year storm event through stormwater management practices shall be provided.* Indian Head is located on the Western Shore of Maryland (according to Figure 2-4 of the 2000 Maryland Stormwater Design Manual). Restoration of the site to pre-construction grades and elevation and by measuring vegetation will result in an increase of pervious area from pre- to post-construction conditions. No peak discharge calculations were performed for this Removal Action.
7. *To protect stream channels from degradation, Cpv shall be provided by 12 to 24 hours of extended detention storage for the one-year storm event. Cpv shall not be provided for direct discharges to tidal waters and the Eastern Shore of Maryland unless the appropriate approval authority deems it is necessary on a case by case basis.* Because the channels that traverse

Site 41 discharge to the Mattawoman Creek, which is tidally influenced, Cpv determinations are not required.

8. *Stormwater discharges to critical areas with sensitive resources [e.g., cold water fisheries, shellfish beds, swimming beaches, recharge areas, water supply reservoirs, Chesapeake Bay Critical Area] may be subject to additional performance criteria or may need to utilize or restrict certain BMPs. Stormwater will be discharged to Mattawoman Creek, and proper stabilization practices will be used to reduce runoff flow velocity and transportation of sediment.*
9. *All BMPs shall have an enforceable operation and maintenance agreement to ensure the system functions as designed. During construction, daily maintenance of erosion and sediment control features is required. The site's approval letter, the approved Erosion and Sediment Control Plan, test reports, and a log of all erosion and sediment control feature inspections will be available on site for inspection by authorized officials. Following construction, placement of permanent erosion and sediment controls will not be required.*
10. *Every BMP shall have an acceptable form of water quality pretreatment. As indicated in Standard 5, it is assumed that the BMP will be acceptable as long as it is sized and constructed correctly. However, no permanent BMPs are required for this project.*
11. *Redevelopment, defined as any construction, alteration, or improvement exceeding 5,000 square feet of land disturbance on sites where existing land use is commercial, industrial, institutional or multi-family residential, is governed by special stormwater sizing criteria depending on the amount of increased or decreased impervious area created by redevelopment. Although the construction site associated with Site 41 will likely disturb 5,000 or more square feet of land, the Removal Action does not meet this definition of redevelopment.*
12. *Certain industrial sites are required to prepare and implement a stormwater pollution prevention plan and file a notice of intent (NOI) under the provision of Maryland's Stormwater Industrial National Pollutant Discharge Elimination System (NPDES) general permit. The requirements for preparing and implementing a stormwater pollution prevention plan are described in the general discharge permit available from MDE and guidance can be found in the USEPA document entitled, "Storm Water Management for Industrial Activities, Developing Pollution Prevention Plans and Best Management Practices" (1992). The stormwater pollution prevention plan requirement applies to both existing and new industrial sites. Site 41 is a CERCLA site. Per this program, the project will comply with the intent of the NOI, notice of termination (NOT), and NPDES permits.*

13. *Stormwater discharges from land uses or activities with higher potential for pollutant loadings, defined as hotspots in Chapter 2 (of the 2000 Maryland Stormwater Design Manual), may require the use of specific structural BMPs and pollution prevention practices. In addition, stormwater from a hotspot land use may not be infiltrated without proper pretreatment. Site 41 does not meet the definition of a stormwater hotspot.*

14. *In Maryland, local governments are usually responsible for most stormwater management review authority. Therefore, prior to design, applicants should always consult with their local reviewing agency to determine if they are subject to additional stormwater design requirements. In addition, certain earth disturbances may require NPDES construction general permit coverage from MDE. Per Navy policy, the project will comply with the intent of these permits.*

Due to the nature of the Site 41 Removal Action and the steps taken to ensure compliance with the 14 general performance standards presented above. The impervious areas associated with the abandoned railroad tracks will be restored as pervious area to promote infiltration. As a result 32 percent of the impervious land under pre-construction conditions will become pervious land under post-construction conditions.

4.0 INSPECTION AND MAINTENANCE PROCEDURES

During construction, all erosion and sediment control facilities will be checked daily and after each runoff-producing rainfall event to assure that the controls remain in effective operating condition. Any required repairs will be made immediately. The following items will be checked during inspections:

- The stabilized construction entrance will be maintained in a condition that will minimize tracking sediment onto roads, including the addition of stone or other repairs.
- The silt fence will be checked daily for undermining or deterioration of the fabric and for fence stability. Sediment will be removed when the level of sediment deposition causes "bulging" or reaches one-half of the fabric height.
- The seeded areas will be checked regularly to ensure that a good stand of vegetation is maintained. Areas will be fertilized and reseeded as needed. The Contractor is responsible for maintenance until formal acceptance by the Contracting Officer and MDE.
- The portable sediment tanks will be easily accessible for proper clean-out and disposal of trapped sediment that is collected from the containment berm area.
- The super silt fence will be checked regularly for undermining or deterioration of the fabric. Sediment will be removed when the level of sediment deposition causes "bulging" or reaches one-half of the fabric height.

5.0 NON-STORMWATER DISCHARGES AND POLLUTION PREVENTION

This section presents a description of non-stormwater discharges and pollution prevention measures that will be employed during the Removal Action.

5.1 NON-STORMWATER DISCHARGES

Non-stormwater discharges anticipated during construction activities will include water resulting from decontamination procedures and dewatering of excavated soil (if needed). Due to the depth of groundwater (2 to 4 feet bgs at high tide) and the proximity of Mattawoman Creek (tidally influenced) to Site 41, no attempts will be made to dewater the excavation that extend into groundwater. The water generated from draining excavated soil will be collected and conveyed through a sediment removal device (portable sediment tank). Following the removal of sediment, the water will be characterized and discharged to Mattawoman Creek (if appropriate) or sent to an off-site TSD facility. Decontamination water will be collected and will also be filtered to remove suspended sediment and characterized. Following characterization, decontamination water will be transported to an approved off-site TSD facility. Sediment removed from water associated with decontamination and draining of soil will be characterized, transported, and disposed at an appropriate off-site facility.

5.2 POLLUTION PREVENTION MEASURES

The following is a list of materials or substances that are anticipated to be stored on site during the Removal Action:

- Detergents for decontamination efforts
- Diesel fuel and other vehicle maintenance substances
- Fertilizer as a soil amendment to promote vegetative growth
- Small quantities of laboratory chemicals, paints, and other flammable substances

Detergents and small containers or drums of oil, grease, antifreeze, hydraulic fluids, etc., if any, will be stored within an enclosed, lined, and diked area, along with any diesel fuel stored in tanks. The storage area will be bermed and lined with a 60-mil polyethylene geomembrane, sized to contain at least 10 percent of the total contents of all materials stored in the area, with an allowance for precipitation. A small sump or low point will be designed to serve as a monitoring point for any leaks or spills from the containers. Inspection of the area and management of substances collected in this area were addressed previously in Section 4.0.

Small quantities of laboratory chemicals, paints, and other flammable substances may be stored on site during the Removal Action. These materials, when not in use, will be stored in a flammable storage cabinet located in the equipment trailer. Practices that will be followed to reduce risks associated with these materials include the following:

- Products will be kept in original containers unless they are not resealable.
- Original labels and Material Safety Data Sheets will be retained.
- If surplus product must be disposed, manufacturer or local and state recommended methods for proper disposal will be followed.

The following paragraphs describe specific spill prevention and material management practices that will be employed during the Removal Action.

5.3 GOOD HOUSEKEEPING

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff:

- An effort will be made to store only enough product to accomplish the task.
- All materials stored on site will be stored in a neat orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturers' labels.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used before the container is disposed.
- Manufacturers' recommendations for proper use and disposal will be followed.
- The competent person will inspect areas daily to ensure proper use and disposal of materials on site.

5.4 SITE CONTROL PRACTICES

In addition to the good housekeeping and material management practices discussed above, the following practices will be followed for spill prevention and cleanup:

- Manufacturers' recommended methods for spill cleanup will be clearly posted, and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area on site. Equipment and materials will include but will not be limited to brooms, dustpans, mops, rags, gloves, goggles, absorbent material, and plastic and metal containers specifically for this purpose.

- All spills will be cleaned immediately after discovery.
- The spill area will be kept well ventilated, and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate state or local government agency, as necessary, in accordance with state and local ordinances.
- If a spill occurs, stormwater pollution prevention plan will be modified to include measures to prevent this type of spill from reoccurring and measures for cleaning the spill if there is a recurrence. A description of the spill, cause, and cleanup measures will also be included in the modified plan.
- The Contractor's on-site construction superintendent responsible for day-to-day site operations will be the spill prevention and cleanup coordinator. The superintendent will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the storage areas and in the decontamination and office trailers located on site.

6.0 POLLUTION PREVENTION PLAN CERTIFICATION

The following certification is signed by the individual certified by the State of Maryland to oversee the preparation of this document. The certified individual must be a professional engineer, professional land surveyor, or landscape architect licensed in the State of Maryland.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the submitted information. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature:

Printed Name:

Organization And Title:

Date:

7.0 CONTRACTOR'S CERTIFICATION

The following certification is signed by the Contractor and any of that Contractors subcontractors assigned to perform work related to potential stormwater discharges that require an NPDES permit.

"I certify under penalty of law that I understand the terms and conditions of the general NPDES permit, if any, that authorizes the stormwater discharges associated with construction activity at the site identified as part of this certification."

Signature	For	Responsible for
_____ Contractor Date: _____	Shaw E&I	Shaw E&I
_____ Subcontractor Date: _____	Company Name and Address	Subcontractor
_____ Subcontractor Date: _____	Company Name and Address	Subcontractor

8.0 AS-BUILT CERTIFICATION

The as-built certification will only be required in the event that permanent erosion and sediment controls (e.g., detention ponds, culverts, etc.) are incorporated into the project. As indicated above, permanent erosion and sediment controls are not proposed for this project. However, for completeness, the following certification will be added to As-Built Drawings if permanent erosion and sediment controls are added to the project.

"I hereby certify that the stormwater management facility shown on the plans (if needed) has been constructed in accordance with the plans approved by the Maryland Department of the Environment, except as noted in red on the "As-Built" Drawings."

Name

Signature

Maryland Registration Number

Date

MDE No.

Facility Identification (number and/or type)

APPENDIX A

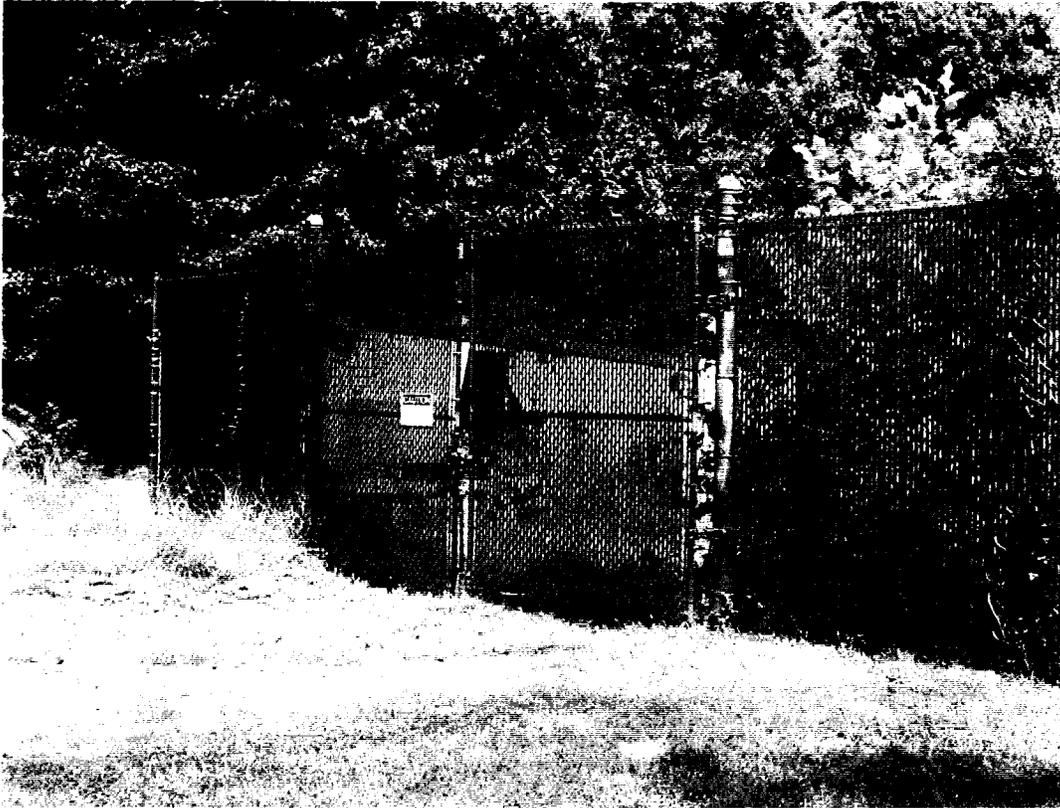
PHOTOGRAPHS



Looking west toward the concrete pad (fenced in scrap yard)



Looking west south of scrap yard. Six foot high security fence with 3 foot high retaining wall (inside fence)



Western end of scrap yard 6 foot high security fence



Looking west from Scrap Yard Entrance 3 foot high retaining wall 6 foot high security fence (left) along down slope edge of concrete pad 3 foot high retaining wall (right) separates upper and lower concrete pad. Photograph taken during scrap removal.



Looking east toward Scrap yard Entrance 3 foot high retaining wall and 6 foot high security fence (right) along downslope edge of concrete pad 3 foot high retaining wall (left) separates upper and lower concrete pad. Photograph taken during scrap removal.

APPENDIX B

STORMWATER MANAGEMENT GUIDELINES CHECKLIST

Stormwater Management Plan Contents

The following is a summary of the required contents of a Stormwater Management Plan as described in the Maryland Stormwater Management Guidelines for State and Federal Projects, July 2001.

Reports submitted for stormwater management plan approval will include:

1. A brief narrative description of the project.

The project description is provided in Section 1.2 of the Stormwater Management/Erosion and Sediment Control Plan (SM/E&SCP).

2. Geotechnical investigations including soil maps, borings, site specific recommendation, and an additional information necessary for the proposed stormwater management design.

Soil types as reported by the Soil Conservation Service are provided in Section 2.2.1 of the SM/E&SCP. Additional soil boring information is provided in the Final Remedial Action Design Submittal for Site 41 – Scrap Yard.

3. Description of all water courses, impoundments and wetlands on or adjacent to the site or into which stormwater directly flows.

A description of adjacent areas is provided under section 2.2.2 of the SM/E&SCP. The title for this section is Critical Areas. The locations of water courses within the vicinity of the proposed Removal Action are identified on Drawing 2 provided in Appendix c.

4. Hydrologic computations, including drainage area maps depicting pre-development and where appropriate, the post development runoff flow path segmentation and land use.

Because of the nature of the Removal Action (removal of contaminated soil, restoration to pre-construction grades, and revegetation), the pre- and post-construction runoff calculations are not provided with this SM/E&SCP. The limits of disturbance and contributing drainage area are identified on Drawing 1 provided in Appendix C.

5. Hydraulic computations.

Hydraulic computations refer to runoff calculations used to evaluate increased runoff expected from the construction zone following construction activities. Because the project includes re-establishing pre-

construction grades and vegetation, no hydraulic calculations are provided with this SM/E&SCP.

6. Structural computations.

Structural computations include calculations that are needed to size permanent stormwater control devices to be installed during construction. Because no permanent stormwater control devices will be installed during construction no structural computations are provided with this SM/E&SCP.

7. Unified sizing criteria volume computations according to the Design Manual.

Because there is no site development associated with this removal action the unified sizing criteria volume computations were not provided with this SM/E&SCP.

8. Any other Information required by the Administration.

Additional information will be provided to the Administration at the time it is requested.

At a minimum each report will include:

1. A title sheet – *Provided*
2. A table of contents – *Provided*
3. A list of Figures – *Provided*
4. Body of the Report will contain an introduction, Methodologies used, analysis, summary, and conclusions – *The report contents are provided, the summary and conclusions are provided in forms of certified design drawings provided in Appendix C of the SM/E&SCP and the Certifications provided in SM/E&SCP Sections 6.0, 7.0, and 8.0.*
5. Appendices – *Appendices include this summary, certified drawings, and the MDE standards and specifications for the erosion and sediment control devices described in Section 2.3 of the SM/E&SCP.*

Construction drawings submitted for stormwater management plan approval shall include the following:

1. A vicinity map

The vicinity map is provided as Figures 1-1 of the SM/E&SCP.

2. Site Characteristics including a topographic survey showing all contours and existing features and all watercourses, impoundments, and wetland adjacent to the project which receives site stormwater runoff.

