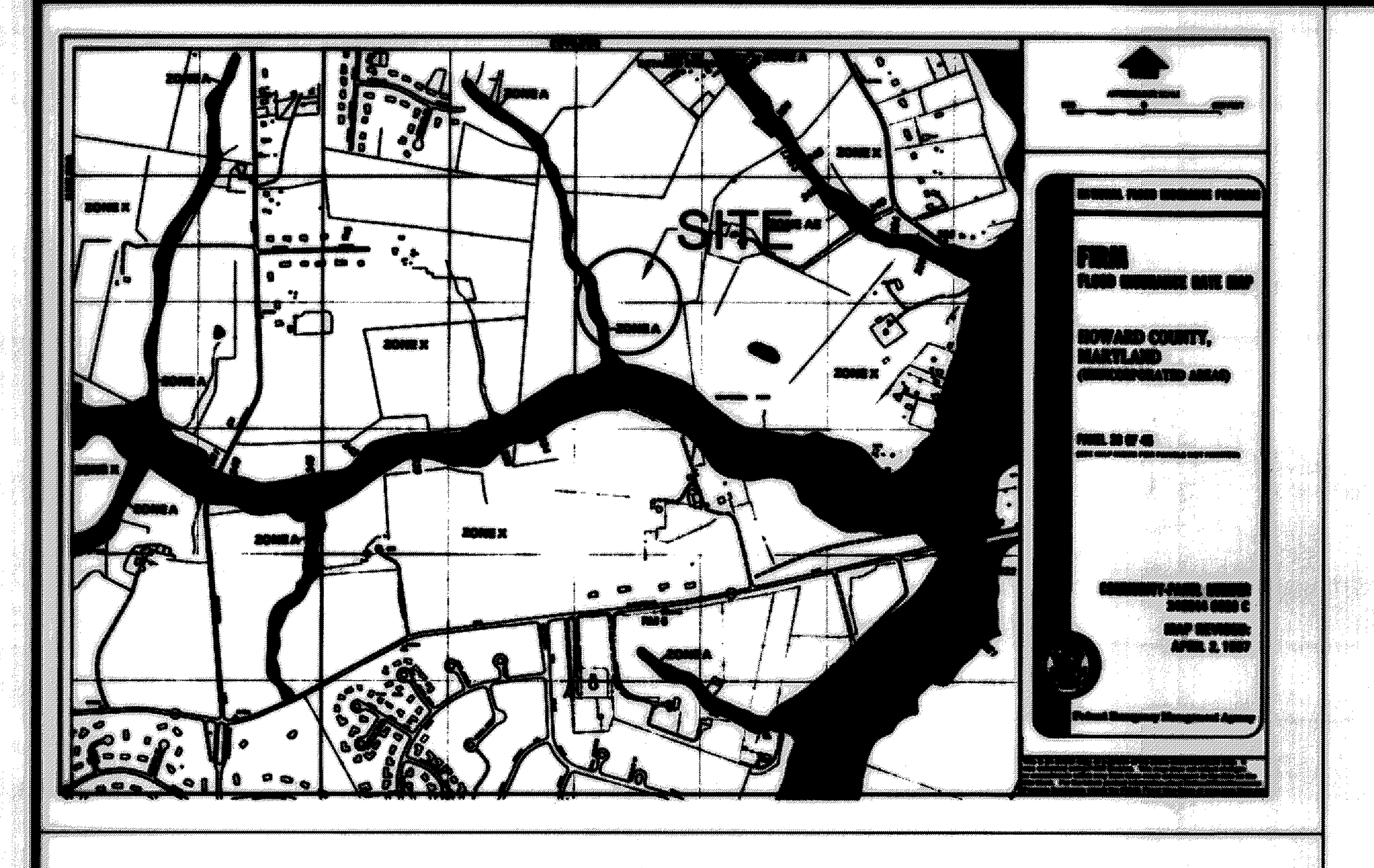
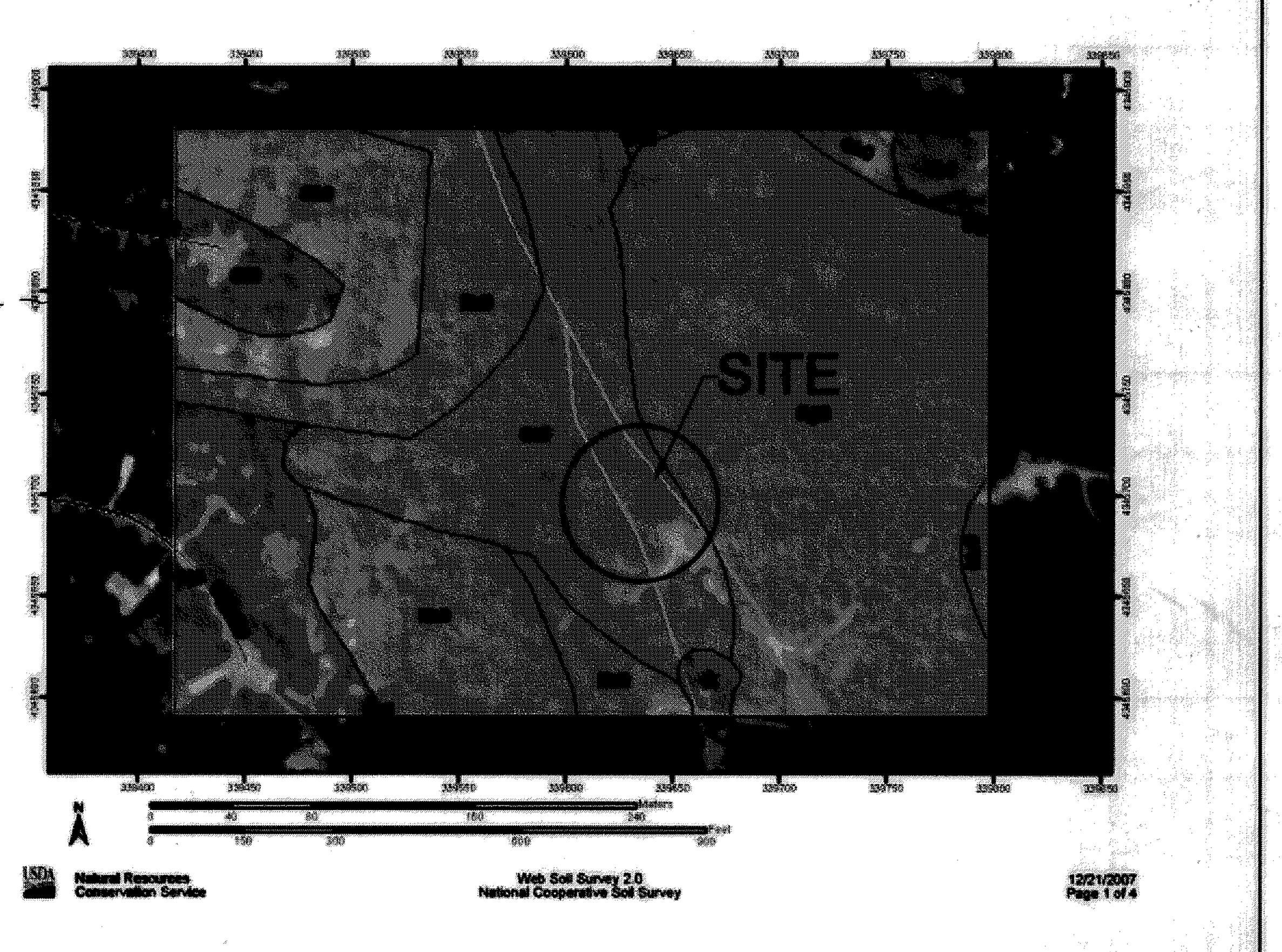
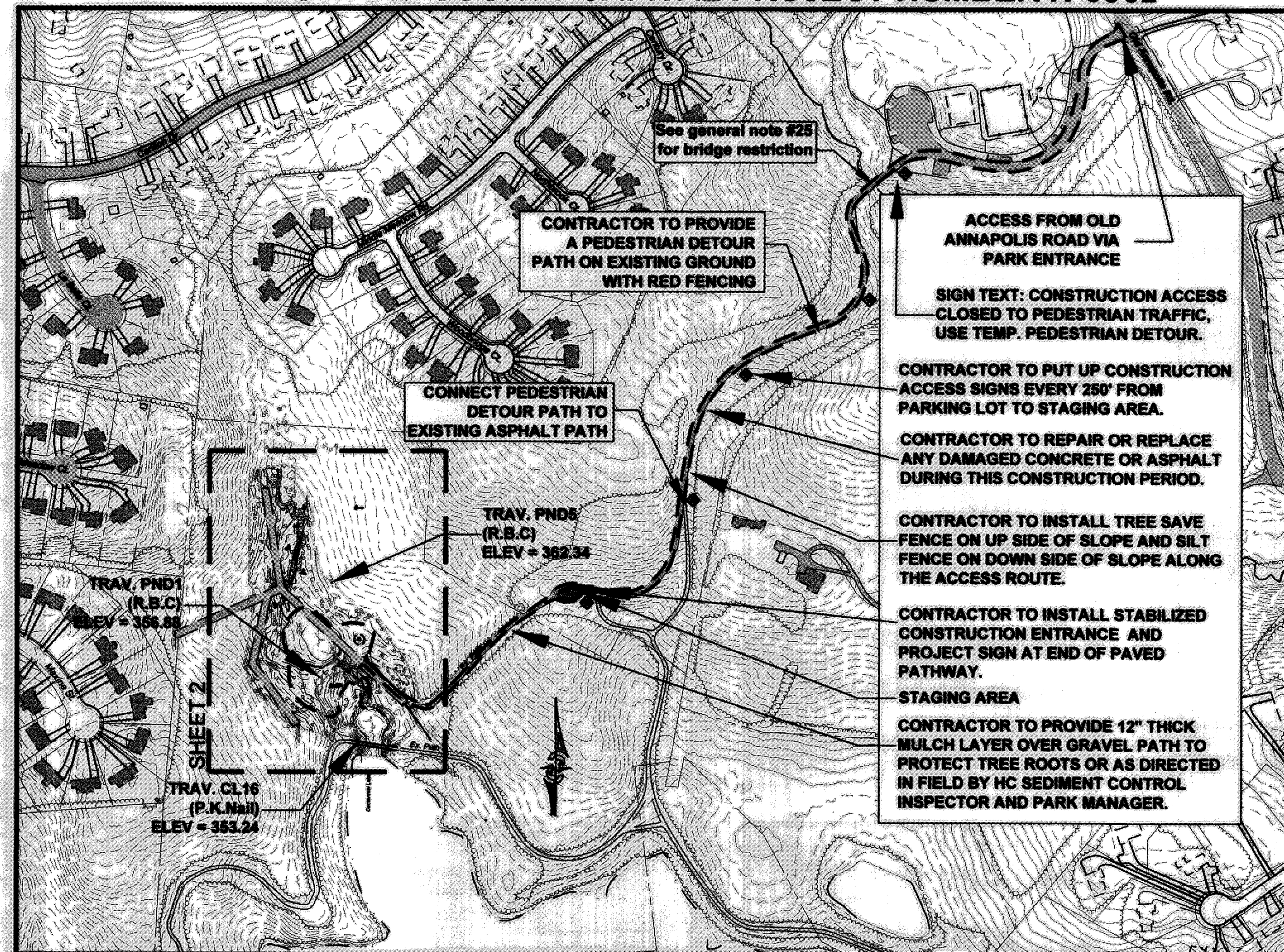
CENTENNIAL PARK NORTH POND RETROFIT

HOWARD COUNTY CAPITAL PROJECT NUMBER N-3962

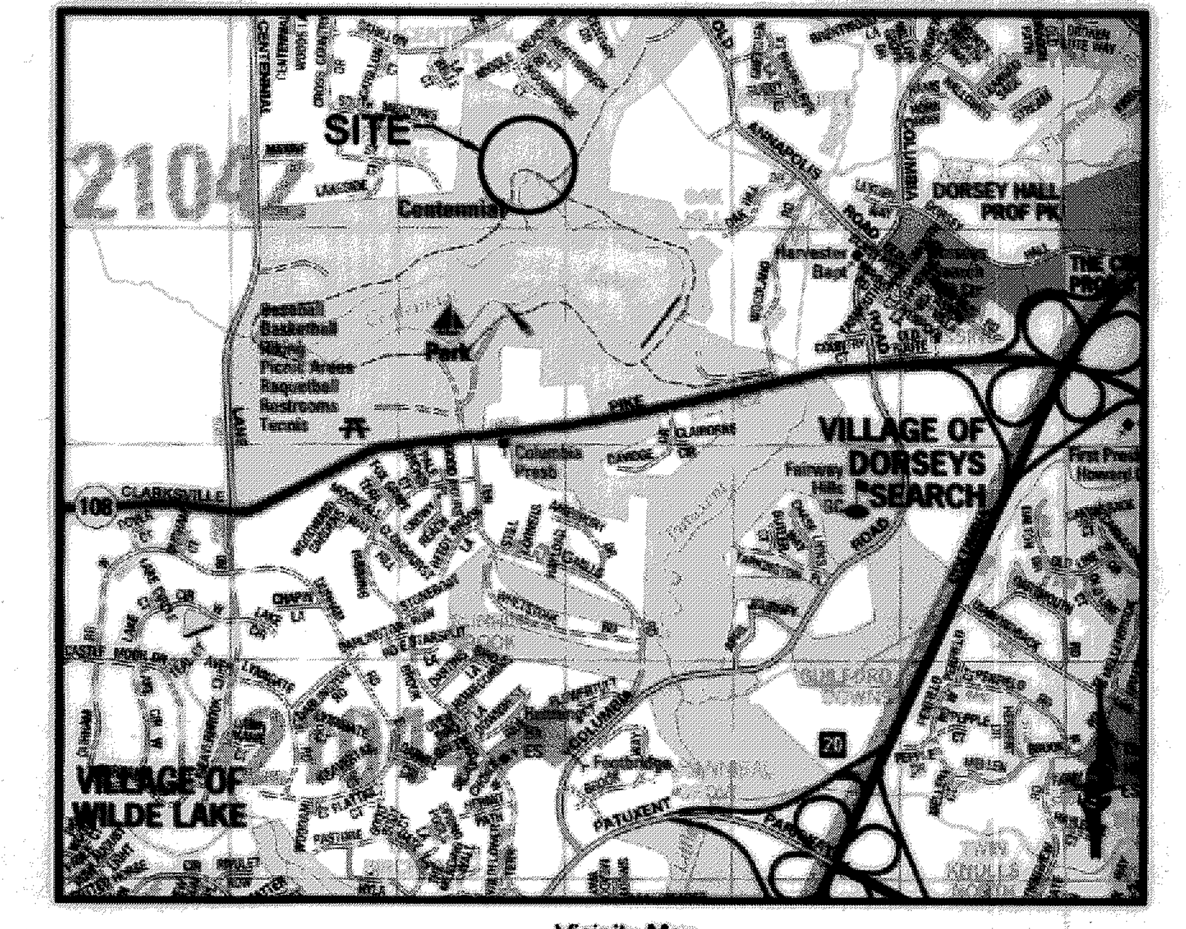






Scale: 1" = 250' 0 250' 500'

SHEET INDEX



Vicinity Map
Howard County, MD
ADC Map #4935-B2
Scale: 1" = 2000'

OPERATION MAINTENANCE AND INSPECTION

Inspection of the pond(s) shown hereon shall be performed at least annually, in accordance with the checklist and requirements contained within the USDA, NRCS "Standards and Specifications for Ponds" (MD-378). The pond owner(s) and any heirs, successors, or assigns shall be responsible for the safety of the pond and the continued operation, surveillance, inspection, and maintenance thereof. The pond owner(s) shall promptly notify the Soil Conservation District of any unusual observations that may be indication of distress such as excessive seepage, turbid seepage, sliding or slumping.

GENERAL NOTES

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 provided by Howard County field survey dated 06/28/2007.
7. SURVEY CONTROL

	Point	Northing	Easting	Elevation	Description
BM1	Trav. CL 16	574787.38	1352536.30	353.24	(P.K. Nail)
BM2	Trav. PND1	574965.50	1352436.28	356.88	(R.B.C)
BM3	Trav. PND5	575214.19	1352468.15	362.34	(R.B.C)

All horizontal control is NAD 83/91.
All vertical control is NGVD 88.

8. Water :522-D
9. Sewer :522-D
10. There is no existing or proposed stormwater management control required for this project.
11. Existing utilities are based on the survey by HC and only include utilities visible at surface (i.e., manholes).
12. The floodplain study for this project was taken from a HEC-RAS study by CPJ and Hazen & Sawyer dated March 2012.
13. Wetland shown hereon were field-delineated by CPJ/MCE on July 27, 2007.
14. No traffic study is required for this project.
15. 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 disturbance shown on these plans have been determined "necessary" in accordance with Section 16.116.c of the Subdivision Regulations.
16. Centennial Lake is a 50-acre impoundment on the Centennial Branch of the Little Patuxent River.These are Maryland Use Class IV-P Waters. Stream use closure dates are March 1 - May 31 inclusive.
17. All material removed from this site shall be taken to a site with an active grading permit.
18. 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.
19. 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.
20. 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.
21. All quantities hereon are estimates only, the contractor is responsible for verifying quantities through a field visit and his own quantity takeoffs.
22. This project is conditionally exempt from the forest conservation requirements of Section 16.1200 of Howard County Code for Forest Conservation: (Forest conservation Waiver Petition WP-08-082 was approved on 04/01/2008.)
23. This plan has been prepared in accordance with the provisions of Section 16.124 of the Howard County Code and the Landscape Manual.
24. This plan was prepared with the best available records which did not include geotechnical testing analysis. It is the Contractor's responsibility to determine geotechnical field conditions prior to bid.
25. The maximum gross vehicle weight (GVW) for frequent traffic over the Low Profile Arch SUPER-SPAN bridge at the construction access should not exceed 36.0 tons per CBC Engineers & Associates, Ltd.,report to Howard County in August 2009.
26. The MDE wetland and waterway tracking permit number for this project is #201061252 dated October 26, 2010.
27. Centennial Park Lake was built in 1985.

SOILS NOTE:

The Glenville soil series (Howard County soil designation 'GnB') 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 acknowledged as a hydric soil type.

SITE ANALYSIS CHART

A	Total project area is 104.36 acres
B	Area of plan submission is the same as the limits of disturbance.
C	Limit of disturbed area (LOD) is 97,400 square feet or 2.2 acres.
D	Present zoning is R-20 County Park (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 2.2 acres.
H	Required open space is not applicable.
I	Building coverage is not applicable.
J	This project is for the replacement of existing pond embankment.

DAM HAZARD SUMMARY

Dam Hazard Summary	
Dam Hazard Classification:	low hazard class "A"
Dam Normal Depth Pool:	4.5 feet
Dam Height (downstream barrel invert to e.s.):	8.5 feet
Dam Height (d/s invert to top of settled dam):	11.2 feet
Surface Area (normal pool at WSE = 353.5):	0.42 acres
Storage (normal pool at WSE = 353.5):	1.05 ac-ft ("dead" storage)
Surface Area (at WSE =355.5 for e.s. flow to begin):	0.65 acres
Storage (at WSE = 355.5 for e.s. flow to begin)	1.08 ac-ft ("live" storage)
Surface Area (when WSE =357.1 for 100-year):	0.90 acres
Storage (when WSE =357.1 for 100-year):	2.25 ac-ft ("live" storage)
Surface Area (when WSE is at settled top of dam):	1.26 acres
Storage (top of settled dam):	4.41 ac-ft ("live" storage)
Q100 release from barrel:	140 cfs
Q100 release from e.s.:	203 cfs
Q100 (total):	343 cfs
Velocity in e.s. at 100-year WSE:	5.4 fps
live storage does not include permanent pool "dead" storage	

TREE IMPACTS TABLE

ID	Common Name	DBH	Trunk	Health	CRZ	Reason
1	Honey Locust	5	Single	Fair	7.5	Grading
2	Red Maple	5	Single	Fair	7.5	Grading
3	Sassafras	5	Single	Fair	7.5	Grading
4	Spice Bush	1	Single	Fair	1.5	Grading
5	Norway Maple	6	Single	Fair	9	Grading
132	Tulip Poplar	20	Single	Fair	30	Grading
133	Black Walnut	8	Single	Poor	12	Grading
134	Black Walnut	18	Single	Fair	27	Grading
160	Tulip Poplar	15	Single	Fair	22.5	Grading
162	Red Maple	10	Single	Fair	15	Grading
163	Tulip Poplar	11	Single	Fair	16.5	Grading
164	Tulip Poplar	13.5	Single	Fair	20.25	Grading
165	Red Maple	8	Single	Fair	12	Grading
166	Black Walnut	9	Double	Fair	13.5	Grading
167	Red Maple	7	Single	Fair	10.5	Grading
168	Honey Locust	9	Single	Fair	13.5	
A	Tree (Unknown)	3.5	Single	NA	5.25	
Total =	17					

APPROVED: HC DEPARTMENT OF PUBLIC WORKS

[signature] 12/24/13
DIRECTOR OF PUBLIC WORKS — DATE

[signature] 12/19/13
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE

Mark S. Richmond 12/6/13
CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

THESE PLANS FOR SMALL POND CONSTRUCTION SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

John R. Robertson 1/2/14
HOWARD SOIL CONSERVATION DISTRICT — DATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT."

[signature] 12/16/13
OWNER/DEVELOPER — DATE

Howard County Recreation and Parks
PRINTED NAME

"This facility has been evaluated for downstream flooding hazard by a study entitled *Centennial Lake Pond Repair Computations* prepared by Hazen & Sawyer and Charles P. Johnson & Associates, Inc. in March of 2012. According to that study, this facility is a Class A facility with classification of low hazard."

[signature] 20207 12/2/13
ENGINEER: TIMOTHY SCHUELER — MD LICENSE # — Date

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.

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

[signature] 12/2/13
SIGNATURE — DATE

TIMOTHY SCHUELER — 20207 — 10/16/2015
PRINTED NAME — MD LICENSE # — EXPIRATION DATE

PERMIT INFORMATION CHART

Subdivision Name	Section/Area	Lot/Parcel
Centennial Park	N/A	P. 10

Plat # or L/F	Grid #	Zone	Tax/Zone Map	Elec. Dist.	Census Tract
L885/F76 L507/F437	7	R-20 County Park	30	5	602304

ADDRESS CHART

Lot Number	Street Address
N/A	9801 Old Annapolis Road Ellicott City, MD 21042

SUMMARY OF ENVIRONMENTAL IMPACTS

Restoration Design Area	Tree Removal (# of trees)	Stream Disturbance (lf)	Permanent Wetland Disturbance (sq ft)	Temp. Wetland Disturbance (sq ft)	Temp. Wetland Buffer Disturbance (sq ft)	Total LOD (sq ft) Includes Access	Total LOD (acres) Includes Access	Phase 1 LOD (sq ft) Excludes Access	Phase 1 LOD (acres) Excludes Access	Phase 2 LOD (sq ft) Excludes Access	Phase 2 LOD (acres) Excludes Access	CUT (cy)	FILL (cy)	NET (cy)
Total	17	0	480	2,000	4,860	98,590	2.3	19,900	0.46	47,850	1.1	1,640	1,930	290

HAZEN AND SAWYER
Environmental Engineers & Scientists
4011 WestChase Blvd, Raleigh, North Carolina 27607

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

9801 Old Annapolis Road
HOWARD COUNTY, MD
ELECTION DISTRICT 5
MAP 30, GRID 7, PARCEL 10

CENTENNIAL PARK NORTH POND RETROFIT

Howard County Project # N-3962

Title Sheet

DATE:	11/2013
DESIGNED:	TCS
DRAFTED:	HT/JM
CHECKED:	CW
BASE DATA:	HC

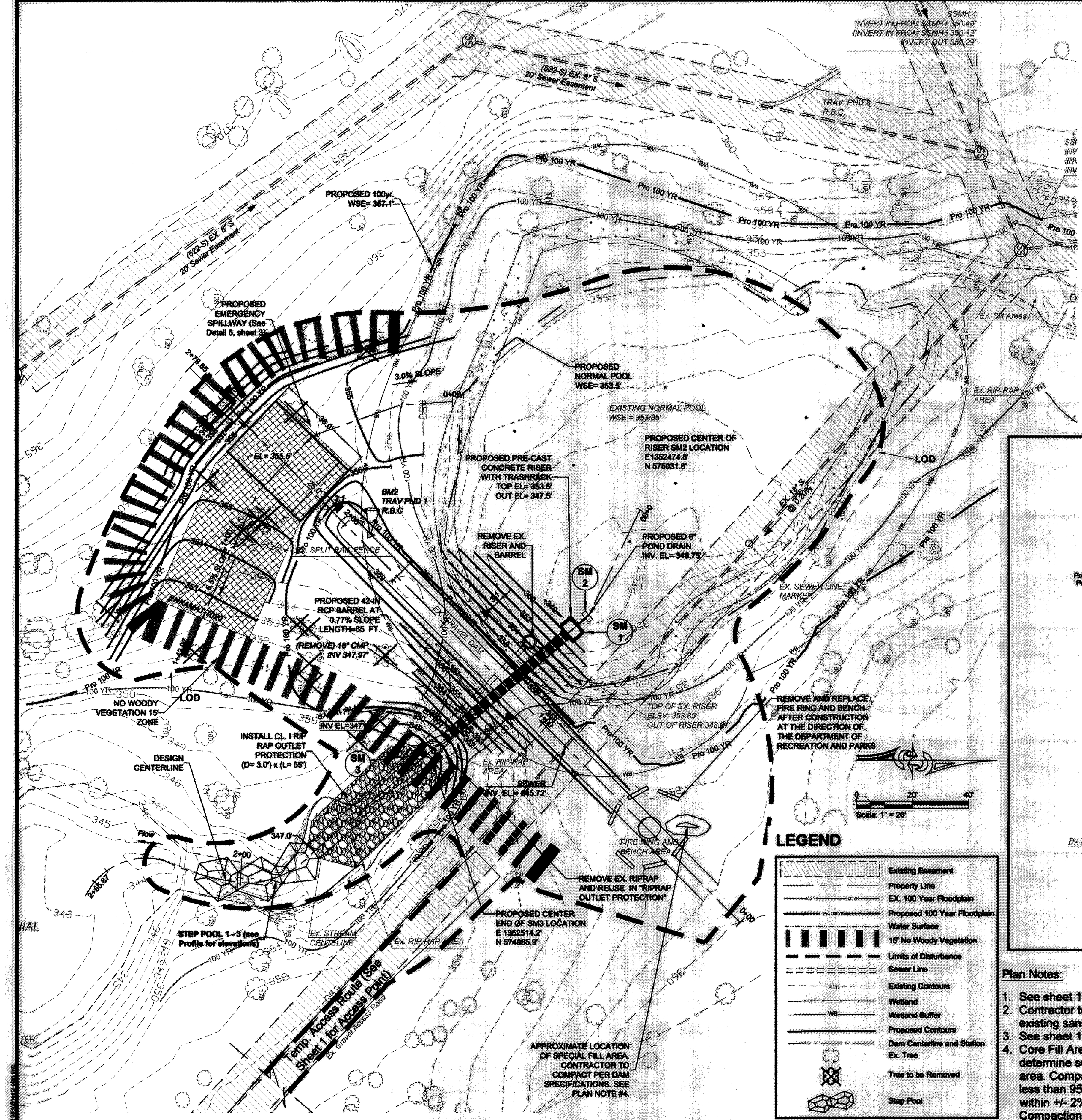
NO.	REVISIONS	BY	DATE

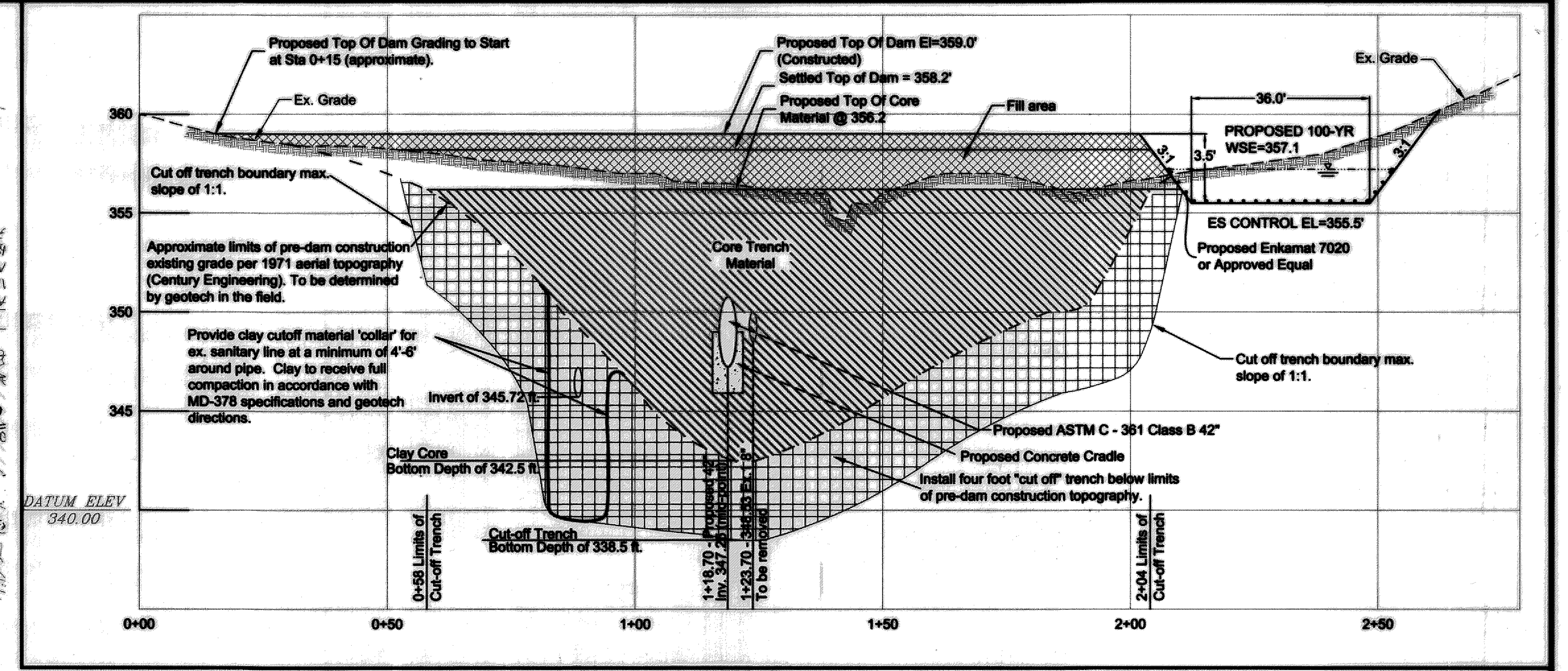
STATE OF MARYLAND — TIMOTHY C. SCHUELER — No. 20207 — PROFESSIONAL ENGINEER — 12/2/13

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

SCALE AS SHOWN

JOB NO. 37-556

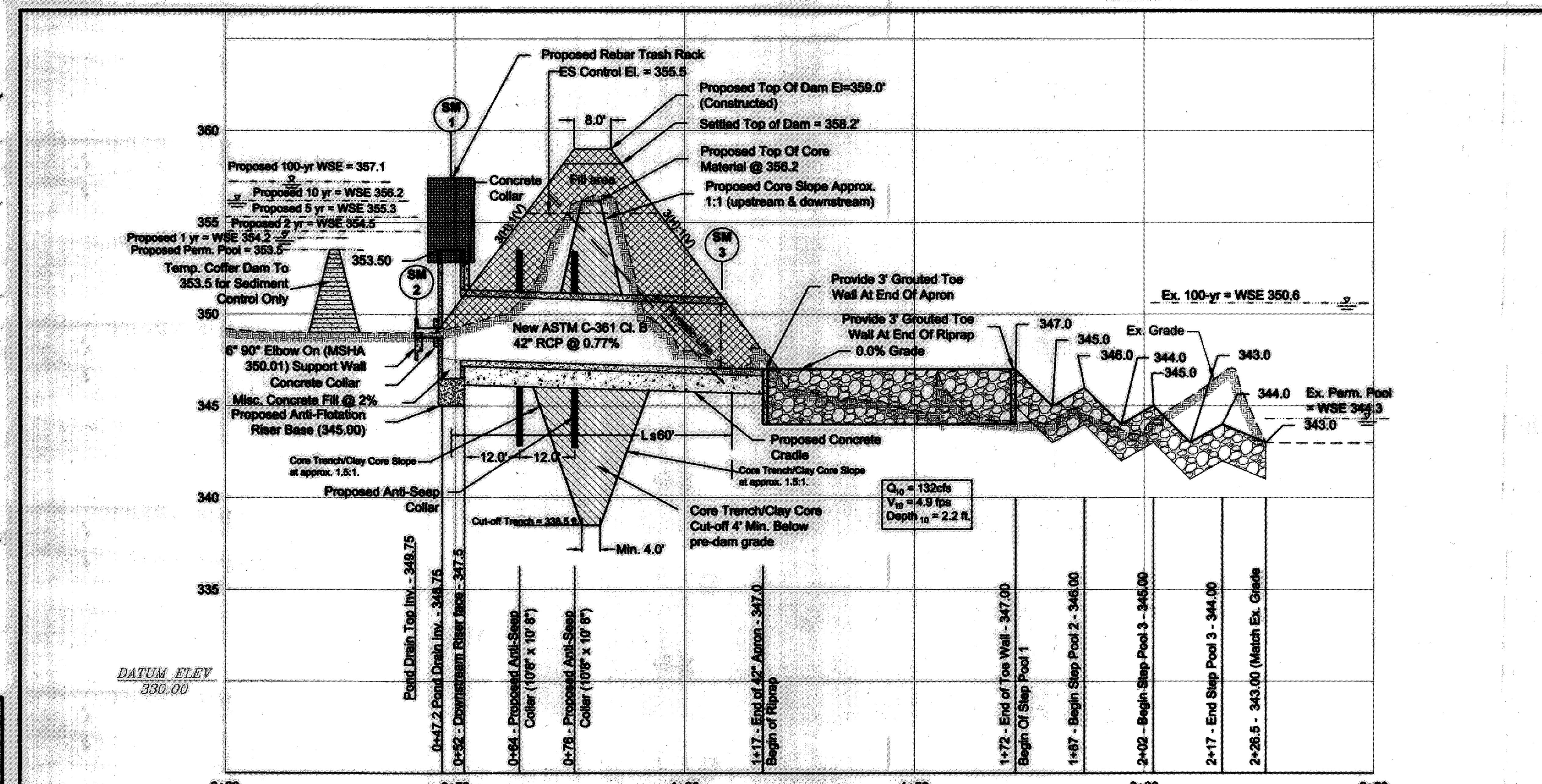




1 PROFILE THROUGH TOP OF DAM AND E.S.

(View Downstream)

Scale: Vertical 1"=5'
Horizontal 1"=20'



Source: Existing 100 year floodplain and permanent pool elevation for Centennial Lake was taken from "Centennial Park construction plans by Rummel, Klepper & Kahl, As-Built plans dated April 9, 1985".

2 PROFILE THROUGH PRINCIPAL SPILLWAY

Scale: Vertical 1"=5'
Horizontal 1"=20'

Plan Notes:

1. See sheet 1 for entire LOD with access point and SCE.
2. Contractor to use extreme care when working near the existing sanitary sewer pipe.
3. See sheet 1 for bench mark locations.
4. Core Fill Area: contractor to perform test pitting to determine subsurface conditions and extent of core fill area. Compacted fill to meet dam fill specifications (not less than 95% of max.dry density with moisture content within +/- 2% of optimum; see MD-378 notes under Compaction on Sheet 4).

APPROVED: HC DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 12/19/13

THESE PLANS FOR SMALL POND CONSTRUCTION SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 1/2/14

HAZEN AND SAWYER
Environmental Engineers & Scientists
4011 WestChase Blvd, Raleigh, North Carolina 27607

HOWARD COUNTY DPW - ENVIRONMENTAL SERVICES 6751 COLUMBIA GATEWAY DRIVE, SUITE 514 COLUMBIA, MD 21046 PHONE: (410) 313-6413 ATTN: MARK RICHMOND	9801 Old Annapolis Road HOWARD COUNTY, MD ELECTION DISTRICT 5 MAP 30, GRID 7, PARCEL 10	**CENTENNIAL PARK NORTH POND RETROFIT** Howard County Project # N-3962 **Plan View and Profiles**	DATE: 11/2013 DESIGNED: TCS DRAFTED: HT/JM CHECKED: CW BASE DATA: HC

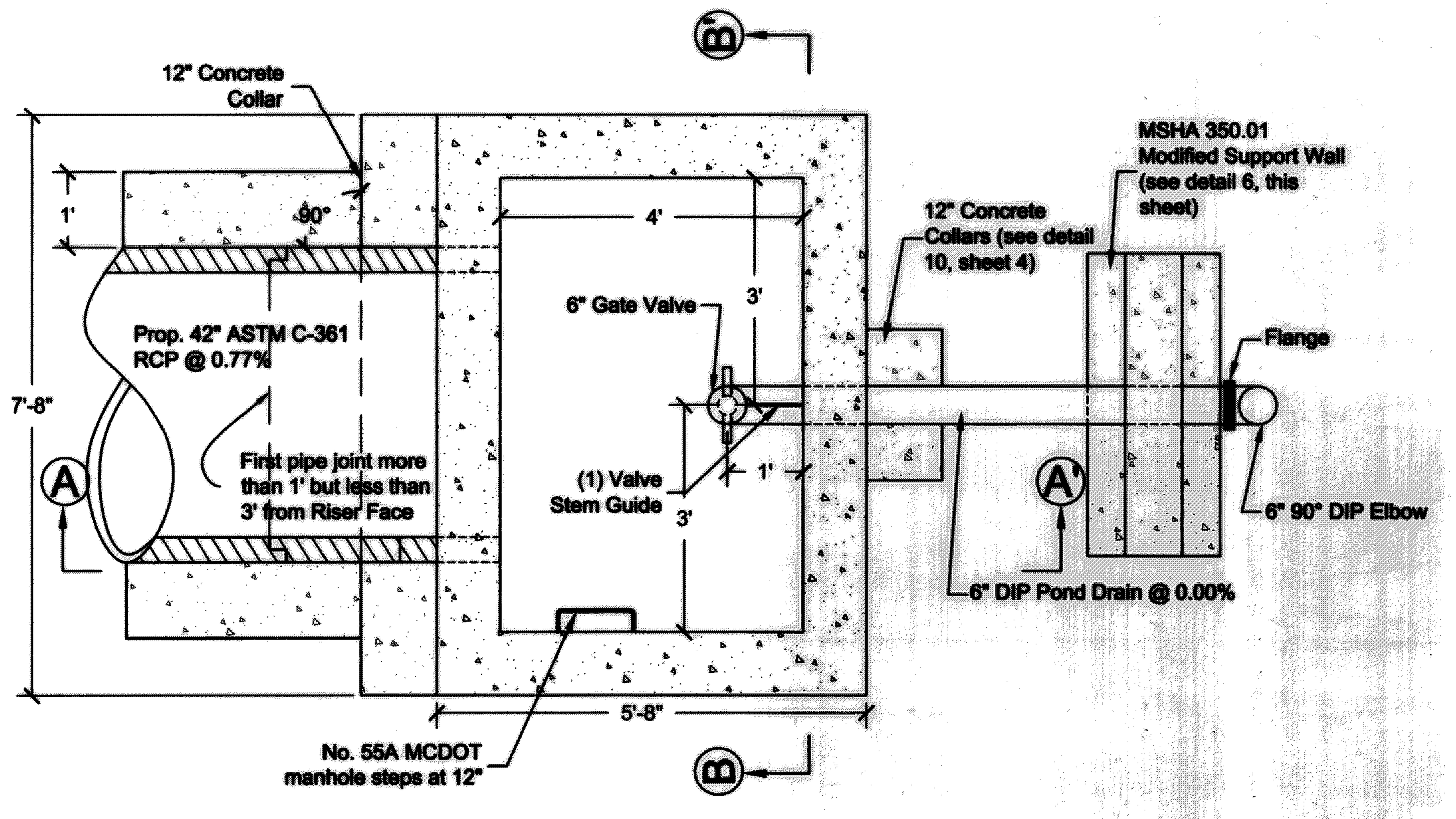
NO.	REVISIONS	BY	DATE

CPJ Associates — CPJ Environmental Services Division
STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
910 CLOPPER ROAD, STE 205N GAITHERSBURG MARYLAND 20878
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

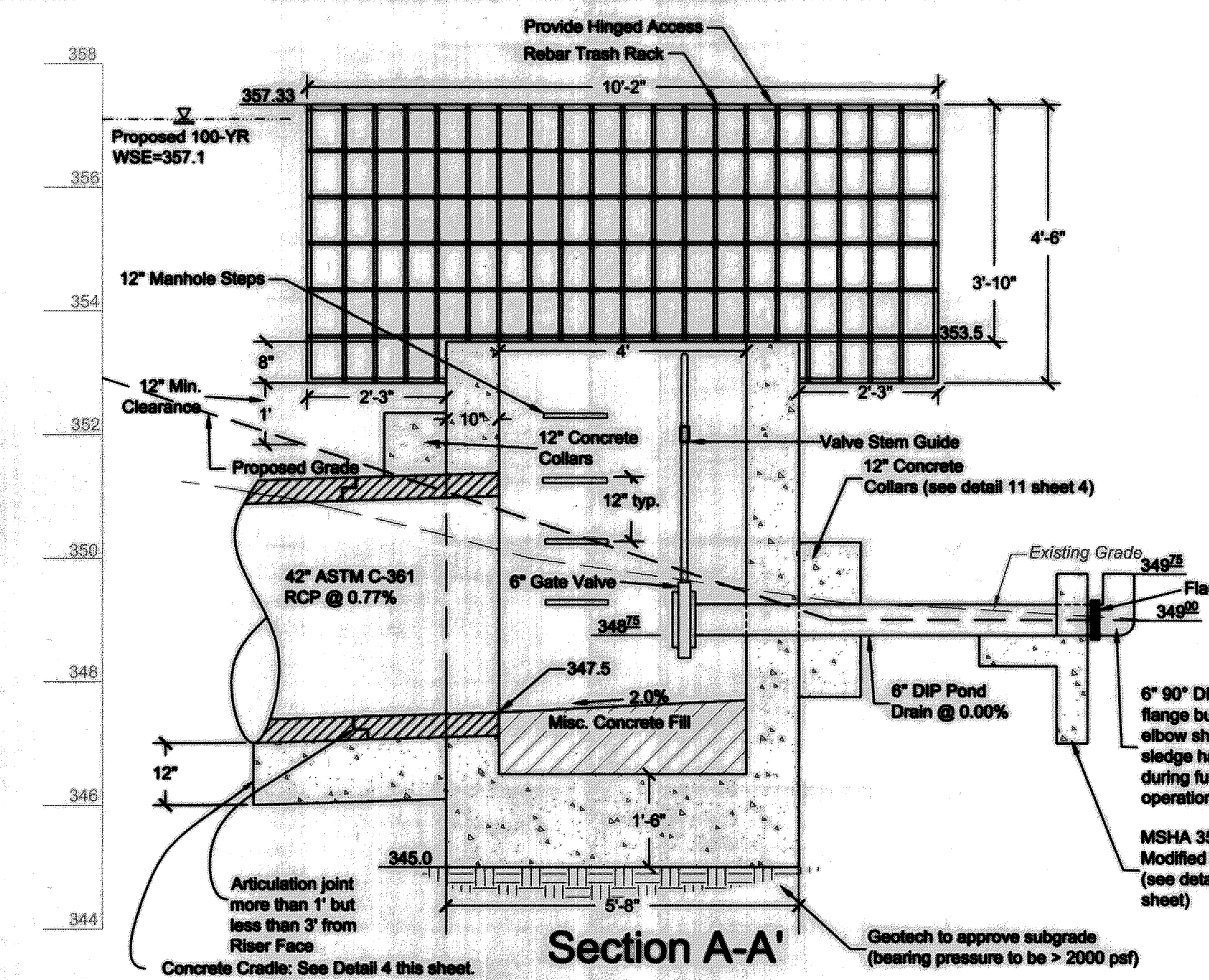
SCALE AS SHOWN

SHEET 2 OF 8 SHEETS

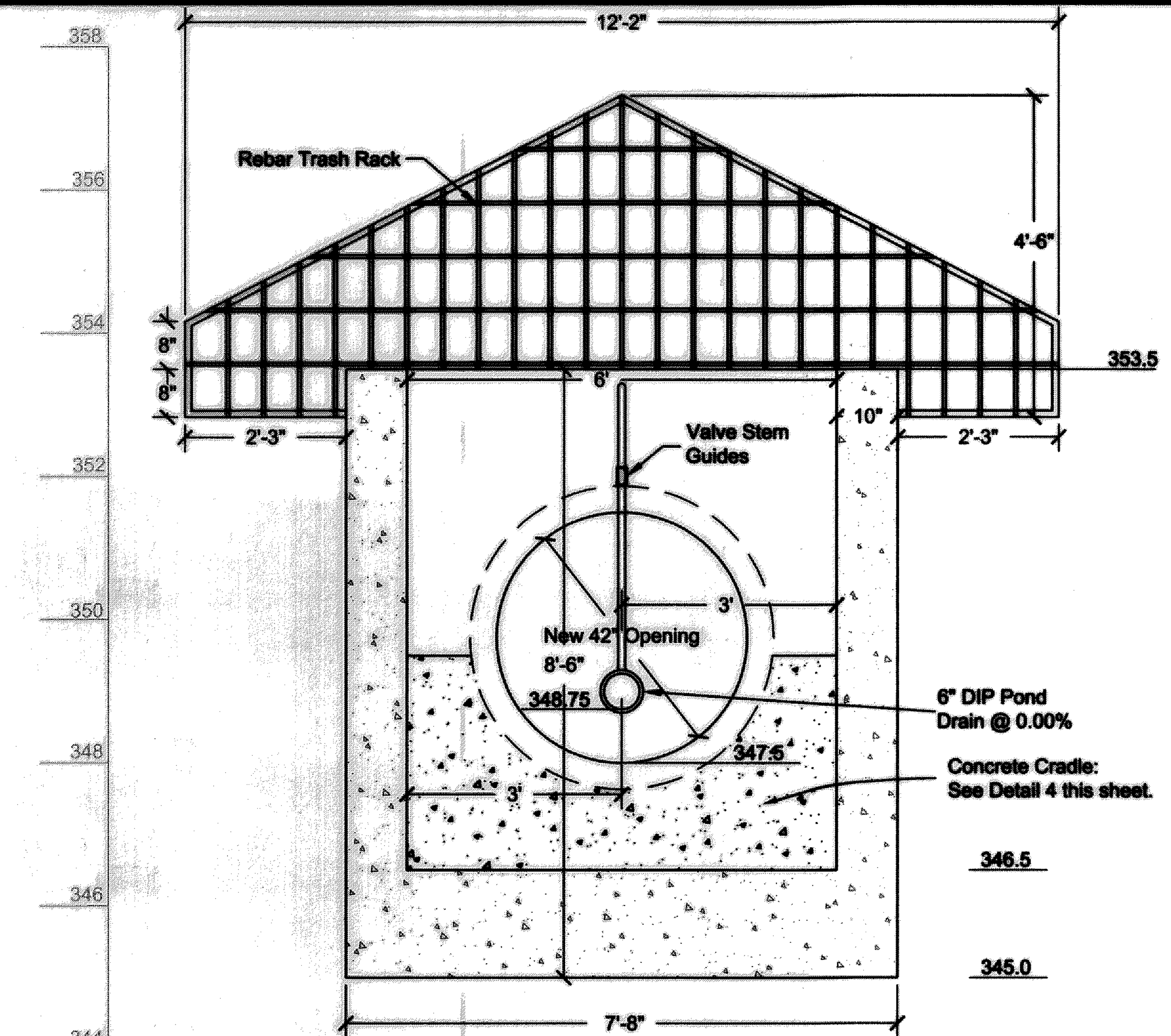
JOB NO. 37-556



Plan View



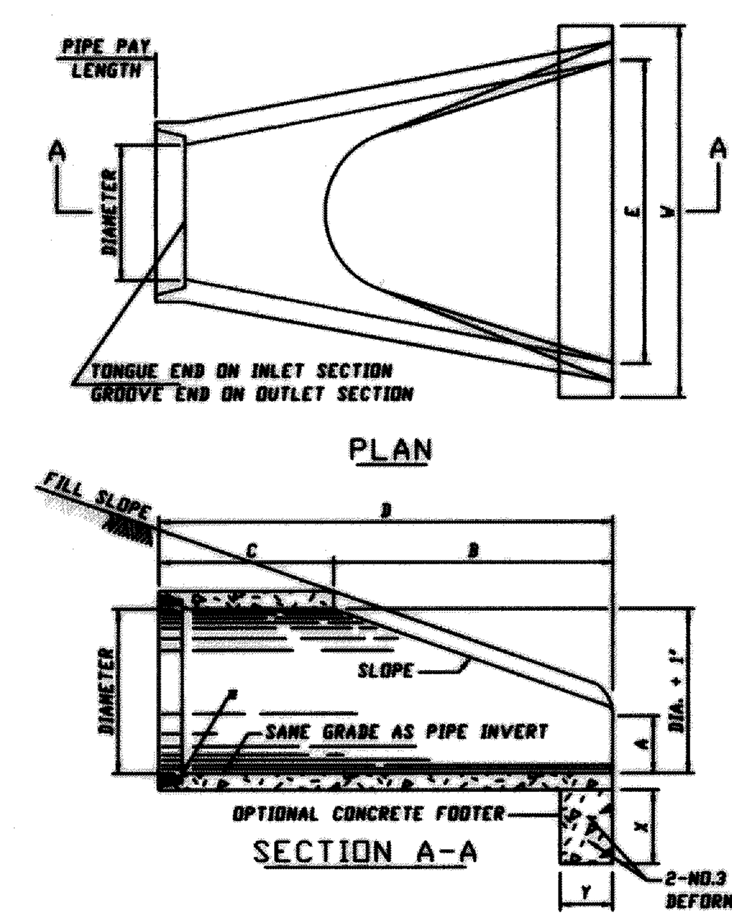
Section A-A'



Section B-B'

1 **SM1 - RISER DETAILS**
Scale: Vertical 1"=2'
Horizontal 1"=2'

Notes:
1. If riser is one piece pre-cast, shop drawings will need to be submitted to and approved by Howard County and the Design Engineer.
2. If riser is not one piece precast, shop drawings must provide details for joint including watertight and straps will need to submitted to and approved by Howard County and the Design Engineer. Use of mastic or similarly approved sealant between joints is required.



NOTES

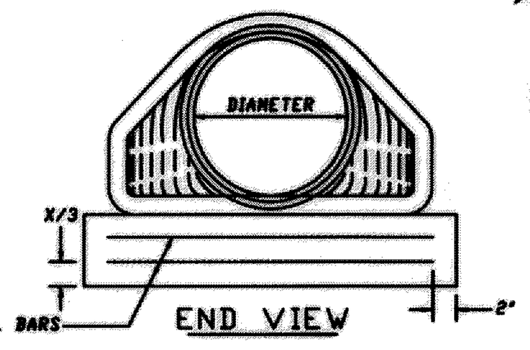
1. CONTRACTOR HAS OPTION OF FURNISHING END SECTIONS CONFORMING TO DETAILS ON THIS SHEET OR END SECTIONS CONFORMING TO DETAILS ON STANDARD MD 368.02.
2. END SECTIONS MUST BE REINFORCED TO CONFORM TO CLASS III PIPE.
3. CONCRETE FOOTER SHALL BE USED WHEN SPECIFIED ON THE PLANS. COST OF CONCRETE FOOTER TO BE INCLUDED IN PRICE OF END SECTION. CONCRETE TO BE MIX. NO.2. REINFORCEMENT TO BE NO.3 BARS.

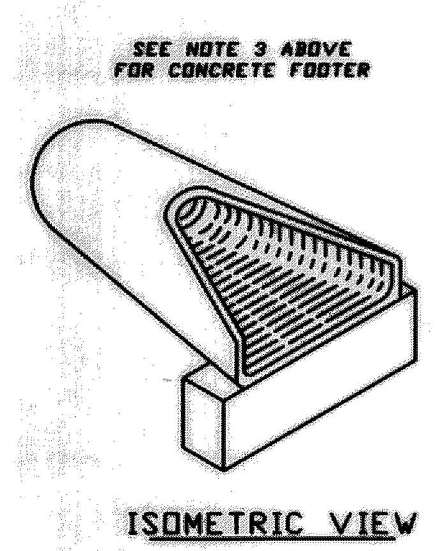
* INVERT ELEVATION TO BE AT THE PIPE END OF THE STANDARD END SECTION. ELEVATIONS TO BE NOTED ON THE CONSTRUCTION PLANS.

QUANTITIES FOR ESTIMATING PURPOSES ONLY

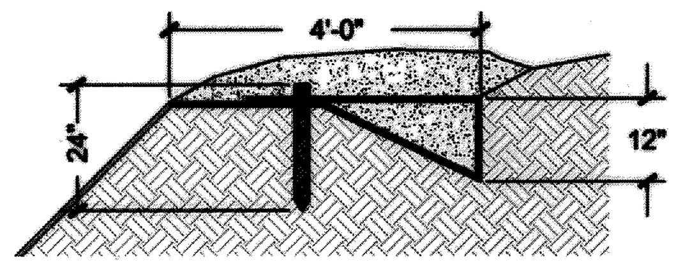
DIMENSIONS										QUANTITIES	
CONCRETE END SECTION							CONCRETE FOOTER				
DIA.	SLOPE	A	B	C	D	E	W	X	Y	CONC. C.Y.	STEEL LBS.
12"	3:1	4"	2'-0"	4'-0½"	6'-0½"	2'-0"	3'-0"	12"	9"	0.08	24.00
15"	3:1	6½"	2'-4"	3'-10"	6'-2"	2'-6"	3'-6"	12"	9"	0.10	28.50
18"	3:1	10½"	2'-2"	4'-0"	6'-2"	3'-0"	4'-0"	12"	9"	0.11	33.00
21"	3:1	9"	3'-0"	3'-½"	6'-½"	3'-6"	4'-6"	12"	9"	0.13	37.50
24"	3:1	11"	3'-7"	2'-8"	6'-3"	4'-0"	5'-0"	15"	9"	0.17	42.00
27"	3:1	10½"	4'-½"	2'-0"	6'-½"	4'-6"	5'-6"	15"	9"	0.19	46.50
30"	3:1	1'-1"	4'-5"	1'-10"	6'-3"	5'-0"	6'-0"	15"	9"	0.21	51.00
33"	3:1	1'-2"	4'-7"	2'-2"	6'-9"	5'-6"	6'-6"	15"	9"	0.23	55.50
36"	3:1	1'-3½"	5'-3"	3'-1"	8'-½"	6'-0"	7'-3"	15"	9"	0.25	62.25
42"	3:1	1'-9½"	5'-5"	2'-10"	8'-3"	6'-6"	7'-9"	15"	9"	0.27	66.75
48"	3:1	2'-1"	6'-0"	2'-2"	8'-2"	7'-0"	8'-6"	18"	12"	0.47	73.50
54"	2.4:1	2'-5"	5'-2"	2'-10"	8'-0"	7'-6"	9'-0"	18"	12"	0.50	78.00
60"	2:1	2'-7"	4'-11"	3'-0½"	8'-7½"	8'-0"	9'-6"	18"	12"	0.53	82.50
66"	2:1	2'-4"	6'-6"	1'-9"	8'-3"	8'-6"	10'-0"	18"	12"	0.56	87.00
72"	2:1	2'-10"	6'-6"	1'-9"	8'-3"	9'-0"	10'-9"	18"	12"	0.60	93.75

* NOTE TO CONTRACTOR: FOOTER IS REQUIRED



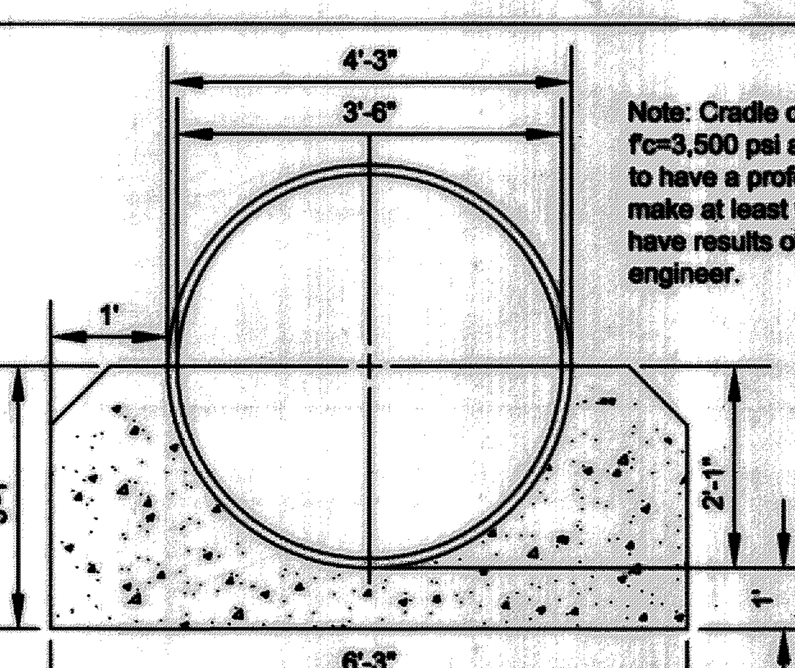


2 **MD-368.01 CONCRETE END SECTION**
Scale: N.T.S.
SM3



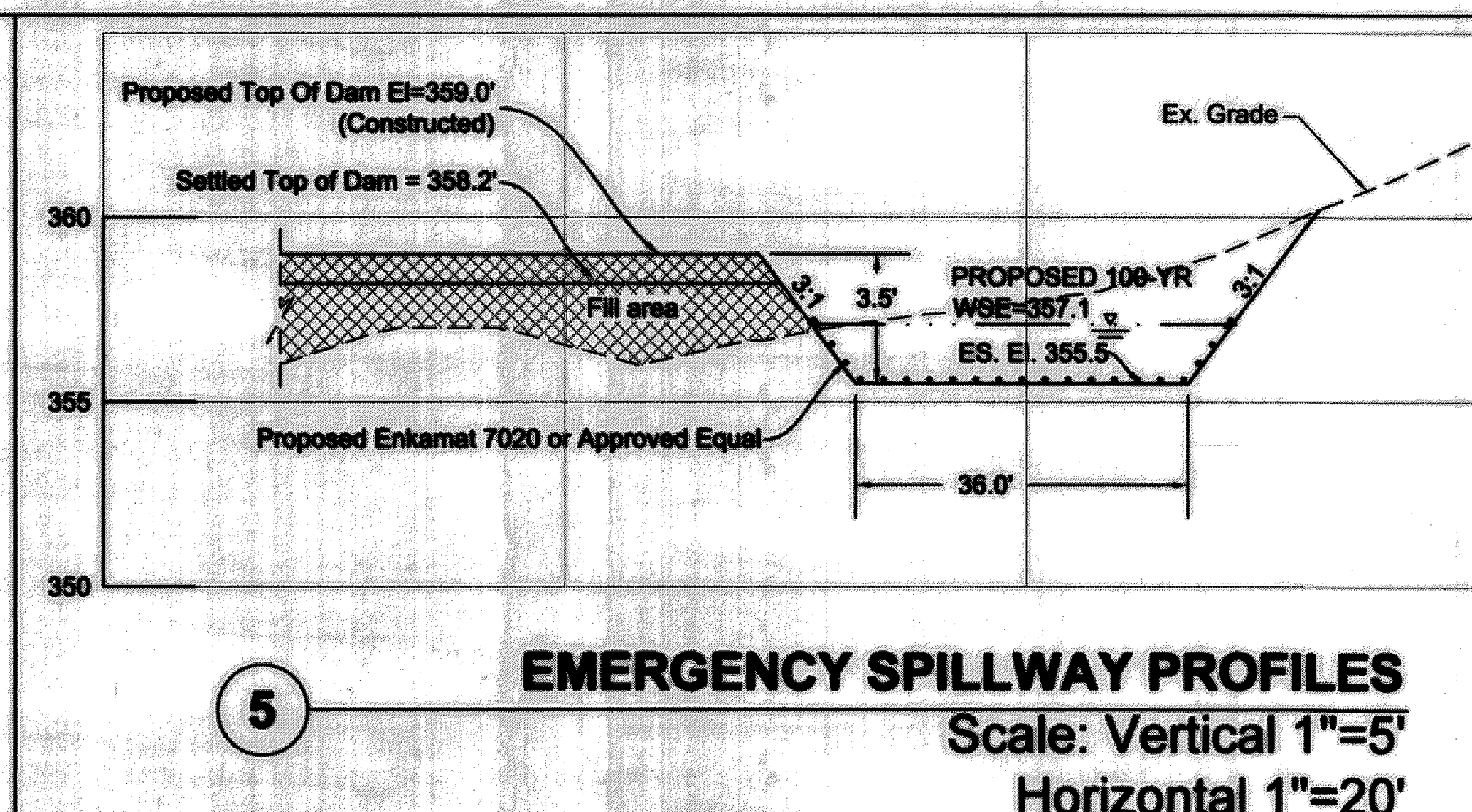
Notes:
1. Begin at the top of the slope and anchor fiber matting in a 12" deep initial anchor trench. Backfill trench and tamp earth firmly.
2. Unroll fiber matting downslope in the direction of water flow.
3. Overlap edges of adjacent parallel rolls 6" and anchor at 12" centers.
4. When fiber mat must 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)

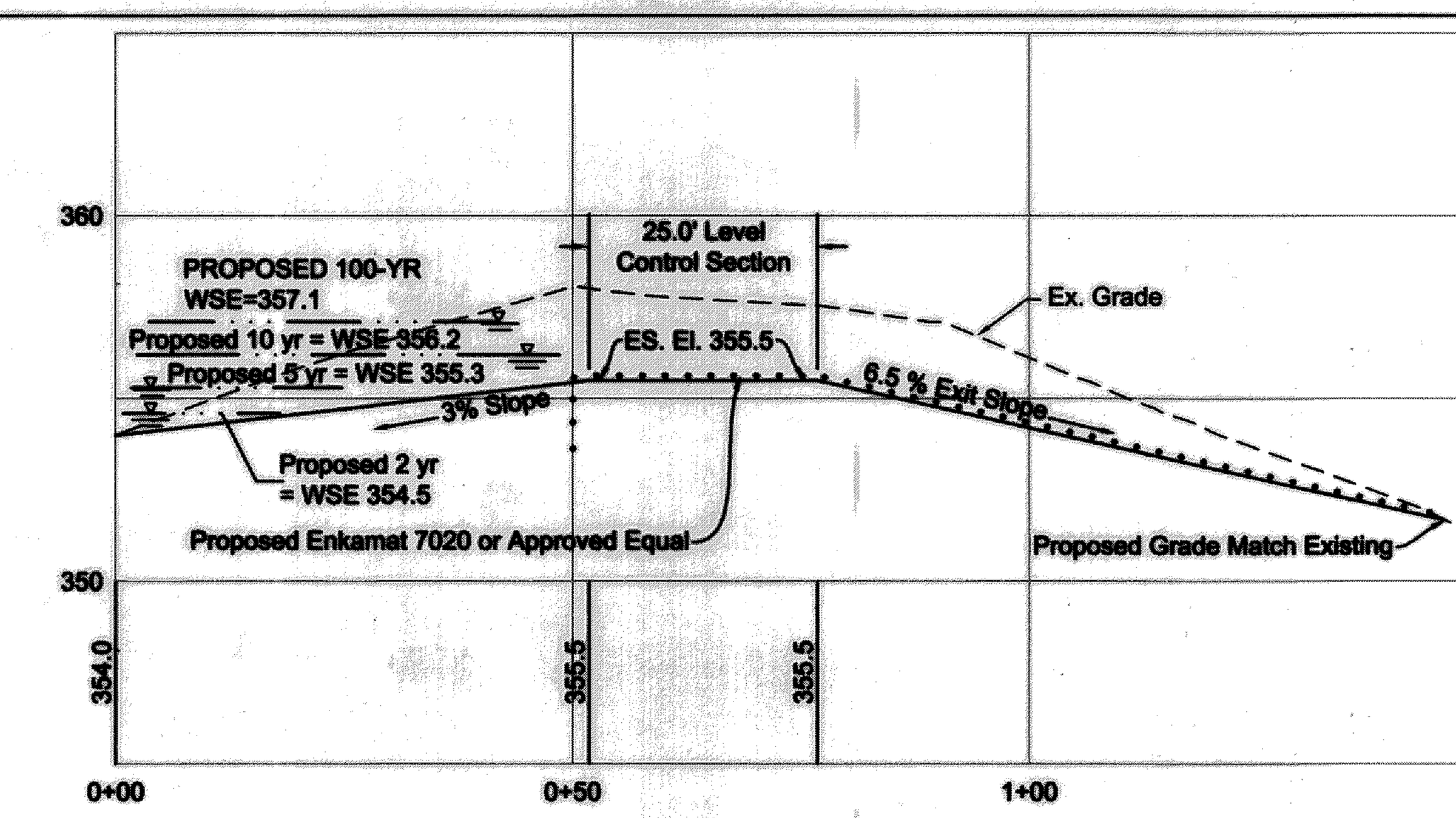
3 **EROSION CONTROL MAT KEYING**
Scale: N.T.S.



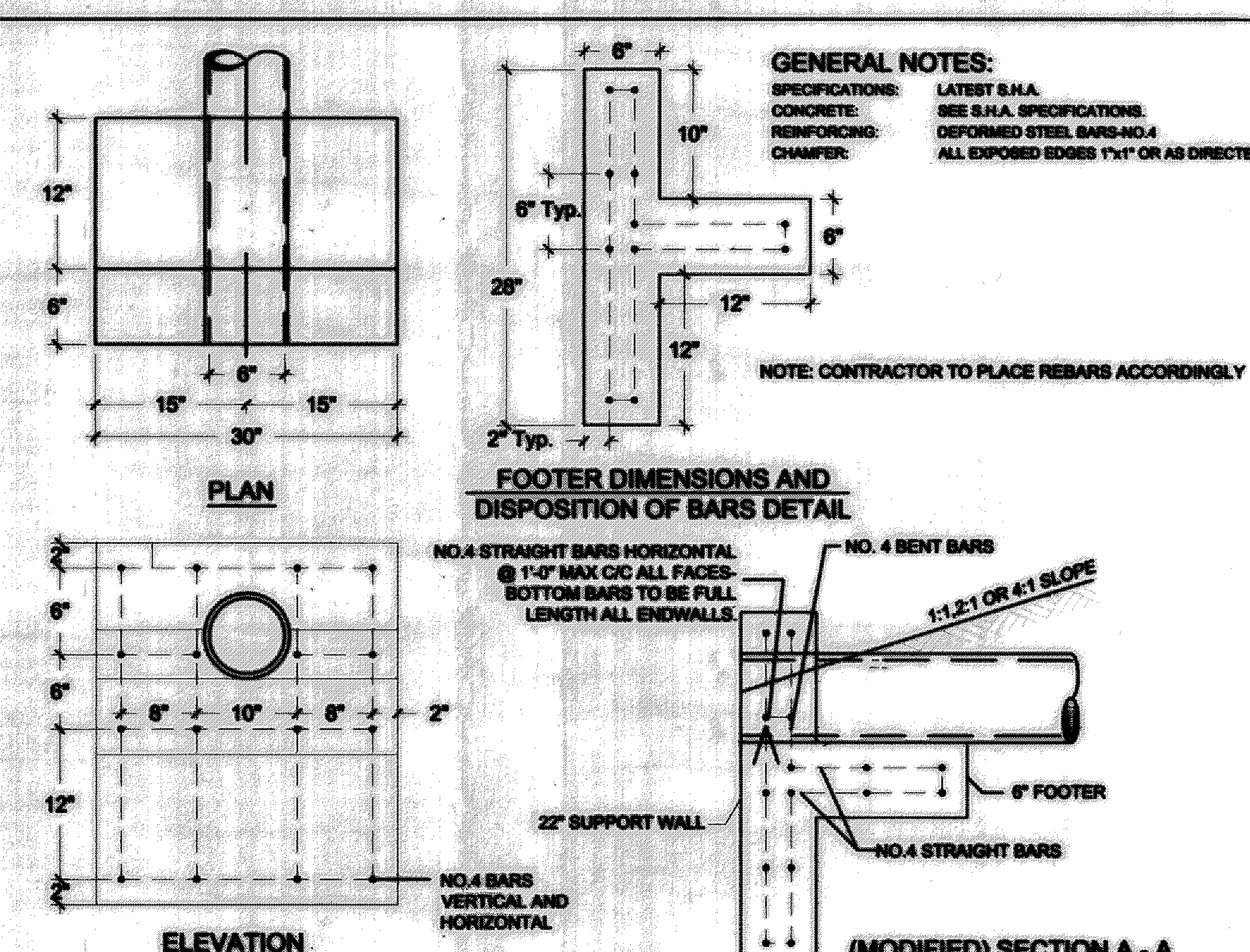
Note: Cradle concrete shall have a strength of f'c=3,500 psi at 28 days (MSHA Mix No.3). Contractor to have a professional geotechnical/structural engineer make at least three cylinders for strength testing and have results of said testing forwarded to the design engineer.

4 **CONCRETE CRADLE**
Scale: N.T.S.





5 **EMERGENCY SPILLWAY PROFILES**
Scale: Vertical 1"=5'
Horizontal 1"=20'

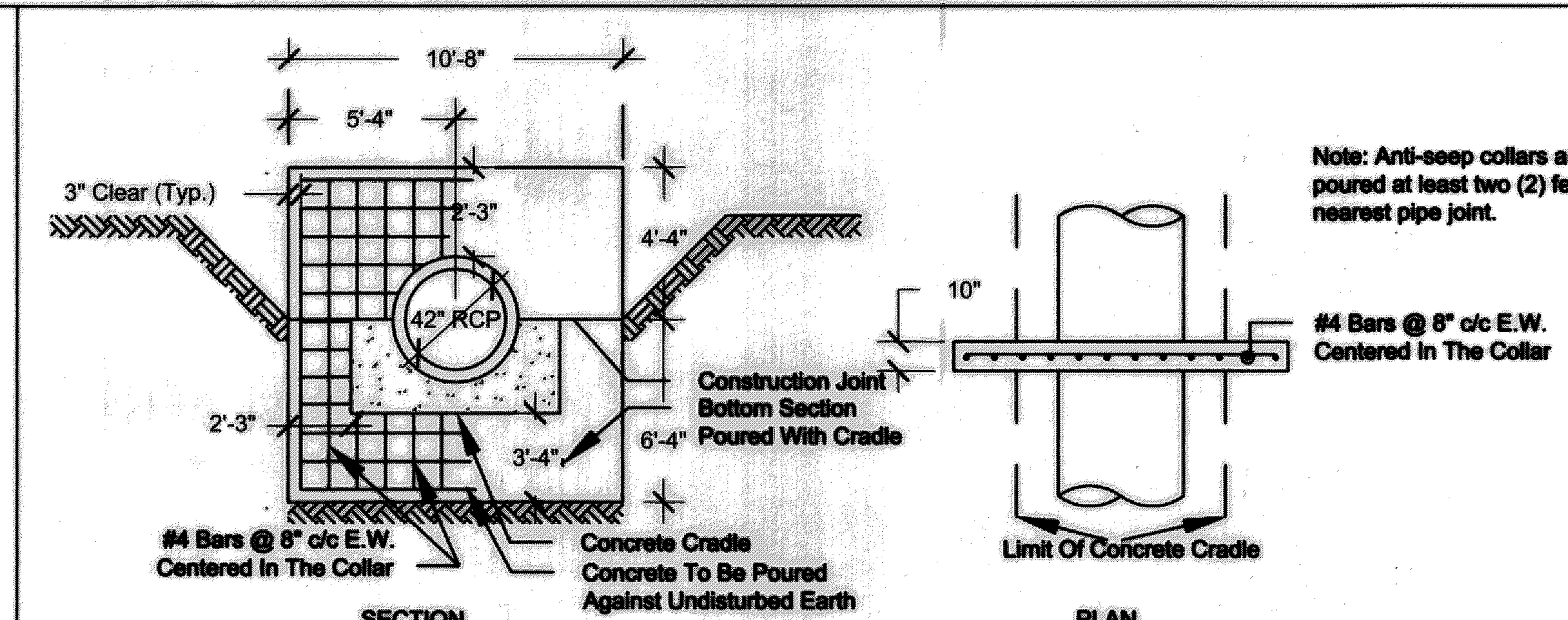


GENERAL NOTES:

SPECIFICATIONS:	LATEST S.H.A.
CONCRETE:	SEE S.H.A. SPECIFICATIONS.
REINFORCING:	DEFORMED STEEL BARS-NO.4
CHAMFER:	ALL EXPOSED EDGES 1"x1" OR AS DIRECTED.

NOTE: CONTRACTOR TO PLACE REBARS ACCORDINGLY

6 **SM2** (MODIFIED) STANDARD END SUPPORT WALL METAL OR CONCRETE ROUND PIPE
STANDARD NO. MD 350.01
Scale: N.T.S.



Note: Anti-seep collars are to be poured at least two (2) feet from the nearest pipe joint.

Note: Anti-seep collar shall have a strength of f'c=3500 psi at 28 days (Mix MSHA No.3). Contractor to have a professional geotechnical/structural engineer make at least three cylinders for strength testing and have results of said testing forwarded to the design engineer.

7 **ANTI-SEEP COLLAR**
Scale: N.T.S.

APPROVED: HC DEPARTMENT OF PUBLIC WORKS
12/19/13
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

THESE PLANS FOR SMALL POND CONSTRUCTION SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
1/2/14
HOWARD SOIL CONSERVATION DISTRICT DATE

HAZEN AND SAWYER
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HOWARD COUNTY DPW - ENVIRONMENTAL SERVICES
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PHONE: (410) 313-6413
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9801 Old Annapolis Road
HOWARD COUNTY, MD
ELECTION DISTRICT 5
MAP 30, GRID 7, PARCEL 10

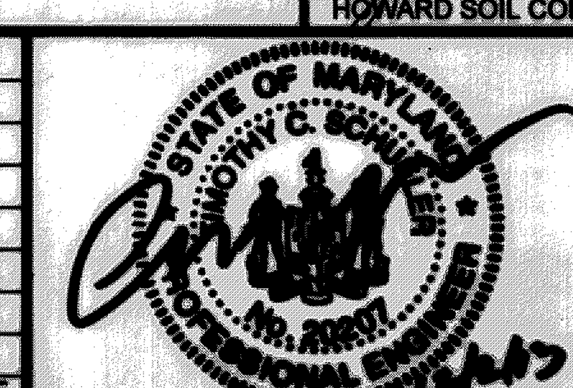
CENTENNIAL PARK NORTH POND RETROFIT

Howard County Project # N-3962

Details

DATE:	11/2013
DESIGNED:	TCS
DRAFTED:	HT/JM
CHECKED:	CW
BASE DATA:	HC

NO.	REVISIONS	BY	DATE



CPJ Associates
CPJ Environmental Services Division
STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
910 CLOPPER ROAD, STE 205N GAITHERSBURG MARYLAND 20878
Phone:(301)208-9573 E-mail: envcpj.com Fax:(301)926-4551
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE AS SHOWN

JOB NO. 37-556

MD-378 NOTES

CONSTRUCTION SPECIFICATIONS

These specifications are appropriate to all ponds within the scope of the Standard for practice MD-378. All references to ASTM and AASHTO specifications apply to the most recent version.

Site Preparation

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the toe of the embankment. Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry tormwater management ponds, a minimum of a 25-foot radius around the inlet structure shall be cleared. All cleared and grubbed material shall be disposed of outside and below the limits of the dam and reservoir as directed by the owner or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated areas.

Earth Fill

Material - The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionablematerials. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification GC, SC, CH, or CL and must have at least 30% passing the #200 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer. Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.

Placement - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8 inch thick (before compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment. The principal spillway must be installed concurrently with fill placement and not excavated into the embankment.

Compaction - The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out. When required by the reviewing agency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within ±2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

Cut Off Trench - The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability.

Embankment Core - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment.

Structure Backfill

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe. Structure backfill may be flowable fill meeting the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 313 as modified. The mixture shall have a 100-200 psi; 28 day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that a minimum of 6" (measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding), over and, on the sides of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill shall be 7" to assure flowability of the material. Adequate measures shall be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill, all metal pipe shall be bituminous coated. Any adjoining soil fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall completely fill all voids adjacent to the flowable fill zone. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a structure or pipe unless there is a compacted fill of 24" or greater over the structure or pipe. Backfill material outside the structural backfill (flowable fill) zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment materials.

Pipe Conduits

All pipes shall be circular in cross section.

Corrugated Metal Pipe - All of the following criteria shall apply for corrugated metal pipe:

1. Materials - (Polymer Coated steel pipe) - Steel pipes with polymeric coatings shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 & M-246 with watertight coupling bands or flanges.
Materials - (Aluminum Coated Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt.
Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-196 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.
2. Coupling bands, anti-seep collars, end sections, etc., must be composed of the same material and coatings as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at least 24 mils in thickness.
3. Connections - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be watertight.
All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24 inches in diameter: flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, pre-punched to the flange bolt circle, sandwiched between adjacent flanges; a 12-inch wide standard lap type band with 12-inch wide by 3/8-inch thick closed cell circular neoprene gasket; and a 12-inch wide hugger type band with oring gaskets having a minimum diameter of 1/2 inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of 4 (four) rods and lugs, 2 on each connecting pipe end.
A 24-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the flange is also acceptable. Helically corrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead.
4. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.
5. Backfilling shall conform to "**Structure Backfill**".
6. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete pipe:

1. Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.
2. Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding / cradle for their entire length. This bedding / cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradle is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this standard. Gravel bedding is not permitted.
3. Laying pipe - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.
4. Backfilling shall conform to "**Structure Backfill**".
5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Plastic Pipe - The following criteria shall apply for plastic pipe:

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" - 10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.
2. Joints and connections to anti-seep collars shall be completely watertight.
3. Bedding -The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.
4. Backfilling shall conform to "**Structure Backfill**".
5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Drainage Diaphragms - When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection.

Concrete

Concrete shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 414, Mix No. 3.

Rock Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 311.
Geotextile shall be placed under all riprap and shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C.

Care of Water during Construction

All work on permanent structures shall be carried out in areas free from 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 requiredi Rei for removal of water from various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the spillway or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the locations being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water sumps from which the water shall be pumped.

Stabilization

All borrow areas shall be graded to provide proper drainage and left in a sightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

B-4-8: STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

(Source: 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control)

Definition

A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

Purpose

To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies

Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

Criteria

1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
3. Runoff from the stockpile area must drain to a suitable sediment control practice.
4. Access the stockpile area from the upgrade side.
5. Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.

Maintenance

The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

SPECIFICATIONS

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

1.1 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.

1.2 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.

1.3 Placement for rock toe protection and/or grade control: Stones to be uniformly placed (non-segregated) with large stones (D_{50} = 16 inches) 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 (D_{50} = 2"). Placement tolerance shall be +/- three (3) inches for grade checks at center, beginning and end of step pool.

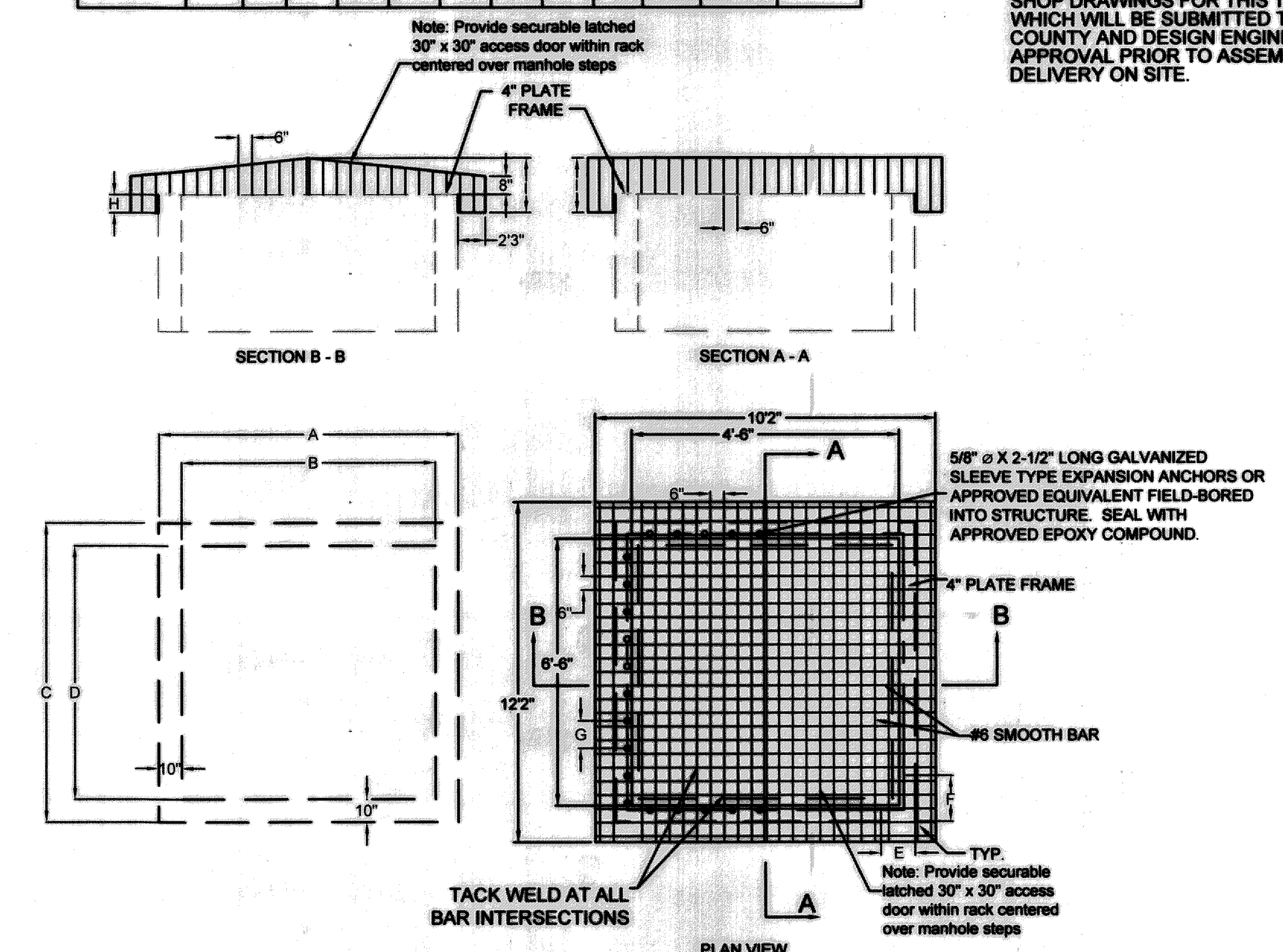
1.4 If excavation is required for placement, follow excavation specifications. No excavation is required if base material is solid or decomposing bedrock. However, if design grades and tolerances cannot be achieved, immediately contact the Design Engineer for a possible field modification.

1.5 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.

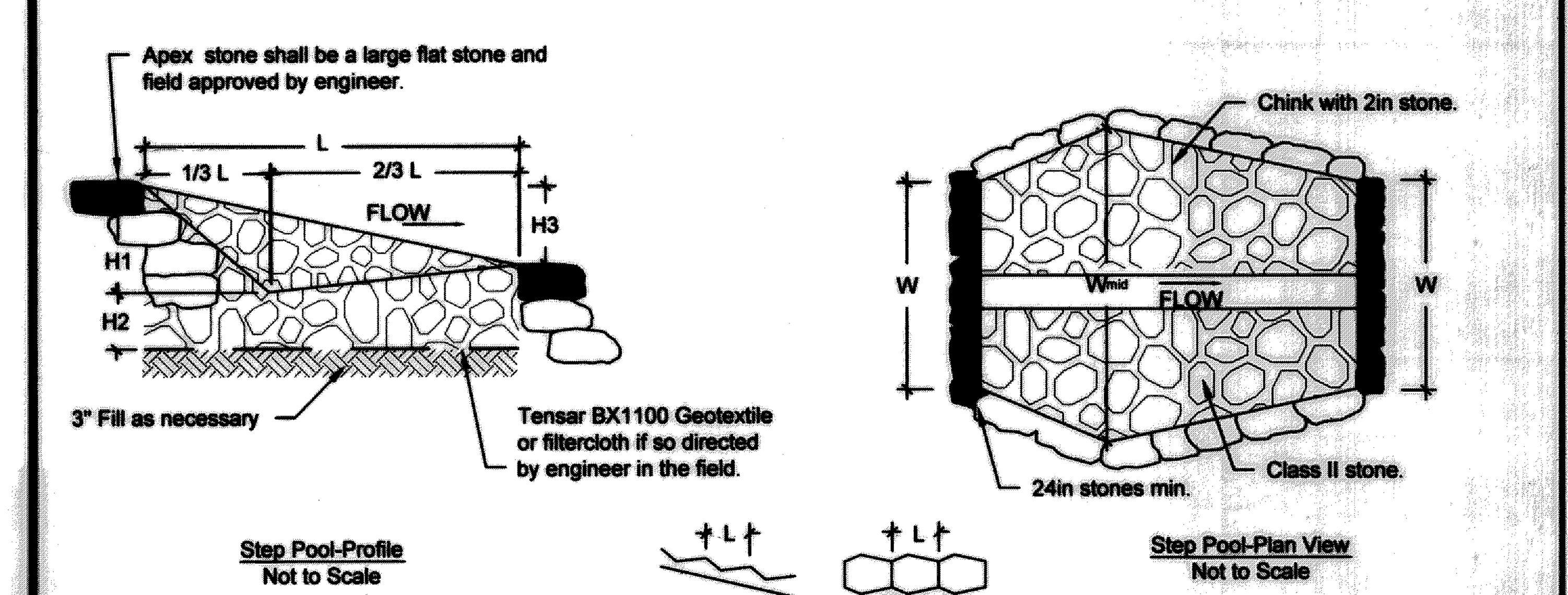
TRASH RACK DETAIL
FABRICATED IN TWO PIECES

LOCATION	QNTY REQ.	"A"	"H"	"I"	"B"	"C"	"D"	"E"	"F"	"G"	BAR SPACING	NOTES
SM1	1	10'-2"	8"	4'-6"	4'-0"	12'-2"	6'-0"	≥6"	≥6"	1'-0"	6" OC	

NOTES:
1. TRASH RACK TO BE HOT-DIPPED GALVANIZED AFTER ASSEMBLY & PRIOR TO INSTALLATION
2. VERTICAL BARS ON OUTSIDE.
3. OVERHANG ON ALL SIDES
4. CONTRACTOR IS REQUIRED TO HAVE A QUALIFIED METAL FABRICATOR PREPARE SHOP DRAWINGS FOR THIS TRASH RACK WHICH WILL BE SUBMITTED TO HOWARD COUNTY AND DESIGN ENGINEER FOR APPROVAL PRIOR TO ASSEMBLY AND DELIVERY ON SITE.



(10) **TRASH RACK DETAIL**
N.T.S.

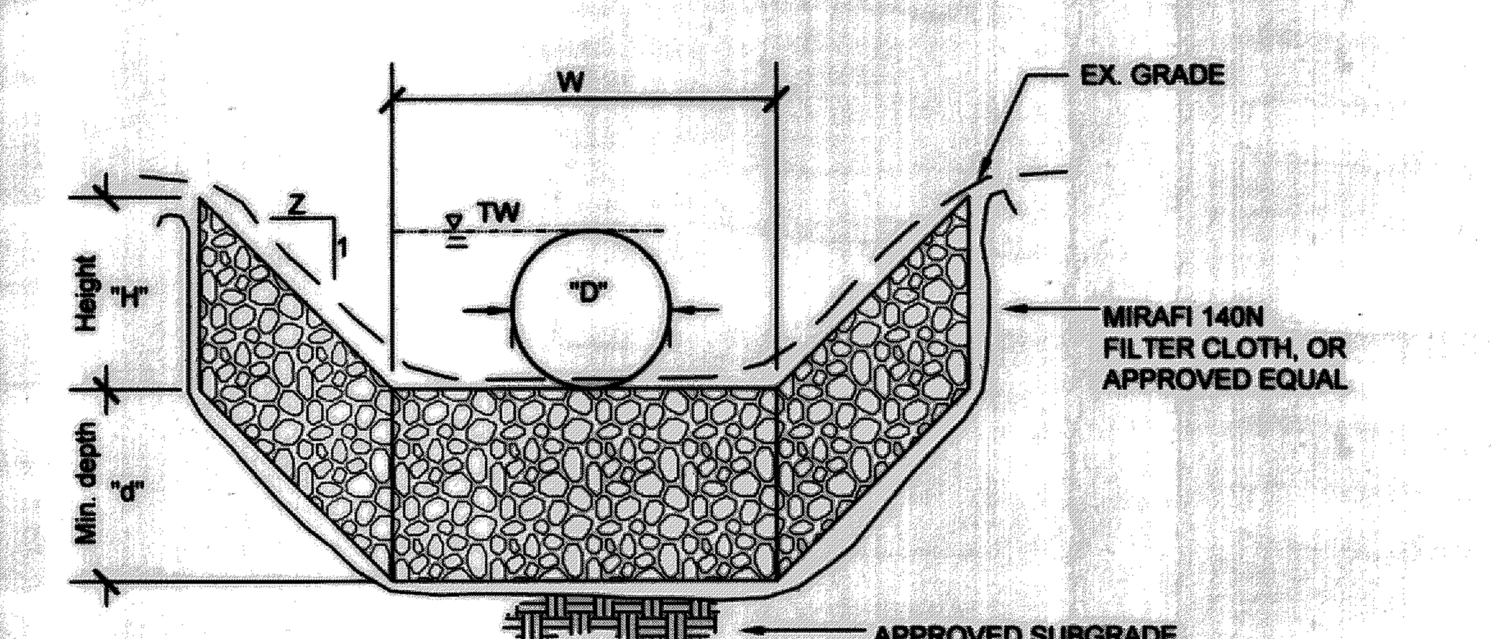


Step Pools

Station	L	W	W_{mid}	H_1	H_2	H_3
1+72	15	6	16	2.0	1.0	1.0
1+87	15	6	16	2.0	1.0	1.0
2+02	15	6	16	2.0	1.0	1.0
2+17	15	6	16	2.0	1.0	1.0

NOTES:
1. D_{50} = 16" (MSHA II). Chink with D_{50} = 2" stone.
2. Field tolerance for field heights (H_1 , H_2) to be 2"+/-.
3. Stone to be replaced by hand or with small machinery.

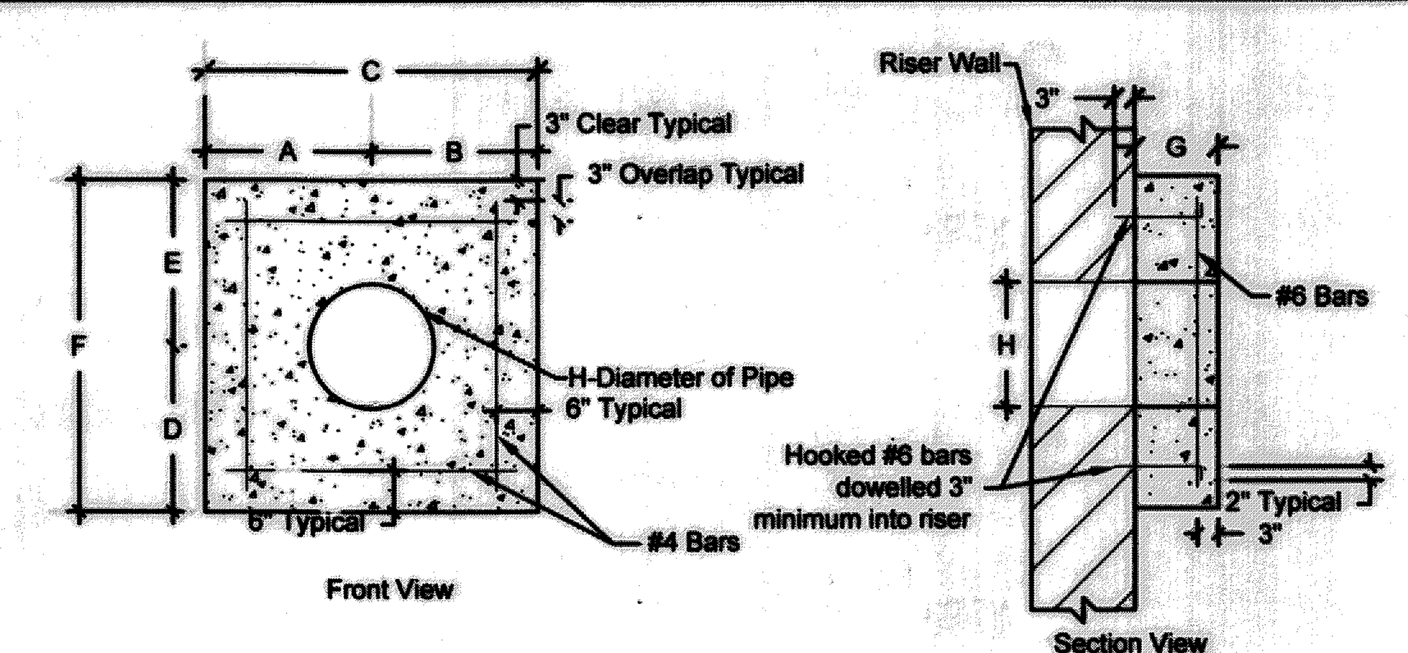
(8) **STEP POOL DETAIL**
N.T.S.



RIPRAP OUTFALL TABLE

Location	Pipe Diam., "D"	invert of pipe	Tailwater "TW" Q10	Flow "Q"	Velocity At Riprap Flare	Type of riprap	D_{50}	D_{100}	Length of Riprap	Slope "Z"	Width at end of Pipe	Width at end of Riprap "W"	H	d
	inches	msl	msl	cfs	fps	Class	inches	inches	feet		feet	feet	feet	feet
SWM3	42	347.0	349.2	132	4.9	MSHA I	12	18	55	3	8	6	Varies	3.0

(9) **RIP-RAP OUTFALL SECTION**
NOT TO SCALE



Concrete Collar Dimension Schedule									
Location	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	Notes
42" RCP	27"	27"	54"	27"	27"	54"	12"	42"	
6" DIP	6"	6"	12"	6"	6"	12"	12"	6"	
6" DIP	6"	6"	12"	6"	6"	12"	12"	6"	

Use MSHA mix # 3 concrete (f'c =3500 psi)

(11) **CONCRETE COLLAR DETAIL**
N.T.S.

APPROVED: HC DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE

THESE PLANS FOR SMALL POND CONSTRUCTION SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
HOWARD SOIL CONSERVATION DISTRICT — DATE

HAZEN AND SAWYER
Environmental Engineers & Scientists
4011 WestChase Blvd, Raleigh, North Carolina 27607

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

9801 Old Annapolis Road
HOWARD COUNTY, MD
ELECTION DISTRICT 5
MAP 30, GRID 7, PARCEL 10

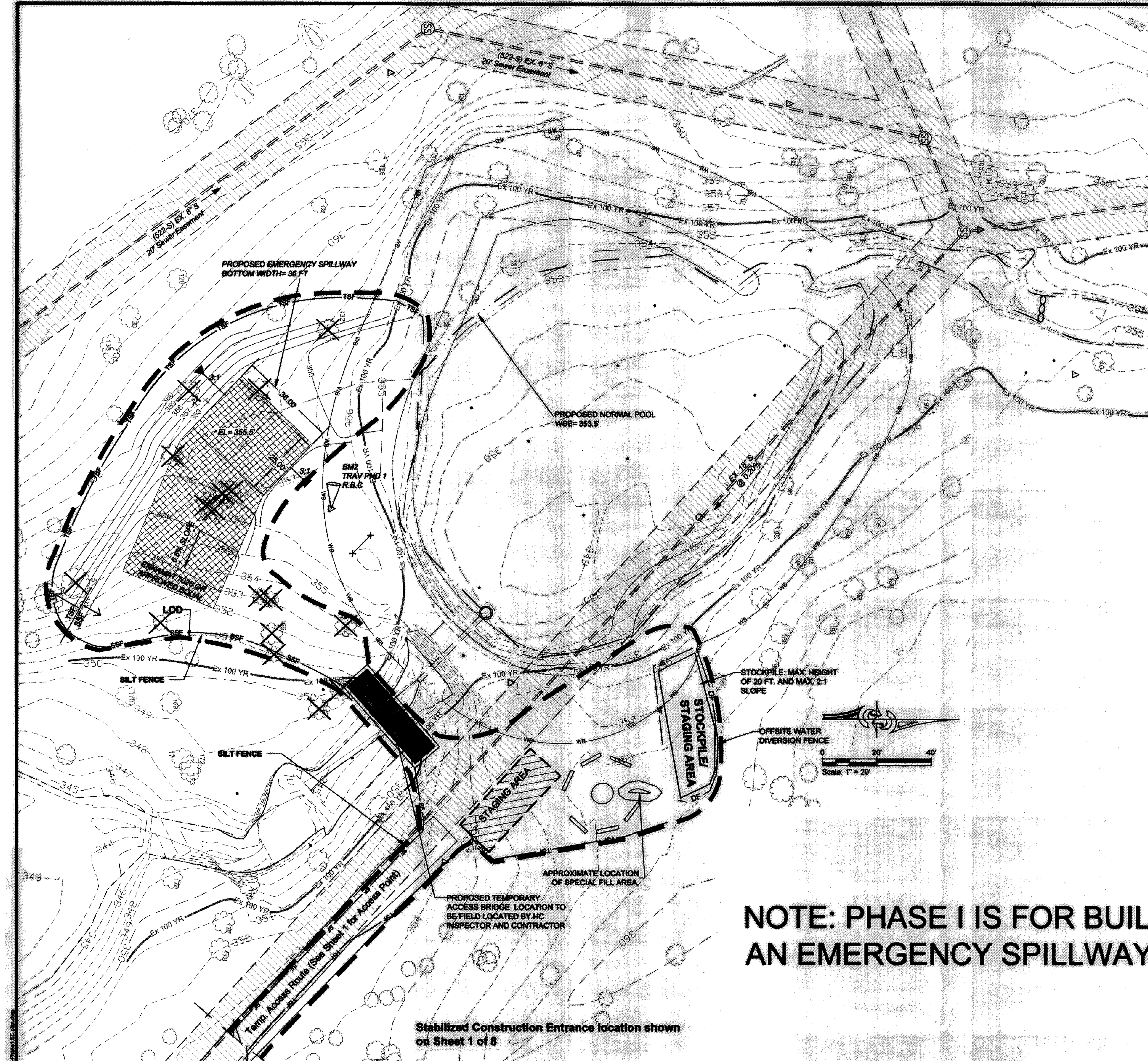
CENTENNIAL PARK
NORTH POND RETROFIT
Howard County Project # N-3962
NOTES AND DETAILS

DATE: 11/2013
DESIGNED: TCS
DRAFTED: HT/JM
CHECKED: CW
BASE DATA: HC

NO.	REVISIONS	BY	DATE

CPJ Associates
CPJ Environmental Services Division
STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
910 CLOPPER ROAD, STE 285N GAITHERSBURG MARYLAND 20878
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE AS SHOWN
SHEET 4 OF 8 SHEETS
JOB NO. 37-556



Stabilized Construction Entrance location shown on Sheet 1 of 8

NOTE: PHASE I IS FOR BUILDING AN EMERGENCY SPILLWAY ONLY

LEGEND

Symbol	Description
	Easement
	Property Line
Ex 100 YR	EX. 100 Year Floodplain
	Water Surface
	Limits of Disturbance
	Sewer Line
426	Existing Contours
	Wetland
WB	Wetland Buffer
	Proposed Contours
	Ex. Tree
	Tree to be Removed
DF	Diversion Fence
SSF	Super Silt Fence (Detail 11, Sheet 8)
SF	Silt Fence (Detail 2, Sheet 7)
TSF	Tree Save Fence (Detail 3, Sheet 7)
	Temporary Access Bridge (Detail 7, Sheet 7)

Centennial Pond North - PHASE I Sequence of Construction

1. Obtain Howard County grading permit prior to construction.The MDE Wetland and Waterways tracking/permit number for this project is #201061252 dated October 26, 2010; permit expires October 2013. There can be no in-stream construction between March 1st and May 31 of any year. Obtain MDE Permit for Stormwater Associated with Construction Activity prior to the start of any construction activity.
2. All erosion and sediment control practices shall be installed and maintained according to the criteria contained in the most current version (2011) of the Maryland Standards and Specifications for Soil Erosion and Sediment Control.
3. All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA Standards and specifications if applicable.The contractor shall notify "MISS Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done. **1 day**
4. Prior to clearing of trees, installing sediment control measures, or grading, the Contractor will schedule a pre-construction meeting on-site with the Sediment Control Inspector, the County Project Manager, Parks Project Manager, and the Design Engineer. All parties require 48 hour notice. **1 day**
5. With Sediment Control Inspector's permission, install stabilized construction entrance. **1 day**
6. Clear and grub for installation of sediment control features. **2 days**
7. Install silt fence, pedestrian fence and tree protection measures as shown on plan. Development activities shall not impair any drainage, create an erosion hazard, or create a source of sediment to any adjacent watercourse, wetland, or property. Maximum height of stockpile shall be 20 ft.; maximum stockpile slope shall be 2:1 (horizontal to vertical) per Detail B-3-1 of 2011 Soil Erosion & SC Standards. (For other stockpile specifications, see Spec.B-4-8 on Sheet 6). **2 days**
8. Install temporary construction access bridge per detail 1 this sheet. **1 day**
9. Grade emergency spillway and install Enkamat per plan. **5 days**
10. Provide written grade check to Design Engineer indicating all spot elevations are within tolerance. **1 day**
11. Permanently stabilize all newly graded area including disturbed areas per permanent seeding specifications. **1 day**
12. With permission of the Sediment Control Inspector, remove any remaining sediment control features and stabilize all areas disturbed by this process. **2 days**

Total 17 days

APPROVED: HC DEPARTMENT OF PUBLIC WORKS
12/19/13
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

THESE PLANS FOR SMALL POND CONSTRUCTION SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
1/2/14
HOWARD SOIL CONSERVATION DISTRICT DATE

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CENTENNIAL PARK NORTH POND RETROFIT

Howard County Project # N-3962

PHASE I - Sediment Control

DATE: 11/2013
DESIGNED: TCS
DRAFTED: HT/JM
CHECKED: CW
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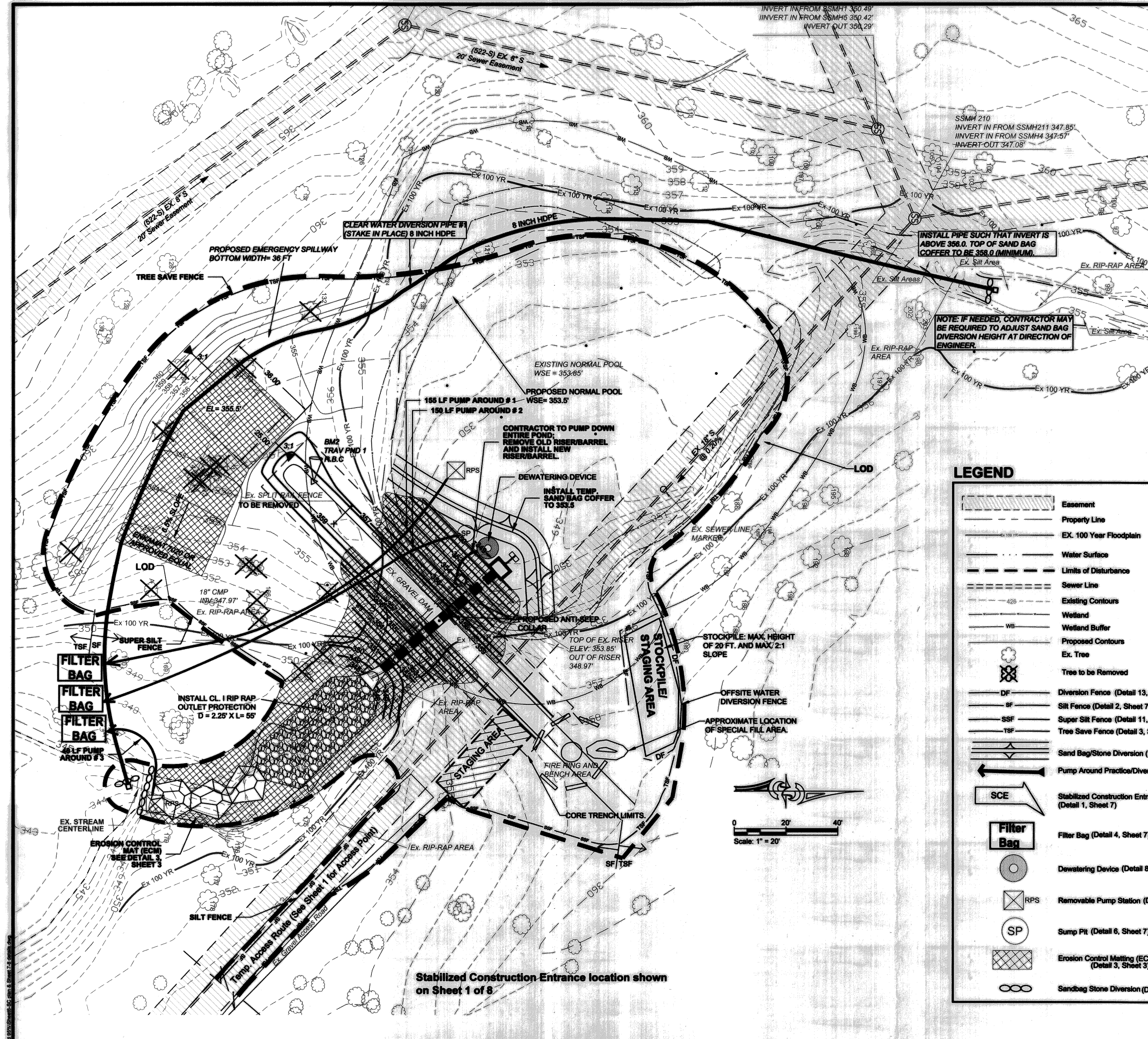
NO.	REVISIONS	BY	DATE

STATE OF MARYLAND · PROFESSIONAL ENGINEER · No. 20207

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

SCALE AS SHOWN
SHEET 5 OF 8 SHEETS
JOB NO. 37-556



LEGEND

- Easement
- Property Line
- EX. 100 Year Floodplain
- Water Surface
- Limits of Disturbance
- Sewer Line
- Existing Contours
- Wetland
- Wetland Buffer
- Proposed Contours
- Ex. Tree
- Tree to be Removed
- DF — Diversion Fence (Detail 13, Sheet 8)
- SF — Silt Fence (Detail 2, Sheet 7)
- SSF — Super Silt Fence (Detail 11, Sheet 8)
- TSF — Tree Save Fence (Detail 3, Sheet 7)
- Sand Bag/Stone Diversion (Detail 5, Sheet 7)
- Pump Around Practice/Diversion
- SCE — Stabilized Construction Entrance (Detail 1, Sheet 7)
- Filter Bag — Filter Bag (Detail 4, Sheet 7)
- Dewatering Device (Detail 8, Sheet 7)
- RPS — Removable Pump Station (Detail 10, Sheet 8)
- SP — Sump Pit (Detail 6, Sheet 7)
- Erosion Control Matting (ECM) (Detail 3, Sheet 3)
- Sandbag Stone Diversion (Detail 5, Sheet 7)

Centennial Pond North Sequence of Construction (PHASE II)

1. Obtain Howard County grading permit prior to construction. The MDE Wetland and Waterways tracking/permit number for this project is #201061252 date October 26, 2010; the permit expires October 2013. There can be no in-stream construction between March 1st and May 31 of any year. Obtain MDE Permit for Stormwater Associated with Construction Activity prior to any construction activity.

2. All erosion and sediment control practices shall be installed and maintained according to the criteria contained in the most current version (2011) of the Maryland Standards and Specifications for Soil Erosion and Sediment Control.

3. All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA Standards and specifications if applicable.The contractor shall notify "MISS Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done. **1 day**

4. Prior to clearing of trees, installing sediment control measures, or grading, the Contractor will schedule a pre-construction meeting on-site with the Sediment Control Inspector, the County Project Manager, Parks Project Manager, MDE/WMA Inspector (if necessary), and the Design Engineer. All parties require 48 hour notice, with the exception of MDE/WMA, which requires a 5 day notification. **1 day**

A. Construction activities including the installation of erosion and sediment control measures shall not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities shall be marked in the field prior to construction. (Note: if HC Parks knows of additional public-private utilities not typically marked by MISS UTILITY, Parks is to inform contractor; contractor to contact private utility locator). The contractor is responsible for any damage to existing utilities that may result from construction and shall repair the damage at his/her own expense to the county's or utility company's satisfaction.

B. The contractor shall 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 limit of disturbance which will be removed for construction access. Trees shall not be removed within the limit of disturbance without approval from HC Parks or local authority.

C. Any earth disturbance shall not begin until all sediment and erosion control measures have been installed and approved by the Sediment Control Inspector. The contractor shall stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.

D. In general, the contractor shall begin work at the upstream project 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 Sediment Control Inspector, HC Project Manager, and/ or Design Engineer; this requirement will be finalized at the pre-con meeting. The contractor shall 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 shall not be conducted in the channel during rain events.

5. With Sediment Control Inspector's permission, install stabilized construction entrance. Limit initial clearing and grubbing for the installation of the construction entrance, perimeter controls, and any remaining controls. **1 day**

6. Clear and grub for installation of sediment control features. **2 days**

7. Install silt fence, pedestrian fence and tree protection measures as shown on phase II plan. All sediment and erosion control require continual maintenance. Any controls that are damaged or disturbed shall be restored or repaired before the end of each day. **2 days**

8. Install clear water diversion pipe #1. The diversion water pipe will convey base flow (max. two-year storm) via gravity flow. The pipe shall discharge onto a stable velocity dissipater made of rip rap or sandbags **5 days**

9. Install pump around #1. Pump down existing pond until flow is turbid. Any pumping of water must be filtered and done according to the criteria contained in the most current version (2011) of the MD Standards and Specifications for Soil Erosion and Sediment Control. Drop water level a maximum of one foot per day. **6 days**

10. Install dewatering sump pit and filter bag pump around #2 with the approval of the Sediment Control Inspector. Pump down remainder of permanent pool. Note to contractor: no water from construction area to leave site without first passing through a filter device (filter bag). **2 days**

11. Install temporary sand bag coffer dam on inside of pond around existing CMP riser as shown on plan . **1 day**

12. Install dewatering device to CMP riser and pump around #3. **1 day**

13. Upon installation of all sediment control measures and approval by the Sediment Control inspector , clear, grub, and grade the remainder of the site as specified by the limits of disturbance. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within three (3) calendar days on the surface areas of all sediment controls, stockpiles, and perimeter slopes, and seven (7) days for all other disturbed areas on the site not being actively graded. Development activities shall not impair any drainage, create an erosion hazard, or create a source of sediment to any adjacent watercourse, wetland, or property. Maximum height of stockpile shall be 20 ft.; maximum stockpile slope shall be 2:1 (horizontal to vertical) per Detail B-3-1 of 2011 Soil Erosion & SC Standards. (For other stockpile specifications, see Spec.B-4-8 on Sheet 6). Begin by removing existing material on upstream dam embankment and pond bottom necessary for grading shown on Sheet 2. Do not begin removal of embankment material until all materials for principal spillway are on site. **3 days**

14. Remove existing embankment to an elevation one foot above the top of dewatering device. Confirm with the local weather service that a 5 day precipitation free window is available along with concurrence from the Sediment Control Inspector prior to embankment removal. **4 days**

15. Shore up temporary sand bag coffer dam. Remove and dispose of existing CMP barrel, concrete riser and remainder of unsuitable embankment material. **2 days**

16. Install cutoff trench at new barrel location. **2 days**

17. Once all the appropriate construction materials for constructing the new barrel and riser are on site the contractor shall install barrel, cradle and anti-seep collar(s) under the supervision of a geotechnical engineer registered in the State of Maryland. **2 days**

18. Install Rip Rap outfall protection and step pools. **2 days**

19. Install new riser structure. Geotechnical engineer to approve sub grade under riser. Connect dewatering device to newly installed riser and route any remaining pumping to dewatering device. Continue to use silt sacks as needed. **1 day**

20. Place controlled backfill over new barrel under supervision of geotechnical engineer to limits of dam grading in controlled lifts. Temporarily seed and stabilize.**5 days, not including 15 days to establish grass cover**

21. With permission from SC Inspector, remove sand bag diversion. Remove pump-arounds as field conditions dictate. **1 day**

22. Provide written grade check to Design Engineer indicating all pipe, orifice and weir elevations are constructed per plans. **1 day**

23. Complete fine grading of facility. **2 days**

24. Provide as-built survey to Design Engineer for verification of storage volume; verification of storage volume must occur prior to full removal of construction equipment. Conduct a "punch-list" walk through with the County Project Manager and Design Engineer. **1.5 days**

25. Permanently stabilize all remaining disturbed areas per permanent seeding specifications. **1 day**

26. After the site has been stabilized with adequate vegetation, with permission of the Howard SC Inspector, remove any remaining sediment control features and stabilize all areas disturbed by this process. **2 days**

Total 51.5 days

APPROVED: HC DEPARTMENT OF PUBLIC WORKS

12/19/13

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

THESE PLANS FOR SMALL POND CONSTRUCTION SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

1/2/14

HOWARD SOIL CONSERVATION DISTRICT DATE

HAZEN AND SAWYER
Environmental Engineers & Scientists
4011 WestChase Blvd, Raleigh, North Carolina 27607

HOWARD COUNTY DPW - ENVIRONMENTAL SERVICES 6751 COLUMBIA GATEWAY DRIVE, SUITE 514 COLUMBIA, MD 21046 PHONE: (410) 313-6413 ATTN: MARK RICHMOND	9801 Old Annapolis Road HOWARD COUNTY, MD ELECTION DISTRICT 5 MAP 30, GRID 7, PARCEL 10	**CENTENNIAL PARK NORTH POND RETROFIT** Howard County Project # N-3962 **Phase II Sediment Control**	DATE: 11/2013 DESIGNED: TCS DRAFTED: HT/JM CHECKED: CW BASE DATA: HC

NO.	REVISIONS	BY	DATE

STATE OF MARYLAND · TIMOTHY C. SCHUELER · No. 20207 · PROFESSIONAL ENGINEER

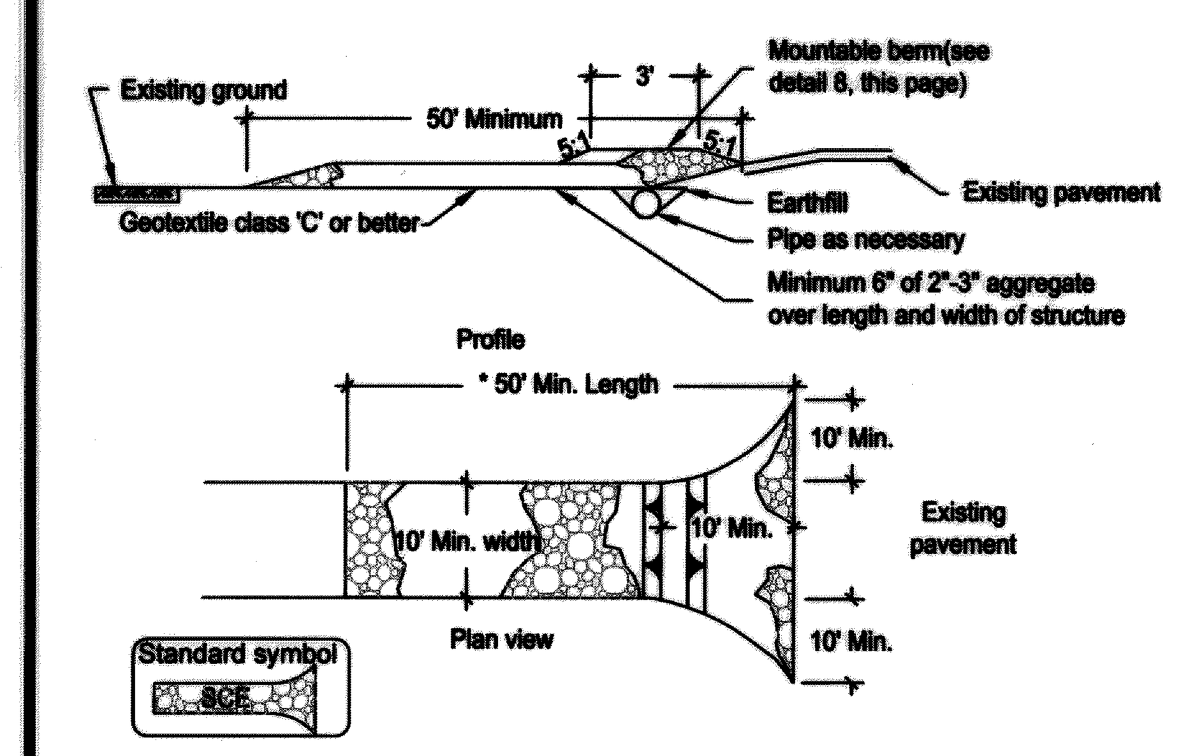
12/4/13

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

SCALE AS SHOWN

SHEET 6 OF 8 SHEETS

JOB NO. 37-556

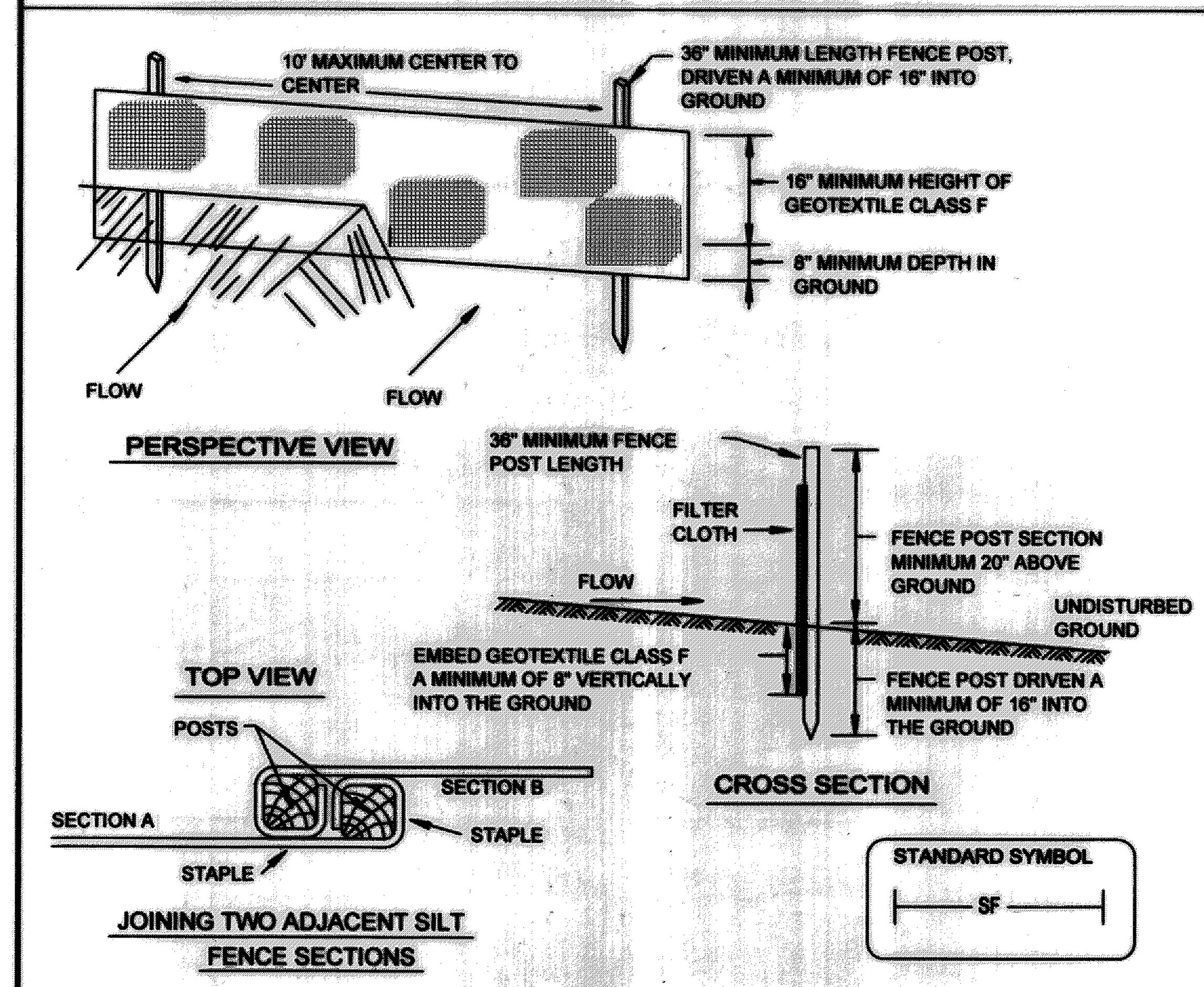


Construction Specifications:
1. Length - minimum of 50' (*30' for single residence lot).
2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval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

(1) **Stabilized Construction Entrance**
Not to scale

DETAIL 22 - SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 11/2" x 11/2" square (minimum) cut, or 13/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pond per linear foot.

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

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

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

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

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 15 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

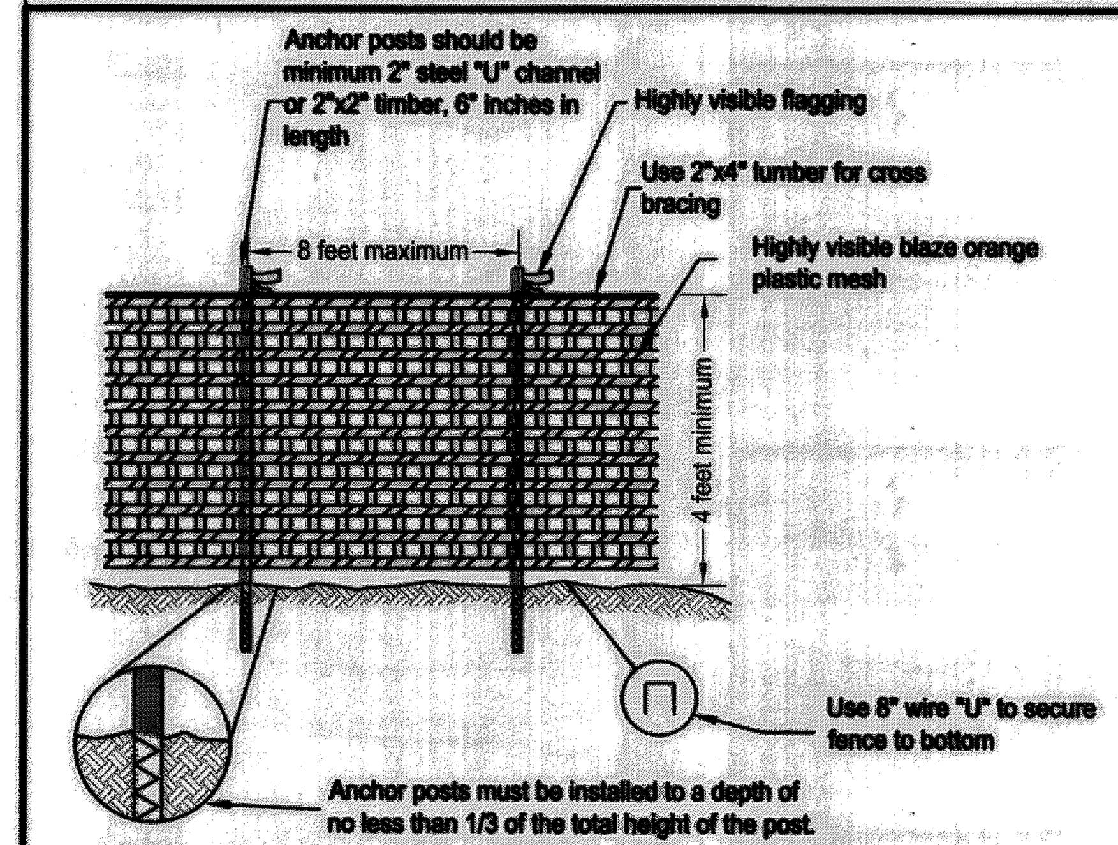
(2) **SILT FENCE DETAIL**
Not to scale

Silt Fence Design Criteria

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

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

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 15 - 3A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



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

(3) **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 initial soil disturbance or re-disturbance, permanant or temporary stabilization shall be completed within: a) 3 calender days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1, b) 7 days as to all other disturbed or graded areas on the project site.
4. All disturbed areas must be stabilized within the time period specified above in accordance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding (Sec. B-4-5), temporary seeding (Sec. B-4-4) and mulching (Sec.B-4-3). Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
5. 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.
6. Site Analysis:

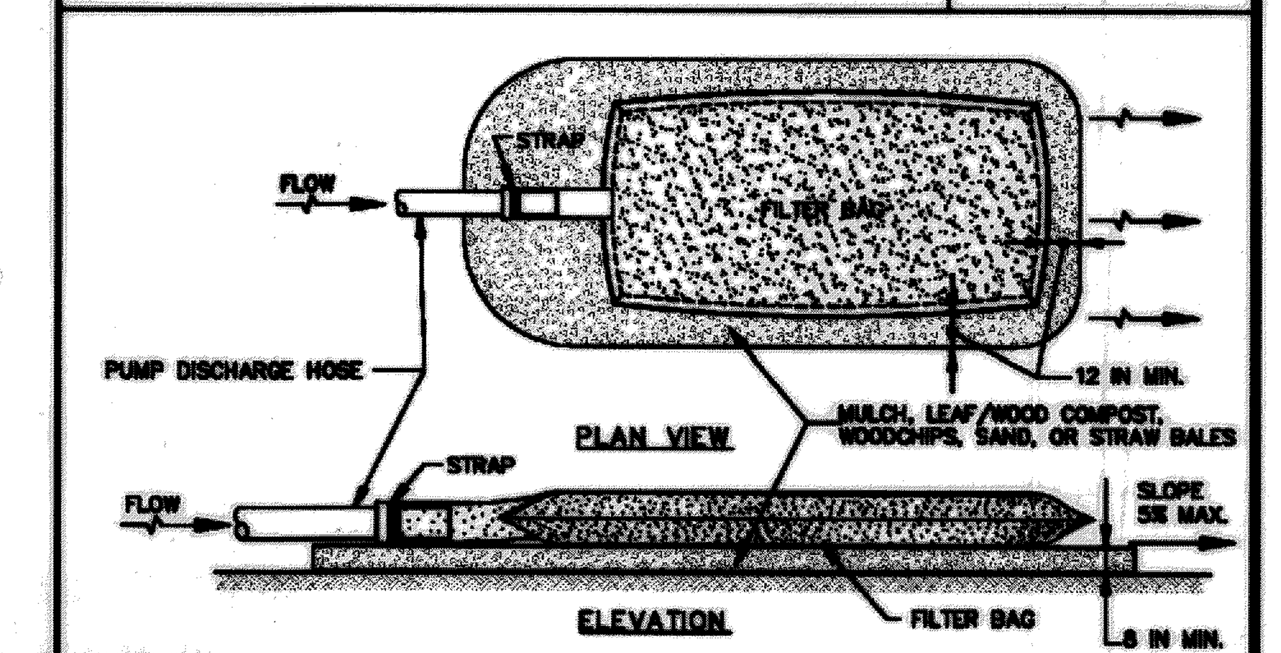
Total Area of site	104.36	acres.
Area Disturbed	2.1	acres.
Area to be roofed or paved	0	acres.
Area to be vegetatively stabilized	0.25	acres.
Total Cut	1,640	Cu. Yds.
Total Fill	1,930	Cu. Yds.
Offsite waste/borrow area location	To be Provided by the Contractor for Approval by the Project Manager; site must have a current open grading permit.	

7. Any sediment control practice that is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
8. Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
9. 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.
10. 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.
11. Any changes or revisions to the sequence of construction must be reviewed and approved by the plan approval authority prior to proceeding with construction.
12. A project is to be sequenced so that grading activities begin on one grading unit (maximum acreage of 20 ac. per grading unit) at a time. Work may proceed to a subsequent grading unit when at least 50 percent of the disturbed area in the preceding grading unit has be stabilized and approved by the enforcement authority. Unless otherwise specified and approved by the approval authority, no more than 30 acres cumulatively may be disturbed at a given time.

Rev. 4/2013

DETAIL F-4 FILTER BAG

STANDARD SYMBOL
FB



CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

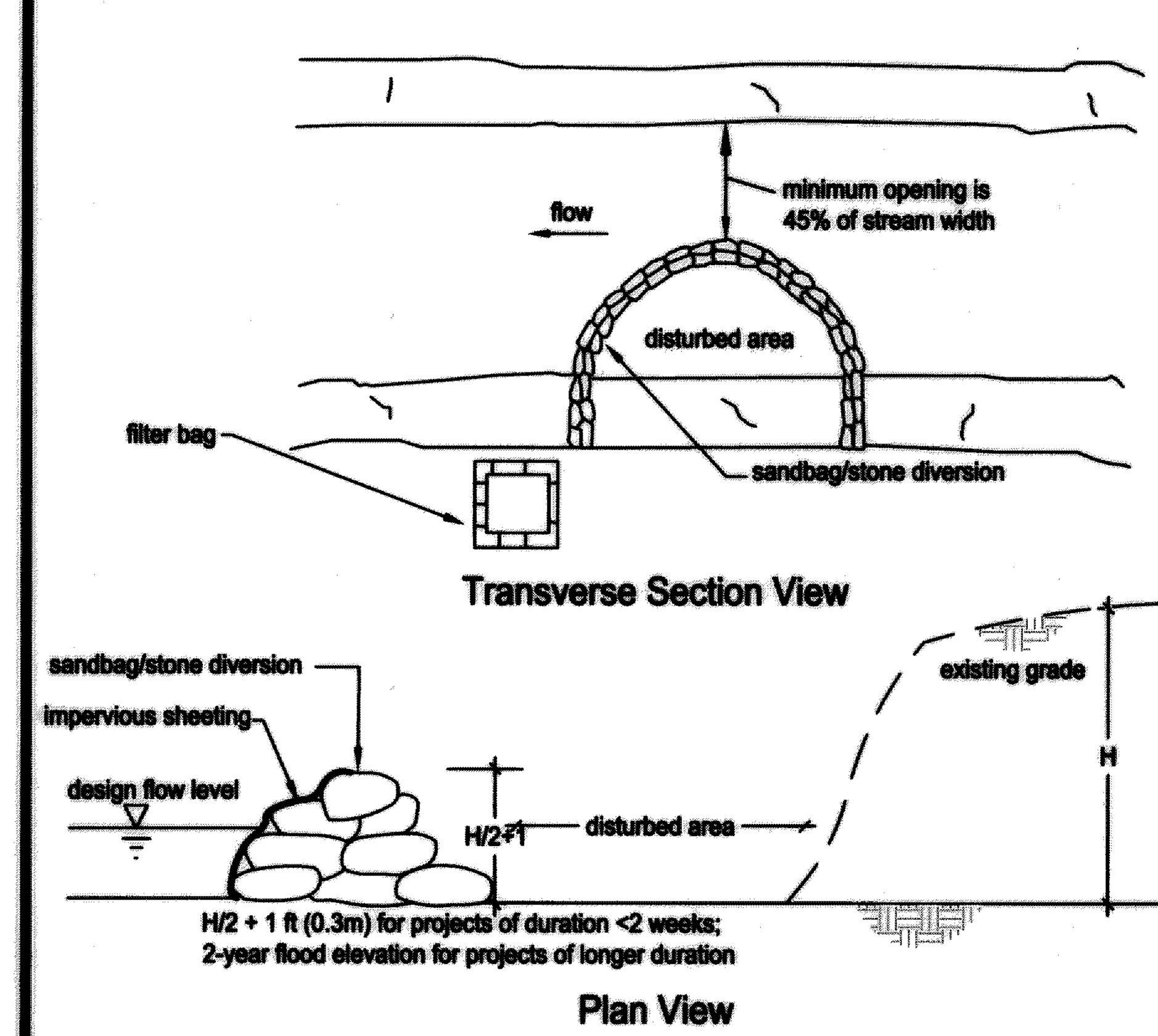
GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT^2	ASTM D-4491
PERMITTIVITY (SEC^{-1})	1.2 SEC^{-1}	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15–0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

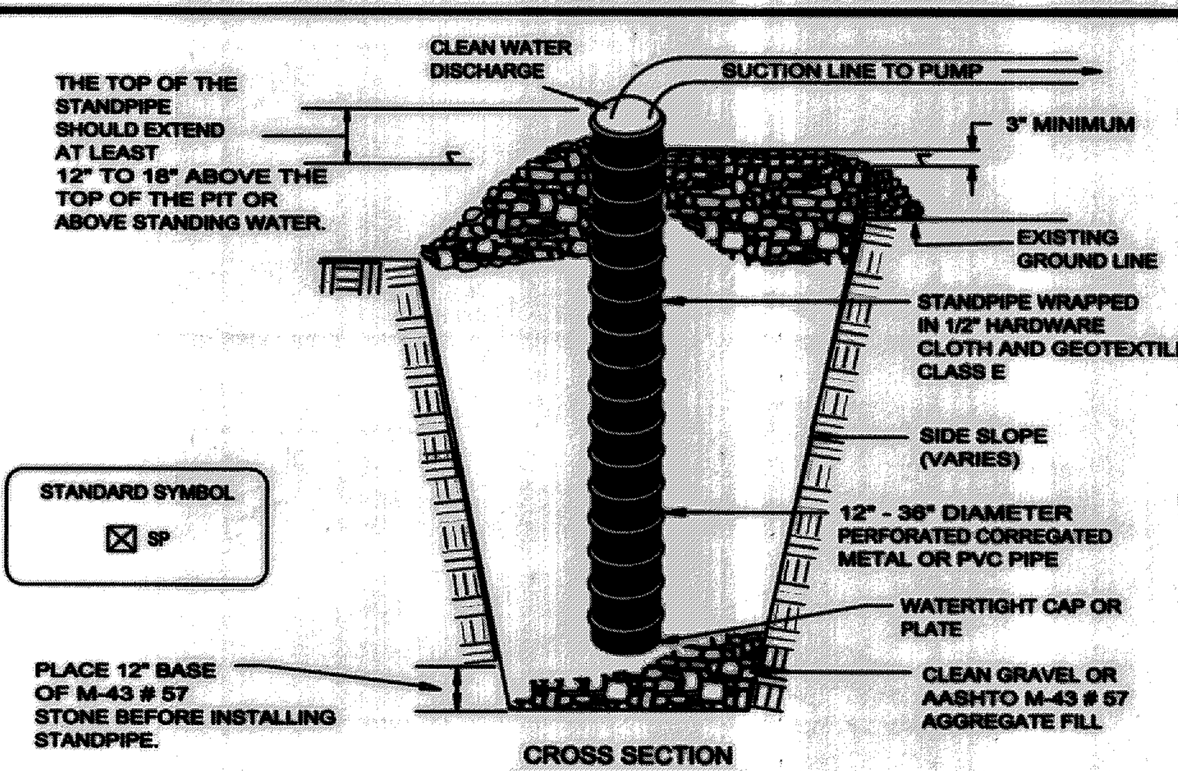
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

(4) **FILTER BAG**
Not to scale



Source: Maryland's guidelines to waterway construction-detail 1.5

(5) **Sandbag Stone Diversion**
Not to scale



Construction Specifications

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

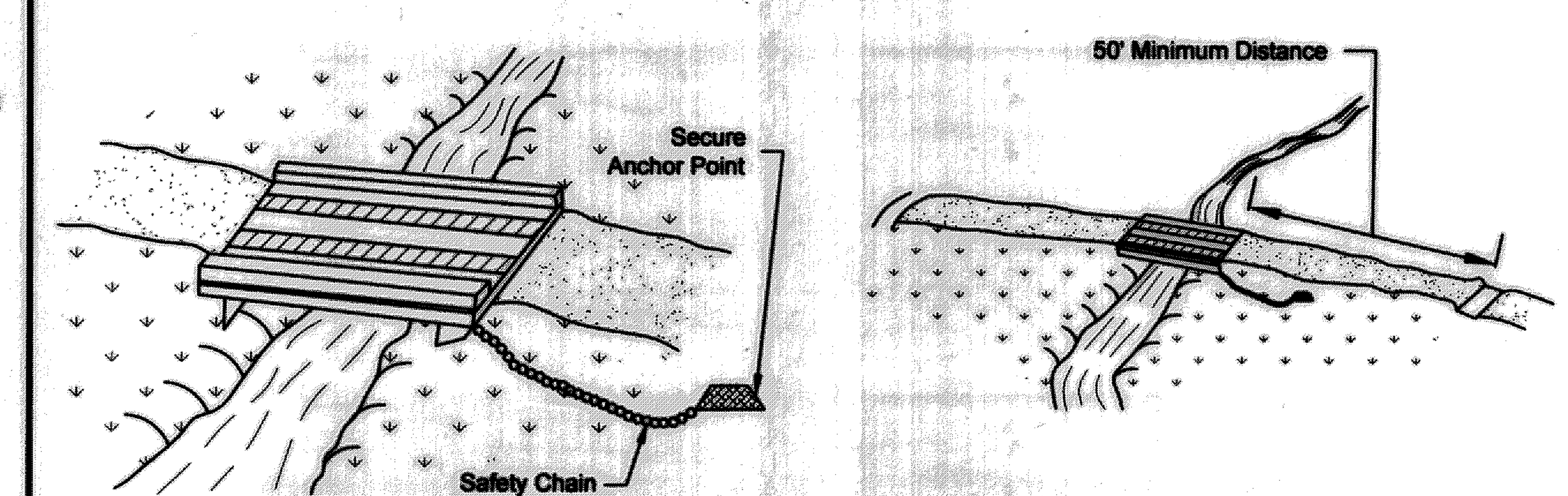
2. The standpipe should be constructed by perforating a 12" to 24" diameter corrugated or PVC pipe. Then wrapping with 1/2" hardware cloth and Geotextile Class E. The perforations shall be 1/2" x 6" slits or 1" diameter holes.

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.

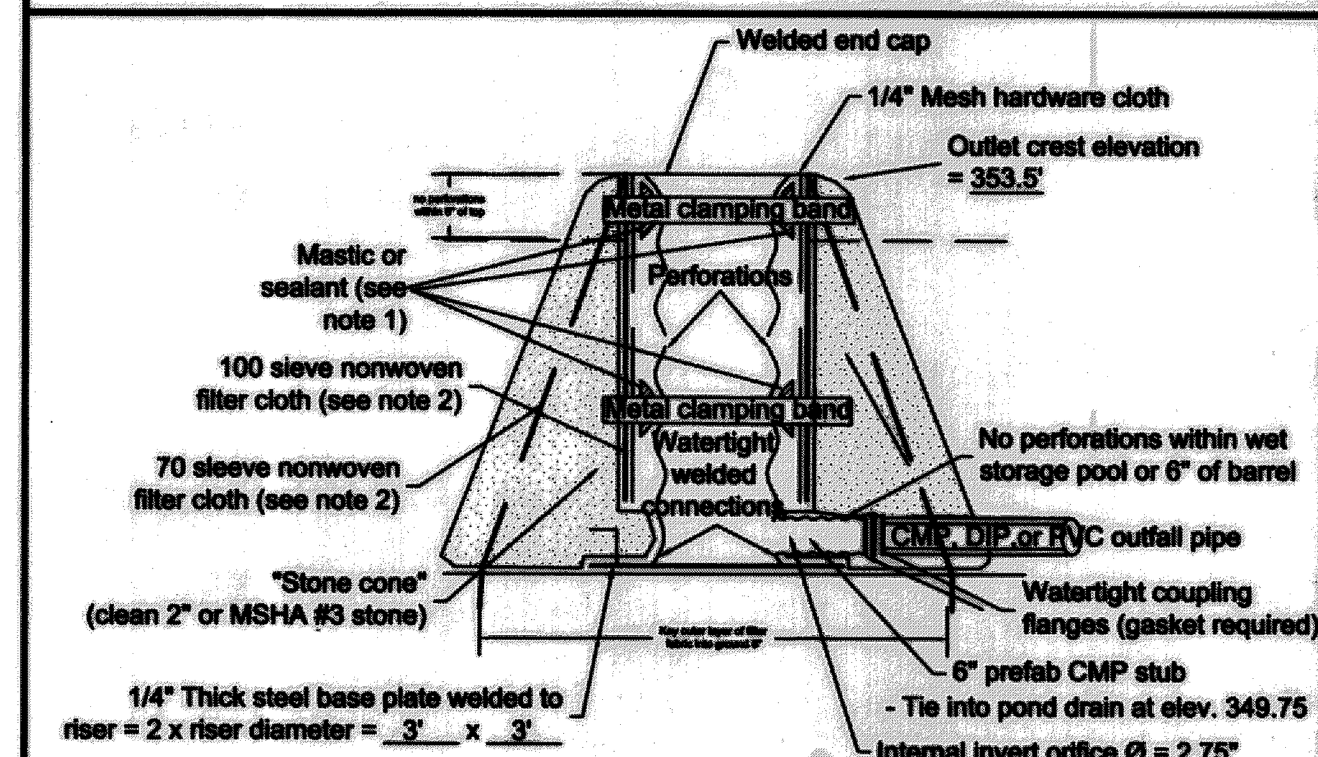
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

(6) **SUMP & DEWATERING DEVICE**
Not to scale



1. Restriction - Construction, use, or removal of a temporary access bridge will not normally have any time of year restrictions since construction, use, or removal should not affect the stream or its banks. Unless the bridge is built with a pier(s) in the water.
2. Bridge Placement - A temporary bridge structure shall be constructed at or above the bank elevation to prevent the entrapment of floating materials and debris.
3. Abutments - Abutments shall be placed parallel to and on stable banks.
4. Bridge Span - Bridges shall be constructed to span the entire channel. If the channel width exceeds 8 feet. (as measured from top-of-bank to top-of-bank), then a footing, pier, or bridge support will be permitted within the waterway. One additional footing, pier, or bridge support will be permitted for each additional 8 foot width of the channel. However, no footing, pier, or bridge support will be permitted within the channel for waterways less than 8 feet wide.
5. Stringers - Stringers shall either be logs, sawn timber, prestressed concrete beams, metal beams, or other approved materials.
6. Deck Material - Decking materials shall be of sufficient strength to support the anticipated load. All decking members shall be placed perpendicular to the stringers, butted tightly, and securely fastened to the stringers. Decking materials must be butted tightly to the stringers. Decking materials must be butted tightly to prevent any soil material tracked onto the bridge form falling into the waterway below.
7. Run Planks (optional) - Run planking shall be securely fastened to the length of the span. One run plank shall be provided for each track of the equipment wheels. Although run planks are optional, they may be necessary to properly distribute loads.
8. Curbs or fenders - Curbs or fenders may be installed along the outer sides of the deck. Curbs or fenders are on option which will provide additional safety.

(7) **Temp. Access Bridge**
Not to scale



Specifications
Notes
1. Sleeve gasket and corrugated connecting band recommended to fasten 100 sleeve filter cloth and hardware cloth to riser.
2. All filter cloth must be a non-woven geotextile fabric. The 100 sleeve filter cloth must have a minimum permitivity of 1.0 sec.-1, the 70 sleeve filter cloth must have a minimum permitivity of 1.5sec.-1. The longitudinal ends of the first layer must be folded together and fastened to produce a lock seam.
3. Only 16 Gauge Corrugated Metal Pipe (CMP) shall be used for the riser. Corrugations shall be 2m -2/3"x1/2". Perforations must be in the "valleys" of the corrugations. Perforations must be 1" diameter holes spaced 6" on center above the wet pool elevation only.
4. Inspection and approval of the riser and filter cloth and bands must be obtained before placement of the stone cone(s).
5. Riser diameter = 18"
6. Cleanout Elevation= 350.5
7. Pond Bottom Elevation = 349.0

Modified dewatering device for sediment traps, sediment basins, and stormwater management ponds

DEWATERING DEVICE
Scale: N.T.S

(8)

Dewatering Device Sizing (Detail 8)

Computed by: T.C.S Date: 03/09/12 Checked by: ______ Date: ______.
Project Name: Centennial Pond Basin #: ______.
Location: Note - Permanent pool set to pond bottom (No permanent Pool) .

Total area draining to basin: 7.7 acres (ac)

Basin Volume Design

1. Min. required Vol. =3600 ft3/ac X 7.7 ac. drainage = 27720 ft3.
2. Actual volume of basin = 45,936 ft3. @ riser elevation = 353.5
3. Excavate NA ft3 (______ yd3) to obtain required capacity.
4. Vol. at dewatering elev =1800 ft3/ac X 7.7 ac. = 13,860 ft3
5. Vol. of basin at cleanout = 900 ft3/ac X 7.7 ac. = 6,930 ft3.
6. Elevation corresponding to mi. required volume of basin (riser crest elevation) 353.5 ft.
7. Permanent pool elevation 349 ft
8. Distance from riser crest elevation to permanent pool elevation 8.5 ft.
9. Basic clean out elevation 350.5 ft.
10. Distance from the riser crest elevation to cleanout elevation 3.0 ft.

Existing Stage Storage

Elevation ft msl	Accum Vol (S) cu ft	
348	0	
349	459	Perm. Pool
350	3920	
351	11749	
352	22904	
353	37343	
353.5	45936	Top of Riser
354	55493	
355	78156	
356	106690	
357	142214	
358	186224	

Draw Down Device Orifice Sizing:

$Q_{dd} = \frac{(1800\ cf/acre)(7.7\ acres)}{(10\ hours)(3600\ sec/hr)} = 0.385$ cfs

$h_{dd} = 353.5 - 349.75 = 3.75$ ft.

$A_o = \frac{Q_{dd}}{C\sqrt{2gh_{dd}}} = \frac{0.385}{0.6\sqrt{(2x32.2x3.75)}} = 0.04\ ft^2$

$d_o^2 = \frac{4A_o}{\pi}$ $d_o = 0.23$ ft. or 2.75"

# of rows of 1" perforations @ 6" = 6
holes per row = 9
Total perforation area = 9x6x0.0055 ft^2 = 0.30 ft^2 >4 A_o

APPROVED: HC DEPARTMENT OF PUBLIC WORKS
[signature] 12/19/13
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

THESE PLANS FOR SMALL POND CONSTRUCTION SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
[signature] 1/2/14
HOWARD SOIL CONSERVATION DISTRICT DATE

HAZEN AND SAWYER
Environmental Engineers & Scientists
4011 WestChase Blvd, Raleigh, North Carolina 27607

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

9801 Old Annapolis Road
HOWARD COUNTY, MD
ELECTION DISTRICT 5
MAP 30, GRID 7, PARCEL 10

CENTENNIAL PARK NORTH POND RETROFIT
Howard County Project # N-3962
Sediment Control Notes and Details

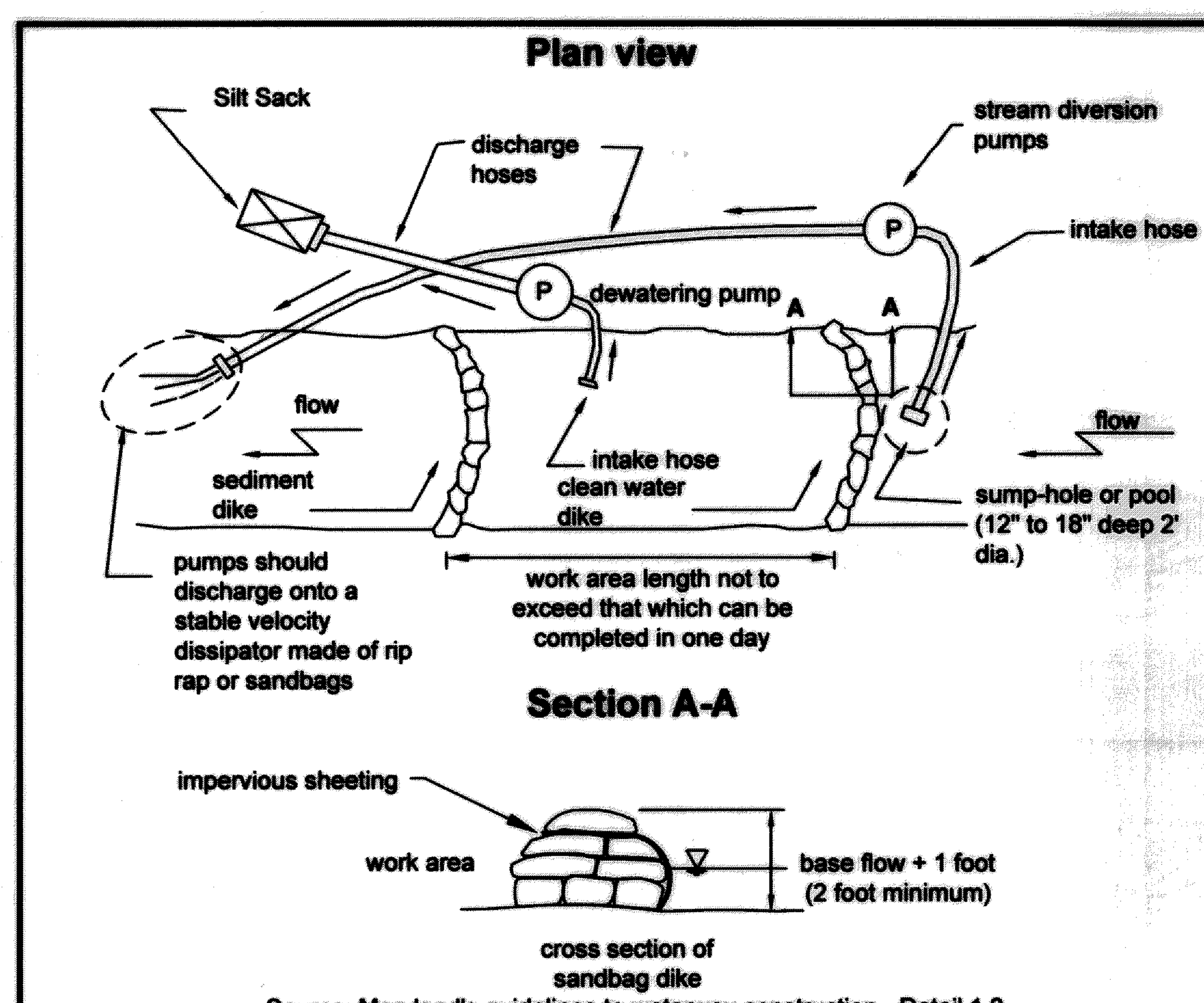
DATE:	11/2013
DESIGNED:	TCS
DRAFTED:	HT/JM
CHECKED:	CW
BASE DATA:	HC

NO.	REVISIONS	BY	DATE

STATE OF MARYLAND
TIMOTHY C. SCHMIDT
No. 30097
PROFESSIONAL ENGINEER

CPJ Associates
CPJ Environmental Services Division
STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
910 CLOPPER ROAD, STE 205N GAITHERSBURG MARYLAND 20878
Phone:(301)208-9573 E-mail: env@cpja.com Fax:(301)926-4551
SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE AS SHOWN
SHEET 7 OF 8 SHEETS
JOB NO. 37-556



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

9 Pump Around Detail

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

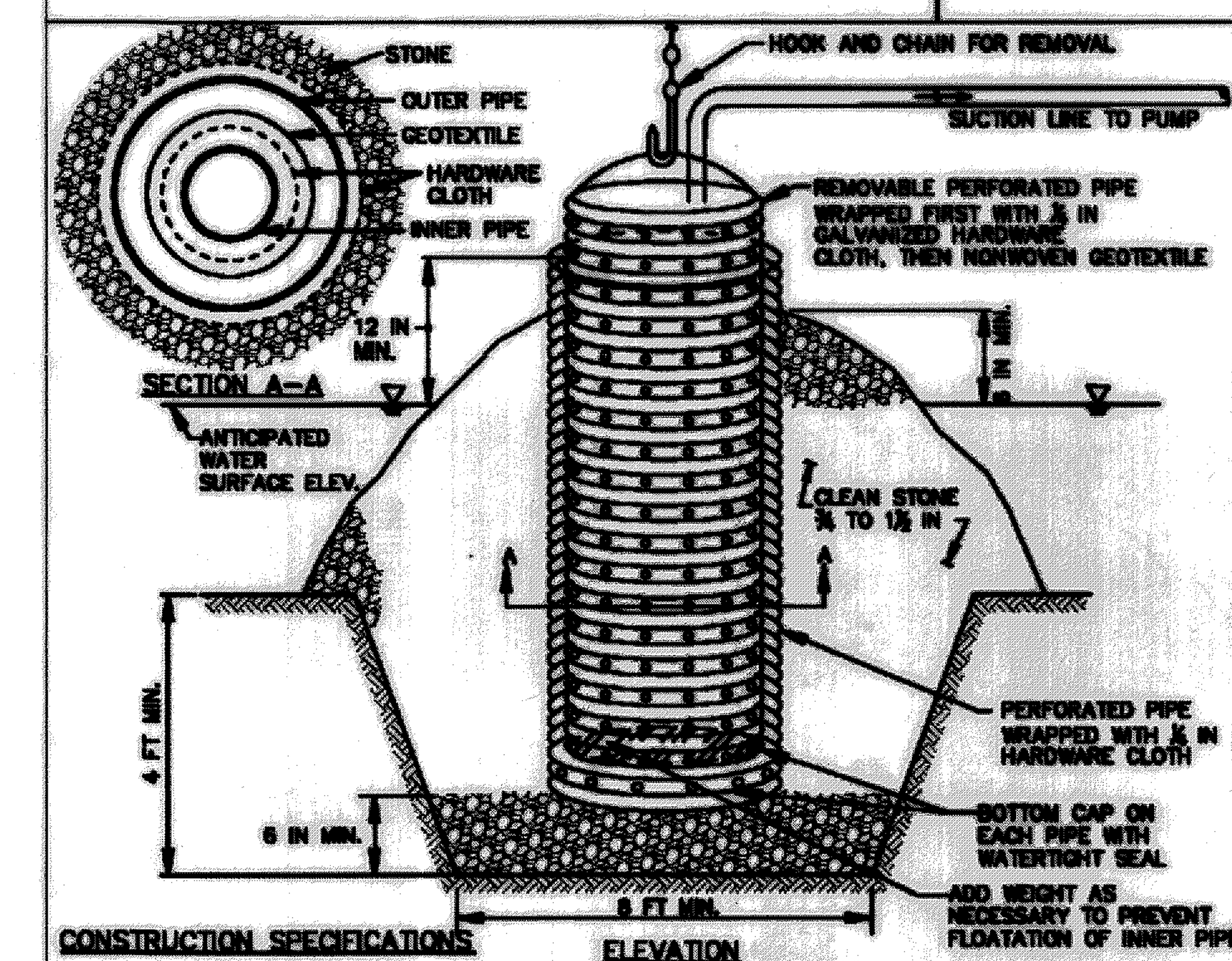
Description
The work shall consist of installing a temporary pump around and supporting measures to divert flow around pond dredge construction sites.

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

1. Construction activities including the installation of erosion and sediment control measures shall not begin until all necessary easements and/or rights-of-ways have been acquired. All existing utilities shall be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and shall repair the damage at his/her own expense to the county's or utility company's satisfaction.
2. The contractor shall notify the Howard County Construction Inspector at least 5 days before beginning construction. Additionally, the contractor shall 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 shall conduct a pre-construction meeting on site with the Construction Inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor shall 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 shall not be removed within the limits of disturbance without approval from the local authority.
4. Construction shall not begin until all sediment and erosion control measures have been installed and approved by the engineer and the Construction Inspector. The contractor shall 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 Construction Inspector, the contractor shall begin work with the establishment of stabilized construction entrances. The sequence of construction must be followed unless the contractor gets written approval for deviations from thelocal authority. The contractor shall only begin work in an area which can be completed by the end of the day. At the end of each work day, the work area must be stabilized and the pump around removed. Work shall not be conducted in the pond during rain events.
6. Sandbag dikes shall be situated at the ends of the work area as shown on the plans, and pond water shall be pumped around the work area. The pump shall discharge onto a stable velocity dissipater made of riprap or sandbags.
7. Water from the work area shall be pumped to a sediment filtering measure such as a silt sack, or other approved source. The measure shall be located such that the water drains downstream of the pond.
8. After an area is completed and stabilized, the clean water dike shall be removed. After the first sediment flush, a new clean water dike would be established from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike shall be removed.
9. A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This shall 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 shall discharge onto the same velocity dissipater used for the main stem pump around.

DETAIL F-1 REMOVABLE PUMPING STATION

STANDARD SYMBOL: RPS



CONSTRUCTION SPECIFICATIONS

1. USE CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS 6 INCHES ON CENTER.
2. USE A MINIMUM 12 INCH DIAMETER INNER PIPE WITH AN OUTER PIPE A MINIMUM 6 INCHES LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
3. WRAP EACH PIPE WITH ¼ INCH GALVANIZED HARDWARE CLOTH. ON INNER PIPE WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, OVER THE HARDWARE CLOTH.
4. EXCAVATE 8 FEET X 8 FEET X 4 FEET DEEP PIT FOR PIPE PLACEMENT. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
5. SET TOP OF INNER AND OUTER PIPES MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION (OR RISER CREST ELEVATION WHEN DEWATERING A BASIN).
6. BACKFILL PIT AROUND THE OUTER PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
7. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
8. A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

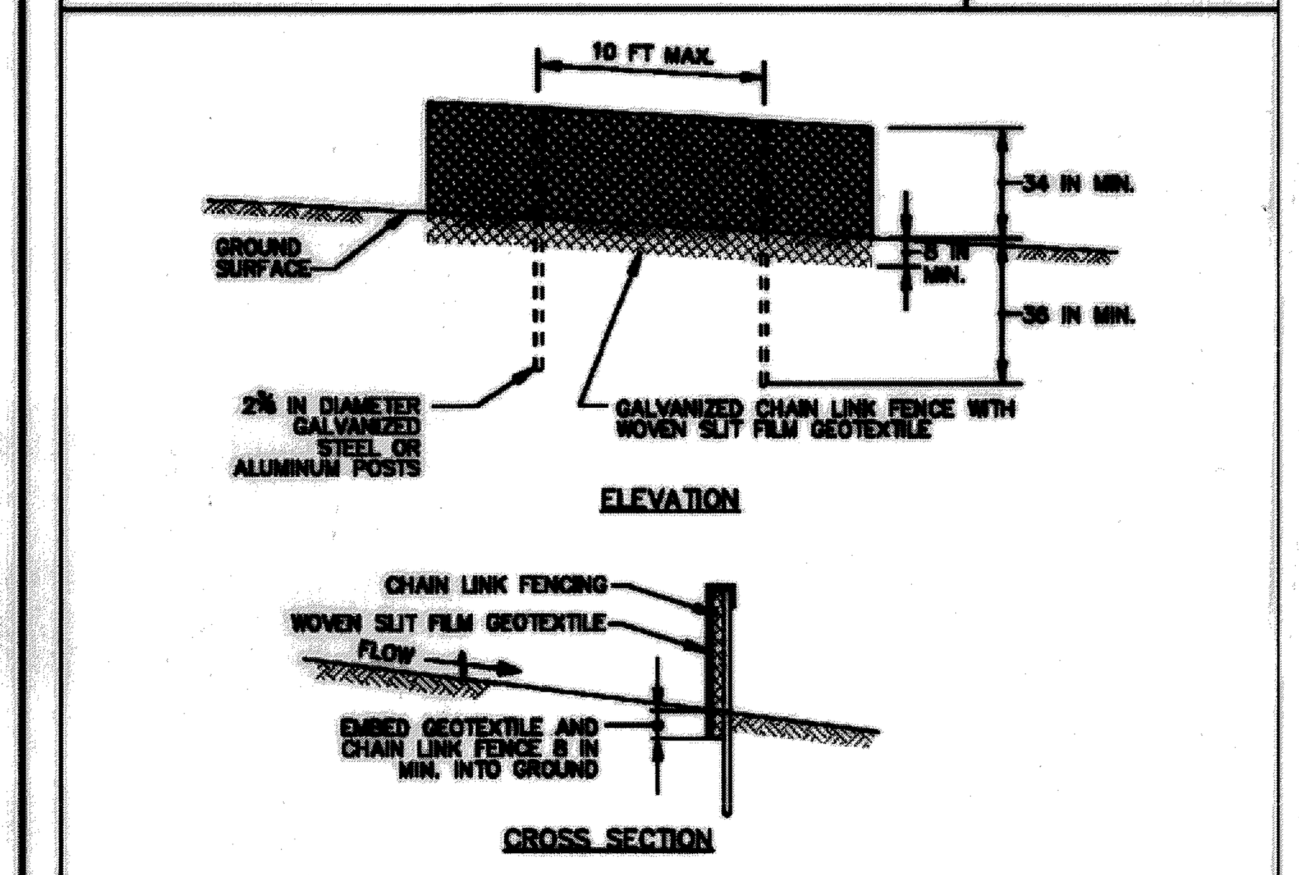
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

10 Removable Pumping Station

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



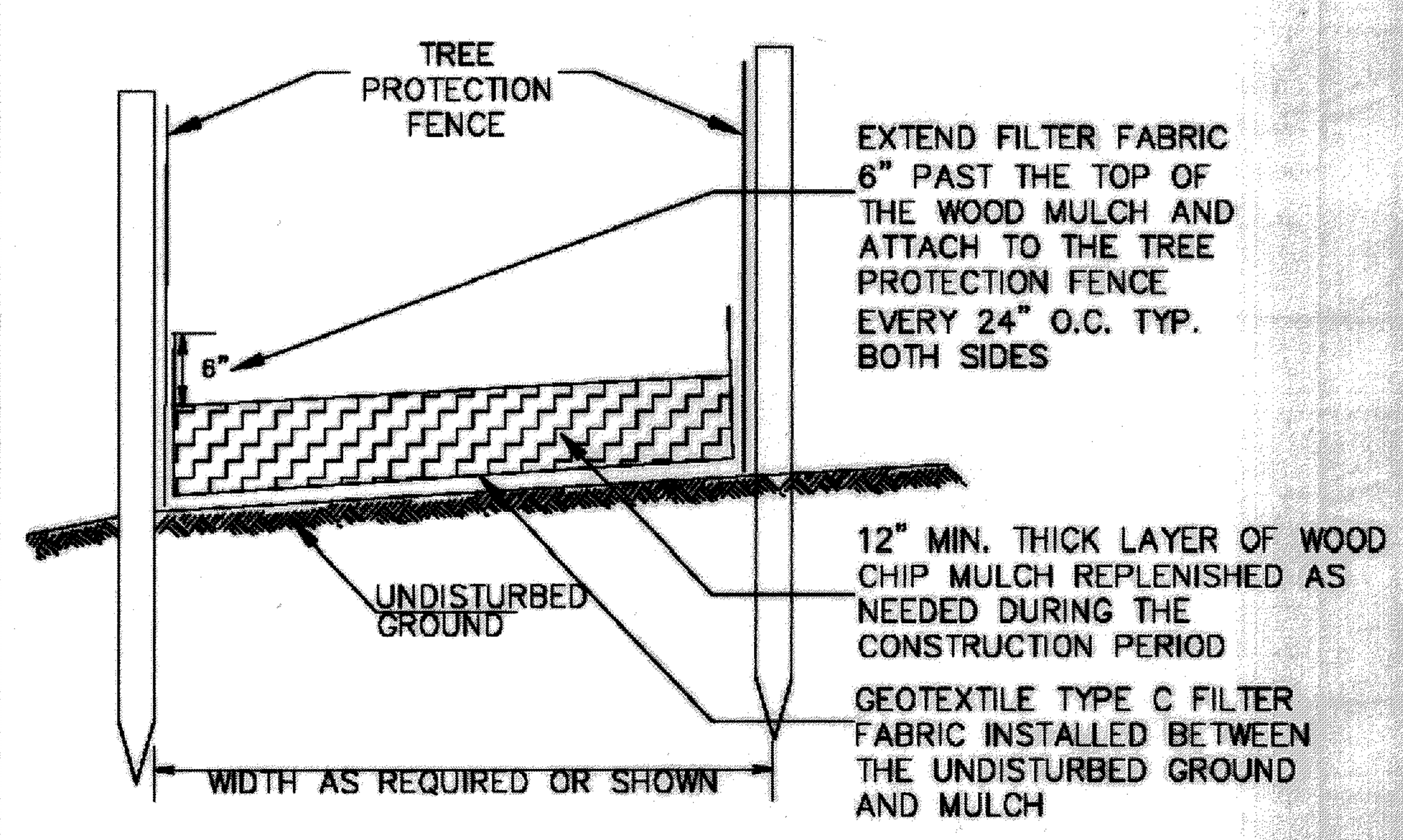
CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

11 Super Silt Fence



PLAN SYMBOL

TEMP. CONSTRUCTION ACCESS–MULCH MAT

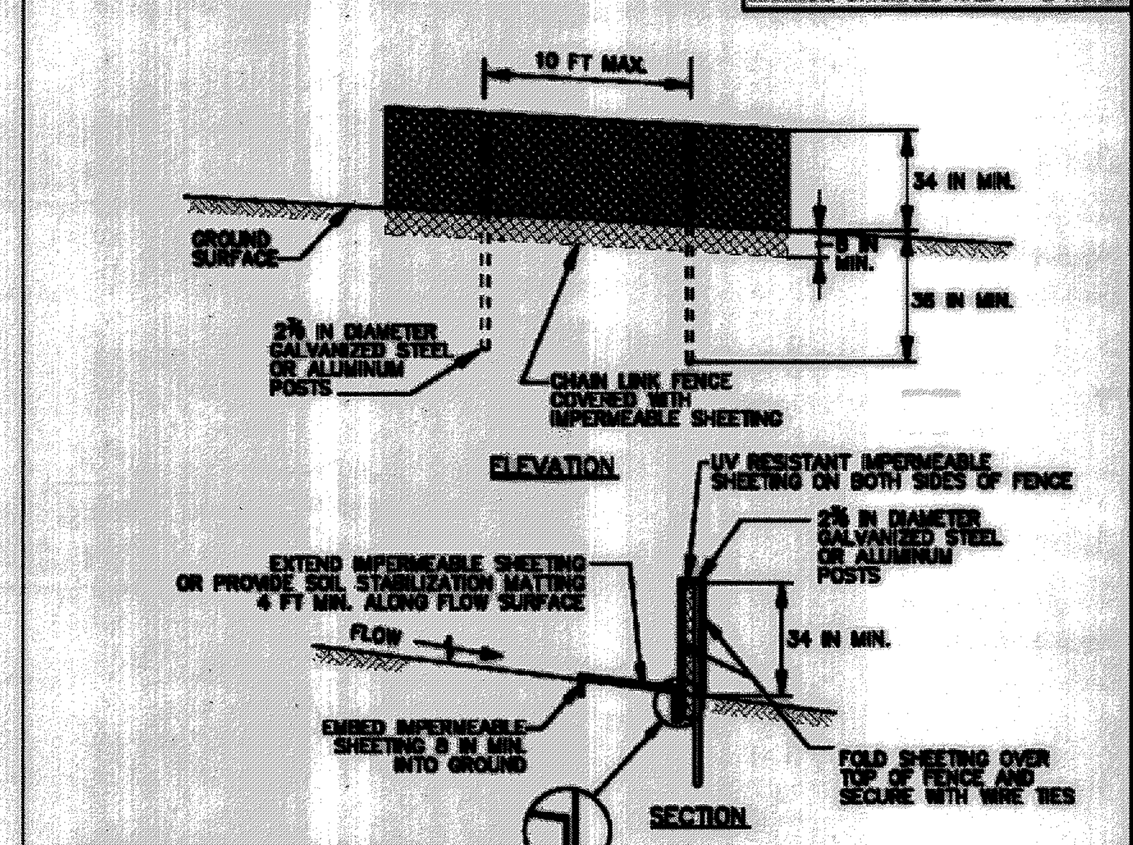
NOT TO SCALE

12 Mulch Mat

DETAIL C-9 DIVERSION FENCE

STANDARD SYMBOL: DF

MAXIMUM DRAINAGE AREA = 2 ACRES



CONSTRUCTION SPECIFICATIONS

1. USE 42 INCH HIGH, 9 GAUGE OR THICKER CHAIN LINK FENCING (2⅜ INCH MAXIMUM OPENING).
2. USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
3. FASTEN CHAIN LINK FENCE SECURELY TO THE FENCE POSTS WITH WIRE TIES.
4. SECURE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING TO CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT TOP, MID SECTION, AND BELOW GROUND SURFACE.
5. EXTEND SHEETING A MINIMUM OF 4 FEET ALONG FLOW SURFACE AND EMBED END A MINIMUM OF 8 INCHES INTO GROUND. SOIL STABILIZATION MATTING MAY BE USED IN LIEU OF IMPERMEABLE SHEETING ALONG FLOW SURFACE.
6. WHEN TWO SECTIONS OF SHEETING ADJOIN EACH OTHER, OVERLAP BY 6 INCHES AND FOLD WITH SEAM FACING DOWNGRADE.
7. KEEP FLOW SURFACE ALONG DIVERSION FENCE AND POINT OF DISCHARGE FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE. REPLACE IMPERMEABLE SHEETING IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

13 Diversion Fence

14 Permanent Seed Mix

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

Definition
To stabilize disturbed soils with permanent vegetation.

Purpose
To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies
Exposed soils where ground cover is needed for 6 months or more.

Criteria

A. Seed Mixtures
1. General Use
a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 ½ pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary .
2. Turfgrass Mixtures
a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where B.22 rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes; Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes; Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1½ to 3 pounds per 1000 square feet.

Notes:
Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland" Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line

c. Ideal Times of Seeding for Turf Grass Mixtures
Western MD: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)
Central MD: March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)
Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)
d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1½ inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
e. If soil moisture is deficient, supply new seedings with adequate water for plant growth (½ to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

Hardiness Zone (from Figure B.3):	Seed Mixture (from Table B.3):				Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	N	P2O5	k20	
3	Deertongue - Tioga	20	March 1 to May 15, August 15 to October 15	1/4 - 1/2 in	45 lb/ac (1lb/1000sf)	90 lb/ac (2lb/1000sf)	90 lb/ac (2lb/1000sf)	2 tons/ac (90lb/1000sf)
	Sheep Fescue - Common	20		1/4 - 1/2 in				
	Common Lespedeza - Kobe	10		1/4 - 1/2 in				

15 Temporary Seed Mix

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

Definition
To stabilize disturbed soils with vegetation for up to 6 months.
Purpose
To use fast growing vegetation that provides cover on disturbed soils.
Conditions Where Practice Applies
Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.
Criteria
1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

Table B.1: Temporary Seeding for Site Stabilization

Plant Species	Seeding Rate 1/		Seeding Depth 2/ (inches)	Recommended Seeding Dates by Plant Hardiness Zone 3/		
	lb/ac	lb/1000 ft²		5b and 6a	6b	7a and 7b
Cool-Season Grasses						
Annual Ryegrass (*Lolium perenne ssp. multiflorum*)	40	1.0	0.5	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Barley (*Hordeum vulgare*)	96	2.2	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Oats (*Avena sativa*)	72	1.7	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Wheat (*Triticum aestivum*)	120	2.8	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30
Cereal Rye (*Secale cereale*)	112	2.8	1.0	Mar 15 to May 31; Aug 1 to Oct 31	Mar 1 to May 15; Aug 1 to Nov 15	Feb 15 to Apr 30; Aug 15 to Dec 15
Warm-Season Grasses						
Foxtail Millet (*Setaria italica*)	30	0.7	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14
Pearl Millet (*Pennisetum glaucum*)	20	0.5	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14

NOTES:
1/ Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses.

Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5% (by weight) of the overall permanent seeding mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.

Oats are the recommended nurse crop for warm-season grasses.

2/ For sandy soils, plant seeds at twice the depth listed above.
3/ The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

APPROVED: HC DEPARTMENT OF PUBLIC WORKS
[signature] 12/19/13
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

THESE PLANS FOR SMALL POND CONSTRUCTION SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
[signature] 1/2/14
HOWARD SOIL CONSERVATION DISTRICT DATE

HAZEN AND SAWYER
Environmental Engineers & Scientists
4011 WestChase Blvd, Raleigh, North Carolina 27607

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

9801 Old Annapolis Road
HOWARD COUNTY, MD
ELECTION DISTRICT 5
MAP 30, GRID 7, PARCEL 10

CENTENNIAL PARK NORTH POND RETROFIT

Howard County Project # N-3962

Sediment Control Notes and Details

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