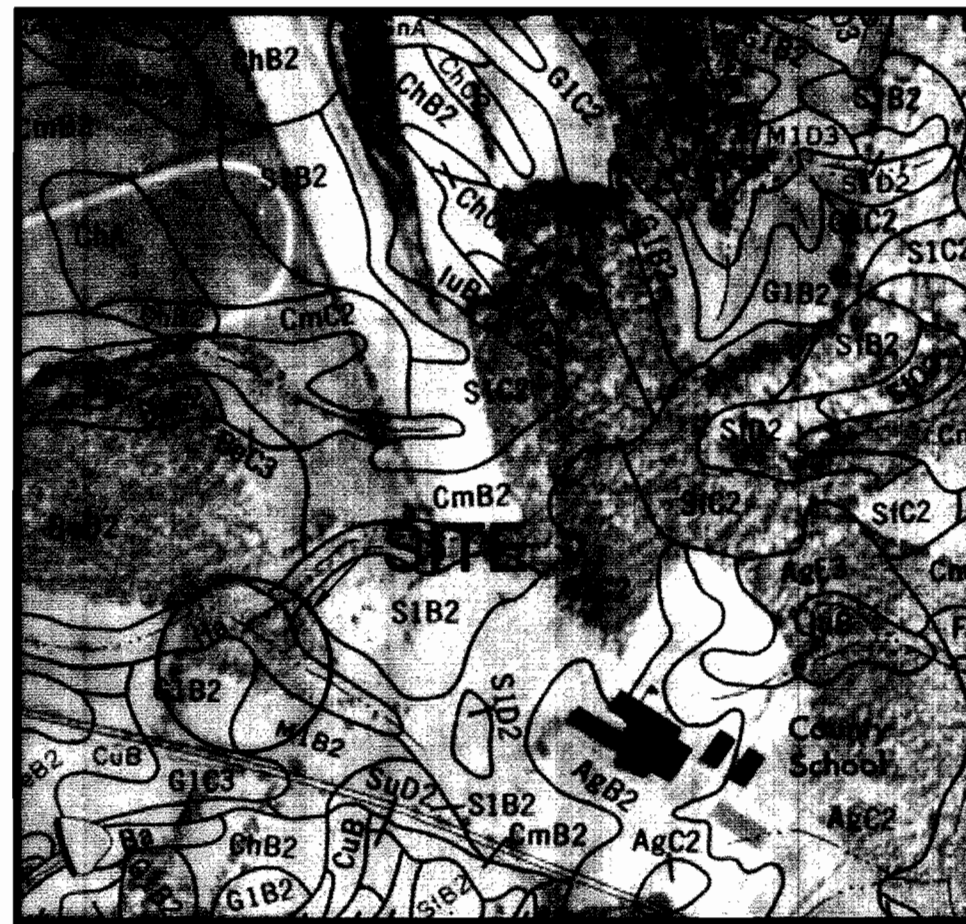
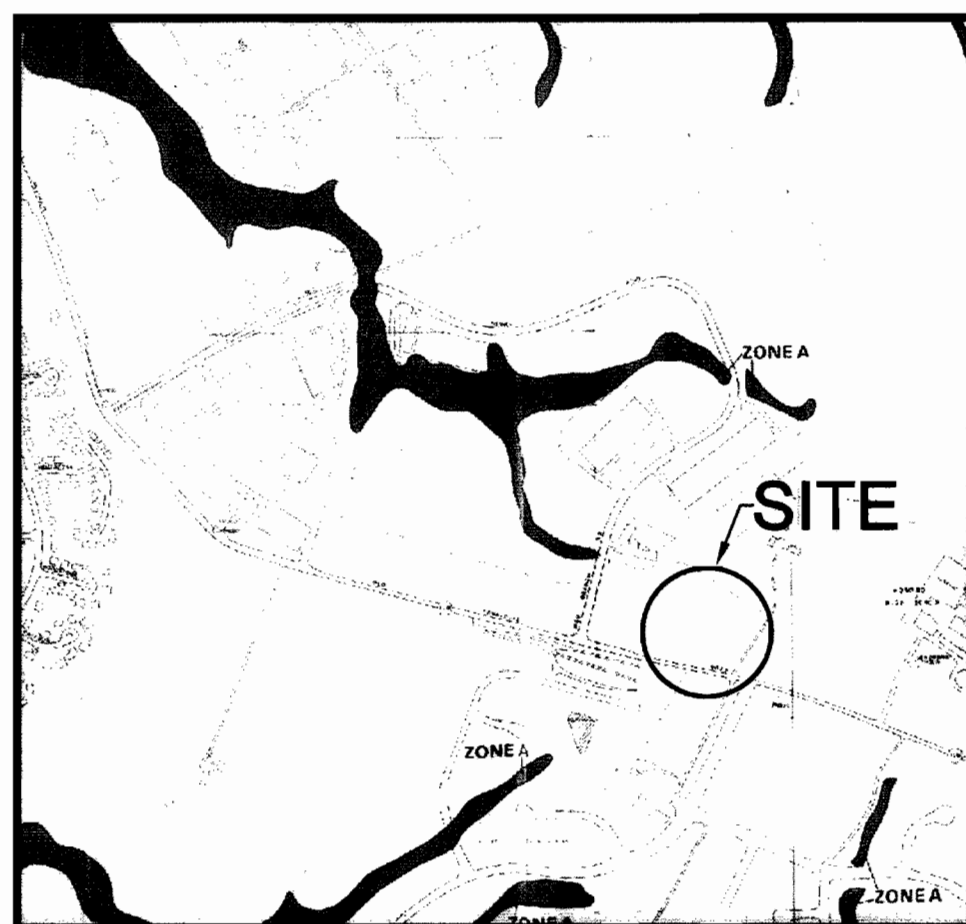


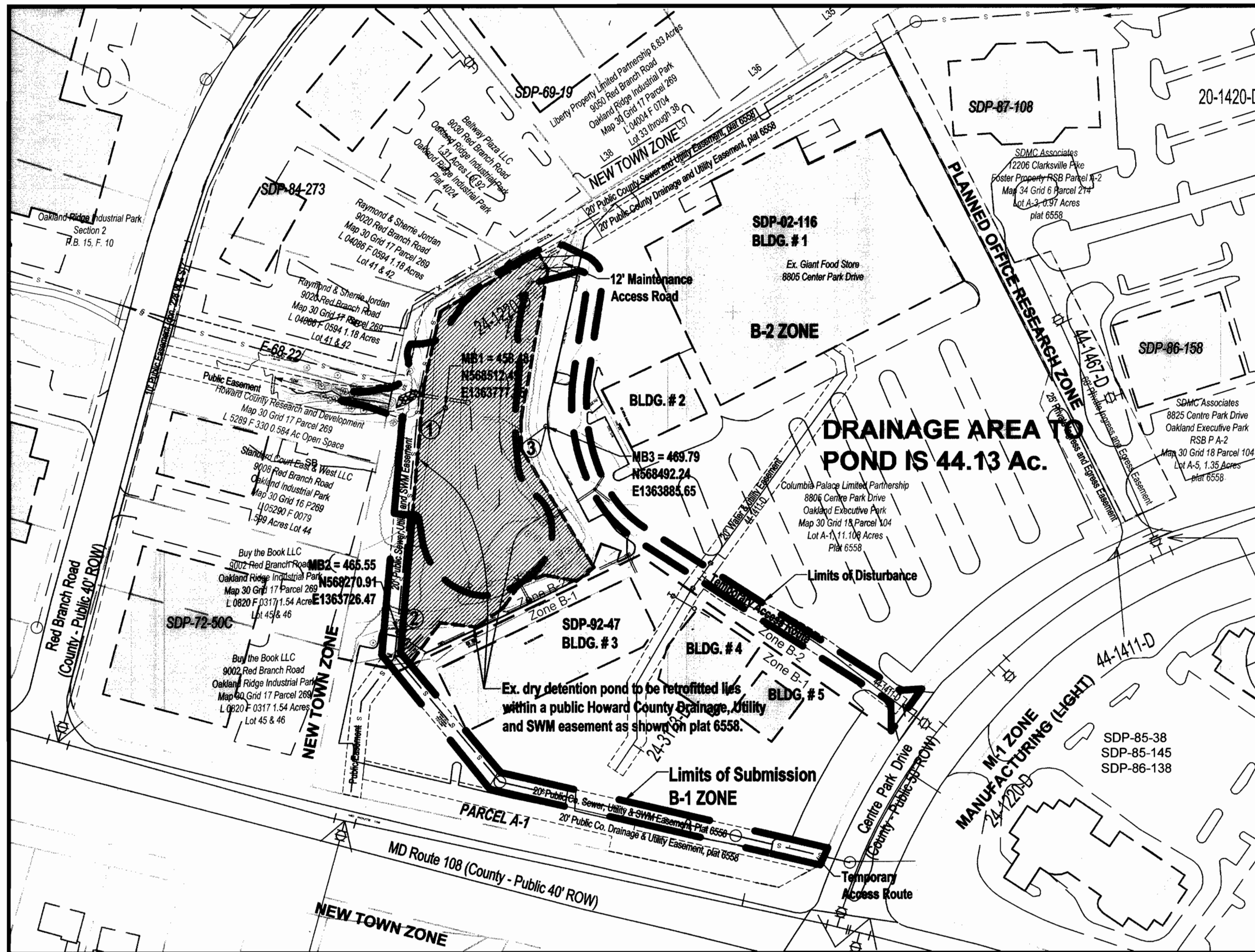
OAKLAND EXECUTIVE PARK POND RETROFIT



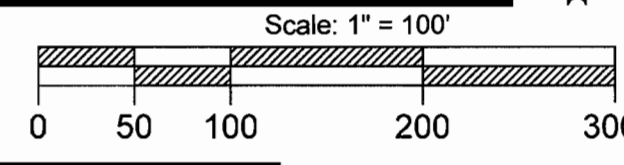
SOIL SURVEY MAP
Howard County, MD
Sheet 20
Dated: July 1968
Not To Scale



FEMA FLOOD INSURANCE RATE MAP
Howard County, MD
Community Panel Number
240044 0028C
Map Revised: April 2, 1997
Not To Scale



100 Scale Site Location Map



PERMIT INFORMATION BLOCK

Subdivision Name Oakland Executive Park	Section/Assessment Area 03	Lot/Parcel Parcel A-1
Plat # or LUF Plat 5558	Block # NA	Zone B1, B2
Tax/Zone Map 30	Elec. Dist. 02	Census Tract 6023.02
Water Code: G07	Sewer Code: 5657400	

ADDRESS CHART

Lot Number A-1	Street Address 9016 Red Branch Road Columbia, MD 21045
-------------------	--

SUMMARY OF ENVIRONMENTAL IMPACTS

Restoration Design Area	Tree Removal (# of trees)	Stream Disturbance (lf)	Wetland Disturbance (sq ft)	Wetland Buffer Disturbance (sq ft)	LOD (sq ft)	LOD (acres)	Cut (cy)	Fill (cy)	Net (cy)
Total	13	50	0	0	49,866	1.14	1,650	80	1,470 Cut

SITE ANALYSIS CHART

A Total project area is 11.108 acres.
B Area of plan submission is the same as the limits of disturbance.
C Limit of disturbed area (LOD) is 49,866 square feet or 1.14 acres.
D Present zoning is B-1: Business Local and B-2: Business General.
E Proposed use of site is to remain B-1 and B-2.
F Floor space/number of units/employees/parking is not applicable.
G Building coverage is not applicable.
H Applicable DPZ file number: SDP-86-49; SDP-92-47; SDP-02-116
I This project is for SWM pond retrofit activities only.

Conditions and Management Practices for Working in Nontidal Wetlands and Buffers

- No excess fill, construction or debris are to be stockpiled or stored in the wetlands or buffers.
- Place materials in a location and manner which does not adversely impact surface or subsurface water flow into or out of the nontidal wetland or buffer.
- Do not use the excavated material as backfill if it contains waste metal products, unsightly debris, toxic material or any other deleterious substance. If additional backfill is required, use clean material free of waste metal products, unsightly debris, toxic material or any other deleterious substance.
- Place heavy equipment on mats, or suitably operate the equipment to prevent damage to the nontidal wetland or buffer.
- Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetland and buffer in excess of nontidal wetland and buffer lost under the original structure or fill.
- Conduct the activity so as not to cause or contribute to a degradation of water quality as determined by the Maryland Department of the Environment.
- All stabilization in the wetland and buffer shall be of the following recommended species: Annual Ryegrass (*Lolium multiflorum*), Millet (*Setaria italica*), Barley (*Hordeum sp.*), Rye (*Secale cereale*), Virginia Rye (native/wet soils), Bottlebrush grass, River Oats (*Chasmanthium latifolium*) and/or Oats (*Uniola sp.*). These species will allow for the stabilization of the site, while also allowing for the voluntary revegetation of natural wetland species. Other non-persistent vegetation may be acceptable, but must be approved by MDE Nontidal Wetlands and Waterways Division. Kentucky 31 shall not be utilized in the wetland or buffer areas. The area should be seeded and mulched to reduce erosion after construction activities have been completed.
- To protect important aquatic species, in-stream work is prohibited as determined by the classification of the stream as follows:
 - Class I Waters. In-stream work may not be conducted during the period March 1 through June 15, inclusive, during any year.

GENERAL NOTES NON-RESIDENTIAL SITE DEVELOPMENT PLAN

- 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 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.
- The contractor shall notify "MISS Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
- 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.
- All plan dimensions are to face of curb unless otherwise noted.
- The existing topography is taken from field run survey with two foot contour intervals prepared by Levant Technologies, Inc. dated April 2005.
- The boundary lines shown hereon are based on recorded plats and limited field evidence found. A complete boundary survey was not performed.

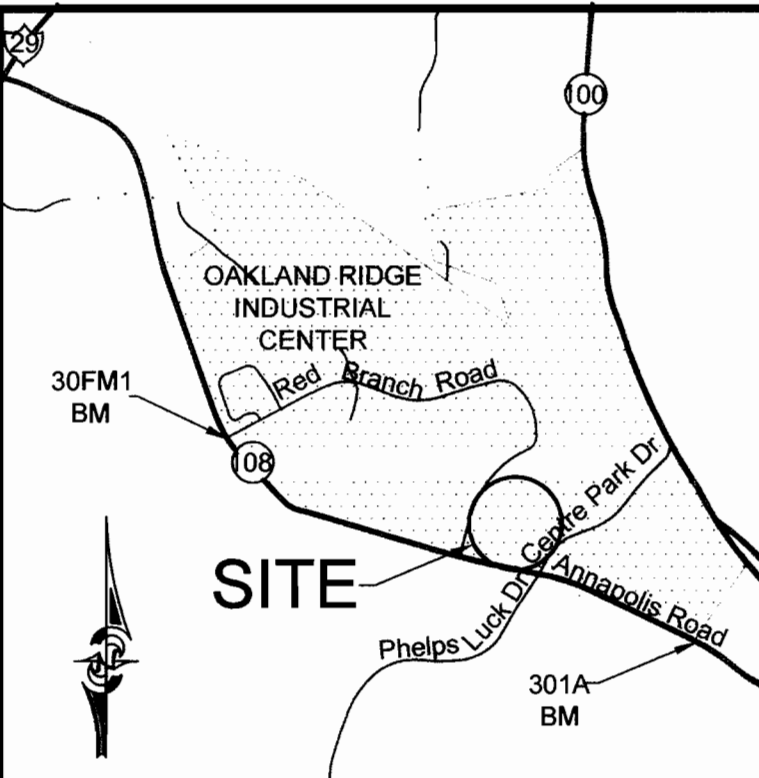
SURVEY CONTROL *

Point	Northing	Easting	Elevation	Description
M01	1588512.43	136377.35	428.48	Tieback & cap
M02	568270.91	136376.47	485.55	trav 3
M03	568492.24	136388.65	485.79	trav 2

- This plan contains proposed work on the following original DPZ file: F-84-174, SDP-86-49, SDP-92-47 and SDP-02-116 (Giant Food Store)
- Water: Contract # 44-1411D
- Sewer is public: Contract no. 24-1220 D
- Proposed work is for retrofitting and maintaining existing stormwater management facility.
- Existing utilities are based on the survey by Levant Technologies, Inc. and only include utilities visible at surface (i.e., manholes).
- The floodplain study for this project was taken from FEMA Floodplain Map Number 240044 0028C.
- There are no wetlands within the LOD as found on May 9, 2005 field visit by CPJ.
- No traffic study is required for this project.
- The subject property is zoned B1 and B2 per the February 2, 2004 Comprehensive Zoning Plan.
- No clearing, grading or construction is permitted within the delineated stream below the pond except as shown hereon. Stream work will be completed under the State of Maryland Department of the Environment Water Management Administration Regional Letter of Authorization Number 02-NT-0194200283733. The stream and stream buffer shown on these plans have been determined "necessary" in accordance with Section 16.116.c of the Subdivision Regulations.
- These streams are Maryland Use Class I Waters. No in-stream work during the period of March 1 through June 15, inclusive.
- All material removed from this site shall be taken to a site with an active grading permit.
- 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.
- 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.
- No landscaping is required for this project except as shown herein.
- 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 reconnaissance to determine the size and number of pumps he/she will need to bid and complete work.
- All quantities hereon are estimates only, the contractor is responsible for verifying quantities through a field visit and his own quantity takeoffs.
- Forest conservation for this project is exempt under Section 16.1202(b)(1)(iii) as the existing pond was created prior to forest conservation regulations and the proposed retrofit can be accommodated within the previously approved Limits of Disturbance.
- This is a public facility maintained by the Howard County Department of Public Works.
- All requested waiver for this project has been approved on May 19, 2006 by Jim Irvin, Director of Department of Public Works. (Please see scan approved letter on sheet 6.)

SEQUENCE OF CONSTRUCTION

- Obtain Howard County grading permit. No in-stream work during the period of March 1 through June 15, inclusive.
 - Contractor to conduct a pre-construction meeting with owner, design engineer, contractor and Howard County Construction Inspector at least 48 hours prior to the start of construction. HC Construction Inspector and contractor to walk embankment and mark all burrows for repair by contractor. (1 day)
 - Clear and grub to install the stabilized construction entrance and silt fence. (1 day)
 - Install stabilized construction entrance and silt fence. (1 day)
 - Install sandbag diversions, dewatering sump, and temporary dewatering device as well as siltbag pump arounds and engage system with the approval of the Construction Inspector. Note to contractor: no water from construction area to leave site without first passing through a filter device (filter bag). Clear and grub remaining areas. (2 day)
 - Install in-stream stone step pools while pumping diversion is employed, if needed. (1 day)
 - Fine grade pond bottom, and construct forebays. (8 days)
 - Contractor shall test pit for depth of sewer as indicated on plan and forward test results to the HC project manager prior to proceeding to step 9. (1 day)
 - Once new barrel pipe and pre-cast riser are on-site, Contractor to excavate for removal of existing barrel, riser, outfall end section and MH S-1 and remove said items offsite for legal disposal. Install temporary pipe diversion and coffer dam. This step shall not commence until permission has been granted by the sediment control inspector. It requires that the contractor does not start this work until he has received a 5-day clear weather (no precipitation) forecast from the National Weather Service (NWS). (3 days)
 - Install core trench below new barrel location under supervision of the Construction Inspector. (1day)
 - Install barrel on concrete blocking and pour concrete cradle and lower half of anti-seep collars. Having geotechnical engineer collect cylinders for strength testing. (2 days)
 - Install riser on subgrade approved by the Geotechnical Engineer. Install temporary dewatering device onto low flow opening in the riser. Pour remaining tops of anti-seep collars and 12" collar for riser/barrel connection. (1day)
 - Backfill over new barrel under supervision of Geotechnical Engineer. Add fill to dam as shown on plan and stabilize. (2days)
 - Stabilize areas upon reaching design grades. (1 day)
 - Permanently stabilize all disturbed areas per permanent seeding specifications. (1 day)
 - Install wetland plantings. (2 days)
 - With permission of the Construction Inspector, remove sediment control features and stabilize all areas disturbed by this process. (1 day)
 - Conduct "punch list" walk through with all parties mentioned in step 1. (1 day)
 - Note: contractor to provide as-built record drawing to HCSD.
- TOTAL = 30 days



ADC Vicinity Map
Howard County, MD
22nd Edition: Map 16, C3
Scale: 1" = 200'
Howard County Benchmark located on the North western quadrant of the intersection between Route 108 and the exit driveway from Senior High School

SHEET INDEX

- Title Sheet
- Design Planview
- Sediment Control Planview
- SWM Retrofit Details
- Sediment Control Details
- Sediment Control Details
- Profiles
- SWM Notes
- Planting Plan, Notes, and Details
- Planting Specifications
- Drainage Area Map and Soils Exhibit
- Natural Resources Exhibit

"This facility has been evaluated for downstream flooding hazard by a study entitled Oakland Executive Park Stormwater Management Retrofit Computations prepared by Charles P. Johnson & Associates, Inc. in November of 2006. According to that study, this facility is a Class A facility with classification of low hazard."

Timothy Schueler 12-7-06
Timothy Schueler, PE #20207 Date
Section Head, Charles P. Johnson

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 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 indicators of distress such as excessive seepage, turbid seepage, sliding or slumping.

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

Jim Myers 12/7/07
USDA - NATURAL RESOURCES CONSERVATION SERVICE DATE

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

Yvette Sullivan 12/7/07
HOWARD SOIL CONSERVATION DISTRICT DATE

BY THE DEVELOPER:
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 SOIL CONSERVATION DISTRICT.

Howard C. Schultz 12/7/06
DEVELOPER DATE

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

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF DEVELOPMENT ENGINEERING DIVISION &
Andy Hamble 11/20/07
CHIEF DIVISION OF LAND DEVELOPMENT
Mark A. Leary 12/12/07
DIRECTOR DATE

BY THE ENGINEER:
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 ADVISED 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.

Timothy Schueler 12-7-06
ENGINEER/TIMOTHY SCHUELER (MD P.E. 20207) DATE

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

Oakland Executive Park
Lot A-1 Plat 5558 Parcel 104
11.108 Acres
Election District #02
Howard County, Maryland
Tax Map 30 Grid 18

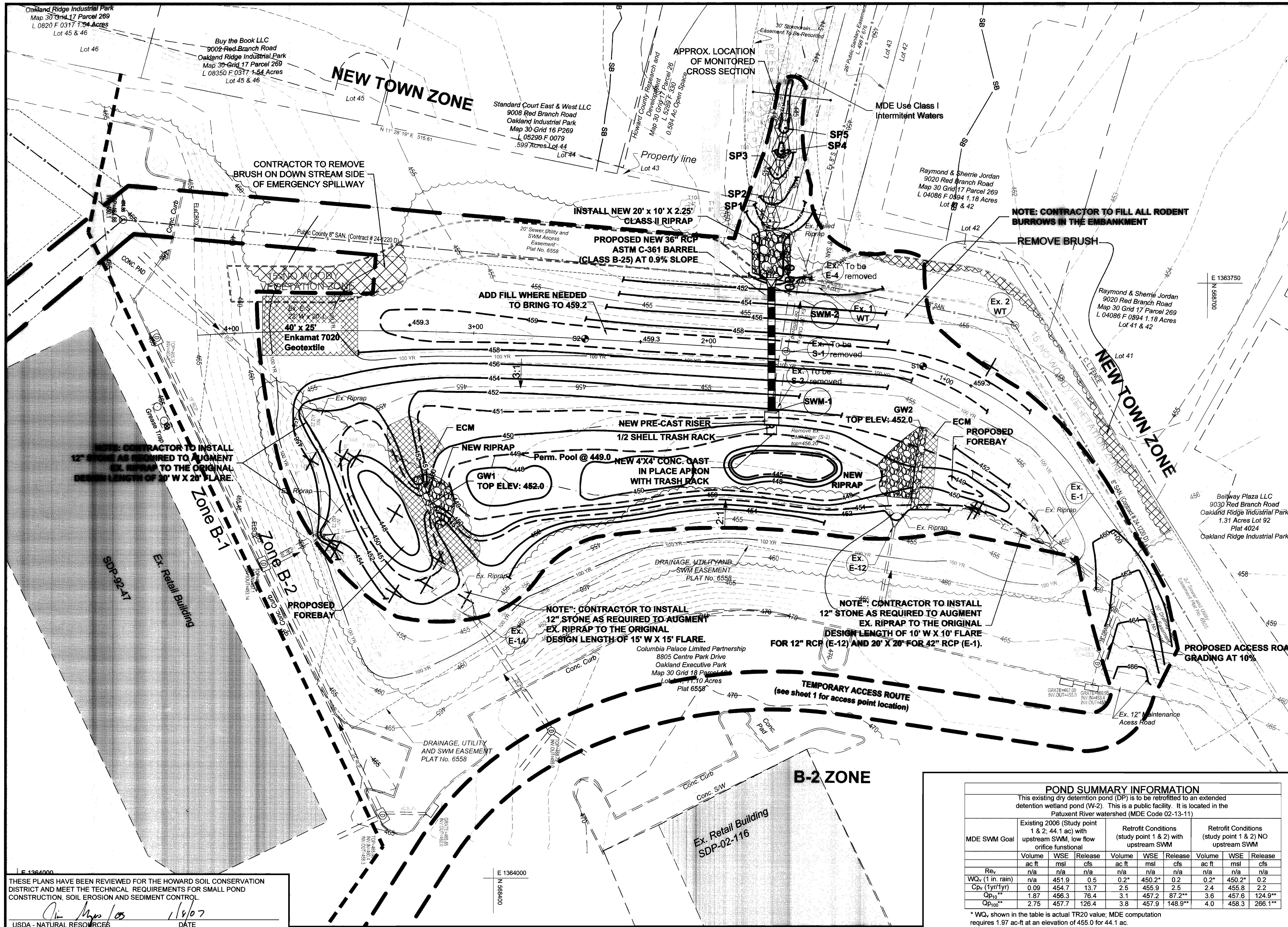
OAKLAND EXECUTIVE PARK POND RETROFIT
Columbia, Maryland
Title Sheet

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DESIGNED:	TCS				
DRAFTED:	HT				
CHECKED:	TCS	2	REVIEWER COMMENTS	TCS	11/06
BASE DATA:	LTI	1	REVIEWER COMMENTS	TCS	09/06
		NO.	REVISIONS	BY	DATE

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

SCALE As Shown
SHEET 1
OF 11 SHEETS
JOB NO. 35-565
SDP # 06-101

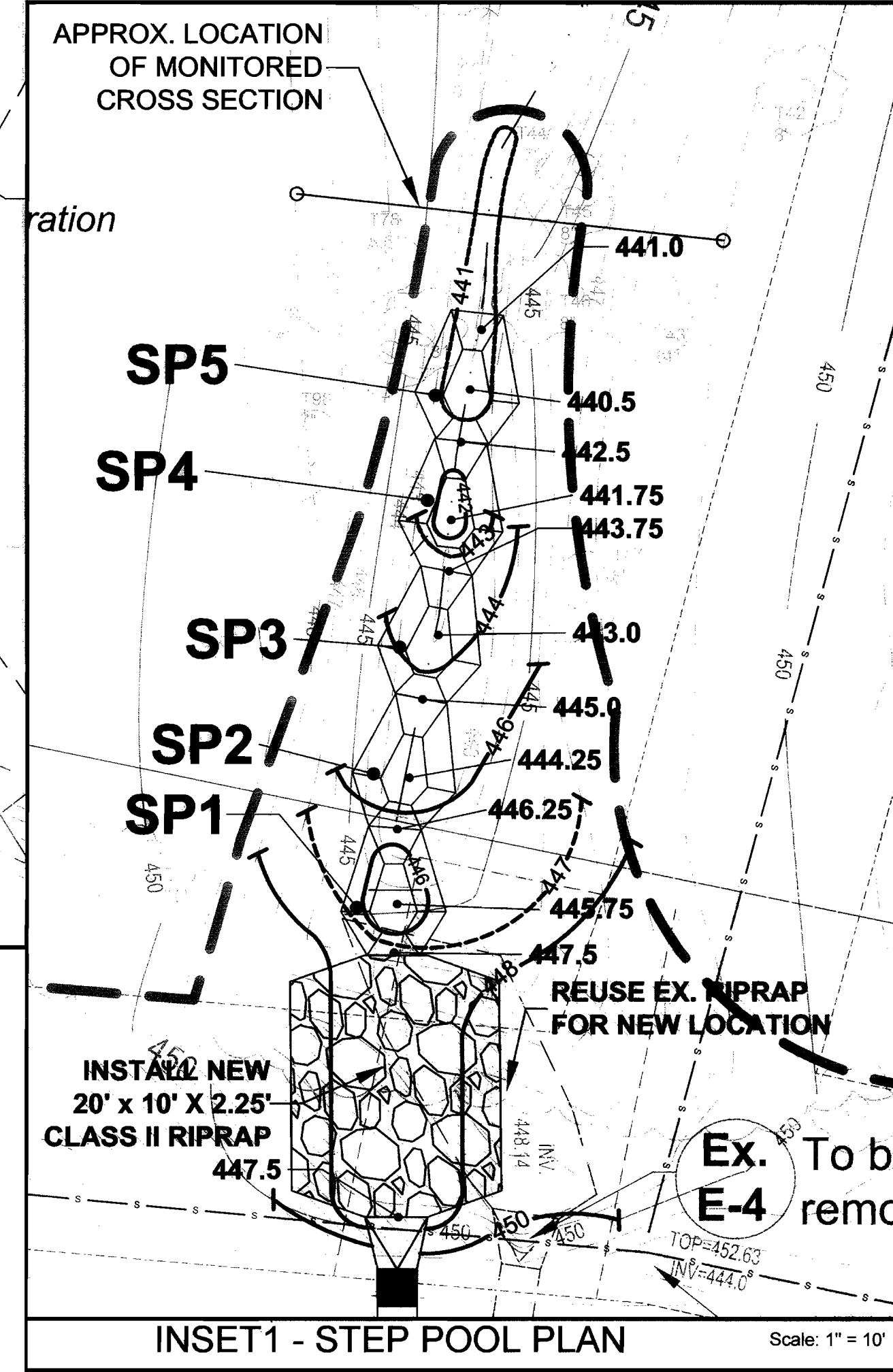
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Sheet: 1 of 11



Legend

- Ex. Fence Line
- - - Existing Stream
- Property Line
- ▨ Easement
- - - Limits of Disturbance
- - - 100 Year Floodplain
- - - Tree Line
- - - Existing Contours
- - - Proposed Contours
- Proposed Pipe/Structure
- ⊗ Ex. Riprap
- ⊙ Soil Boring
- Step Pool
- 75' Stream Buffer
- Sanitary sewer line
- Erosion Control Matting

- #### General Notes:
- 100 year floodplain for pond from CPJ TR-20 calculations for existing 2006 conditions calculations dated September, 2006.
 - Soil borings performed on September 5, 2005 by Penniman and Browne, Inc.
 - Site visit by CPJ staff on January 12, 2006 could not verify existing infill riprap protection at storm drain inflow pipes due to sediment.
 - Existing rip rap outfall stone has been buried by sediment. Contractor to remove sediment and re-work rip rap if necessary to as-built conditions.
 - Contractor to fill all animal burrows on the dam embankment with a 50/50 mixture of lean concrete and soil prior to placing fill, erosion control mat or seed on the embankment.



POND SUMMARY INFORMATION

This existing dry detention pond (DP) is to be retrofitted to an extended detention wetland pond (W-2). This is a public facility. It is located in the Patuxent River watershed (MDE Code 02-13-11)

MDE SWM Goal	Existing 2006 (Study point 1 & 2; 44.1 ac) with upstream SWM, low flow orifice functional			Retrofit Conditions (study point 1 & 2) with upstream SWM			Retrofit Conditions (study point 1 & 2) NO upstream SWM		
	Volume	WSE	Release	Volume	WSE	Release	Volume	WSE	Release
Rev.	ac ft	msl	cfs	ac ft	msl	cfs	ac ft	msl	cfs
WQ _v (1 in. rain)	n/a	451.9	0.5	0.2*	450.2*	0.2	0.2*	450.2*	0.2
Cp _v (1yr/1yr)	0.09	454.7	13.7	2.5	455.9	2.5	2.4	455.8	2.2
Q _{p10} **	1.87	456.3	76.4	3.1	457.2	87.2**	3.6	457.6	124.9**
Q _{p100} **	2.75	457.7	126.4	3.8	457.9	148.9**	4.0	458.3	266.1**

* WQ_v shown in the table is actual TR20 value. MDE computation requires 1.97 ac-ft at an elevation of 455.0 for 44.1 ac.
 ** Assumes low flow orifice is blocked.

1:8/07
 THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 CHIEF DEVELOPMENT ENGINEERING DIVISION & DATE 11/16/07
 CHIEF DIVISION OF LAND DEVELOPMENT DATE 11/16/07
 DIRECTOR DATE 11/16/07

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

Oakland Executive Park
 Lot A-1 Plat 6558 Parcel 104
 11.108 Acres
 Election District #02
 Howard County, Maryland
 Tax Map 30 Grid 18

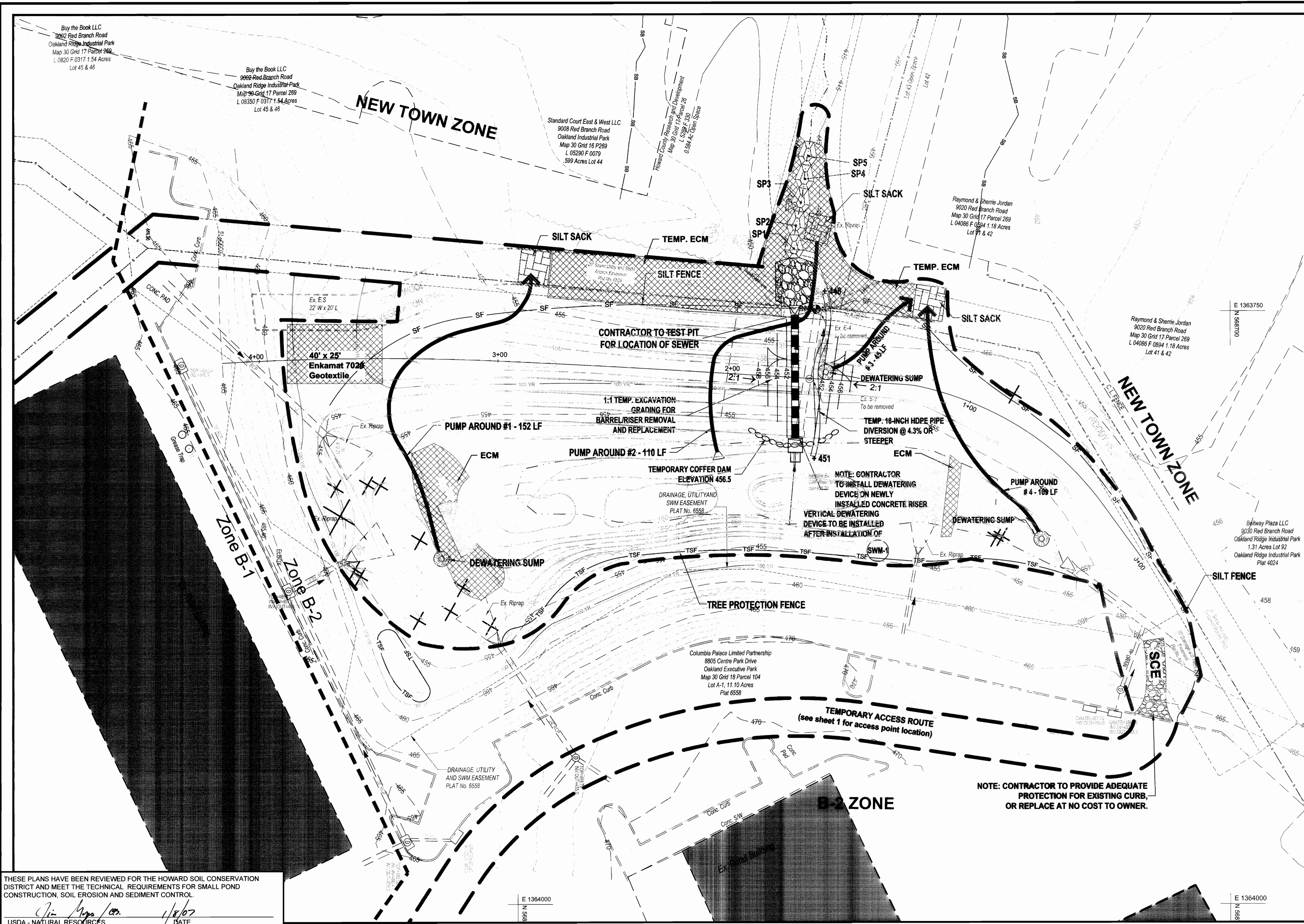
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CPJ Environmental Services Division
 STREAM RESTORATION • STORMWATER MANAGEMENT • INSPECTION
 910 CLOPPER ROAD SUITE 215N GAITHERSBURG MARYLAND 20878
 Phone: (301)208-9573 E-mail: env@cpja.com Fax: (301)926-4551
 SILVER SPRING, MD FREDERICK, MD FAIRFAX,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

SCALE	As Shown
SHEET	2
OF 11 SHEETS	
JOB NO.	35-565
SDP #	06-101

Dec 07, 2006 - 2:56pm User: rhenning
 Project: Oakland Executive Park Pond Retrofit
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 Legend.dwg
 BaseData/Flow.dwg
 SP-INSET.dwg



Legend

- Ex. Stream
- Property Line
- Easement
- Limits of Disturbance
- 100 Year Floodplain
- Tree Line
- Existing Contours
- Proposed Contours
- Silt Fence (Detail B, Sheet 5)
- Tree Save Fence (Detail F, Sheet 5)
- Sand Bag/Stone Diversion
- Pump Around Practice (Detail D, Sheet 5)
- Stabilized Construction Entrance (Detail A, Sheet 5)
- Tree to be Removed
- Ex. Riprap
- Sump & Dewatering Device (Detail E, Sheet 5)
- Silt Sack
- 75' Stream Buffer
- Soil Boring/Test pit
- Temporary ditch or pipe
- ECM

Tree Impact Table

Tree #	Species	DBH	Health	Impact	Reason
108	Ulmus L. / Elm	9	Good	Remove	Grading
109	Ulmus L. / Elm	7.5	Good	Remove	Grading
110	Glendistia triacanthos/Honey Locust	8	Good	Remove	Grading
112	Ulmus L. / Elm	8.5	Fair	Remove	MDE 378 Requirement
113	Ulmus L. / Elm	6	Good	Remove	MDE 378 Requirement
114	Salix nigra/Black Willow	7	Good	Remove	Grading
115	Salix nigra/Black Willow	8	Good	Remove	Grading
116	Salix nigra/Black Willow	8	Good	Remove	Grading
117	Ulmus L. / Elm	7.5	Good	Remove	Grading
127	Ulmus L. / Elm	11	Fair	Remove	MDE 378 Requirement
131	Salix nigra/Black Willow	7.5	Fair	Remove	Grading
132	Salix nigra/Black Willow	6.5	Fair	Remove	Grading
	Tree Unknown #1 (top of dam)			Remove	MDE 378 Requirement

TOTAL: 13

Notes:

- DA to Temporary diversion = 44.13 AC. The one inch storm generates 3.2 cfs to diversion. An eighteen inch HDPE will pass 6.0 cfs in inlet control and create headwater equal to elevation 351.5.
- DA to silt fence = 0.25 AC.

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

[Signature] 1/8/07
USDA - NATURAL RESOURCES CONSERVATION SERVICE

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

[Signature] 1/8/07
HOWARD SOIL CONSERVATION DISTRICT

APPROVED DEPARTMENT OF PLANNING AND ZONING

[Signature] 1/11/07
CHIEF DEVELOPMENT ENGINEERING DIVISION

[Signature] 1/16/07
CHIEF DIVISION OF LAND DEVELOPMENT

[Signature] 1/16/07
DIRECTOR

Prepared for:
Howard County Dept. of Public Works
Bureau of Environmental Services
6751 Columbia Gateway Drive, #514
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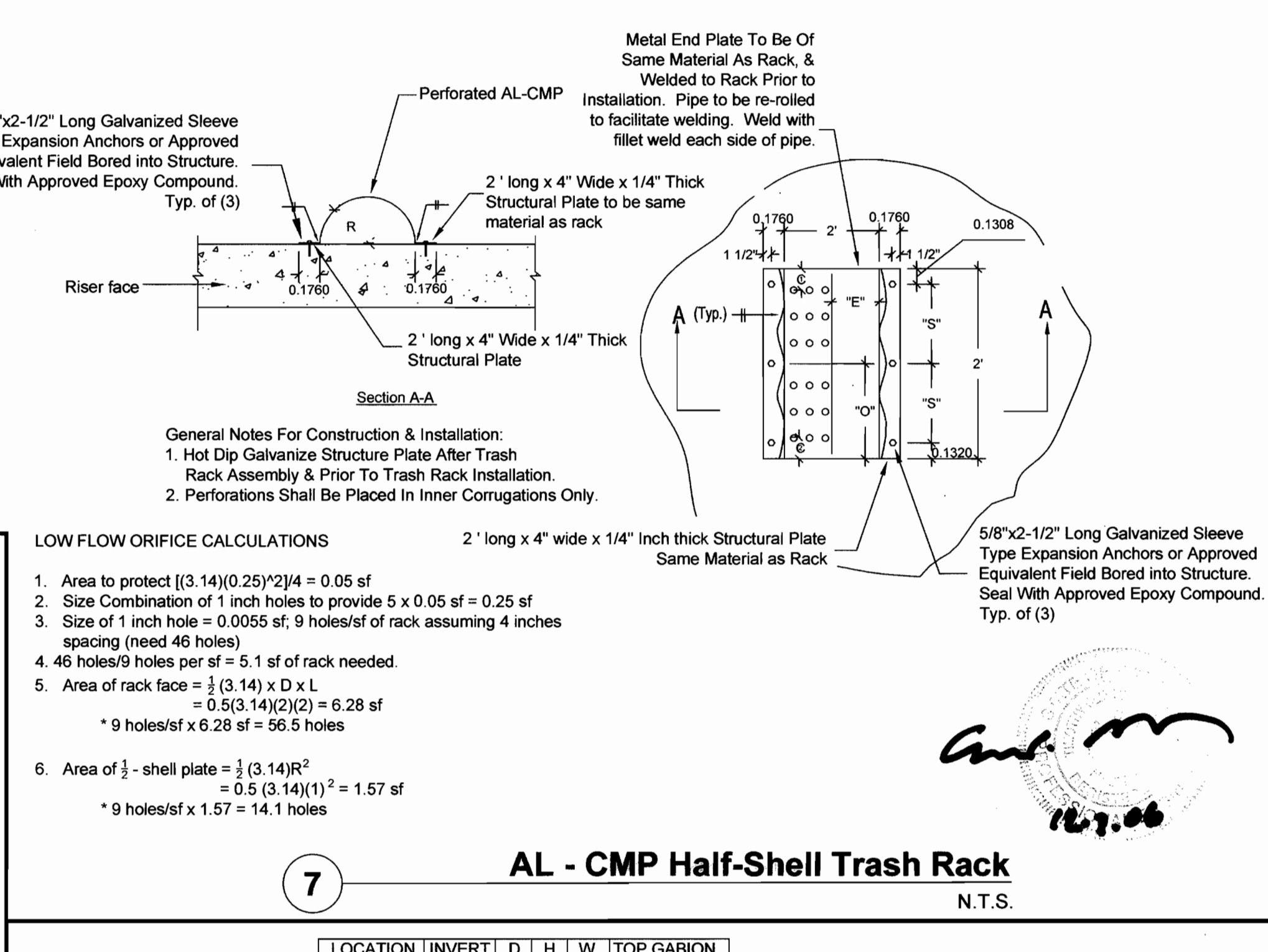
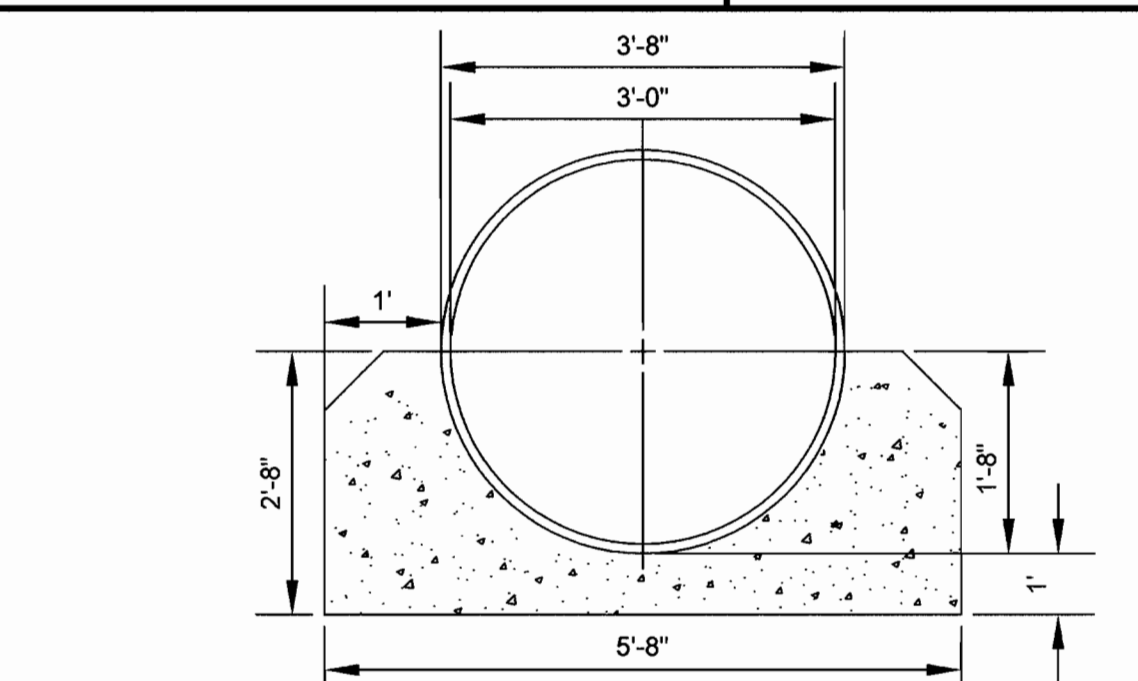
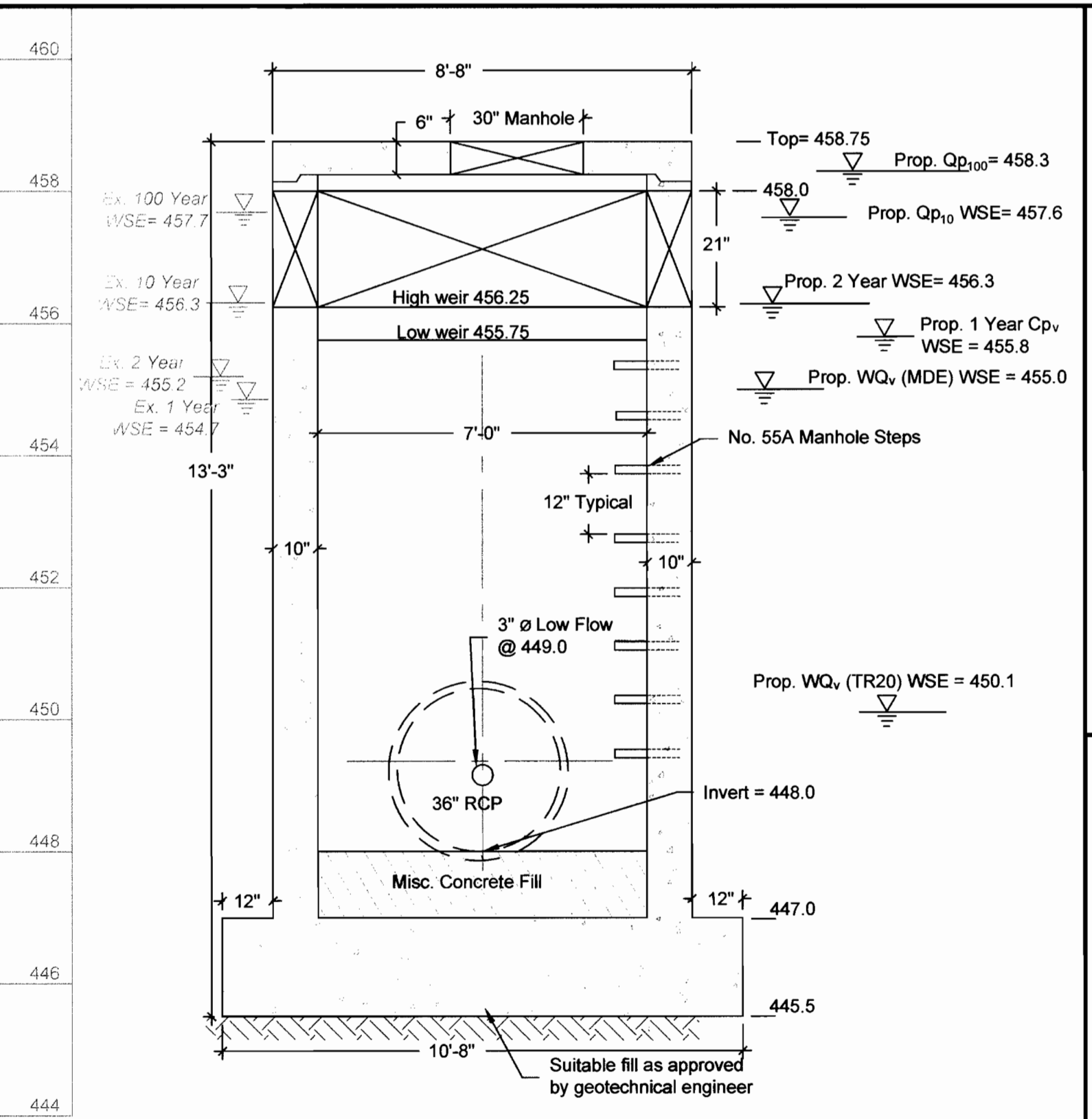
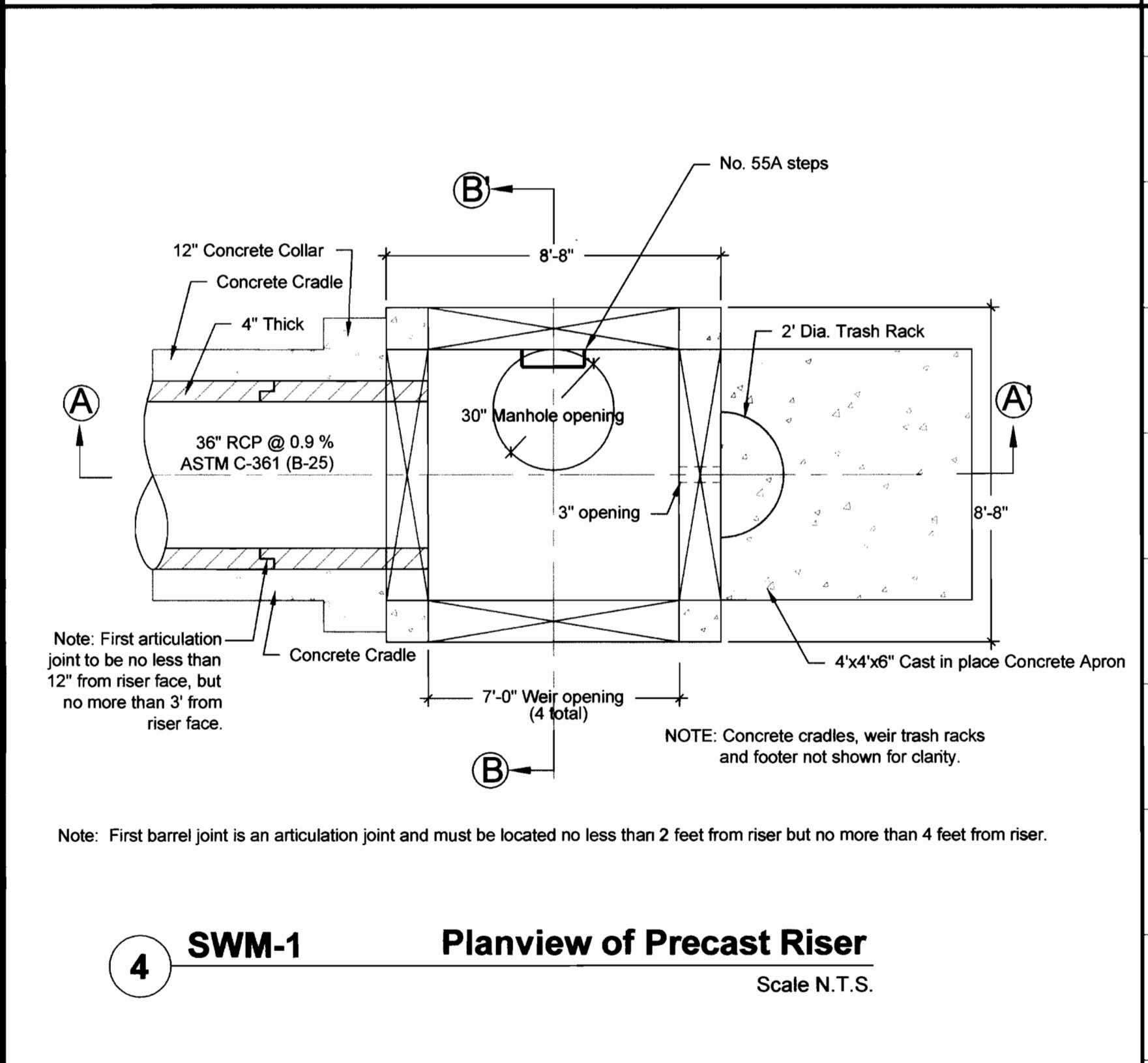
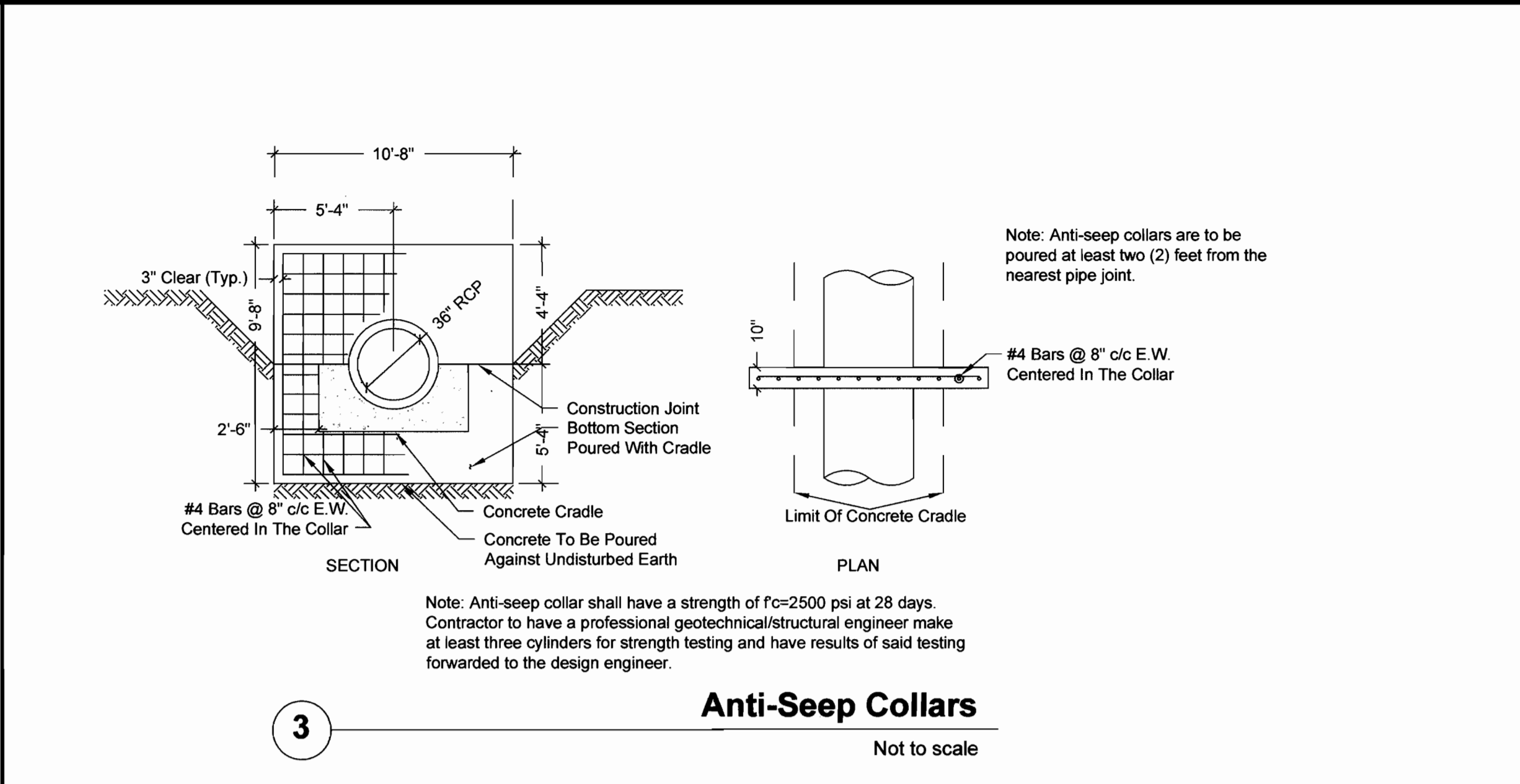
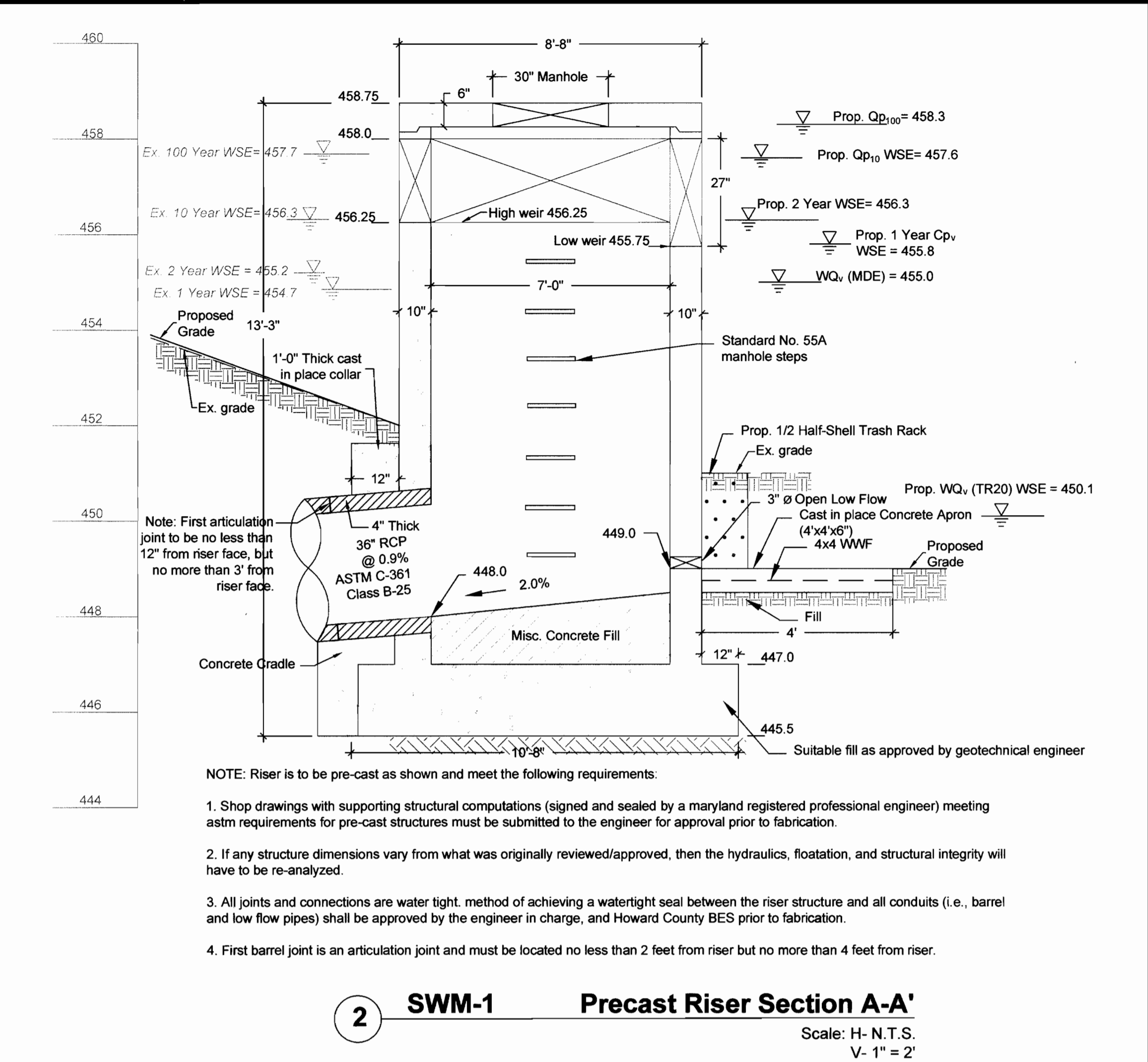
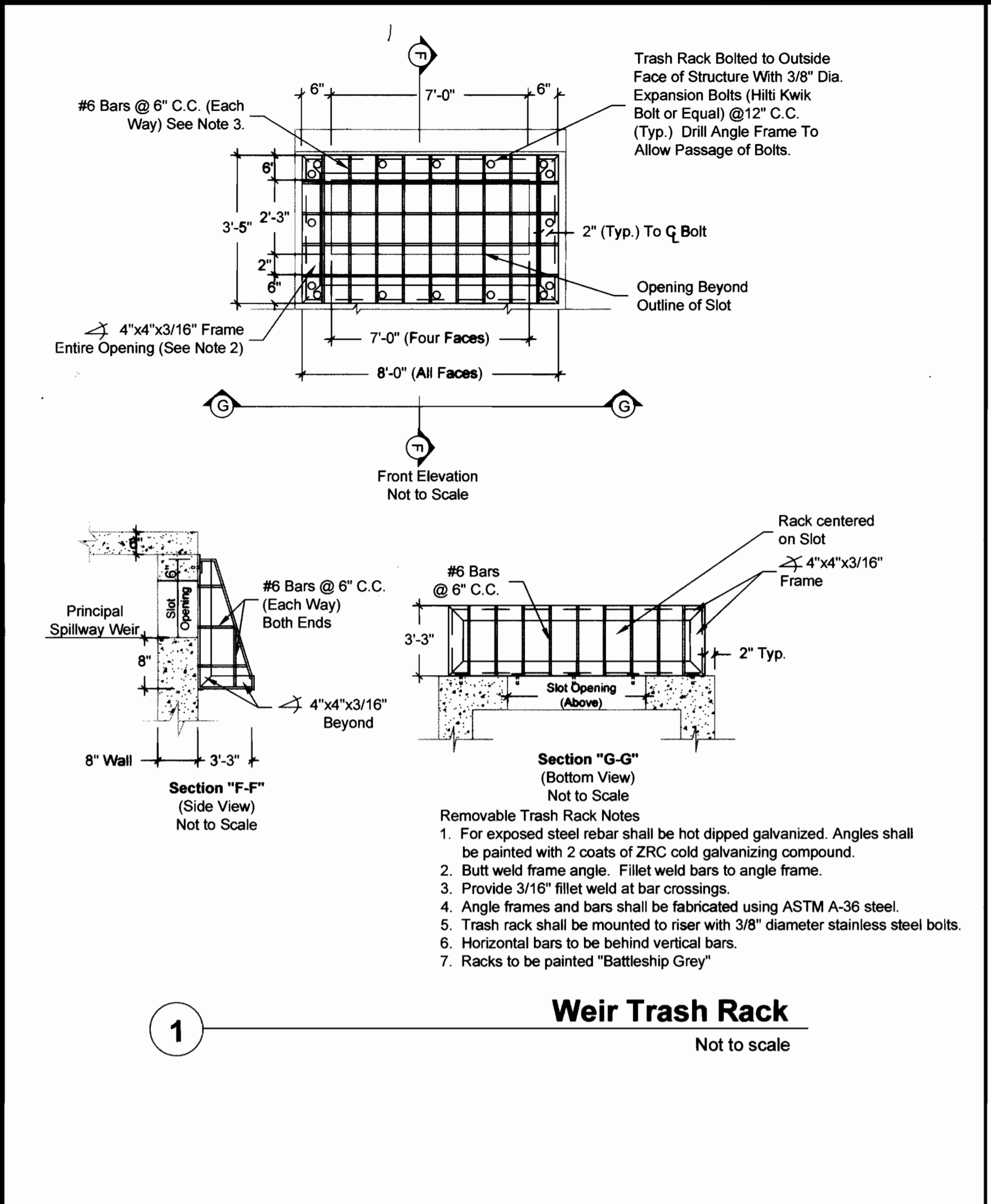
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Howard County, Maryland
Tax Map 30 Grid 18

OAKLAND EXECUTIVE PARK POND RETROFIT
Columbia, Maryland
Sediment Control Planview

DATE:	11/06				
DESIGNED:	TCS				
DRAFTED:	HT				
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BASE DATA:	LTI	1	REVIEWER COMMENTS	TCS	09/06
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910 CLOPPER ROAD SUITE 215N GAITHERSBURG MARYLAND 20878
Phone: (301) 208-9573 E-mail: env@cpja.com Fax: (301) 926-4551
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SCALE As Shown
SHEET 3
OF 11 SHEETS
JOB NO. 35-565

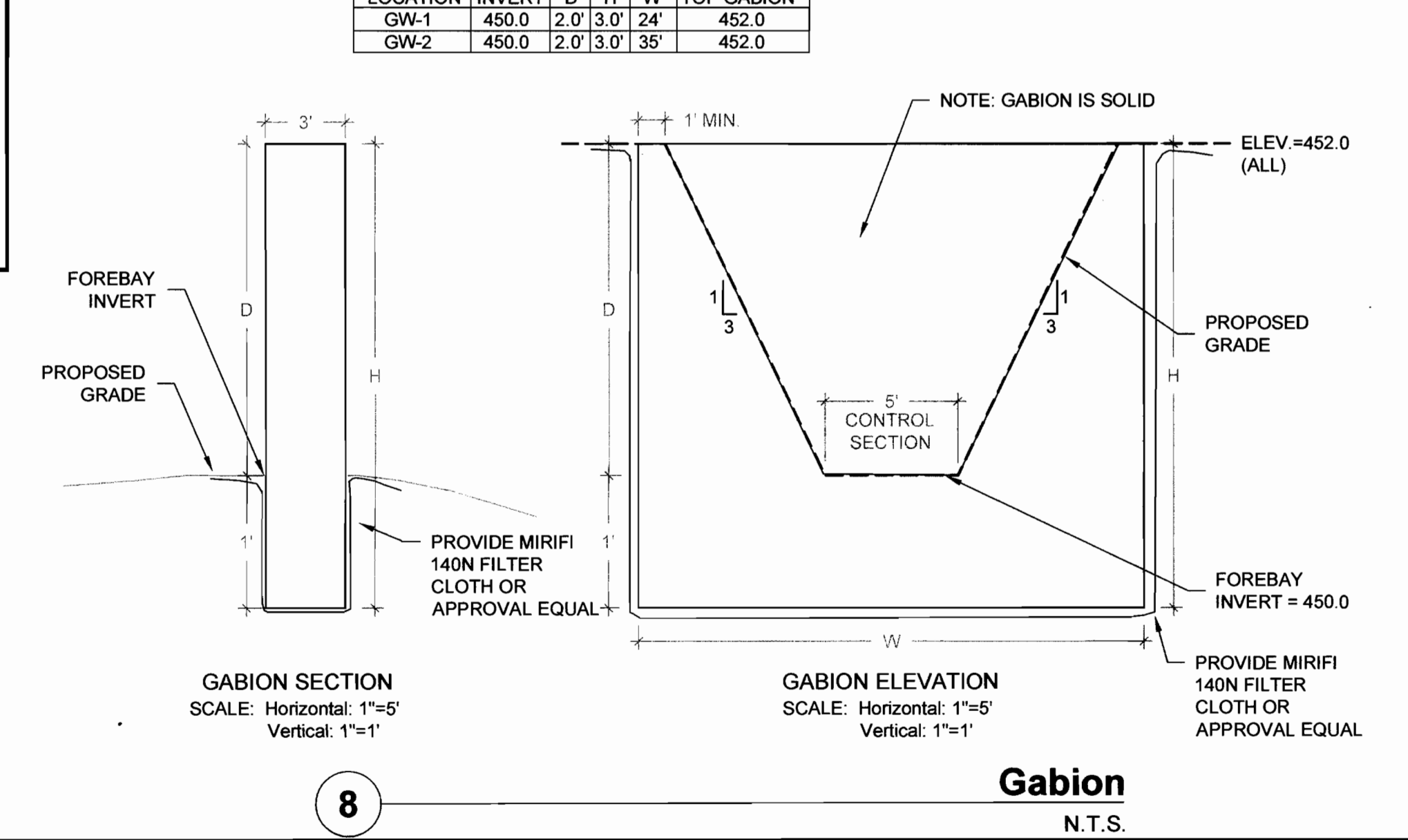
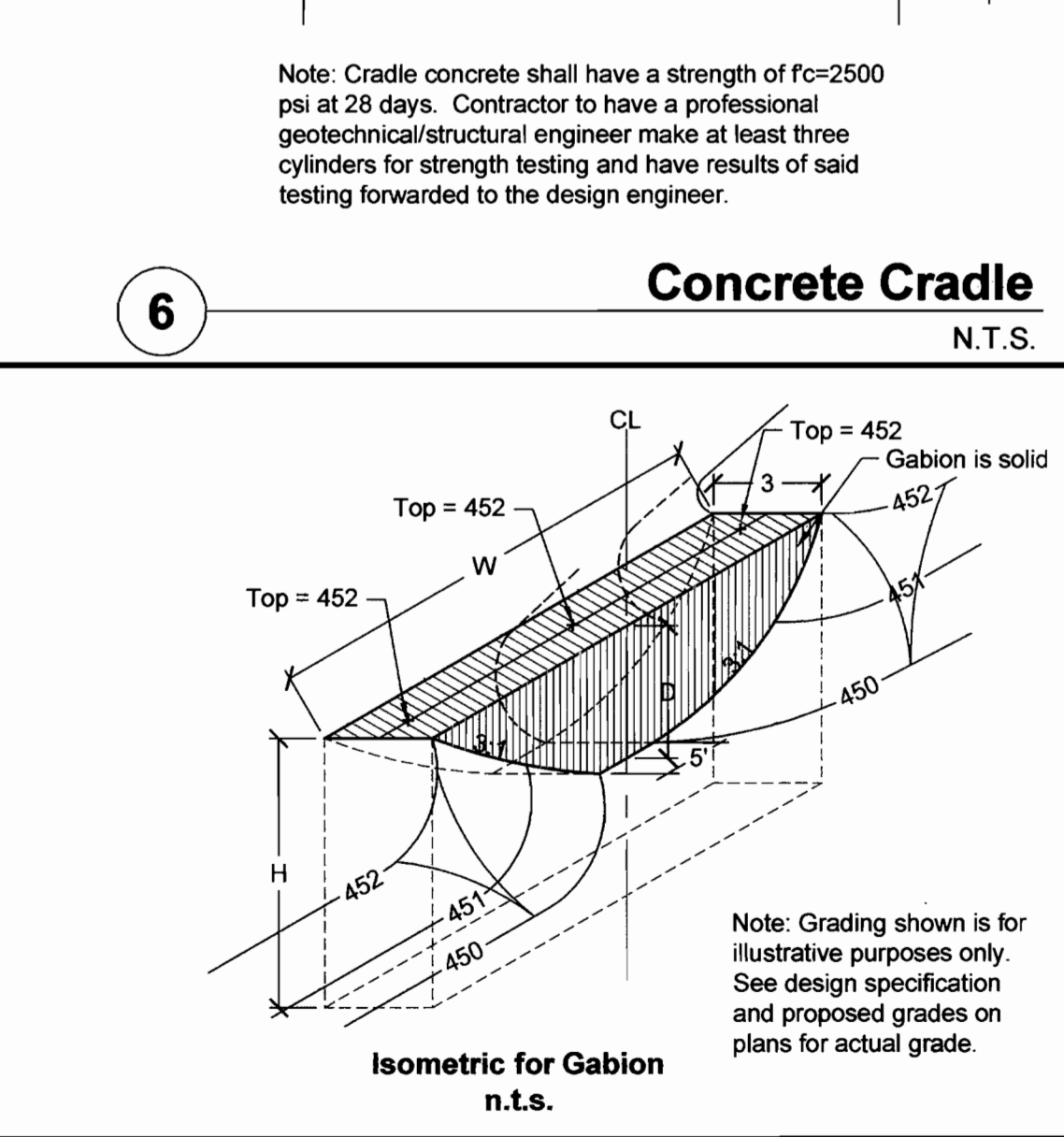


THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF DEVELOPMENT ENGINEERING DIVISION
CHIEF DIVISION OF LAND DEVELOPMENT
DIRECTOR

DATE: 11/16/07
DATE: 11/16/07
DATE: 11/16/07

SWM-1 Precast Riser Section B-B'
Scale: H- N.T.S. V- 1" = 2'



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

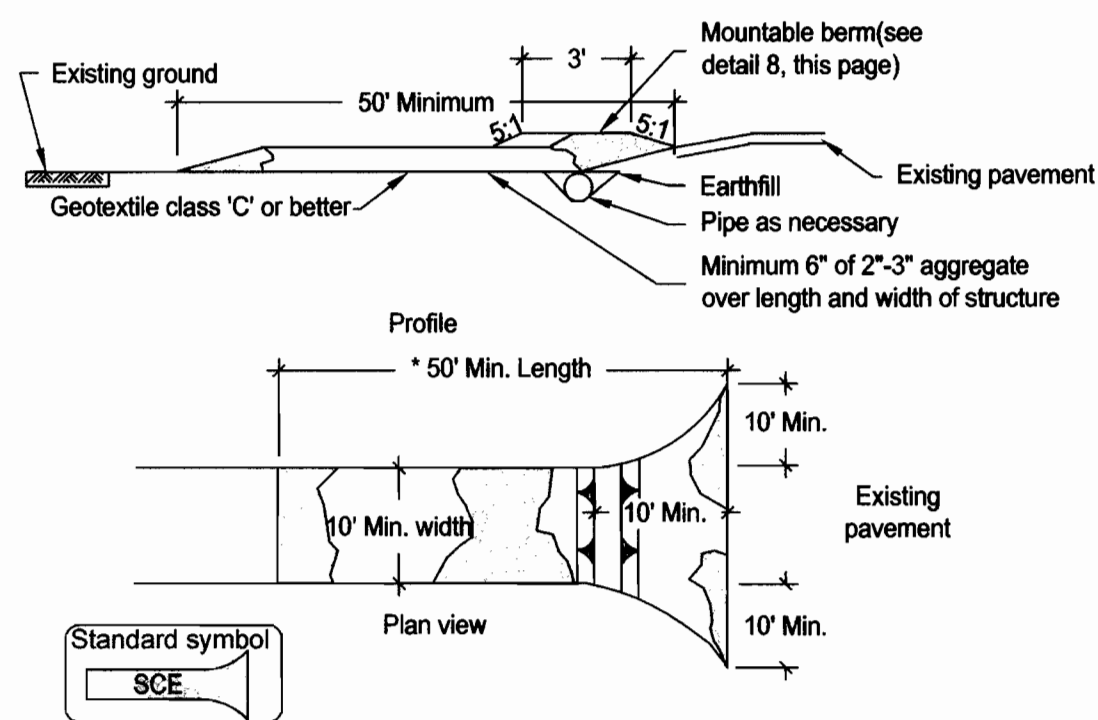
Oakland Executive Park
Lot A-1 Plat 6558 Parcel 104
11.108 Acres
Election District #02
Howard County, Maryland
Tax Map 30 Grid 18

OAKLAND EXECUTIVE PARK POND RETROFIT
Columbia, Maryland
SWM Retrofit Details

DATE:	11/06				
DESIGNED:	TCS				
DRAFTED:	HT				
CHECKED:	TCS	2	REVIEWER COMMENTS	TCS	11/06
BASE DATA:	LTI	1	REVIEWER COMMENTS	TCS	09/06
		NO.	REVISIONS	BY	DATE

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

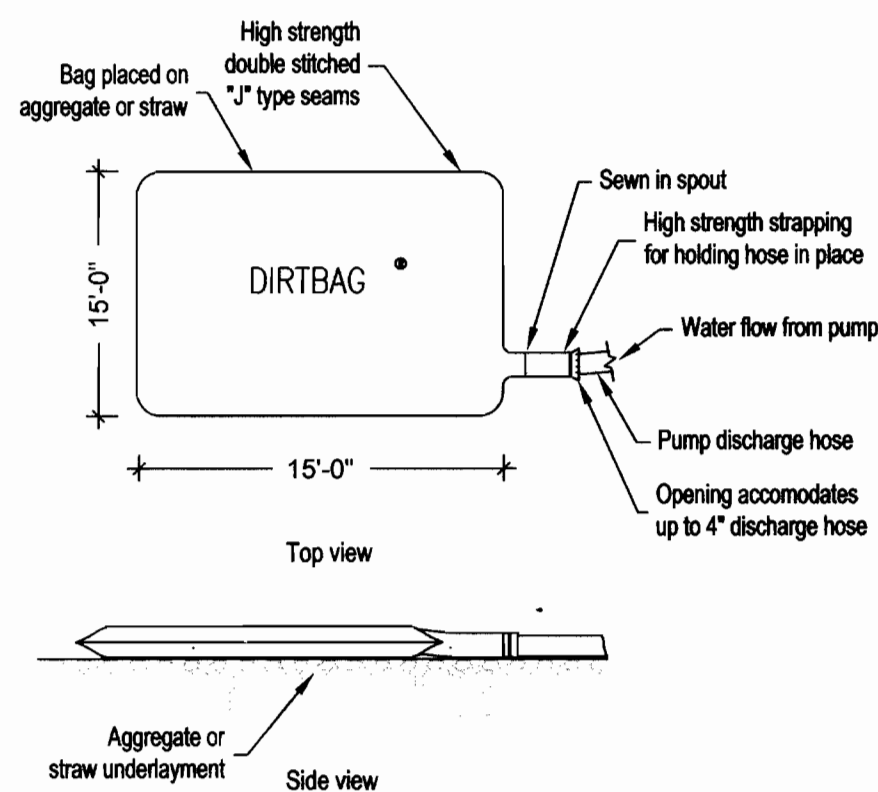
SCALE: As Shown
SHEET: 4
OF 11 SHEETS
JOB NO: 35-565
SDP # 06-101



- Construction Specifications:**
- Length - minimum of 50' (*30' for single residence lot).
 - Width - 10' minimum, should be flared at the existing road to provide a turning radius.
 - 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.
 - 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.
 - 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.
 - 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

A STABILIZED CONSTRUCTION ENTRANCE
Not to scale



Note:
Silt control system to be used in conjunction with pump around if deemed necessary by sediment control inspector to treat any sediment-laden water within the dry work area.

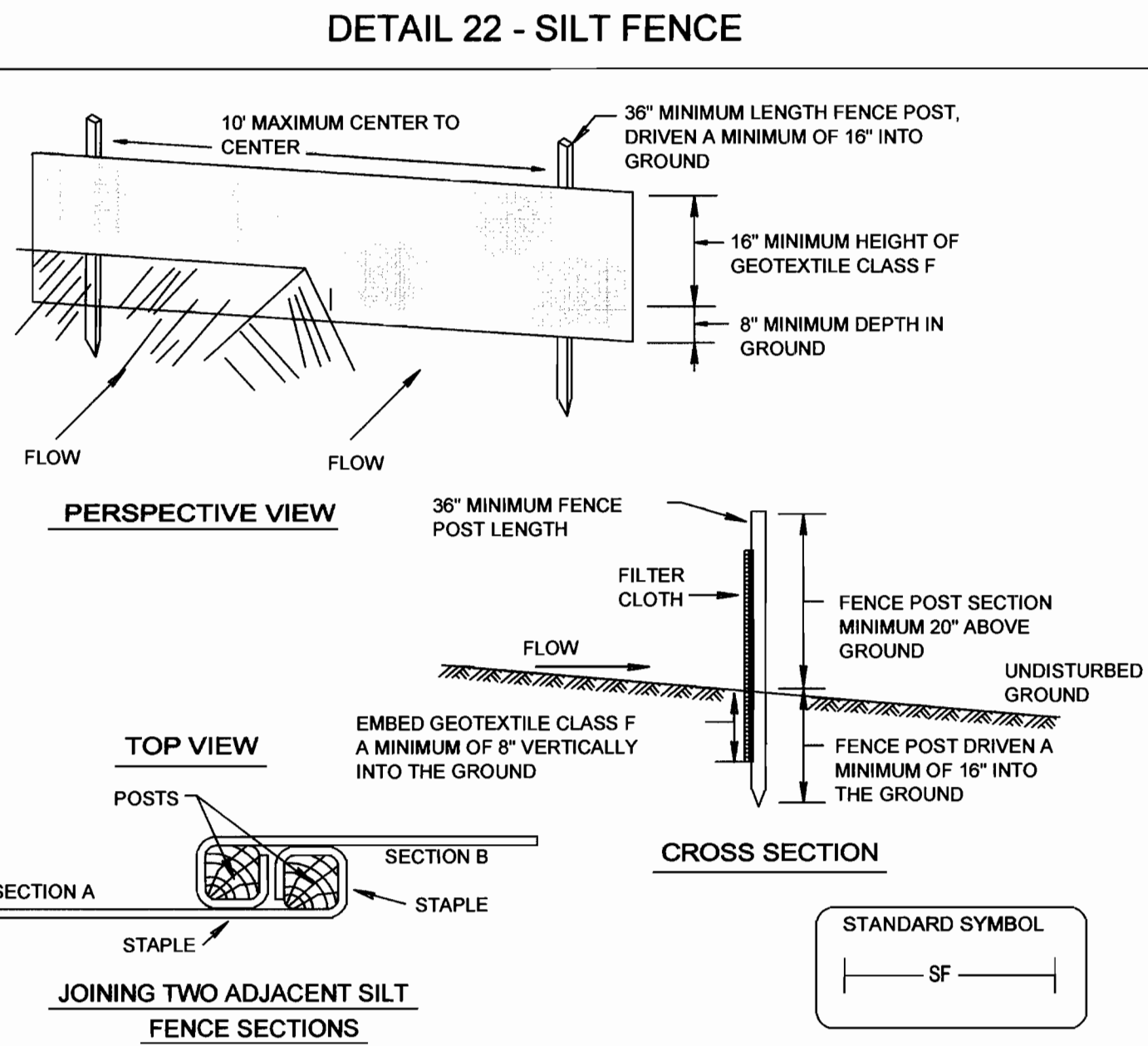
Dewatering/Filter Bag Materials Specifications:

The dewatering/filter bag shall be made of non-woven geotextile with a minimum surface area of 225 square feet per side. All structural seams shall be sewn with a double stitch using a double needle machine with high strength thread. The seam strength shall withstand 100lb/in using ASTM D-4894 test method. The dewatering/filter bag shall have a nozzle large enough to accommodate a four inch discharge hose. The nozzle shall be sealed tightly around the discharge hose with a strap or similar device to prevent untreated water from escaping. The geotextile fabric shall be a non-woven fabric with the following properties:

Weight	ASTM D-3776	10 oz/yd
Grab Tensile	ASTM D-4632	270 lbs
Puncture	ASTM D-4833	150 lbs
Flow Rate	ASTM D-4491	70 Gal/min/sq ft
Permittivity	ASTM D-4991	1/1.3 sec
LV Resistance	ASTM D-4355	70%
ACS % Retained	ASTM D-4751	100

Construction:
The dewatering/filter bag shall be installed over a 3 inch gravel base or a straw bale base to promote infiltration and dewatering of the filter bag.

C SILT SACK
Not to scale



- Construction Specifications**
- Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pond per linear foot.
 - 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 / minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

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

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SOIL CONSERVATION SERVICE

B SILT FENCE DETAIL
Not to scale

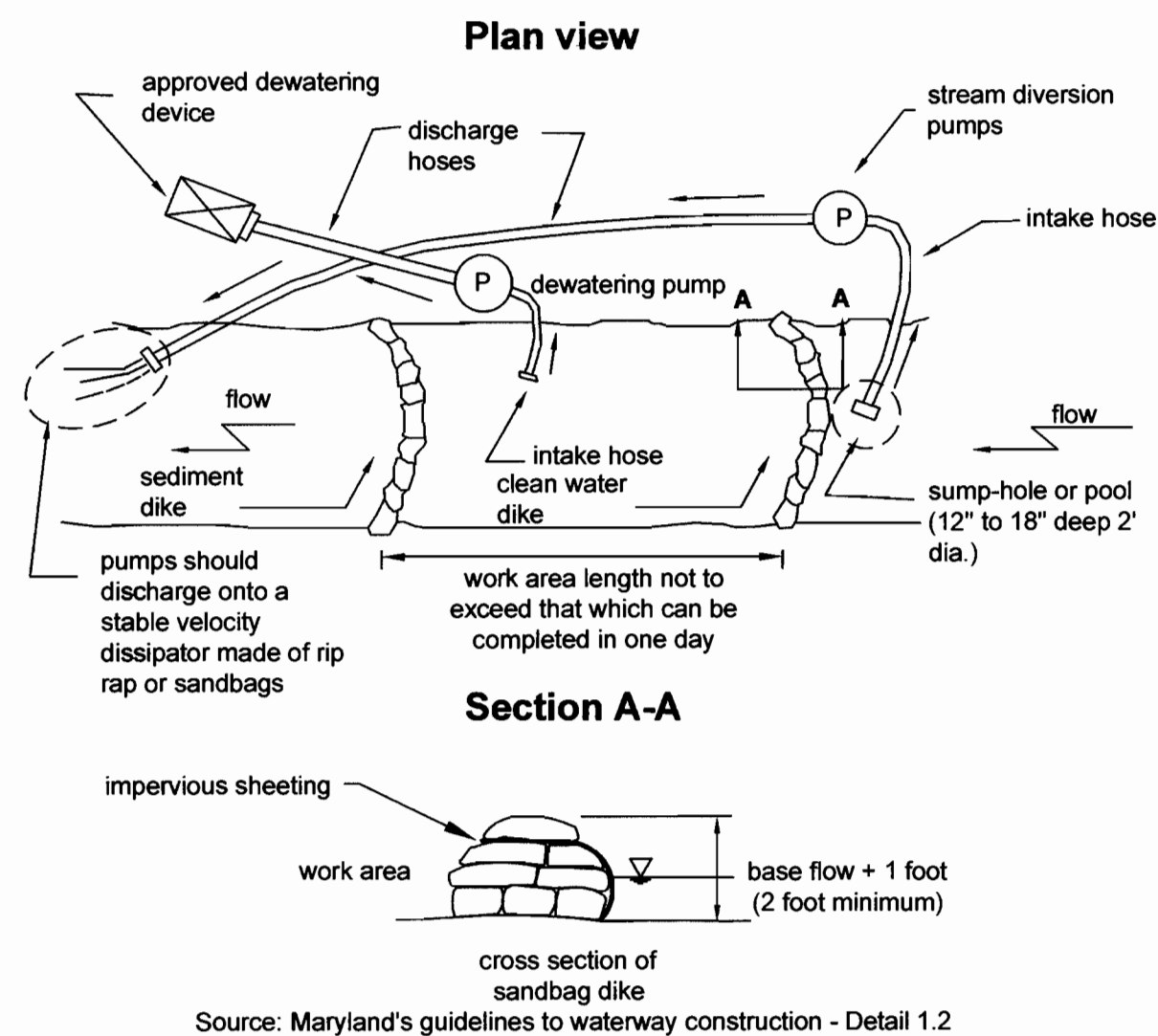
Silt Fence Design Criteria

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



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

D PUMP-AROUND PRACTICE
Not to scale

Pump-Around Practice

Temporary measure for dewatering pond construction sites.

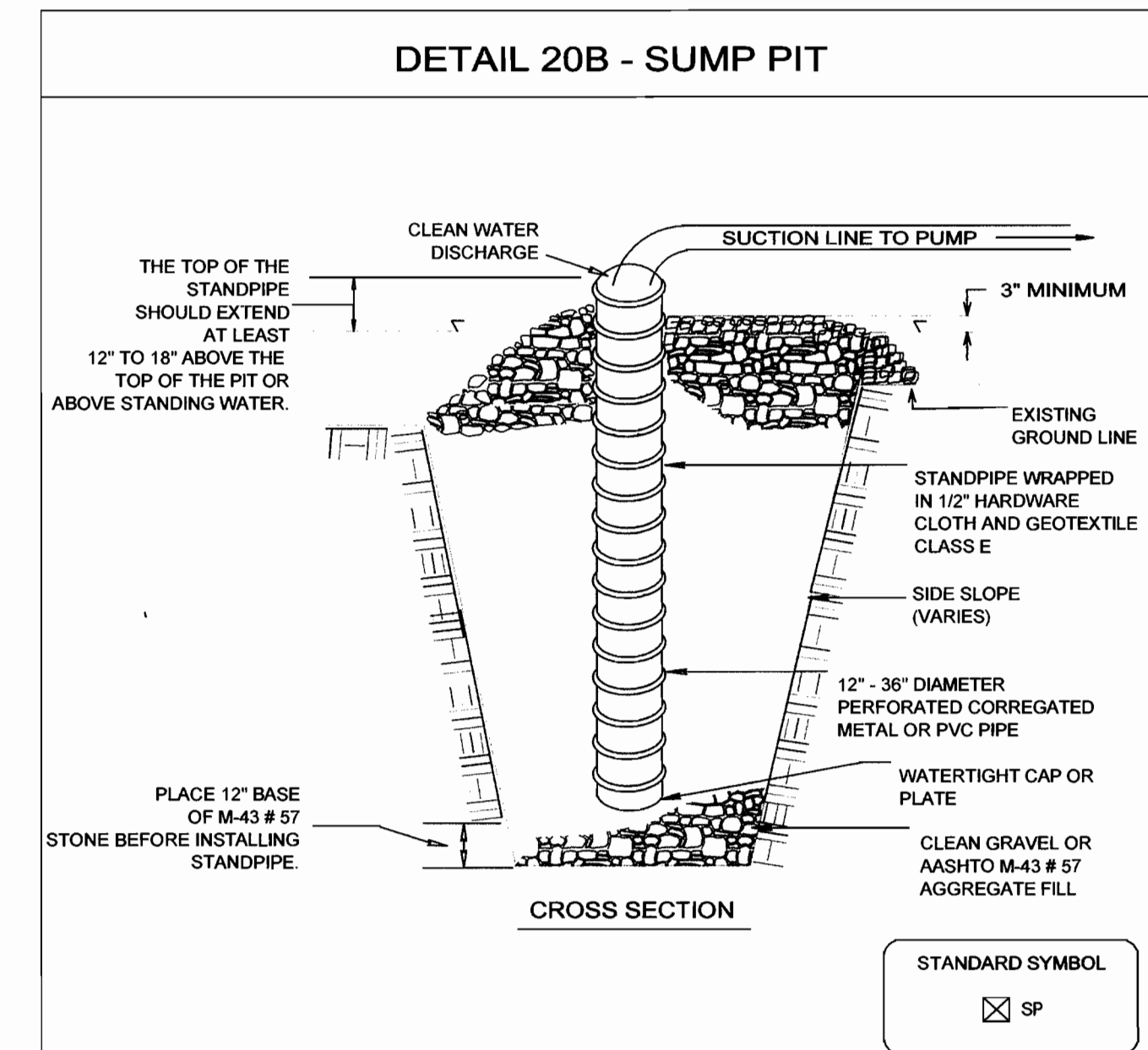
Description

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

Implementation Sequence

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

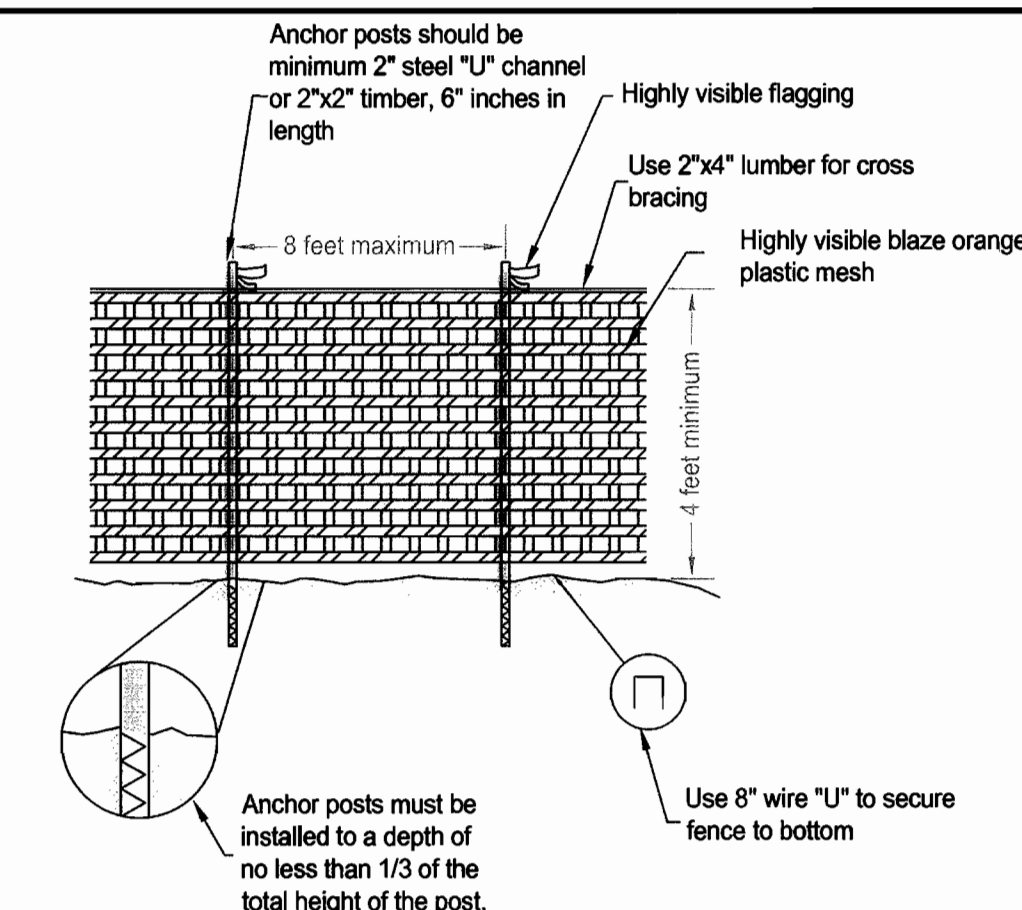
- Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or rights-of-ways have been acquired. All existing utilities that may result from construction and should repair the damage at his/her own expense to the county's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



- Construction Specifications**
- Pit dimensions are variable, with the minimum diameter being 2 times the standpipe diameter.
 - 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.
 - 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.
 - 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

E SUMP & DEWATERING DEVICE
Not to scale



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

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

F PEDESTRIAN AND TREE SAVE FENCE DETAIL
Not to scale

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

J. J. [Signature] 11/10/07 DATE
NATURAL RESOURCES CONSERVATION SERVICE

APPROVED DEPARTMENT OF PLANNING AND ZONING

CHIEF DEVELOPMENT ENGINEERING DIVISION & DATE 11/10/07
[Signature]

CHIEF, DIVISION OF LAND DEVELOPMENT DATE 11/10/07
[Signature]

DIRECTOR DATE 11/10/07

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

Oakland Executive Park
Lot A-1 Plat 6558 Parcel 104
11.108 Acres
Election District #02
Howard County, Maryland
Tax Map 30 Grid 18

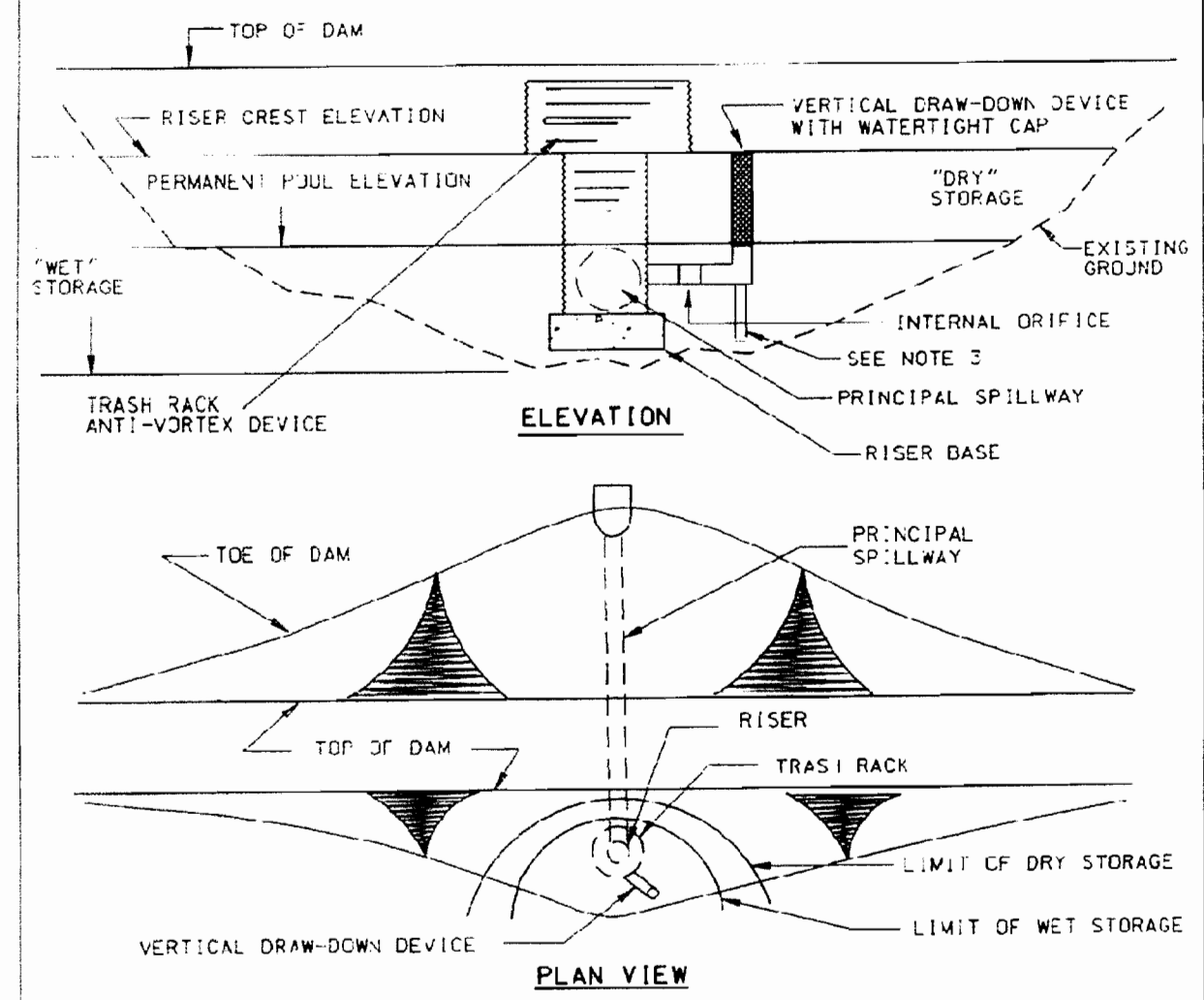
OAKLAND EXECUTIVE PARK POND RETROFIT
Columbia, Maryland
Sediment Control Details

DATE:	11/06				
DESIGNED:	TCS				
DRAFTED:	HT				
CHECKED:	TCS	2	REVIEWER COMMENTS	TCS	11/06
BASE DATA:	LTI	1	REVIEWER COMMENTS	TCS	09/06
		NO.	REVISIONS	BY	DATE

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

SCALE
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SHEET
5
OF 11 SHEETS
JOB NO.
35-565

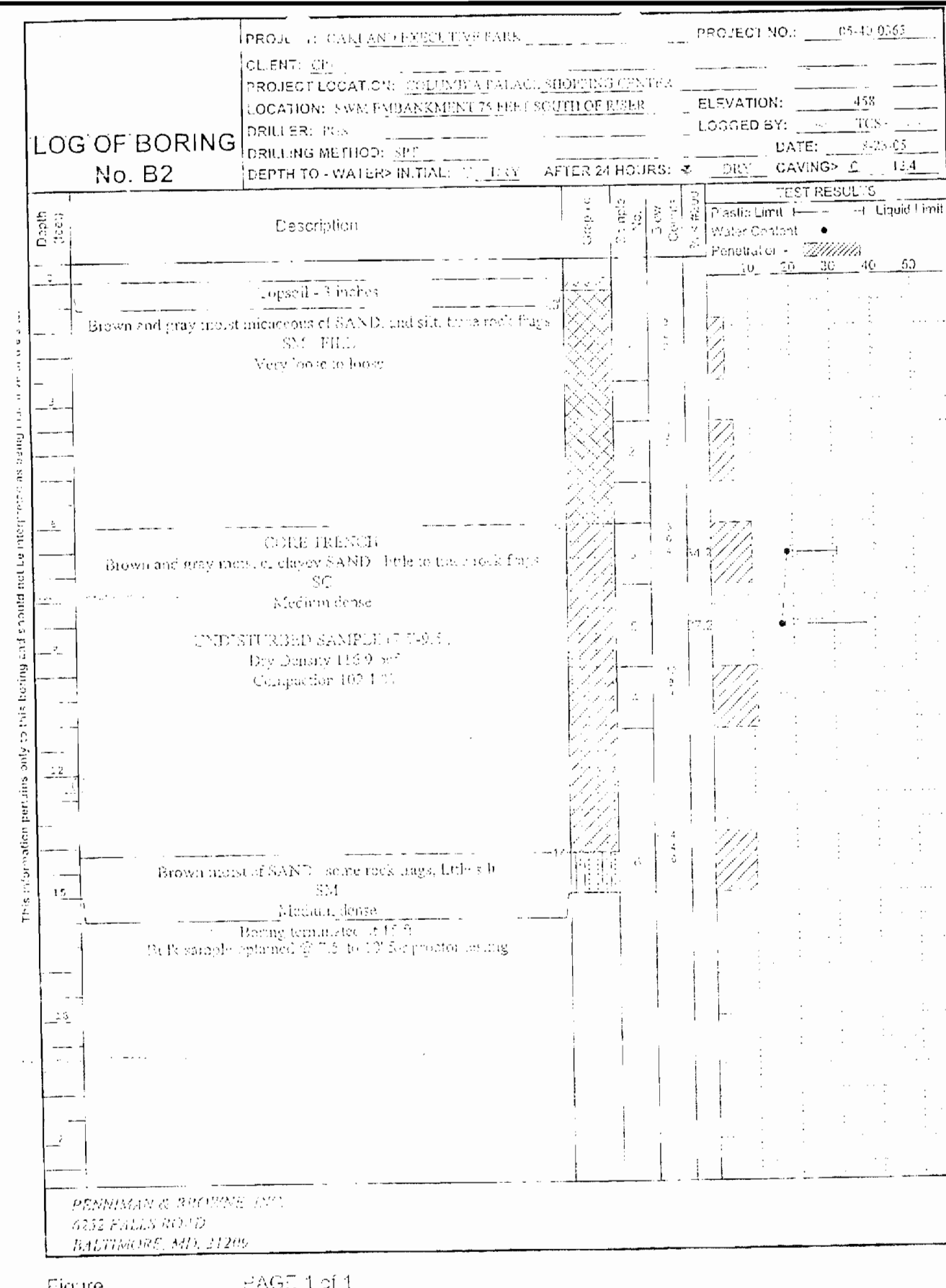
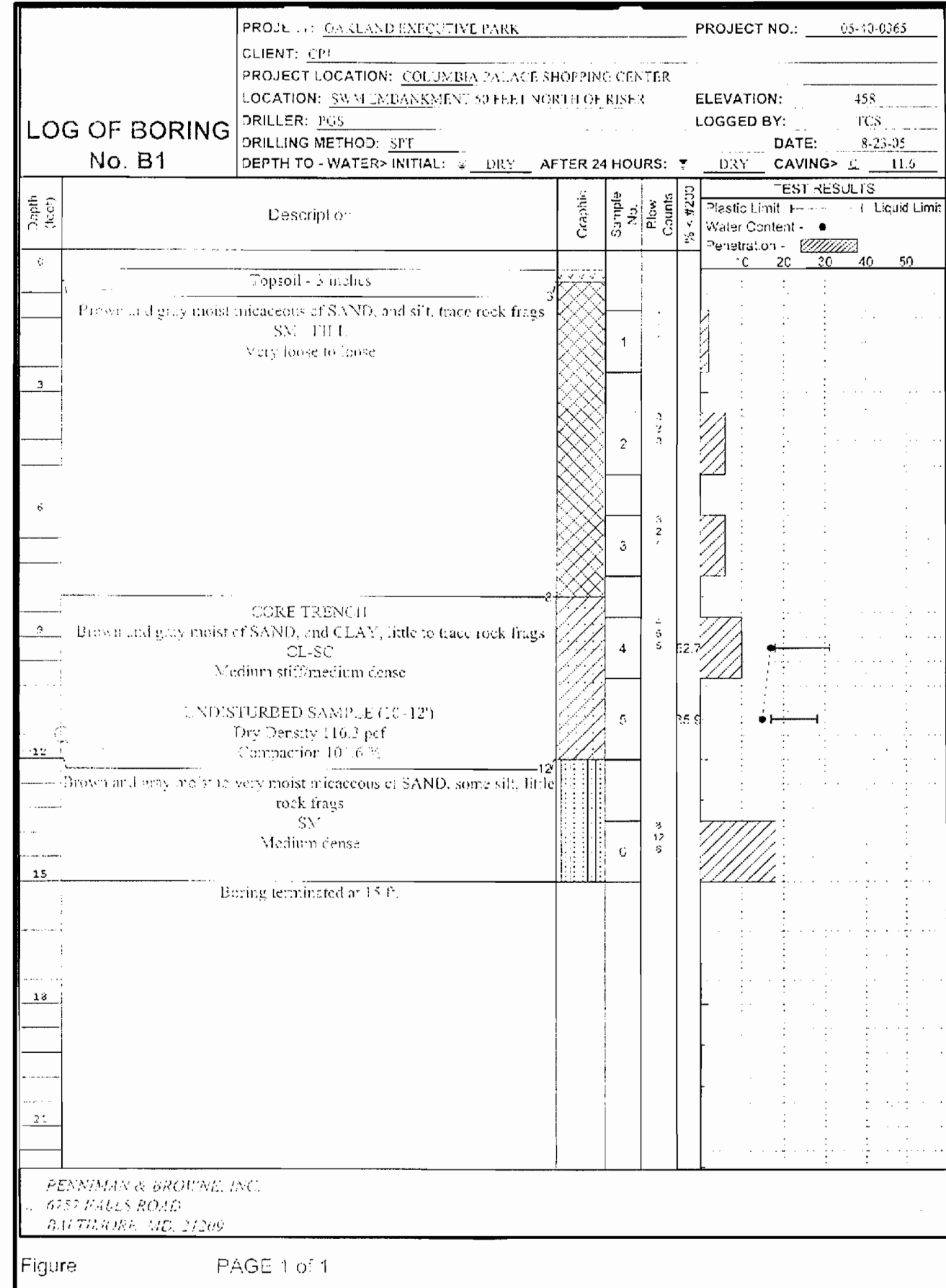
**BASIN DRAWDOWN SCHEMATIC
VERTICAL DRAW-DOWN DEVICE**



Construction Specifications

- Perforations in the draw-down device may not extend into the wet storage.
- The total area of the perforations must be greater than 2 times the area of the internal orifice.
- The perforated portion of the draw-down device shall be wrapped with 1/2" hardware cloth and geotextile fabric. The geotextile fabric shall meet the specifications for Geotextile Class C.
- Provide support of draw-down device to prevent sagging and flotation. An acceptable preventative measure is to stake both sides of draw-down device with 1" steel angle, or 1" by 4" square or 2" round wooden posts set 3' minimum into the ground then joining them to the device by wrapping with 12 gauge minimum wire.

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



**HOWARD SOIL CONSERVATION DISTRICT
STANDARD SEDIMENT CONTROL NOTES**

- 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 (313-1655).
- 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.
- Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within: a) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1, b) 14 days as to all other disturbed or graded areas on the project site.
- All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol 1, Chapter 12 of the HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
- All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding (Sec. 51) soil (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52). Temporary stabilization and mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
- All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.
- Site Analysis:
Total Area of site: 11.10 acres
Area Disturbed: 1.17 acres
Area to be roofed or paved: 0 acres
Area to be vegetatively stabilized: 0.25 acres
Total Cut: 1,650 Cu. Yds.
Total Fill: 80 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.
- Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
- Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
- On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.
- Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized by the end of each work day, whichever is shorter.

DATE: 05/16/06
DRAWN BY: JCS
CHECKED BY: JCS
APPROVED BY: JCS



Subject: Design Manual Volume I Water Resources
Oakland Executive Park Pond Retrofit
Capital Project D-1141

Memo To: James M. Irwin, Director
Department of Public Works

From: Richard Powell, Project Manager
Stormwater Management Division

Date: May 16, 2006

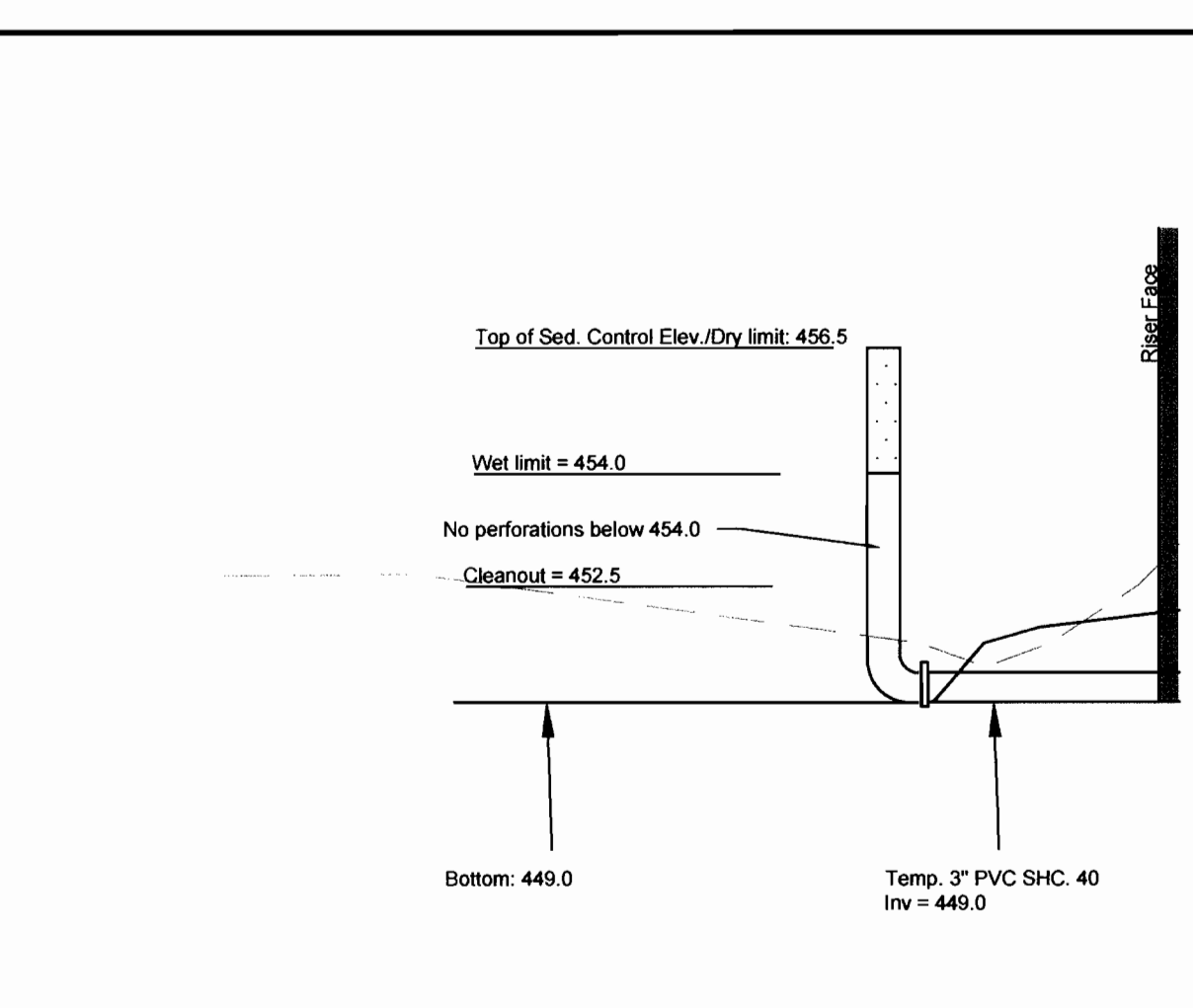
The Stormwater Management Division requests waiver of the following design standards for the reauthorized capital project:

- Waiver requested: to develop Runoff Curve Numbers based on actual measured imperviousness rather than on FR-05 tables. (DMV I - Section 5.2.4.1)
Justification: The drainage area of the pond is outlet cut and therefore the imperviousness assumptions based on zoning are unnecessary. Imperviousness calculations were taken from GIS and field observation and are deemed more accurate than zoning assumptions.
- Waiver requested: No 12' wide minimum access route entirely around pond will be provided. (DMV I - Section 5.2.6.1)
Justification: Because this is a retrofit which is constructed by existing structures, easements, or property lines, a 10' wide access does not currently exist all around the pond. A new access easement over private property would be needed to meet this requirement. The existing access easement to the pond provides access to the embankment, riser, and outlet, emergency spillway and pond interior.
- Waiver requested: To locate a rip-rap outlet channel closer than 20 feet to the downstream property line. (DMV I - Section 5.3.4.1)
Justification: The existing outlet channel is currently closer than 20 feet to the property line and cannot be moved any further away due to the location of other structures. Further, the means of addressing the headcut erosion in the stream below the outlet, a series of step pools are to be constructed which will essentially extend the outlet structure into the adjoining open space lot. A drainage easement on that lot is already platting and the County is in the process of obtaining a deed of easement.
- Waiver requested: No 12' A wide safety bench 1 ft above the normal pool will be provided. (DMV I - Section 5.2.7 A. 3)
Justification: There are no safety benches in the existing pond. Adding the safety bench would reduce the storage volume of the pond, retrofit and prevent the design from achieving the water quality volume standard. The existing pond is not a residential development that is adjacent to any residential properties.

Approved: *James M. Irwin*
James M. Irwin, Director



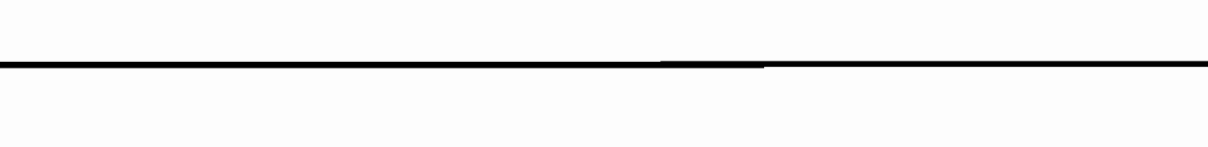
**G VERTICAL BASIN DRAWDOWN DEVICE
Not to scale**



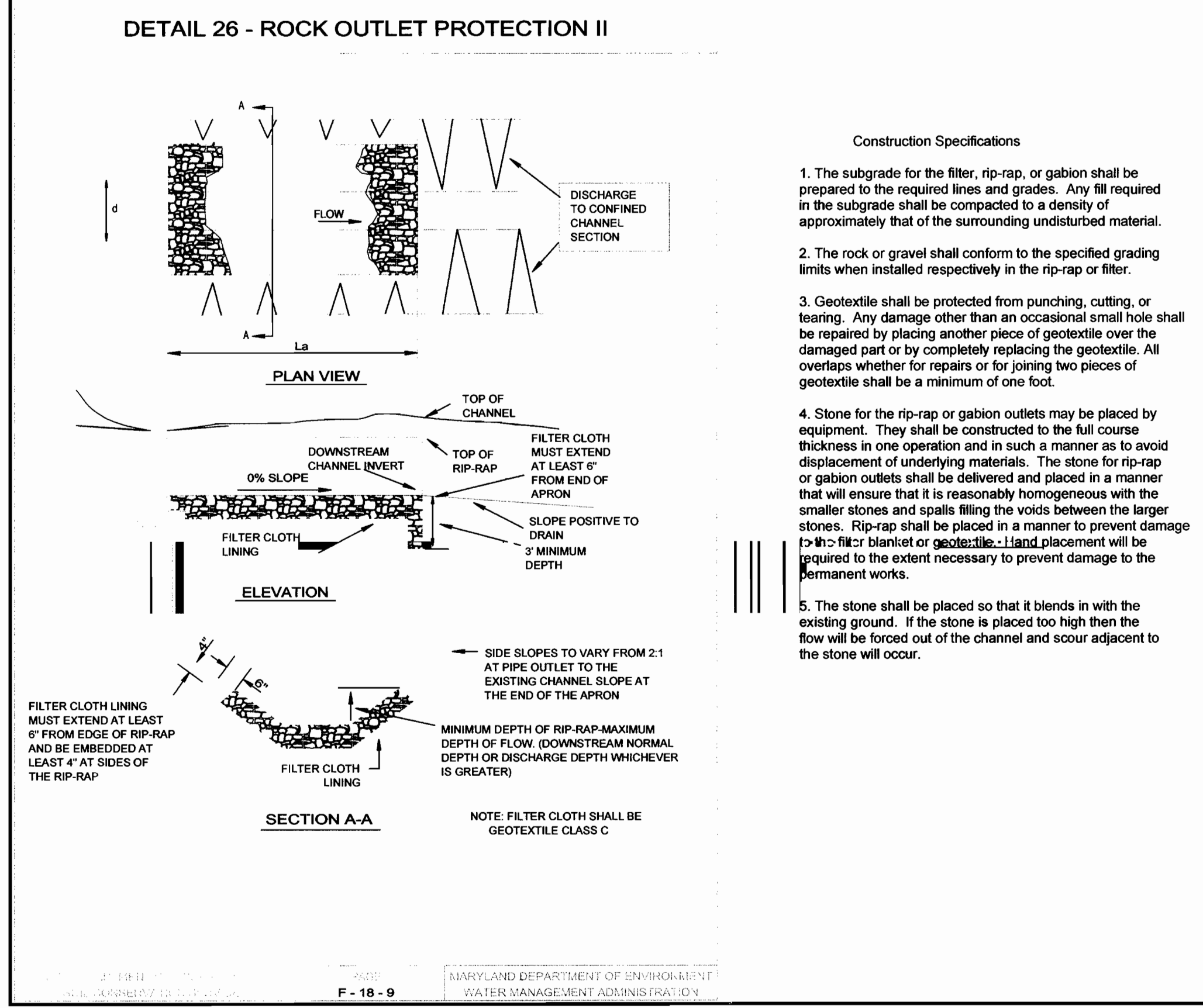
Note:

- Required temporary sediment control basin volume is 26.6 acres (direct drainage) times 3600 cf or 95,760 cf. Proposed design allows for 47,900 cf of wet storage and 47,900 for dry storage.
- Per the design stage-storage curve, the device will treat 47,900 cf of wet storage at an elevation of 454.0. The device will treat 47,900 cf of dry storage at an elevation of 456.5.
- The 3-inch pipe to function as dewatering conduit is set at 449.0. Perforations start at 454.0.
- The required perforation area is twice the 3-inch opening or 0.05 sf x 2 = 0.1 sf. One-inch perforations, four to a row, rows spaced 3 inches apart, yields 0.049 sf per foot. With 2.5 feet of perforated pipe, this yields 2.5 x 0.049 or 0.122sf > 0.1 required [ok].
- Cleanout volume and elevation are set at one-half the wet volume or 452.5 feet.

**H VERTICAL BASIN DRAWDOWN SCHEMATIC
Not to scale**



SOIL BORING RESULTS



**I OUTFALL PROTECTION
Not to scale**



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

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION
CHIEF, DIVISION OF LAND DEVELOPMENT
DIRECTOR

DATE: 1/11/07
DATE: 1/12/07
DATE: 1/14/07

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

Oakland Executive Park
Lot A-1 Plat 6558 Parcel 104
11.108 Acres
Election District #02
Howard County, Maryland
Tax Map 30 Grid 18

**OAKLAND EXECUTIVE PARK POND RETROFIT
Columbia, Maryland
Sediment Control Details**

DATE	11/06				
DESIGNED:	TCS				
DRAFTED:	HT				
CHECKED:	TCS	2	REVIEWER COMMENTS	TCS	11/06
		1	REVIEWER COMMENTS	TCS	09/06
BASE DATA:	LTI	NO.	REVISIONS	BY	DATE

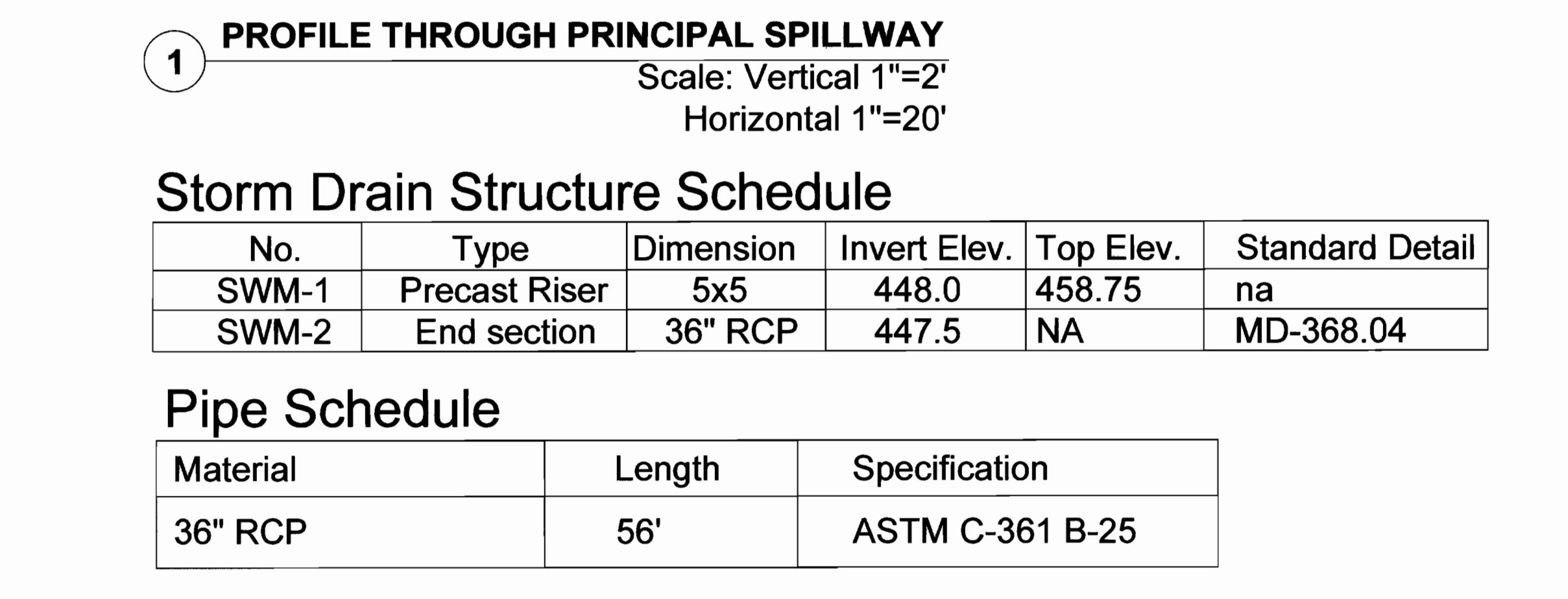
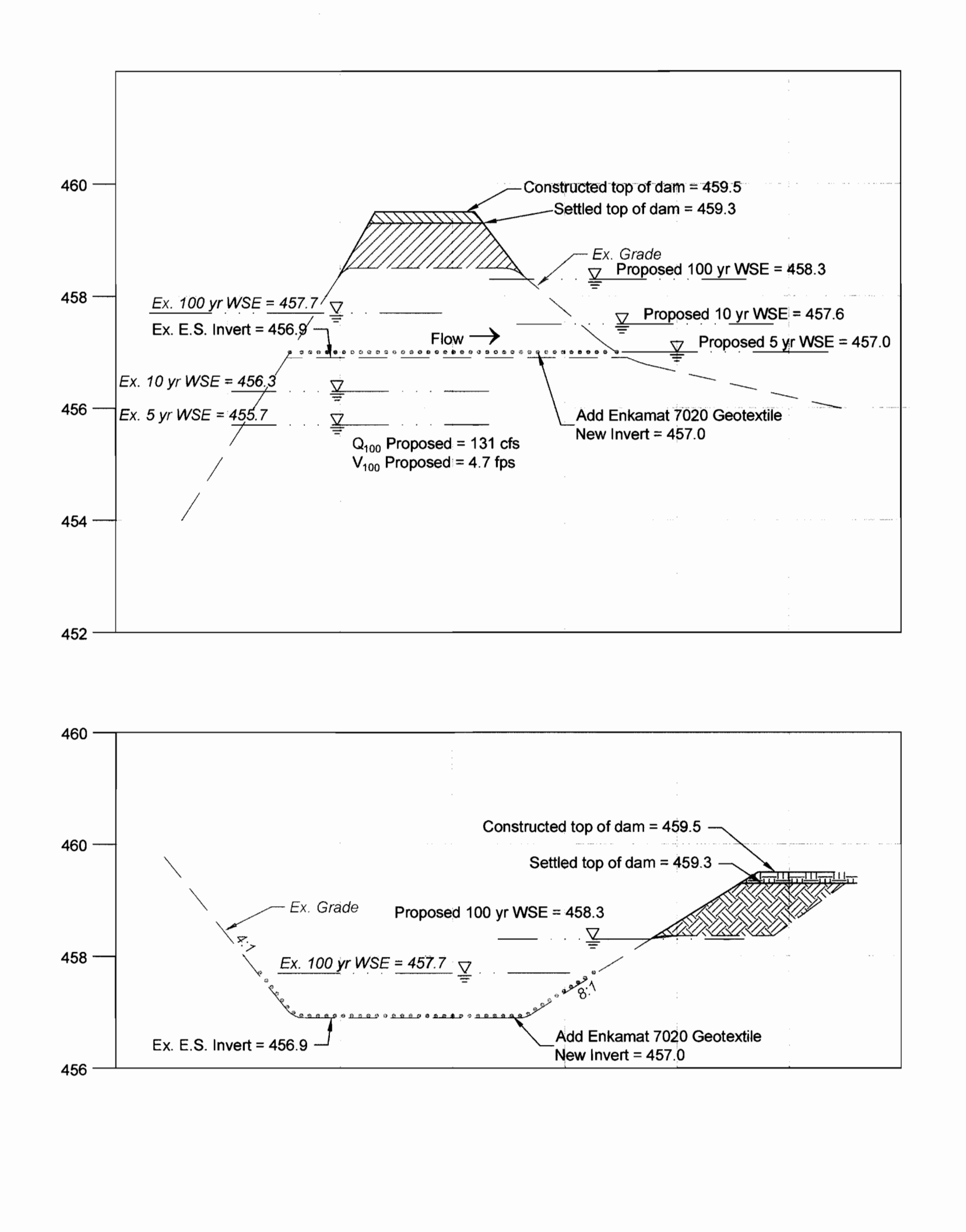
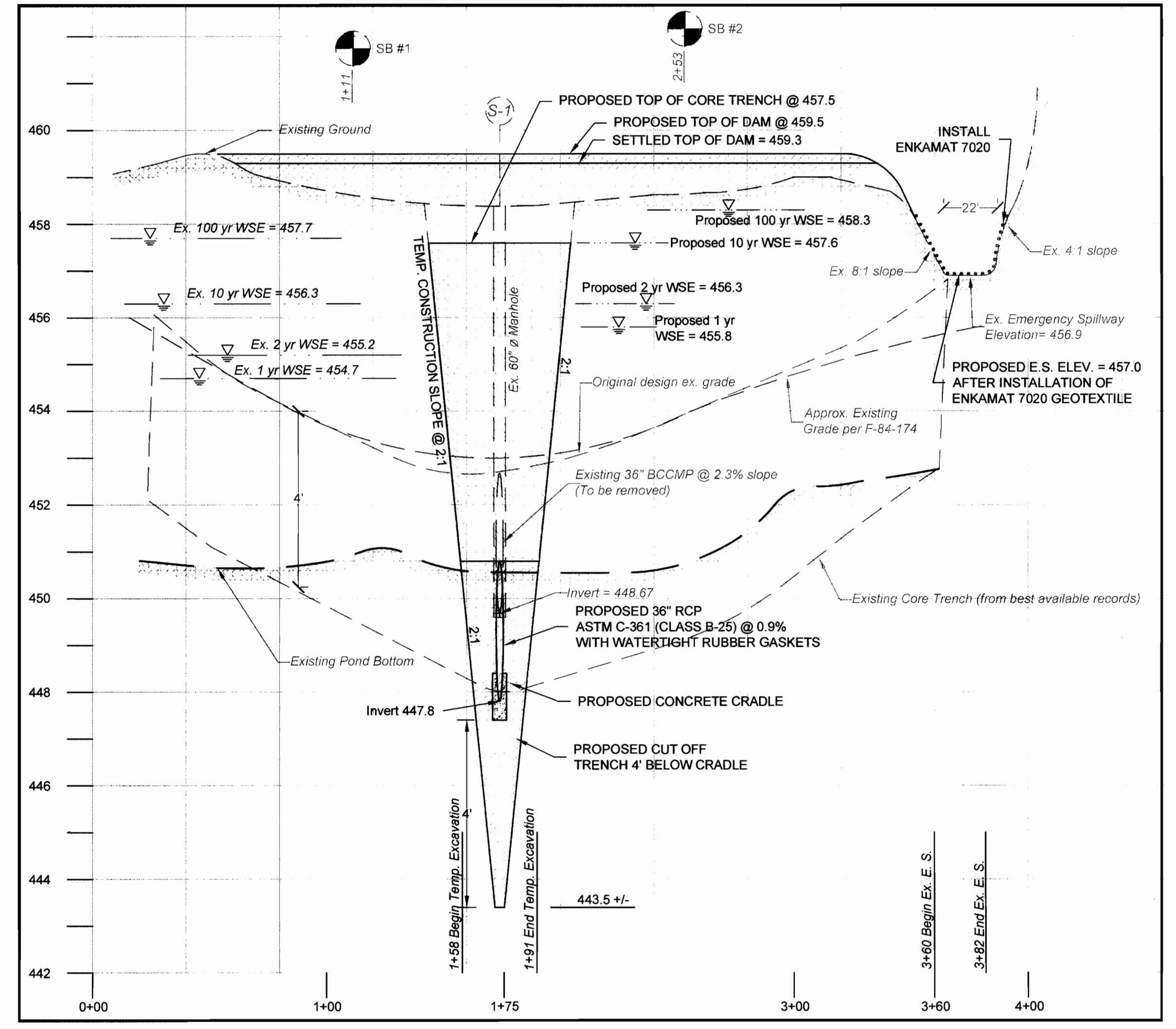
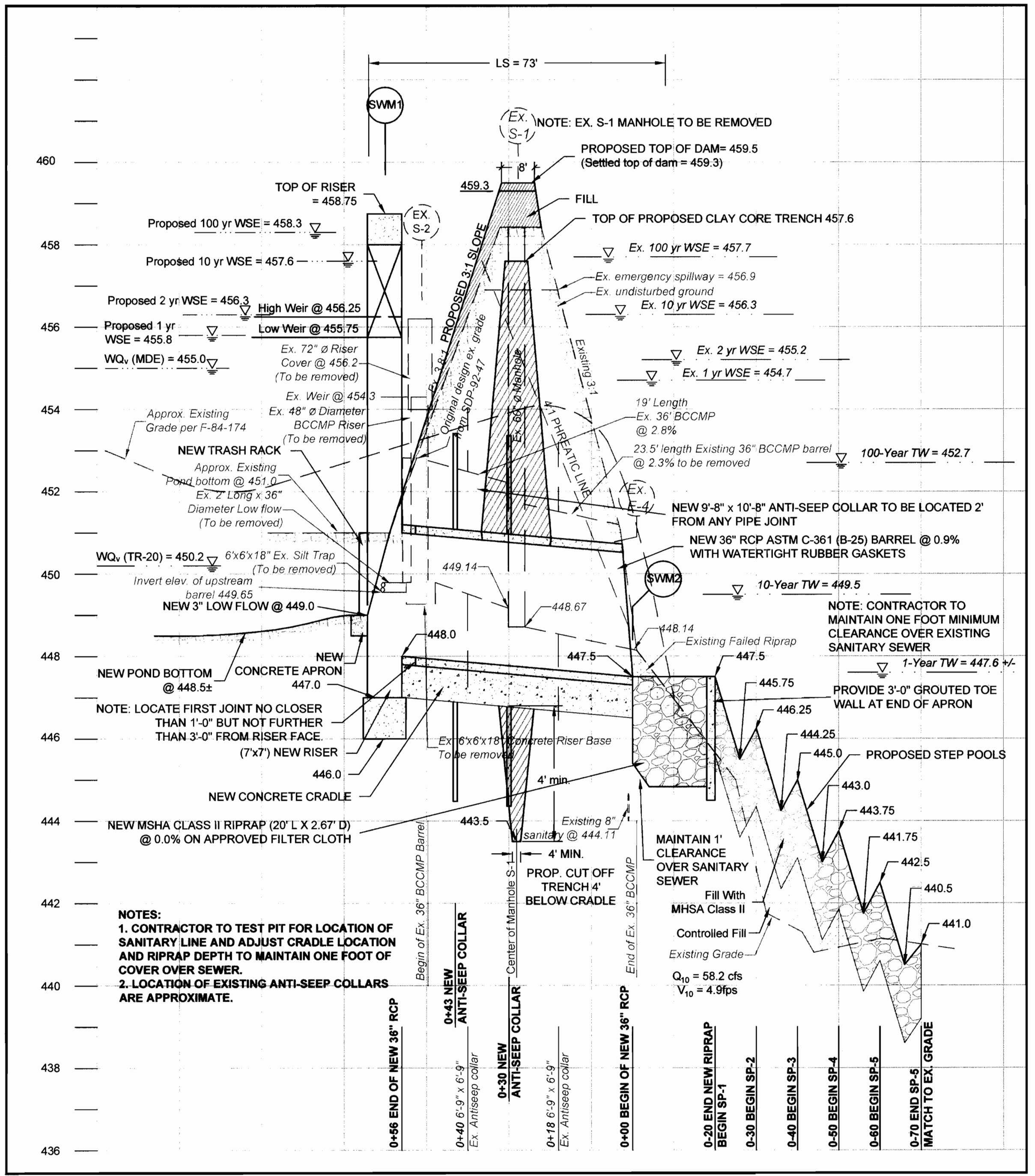
CPJ Associates
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910 CLOPPER ROAD SUITE 215N GAITHERSBURG MARYLAND 20878
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SCALE
As Shown

SHEET
6
OF 11 SHEETS

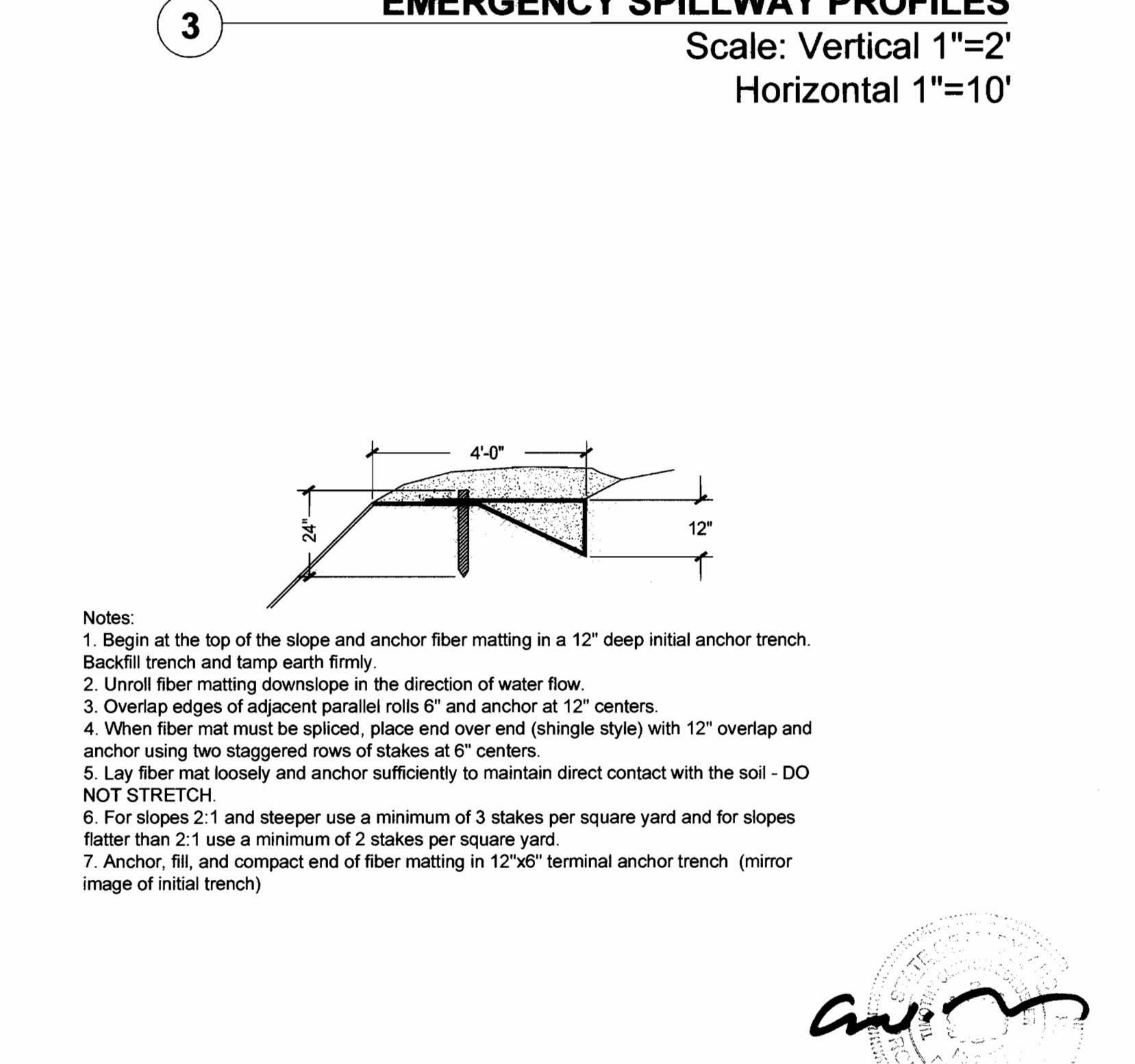
JOB NO.
35-565

Date: 05/16/06 3:33pm User: amcshon
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RIPRAP OUTFALL TABLE

Location	Pipe Diam. "D"	Invert of pipe	Tailwater "TW" Q10	Flow "Q"	Velocity At Riprap Flare	Type of riprap	D50	D100	Length of Riprap	Slope "Z"	Width at end of Pipe	Width at end of Riprap "W"	H	d
SWM2	36	447.5	451.0	96.0	4.6	MSHA II	16	24	20	3	3	10	3.5	2.67



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

APPROVED DEPARTMENT OF PLANNING AND ZONING
CHIEF DEVELOPMENT ENGINEERING DIVISION
CHIEF DIVISION OF LAND DEVELOPMENT
DIRECTOR

DATE: 11/1/07
DATE: 11/16/07
DATE: 11/16/07
DATE:

Prepared for:
Howard County Dept. of Public Works
Bureau of Environmental Services
6751 Columbia Gateway Drive, #514
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Phone: (410) 313-6417
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Tax Map 30 Grid 18

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CPJ Environmental Services Division
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SILVER SPRING, MD. FREDERICK, MD. FAIRFAX, VA

SCALE As Shown
SHEET 7 OF 11 SHEETS
JOB NO. 35-565
SDP # 06-101

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 stormwater 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 objectionable materials. 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 to 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 sheepfoot, 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.
2. 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.
3. 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.
4. 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 ring 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 nuts, 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".

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".

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".

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 required 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.

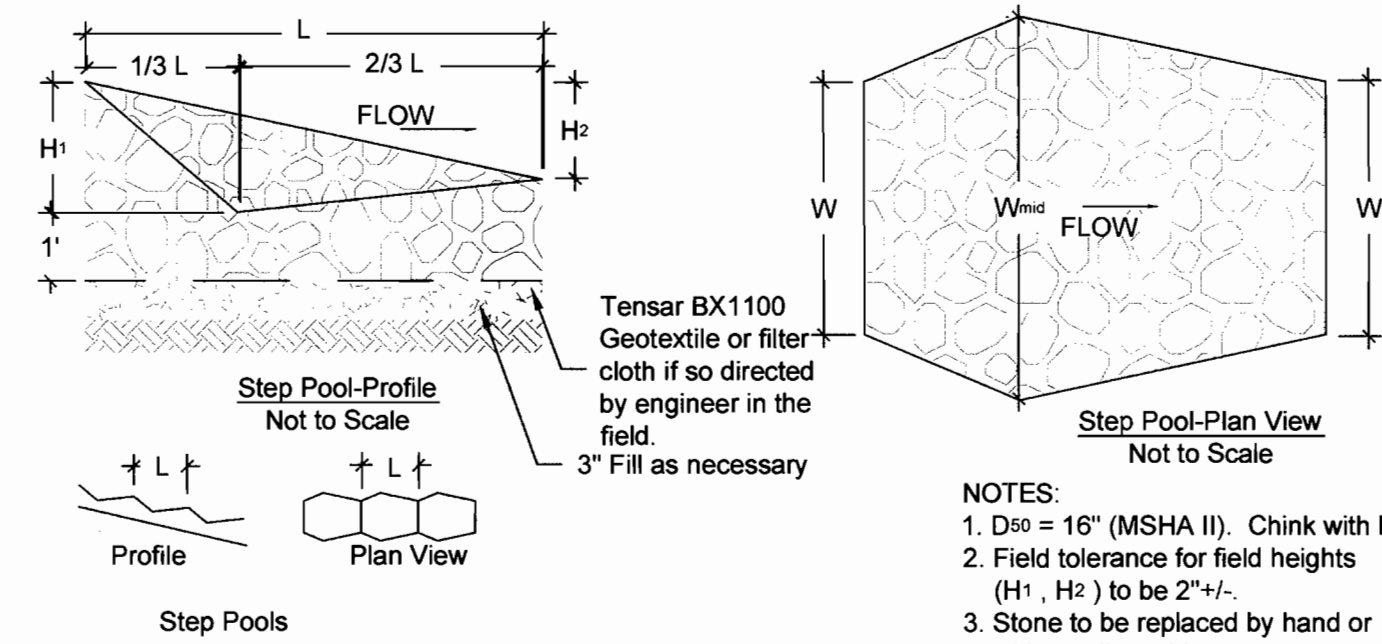
Stabilization

All borrow areas shall be graded to provide proper drainage and left in a slightly 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.

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 (D₅₀ = 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 (D₅₀ = 6"). 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.

Station	L	W	W _{mid}	H ₁	H ₂
0-20	10	4	8	1.75	0.5
0-30	10	4	8	1.75	0.5
0-40	10	4	8	1.75	0.5
0-50	10	4	8	1.75	0.5
0-60	10	4	8	1.75	0.5
0-70	10	4	8	1.75	0.5



- NOTES:
1. D₅₀ = 16" (MSHA II). Chink with D₅₀ = 6" stone.
 2. Field tolerance for field heights (H₁, H₂) to be 2" +/-.
 3. Stone to be replaced by hand or with small machinery.

1 STEP POOL DETAIL/SPECIFICATION N.T.S.

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

Jim Myer / 1/8/07
NATURAL RESOURCES CONSERVATION SERVICE DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature] / 1/14/07
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE
[Signature] / 1/12/07
CHIEF, DIVISION OF LAND DEVELOPMENT DATE
[Signature] / 1/16/07
DIRECTOR DATE



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

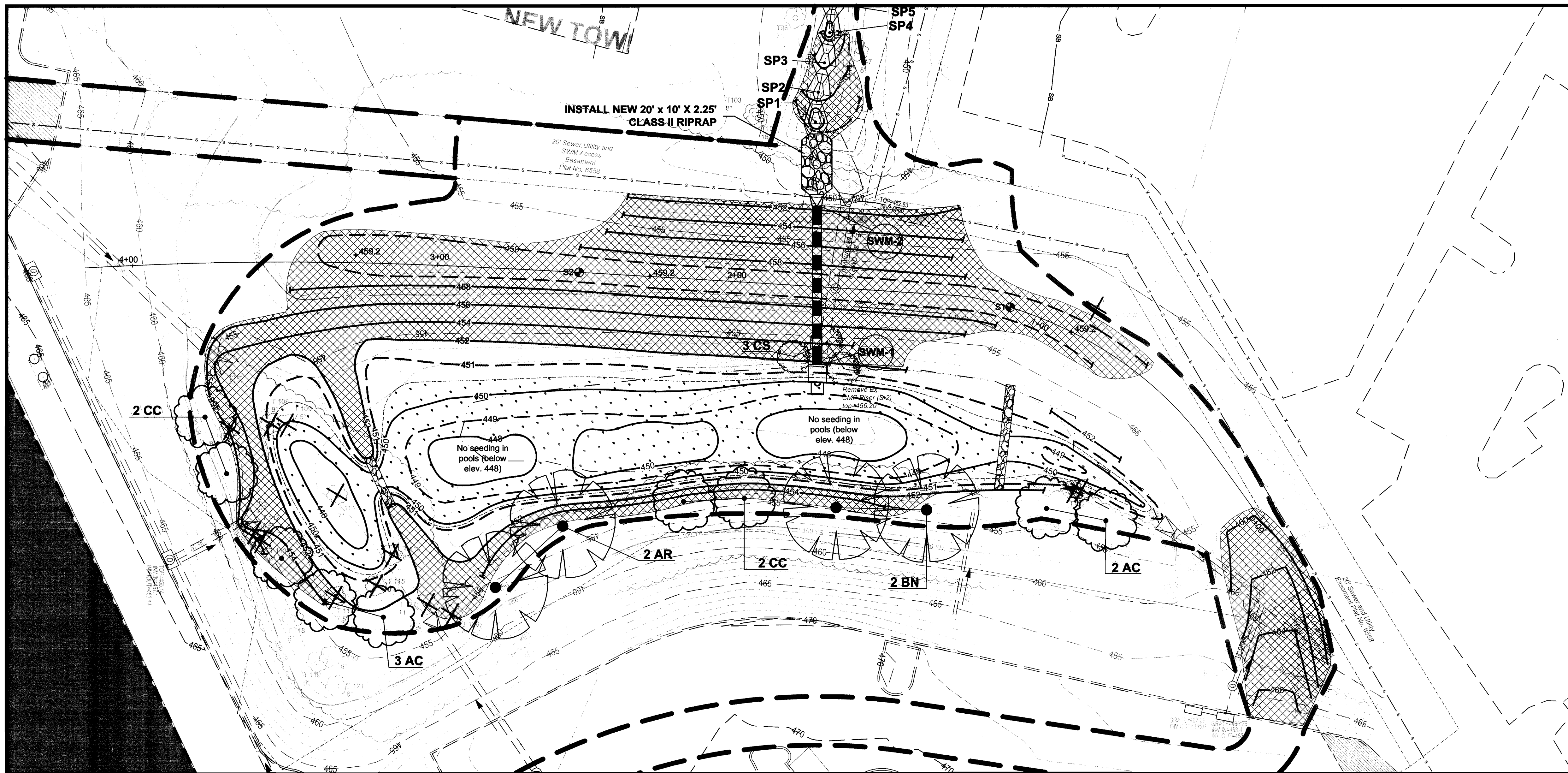
Oakland Executive Park
Lot A-1 Plat 6558 Parcel 104
11.108 Acres
Election District #02
Howard County, Maryland
Tax Map 30 Grid 18

OAKLAND EXECUTIVE PARK POND RETROFIT
Columbia, Maryland
MD-378 NOTES AND BIO-ENGINEERING DETAILS

DATE:	11/06				
DESIGNED:	TCS				
DRAFTED:	HT				
CHECKED:	TCS	2	REVIEWER COMMENTS	TCS	11/06
BASE DATA:	LTI	1	REVIEWER COMMENTS	TCS	09/06
		NO.	REVISIONS	BY	DATE

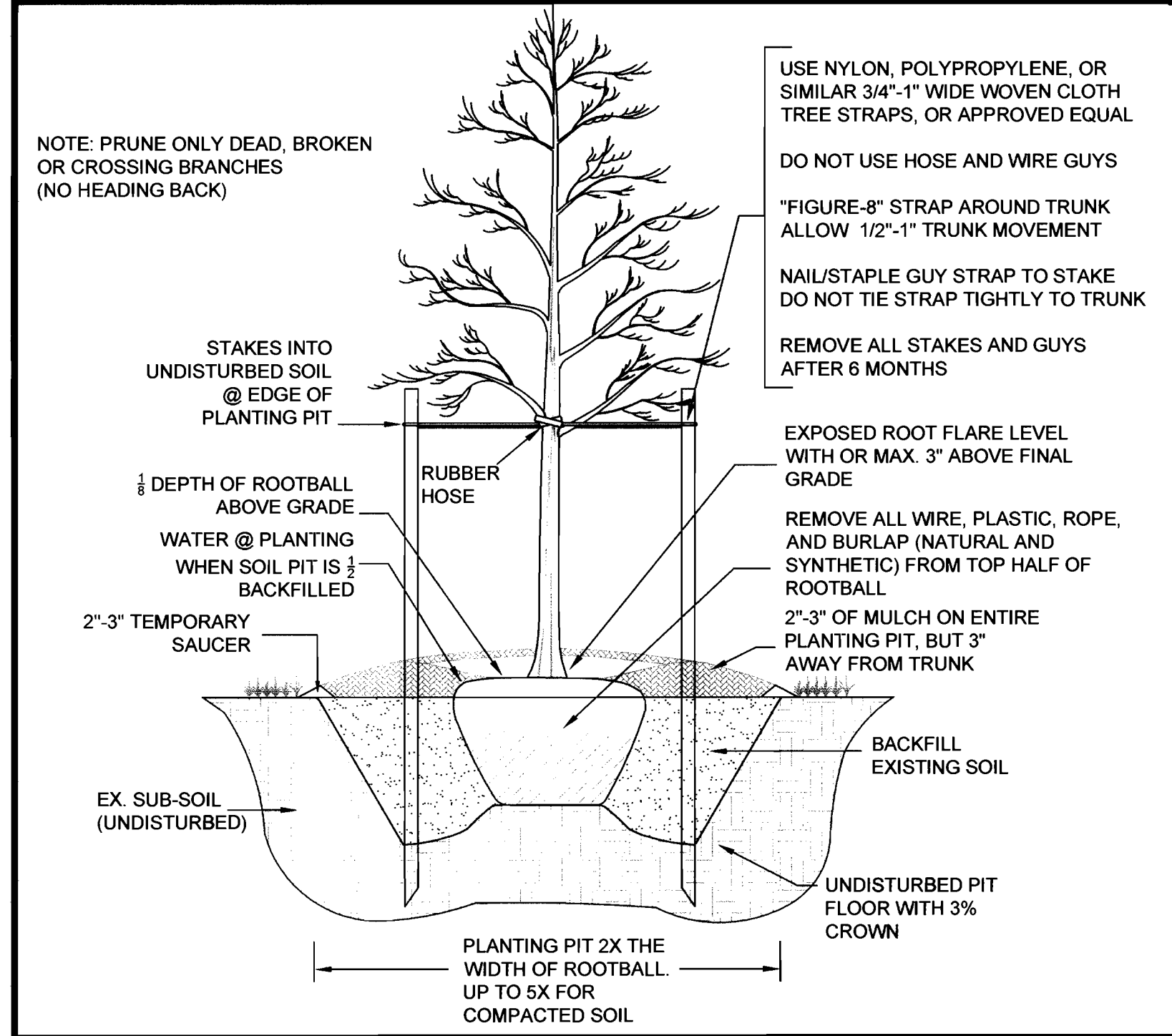
CPJ Associates
CPJ Environmental Services Division
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8
OF 11 SHEETS
JOB NO.
35-565

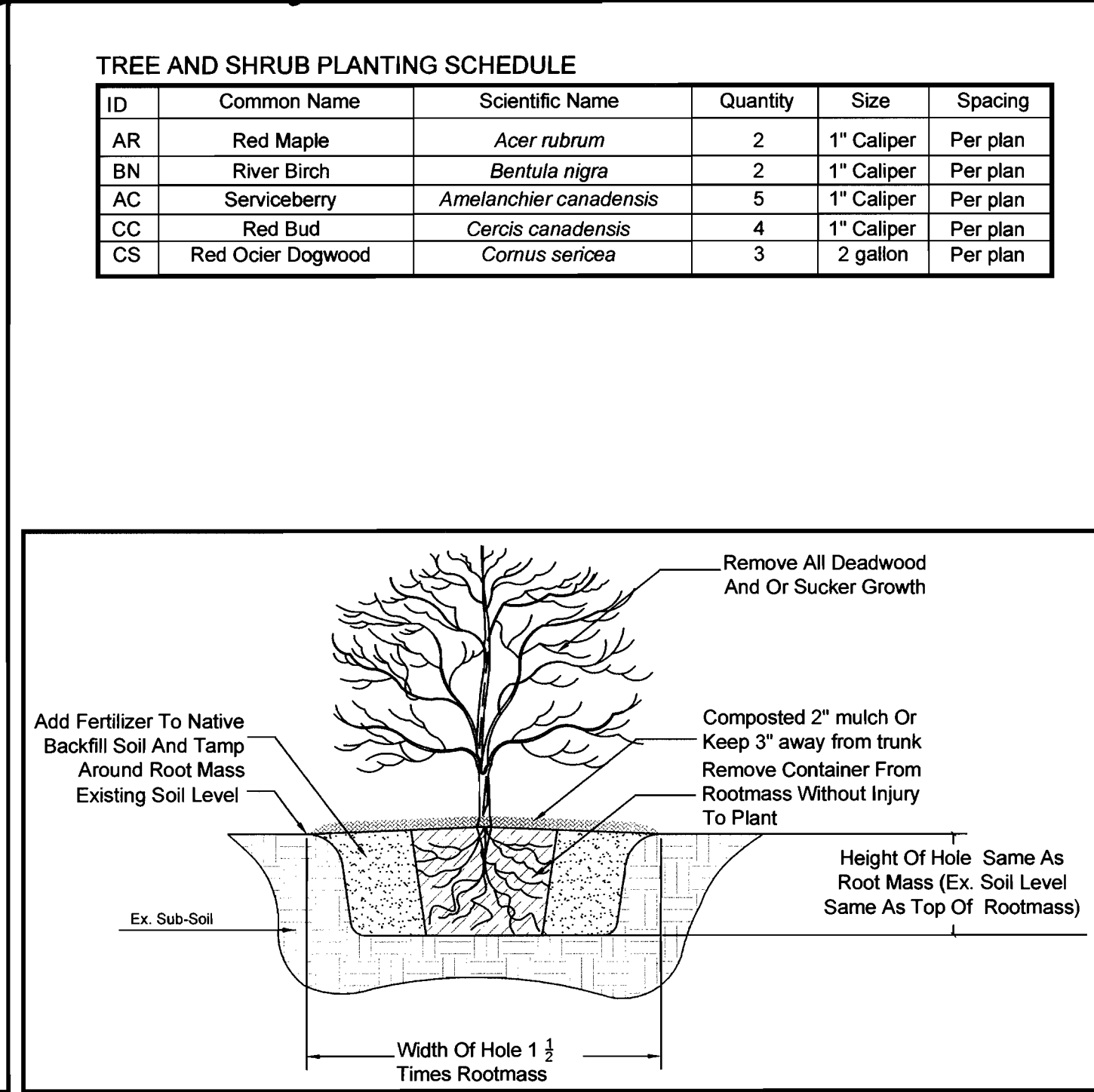


LEGEND

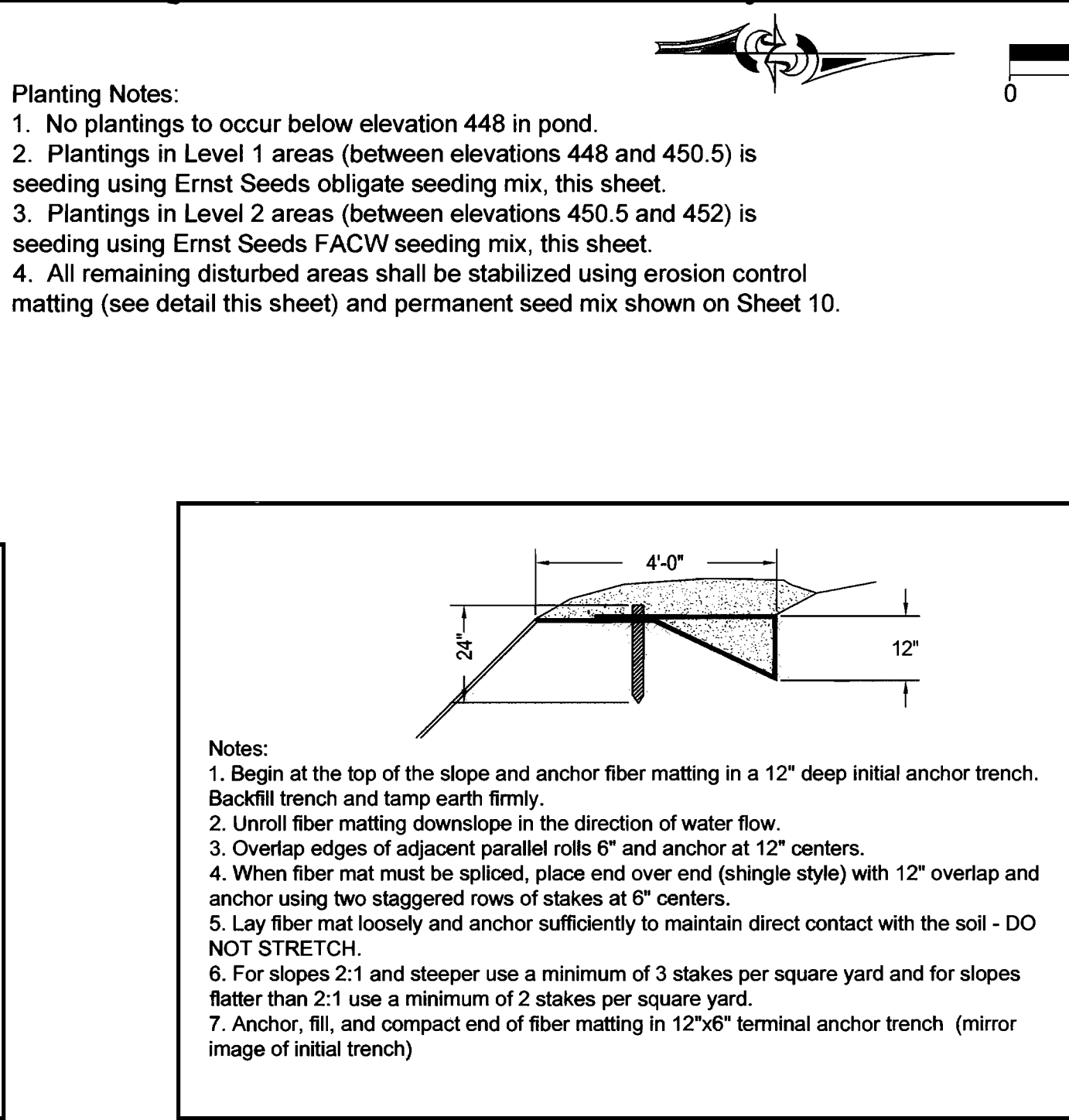
- Level 1 Seeding (Obligate)
- Level 2 Seeding (FACW)
- Erosion Control Matting
- Large Tree
- Small Tree
- Shrub



1 Deciduous Planting
not to scale



2 Shrub Planting
not to scale



3 ECM Keying
not to scale

TREE AND SHRUB PLANTING SCHEDULE

ID	Common Name	Scientific Name	Quantity	Size	Spacing
AR	Red Maple	<i>Acer rubrum</i>	2	1" Caliper	Per plan
BN	River Birch	<i>Betula nigra</i>	2	1" Caliper	Per plan
AC	Serviceberry	<i>Amelanchier canadensis</i>	5	1" Caliper	Per plan
CC	Red Bud	<i>Cercis canadensis</i>	4	1" Caliper	Per plan
CS	Red Osier Dogwood	<i>Cornus sericea</i>	3	2 gallon	Per plan

Planting Notes:

- No plantings to occur below elevation 448 in pond.
- Plantings in Level 1 areas (between elevations 448 and 450.5) is seeding using Ernst Seeds obligate seeding mix, this sheet.
- Plantings in Level 2 areas (between elevations 450.5 and 452) is seeding using Ernst Seeds FACW seeding mix, this sheet.
- All remaining disturbed areas shall be stabilized using erosion control matting (see detail this sheet) and permanent seed mix shown on Sheet 10.

LEVEL 1 SEEDING: OBL. WETLAND MIX: ERNMX-131
SEED AT 15 LBS PER ACRE OR 10 LBS. TO 10 LBS. PER 1000 SQ. FT.

20%	<i>Carex vulpinoidea</i>	Fox Sedge
9%	<i>Sparganium eurycarpum</i>	Giant Bur Reed
7%	<i>Verbena hastata</i>	Blue Vervain
6%	<i>Glyceria canadensis</i>	Rattlesnake Grass
6%	<i>Scirpus atrovirens</i>	Green Bulrush
6%	<i>Scirpus polyphyllus</i>	Many Leaved Bulrush
5%	<i>Carex comosa</i>	Cosmos (Bristly) Sedge
5%	<i>Carex lurida</i>	Lurid (Shallow) Sedge
5%	<i>Glyceria striata</i>	Fowl Mannagrass
5%	<i>Juncus effusus</i>	Soft Rush
3%	<i>Sparganium americanum</i>	Eastern Lesser Bur Reed
2.5%	<i>Asclepias incarnata</i>	Swamp Milkweed
2.5%	<i>Carex scoparia</i>	Blunt Broom Sedge
2%	<i>Bidens frondosa</i>	Beggar Ticks
2%	<i>Carex crinita</i>	Fringed (Nodding) sedge
2%	<i>Carex stipata</i>	Awl Sedge
2%	<i>Iris versicolor</i>	Blue Flag
2%	<i>Mimulus ringens</i>	Square Stemmed Monkey Flower
1%	<i>Carex lupulina</i>	Hop Sedge
1%	<i>Eupatorium fistulosum</i>	Joe Pye Weed
1%	<i>Eupatorium perfoliatum</i>	Boneset
1%	<i>Scirpus acutus</i>	Hard Stemmed Bulrush
1%	<i>Scirpus validus</i>	Soft Stem Bulrush
.5%	<i>Caltha palustris</i>	Marsh Marigold
.5%	<i>Carex baileyi</i>	Bailey's Sedge
.5%	<i>Carex tuckermanni</i>	Tuckerman's Sedge
.5%	<i>Helenium autumnale</i>	Common Sneezeweed
.5%	<i>Lilium superbum</i>	Turk's cap Lilly
.5%	<i>Penthorum sedoides</i>	Ditch Stonecrop

LEVEL 2 SEEDING: FACW WETLAND MEADOW MIX ERNMX-122
SEED AT 15 LBS PER ACRE OR 10 LBS. TO 10 LBS. PER 1000 SQ. FT.

20%	<i>Elymus virginicus</i>	Virginia Wild Rye
19%	<i>Carex vulpinoidea</i>	Fox Sedge
7%	<i>Scirpus atrovirens</i>	Green Bulrush
5.5%	<i>Verbena hastata</i>	Blue Vervain
5%	<i>Helopsis helianthoides</i>	Ox-Eye Sunflower
4%	<i>Eupatorium perfoliatum</i>	Boneset
4%	<i>Glyceria grandis</i>	American Mannagrass
3%	<i>Carex lurida</i>	Lurid/Shallow Sedge
3%	<i>Eupatorium maculatum</i>	Spotted Joe Pye Weed
3%	<i>Juncus effusus</i>	Soft Rush
3%	<i>Scirpus polyphyllus</i>	Many Leaved Bulrush
2.5%	<i>Carex scoparia</i>	Blunt Broom Grass
2%	<i>Asclepias incarnata</i>	Swamp Milkweed
2%	<i>Carex comosa</i>	Cosmos/Bristly Sedge
2%	<i>Carex lupulina</i>	Hop Sedge
2%	<i>Helenium autumnale</i>	Common Sneezeweed
2%	<i>Iris versicolor</i>	Blue Flag
2%	<i>Vernonia gigantea</i>	Giant Ironweed
1%	<i>Aster novae-angliae</i>	New England Aster
1%	<i>Bromus altissima</i>	Joe Pye Weed
1%	<i>Carex stipata</i>	Awl Sedge
1%	<i>Glyceria canadensis</i>	Rattlesnake Grass
1%	<i>Glyceria striata</i>	Fowl Mannagrass
1%	<i>Juncus tenuis</i>	Path Rush
1%	<i>Zizia aurea</i>	Golden Alexanders
.5%	<i>Aster umbellatus</i>	Flat Topped White Aster
.5%	<i>Lilium superbum</i>	Turk's Cap Lilly
.5%	<i>Mimulus ringens</i>	Square Stemmed Monkey Flower
.5%	<i>Penthorum sedoides</i>	Ditch Stonecrop

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

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF DEVELOPMENT ENGINEERING DIVISION & DATE 1/11/07
CHIEF DIVISION OF LAND DEVELOPMENT DATE 1/12/07
DIRECTOR DATE 1/22/07

Prepared for:
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Bureau of Environmental Services
6751 Columbia Gateway Drive, #514
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Phone: (410) 313-6417
Attn: Mr. Richard Powell

Oakland Executive Park
Lot A-1 Plat 6558 Parcel 104
11.108 Acres
Election District #02
Howard County, Maryland
Tax Map 30 Grid 18

OAKLAND EXECUTIVE PARK POND RETROFIT
Columbia, Maryland
Planting Plan

DATE:	11/06				
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BASE DATA:	LTI	1	REVIEWER COMMENTS	TCS	09/08
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SCALE
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SHEET
9
OF 11 SHEETS
JOB NO.
35-565
SDP # 06-101

SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS

A. Site Preparation

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

B. Soil Amendments (Fertilizer and Lime Specifications)

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

C. Seeded Preparation

- i) Temporary Seeding
 - a. Seeded preparation shall consist of loosening soil to a depth of 3" to 5" by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened it should not be rolled or dragged smooth but left in the roughened condition. Sloped areas (greater than 3: 1) should be tracked leaving the surface in an irregular condition with ridges running parallel to the contour of the slope.
 - b. Apply fertilizer and lime as prescribed on the plans.
 - c. Incorporate lime and fertilizer into the top 3 -5" of soil by disking or other suitable means.
- ii) Permanent Seeding
 - a. Minimum soil conditions required for permanent vegetative establishment:
 1. Soil pH shall be between 6.0 and 7.0.
 2. Soluble salts shall be less than 500 parts per million (ppm).
 3. The soil shall contain less than 40% clay but enough fine grained material (> 30% silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception is if lovegrass or *Serecia lespedeza* is to be planted, then a sandy soil (< 30% silt plus clay) would be acceptable.
 4. Soil shall contain 1.5% minimum organic matter by weight.
 5. Soil must contain sufficient pore space to permit adequate root penetration.
 6. If these conditions cannot be met by soils on site, adding topsoil is required in accordance with Section 21 Standard and Specification for Topsoil.
 - b. Areas previously graded in conformance with the drawings shall be maintained in a true and even grade, then scarified or otherwise loosened to a depth of 3 -5" to permit bonding of the topsoil to the surface area and to create horizontal erosion check slots to prevent topsoil from sliding down a slope.
 - c. Apply soil amendments as per soil test or as included on the plans.
 - d. Mix soil amendments into the top 3 -5" of topsoil by disking or other suitable means. Lawn areas should be raked to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Where site conditions will not permit normal seeded preparation, loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface. Steep slopes (steeper than 3:1) should be tracked by a dozer leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. The top 1 -3" of soil should be loose and friable. Seeded loosening may not be necessary on newly disturbed areas.

D. Seed Specifications

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

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

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

E. Methods of Seeding

- i. **Hydroseeding:** Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer), broadcast or drop seeder, or a cultipacker seeder.
 - a. If fertilizer is being applied at the time of seeding, the application rates amounts will not exceed the following: nitrogen, maximum of 100 lbs. per acre total of soluble nitrogen; P2O5 (phosphorous): 200 lbs/ac; K2O (potassium): 200 lbs/ac.
 - b. Lime -use only ground agricultural limestone. (Up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at anyone time. Do not use burnt or hydrated lime when hydroseeding.
 - c. Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without interruption.
- ii) **Dry Seeding:** This includes use of conventional drop or broadcast spreaders.
 - a. Seed spread dry shall be incorporated into the subsoil at the rates prescribed on the Temporary or Permanent Seeding Summaries or Tables 25 or 26. The seeded area shall then be rolled with a weighted roller to provide good seed to soil contact.
 - b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.
- iii) **Drill or Cultipacker Seeding:** Mechanized seeders that apply and cover seed with soil.
 - a. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
 - b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.

F. Mulch Specifications (In order of preference)

- i) Straw shall consist of thoroughly threshed wheat, rye or oat straw, reasonably bright in color, and shall not be musty, moldy, caked, decayed, or excessively dusty and shall be free of noxious weed seeds as specified in the Maryland Seed Law.
- ii) Wood Cellulose Fiber Mulch (WCFM)
 - a. WCFM shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state. down a sil
 - b. WCFM shall be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
 - c. WCFM, including dye, shall contain no germination or growth inhibiting factors.
 - d. WCFM materials shall be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material shall form a blotter-like ground cover, on application, having moisture absorption and percolation properties and shall cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
 - e. WCFM material shall contain no elements or compounds at concentration levels that will be phyto-toxic.
 - f. WCFM must conform to the following physical requirements: fiber length to approximately 10 mm, diameter approximately 1 mm, pH range of 4.0 to 8.5, ash content of 1.6% maximum and water holding capacity of 90% minimum.

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

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

- i) If grading is completed outside of the seeding season, mulch alone shall be applied as prescribed in this section and maintained until the seeding season returns and seeding can be performed in accordance with these specifications.
 - ii) When straw mulch is used, it shall be spread over all seeded areas at the rate of 2 tons/acre. Mulch shall be applied to a uniform loose depth of between 1" and 2". Mulch applied shall achieve a uniform distribution and depth so that the soil surface is not exposed. If a mulch anchoring tool is to be used, the rate should be increased to 2.5 tons/acre.
 - iii) Wood cellulose fiber used as a mulch shall be applied at a net dry weight of 1,500 lbs. per acre. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 lbs. of wood cellulose fiber per 100 gallons of water.
- H. Securing Straw Mulch (Mulch Anchoring): Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon size of area and erosion hazard:**
- i) A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of two (2) inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should be used on the contour if possible.
 - ii) Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 pounds/acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
 - iii) Application of liquid binders should be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. The remainder of area should be appear uniform after binder application. Synthetic binders -such as Acrylic DLR (Agro-Tack), DCA-70, Petrosel, Terra Tax II, Terra Tack AR or other approved equal may be used at rates recommended by the manufacturer to anchor mulch.
 - iv) Lightweight plastic netting may be stapled over the mulch according to manufacturer's recommendations. Netting is usually available in roll 4' to 15' wide and 300 to 3,000 feet long.

SECTION II -TEMPORARY SEEDING

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

A. Seed Mixtures - Temporary Seeding

- i) Select one or more of the species or mixtures listed in Table 26 for the appropriate Plant Hardiness Zone (from Figure 5) and enter them in the Temporary Seeding Summary below, along with application rates, seeding dates and seeding depths. If this Summary is not put on the plans and completed, then Table 26 must be put on the plans.

- ii) For sites having soil tests performed, the rates shown on this table shall be deleted and the rates recommended by the testing agency shall be written in. Soil tests are not required for Temporary Seeding.

SECTION III: PERMANENT SEEDING

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

A. Seed Mixtures -Permanent Seeding

- i) Select one or more of the species or mixtures listed in Table 25 for the appropriate Plant Hardiness Zone (from Figure 5) and enter them in the Permanent Seeding summary below, along with application rates and seeding dates. Seeding depths can be estimated using Table 26. If this Summary is not put on the construction plans and completed, then Table 25 must be put on the plans. Additional planting specifications for exceptional sites such as shorelines, streambanks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-SCS Technical Field Office Guide, Section 342- Critical Area Planting. For special lawn maintenance areas, see Sections IV Sod and V Turfgrass.

- ii) For sites having disturbed area over 5 acres, the rates shown on this table shall be deleted and the rates recommended by the soil testing agency shall be written in.

- iii) For areas receiving low maintenance, apply ureaform fertilizer (46-0-0) at 3 1/2 lbs/1000 sq. ft. (150 lbs/ac), in addition to the above soil amendments shown in the table below, to be performed at the time of seeding.

Permanent Seed Mixture (For Hardiness Zone 7a) (From Table 25, MDE 1994)				Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	N	P205	
7	Tall Fescue	110			90 lb/ac	175 lb/ac	2 tons/ac
	Weeping Lovegrass	3	3/1-11/15	1-2 inches	(2.0 lb/1000sf)	(4 lb/1000 sf)	(100 lb/1000 sf)
	Serecia lespedeza	20			175 lb/ac	(4 lb/1000 sf)	(100 lb/1000 sf)

Temporary Seed Mixture (For Hardiness Zone 7a) (From Table 26, MDE 1994)				Fertilizer Rate (10-10-10)	Lime Rate	
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths		
2	Rye plus Foxtail Millet	150	2/1-11/30	1/4-1/2 in.	800 lb/ac (15 lb/1000sf)	2 tons/ac (100 lb/1000 sf)

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

A. General specifications

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

B. Sod Installation

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

C. Sod Maintenance

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

CLASS	APPARENT OPENING SIZE	GRAB TENSILE STRENGTH	BURST STRENGTH P.S.I.
	MM. MAX	LB. MIN	MIN
A	0.30"	250	500
B	0.60	200	320
C	0.30	200	320
D	0.60	90	145
E	0.30	90	145
F	0.40-0.60"	90	190

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

Jim Myles
NATURAL RESOURCES CONSERVATION SERVICE
DATE: 1/8/07

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Cheryl Cummings
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE: 1/11/07
Frank M. Wright
CHIEF, DIVISION OF LAND DEVELOPMENT
DATE: 1/2/07
DIRECTOR
DATE: 1/4/07

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

Oakland Executive Park
Lot A-1 Plat 6558 Parcel 104
11,108 Acres
Election District #02
Howard County, Maryland
Tax Map 30 Grid 18

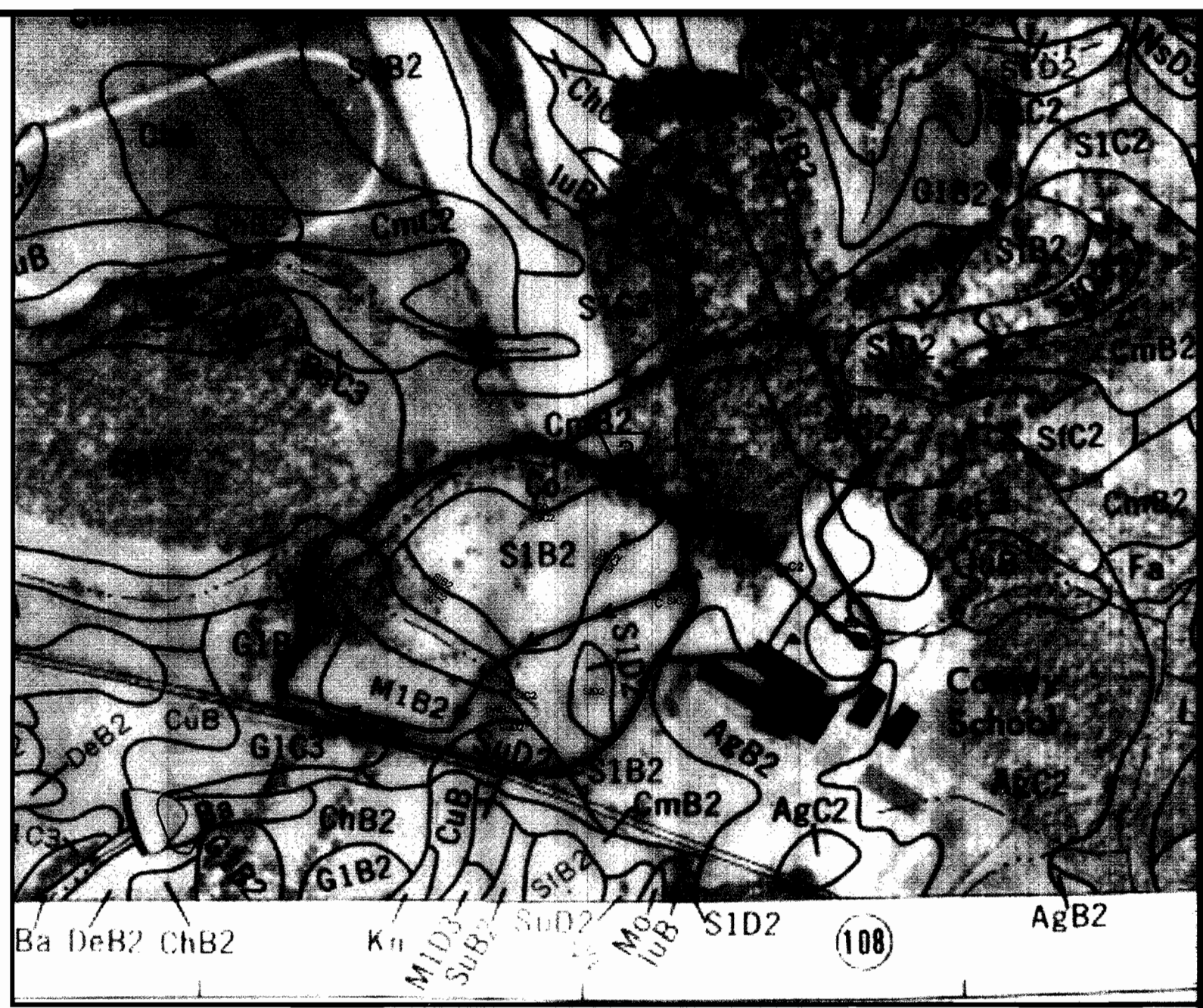
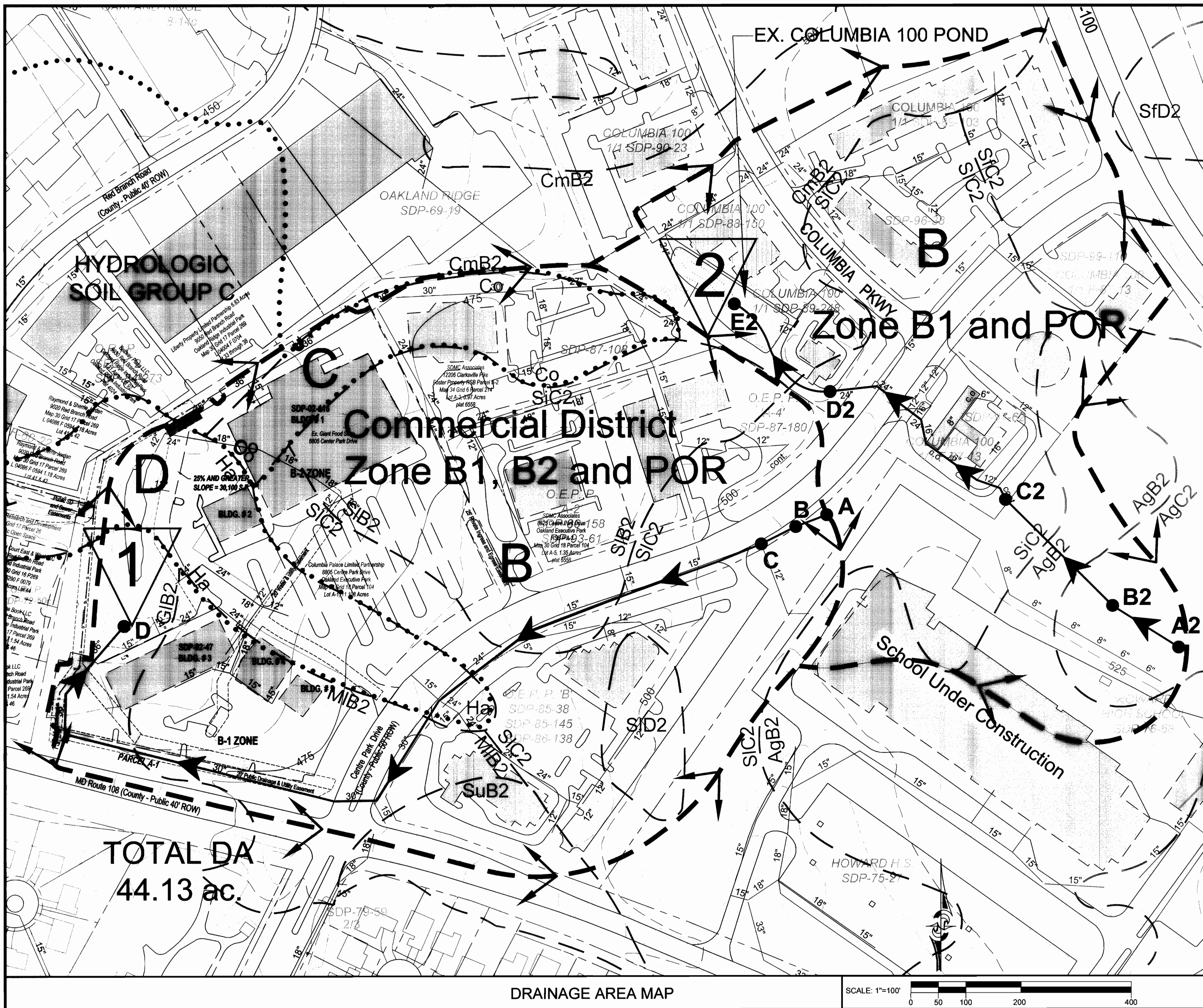
OAKLAND EXECUTIVE PARK POND RETROFIT
Columbia, Maryland
Planting Specifications

DATE:	11/06				
DESIGNED:	TCS				
DRAFTED:	HT				
CHECKED:	TCS	2	REVIEWER COMMENTS	TCS	11/06
BASE DATA:	LTI	1	REVIEWER COMMENTS	TCS	09/06
		NO.	REVISIONS	BY	DATE

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CPJ Environmental Services Division
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SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA



SCALE
As Shown
SHEET
10
OF 11 SHEETS
JOB NO.
35-565



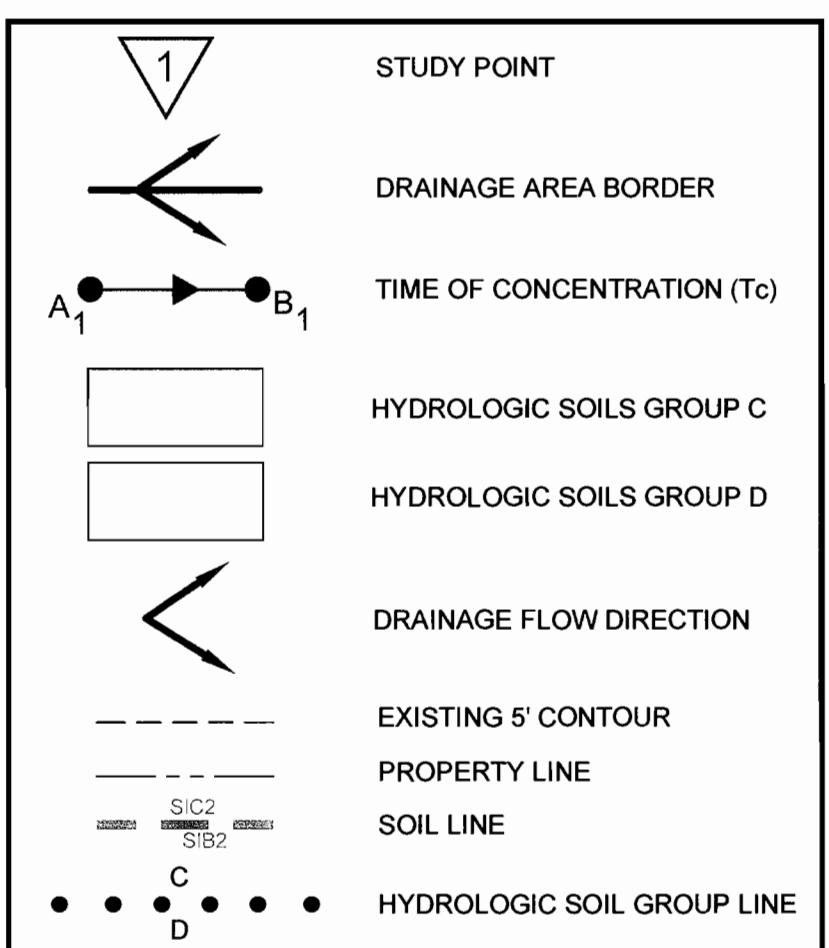
SOIL SURVEY MAP
Howard County, MD
Sheet 20
Dated: July 1968
Scale: 1" = 500'

SOILS NOTE:
The Glenelg soil series (Howard County soil designation 'G') is a fine-loamy, mixed, micaceous, mesic Aquic Fragluudults. The Glenelg series consists of deep, well-drained, nearly level to steep soils on the uplands of the Piedmont Plateau. These soils formed from material weathered in place from crystalline rocks that contain large amounts of mica, mostly mica schist. Glenelg soils are strongly acidic and have a high available moisture capacity. Depth to bedrock is usually four to ten feet. It has moderate susceptibility to frost action. The water table is usually very deep (20 feet +). This soil is a type 'B' soil as classified by Hydrologic Soil Grouping per Technical Release 55: Urban Hydrology for Small Watersheds. Glenelg silt loam is not an acknowledged hydric soil.

Soil Symbol	Soil Name
SuB2	Sunnyside fine sandy loam, 5 to 15% slopes
Ha	Hatboro silt loam (hydric)
MIB2	Manor loam, 3 to 8% slopes
GIB2	Glenelg loam, 3 to 8% slopes
Co	Codorus silt loam
SIB2	Sassafras loam, 10 to 15% slopes
SIB2	Sassafras loam, 1 to 5% slopes
SIC2	Sassafras loam, 5 to 10% slopes

Hatboro Silt Loam (Howard County soil designation Ha) has 0-3% slopes, frequently but briefly flooded. Apparent high water table is typically at or within 6 inches of the surface (October - May) with bedrock at a depth of greater than 60 inches. Hatboro soil is typically a fine-loamy mixed, non-acid mesic Typic Fluvaquents which is poorly drained and is a deep flood plain soil. Included with this soil in mapping are small areas of Codorus soils on the slightly higher parts of the landscape. Hatboro silt loam is a locally and nationally acknowledged hydric soil. This soil is a type 'D' soil as classified by Hydrologic Soil Grouping per Technical Release 55: Urban Hydrology for Small Watersheds. The potential for frost action is high.

DRAINAGE AREA LEGEND



TC Segment Descriptions

- Study Point 1**
A-B 60' Sheet Flow @ 1.5% Slope
B-C 70' Unpaved Shallow Con. Flow @ 2.0% Slope
C-D 1680' Storm Drain @ (Assumed Velocity of 10 fps)
- Study Point 2**
A-B 100' Sheet Flow @ 0.5% Slope
B-C 275' Unpaved Shallow Con. Flow @ 0.5% Slope
C-D 410' Storm Drain @ (Assumed Velocity of 10 fps)
D-E 250' Open Channel Flow @ 4.4% Slope

GENERAL NOTES:

- Source of soils information is from Howard County Soils Survey sheet 20 dated 1968.
- Source of topography is from Howard County GIS dated 1999.
- Time of concentration and drainage divides field verified by Charles P. Johnson and Associates on December 8, 2005 for study point 1 and August 8, 2006 for study point 2.
- Land use is commercial taken from Howard County GIS dated 1999.
- All scenarios assume upstream "Columbia 100 pond" is functional except "H" and "I."

HYDROLOGIC SUMMARY TABLE -TR20

Scenario	Study Point	Drainage Area	RCN	T _c (hours)	Q _{one inch} (cfs)	Q ₁ (cfs)	Q ₂ (cfs)	Q ₅ (cfs)	Q ₁₀ (cfs)	Q ₅₀ (cfs)	Q ₁₀₀ (cfs)	Notes	
A	1	Pre-Developed	26.6	59	0.36	nc	2.0	5.7	16.5	28.8	47.4	63.2	
B	1	Existing	26.6	83	0.19	3.2	37.4	53.4	78.4	108.9	141.4	167.4	
C	2	Existing	17.5	78	0.37	0.3	2.3	3.4	11.3	19.0	31.2	36.3	
D	1+2	Existing Inflow	44.1	na	na	3.2	38.4	54.6	80.0	108.9	143.9	170.3	
E	1+2	Existing Outflow	44.1	na	na	0.5	13.7	34.5	61.9	76.4	93.0	126.4	
F	1+2	Proposed (low flow open)	44.1	na	na	0.2	2.5	5.4	19.6	70.0	120.2	148.4	
G	1+2	Proposed (low flow blocked)	44.1	na	na	0.3	6.2	18.8	54.9	87.2	124.0	148.9	
H	1+2	Proposed (low flow open)	44.1	na	na	0.2	2.2	10.9	74.6	123.9	177.8	225.7	No Upstream SWM
I	1+2	Proposed (low flow blocked)	44.1	na	na	0.3	13.4	43.0	81.1	124.9	179.1	226.1	No Upstream SWM

Handwritten signature and date: 12-7-06

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

Signature: Jim Ryan / 1/8/07
NATURAL RESOURCES CONSERVATION SERVICE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Signature: [illegible] / 1/10/07
CHIEF, DEVELOPMENT ENGINEERING DIVISION

Signature: [illegible] / 1/10/07
CHIEF, DIVISION OF LAND DEVELOPMENT

Signature: [illegible] / 1/10/07
DIRECTOR

Prepared for:
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6751 Columbia Gateway Drive, #514
Columbia, MD 21046
Phone: (410) 313-6417
Attn: Mr. Richard Powell

Oakland Executive Park
Lot A-1 Plat 6558 Parcel 104
11.108 Acres
Election District #02
Howard County, Maryland
Tax Map 30 Grid 18

OAKLAND EXECUTIVE PARK POND RETROFIT
Columbia, Maryland
DRAINAGE AREA MAP EXHIBIT

DATE:	11/06		
DESIGNED:	TCS		
DRAFTED:	HT		
CHECKED:	TCS	2	REVIEWER COMMENTS
		1	REVIEWER COMMENTS
BASE DATA:	LTI	NO.	REVISIONS
			TCS 11/06
			TCS 09/06
			BY DATE

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SILVER SPRING, MD FREDERICK, MD FAIRFAX, VA

SCALE As Shown
SHEET 11
OF 11 SHEETS
JOB NO. 35-565
SDP #06-101