The site characteristics are illustrated in certified Drawing 1, provide in Appendix C of this SM/E&SCP.

3. All proposed improvement including locations of buildings or other structures, impervious surfaces, storm drainage facilities and all grading.

The proposed improvement drawing is provided in Appendix C as Certified Drawing 4. This drawing identifies proposed final grades as well as revegetation.

4. The location of existing and proposed structures and utilities.

Within the proposed limits of the removal action and within the limits of disturbance there are no existing or proposed structures and no identified utilities. The contractor will be required to verify the presence or absence of utilities prior to land disturbance. Site conditions and post construction conditions are presented on Certified Drawings 2 and 4 provided in Appendix C of this SM/E&SCP.

5. Any easements and right-of-way.

None required. Site conditions and post construction conditions are presented on Certified Drawings 2 and 4 provided in Appendix C of this SM/E&SCP.

6. The delineation if applicable of the 100-year floodplain and any on site wetlands.

The identified wetlands are presented on Certified Drawing 1 provided in Appendix C of this SM/E&SCP. The identified wetlands are not within the area of disturbance.

7. Structural and construction details for all components of the proposed drainage system or systems, and stormwater management facilities.

None Required.

8. All necessary construction specifications.

Standards and specifications for the erosion and sediment control devices identified on Certified Drawing 2 and within the text of this SM/E&SCP are provided in Appendix D of this SM/E&SCP.

9. A sequence of construction which includes, in the appropriate order;
- Notification of the MDE 7 days in advance of any earth disturbance activities
 - Installation of perimeter erosion/sediment controls
 - Development clearing, grubbing, rough grading
 - Construction
 - Final grading
 - Vegetation stabilization
 - Installation of stormwater management practices
 - Removal, with MDE approval, of the erosion/sediment controls.

A sequence of construction is provided on Certified Drawing 3, provided in Appendix C of this SM/E&SCP.

10. Data for total site area, disturbed area, new imperious area, and total imperious areas.

Disturbance area information is presented on Certified Drawing 3, provided in Appendix C of this SM/E&SCP.

11. A table showing the unified sizing criteria volumes required in the Design Manual.

Not provided since no permanent stormwater management facilities are proposed for this project.

12. A table of material to be used for stormwater management facility planting.

Not provided since no permanent stormwater management facilities are proposed for this project. However a planting mixture for permanent stabilization is presented in Section 2.5 of the SM/E&SCP and on Certified Drawing 4, provided in Appendix C of this SM/E&SCP.

13. All soil boring logs and locations.

Soil boring logs and soil boring mapping is provided in the Final Remedial Action Design Submittal for Site 41 – Scrap Yard. Due to the nature of this project this information was not provided in this SM/E&SCP.

14. A maintenance schedule.

The maintenance schedule is identified in Section 4 of the SM/E&SCP and within the notes presented on Certified Drawing 3, provided in Appendix B of this SM/E&SCP.

15. Certification by the owner/developer that all stormwater management construction will be done according to this plan.

Certifications are provided on Certified Drawing 3 presented in Appendix B of this SM/E&SCP.

16. An as-built certification signature block to be executed after project completion.

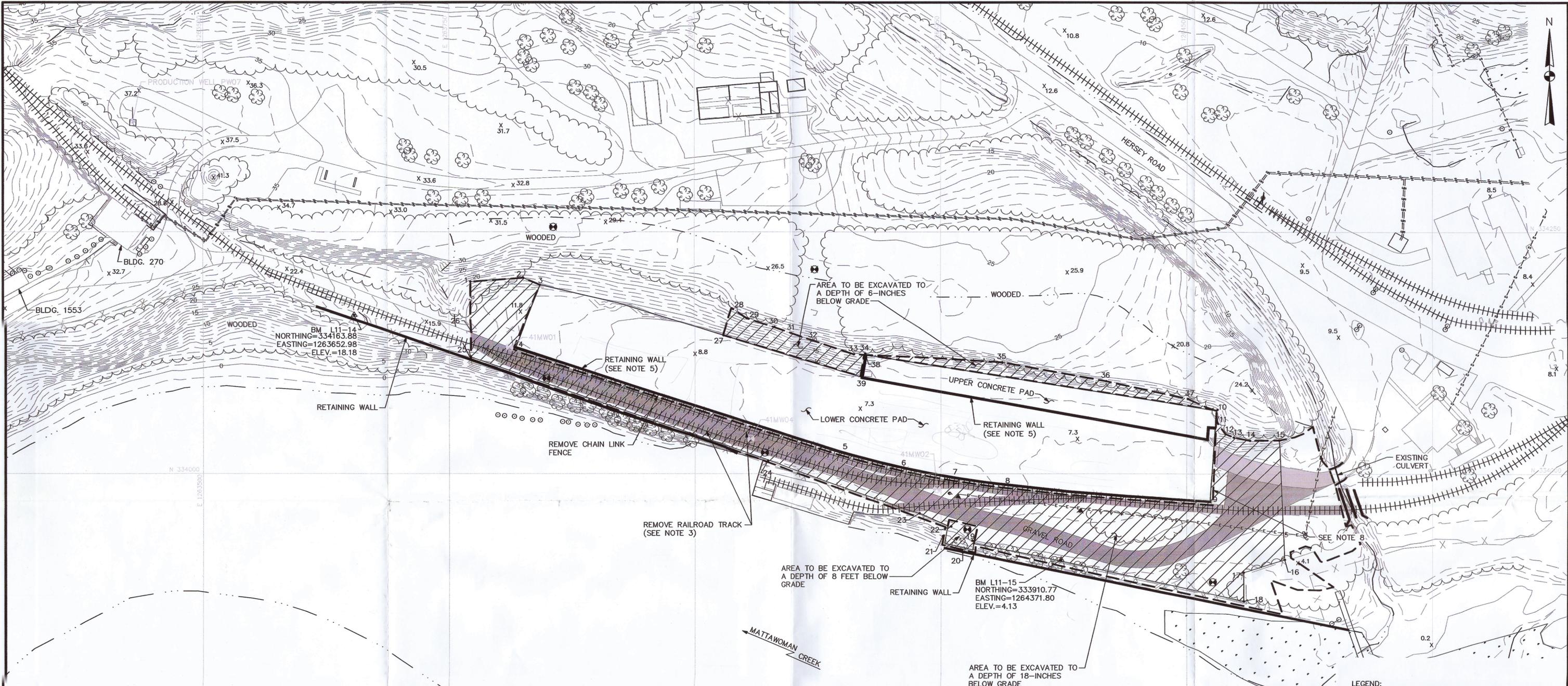
As-built drawings of permanent stormwater management facilities will not be required for this project. However, for completeness this certification along with directions to add the certification to As-built drawings is provided in Section 8.0 of the SM/E&SCP in the event that as-built drawings for stormwater management facilities are required.

17. Any other information required by the Administration.

Additional information will be provided to the Administration at the time it is requested.

APPENDIX C

CERTIFIED DRAWINGS



SOIL REMOVAL

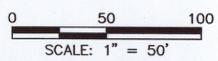
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8	333988	1264314
9	333970	1264524
10	334066	1264532
11	334053	1264531
12	334041	1264540
13	334038	1264548
14	334034	1264564
15	334035	1264594
16	333911	1264600
17	333898	1264558
18	333868	1264558
19	333931	1264282
20	333919	1264272
21	333935	1264252
22	333945	1264260
23	333959	1264228
24	334013	1264074
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SOIL REMOVAL

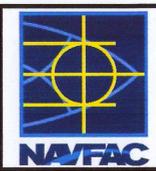
LOCATION ID	NORTHING	EASTING
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34	334124	1264173
35	334115	1264312
36	334096	1264417
37	334078	1264501
38	334123	1264173
39	334100	1264170

- NOTES:**
- EXCAVATION LIMITS INDICATED ARE INITIAL LIMITS. EXCAVATION DEPTHS INDICATED ARE INITIAL DEPTHS. EXCAVATION LIMITS AND DEPTHS MAY INCREASE BASED ON RESULTS OF POST-REMOVAL VERIFICATION SAMPLING AND ANALYSIS. EXCAVATION DEPTHS SHALL NOT EXTEND BELOW THE GROUNDWATER TABLE, EXCEPT WHERE INDICATED.
 - THE CONTRACTOR SHALL DETERMINE THE NUMBER OF STOCKPILES REQUIRED BASED ON WASTE DISPOSAL CHARACTERIZATION RESULTS AND THE REQUIREMENTS OF THE SELECTED TSD FACILITY, SUBJECT TO APPROVAL BY THE ROICC.
 - REMOVE RAILROAD RAIL AND TIES WITHIN LIMITS OF REMEDIATION. CLEAN SOIL FROM RAILS AND TIES AND STOCKPILE CLEANED RAILS FOR SALVAGE BY OTHERS. STOCKPILE TIES FOR SUBSEQUENT OFF-SITE DISPOSAL AT AN APPROVED DISPOSAL FACILITY. BALLAST ALONG WITH SOIL FOUND ABOVE, BELOW, AND BETWEEN TIES SHALL BE STOCKPILED FOR DISPOSAL OFF-SITE AT AN APPROVED TSD FACILITY WITH OTHER EXCAVATED SOILS.
 - LIMITS OF EXCAVATION AROUND 8-FOOT DEEP EXCAVATION AREA INDICATES EXCAVATION SIDE SLOPES OF 1 FOOT HORIZONTAL TO 1 FOOT VERTICAL (1H:1V).
 - RETAINING WALL ALONG SOUTHERN LIMITS OF THE SCRAP YARD IS APPROXIMATELY 3 FEET TALL WITH A 6 FOOT TALL SAFETY FENCE. RETAINING WALL ALONG THE NORTHERN LIMITS OF THE SCRAP YARD SEPARATING THE LOWER AND UPPER CONCRETE PADS IS APPROXIMATELY 3 FEET TALL. REFER TO PHOTOS PROVIDED IN APPENDIX A. EXISTING RETAINING WALLS TO BE RETAINED THROUGH THE REMEDIAL PROCESS.
 - REMEDIAL ACTIVITIES ARE WITHIN THE CHESAPEAKE BAY CRITICAL AREA.
 - IMPERVIOUS AREAS, WITH THE EXCEPTION OF THE RAILROAD RIGHT-OF-WAYS, WILL BE RETURNED TO IMPERVIOUS AREAS FOLLOWING REMOVAL ACTIVITIES.
 - LIMIT OF DISTURBANCE LINE IS CONGRUENT WITH SOUTHERN CONCRETE PAD RETAINING WALL. LINE OFFSET FOR CLARITY.
 - IMPERVIOUS AREA WITHIN LIMITS OF DISTURBANCE PRIOR TO CONSTRUCTION EQUALS 26,061 SQUARE FEET (0.598 ACRES).

- LEGEND:**
- EXISTING MONITORING WELL (TO BE ABANDONED)
 - RAILROAD TRACKS
 - AREAS TO BE EXCAVATED
 - IMPERVIOUS AREA WITHIN LIMIT OF DISTURBANCE (GRAVEL)
 - IMPERVIOUS AREA WITHIN LIMIT OF DISTURBANCE (BITUMINOUS CONCRETE)
 - LIMITS OF DISTURBANCE
 - RETAINING WALL
 - WATERSHED CONTRIBUTING FLOW TO AREAS OF DISTURBANCE
 - DELINEATED WETLAND

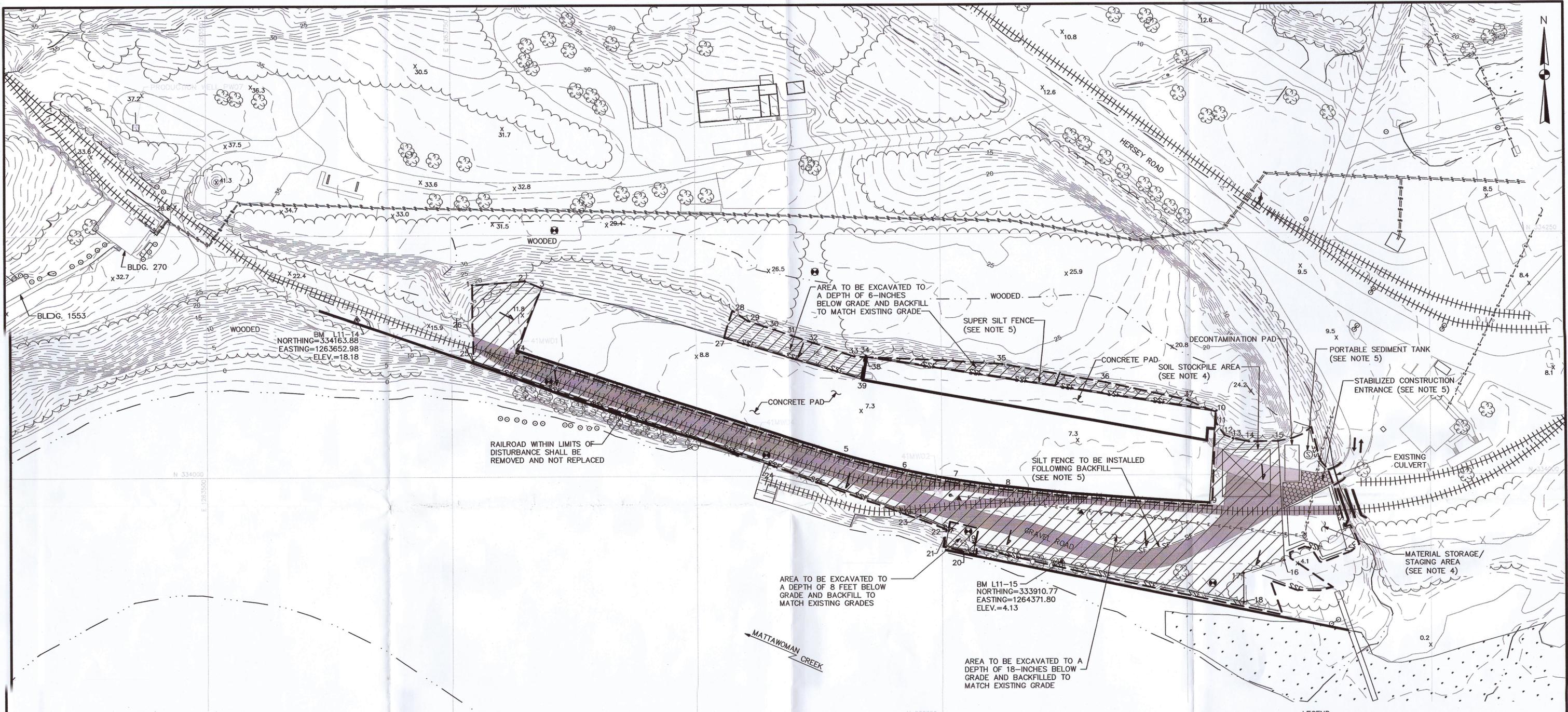


DRAWN BY	DATE
HJB	8-14-02
CHECKED BY	DATE
DMW	3-8-10
REVISED BY	DATE
SCALE	
1" = 50'	



EXCAVATION PLAN
SITE 41 - SCRAP YARD
NSF-IH
INDIAN HEAD, MARYLAND

CONTRACT NO.	
47	
OWNER NO.	
112G00307	
APPROVED BY	DATE
SN	3-9-10
DRAWING NO.	REV.
DRAWING 1	0



SOIL REMOVAL		
LOCATION ID	NORTHING	EASTING
1	334198	1263772
2	334202	1263825
3	334195	1263843
4	334131	1263818
5	334022	1264148
6	334007	1264207
7	333996	1264261
8	333988	1264314
9	333970	1264524
10	334066	1264532
11	334053	1264531
12	334041	1264540
13	334038	1264548
14	334034	1264564
15	334035	1264594
16	333911	1264600
17	333898	1264558
18	333868	1264558
19	333931	1264282
20	333919	1264272
21	333935	1264252
22	333945	1264260
23	333959	1264228
24	334013	1264074
25	334118	1263772
26	334146	1263772
27	334143	1264029
28	334171	1264038
29	334161	1264053

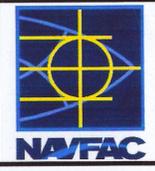
SOIL REMOVAL		
LOCATION ID	NORTHING	EASTING
30	334152	1264082
31	334145	1264098
32	334137	1264121
33	334123	1264162
34	334124	1264173
35	334115	1264312
36	334096	1264417
37	334078	1264501
38	334123	1264173
39	334100	1264170

NOTES:

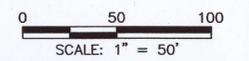
- REFER TO DRAWING 3 FOR EROSION AND SEDIMENT CONTROL PLAN NOTES.
- CLEAR BUT DO NOT GRUB WITHIN THE LIMITS OF DISTURBANCE WHERE REQUIRED FOR INSTALLATION OF TEMPORARY FACILITIES. REMOVE RAILROAD RAILS, TIES, AND BALLAST WITHIN THE LIMITS OF DISTURBANCE UNLESS OTHERWISE INDICATED.
- TEMPORARY SAFETY/SECURITY FENCE SHALL BE INSTALLED ALONG THE SITE PERIMETER AS NECESSARY OR AS DIRECTED BY THE RESIDENT OFFICER IN CHARGE OF CONSTRUCTION (ROICC) TO RESTRICT ACCESS DURING THE REMOVAL ACTION.
- THE MATERIAL HANDLING PAD AND STOCKPILE AREAS SHALL BE LINED AND COVERED TO PREVENT DISCHARGES TO THE ENVIRONMENT. STOCKPILES SHALL BE ESTABLISHED WITHIN THE EXCAVATION LIMITS TO PREVENT SPREAD OF CONTAMINATED SOILS.
- EROSION AND SEDIMENT CONTROL DEVICE DETAILS AND SPECIFICATIONS NOT PROVIDED ON THIS DRAWING ARE PROVIDED IN APPENDIX D.
- POST-CONSTRUCTION GRADES TO MATCH PRE-CONSTRUCTION GRADES.



