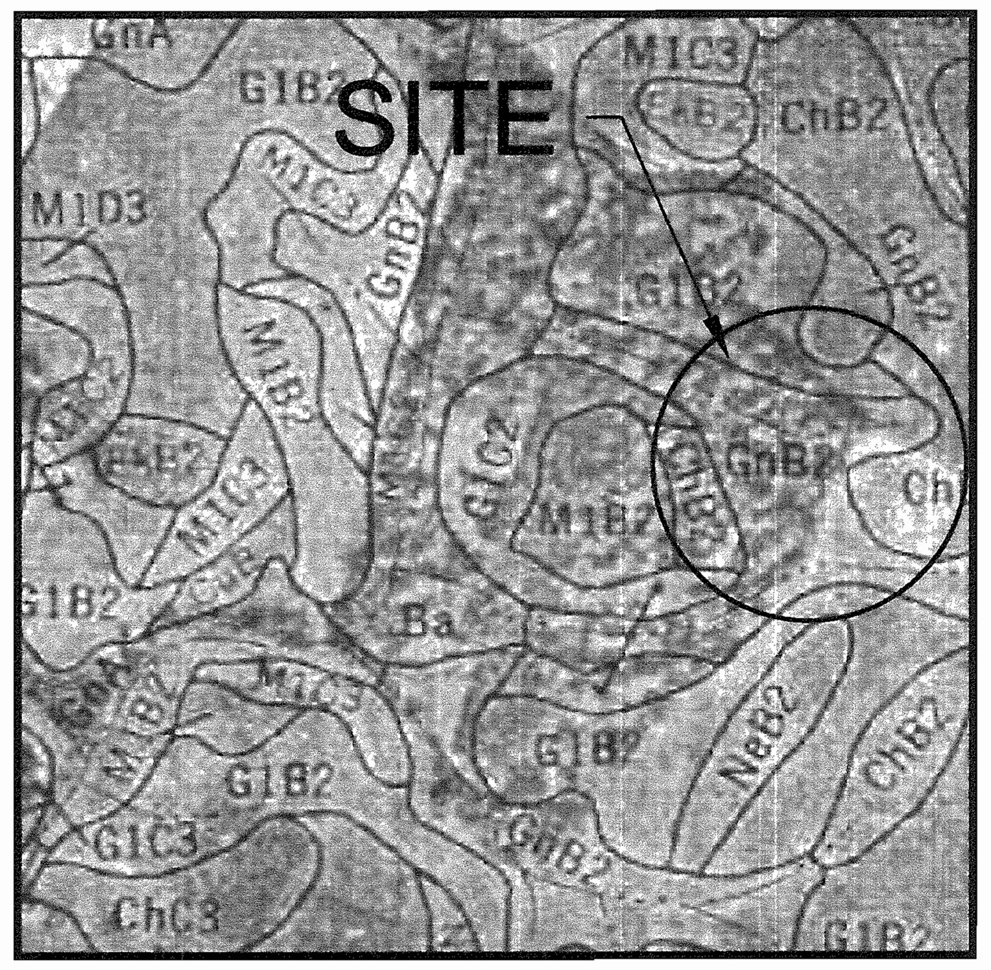
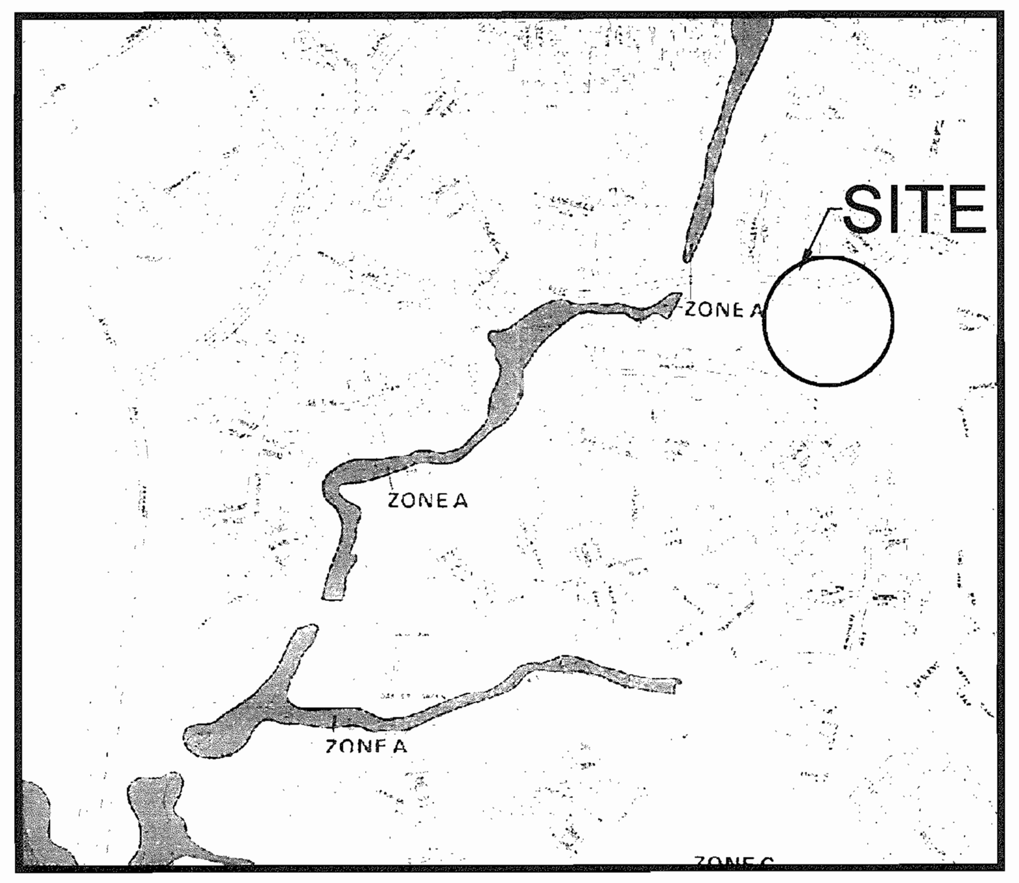
FAREWELL ROAD STREAM STABILIZATION



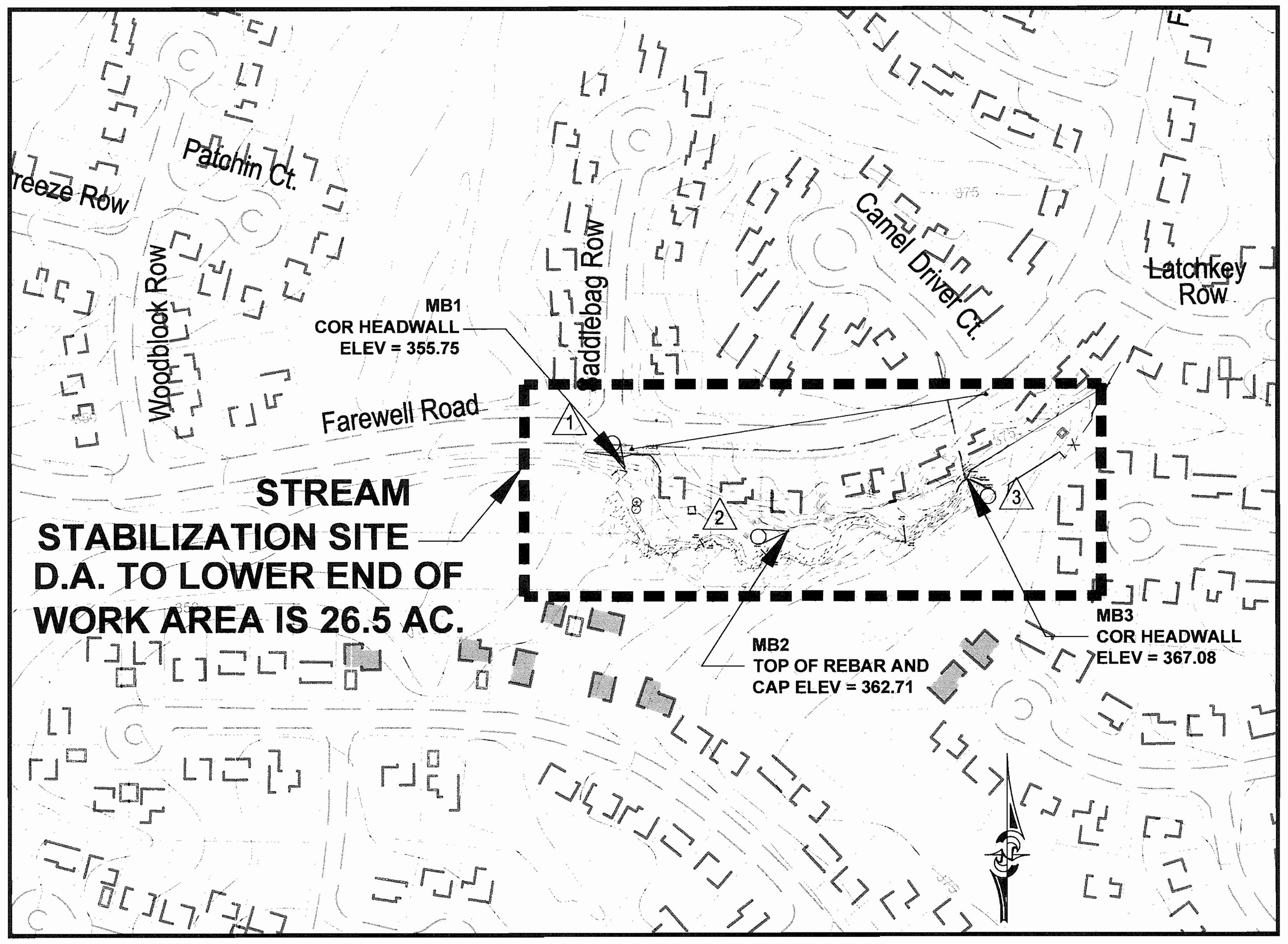
SOIL SURVEY MAP

Howard County, MD
Sheet 19
Dated: July 1968
Not To Scale



FEMA FLOOD INSURANCE RATE MAP

Howard County, MD
Community Panel Number
240044 0034 B
Map Revised: December 4, 1986
Not To Scale



Scale: 1" = 150'
0 75 150 300 450

GENERAL NOTES NON-RESIDENTIAL SITE DEVELOPMENT PLAN

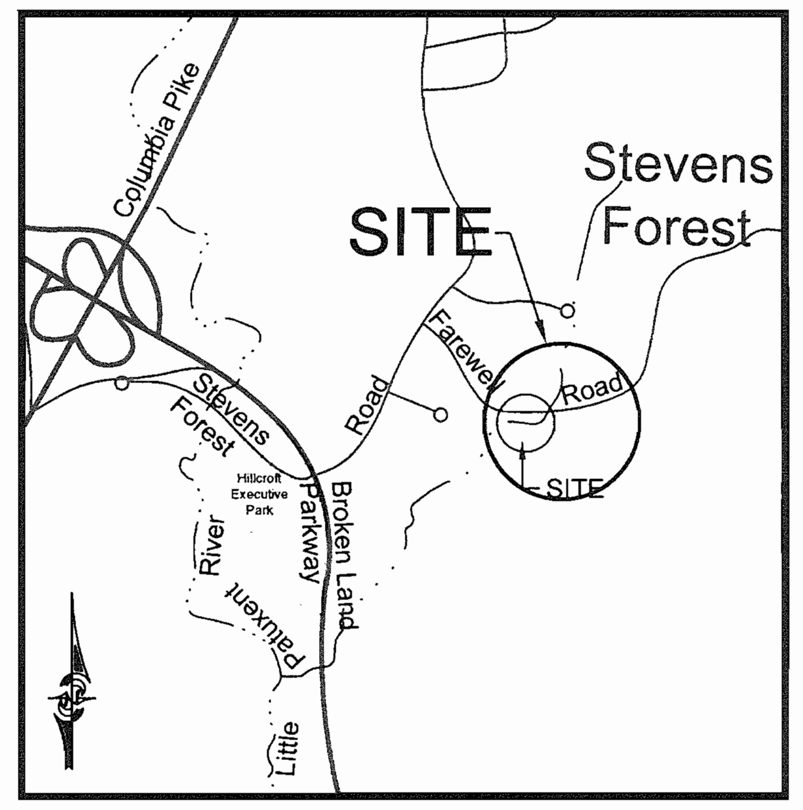
1. All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA Standards and specifications if applicable.
2. The contractor shall notify the Department of Public Works/Bureau of Engineering/Construction Inspection Division at (410) 313-1880 at least five (5) working days prior to the start of work.
3. The contractor shall notify "MISS Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
4. Traffic control devices, markings and signing shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). All street and regulatory signs shall be in place prior to the placement of any asphalt.
5. All plan dimensions are to face of curb unless otherwise noted.
6. The existing topography is taken from field run survey with two foot contour intervals prepared by CPJ dated April 2005.
7. The boundary lines shown hereon are based on recorded plats and limited field evidence found. A complete boundary survey was not performed. The metes and bounds shown hereon for Lot 258 were taken from the *Section 5 and 6 and Resubmission of Village of Oakland Mills Section 5 area 2 Lot 184 plat*, Sheet 2 of 5 as prepared by Richard P Browne and Associates dated February 5, 1971.

SURVEY CONTROL

Point	Northing	Easting	Elevation	Description
MB1	557996.96	1357163.71	355.75	BM Cor Headwall
MB2	557907.92	1357396.24	362.71	(REBAR & CAP)
MB3	557982.12	1357650.82	367.08	BM Cor Headwall

All horizontal control is NAD 83/91.
All vertical control is NGVD 29.

8. This plan contains proposed work on the following original DPZ file: F71-42C, FDP-97.
9. Water :24-0602-D
10. Sewer :24-0602-D
11. There is no existing or proposed stormwater management control, ownership or maintenance responsible for this project.
12. Existing utilities are based on the survey by CPJ and only include utilities visible at surface (i.e., manholes).
13. The floodplain study for this project was taken from FEMA Floodplain Map Number 240044 0034B.
14. There are no wetlands within the LOD as found on March 23, 2004 field visit by CPJ.
15. No traffic study is required for this project.
16. Project background information is included in the title block with the following additional information: Zoning New Town Open Space, Election District No. 6.
17. No clearing, grading or construction is permitted within the delineated stream except as shown hereon. No work can be done within the stream until a permit from the Maryland Department of the Environment is secured. The stream and stream buffer shown on these plans have been determined "necessary" in accordance with Section 16.116.c of the Subdivision Regulations.
18. These streams are Maryland Use Class I-P Waters.
19. All material removed from this site shall be taken to a site with an active grading permit.
20. These plans were prepared with the field information at the time of project survey. It is possible that field conditions at the time 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 given field conditions.The design engineer should be notified immediately if any deviations from the design plan are found.
21. 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 of the design engineer.
22. No landscaping is required for this project except as shown herein.
23. The average estimated dry weather base flow for this project was estimated at 0.01 cfs for pump-around purposes. This information is provided for conceptual use by the contractor but should not be considered binding to this design as distant storm events, weather patterns, groundwater discharge, upstream man-induced releases, snow melt,etc are incalculable factors which can increase or decrease dry weather flow. The contractor is responsible to carry out a site reconaissance to determine the size and number of pumps he/she will need to bid and complete work.
24. All quantities hereon are estimates only, the contractor is responsible for verifying quantities through a field visit and his own quantity takeoffs.
25. This project is exempt from the forest conservation requirements because the subject property is located within the New Town Zoning District which is a planned unit development and is more than 50% developed prior to 12/31/92. This is in accordance with Section 16.1202(b)(1)(iv) of the subdivision regulations.
26. No work or disturbance is proposed in any existing cemetery. The subject property is zoned New Town credited open space per the 2/2/04 comprehensive zoning plan.



ADC Vicinity Map
Howard County, MD
21st Edition Map 15, K9
Scale: 1" = 2000'

SOILS NOTE:

The Glenville soil series (Howard County soil designation 'GnB2') are moderately drained, strongly acidic to very strongly acidic soils that have a fragipan. Taxonomic class is fine-loamy, mixed, active, mesic Aquic Fragiudults. They are found on flats, in depressions, at the foot of slopes, and around the heads of drains. Slopes range from 0 to 3 percent. Glenville silt loam is not an acknowledged as a hydric soil type.

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

Approved [signature] 7/11/06
Howard S.C.D. Date

PERMIT INFORMATION CHART

Subdivision Name	Section/Area	Lot/Parcel
Village of Oakland Mills	Section 5: Area 6 Stevens Forest	Open Space Lot 258 Parcel 341

Plat # or L/F	Block #	Zone	Tax/Zone Map	Elec. Dist.	Census Tract
L. 3324/ F. 191	8,9	New Town Open Space	36	6	6066.03

ADDRESS CHART

Lot Number	Street Address
258	9523 Farewell Road Columbia, MD 21045

SITE ANALYSIS CHART

A	Total project area is 0.86 acres
B	Area of plan submission is the same as the limits of disturbance.
C	Limit of disturbed area (LOD) is 28,130 square feet or 0.65 acres.
D	Present zoning is New Town Open Space.
E	Proposed use of site is to remain open space.
F	Floor space/number of units/employees/parking is not applicable.
G	Open space on this site is assumed to be the same as the LOD or 0.65 acres.
H	Required open space is not applicable.
I	Building coverage is not applicable.
J	Applicable DPZ file number: pending
K	This project is for stream stabilization only.

SUMMARY OF ENVIRONMENTAL IMPACTS

Restoration Design Area	Tree Removal (# of trees)	Stream Disturbance (lf)	Wetland Disturbance (sq ft)	Wetland Buffer Disturbance (sq ft)	LOD (sq ft)	LOD (acres)
Total	13	600	0	0	28,130	0.65

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.

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.

[signature] 7/11/06
NATURAL RESOURCES CONSERVATION SERVICE DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] 7/17/06
CHIEF, DEVELOPMENT ENGINEERING DEVISION DATE

[signature] 7/18/06
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[signature] 7/19/06
DIRECTOR DATE

BY THE DEVELOPER :

I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, 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 COUNTY SOIL CONSERVATION DISTRICT.

Howard E. Saltzman 7/6/06
DEVELOPER 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 AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.

[signature] 7/5/06
TIMOTHY SCHUELER, PE #20207 DATE

SHEET INDEX

Tree Impact Table

Tree #	Species	DBH	Health	Impact	Reason
4	Carya sp./Hickory	18"	Good	Remove	Grading
5	Carya sp./Hickory	20"	Fair	Remove	Grading
42	Quercus Alba/White Oak	17.5"	Good	Remove	Grading
348	Acer Rubrum/Red Maple	9"	Fair	Remove	Grading
350	Carpinus caroliniana/Blue Beech	6"	poor	Remove	Grading
358	Carpinus caroliniana/Blue Beech	8"	Fair	Flush cut	Grading
368	Prunus serotina/Black Cherry	17"	Fair	Remove	Grading
393	Prunus serotina/Black Cherry	10.5"	Fair	Remove	Access
395	Acer rubrum/Red Maple	9.5"	Fair	Remove	Access
422	Carpinus caroliniana/Blue Beech	8.5"	Good	Remove	Grading
432	Quercus rubrum/Read Oak	9.5"	Good	Remove	Grading
433	Quercus rubrum/Read Oak	9.5"	Pool	Remove	Grading

TOTAL 12

SEQUENCE OF CONSTRUCTION

A. The Little Patuxent River is designated Use Class I-P by the Maryland Department of Environment.
B. Closure dates for Use Class I-P stream are March 1-June 15.
C. Work should be started no later than November 13 to assure completion before closure dates apply.
D. Work upstream to downstream unless specifically directed by Designer and Sediment Control Inspector.
E. The contractor or developer shall contact the Construction Inspection Division 24 hours in advance of commencement of work at (410) 313-1880.

