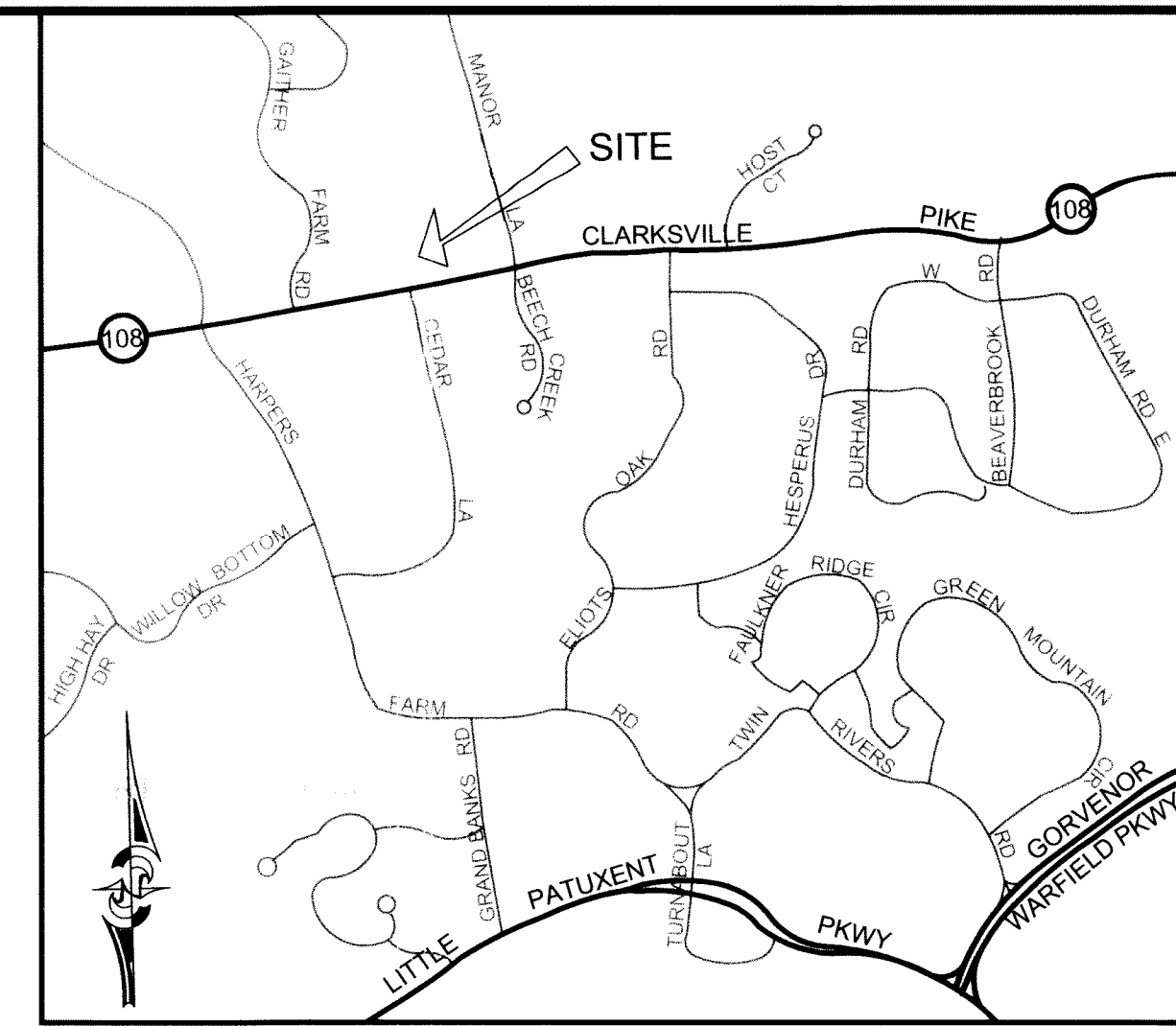
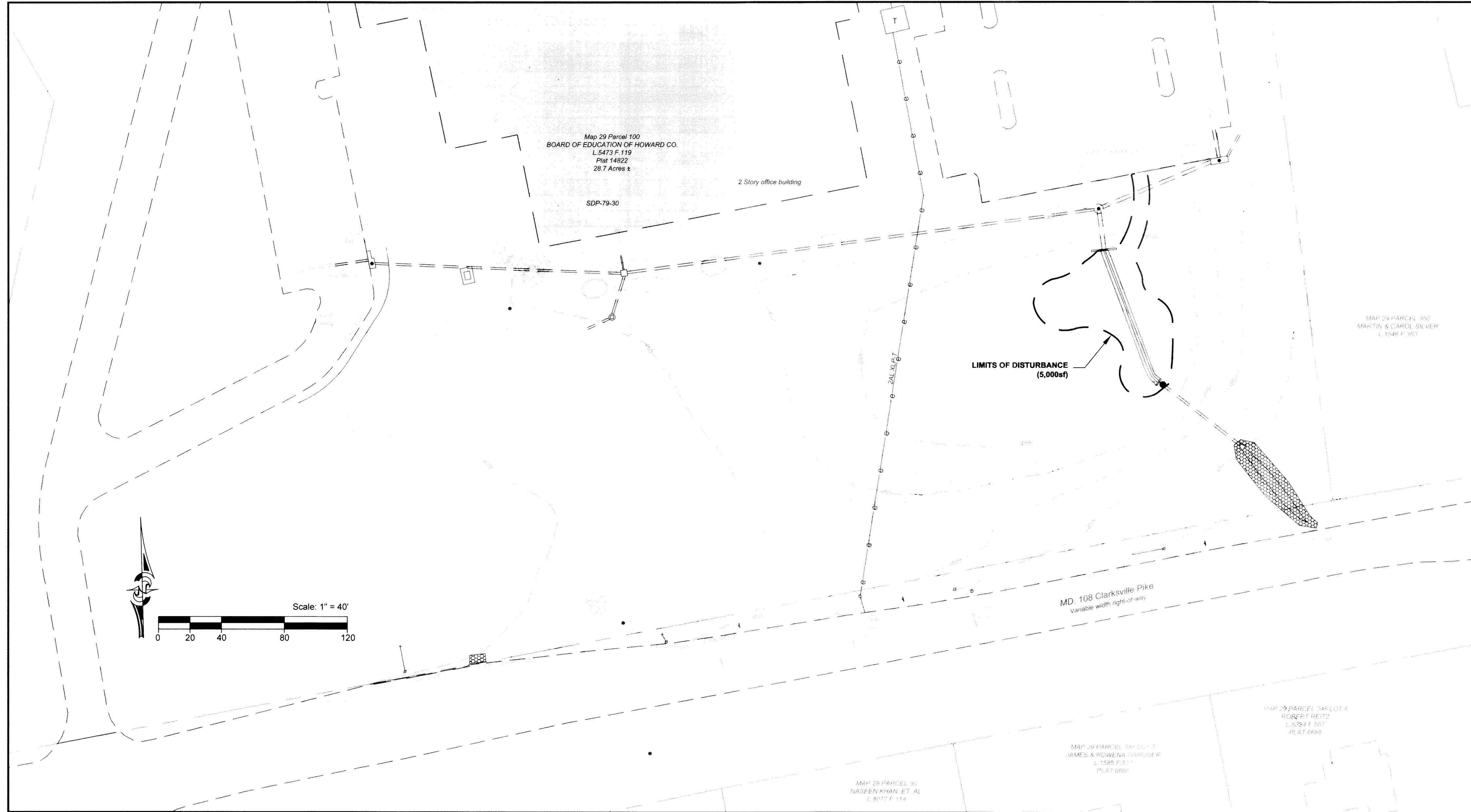


BOARD OF EDUCATION Bioretention Design



Vicinity Map
Howard Co. MD
ADC Map 15 B2 & C2
Scale: 1" = 2000'

General Notes

- These plans were prepared with the field information at the time of project survey. It is possible that field conditions as of the date of construction vary from these plans and it is the contractor's responsibility to verify field conditions such as elevations, depths, etc. prior to proceeding with work. It is the contractor's responsibility to verify with the supplier / manufacturer of any proprietary product that their product will function per the design for the field conditions at time of construction. The design engineer should be notified immediately if any deviations from the design plan are found.
- All specified and/or proprietary products shown hereon may be subject to substitution with other products recommended by the contractor, subject to written review and approval by the design engineer.
- All construction shall be in accordance with the latest standards and specifications of Howard County.
- The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work. The contractor shall also notify HC Public School System representatives at (410)-313-7084 or (410)-313-2577 to locate and mark on-site HC PSS utilities at least 48 hours prior to any excavation work.
- The coordinates shown hereon are based upon the Howard County Geodetic control which is based upon the Maryland State Plane Coordinate System.
- Source of existing topography is J.A. Rice Inc. field survey dated June 2006. Control was established from Howard County Geodetic Survey Control Monuments (291D and 291A). The Horizontal Datum is referenced to NAD83 (ADJ. 1991) and the Vertical is referenced to the NGVD29 Datum.
- The contractor shall field visit and familiarize themselves with the site prior to bidding and construction.
- All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the most current Maryland Standards and Specifications for Soil and Erosion and Sediment Control and any revisions thereto.
- Existing pond approved under SDP-79-030.** Currently proposed work is a water quality enhancement, which does not alter the approved quantity control function and design of the existing pond.
- Contractor shall not store any material and/or equipment within 2 feet of private property.
- Contractor shall take caution not to damage any existing trees, except those designated on the plan to be removed. Any damaged tree shall be replaced at contractor's expense.
- Contractor to install erosion control matting, top soil, seeding and grading so as not to affect positive drainage from parking area.
- All quantities are estimates only. The contractor is responsible for verifying quantities through a field visit and his own quantity takeoffs.
- The final staging and storage area needed for construction will be coordinated with HC PSS. A defined area on the existing paved parking lot area, prior to final HC PSS approval, is shown on the Sediment Control Plan.
- All material removed from this site shall be taken to a site with an active grading permit.

Sequence of Construction

- Obtain County grading permits if required. Conduct pre-construction meeting. (1 day)
- Clear and grub in preparation to install silt fence, pedestrian fence and inlet protection. (1 day)
- Install sediment control items (1 day).
- Install de-watering sump pit and de-water basin area if permanent pool saturated soils exist. (1 day)
- Note to contractor: steps 6 to 9 must be completed in 5 working days.**
- Demolish and remove existing concrete channel. (1 day)
- Grade new facility to the depth shown on plans. (2 days)
- Install riprap at new forebay as shown on plans. (1 day)
- Install plantings and permanent seeding. (1 day)
- With sediment control inspector's permission remove remaining sediment control devices and stabilize areas disturbed by this process. (1 day).

Total = 10 days

Summary of Environmental Impacts

	Tree Removal (each)	Stream Disturbance (lf)	Wetland Disturbance (sq.ft)	Limits of Disturbance (sq.ft)	Limits of Disturbance (ac)	Cut (cy)	Fill (cy)	Net (cy)
Total	0	0	0	5,000	0.11	163	13	150

LEGEND

	Limits of Disturbance
	Existing Contours
	Property Line
	Ex. Curb
	Ex. Electric Line
	Tree line
	Sign
	Electric Pole
	Ex. Tree
	Manhole

SHEET INDEX

- Title Sheet
- Design View
- Sediment Control
- Sediment Control Notes and Details
- Planting Plan
- Planting Notes and Details

APPROVED: DEPARTMENT OF PUBLIC WORKS

James M. He 2/26/08
DIRECTOR OF PUBLIC WORKS DATE
Howard E. Saltzman 2/25/08
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE
Howard E. Saltzman 2/21/08
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

BY THE ENGINEER:

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Timothy Schueler 2/18/08
ENGINEER/ Timothy Schueler - PE# 20207 DATE

Howard County Public School System

James M. He
Executive Director Facilities Planning And Management Date

MISS UTILITY

Call "Miss Utility" at 1-800-257-7777, 48 hours prior to the start of work. The excavator must notify all public utility companies with underground facilities in the area of proposed excavation and have those facilities located by the utility companies prior to commencing excavation.

