SWM REHABILITATION
LONGRIDGE KNOLLS
POND "A"

LOT 31
LONGRIDGE KNOLLS
SECTION 1, AREA 1
HOWARD COUNTY, MARYLAND

INDEX OF SHEETS

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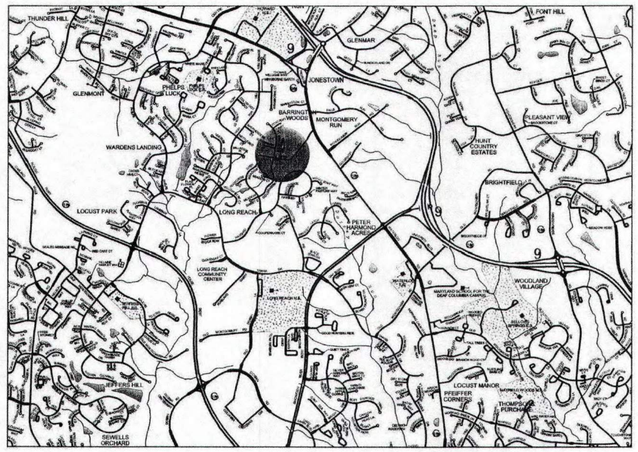
LEGEND

- STABILIZED CONSTRUCTION ENTRANCE (SCE)
- RIPRAP PROTECTION
- LIMIT OF DISTRURBANCE (LOD)
- SUPER SILT FENCE (SSF)
- FILTER BAG
- TYPE "A" SOIL STABILIZATION MATTING
- EXISTING CONTOURS (465)
- PROPOSED CONTOURS (465)
- PROPOSED STORMDRAIN (HOWARD COUNTY)
- EXISTING UTILITIES
- EXISTING FENCE
- EDGE OF PAVEMENT
- EXISTING BUILDINGS
- EXISTING STORM DRAIN (24"RCP)
- EDGE OF WATER
- EXISTING TREE LINE
- SPECIMEN TREE (30" TULIP POPLAR)
- PROPERTY BOUNDARY
- WATERS OF THE US (WUS)
- NONTIDAL WETLAND BOUNDARY
- 25' NONTIDAL WETLAND BUFFER (B)



VICINITY MAP
SCALE: 1" = 2000

GENERAL NOTES

1. THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS/ BUREAU OF ENGINEERING CONSTRUCTION INSPECTION DIVISION AT (410)-313-1880 AT LEAST FIVE (5) WORKING DAYS BEFORE STARTING WORK. THE CONTRACTOR SHALL NOTIFY MISS UTILITY AT 1-(800)-257-7777 AT LEAST TWO (2) WORKING DAYS BEFORE STARTING WORK.

2. THE HORIZONTAL AND VERTICAL CONTROL FOR THESE PLANS ARE BASED ON THE MARYLAND STATE SYSTEM OF PLANE COORDINATES AS ESTABLISHED FROM THE FOLLOWING HOWARD COUNTY CONTROL POINTS:

	NORTH	EAST	ELEV.
31GM2	—	—	525.110
31GA	564925.802	1367067.640	511.698
37A4	563835.945	1367971.630	437.273

THE SYSTEM OF COORDINATES USED IS BASED ON THE FOLLOWING DATUMS AND PROJECTIONS:

HORIZONTAL: NAD83/07
VERTICAL: NAVD88

3. THE ORIGINAL AS-BUILT FOR THIS POND WAS APPROVED BY HSCD ON FEBRUARY 17, 1986 (F-89-76)

4. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY.

5. ALL WORK SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF THE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL." ISSUED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT AND THE NATURAL RESOURCES CONSERVATION SERVICE.

6. TOPOGRAPHIC SURVEYS WERE PERFORMED BY AB CONSULTANTS, INC., IN SEPTEMBER, 2013.

7. THE PROPERTY LINES AND EASEMENT LINES ARE APPROXIMATE.

8. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE PLANS AND THE FIELD CONDITIONS, THE COUNTY IS TO BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING THE COUNTY, THEN THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.

9. CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHOD, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFTEY PRECAUTIONS AND PROGRAMS.

10. APPROXIMATE UTILITIES ARE SHOWN FROM AVAILABLE RECORDS AND/ OR FIELD RECONNAISSANCE, THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO LOCATE AND PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTORS EXPENSE.

UTILITY CONTACTS:

BGE (ELECTRIC): (410)-597-7920
BGE (GAS): (410)-291-4844
VERIZON: (410)-224-9285
COMCAST: (301)-630-7094

11. THE WETLAND DELINEATION FOR THIS PROJECT WAS PERFORMED BY CENTURY ENGINEERING IN AUGUST, 2013.

12. ALL WORK SHALL BE CONSTRUCTED ACCORDING TO THE REQUIREMENTS OF THE NONTIDAL WETLANDS AND WATERWAYS PERMIT APPROVED 07/03/2014. (MDE TRACKING # 14-NT-3157)

13. THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) HAS NO OBLIGATION OF REFORESTATION FOR THIS PROJECT.

14. ALL SPECIFIED OR PROPRIETARY PRODUCTS SHOWN HEREON MAY BE SUBJECT TO SUBSTITUTION WITH OTHER PRODUCTS RECOMMENDED BY THE CONTRACTOR, SUBJECT TO WRITTEN REVIEW AND APPROVAL BY THE COUNTY.

15. ON JUNE, 30, 2015 THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS HAS GRAN TED A WAIVER FOR THE HYDRAULIC GRADIENT REQUIREMENTS FOR THE EXISTING STORM DRAIN SYSTEM (DMV I: SECTION 4.1.1.G.).

SPECIAL CONTRACTOR NOTES

1. IN-STREAM WORK IS PROHIBITED FROM MARCH 1ST TO MAY 31, INCLUSIVE. STREAM CLASSIFICATION, USE IV-P.

2. FEMA FIRM PANEL NO. 24004400034B, NO FEMA REGULATED FLOODPLAINS ARE LOCATED WITHIN THE STUDY AREA.

3. CONTRACTOR SHALL CONTINUALLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.

4. THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES INVOLVING EITHER CUT AND FILL OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN SHALL BE MADE IN A MANNER THAT DOES NOT DISTURB THE CRITICAL ROOT ZONE WITHIN THE DRIPLINE OF THE TREE. PROTECTIVE ORANGE FENCING SHALL BE INSTALLED AROUND THE PERIMETER OF THE CRITICAL ROOT ZONE PRIOR TO CONSTRUCTION. THE LOCATION OF THE PROTECTIVE ORANGE FENCING SHALL BE APPROVED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS PRIOR TO CONSTRUCTION.

5. CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS AND/OR SUPPLIES BEYOND THE ORANGE FENCING.

6. UPON COMPLETION OF THE WORK, BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE ALL REMNANTS OF CONSTRUCTION MATERIALS FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.

7. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN.

8. TREES WITHIN THE "NO WOODY VEGETATION ZONE" MARKED ON THE PLANS SHALL BE REMOVED ACCORDING TO "TECHNICAL NOTE 705 - OPERATIONS AND MAINTENANCE ALTERNATIVES FOR REMOVING TREES ON DAMS". ALL OTHER TREES TO BE REMOVED SHALL BE CUT AT THE BASE WITH A SAW AND NOT PUSHED OVER. TREE STUMPS MAY BE LEFT IN PLACE, UNLESS OTHERWISE DIRECTED ON THE PLANS.

9. ALL MATERIAL SHALL BE REMOVED AND DISPOSED OF OFFSITE. REMOVED TREES AND BRUSH MAY BE REDISTRIBUTED ON SITE AT THE DISCRETION OF THE COUNTY OR HIS/HER REPRESENTATIVE.

10. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN EXITING THE PROJECT SITE AND PAY CLOSE ATTENTION TO PEDESTRIANS WALKING NEAR THE WORK SITE.

11. WORKING HOURS ARE 7 AM TO 7 PM MONDAY THROUGH FRIDAY.

12. THE CONTRACTOR SHALL AVOID TRACKING HEAVY EQUIPMENT OVER THE CRITICAL ROOT ZONE OF SPECIMEN TREES. IF UNAVOIDABLE, LOAD MATTS SHOULD BE USED WHEN TRACKING OVER THE CRITICAL ROOT ZONES.

ENGINEERS CERTIFICATE

"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 COUNTY SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/ SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD COUNTY SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Thomas G. Truxal Jr. — 7/13/15
SIGNATURE OF ENGINEER (PRINTNAME BELOW SIGNATURE) — DATE
THOMAS G. TRUXAL JR.

DEVELOPERS CERTIFICATE

"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 ATTENDENCE AT A DEPARTMENT OF THE ENVIRONEMENT 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.

Mark S. Richmond — 9/17/15
SIGNATURE OF DEVELOPER (PRINTNAME BELOW SIGNATURE) — DATE
Mark S. Richmond

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

9/17/15
DIRECTOR OF PUBLIC WORKS

9/17/15
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

Mark S. Richmond 9/17/15
CHIEF, STORMWATER MANAGEMENT DIVISION

AS-BUILT CERTIFICATION

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

Thomas G. Truxal — PE. No. 16997 — DATE 6/24/16
SIGNATURE

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

John R. Robertson — 7/20/15
HOWARD SCD — DATE

PERMIT INFORMATION CHART

SUBDIVISION NAME		SECTION/AREA		LOT/PARCEL#
LONG RIDGE KNOLLS		SECTION 1, AREA 1		31/5
PLAT# OR L/F	GRID#	ZONING	TAX MAP NO.	ELECT. DISTR.	CENSUS TRACT
9866	6	R-12	36	2ND	6066
WATER CODE			SEWER CODE	
G-07			5335300	

PROFESSIONAL CERTIFICATION.

"I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND."

LICENSE NO. 16997
EXPIRATION DATE 7-19-2016

MISS UTILITY

CALL "MISS UTILITY" AT 1-(8010)-257-777, 48 HOURS PRIOR TO THE START OF WORK. THE EXCAVATOR MUST NOTIFY ALL PUBLIC UTILITY COMPANIES WITH UNDERGROUND FACILITIES IN THE AREA OF THE PROPOSED EXCAVATION AND HAVE THOSE FACILITIES LOCATED BY THE UTILITY COMPANIES PRIOR TO COMMENCING EXCAVATION.

SUMMARY OF ENVIRONMENTAL IMPACTS

	TREE REMOVAL (EACH)	STREAM DISTURBANCE (LF)	WETLAND DISTURBANCE (SQ. FT)	LIMIT OF DISTURBANCE (SQ. FT.)	LIMITS OF DISTURBANCE(AC.)	CUT (CY)	FILL (CY)	NET (CY)
TOTAL	8	31	0	29,500	0.68	150	175	+25

CLIENT

HOWARD COUNTY DPW
ENVIRONMENTAL SERVICES
6751 GATEWAY DRIVE, SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6444

DATE: 09.18.13 ISSUES / REVISIONS

CENTURY ENGINEERING
CONSULTING ENGINEERS – PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MD 21031
Phone: (443) 589-2400 Fax: (443) 589-2401

SWM REHABILITATION
LONGRIDGE KNOLLS
POND "A"

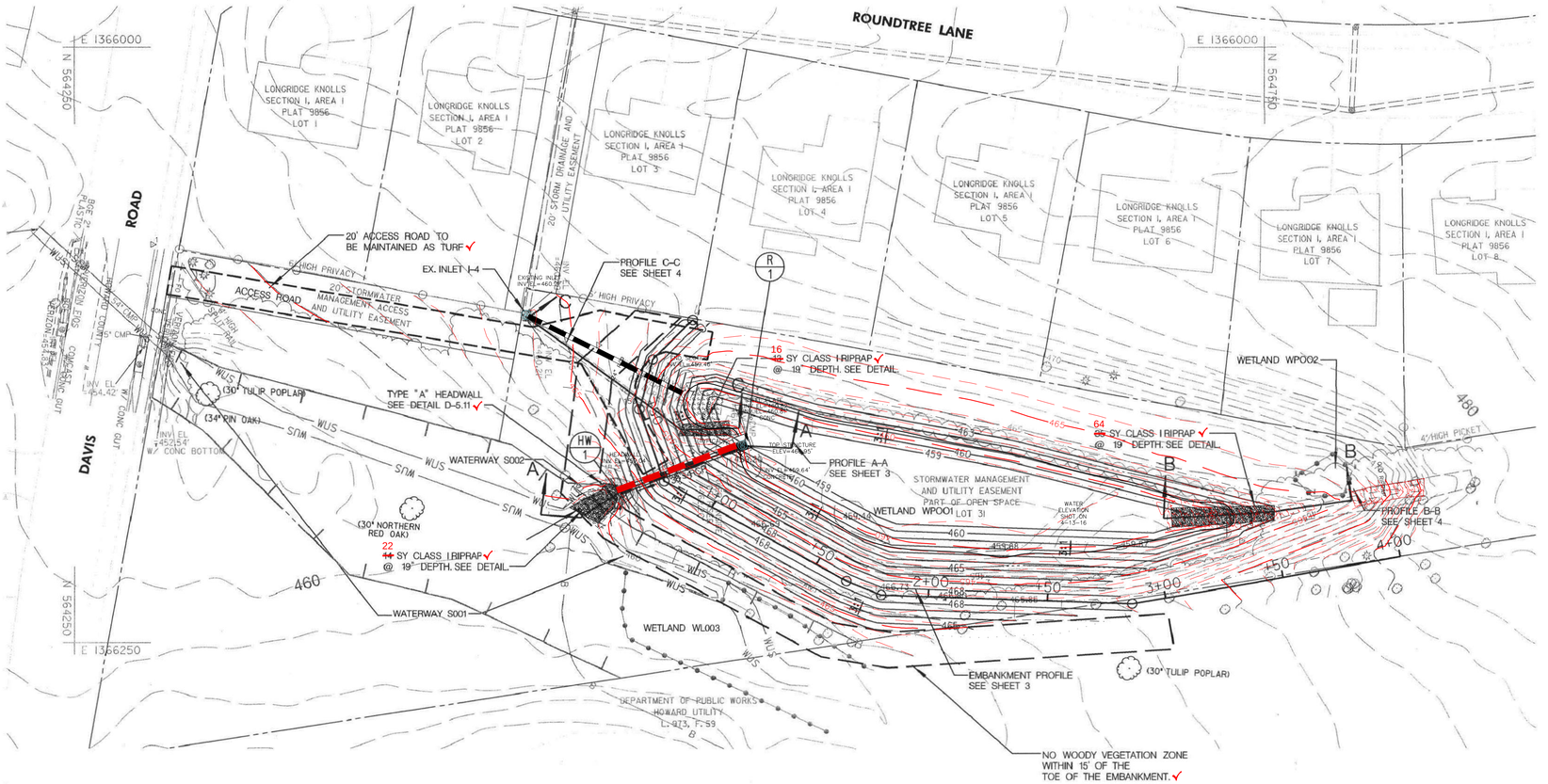
TITLE:

TITLE SHEET

PROJECT NO.: SWM DB #28-2012
SCALE:
SEAL:
BY: JMS
CHECK:
DWG. NO.:

1 OF 15

PROPOSED POND IMPROVEMENTS		
WQ VOLUME REQUIRED	0.289 AC-FT	
WQ VOLUME EXISTING	0.234 AC-FT	
WQ VOLUME PROVIDED	~~0.236~~ AC-FT	0.283
ORIFICE ELEVATION	~~460.90~~	460.97
ORIFICE DIAMETER	8.1 INCHES ✓	
2-YR Q ORIGINAL	12.4 CFS	
2-YR Q PROVIDED	~~11.6~~ CFS	8.6
10-YR Q ORIGINAL	36.8 CFS	
10-YR Q PROVIDED	~~35.9~~ CFS	34.2
MID-FLOW WEIR ELEVATION	~~464.40~~	464.39
PRINCIPAL SPILLWAY ELEVATION	~~465.30~~	465.33
Q 100 YEAR	~~44.1~~ CFS	43.0



EMBANKMENT BASELINE COORDINATES		
STATION	NORTHING	EASTING
0+00.00	564,507.38	1,366,108.53
0+23.67	564,490.67	1,366,125.30
0+45.31	564,484.85	1,366,146.13
0+77.09	564,495.30	1,136,176.14
1+64.44	564,571.93	1,366,218.08
1+80.17	564,586.53	1,366,223.93
2+85.76	564,692.05	1,336,227.67
4+00.00	564,804.56	1,366,208.36

LEGEND

- RIPRAP PROTECTION
- EXISTING CONTOURS (465)
- PROPOSED CONTOURS (465)
- PROPOSED STORMDRAIN (HOWARD COUNTY)
- EXISTING UTILITIES
- EXISTING FENCE
- EDGE OF PAVEMENT
- EXISTING BUILDINGS
- EXISTING STORM DRAIN (24" RCP)
- EDGE OF WATER
- EXISTING TREE LINE
- SPECIMEN TREE (30" TULIP POPLAR)
- PROPERTY BOUNDARY
- WATERS OF THE US (WUS)
- NONTIDAL WETLAND BOUNDARY
- 25' NONTIDAL WETLAND BUFFER (B)
- 100 YR-FLOODPLAIN (TAKEN FROM F-89-76)

30' 0 30' 60'
SCALE: 1" = 30'

STRUCTURE TABLE

No.	STATION	OFFSET	TOP ELEVATION	INVERT ELEV.	NOTES
R-1	0+73.71	35.92 LT.	~~466.97~~ 466.95	~~459.75~~ 459.64	SEE DETAIL ON SHEET 7 AND 8 OF 15
HW-1	0+75.07	19.75 RT.	~~463.00~~ 463.08	~~459.00~~ 459.04	D-5.11 ✓

PIPE SCHEDULE

SIZE	TYPE	LENGTH
30" ✓	B-25 ASTM C-361 ✓	~~54 L.F.~~ 53.4

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

9/18/15

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

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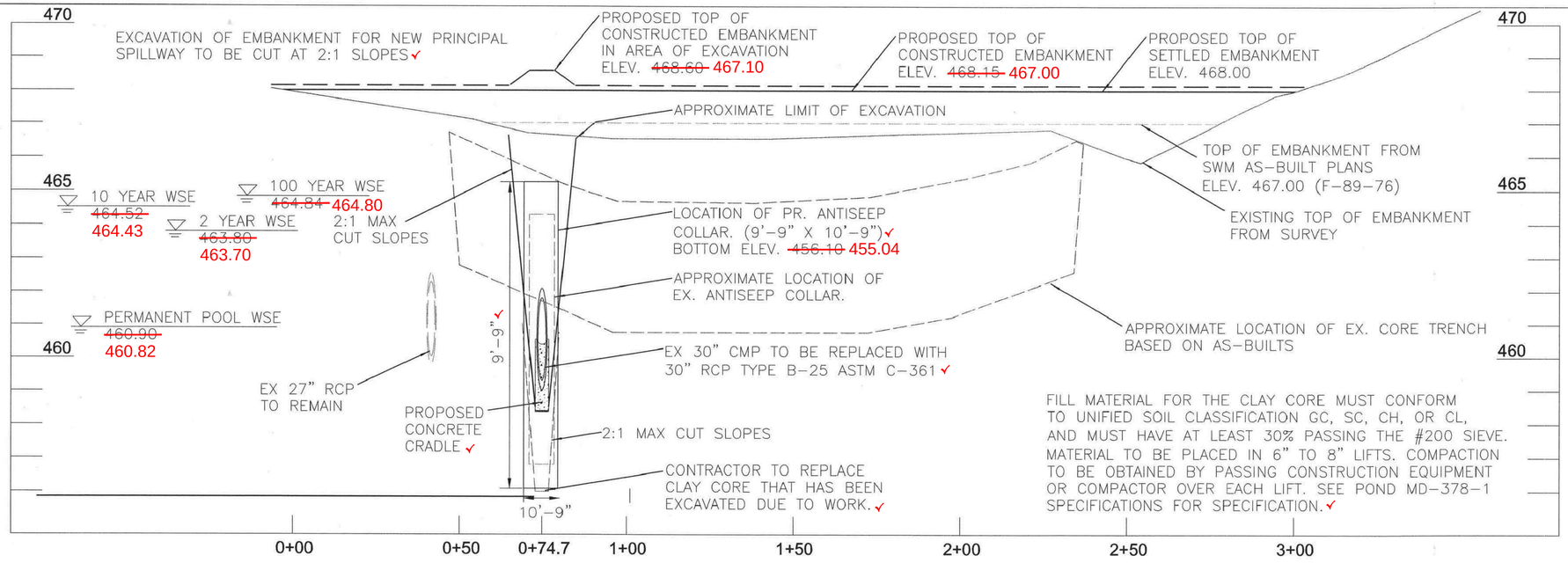
SWM REHABILITATION LONGRIDGE KNOLLS POND "A"

TITLE:

STORMWATER MANAGEMENT PLAN

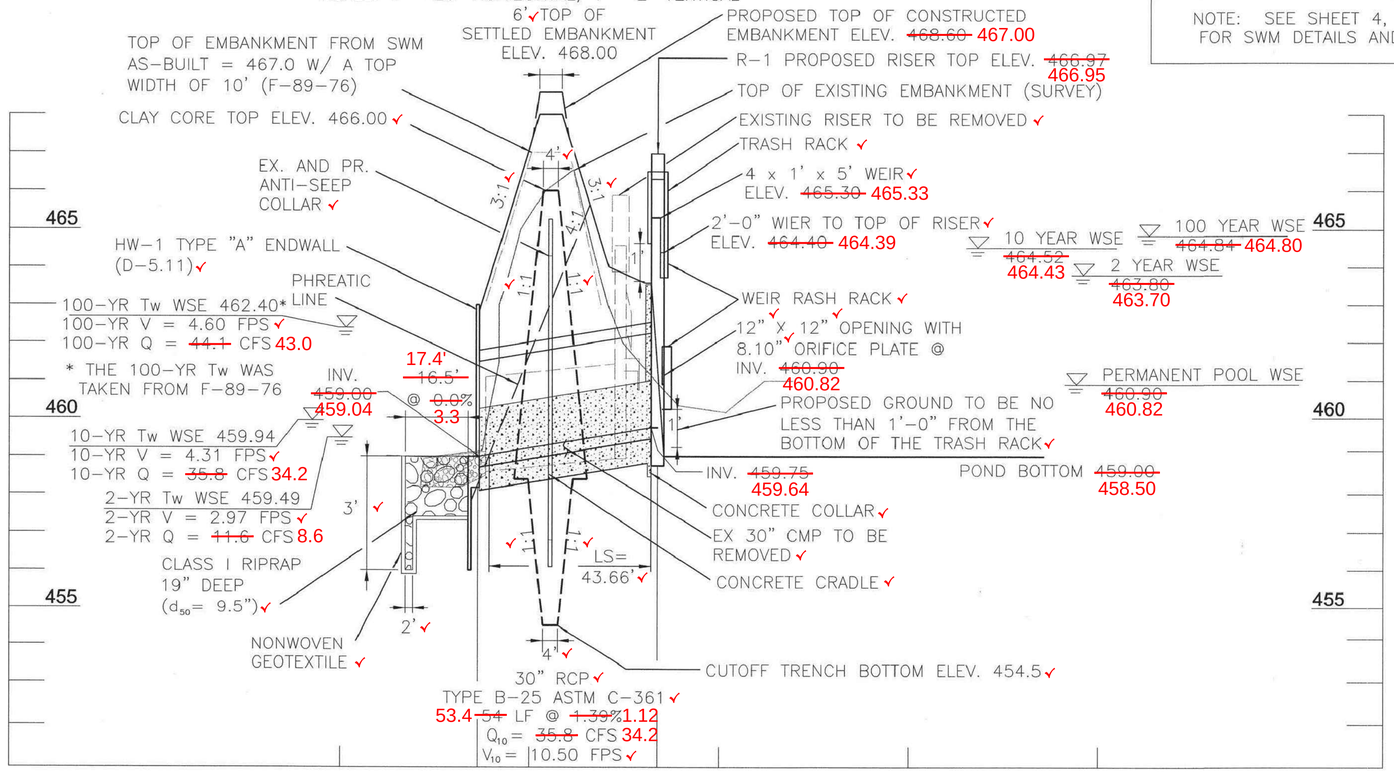
PROJECT NO.: SWM DB #28-2012
SCALE: 1" = 30'
SEAL: STATE OF MARYLAND TRAVIS S. TOMLAND NO. 16997 REGISTERED PROFESSIONAL ENGINEER
BY: JMS CHECK:
DWG. NO.:



LONG RIDGE KNOLLS: EMBANKMENT PROFILE

SCALE: 1"= 20' HORIZONTAL; 1"= 2' VERTICAL

NOTE: SEE SHEET 4, 5, 6, 7, AND 8 FOR SWM DETAILS AND SPECIFICATIONS



SECTION A-A: LONG RIDGE KNOLLS POND "A": PRINCIPAL SPILLWAY PROFILE

SCALE: 1"= 20' HORIZONTAL; 1"= 2' VERTICAL

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES 8/18/15

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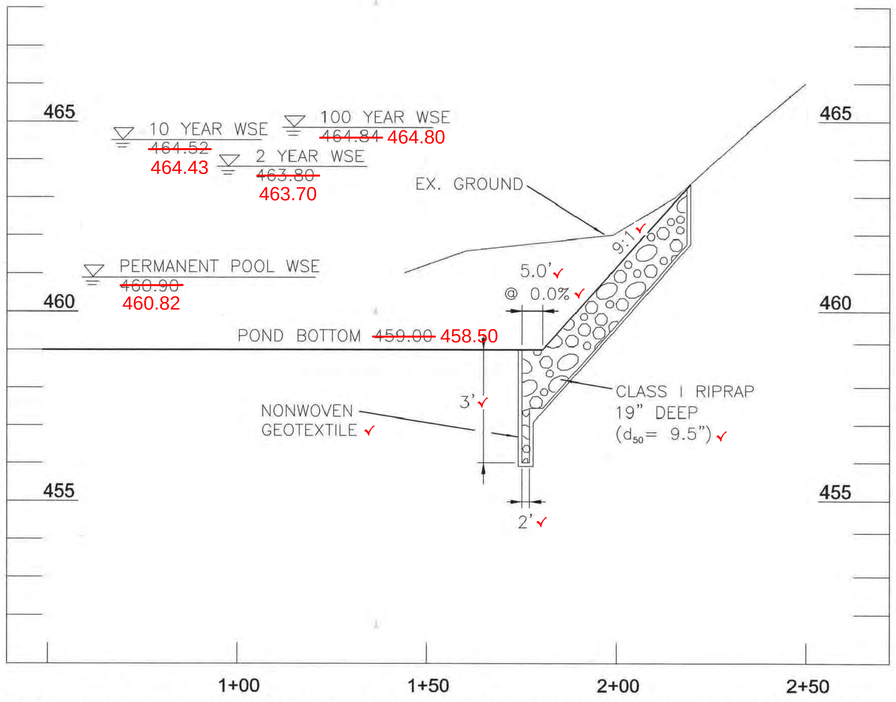
SWM REHABILITATION LONGRIDGE KNOLLS POND "A"

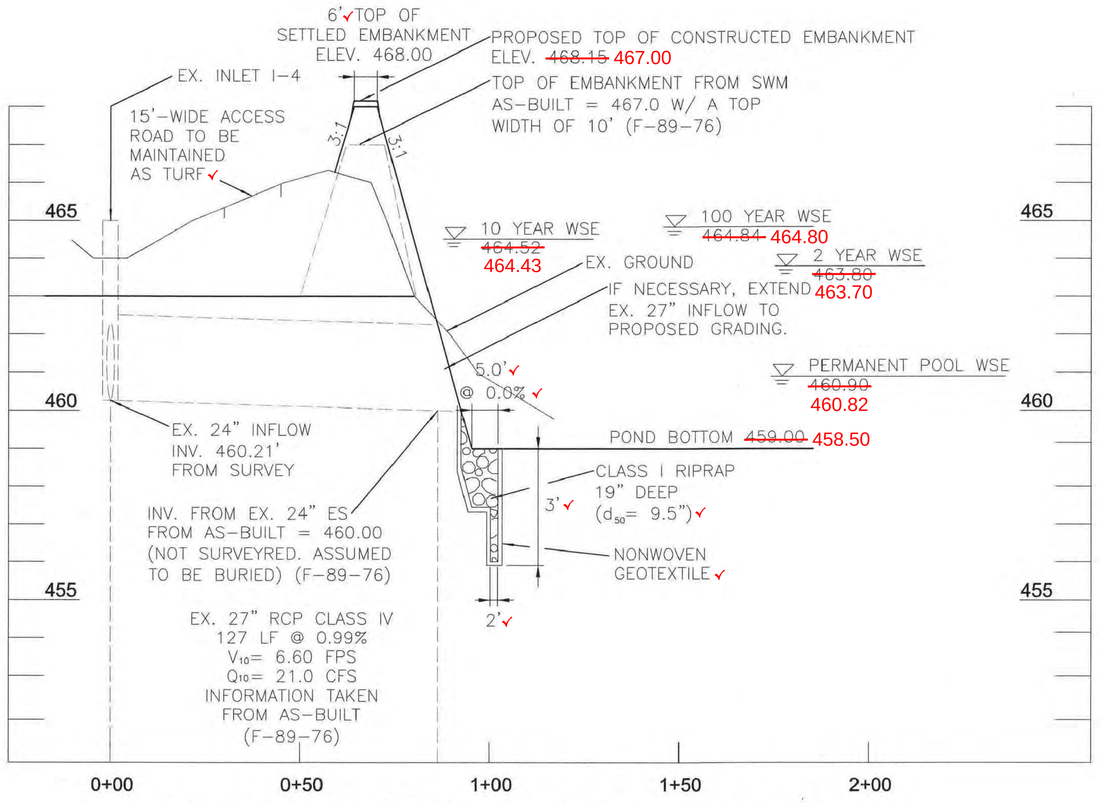
TITLE: STORMWATER MANAGEMENT PROFILES

PROJECT NO.: SWM DB #28-2012
SCALE: AS-SHOWN
SEAL: STATE OF MARYLAND THOMAS G. THOMPSON No. 16997 REGISTERED PROFESSIONAL ENGINEER
BY: JMS CHECK:
DWG. NO.:



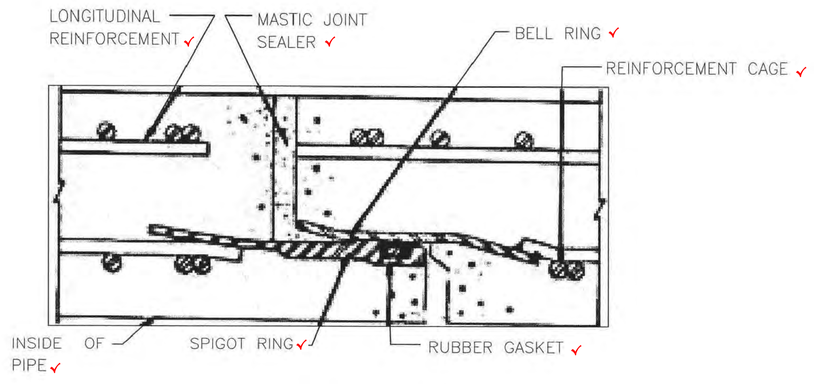
SECTION B-B: LONG RIDGE KNOLLS POND "A": RIPRAP INFLOW DITCH PROFILE

SCALE: 1"= 20' HORIZONTAL; 1"= 2' VERTICAL



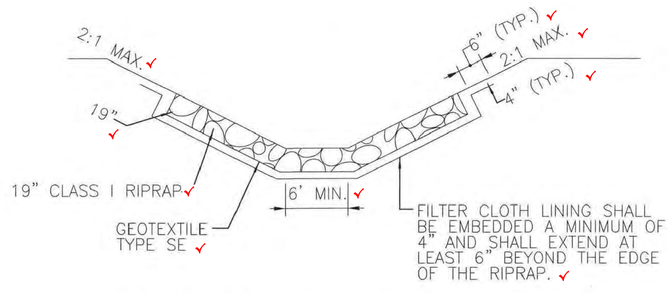
SECTION C-C: LONG RIDGE KNOLLS POND "A": INFLOW PROFILE

SCALE: 1"= 20' HORIZONTAL; 1"= 2' VERTICAL



RCP PIPE CONNECTION

SCALE: NTS



DETAIL FOR RIPRAP INFLOW DITCH

NTS

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

9/18/15

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

CLIENT

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SWM REHABILITATION LONGRIDGE KNOLLS POND "A"

TITLE: STORMWATER MANAGEMENT PROFILES AND DETAILS

PROJECT NO.: SWM DB #28-2012
SCALE: AS-SHOWN
SEAL:
BY: JMS
CHECK:
DWG. NO.:

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 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, roll-

ers, or hand tampers to assure maximum density and minimum permeability.

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

Structure Backfill

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

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

Pipe Conduits

All pipes shall be circular in cross section.

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

1. Materials - (Polymer Coated steel pipe) - Steel pipes with polymeric coatings shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 & M-246 with watertight coupling bands or flanges.

   Materials - (Aluminum Coated Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be painted

   with one coat of zinc chromate primer or two coats of asphalt.

   Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-196 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

2. Coupling bands, anti-seep collars, end sections, etc., must be composed of the same material and coatings as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at least 24 mils in thickness.

3. Connections - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be watertight.

   All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24 inches in diameter: flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, pre-punched to the flange bolt circle, sandwiched between adjacent flanges; a 12-inch wide standard lap type band with 12-inch wide by 3/8-inch thick closed cell circular neoprene gasket; and a 12-inch wide hugger type band with 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.

4. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

5. Backfilling shall conform to "**Structure Backfill**".

6. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

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

1. Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.

2. Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding / cradle for their entire length. This bedding / cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradle is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this standard. Gravel bedding is not permitted.

3. Laying pipe - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform to "**Structure Backfill**".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

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

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" – 10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

2. Joints and connections to anti-seep collars shall be completely watertight.

3. Bedding -The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

4. Backfilling shall conform to "**Structure Backfill**".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

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

Concrete

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

Rock Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 311.

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

Care of Water during Construction

All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment 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 per-

formance 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.

OPERATION AND MAINTENANCE

An operation and maintenance plan in accordance with Local or State Regulations will be prepared for all ponds. As a minimum, the dam inspection checklist located in Appendix A shall be included as part of the operation and maintenance plan and performed at least annually. Written records of maintenance and major repairs needs to be retained in a file. The issuance of a Maintenance and Repair Permit for any repairs or maintenance that involves the modification of the dam or spillway from its original design and specifications is required. A permit is also required for any repairs or reconstruction that involve a substantial portion of the structure. All indicated repairs are to be made as soon as practical.

CLIENT

HOWARD COUNTY DPW
ENVIRONMENTAL SERVICES
6751 GATEWAY DRIVE, SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6444

DATE: 09.18.13 ISSUES / REVISIONS

THERE IS NO AS-BUILT INFORMATION ON THIS SHEET. SHEET IS INCLUDED FOR REFERENCE ONLY.

CENTURY ENGINEERING
CONSULTING ENGINEERS – PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MD 21031
Phone: (443) 589-2400 Fax: (443) 589-2401

SWM REHABILITATION
LONGRIDGE KNOLLS
POND "A"

TITLE: STORMWATER MANAGEMENT MD POND 378 SPECIFICATIONS

PROJECT NO.: SWM DB #28-2012

SCALE: N/A

SEAL: STATE OF MARYLAND, THOMAS G. TURNER, JR., NO. 16997, REGISTERED PROFESSIONAL ENGINEER

BY: JMS

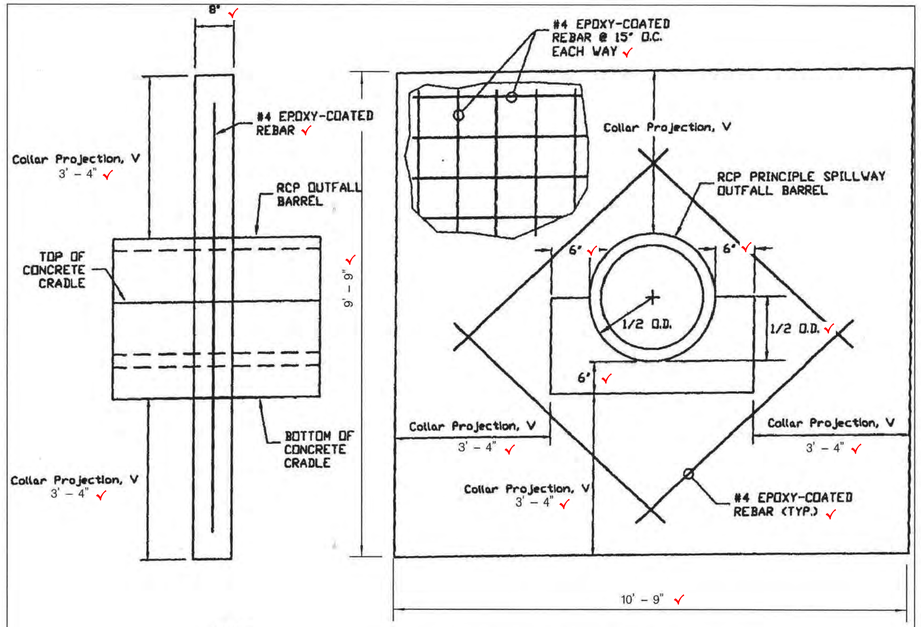
CHECK:

DWG. NO.:

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

8/18/15

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES



NOTES:

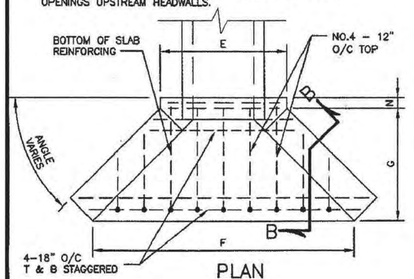
1. CONCRETE CRADLE TO BE POURED UNDER OUTFALL BARREL ALONG THE ENTIRE LENGTH OF BARREL
2. ANTI-SEEP COLLARS TO BE MIN. 2' FROM NEAREST JOINTS IN OUTFALL BARREL
3. JOINT BETWEEN OUTFALL BARREL AND ANTI-SEEP COLLAR TO BE WATERTIGHT (TYP.)
4. JOINT BETWEEN OUTFALL BARREL AND RISER TO BE WATERTIGHT
5. ALL STEEL REINFORCEMENT BARS (REBAR) SHALL BE EPOXY-COATED AND HAVE A MINIMUM COVER OF 3 INCHES IN THE CONCRETE
6. CONCRETE SHALL BE AIR-ENTRAINED AND HAVE A MINIMUM 28-DAY STRENGTH OF 3000 PSI

CONCRTE ANTISEEP COLLAR

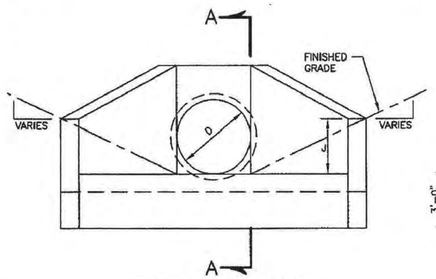
NTS

NOTES:

1. CONTRACTOR SHALL PROVIDE 3"-45° BEVEL AROUND PIPE OPENINGS UPSTREAM HEADWALLS.



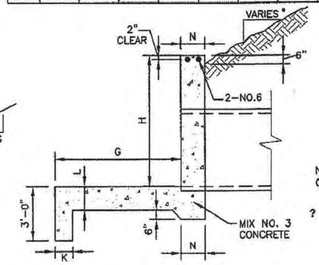
PLAN



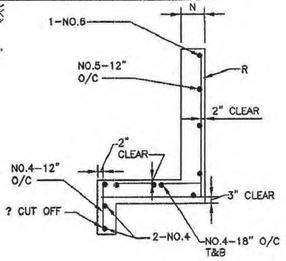
FRONT ELEVATION

D	E	F	G	H	J	K	L	N	R	Δ VOL. CY
12" 15"	2'-8" 2'-11"	7'-2" 7'-5"	3'-0" 3'-0"	2'-6" 2'-9"	2'-0" 2'-0"	8"	8"	8"	#5-12" O/C	1.50 1.60
18" 21"	3'-0" 3'-4"	7'-6" 7'-9"	3'-0"	3'-0" 3'-3"	2'-0" 2'-0"	8"	8"	8"	#5-12" O/C	1.70 1.80
24" 27"	3'-8" 3'-11"	8'-0" 8'-3"	3'-0"	3'-6" 3'-9"	2'-0" 2'-0"	8"	8"	8"	#5-12" O/C	1.90 2.00
30"	4'-2"	8'-6"	3'-0"	4'-0"	2'-1±"	8"	8"	10"	#5-12" O/C	2.85
36"	4'-8"	10'-0"	3'-6"	4'-6"	2'-3"	8"	10"	10"	#5-12" O/C	3.15
42"	5'-3"	11'-6"	4'-0"	5'-0"	2'-9"	8"	10"	10"	#5-12" O/C	3.87
48"	5'-10"	13'-0"	4'-6"	5'-6"	3'-0"	8"	10"	12"	#5-12" O/C	5.08
54"	6'-5"	14'-6"	5'-0"	6'-0"	3'-3"	9"	12"	12"	#6-8" O/C	6.50
60"	7'-0"	16'-0"	5'-6"	6'-6"	3'-6"	9"	12"	12"	#6-8" O/C	7.98
66"	7'-7"	17'-6"	6'-0"	7'-0"	3'-9"	9"	12"	14"	#6-8" O/C	9.14
72"	8'-2"	19'-0"	6'-6"	7'-6"	4'-3"	9"	12"	14"	#6-8" O/C	11.10

Δ – BASED ON 2:1 CHANNEL SIDE SLOPES AND 45 ANGLE

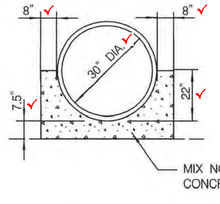


SECTION A–A



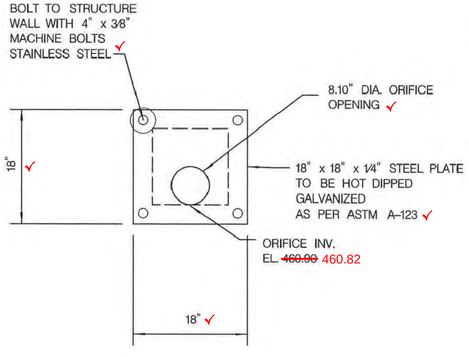
SECTION B–B

Revised	Howard County, Maryland Department of Public Works	TYPE 'A' Headwall Circular Pipe	Detail D-5.11
Revised 5/7/2007 Approved	Approved: Chief, Bureau of Engineering		



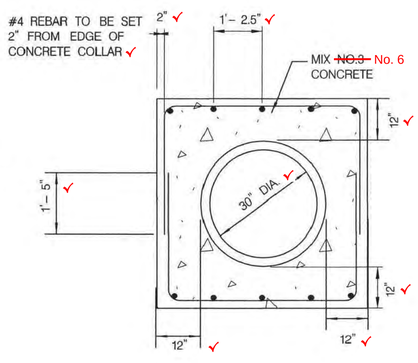
CONCRETE CRADLE

NTS



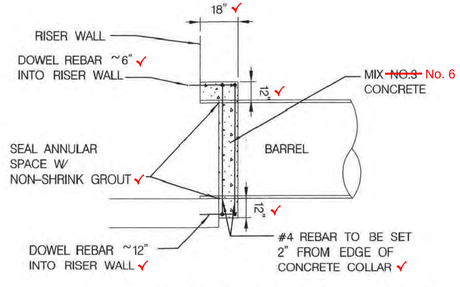
ORIFICE PLATE DETAIL

NTS



CONCRETE COLLAR

NTS



NOTE: THE CONCRETE COLLAR IS INCIDENTAL TO THE SWM POND RISER OUTLET ITEM.

CONCRETE COLLAR

NTS

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

9/15/15

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

CLIENT

HOWARD COUNTY DPW
ENVIRONMENTAL SERVICES
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COLUMBIA, MD 21046
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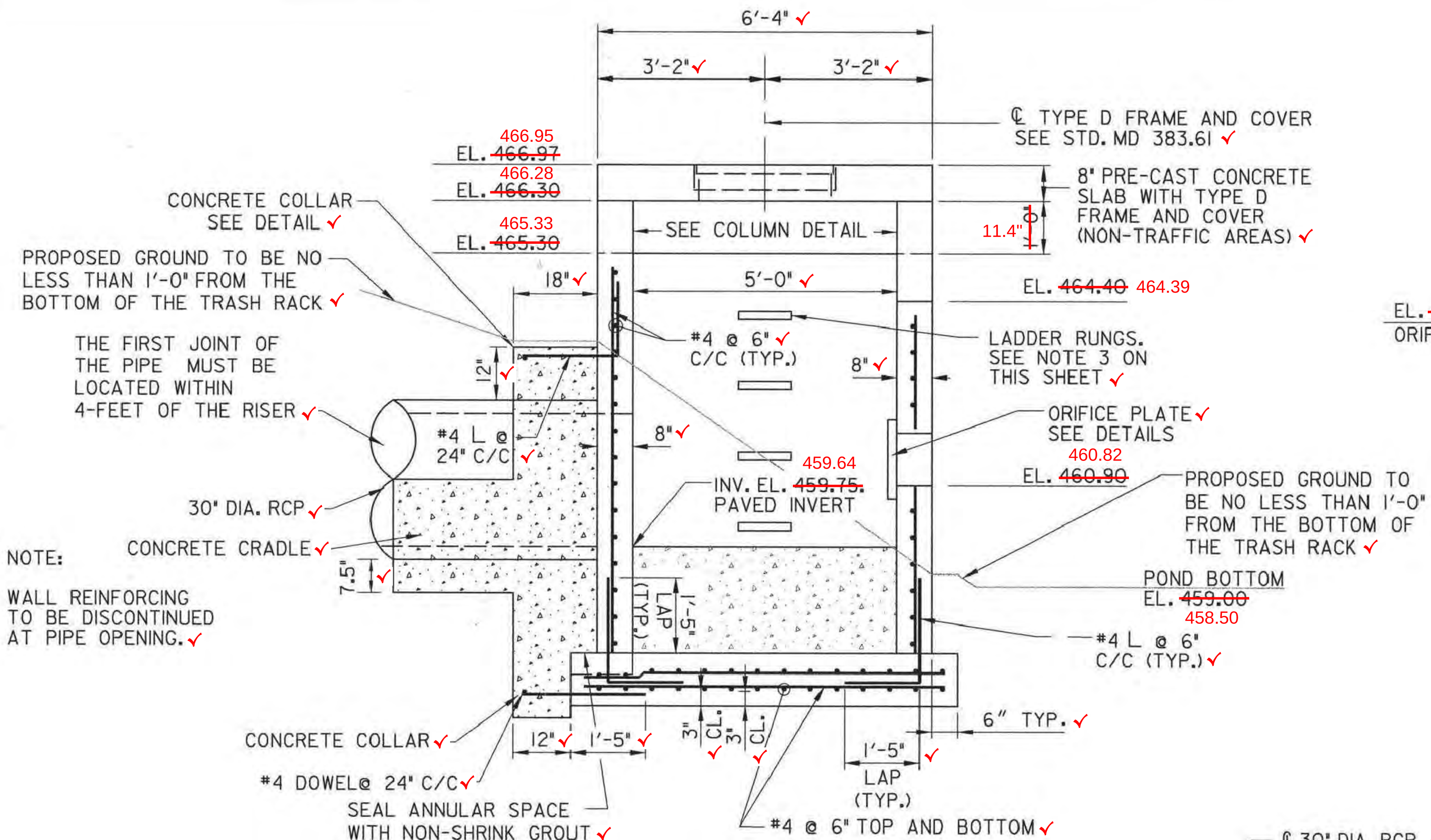
CONSULTING ENGINEERS – PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MD 21031
Phone: (443) 589-2400 Fax: (443) 589-2401

SWM REHABILITATION LONGRIDGE KNOLLS POND "A"

TITLE:

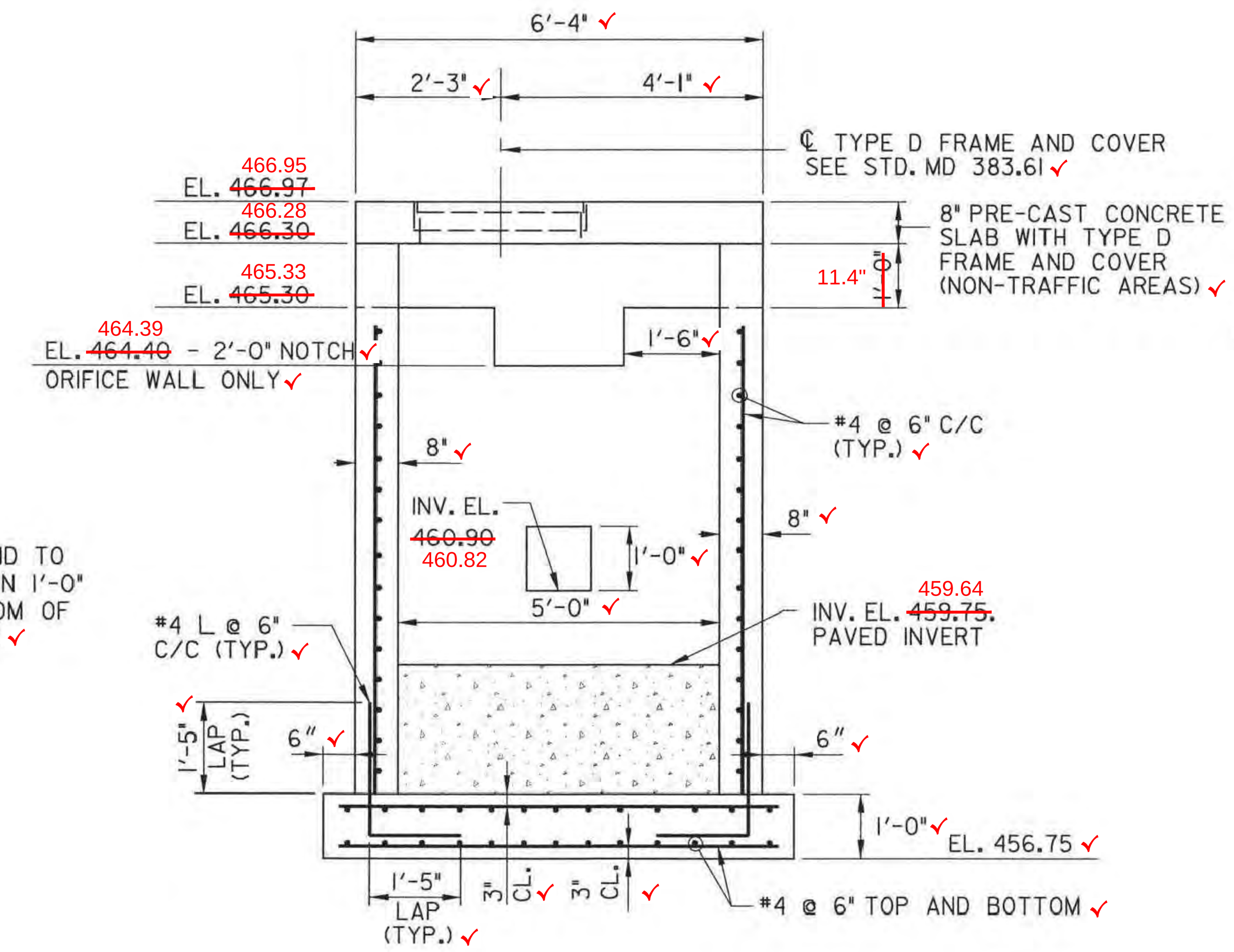
STORMWATER MANAGEMENT DETAILS

PROJECT NO.: SWM DB #28-2012
SCALE: AS-SHOWN
SEAL:
BY: JMS CHECK:
DWG. NO.:



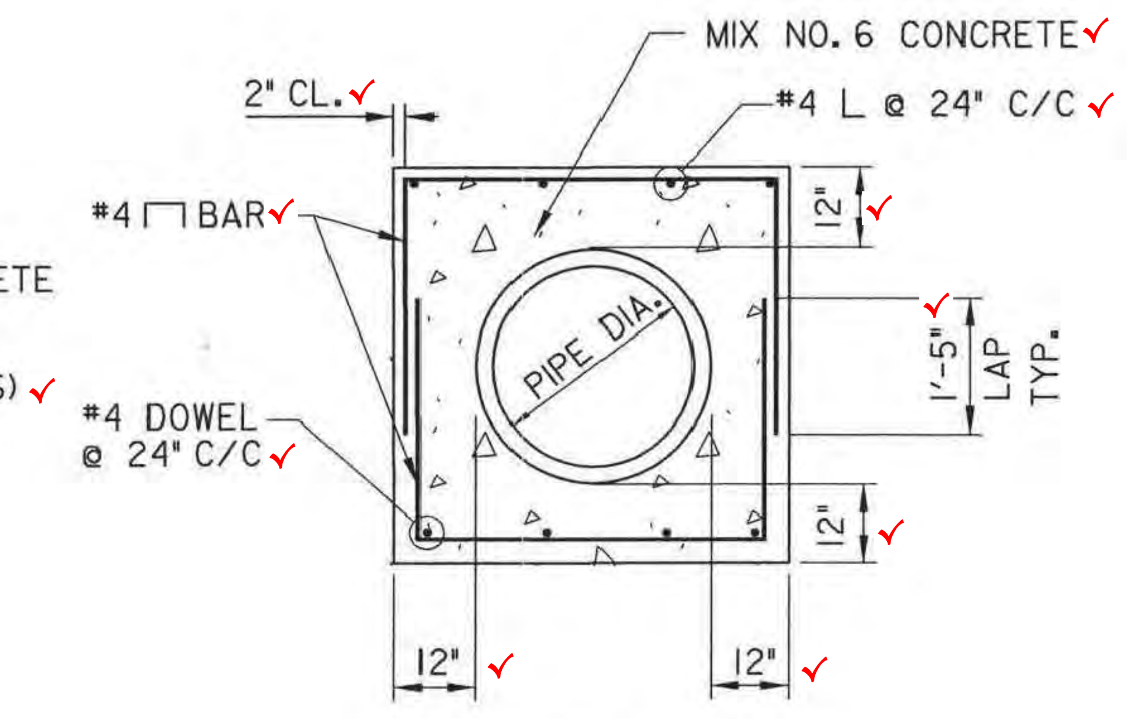
VIEW A-A

SCALE: 1/2" = 1'-0"



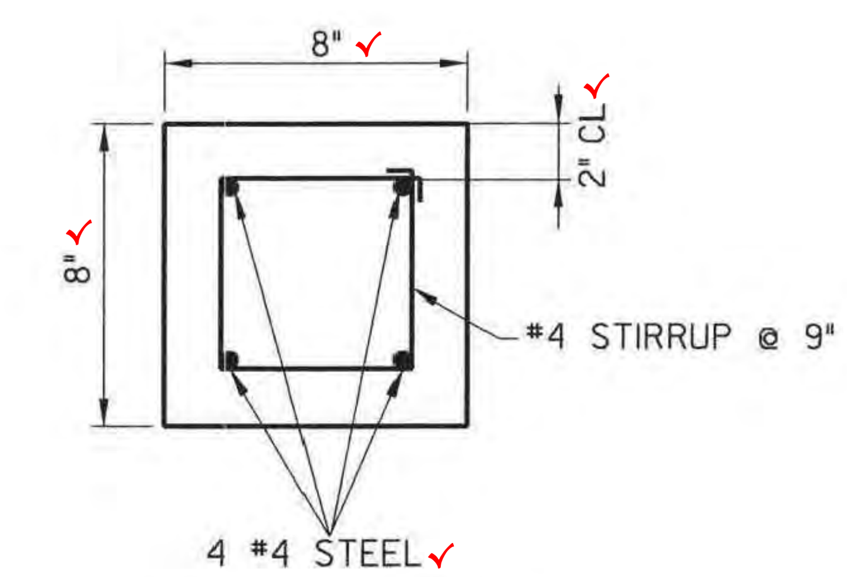
SECTION B-B

SCALE: 1/2" = 1'-0"



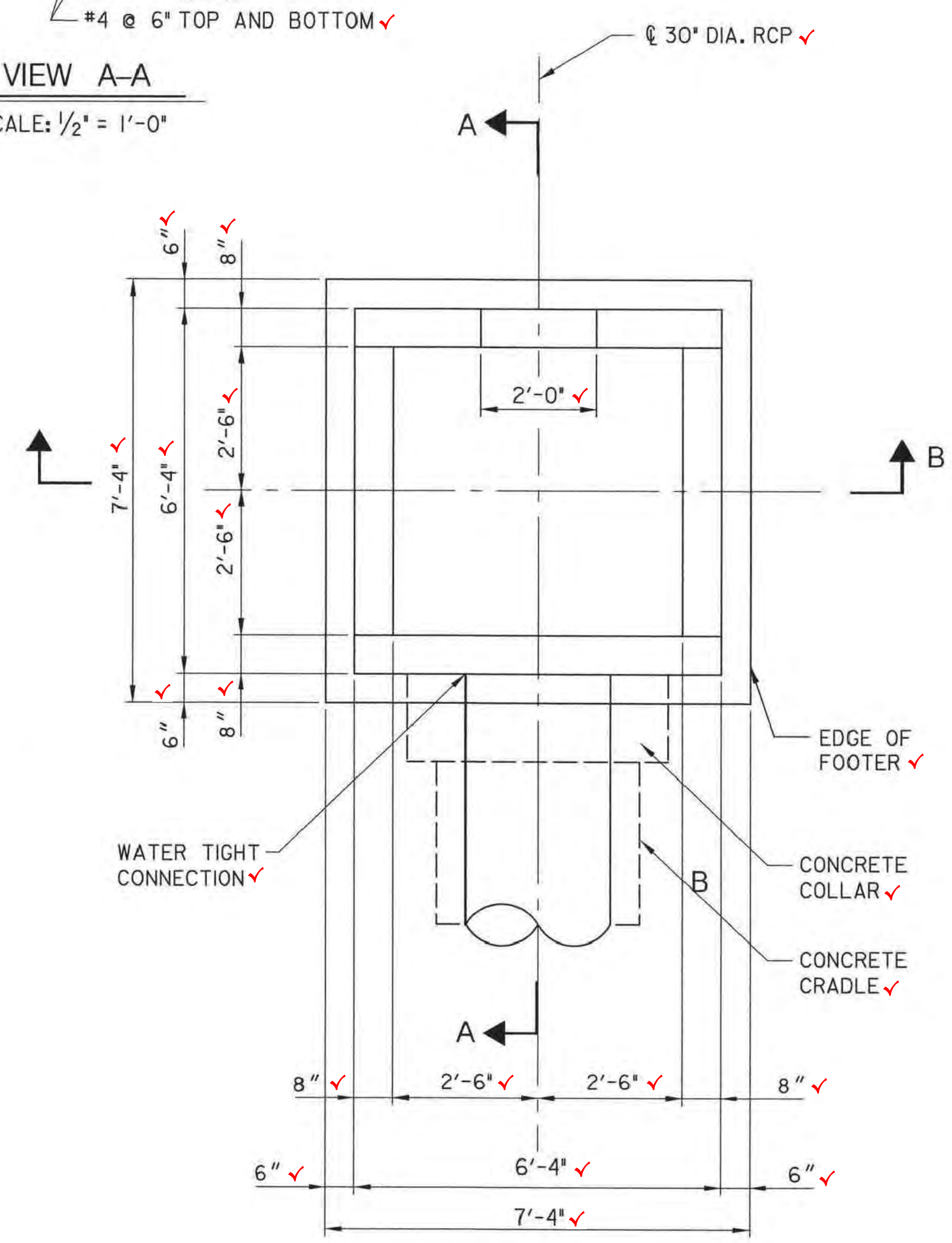
CONCRETE COLLAR

NOT TO SCALE



COLUMN DETAIL

NOT TO SCALE



PLAN VIEW

SCALE: 1/2" = 1'-0"

GENERAL NOTES:

SPECIFICATIONS : SHA SPECIFICATIONS DATED JULY 2008 REVISIONS THERE OF AND ADDITIONS THERE TO AND SPECIAL PROVISIONS FOR MATERIALS AND CONSTRUCTION.

CONCRETE : CONCRETE SHALL BE MIX NO. 6, CAST-IN-PLACE.

REINFORCING STEEL : ALL REINFORCING AND DIMENSIONS SHALL BE AS SHOWN. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60. MINIMUM COVER FOR ANY BAR SHALL BE 2" UNLESS OTHERWISE NOTED.

NOTE:

1. TRASH RACK BASIS OF PAYMENT IS INCIDENTAL TO COST OF RISER STRUCTURE. ONE UNIT IS TO BE INSTALLED ON EACH FACE OF WALL. HOT DIP GALVANIZED AFTER ASSEMBLING UNIT.
2. FOR DETAILS NOT SHOWN, REFER TO STANDARD NO. MD-383.00
3. LADDER RUNGS SHALL BE INSTALLED IN VERTICAL ALIGNMENT AT 1'-4" MAXIMUM C/C. RUNG TYPES SHALL BE IN ACCORDANCE WITH STANDARDS MD 383.91 OR MD 383.82. LADDER RUNGS SHALL BE INCIDENTAL TO THE COST TO THE RISER.

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

[signature] 9/18/15

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

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ENVIRONMENTAL SERVICES
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HUNT VALLEY, MD 21031
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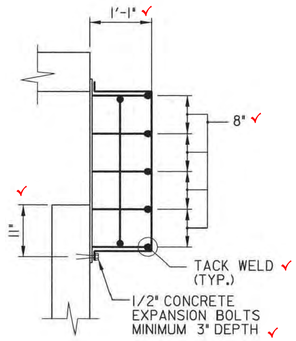
SWM REHABILITATION
LONGRIDGE KNOLLS
POND "A"

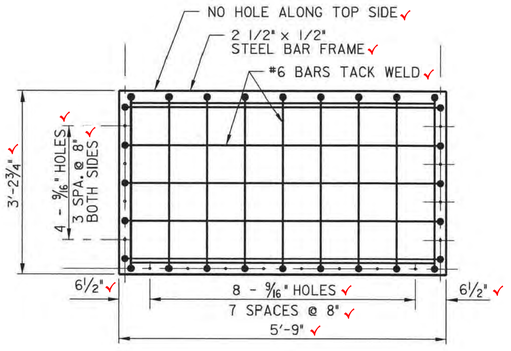
TITLE:

SWM DETAILS

PROJECT NO.: SWM DB #28-2012
SCALE: AS SHOWN
SEAL:
BY: JMS
CHECK:
DWG. NO.:



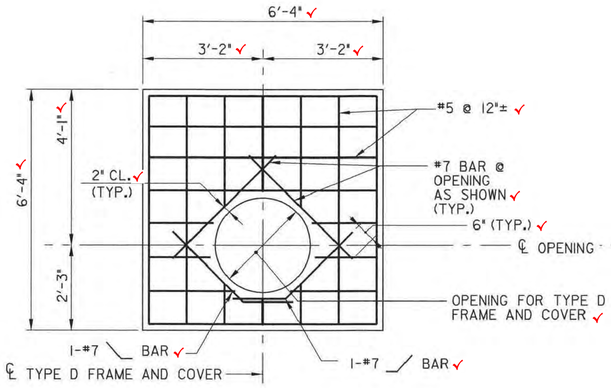
SIDE VIEW



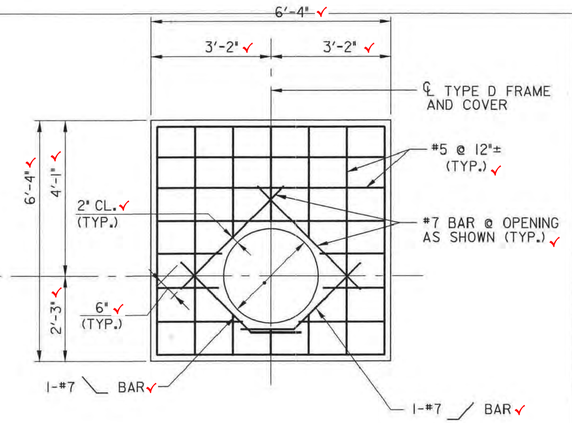
ELEVATION VIEW

WEIR TRASH RACK UNIT – NOTCHED WALL

SCALE: 3/4" = 1'-0"



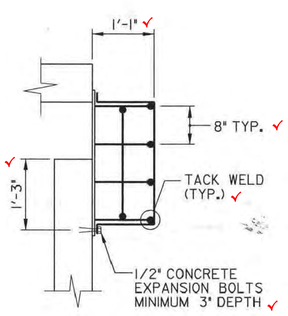
UPPER REINFORCING FOR TOP SLAB



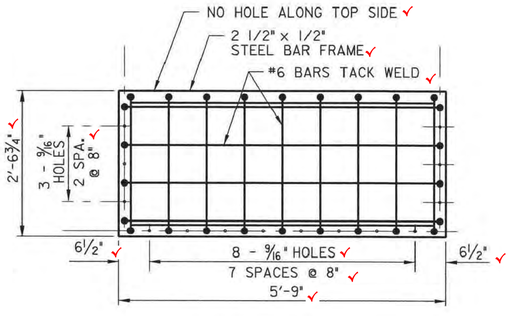
LOWER REINFORCING FOR TOP SLAB

PRECAST CONCRETE TOP SLAB

SCALE: 1/2" = 1'-0"



SIDE VIEW



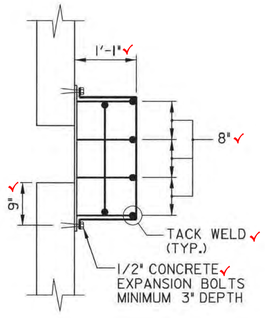
ELEVATION VIEW

TYPICAL WEIR TRASH RACK UNIT

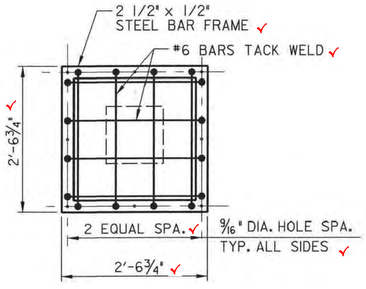
SCALE: 3/4" = 1'-0"

NOTE:

TRASH RACK BASIS OF PAYMENT IS INCIDENTAL TO COST OF RISER STRUCTURE. ONE UNIT IS TO BE INSTALLED ON EACH FACE OF WALL. HOT DIP GALVANIZED AFTER ASSEMBLING UNIT.



SIDE VIEW



ELEVATION VIEW

ORIFICE TRASH RACK UNIT

SCALE: 3/4" = 1'-0"

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — 9/15/15

CLIENT

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ENVIRONMENTAL SERVICES
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SWM REHABILITATION LONGRIDGE KNOLLS POND "A"

TITLE:

SWM DETAILS

PROJECT NO.: SWM DB #28-2012
SCALE: AS SHOWN
SEAL:
BY: JMS CHECK:
DWG. NO.:

LEGEND

EXISTING DRAINAGE AREA

Tc – PATH

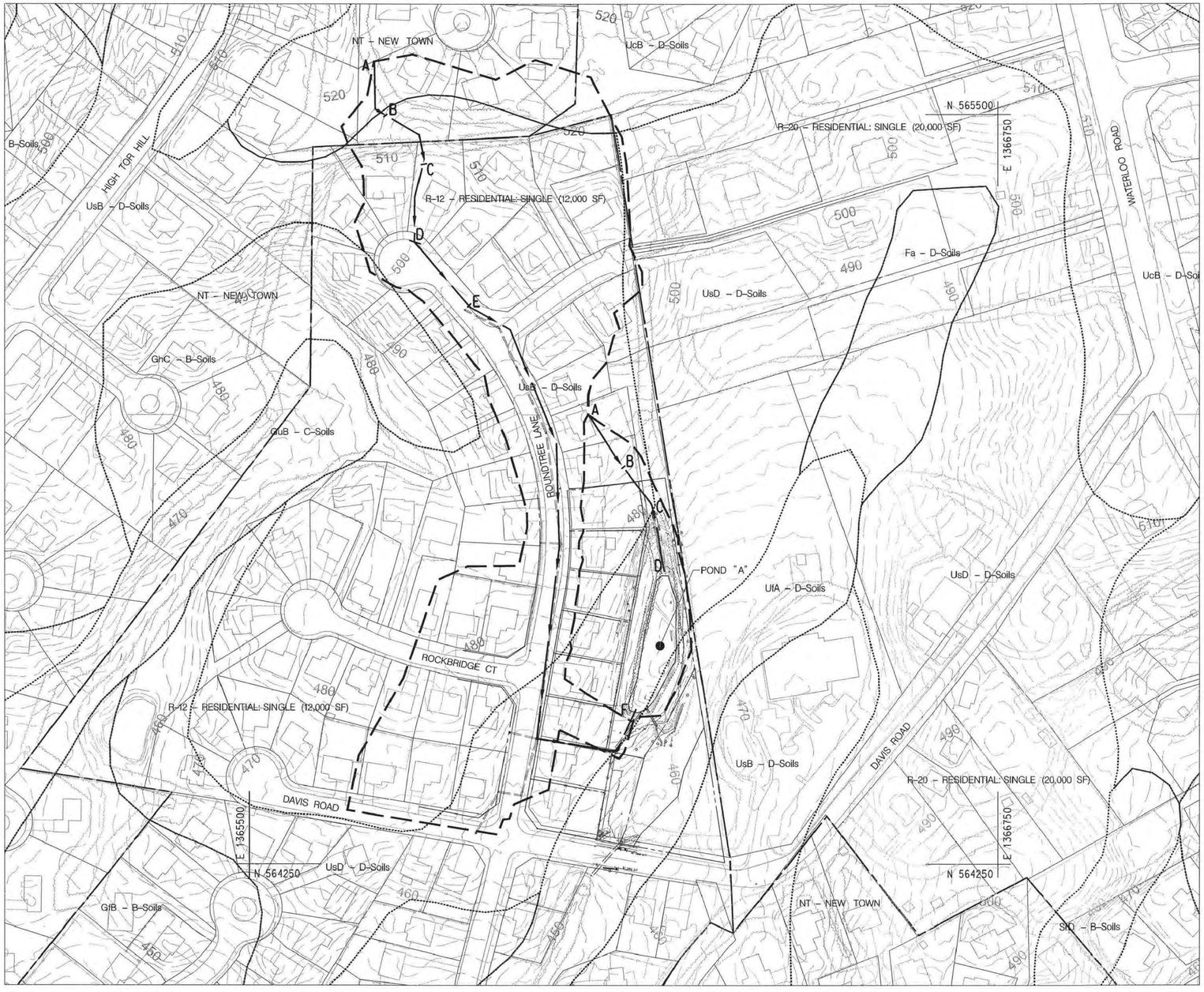
EXISTING STORM DRAINS

EXISTING CONTOURS 520

SOILS BOUNDARY UsB – D–Soils

ZONING NT – NEW TOWN / R–12 – RESIDENTIAL: SINGLE (12,000 SF)

EXISTING IMPERVIOUS AREAS



N

100' 0 100' 200'

SCALE: 1" = 100'

EXISTING CONDITIONS SHALLOW MARSH	
DRAINAGE AREA	10.1 AC.
IMPERVIOUS AREA	3.29 AC.
RUNOFF CURVE NUMBER (RCN)	87
TIME OF CONCENTRATION (Tc)	0.238 HOURS
WQ VOLUME PROVIDED	0.234 AC-FT
Q 2 YEAR CONTROL	12.4 CFS
Q 10 YEAR CONTROL	36.8 CFS

RETROFIT POND IMPROVEMENTS EXTENDED DETENTION POND		
DRAINAGE AREA	10.1 AC.	
IMPERVIOUS AREA	3.29 AC.	
RUNOFF CURVE NUMBER (RCN)	87	
TIME OF CONCENTRATION (Tc)	0.238 HOURS	
WQ VOLUME PROVIDED	~~0.236~~ AC-FT	0.283
Q 2 YEAR CONTROL	~~11.6~~ CFS	8.6
Q 10 YEAR CONTROL	~~35.8~~ CFS	34.2

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES 9/5/15

CLIENT

HOWARD COUNTY DPW
ENVIRONMENTAL SERVICES
6751 GATEWAY DRIVE, SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6444

DATE: 09.18.13 ISSUES / REVISIONS

CENTURY ENGINEERING
CONSULTING ENGINEERS – PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MD 21031
Phone: (443) 589–2400 Fax: (443) 589–2401

SWM REHABILITATION LONGRIDGE KNOLLS POND "A"

TITLE:

DRAINAGE AREA MAP

PROJECT NO.: SWM DB #28-2012

SCALE: 1" = 100'

SEAL:

BY: JMS CHECK:

DWG. NO.:

STABILIZED CONSTRUCTION ENTRANCE			
LABEL	STATION	OFFSET	QNTY
SCE-1	0+44.0	184' RT.	20 TONS

ORANGE CONSTRUCTION FENCE		
LABEL	LOCATION	QNTY
NOT SHOWN FOR CLARITY	TO BE PLACED ALONG THE LOD	1150 L.F.

SUPER SILT FENCE					
LABEL	STATION (FROM)	OFFSET	STATION (TO)	OFFSET	QNTY
SSF-1	0+52.5	204' RT.	0+75.0	21' RT.	231 L.F.
SSF-2	0+78.0	21' RT.	2+88.0	7.5' RT.	42 L.F.

STONE CHECK DAM			
LABEL	STATION	OFFSET	QNTY
CD-1	1+90.0	20' RT.	5.5 TONS

FILTER BAG			
LABEL	STATION	OFFSET	QNTY
FB-1	0+82.0	27' RT.	1 EA.

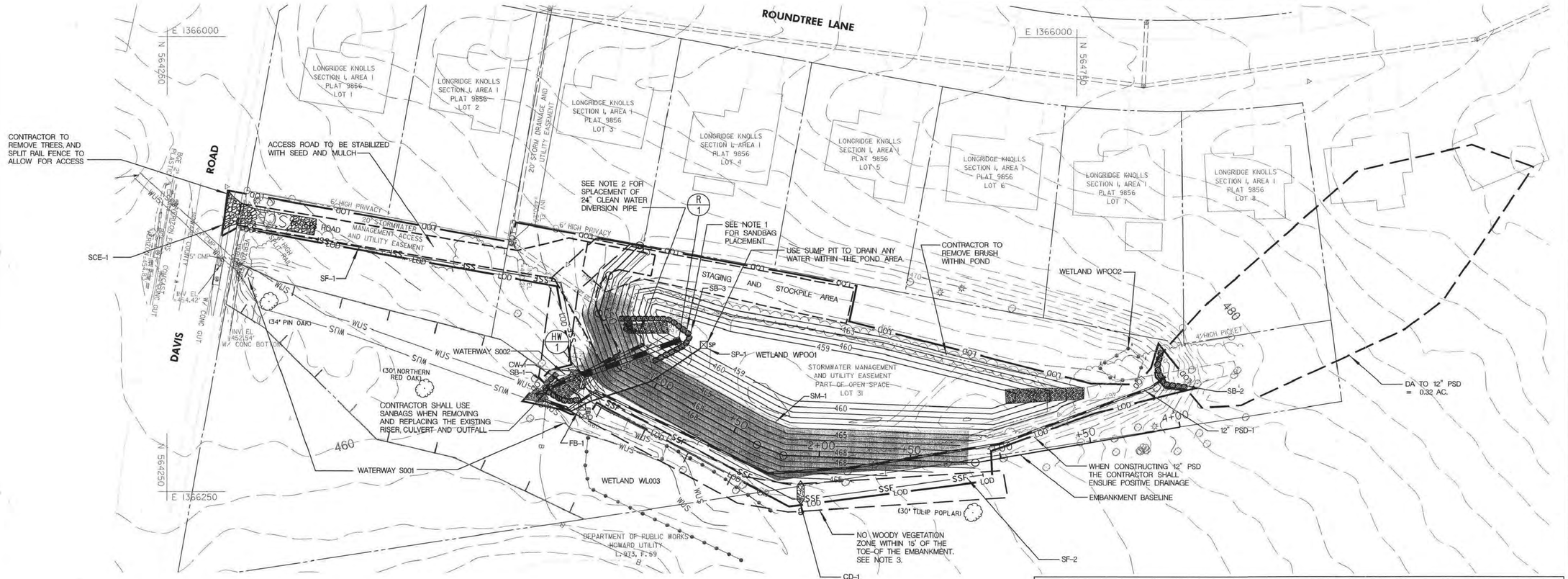
SUMP PIT			
LABEL	STATION	OFFSET	QNTY
SP-1	1+12.0	34' LT.	1 EA.

SAND BAGS					
LABEL	STATION (FROM)	OFFSET	STATION (TO)	OFFSET	QNTY
SB-1	0+69.5	32' RT.	0+77.0	25' RT.	180 EA.
SB-2	3+95.0	43' LT.	4+07.0	21' LT.	180 EA.
SB-3	0+52.0	10' LT.	0+92.0	11' LT.	150 EA.

TYPE 'A' STABILIZATION MATTING		
LABEL	LOCATION	QNTY
SM-1	EMBANKMENT	700 S.Y.

24" CLEAN WATER DIVERSION PIPE					
LABEL	STATION (FROM)	OFFSET	STATION (TO)	OFFSET	QNTY
CW-1	0+55.0	11' LT.	0+75	46' RT.	82 L.F.

12" PIPE SLOPE DRAIN						
LABEL	STATION (FROM)	OFFSET	STATION (TO)	OFFSET	QNTY	DA
PSD-1	0+79.0	45' RT.	3+96	29' LT.	365 L.F.	0.32 AC.



NOTES:

NOTE 1: PLACE SAND BAGS WITHIN POND APPROXIMATLY 2' HIGH. THE CONTRACTOR SHALL ADJUST THE SANDBAGS TO BLOCK ALL FLOW FROM WITHIN THE POND FROM ENTERING THE EXCAVATED EMBANKMENT AREA. ANY WATER PONDED WITHIN THE POND SHALL BE PUMPED THROUGH THE SUMP PIT AND DISCHARGED TO A STABLE OUTFALL.

NOTE 2: DURING THE REMOVAL OF THE EXISTING 30" CMP AND THE INSTALLATION OF THE PROPOSED 30" RCP, THE CONTRACTOR SHALL ADJUST THE 24" CLEAN WATER DIVERSION PIPE SO THAT IT IS EITHER EXTENDS THROUGH THE EXISTING 30" CMP, EXTENDS THROUGH THE PROPOSED 30" RCP, OR IS PLACED THROUGH THE AREA OF THE EXCAVATED EMBANKMENT. THE CONTRACTOR SHALL ALWAYS ENSURE POSITIVE FLOW. THIS SHALL BE DONE AT THE END OF EACH WORK DAY OR IF A RAIN EVENT IS IMMINENT. SEE 24" CLEAN WATER DIVERSION DETAL ON SHEET 07.

NOTE 3: TREES WITHIN THE "NO WOODY VEGETATION ZONE" SHALL BE REMOVED ACCORDING TO "TECHNICAL NOTE 705 – OPERATIONS AND MAINTENANCE ALTERNATIVES FOR REMOVING TREES ON DAMS".

30' 0 30' 60'
SCALE: 1" = 30'

LEGEND

STABILIZED CONSTRUCTION ENTRANCE	SCE
RIPRAP PROTECTION	
LIMIT OF DISTRURBANCE	LOD
SUPER SILT FENCE	SSF
SANDBAGS	
PIPE SLOPE DRAIN/ CLEAN WATER DIVERSION	
FILTER BAG	FB
SUMP PIT	SP
TYPE "A" SOIL STABILIZATION MATTING	
EXISTING CONTOURS	465
PROPOSED CONTOURS	465
PROPOSED STORMDRAIN	HOWARD COUNTY
EXISTING UTILITIES	W
EXISTING FENCE	
EDGE OF PAVEMENT	
EXISTING BUILDINGS	
EXISTING STORM DRAIN	24" RCP
EDGE OF WATER	
EXISTING TREE LINE	
SPECIMEN TREE	(30" TULIP POPLAR)
PROPERTY BOUNDARY	
WATERS OF THE US	WUS
NONTIDAL WETLAND BOUNDARY	
25' NONTIDAL WETLAND BUFFER	B
NO WOODY VEGETATION ZONE	
100 YR-FLOODPLAIN (TAKEN FROM F-89-76)	

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — 9/18/15

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

HOWARD SCD — DATE 7/20/15

CLIENT

HOWARD COUNTY DPW
ENVIRONMENTAL SERVICES
6751 GATEWAY DRIVE, SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6444

DATE: 09.18.13 ISSUES / REVISIONS

THERE IS NO AS-BUILT INFORMATION ON THIS SHEET. SHEET IS INCLUDED FOR REFERENCE ONLY.

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CONSULTING ENGINEERS – PLANNERS
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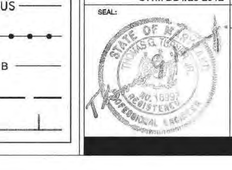
HUNT VALLEY, MD 21031
Phone: (443) 589-2400 Fax: (443) 589-2401

SWM REHABILITATION LONGRIDGE KNOLLS POND "A"

TITLE:
GRADING, EROSION & SEDIMENT CONTROL PLAN

PROJECT NO.: SWM DB #28-2012
SCALE: 1" = 30'
SEAL:
BY: JMS
CHECK:
DWG. NO.:



HOWARD SOIL CONSERVATION DISTRICT
STANDARD SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION INSPECTION DIVISION (CID) PRIOR TO THE START OF ANY CONSTRUCTION (410–313–1855).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE–DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 3 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. B–4–5), TEMPORARY SEEDING (SEC. B–4–4) AND MULCHING (SEC. B–4–3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
5. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
6. SITE ANALYSIS:

TOTAL AREA OF SITE:	1.71	ACRES
AREA DISTURBED	0.71	ACRES
AREA TO BE ROOFED OR PAVED	0.00	ACRES
AREA TO BE VEGETATIVELY STABILIZED	0.50	ACRES
TOTAL CUT	325	CU. YDS.
TOTAL FILL	175	CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION	N/A	

7. ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FRO PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
8. ANY SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
9. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
10. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH CAN BE BACK–FILLED AND STABILIZED BY THE END OF EACH WORKDAY, WHICHEVER IS SHORTER.
11. ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE PLAN APPROVAL AUTHORITY PRIOR TO PROCEEDING WITH CONSTRUCTION.
12. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 AC. PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE ENFORCEMENT AUTHORITY. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE APPROVAL AUTHORITY, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.

SEQUENCE OF CONSTRUCTION

EROSION AND SEDIEMTN CONTROL SETUP - 5 DAYS

1. (DAY 1) THE CONTRACTOR SHALL STAKE OUT THE LIMITS OF DISTURBANCE AS SHOWN ON THE GRADING PLAN.
2. (DAY 2) THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION MEETING ONSITE WITH THE SEDIMENT CONTROL INSPECTOR AND ENGINEER TO REVIEW THE LIMITS OF DISTURBANCE, STRUCTURE STAKEOUT, EROSION AND SEDIMENT CONTROL REQUIREMENTS, AND THE SEQUENCE OF CONSTRUCTION. THE PARTICIPANTS WILL ALSO VERIFY THE LOCATION OF THE TEMPORARY STOCKPILE AREA AND ANY NECESSARY STAGING AREA, AND FLAG ANY TREES WITHIN THE LIMITS OF DISTURBANCE WHICH WILL BE REMOVED FOR CONSTRUCTION ACCESS AND GRADING.
3. (DAY 3) THE CONTRACTOR SHALL INSTALL THE STABILIZED CONSTRUCTION ENTRANCE AND BLAZE ORANGE CONSTRUCTION FENCE AND TREE PROTECTION AREAS AS SHOWN ON THE GRADING PLANS.
4. (DAY 3) THE CONTRACTOR SHALL ESTABLISH THE TEMPORARY STOCKPILE AREA IN THE LOCATION INDICATED ON THE GRADING PLAN.
5. (DAY 4) INSTALL REMAINING PERIMETER EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLAN INCLUDING THE SUPER SILT FENCE, STONE CHECK DAM, PIPE SLOPE DRAIN, AND SUMP PIT.
6. (DAY 5) THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION SHALL BE NOTIFIED UPON COMPLETION OF CONTROLS. UPON COMPLETION OF CONTROL INSTALLATION, AND WITH APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, THE CONTRACTOR MAY BEGIN OPERATIONS. CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE SEQUENCE OF CONSTRUCTION AND GRADING PLANS, AND EROSION AND SEDIMENT CONTROL STANDARD DETAILS AND NOTES.

CONSTRUCTION

1. NOTE: DUE TO THE NATURE OF THE PROJECT, THE CONTRACTOR SHALL PERFORM CERTAIN STAGES OF THE WORK DURING A PERIOD OF EXTENDED DRY WEATHER FORECAST.
2. (DAY 1-2) CLEAR AND GRUB AREA WITHIN THE LIMIT OF DISTURBANCE.
3. (DAY 3) DEWATER POND THROUGH THE SUMP PITS. THE SUMP PIT SHALL DISCHARGE AT THE DOWNSTREAM LIMITS OF DISTURBANCE TO A STABLE OUTFALL.
4. (DAY 4-5) DURING A PERIOD OF EXTENDED DRY WEATHER FORECAST, INSTALL SAND BAGS WITHIN POND. DURING THE REMOVAL OF THE EXISTING 30" CMP AND THE INSTALLATION OF THE PROPOSED 30" RCP, THE CONTRACTOR SHALL ADJUST THE SANDBAGS TO BLOCK ALL FLOW FROM WITHIN THE POND FROM ENTERING THE EXCAVATED EMBANKMENT AREA. ANY WATER PONDED WITHIN THE POND SHALL BE PUMPED THROUGH THE SUMP PIT AND DISCHARGED TO A STABLE OUTFALL.
5. (DAY 5-6) REMOVE EXISTING RISER AND INSTALL 24" CLEAN WATER DIVERSION PIPE. DURING THE REMOVAL OF THE EXISTING 30" CMP AND THE INSTALLATION OF THE PROPOSED 30" RCP, THE CONTRACTOR SHALL ADJUST THE 24" CLEAN WATER DIVERSION PIPE SO THAT IT IS EITHER EXTENDS THROUGH THE EXISTING 30" CMP, EXTENDS THROUGH THE PROPOSED 30" RCP, OR IS PLACED THROUGH THE AREA OF THE EXCAVATED EMBANKMENT. THE CONTRACTOR SHALL ALWAYS ENSURE POSITIVE FLOW. THIS SHALL BE DONE AT THE END OF EACH WORK DAY OR IF A RAIN EVENT IS IMINENT.
6. (DAY 7-8) REMOVE EXISTING 30" CMP, ANTISEEP COLLAR, AND OUTFALL STRUCTURE. THE CONTRACTOR SHALL EXCAVATE 4' BELOW THE PROPOSED CULVERT WITH A 2:1 CUT SLOPE.
7. (DAY 9-16) CONSTRUCT THE REPAIRS OF THE CLAY CORE, THE CULVERT, CONCRETE CRADLE, CONCRETE COLLAR, ANTISEEP COLLAR, AND OUTFALL PROTECTION.
8. (DAY 17-24) GRADE THE POND AS SHOWN ON THE PLANS.
9. (DAY 25) INSTALL SOIL STABILIZATION MATTING AND SEED AS SHOWN ON THE PLAN.
10. (DAY 26-28) DURING A PERIOD OF EXTENDED DRY WEATHER FORECAST, THE CONTRACTOR SHALL REMOVE THE 24" CLEAN WATER DIVERSION PIPE AND THE SAND BAGS WITHIN THE POND. CONSTRUCT THE PROPOSED RISER.
11. (DAY 29-30) UPON STABILIZATION OF THE SITE WITH ESTABLISHED VEGETATION AND WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, REMOVE REMAINING SEDIMENT CONTROL DEVICES. STABILIZE ANY AREAS DISTURBED BY SEDIMENT CONTROL REMOVAL.

BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS

1) No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
2) Place materials in a location and manner which does not adversely impact surface or subsurface water flow into or out of nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
3) 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.
4) Place heavy equipment on mats or suitably operate the equipment to prevent damage to nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
5) Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetlands, nontidal wetland buffers, or waterways, or permanent modification of the 100-year floodplain in excess of that lost under the originally authorized structure or fill.
6) Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
7) All stabilization in the nontidal wetland and nontidal wetland buffer shall consist of the following species: Annual Ryegrass (Lolium multiflorum), Millet (Setaria italica), Barley (Hordeum sp.), Oats (Uniola sp.), and/or Rye (Secale cereale). 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 the Nontidal Wetlands and Waterways Division. **Kentucky 31 fescue shall not be utilized in wetland or buffer areas.** The area should be seeded and mulched to reduce erosion after construction activities have been completed.
8) After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
9) To protect aquatic species, in-stream work is prohibited as determined by the classification of the stream:

   Use I waters: In-stream work shall not be conducted during the period March 1 through June 15, inclusive, during any year.
   Use III waters: In-stream work shall not be conducted during the period October 1 through April 30, inclusive, during any year.
   Use IV waters: In-stream work shall not be conducted during the period March 1 through May 31, inclusive, during any year.

10) Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
11) Culverts shall be constructed and any riprap placed so as not to obstruct the movement of aquatic species, unless the purpose of the activity is to impound water.

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

Definition

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

Purpose

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

Conditions Where Practice Applies

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

Criteria

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

Maintenance

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

B.43

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 OWNERS(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 OWNERS(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATIONS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OF SLUMPING.

STANDARD STABILIZATION NOTE

FOLLOWING INITIAL SOIL DISTURBANCE OR -RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN:

A.) THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND

B.) SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.

SEDIMENT CONTROL & POND CONSTRUCTION

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

HOWARD SCD — DATE 7/2/15

ENGINEERS CERTIFICATE

"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 COUNTY SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD COUNTY SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

SIGNATURE OF ENGINEER (PRINTNAME BELOW SIGNATURE) — DATE 7/13/15

THOMAS G. TRUMPER JR.

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — 9/18/15

PROFESSIONAL CERTIFICATION.

"I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND."

LICENSE NO. 10997

EXPIRATION DATE 7-19-2016

CLIENT

HOWARD COUNTY DPW
ENVIRONMENTAL SERVICES
6751 GATEWAY DRIVE, SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6444

DATE: 09.18.13 ISSUES / REVISIONS

THERE IS NO AS-BUILT INFORMATION ON THIS SHEET. SHEET IS INCLUDED FOR REFERENCE ONLY.

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HUNT VALLEY, MD 21031
Phone: (443) 589-2400 Fax: (443) 589-2401

SWM REHABILITATION LONGRIDGE KNOLLS POND "A"

TITLE:

EROSION AND SEDIMENT CONTROL NOTES

PROJECT NO.: SWM DB #28-2012 | SCALE: N/A

SEAL: | BY: JMS | CHECK:

DWG. NO.:

B-4-2 STANDARDS AND SPECIFICATIONS

FOR

SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition

The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

A. Soil Preparation

1. 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.
   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 means.
2. Permanent Stabilization
   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:
      i. 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) would be acceptable.
      iv. Soil contains 1.5 percent minimum organic matter by weight.
      v. Soil contains sufficient pore space to permit adequate root penetration.
   b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
   c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
   d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
   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 irregular 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.

B. Topsoiling

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.
3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
   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.
   c. 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 1½ 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.
6. Topsoil Application
   a. Erosion and sediment control practices must be maintained when applying topsoil.
   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.

C. Soil Amendments (Fertilizer and Lime Specifications)

1. 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 be used for chemical analyses.
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.
5. 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-4-3 STANDARDS AND SPECIFICATIONS

FOR

SEEDING AND MULCHING

Definition

The application of seed and mulch to establish vegetative cover.

Purpose

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.

Criteria

A. Seeding

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 contact.
   b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
      i. 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 each direction.
   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; P_2O_5 (phosphorous), 200 pounds per acre; K_2O (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.

B. Mulching

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.
2. Application
   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.
3. Anchoring
   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:
      i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch 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 prohibited.**
      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 feet long.

TEMPORARY SEEDING SUMMARY

No.	Species	Seed Mixture (Hardiness Zone 6B) From Table 26 — Application Rate (lb/ac)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-10-10)	Lime Rate
	ANNUAL RYEGRASS	40	3/1 to 5/31; 8/1 to 10/15	1"	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
	BARLEY	96	3/1 to 5/31; 8/1 to 10/15	1/2"	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
	FOXTAIL MILLET	30	5/16 to 7/31	1/2"	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)

PERMANENT SEEDING SUMMARY

No.	Species	Seed Mixture (Hardiness Zone 6B) From Table 25 — Application Rate (lb/ac)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20) N	P2O5	K20	Lime Rate
1	SWITCH GRASS CREEPING RED FESCUE PARTRIDGE PEA	10 15 4	3/1 to 5/15 or 8/15 to 10/15	1/4" to 1/12"	45 lb/ac (1.0 lb/ 1000 sf	90 lb/ac (2 lb/ 1000 sf)	90 lb/ac (2 lb/ 1000 sf)	2 tons/ac (90 lb/ 1000 sf)
2	BIG BLUESTEM INDIAN GRASS LITTLE BLUESTEM CREEPING RED FESCUE PARTRIDGE PEA	6 6 4 15 4	3/1 to 5/15 or 8/15 to 10/15	1/4" to 1/12"				
4	DEER TONGUE CREEPING RED FESCUE VIRGINIA WILD RYE	15 20 5	3/1 to 5/15 or 8/15 to 10/15	1/4" to 1/12"				

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 9/18/15

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

HOWARD SCD — DATE 7/20/15

CLIENT

HOWARD COUNTY DPW
ENVIRONMENTAL SERVICES
6751 GATEWAY DRIVE, SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6444

DATE: 09.18.13 ISSUES / REVISIONS

THERE IS NO AS-BUILT INFORMATION ON THIS SHEET. SHEET IS INCLUDED FOR REFERENCE ONLY.

CENTURY ENGINEERING
CONSULTING ENGINEERS – PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MD 21031
Phone: (443) 589-2400 Fax: (443) 589-2401

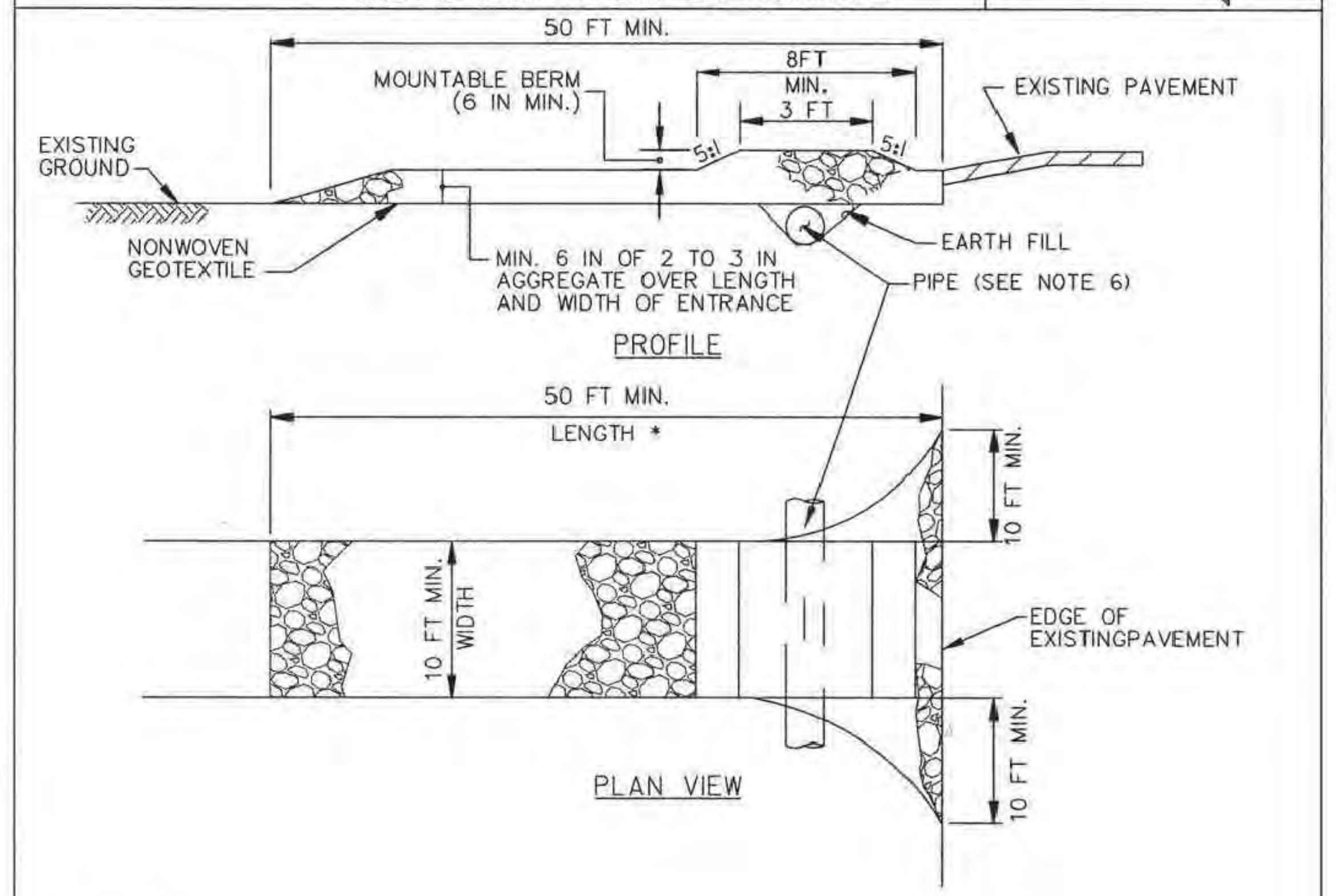
SWM REHABILITATION
LONGRIDGE KNOLLS
POND "A"

TITLE:
EROSION AND SEDIMENT CONTROL NOTES

PROJECT NO.: SWM DB #28-2012
SCALE: N/A
SEAL:
BY: JMS
CHECK:
DWG. NO.:

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

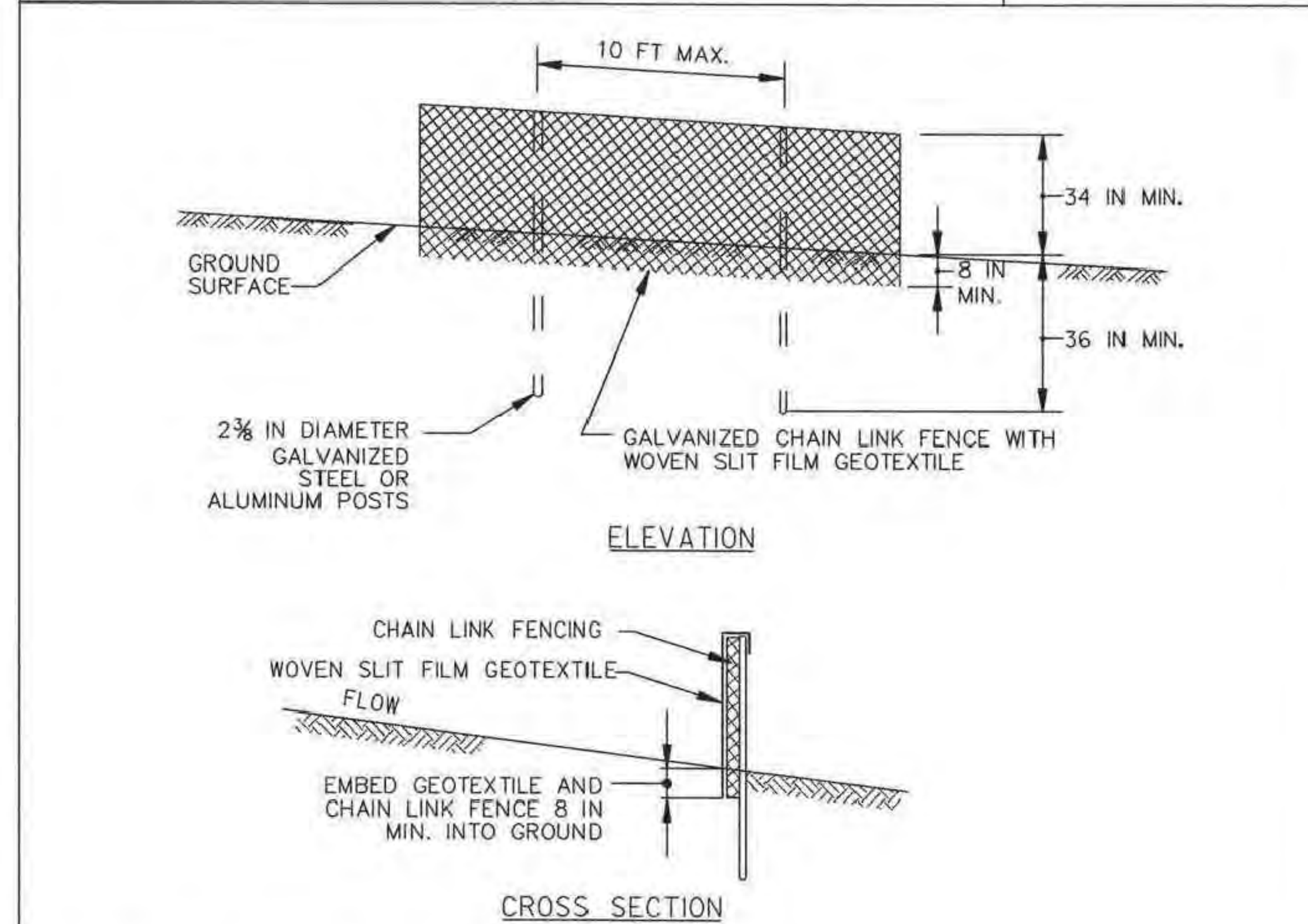
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

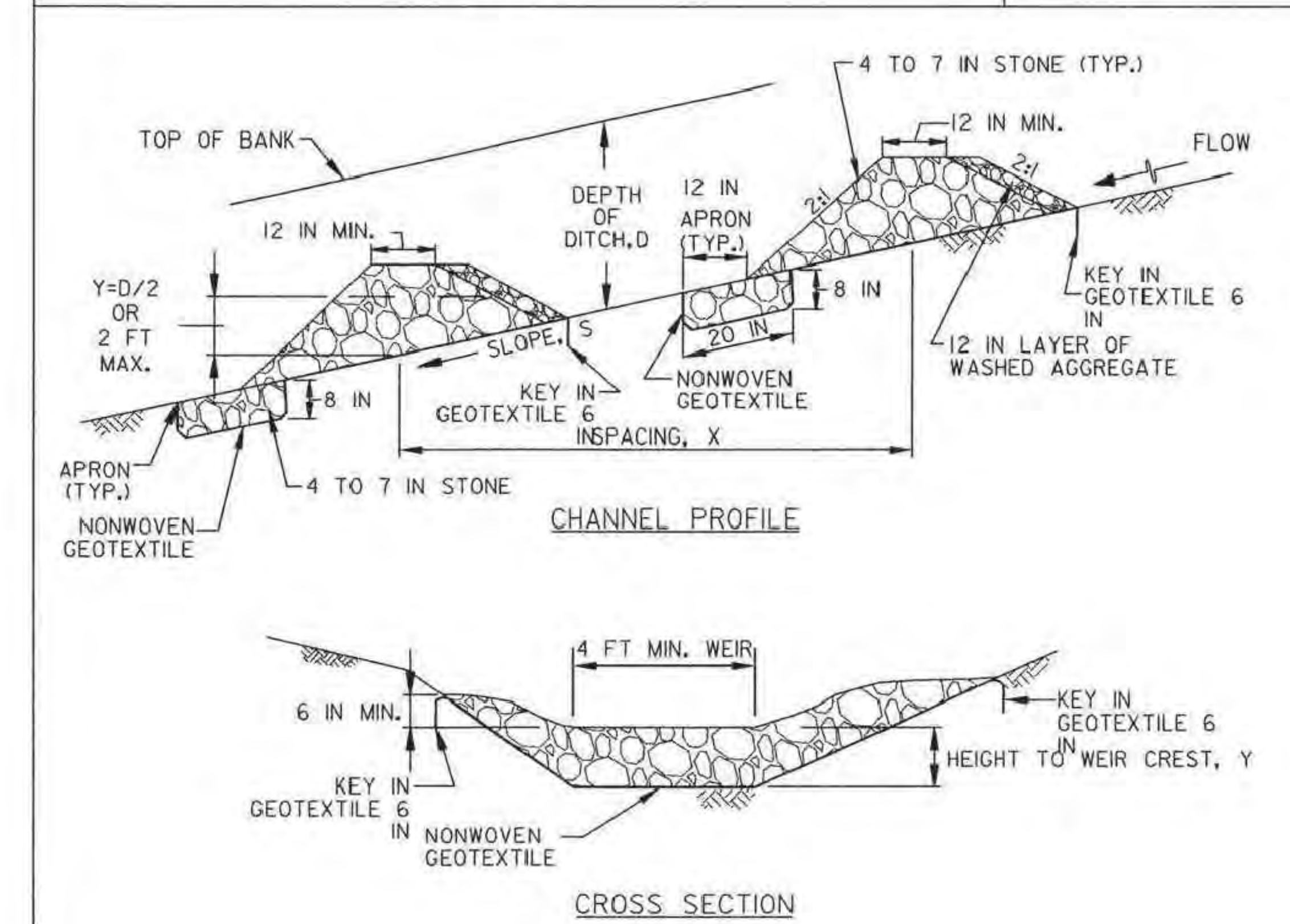
1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL D-2 STONE CHECK DAM

STANDARD SYMBOL: CD

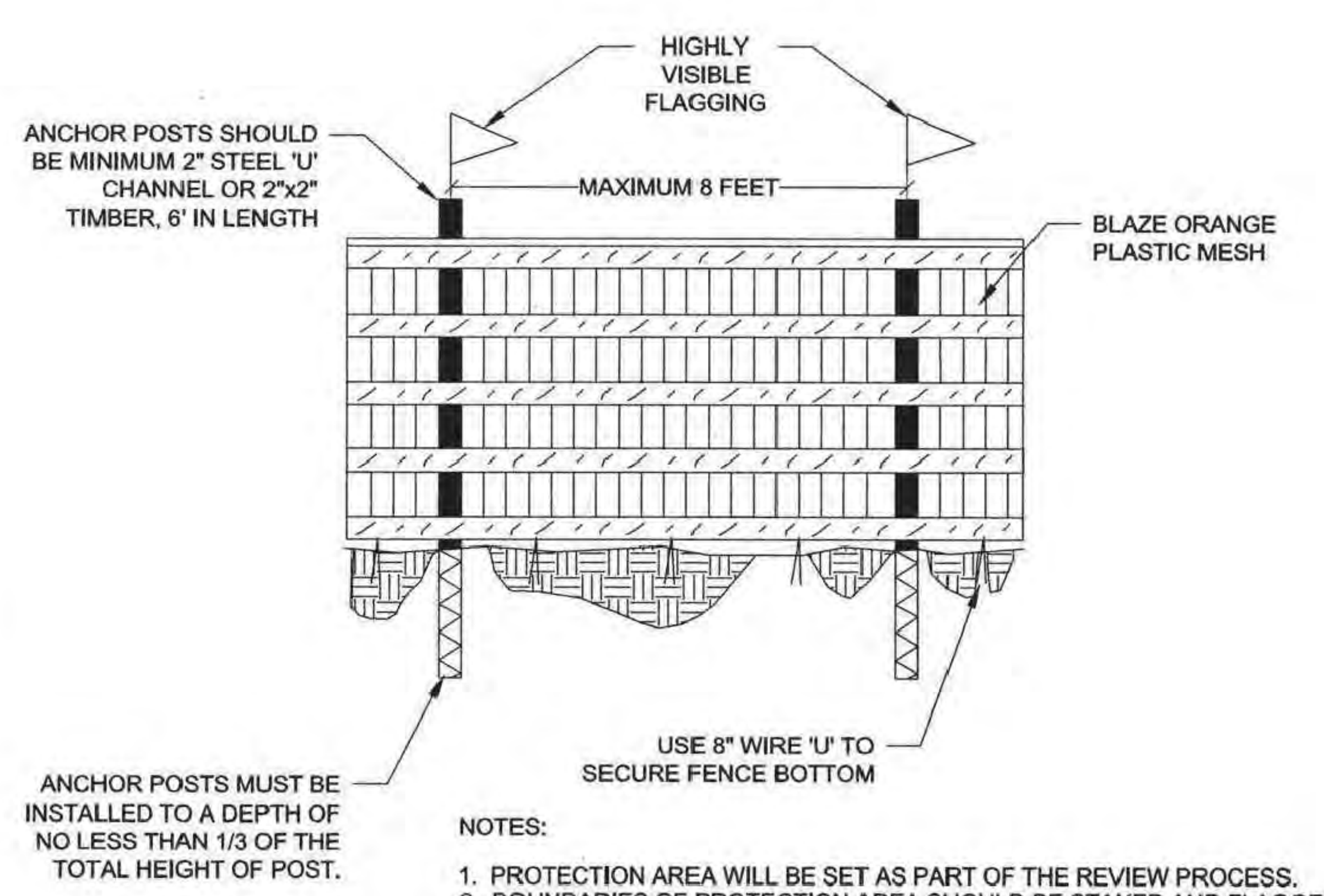


CONSTRUCTION SPECIFICATIONS

1. ~~PREPARE SWALES IN ACCORDANCE WITH THE CONSTRUCTION SPECIFICATIONS DESCRIBED IN SECTION C-2, STANDARDS AND SPECIFICATIONS FOR TEMPORARY SWALE, OR AS SPECIFIED ON PLAN.~~
2. PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, UNDER THE BOTTOM AND SIDES OF THE DAM PRIOR TO PLACEMENT OF STONE. CONSTRUCT THE CHECK DAM WITH WASHED 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) WITH SIDE SLOPES OF 2:1 OR FLATTER AND A MINIMUM TOP WIDTH OF 12 INCHES. PLACE THE STONE SO THAT IT COMPLETELY COVERS THE WIDTH OF THE CHANNEL AND CHANNEL BANKS. FORM THE WEIR SO THAT TOP OF THE OUTLET CREST IS APPROXIMATELY 6 INCHES LOWER THAN THE OUTER EDGES. LINE THE UPSTREAM FACE OF THE DAM WITH A 1 FOOT THICK LAYER OF WASHED AGGREGATE (¾ TO 1½ INCH).
3. SET THE HEIGHT FOR THE WEIR CREST EQUAL TO ONE-HALF THE DEPTH OF THE CHANNEL OR DITCH. TO AVOID SCOUR THE MAXIMUM HEIGHT OF THE WEIR CREST MUST NOT EXCEED 2.0 FEET.
4. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES ONE-HALF OF THE HEIGHT OF THE WEIR CREST. MAINTAIN LINE, GRADE, AND CROSS SECTION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

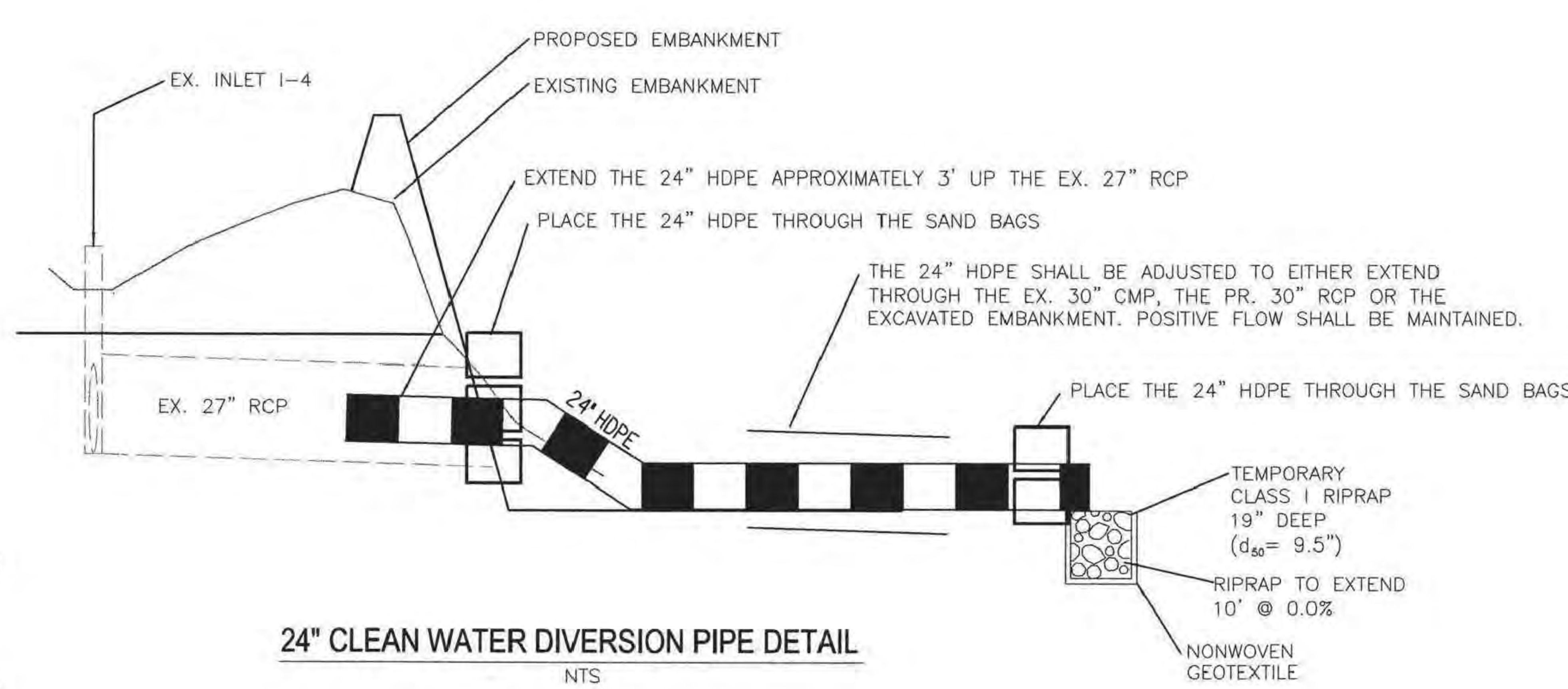
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



NOTES:
1. PROTECTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
2. BOUNDARIES OF PROTECTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICES.
3. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

BLAZE ORANGE PLASTIC FENCE

NOT TO SCALE



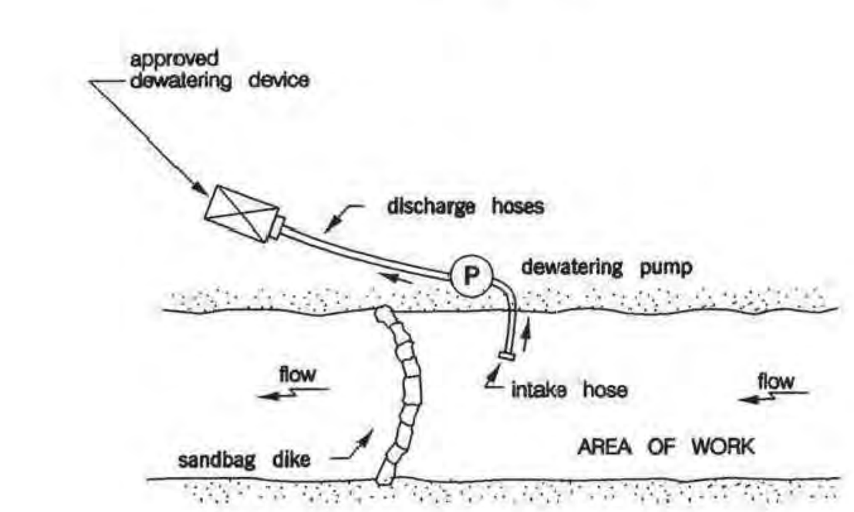
24" CLEAN WATER DIVERSION PIPE DETAIL

NTS

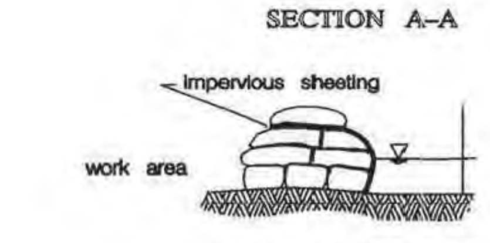
STANDARD SYMBOL

DETAIL: SAND BAGS

PLAN VIEW



SECTION A-A



SAND BAGS

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

9/18/15

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

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

HOWARD SCD

7/22/15

DATE

CLIENT

HOWARD COUNTY DPW
ENVIRONMENTAL SERVICES
6751 GATEWAY DRIVE, SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6444

DATE: 09.18.13 ISSUES / REVISIONS

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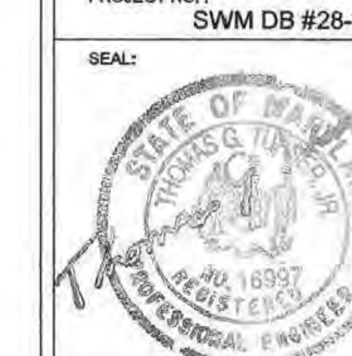
CONSULTING ENGINEERS – PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MD 21031
Phone: (443) 589-2400 Fax: (443) 589-2401

SWM REHABILITATION
LONGRIDGE KNOLLS
POND "A"

TITLE:

EROSION & SEDIMENT CONTROL DETAILS

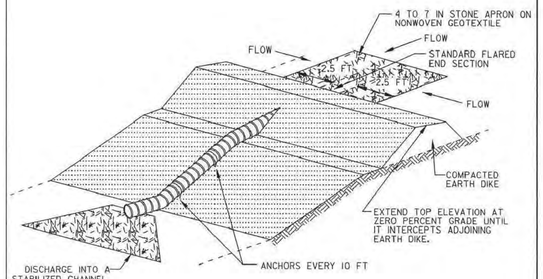
PROJECT NO.: SWM DB #28-2012	SCALE: NTS	
SEAL:	BY: JMS	CHECK:
	DWG. NO.: 13 OF 15	



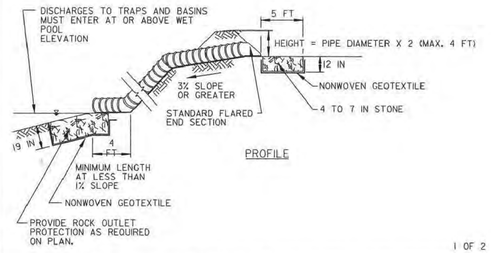
DETAIL D-1 PIPE SLOPE DRAIN

STANDARD SYMBOL: PSD - 12

DESIGNATION PSD-12 REFERS TO 12 IN PIPE SLOPE DRAIN.



ISOMETRIC VIEW



PROFILE

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL D-1 PIPE SLOPE DRAIN

STANDARD SYMBOL: PSD - 12

DESIGNATION PSD-12 REFERS TO 12 IN PIPE SLOPE DRAIN.

CONSTRUCTION SPECIFICATIONS

1. THE HEIGHT OF THE EARTH DIKE MUST BE AT LEAST 2 TIMES THE PIPE DIAMETER MEASURED FROM THE INVERT OF THE PIPE. EXTEND THE TOP ELEVATION OF DIKE AT ZERO PERCENT GRADE UNTIL IT INTERCEPTS THE TOP OF THE ADJOINING EARTH DIKE.
2. FLEXIBLE PIPE IS PREFERRED. HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. ALL CONNECTIONS MUST BE WATERTIGHT.
3. ATTACH A FLARED END SECTION TO THE INLET END OF PIPE WITH A WATERTIGHT CONNECTION. AT THE INLET OF THE PIPE SLOPE DRAIN, INSTALL 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PLACED 12 INCHES IN DEPTH ON NONWOVEN GEOTEXTILE AND EXTEND OUT 5 FEET FROM THE INLET IN ALL DIRECTIONS.
4. PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL RIPRAP.
5. SECURELY ANCHOR THE PIPE SLOPE DRAIN (PSD) TO THE SLOPE. SPACE THE ANCHORS EVERY 10 FEET.
6. HAND TAMP THE SOIL AROUND AND UNDER THE PIPE AND END SECTION IN 4 INCH LIFTS TO THE TOP OF THE EARTH DIKE.
7. UPON COMPLETING INSTALLATION OF THE PSD, STABILIZE ASSOCIATED DISTURBANCES WITH SEED, MULCH, AND TACK.
8. INSTALL OUTLET PROTECTION AS SPECIFIED ON APPROVED PLAN.
9. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION. MAINTAIN WATER TIGHT CONNECTIONS AND POSITIVE DRAINAGE. REMOVE ACCUMULATED SEDIMENT AND DEBRIS.

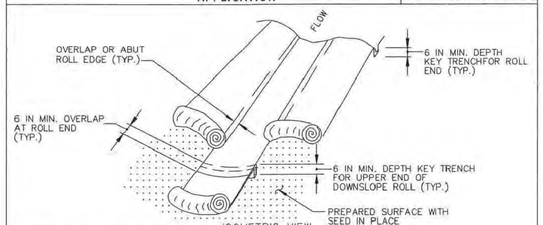
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL: TSSMC – * lb/ft² (* INCLUDE SHEAR STRESS)



ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. 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 TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. 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 1½ 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 A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. 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 PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. KEY-IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
7. OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. 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

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

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

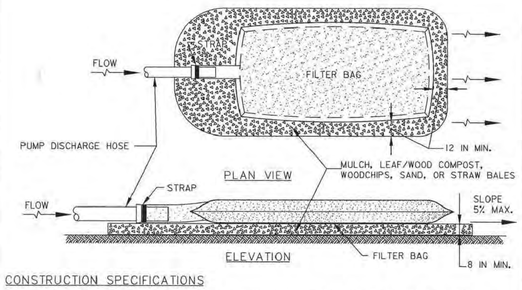
HOWARD SCD — DATE 7/22/15

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — 2/18/15

DETAIL F-4 FILTER BAG

☒FB



CONSTRUCTION SPECIFICATIONS

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

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT²	ASTM D-4491
PERMITTIVITY (SEC^{-1})	1.2 SEC^{-1}	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

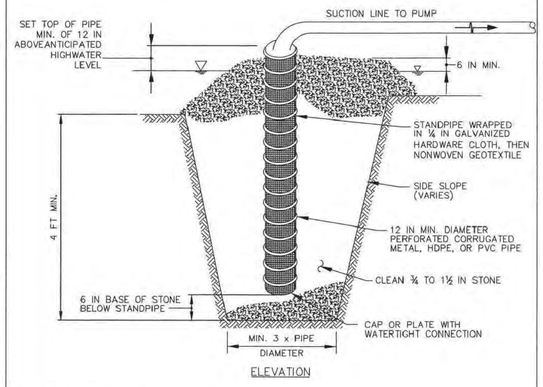
6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL F-2 SUMP PIT

STANDARD SYMBOL: ☒SP



ELEVATION

CONSTRUCTION SPECIFICATIONS

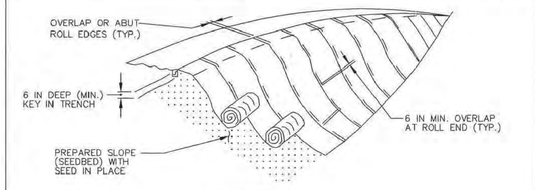
1. USE 12 INCH OR LARGER DIAMETER CORRUGATED METAL, HDPE, OR PVC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER. BOTTOM OF PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
2. WRAP PIPE WITH ¼ INCH GALVANIZED HARDWARE CLOTH AND WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE HARDWARE CLOTH.
3. EXCAVATE PIT TO THREE TIMES THE PIPE DIAMETER AND FOUR FEET IN DEPTH. PLACE ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
4. SET TOP OF PIPE MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
5. BACKFILL PIT AROUND THE PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
6. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
7. A SUMP PIT REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, REMOVE PERFORATED PIPE AND REPLACE GEOTEXTILE AND STONE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL: TSSMS – * lb/ft² (* INCLUDE SHEAR STRESS)



ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. 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 TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. 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 1½ 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 A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. 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 & SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE UPSLOPE 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.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. 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

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

CLIENT

HOWARD COUNTY DPW
ENVIRONMENTAL SERVICES
6751 GATEWAY DRIVE, SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6444

DATE: 09.18.13 ISSUES / REVISIONS

THERE IS NO AS-BUILT INFORMATION ON THIS SHEET. SHEET IS INCLUDED FOR REFERENCE ONLY.

CENTURY ENGINEERING
CONSULTING ENGINEERS – PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MD 21031
Phone: (443) 589-2400 Fax: (443) 589-2401

SWM REHABILITATION LONGRIDGE KNOLLS POND "A"

TITLE:

EROSION & SEDIMENT CONTROL DETAILS

PROJECT NO.: SWM DB #28-2012

SCALE: NTS

SEAL: STATE OF MARYLAND THOMAS G. VIDMAR NO. 16997 PROFESSIONAL ENGINEER

BY: JMS CHECK:

DWG. NO.:

14 OF 15

OPERATIONS AND MAINTENENCE ALTERNATIVES FOR REMOVING TREES FROM DAMS

General Operations and Maintenance Considerations

A. Purpose

The purpose of this technical note is to outline and discuss the alternatives for maintenance of dam embankments containing trees and heavy brush. This Technical Note contains general recommendations and provides guidance on evaluating the interrelationships between tree types, tree locations, soil types, and depth of normal pool. It is recognized that the responsible engineer may weigh additional factors in arriving at a final plan for tree removal or treatment. In some cases the final plan may require total removal of all tree roots.

The guidelines presented here assume that the dam in question has been properly designed and constructed prior to tree invasion. It is anticipated that this document will serve as a working tool and help promote consistency (1) when evaluating several damsites simultaneously, (2) when two or more individuals are involved in maintenance inspections and recommendations, and (3) over extended periods of time and changes in personnel.

B. Problem Discussion

SCS O&M Handbooks and project agreements have always required that dams and emergency spillways be kept free of trees and brush by regular mowing or treatment. It is also recognized that maintenance has not always been performed when needed. If yearly O&M inspections indicate the existence of trees and brush, our O&M recommendations require that trees and brush be removed from the dam embankments immediately.

1. Roots

   a. Piping - Where trees have been allowed to grow to some size, cutting the trees may create a problem. The decay and deterioration of larger roots after the tree has been cut and killed can eventually result in open channels in the fill, creating possible seepage paths. This condition could be extremely serious in soils with a high potential for piping. The greatest concern usually involves trees on the downstream side of the earthfill dam where seepage exits occur.

   b. Drain infiltration - Tree roots commonly plug drain lines used for subsurface land drainage, and they can and do plug drain outlets for dams.

2. Scour

   Scour damage can be induced by trees located in the exit of emergency spillways and on the slopes of dams. The scour damage occurs during overtopping of the dam or when the emergency spillway flows. The damage is caused by water turbulence around an obstruction to the flow. Trees providing obstructions along the top of the dam, on the downstream slopes or in the exit channel of the earth spillway can induce serious damage by progressive scour eorsion. This kind of failure has been observed and documented in numerous cases.

   During high water levels scour damages can occur on the upstream slope of the dam. The scour damage is caused when waves are wind driven up the slope and the sheet of water recedes at a faster rate causing scour below the tree obstruction.

3. Vegetation

   Trees reduce the available moisture in the soil due to interception and transpiration. They also reduce light available to desirable grass and legume cover and compete for space. It is clear that the establishment and maintenance of good grass and legume vegetative covers require the control of trees and other woody growth on dams.

C. Considerations for Tree Removal

1. The best alternative is to prevent the growth of trees by regular mowing of the dam. If a low maintenance cover is established, then cutting new trees every 2-3 years would be necessary.

2. Once trees have been allowed to establish, the recommendation is to remove them in all cases. Remaining stumps should be chemically treated to prevent sprouting.

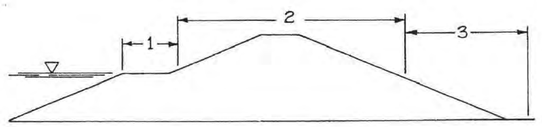
3. The removal of stumps and root mass will be required where the potential for problems from seepage, slope stability or drain clogging exists.

4. Where scouring potential exists from flowing water, the remaining stumps should be cut at least 6" below ground and filled over with compacted earth.

II. Factors Affecting Recommendations for Stump and Root Mass Removal

A. Tree Location Zones

These zones are general areas of an earthfill dam that can have significant differences with regard to alternatives for tree removal. Zone limits are variable with each individual structure. Recommendations in Table A are keyed to these zones.



1. Waterline - Potential problems include slope damage from tree blowdown, visual masking of the structure that may hinder clear observation of a potential problem, tree root interception of spillway conduits, treetop interference with hydraulic performance of principal spillways and wave action scour due to obstructions.

2. Frontslope, Crown and Backslope - Potential problems include seepage in root zone through the narrow top section at high water periods, damage from uprooting during blowdown, visual masking of covered areas, scour potential during overtopping due to obstructions, and seepage paths along roots that intercept the phreatic line from the backslope.

3. Toe of Dam - Potential problems include the development of a seepage path along roots that intercept drainage outlets or phreatic surfaces, root clogging of drainage systems, visual masking of the toe area where seepage is most likely, loss of the protective blanket if trees are uprooted by a storm event and scour from obstructions during overtopping. (This zone needs to extend at least 20 feet beyond the toe of slope.)

B. Types of Impoundments and Embankments

1. Impoundment

As the depth of permanently impounded water becomes a greater percent of dam height, the potential problems associated with existing trees may increase. This may require more careful and extensive removal and repair. Although this factor is not recognized in Table A, it must be a consideration in determining the extent of the problem and potential hazard in each case.

2. Embankment

The nature of the materials and their distribution in the embankment are the factors considered.

   a. Dispersed clay shells or dispersed materials in dams with thin protective shell.

   b. Embankment with chimney drain or pervious downstream shell.

   c. Homogeneous or zoned embankment with outside shell soils of low PI, with moderate to high piping potential.

   d. Homogeneous or zoned embankment with soils of moderate-high PI, low permeability, low piping potential.

C. Types, Sizes, and Distribution of Trees

1. Types of Trees (Root Systems)

A distinction is made between trees that have a deep taproot as opposed to the more common spreading root system. Special notes are used in the tables to address the root growth of water-loving trees such as willow.

   a. Long taproot - Generally, pines and other coniferous trees.

   b. Spreading root systems - Deciduous trees such as willows, cottonwood, sycamore, sweetgum, red maple, silver maple, water oak, willow oak, pin oak, Nuttall's oak, Southern red oak, elm, yellow poplar, hickory, etc.

2. Sizes of Trees

Eight inches diameter at breast height is used as the tree size where root system may start to be significant.

   a. DBH < 8" = Average diameter at breast height is less than 8".

   b. DBH ≥ 8" = Average diameter at breast height is 8" or greater.

3. Distribution of Trees

Tree distribution will determine whether the root system can be considered isolated and independent or continuous and joined with other systems over a significant area.

   a. Isolated or scattered trees = light cover. Light cover is defined as three trees per 400 square feet with a DBH < 8" or two trees per 400 square feet with a DBH ≥ 8" or more.

   b. Clumps or continuous tree growth = heavy cover. Heavy cover is defined as more than three trees per 400 square feet with a DBH < 8" or more than two trees per 400 square feet with a DBH ≥ 8" or more.

Criteria and Recommendations for Stump and Root Mass Removal

A. Definition of Treatment Methods

Consideration of the factors previously listed was used to develop the appropriate treatment methods for stump and root mass removal on embankments. General recommendations are summarized in Table A.

Definitions of each of the treatment methods listed in this table is as follows:

1. Cut and Kill Stump

Trees should be cut approximately six inches below the ground surface to eliminate the hazard of any surface obstruction.

An approved silvicide should be applied to the stump surface, as recommended by the manufacturer, prior to backfilling and reseeding.

2. Cut and Grub Stumps and Root Mass to Specified Depth Uniformly

In the area specified, a uniform cut will be made with appropriate equipment. The underlying root mass that remains will be disturbed as little as possible by using sharp cutting tools. Exposed tap roots will be treated with an appropriate silvicide to prevent reemergence.

3. Cut and Grub Stumps and Root Mass to Depth and Diameter of Removal Dictated by Type and Size of Tree (See Tables)

For taprooted trees, the removal of this mass should create a roughly parabolic shaped hole with a depth and diameter at the surface as specified in the tables. For spreading root trees, the depth of removal shown in the tables should be uniform over the diameter area specified in the tables.

4. Complete Removal of Stump and Root System

It is anticipated that this treatment will be unusual and must be judged on an individual basis. Generally this would be an impractical solution and may, in some cases, be detrimental to the structure. Some of the complications are as follows: (1) area of disturbance, (2) depth and slopes of excavation, (3) procedures for effective backfilling of the excavation, (4) timing and duration of the removal operation.

5. Partial Removal of Stumps and Root Systems and the Addition of a Filter (See backfill method 3, page 6.)

This treatment may be the most positive solution when there is concern for piping but treatment number 4 (complete removal) is not feasible.

B. Types of Backfill and Methods of Backfilling After Removal of Stumps and Root Mass

1. Selection of Soil Materials for Backfill

The selection of soil for the backfilling of treated areas should be based primarily on the permeability characteristics of the backfill with respect to the surrounding embankment.

Generally backfill materials in Zones 1 and 2 of the embankment should be of similar permeability to the adjacent embankment. In embankments of known dispersive clays care must be taken to find nondispersed clay borrow material or treat dispersed borrow material with hydrated lime.

For backfill in Zones 3 and 4, if the materials in the embankment are permeable shell type materials, it is important that borrow material be at least as permeable and preferably more permeable than the adjacent fill material. At the same time, in critical locations, the borrow soils should satisfy filter design criteria to prevent any possible piping.

2. Method of Placement and Backfill

Where stump and root mass removal is to a uniform depth over an accessible area, backfill should be placed in lifts no thicker than 6" and compacted at about optimum moisture by at least two passes of the tracks of the earth moving equipment.

Where stump and root mass removal is in confined areas, backfill should be compacted with hand directed power tampers. Backfill should be placed at a minimum of 90 percent maximum dry density (ASTM D-698A) and approximately optimum moisture. Lift thickness should be 4-6".

3. Special Treatment

Where extensive root mass removal is necessary and seepage is either evident or probable, the use of a filter may be appropriate. Filter material gradations must be selected to prevent piping or movement of embankment materials but allow seepage and safe exit of water. The filter may be added in conjunction with partial removal of extensive root systems.

C. General Recommendations for Tree Removal

Table A on page 8 contains general recommendations for tree removal.

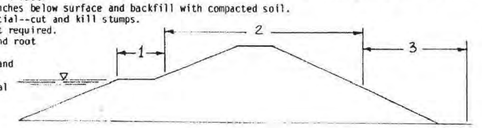
TABLE A

GENERAL RECOMMENDATIONS FOR TREE REMOVAL 1/

2-1-81

TREE LOCATION ZONE	TREE TYPE A (TAP ROOT) DBH < 8" LIGHT COVER	TREE TYPE A (TAP ROOT) DBH < 8" HEAVY COVER	TREE TYPE A (TAP ROOT) DBH ≥ 8" LIGHT COVER	TREE TYPE A (TAP ROOT) DBH ≥ 8" HEAVY COVER	TREE TYPE B (SPREADING ROOTS) DBH < 8" LIGHT COVER	TREE TYPE B (SPREADING ROOTS) DBH < 8" HEAVY COVER	TREE TYPE B (SPREADING ROOTS) DBH ≥ 8" LIGHT COVER	TREE TYPE B (SPREADING ROOTS) DBH ≥ 8" HEAVY COVER
1 1/	Cut and kill stumps.	Cut and kill stumps.	Cut and kill stumps.	Cut and kill stumps.	Cut and kill stumps.	Cut and kill stumps.	Cut and kill stumps.	Cut and kill stumps.
2 4/	Cut and kill stumps. 2/	Cut and grub stumps and root mass to 18" depth uniformly.	Cut and grub stumps and root mass to 24" depth in 1/2 crown width diameter area.	Cut and grub stumps and root mass to 24" depth uniformly.	Cut and kill stumps 2/	Cut and grub stumps and root mass to 12" depth uniformly.	Cut and grub stumps and root mass to 18" depth in crown width diameter area.	Cut and grub stump and root mass to 18" depth uniformly.
3 7/	Cut and kill stumps.	Cut and grub stumps and root mass to 18" depth uniformly.	Cut and grub stumps and root mass to 24" depth in 1/2 crown width diameter area. 3/	Cut and grub stumps and root mass uniformly to 18" depth.	Cut and kill stumps. 5/	Cut and grub stumps and root mass to 12" depth uniformly. 5/	Cut and grub stumps and root mass to 18" depth in crown width diameter area. 3/ 5/	Cut and grub stumps and root mass uniformly to 12" depth. 6/

1/ Tree growth smaller than 2" DBH will be removed by spraying, injection or cutting and stump killing. Trees and shrubs planted for shoreline protection in Zone 1 shall be maintained at heights < 4 feet.
2/ In embankment type (a) dispersed soil--cut stumps 12 inches below surface and backfill with compacted soil.
3/ In embankment type (d) earthfill with low piping potential--cut and kill stumps.
4/ In riprapped or heavy rockfill sections grubbing is not required.
5/ For water-loving trees such as willows, remove stump and root mass in twice the crown width area.
6/ For water-loving trees such as willows, remove stumps and root mass to 18" depth uniformly.
7/ Individual large trees in this zone may need the special treatment as described in Section 3.



DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — 9/14/15

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

HOWARD SCD — DATE 7/29/15

CLIENT

HOWARD COUNTY DPW
ENVIRONMENTAL SERVICES
6751 GATEWAY DRIVE, SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6444

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CONSULTING ENGINEERS – PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MD 21031
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SWM REHABILITATION
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NOTES

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SCALE: N/A
SEAL:
BY: JMS
CHECK:
DWG. NO.:
15 OF 15