1. The Maryland Department of the Environment joint permit number for this project is 05-NT-0284. Obtain a grading permit. Conduct a pre-construction meeting with Contractor, Designer, Owner, MDE Inspector and Sediment Control Inspector at least 48 hours prior to the start of construction. MISS Utility is to have been contacted by this time and is to have had an opportunity to mark all utilities within the limits of disturbance. Work areas and limits of disturbance to be marked in the field prior to this meeting. 1 day
2. With Sediment Control Inspector's (SCI) permission, install stabilized construction entrance(s). 1 day
3. Clear and grub for installation of sediment control features. 2 days
4. Install tree save fencing and silt fence as shown on the plans. 1 day
5. a. 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 back into the channel below the downstream sandbag dike.
   b. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified.
   c. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on plans. After installation of each day's permanent erosion control matting, temporary coir log is to be placed at the bottom of the newly stabilized toe.
   d. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.
   e. 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 dissipator used for the main stem pump around.
   f. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.
   g. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
   h. AFTER CONSTRUCTION, ALL DISTURBED AREAS SHOULD BE REGRADED AND REVEGETATED AS PER PLANTING DETAILS SHOWN HEREIN. INSTALL COMPLETE IN-STREAM PUMP-AROUND DIKES WITH DEWATERING SYSTEM ABOVE AND BELOW SECTIONS TO BE WORKED ON AND RUN PUMPING EQUIPMENT DOWNSTREAM TO A LOCATION AGREED UPON WITH THE SCI AS BEING ABLE TO BE COMPLETE AND PERMANENTLY STABILIZED IN A ONE DAY PERIOD. NO WORK TO BE DONE IF RAIN IS FORECAST BY THE NATIONAL WEATHER SERVICE (NWS) WITHIN 1 DAY. 2 days
6. Clear and grub bank areas as shown on plans. 1 day
7. Install practices within dry work area. 12 days
8. Temporarily seed and stabilize. 2 days.
9. Once work is complete , conduct a "punchlist" walk with Owner, SCI, Contractor and Designer. 1 day
10. With permission of SCI, remove any remaining sediment control devices including temporary coir log toe protection. 2 days
11. Install plantings. 1 day

Total duration of construction: 25 days

Prepared for:
Howard County Dept. of Public Works
Bureau of Environmental Services
6751 Columbia Gateway Drive, #514
Columbia, MD 21046
Phone: (410) 313-6417
Attn: Mr. Richard Powell

Village of Oakland Mills
Election District 6
Section 5 Stevens Forest Area 6
Open Space Lot 258
0.989 Acres

Howard County Capital Improvements Project No. D-1126
FAREWELL ROAD STREAM STABILIZATION
Columbia, Maryland

Title Sheet

DATE:	06/06
DESIGNED:	TCS
DRAFTED:	HT
CHECKED:	TCS
BASE DATA:	CPJ

NO.	REVISIONS	BY	DATE

CPJ Associates
CPJ/EQR Environmental Services Division
STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
895 QUINCE ORCHARD ROAD GAITHERSBURG MARYLAND 20878
Phone:(301)208-9573 E-mail:info@eqri.com Fax:(301)926-4551
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE As Shown

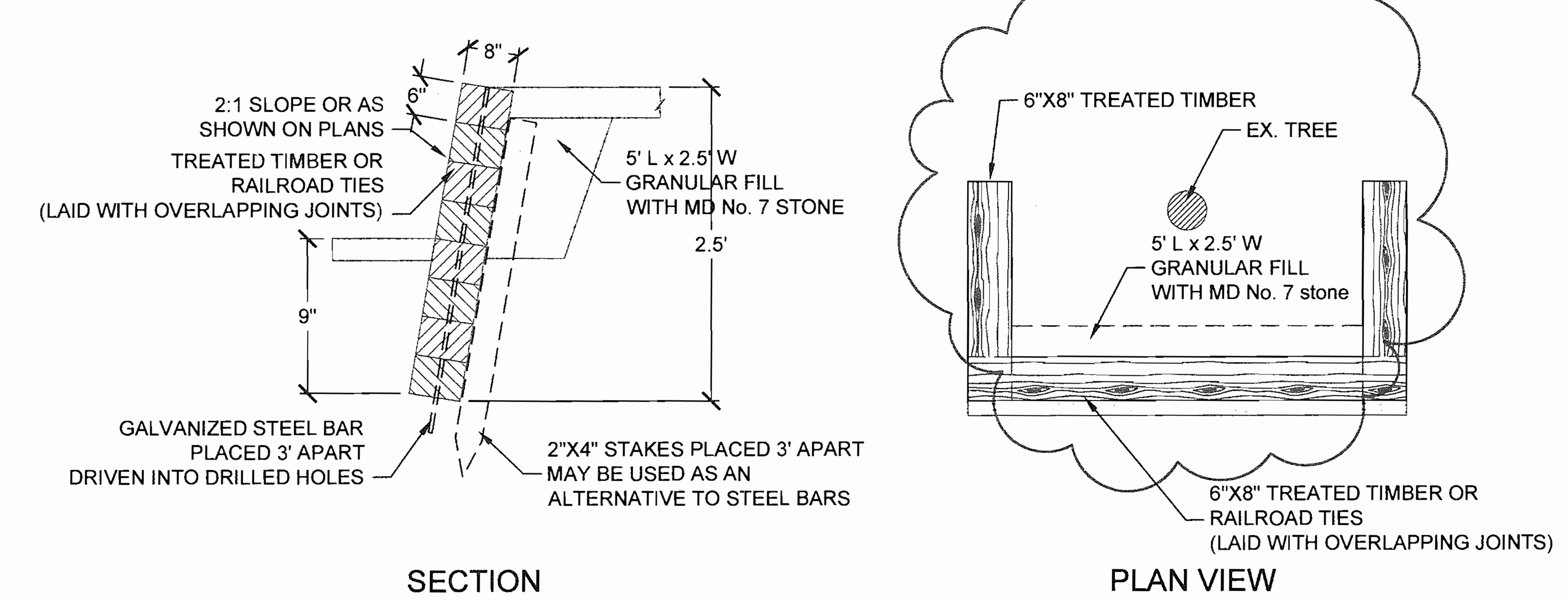
SHEET 1 OF 9 SHEETS

JOB NO. 35-554

SDP-06-091

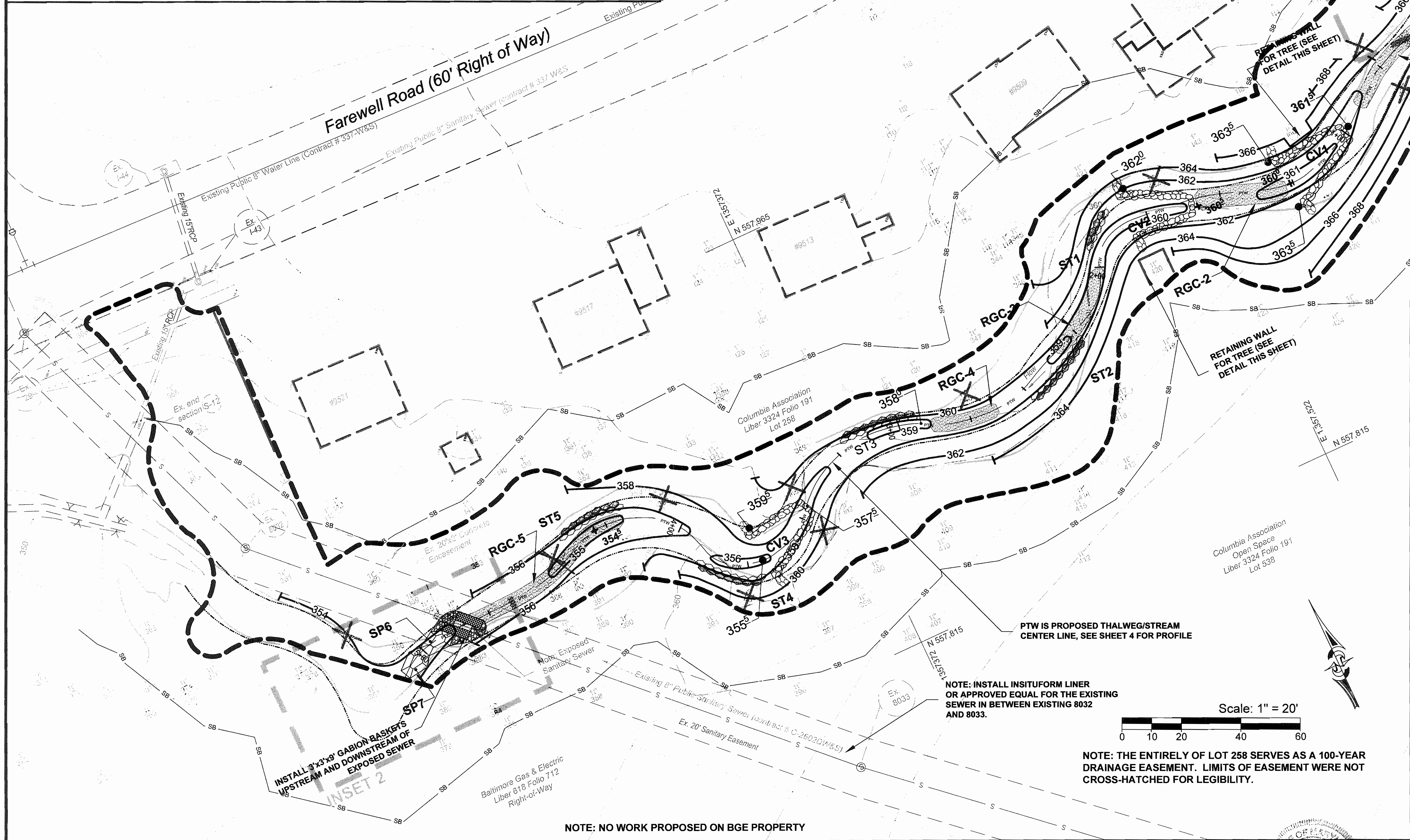
Plotted Jul 05, 2006 - 9:03am User: rfenteng F:\Farewell Road\CAD\90%\sheet1-title.dwg
Xrefs: Title.dwg vicinity map.dwg Sheet 1 Base.dwg

SDP-06-091



TYPICAL TIMBER RETAINING WALL FOR TREE

Scale: N.T.S.

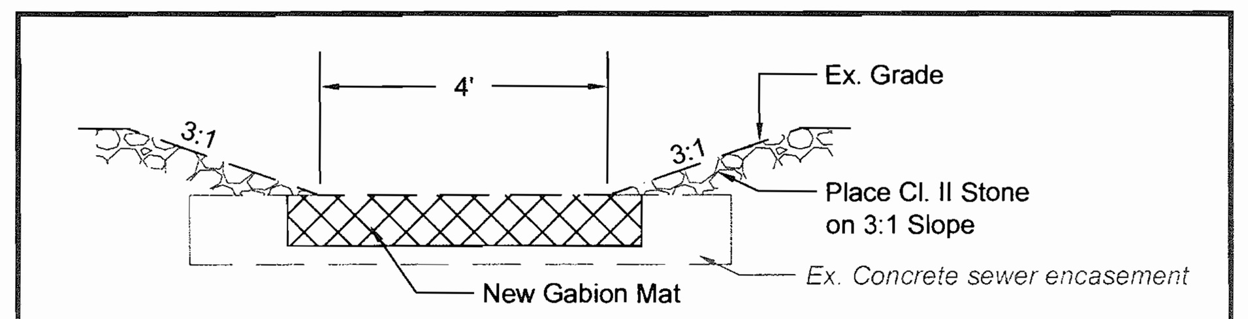


NOTE: THE ENTIRELY OF LOT 258 SERVES AS A 100-YEAR DRAINAGE EASEMENT. LIMITS OF EASEMENT WERE NOT CROSS-HATCHED FOR LEGIBILITY.

NOTE: NO WORK PROPOSED ON BGE PROPERTY

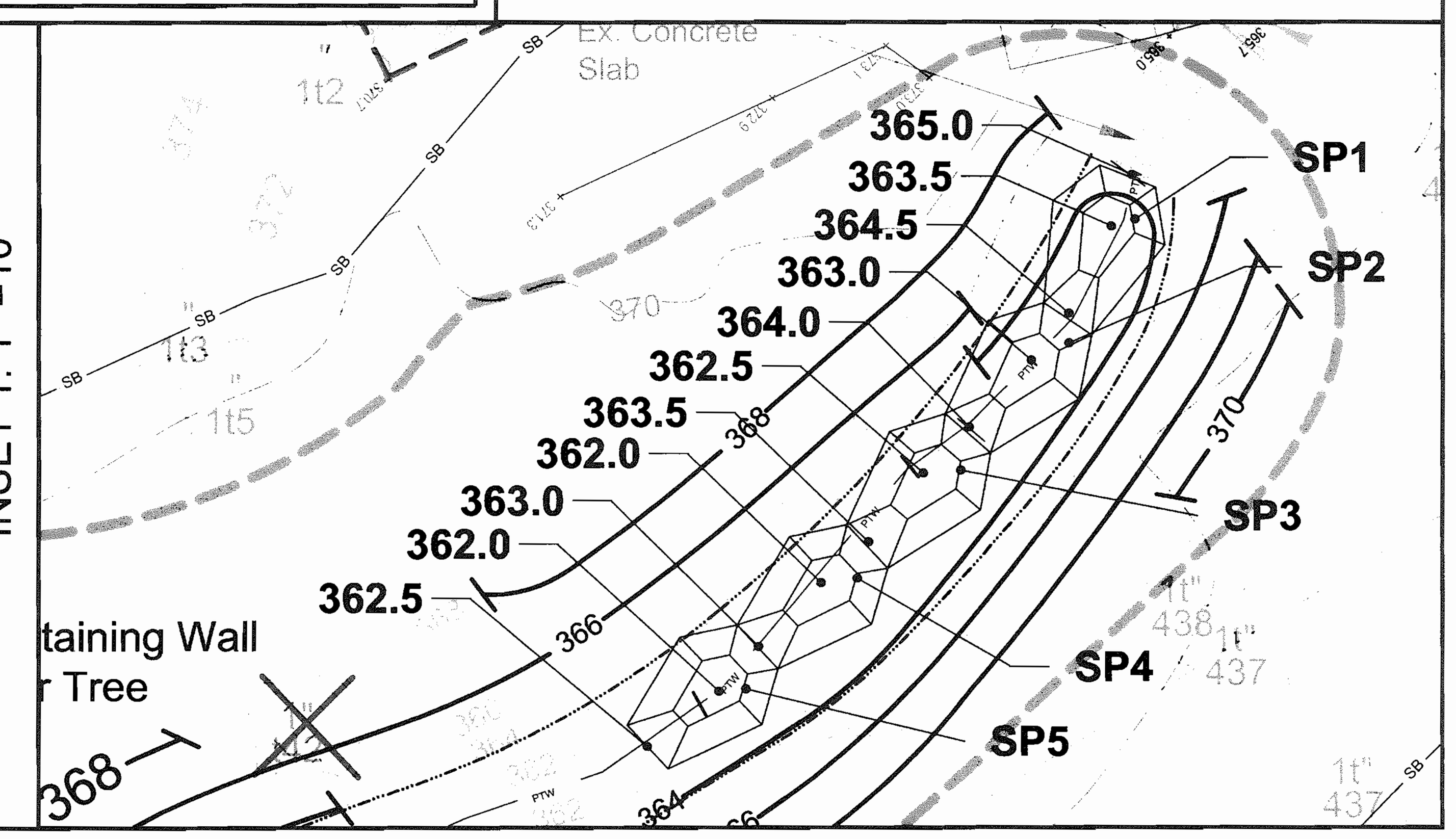
Legend

- Bankfull WSE
- Property Line
- Easement
- Limits of Grading
- Ex. 100 Year Floodplain
- Tree Line
- Existing Contours
- Proposed Contours (426)
- T6 X — Tree to be Removed
- Stone Toe (Detail 4, Sheet 6)
- Erosion Control Matting
- SB — 50' Stream Buffer
- ETW — Existing Thalweg
- PTW — Proposed Thalweg
- Cross Vane (Detail 1, Sheet 6)
- Riffle Grade Control
- Step Pool (Detail 5, Sheet 9)

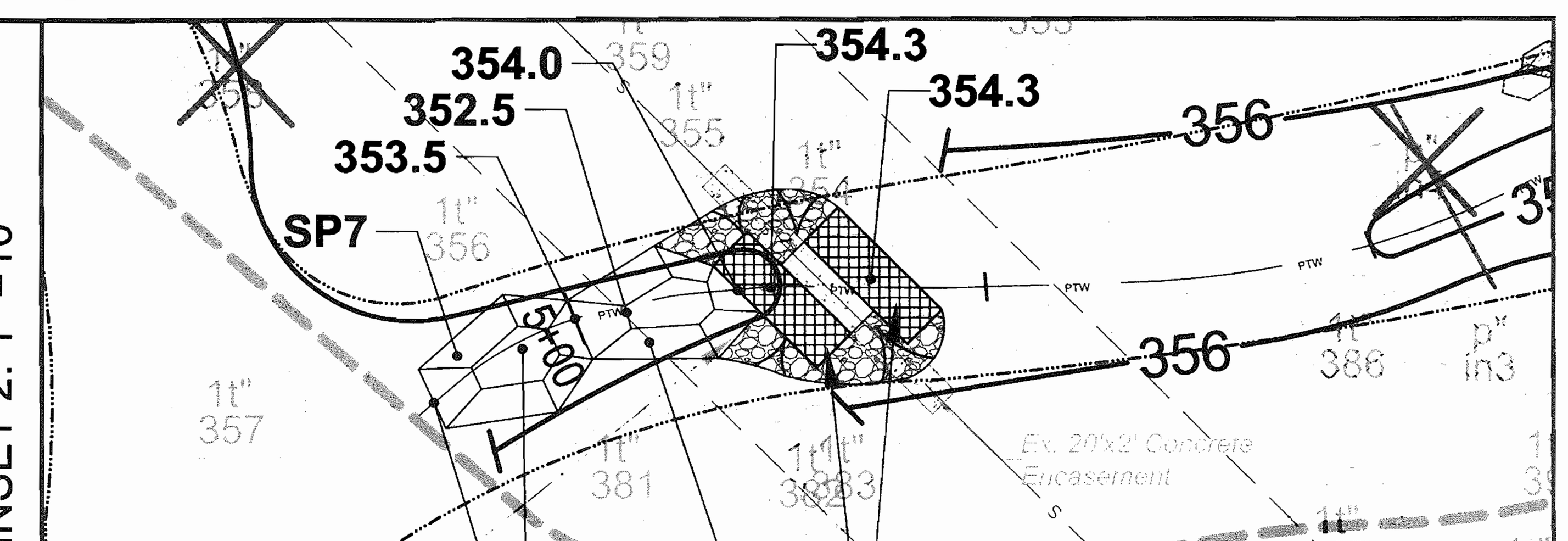


Section Along Exposed Sewer n.t.s.

INSET 1: 1" =10'



INSET 2: 1" =10'



INSTALL 3'x3'x9' GABION BASKETS UPSTREAM AND DOWNSTREAM OF EXPOSED SEWER; INSTALL CL. II STONE TO FLANK GABION MATS AT 3:1 WITH 4 FOOT BOTTOM WIDTH, (See Section Along Exposed Sewer Detail)

~~THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.~~

~~NATURAL RESOURCES CONSERVATION SERVICE — DATE~~

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature]	7/17/06
CHIEF, DEVELOPMENT ENGINEERING DEVISION	DATE 7/18/06
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 7/19/06
DIRECTOR	DATE

Reviewed for HOWARD S.C.D. Name and meets Technical Requirements. Signature [signature] Date 7/11/06 NATURAL RESOURCES CONS. SERVICE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

Approved [signature] 7/11/06 Howard S.C.D. Date

[Seal: State of Maryland Registered Professional Engineer] [signature] 6/30/06

Prepared for:
Howard County Dept. of Public Works
Bureau of Environmental Services
6751 Columbia Gateway Drive, #514
Columbia, MD 21046
Phone: (410) 313-6417
Attn: Mr. Richard Powell

Village of Oakland Mills
Election District 6
Section 5 Stevens Forest Area 6
Open Space Lot 258
0.989 Acres

Howard County Capital Improvements Project No. D-1126
FAREWELL ROAD STREAM STABILIZATION
Columbia, Maryland

Site Plan for Stream Stabilization

DATE:	06/06
DESIGNED:	TCS
DRAFTED:	HT
CHECKED:	TCS
BASE DATA:	CPJ

NO.	REVISIONS	BY	DATE

CPJ Associates
CPJ/EQR Environmental Services Division
STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
895 QUINCE ORCHARD ROAD GAITHERSBURG MARYLAND 20878
Phone:(301)208-9573 E-mail:info@eqri.com Fax:(301)926-4551
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE As Shown

SHEET 2 OF 9 SHEETS

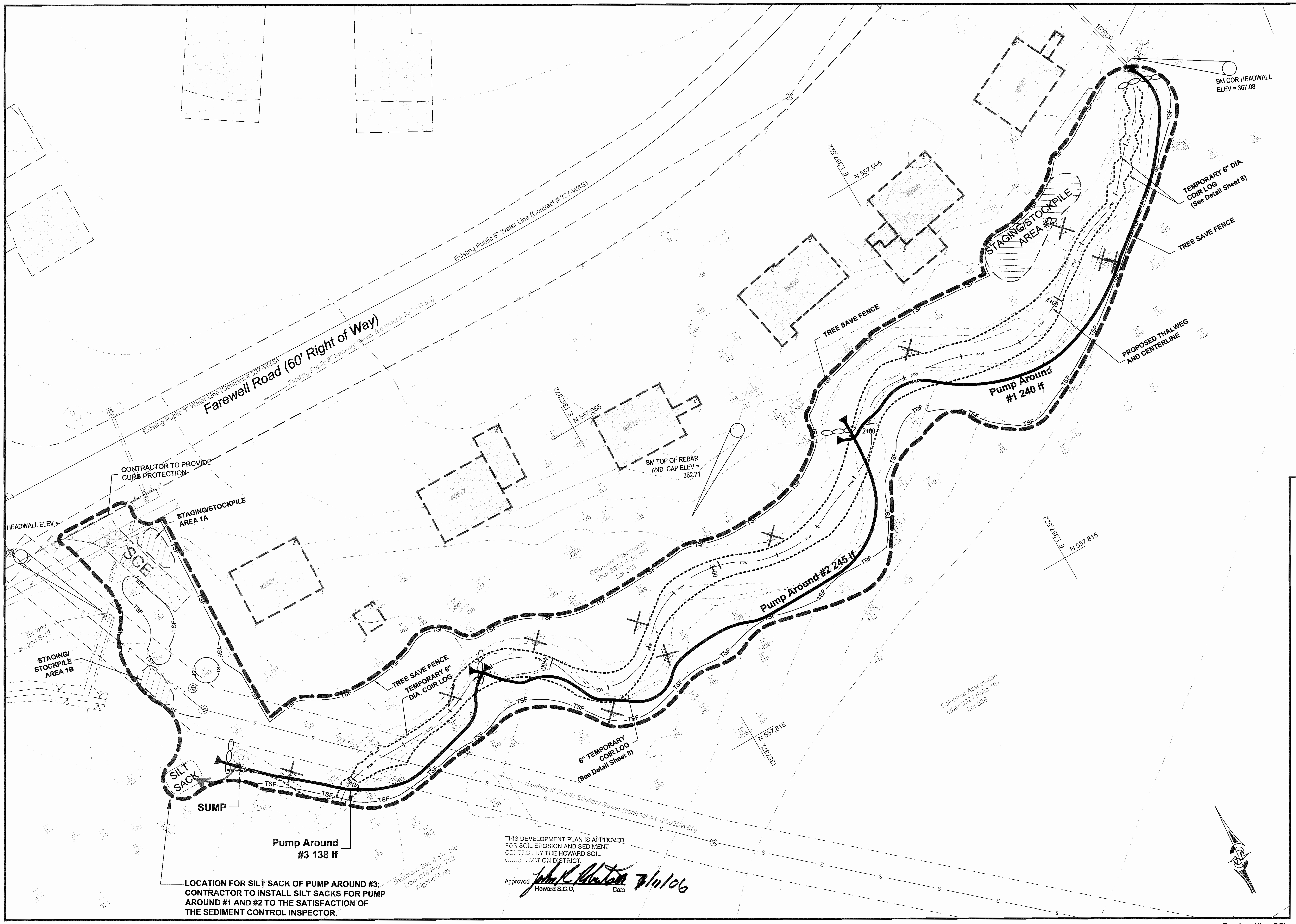
JOB NO. 35-554

SDP-06-091

Plotted Jun 29, 2006 - 9:27am User: hta F:\Farewell Road\CAD\90%\Sheet2-Design Planview.dwg

Xrefs: Title.dwg
Legend.dwg
NEW-Design Base Inset.dwg
Timber retaining wall for tree.dwg
NEW2006-Design Base.dwg

SDP-06-091



Legend

- Bankfull WSE
- Property Line
- Easement
- Limits of Grading
- 100 Year Floodplain
- Tree Line
- Existing Contours
- Proposed Contours
- Temporary Coir Log
- Silt Fence (Detail C, Sheet 7)
- Tree Save Fence (Detail D, Sheet 7)
- Sand Bag/Stone Diversion (Detail E, Sheet 7)
- Pump Around Practice(Detail E, Sheet 7)
- Stabilized Construction Entrance (Detail B, Sheet 7)
- T6 Tree to be Removed
- Sump & Dewatering Device (Detail F,Sheet 6)
- SB 75' Stream Buffer
- ETW Existing Thalweg
- PTW Proposed Thalweg
- Silt Sack

Page 1 of 2

Timothy Schueler

From: Woodall, R Scott [RScott.Woodall@bge.com]
Sent: Tuesday, June 20, 2006 3:44 PM
To: Timothy Schueler
Cc: Woodall, R Scott
Subject: RE: Farewell Road BGE property flood plain discussion

Tim,
BGE has reviewed the subject proposal pertaining to an increase in the existing 100-year floodplain adjacent to our Wilde Lake to Columbia 230kV transmission corridor. Since there are no transmission structures within the floodplain limits, we hereby approve the county's proposal to increase the floodplain level by a tenth of a foot.