BY THE OWNER/DEVELOPER:

IWE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

Howard E. Saltzman 2/21/08
OWNER/DEVELOPER DATE
Howard E. Saltzman
OWNER/DEVELOPER: PRINTED NAME

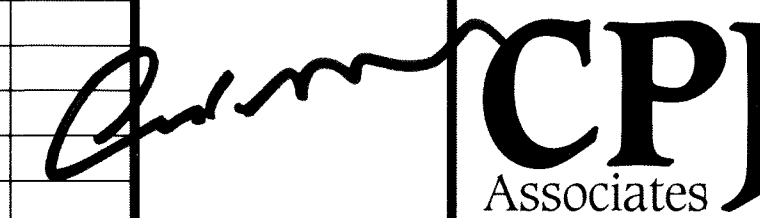
HOWARD COUNTY DPW - ENVIRONMENTAL SERVICES
6751 COLUMBIA GATEWAY DRIVE, #514
COLUMBIA, MD 21046
PHONE: (410) 313-6413
ATTN: MARK RICHMOND

OWNER
HOWARD COUNTY, MD
BOARD OF EDUCATION
PARCEL 100; PLAT 14822
ELECTION DISTRICT 15
MAP 29

BOARD OF EDUCATION
STORM WATER QUALITY ENHANCEMENT

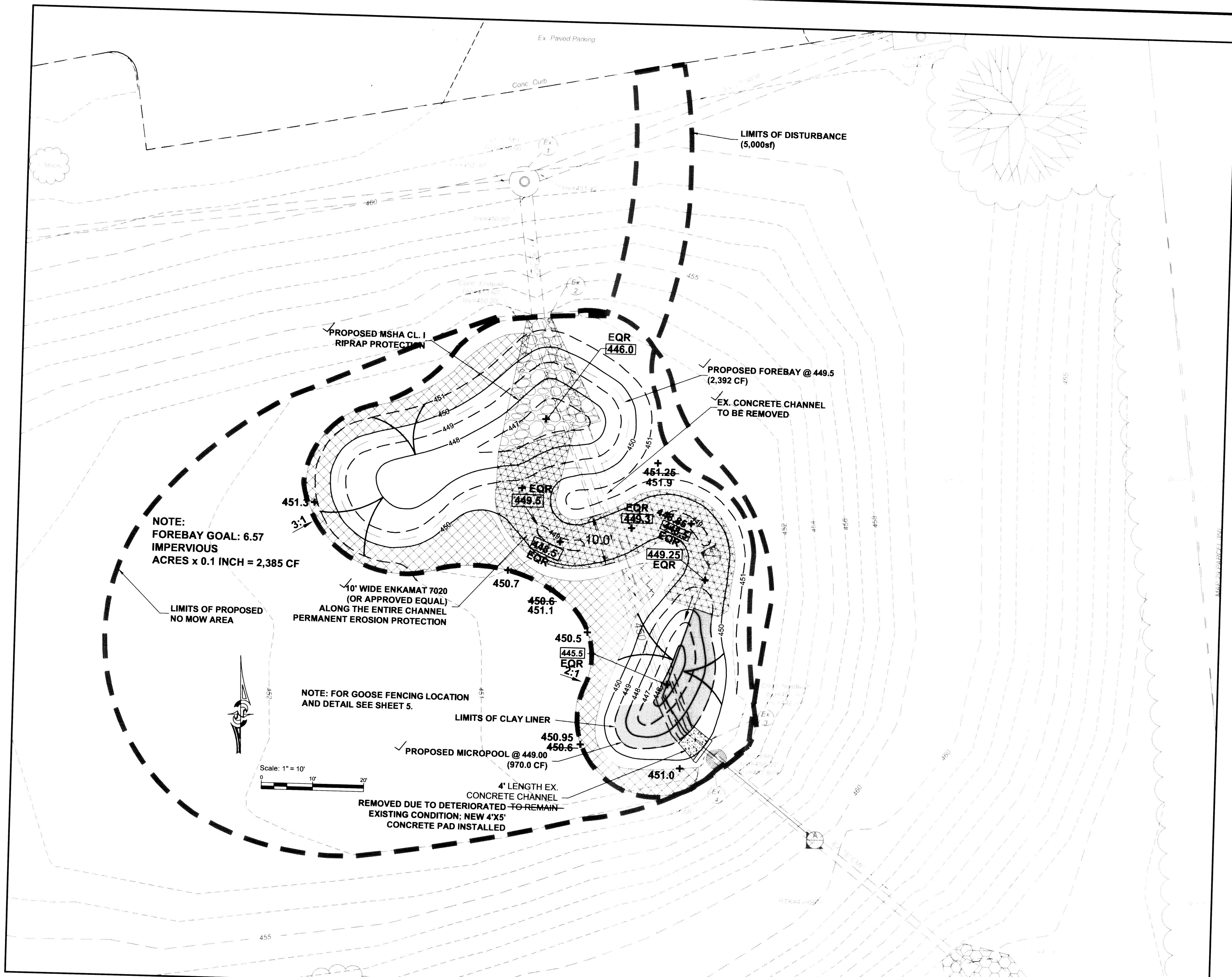
Title Sheet and Existing Conditions

DATE:	12/07				
DESIGNED:	TCS/HT				
DRAFTED:	HT				
CHECKED:	TCS				
BASE DATA:	JA Rice Inc.	NO.	REVISIONS	BY	DATE



CPJ Environmental Services Division
STREAM RESTORATION - STORMWATER MANAGEMENT INSPECTION
910 CLOPPER ROAD SUITE 215N GAITHERSBURG MARYLAND 20878
Phone: (301) 208-9575 E-mail: env@cpj.com Fax: (301) 926-4551
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE	As Shown
SHEET	1
	OF 6 SHEETS
JOB NO.	36-512



LEGEND

	Limits of Disturbance		Ex. Tree
	Limits of No Mow Area		Ex. Manhole
	Existing Contours		Proposed Riprap
	Proposed Contours		Enkamat 7020
	Ex. Curb		Erosion Control Mat (ECM)
	Property Line		Proposed Spot Shoot
	Perm. Pool		
	Ex. Electric line		
	Cross Section		
	Ex. Tree line		
	Ex. Sign		
	Ex. Electric Pole		

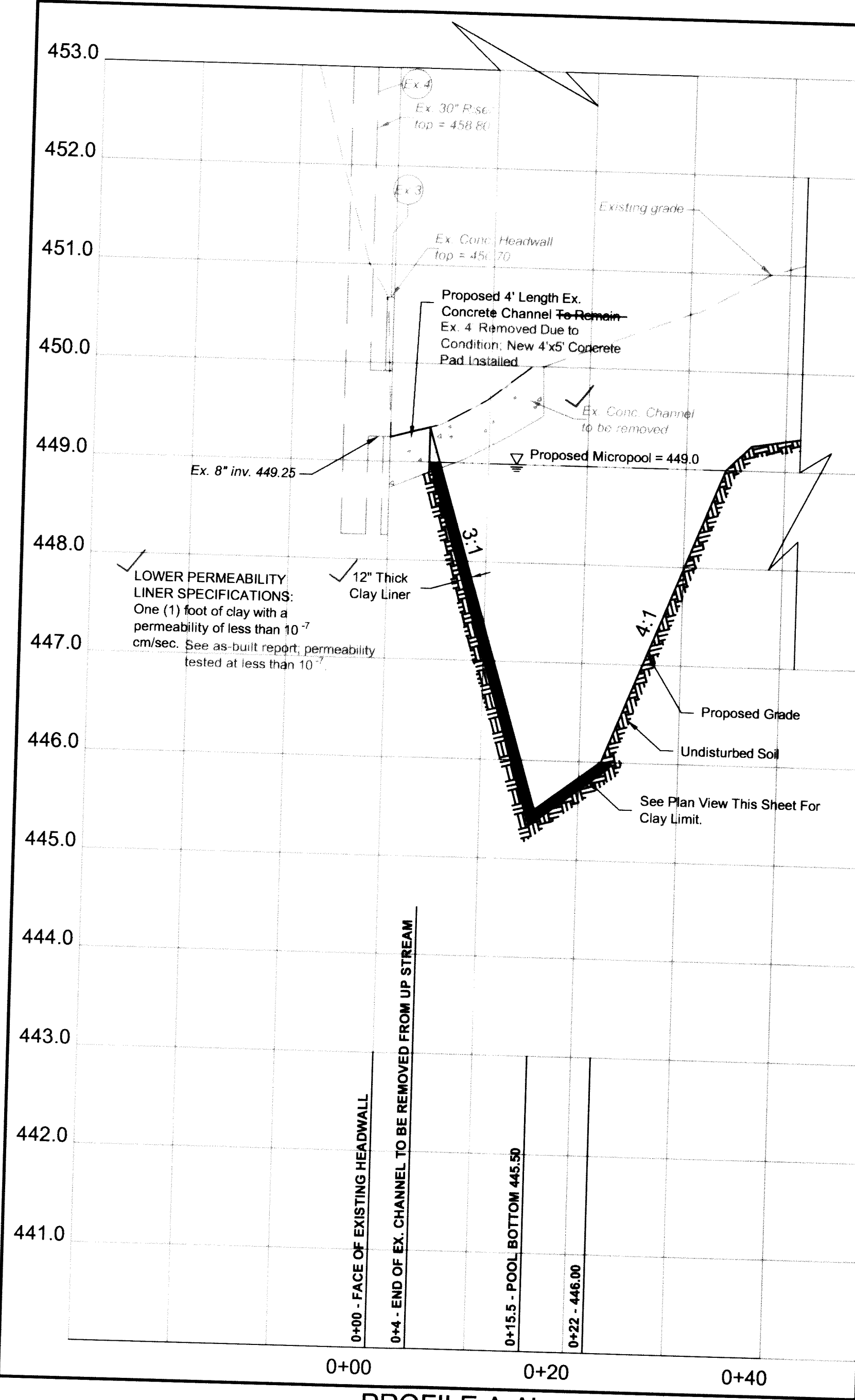
NOTE:
FOREBAY GOAL: 6.57
IMPERVIOUS
ACRES x 0.1 INCH = 2,385 CF

10' WIDE ENKAMAT 7020
(OR APPROVED EQUAL)
ALONG THE ENTIRE CHANNEL
PERMANENT EROSION PROTECTION

NOTE: FOR GOOSE FENCING LOCATION
AND DETAIL SEE SHEET 5.

Scale: 1" = 10'

General As-built Notes:
1. As-built elevations were not professionally surveyed. Elevations were taken by CPJ staff (CW) on June 18, 2008; locations are approximate. CPJ used "Ex. 1, the top of the Storm MH" as the benchmark for elevations. Elevations taken by EQR during the construction phase were recorded by CPJ (CW) on March 26, 2008; a tolerance of 0.2 feet was used.
2. Checked items were visually confirmed by CPJ staff (CW), unless otherwise noted.



PROFILE A-A'
Scale: V - 1" = 1'
H - 1" = 10'

HOWARD COUNTY DPW -
ENVIRONMENTAL SERVICES
6751 COLUMBIA GATEWAY DRIVE, #514
COLUMBIA, MD 21046
PHONE: (410) 313-6413
ATTN: MARK RICHMOND

OWNER
HOWARD COUNTY, MD
BOARD OF EDUCATION
PARCEL 100; PLAT 14822
ELECTION DISTRICT 15
MAP 29

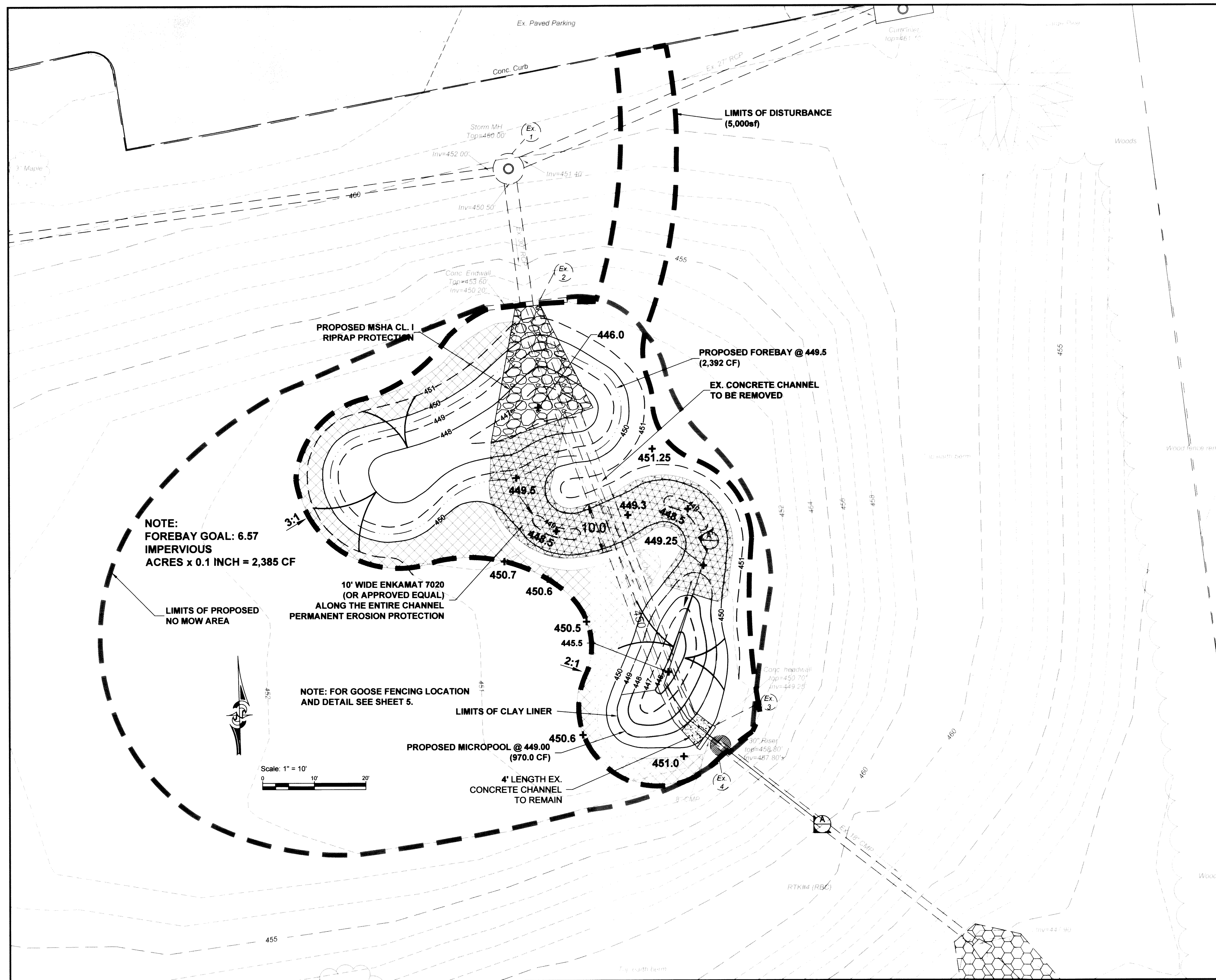
**BOARD OF EDUCATION
STORM WATER QUALITY ENHANCEMENT**
Design Plan View As-built