DRAWN BY HJB	DATE 8-14-02
CHECKED BY DMW	DATE 3-8-10
REVISED BY	DATE
SCALE 1" = 50'	



- LEGEND:**
- HAUL ROUTE
 - SILT FENCE
 - SUPER SILT FENCE
 - STABILIZED CONSTRUCTION ENTRANCE
 - POST-CONSTRUCTION RUNOFF DIRECTION
 - RETAINING WALL
 - WATERSHED CONTRIBUTING FLOW TO AREAS OF DISTURBANCE
 - DELINEATED WETLAND
 - EXISTING MONITORING WELL (TO BE ABANDONED)
 - RAILROAD TRACKS
 - AREAS TO BE EXCAVATED
 - IMPERVIOUS AREA WITHIN LIMIT OF DISTURBANCE (GRAVEL)
 - IMPERVIOUS AREA WITHIN LIMIT OF DISTURBANCE (BITUMINOUS CONCRETE)
 - LIMITS OF DISTURBANCE



EROSION & SEDIMENT CONTROL PLAN		CONTRACT NO. 47
SITE 41 - SCRAP YARD		OWNER NO. 112G00307
NSF-IH		APPROVED BY _____ DATE SN 3-9-10
INDIAN HEAD, MARYLAND		DRAWING NO. 2 REV. 0

EROSION AND SEDIMENT CONTROL PLAN NOTES

- THE CONTRACTOR SHALL NOTIFY THE ADMINISTRATION (WMA) AT (410)537-3510 SEVEN (7) DAYS BEFORE COMMENCING ANY LAND DISTURBANCE ACTIVITY AND, UNLESS WAIVED BY THE ADMINISTRATION, SHALL BE REQUIRED TO HOLD A PRE-CONSTRUCTION MEETING BETWEEN PROJECT REPRESENTATIVES AND A REPRESENTATIVE OF WMA.
- THE CONTRACTOR MUST NOTIFY WMA IN WRITING AND BY TELEPHONE AT THE FOLLOWING POINTS:
 - THE REQUIRED PRE-CONSTRUCTION MEETING
 - FOLLOWING INSTALLATION OF SEDIMENT CONTROL MEASURES.
 - DURING THE INSTALLATION OF SEDIMENT BASINS (TO BE CONVERTED INTO PERMANENT STORMWATER MANAGEMENT STRUCTURES) AT THE REQUIRED INSPECTION POINTS (SEE INSPECTION CHECKLISTS), NOTIFICATION PRIOR TO COMMENCING CONSTRUCTION OF EACH STEP IS MANDATORY.
 - PRIOR TO REMOVAL OR MODIFICATION OF ANY SEDIMENT CONTROL STRUCTURE(S).
 - PRIOR TO REMOVAL OF ALL SEDIMENT CONTROL DEVICES.
 - PRIOR TO FINAL ACCEPTANCE.
- THE CONTRACTOR SHALL CONSTRUCT ALL EROSION AND SEDIMENT CONTROL MEASURES PER THE APPROVED PLAN AND CONSTRUCTION SEQUENCE AND SHALL HAVE THEM INSPECTED AND APPROVED BY THE AGENCY INSPECTOR OR WMA INSPECTOR PRIOR TO BEGINNING ANY OTHER LAND DISTURBANCES. MINOR SEDIMENT CONTROL DEVICE LOCATION ADJUSTMENTS MAY BE MADE IN THE FIELD WITH THE APPROVAL OF THE WMA INSPECTOR. THE CONTRACTOR SHALL ENSURE THAT ALL RUNOFF FROM DISTURBED AREAS IS DIRECTED TO THE SEDIMENT CONTROL DEVICES AND SHALL NOT REMOVE ANY EROSION OR SEDIMENT CONTROL MEASURE WITHOUT PRIOR PERMISSION FROM WMA INSPECTOR AND AGENCY INSPECTOR. THE CONTRACTOR MUST OBTAIN PRIOR AGENCY AND WMA APPROVAL FOR CHANGES TO THE SEDIMENT CONTROL PLAN AND/OR SEQUENCE OF CONSTRUCTION.
- THE CONTRACTOR SHALL PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO PREVENT THE DEPOSITION OF MATERIALS ONTO PUBLIC ROADS. ALL MATERIALS DEPOSITED ONTO PUBLIC ROADS SHALL BE REMOVED IMMEDIATELY.
- THE CONTRACTOR SHALL INSPECT DAILY AND MAINTAIN CONTINUOUSLY IN AN EFFECTIVE OPERATING CONDITION ALL EROSION AND SEDIMENT CONTROL MEASURES UNTIL SUCH TIMES AS THEY ARE REMOVED WITH PRIOR PERMISSION FROM WMA INSPECTOR AND AGENCY INSPECTOR.
- ALL SEDIMENT BASINS, TRAP EMBANKMENTS AND SLOPES, PERIMETER DIKES, SWALES, AND ALL DISTURBED SLOPES STEEPER OR EQUAL TO 3:1 SHALL BE STABILIZED WITH SOD OR SEED AND ANCHORED STRAW MULCH, OR OTHER APPROVED STABILIZATION MEASURES, AS SOON AS POSSIBLE BUT NO LATER THAN SEVEN (7) CALENDAR DAYS AFTER ESTABLISHMENT. ALL AREAS DISTURBED OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM MUST BE MINIMIZED. MAINTENANCE MUST BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION. (REQUIREMENT FOR STABILIZATION MAY BE REDUCED TO THREE (3) DAYS FOR SENSITIVE AREAS.)
- THE CONTRACTOR SHALL APPLY SOD OR SEED AND ANCHORED STRAW MULCH, OR OTHER APPROVED STABILIZATION MEASURES TO ALL DISTURBED AREAS AND STOCKPILES WITHIN FOURTEEN (14) CALENDAR DAYS AFTER STRIPPING AND GRADING ACTIVITIES HAVE CEASED IN THE AREA. MAINTENANCE SHALL BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION. (REQUIREMENT MAY BE REDUCED TO SEVEN (7) DAYS FOR SENSITIVE AREAS.)
- PRIOR TO REMOVAL OF SEDIMENT CONTROL MEASURES, THE CONTRACTOR SHALL STABILIZE AND HAVE ESTABLISHED PERMANENT STABILIZATION FOR ALL CONTRIBUTORY DISTURBED AREAS USING SOD OR AN APPROVED PERMANENT SEED MIXTURE WITH REQUIRED SOIL AMENDMENTS AND AN APPROVED ANCHORED MULCH. WOOD FIBER MULCH MAY ONLY BE USED IN SEEDING SEASON WHERE THE SLOPE DOES NOT EXCEED 10% AND GRADING HAS BEEN DONE TO PROMOTE SHEET FLOW DRAINAGE. AREAS BROUGHT TO FINISHED GRADE DURING THE SEEDING SEASON SHALL BE PERMANENTLY STABILIZED AS SOON AS POSSIBLE, BUT NO LATER THAN FOURTEEN (14) CALENDAR DAYS AFTER ESTABLISHMENT. WHEN PROPERTY IS BROUGHT TO FINISHED GRADE DURING THE MONTHS OF NOVEMBER THROUGH FEBRUARY, AND PERMANENT STABILIZATION IS FOUND TO BE IMPRACTICAL, TEMPORARY SEED AND ANCHORED STRAW MULCH SHALL BE APPLIED TO DISTURBED AREAS. THE FINAL PERMANENT STABILIZATION OF SUCH PROPERTY SHALL BE APPLIED BY MARCH 15 OR EARLIER IF GROUND AND WEATHER CONDITIONS ALLOW.
- THE SITES APPROVAL LETTER, APPROVED EROSION AND SEDIMENT CONTROL PLANS, DAILY LOG BOOKS, AND TEST REPORTS SHALL BE AVAILABLE AT THE SITE FOR INSPECTION BY DULY AUTHORIZED OFFICIALS OF WMA AND THE AGENCY RESPONSIBLE FOR PROJECT.
- SURFACE DRAINAGE FLOWS OVER UNSTABILIZED CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER PREVENTING DRAINAGE FLOW FROM TRAVERSING THE SLOPES OR BY INSTALLING PROTECTIVE DEVICES TO LOWER THE WATER DOWN SLOPE WITHOUT CAUSING EROSION. DIKES SHALL BE INSTALLED AND MAINTAINED AT THE TOP OF A CUT OR FILL SLOPE UNTIL THE SLOPE AND DRAINAGE AREA TO IT ARE FULLY STABILIZED, AT WHICH TIME THEY MUST BE REMOVED AND FINAL GRADES DONE TO PROMOTE SHEET FLOW DRAINAGE. PROTECTIVE METHODS MUST BE PROVIDED AT POINTS OF CONCENTRATED FLOW WHERE EROSION IS LIKELY TO OCCUR.
- PERMANENT SWALES OR OTHER POINTS OF CONCENTRATED WATER FLOW SHALL BE STABILIZED WITH SOD OR SEED WITH AN APPROVED EROSION CONTROL MATTING, RIP-RAP, OR BY OTHER APPROVED STABILIZATION MEASURES.
- TEMPORARY SEDIMENT CONTROL DEVICES MAY BE REMOVED, WITH PERMISSION OF WMA INSPECTOR AND AGENCY INSPECTORS, WITHIN THIRTY (30) CALENDAR DAYS FOLLOWING ESTABLISHMENT OF PERMANENT STABILIZATION IN ALL CONTRIBUTORY DRAINAGE AREAS. STORMWATER MANAGEMENT STRUCTURES USED TEMPORARILY FOR SEDIMENT CONTROL SHALL BE CONVERTED TO THE PERMANENT CONFIGURATIONS WITHIN THIS TIME PERIOD AS WELL.
- NO PERMANENT CUT OR FILL SLOPE WITH A GRADIENT STEEPER THAN 3:1 WILL BE PERMITTED IN LAWN MAINTENANCE AREAS. A SLOPE GRADIENT OF UP TO 2:1 WILL BE PERMITTED IN NON-MAINTENANCE AREAS PROVIDED THAT THOSE AREAS ARE INDICATED ON THE EROSION AND SEDIMENT CONTROL PLAN WITH A LOW-MAINTENANCE GROUND COVER SPECIFIED FOR PERMANENT STABILIZATION. SLOPE GRADIENT STEEPER THAN 2:1 WILL NOT BE PERMITTED WITH VEGETATIVE STABILIZATION.
- FOR FINISHED GRADING, THE CONTRACTOR SHALL PROVIDE ADEQUATE GRADIENTS TO PREVENT WATER FROM PONDING FOR MORE THAN TWENTY FOUR (24) HOURS AFTER THE END OF THE RAINFALL EVENT. DRAINAGE COURSES AND SWALE FLOW AREAS MAY TAKE AS LONG AS FORTY-EIGHT (48) HOURS AFTER THE END OF A RAINFALL EVENT TO DRAIN. AREAS DESIGNATED TO HAVE STANDING WATER SHALL NOT BE REQUIRED TO MEET THIS REQUIREMENT.
- SEDIMENT TRAPS AND BASINS ARE NOT PERMITTED WITHIN 20 FEET OF A FOUNDATION THAT EXISTS OR IS UNDER CONSTRUCTION. NO STRUCTURE MAY BE CONSTRUCTED WITHIN 20 FEET OF AN ACTIVE SEDIMENT TRAP OR BASIN.
- THE WMA INSPECTOR HAS THE OPTION OF REQUIRING ADDITIONAL SAFETY OR SEDIMENT CONTROL MEASURES, IF DEEMED NECESSARY.
- ALL TRAP DEPTH DIMENSIONS ARE RELATIVE TO OUTLET ELEVATION. ALL TRAPS MUST HAVE A STABLE OUTFALL. ALL TRAPS AND BASINS SHALL HAVE STABLE INFLOW POINTS.
- VEGETATIVE STABILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. REFER TO APPROPRIATE SPECIFICATIONS FOR TEMPORARY SEEDING, PERMANENT SEEDING, MULCHING, SODDING, AND GROUND COVERS.
- SEDIMENT SHALL BE REMOVED AND THE TRAP OR BASIN RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE QUARTER OF THE TOTAL DEPTH OF THE TRAP OR BASIN. TOTAL DEPTH SHALL BE MEASURED FROM THE TRAP OR BASIN BOTTOM TO THE CREST OF THE OUTFALL.
- SEDIMENT REMOVED FROM TRAPS (AND BASINS) SHALL BE PLACED AND STABILIZED IN APPROVED AREAS, BUT NOT WITHIN A FLOODPLAIN, WETLAND, OR TREE-SAVE AREA. WHEN PUMPING SEDIMENT LADEN WATER, THE DISCHARGE MUST BE DIRECTED TO A SEDIMENT TRAPPING DEVICE PRIOR TO RELEASE FROM THE SITE. A SUMP PIT MAY BE USED IF SEDIMENT TRAPS THEMSELVES ARE BEING PUMPED OUT.
- ALL WATER REMOVED FROM EXCAVATED AREAS (E.G., UTILITY TRENCHES) SHALL BE PASSED THROUGH AN APPROVED DEWATERING PRACTICE OR PUMPED TO A SEDIMENT TRAP OR BASIN PRIOR TO DISCHARGE FROM THE SITE (I.E., VIA FUNCTIONAL STORM DRAIN SYSTEM OR TO STABLE GROUND SURFACE).
- SEDIMENT CONTROL FOR UTILITY CONSTRUCTION FOR AREAS OUTSIDE OF DESIGNATED CONTROLS OR AS DIRECTED BY ENGINEER OR WMA INSPECTOR:
 - CALL MISS UTILITY AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF WORK.
 - EXCAVATED TRENCH MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH.
 - TRENCHES FOR UTILITY INSTALLATION SHALL BE BACKFILLED, COMPACTED, AND STABILIZED AT THE END OF EACH WORKING DAY. NO MORE TRENCH SHALL BE OPENED THAN CAN BE COMPLETED THE SAME DAY, UNLESS:
 - TEMPORARY SILT FENCE SHALL BE PLACED IMMEDIATELY DOWNSTREAM OF ANY DISTURBED AREAS INTENDED TO REMAIN DISTURBED FOR MORE THAN ONE DAY.