Thank you for your thorough submittal and professionalism.

Best Regards,

Scott Woodall

R. Scott Woodall
Property Development Analyst
BGE
1068 North Front Street
Rm. 200
Balto., MD 21202
Ph. (410) 291-5738

From: Timothy Schueler [mailto:tschueler@cpja.com]
Sent: Tuesday, June 20, 2006 2:57 PM
To: Woodall, R Scott
Cc: James Fetchu
Subject: Farewell Road BGE property flood plain discussion

Scott,

Per our discussion today (6/20/06), there are now BGE structures within the area of the BGE right-of-way (liber 618, folio 712) that will have an increase in the 100-year flood plain by approximately 0.1 foot when the Farewell Road stream improvements are completed per Howard County Department of Public Works project D-1126. No grading work will occur on BGE property. We respectfully request that you respond to this email indicating that HC DPW has your company's permission to raise said flood plain.

Sincerely, Tim Schueler

6/20/2006

Scale: 1" = 20'
0 10 20 40 60

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.
NATURAL RESOURCES CONSERVATION SERVICE 7/1/06 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION 7/17/06 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT 7/18/06 DATE
DIRECTOR 7/19/06 DATE

Prepared for:
Howard County Dept. of Public Works
Bureau of Environmental Services
6751 Columbia Gateway Drive, #514
Columbia, MD 21046
Phone: (410) 313-6417
Attn: Mr. Richard Powell

Village of Oakland Mills
Election District 6
Section 5 Stevens Forest Area 6
Open Space Lot 258
0.989 Acres

Howard County Capital Improvements Project No. D-1126
FAREWELL ROAD STREAM STABILIZATION
Columbia, Maryland
Sediment Control Planview

DATE: 06/06					
DESIGNED: TCS					
DRAFTED: HT					
CHECKED: TCS					
BASE DATA: CPJ	NO.	REVISIONS	BY	DATE	

CPJ Associates
CPJ/EQR Environmental Services Division
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SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE As Shown
SHEET 3 OF 9 SHEETS
JOB NO. 35-554
SDP-06-091

Xrefs: Title.dwg SedCon Base.dwg

SDP-06-091

PROFILE OF PROPOSED CENTERLINE/PROPOSED THALWEG

Scale - Horizontal:1" = 20'
Vertical:1" = 2'

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL	APPROVED: DEPARTMENT OF PLANNING AND ZONING
	CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/7/06
	CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 7/15/06
NATURAL RESOURCES CONSERVATION SERVICE — DATE	DIRECTOR — DATE 7/15/06

Prepared for:
Howard County Dept. of Public Works
Bureau of Environmental Services
6751 Columbia Gateway Drive, #514
Columbia, MD 21046
Phone: (410) 313-6417
Attn: Mr. Richard Powell

Village of Oakland Mills
Election District 6
Section 5 Stevens Forest Area 6
Open Space Lot 258
0.989 Acres

Howard County Capital Improvements Project No. D-1126
FAREWELL ROAD STREAM STABILIZATION
Columbia, Maryland

Stream Profile

DATE:	06/06
DESIGNED:	TCS
DRAFTED:	HT
CHECKED:	TCS
BASE DATA:	CPJ

NO.	REVISIONS	BY	DATE

CPJ Associates
CPJ/EQR Environmental Services Division
STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
895 QUINCE ORCHARD ROAD GAITHERSBURG MARYLAND 20878
Phone:(301)208-9573 E-mail:info@cpjeqri.com Fax:(301)926-4551
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE
As Shown

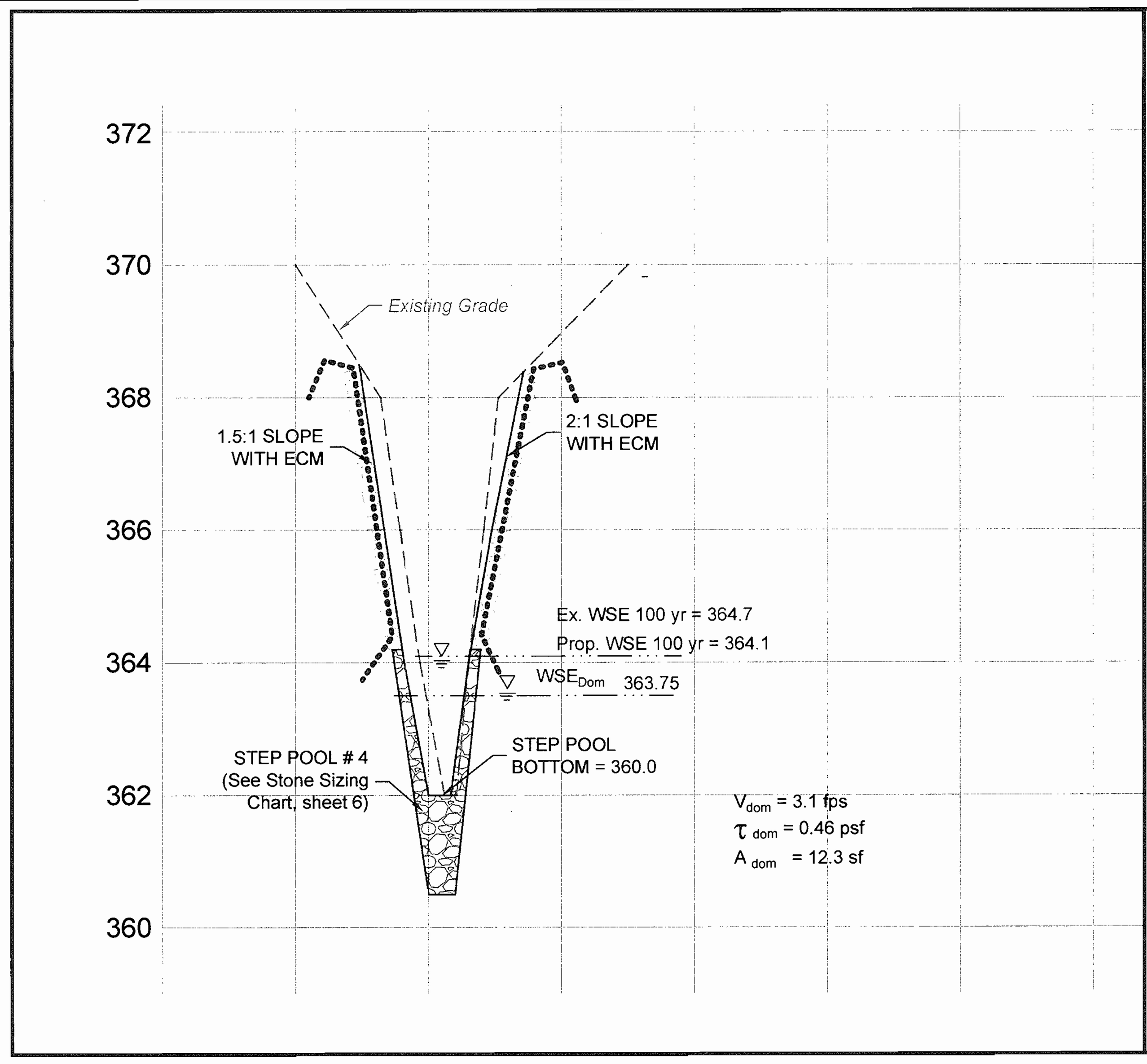
SHEET
4
OF 9 SHEETS

JOB NO.
35-554

SDP-06-091

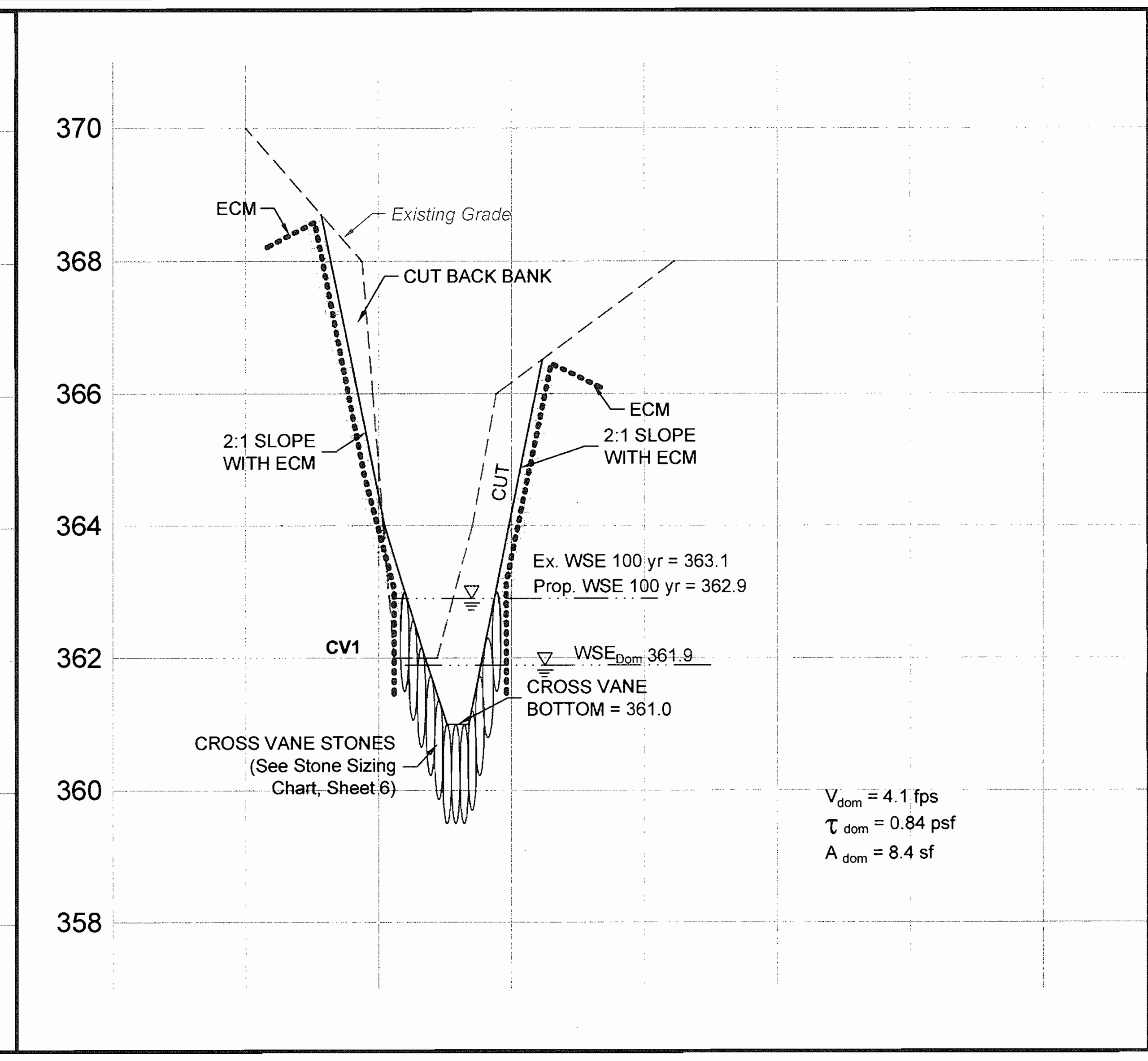
Xrefs: Title.dwg
2006Pro profile.dwg

SDP-06-091



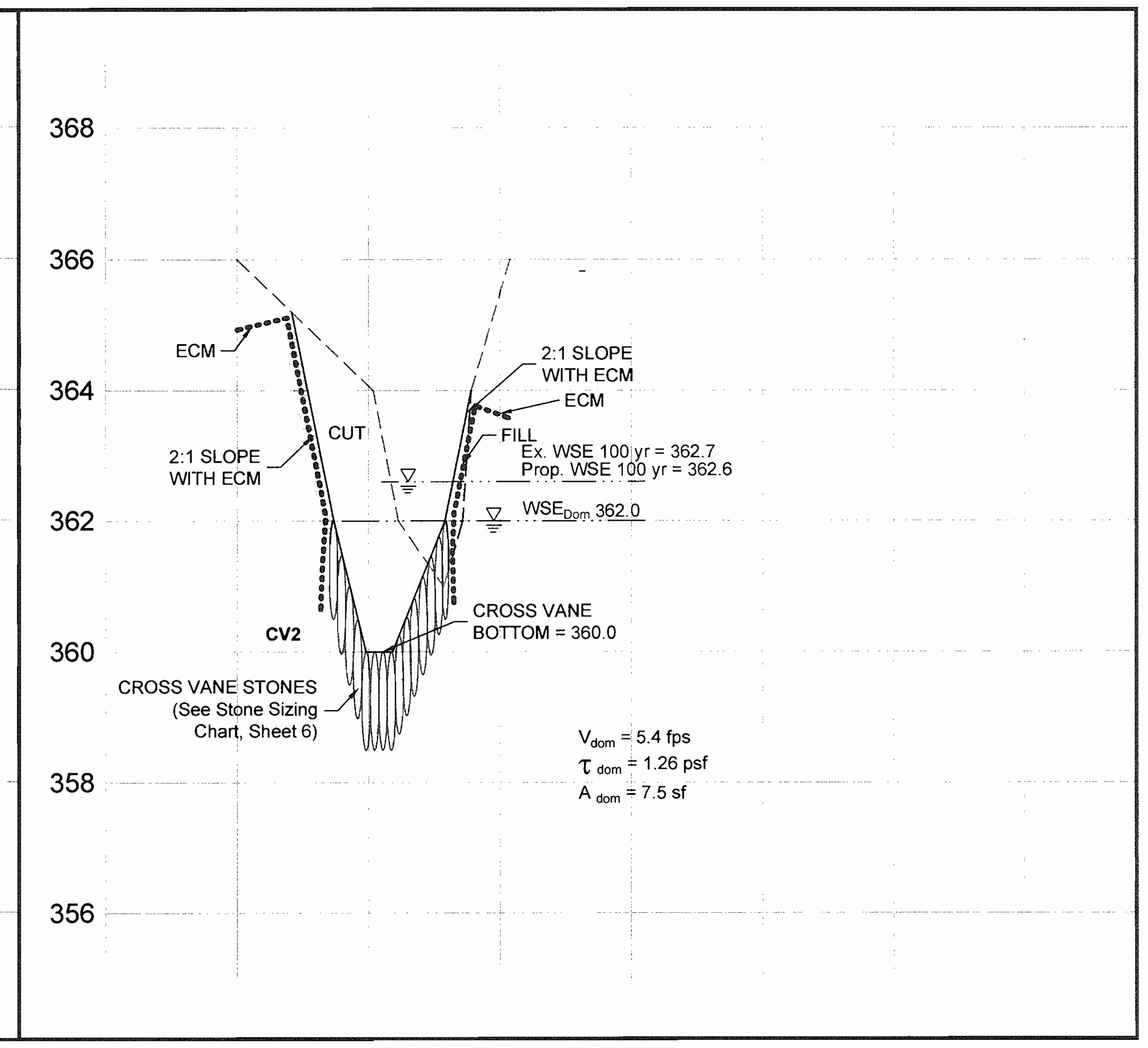
Cross Section 0+38

Vertical: 1" = 2'- 0"
Horizontal: 1" = 20'- 0"



Cross Section 1+04

Vertical: 1" = 2'- 0"
Horizontal: 1" = 20'- 0"



Cross Section 1+84

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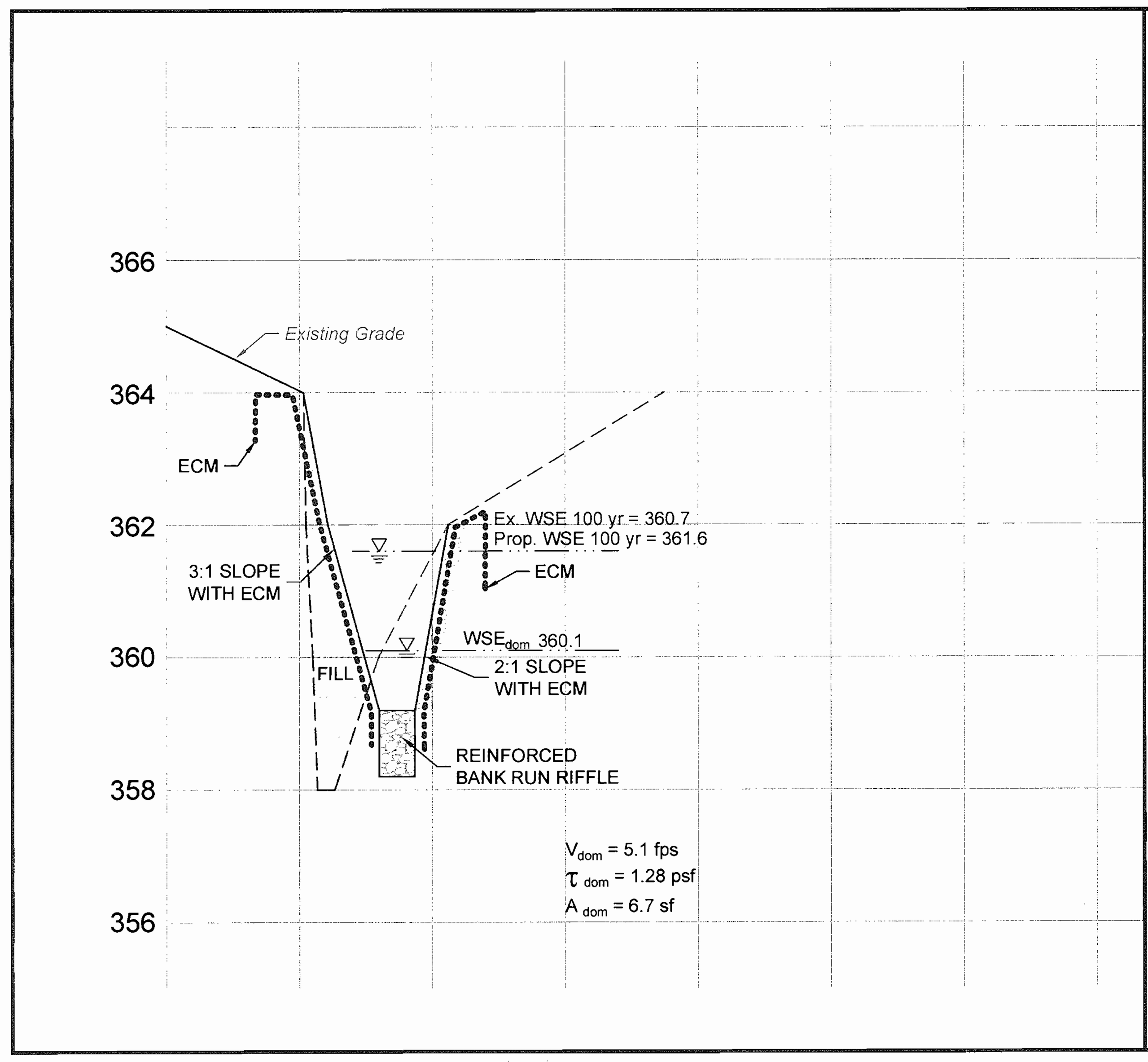
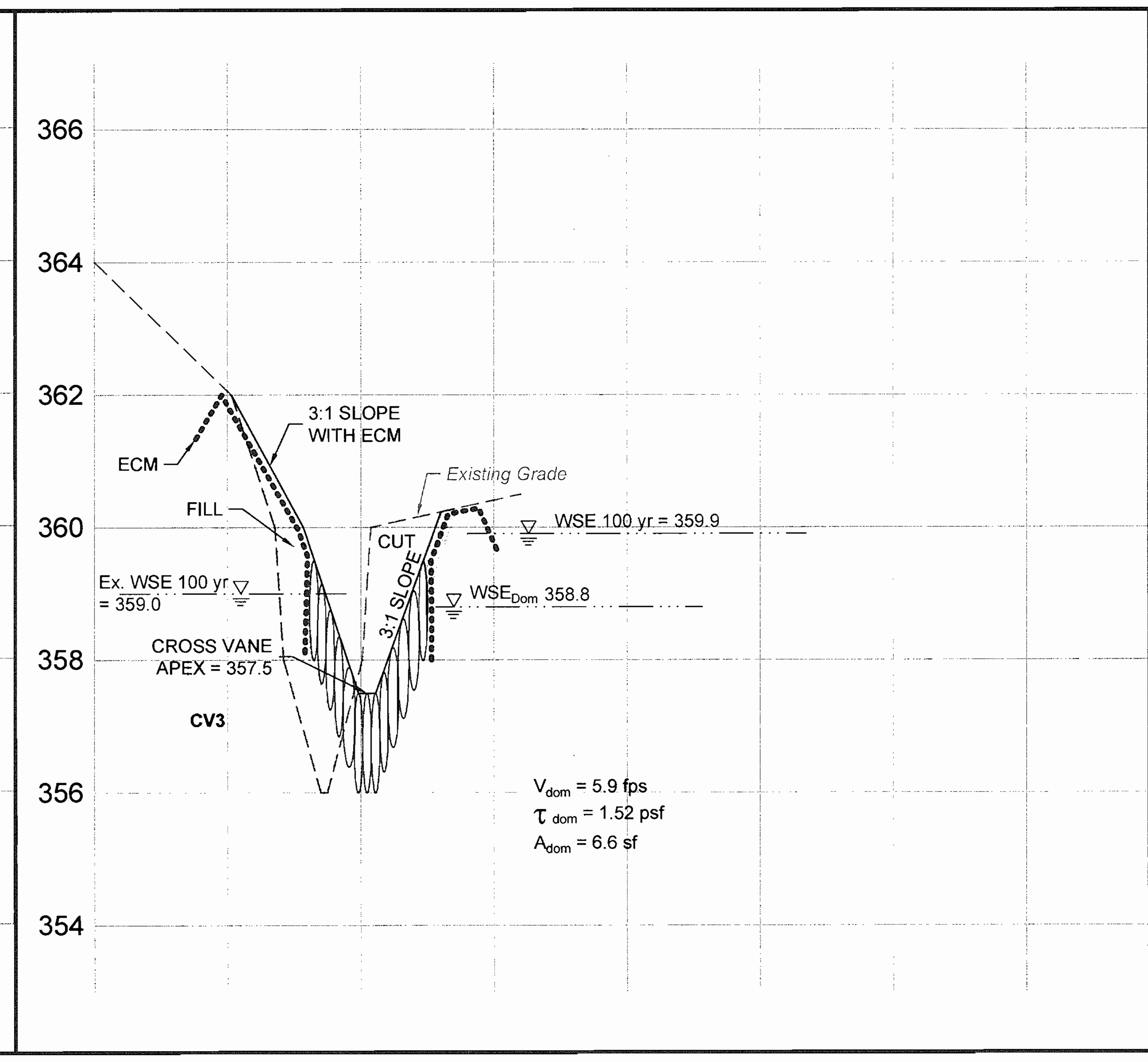
Horizontal: 1" = 20'- 0"



Cross Section 2+86

Vertical: 1" = 2'- 0"
Horizontal: 1" = 20'- 0"



Cross Section 3+45

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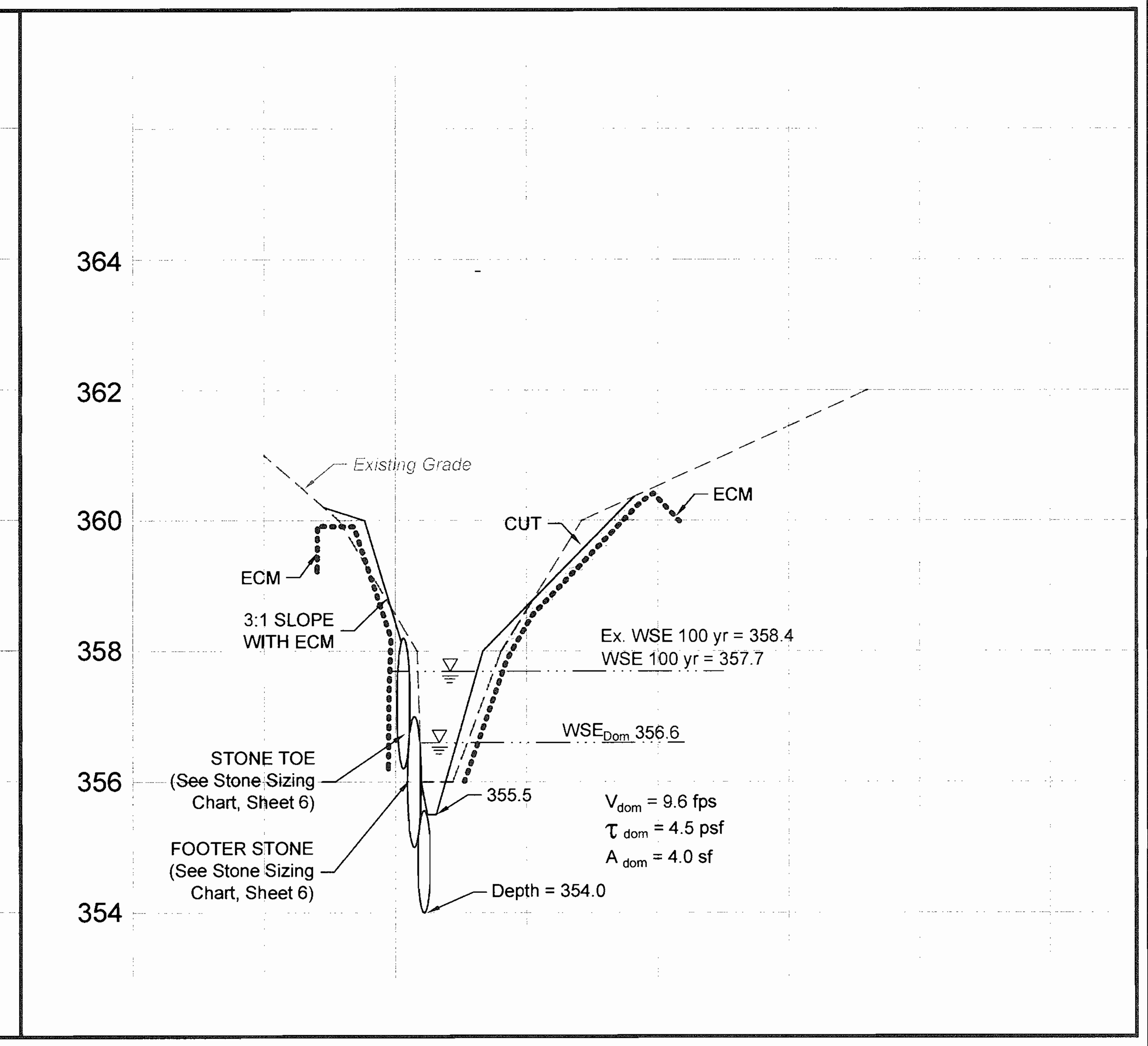
Horizontal: 1" = 20'- 0"



Cross Section 3+75

Vertical: 1" = 2'- 0"
Horizontal: 1" = 20'- 0"

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL

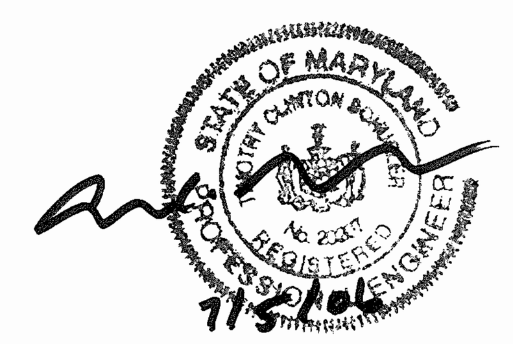
NATURAL RESOURCES CONSERVATION SERVICE — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/17/06

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 7/18/06

DIRECTOR — DATE 7/19/06



Note: All Sections area looking downstream.

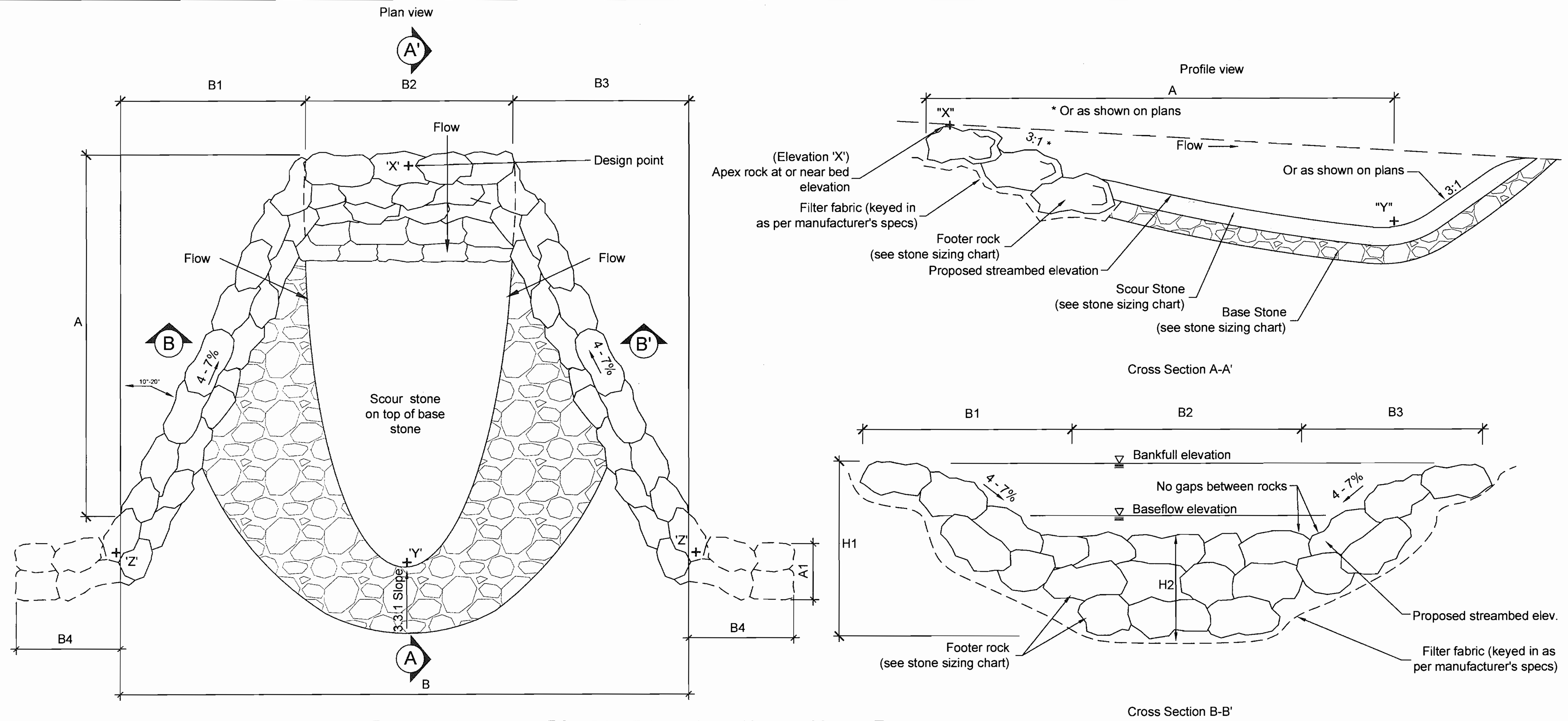
Prepared for:		Project			Scale / Sheet
Prepared for: Howard County Dept. of Public Works, Bureau of Environmental Services, 6751 Columbia Gateway Drive, #514, Columbia, MD 21046, Phone: (410) 313-6417, Attn: Mr. Richard Powell	Village of Oakland Mills, Election District 6, Section 5 Stevens Forest Area 6, Open Space Lot 258, 0.989 Acres	Howard County Capital Improvements Project No. D-1126 FAREWELL ROAD STREAM STABILIZATION Columbia, Maryland *Cross Sections*	DATE: 06/06; DESIGNED: TCS; DRAFTED: HT; CHECKED: TCS; BASE DATA: CPJ	CPJ Associates — CPJ/EQR Environmental Services Division, STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION, 895 QUINCE ORCHARD ROAD GAITHERSBURG MARYLAND 20878, Phone:(301)208-9575 E-mail:info@cpjeqr.com Fax:(301)926-4551, SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA	SCALE As Shown; SHEET 5 OF 9 SHEETS; JOB NO. 35-554

NO.	REVISIONS	BY	DATE

SDP-06-091

Xrefs: Title.dwg
Proposed X-sections.dwg

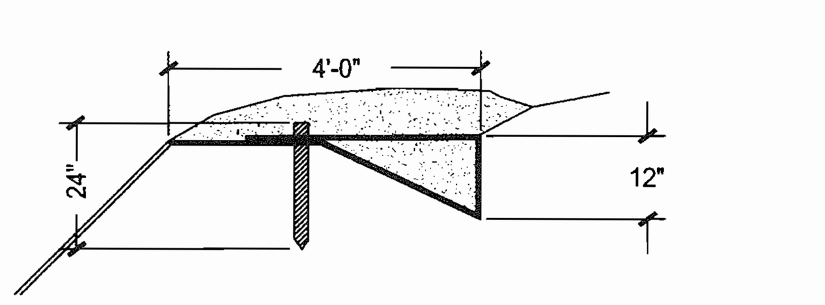
SDP-06-091



Designation	Station	A feet	B feet	H1 feet	H2 feet	B1 feet	B2 feet	B3 feet	B4 feet	A1 feet	X msl	Y msl	Z msl
CV1	1+00	27	12	5	2.0	4	4	4	3	2	361.5	360.0	363.5
CV2	1+60	27	12	4	2.0	4	4	4	3	2	360.5	359.2	362.0
CV3	3+45	27	12	4	2.0	4	4	4	3	2	357.5	355.5	359.5

1 **CROSS VANE (SPECIFICATION 1.0)**

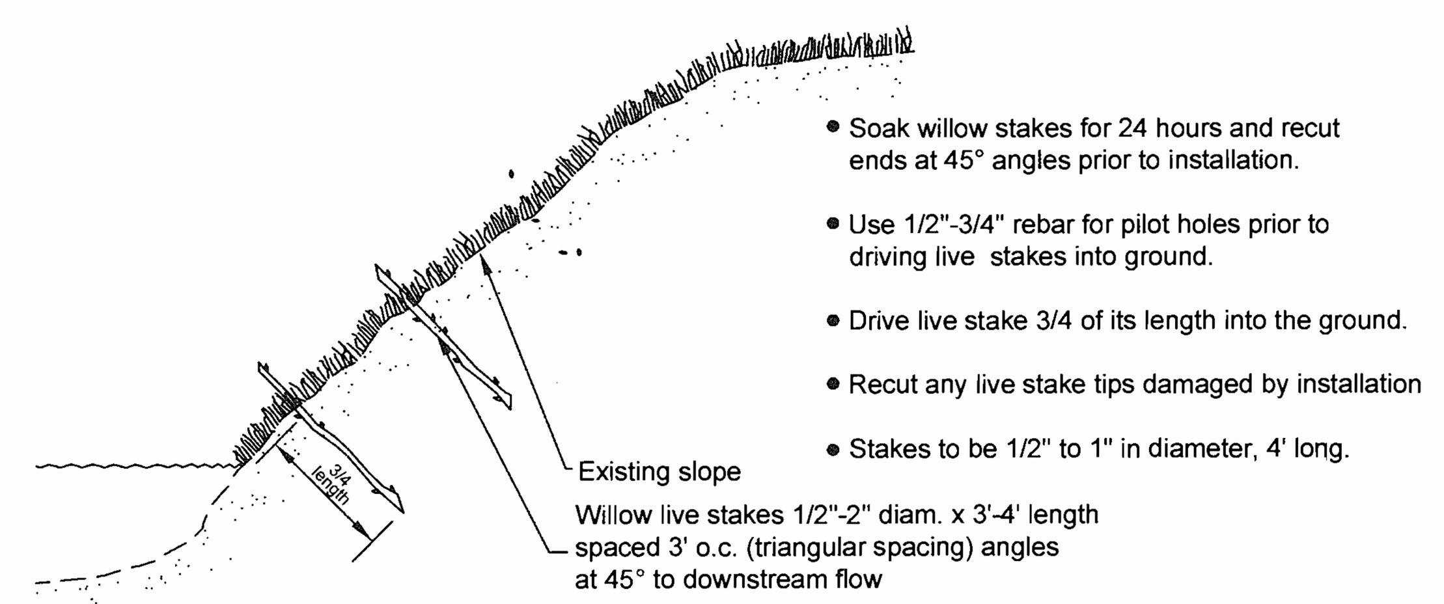
Not to scale



Notes:
1. Begin at the top of the slope and anchor fiber matting in a 12" deep initial anchor trench. Backfill trench and tamp earth firmly.
2. Unroll fiber matting downslope in the direction of water flow.
3. Overlap edges of adjacent parallel rolls 6" and anchor at 12" centers.
4. When fiber mat must be spliced, place end over end (shingle style) with 12" overlap and anchor using two staggered rows of stakes at 6" centers.
5. Lay fiber mat loosely and anchor sufficiently to maintain direct contact with the soil - DO NOT STRETCH.
6. For slopes 2:1 and steeper use a minimum of 3 stakes per square yard and for slopes flatter than 2:1 use a minimum of 2 stakes per square yard.
7. Anchor, fill, and compact end of fiber matting in 12"x6" terminal anchor trench (mirror image of initial trench)

2 **FIBER MATTING KEYING(SPECIFICATION 3.0)**

Not to scale



- Soak willow stakes for 24 hours and recut ends at 45° angles prior to installation.
- Use 1/2"-3/4" rebar for pilot holes prior to driving live stakes into ground.
- Drive live stake 3/4 of its length into the ground.
- Recut any live stake tips damaged by installation
- Stakes to be 1/2" to 1" in diameter, 4' long.

Note: NO LIVE STAKES SHALL BE INSTALLED WITHIN PUBLIC SANITARY OR STORM DRAIN RIGHTS-OF-WAY.

3 **LIVE STAKE (SPECIFICATION 6.0)**

Not to scale

Stone Sizing Chart

Type of Treatment	Bio. Detail No.	Bioengineering Specification Reference	D_{50} in inches	Anticipated Weight @ #160/cuft	MSHA Class for D_{50} by weight	Scour Depth Minimum(inches)
Stone Toe	4	9.0	12	84	Class II	24
Cross Vane Arms	1	1.0	15	163	Class II	27
Cross Vane Scour Pool	1	1.0	9	35	Class I	12
Cross Vane Base Stone	1	1.0	6	10	Class I	12
Step Pool	5	10.0	9	35	Class I	24
Riffle Grade Control	NA	11.0	80% 4", 20% 8"	5	Class 0	12

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL

NATURAL RESOURCES CONSERVATION SERVICE — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DEVISION — DATE 7/7/06

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 7/18/06

DIRECTOR — DATE 7/19/06

1.0 Cross Vane (CV)

1.1 Cross vanes are constructed such that the apex of the structure points upstream. The angle the wings make the upstream bank should be approximately 20 to 30 degrees so that flows are directed away from the banks and deeper pool areas are created directly downstream of the vane or weir. The center portion of the cross vane(s) is to be 1/3 the width of the top of the channel bank.

1.2 The top layer of rock shall rest upon at least one teir of footer rocks and shall be completely buried to match the streambed. On unstable bed substrates, two or more tiers of footer rocks may be required to prevent the downstream face of the vortex weir or cross vane from being undermined.

1.3 The top elevation of the center vortex rock at the apex of the vane should be at bed level to permit fish passage at low flows and the end vortex rocks on either bank should be at bankful level. The end vortex rocks should be partially buried in the streambank and should touch the adjoining vortex rocks.

1.4 Once the excavated portion of the bank has been backfilled, it should be armored with appropriately sized stone, sod mats, or willow transplants, as shown on the plan set.

1.5 Rocks shall meet the tenets of the 'Stone Sizing Chart' (this sheet). Rocks must have a density of greater than 160 lbs / cu. ft. Concrete will not be accepted in lieu of rocks for cross vanes. Immediately after construction, all voids shall be chinked by raking in bank run stone meeting the tenents of Specification 11.0.

2.0 Topsoil For Fill Areas

2.1 Immediately prior to spreading borrow topsoil, loosen the subgrade by tilling to a depth of at least three (3) inches to ensure adequate aeration of the subsoil. The subsoil shall be free of loose stones or other foreign material.

2.2 Borrow topsoil shall be uniformly placed and spread a minimum thickness of 3" within the project limits as indicated on the construction drawings or as directed by the design engineer. Do not spread topsoil while it is frozen, saturated or when the subsoil is wet or frozen. Correct any irregularities in the surface that result from topsoiling or other operations to prevent the formation of water pockets.

2.3 Incorporate the topsoil into the underlying subsoil. When topsoil is to be placed on slopes 3:1 or greater, on which the subsoil is of a suitable condition to blend with topsoil, the contractor shall work the topsoil into the subsoil by tilling. Where subsoil on slopes are of such a character that they will not blend with the topsoil, the contractor shall roughen, bench or serrate the slope to provide a bond for the topsoil. The stone shall be placed to its full course thickness in one operation in a manner that the underlying material will not be displaced or worked into the course of rock toe being placed.

3.0 Erosion Control Matting(ECM)

3.1 Unless specified otherwise, all erosion control matting (ECM) shall be BIO D-70, or approved equal. Matting shall be "keyed" into ground 12 inches on the top and bottom of slopes. Secure with 24"x2"x2" wooden stakes, 2 per square yard.

3.2 Base soil shall be tilled to a three-inch depth; rake in three inches of organic matter or top soil prior to ECM placement.

3.3 Seeding for ECM areas shall be seeded with mix as described in these specifications.

4.0 Backfill and Compaction

4.1 Stripping: The top 6 inches of soil and organic matter shall be stripped within the designated excavations and grading lines and deposited in storage piles. All excavated materials not suitable as topsoil or for other uses at the site shall be disposed offsite.

4.2 Satisfactory Fill Materials: Fill and backfill within the limits of the design points and beneath appurtenant structures shall be those materials classified in ASTM D 2487 as GW, GP, GM, GC, SW, SM, SC, or combinations thereof. The Contractor shall maintain proper specified compaction as directed by a qualified Geotechnical Engineer.

4.3 Subgrade Preparation: Unsatisfactory subgrade material shall be removed and replaced with satisfactory material as directed by the Design Engineer. All exposed subgrades shall be scarified to a depth of 3 inches before the fill is started. Slope surface steeper than 1 vertical to 3 horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. Compaction shall be accomplished by tamping (sheepfoot) rollers, pnuematic-tires rollers, steel-wheeled rollers, or other approved well suited to the soil being compacted. The contractor shall be prepared to moisten or aerate as necessary to provide an in-place moisture content within plus or minus 2 percent of optimum within the compacted lifts and/or subgrades for each material. Minimum subgrade density shall be as specified in paragraph for filling and backfilling.

4.4 Filling and Backfilling: Satisfactory materials shall be used in bringing fills and backfill to the proposed contours indicated on the plan and for replacing unsatisfactory materials. Satisfactory materials will be determined by the Design Engineer. Satisfactory materials shall be placed in horizontal layers not exceeding 8 inches in uncompacted thickness, or 6 inches when hand-operated compactors are used. After placing, each layer shall be moistened or aerated as necessary to obtain plus or minus 2 percent of optimum moisture, thoroughly mixed and compacted as specified. Backfilling shall not begin until construction below finish grade has been approved, underground utilities systems have been inspected, tested approved, and forms removed.

5.0 Erosion and Sediment Control

5.1 Construction operations will be carried out in such a manner that erosion will be controlled and water, air, and ground pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures to be employed during the construction process.

5.2 All work on permanent structures shall be carried out in areas free from flowing water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the permanent works. The Contractor shall also furnish, install, operate and maintain all necessary pumping and other equipment required for removal of water from the work area and for maintaining the excavations, foundations and other parts of the work free from water as required or directed by the Engineer. The stone shall be placed to its full course thickness in one operation in a manner that the underlying material will not be displaced or worked into the course of rock toe being placed.

6.0 Live Stake

6.1 Live branch cutting shall be approximately one quarter to one half inch (0.5" to 2") in diameter.

6.2 Cutting shall be long enough to reach the back of the bench and extend a minimum of one-foot (1') from the rebuilt slope face. Side branches and bark shall remain intact prior to installation.

6.3 Live branch cutting shall consist of a mix of three or more of the following species with at least one willow (Salix) and one dogwood (cornus) species included. Each species shall comprise no more than 50 % and no less than 20% of the mix.

Cornus amomum	Silky dogwood
Salix nigra	Black Willow
Sambucus canadensis	American elderberry
Vibernum dentatum	Arrowwood

STATE OF MARYLAND — TIMOTHY CLINTON SCHLER — No. 20207 — REGISTERED PROFESSIONAL ENGINEER — 6/29/06

6.3 Harvesting: The source of all live cutting shall be approved by the Project Engineer. The contractor shall locate, flag, and code the live cutting sites. The contractor shall notify the Project Engineer seventy-two (72) hours prior to harvesting for review and approval of all harvesting sites. Upon approval by the Project Engineer, the contactor shall be responsible for harvesting and transporting the cutting to the job site.

6.4 Live Material Preparation:

6.4.1 All cuts shall be smooth and the cut surface kept small. The use of large pruning shear or power saws may be required.

6.4.2 Live materials not installed within eight (8) hours of harvesting, shall be protected against drying out and overheating. Protection against drying out shall be accomplished by keeping the material: covered, transported in refrigerated vehicles, moistened and/or kept in soak pits. Storage of live materials shall include continuous shade by covering with evergreen branches or plastic sheeting. Proper storage shall also include sheltering live plant material from the wind and protection from drying by being heeled into moist soils and/or sprayed with anti-transpirant chemicals. Where water is available, live branch cutting shall be sprayed or immersed. Warm water (over 15°C) Stimulates growth and should be used only upon the approval of the engineer. Any cost associated with such storage is incidental to the overall costs

6.5 Construction:

6.5.1 Branches shall be constructed two to three foot (2'-3') deep and bud upward.

6.5.2 Branches shall be excavated horizontally on the contour. The surface of the branch shall be sloped so that the outside edge is higher than the back edge.

6.5.3 Branch tips shall extend a minimum of 6" into parent soil beyond leveling stone.

7.0 Invasive Species Control

7.1 Invasive species control program shall utilize appropriate Integrated Pest Management practices and the use of a professional certified pesticide applicator. The applicator shall be certified in the following categories depending upon the nature of the application area: Forest, Right of Way, or Aquatic Pest Control (for work directly adjacent to or over water).

7.2 Growth habits of invasives are rapid and site conditions may change dramatically, therefore the program may be altered at the time of implementation.

7.3 Cutting of the large plant masses followed by chemical controls is suggested at this time. Mowing of the the target species may occur any time of the year. Herbicide application will follow cutting. During the growing season, the identified plants may be treated with a non-selective herbicide (glyphosphate), applied according to label directions. However, care should be taken to ensure that the timing of the application is conducive to uptake and translocation of the herbicide. The applicator should ensure that the herbicide is listed for use against the selected species, and is labeled for aquatic use if the application will be made over water. During periods outside of the growing season, the woody weeds identified may be treated with systemic herbicides labeled for dormant season applications (triclopyr).

7.4 A follow up treatment of control is to be performed 1 month after the beginning of the following growing season (approximately May 1st).

7.5 It is the responsibility of the applicator to select the proper herbicide for the targeted species based on the time of year, and to use the herbicide in a manner that is consistent with the label. Additionally, it is the responsibility of the applicator to obtain Toxic Materials Permits for the use of herbicides over open water.

8.0 Class II Rip Rap

8.1 The contractor shall use MSHA Class II ungrouted rip rap (D_{50}=12 inches) as described according to the *Maryland Department of the Environment's 1994 Maryland Standards and Specifications for Soil and Erosion Control* , Section 18, "Standards and Specifications for Rock Outlet Protection." Rock shall be placed on a suitable filter cloth to a depth of 27 inches.

9.0 Stone Toe Protection

9.1 Rock toe protection shall be composed of angular stones sized per the tenets of the "Stone Sizing Chart" (this sheet).

9.2 All erosion and sediment control devices, including dewatering basins, shall be implemented as the first order of business according to a plan approved by the MCDPS. The proposed construction sequence for toe protection measures are as follows:

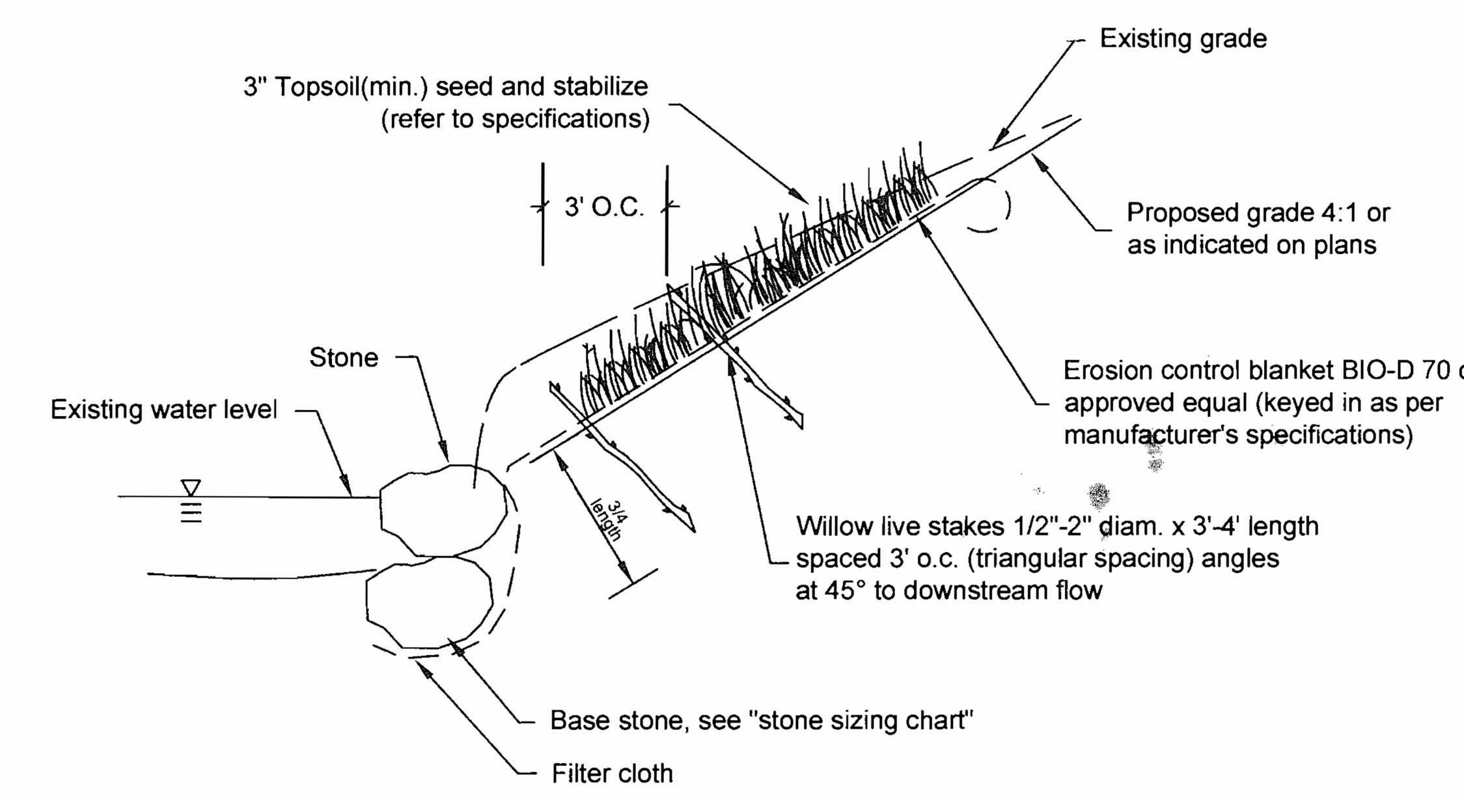
9.2.1 The stream shall be redirected by an approved temporary stream diversion. The construction area shall be dewatered, and any disturbed banks shall be stabilized.

9.2.2 Once construction is completed, the diversion shall be removed from upstream to downstream. Sediment control devices, including perimeter erosion controls, are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspection authority approves their removal.

10.0 Step Pools

10.1 See Sheet 8 for step pool details and specifications.

11.0 Reinforced Riffle Bank Run Stone See Sheet 8 for this information.



4 **STONE TOE (SPECIFICATION 9.0)**

Not to scale

Prepared for:
Howard County Dept. of Public Works
Bureau of Environmental Services
6751 Columbia Gateway Drive, #514
Columbia, MD 21046
Phone: (410) 313-6417
Attn: Mr. Richard Powell

Village of Oakland Mills
Election District 6
Section 5 Stevens Forest Area 6
Open Space Lot 258
0.989 Acres

Howard County Capital Improvements Project No. D-1126
FAREWELL ROAD STREAM STABILIZATION
Columbia, Maryland
Bioengineering Details & Specifications

DATE:	06/06
DESIGNED:	TCS
DRAFTED:	HT
CHECKED:	TCS
BASE DATA:	CPJ

NO.	REVISIONS	BY	DATE

CPJ Associates
CPJ/EQR Environmental Services Division
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SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE As Shown

SHEET 6 OF 9 SHEETS

JOB NO. 35-554

SDP-06-091

Xrefs: Title.dwg Livestakes.dwg Fibermatkey.dwg Crossvane.dwg Stone toe.dwg

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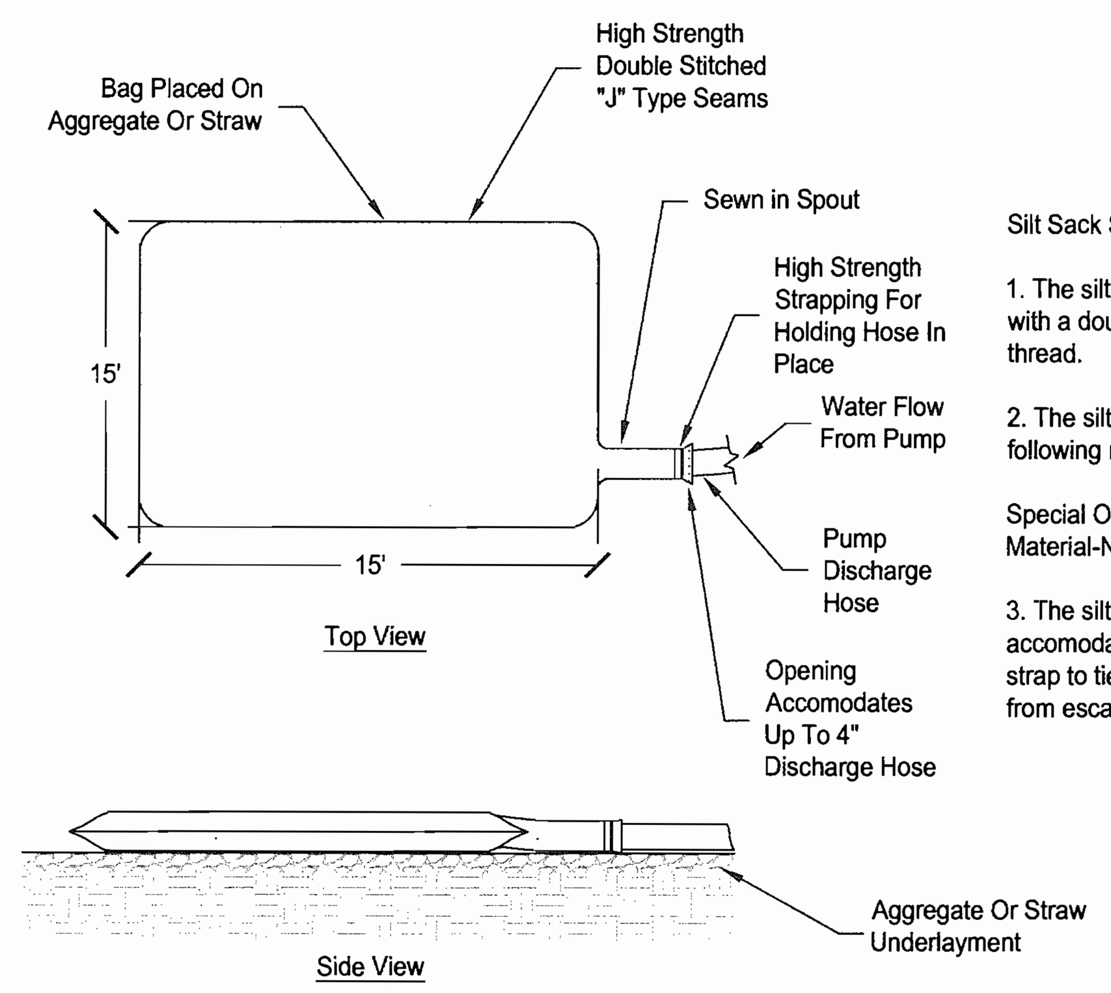

Silt Sack Specifications:

1. The silt sack shall be a nonwoven bag which is sewn with a double needle machine using a high strength thread.

2. The silt sack seams shall shall be constructed of the following material:

Special Order-Amoco Fabric #4557-12OZ.
Material-Nonwoven

3. The silt sack will have an opening large enough to accomodate a four (4) inch discharge hose with attached strap to tie off the hose to prevent the pumped water from escaping from the silt sack without being filtered.

(A) SILT CONTROL SYSTEM SILT SACK

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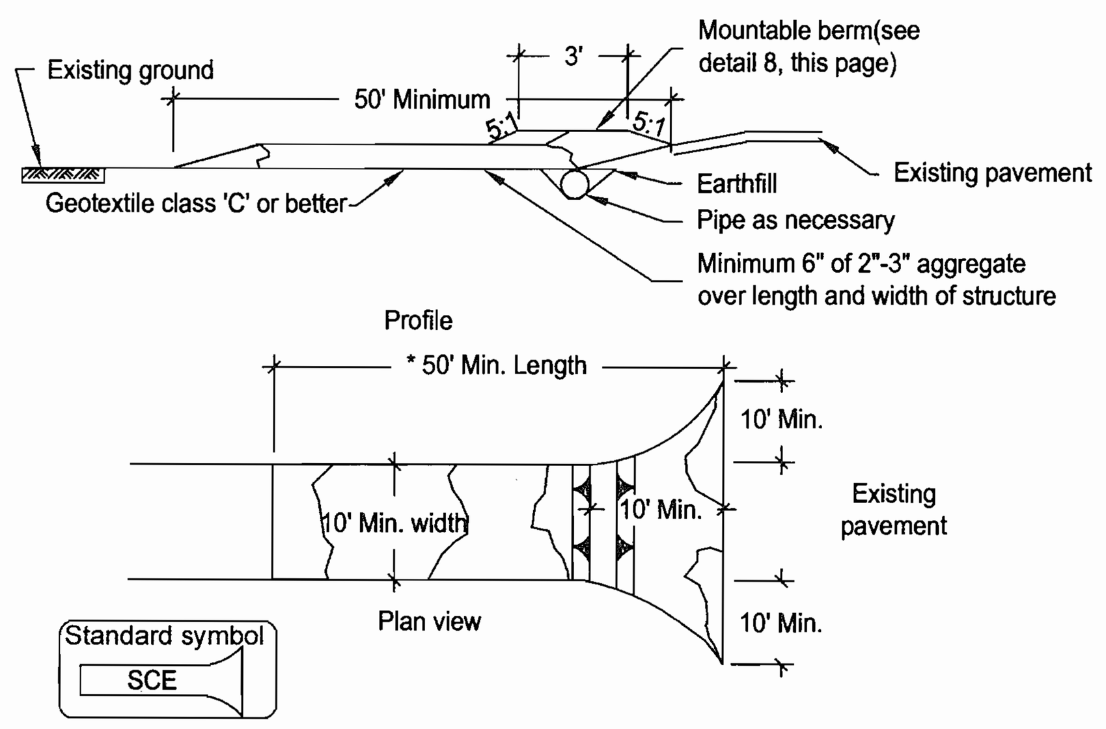
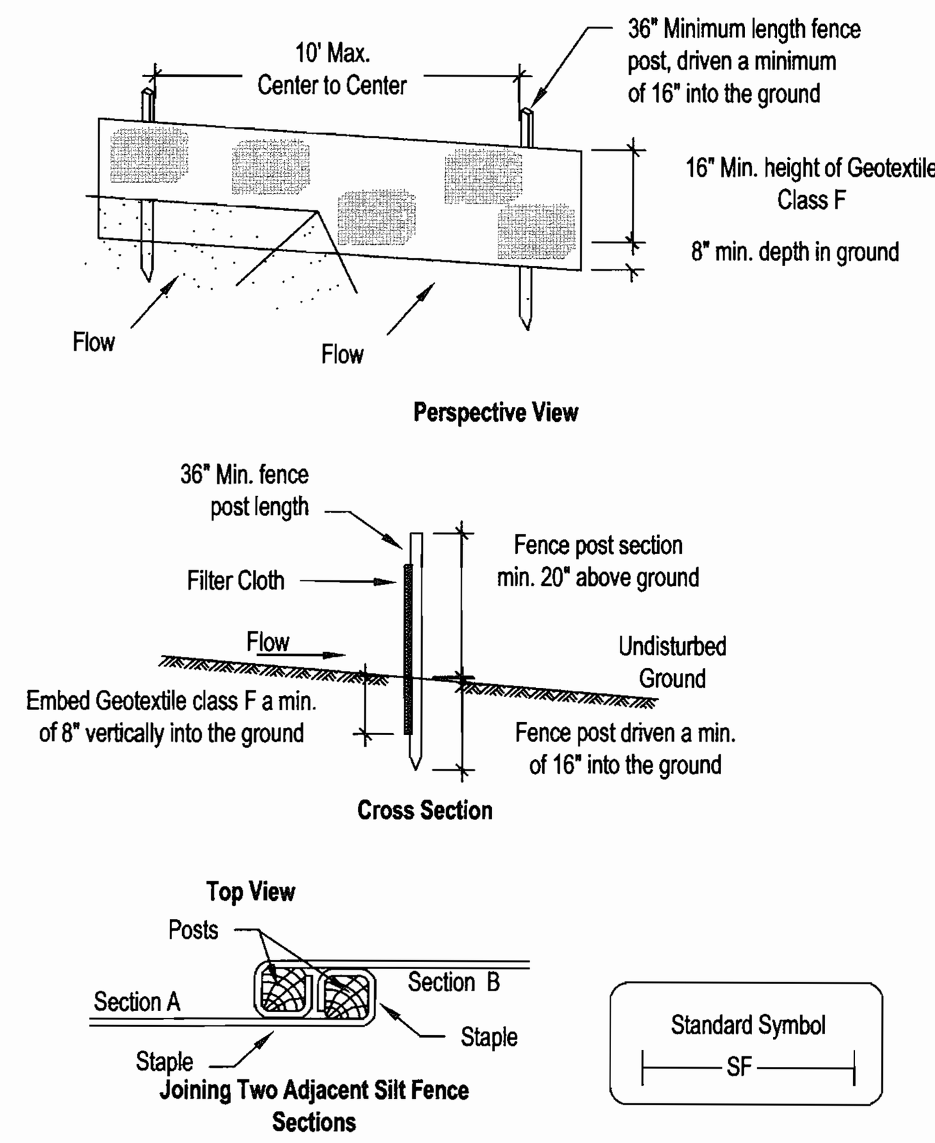


Construction Specifications:
1. Length - minimum of 50' (*30' for single residence lot).
2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval 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.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

(B) STABILIZED CONSTRUCTION ENTRANCE

Not to scale



(C) SILT FENCE DETAIL

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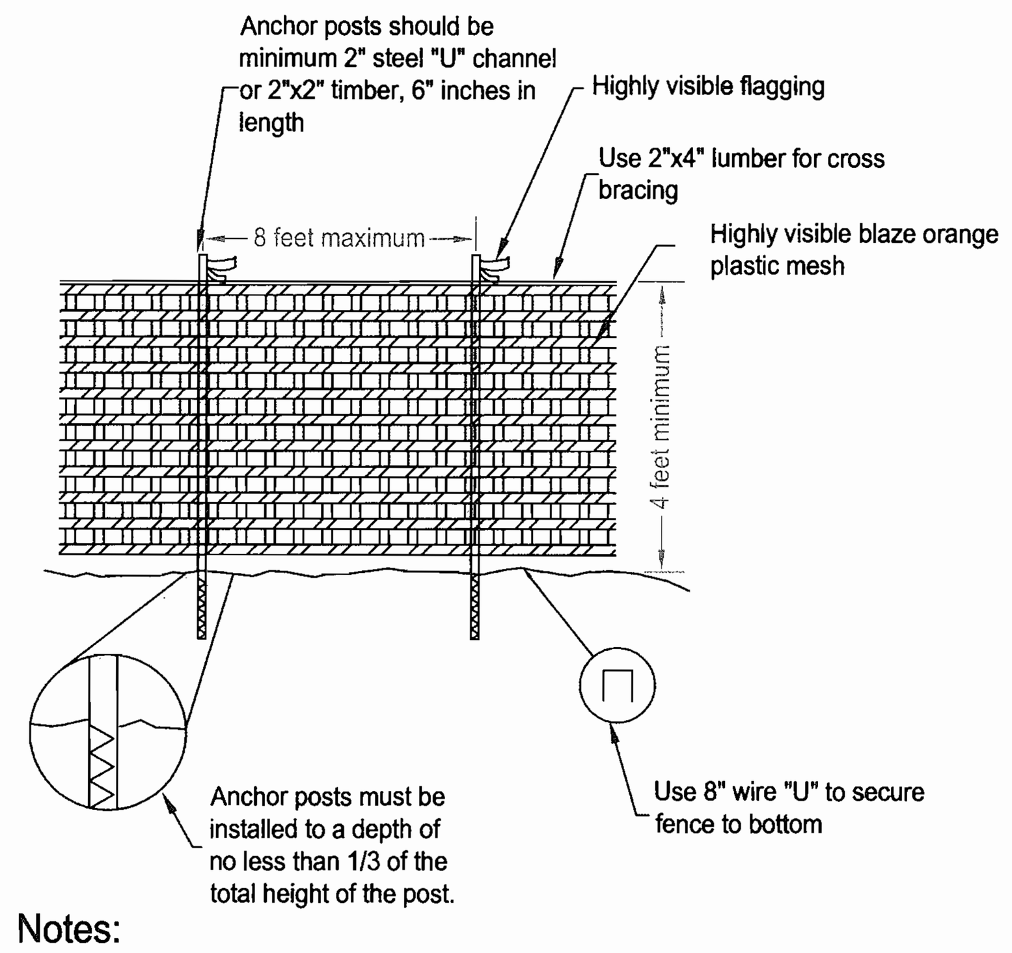


Notes:
1. Forest protection device only.
2. Retention area will be set as part of the review process.
3. Boundaries of retention area should be staked and flagged prior to installing devices.
4. Avoid root damage when placing anchor posts.
5. Device should be properly maintained during construction.
6. Protective signage is also required.

Source: :Prince Georges County, Maryland: Woodland Conservation Manual from Maryland State Forest Conservation Manual

(D) PEDESTRIAN AND TREE SAVE FENCE DETAIL

Not to scale

HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A minimum of 48 hours notice must be given to the Howard County Department of Inspections, Licenses and Permits, Sediment Control Division prior to the start of any construction (313-1855).
2. 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 EROSION AND SEDIMENT CONTROL and revisions thereto.
3. Following intial soil disturbance or re-disturbance, permanant or temporary stabilization shall be completed within: a) 7 calender days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1, b) 14 days as to all other disturbed or graded areas on the project site.
4. All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol 1, Chapter 12 of the HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
5. All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanant seeding (Sec. 51), sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec.52). Temporary stabilization and mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
6. 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.
7. Site Analysis:

Total Area of site	2.46	acres.
Area Disturbed	0.65	acres.
Area to be roofed or paved	0	acres.
Area to be vegetatively stabilized	1.1	acres.
Total Cut	615	Cu. Yds.
Total Fill	200	Cu. Yds.
Offsite waste/borrow area location	To be Provided by the Contractor for Approval by the Project Manager	

8. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
9. Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
10. 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.
11. Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized by the end of each work day, whichever is shorter.

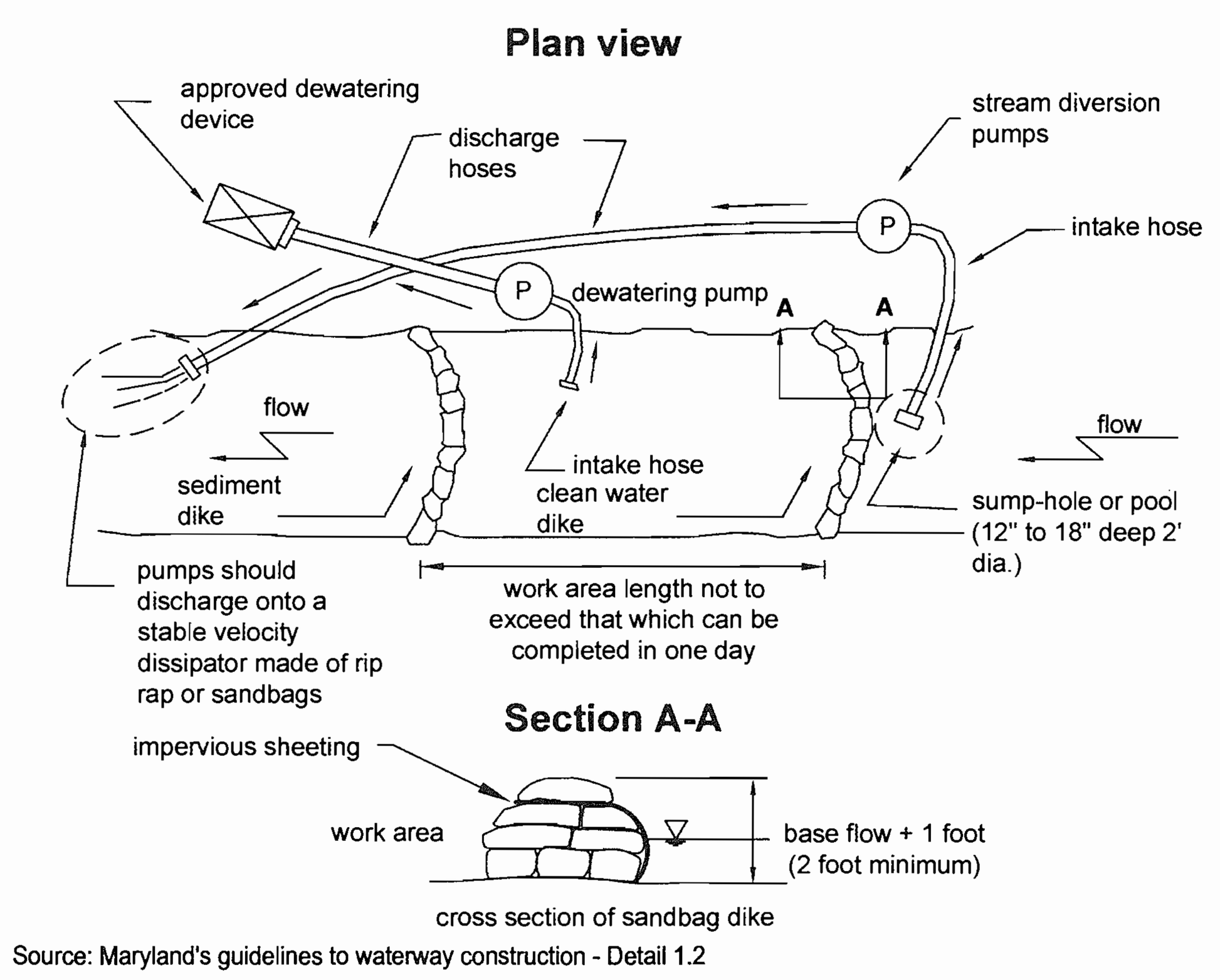
1. All sediment control practices will be based on criteria from the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control or as amended by the District.
2. Stormwater management must be in accordance with the Howard County Guidelines.
3. Following initial soil disturbance or redisturbances, permanent or temporary stabilization shall be completed within 7 working days.
4. A stabilized construction entrance will be installed and maintained for each site.
5. Topsoil will be stockpiled within the limits of the site and the area down slope protected by straw bale, dikes, or silt fence.
6. All clearing and grading shall be completed in the following sequence:
   A. Clear and grub for the installation of construction entrance, silt fence, straw bale dike and other sediment control practices.
   B. Install silt fence, straw bale dike, stabilized construction entrance, and any other sediment control practices required by inspector.
   C. Grade and site and/or construct any structures, paving, and/or utilities.
   D. Stabilize the site according to the seeding or sodding specs.
   E. After site has been stabilized (minimum stabilization by seeding and mulching), with the permission of the sediment control Inspector, remove sediment control practices and stabilize remaining disturbed areas.
7. Access to the site will be available at all times to Howard County personnel.
8. A site plan must be provided showing all information such as location, type of sediment control devices, etc.
9. Refer to *"1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control"* for standard details and detailed specifications of each practice specified herein.
10. With the approval of the sediment control inspector, minor field adjustments can and will be made to insure the control of any sediment. Changes in sediment control practices require prior approval of the sediment control inspector and the Howard County Soil Conservation District.
11. At the end of each working day, all sediment control practices will be inspected and left in operational condition.
12. Following initial soil disturbance or redisturbance, permanent or temporary stabilization shall be completed within: a) seven calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes greater than three horizontal to one vertical (3:1), and b) fourteen days as to all other disturbed or graded areas on the project sites which will remain idle over fourteen days.
13. Any change to the grading proposed on this plan requires re-submission to Howard County Soil Conservation District for approval.
14. Dust control will be provided for all disturbed areas. *Refer to "1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control"*, page H-30-1, for acceptable methods and specifications for dust control.
15. Any variations from the sequence of operations stated on this plan requires the approval of the sediment control inspector and the Howard County Soil Conservation District prior to the initiation of the change.
16. Excess cut of borrow material shall go to, or come from, respectively, a site with an open grading permit.
17. The following item may be used as applicable: Refer to *"Maryland's Guidelines to Waterway Construction"* by the Water Management Administration of the Maryland Department of the Environment, revised November 2000, for standard details and detailed specifications of each practice specified herein for waterway construction.

Pump-Around Practice
Temporary measure for dewatering in-channel construction sites.

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

Implementation Sequence
Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to detail 1.2).

1. 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.
2. The contractor should notify the Maryland Department of the Environment or WMA sediment control 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.
3. The contractor should conduct a pre-construction meeting on site with the WMA sediment control 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 WMA or local authority.
4. Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control 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.
5. Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.
6. Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of riprap or sandbags.
7. 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 back into the channel below the downstream sandbag dike.
8. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified. (*See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction*).
9. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans.
10. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike would be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.
11. 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.
12. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.
13. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
14. After construction, all disturbed areas should be regraded and revegetated as per the planting plan.



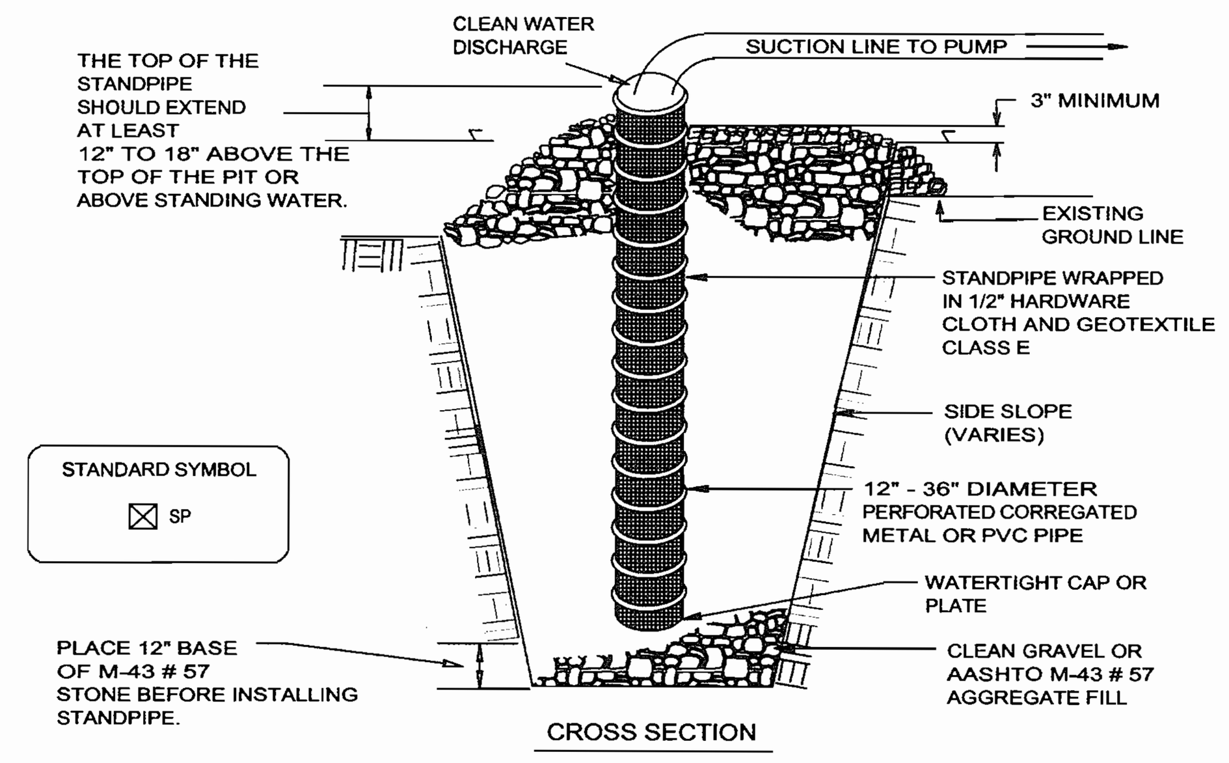
Source: Maryland's guidelines to waterway construction - Detail 1.2

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

Approved [signature] 7/11/06
Howard S.C.D. Date

(E) PUMP-AROUND PRACTICE SANDBAG/STONE CHANNEL DIVERSION

Not to scale



CROSS SECTION

Construction Specifications

1. Pit dimensions are variable, with the minimum diameter being 2 times the standpipe diameter.

2. The standpipe should be constructed by perforating a 12" to 24" diameter corrugated or PVC pipe. Then wrapping with 1/2" hardware cloth and Geotextile Class E. The perforations shall be 1/2" x 6" slits or 1" diameter holes.

3. A base of filter material consisting of clean gravel or #57 stone should be placed in the pit to a depth of 12". After installing the standpipe, the pit surrounding the standpipe should then be backfilled with the same filter material.

4. The standpipe should extend 12" to 18" above the lip of the pit or the riser crest elevation (basin dewatering only) and the filter material should extend 3" minimum above the anticipated standing water elevation.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

(F) SUMP & DEWATERING DEVICE

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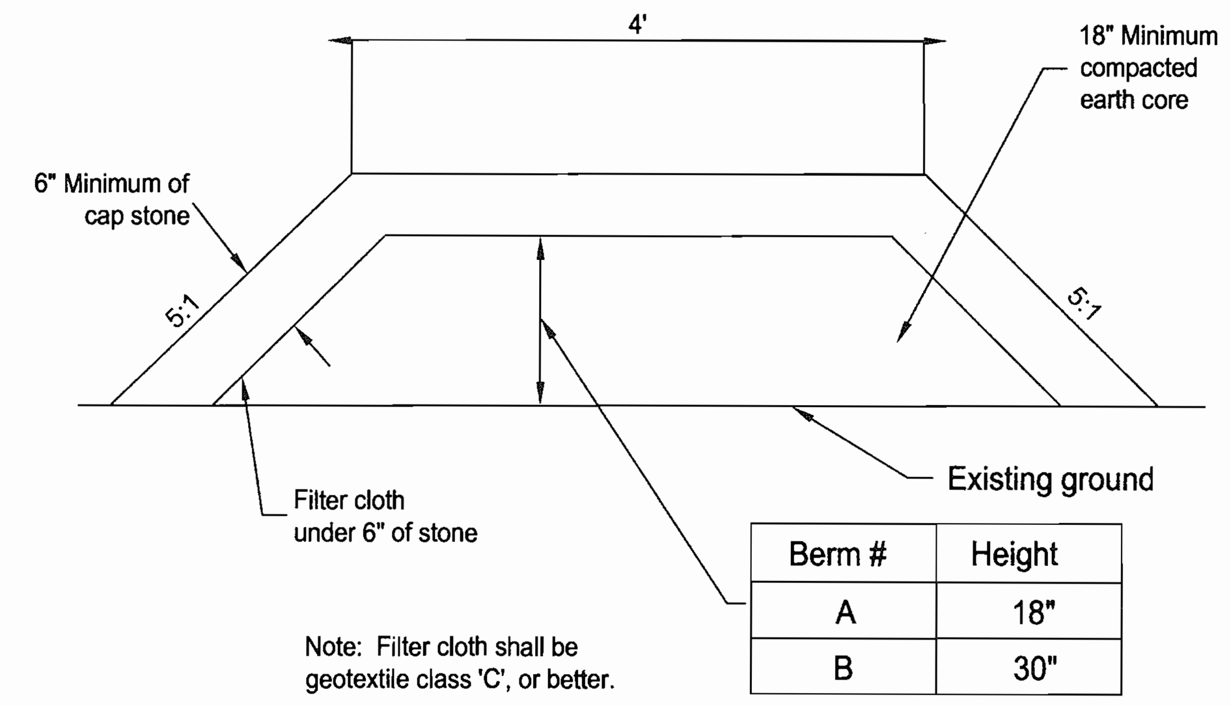


Berm #	Height
A	18"
B	30"

Note: Filter cloth shall be geotextile class 'C', or better.

(G) MOUNTABLE BERM

Not to scale

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.

[signature] 7/11/06
NATURAL RESOURCES CONSERVATION SERVICE DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION [signature]	DATE 7/17/06
CHIEF, DIVISION OF LAND DEVELOPMENT [signature]	7/18/06
DIRECTOR [signature]	DATE 7/18/06

Prepared for:
Howard County Dept. of Public Works
Bureau of Environmental Services
6751 Columbia Gateway Drive, #514
Columbia, MD 21046
Phone: (410) 313-6417
Attn: Mr. Richard Powell

Village of Oakland Mills
Election District 6
Section 5 Stevens Forest Area 6
Open Space Lot 258
0.989 Acres

Howard County Capital Improvements Project No. D-1126
FAREWELL ROAD STREAM STABILIZATION
Columbia, Maryland

Sediment Control Details

DATE:	06/06
DESIGNED:	TCS
DRAFTED:	HT
CHECKED:	TCS
BASE DATA:	CPJ

NO.	REVISIONS	BY	DATE

CPJ Associates
CPJ/EQR Environmental Services Division
STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
8905 QUINCE ORCHARD ROAD GAITHERSBURG MARYLAND 20878
Phone:(301)208-9573 E-mail:info@eqri.com Fax:(301)926-4551
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE As Shown

JOB NO. 35-554

SDP-06-091

SDP-06-091

Xrefs: Title.dwg
Silt Control.dwg
sce.dwg
Siltfence.dwg
Pedandtreefence.dwg
Mountberm.dwg
Pumparound.dwg
Dewater.dwg

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 *serecia 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; P20S (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 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 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. down a sl

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

SECTION II -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 113 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.

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

Approved [signature] 7/11/06
Howard S.C.D. Date

SECTION III-GEOTEXTILE FABRICS MATERIALS SPECIFICATIONS:

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	190

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

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

a.Apparent opening size MSMT 323

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

c.Burst strength ASTM D 3786

d.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 polyolephins, polyesters, or polyamides. The geotextile fabric shall resist deterioration from ultraviolet exposure.

e.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.

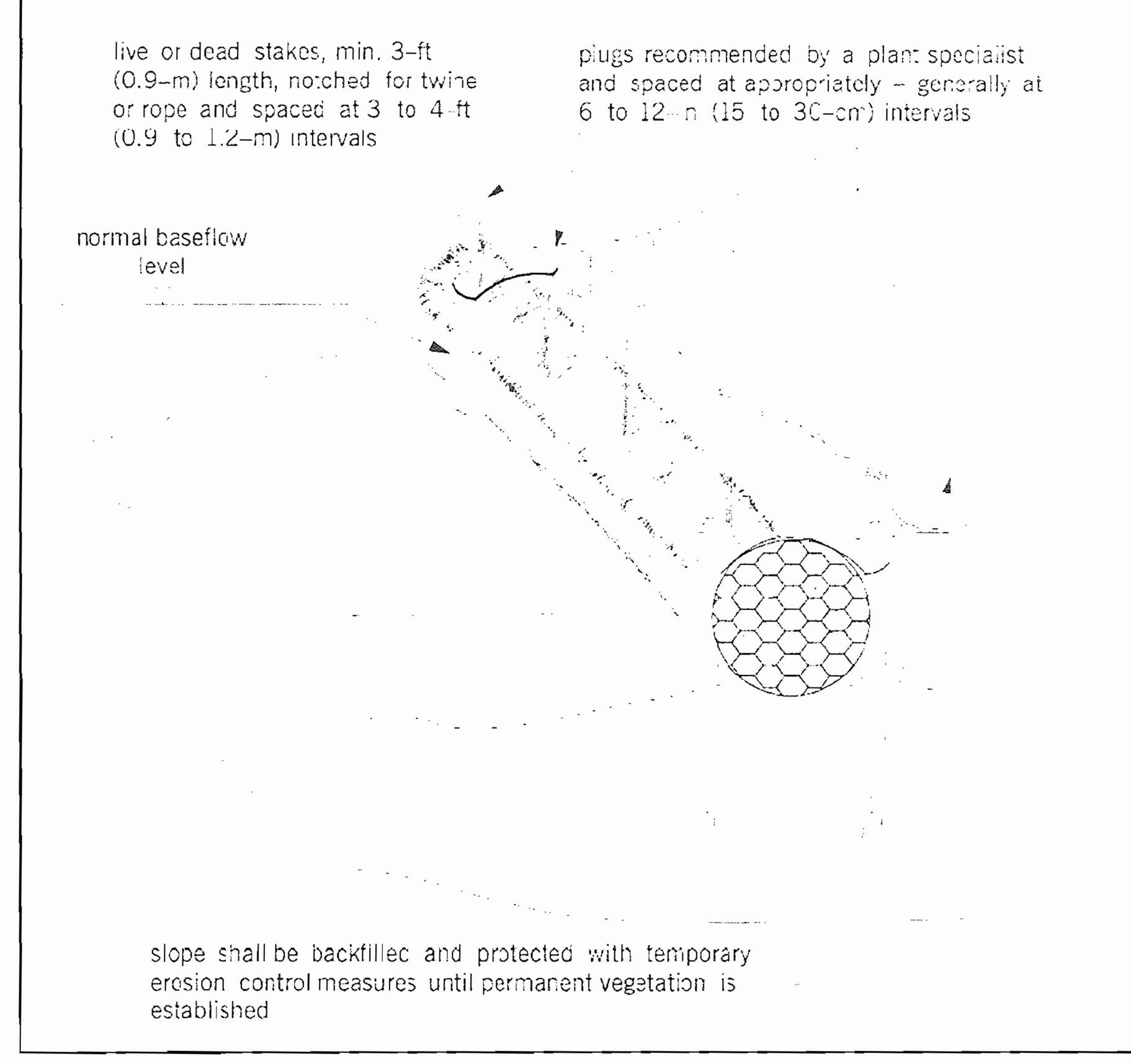
SECTION IV-SILT FENCE MATERIALS:
a. Class F geotextile fabrics for silt fence shall have a 50 lb./in. minimum tensile strength and a 20 lb./in. minimum tensile modules when tested in accordance with MSMT 509. The material shall also have a 0.3 gal./ft.2/min. flow rate and seventy-five percent (75 %) minimum filtering efficiency when tested in accordance with MSMT 322.

b. 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.

Maryland's Guidelines To Waterway Construction
DETAIL 2.6: NATURAL FIBER ROLLS

DETAIL

Adapted From Goldsmith and Bestmann (1992)



MGWC 2.6: NATURAL FIBER ROLLS
2. Plants should be plugged in an alternating pattern along the top of the fiber log in gaps between the coir fiber netting. Appropriate species and a spacing ranging from 6 to 12 inches (0.15 to 0.3 meters) should be selected by a plant specialist according to site characteristics such as soil properties, anticipated post-construction bank slope, water chemistry, amount of available sunlight, and expected duration of inundation during high stream flows. If water levels are too low for the fiber logs to be submerged *Y2* to 2/3 of their diameter, plants should be plugged inside the soil/log interface where they will receive adequate moisture.

3. Dead or live stakes should be used to anchor the fiber logs in place. Stakes should be notched approximately 5 inches (13 centimeters) from their tops and pounded partially into the ground on either side of the bundle at a spacing of3 to 4 feet (0.9 to 1.2 meters). Twine should be tied from the notch in one stake to the notch in the stake directly opposite. The stakes should then be driven so that the twine is secured against the top of the roll. Ideally, the top of the stake should be flush with the top of the roll.

4. The ends of adjacent logs should be laced together with twine by making a number of passes in the end netting between the logs and pulling the twine taut. Where a fiber roll does not abut another fiber roll, the end should be bent inward and buried in the bank to prevent water from intruding behind the roll and dislodging it.

5. Successive rows of fiber rolls should be offset 3 to 8 inches (8 to 20 centimeters). Additional1y, to ensure that roots extend into the soil, plants should be plugged into the sides of the fiber log near the soil. The need to backfill/contour the soil behind the fiber logs and between successive lifts will depend on the specific aesthetic and physical requirements of the project. The re-contoured soil should be seeded and/or plugged with appropriate vegetative species and covered with an erosion control blanket to prevent slope erosion.

Coir Log for Sediment Control

10.0 ROCK/STONE PLACEMENT FOR RIP RAP CHANNELS AND STEP POOLS

10.1 All stone shall be from quarries within 50 miles of site. Stone shall be angular, similar in color, texture and density to the native rock onsite. The dry unit weight of the stone shall be 160 lb / cu ft or greater. Concrete shall not be acceptable.

10.2 The contractor shall supply to the design engineer certification from the source quarry that the stone meets (1) the proper rock classification, (2) weight per cubic foot, and (3) sizing and quantities as detailed below.

10.3 Placement for rock toe protection and/or grade control: Stones to be uniformly placed (non-segregated) with large stones buried or "push-placed" at least one-half their diameter. Place on erosion control matting/geotextile as specified herein. Stones shall not prohibit or retard flow over what is called for on plans. Voids shall be chinked with smaller select stone. Placement tolerance shall be +/- three (3) inches for grade checks at center, beginning and end of step pool.

10.4 If excavation is required for placement, follow excavation specifications. No excavation is required if base material is solid or decomposing bedrock. However, if design grades and tolerances cannot be achieved, immediately contact the Design Engineer for a possible field modification.

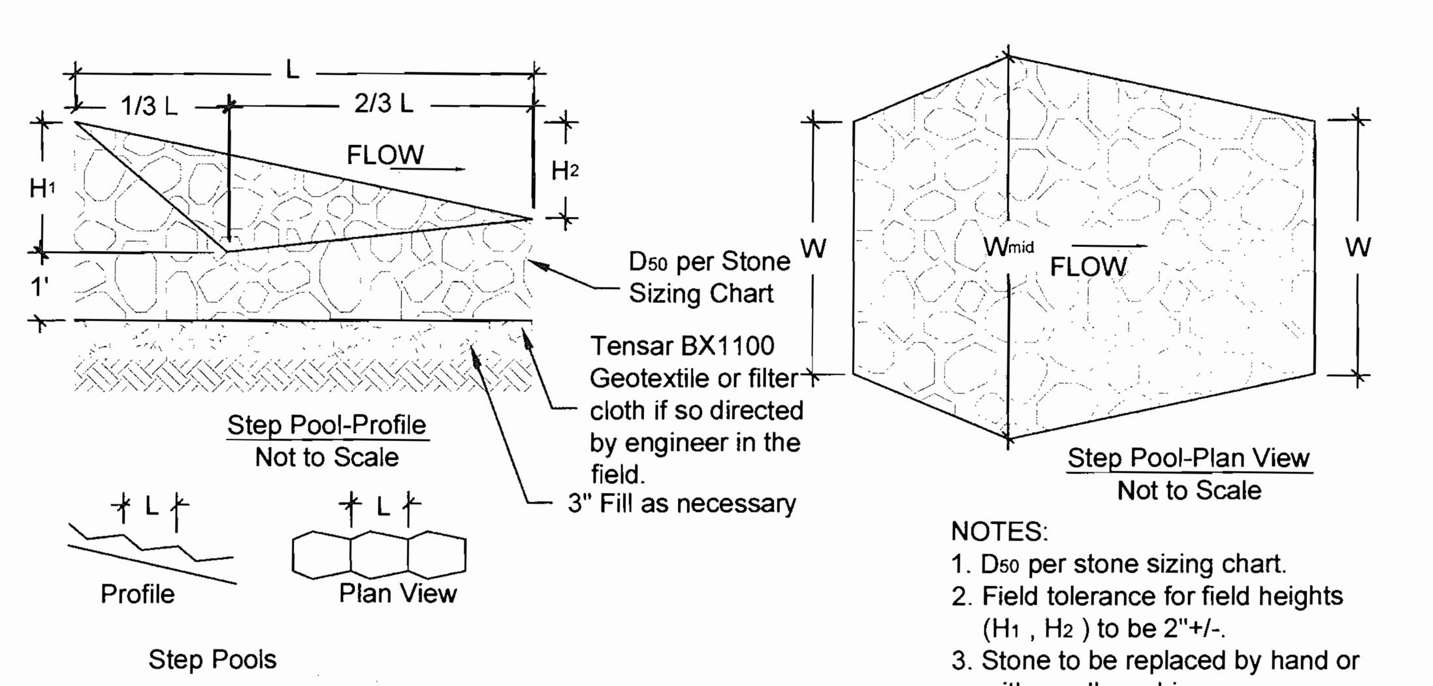
10.5 If fill is required for placement, follow suitable backfill specifications. The transition of layers (from bottom to top): sub base (scarified if not bedrock), compacted suitable subgrade, filter cloth, transitional gravel, cobble layer, (Tensar BX1100 or approved equivalent), then stone.

10.6 Stone size shall be per stone sizing chart. Immediately after construction, all voids shall be chinked by raking in bank run stone meeting the tenents of Specification 11.0.

11.0 REINFORCED RIFFLE BANK RUN STONE

11.1 Contractor shall use bank run rounded stone to reinforce the riffles and elsewhere as specified. A sample of stone must be approved by the disign engineer prior to placement. 80 % of the material shall have a D_0 of 1.0 inch, D_{50} of 4.0 inches and a D_{100} of 6.0 inches, and shall be well graded. 20 % of the mix shall have a D_0 of 4 inches, a D_{50} of 8 inches and a D_{100} of 10 inches.

Station	L	W	W_{mid}	H_1	H_2
0+00	10	4	8	1.5	0.5
0+10	10	4	8	1.5	0.5
0+20	10	4	8	1.5	0.5
0+30	10	4	8	1.5	0.5
0+40	10	4	8	1.5	0.5
4+86	10	4	8	1.5	0.5
4+96	10	4	8	1.5	0.5



NOTES:
1. D_{50} per stone sizing chart.
2. Field tolerance for field heights (H_1 , H_2) to be 2"+/-.
3. Stone to be replaced by hand or with small machinery.

5 **STEP POOL (SPECIFICATION 10.0)**
Not to scale

STATE OF MARYLAND REGISTERED PROFESSIONAL ENGINEER [seal] 6/29/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.

[signature] 7/11/06
NATURAL RESOURCES CONSERVATION SERVICE DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
[signature] 7/17/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE
[signature] 7/18/06
CHIEF, DIVISION OF LAND DEVELOPMENT DATE
[signature] 7/19/06
DIRECTOR DATE

Prepared for:
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Attn: Mr. Richard Powell

Village of Oakland Mills
Election District 6
Section 5 Stevens Forest Area 6
Open Space Lot 258
0.989 Acres

Howard County Capital Improvements Project No. D-1126
FAREWELL ROAD STREAM STABILIZATION
Columbia, Maryland
Sediment Control Specifications

DATE: 06/06					
DESIGNED: TCS					
DRAFTED: HT					
CHECKED: TCS					
BASE DATA: CPJ	NO.	REVISIONS	BY	DATE	

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CPJ/EQR Environmental Services Division
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895 QUINCE ORCHARD ROAD GAITHERSBURG MARYLAND 20878
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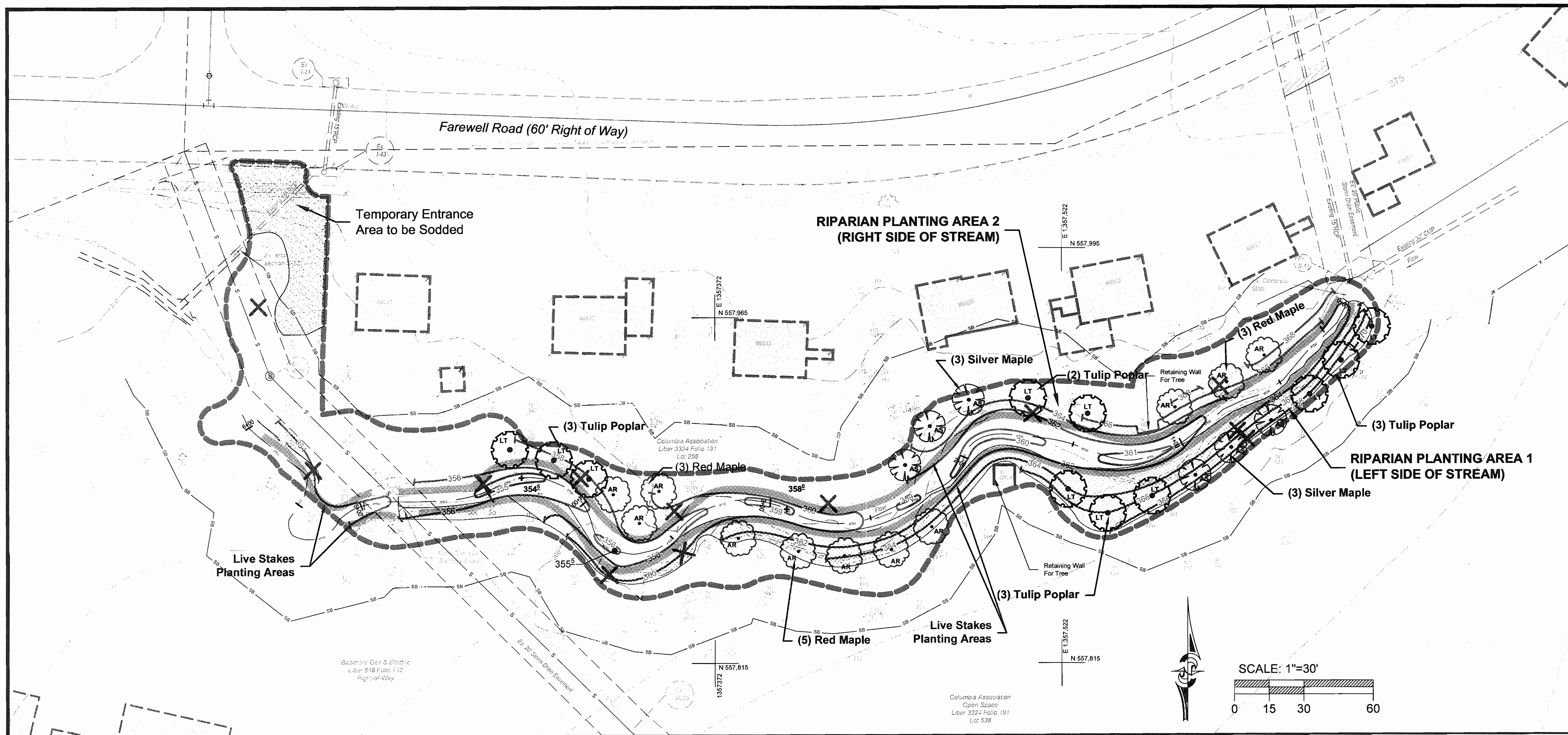
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE
As Shown
SHEET
8
OF 9 SHEETS
JOB NO.
35-554

Xrefs: Title.dwg
Step Pool.dwg

SDP-06-091

SDP-06-091



STREAMBANK PLANTING SCHEDULE
PARTIAL SHADED RIPARIAN CONDTITION

	Common Name	Scientific Name	Size	QUANTITY 1	2	*	Total	Spacing
TREES	Red Maple (AR)	*Acer rubrum*	1" Caliper	5	5		10	20' O.C.
	Silver Maple	*Acer Saccharinum*	1" Caliper	3	3		6	20' O.C.
	Tulip Poplar (LT)	*Liriodendron tulipifera*	1" Caliper	6	5		11	20' O.C.
SHRUBS	Spicebush	*Lindera benzoin*	1" Caliper	15	13		28	10' O.C.
	Arrowwood	*Viburnum dentatum*	2 Gallon	15	13		28	10' O.C.
	Common Alder	*Alnus serrulata*	2 gallon	20	14		34	10' O.C.
STAKES Stationing 0+00-6+00	Silky Dogwood	*Cornus amomum*	3' Stakes	60	60		120	3' O.C.
	River Birch	*Betula nigra L.*	3' Stakes	60	60		120	3' O.C.
	Black Willow	*Salix nigra*	3' Stakes	80	80		160	3' O.C.

Notes:
1. If any of the plants listed are unavailable, substitutions must be approved by designer and County Forester.
2. Live stakes shall not be planted higher than 2.5' above stream invert.

Partial Shaded Woodland - For use with Coir Fiber Matting and all other disturbed areas.
Application Rate - 15 pounds per acre
(pure live seed - 20 lb/ac annual Rye)
Ernst Conservation Seeds (ERNMX-MOD-140)

Percent	Scientific Name	Common Name
25.0%	*Elymus virginicus*	Virginia Wild Rye
10.0%	*Elymus canadensis*	Canada Wild Rye
5.0%	*Onoclea sensibilis*	Sensitive Fern
4.0%	*Lobelia cardinalis*	Cardinal Flower
3.0%	*Cinnia arundinacea*	Wood Reedgrass
3.0%	*Leersia oryzoides*	Rice Cutgrass
6.0%	*Hamamelis virginiana*	Witch Hazel
8.0%	*Cornus racemosa*	Gray Dogwood
5.0%	*Cornus amomum*	Silky Dogwood
5.0%	*Acer rubra*	Red Maple
5.0%	*Lindera benzoin*	Spicebush
8.0%	*Platanus occidentalis*	American Sycamore
6.0%	*Viburnum dentatum*	Arrowwood
7.0%	*Cornus florida*	Flowering Dogwood

Temporary Seeding	
Quantity	Common Name
20 lbs./ac.	Annual Rye

PLANTING SPECIFICATIONS

QUALITY ASSURANCE (reference standards)

A. American Association of Nurserymen (A.A.N.): "American Standard for Nursery Stock", (A.N.S.I. Z60.1, 1996) as expanded herein.
B. Nomenclature: In accordance with HORTUS III by L. H. Bailey.
C. United States Department of Agriculture: Textural Classification
D. Diagram for Soils. Federal Specifications: Q-P-166e as applicable to Peat Moss.
E. National Arborist Association "Standard for Pruning of Shade Trees, Guying of Shade Trees, Fertilizing Shade and Ornamental Trees and Pesticides Application Operations."

DELIVERY, STORAGE, AND HANDLING

1. Store plants that cannot be planted within 24 hours in a sheltered place, balls covered with straw mulch; water and maintain as required until planted.
2. Transport and handle plants so foliage, roots, and containers are protected from breakage, sun, and winds. Tops or roots of plants allowed to dry out or which have been damaged or have disturbed root balls will be cause for rejection.
3. B & B (balled and burlapped) plants: Firm, natural balls of soil, with size and in accordance with A.A.N. Standards.
4. Container-grown stock shall not be removed from containers until planting time.

PLANT CRITERIA

1. Plants supplied shall conform in all respects to the current edition of the *American Standard for Nursery Stock* (ANSI Z60.2.) They shall be nursery grown in accordance with good horticultural practice and grown under climatic conditions similar to those in the locality of the project. Plant names shall be those given in the edition of *Standard Plant Names*.
2. Prior to planting, protect plants at all times from sun and drying winds. Plants that cannot be planted immediately shall be kept in the shade, and kept well watered. Plants shall not remain unplanted for more than three (3) calendar days unless adequate irrigation and protection from the elements is provided on site.
3. Plants shall not be bound with wire or rope at any time so as to damage the bark or break branches and twigs.
4. Plants must be sound, healthy, and vigorous; well branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs, or larvae and shall have healthy, well-developed root systems. Plants must be free from physical damage or adverse conditions that would prevent vigorous growth. All trees shall be single stem specimens unless otherwise noted.
5. Plants must be true species and variety shown on drawings.
6. Container grown plants shall not have roots that encircle the rootball.
7. Trees that have damaged or crooked leader, missing leaders or multiple leaders, unless specifically specified, will be rejected. Trees with damage or abrasion of the bark, sun scalds, disfiguring knots, or fresh cuts more than 1-1/4" that have not completely callused will be rejected. Rejected plants will be removed immediately from the site.
8. All plants shall be certified pest free by the Department of Agriculture of the state of origin.

SITE CONDITIONS AND PLANT INSTALLATION METHODS
1. Wetland planting shall commence after final grading has been completed.
2. Planting window for containerized woody plant material March 1 - December 30; for herbaceous plugs - March 1 - May 15 and September 15 - November 15. When planting in June and August, careful consideration should be given to weather conditions (drought, high temperatures, etc.) and the ability to water during adverse weather conditions.
3. Layout plants in locations shown on drawings. Use wire stakes color-coded for each species of plant material. Stake location of each tree and major shrub and outline of shrub and ground cover beds.
4. Obtain the approval of the M-NCPPC Construction Manager of layout before planting. The Contractor shall provide a minimum of 14 calendar days notice to M-NCPPC for review of planting bed and plant layout.
5. Plant Spacing, layout and installation - See Planting Plan Details, Plant Lists, and Plant Layout details this sheet.
6. The Landscape Designer will check location of plants in the field and shall adjust to exact position before planting begins.
7. The Contractor shall determine the location of all underground utilities prior to soil work and plant installation and perform work in a manner that will protect utilities from damage. Hand excavate as required and provide adequate means of support and protection of utilities during soil and planting operations. Maintain grade stakes set by others until parties concerned mutually agree upon removal. The Contractor shall repair all utilities damaged by soil and planting operations at the Contractor's expense.

8. INSTALLATION OF B&B AND CONTAINERIZED PLANT MATERIAL
a. The root collar of all trees and shrubs should be planted level with existing grade as shown in the planting details. The root collar flares out at the base of the trunk, just above the roots. The flared base of the trunk shall always remain above the surface and the roots should be covered with soil. Compliance could entail excavation and removal of excessive soil on the top of the root ball before the plant is acceptable for planting.
b. Place the plant material in the planting pit, planting bed, or planter to proper grade and alignment indicated.
c. Set trees on undisturbed grade to prevent plant from sinking.
d. For container plants, remove plant from container taking care not to damage root ball. After removing plant, vertically score root ball using a sharp knife, about 1/8-inch deep and about every 2 to 3-inches in circumference.
e. For balled and burlapped material, remove and discard of all burlap, ropes, and wires from trunks and top one-half of B&B root balls.
f. Set plants upright, plumb centered in pits and positioned as directed by the M-NCPPC Construction Manager.
g. Space ground cover and perennial plants in accordance with indicated dimensions and spacing requirements as shown on plans.
h. Install ground cover plants and perennials so that roots are surrounded by soil below mulch.
i. Install bulbs so that growing tip is at depth recommended by bulb supplier for the species.
j. Backfill with soil mixture specified: existing soil & inoculant. Inoculant must be added to existing soil backfill in the presence of the M-NCPPC Construction Manager.
k. Spread mulch in required areas to a depth of 3 inches.
l. Thoroughly water all planted areas immediately after planting. Ensure root balls are saturated and saucers do not wash out. Each plant should be watered thoroughly on the inside of the saucer until it is filled, even during rain. After watering, rake mulch to provide a uniform finished surface. Slow release watering devices will improve survivability.
9. Stake all trees requiring staking within 24 hours after planting. Stakes and any guy wire shall be removed at the end of guarantee period and disposed of off-site by the contractor.

MAINTENANCE BY THE CONTRACTOR

A. The Contractor's Maintenance Period shall begin at mobilization and last through 1 year after the issuance of a Certificate of Substantial Completion (AIA#G704).
B. The Contractor's maintenance of new planting shall consist of watering, cultivating, weeding, mulching, re-staking, tightening and repair of guys, resetting plants to proper grades or upright position, and furnishing and applying such pesticide sprays and invigorants as are necessary to keep the plantings free of insects and disease and in thriving condition. against damage of all kinds for duration
C. Protect planting areas and plants at all times of maintenance period. Maintenance includes temporary protection barriers and signs as required for protection. If any plants become damaged or injured, because sufficient protection was not provided, treat or replace as directed by the Landscape Designer at no additional cost to the Owner.

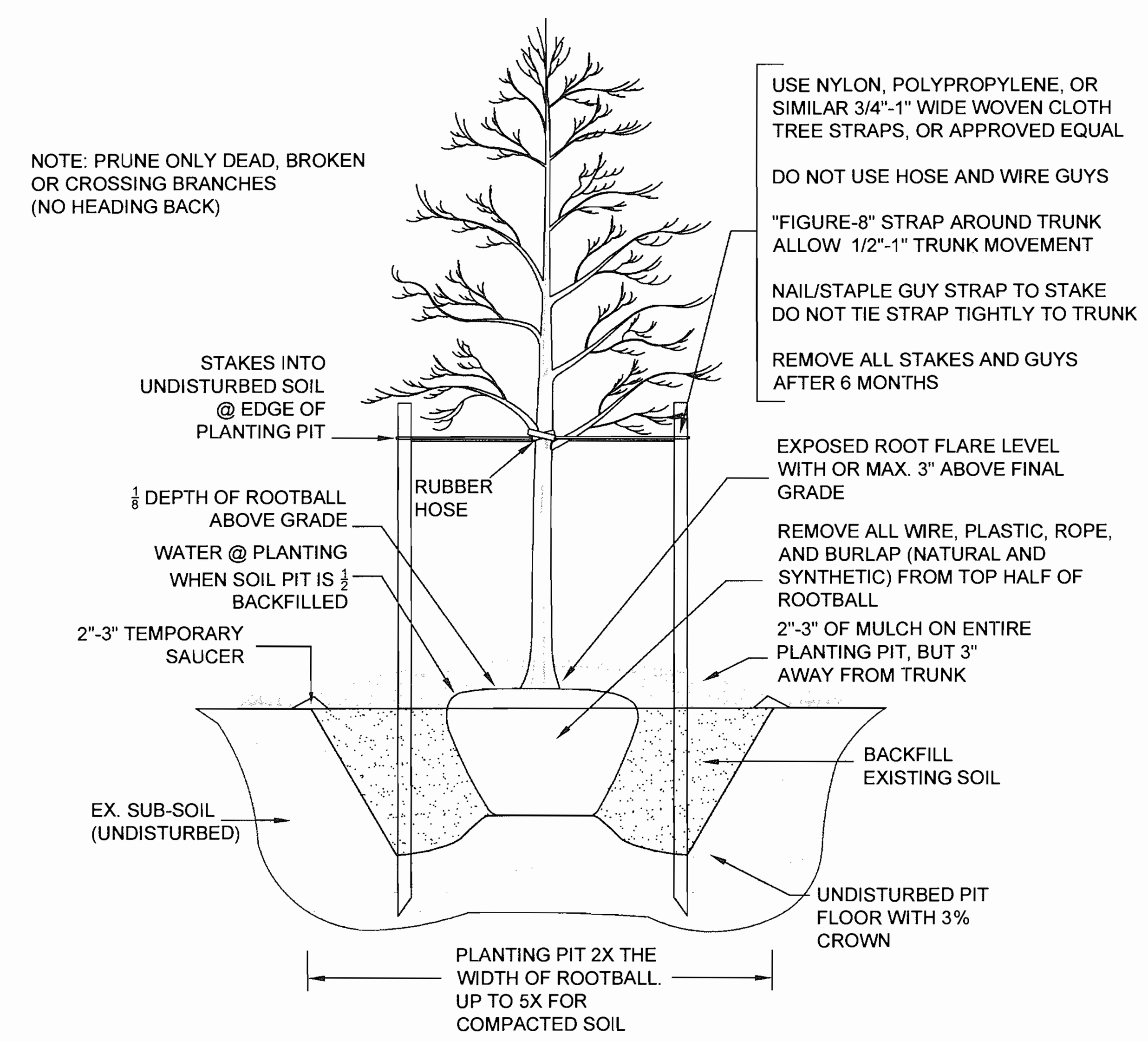
FINAL ACCEPTANCE

Work under this Section will be accepted by the Landscape Designer upon satisfactory completion of all work, including maintenance, but exclusive of replacement of plant materials under the Warranty Period. Upon termination of maintenance period, the Owner will assume responsibility for maintenance of the work.

WARRANTY

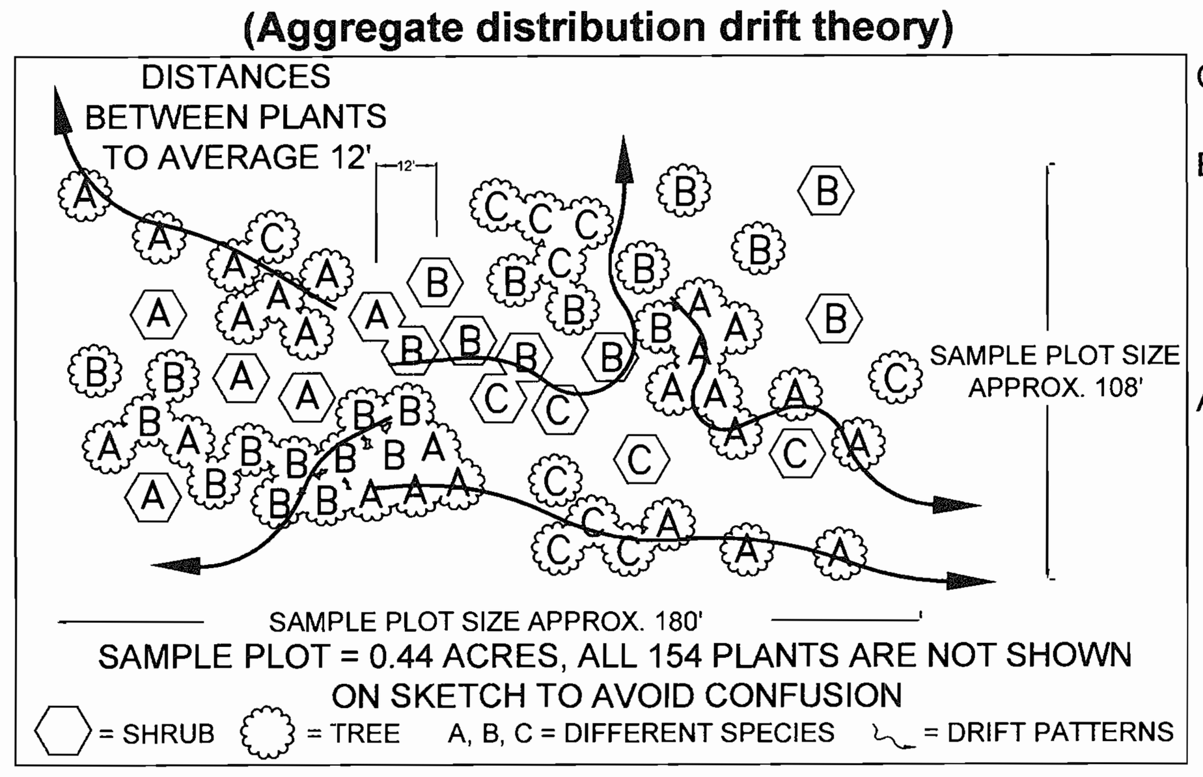
A. Warrant plant material for per iod of one year to be in good, healthy, and flourishing conditions.
B. Planting shall be warranted by the Contractor to remain alive and healthy for a period of 12 months after the date of Substantial Completion. Plants in an impaired, dead, or dying condition after initial acceptance or within 12 months shall be removed and replaced. New planting and method of placing shall comply with the requirements of the specifications. Plants replacing those removed during the guarantee period shall also be guaranteed to remain alive and healthy for an additional 12 months after installation and acceptance.
C. Contractor shall not be held responsible for failure due to neglect by Owner, vandalism, natural phenomena, or predation during warranty period. Report such conditions to the Landscape Designerontra in writing when discovered.
D. Submit a letter of warranty containing the following information: "We hereby guarantee that the landscape planting we have furnished and installed is free from disease and in good condition, and the work has been completed in accordance with the drawings and specifications, ordinary wear and tear and unusual abuse, or neglect excepted. We agree to repair or replace any defects in material or workmanship which may develop during the period of one (1) year from the date of acceptance and also to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the Owner. We shall make such repairs or replacements within a reasonable time, as determined by the Owner. In the event of our failure to make such repairs or replacements within a reasonable time after receipt of written notice from the Owner by Certified Mail, we authorize the Owner to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand."

NOTES:
1. 2" COMPOST TO BE SPREAD EVENLY OVER ALL PLANTING AREAS.
2. ALL NONE PLANTING AREAS WITHIN (LOD) TO BE SEEDED.
3. FOR TREE WALL DETAIL SEE SHEET 2.



1 Deciduous Planting
not to scale

PLANTING LAYOUT
(Aggregate distribution drift theory)

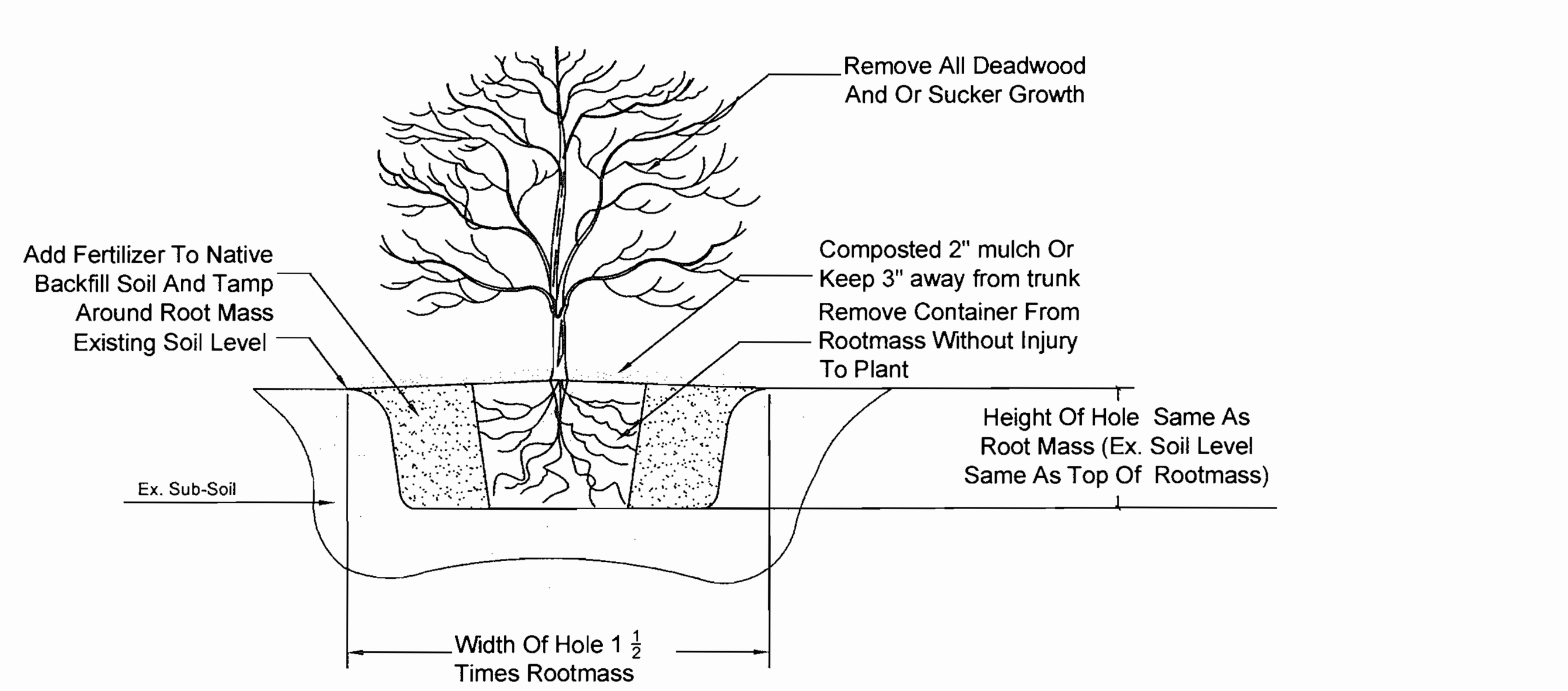


Concept: Aggregate Drift or Sweep. A cluster type grouping which tapers or feathers out along the edges.

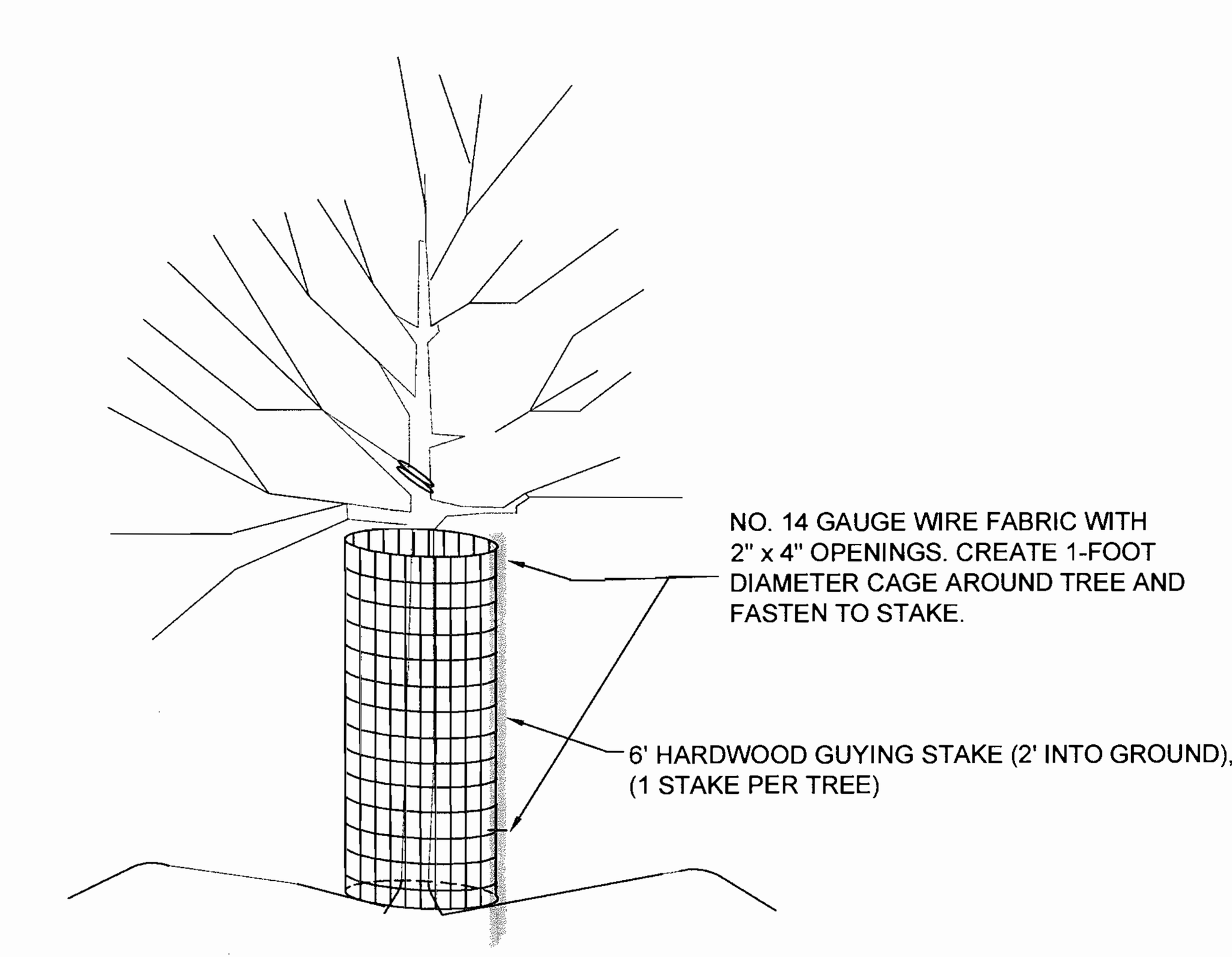
Example: Aggregate massing or drifts are one of the most common vegetation distribution patterns occurring in nature. Principle seed bearers are at the central core of the cluster with seed dispersal outwards, often windblown with densities thinning out along the fringes or extremities. Groupings blend through and into other groupings.

Application: This does not mean that plants must be in a grid pattern, that drifts of shrubs cannot blend into groupings of trees or that groupings of the same species cannot occur together. It simply means that the installer should meet the aforementioned forest conservation act criteria at the same time replicating natures aggregate drift patterns (see detail).
When using this theory to lay out a planting plan the size of the drifts will depend on the quantity of plants allocated, the scale of the site and the careful consideration of the installer.

2 Planting Layout
not to scale



3 Shrub Planting
not to scale



NOTES:
1. HEIGHT OF CAGE SHALL BE 4-FEET (MIN.)
2. CAGE SHALL BE FASTENED TO STAKE WITH TWO (MIN.) 11-INCH RELEASABLE CABLE TIES (ONE AT TOP AND ONE 6" (MIN.) ABOVE THE GROUND.
3. DO NOT DAMAGE TREE DURING INSTALLATION.
4. SUBSTITUTIONS MUST BE APPROVED BY FOREST ECOLOGIST.
5. CAGES TO BE REMOVED AT DIRECTION OF FOREST ECOLOGIST.

4 Deer Protection Cage
not to scale

LANDSCAPE ARCHITECT 0003241 JAMES M. FETCHU STATE OF MARYLAND

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.
NATURAL RESOURCES CONSERVATION SERVICE DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DEVELOPMENT ENGINEERING DEVISION DATE 7/17/06
CHIEF, DIVISION OF LAND DEVELOPMENT DATE 7/18/06
DIRECTOR DATE 7/19/06

Plotted: Jul 05, 2006 - 3:27pm User: rfenteng F:\Farewell Road\CAD\90%\Sheet9-Planting.dwg

Prepared for:
Howard County Dept. of Public Works
Bureau of Environmental Services
6751 Columbia Gateway Drive, #514
Columbia, MD 21046
Phone: (410) 313-6417
Attn: Mr. Richard Powell

Village of Oakland Mills
Election District 6
Section 5 Stevens Forest Area 6
Open Space Lot 258
0.989 Acres

Howard County Capital Improvements Project No. D-1126
FAREWELL ROAD STREAM STABILIZATION
Columbia, Maryland
Stream Stabilization Planting Plan

DATE:	06/06
DESIGNED:	TCS
DRAFTED:	HT
CHECKED:	TCS
BASE DATA:	CPJ

NO.	REVISIONS	BY	DATE

CPJ Associates
CPJ/EQR Environmental Services Division
STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
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