DATE:	12/08				
DESIGNED:	TCS/HT				
DRAFTED:	HT/CW				
CHECKED:	TES/DO				
BASE DATA:	JA Rice Inc.				
NO.		REVISIONS		BY	DATE

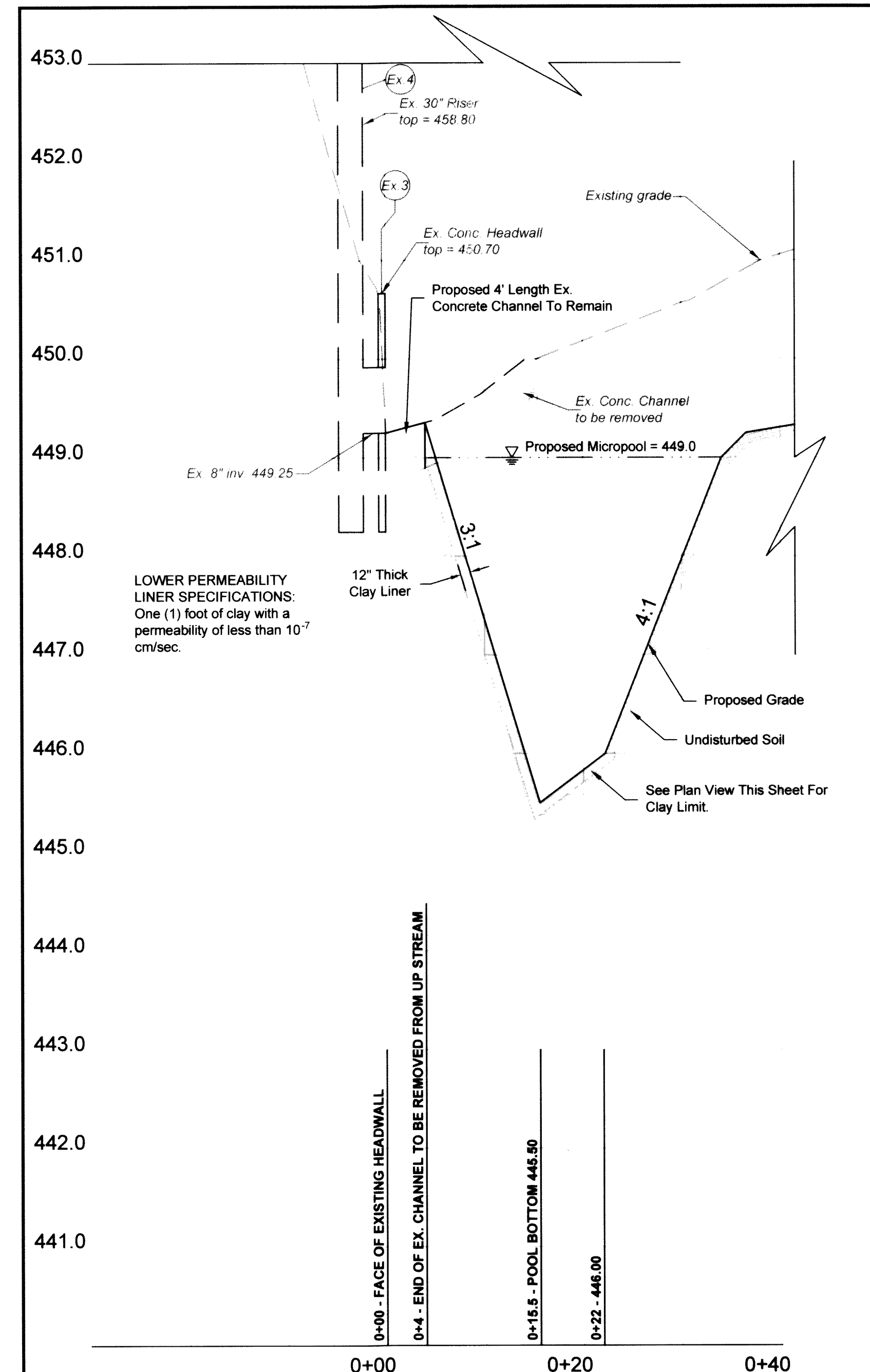
CPJ Associates CPJ Environmental Services Division
910 CLOPPER ROAD SUITE 215N GAITHERSBURG MARYLAND 20878
Phone: (301) 208-9573 E-mail: env@cpj.com Fax: (301) 926-4551
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE
As Shown
SHEET
1
OF 2 SHEETS
JOB NO.
36-512

Plotted: Feb 11, 2009 11:38am User: cwh/ht
 Design: Base: As-Built.dwg
 Plotfile: As-Built.dwg



LEGEND			
	Limits of Disturbance		Ex. Tree
	Limits of No Mow Area		Ex. Manhole
	Existing Contours		Proposed Riprap
	Proposed Contours		Enkamat 7020
	Ex. Curb		Erosion Control Mat (ECM)
	Property Line		Proposed Spot Shoot
	Perm. Pool		
	Ex. Electric line		
	Cross Section		
	Ex. Tree line		
	Ex. Sign		
	Ex. Electric Pole		



Plotted: Feb 11, 2008 1:32pm User: cshar
 F:\BDC\CAD\DWG\2 - BDC Design.dwg
 Author: Yfeng,2/10/08
 Design: Steve Berg
 Profile.dwg

HOWARD COUNTY DPW - ENVIRONMENTAL SERVICES
 6751 COLUMBIA GATEWAY DRIVE, #514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413
 ATTN: MARK RICHMOND

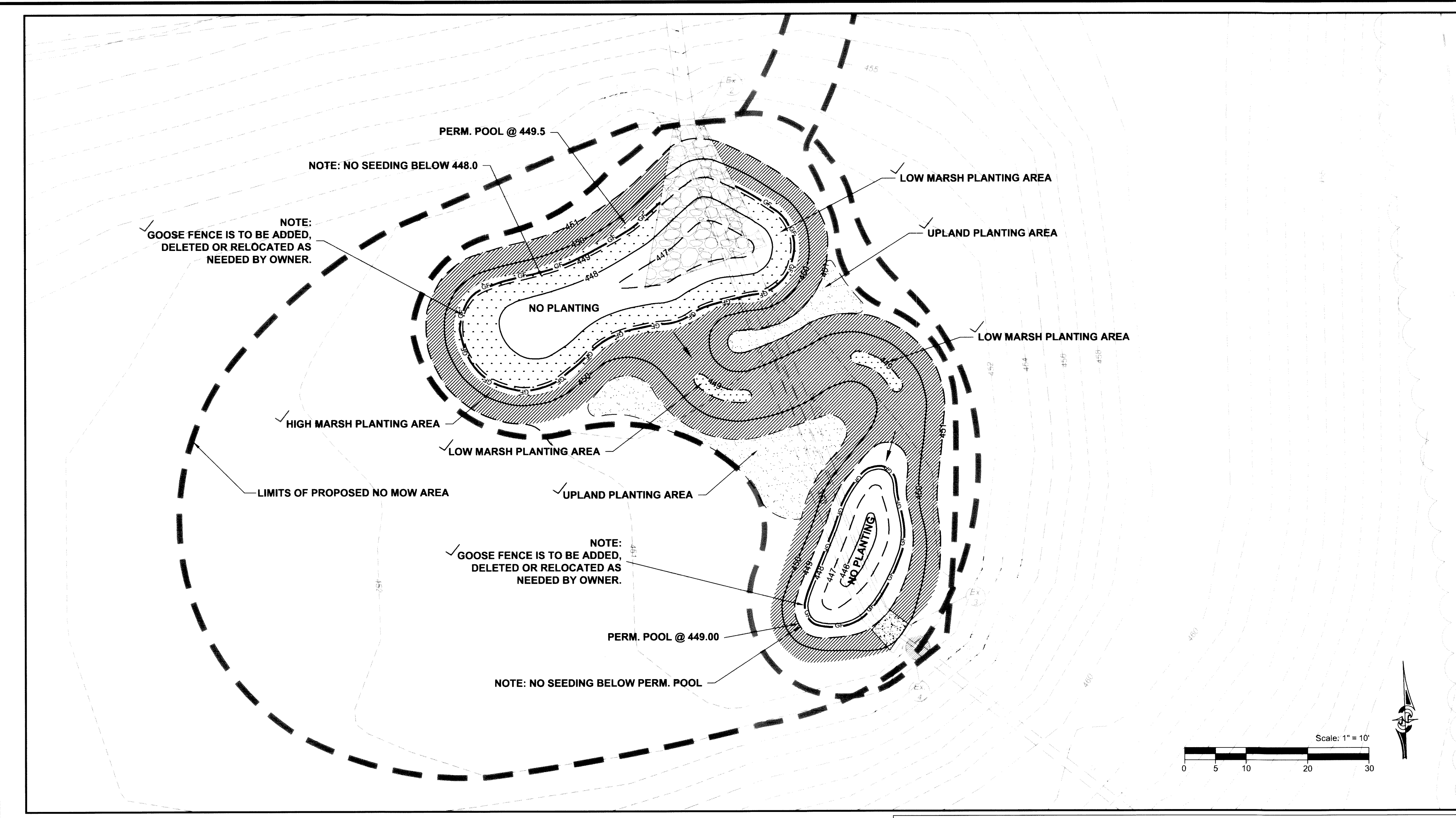
OWNER
 HOWARD COUNTY, MD
 BOARD OF EDUCATION
 PARCEL 100; PLAT 14822
 ELECTION DISTRICT 15
 MAP 29

BOARD OF EDUCATION
STORM WATER QUALITY ENHANCEMENT
Design Plan View

DATE:	12/07				
DESIGNED:	TCS/HT				
DRAFTED:	HT				
CHECKED:	TCS				
BASE DATA:	JA Rice Inc.	NO.	REVISIONS	BY	DATE

CPJ Associates CPJ Environmental Services Division
 STREAM RESTORATION - STORMWATER MANAGEMENT INSPECTION
 910 CLOPPER ROAD SUITE 215N GAITHERSBURG MARYLAND 20878
 Phone: (301) 208-9573 E-mail: env@cpja.com Fax: (301) 926-4551
 SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE As Shown
 SHEET 2 OF 6 SHEETS
 JOB NO 36-512



Symbol	Zone	Area (s.f.)	Common Name	Scientific Name	Quantity	Size	Spacing
[Hatched Box]	High Marsh	1740	ERNMX-122	na	-	-	-
[Dotted Box]	Low Marsh	590	ERNMX-131	na	-	-	-
[Stippled Box]	Upland/Riparian	380	Blue Switch Grass	<i>Panicum virgatum</i> <i>'Heavy Metal'</i>	✓20	2 gal.	3' o.c.
			Karl Foerster Reed Grass	<i>Calamagrostis x acutiflora</i> 'Karl Foerster'	✓20	2 gal.	3' o.c.