EROSION AND SEDIMENT CONTROL PLAN NOTES (CONTINUED)

- WHERE DEEMED APPROPRIATE BY THE ENGINEER OR INSPECTOR, SEDIMENT BASINS AND TRAPS MAY NEED TO BE SURROUNDED WITH AN APPROVED SAFETY FENCE. THE FENCE MUST CONFORM TO LOCAL ORDINANCES AND REGULATIONS. THE DEVELOPER OR OWNER SHALL CHECK WITH LOCAL BUILDING OFFICIALS ON APPLICABLE SAFETY REQUIREMENTS. WHERE SAFETY FENCE IS DEEMED APPROPRIATE AND LOCAL ORDINANCES DO NOT SPECIFY FENCING SIZES AND TYPES, THE FOLLOWING SHALL BE USED AS A MINIMUM STANDARD: THE SAFETY FENCE MUST BE MADE OF WELDED WIRE AND AT LEAST 42 INCHES HIGH, HAVE POSTS SPACED NO FARTHER APART THAN 8 FEET, HAVE MESH OPENINGS NO GREATER THAN 2 INCHES IN WIDTH AND 4 INCHES IN HEIGHT WITH A MINIMUM OF 14 GAUGE WIRE. SAFETY FENCE MUST BE MAINTAINED AND IN GOOD CONDITION AT ALL TIMES.
- OFF-SITE SPOIL OR BORROW AREAS ON STATE OR FEDERAL PROPERTY MUST HAVE PRIOR APPROVAL BY WMA AND OTHER APPLICABLE STATE, FEDERAL, AND LOCAL AGENCIES; OTHERWISE APPROVAL MUST BE GRANTED BY THE LOCAL AUTHORITIES. ALL WASTE AND BORROW AREAS OFF-SITE MUST BE PROTECTED BY SEDIMENT CONTROL MEASURES AND STABILIZED.
- SITES WHERE INFILTRATION DEVICES ARE USED FOR THE CONTROL OF STORMWATER, EXTREME CARE MUST BE TAKEN TO PREVENT RUNOFF FROM UNSTABILIZED AREAS FROM ENTERING THE STRUCTURE DURING CONSTRUCTION. SEDIMENT CONTROL DEVICES PLACED IN INFILTRATION AREAS MUST HAVE BOTTOM ELEVATIONS AT LEAST TWO (2) FEET HIGHER THAN THE FINISH GRADE BOTTOM ELEVATION OF THE INFILTRATION PRACTICE. WHEN CONVERTING A SEDIMENT TRAP TO AN INFILTRATION DEVICE, ALL ACCUMULATED SEDIMENT MUST BE REMOVED AND DISPOSED OF PRIOR TO FINAL GRADING OF INFILTRATION DEVICE.
- WHEN A STORM DRAIN SYSTEM OUTFALL IS DIRECTED TO A SEDIMENT TRAP OR SEDIMENT BASIN AND THE SYSTEM IS TO BE USED FOR TEMPORARILY CONVEYING SEDIMENT LADEN WATER, ALL STORM DRAIN INLETS IN NON-SUMP AREAS SHALL HAVE A TEMPORARY ASPHALT BERMS CONSTRUCTED AT THE TIME OF BASE PAVING TO DIRECT GUTTER FLOW INTO THE INLETS TO AVOID SURCHARGING AND OVERFLOW OF INLETS IN SUMP AREAS.
- SITE INFORMATION:
 - TOTAL AREA OF FACILITY = 3,500 ACRES
 - TOTAL AREA OF PROJECT SITE = 3.2 ACRES
 - AREA DISTURBED = 1,593 ACRES
 - TOTAL IMPERVIOUS AREA (PRE-CONSTRUCTION) = 0.598 ACRES
 - TOTAL IMPERVIOUS AREA (POST-CONSTRUCTION) = 0.406 ACRES
 - AREA TO BE ROOFED OR PAVED = 0 ACRES OF NEWLY PAVED AREAS
 - TOTAL CUT = 3,112 CUBIC YARDS
 - TOTAL FILL = 3,112 CUBIC YARDS
 - OFF-SITE WASTE / BORROW AREA LOCATION - CUBIC YARDS / DISPOSAL LOCATIONS NOT YET DETERMINED

STANDARD STABILIZATION NOTE

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN SEVEN (7) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) AND FOURTEEN DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

SEQUENCE OF CONSTRUCTION

- FOLLOWING THE COMPLETION OF HOUSE KEEPING ACTIVITIES WITHIN THE LIMITS OF THE SCRAP YARD'S CONCRETE PADS, NOTIFY MDE 7 DAYS PRIOR TO IMPLEMENTING CONSTRUCTION ACTIVITIES BEYOND THE CONCRETE PAD LIMITS. HOLD PRE-CONSTRUCTION MEETING WITH THE CONTRACTING OFFICER AND THE MDE INSPECTOR.
- INSPECT SITE PRIOR TO CONSTRUCTION TO VERIFY EXISTING SITE CONDITIONS AND UNDERGROUND UTILITY LOCATIONS.
- ESTABLISH HORIZONTAL AND VERTICAL CONTROL FOR EXCAVATION. STAKE THE LOCATIONS OF ALL AREAS TO BE EXCAVATED OR DISTURBED PRIOR TO ACTUAL WORK.
- INSTALL ALL PERIMETER CONTROLS FOR STABILIZED CONSTRUCTION ENTRANCE. REMOVE THE EXISTING PAVED SURFACE WITHIN THE PROPOSED FOOTPRINT OF THE STABILIZED CONSTRUCTION ENTRANCE AND INSTALL THE STABILIZED CONSTRUCTION ENTRANCE. INSTALL ALL PERIMETER CONTROLS FOR DECONTAMINATION PAD, AND MATERIALS STORAGE AND STAGING AREAS AS INDICATED ON DRAWING 2. PERIMETER CONTROL LOCATIONS ARE SUBJECT TO APPROVAL BY THE ROICC AND MDE AND MUST BE APPROVED PRIOR TO ANY EARTH DISTURBANCE ACTIVITIES. ALL PERIMETER CONTROLS WILL CONFORM TO STANDARDS AND SPECIFICATIONS IDENTIFIED IN THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL MANUAL. THE PERIMETER CONTROLS TO BE INSTALLED INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
 - * SUPER SILT FENCE LOCATED SOUTH OF THE THREE SITE 41 EXCAVATION AREAS AS INDICATED.
 - * SILT FENCE INSTALLED MID-SLOPE FOLLOWING BACKFILLING WHERE INDICATED.
 - * ADDITIONAL CONTROLS AS MAY BE REQUIRED BY THE CONTRACTING OFFICER AND/OR WARRANTED BY SITE CONDITIONS AND BEST CONSTRUCTION PRACTICES.
- CLEAR AND GRUB CONSTRUCTION LAY DOWN AREAS AND AREAS FOR MATERIALS STORAGE AND STAGING AREAS, AND DECONTAMINATION PAD.
- CONSTRUCT DECONTAMINATION PAD, CONSTRUCTION LAY DOWN AREAS, AND MATERIALS STORAGE AND STAGING AREAS. ERECT SAFETY/SECURITY FENCING (IF REQUIRED).
- CLEAR BUT DO NOT GRUB WITHIN THE EXCAVATION LIMITS.
- ABANDON EXISTING GROUNDWATER MONITORING WELLS 41MW01, 41MW02, AND 41MW04 IN ACCORDANCE WITH CODE OF MARYLAND REGULATIONS (COMAR) 26.04.04. VERIFY ABANDONMENT OF GROUNDWATER MONITORING WELL 41MW03 IN ACCORDANCE WITH COMAR 26.04.04.
- REMOVE RAILROAD RAILS, TIES, AND BALLAST WITHIN LIMITS INDICATED. CLEAN RAILS WITHIN CONTAMINATED AREAS, AND STOCKPILE CLEANED RAILS FOR SALVAGE BY OTHERS. STOCKPILE TIES FOR OFF-SITE DISPOSAL. DISPOSE BALLAST ALONG WITH EXCAVATED SOIL.
- EXCAVATE AND MECHANICALLY SCREEN THE SOILS TO REMOVE CADS. STOCKPILE SCREENED SOIL WITHIN THE LIMITS OF DISTURBANCE AT A DESIGNATED LOCATION, BASED ON THE REQUIREMENTS OF THE SELECTED DISPOSAL FACILITY, SUBJECT TO APPROVAL BY THE ROICC. MANAGE STOCKPILED SOILS OFF-SITE AT AN APPROVED DISPOSAL FACILITY. MANAGE CADS IN ACCORDANCE WITH NAVSEA INSTRUCTION 8023.11, STANDARD OPERATING PROCEDURES FOR THE PROCESSING OF EXPENDABLE ORDNANCE AT NAVY AND MARINE CORPS ACTIVITIES (NAVSEA, 1991). MANAGE MATERIALS REMAINING FROM TREATMENT OF CADS OFF-SITE AT AN APPROVED DISPOSAL FACILITY. PERFORM VERIFICATION SAMPLING FOR THE AREA OUTSIDE THE CONCRETE PAD IN ACCORDANCE WITH THE VERIFICATION SAMPLING AND ANALYSIS PLAN. EXCAVATE ADDITIONAL SOIL AS REQUIRED PENDING RESULTS OF POST-REMOVAL VERIFICATION SAMPLING AND ANALYSIS.
- FOLLOWING VERIFICATION THAT ALL COCS HAVE BEEN REMOVED OR REDUCED TO LEVELS BELOW THE PRGS, BACKFILL EXCAVATIONS TO PRE-EXCAVATION GRADES AND ELEVATIONS AND RESTORE THE SITE AS INDICATED ON DRAWING 4 USING FILL, TOPSOIL, BITUMINOUS CONCRETE, AND GRANULAR MATERIAL, AS INDICATED. VEGETATE IMMEDIATELY AFTER TOPSOIL IS PLACED.
- INSTALL NEW GROUNDWATER MONITORING WELLS (41MW05 THROUGH 41MW10) AS INDICATED.
- REMOVE ALL TEMPORARY FACILITIES (I.E., DECONTAMINATION PAD, SEDIMENT TANKS, WASTEWATER STORAGE TANKS, ETC.). RESTORE AND REVEGETATE AS NEEDED. WHEN ALL UPSTREAM AREAS HAVE BEEN STABILIZED AND HAVE BEEN ACCEPTED BY THE ROICC, WITH THE APPROVAL OF THE MDE INSPECTOR, REMOVE ALL PERIMETER CONTROLS AND IMMEDIATELY STABILIZE THE AREAS DISTURBED BY THE PLACEMENT OF THESE PERIMETER CONTROLS.

DESIGN CERTIFICATION:

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II, AND THE MARYLAND DEPARTMENT OF THE ENVIRONMENT EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT REGULATIONS.

4/12/10 DATE DESIGNER'S SIGNATURE
 Scott A. Nesbit DESIGNER'S SIGNATURE
 Scott A. Nesbit PRINTED NAME
 REGISTRATION NO. 26015
 P.E. R.L.S., R.L.A., OR R.A. (CIRCLE ONE)

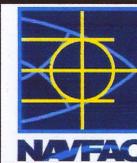
OWNER'S/DEVELOPER'S CERTIFICATION:

I/WE HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION, AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT THE MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT BEFORE BEGINNING THE PROJECT. I HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY STATE OF MARYLAND, DEPARTMENT OF THE ENVIRONMENT, COMPLIANCE INSPECTORS.

DATE OWNER/DEVELOPER SIGNATURE
 CARD NO. PRINTED NAME AND TITLE

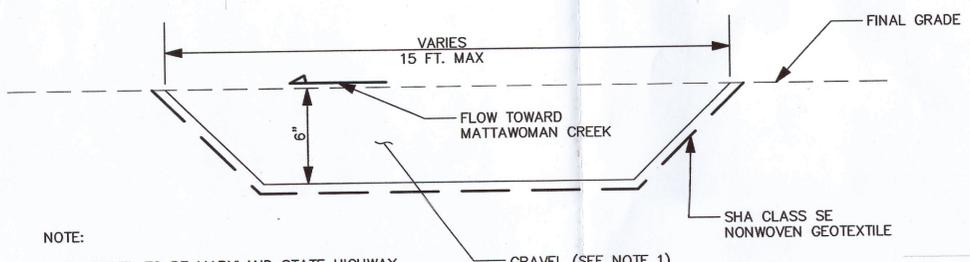
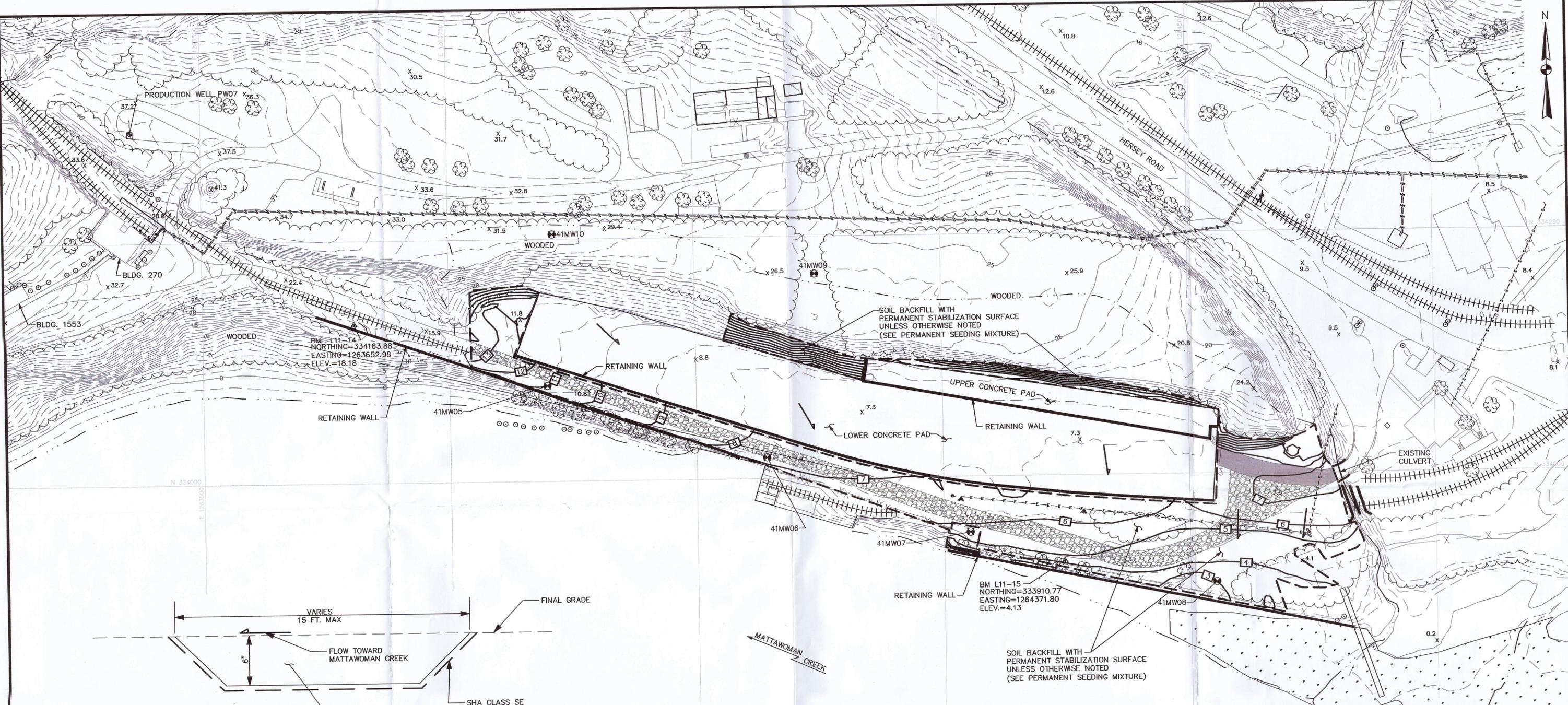


DRAWN BY DLT	DATE 8-14-02
CHECKED BY DMW	DATE 3-8-10
REVISED BY	DATE
SCALE NOT-TO-SCALE	



EROSION & SEDIMENT CONTROL NOTES
SITE 41 - SCRAP YARD
NSF-IIH
INDIAN HEAD, MARYLAND

CONTRACT NO. 47	
OWNER NO. 112G00307	
APPROVED BY SN	DATE 3-9-10
DRAWING NO. DRAWING 3	REV. 0



- NOTE:
- GRAVEL TO BE MARYLAND STATE HIGHWAY ADMINISTRATION GRADED AGGREGATE BASE.

