LEGEND

LIMIT OF DISTURBANCE ORANGE SAFETY FENCE INTAKE & DISCHARGE PIPE 68866886 100-YR PONDING LIMIT MAINTENANCE ACCESS ROAD SOIL STABILIZATION MATTING TREE PROTECTION FENCE NON-TIDAL WETLAND mm EXISTING TREE LINE EXISTING SEWER LINE STABILIZED CONSTRUCTION ENTRANCE PROPERTY LINE EXISTING STORM DRAIN EX. TREES , EXIST. MAJOR CONTOUR EXIST. MINOR CONTOUR PROP. CONTOURS REMOVABLE PUMPING STATION SILT BAG FILTERING DEVICE SB SANDBAG DAM SAND BAGS

INDEX OF SHEETS

— WB —

SHEET DESCRIPTION TITLE SHEET SWM NOTES AND DETAILS PLAN SHEET POND 1 POND 1 PROFILES POND 1 DETAILS PLAN SHEET POND 2 POND 2 PROFILES POND 2 DETAILS

SOIL BORING LOGS EROSION AND SEDIMENT CONTROL CONSTRUCTION ACCESS EROSION AND SEDIMENT CONTROL PLAN SHEET EROSION AND SEDIMENT CONTROL NOTES & DETAIL

EROSION AND SEDIMENT CONTROL NOTES

FOREST CONSERVATION PLAN

FOREST CONSERVATION PLAN NOTES AND DETAIL

NATURAL RESOURCES INVENTORY/ FOREST STAND DELINEATION MAP

WETLAND BUFFER

SITE ANALYSIS DATA CHART

- TOTAL PROJECT AREA: 1.30 ACRES.
- DISTURBED AREA: 1.30 ACRES (56,535 SF).
- PROPOSED USE FOR THE SITE: RETROFIT EXISTING STORMWATER FACILITIES

APPLICABLE DPZ FILE REFRENCE: F-87-213/PLAT NO. 7984. THE AREA OF OPEN SPACE LOT 78 IS 5.18 ACRES.

COUNTRY LANE SWM POND ENHANCEMENT POND#1 & POND#2

HOWARD COUNTY, MARYLAND STORMWATER MANAGEMENT DIVISION CAPITAL PROJECT D-1160

GENERAL NOTES

- 4. THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. BENCHMARKS SHOWN HEREON WERE PROVIDED BY HOWARD COUNTY SURVEY DIVISION AND AB CONSULTANTS.
- 5. EXISTING UTILITIES ARE BASED ON FIELD SURVEYS AND AVAILABLE RECORD DRAWINGS.
- 6. THE WETLAND DELINEATION FOR THIS PROJECT WAS PERFORMED BY KCI TECHNOLOGIES, INC. IN DECEMBER 2011.
- 7. TOPOGRAPHIC SURVEY OF THE SITE WAS PERFORMED BY AB CONSULTANTS, INC. IN DECEMBER 2011.
- 8. A JOINT PERMIT APPLICATION HAS BEEN SUBMITTED TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT FOR THIS PROJECT. (TRACKING NUMBER 201260570)
- 9. NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
- 10. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND KCITECHNOLOGIES, INC. DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY SUCH INFORMATION TO HIS OWN SATISFACTION.
- 11. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE PLANS AND THE FIELD CONDITIONS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING THE ENGINEER, THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.
- 12. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATION SHALL BE
- REPAIRED IMMEDIATELY. 13. EXISTING GROUND AND/OR VEGETATION DISTURBED BY THE PROPOSED WORK SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION OR BETTER BY CONCLUSION OF THE PROJECT.
- 14. THE PROPOSED PROJECT IS LOCATED SOUTH OF COUNTRY LANE AND WEST OF HEARTHSTONE ROAD.
- 15. THE TWO EXISTING PUBLIC SWM PONDS WERE CONSTRUCTED UNDER BOONE FARM ROADWAY PLAN F-87-213. AS-BUILT WAS APPROVED BY THE HOWARD SOIL CONSERVATION DISTRICT DATED MAY 27, 1988.

ENGINEER'S CERTIFICATE

AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. IHAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH "AS-BUILT" PLANS OF THE PONDS WITHIN 30 DAYS OF COMPLETION."

DEVELOPER'S CERTIFICATE

AND EROSION CONTROL, AND THAT ALL 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 THE BEGINNING OF THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT"

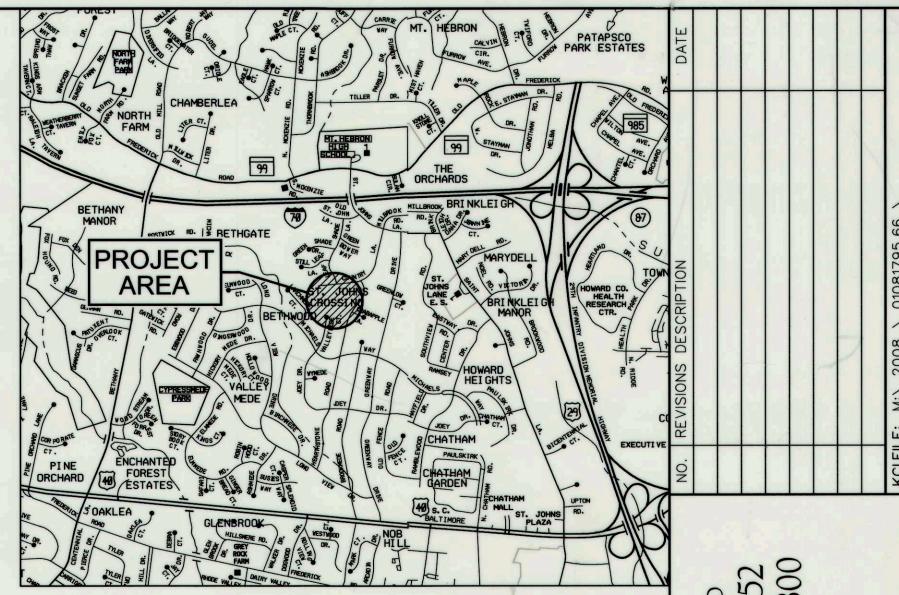
Howard E. Saltzman

10-01-12

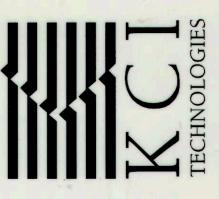
AS - BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.





VICINITY MAP SCALE: 1"= 2,000"





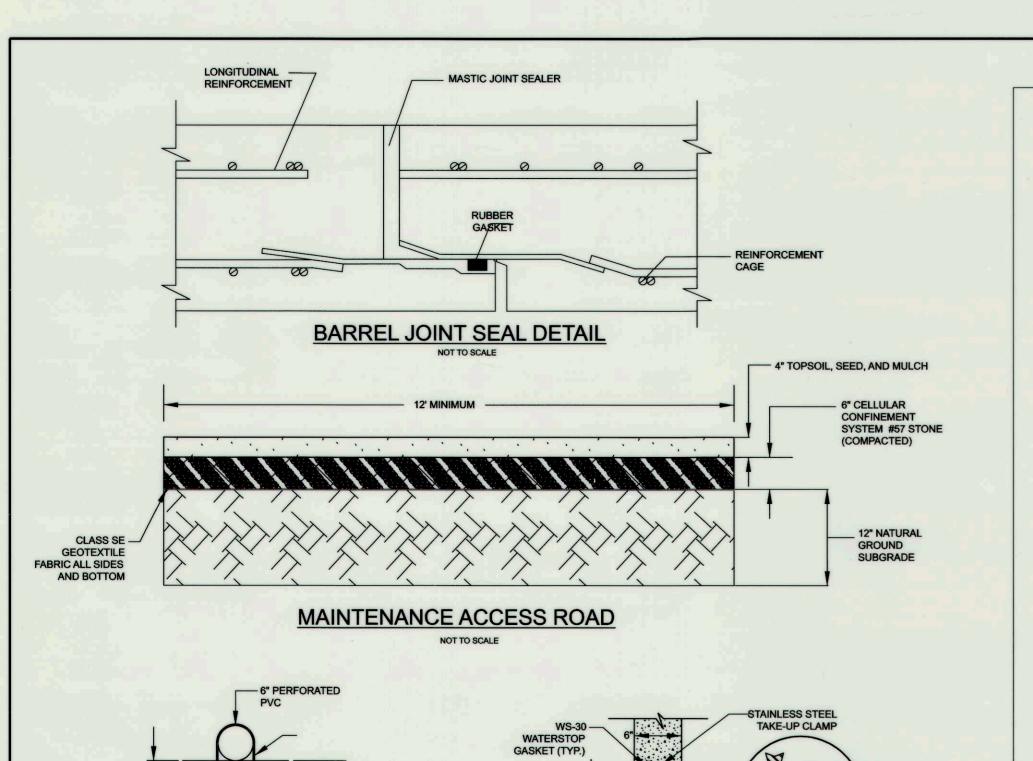
COUNTRY LANE POND ENHANCE

TITLE SHEET

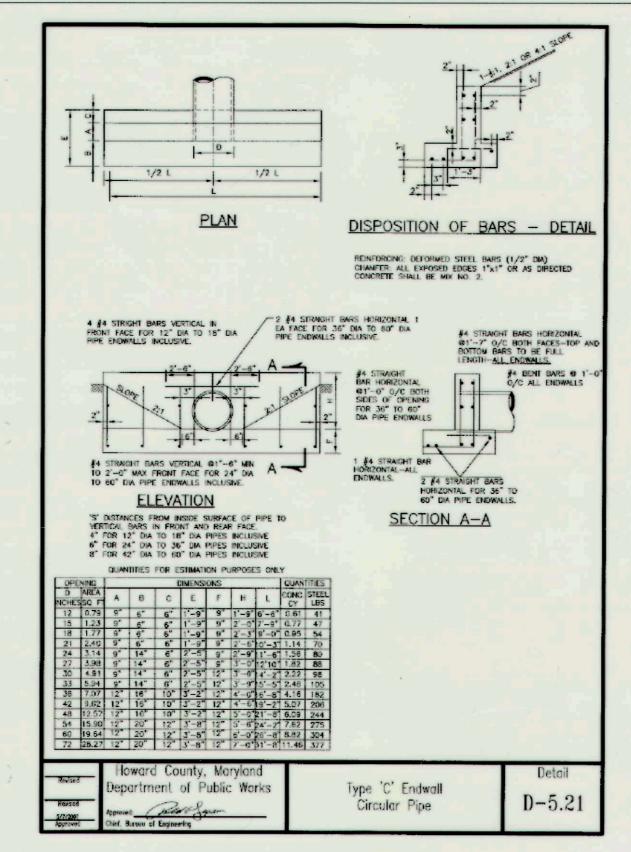
SEPTEMBER 2012 01-081795.66 CAPITAL PROJECT NO .: CONSTRUCTION ISSUE:

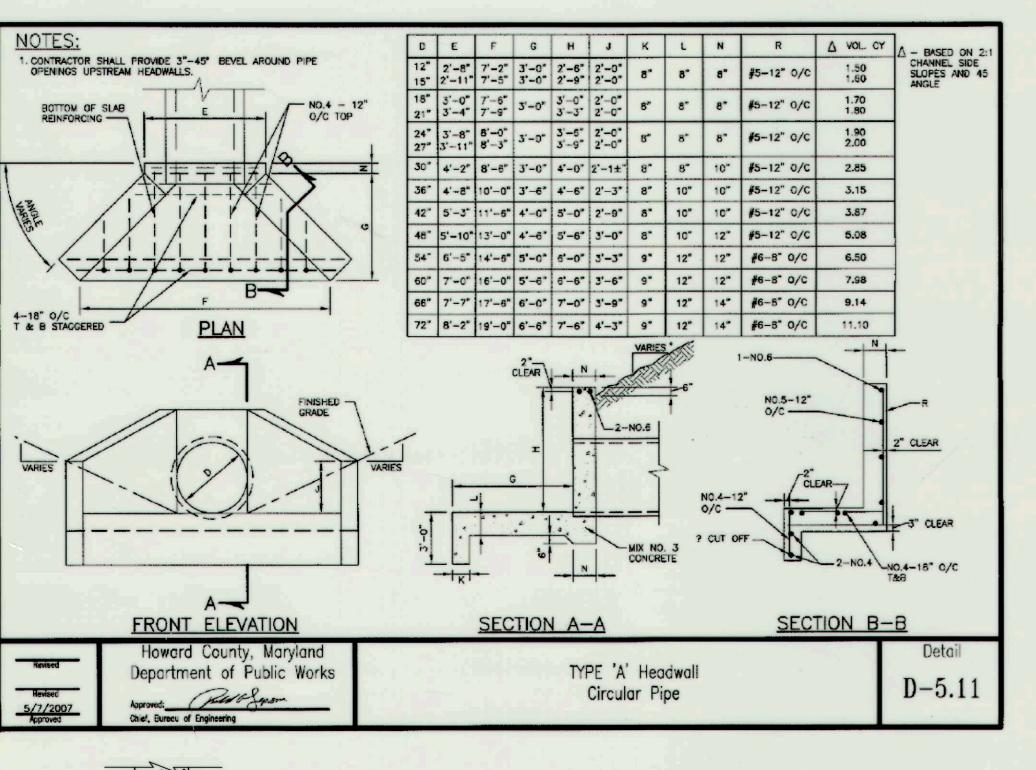
SHEET NO.: 1 OF 16

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD



CONCRETE ANCHOR FOR PVC





- 15" OR

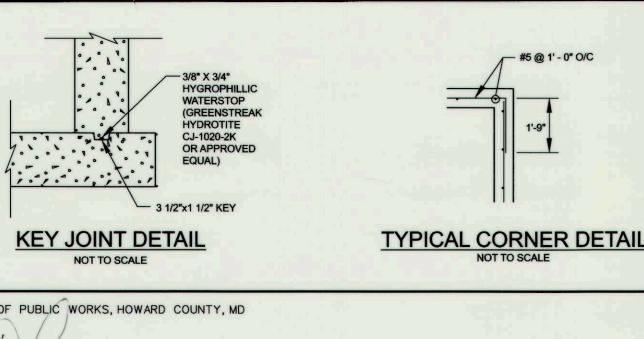
18" RCP -

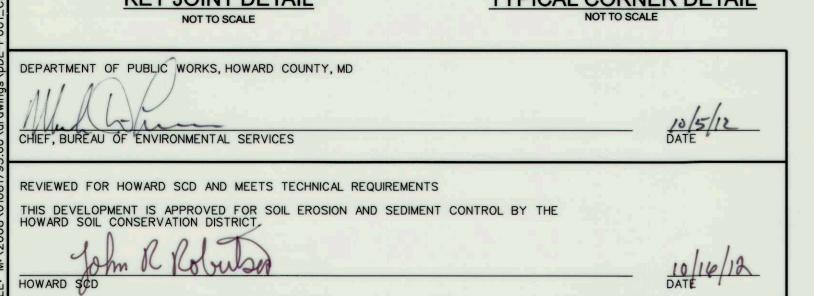
WS-30 WATERSTOP GASKET DETAIL

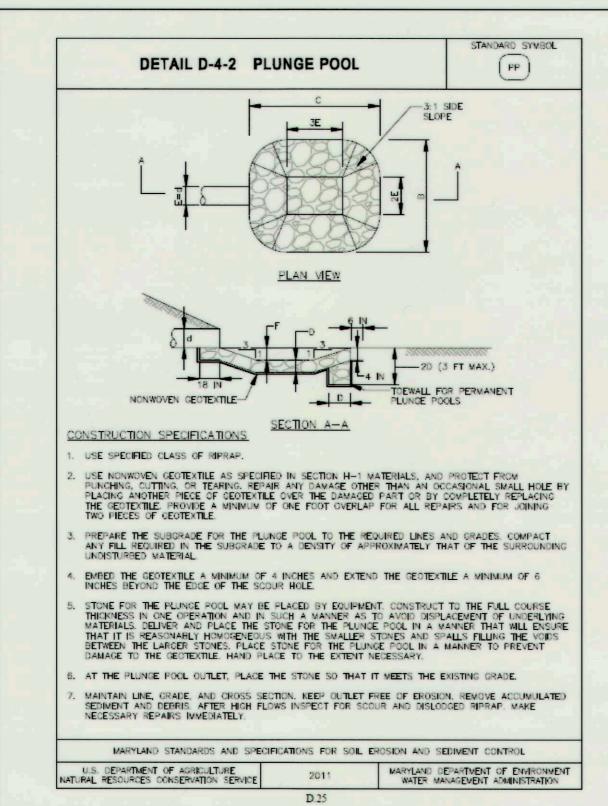
NOT TO SCALE

WATERSTOR

GASKET WITH TAKE-UI







WEIR OPENING

STRUCTURE DETAIL

1/4" THICK STEEL PLATE

WITH/ 3/4" DIA.x2" LONG

EXPANSION BOLTS

FOR DIMENSIONS)

(SEE RISER

Pipe Conduits All pipes shall be circular in cross section Corrugated Metal Pipe - All of the following criteria shall apply for corrugated metal pipe: watertight coupling bands or flanges. asphalt. PLUNGE POOL DIMENSIONS | C | D | E | F (ft.) (ft.) (ft.) (ft.) (ft.) (ft.) 1'-6" 7'-6" 10'-6" 7" 1'-6" 1' 1'-3" | 6'-3" | 9'-9" | 7" | 1'-3" | 1

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS (Maryland Code 378 Pond - January 2000)

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 25foot 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.

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 of the quality required to prevent erosion of the embankment.

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

Compaction - The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.

When required by the reviewing agency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within ±2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

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

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

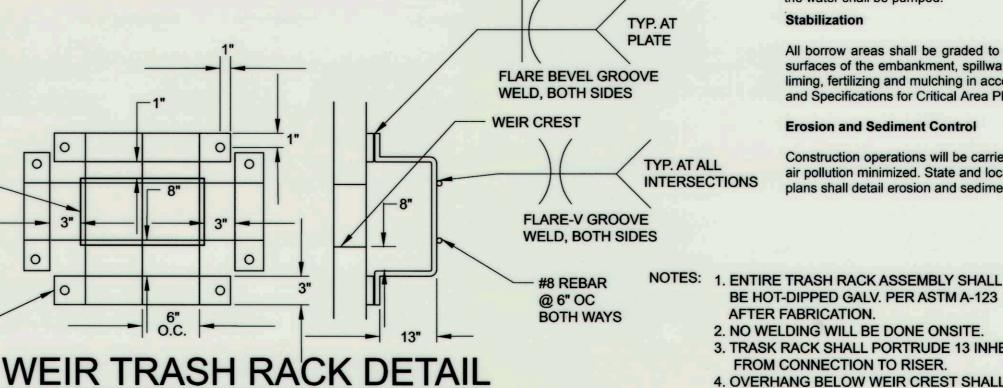
Structure Backfill

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

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

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

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 com-pound. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of



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.

- 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 thick-ness.
- 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 o-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 lugs, 2 on each connecting pipe end. A 24-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the flange is also acceptable. Helically corrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead.

- 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.
- Backfilling shall conform to "Structure Backfill"
- 7. 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:

- Materials Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.
- Bedding Reinforced concrete pipe conduits shall be laid in a concrete bedding/cradle for their entire length. This bed-ding/cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 50% of its out-side 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.
- 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.
- 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:

- 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.
- 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.
- 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 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 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

Care of Water during Construction

All work on permanent structures shall be carried out in areas free from water. The Con-tractor 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, in-stall, 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 sightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

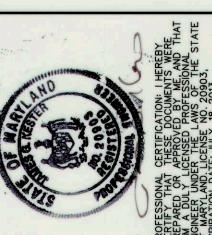
Erosion and Sediment Control

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures.

BE HOT-DIPPED GALV. PER ASTM A-123 AFTER FABRICATION. 2. NO WELDING WILL BE DONE ONSITE. 3. TRASK RACK SHALL PORTRUDE 13 INHES FROM CONNECTION TO RISER. 4. OVERHANG BELOW WEIR CREST SHALL BE 8 INCHES.

OOK ROAD AND 21152 (152) 316-7800 (152) 5-7818 MARYLAND NE: (410) 316 (410) 316-78 ww.kci.com RIDGEBROOK Telephone: (4 Fax: (410) 936



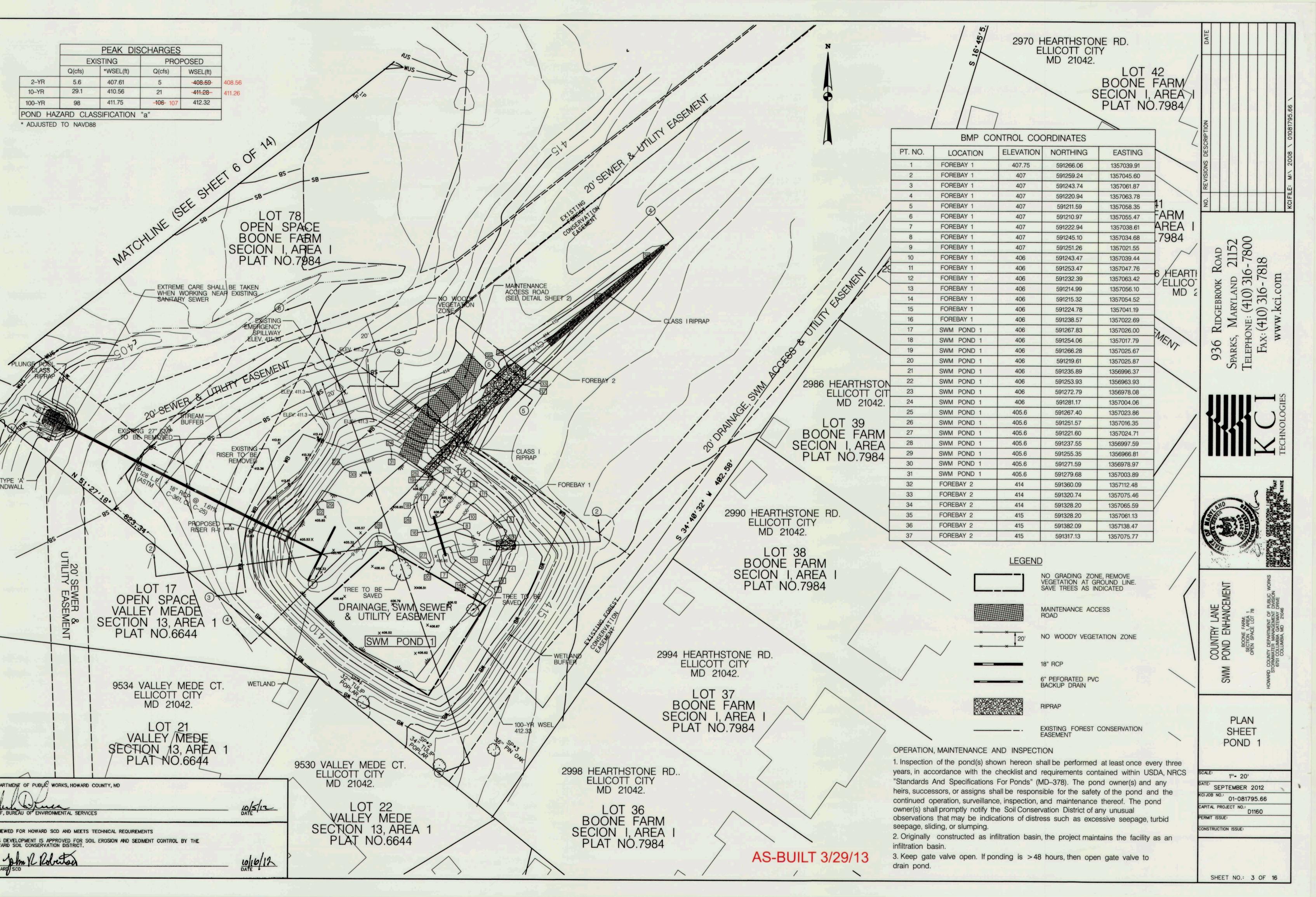


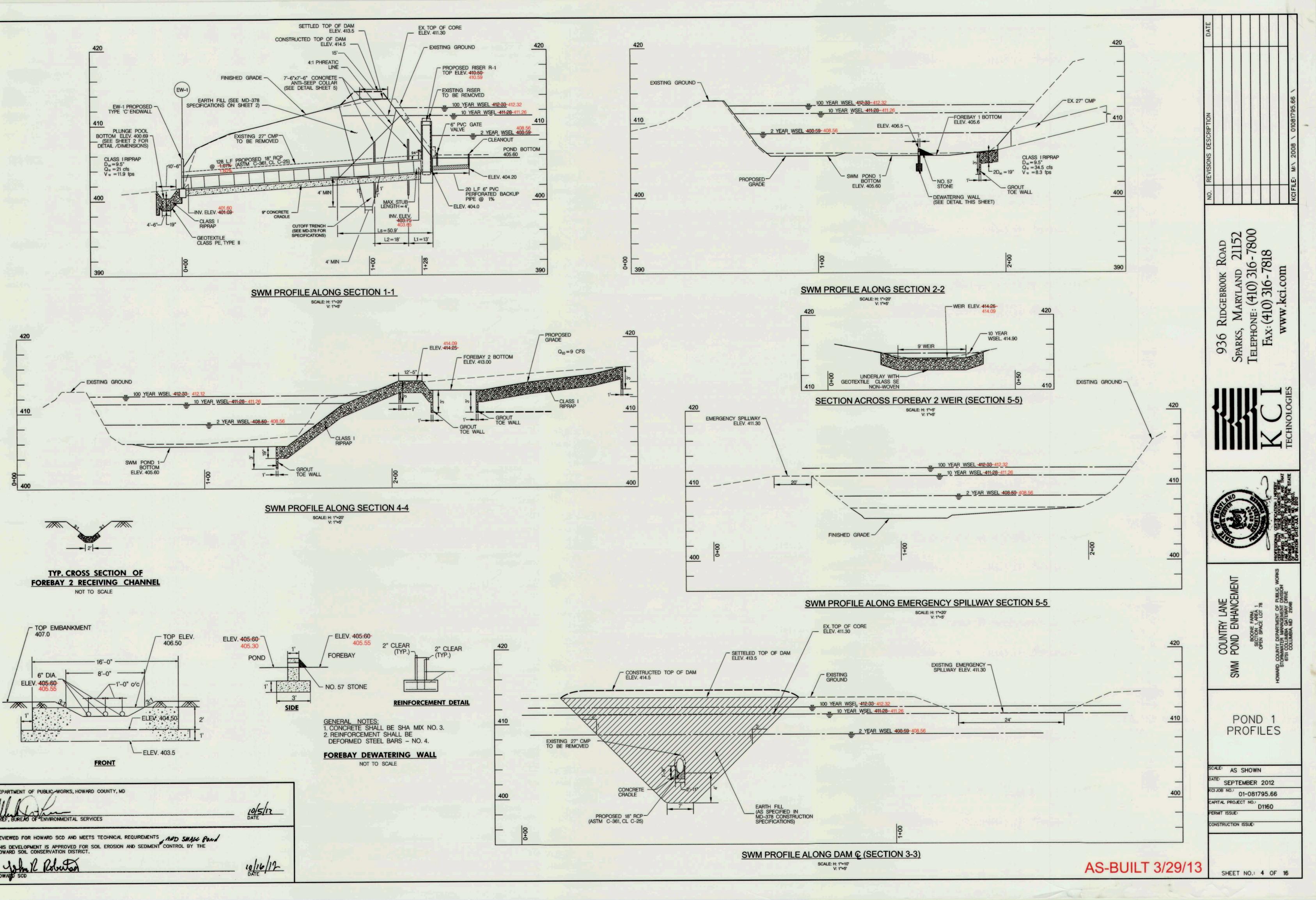
COUNTRY LANE POND ENHANCEMENT JNTY DEPARTMENT OF F MWATER MANAGEMENT D 1 COLUMBIA GATEWAY D COLUMBIA, MD 21046 BOONE FARM; SECTION 1, AREA OPEN SPACE LOT