LOW MARSH SEEDING:		HIGH MARSH SEEDING:	
OBL WETLAND MIX: ERNMX-131		FACW WETLAND MEADOW MIX ERNMX-122	
SEED AT 15 LBS PER ACRE OR 1/3 LB. TO 1/2 LB. PER 1000 SQ. FT.			
20% <i>Carex vulpinoidea</i>	Fox Sedge	20% <i>Elymus virginicus</i>	Virginia Wild Rye
9% <i>Sparganium eurycarpum</i>	Giant Bur Reed	19% <i>Carex vulpinoidea</i>	Fox Sedge
7% <i>Verbena hastata</i>	Blue Vervain	7% <i>Scirpus atrovirens</i>	Green Bulrush
6% <i>Glyceria canadensis</i>	Rattlesnake Grass	5.5% <i>Verbena hastata</i>	Blue Vervain
6% <i>Scirpus atrovirens</i>	Green Bulrush	5% <i>Heliopsis helianthoides</i>	Ox-Eye Sunflower
6% <i>Scirpus polyphyllus</i>	Many Leaved Bulrush	4% <i>Eupatorium perfoliatum</i>	Boneset
5% <i>Carex comosa</i>	Cosmos (Bristly) Sedge	4% <i>Glyceria grandis</i>	American Mannagrass
5% <i>Carex lurida</i>	Lurid (Shallow) Sedge	3% <i>Carex lurida</i>	Lurid/Shallow Sedge
5% <i>Glyceria striata</i>	Fowl Mannagrass	3% <i>Eupatorium maculatum</i>	Spotted Joe Pye Weed
5% <i>Juncus effusus</i>	Soft Rush	3% <i>Juncus effusus</i>	Soft Rush
3% <i>Sparganium americanum</i>	Eastern Lesser Bur Reed	3% <i>Scirpus polyphyllus</i>	Many Leaved Bulrush
2.5% <i>Asclepias incarnata</i>	Swamp Milkweed	2.5% <i>Carex scoparia</i>	Blunt Broom Grass
2.5% <i>Carex scoparia</i>	Blunt Broom Sedge	2% <i>Asclepias incarnata</i>	Swamp Milkweed
2% <i>Bidens frondosa</i>	Beggar Ticks	2% <i>Carex comosa</i>	Cosmos/Bristly Sedge
2% <i>Carex crinita</i>	Fringed (Nodding) sedge	2% <i>Carex lupulina</i>	Hop Sedge
2% <i>Carex stipata</i>	Awl Sedge	2% <i>Helenium autumnale</i>	Common Sneezeweed
2% <i>Iris versicolor</i>	Blue Flag	2% <i>Iris versicolor</i>	Blue Flag
2% <i>Mimulus ringens</i>	Square Stemmed Monkey Flower	2% <i>Vernonia agrestis</i>	Giant Ironweed
1% <i>Carex lupulina</i>	Hop Sedge	1% <i>Aster novae-angliae</i>	New England Aster
1% <i>Eupatorium fistulosum</i>	Joe Pye Weed	1% <i>Bromus altissima</i>	Wild Brome Grass
1% <i>Eupatorium perfoliatum</i>	Boneset	1% <i>Carex stipata</i>	Awl Sedge
1% <i>Scirpus acutus</i>	Hard Stemmed Bulrush	1% <i>Glyceria canadensis</i>	Rattlesnake Grass
1% <i>Scirpus validus</i>	Soft Stem Bulrush	1% <i>Glyceria striata</i>	Fowl Mannagrass
5% <i>Caltha palustris</i>	Marsh Marigold	1% <i>Juncus tenuis</i>	Path Rush
5% <i>Carex baileyi</i>	Bailey's Sedge	1% <i>Zizia aurea</i>	Golden Alexanders
5% <i>Carex tuckermanii</i>	Tuckerman's Sedge	5% <i>Aster umbellatus</i>	Flat Topped White Aster
5% <i>Helenium autumnale</i>	Common Sneezeweed	5% <i>Lilium superbum</i>	Turk's Cap Lilly
5% <i>Lilium superbum</i>	Turk's cap Lilly	5% <i>Mimulus ringens</i>	Square Stemmed Monkey Flower
5% <i>Penthorum sedoides</i>	Ditch Stonecrop	5% <i>Penthorum sedoides</i>	Ditch Stonecrop

WETLAND SEEDING (continued)

CONSTRUCTION

Installation

All areas disturbed by construction shall be seeded in accordance with the planting plans and schedules.

All areas to be seeded shall conform to the finished grades as specified on the plans and be free of all weeds, trash, debris, brush, clods, loose rocks and other foreign materials larger than 3 inches in diameter or length that would interfere with seeding. All gullies, washes or disturbed areas that develop subsequent to final dressing shall be repaired prior to seeding.

No seeding shall be performed on frozen ground or when the temperature is 32°F/0°C or lower.

Soil seed mixture between the dates of March 1 and May 31 or between the dates of August 15 and October 31. Apply ground agricultural limestone at a rate of 92 lbs. / 1000 sf. Immediately prior to seeding, supply 10 pounds of 38-0-0 ureaforn and 12 pounds of 10-20-20 or equivalent per 1000 sf.

If planting cannot be accomplished within the dates noted above, apply temporary seeding and mulch. Mulch as specified above. Lime and fertilizer requirements shall be as noted above.

Temporary seed mix shall be as follows: 100% Rye at 3.22 lbs per 1000 sf.

Site Preparation:

Areas that are to be seeded as directed by the planting plan AND have not been graded or otherwise had the soil exposed, will require some site preparation. A light disking or rototilling ONLY 1 inch deep is all that is needed.

Broadcast Method:

Broadcast by hand or by backpack seeder using the proper proportion seeding rate and seed proportion for area. To help proportion the seed, filler can be used such as: sawdust, kitty litter, or sand. Broadcast half the seed in direction (vertically) and the other half in the opposite direction (horizontally). To achieve good seed to soil contact this procedure is to be followed by rolling or tracking seed into top 1/4 inch of the soil.

Hydro-seeding Method:

In areas too wet to work use the hydro-seed. Apply seed with amount of hydro-mulch for good seed placement. To follow up use straw mulch or hydro-mulch to seed cover.

Seed with the following mixture of stabilization seed mixes:

ERNMX-122 - FACW Wetland Meadow Mix @ 1/2 lb per 1000 sf

ERNMX-131 - OBL Wetland Mix @ 1/2 lb per 1000 sf

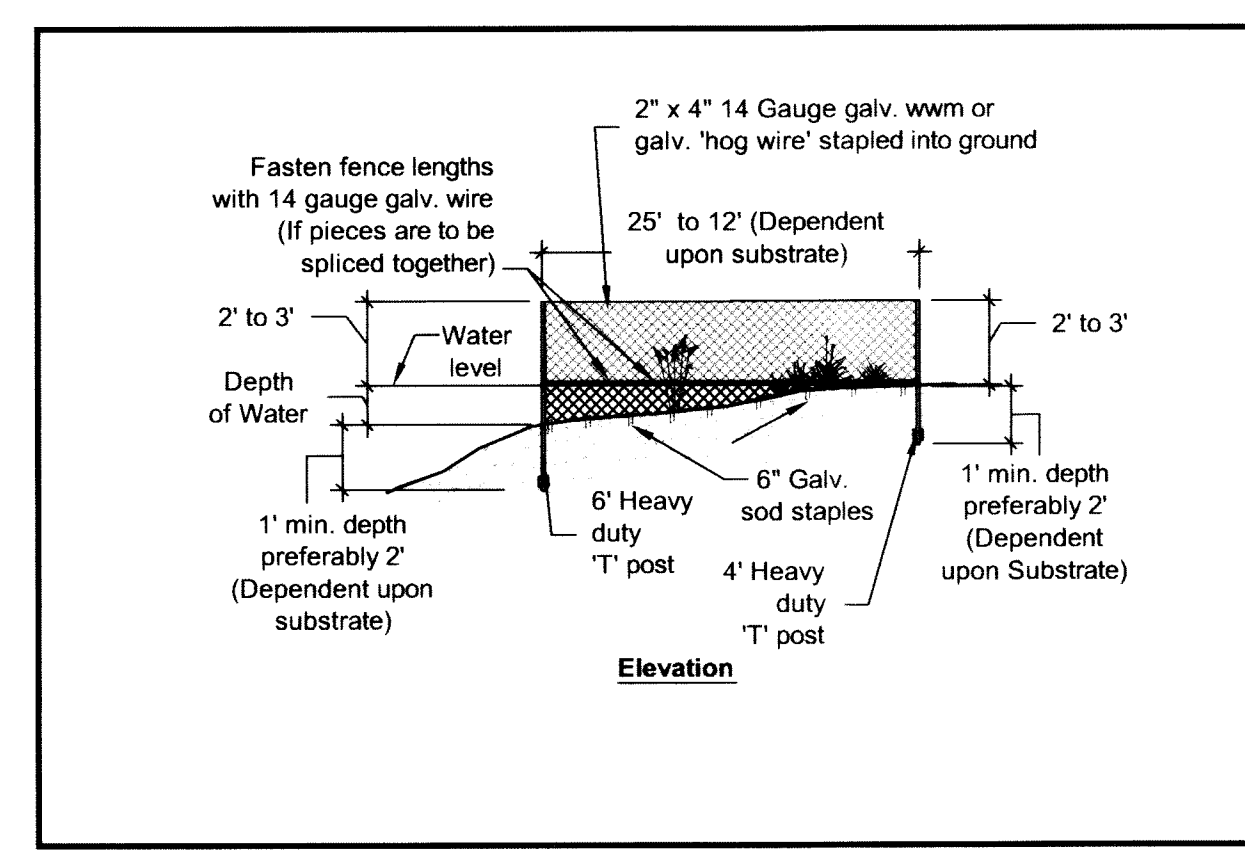
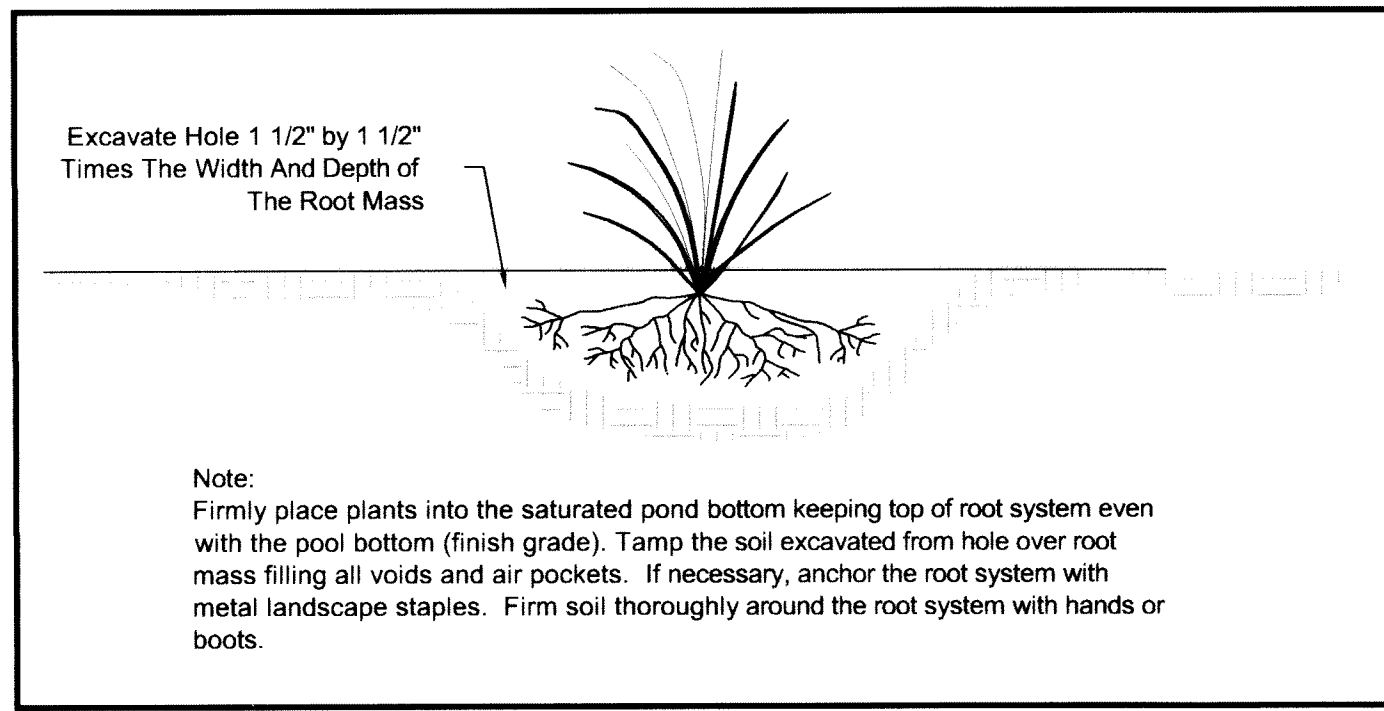
During the period of October 31 through February 28 the site should be protected by applying and anchoring straw mulch at the rate of two tons per acre, seeding should start as soon as possible in the spring.

Mulching: At the rate of two tons/acre apply unrotten small grain straw after seeding. Using a vegetable oil based tackifier at the rate of 100 pounds in 750 gallons of water per acre or an approved tackifier and anchor mulch immediately after application.

Seed shall be applied within the top 1/4 inch of the soil in two different directions. The Contractor shall maximize the seed/soil contact by firming soil around the seed with a cultipacker, other similar equipment, or by dragging the surface with chain link fence.

Immediately after seeding, the site shall be watered lightly but thoroughly so that the top 4 inches of soil is saturated.

The Contractor shall mulch and tack all seeded areas within 24 hours after seeding.



WETLAND SEEDING

DESCRIPTION

This work shall consist of furnishing and installing all seed for the areas specified to be seeded with wildflower meadow seed, wetland seed, or native woodland seed mixes and in accordance with the Maryland Seeding Association Specifications, 2005.

MATERIALS

Wetland seed mixes shall consist of: **See as-built report for seed mix tickets.**

ERNMX-122 - FACW Wetland Meadow Mix

ERNMX-131 - OBL Wetland Mix

Seed shall be certified that the Pure Live Seed (PLS) percentage is equal to or greater than that which is specified on the Plant Schedules. If the PLS is less than specified, the Contractor shall increase the seeding rate to compensate for the PLS difference at his/her own expense.

All seed and seed varieties shall be free from State and Federal prohibited noxious weed seeds and the following:

Annual bluegrass	Corn cockle	Spurred anode
Bermuda grass	Dodder	Wild garlic
Bindweed	Giant foxtail	Wild onion
Cocklebur	Horse nettle	

Mulch

- Bright, small grain type straw. Shall be free of rot and noxious weed seeds. Apply 1/2-3/4" thick layer or 60-80 bales/acre.
- Hydro mulch: Wood cellulose applied at a net dry weight of 750 pounds per acre. See LCA, Landscape Specification Guidelines, Seeding and Sodding specifications, Section 5.3 Mulching Materials, for detailed specifications.

Mulching and Stabilizing Materials:

All straw mulch shall be bound with a suitable binder or straw shall be rolled thoroughly with a crimping roller in several directions to prevent erosion of the soil and/or mulch. See LCA, Landscape Specification Guidelines, Seed and Sod specifications, Section 5.3 Stabilizing Materials, for detailed specifications.