PROPOSED GRAVEL ROAD DETAIL
NOT-TO-SCALE

TEMPORARY SEEDING MIXTURE

SEED MIXTURE (HARDINESS ZONE 7a) TEMPORARY SEED MIXTURE FROM TABLE 26 OF THE 1994 MARYLAND HANDBOOK					FERTILIZER RATE (10-10-10)	LIME RATE
NO.	SPECIES	APPLICATION RATE (LBS/AC)	SEEDING DATES	SEEDING DEPTHS (INCHES)		
1	ANNUAL RYEGRASS	50	11/15 - 3/15	1/4 - 1/2	600 LBS/AC (15 LB/1000 SF)	2 TONS/AC (100 LB/ 1000 SF)

PERMANENT SEEDING MIXTURE

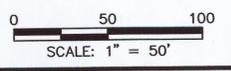
SEED MIXTURE (HARDINESS ZONE 7a) PERMANENT SEED MIXTURE 5 FROM TABLE 25 OF THE 1994 MARYLAND HANDBOOK					FERTILIZER RATE (10-20-20)		LIME RATE
NO.	SPECIES	APPLICATION RATE (LBS/AC)	SEEDING DATES	SEEDING DEPTHS (INCHES)	N	K20	
6	PERENIAL RYEGRASS	20	3/15 - 5/15 8/15 - 11/15	1/4 - 1/2	90 LBS/AC (2 LB/1000 SF)	175 LBS/AC (4 LB/1000 SF)	2 TONS/AC (100 LB/ 1000 SF)
7	FLAT PEA	20	3/15 - 5/15 8/15 - 11/15	1/4 - 1/2		175 LBS/AC (4 LB/1000 SF)	

NOTES:

- FINAL GRADES SHALL BE RE-ESTABLISHED TO EXISTING GRADES BY BACKFILLING WITH CERTIFIED CLEAN COMMON FILL TO A DEPTH 6-INCHES BELOW FINAL GRADE AND BY BACKFILLING WITH 6-INCHES OF CERTIFIED CLEAN TOPSOIL TO ACHIEVE FINAL GRADES.
- SEED ALL DISTURBED AREAS OUTSIDE LIMITS OF THE CONCRETE PAD NOT DESIGNATED FOR BITUMINOUS CONCRETE PAVEMENT OR GRAVEL PAVEMENT USING PERMANENT SEED MIXTURE. IF OUTSIDE PERMANENT SEED MIXTURE DATES, STABILIZE WITH TEMPORARY SEED MIXTURE AND RE-SEED WITH PERMANENT SEED MIXTURE AT THE EARLIEST OPPORTUNITY. DO NOT REMOVE PERIMETER CONTROLS UNTIL PERMANENT STABILIZATION IS ESTABLISHED AND APPROVED BY NSF-IH AND MDE.
- THE MARYLAND HANDBOOK REFERENCED IN THE SEEDING TABLES REFERS TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL PRODUCED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION.
- IMPERVIOUS AREA WITHIN LIMITS OF DISTURBANCE FOLLOWING EXCAVATION AND SITE RESTORATION 17,690 SQUARE FEET (0.406 ACRES).



- LEGEND:
- 41MW06 NEW GROUNDWATER MONITORING WELL
 - ++++ RAILROAD TRACKS
 - LIMITS OF DISTURBANCE
 - POST-CONSTRUCTION RUNOFF DIRECTION
 - SOIL BACKFILL WITH BITUMINOUS CONCRETE SURFACE (SEE PROPOSED GRAVEL ROAD DETAIL)
 - SOIL BACKFILL WITH GRAVEL SURFACE
 - RETAINING WALL
 - WATERSHED CONTRIBUTING FLOW TO AREAS OF DISTURBANCE
 - DELINEATED WETLAND



DRAWN BY HJB	DATE 8-14-02
CHECKED BY DMW	DATE 3-8-10
REVISED BY	DATE
SCALE 1" = 50'	



RESTORATION PLAN
SITE 41 - SCRAP YARD
NSF-IH
INDIAN HEAD, MARYLAND

CONTRACT NO. 47	
OWNER NO. 112600307	
APPROVED BY SN	DATE 3-9-10
DRAWING NO. DRAWING 4	REV. 0

APPENDIX D

MDE EROSION AND SEDIMENT STANDARDS AND SPECIFICATIONS

- D.1 SILT FENCE/SUPER SILT FENCE EVALUATION**
- D.2 MDE STANDARDS AND SPECIFICATIONS**

D.1 SILT FENCE/SUPER SILT FENCE EVALUATION

CLIENT: Naval Support Facility - Indian Head		JOB NUMBER: 112G00307 - 0000.1710	
SUBJECT: Silt Fence Design - Site 41 Scrap Yard			
BASED ON: Drawings 2 and 4 - Appendix C		DRAWING NUMBER:	
BY: TWS	CHECKED BY: DMW	APPROVED BY:	DATE:
Date: 03-05-10	Date: 3/5/10		

OBJECTIVE:

To properly locate and determine the type of silt fence to intercept and retain small amounts of sediment from disturbed areas during soil removal activities (excavation) within the Site 41 Scrap Yard limits of disturbance, and to provide protection for the Mattawoman Creek located down gradient from the disturbance area.

APPROACH:

- 1) Locate and determine the type of silt fence required according to Sections 15 and 26 of the 1994 Maryland Standards and Specifications for Erosion and Sediment Control.

REFERENCES:

- 1) Maryland Standards and Specifications for Soil Erosion and Sediment Control, 1994.

CALCULATIONS:

According to Section 15 of Reference 1, no formal design is required for silt and super silt fencing. However, the selection of silt or super silt fence is determined upon slopes and lengths of silt fencing. The following are installation guidelines for silt fences and super silt fences.

Silt Fence

- 1) Silt fence should be used with caution in areas of rocky soils that may prevent trenching.
- 2) Silt fence should be placed on or parallel to contours.
- 3) The length of silt fence must conform with the following

Slope Steepness	Slope Length	Allowable Length of Silt Fence
Flatter than 2%	unlimited	unlimited
2 - 10%	125 feet	1,000 feet
10 - 20%	100 feet	750 feet
20 - 33%	60 feet	500 feet
33 - 50%	40 feet	250 feet
>50%	20 feet	125 feet

Table 17 (Silt Fence Design Constraints) on page E-15-1 of Reference 1.

- 4) In areas of less than 2% slope and sandy soils (USDA general classification system, soil class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.
- 5) Down slope from the silt fence should be undisturbed ground.

Super Silt Fence

- 1) Super silt fence should be used with caution in areas of rocky soils that may prevent trenching.

CLIENT: Naval Support Facility - Indian Head		JOB NUMBER: 112G00307 - 0000.1710	
SUBJECT: Silt Fence Design - Site 41 Scrap Yard			
BASED ON: Drawings 2 and 4 - Appendix C		DRAWING NUMBER:	
BY: TWS	CHECKED BY: DMW	APPROVED BY:	DATE:
Date: 03-05-10	Date: 3/5/10		

- 2) Super silt fence should be placed on or parallel to contours.
- 3) The length of super silt fence must conform with the following:

Slope Steepness	Slope Length	Allowable Length of Silt Fence
Flatter than 10%	unlimited	unlimited
10 - 20%	200 feet	1,500 feet
20 - 33%	100 feet	1,000 feet
33 - 50%	100 feet	500 feet
>50%	50 feet	250 feet

Super Silt Fence Design Criteria (page H-26-3A of Reference 1).

Actual Conditions

For actual conditions refer to Drawings 2 and 4 provided in Appendix C and on page 4 of this calculation. Due to the construction of the retaining wall on the southern limits of the concrete pad (Jersey Barrier with gaps to allow drainage) the flow length is not required to follow the entire wall length. The following table and attached drawing reflects this condition. Because the excavation will help to prevent runoff during excavation activities, the silt fence evaluation considers post excavation conditions when excavation has been backfilled but permanent stabilization has not been established as the critical time for controlling runoff. Therefore the slope lengths and slopes presented in the table below present the post-excavation drainage patterns.

Location of Silt/Super Silt Fence	Point of Maximum Slope Length		Point of Maximum Slope	
	Slope Length (ft)	Slope (%)	Slope (%)	Slope Length (ft)
Area 1 - Along the up gradient side of the lower concrete pad.	82	21	49	35
Area 2 - Along the up gradient side of the upper concrete pad.	120	8	34	30
Area 3 - Along the down gradient side of the excavation limits.	265	7.3	13.6	146

Allowable Silt Fence / Super Silt Fence Usage.

Based on the locations of the excavations the approaching slopes require the usage of super silt fence.

CLIENT:	Naval Support Facility - Indian Head	JOB NUMBER:	112G00307 - 0000.1710
SUBJECT:	Silt Fence Design - Site 41 Scrap Yard		
BASED ON:	Drawings 2 and 4 - Appendix C	DRAWING NUMBER:	
BY:	TWS	CHECKED BY:	DMM
Date:	03-05-10	Date:	3/5/10
		APPROVED BY:	DATE:

For Area 1, based on a maximum slope of 49%, the allowed slope length approaching the super silt fence is 100 feet (actual slope length is 35 feet) and the allowed length of super silt fence is 500 feet (design length is 152 feet). Under maximum slope length conditions the slope is 21% and the allowed slope length associated with this slope is 100 feet (actual slope length under this condition is 81 feet) which is less than the designed length of super silt fence.

For Area 2, based on the maximum slope of 34%, the allowed slope length approaching the super silt fence is 100 feet (actual slope length is 30 feet) and the allowed length of super silt fence is 500 feet (design length is 363 feet). Where slope length exceeds 100 feet, the associated slope (less than 10%) allows for unlimited slope length.

For Area 3, based on a maximum slope of 13.6%, the allowed slope length approaching the super silt fence is 200 feet (actual slope length is 146 feet) and the allowed length of super silt fence is 1,500 feet (design length is 936 feet). Where slope length exceeds 200 feet, the associated slope (less than 10%) allows for unlimited slope length.

D.2 MDE E&S STANDARDS AND SPECIFICATIONS

**MDE EROSION AND SEDIMENT CONTROL DEVICE STANDARDS AND
SPECIFICATIONS PROVIDED IN THIS APPENDIX INCLUDE:**

- 1. SEDIMENT TANK**
- 2. STABILIZED CONSTRUCTION ENTRANCE**
- 3. VEGETATIVE STABILIZATION**
- 4. SILT FENCE**
- 5. SUPER SILT FENCE**

1. SEDIMENT TANK

14.0 STANDARDS AND SPECIFICATIONS

FOR SEDIMENT TANK

Definition

A sediment tank is a compartmented tank container through which sediment laden water is pumped to trap and retain the sediment.

Purpose

To trap and retain sediment prior to pumping the water to drainageways, adjoining properties, and rights-of-way below the sediment tank site.

Conditions Where Practice Applies

A sediment tank is to be used on sites where excavations are deep, and space is limited, such as urban construction, where direct discharge of sediment laden water to stream and storm drainage systems is to be avoided.

Design Criteria

1. Location The sediment tank shall be located for ease of clean-out and disposal of the trapped sediment and to minimize interference with construction activities and pedestrian traffic.

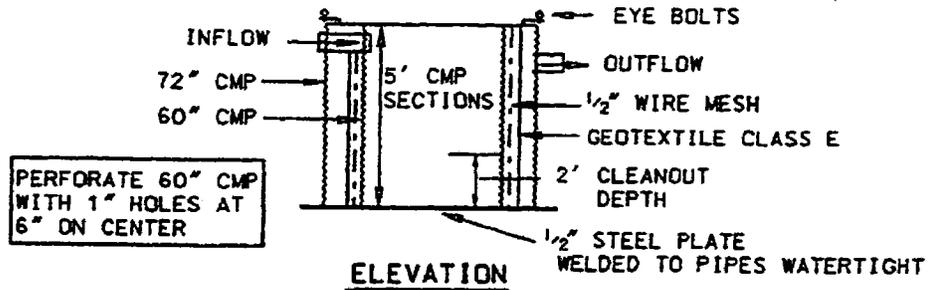
2. Tank Size The following formula should be used in determining the storage volume of the sediment tank: 1 cubic foot of storage for each gallon per minute of pump discharge capacity.

An example of a typical sediment tank is shown below. Other container designs can be used if the storage volume is adequate and approval is obtained from the local approving agency.

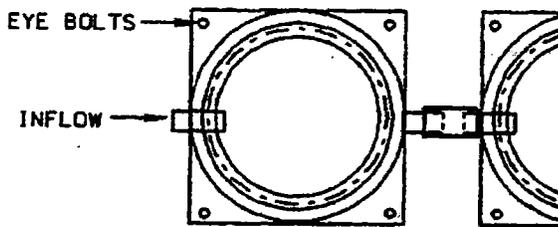
Tanks may be connected in series. Geotextile fabric mesh sizes may vary from tank to tank with the downstream-most layer meeting Geotextile Class C²² or better.

²² Refer to Table 27

DETAIL 21 - PORTABLE SEDIMENT TANK



PERFORATE 60" CMP WITH 1" HOLES AT 6" ON CENTER



STANDARD SYMBOL

☒ PST

Construction Specifications

1. The following formula should be used in determining the storage volume of the sediment tank: 1 cubic foot of storage for each gallon per minute of pump discharge capacity.
2. An example of a typical sediment tank is shown above. Other container designs can be used if the storage volume is adequate and approval is obtained from the local approving agency.
3. Tanks may be connected in series.

2. STABILIZED CONSTRUCTION ENTRANCE

17.0 STANDARDS AND SPECIFICATIONS

FOR

STABILIZED CONSTRUCTION ENTRANCE

Definition

A stabilized layer of aggregate that is underlain with Geotextile Class C²⁵. Stabilized entrances are located at any point where traffic enters or leaves a construction site.

Purpose

Stabilized construction entrances reduce tracking of sediment onto streets or public rights-of-way and provide a stable area for entrance or exit from the construction site.

Conditions Where Practice Applies

1. Stabilized construction entrances shall be located at points of construction ingress and egress.
2. For single family residences, the entrance should be located at the permanent driveway.
3. Stabilized construction entrances should not be used on existing pavement.

Design Criteria

1. Length - minimum of 50' (30' for single residence lot).
2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile Class C shall be placed over the existing ground prior to placing stone. The plan approval authority may not require geotextile fabric for single family residences.
4. Stone - crushed aggregate (2" to 3")²⁶, or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped under the entrance to maintain positive drainage. Pipe installed under the construction entrance shall be protected with a mountable berm. The pipe shall be sized according to the drainage, with the min. diameter being 6". A pipe will not be necessary when the SCE is located at a high spot.
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

²⁵ Refer to Table 27.

²⁶ Refer to Table 28

Maintenance

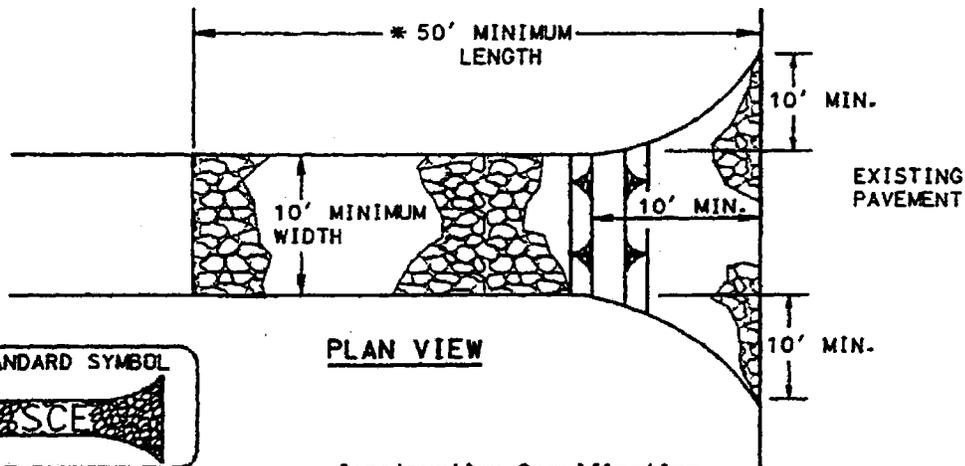
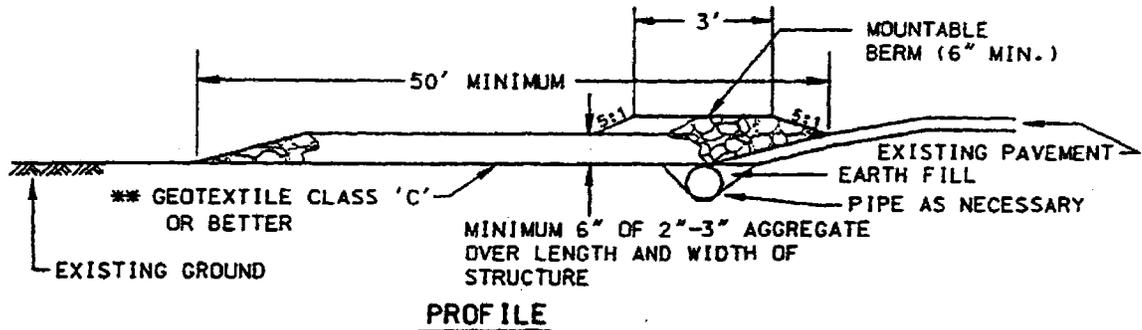
The entrance shall be maintained in a condition which will minimize tracking of sediment onto public rights-of-way. This may require adding stone or other repairs as conditions demand. All sediment spilled, dropped, or tracked onto public rights-of-way must be removed immediately by vacuum sweeping, scraping, or sweeping.

When necessary, wheels shall be cleaned or washed to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device. Daily inspection and maintenance is required.

Removal

After construction is complete and the site is stabilized, the stabilized construction entrance will be removed and the area stabilized unless it will be used as an underlayment for a driveway.