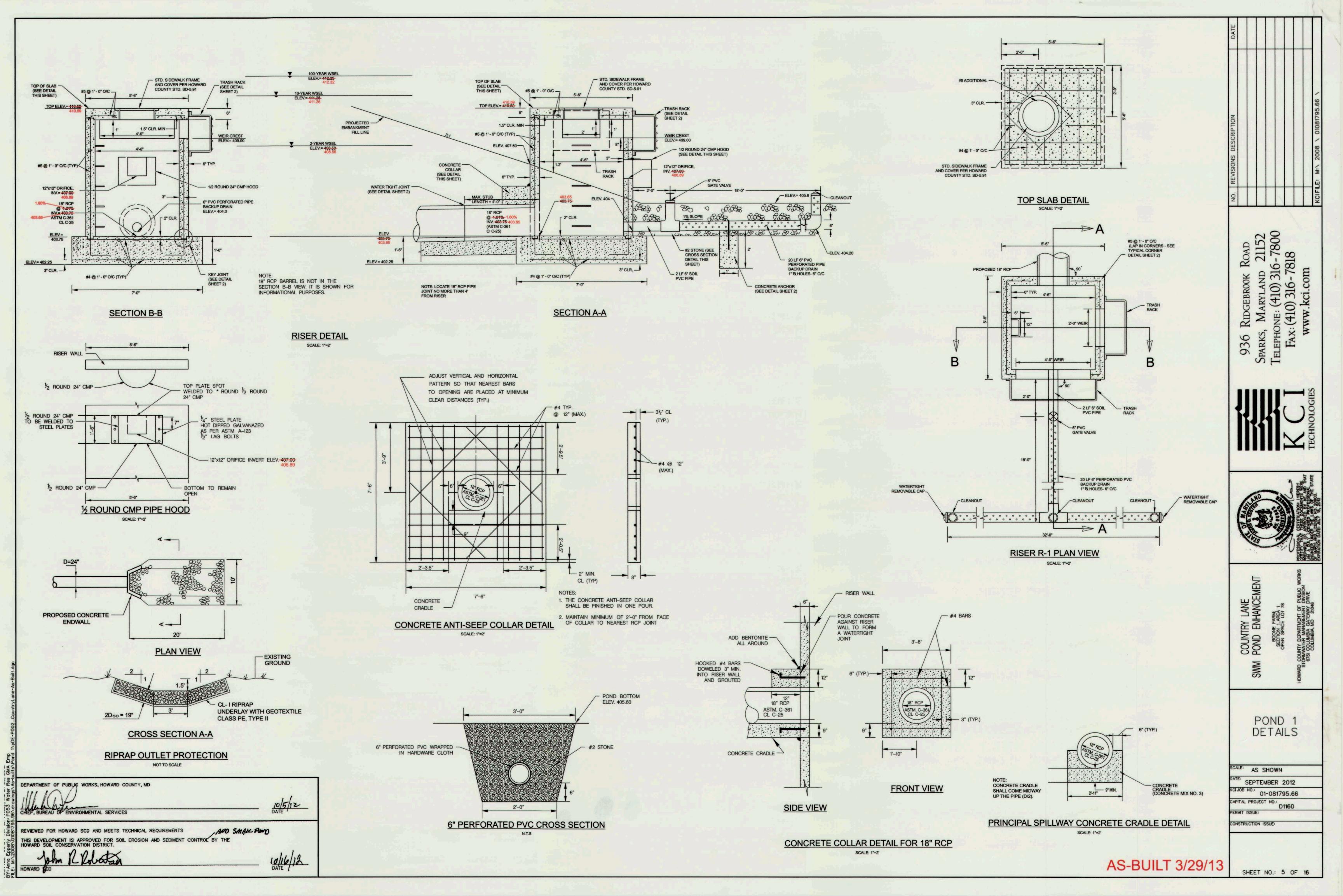
SWM NOTES AND DETAILS

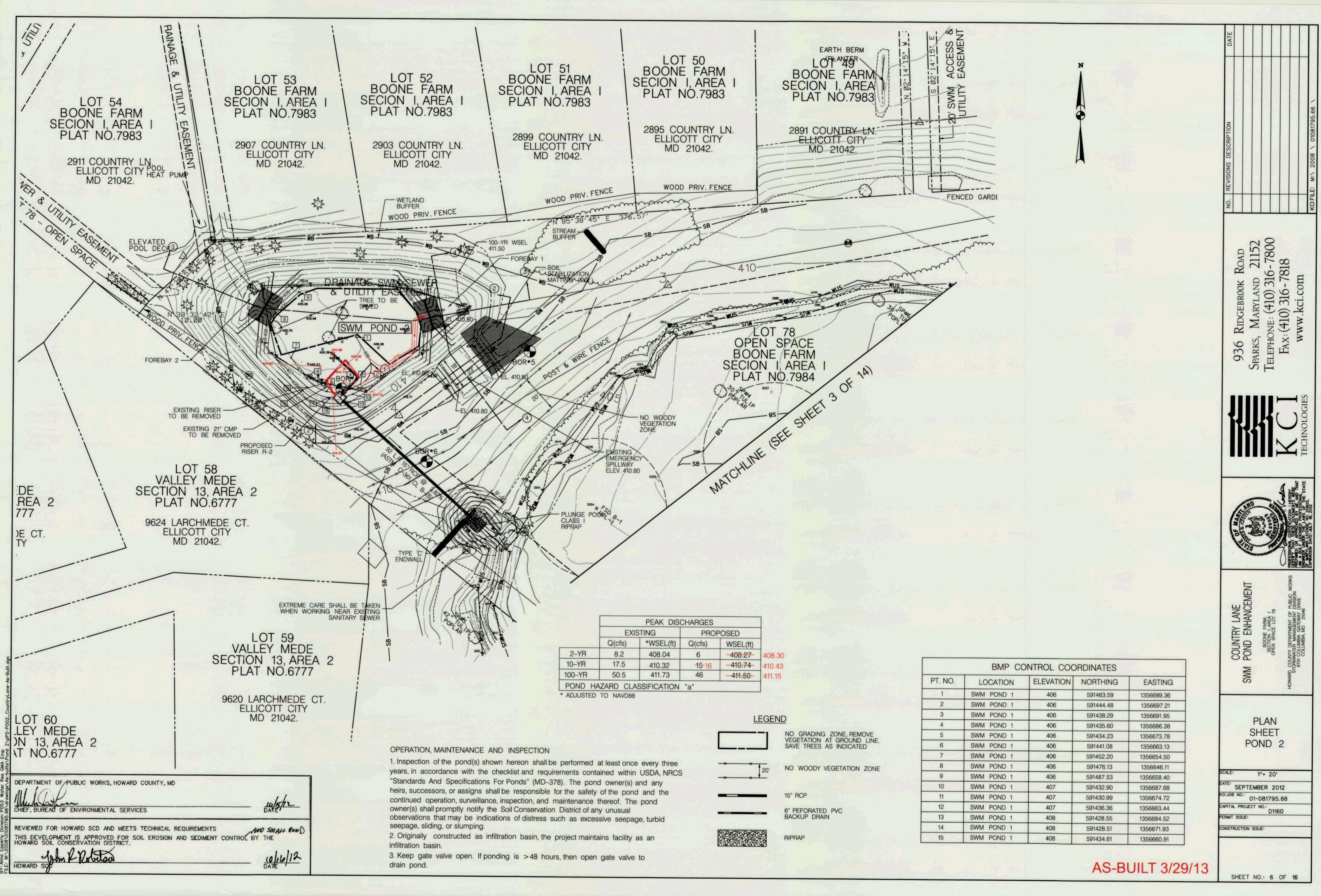
AS SHOWN SEPTEMBER 2012 01-081795.66 CAPITAL PROJECT NO .: CONSTRUCTION ISSUE:

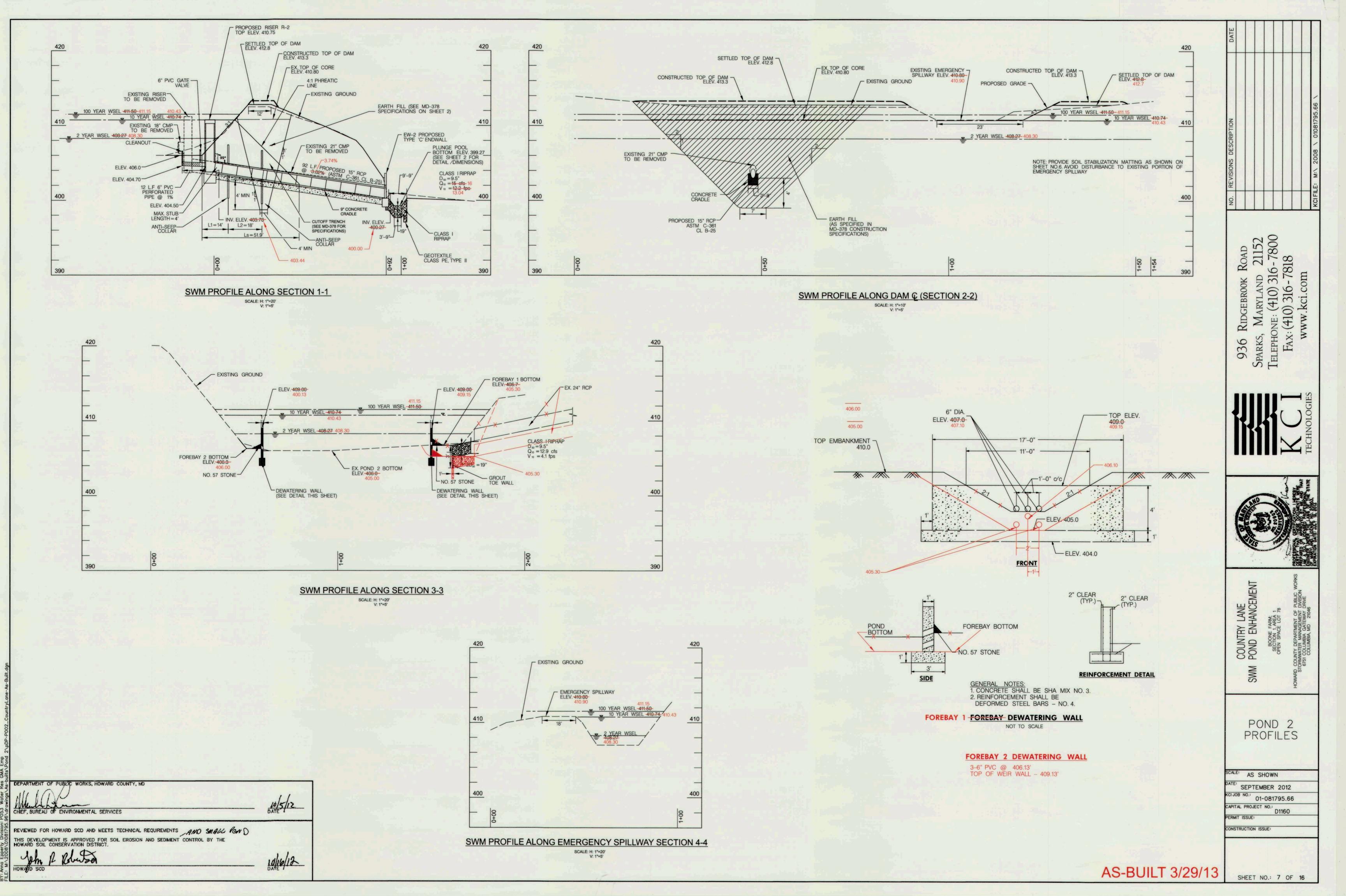
SHEET NO.: 2 OF 16

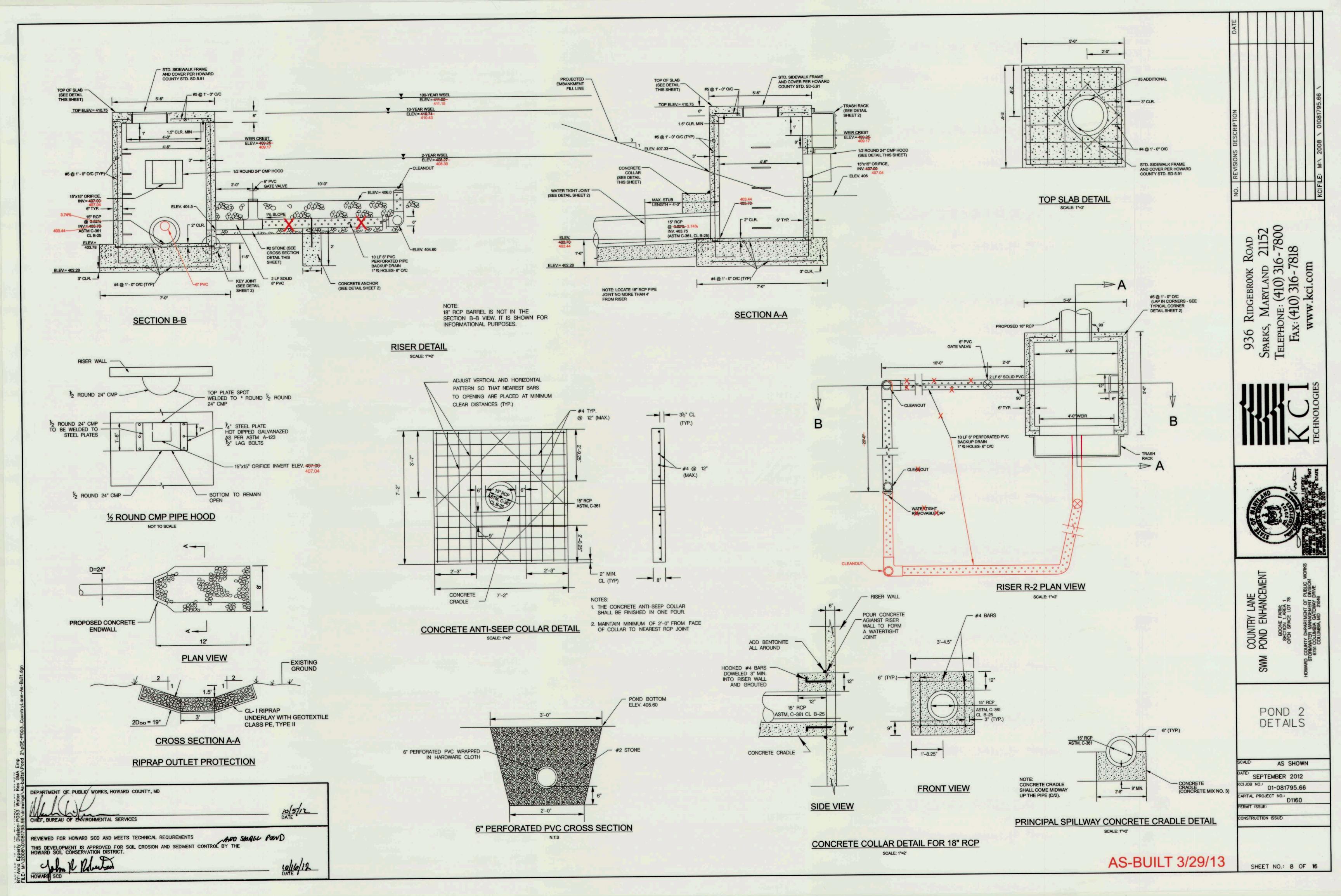


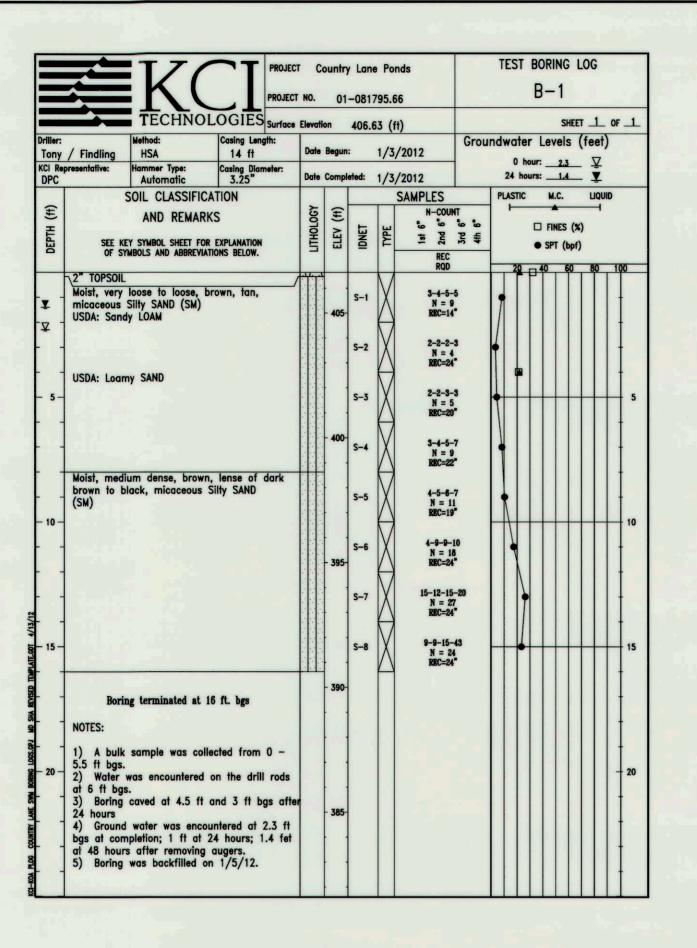








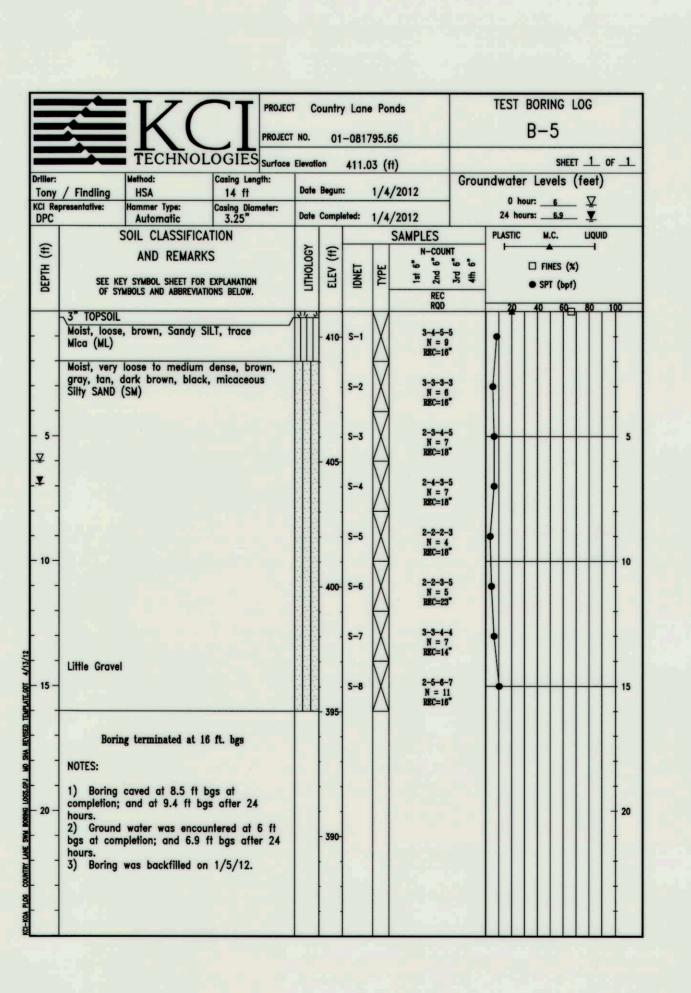




			LOGIES Surface	Elevation	on	411.7	76 (ft)			11	778	EET 1	- 50
Driller:	/ Findling	Method: HSA	Casing Length: 14 ft	Date	Begun	:	1/3/2	2012	Grou		r Levels		
	presentative:	Hammer Type: Automatic	Casing Diameter:	Date	Compl		1/3/2				our: 9,5 urs: 8.2		
		SOIL CLASSIFIC						AMPLES		PLASTIC	M.C.	LIQU	JID
DEPTH (ff)		AND REMAR EY SYMBOL SHEET FO MBOLS AND ABBREVIA	R EXPLANATION	LITHOLOGY	ELEV (ff)	IDNET	TYPE	ts 2 REC	3rd 6.		☐ FINES ■ SPT (b	opf)	
	2" TOPSOIL			Y			1	RQD		20	40 6	0 80	100
	SAND (SM)	e, brown, micac			- 410-	S-1	X	2-2-3-3 N = 5 REC=18					
	SAND (SM)	e, brown, gray, r				S-2	\mathbb{N}	3-3-3-4 N = 6 REC=19'					
- 5-	Moist, loose brown, mic	e to medium den aceous Silty SAN	se, gray, D (SM)			S-3	\mathbb{N}	2-4-6-1 N = 10 REC=24'		+			
					405	S-4	X	4-5-7-1 N = 12 REC=24'					
▼ -	L'.					S-5	X	2-2-3-3 N = 5 REC=24'					
- 10 -	Moist, very Clayey SAN	loose, brown, m D (SC-SM)	icaceous Silty		- 400-	S-6	X	2-2-2-1 N = 4 RBC=6		•			
	Moist, loose Silty SAND	e to dense, brow (SM)	n, micaceous			S-7	\bigvee	3-3-4- N = 7 REC=24	5				
- 15 -						S-8	M	4-12-25- N = 37	26				\coprod
-	SAND and	e, brown, micaco GRAVEL (SM)			- 395-			REC=24					
	NOTES:	ng terminated at	10 It. Dgs			×							
- 15	of drilling 2) Ground bgs at com removing a	and at 9.2 ft af water was enco ppletion; 8.2 ft a	ountered at 9.5 ft t 24 hours after		- 390-		11						

Driller: Tony	/ Findling	Method: HSA	OLOGIES Surface Casing Length: 14 ft	1	Begun	413.5	1/3/2	Grou			vels (f	eet)
KCI Re	presentative:	Hammer Type: Automatic	Casing Diameter: 3.25"	Date	Compl	eted:	1/3/2	2012	24	hour: _ hours: _	1.5	Ţ
DEPTH (ft)	SEE KE	AND REMA Y SYMBOL SHEET MBOLS AND ABBRE	ARKS FOR EXPLANATION	ПТНОГОСУ	ELEV (#)	IDNET	TYPE	AMPLES N-COUNT 5 5 5 5 E REC	PLAST	□ FI	INES (%) PT (bpf)	LIQUID
	Gravel, Micc			31/3		S-1	M	RQD 2-2-4-4 N = 6 RBC=18"	1	10		80
	SILT (ML)		micaceous Sandy		- 410-	S-2		4-5-5-5 N = 10 REC=14"				
¥ - 5-	trace Grave	(SM)	SAND, little Mica,			S-3	\mathbb{N}	4-4-6-7 N = 10 REC=18"				
	Moist, medi micaceous	um dense, gra Clayey SAND, I	y, brown, ittle Gravel (SC)			S-4	M	7-10-9-10 N = 19 REC=14"				
- 10 -	Moist, loose dark brown (SM)	to medium d , black, micac	ense, tan, brown, eous Silty SAND		- 405-	S-5		3-3-3-4 N = 6 RBC=24"				
						S-6		3-4-5-8 N = 9 REC=22"	$\left \frac{1}{1} \right $			
					- 400-	S-7		6-5-6-10 N = 11 REC=24"				
- 15 -						S-8	X	8-10-17-16 N = 27 REC=24"				H
-	Boriz NOTES:	ng terminated a	t 16 ft. bgs	1	- 395-							
	and at 5.5 2) Ground completion;	ft after 24 he water was no	t encountered at after 24 hours.		383							

	<u>, </u>	K	PROJECT PROJECT				e Pon			TE		BORING B-4	G LOG	
	- -	TECHNO	LOGIES Surface		17102-111		08 (ft					s	HEET _1	_ OF .
Driller:	/ F. III	Method:	Casing Length:	Date 6					Grou	ndw	ater	Level	s (fee	t)
	/ Findling presentative:	HSA Hammer Type:	14 ft Casing Diameter:					2012				r:4.		
DPC		Automatic	3.25"	Date (Compl	eted:	1/4/				4 hour	s:3.:		
(SOIL CLASSIFI AND REMA		5	£		$\overline{}$	N-COUN	IT	100	l-	M.C.		UID
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٥	OF S	MBOLS AND ABBREV	TATIONS BELOW.	1-1				REC RQD		_	20	40 🗖		10
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·¥ -						S-2	X	3-3-3- N = 6 REC=16'		•				
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 - 10 -						S-5	X	2-4-5- N = 9 REC=16		1				
					395-	S-6	X	5-7-9-1 N = 16 REC=16						
						S-7	X	7-7-10- N = 17 REC=16						
- 15	+++			Щ		S-8	X	2-8-13- N = 21 REC=16			+			H
	Bori NOTES:	ng terminated at	16 ft. bgs		390-									
- 15	1) A bulk ft bgs. 2) Water at 9.5 ft b 3) Boring 24 hours. 4) Ground	was encountered gs. caved at 7 ft water was enc apletion; and 3.	ollected from 0 - 6 d on the drill rods and 4.1 ft bgs af countered at 4.5 ft 2 ft bgs after 24		385									-



	K	PROJEC	CT NO.	01					TE		3-6		
			e Elevat	ion	410.	50 (fl)	Cravi	ndu	ater	4-24-	CHILDREN .	
/ Findling	HSA	14 ff	Date	Begur	1:	1/4/	/2012	Grou					
resentative:	Hammer Type: Automatic	Casing Diameter: 3.25"	Date	Comp	leted:	1/4/	/2012						
SEE K	AND REMA	ARKS FOR EXPLANATION	ПТНОГОСУ	ELEV (#)	IDNET	TYPE	N-COUN	9 0	100000			(%)	OUID I
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					S-5	X	N = 6		•			1	10
Trace Gray	el			- 400	S-6	X	N = 7	11	•				
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at 12 ft b 2) Boring 3) Ground bgs at con hours.	gs. caved at 9.6 I water was en npletion; at 7.3	ft bgs. countered at 7.2 ft 5 fet bgs after 24		390-									- 20
	Z" TOPSOIL Moist, very Sandy SILT Moist, very Silty SAND Moist, loose micaceous Trace Grav Bori NOTES: 1) Water at 12 ft be 2) Boring 3) Ground bg at conhours.	Findling HSA resentative: Hammer Type: Automatic SOIL CLASSIF AND REMA SEE KEY SYMBOL SHEET OF SYMBOLS AND ABBRE 2" TOPSOIL Moist, very loose, brown, Sandy SILT (ML) Moist, soft, gray, brown, little Mica (ML) Moist, loose, brown, gray, micaceous Silty SAND (SM) Trace Gravel Boring terminated a NOTES: 1) Water was encountered at 12 ft bgs. 2) Boring caved at 9.6 3) Ground water was en bgs at completion; at 7.3 hours.	Findling Method: Casing Length: HSA 14 ft HSA 14 ft Automatic 3.25" SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW. 2" TOPSOIL Moist, very loose, brown, gray, micaceous Sandy SILT (ML) Moist, very loose, gray, brown, micaceous Silty SAND (SM) Moist, soft, gray, brown, SILT, some Sand, little Mica (ML) Moist, loose, brown, gray, tan, dark brown, micaceous Silty SAND (SM) Trace Gravel Boring terminated at 16 ft. bgs NOTES: 1) Water was encountered on the drill rods at 12 ft bgs. 2) Boring aved at 9.6 ft bgs. 3) Ground avet was encountered at 7.2 ft bgs at completion; at 7.35 fet bgs after 24	TECHNOLOGIES Surface Elevate Findling HSA Casing Length: HSA 14 ft Date resentative: Hammer Type: Automatic 3.25" SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW. 2" TOPSOIL Moist, very loose, brown, gray, micaceous Sandy SILT (ML) Moist, very loose, gray, brown, micaceous Silty SAND (SM) Moist, soft, gray, brown, SILT, some Sand, little Mica (ML) Moist, loose, brown, gray, tan, dark brown, micaceous Silty SAND (SM) Trace Gravel Boring terminated at 16 ft. bgs NOTES: 1) Water was encountered on the drill rods at 12 ft bgs. 2) Boring caved at 9.6 ft bgs. 3) Ground water was encountered at 7.2 ft bgs at completion; at 7.35 fet bgs after 24 hours.	TECHNOLOGIES Surface Elevation Method: HSA 14 ft 14 ft Date Begur resentative: Hammer Type: Automatic SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW. 2" TOPSOIL Moist, very loose, brown, gray, micaceous Sandy SILT (ML) Moist, very loose, gray, brown, micaceous Silty SAND (SM) Moist, soft, gray, brown, SILT, some Sand, Nittle Mica (ML) Moist, loose, brown, gray, tan, dark brown, micaceous Silty SAND (SM) Trace Gravel Boring terminated at 16 ft. bgs NOTES: 1) Water was encountered on the drill rods at 12 ft bgs. 2) Boring caved at 9.6 ft bgs. 3) Ground water was encountered at 7.2 ft bgs at completion; at 7.35 fet bgs after 24 hours. 390- 390- 390- 390- 390- 390- 390- 390	TECHNOLOGIES Surface Elevation 410.5 Findling	TECHNOLOGIES Findling	TECHNOLOGIES Surface Elevation 410.50 (ft) Findling	TECHNOLOGIES Surface Elevation 410.50 (ff) Findling HSA 14 ff 14 ft Date Begun: 1/4/2012 Findling HSA 2 casing Diameter: 3.25" SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW. SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW. 1410 Moist, very loose, brown, gray, micaceous Sandy Silt (ML) Moist, very loose, gray, brown, micaceous Silty SAND (SM) Moist, soft, gray, brown, silt, some Sand, liftle Mica (ML) Moist, loose, brown, gray, tan, dark brown, micaceous Silty SAND (SM) Trace Gravel All of the Begun: 1/4/2012 SAMPLES SAMPLES SAMPLES SAMPLES N-COUNT SOIL CLASSIFICATION SAMPLES SA	TECHNOLOGIES TECHNOLOGIES Surface Elevation 410.50 (ft) Findling HSA 14 ft Date Begun: 1/4/2012 Findling HSA 14 ft Date Begun: 1/4/2012 SOIL CLASSFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW. 2" TOPSOIL Moist, very loose, brown, gray, micaceous Silty SAND (SM) Moist, very loose, gray, brown, micaceous Silty SAND (SM) Moist, soft, gray, brown, SILT, some Sand, Illifle Mica (ML) Moist, soft, gray, brown, gray, tan, dark brown, micaceous Silty SAND (SM) Trace Gravel Trace Gravel Boring terminated at 16 ft. bgs NOTES: 1) Water was encountered on the drill rods at 12 ft bgs. Boring coved at 9.6 ft bgs. 390- Boring derivations of the bgs. 390- Boring derivation of the bgs. 390- Boring derivation of the bgs. 390- Boring derivation of 7.35 fet bgs affer 24 hours.	TECHNOLOGIES Surface Eleverlion Findling	TECHNOLOGIES Surface Elevellon Findling Method: Hash Casing Langth: 14 ft Hash Hash	TECHNOLOGIES Surface Devotion ### Automatic Findling Mathod: Casing Length: 14 ft Date Begun: 1/4/2012 Groundwater Levels (fee O hour: 7.2 2/2 hours: 7.4 2012 Casing Diameter: Automatic Casing Diameter: Automa

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD CHIEF, BUREAU OF ENVIRONMENTAL SERVICES	10/5/12 DATE
REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT. HOWARD SCD	10/16/12 DATE

	/ Findling	Method: HSA Hammer Type:	Casing Length: 14 ft Casing Diameter:	Date	Begur	1:	1/4/	/2012 Gro		0 h	r Lev	7.2	_ <u>\</u>	
DPC	presentanve.	Automatic	3.25"	Date	Comp	leted:	1/4/	/2012		24 ho	urs:	7.4	- ₹	
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	Silty SAND	(SM)	rown, micaceous			S-2	M	2-2-2-3 N = 4 RBC=18"	+	^				
- 5-	little Mica Moist, loose	(ML)	SILT, some Sand, tan, dark brown,	/	- 405	S-3	M	1-1-5-6 N = 6 RBC=18"	+				H	5
₹ -						S-4	M	2-3-5-5 N = 8 RBC=16"	•					
						S-5	M	3-3-3-4 N = 6 RBC=16"	+					
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	Trace Grav	el				S-7	X	1-3-3-3 N = 6 RBC=12"	•					
- 15 -	4-		'		395	S-8	M	3-4-4-5 N = 8 REC=14"	1				+	15
		ng terminated a	t 16 ft. bgs											
- 20	at 12 ft b 2) Boring 3) Ground bgs at con hours.	gs. caved at 9.6 t I water was end	countered at 7.2 ft 5 fet bgs after 24		390-									- 20

936 RIDGEBROOK ROAD SPARKS, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com



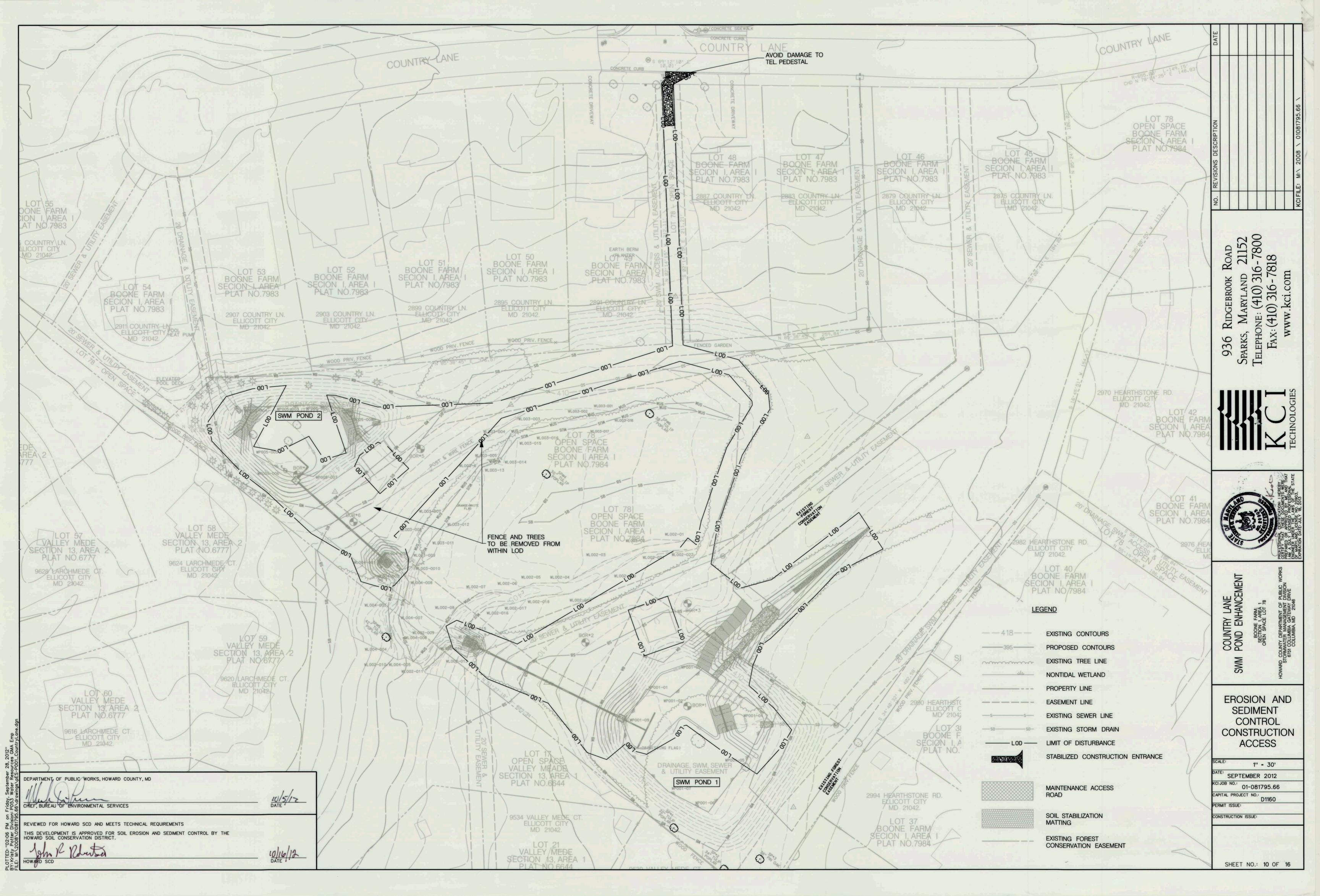


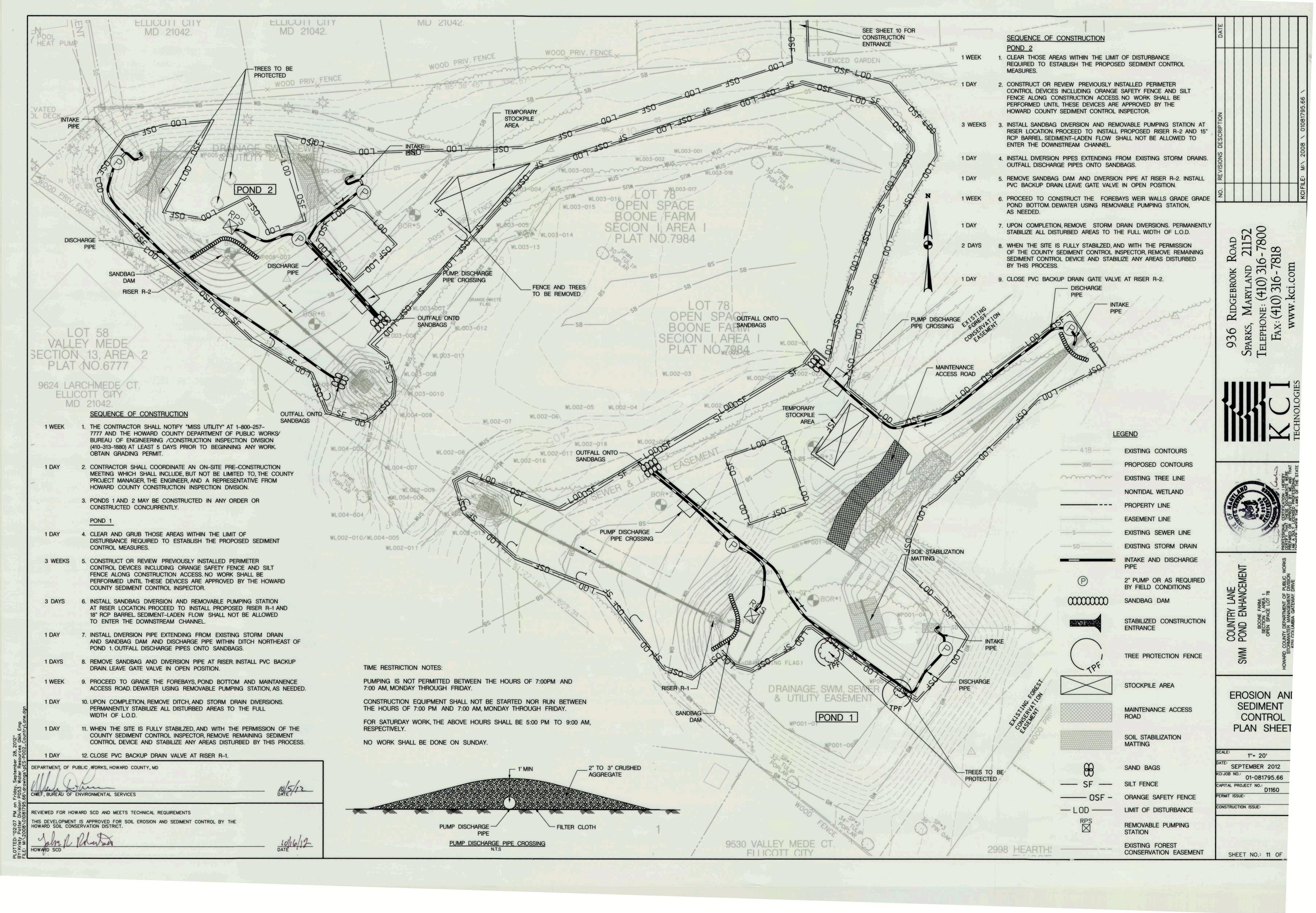
COUNTRY LANE POND ENHANCEMENT SWM

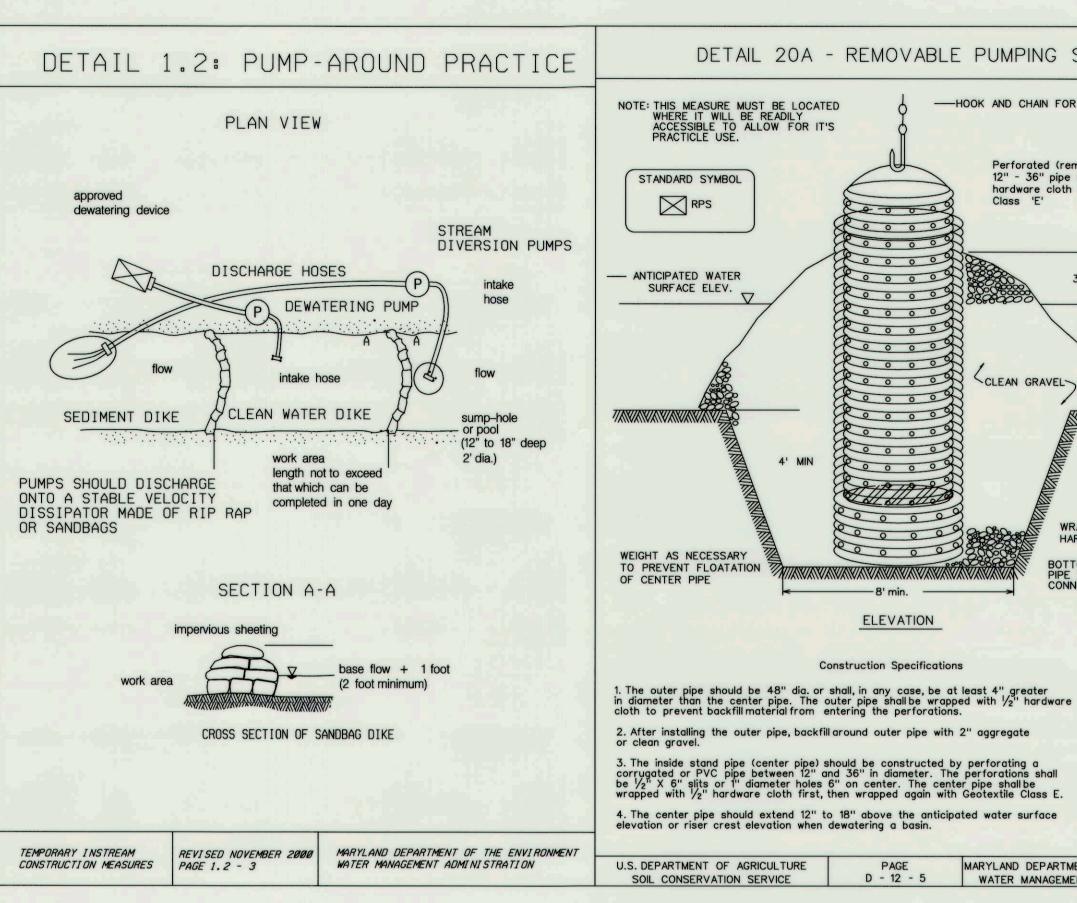
SOIL BORING LOGS

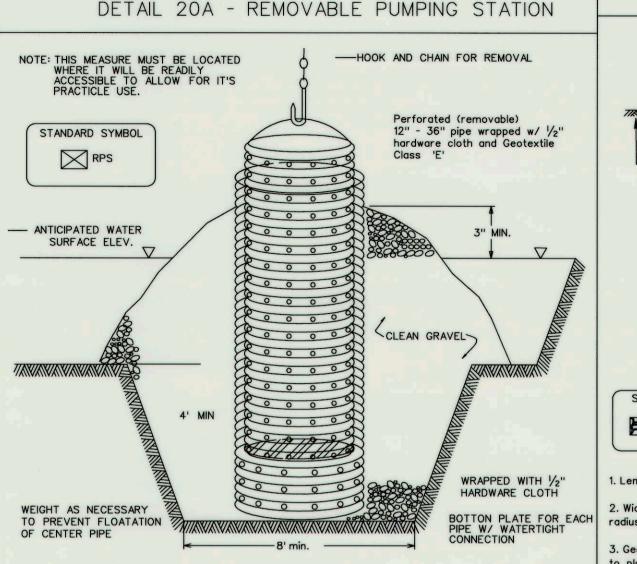
SCALE:	AS SHOWN	
	SEPTEMBER 2012	
KCIJOB	NO.: 01-081795.66	ı
CAPITAL	PROJECT NO.: D1160	
PERMIT	ISSUE:	G-EIII (CA
CONSTR	CUCTION ISSUE:	

SHEET NO .: 9 OF 16









Construction Specifications

ELEVATION

2. After installing the outer pipe, backfill around outer pipe with 2" aggregate

3. The inside stand pipe (center pipe) should be constructed by perforating a corrugated or PVC pipe between 12" and 36" in diameter. The perforations shall be $\frac{1}{2}$ " X 6" slits or 1" diameter holes 6" on center. The center pipe shall be wrapped with $\frac{1}{2}$ " hardware cloth first, then wrapped again with Geotextile Class E.

4. The center pipe should extend 12" to 18" above the anticipated water surface elevation or riser crest elevation when dewatering a basin.

- MOUNTABLE BERM (SEE DETAIL) - 50' MINIMUM EXISTING PAVEMENT - EARTH FILL ** GEOTEXTILE CLASS 'C' - PIPE AS NECESSARY OR BETTER MINIMUM 6" OF 2"-3" AGGREGATE OVER LENGTH AND WIDTH OF EXISTING GROUND STRUCTURE PROFILE 50' MINIMUM LENGTH PAVEMENT PLAN VIEW STANDARD SYMBOL SCE Construction Specification 1. Length - minimum of 50' (*30' for single residence lot).

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE

2. Width - 10' minimum, should be flared at the existing road to provide a turning

3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residences to use geotextile.

4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the

5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.

F -- 17 - 3

6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance

-16" MINIMUM HEIGHT OF GEOTEXTILE CLASS F - 8" MINIMUM DEPTH IN GROUND FLOW 36" MINIMUM FENCE PERSPECTIVE VIEW POST LENGTH FENCE POST SECTION CLOTH-MINIMUM 20" ABOVE GROUND UNDISTURBED TRANSPORTATION OF THE PROPERTY EMBED GEOTEXTILE CLASS F TOP VIEW - FENCE POST DRIVEN A A MINIMUM OF 8" VERTICALLY MINIMUM OF 16" INTO THE GROUND INTO THE GROUND SECTION B CROSS SECTION SECTION A STANDARD SYMBOL STAPLE? ____SF____ JOINING TWO ADJACENT SILT FENCE SECTIONS Construction Specifications . Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 11/2" x 11/2" square (minimum) cut, or 13/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pond per linear foot 2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F: Test: MSMT 509 Tensile Strength 50 lbs/in (min.) Test: MSMT 509 20 lbs/in (min.) Tensile Modulus Flow Rate 0.3 galft / minute (max.) Test: MSMT 322 Filtering Efficiency 75% (min.) ² Test: MSMT 322 3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass. 4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height. MARYLAND DEPARTMENT OF ENVIRONMENT U.S. DEPARTMENT OF AGRICULTURE

DETAIL 22. - SILT FENCE

36" MINIMUM LENGTH FENCE POST

DRIVEN A MINIMUM OF 16" INTO

STABILIZATION MATTING PSSMS - * 16/ft37/64 SLOPE APPLICATION (* INCLUDE SHEAR STRESS) OVERLAP OR ABUT ROLL EDGES (TYP.) IF SPECIFIED (SEE NOTE 9) 6 IN MIN. OVERLAP AT ROLL END (TYP.) PREPARED SLOPE WITH SEED IN PLACE-ISOMETRIC VIEW CONSTRUCTION SPECIFICATIONS USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.

DETAIL B-4-6-D PERMANENT SOIL

USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL

SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 11/2 INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE

PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL

UNROLL MATTING DOWN SLOPE. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID

OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL END BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT

KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING

ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY. B. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND

2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS. . IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR

MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT. 10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

MARYLAND DEPARTMENT OF ENVIRONMENT U.S. DEPARTMENT OF AGRICULTURE MARYLAND DEPARTMENT OF ENVIRONMENT

HOWARD COUNTY CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855). 2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY

EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO. 3. 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

WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATION FOR SOIL

4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGN POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL 1, CHAPTER 12 OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.

5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. 51), SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.

6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

7. SITE ANALYSIS:

TOTAL AREA OF SITE 1.30 ACRES AREA DISTURBED 1.30 ACRES AREA TO BE ROOFED OR PAVED 0 ACRES AREA TO BE VEGETATIVELY STABILIZED 1.30 ACRES TOTAL CUT 150 CU. YARDS TOTAL FILL

HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

GRADED AREAS ON THE PROJECT SITE.

45 CU. YARDS OFFSITE WASTE/BORROW AREA LOCATION TO BE DETERMINED*

8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE. 9. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE

10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.

11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORK DAY, WHICHEVER IS SHORTER.

*OFFSITE WASTE/BORROW SITE SHALL HAVE AN APPROVED SEDIMENT CONTROL PLAN.

B-4-2 STANDARDS AND SPECIFICATIONS

SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

To provide a suitable soil medium for vegetative growth.

A. Soil Preparation Temporary Stabilization

a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches 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 must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.

a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:

Soil pH between 6.0 and 7.0.

ii. Soluble salts less than 500 parts per million (ppm).

iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay)

b. Application of amendments or topsoil is required if on-site soils do not meet the above

then scarified or otherwise loosened to a depth of 3 to 5 inches.

The process of preparing the soils to sustain adequate vegetative stabilization

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

b. Apply fertilizer and lime as prescribed on the plans.

c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable

would be acceptable.

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE

iv. Soil contains 1.5 percent minimum organic matter by weight.

v. Soil contains sufficient pore space to permit adequate root penetration.

c. Graded areas must be maintained in a true and even grade as specified on the approved plan,

d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil

e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregula condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

SOIL CONSERVATION SERVICE

10/16/12 DATE

DATE

D - 12 - 5 WATER MANAGEMENT ADMINISTRATION

1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.

2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.

Topsoiling is limited to areas having 2:1 or flatter slopes where:

MARYLAND DEPARTMENT OF ENVIRONMENT U.S. DEPARTMENT OF AGRICULTURE

a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth. b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.

 The original soil to be vegetated contains material toxic to plant growth. d. The soil is so acidic that treatment with limestone is not feasible.

4. Areas having slopes steeper than 2:1 require special consideration and design. 5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:

a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 11/2 inches in diameter.

b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.

c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.

a. Erosion and sediment control practices must be maintained when applying topsoil.

B.13

b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.

c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading

and seedbed preparation. Soil Amendments (Fertilizer and Lime Specifications)

be used for chemical analyses

WATER MANAGEMENT ADMINISTRATION

Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also

SOIL CONSERVATION SERVICE

2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.

3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve. 4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by

disking or other suitable means. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B.14

TOTAL DISTURBED AREA: 1.30 AC.

B-4-3 STANDARDS AND SPECIFICATIONS

SEEDING AND MULCHING

WATER MANAGEMENT ADMINISTRATION NATURAL RESOURCES CONSERVATION SERVICE

The application of seed and mulch to establish vegetative cover.

To protect disturbed soils from erosion during and at the end of construction.

Conditions Where Practice Applies

To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

1. Specifications

a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.

b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws. c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture

of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the 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 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.

d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.

2. Application

a. Dry Seeding: This includes use of conventional drop or broadcast spreaders. i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1,

Permanent Seeding Table B.3, or site-specific seeding summaries. ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil

OF 2" STONE -EXISTING GROUND

WATER MANAGEMENT ADMINISTRATION

FILTER CLOTH SHALL BE GEOTEXTILE CLASS "C", OR BETTER STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

B.15

		TEMPURA	RY SEEDING	G SUMMAR	71	
	MIXTURE (HARDINE M TABLE 26	SS ZONE 6B)			FERTILIZER RATE	LIME
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEED ING DEPTHS	(10-10-10)	RATE
1	RYE	140	3/1-4/30 8/15-11/15	1-2 INCH	600 LB/AC (15 LB/1000 SF)	2 tons/a
2	RYE PLUS FOXTAIL MILLET	150	3/1-4/30 5/1-8/14 8/15-11/15	1 INCH		1000 SF)

SEED FROM NO.

	PERMANENT	SEEDING	SUMMARY				
D MIXTURE (HARDINESS ZONE M TABLE 25	6B)			FERTILIZER (10-20-20)	RATE	ti-	LIME
SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEED ING DEPTHS	N	P205	K20	EPE
TALL FESCUE (85%) PERENNIAL RYEGRASS (10%) KENTUCKY BLUEGRASS (5%)	125 15 10	3/1-5/15 8/15-10/15	1-2 INCH	90 LB/AC	175 lb/ac (4.0 LB/	175 lb/ac (4.0 LB/	2 tons/ac (100 LB/
KENTUCKY BLUEGRASS (50%) HARD FESCUE (40%) RED TOP (10%)	150	3/1-5/15 8/15-10/15	1-2 INCH	1000 SF)	1000 SF)	1000 SF)	1000 SF)

TEMPODADY SEEDING SHAMADY

FROM	M TABLE 26				FERTILIZER RATE	LIME
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEED ING DEPTHS	(10-10-10)	RATI
1	RYE	140	3/1-4/30 8/15-11/15	1-2 INCH	600 LB/AC (15 LB/1000 SF)	2 tons/
2	RYE PLUS FOXTAIL MILLET	150	3/1-4/30 5/1-8/14 8/15-11/15	1 INCH	(10 25) , 000 01 /	1000 SF

PM on Friday, Division: P053 "02:07 Potter

SHEET NO .: 12 OF 16

EROSION &

SEDIMENT

CONTROL

NOTES &

DETAILS

NOT TO SCALE

01-081795.66

SEPTEMBER 2012

APITAL PROJECT NO .:

CONSTRUCTION ISSUE:

ROAD 21152 6-7800 818

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SPARKS, TELEPHONE: (4)
FAX: (410) 3

- 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.
- ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in
- c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
- i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P2O5 (phosphorous),
- 200 pounds per acre; K₂O (potassium), 200 pounds per acre. ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by

hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one

- time. Do not use burnt or hydrated lime when hydroseeding. iii. Mix seed and fertilizer on site and seed immediately and without interruption.
- iv. When hydroseeding do not incorporate seed into the soil.

1. Mulch Materials (in order of preference)

- a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.
- b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
- i. WCFM is to 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.
- ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
- iii. WCFM materials are to 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 must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
- iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
- v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.

a. Apply mulch to all seeded areas immediately after seeding.

- b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
- c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.

- a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
- into the soil surface a minimum of 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 follow the contour.
- ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
- iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly
- iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000

B-4-4 STANDARDS AND SPECIFICATIONS

TEMPORARY STABILIZATION

To stabilize disturbed soils with vegetation for up to 6 months.

To use fast growing vegetation that provides cover on disturbed soils.

Conditions Where Practice Applies

i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch

Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

- 1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
- 2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
- 3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

B-4-5 STANDARDS AND SPECIFICATIONS

PERMANENT STABILIZATION

To stabilize disturbed soils with permanent vegetation

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

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

Seed Mixtures

- 1. General Use
 - a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
- b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting
- c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil
- d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 ½ pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.

2. Turfgrass Mixtures

- a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance
- b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
- i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
- ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where

rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.

- iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes; Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
- iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes; Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1½ to 3 pounds per 1000 square feet.

Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"

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

c. Ideal Times of Seeding for Turf Grass Mixtures

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

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

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

- d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 11/2 inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
- e. If soil moisture is deficient, supply new seedings with adequate water for plant growth (½ to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

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

General Specifications

- a. Class of turfgrass sod must be Maryland State Certified. Sod labels must be made available to
- b. Sod must be machine cut at a uniform soil thickness of 3/4 inch, plus or minus 1/4 inch, at the time crude top growth and thaten. Broken paus and torn or uneven ends will not be acceptable.
- c. Standard size sections of sod must 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
- d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
- e. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its

2. Sod Installation

- a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
- wedged against each other. Stagger lateral joints 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.
- c. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.

b. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly

d. Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.

3. Sod Maintenance

- a. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to prevent wilting.
- b. After the first week, sod watering is required as necessary to maintain adequate moisture
- c. Do not mow until the sod is firmly rooted. No more than 1/3 of the grass leaf must be removed by the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless otherwise specified.

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

B-4-6 STANDARDS AND SPECIFICATIONS

B.17

SOIL STABILIZATION MATTING

Material used to temporarily or permanently stabilize channels or steep slopes until groundcover is established.

To protect the soils until vegetation is established

Conditions Where Practice Applies

On newly seeded surfaces to prevent the applied seed from washing out; in channels and on steep slopes where the flow has erosive velocities or conveys clear water; on temporary swales, earth dikes, and perimeter dike swales as required by the respective design standard; and, on stream banks where moving water is likely to wash out new vegetative plantings.

Design Criteria

- 1. The soil stabilization matting that is used must withstand the flow velocities and shear stresses determined for the area, based on the 2-year, 24-hour frequency storm for temporary applications and the 10-year, 24-hour frequency storm for permanent applications. Designate on the plan the type of soil stabilization matting using the standard symbol and include the calculated shear stress for the respective treatment area.
- 2. Matting is required on permanent channels where the runoff velocity exceeds two and half feet per second (2.5 fps) or the shear stress exceeds two pounds per square foot (2 lbs/ft²). On temporary channels discharging to a sediment trapping practice, provide matting where the runoff velocity exceeds four feet per second (4 fps).
- 3. Temporary soil stabilization matting is made with degradable (lasts 6 months minimum), natural, or manmade fibers of uniform thickness and distribution of fibers throughout and is smolder resistant. The maximum permissible velocity for temporary matting is 6 feet per second.

4. Permanent soil stabilization matting is an open weave, synthetic material consisting of non-

maximum permissible velocity for permanent matting is 8.5 feet per second. 5. Calculate channel velocity and shear stress using the following procedure:

 $\tau = \text{shear stress (lb/ft}^2)$

Shear Stress (τ) is a measure of the force of moving water against the substrate and is calculated as:

degradable fibers or elements of uniform thickness and distribution of weave throughout. The

- γ = weight density of water (62.4 lb/ft³)
- R = average water depth (hydraulic radius) (ft) S_w = water surface slope (ft/ft)

v = velocity (ft/sec)

Velocity (v) measures the rate of flow through a defined area and is calculated as:

$v = \frac{1.486R^{\frac{2}{3}}s^{\frac{1}{2}}}{1}$

n = Manning's roughness coefficient R = hydraulic radius (ft) s = channel slope (ft/ft)

6. Use Table B.7 to assist in selecting the appropriate soil stabilization matting for slope applications based on the slope, the slope length, and the soil-erodibility K factor.

Table B.7: Soil Stabilization on Slopes

Slope	20:	1 or F (≤5%	THE THE PARTY OF T		20:1 to >5 - 25	C (HILLIAN)	***	4:1 to 3			3:1 to 2 33 - 40	DECKIMI.		5:1 to 2 -40 - 50		To provide runoff of th	COLUMN TO SERVICE DE LA COLUMN TO SERVICE DESCRICA DE LA COLUMN TO SERVICE DE
Slope Length (feet)*	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120		
Straw Mulch/Wood Cellulose Fiber					for	K ≤ 0.3	5***									This practic	ce applies to
Temporary Matting with Design Shear Stress ≥ 1.5 lb/sf																travel lanes).
Temporary Matting with Design Shear Stress ≥ 1.75 lb/sf																1.	A minimu
Temporary Matting with Design Shear Stress ≥ 2.0 lb/sf							ä									2.	Select the control.
Temporary Matting with Design Shear Stress ≥ 2.25 lb/sf																3.	The transp traffic and Additiona

Effective range for all K values unless otherwise specified

- * Slope length includes contributing flow length.
- ** Slopes steeper than 2:1 must be engineered. *** Soil having a K value less than or equal to 0.35 can be stabilized effectively with straw mulch or wood cellulose fiber when located on slopes steeper than 5%. Soil stabilization matting is required on all slopes steeper than 5% that have soil with a K factor greater than 0.35. K factor ratings are published in the NRCS Soil Survey http://websoilsurvey.nrcs.usda.gov/app. During construction or reclamation, the soilerodibility K value should represent the upper 6 inches of the final fill material re-spread as the last lift. Only the effects of rock fragments within the soil profile are considered in the estimation of the K value. Do not adjust K values to account for rocks on the soil surface or increases in soil organic matter related to management activities.

B.37

Vegetation must be established and maintained so that the requirements for Adequate Vegetative Establishment are continuously met in accordance with Section B-4 Vegetative Stabilization.

HEAVY USE AREA PROTECTION

B-4-7 STANDARDS AND SPECIFICATIONS

The stabilization of areas frequently and intensively used by surfacing with suitable materials (e.g., mulch and

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

provide a stable, non-eroding surface for areas frequently used and to improve the water quality from the

Conditions Where Practice Applies

his practice applies to intensively used areas (e.g., equipment and material storage, staging areas, heavily used

- 1. A minimum 4-inch base course of crushed stone or other suitable materials including wood chips
- over nonwoven geotextile should be provided as specified in Section H-1 Materials. 2. Select the stabilizing material based on the intended use, desired maintenance frequency, and runoff
- 3. The transport of sediments, nutrients, oils, chemicals, particulate matter associated with vehicular traffic and equipment, and material storage needs to be considered in the selection of material. Additional control measures may be necessary to control some of these potential pollutants.

4. Surface erosion can be a problem on large heavy use areas. In these situations, measures to reduce

the flow length of runoff or erosive velocities need to be considered.

The heavy use areas must be maintained in a condition that minimizes erosion. This may require adding suitable material, as specified on the approved plans, to maintain a clean surface.

B-4-8 STANDARDS AND SPECIFICATIONS

STOCKPILE AREA

To provide a designated location for the temporary storage of soil that controls the potential for erosion,

sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies

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

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

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

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

B.42

OK ROAD
ND 21152
316-7800
-7818

RIDGEBROOK (410) (9316) (410) ww.kg 936





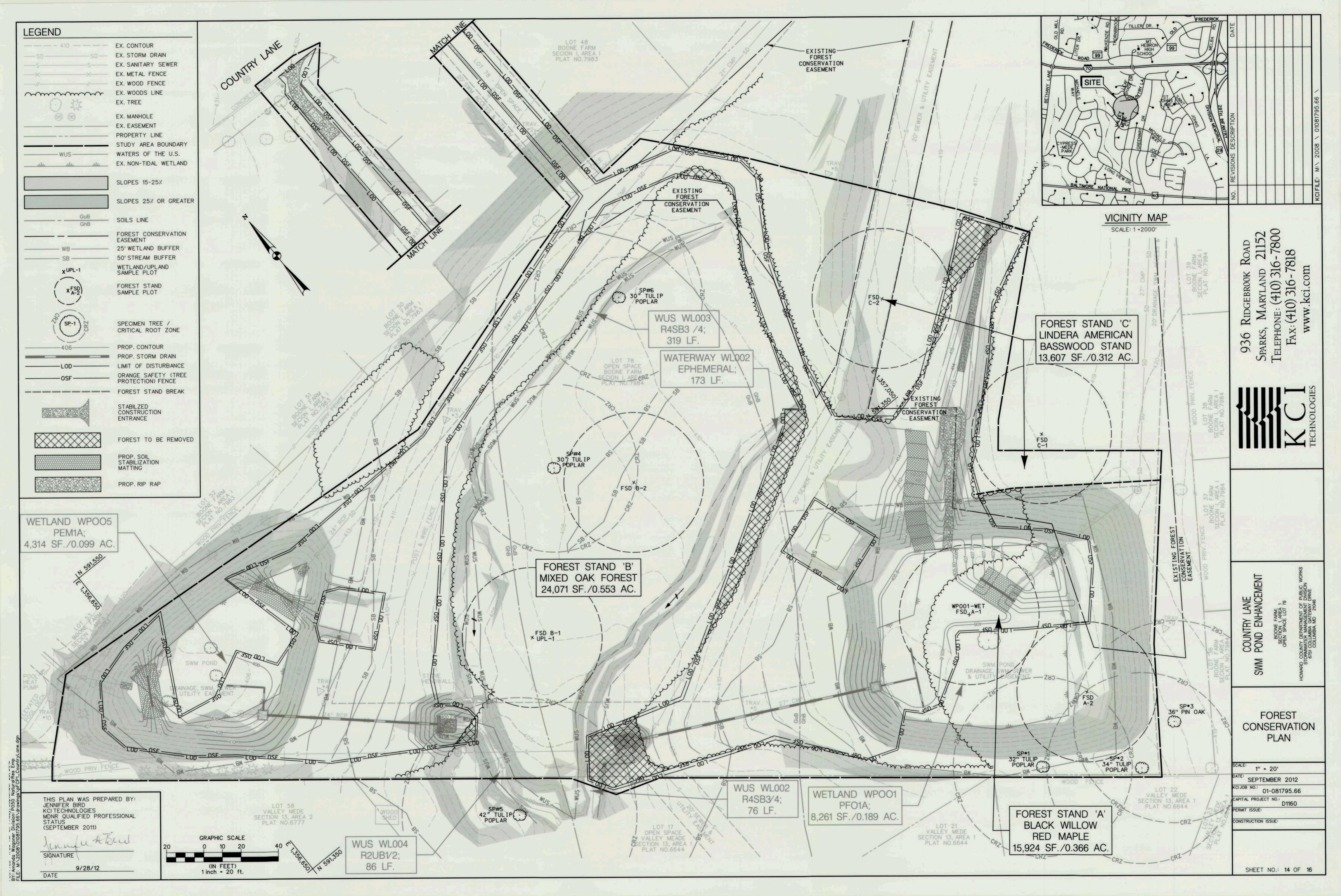
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EROSION & SEDIMENT CONTROL **NOTES**

NOT TO SCALE SEPTEMBER 2012 01-081795.66 CAPITAL PROJECT NO. PERMIT ISSUE:

CONSTRUCTION ISSUE:

SHEET NO.: 13 OF 16

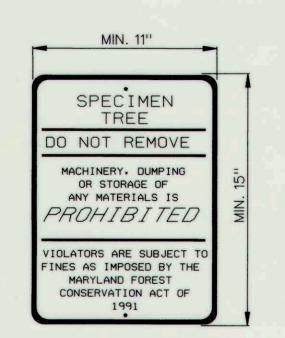


FOREST CONSERVATION NOTES

- 1. THE LOD WAS USED AS THE TOTAL TRACT AREA AND AS THE NET TRACT AREA (NTA) FOR FOREST CONSERVATION CALCULATIONS.
- NO CLEARING WILL OCCUR WITHIN A 100-YEAR FLOODPLAIN.
- APPROXIMATELY 0.14 ACRES OF FOREST CLEARING IS PROPOSED,
 3. REQUIRING 0.39 ACRES OF MITIGATION. APPROXIMATELY 1,065 SF.
 OF CLEARING IS WITHIN A FOREST CONSERVATION EASEMENT.
 THE FOREST CONSERVATION EASEMENT WILL BE REPLACED AT A
 1:1 RATIO AS SHOWN ON THE LANDSCAPE PLAN.
- 4. ALL EFFORTS TO MINIMIZE THE AREA OF DISTURBANCE WILL BE MADE.

GENERAL NOTES

- 1. PROJECT AREA IS LOCATED ON ONE PROPERTY OWNED BY HOWARD COUNTY RECREATION AND PARKS (MAP 0024, GRID 0002, PARCEL 0020).
- 2. EXISTING ZONING: R-20, SINGLE
- 3. EXISTING LAND USE: RESIDENTIAL RURAL MEDIUM DENSITY
- 4. WATERS OF THE U.S. WERE DELINEATED BY KCITECHNOLOGIES, INC. ON DECEMBER 2, 2011 AND MARCH 9, 2012. WATERS OF THE U.S. SHOWN REPRESENT THE UNVERIFIED USACE/MDE WATER RESOURCE BOUNDARIES.
- 5. TOTAL AREA OF NONTIDAL WETLANDS WITHIN THE PROJECT AREA: 0.288 AC.
- 6. TOTAL LINEAR FEET OF PERENNIAL AND INTERMITTENT STREAMS: 481 LF.
- 7. TOTAL FORESTED AREA WITHIN LIMITS OF DISTURBANCE: 0.14 AC.
- 8. THERE ARE NO CRITICAL HABITAT AREAS WITHIN THE PROJECT AREA. NO RARE, THREATENED OR ENDANGERED SPECIES WERE ENCOUNTERED DURING THE FIELD INVESTIGATIONS. IN ADDITION, CORRESPONDENCE WITH THE MARYLAND HISTORIC TRUST, THE U.S. FISH AND WILDLIFE SERVICE, AND THE MARYLAND DEPARTMENT OF NATURAL RESOURCES INDICATE THERE ARE NO RECORDS OF HISTORIC RESOURCES OR SENSITIVE NATURAL RESOURCES WITHIN THE AFFECTED AREA.
- 9. NO SPECIMEN TREES WILL BE REMOVED.
- 10. TREES WILL ONLY BE REMOVED IF NECESSARY FOR GRADING OR ACCESS.
- 11. THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NUMBERS 30EC AND 31GB WERE USED FOR THIS SITE. THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH ONE FOOT CONTOUR INTERVALS PREPARED BY KCI TECHNOLOGIES, INC., IN JANUARY 2011.
- 12. ALL WETLAND AND WUS SYSTEMS DENOTED WITH AN ASTERISK (*)
 CONTINUE BEYOND THE LIMITS OF THE STUDY AREA.





FOREST CONSERVATION SIGNAGE

NOT TO SCALE

NOTES:

- 1. BOTTOM OF SIGN TO BE HIGHER THAN TREE PROTECTION FENCE.
- 2. SIGNS TO BE PLACED 50 TO 100' APART. CONDITIONS ON SITE AFFECTING VISIBILITY MAY WARRANT PLACING SIGNS CLOSER OR FARTHER APART WITHIN THE ACCEPTABLE NOTED RANGE.
- 3. ATTACHMENT OF SIGNS TO TREES IS PROHIBITED.
- 4. SIGNS MAY BE REMOVED FROM RESIDENTIAL LOTS UPON ISSUANCE OF USE AND OCCUPANCY RETENTION FOREST ONLY.
- 5. ALL SIGNAGE MUST REMAIN DURING THE MAINTENANCE PERIOD.
- 6. THE SIGNS NOTIFY CONSTRUCTION WORKERS AND FUTURE RESIDENTS OF THE NEWLY PLANTED MATERIAL, IMPROVING THE TREES' SURVIVAL
- 7. SIGNS MAY BE ADAPTED BY RESIDENTS FOR IDENTIFICATION OF FOREST RETENTION AREAS.

THIS PLAN WAS PREPARED BY:
JENNIFER BIRD
KCI TECHNOLOGIES
MDNR QUALIFIED PROFESSIONAL
STATUS
(SEPTEMBER 2011)

SIGNATURE

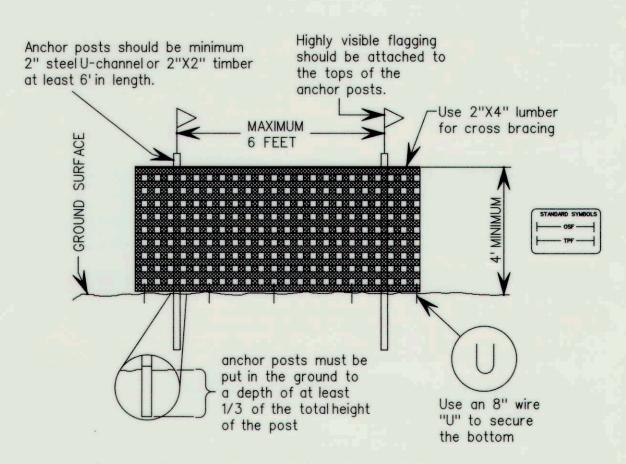
9/28/2012

SOILS TABLE

Soil Symbol	Soil Unit Name	Percent Slope	K, value	Hydric (Y/N
GhB	Glenelg-Urban land complex	0-8%	N/A	No
GuB	Glenville-Urban land-Udorthents complex	0-8%	0.37	No

SPECIMEN TREE TABLE

Number	Species	Common Name	Size, DBH (in)	Condition
SP-1	Liriodendron tulipifera	Tulip poplar	32.0	Good
SP-2	Liriodendron tulipifera	Tulip poplar	34.0	Good
SP-3	Quercus palustris	Pin oak	36.0	Good
SP-4	Liriodendron tulipifera	Tulip poplar	30.0	Good
SP-5	Liriodendron tulipifera	Tulip poplar	42.0	Good
SP-6	Liriodendron tulipifera	Tulip poplar	30.0	Good



BLAZE ORANGE PLASTIC MESH SAFETY FENCE/TREE PROTECTION DETAIL

NOT TO SCALE

PLACEMENT OF ORANGE HIGH VISIBILITY FENCE:

- 1. ORANGE HIGH VISIBILITY FENCE SHALL BE MANUALLY INSTALLED ALONG THE LIMITS OF DISTURBANCE, WHERE THAT LIMIT IS WITHIN 50' OF THE FOREST CONSERVATION/FOREST BUFFER EASEMENTS AND SHALL FUNCTION AS A FOREST PROTECTION DEVICE.
- 2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
- 3. BOUNDARIES OF THE RETENTION AREA SHALL BE STAKES AND FLAGGED PRIOR TO INSTALLING THE DEVICE.
- 4. ROOT DAMAGE SHALL BE AVOIDED.
- 5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
- 6. DEVICE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

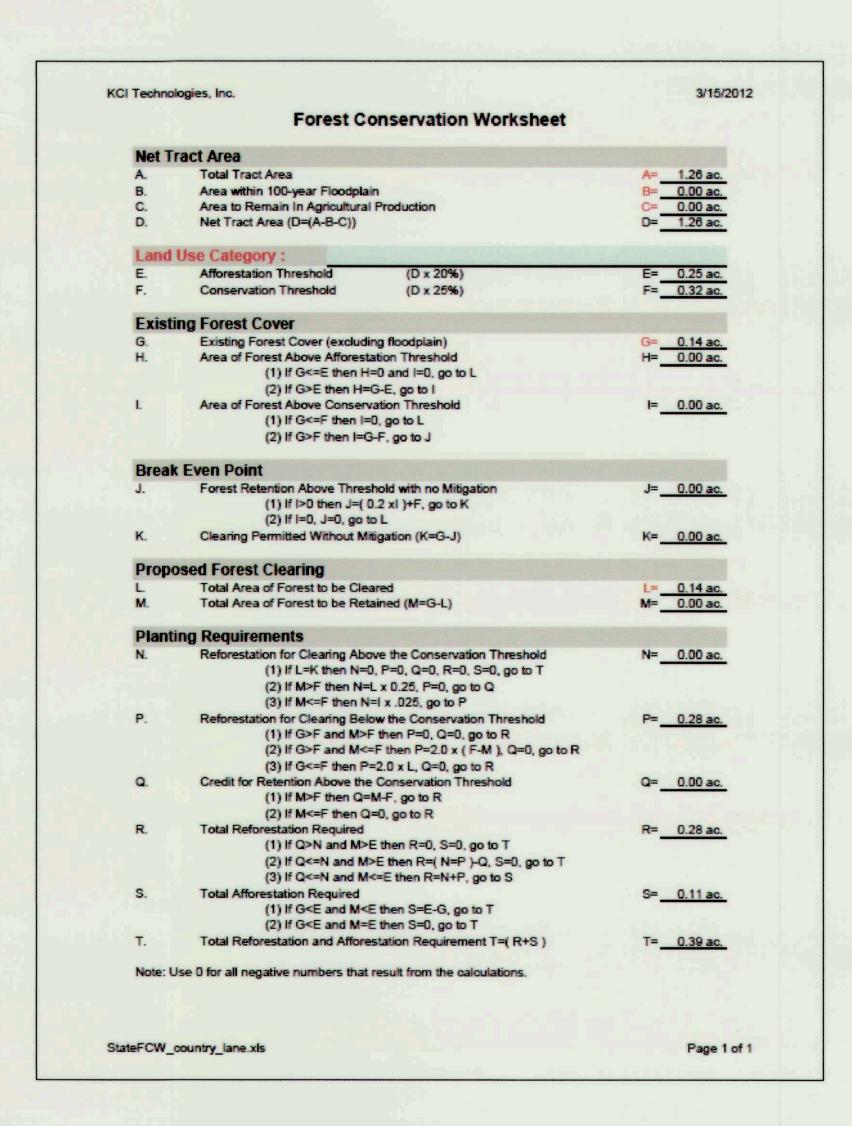
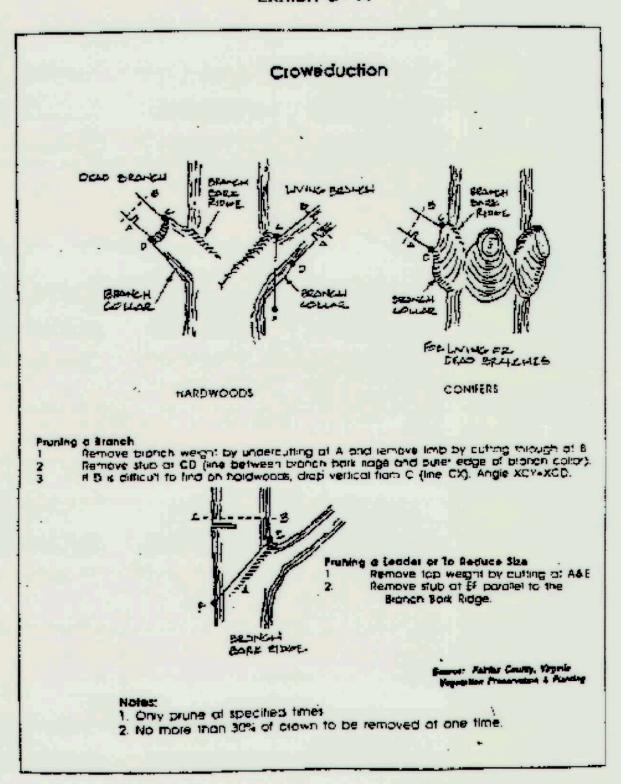


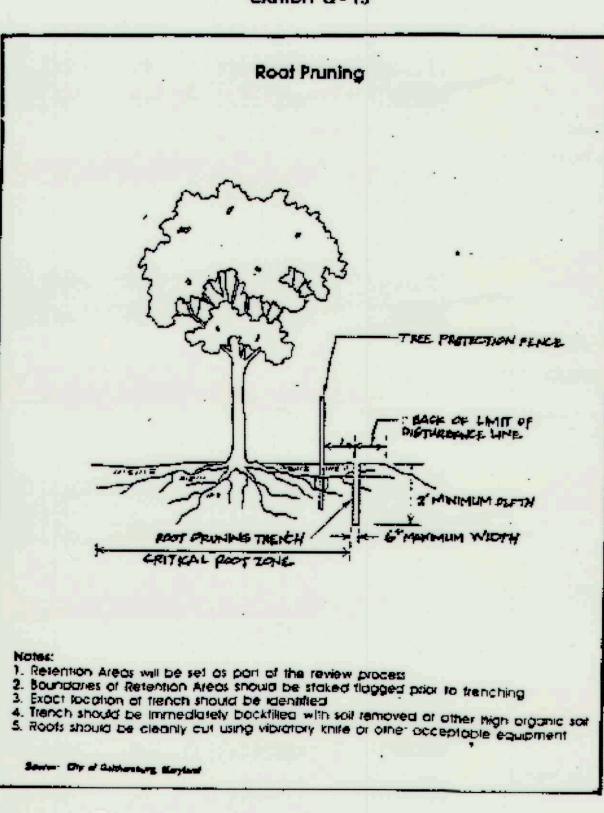
EXHIBIT G - 14



CROWN REDUCTION

NOT TO SCALE

EXHIBIT G - 15



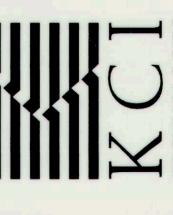
ROOT PRUNING
NOT TO SCALE

NO. REVISIONS DESCRIPTION

DATE

KCIFILE: M:\ 2008 \ 01081795.66 \

SPARKS, MARYLAND 21152
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WM POND ENHANCEMENT

BOONE FARM:

SECTION 1, AREA 1

OPEN SPACE LOT 78

STORMWATER MANAGEMENT DIVISION

FOREST CONSERVATION PLAN NOTES AND DETAILS

AS SHOWN

DATE: SEPTEMBER 2012

KCI JOB NO.: 01-081795.66

CAPITAL PROJECT NO.: D1160

PERMIT ISSUE:

CONSTRUCTION ISSUE:

SHEET NO.: 15 OF 16