Water

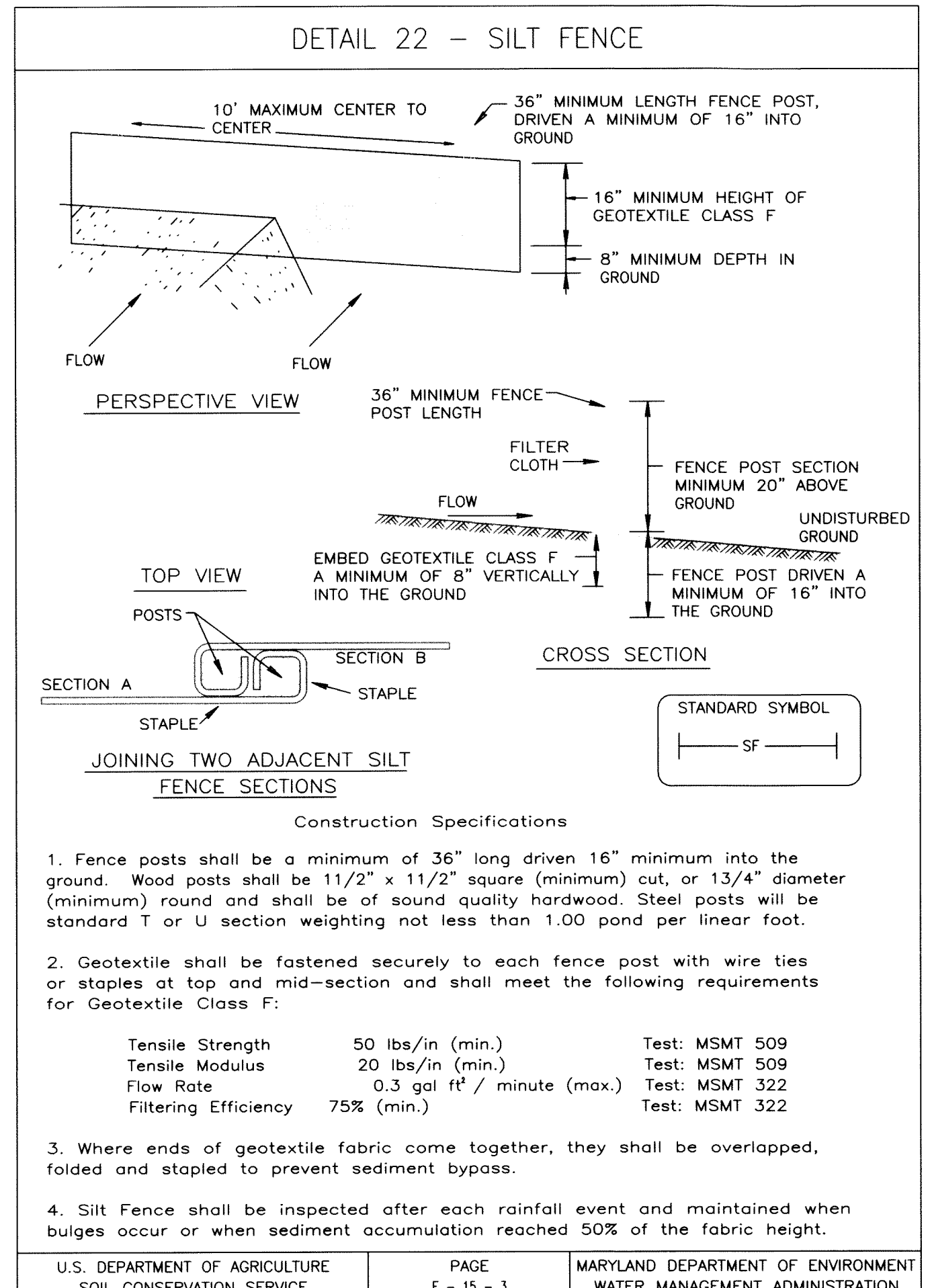
Water used in the establishment or caring of plants and seed shall be free from any substance that is injurious to plant life.

Fertilizer and Limestone

See Installation below.

HOWARD COUNTY DPW - ENVIRONMENTAL SERVICES 6751 COLUMBIA GATEWAY DRIVE, #514 COLUMBIA, MD 21046 PHONE: (410) 313-6413 ATTN: MARK RICHMOND	OWNER HOWARD COUNTY, MD BOARD OF EDUCATION PARCEL 100; PLAT 14822 ELECTION DISTRICT 15 MAP 29	BOARD OF EDUCATION STORM WATER QUALITY ENHANCEMENT Planting Plan As-built	DATE: 12.08						CPJ Associates CPJ Environmental Services Division STREAM RESTORATION - STORMWATER MANAGEMENT - INSPECTION 910 CLOPPER ROAD SUITE 215N GAITHERSBURG MARYLAND 20878 Phone: (301) 208-9575 E-mail: env@cpj.com Fax: (301) 926-4551 SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA	SCALE As Shown
			DESIGNED: TCS/HT							SHEET 5-2 OF 6 SHEETS
			DRAFTED: HFW/CW						JOB NO. 36-512	
			CHECKED: FES/DO							
			BASE DATA: JA Rice Inc.	NO.		REVISIONS	BY	DATE		

Project: Fig. 11, 2006-11-06, 11:48:00 AM, owner: HOWARD COUNTY DPW, 6751 Columbia Gateway Drive, Columbia, MD 21046
 Drawing Base: As-built.dwg
 Submitted: 2006-11-06, 11:48:00 AM
 Waterfowl fence-goose.dwg



1 **SILT FENCE**
Not to scale

Enkamat 7020

I. Materials

- i. Turf Reinforcement Mat.
 - a. The TRM shall be Enkamat 7020 manufactured for the purpose of permanent channel lining and turf reinforcement. The TRM shall be made from 100% synthetic material and contain no biodegradable or photodegradable components or materials.
 - b. The TRM shall be a three-dimensional matrix and maintain the three dimensional stability without laminated or stitched layers. The TRM shall have a sufficient Area Holding Capacity and a minimum 90% open space available for soil and root. The TRM shall not lose its structural integrity and shall not unravel or separate when TRM is cut in the field.
 - c. The TRM shall exhibit no buoyancy factor (i.e., the specific gravity of the fibers used should be greater than 1.0) so as to allow the TRM to maintain intimate contact with the soil (particularly between fasteners) under low flow conditions.
 - d. The TRM shall meet the requirements of Table 1.

Table 1 - Permanent turf reinforcement mat

Property	Test Method	Units	Value
Mass/Unit Area	ASTM D 5261	oz/sq yd	12.0
Thickness	ASTM D 5199	inches	0.7
Tensile Strength (MD)	ASTM D 5035 mod	lb/ft	240.0
Area Holding Capacity	Calculated	cu.in/sq.yd	850
Porosity	Calculated	%	95
UV Stability	ASTM D 1682 mod	%	80
Velocity	Flume Testing	ft/sec	
30 min. Vegetated			19.0
50 hr. Vegetated			14.0
Shear	Flume Testing	ft/sec	
30 min. Vegetated			10.0
50 hr. Vegetated			8.0

II. Accessories

- i. Anchoring Devices
 - a. The TRM shall be secured in place using heavy-duty metal staples. The metal staples shall be U-shaped, a minimum of 6 inch long (each leg), one and one half (1-1/2) inches wide, and shall be fabricated from 9 gauge diameter metal wire. If difficulties arise installing the staples, then 10 inch pins fabricated from 9 gauge with one and one half (1-1/2) inch diameter washer or 7 inch gutter spike with one and one half (1-1/2) inch diameter washer shall be used. In some cases where loose soil conditions exists and anchors of stated length do not properly secure the TRM to the ground, then longer staple should be used such as a 8-12 inch long staples or pins.

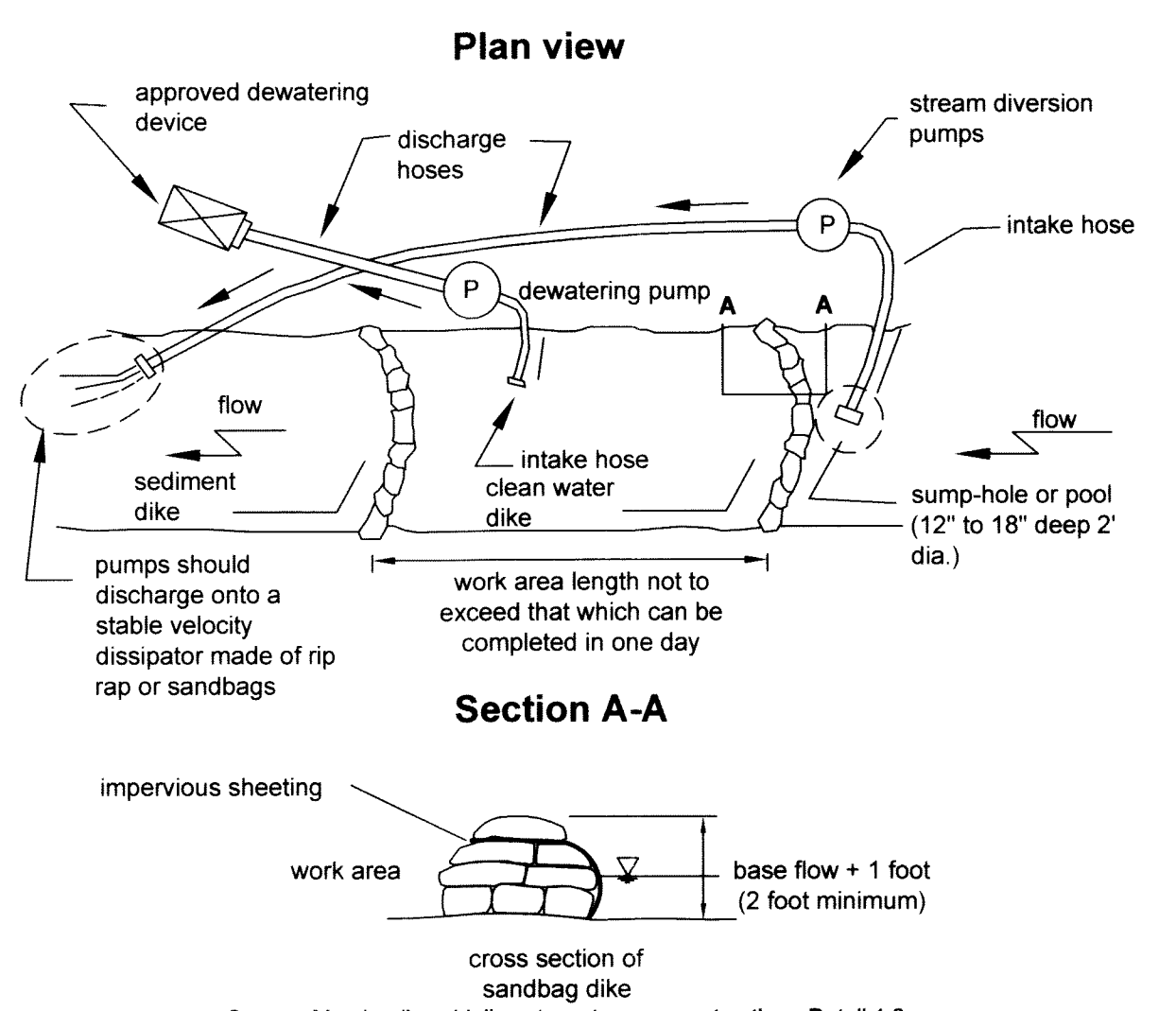
Sediment Control Notes

- A minimum of 48 hours notice must be given to the Howard County Department of Inspections and Permits prior to the start of any construction (410-313-1855).
 - All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the Maryland Standards and Specifications for Soil and Erosion Control, revisions thereto.
 - Following initial soil disturbance or redistribution, permanent or temporary stabilization shall be completed within: (a) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1, (b) 14 days as to other disturbed or graded areas on the project site.
 - All sediment traps/ basins shown must be fenced and warning signs posted around the perimeter in accordance with Vol. 1, Chapter 12, of the Howard County Design Manual, storm drainage.
 - All disturbed areas must be stabilized within the time period specified above in accordance with the 1991 Maryland Standards and Specifications for Soil and Erosion Control for permanent seedings (Sec. 51), sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52). Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
 - All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.
 - Site Analysis :**
 - Total area of site: **28.7 acres**
 - Area disturbed: **0.11 acres**
 - Area that is roofed or paved: **0.0 acres**
 - Area to be vegetatively stabilized: **0.05 acres**
 - Drainage area: **15.17 acres**
 - Total cut: **163.0 cu. Yds.**
 - Total fill: **13.0 cu. Yds.**
 - Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
 - Additional sediment controls must be provided if deemed necessary by the Howard County Sediment Control Inspector.
 - On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.
 - Trenches for the construction of utilities is limited to three pipe lengths or that which can be backfilled and stabilized within one working day, whichever is shorter.
 - Site grading will begin only after all perimeter sediment control measures have been installed and are in a functioning condition.
 - Sediment will be removed from traps when its depth reaches clean out elevation shown on plans.
 - Cut and fill quantities provided under site analysis do not represent bid quantities. These quantities do not distinguish between topsoil, structural fill or embankment material, nor do they reflect consideration of undercutting or removal of unsuitable material. The contractor shall familiarize himself/herself with site conditions which may affect the work.
- Standard and Specifications For Topsoil**
Definition: Placement of topsoil over prepared subsoil prior to establishment of permanent vegetation.
Purpose: To provide a suitable soil medium for vegetation growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
Condition where practice applies:
- This practice is limited to areas having 2:1 or flatter slopes where:
 - The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth
 - The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
 - The original soil to be vegetated contains material toxic to plant growth.
 - The soil is so acidic that treatment with limestone is not feasible.
 - For the purpose of these Standard and Specifications, areas having slopes steeper than 2:1 require special consideration and design for adequate stabilization. Areas having slopes steeper than 2:1 shall have the appropriate stabilization shown on the plans.

Construction and Material Specification

- Topsoil salvaged from the existing site may be used provided that it meets the standard as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the soil survey published by USDA-SCS in cooperation with Maryland Agricultural Experimentation Station.
 - Topsoil Specifications - Soil to be used as topsoil must meet the following:
 - Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, and loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5 % by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1/2" in diameter.
 - Topsoil must be free of plants or plant parts such as Bermuda grass, quackgrass, Johnson grass, nutsedge, poison ivy, thistle, or other as specified.
 - Where subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operation as described in the following procedures.
 - For site having disturbed areas under 5 acres:
 - Place topsoil (if required) and apply soil amendments as specified in 20.0 vegetation Stabilization - b Section I - Vegetation Stabilization Method and Materials.
 - For site having disturbed areas over 5 acres:
 - On soil meeting Topsoil Specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
 - pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
 - Organic content of topsoil shall be not less than 1.5 percent by weight.
 - Topsoil having soluble salt content greater than 500 parts per million shall not be used.
 - No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
- * Note: Topsoil substitutes to amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriated approval authority may be used in lieu of natural topsoil.

- When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade Stabilization Structures, Earth Dikes, Slope Silt Fence and sediment Traps and Basins.
 - Grade on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4"-8" higher in elevation.
 - Topsoil shall be uniformly distributed in a 4" - 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
 - Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.
 - Alternative for Permanent Seeding - instead of applying the full amounts of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below.
 - Composted Sludge Material for used as a soil conditioner for sites having areas over 5 acres shall be tested to prescribe amendments and for site having disturbed areas under 5 acres shall conform to the following requirements:
 - Composted sludge shall be supplied by, or originate from, a person or persons that are permitted (at the time of acquisition of the compost) by the Maryland Department of the Environment under COMAR 26.04.06.
 - Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a pH of 7.0 to 8.0.
 If composted does not meet these requirements, the appropriated constituents must be added to meet the requirement prior to use.
 - Composted sludge shall be applied at a rate of 1 ton/1,000 square feet.
 - Composted sludge shall be amended with a potassium fertilizer applied at the rate of 4 lb/1,000 square feet and 1/3 the normal lime application rate.
- * Reference: Guideline Specifications, Soil Preparation and Sodding, MD - VA, Pub. #1, Cooperative Extension Service, University of Maryland and Virginia Polytechnic Institutes, Revised 1973.



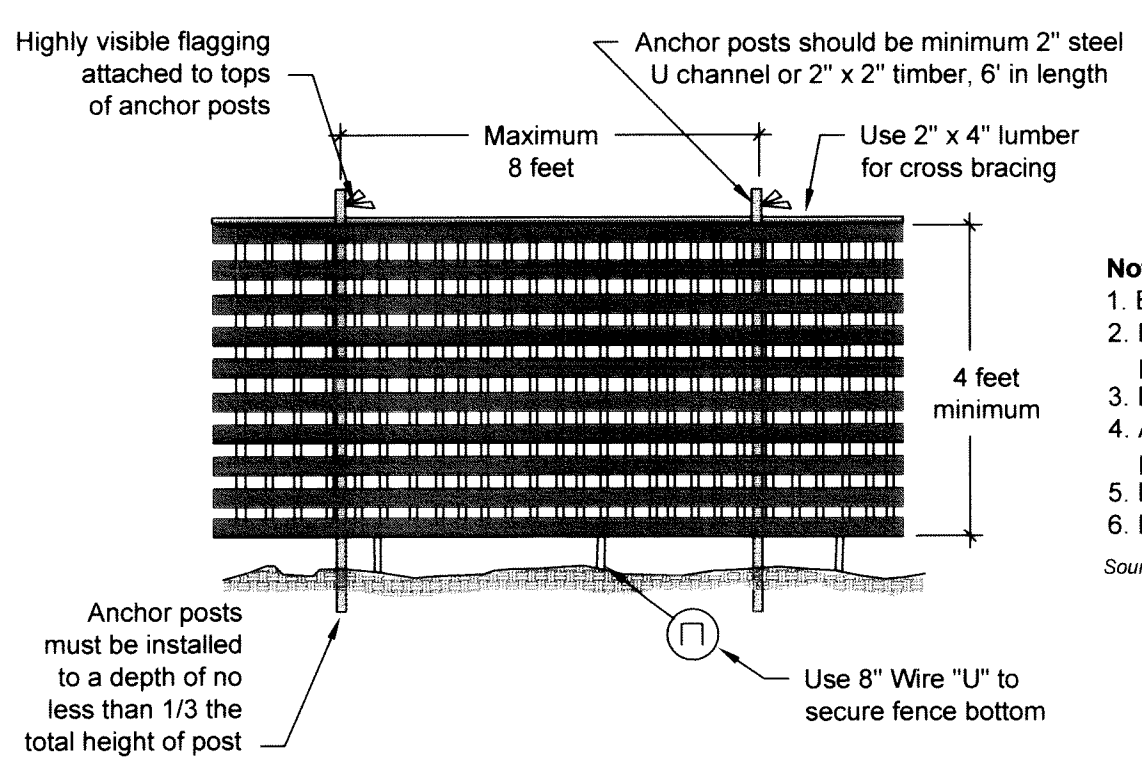
4 **PUMP AROUND**
Not to scale

Pump-Around Practice
Temporary measure for dewatering pond construction sites.

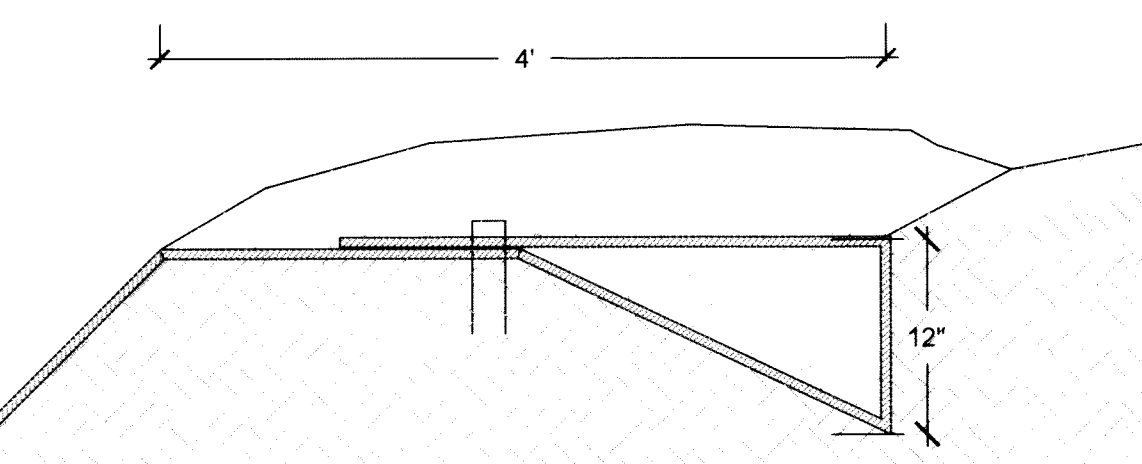
Description
The work should consist of installing a temporary pump around and supporting measures to divert flow around pond dredge construction sites.

Implementation Sequence
Sediment control measures, pump-around practices, and associated dredge construction should be completed in the following sequence (refer to detail).

- Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or rights-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the county's or utility company's satisfaction.
- The contractor should notify the Howard County Construction Inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
- The contractor should conduct a pre-construction meeting on site with the Construction Inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limits of disturbance which will be removed for construction access. Trees should not be removed within the limits of disturbance without approval from the local authority.
- Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the Construction Inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
- Upon installation of all sediment control measures and approval by the Construction Inspector, the contractor should begin work with the establishment of stabilized construction entrances. The sequence of construction must be followed unless the contractor gets written approval for deviations from the local authority. The contractor should only begin work in an area which can be completed by the end of the day. At the end of each work day, the work area must be stabilized and the pump around removed. Work should not be conducted in the pond during rain events.
- Sandbag dikes should be situated at the ends of the work area as shown on the plans, and pond water should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of riprap or sandbags.
- Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains downstream of the pond.
- After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike will be established from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.
- A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.



2 **PEDESTRIAN FENCE**
Not to scale



3 **(ECM) FIBER MATTING KEY-IN**
Not to scale

HOWARD COUNTY DPW - ENVIRONMENTAL SERVICES
6751 COLUMBIA GATEWAY DRIVE, #514
COLUMBIA, MD 21046
PHONE: (410) 313-6413
ATTN: MARK RICHMOND

OWNER
HOWARD COUNTY, MD
BOARD OF EDUCATION
PARCEL 100; PLAT 14822
ELECTION DISTRICT 15
MAP 29

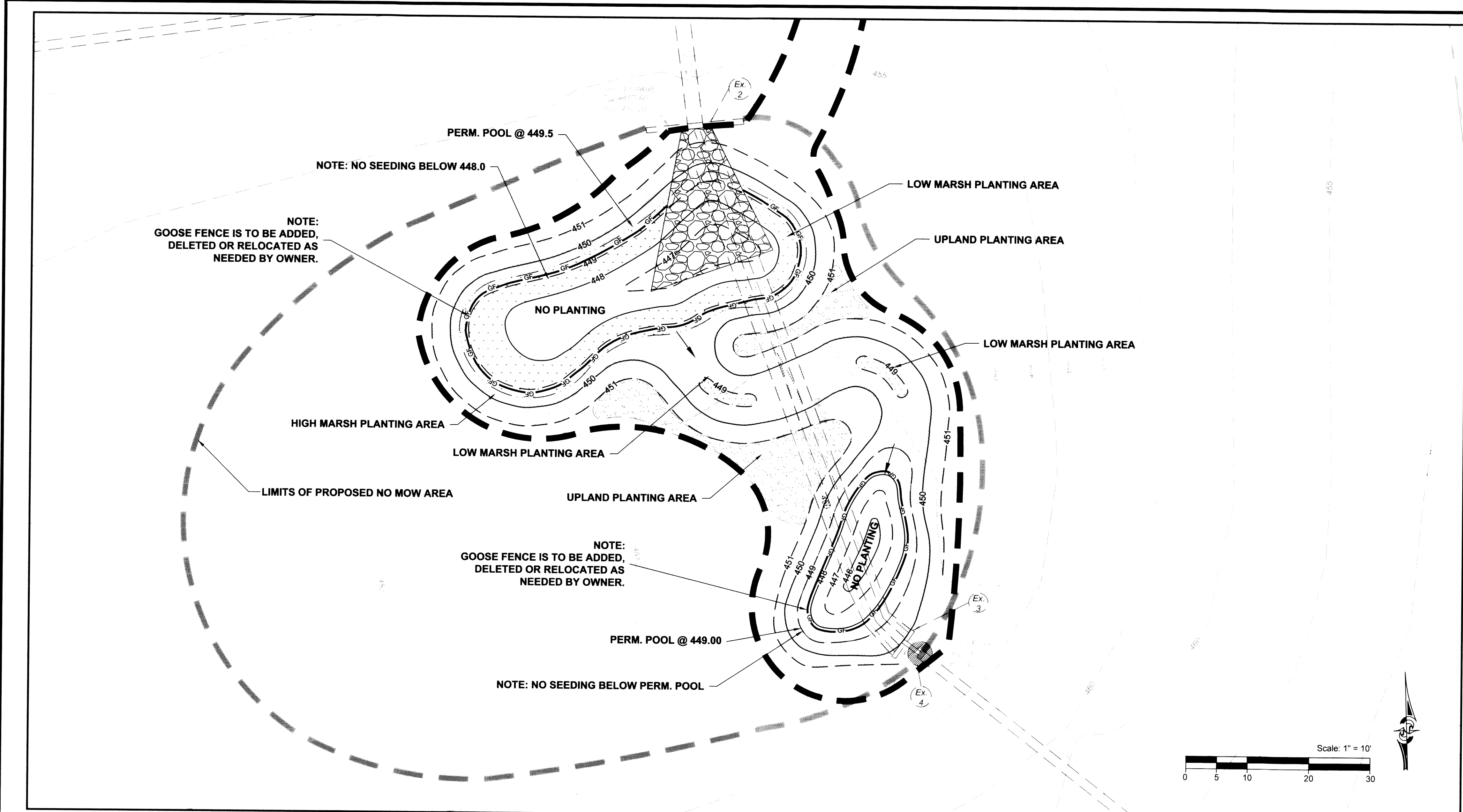
BOARD OF EDUCATION
STORM WATER QUALITY ENHANCEMENT
Sediment Control Notes and Details

DATE:	12/07				
DESIGNED:	TCS/HT				
DRAFTED:	HT				
CHECKED:	TCS				
BASE DATA:	JA Rice Inc.	NO	REVISIONS	BY	DATE

CPJ Associates
CPJ Environmental Services Division
STREAM RESTORATION - STORMWATER MANAGEMENT INSPECTION
910 CLOPPER ROAD SUITE 215N GAITHERSBURG MARYLAND 20878
Phone:(301)208-9573 E-mail:env@cpja.com Fax:(301)926-4551
SILVER SPRING, MD. FREDERICK, MD. FAIRFAX, VA

SCALE
As Shown
SHEET
4
OF 6 SHEETS
JOB NO.
36-512

Printed: Feb 13, 2008 - 12:27pm User: cwhilton
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PLANTING SCHEDULE

Symbol	Zone	Area (s.f.)	Common Name	Scientific Name	Quantity	Size	Spacing
[Symbol]	High Marsh	1740	ERNMX-122	na	-	-	-
[Symbol]	Low Marsh	590	ERNMX-131	na	-	-	-
[Symbol]	Upland/Riparian	380	Blue Switch Grass	<i>Panicum Virgatum</i>	20	2 gal.	3' o.c.
			Karl Foerster Feather Reed Grass	<i>Calamagrostis x acutiflora</i> 'Karl Foerster'	20	2 gal.	3' o.c.

LOW MARSH SEEDING: OBL WETLAND MIX: ERNMX-131 SEED AT 15 LBS PER ACRE OR 1/3 LB. TO 1/2 LB. PER 1000 SQ. FT.		HIGH MARSH SEEDING: FACW WETLAND MEADOW MIX ERNMX-122 SEED AT 15 LBS PER ACRE OR 1/3 LB. TO 1/2 LB. PER 1000 SQ. FT.	
20% <i>Carex vulpinoidea</i>	Fox Sedge	20% <i>Elymus virginicus</i>	Virginia Wild Rye
9% <i>Sparganium eurycarpum</i>	Giant Bur Reed	19% <i>Carex vulpinoidea</i>	Fox Sedge
7% <i>Verbena hastata</i>	Blue Vervain	7% <i>Scirpus atrovirens</i>	Green Bulrush
6% <i>Glyceria canadensis</i>	Rattlesnake Grass	5% <i>Verbena hastata</i>	Blue Vervain
6% <i>Scirpus atrovirens</i>	Green Bulrush	5% <i>Helipopsis helianthoides</i>	Ox-Eye Sunflower
6% <i>Scirpus polyphyllus</i>	Many Leaved Bulrush	4% <i>Eupatorium perfoliatum</i>	Boneset
5% <i>Carex comosa</i>	Cosmos (Bristly) Sedge	4% <i>Glyceria grandis</i>	American Mannagrass
5% <i>Carex lurida</i>	Lurid (Shallow) Sedge	3% <i>Carex lurida</i>	Lurid/Shallow Sedge
5% <i>Glyceria striata</i>	Fowl Mannagrass	3% <i>Eupatorium maculatum</i>	Spotted Joe Pye Weed
5% <i>Juncus effusus</i>	Soft Rush	3% <i>Juncus effusus</i>	Soft Rush
3% <i>Sparganium americanum</i>	Eastern Lesser Bur Reed	3% <i>Scirpus polyphyllus</i>	Many Leaved Bulrush
2.5% <i>Asclepias incarnata</i>	Swamp Milkweed	2.5% <i>Carex scoparia</i>	Swamp Milkweed
2.5% <i>Carex scoparia</i>	Blunt Broom Sedge	2% <i>Asclepias incarnata</i>	Swamp Milkweed
2% <i>Bidens frondosa</i>	Beggar Ticks	2% <i>Carex comosa</i>	Cosmos/Bristly Sedge
2% <i>Carex crinita</i>	Fringed (Nodding) sedge	2% <i>Carex lupulina</i>	Hop Sedge
2% <i>Carex stipata</i>	Awl Sedge	2% <i>Helenium autumnale</i>	Common Sneezeweed
2% <i>Iris versicolor</i>	Blue Flag	2% <i>Iris versicolor</i>	Blue Flag
2% <i>Mimulus ringens</i>	Square Stemmed Monkey Flower	2% <i>Vernonia gigantea</i>	Giant Ironweed
1% <i>Carex lupulina</i>	Hop Sedge	1% <i>Aster novae-angliae</i>	New England Aster
1% <i>Eupatorium fistulosum</i>	Joe Pye Weed	1% <i>Bromus allisima</i>	Wild Brome Grass
1% <i>Eupatorium perfoliatum</i>	Boneset	1% <i>Carex stipata</i>	Awl Sedge
1% <i>Scirpus acutus</i>	Hard Stemmed Bulrush	1% <i>Glyceria canadensis</i>	Rattlesnake Grass
1% <i>Scirpus validus</i>	Soft Stem Bulrush	1% <i>Glyceria striata</i>	Fowl Mannagrass
5% <i>Caltha palustris</i>	Marsh Marigold	1% <i>Juncus tenuis</i>	Path Rush
5% <i>Carex baileyi</i>	Bailey's Sedge	1% <i>Zizia aurea</i>	Golden Alexanders
5% <i>Carex tuckermanni</i>	Tuckerman's Sedge	5% <i>Aster umbellatus</i>	Flat Topped White Aster
5% <i>Helenium autumnale</i>	Common Sneezeweed	5% <i>Lilium superbum</i>	Turk's Cap Lily
5% <i>Lilium superbum</i>	Turk's cap Lily	5% <i>Mimulus ringens</i>	Square Stemmed Monkey Flower
5% <i>Penthorum sedoides</i>	Ditch Stoncrop	5% <i>Penthorum sedoides</i>	Ditch Stoncrop

WETLAND SEEDING (continued)

CONSTRUCTION

Installation

All areas disturbed by construction shall be seeded in accordance with the planting plans and schedules.

All areas to be seeded shall conform to the finished grades as specified on the plans and be free of all weeds, trash, debris, brush, clods, loose rocks and other foreign materials larger than 3 inches in diameter or length that would interfere with seeding. All gullies, washes or disturbed areas that develop subsequent to final dressing shall be repaired prior to seeding.

No seeding shall be performed on frozen ground or when the temperature is 32°F/0°C or lower.

Sow seed mixture between the dates of March 1 and May 31 or between the dates of August 15 and October 31. Apply ground agricultural limestone at a rate of 92 lbs / 1000 sf. Immediately prior to seeding, supply 10 pounds of 38-0-0 ureaform and 12 pounds of 10-20-20 or equivalent per 1000 sf.

If planting cannot be accomplished within the dates noted above, apply temporary seeding and mulch. Mulch as specified above. Lime and fertilizer requirements shall be as noted above.

Temporary seed mix shall be as follows: 100% Rye at 3.22 lbs per 1000 sf.

Site Preparation:

Areas that are to be seeded as directed by the planting plan AND have not been graded or otherwise had the soil exposed, will require some site preparation. A light disking or rototilling ONLY, 1 inch deep is all that is needed.

Broadcast Method:

Broadcast by hand or by backpack seeder using the proper proportion seeding rate and seed proportion for area. To help proportion the seed, filler can be used such as: sawdust, kity litter, or sand. Broadcast half the seed in direction (vertically) and the other half in the opposite direction (horizontally). To achieve good seed to soil contact this procedure is to be followed by rolling or tracking seed into top 1/4 inch of the soil.

Hydro-seeding Method:

In areas too wet to work use the hydro-seed. Apply seed with amount of hydro-mulch for good seed placement. To follow up use straw mulch or hydro-mulch to seed cover.

Seed with the following mixture of stabilization seed mixes:

ERNMX-122 - FACW Wetland Meadow Mix @ 1/2 lb per 1000 sf

ERNMX-131 - OBL Wetland Mix: @ 1/2 lb per 1000 sf

During the period of October 31 through February 28 the site should be protected by applying and anchoring straw mulch at the rate of two tons per acre, seeding should start as soon as possible in the spring.

Mulching: At the rate of two tons/acre apply unrotten small grain straw after seeding. Using a vegetable oil based tackifier at the rate of 100 pounds in 750 gallons of water per acre or an approved tackifier and anchor mulch immediately after application.

Seed shall be applied within the top 1/4 inch of the soil in two different directions. The Contractor shall maximize the seed/soil contact by firming soil around the seed with a cultipacker, other similar equipment, or by dragging the surface with chain link fence.

Immediately after seeding, the site shall be watered lightly but thoroughly so that the top 4 inches of soil is saturated.

The Contractor shall mulch and tack all seeded areas within 24 hours after seeding.

WETLAND SEEDING

DESCRIPTION

This work shall consist of furnishing and installing all seed for the areas specified to be seeded with wildflower meadow seed, wetland seed, or native woodland seed mixes and in accordance with the Maryland Seeding Association Specifications, 2005.

MATERIALS

Wetland seed mixes shall consist of:

ERNMX-122 - FACW Wetland Meadow Mix

ERNMX-131 - OBL Wetland Mix:

Seed shall be certified that the Pure Live Seed (PLS) percentage is equal to or greater than that which is specified on the Plant Schedules. If the PLS is less than specified, the Contractor shall increase the seeding rate to compensate for the PLS difference at his/her own expense.

All seed and seed varieties shall be free from State and Federal prohibited noxious weed seeds and the following:

Annual bluegrass	Corn cockle	Spurred anode
Bermuda grass	Dodder	Wild garlic
Bindweed	Giant foxtail	Wild onion
Cocklebur	Horse nettle	

Mulch

- Bright, small grain type straw. Shall be free of rot and noxious weed seeds. Apply 1/2"-3/4" thick layer or 60-80 bales/acre.
- Hydro mulch: Wood cellulose applied at a net dry weight of 750 pounds per acre. See LCA, Landscape Specification Guidelines, Seeding and Sodding specifications, Section 5.3 Mulching Materials, for detailed specifications.

Mulching and Stabilizing Materials:

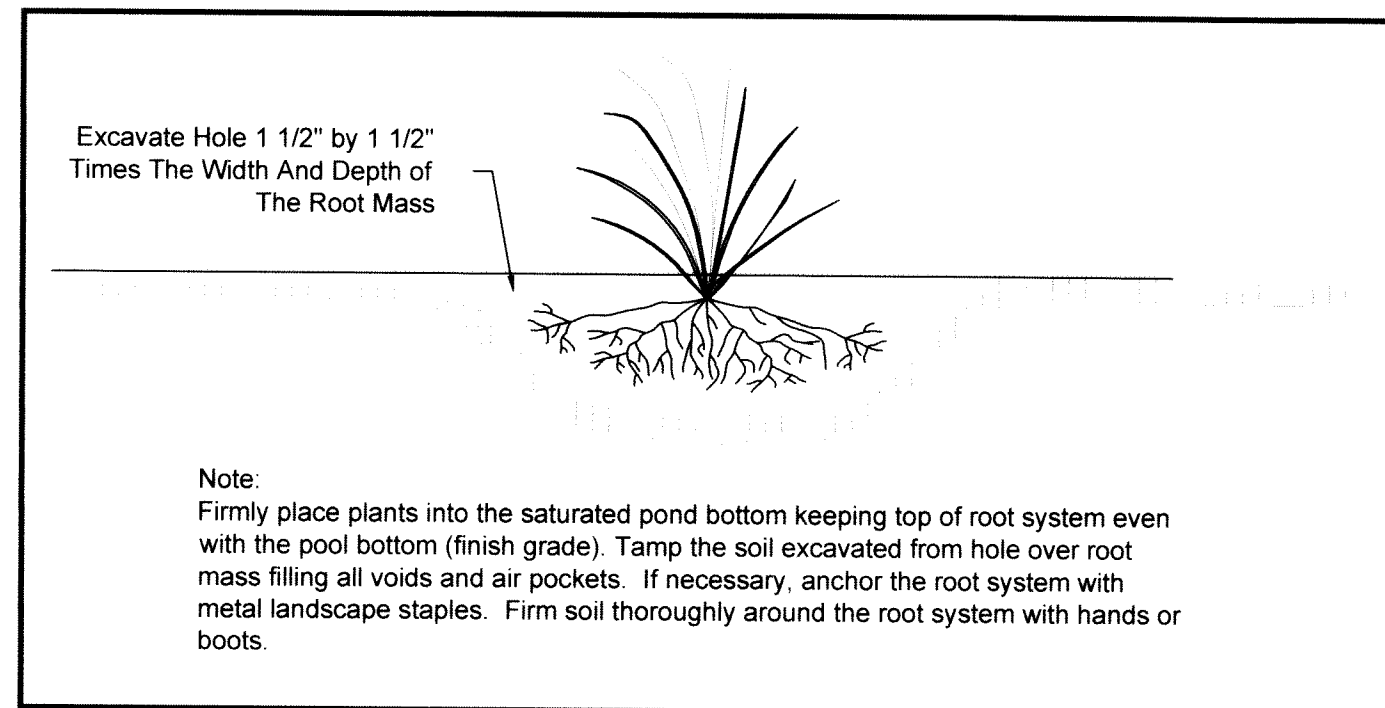
All straw mulch shall be bound with a suitable binder or straw shall be rolled thoroughly with a crimping roller in several directions to prevent erosion of the soil and/or mulch. See LCA, Landscape Specification Guidelines, Seed and Sod specifications, Section 5.3 Stabilizing Materials, for detailed specifications.

Water

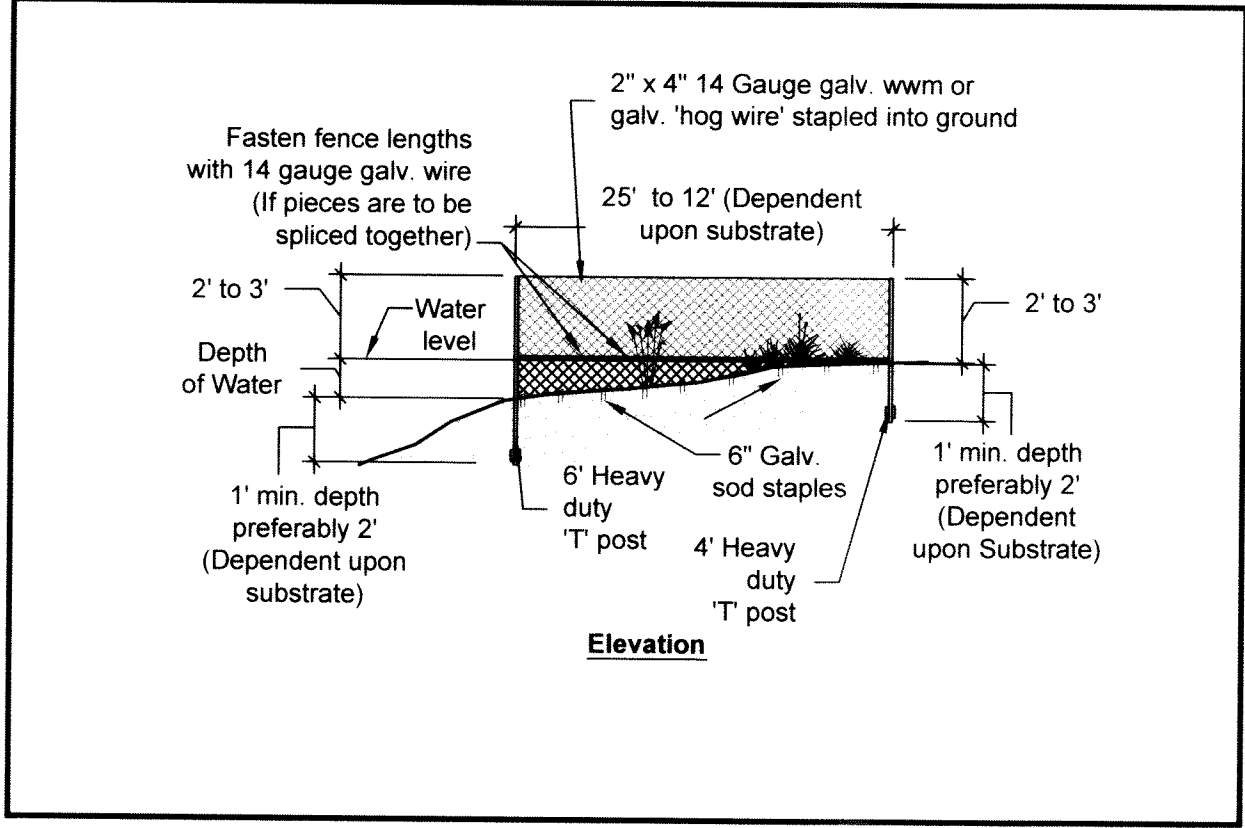
Water used in the establishment or caring of plants and seed shall be free from any substance that is injurious to plant life.

Fertilizer and Limestone

See Installation below.



1 SUBMERGED-PLANTING DETAIL
Not to Scale



2 GOOSE FENCING DETAIL
Not to Scale

HOWARD COUNTY DPW - ENVIRONMENTAL SERVICES
6751 COLUMBIA GATEWAY DRIVE, #514
COLUMBIA, MD 21046
PHONE: (410) 313-6413
ATTN: MARK RICHMOND

OWNER
HOWARD COUNTY, MD
BOARD OF EDUCATION
PARCEL 100; PLAT 14822
ELECTION DISTRICT 15
MAP 29

BOARD OF EDUCATION
STORM WATER QUALITY ENHANCEMENT
Planting Plan

DATE:	12/07				
DESIGNED:	TCS/HT				
DRAFTED:	HT				
CHECKED:	TCS				
BASE DATA:	JA Rice Inc.	NO.	REVISIONS	BY	DATE

CPJ Associates
CPJ Environmental Services Division
STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
910 CLOPPER ROAD SUITE 215N GATHERSBURG MARYLAND 20878
Phone: (301) 208-9573 E-mail: env@cpj.com Fax: (301) 926-4551
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE
As Shown

SHEET
5
OF 6 SHEETS

JOB NO.
36-512

Plotted: 12/12/07 10:00 AM
Plotfile: 12/12/07 10:00 AM
Printer: HP DesignJet 2400
Waterflow: 12/12/07 10:00 AM

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 per Howard County Public Schools System Grounds Dept. Spec. Sect.#02490)

- i) Lime shall be agricultural grade lime material (ground limestone, hydrated or burnt lime) which contains total carbonates of 85% with a minimum of 30% magnesium carbonate and which contains at least 50% total oxides (calcium oxide plus magnesium oxide). Limestone shall be ground so that not less than 50% passes a 100-mesh sieve and 90-100% passes a 20-mesh sieve.
- ii) Lawn fertilizer. Complete fertilizer of neutral character and uniform composition that is suitable for applications with approved equipment. Lawn fertilizer shall be the only used after seeding operations

- a. Fertilizer shall contain some elements derived from organic sources and provide nitrogen in a form that will be available to the lawn during its initial period of growth.
- b. Fertilizer shall be delivered to the site fully labeled according to applicable state fertilizer laws and shall bear the name, trade name or trademark and warranty or the producer.
- c. Fertilizer shall, at a minimum contain the following percentages of available plant nutrients: 18% N, 24% P, 12% K, 50% SCU applied at a rate of 1 lb. Per 1,000 square feet lawn area.

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 *sericea 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; P2O5 (phosphorous): 200 lbs/ac; K2O (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 anyone 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 cultipacking.
 - b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.

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) (per Howard County Public School Spec. Sect.#02490) Mulch shall be threshed barley, wheat or oat straw. It shall be clean and free of noxious weeds, weed seeds, and other foreign materials. Mulch all seeded areas as follows.

- a. Mulch shall be applied at a rate of 2,000 pounds per acre in a uniform manner. The material shall be anchored immediately after application.

- 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.

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 roll 4' to 15' wide and 300 to 3,000 feet long.

SECTION II -TEMPORARY SEEDING

Temporary Seed Mixtures (For Hardiness Zone 6b) (From Table 26, MDE 1994)					Fertilizer Rate (10-10-10)	Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depth		
2	Rye plus Foxtail Millet	150	3/1-11/15	1 in.	600 lb/ac (15 lb/1000sq)	2 tons/ac (100 lb/1000 sq)

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.

SECTION III: PERMANENT SEEDING (per Howard County Public School System Grounds Dept. Sect.#02490)

A. GENERAL

- i)Description
 - a. The extent of seeding work is as shown on drawings and as specified. Contractor shall produce a dense, well-established turf.
 - b. Furnish, install, and remove temporary seeding as shown and specified.
 - c. Seed all disturbed site areas.
 - d. Seeding notes appearing on Sediment Control drawings shall pertain only to temporary stabilization seeding and shall apply only to work covered on those drawings. Permanent seeding of all areas of the project to be seeded shall be performed in accordance with this specification.

ii) Job Conditions

- a. Seed shall be sown following construction as soon as the soil is dry enough to allow proper penetration of a seedbed. Extensions beyond these time periods may be granted by the Contract Manager, depending upon weather conditions for the period in question. Any planting outside of these seasons shall be solely at the Contractor's risk and shall not be subject to compensation until stabilization has been accomplished in accordance with these Specifications.
 - 1. No seeding shall be done in frozen ground or when the temperature is 32 °F or lower. (CPJ notes 1994 MDE Standards indicate ideal times of seeding for turfgrass establishment is March 1-May 15 and August 15-October 15 for Hardiness Zone 6b.)
 - 2. No seeding shall be done during windy weather or when ground is wet or otherwise untellable.
 - 3. Seed all areas within the project limits that are not paved or designated on the drawings to receive special treatment. Seed disturbed areas in the public right-of-way.
 - 4. Complete seeding of all playfields. Playfields shall be over seeded and refertilized in the spring, as directed by the Contract Manager. Contractor shall maintain, water, and mow all seeded areas until date of substantial completion.

iii) Workmanship

- a. During seeding, all areas shall be kept neat and clean, and precautions shall be taken to avoid damage to existing plants, turf, and structures.
- b. Upon completion, all debris and waste material resulting from seeding operations shall be removed from the project and the area cleaned up.
- c. Any areas damaged by the seeding contractor shall be restored to the original condition.

B. PRODUCTS

i)Materials

a. Grass Seeds

- 1. Seed lots must be state certified and blended under the supervision of the Maryland Department of Agriculture (MDA) Turf and Seed Section.
- 2. All seed and labeling must fully comply with the Maryland Seed Law and these Specifications.
- 3. Seed shall be packed 50 lbs. net weight and packed in new, clean, poly-woven bags, tightly woven to prevent leaking and contamination.
- 4. Each container shall have permanently affixed to it an accurate analysis tag and a certification tag.
- 5. All seed lots to be used in this mixture shall have been previously tested by the Maryland Seed Laboratory to insure compliance with Specification.
- 6. A quality control sample of the delivered mixture shall be submitted to the Maryland Seed Laboratory for testing prior to payment and any lots found not to comply with the Specification shall be returned at the Contractors expense.
- 7. The Contractor shall submit seed certification tags to Contractor Manager's representative prior to the beginning of any seed work.
- 8. Application rate: Grass seed mixture shall be applied at the rate of eight (8) pounds per 1,000 square feet immediately after fertilizing rake and/or air drag mat fertilizer is applied.

b. Seed Mixture:

- 1. The turfgrass seed mixture shall conform to the following requirements.
- 2. Improved varieties of each species are required. Acceptable varieties of 100% Tall Fescue mix is to contain any two (2) certified varieties from the latest issue of the University of Maryland Memo No. 77.
- 3. Seed mixtures must be free of all prohibited and restricted noxious weeds in accordance with the Maryland Seed Law.
- 4. Seed lots must be blended and certified as per the general certification specifications of the Maryland Department of Agriculture.
- 5. Seed filling must comply with the MARYLAND SEED AND REGULATIONS LAW.
- 6. All seed shall be certified with complete and accurate analysis tags attached to each container. The Contractor shall have all seed tags and submit them to the Contract Manager.

SECTION IV -SOD: TO PROVIDE QUICK COVER ON DISTURBED AREAS (2:1 GRADE OR FLATTER).

A. General specifications

- i) Class of turf grass 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.

SECTION V - FILTER CLOTH

CLASS	APPARENT OPENING SIZE MM. MAX	GRAB TENSILE STRENGTH LB. MIN	BURST STRENGTH P.S.I. MIN
A	0.30**	250	500
B	0.60	200	320
C	0.30	200	320
D	0.60	90	145
E	0.30	90	145
F	0.40-0.80*	90	180

USE CLASS "C"

*US Std Sieve CW - 02215 ** 0.50 mm. max. for Super Silt Fence

The properties shall be determined in accordance with the following procedures:

-Apparent opening size MSMT 323

-Grab tensile strength ASTM D 1682: 4x8" specimen, 1x2" clamps, 12"/min. strain rate in both principal directions of geotextile fabric.

-Burst strength ASTM D 3786

The fabric shall be inert to commonly encountered chemicals and hydrocarbons, and will be rot and mildew resistant. It shall be manufactured from fibers consisting of long chain synthetic polymers, and composed of a minimum of 85% by weight of polyolefins, polyesters, or polyamides. The geotextile fabric shall resist deterioration from ultraviolet exposure.

In addition, Classes A through E shall have a 0.01 cm./sec. minimum permeability when tested in accordance with MSMT 507, and an apparent minimum elongation of 20 percent (20%) when tested in accordance with the grab tensile strength requirements listed above.

SECTION VI - SILT FENCE MATERIALS:

Class F geotextile fabrics for silt fence shall have a 50 lb./in. minimum tensile strength and a 20 lb./in. minimum tensile modulus when tested in accordance with MSMT 509. The material shall also have a 0.3 gal./ft./min. flow rate and seventy-five percent (75%) minimum filtering efficiency when tested in accordance with MSMT 322.

Geotextile fabrics used in the construction of silt fence shall resist deterioration from ultraviolet exposure. The fabric shall contain sufficient amounts of ultraviolet ray inhibitors and stabilizers to provide a minimum of 12 months of expected usable construction life at a temperature of 0 to 120 degrees F.

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 PHONE: (410) 313-6413
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OWNER
 HOWARD COUNTY, MD
 BOARD OF EDUCATION
 PARCEL 100; PLAT 14822
 ELECTION DISTRICT 15
 MAP 29

BOARD OF EDUCATION
STORM WATER QUALITY ENHANCEMENT

Planting Notes

DATE:	12/07						
DESIGNED:	TCS/HT						
DRAFTED:	HT						
CHECKED:	TCS						
BASE DATA:	JA Rice Inc.	NO	REVISIONS	BY	DATE		


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SCALE As Shown
SHEET 6 OF 6 SHEETS
JOB NO. 36-512