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

1. Length - minimum of 50' (*30' for single residence lot).
2. Width - 10' minimum. should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residences to use geotextile.
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance. maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

3. VEGETATIVE STABILIZATION

20.0 STANDARDS AND SPECIFICATIONS

FOR VEGETATIVE STABILIZATION

Definition

Using vegetation as cover for barren soil to protect it from forces that cause erosion.

Purpose

Vegetative Stabilization specifications are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas, and improving wildlife habitat and visual resources.

Conditions Where Practice Applies

This practice shall be used on denuded areas as specified on the plans and may be used on highly erodible or critically eroding areas. This specification is divided into Temporary Seeding, to quickly establish vegetative cover for short duration (up to one year), and Permanent Seeding, for long term vegetative cover. Examples of applicable areas for Temporary Seeding are temporary soil stockpiles, cleared areas being left idle between construction phases, earth dikes, etc. and for Permanent Seeding are lawns, dams, cut and fill slopes and other areas at final grade, former stockpile and staging areas, etc.

Effects on Water Quality and Quantity

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Vegetation, over time, will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control devices must remain in place during grading, seedbed preparation, seeding, mulching and vegetative establishment to prevent large quantities of sediment and associated chemicals and nutrients from washing into surface waters.

Section I - Vegetative Stabilization Methods and Materials

A. Site Preparation

- i. Install erosion and sediment control structures (either temporary or permanent) such as diversions, grade stabilization structures, berms, waterways, or sediment control basins.
- ii. Perform all grading operations at right angles to the slope. Final grading and shaping is not usually necessary for temporary seeding.
- iii. Schedule required soil tests to determine soil amendment composition and application rates for sites having disturbed area over 5 acres.

B. Soil Amendments (Fertilizer and Lime Specifications)

- i. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas over 5 acres. Soil analysis may be performed by the University of Maryland or a recognized commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
- ii. Fertilizers shall be uniform in composition, free flowing and suitable for accurate application by approved equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers shall all be delivered to the site fully labeled according to the applicable state fertilizer laws and shall bear the name, trade name or trademark and warrantee of the producer.
- iii. Lime materials shall be ground limestone (hydrated or burnt lime may be substituted) which contains at least 50% total oxides (calcium oxide plus magnesium oxide). Limestone shall be ground to such fineness that at least 50% will pass through a #100 mesh sieve and 98 - 100% will pass through a #20 mesh sieve.
- iv. Incorporate lime and fertilizer into the top 3 - 5" of soil by disking or other suitable means.

C. Seedbed Preparation

- i. Temporary Seeding
 - a. Seedbed preparation shall consist of loosening soil to a depth of 3" to 5" by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened it should not be rolled or dragged smooth but left in the roughened condition. Sloped areas (greater than 3:1) should be tracked leaving the surface in an irregular condition with ridges running parallel to the contour of the slope.
 - b. Apply fertilizer and lime as prescribed on the plans.
 - c. Incorporate lime and fertilizer into the top 3 - 5" of soil by disking or other suitable means.

ii. Permanent Seeding

a. Minimum soil conditions required for permanent vegetative establishment:

1. Soil pH shall be between 6.0 and 7.0
2. Soluble salts shall be less than 500 parts per million (ppm).
3. The soil shall contain less than 40% clay but enough fine grained material (> 30% silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception is if lovegrass or seresia lespedeza is to be planted, then a sandy soil (< 30% silt plus clay) would be acceptable.
4. Soil shall contain 1.5% minimum organic matter by weight.
5. Soil must contain sufficient pore space to permit adequate root penetration.
6. If these conditions cannot be met by soils on site, adding topsoil is required in accordance with Section 21 Standard and Specification for Topsoil.

b. Areas previously graded in conformance with the drawings shall be maintained in a true and even grade, then scarified or otherwise loosened to a depth of 3 - 5" to permit bonding of the topsoil to the surface area and to create horizontal erosion check slots to prevent topsoil from sliding down a slope.

c. Apply soil amendments as per soil test or as included on the plans.

d. Mix soil amendments into the top 3 - 5" of topsoil by disking or other suitable means. Lawn areas should be raked to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Where site conditions will not permit normal seedbed preparation, loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface. Steep slopes (steeper than 3:1) should be tracked by a dozer leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. The top 1 - 3" of soil should be loose and friable. Seedbed loosening may not be necessary on newly disturbed areas.

D. Seed Specifications

- i. All seed must meet the requirements of the Maryland State Seed Law. All seed shall be subject to re-testing by a recognized seed laboratory. All seed used shall have been tested within the 6 months immediately preceding the date of sowing such material on this job.

Note: Seed tags shall be made available to the inspector to verify type and rate of seed used.

- ii. Inoculant - The inoculant for treating legume seed in the seed mixtures shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species. Inoculants shall not be used later than the date indicated on the container. Add fresh inoculant as directed on package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75-80° F. can weaken bacteria and make the inoculant less effective.

E. Methods of Seeding

- i. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer), broadcast or drop seeder, or a cultipacker seeder.
 - a. If fertilizer is being applied at the time of seeding, the application rates amounts will not exceed the following: nitrogen; maximum of 100 lbs. per acre total of soluble nitrogen; P205 (phosphorous): 200 lbs/ac; K20 (potassium): 200 lbs/ac.
 - b. Lime - use only ground agricultural limestone, (Up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
 - c. Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without interruption.
- ii. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
 - a. Seed spread dry shall be incorporated into the subsoil at the rates prescribed on the Temporary or Permanent Seeding Summaries or Tables 25 or 26. The seeded area shall then be rolled with a weighted roller to provide good seed to soil contact.
 - b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.
- iii. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
 - a. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
 - b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.

F. Mulch Specifications (In order of preference)

- i. Straw shall consist of thoroughly threshed wheat, rye or oat straw, reasonably bright in color, and shall not be musty, moldy, caked, decayed, or excessively dusty and shall be free of noxious weed seeds as specified in the Maryland Seed Law.
- ii. Wood Cellulose Fiber Mulch (WCFM)
 - a. WCFM shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state.
 - b. WCFM shall be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
 - c. WCFM, including dye, shall contain no germination or growth inhibiting factors.

- d. WCFM materials shall be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material shall form a blotter-like ground cover, on application, having moisture absorption and percolation properties and shall cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
- e. WCFM material shall contain no elements or compounds at concentration levels that will be phyto-toxic.
- f. WCFM must conform to the following physical requirements: fiber length to approximately 10 mm., diameter approximately 1 mm., pH range of 4.0 to 8.5, ash content of 1.6% maximum and water holding capacity of 90% minimum.

Note: Only sterile straw mulch should be used in areas where one species of grass is desired.

G. Mulching Seeded Areas - Mulch shall be applied to all seeded areas immediately after seeding.

- i. If grading is completed outside of the seeding season, mulch alone shall be applied as prescribed in this section and maintained until the seeding season returns and seeding can be performed in accordance with these specifications.
- ii. When straw mulch is used, it shall be spread over all seeded areas at the rate of 2 tons/acre. Mulch shall be applied to a uniform loose depth of between 1" and 2". Mulch applied shall achieve a uniform distribution and depth so that the soil surface is not exposed. If a mulch anchoring tool is to be used, the rate should be increased to 2.5 tons/acre.
- iii. Wood cellulose fiber used as a mulch shall be applied at a net dry weight of 1,500 lbs. per acre. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 lbs. of wood cellulose fiber per 100 gallons of water.

H. Securing Straw Mulch (Mulch Anchoring): Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon size of area and erosion hazard:

- i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of two (2) inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should be used on the contour if possible.
- ii. Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 pounds/acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
- iii. Application of liquid binders should be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. The remainder of area should be appear uniform after binder application. Synthetic binders - such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used at rates recommended by the manufacturer to anchor mulch.

- iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer's recommendations. Netting is usually available in rolls 4' to 15' feet wide and 300 to 3,000 feet long.

I. Incremental Stabilization - Cut Slopes

- i. All cut slopes shall be dressed, prepared, seeded and mulched as the work progresses. Slopes shall be excavated and stabilized in equal increments not to exceed 15'.
- ii. Construction sequence (Refer to Figure 3 below):
 - a. Excavate and stabilize all temporary swales, side ditches, or berms that will be used to convey runoff from the excavation.
 - b. Perform phase 1 excavation, dress, and stabilize.
 - c. Perform phase 2 excavation, dress, and stabilize. Overseed phase 1 areas as necessary.
 - d. Perform final phase excavation, dress, and stabilize. Overseed previously seeded areas as necessary.

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

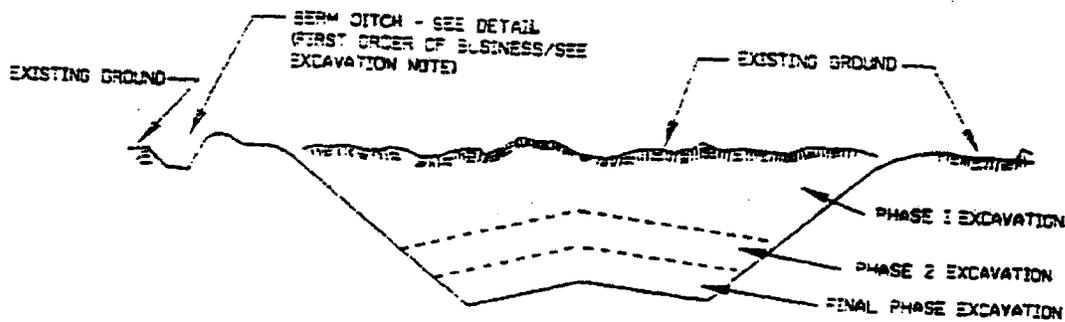


Figure 4 Incremental Stabilization - Cut

J. Incremental Stabilization of Embankments - Fill Slopes

- i. Embankments shall be constructed in lifts as prescribed on the plans.
- ii. Slopes shall be stabilized immediately when the vertical height of the multiple lifts reaches 15', or when the grading operation ceases as prescribed in the plans.
- iii. At the end of each day, temporary berms and pipe slope drains should be constructed along the top edge of the embankment to intercept surface runoff and convey it down the slope in a non-erosive manner to a sediment trapping device.
- iv. Construction sequence: Refer to Figure 4 (below).
 - a. Excavate and stabilize all temporary swales, side ditches, or berms that will be used to divert runoff around the fill. Construct Slope Silt Fence on low side of fill as shown in Figure 5, unless other methods shown on the plans address this area.
 - b. Place phase 1 embankment, dress and stabilize.
 - c. Place phase 2 embankment, dress and stabilize.
 - d. Place final phase embankment, dress and stabilize. Overseed previously seeded areas as necessary.

Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

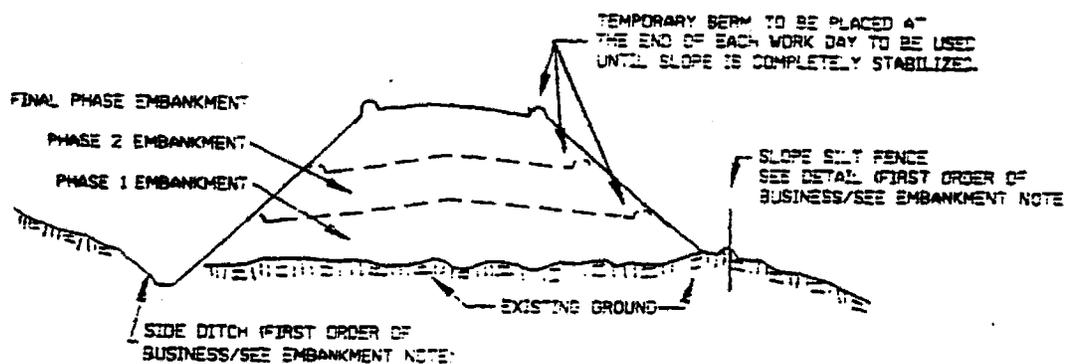


Figure 5 Incremental Stabilization - Fill

Section II - Temporary Seeding

Vegetation - annual grass or grain used to provide cover on disturbed areas for up to 12 months. For longer duration of vegetative cover, Permanent Seeding is required.

A. Seed Mixtures - Temporary Seeding

- i. Select one or more of the species or mixtures listed in Table 26 for the appropriate Plant Hardiness Zone (from Figure 5) and enter them in the Temporary Seeding Summary below, along with application rates, seeding dates and seeding depths. If this Summary is not put on the plans and completed, then Table 26 must be put on the plans.
- ii. For sites having soil tests performed, the rates shown on this table shall be deleted and the rates recommended by the testing agency shall be written in. Soil tests are not required for Temporary Seeding.

Temporary Seeding Summary

Seed Mixture (Hardiness Zone _____) From Table 26					Fertilizer Rate (10-10-10)	Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths		
					600 lb/ac (15 lb/1000 sf)	2 tons/ac (100 lb/1000 sf)

Section III: Permanent Seeding

Seeding grass and legumes to establish ground cover for a minimum period of one year on disturbed areas generally receiving low maintenance.

A. Seed Mixtures - Permanent Seeding

- i. Select one or more of the species or mixtures listed in Table 25 for the appropriate Plant Hardiness Zone (from Figure 5) and enter them in the Permanent Seeding Summary below, along with application rates and seeding dates. Seeding depths can be estimated using Table 26. If this Summary is not put on the construction plans and completed, then Table 25 must be put on the plans. Additional planting specifications for exceptional sites such as shorelines, streambanks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-SCS Technical Field Office Guide, Section 342 - Critical Area Planting. For special lawn maintenance areas, see Sections IV Sod and V Turfgrass.
- ii. For sites having disturbed area over 5 acres, the rates shown on this table shall be deleted and the rates recommended by the soil testing agency shall be written in.
- iii. For areas receiving low maintenance, apply ureaform fertilizer (46-0-0) at 3 1/2 lbs/1000 sq.ft. (150 lbs/ac), in addition to the above soil amendments shown in the table below, to be performed at the time of seeding.

Permanent Seeding Summary

Seed Mixture (For Hardiness Zone _____) (From Table 25)					Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	N	P205	K20	
					90 lb/ac (2.0 lb/ 1000 sf)	175 lb/ac (4 lb/ 1000 sf)	175 lb/ac (4 lb/ 1000 sf)	2 tons/ac (100 lb/ 1000 sf)

Section IV - Sod: To provide quick cover on disturbed areas (2:1 grade or flatter).

A. General specifications

- i. Class of turfgrass sod shall be Maryland or Virginia State Certified or Approved. Sod labels shall be made available to the job foreman and inspector.
- ii. Sod shall be machine cut at a uniform soil thickness of 3/4", plus or minus 1/4", at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Individual pieces of sod shall be cut to the suppliers width and length. Maximum allowable deviation from standard widths and lengths shall be 5 percent. Broken pads and torn or uneven ends will not be acceptable.
- iii. Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
- iv. Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
- v. Sod shall be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period shall be approved by an agronomist or soil scientist prior to its installation.

B. Sod Installation

- i. During periods of excessively high temperature or in areas having dry subsoil, the subsoil shall be lightly irrigated immediately prior to laying the sod.
- ii. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and tightly wedged against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
- iii. Wherever possible, sod shall be laid with the long edges parallel to the contour and with staggering joints. Sod shall be rolled and tamped, pegged or otherwise secured to prevent slippage on slopes and to ensure solid contact between sod roots and the underlying soil surface.
- iv. Sod shall be watered immediately following rolling or tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. The operations of laying, tamping and irrigating for any piece of sod shall be completed within eight hours.

C. Sod Maintenance

- i. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of 4". Watering should be done during the heat of the day to prevent wilting.
- ii. After the first week, sod watering is required as necessary to maintain adequate moisture content.
- iii. The first mowing of sod should not be attempted until the sod is firmly rooted. No more than 1/3 of the grass leaf shall be removed by the initial cutting or subsequent cuttings. Grass height shall be maintained between 2" and 3" unless otherwise specified.

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Section IV - Turfgrass Establishment

Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance. Areas to receive seed shall be tilled by disking or other approved methods to a depth of 2 to 4 inches, leveled and raked to prepare a proper seedbed. Stones and debris over 1 1/2 inches in diameter shall be removed. The resulting seedbed shall be in such condition that future mowing of grasses will pose no difficulty.

Note: Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line.

A. Turfgrass Mixtures

- i. Kentucky Bluegrass - Full sun mixture - For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and eastern shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds/1000 square feet. A minimum of three bluegrass cultivars should be chosen ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.
- ii. Kentucky Bluegrass/Perennial Rye - Full sun mixture - For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding rate: 2 pounds mixture/1000 square feet. A minimum of 3 Kentucky Bluegrass Cultivars must be chosen, with each cultivar ranging from 10% to 35% of the mixture by weight.
- iii. Tall Fescue/Kentucky Bluegrass - Full sun mixture - For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes; certified Tall Fescue Cultivars 95 - 100% , certified Kentucky Bluegrass Cultivars 0 - 5%. Seeding rate: 5 to 8 lb/1000 sf. One or more cultivars may be blended.
- iv. Kentucky Bluegrass/Fine Fescue - Shade Mixture - For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes; certified Kentucky Bluegrass Cultivars 30-40% and certified Fine Fescue and 60-70%. Seeding rate: 1 1/2 - 3 lbs/1000 square feet. A minimum of 3 Kentucky bluegrass cultivars must be chosen, with each cultivar ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.

Note: Turfgrass varieties should be selected from those listed in the most current University of Maryland Publication, Agronomy Mimeo #77, "Turfgrass Cultivar Recommendations for Maryland".

B. Ideal times of seeding

Western MD: March 15 - June 1, August 1 - October 1 (Hardiness Zones - 5b, 6a)

Central MD: March 1 - May 15, August 15 - October 15 (Hardiness Zone - 6b)

Southern MD, Eastern Shore: March 1 - May 15, August 15 - October 15 (Hardiness Zones - 7a, 7b)

C. Irrigation

If soil moisture is deficient, supply new seedings with adequate water for plant growth (1/2" - 1" every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

D. Repairs and Maintenance

Inspect all seeded areas for failures and make necessary repairs, replacements, and reseedings within the planting season.

- i. Once the vegetation is established, the site shall have 95% groundcover to be considered adequately stabilized.
- ii. If the stand provides less than 40% ground coverage, reestablish following original lime, fertilizer, seedbed preparation and seeding recommendations.
- iii. If the stand provides between 40% and 94% ground coverage, overseeding and fertilizing using half of the rates originally applied may be necessary.
- iv. Maintenance fertilizer rates for permanent seedings are shown in Table 24. For lawns and other medium to high maintenance turfgrass areas, refer to the University of Maryland publication "Lawn Care in Maryland" Bulletin No. 171.

Table 21 Recommended Varieties of Grasses and Legumes for Disturbed Areas

Areas Receiving Low Maintenance^{1/}

<u>Grasses</u>	<u>Varieties</u>
Tall Fescue	Adventure, Apache, Arid, Bonanza, Falcon, Clemfine, Finelawn I, Hounddog, Jaguar, Kentucky 31 ^{2/} , Mustang, Olympic, Rebel II, Tribute
Perennial Ryegrass	All-Star, Blazer, Manhattan, Palmer, Pennant, Pennfine, Premier, Prelude, Regal, Repell
Kentucky Bluegrass	"Common", Kenblue, Victa, Ram I, Monopoly
Creeping Red Fescue	Pennlawn, Flyer
Hard Fescue	Aurora, Biljart, Reliant, Scaldis, Spartan, Waldina
Chewings Fescue	Longfellow, Victory, Jamestown
Canada Bluegrass	Reubens
Redtop	Streaker
Poa Trivialis	Laser, Sabre
Reed Canarygrass	Ioreed, Palaton, Rise
Weeping Lovegrass	Morpa, "Common"
Legumes	Variety
Crownvetch	Penngift, Chemung
Serecia Lespedeza	Interstate, Interstate 76, Appalow
Flatpea	Lathco
Birdsfoot Trefoil	Empire, Norcen, Viking

1/ Refer to latest Agronomy Memo #77, University of Maryland - Cooperative Extension Service, for the Turfgrass Cultivars recommended for Maryland. This publication is updated annually.

2/ Kentucky 31 Tall Fescue shall not be used to stabilize wetlands or wetland buffer areas. Contact Maryland Department of Natural Resources, Nontidal Wetlands Division for more information.

Table 22 Quality of Seed

	Minimum <u>Seed Purity (%)</u>	Minimum <u>Germination(%)</u>
<u>LEGUMES</u>		
Birdsfoot Trefoil	97	85
Crownvetch	98.5	80
Lespedeza, Sericea	98	85
Flatpea	98	80
<u>GRASSES</u>		
Bluegrass, Canada	90	80
Bluegrass, Kentucky	90	80
Fescue, red	98.5	85
Fescue, Chewings	98	85
Fescue, tall	98	90
Lovegrass, weeping	98	80
Redtop	92	80
Reed canarygrass	96	80
Ryegrass, Annual	95	85
Ryegrass, Perennial	98	90
<u>OTHER ANNUALS</u>		
Barley	98	90
Millet	99	80
Oats	99	90
Rye	98.5	85

NOTE: Seed containing prohibited or restricted noxious weeds is unacceptable.

Prohibited Noxious Weeds - Johnsongrass or Johnsongrass crosses, Canada thistle, and quackgrass.

Restricted Noxious Weeds - Wild garlic and wild onion, bermudagrass, annual bluegrass, corn cockle, dodder and bindweed.

Seed should contain less than 2.5% of weed seeds, however, 0% is desirable.

To calculate percent pure live seed, multiply germination times purity and divide by 100.

Example: Tall fescue with a germination of 85 percent and a purity of 97 percent. $97 \times 85 = 8245$. $8245/100 = 82.45$ percent pure live seed.

Table 23 Grass and Legume Plant Characteristics

Common Name	Redtop	Eye	Ryegrass Halm	Sweetclover	Sedagrass	Crowvetch	Lespedeza Kurana	Lespedeza Sericea	Ryegrass Perennial	Birdfoot Trefol
Botanical Name	Argemone Alba	Secale Cereale	Lolium Makiflorum	Lolium Perenne	Melilotus Alba Officinalis	Sorghum Sedumet	Cerastium Varia	Lespedeza Elipuisosa	Lolium Perenne	Lotus Corniculatis
Germination Time ²⁹⁾ (Days)	5 - 10	4 - 7	5 - 14	10	4 - 10	14 - 21	5 - 14	7 - 28	5 - 14	10
Growth Habitat ³⁰⁾	P, SL, B	A	A	B, I	A	P, L, R	A	P, L, B	P, S, B	P, L
Seasons	Cool	X	X	X	X		X		X	X
	Warm				X	X	X	X		X
Drainage Class	Dry, Not Droughty	X	X		X	X	X	X		X
	Well Drained	X	X	X	X	X	X	X	X	X
	Moderately Well Drained	X	X	X	X	X	X	X	X	X
	Somewhat Poorly Drained	X		X		X		X	X	X
	Poorly Drained	X								
Annual Cover	Winter		X	X	X				X	X
	Summer				X	X	X			
pH Range	4.0 - 7.5	5.5 - 7.5	5.5 - 7.5	6.5 - 7.5	4.5 - 7.5	5.5 - 7.5	5.5 - 7.5	5.5 - 7.5	5.5 - 7.5	5.0 - 7.5
Flooding Tolerance	X		X						X	X
Erodible Areas	X	X	X	X	X	X	X	X	X	X
Waterways and Channels	X									
Shade Tolerance			X			X			X	
Foot Traffic	X									
Playgrounds, Athletic Fields, Lawns	X									
Reestify						X				X
Levels of Maintenance	High			X						
	Medium	X	X	X	X		X	X	X	X
	Low					X	X	X	X	X

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²⁹⁾ Number of days required for majority of seeds to germinate and emerge under favorable conditions

³⁰⁾ Growth Habits: A-Annual, B-Bunch, BI-Biannual, L-Long Lived, R-Rhizomatous or spreads by root stocks, SL-Short Lived, S-Stoloniferous

Table 24 Maintenance Fertilization for Permanent Seedings

Use Soil Test Results or Rates Shown Below

Seeding Mixture	Type	lb/ac	lb/1000 sf	Time	Mowing
Tall fescue makes up 70% or more of cover	10-10-10	500	11.5	Yearly or as needed. Fall	Not closer than 3" if occasional mowing is desired
	or 30-10-10	400	9.2		
Crownvetch Sericea Lespedeza Birdsfoot Trefoil	0-20-0	400	9.2	Spring, the year following establishment and every 4-5 years thereafter	Do not mow crownvetch
Fairly uniform stand of tall fescue and sericea lespedeza, or birdsfoot trefoil	5-10-10	500	11.5	Fall the year following establishment and every 4-5 years thereafter	Not required, no closer than 4" in the fall after seed has matured.
Weeping lovegrass & sericea lespedeza fairly uniform plant distribution.	5-10-10	500	11.5	Spring, the year following establishment and every 3-4 years thereafter.	Not required, not closer than 4" in fall after seed has matured.
Red & chowings fescue, Kentucky bluegrass, hard fescue mixtures	20-10-10	250	5.8	September, 30 days later. December, May 20, June 30, if needed.	Mow no closer than 2" for red fescue and K. bluegrass, 3" for fescue.
		100	2.3		

FIGURE 5

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MARYLAND USDA PLANT HARDINESS ZONES

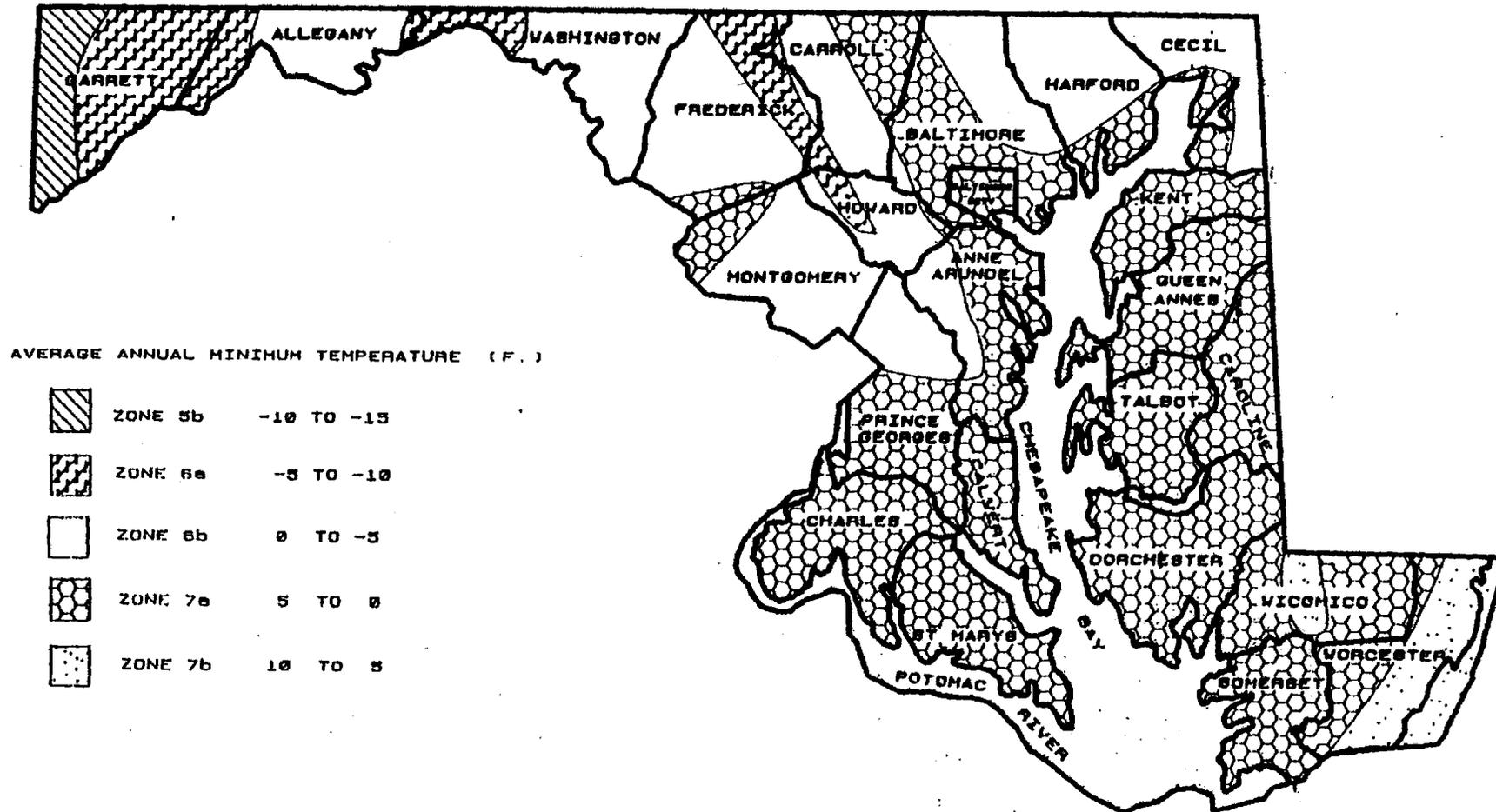


Table 25 Permanent Seeding for Low Maintenance Areas

MIX	SEED MIX (USE CERTIFIED ²⁴ MATERIAL IF AVAILABLE)	PLANTING		SITE CONDITIONS	USDA HARDI- NESS ZONES ²²	RECOMMENDED PLANTING DATES ²³								
		LBS/AC	LBS/1000 SQ FT			3/1- 5/15	3/15- 6/1	5/16- 8/14	6/2- 7/31	8/1- 10/1	8/15- 10/15	8/15- 11/15		
1	TALL FESCUE (75%), CANADA BLUEGRASS (10%), KENTUCKY BLUEGRASS (10%), REDTOP (5%) ²⁴	150	3.4	MOIST TO DRY	5b		X			X			A	
					6a		X			X				
					6b	X					X			
					7a	X						X		
					7b	X								X
2	KENTUCKY BLUEGRASS (50%), CREEPING RED FESCUE OR A HARD FESCUE (40%), REDTOP (10%)	150	3.4	MOIST TO MODERATELY DRY TO DRY	5b		X			X			B	
					6a		X			X				
					6b	X					X			
3	TALL FESCUE (85%), PERENNIAL RYEGRASS (10%), KENTUCKY BLUEGRASS (5%)	125	2.9	MOIST TO DRY	5B		X			X			C	
		15	.34		6A		X			X				
		10	.23		6B	X					X			
					7A	X						X		
					7B	X								X
4	RED FESCUE OR CHEWINGS FESCUE (80%) PERENNIAL RYEGRASS (20%)	60	.92	MOIST TO DRY	5b		X			X			D	
		60	.92		6a		X			X				
		15	.34		6b	X					X			
5	TALL FESCUE (85%) OR, PERENNIAL RYEGRASS (50%) PLUS CROWN VETCH OR FLATPEA	110	2.3	MOIST TO DRY	5b		X			X			E	
		20	.46		6a		X			X				
		20	.46		6b	X					X			
		20	.46		7a	X						X		
					7b	X								X
6	WEEPING LOVEGRASS (17%) SERECIA LESPEDEZA (83%)	4	.09	DRY TO VERY DRY	6a	X		X					F	
		20	.46		7a	X		X						
					7b	X		X						

NOTES: A/ USED BY SHA ON SLOPED AREAS. ADD A LEGUME FOR SLOPES > THAN 3:1.
 B/ USED IN MEDIAN AREAS BY SHA. SHADE TOLERANT.
 C/ POPULAR MIX - PRODUCES PERMANENT GROUND COVER QUICKLY. BLUEGRASS THICKENS STAND.
 D/ BEST USE ON SHADY SLOPES NOT ON POORLY DRAINED CLAYS.
 E/ USE ON LOW MAINTENANCE, STEEP SLOPES. USE TALL FESCUE IN DRAUGHTY COND. CROWN VETCH BEST FOR 5b, 6a, 6b
 F/ SUITABLE FOR SEEDING IN MID-SUMMER.

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²¹ See Table 20 for a list of recommended varieties best suited for Maryland.

²² Refer to Figure 5.

²³ Recommended planting dates are indicated by an X. For seeding during time periods not recommended use a nurse crop such as weeping love grass or millet (mid-summer), or cereal rye (fall to early spring) refer to Table 26 Temporary Seeding.

²⁴ Maryland State Highway Administration Approved Mixes.

Table 25 Permanent Seeding for Low Maintenance Areas (Cont'd)

MIX	SEED MIX (USE CERTIFIED MATERIAL IF AVAILABLE)	PLANTING RATE		SITE CONDITIONS	USDA HARDINESS ZONES	RECOMMENDED PLANTING DATES						NOTES		
		LBS/AC	LBS/1000 SQ FT			3/1-5/15	3/15-6/1	5/16-8/14	6/2-7/31	8/1-10/1	8/15-10/15		8/15-11/15	
7	TALL FESCUE (83%) WEeping LOVEGRASS (2%) PLUS SERECIA LESPEDEZA (15%)	110	2.5	DRY TO VERY DRY	5b		X		X	X			G	
		3	.07		6a		X		X	x				
		20	.46		6b	X		X				X		
					7a	X		X						X
					7b	X		X						X
8	REED CANARYGRASS (75%) REDTOP (6%) PLUS BIRDSFOOT TREEFOIL ^h (19%)	40	.92	WET TO MODERATELY DRY	5b		X			X			H	
		3	.07		6a		X			X				
		10	.23		6b	X						X		
					7a	X								X
					7b	X								x
9	TALL FESCUE (86%) POA TRIVIALIS (7%) BIRDSFOOT TREEFOIL (7%)	125	2.9	WET TO MODERATELY DRY	5b		X			X			I	
		10	.23		6a		X			X				
		10	.23		6b	X						X		
10	TALL FESCUE (80%) HARD FESCUE (20%)	120	3.4	WET TO DRY	5b		X			X			J	
		30	.69		6a		X			X				
					6b	X						X		
					7a	X								X
					7b	X								X
11	HARD FESCUE (100%)	.. 75	1.7	MOIST TO DRY	5b		X			X			K	
					6a		X			X				
					6b	X						X		
					7a	X								X

NOTES: G/ WEeping LOVEGRASS MAY BE SEEDED WITH TALL FESCUE IN MID-SUMMER. SERECIA LESPEDEZA IS BEST SUITED FOR ZONES 7a AND 7b.
H/ USE ON POORLY DRAINED SOILS - DITCHES OR WATERWAYS. BIRDSFOOT TREEFOILS BEST FOR ZONES 5b, 6a, ABOVE 2,000 FT.
I/ USE IN AREAS OF MOIST SHADE. POA TRIVIALIS THRIVES IN WET SHADY AREAS.
J/ TALL FESCUE MAY BE SEEDED ALONE. THE HARD FESCUE PROVIDES BETTER SHADE TOLERANCE AND PRODUCES A BETTER STAND.
K/ LOW FERTILITY GRASS. REQUIRES INFREQUENT MOWING, GOOD COMPANION FOR WILDFLOWERS.

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* LEGUMINOUS SEEDS SHALL BE INOCULATED OR TREATED WITH UNEXPIRED APPROVED CULTURE FOR THE SPECIFIC LEGUME, IN THE PROPER PROPORTIONS, AS SPECIFIED ON THE PACKAGE LABEL. THE INOCULANT SHALL BE STORED AT ROOM TEMPERATURE, OUT OF DIRECT SUNLIGHT AND AWAY FROM HEATING UNITS. WHEN SEEDING DRY WITH MECHANICAL SEEDERS THOROUGHLY MIX THE POWDER FORM OF THE INOCULANT WITH THE SEED BY WETTING THE SEED WITH A SMALL AMOUNT OF WATER AND THEN ADDING THE POWDER. THE INOCULATED SEED IS THEN MIXED WITH OTHER SEEDS AND PLANTED WITHIN 48 HOURS. SEEDS INOCULATED WITH LIQUID CULTURES SHALL BE PLANTED WITHIN 24 HOURS. INOCULATED SEED NOT PLANTED WITHIN THE SPECIFIED TIME WILL BE REINOCULATED. WHEN USING HYDRAULIC SEEDERS, USE 10 TIMES THE AMOUNT OF INOCULANT SPECIFIED FOR DRY SEEDING. INOCULATED SEED SHALL NOT BE EXPOSED TO SUNLIGHT OR LEFT IN A SLURRY FOR MORE THAN ONE HOUR. TWICE REINOCULATION WILL BE NECESSARY.

Table 26 Temporary Seeding Rates, Depths, and Dates

SPECIES	MINIMUM SEEDING RATES		PLANTING DEPTIF ⁴	HARDINESS ZONES ⁷ AND SEEDING DATES ⁸								
				7a and 7b			6b			6a and 5b		
	PER ACRE	LBS/1000 SQ.FT.	INCHES	2/1-4/30	5/1-8/14	8/15-11/30	3/1-4/30	5/1-8/14	8/15-11/15	3/15-5/31	6/1-7/31	8/1-10/31
CHOOSE ONE: BARLEY OATS RYE ⁹	2.5 BU. (122 lbs) 3 BU. (96 lbs) 2.5 BU. (140 lbs)	2.80 2.21 3.22	1-2 1-2 1-2	X X X	- - -	BY 10/15 - X	X X X	- - -	BY 10/15 - X	X X X	- - -	BY 10/1 - X
BARLEY OR RYE PLUS FOXTAIL MILLET ¹⁰	150 lbs	3.45	1	X X	X X	10/15 X	X X	X X	10/15 X	X X	X X	10/1 X
WEAVING LOVEGRASS ¹¹	4 lbs	.09	1/4 - 1/2	-	X	-	-	X	-	-	X	-
ANNUAL RYEGRASS	50 lbs	1.15	1/4 - 1/2	X	-	11/1	X	-	11/1	X	-	8/15
MILLET ¹²	50 lbs	1.15	1/2	-	X	-	-	X	-	-	X	-

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- ¹ Applicable on slopes of 3:1 or flatter
- ² Refer to Figure A - Adapted from USDA, ARS Miscellaneous Publication #1475, January 1990
- ³ Between fall and spring seeding dates, use match only if ground is frozen and reseed when thawed
- ⁴ May be used as a nurse crop for late fall/early winter permanent seedings, add 56 lbs/ac to the permanent seeding mixture
- ⁵ Maryland State Highway Administration Temporary Seed Mix
- ⁶ May be used as a nurse crop for mid-summer permanent seedings. Add 2 lbs/ac to permanent seed mix.
- ⁷ May be used as a nurse crop for mid-summer permanent seedings. Add 10 lbs/ac to the permanent seeding mix.

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4. SILT FENCE

15.0 STANDARDS AND SPECIFICATIONS

FOR SILT FENCE

Definition

Temporary barriers of woven geotextile fabric used to intercept, reduce velocity and filter surface runoff from disturbed areas.

Purpose

Silt fences filter sediment from runoff so that deposition of transported sediment can occur. Silt fences can be used to intercept sheet flow only. They cannot be used as velocity checks in ditches or swales, or placed where they will intercept concentrated flow.

Conditions Where Practice Applies

Silt fence is limited to intercepting sheet flow runoff from limited distances according to slope. Silt fence provides filtering and velocity dissipation to promote gravity settling of sediments.

Design Criteria

1. Silt fence should be used with caution in areas of rocky soils that may prevent trenching.
2. Silt fence should be placed on or parallel to contours.
3. The length of silt fences must conform to the following:

Table 17 Silt Fence Design Constraints

<u>Slope Steepness</u>	<u>(Maximum) Slope Length</u>	<u>(Maximum) Silt Fence Length</u>
Flatter than 50:1 (2%)	unlimited	unlimited
50:1 to 10:1 (2 - 10%)	125 feet	1,000 feet
10:1 to 5:1 (10 - 20%)	100 feet	750 feet
5:1 to 3:1 (20 - 33%)	60 feet	500 feet
3:1 to 2:1 (33 - 50%)	40 feet	250 feet
> 2:1 (> 50%)	20 feet	125 feet

4. In areas of less than 2% slope and sandy soils (USDA general classification system, soil class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.

5. Downslope from the silt fence should be undisturbed ground.

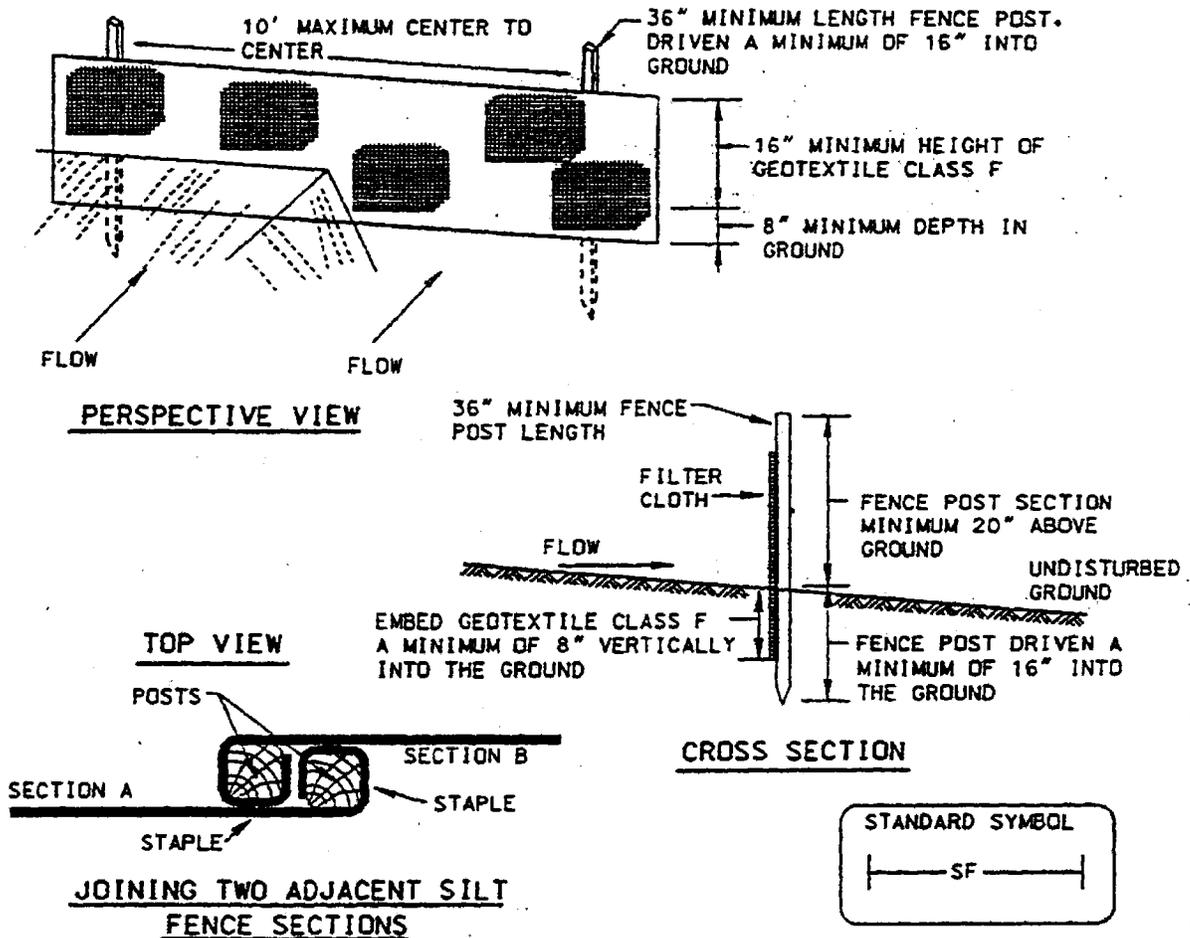
Construction Specifications

1. Fence posts shall be a minimum of 36 inches long driven 16" minimum into ground. Wood posts shall be 1 1/2" X 1 1/2" (minimum) square cut, or 1 3/4" (minimum) diameter round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighing not less than 1.00 pound per linear foot.
2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate.	3 gal/ft ² /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

DETAIL 22 - SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pond per linear foot.

2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft ² / minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.

4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

SILT FENCE

Silt Fence Design Criteria

<u>Slope Steepness</u>	(Maximum) <u>Slope Length</u>	(Maximum) <u>Silt Fence Length</u>
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

Note: In areas of less than 2% slope and sandy soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.

5. SUPER SILT FENCE

26.0 SUPER SILT FENCE

Definition

A temporary barrier of Geotextile Class F over chain link fence used to intercept sediment laden runoff from small drainage areas.

Purpose

To reduce runoff velocity and allow the deposition of transported sediment to occur. Limits imposed by ultraviolet light stability of the fabric will dictate the maximum period that the silt fence may be used.

1. Super silt fence provides a barrier that can collect and hold debris and soil, preventing the material from entering critical areas, streams, streets, etc.
2. Super silt fence can be used where the installation of a dike would destroy sensitive areas, woods, wetlands, etc.
3. Super silt fence should be placed as close to the contour as possible. No section of silt fence should exceed a grade of 5% for a distance of more than 50 feet.

Table 30 Design Criteria

Length of the flow contributing to Super Silt Fence shall conform to the following limitations:

<u>Slope</u>	<u>Slope Steepness</u>	<u>Slope Length (maximum)</u>	<u>Silt Fence Length (maximum)</u>
0 - 10%	0 - 10:1	Unlimited	Unlimited
10 - 20%	10:1 - 5:1	200 feet	1,500 feet
20 - 33%	5:1 - 3:1	100 feet	1,000 feet
33 - 50%	3:1 - 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet

Where ends of the geotextile fabric come together, the ends shall be overlapped, folded, and stapled to prevent sediment bypass.

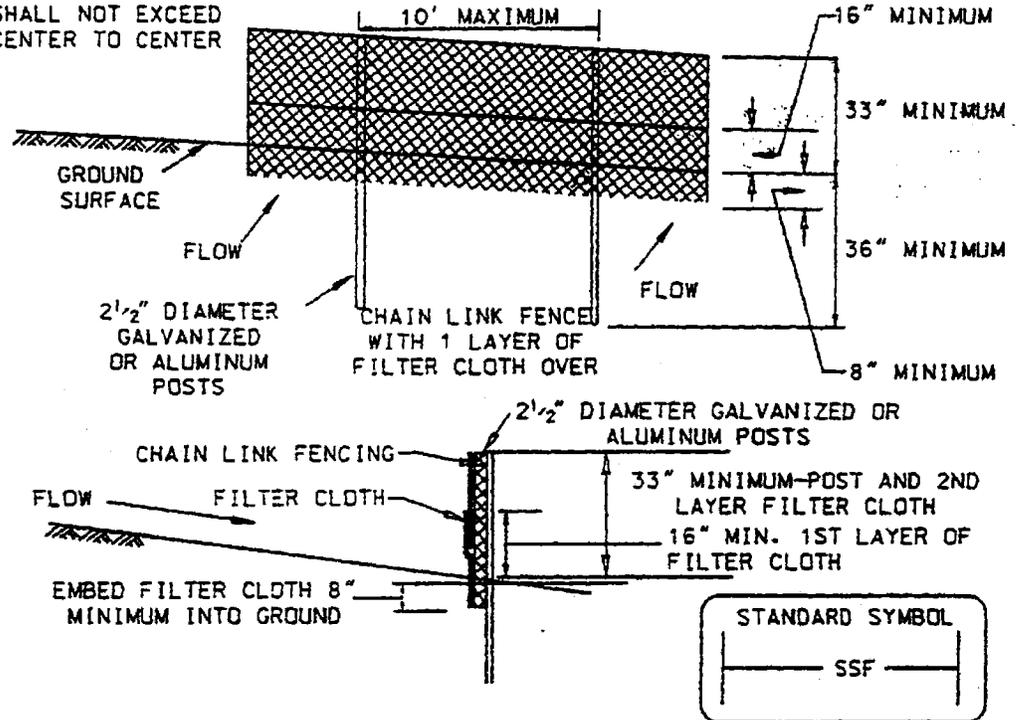
Construction Specifications

1. Fencing shall be 42 inches in height and constructed in accordance with the latest Maryland State Highway (SHA) Details for Chain Link Fencing. The SHA specification for a 6 foot fence shall be used, substituting 42 inch fabric and 6 foot length posts.
2. Chain link fence shall be fastened securely to the fence posts with wire ties or staples. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.
3. Filter Cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
4. Filter cloth shall be embedded a minimum of 8" into the ground.
5. When two sections of geotextile fabric adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of the fence height.
7. Filter cloth shall meet the following requirements for Geotextile Class F:

Tension Strength	50 lb/in (min.)	Test: MSMT 509
Tensile Modulus	20 lb/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft ² /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

DETAIL 33 - SUPER SILT FENCE

NOTE: FENCE POST SPACING SHALL NOT EXCEED 10' CENTER TO CENTER



Construction Specifications

Fencing shall be 42 inches in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6 foot fence shall be used, substituting 42 inch fabric and 6 foot length posts.

1. The poles do not need to set in concrete.
2. Chain link fence shall be fastened securely to the fence posts with wire ties or staples.
3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
4. Filter cloth shall be embedded a minimum of 8" into the ground.
5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence.

SUPER SILT FENCE

Design Criteria

<u>Slope</u>	<u>Slope Steepness</u>	<u>Slope Length (maximum)</u>	<u>Silt Fence Length (maximum)</u>
0 - 10%	0 - 10:1	Unlimited	Unlimited
10 - 20%	10:1 - 5:1	200 feet	1,500 feet
20 - 33%	5:1 - 3:1	100 feet	1,000 feet
33 - 50%	3:1 - 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet