

HOWARD COUNTY

DEPARTMENT OF PUBLIC WORKS

ELLCOTT CITY, MARYLAND 21043

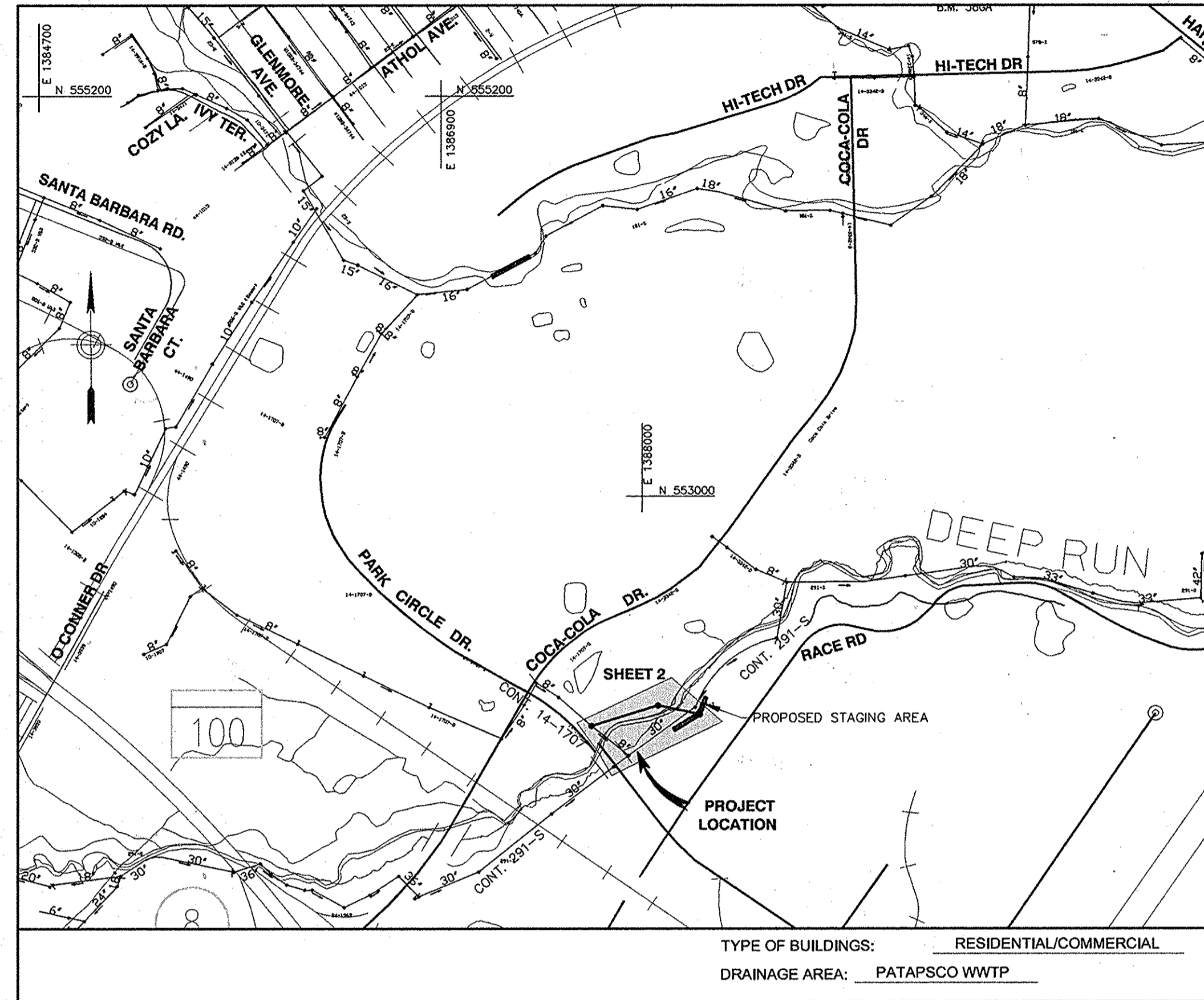
POINT	NORTHING	EASTING	ELEV.	DESCRIPTION
100B	551591.2140	1387816.7380	73.45	REBAR & CAP
101B	551859.9520	1387547.4670	80.71	REBAR & CAP
200B	551609.9970	1388089.5993	77.82	SPUR R&C

SURVEY CONTROL
B.M. #1
 HOWARD CO. CONTROL PT. 38GA
 CONCRETE MONUMENT
 NAD 83 (Adj 1991): N 555,897.3157 E
 1,390,132.1323
 NAVD 88: EL. 24.6386

ITEM	NORTHING	EASTING
MANHOLE #13A (HO. CO. STD. G-5.12)	551,849.89	1,388,087.42

B.M. #2
 HOWARD CO. CONTROL PT. 38DA
 CONCRETE MONUMENT
 NAD 83 (Adj 1991): N 556,796.2929 E
 1,390,221.4861
 NAVD 88: EL. 38.4419

ITEM	UNIT	ESTIMATE	AS-BUILT	SUPPLIER
12" DIP CLASS 54 SEWER MAIN	L.F.	604	604	U.S. PIPE
STD. 4'-0" PRECAST MANHOLE WT (HO. CO. STD. G-5.12)	EA.	1	1	C.P. & P.
ADDITIONAL MANHOLE DEPTH	V.F.	3	2.5'	



VICINITY MAP
 SCALE: 1" = 600'

DEEP RUN SEWER RELOCATION & STREAM RESTORATION

CAPITAL PROJECT S-6268
 CONTRACT NO. 10-4829

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	DEEP RUN PLAN, PROFILE, & DETAILS
3	SEDIMENT AND EROSION CONTROL SPECIFICATIONS
4	SEDIMENT AND EROSION CONTROL DETAILS AND NOTES
5	SEDIMENT AND EROSION CONTROL DETAILS
6	MISCELLANEOUS DETAILS
7	STREAM RESTORATION SEDIMENT AND EROSION CONTROL DETAILS & SPECIFICATIONS
8	ANNE ARUNDEL COUNTY/MAA SPECIFICATIONS

GENERAL NOTES

- Approximate locations of existing sanitary sewer are shown. The Contractor shall take all necessary precautions to protect existing mains and services and maintain uninterrupted service. Any damage incurred shall be repaired immediately to the satisfaction of the Engineer by the Contractor at the Contractor's expense.
- Topographic field surveys were performed in February 2011 by Dewberry Consultants LLC.
- Horizontal and Vertical Survey Controls:
 The coordinates shown on the drawings are based on Maryland State Reference System NAD 83/91 and NAVD 88 as projected by Howard County Geodetic Control Stations Howard Co. B.M. 37IM3 and B.M. 38GM1.
- All pipe elevations shown are invert elevations unless otherwise noted on the plans.
- Clear all utilities by a minimum of 12'.
- For details not shown on the drawings or described in the contract documents, and for materials and construction methods, use Howard County Design Manual, Volume IV, Standard Specifications and Details for Construction (Latest Edition). The Contractor shall have a copy of Volume IV on the job.
- All existing utilities shall be test pitted/located as necessary and in advance of the proposed construction, in order to properly make all required utility crossings and/or connections. Any discrepancies or utility conflicts shall be immediately reported to the Engineer. Where test pits have been made on existing utilities, they are noted by the symbol at the location of the test pit. A note or notes containing the results of the test pit or pits is included on the drawings or specifications. Existing utilities in the vicinity of the proposed work for which test pits have not been dug shall be located by the Contractor two (2) weeks in advance of construction operations at his own expense.
- Contractor shall notify the following utility companies or agencies at least five (5) working days before starting work shown on these plans:
 AT&T 1-800-252-1133
 BGE - Contractor Services 410-637-8713
 BGE - Emergency 800-685-0123
 Bureau of Highways 410-313-7450
 Bureau of Utilities (DPW) 410-313-4900
 Colonial Pipeline Co. 410-795-1390
 Miss Utility 1-800-257-7777
 State Highway Administration 410-531-5533
 Verizon 1-800-743-0033 / 410-224-9210
- Trees and shrubs are to be protected from damage to the maximum extent. Trees and shrubs located within the construction strip noted by the symbol are to be protected in accordance with Howard County Volume IV Design Manual Standard Detail L-9.02.
- Contractor shall remove trees, stumps and roots along the line of excavation. Payment for such removal shall be included in the unit price bid for construction of the sanitary sewer.
- The approval of these drawings will constitute compliance with DPW requirements per Section 18.114(a) of the Howard County Code.
- The Contractor shall provide all necessary lines, grades and elevations. Cut sheets shall be prepared based on the lines and grades shown on the Contract drawings.
- Remove all existing concrete bank protection to an approved location off-site.

SEWER MAIN NOTES

- Sewer main sizes and types are indicated on the drawings and Quantities Table.
- Distances shown for the sewer main are along the centerline of the pipe from manhole to manhole.
- All manholes shall be 4'-0" inside diameter unless otherwise noted.
- Manholes designated as W.T. in Plan and Profile shall have water tight frames and covers, Standard Detail G-5.52. Where water tight frame and cover is used, set top of frame 1'-6" above existing ground unless otherwise noted on drawings.

SEWER BY-PASS NOTES FOR EXISTING MANHOLES 6562 & 13

- Contractor to submit the following prior to execution:
 a. Submit method for maintaining sewage flows to include:
 Bypass pumping plan showing;
 1) Intake manhole.
 2) Receiving manhole.
 3) Expected flows. (Contractor to field verify)
 a) Design Q MH 13= 0.67 M.G.D.
 b) Design Q MH 6562= 4.41 M.G.D.
 4) Pump size.
 5) Pipe layout.
 6) Backup equipment.
- Maintain existing sewage flows during connection to existing sewer.
- Take precautions and employ methods required to prevent sewage backup.
- Return diverted sewage to sanitary system and do not discharge on surfaces or into streams or storm drains.
- Use enclosed bypass flumes equivalent in size to existing sewer being diverted, when required.
- Immediately clean and disinfect raw sewage spills and overflows, and notify Howard County Bureau of Utilities at 410-313-4900.

LEGEND

	TRAVERSE
	PROPERTY LINE
	DECIDUOUS TREE
	EVERGREEN TREE
	EX. CONTOUR
	EX. SAN. MANHOLE
	EX. SAN. SEWER MAIN
	PROP. SAN. MANHOLE
	PROP. SAN. SEWER MAIN
	PROP. CLAY DAM
	TREELINE
	TREE PROTECTION
	SUPER SILT FENCE
	SILT FENCE
	RIPRAP
	LIMITS OF DISTURBANCE
	PROPOSED ACCESS EASEMENT
	100 YEAR FLOODPLAIN
	25 FT WETLAND BUFFER
	NON-TIDAL WETLAND LIMITS
	WATERS OF THE STATE

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. 10966
 EXPIRATION DATE: MAY 12, 2014

Thomas N. DellaPalu
 Signature of Engineer
 4/8/2014
 Date

EP-14-061
 I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

Signature of Developer
 JOSEPH GLETTES
 Print Name
 4/14/14
 Date

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT

Thomas N. DellaPalu
 Signature of Engineer
 4/8/2014
 Date
 Thomas N. DellaPalu
 Print Name

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

 Howard Soil Conservation District
 4/14/14
 Date

03-01-2016
 AS-BUILTS

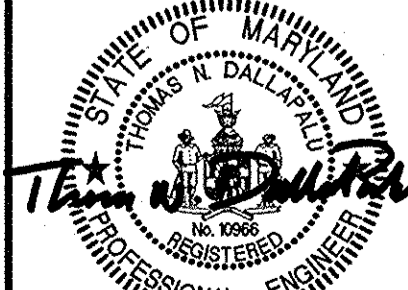
DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS
 DATE: 4/14/14

CHIEF, BUREAU OF UTILITIES
 DATE: 4/14/14

CHIEF, UTILITY DESIGN DIVISION
 DATE: 4/14/14

Dewberry
 Dewberry Consultants LLC
 3106 LORD BALTIMORE DRIVE
 SUITE 110
 BALTIMORE, MD 21244-2962
 410.265.9500
 FAX: 410.265.8875



DES: LAL					
DRN: RLJ					
CHK: TND					
DATE: 04/2014	BY	NO.	REVISIONS	DATE	

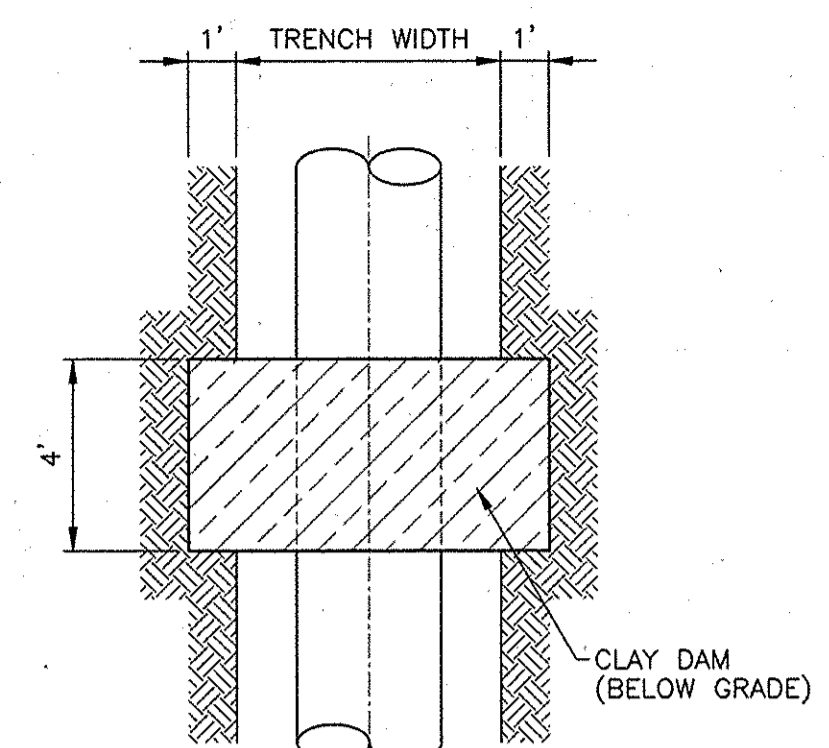
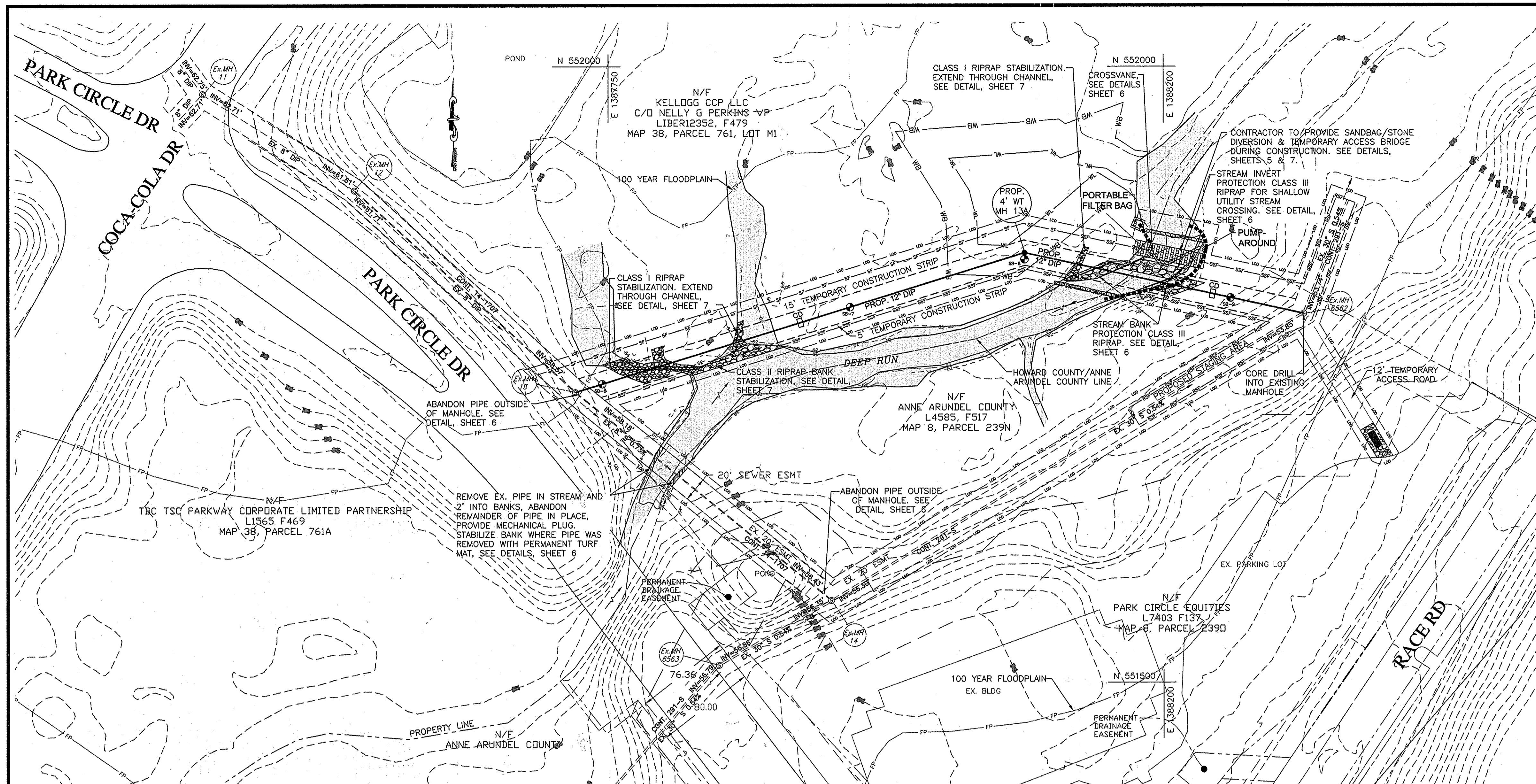
TITLE SHEET	
DATE: 04/2014	BY: NO.

DEEP RUN SEWER RELOCATION AND STREAM RESTORATION
 CAPITAL PROJECT NO. S-6268
 CONTRACT NO. 10-4829

ELECTION DISTRICT NO. 5
 HOWARD COUNTY, MARYLAND

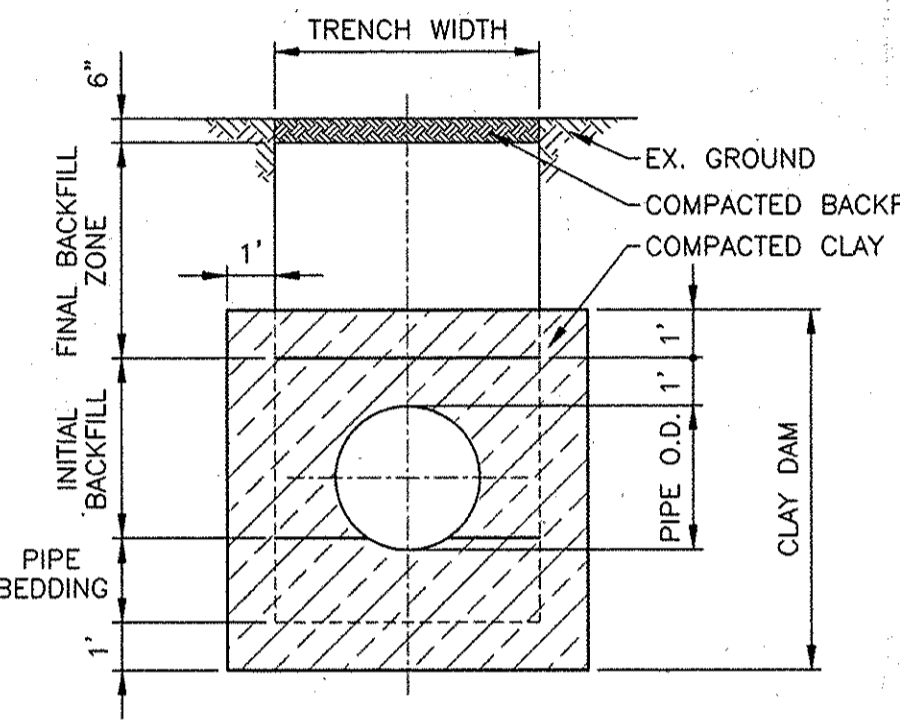
SCALE: AS SHOWN
 SHEET 1 OF 7

600' SCALE MAP NO. 43 38
 BLOCK NO. 23 20



- CLAY DAM NOTES:**
1. CLAY DAM SHALL BE INSTALLED AT INTERVALS NO GREATER THAN 500 FEET AND AS SHOWN ON THE PLANS.
 2. CLAY DAM LENGTH SHALL BE 4 FEET ALONG THE PIPE AXIS, AND SHALL BE PLACED FROM UNDERCUT SUBGRADE OR TRENCH SUBGRADE UP TO 1 FOOT OVER THE INITIAL BACKFILL.
 3. PLACE CLAY DAM IN 6" LIFTS, USING CLAY MEETING THE REQUIREMENTS OF AASHTO M145 SOIL GROUPS A-6 OR A-7 AND COMPACT TO MIN. 92%.
 4. NO STONE SHALL BE USED IN THE BOTTOM OF THE TRENCH OR IN THE FINAL BACKFILL ZONE ALONG THE LENGTH OF THE DAM.

PLAN VIEW



ELEVATION VIEW

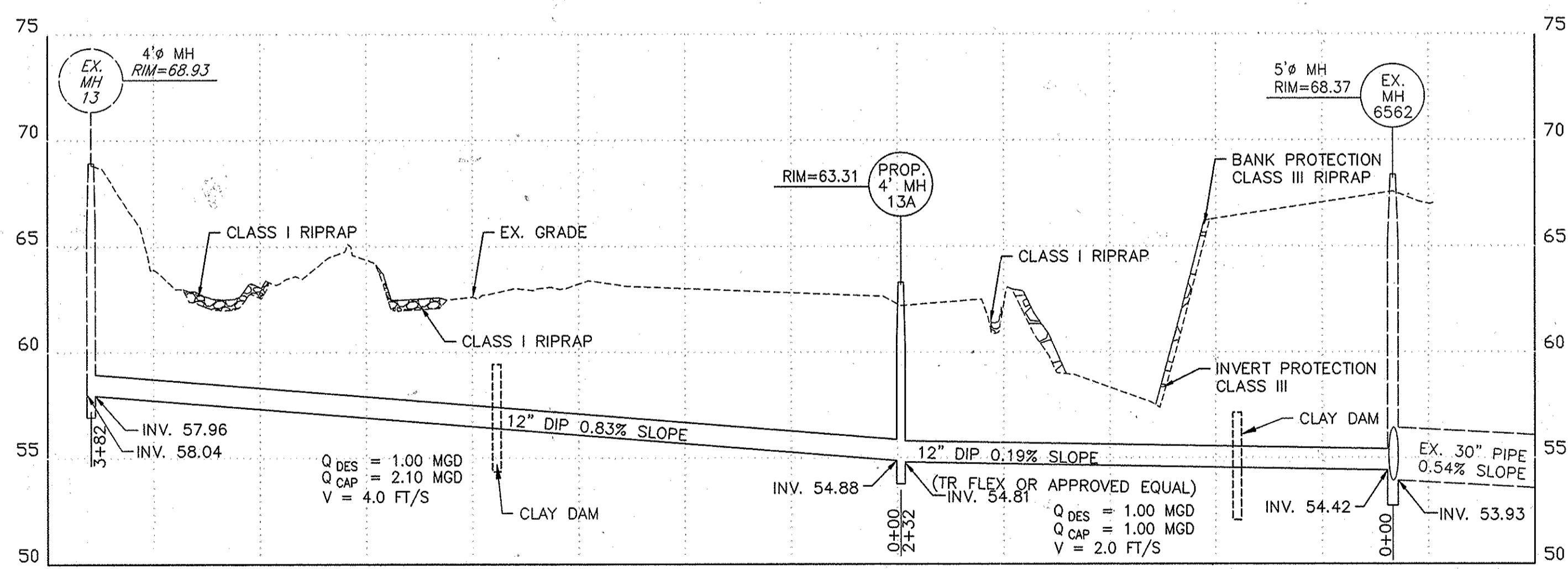
CLAY DAM TYPICAL PIPE BEDDING DETAIL

Note: All utilized staging areas are to be protected with silt fence as directed. No stockpiling is permitted onsite due to the entire site being within the 100 year floodplain limits.

PLAN
SCALE: HORIZ. 1" = 50'

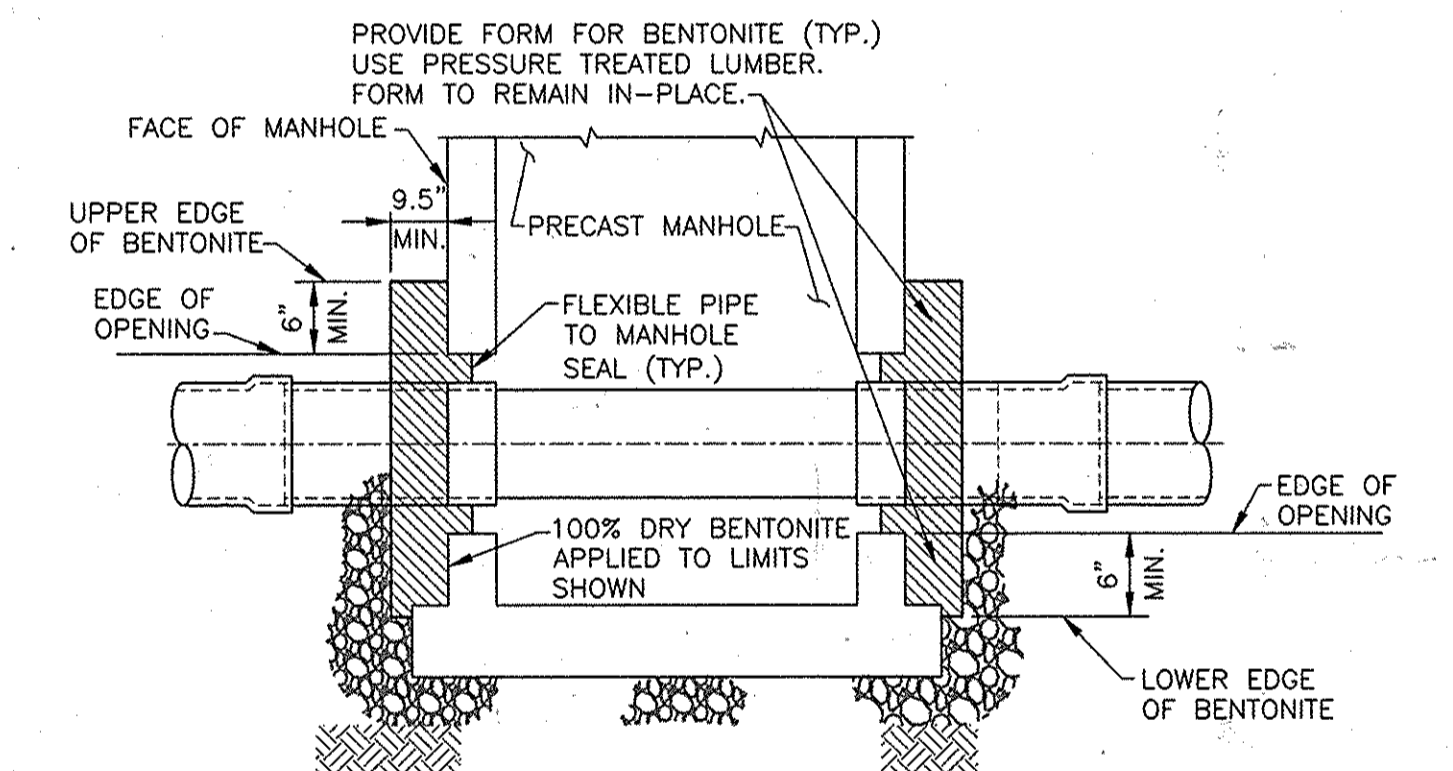
NOTE: THE LOD IS COINCIDENT WITH THE PROPOSED UTILITY EASEMENT LINE AND SHOWN FIVE (5) FEET OUTSIDE THE ACTUAL LIMIT OF DISTURBANCE FOR CLARITY

- DEEP RUN SEQUENCE OF CONSTRUCTION**
1. Deliver written notice to adjacent properties 48 hours prior to commencement of work being conducted to include the following:
 - a. Local telephone number for inquiries.
 - b. A summary of work to be completed.
 - c. Contract name & number.
 - d. Potential disturbance to area.
 Fax or email copies of all delivered residential notices to the Howard County Department of Public Works Project Manager.
 2. Provide sewer by-pass as needed.
 3. Provide silt fence, stabilized construction entrance, temporary access bridge, stream diversion and all other devices as shown on the contract drawings prior to commencement of the work.
 4. Commence sewer main installation @ existing MH 6562.
 5. Build and complete backfill of sewer to within five feet of MH 13.
 6. Provide mirror and low pressure air test of the new sewer.
 7. Connect to MH 13.
 8. Form new channel in existing MH 13 and existing MH 6562.
 9. Perform all removals and abandonments with approved stream diversions after new sewer main and service connections have been tested, approved and placed in service and existing sewer has been jet cleaned as directed on Sheet 6 of 7.
 10. Provide bank and stream stabilization between existing MH 13 and existing MH 6562.
 11. Seed, mulch, stabilize and remove all debris before commencement of work on the next area of work.



PROFILE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'

NO SCALE



PIPE TO MANHOLE CONNECTIONS
NOT TO SCALE

ASBULLTS REPLACEMENT ASBULLTS 03-01-2016

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *L. J. ...* 5/3/16
 Chief, Bureau of Utilities: *...* 5/11/16

Chief, Utility Design Division: *...* 4/21/16

Dewberry
Dewberry Consultants LLC
3108 LORD BALTIMORE DRIVE
SUITE 110
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410.265.3500
FAX: 410.265.8875

DES: LAL
DRN: RLI
CHK: TND
DATE: 03/2016

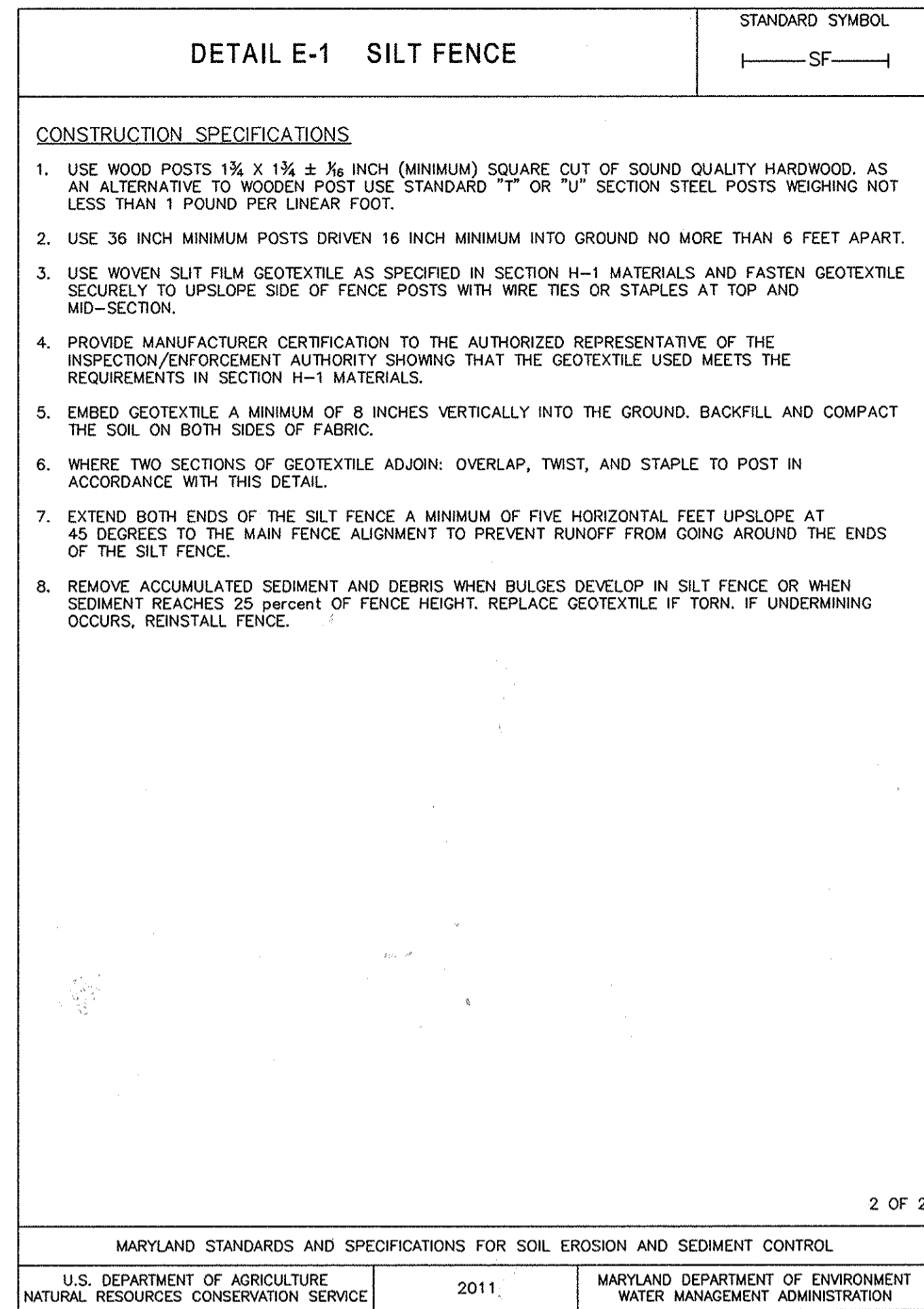
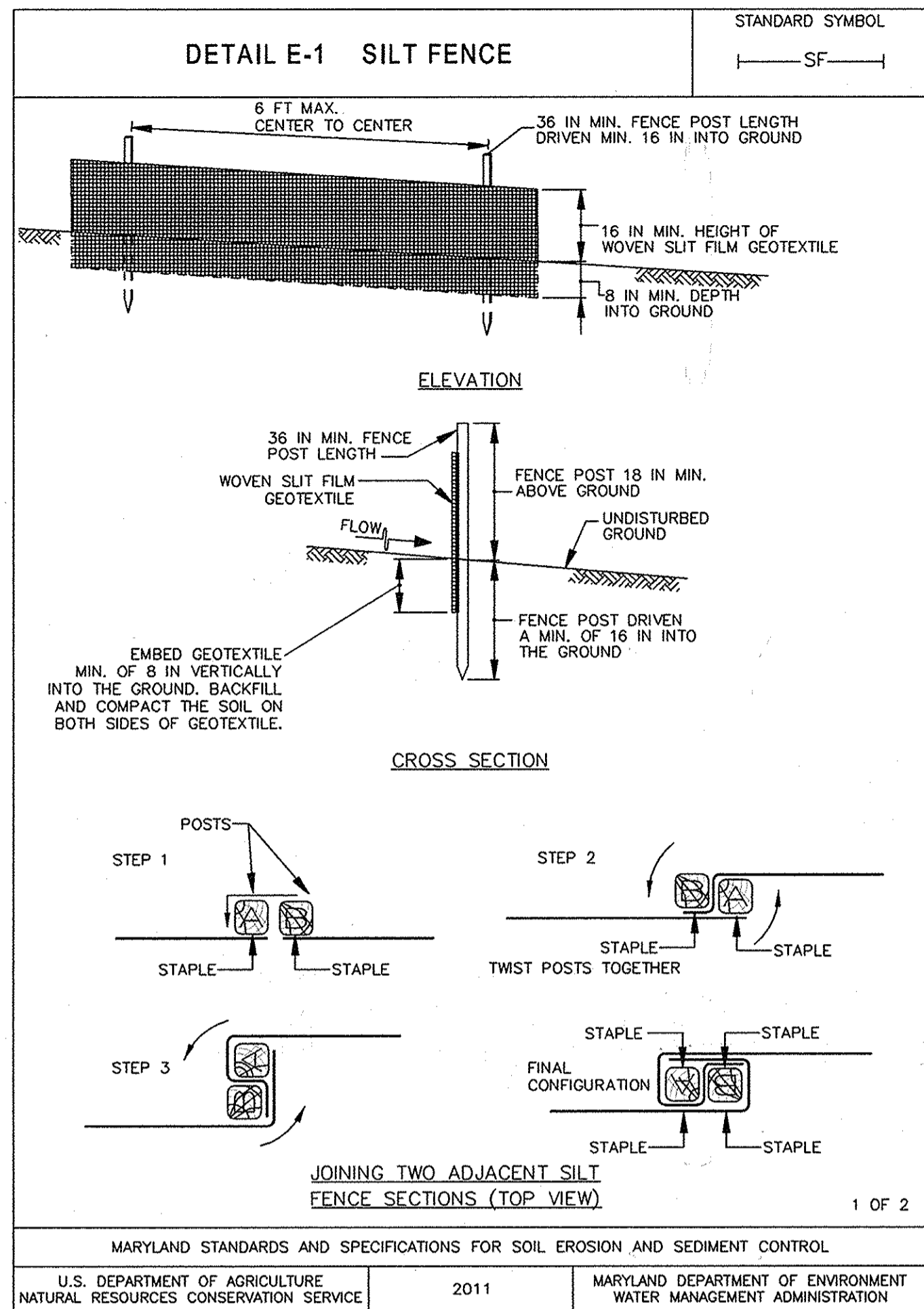
NO.	REVISIONS	DATE

DEEP RUN PLAN, PROFILE, & DETAILS

600' SCALE MAP NO. 43-38 BLOCK NO. 23-20

DEEP RUN SEWER RELOCATION AND STREAM RESTORATION
CAPITAL PROJECT NO. S-6268
CONTRACT NO. 10-4829
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN
SHEET 2 OF 8



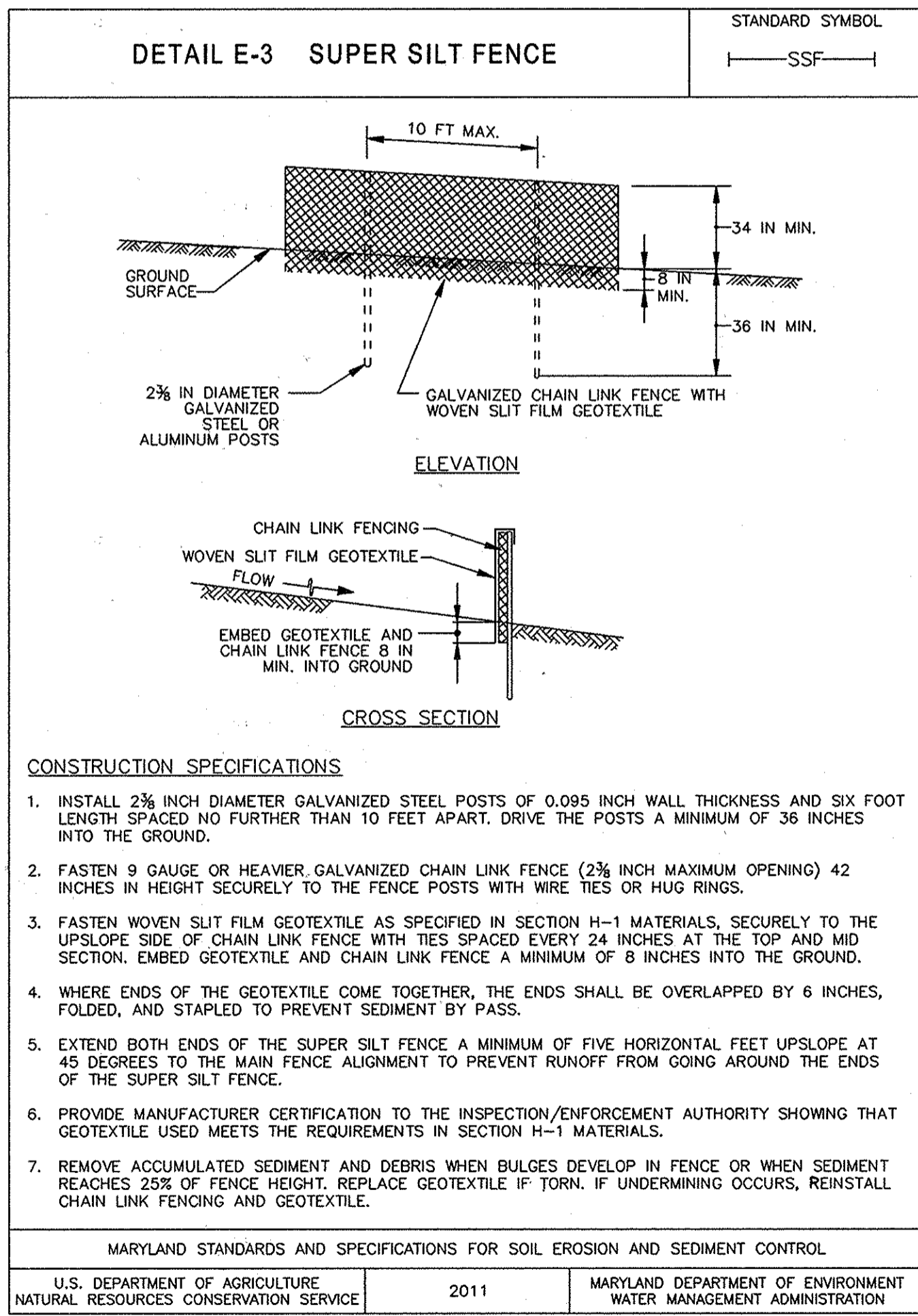
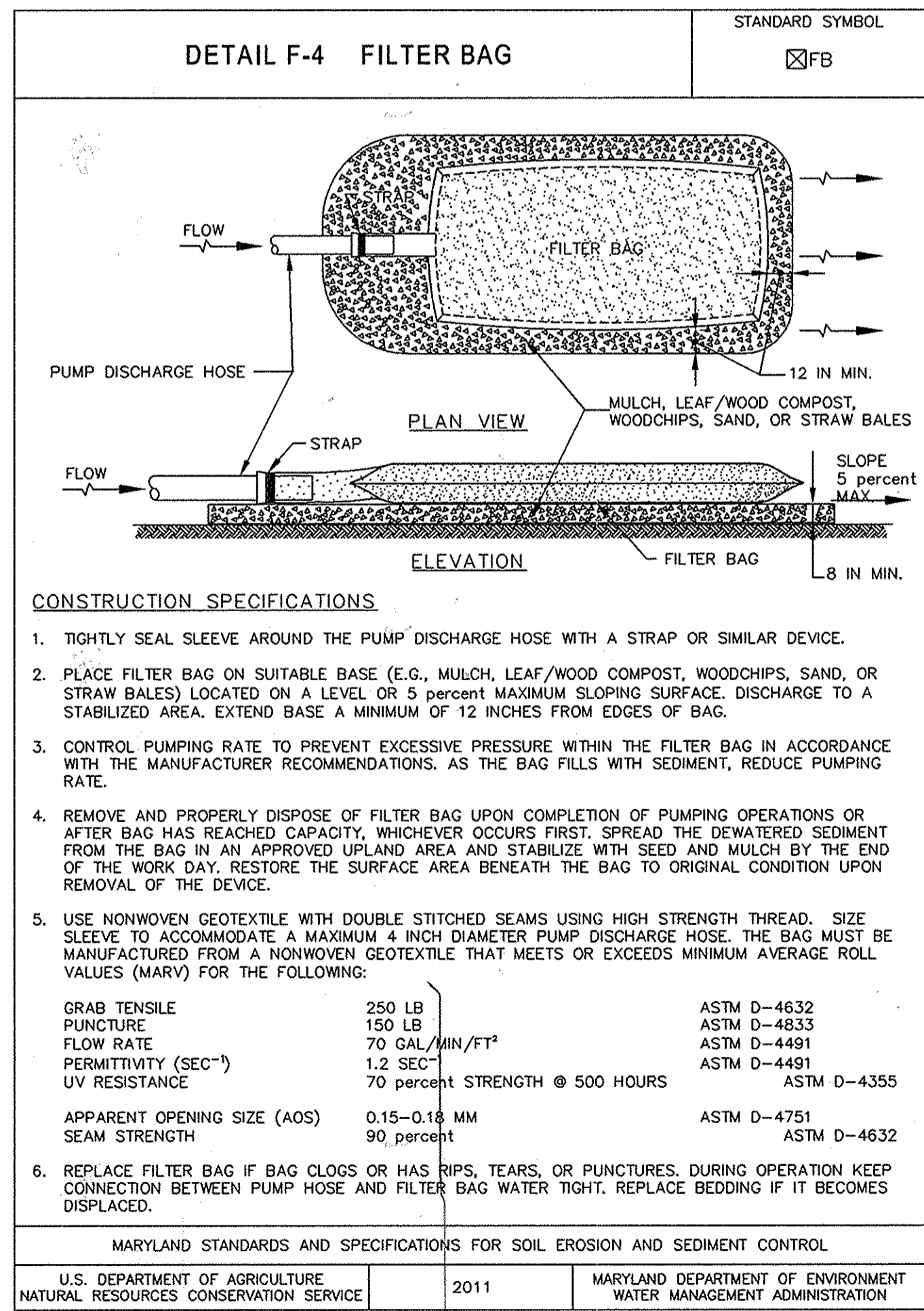
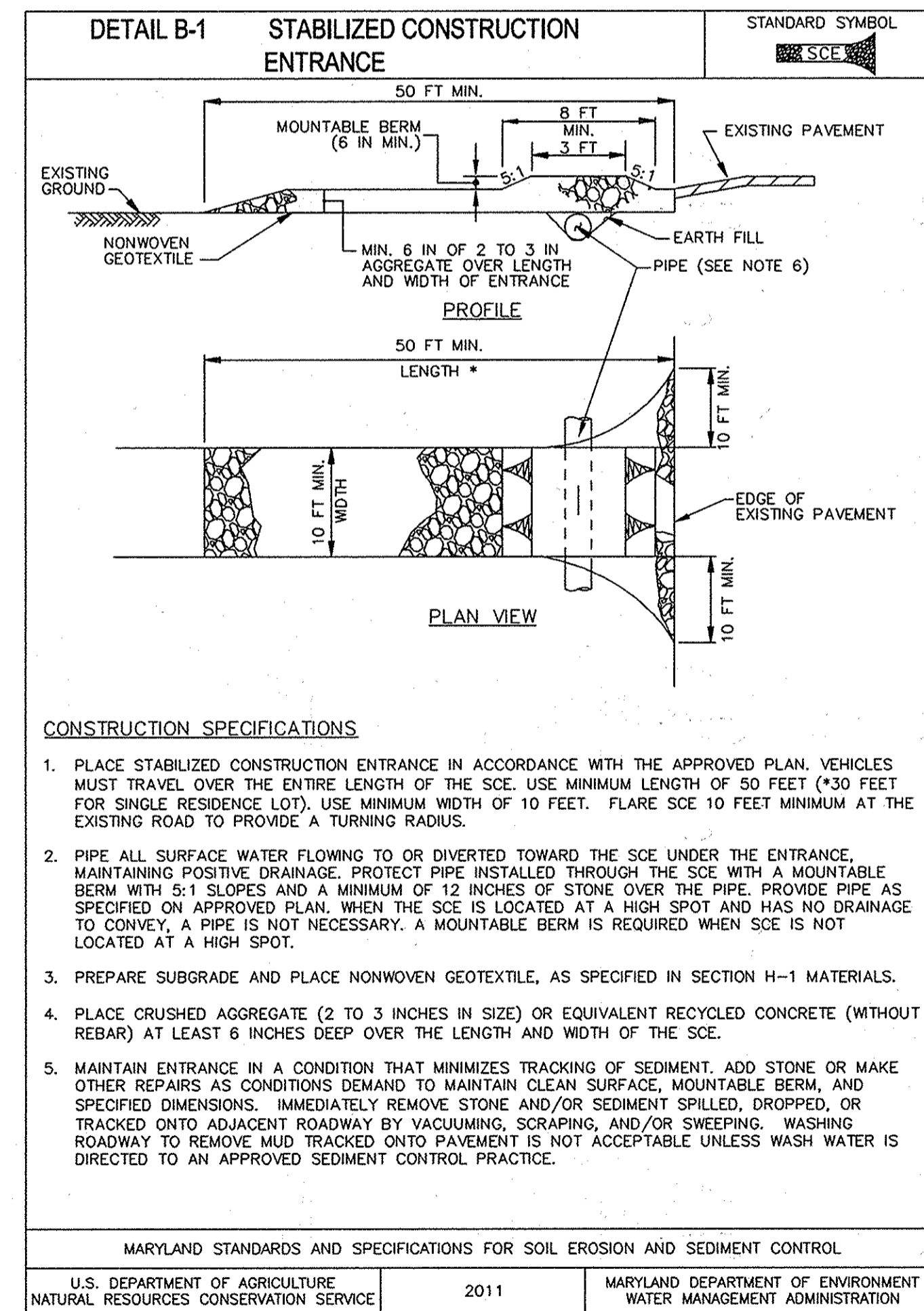
BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100 YEAR FLOODPLAIN

- NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100 YEAR FLOODPLAIN.
- 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.
- 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 ANY WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
- PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100 YEAR FLOODPLAIN.
- 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.
- RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100 YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
- 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 (*AVENA 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.
- AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
- TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM: USE III WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD OCTOBER 1 THROUGH APRIL 30, INCLUSIVE, DURING ANY YEAR.
- STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
- 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.

SEDIMENT CONTROL GENERAL NOTES

- A minimum of 48 hours notice must be given to Howard County Department of Inspections, Licenses and Permits, Sediment Control Division prior to the start of any construction. 410-313-1855.
- All vegetative and structural practices are to be installed according to the provisions of the plan and are to be in conformance with the most current Maryland Standards and Specifications for Soil Erosion and Sediment Control and revisions thereto.
- Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within: a) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1, b) 14 days as to all other disturbed or graded areas on the project site.
- All 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. 51), sod (Sec. 54) temporary seeding (Sec. 50) and mulching (Sec. 52). Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
- All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.
- Site Analysis

Site is defined as areas involving any improvement.	
Total Area of Site	1.35 Acres
Area Disturbed	1.35 Acres
Area to be paved	0 Acres
Area to be Vegetatively Stabilized	1.35 Acres
Total Cut	0 Cu. Yds. (Not including trench excavation)
Total Fill	0 Cu. Yds. (Not including trench excavation)
Offsite waste/borrow area location	To be determined by contractor.
- Any sediment control practices which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
- Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
- On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.
- Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized by the end of each work day, whichever is shorter.
- Spoil from trench excavation shall be placed on the uphill side of the excavation.



03-01-2016
ASBULTS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *Joseph M. Alie* DATE: 4/11/14
 Chief, Bureau of Engineering: *Thomas S. Rutledge* DATE: 4/11/14
 Chief, Bureau of Utilities: *Stephen Lee* DATE: 4/11/14
 Chief, Utility Design Division: *Opal* DATE: 4/11/14

Dewberry
Dewberry Consultants LLC
3106 LORD BALTIMORE DRIVE
SUITE 110
BALTIMORE, MD 21244-2662
410.265.9500
FAX 410.265.8875



DES: LAL			
DRN: RLI			
CHK: TND			
DATE: 04/2014	BY: NO.	REVISIONS	DATE

SEDIMENT AND EROSION
CONTROL DETAILS & NOTES

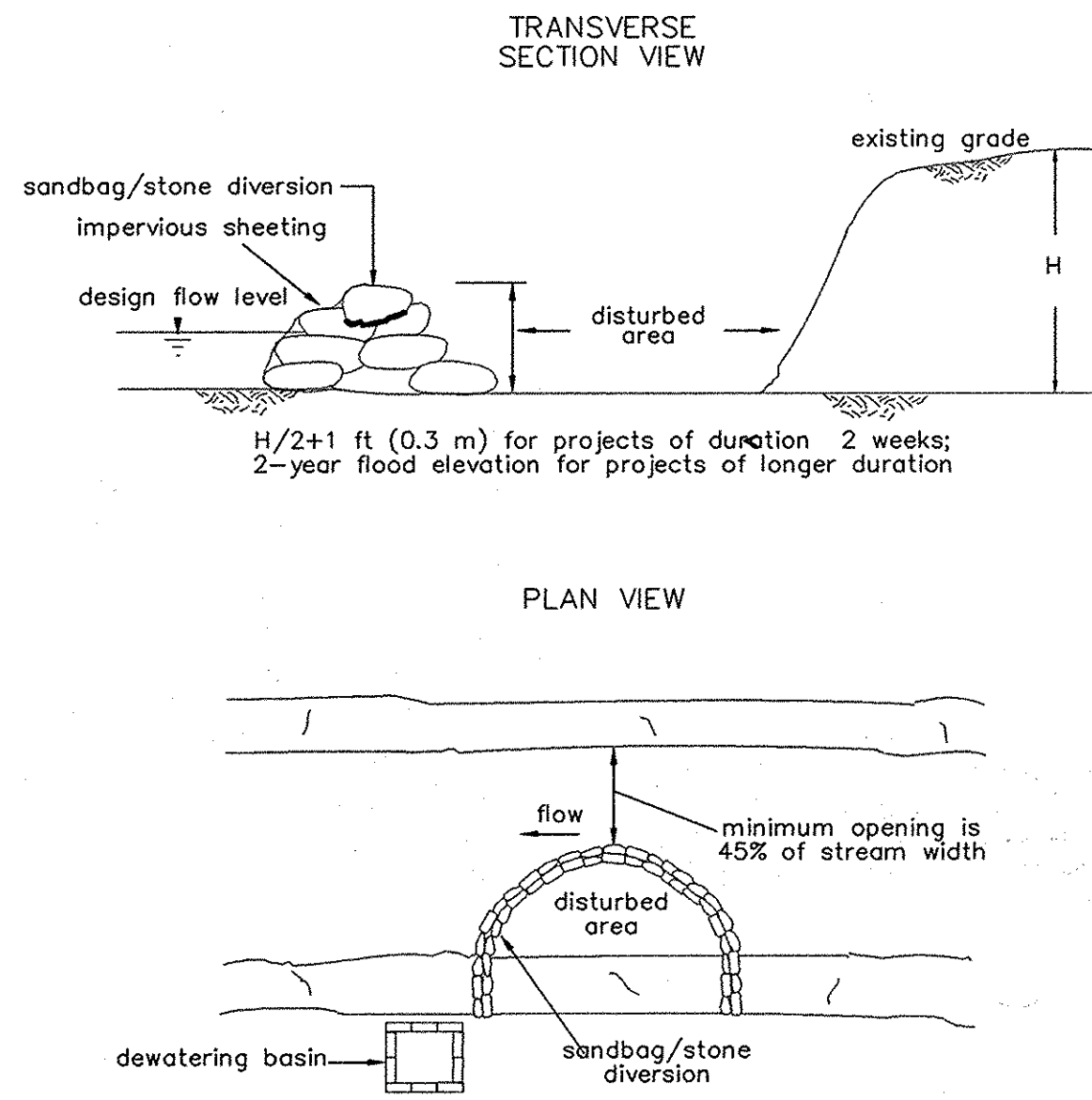
DEEP RUN SEWER RELOCATION AND
STREAM RESTORATION

CAPITAL PROJECT NO. S-6268
CONTRACT NO. 10-4829

600' SCALE MAP NO. 4338 BLOCK NO. 2320 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN
SHEET 4 OF 7

DETAIL 1.5: SANDBAG/STONE DIVERSION



MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

Temporary measure for dewatering in-channel construction sites

DESCRIPTION

The work should consist of installing sandbag or stone flow diversions for the purpose of erosion control when construction activities occur within the stream channel.

EFFECTIVE USES & LIMITATIONS

Diversions are used to isolate work areas from flow during the construction of in-stream projects. Diversions which have an insufficient flow capacity can fail and severely erode the disturbed channel section under construction. Therefore, in-channel construction activities should occur only during periods of low rainfall. This temporary measure may not be practical in large channels.

MATERIAL SPECIFICATIONS

Materials for sandbag and stone stream diversions should meet the following requirements:

- **Riprap:** Riprap should be washed and have a minimum diameter of 6 inches (0.15 meters).
- **Sandbags:** Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing & puncture, and should be woven tightly enough to prevent leakage of fill material (i.e. sand, fine gravel, etc.).
- **Sheeting:** Sheeting should consist of polyethylene or other materials which are impervious and resistant to puncture and tearing.

MATERIAL SPECIFICATIONS

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Installation should proceed from upstream to downstream during periods of low flow. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.

Sandbag/stone diversions can be used independently or as components of other stream diversion techniques. Installation of this measure should be installed around the perimeter of the work area.

1. The diversion structure should be installed from upstream to downstream.
2. The height of the sandbag/stone diversion should be a function of the duration of the project in the stream reach. For projects with a duration of less than 2 weeks, the height of the diversion should be one half of the streambank height, measured from the channel bed, plus 1 foot (0.3 meters) or bankfull height, whichever is greater. For projects of longer duration, the top of the sandbag or stone diversion should correspond to bankfull height. For diversion structures utilizing sandbags, the stream bed should be hand prepared prior to placement of the base layer of sandbags in order to ensure a water tight fit. Additionally, it may be necessary to prepare the bank in a similar fashion.
3. All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless authorized by the WMA.
4. Sediment-laden water from the construction area should be pumped to a dewatering basin.

TEMPORARY IN STREAM CONSTRUCTION MEASURES MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES

PAGE 1.5-1

MGWC 1.5: SANDBAG/STONE CHANNEL DIVERSION

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Sandbag/stone diversions can be used independently or as components of other stream diversion techniques. Installation of this measure should be installed around the perimeter of the work area.

5. Sheeting on the diversion should be positioned such that the upstream portion covers the downstream portion with at least a 18-inch (0.45 meters) overlap.
6. Sandbag or stone diversions should not obstruct more than 45% of the stream width. Additionally, bank stabilization measures should be placed in the constricted section if accelerated erosion and bank scour are observed during the construction time or if project time is expected to last more than 2 weeks.
7. Prior to removal of these temporary structures, any accumulated sediment should be removed, deposited and stabilized in an approved area outside the 100-year floodplain unless authorized by the WMA.
8. Sediment control devices are to remain in place until all disturbed areas stabilized in accordance with an approved sediment and control plan and the inspecting authority approves their removal.

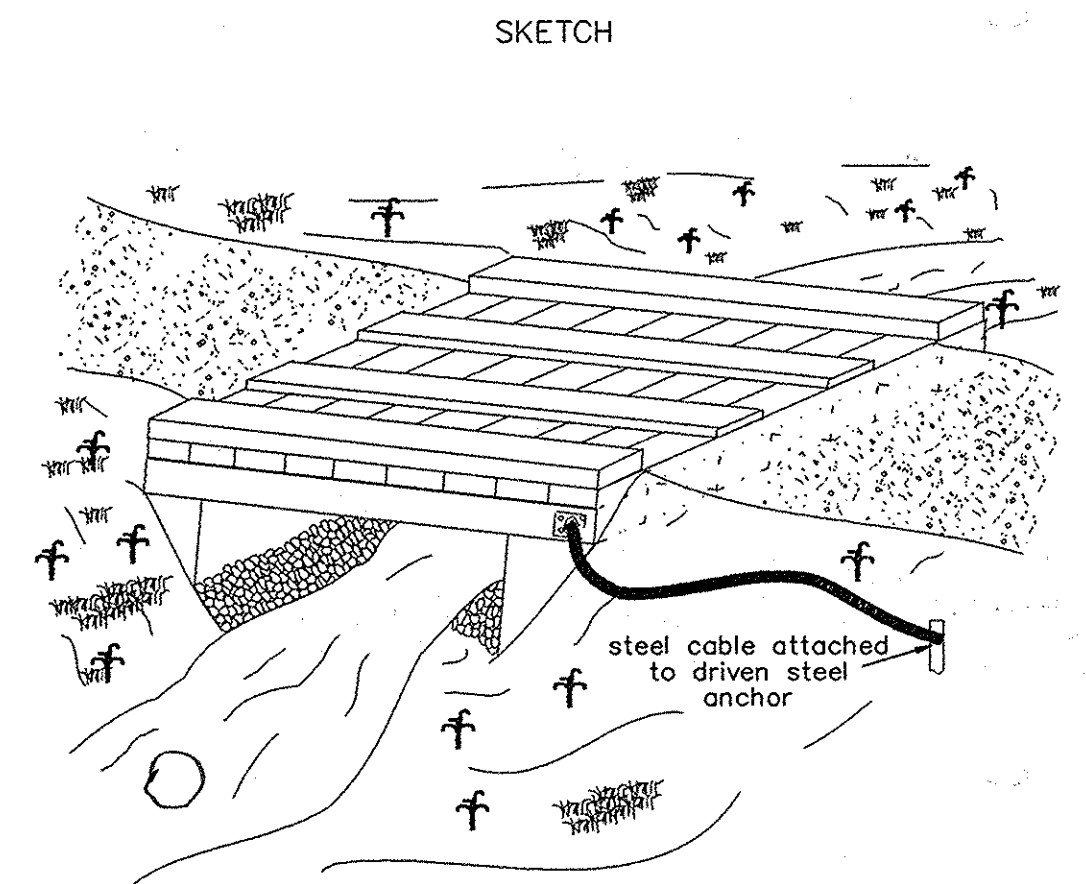
TEMPORARY IN STREAM CONSTRUCTION MEASURES MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES

PAGE 1.5-1

SEQUENCE OF OPERATION

1. Howard County will schedule the Pre-construction Meeting. Notify the Howard County Construction Division (1-410-313-3800) at least 48 hours before commencing work. Work may not commence until the permittee or the responsible personnel have met on site with the County Sediment and Erosion Control Inspector to review the approved plans.
2. Contractor shall locate and procure all staging and stockpiling areas which shall be approved by the Project Inspector/Manager.
3. Stake out Limit of Disturbance and Sediment Control Features.
4. Install sediment and erosion control measures including the stabilized construction entrance from the paved parking lot and super silt fence along the proposed sewer alignment.
5. Clear and grub those areas for installation of sediment and erosion perimeter controls. Remove and salvage topsoil.
6. With the approval of the County Sediment and Erosion Control Inspector, clear and grub the remainder of the site.
7. Perform the following sequence for each day of utility construction operations:
 - a. Excavate and install sanitary sewer and appurtenances. Place backfill and compact.
 - b. Place spoil on uphill side of trench.
 - c. Place topsoil, fine grade, seed and apply mulch to disturbed area.
 - d. All roadways (Public & Private) are to be swept free of dirt and debris.
8. Direct all water pumped during trench dewatering operations to an approved portable sediment tank. Clean out tank when one-third (1/3) filled with silt. Haul sediment to a Howard County approved site.
9. No excavated material shall be placed in the ditch adjacent to the existing roadway. The Contractor shall take precautions to prevent the disturbance of existing vegetated areas to the extent possible. Any existing vegetated areas disturbed as a result of the contractor's work operations shall be stabilized by the end of the work day.
10. Trenching is not to exceed that which can be backfilled and stabilized at the end of each working day. Stabilize the top of all trenches by the end of each work day. All excess stockpiled soil remaining after refilling of the trench(s) shall be removed from the surface and hauled from the site by the end of the working day. The Contractor shall be responsible for obtaining all permits for his off-site stockpile areas. The Contractor shall also adequately clean all dirt and mud off the roadways by the end of each working day.
11. Stabilize any remaining disturbed areas as required.
12. Remove any remaining sediment controls after prior approval from Howard County Inspections and Permits Division. Fine grade and stabilize area formerly occupied by perimeter controls.

DETAIL 4.8: TEMPORARY ACCESS BRIDGE



MGWC 4.8: TEMPORARY ACCESS BRIDGE

Temporary stream crossing intended for minimum corridor disturbance

DESCRIPTION

A temporary access bridge is a stream crossing made of wood, metal, or other materials designed to limit the amount of disturbance to the stream banks and bed.

EFFECTIVE USES & LIMITATIONS

Temporary access bridges are the preferred method of waterway crossing since they typically cause the least disturbance to the waterway bed and banks, pose the least chance for interference with fish migration, and can be quickly removed and reused.

MATERIAL SPECIFICATIONS

- **Stringers:** Stringers should either be logs, sawn timber, prestressed concrete beams, or other approved materials.
- **Deck Materials:** Deck materials should be of sufficient strength to support the anticipated load.

CONSTRUCTION SEQUENCE

All erosion and sediment control devices, including stream diversions, should be implemented as the first order of business according to plan approval by the WMA or local authority. Dewatering basins should be built as needed and swales or ditches should be used to prevent surface (See the 1994 Maryland Standards drainage from entering the stream via the bridge crossing. The proposed construction, maintenance, and Specifications for Soil Erosion and Sediment Control.) and removal sequence is as follows:

1. Abutments should be placed parallel to, and on, stable banks such that the structure is at or above bankfull depth to prevent the entrapment of floating materials and debris.
2. Temporary access bridges should be constructed to span the entire channel. If the bankfull channel width exceeds 8 feet (2.5 meters), then a trestle, pier, or other bridge support may be constructed within the waterway. No support will be permitted within the channel for waterways less than 8 feet wide. One additional bridge support will be permitted for each 8-foot width of the channel.
3. All decking members should be placed perpendicular to the stringers, butted tightly, and securely fastened to the stringers. Decking materials must be butted tightly to prevent any soil material tracked onto the bridge from falling into the waterway.
4. Although run planks are optional, they may be necessary to properly distribute loads. One run plank should be provided for each track of the equipment wheels and should be securely fastened to the length of the span.
5. Curbs or fenders may be installed along the outer sides of the deck to provide additional safety.
6. Bridges should be securely anchored at one end using steel cable or chain to prevent the bridge from floating downstream and possibly causing an obstruction to the flow. Anchoring at only one end will prevent channel obstruction in the event that flood waters float the bridge. Acceptable anchors are large trees, boulders, or driven steel anchors.

TEMPORARY IN STREAM CONSTRUCTION MEASURES MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES

PAGE 4.8-1

MGWC 4.8: TEMPORARY ACCESS BRIDGE

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7. All areas disturbed during installation should be stabilized within 14 calendar days in accordance with a revegetation plan approved by the WMA.
8. Periodic inspection should be performed by the user to ensure that the bridge, streambed, and stream banks are maintained and not damaged.
9. Maintenance should be performed as needed to ensure that the structure complies with all the standards and specifications. This should include the removal of trapped sediment and debris which should then be disposed of and stabilized outside the floodplain.
10. When the temporary bridge is no longer needed, all structures, including abutments and other bridging materials, should be removed within 14 calendar days. In all cases, the bridge materials should be removed within 1 year of installation. Removal of the bridge and clean-up of the area, including protection and stabilization of disturbed stream banks, should be accomplished without the use of construction equipment in the waterway.

TEMPORARY IN STREAM CONSTRUCTION MEASURES MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES

PAGE 4.8-2

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works DATE 4/16/14
Chief, Bureau of Engineering DATE 4/16/14
Chief, Bureau of Utilities DATE 4/16/14
Chief, Utility Design Division DATE 4/16/14

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DES: LAL					
DRN: RLI					
CHK: TND					
DATE: 04/2014	BY	NO.	REVISIONS	DATE	

SEDIMENT AND EROSION
CONTROL DETAILS

600' SCALE MAP NO. 43-38 BLOCK NO. 23-20

DEEP RUN SEWER RELOCATION AND
STREAM RESTORATION

CAPITAL PROJECT NO. S-6268
CONTRACT NO. 10-4829

ELECTION DISTRICT NO. 5

HOWARD COUNTY, MARYLAND

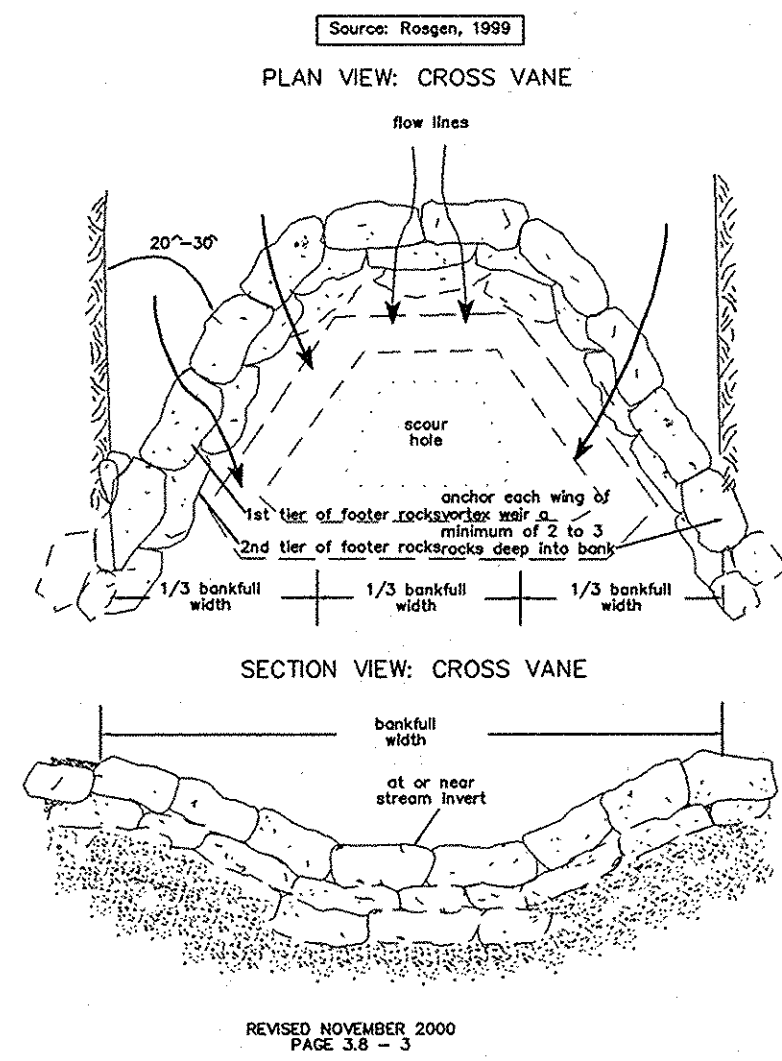
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SHEET
5 OF 7
8

03-01-2016
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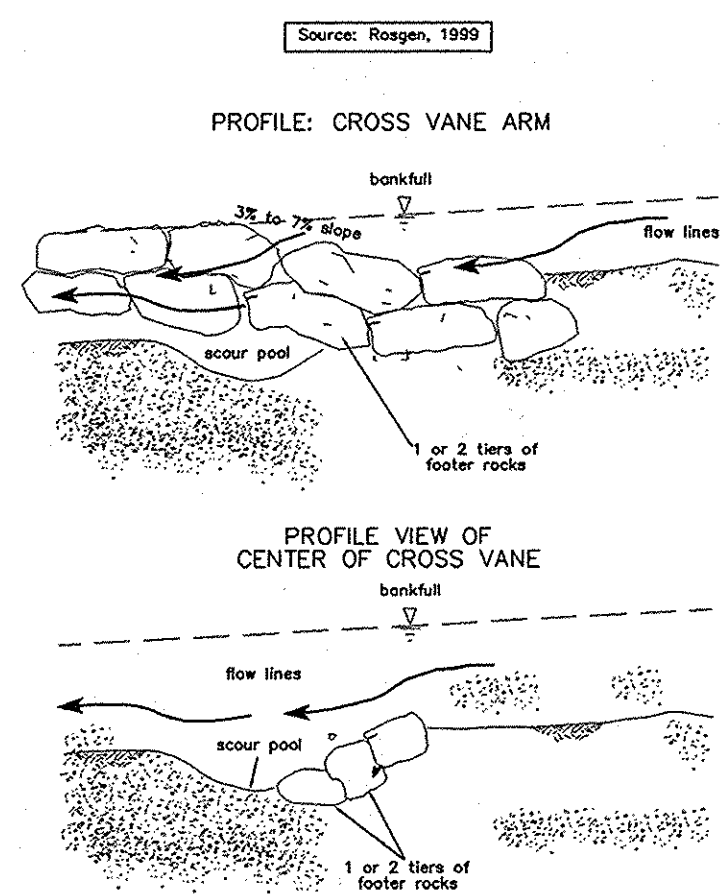
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DETAIL 3.8(a): CROSS VANES



CROSS VANE
NOT TO SCALE

DETAIL 3.8(b): CROSS VANES



CROSS VANE
NOT TO SCALE

CROSS VANES INSTALLATION & MATERIALS

- Divert stream and dewater work area per design plans.
- Rocks to be a minimum of 3" in diameter and a minimum of 200 pounds. Footer rocks should be long and flat.
- Cross Vanes shall be installed per approved plans.
- Vane rocks to be placed on top of footer rocks so that each rock touches an adjacent rock and rests upon 2 halves of each footer rock below it and so that the vane rock is offset in the upstream direction.
- Cross Vanes to be firmly anchored a minimum of 2-3 rocks into the bank.
- Armor excavated bank with Class III rip rap.
- All disturbed area should be permanently stabilized in accordance with approved design plans.
- Adjust crossvanes to match current stream width.
- Assume Bankfull Height to be 2' above normal water surface elevation.

MGWC 1.1: DEWATERING BASINS

Temporary measure for filtering sediment-laden water

DESCRIPTION

The work should consist of installing dewatering basins jointly with channel diversion measures to filter sediment-laden water from in-stream construction sites before the water re-enters the downstream reach.

EFFECTIVE USES & LIMITATIONS

Undersized dewatering basins will not adequately filter sediment-laden water from the construction site.

MATERIAL SPECIFICATIONS

Materials for dewatering basins should meet the following requirements:

- Riprap:** Riprap should be washed and have a diameter ranging from 4 to 6 inches (10 to 15 centimeters).
- Filter Cloth:** Filter cloth should be a woven or non-woven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric should be inert to commonly encountered chemicals, hydrocarbons, ultraviolet light, and mildew and should be rot resistant.
- Straw Bales/Silt Fence:** Straw bales should meet the criteria as specified in the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control.

INSTALLATION GUIDELINES

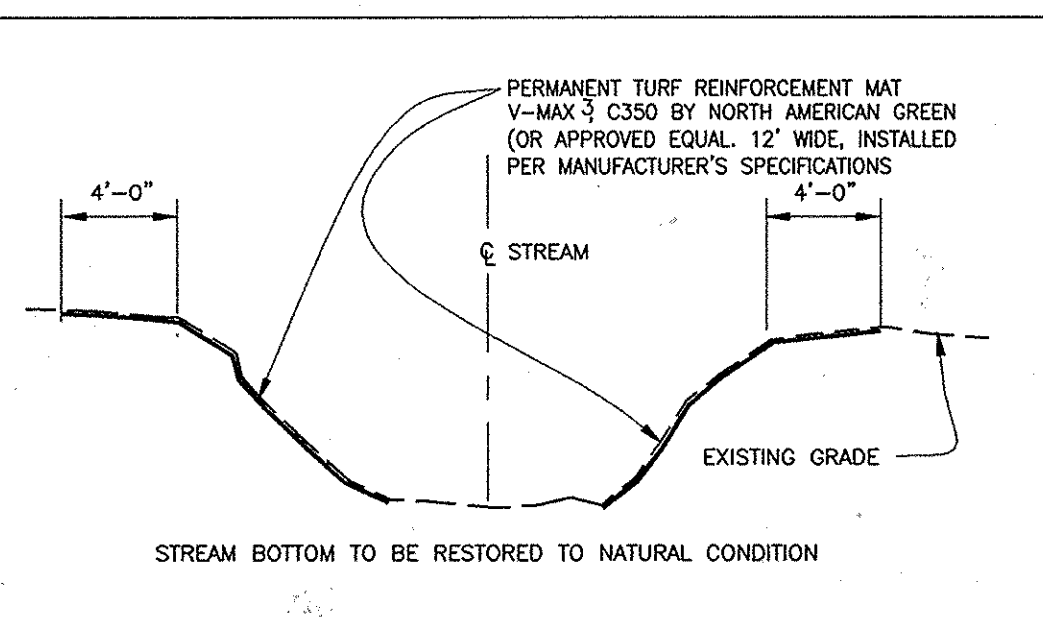
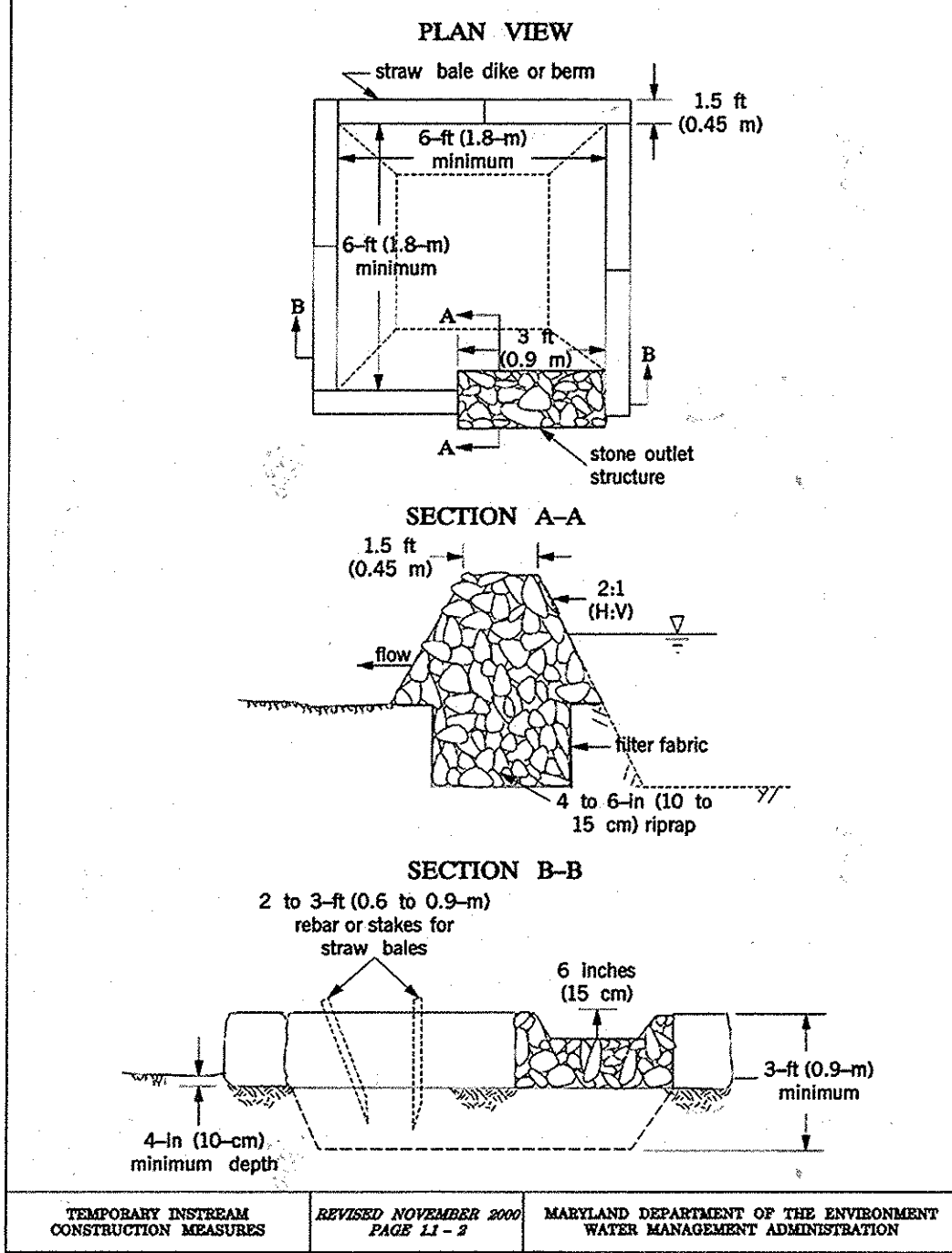
Due to the danger of overtopping by events greater than the design flow, dewatering basins require a vegetative buffer strip to filter sediment-laden overflow. A 50-foot (15-meter) minimum grass-covered buffer width is required for slopes less than 20 degrees (1:2.7) when right-of-way is not limited. For slopes greater than 20 degrees, basins should have a 100-foot (30-meter) minimum buffer width when practical.

All erosion and sediment control devices should be installed as the first order of business according to a plan approved by the Water Management Administration (WMA) or local authority. Dewatering basins should be constructed as follows (refer to Detail 1.1):

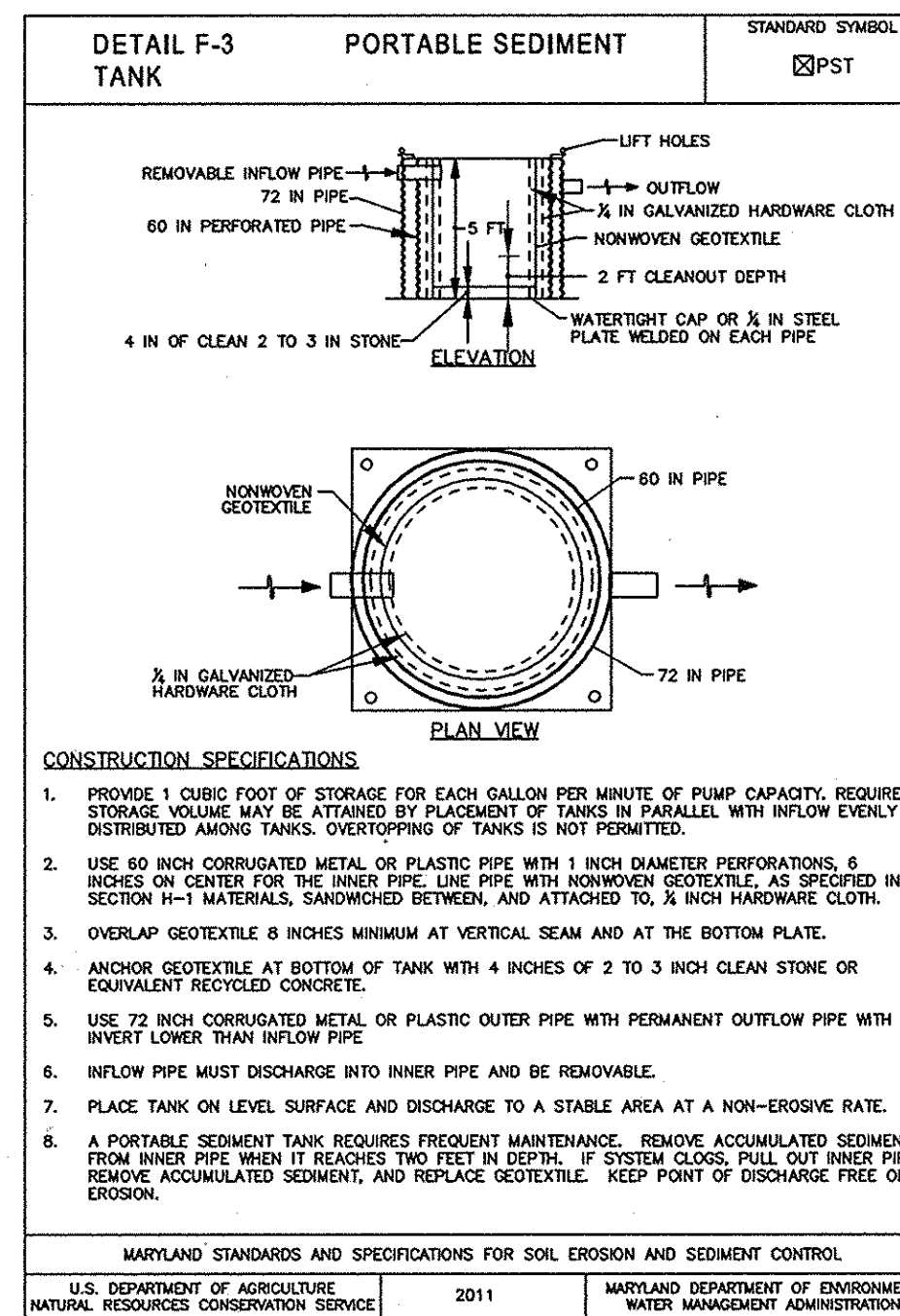
- Excavated subsoil and topsoil should be stored separately and replaced in their natural order. Additionally, the excavated sediments should be prevented from entering the waterway by using sediment perimeter controls or other measures.
- The dewatering basin should have a minimum depth of 3 feet (1 meter) where basin depth is measured from the top of the straw bales to the bottom of the excavation.
- Once the dewatering basin becomes filled to one-half of the excavated depth, accumulated sediment should be removed and disposed of in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
- Sediment control devices should remain in place until all disturbed areas are stabilized and the inspecting authority approves their removal. All disturbed ground contours should be returned to their original condition unless otherwise approved by the WMA or local authority.

TEMPORARY INSTREAM CONSTRUCTION MEASURES MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000 PAGE 1.1 - 1

**Maryland's Guidelines To Waterway Construction
DETAIL 1.1: DEWATERING BASINS**

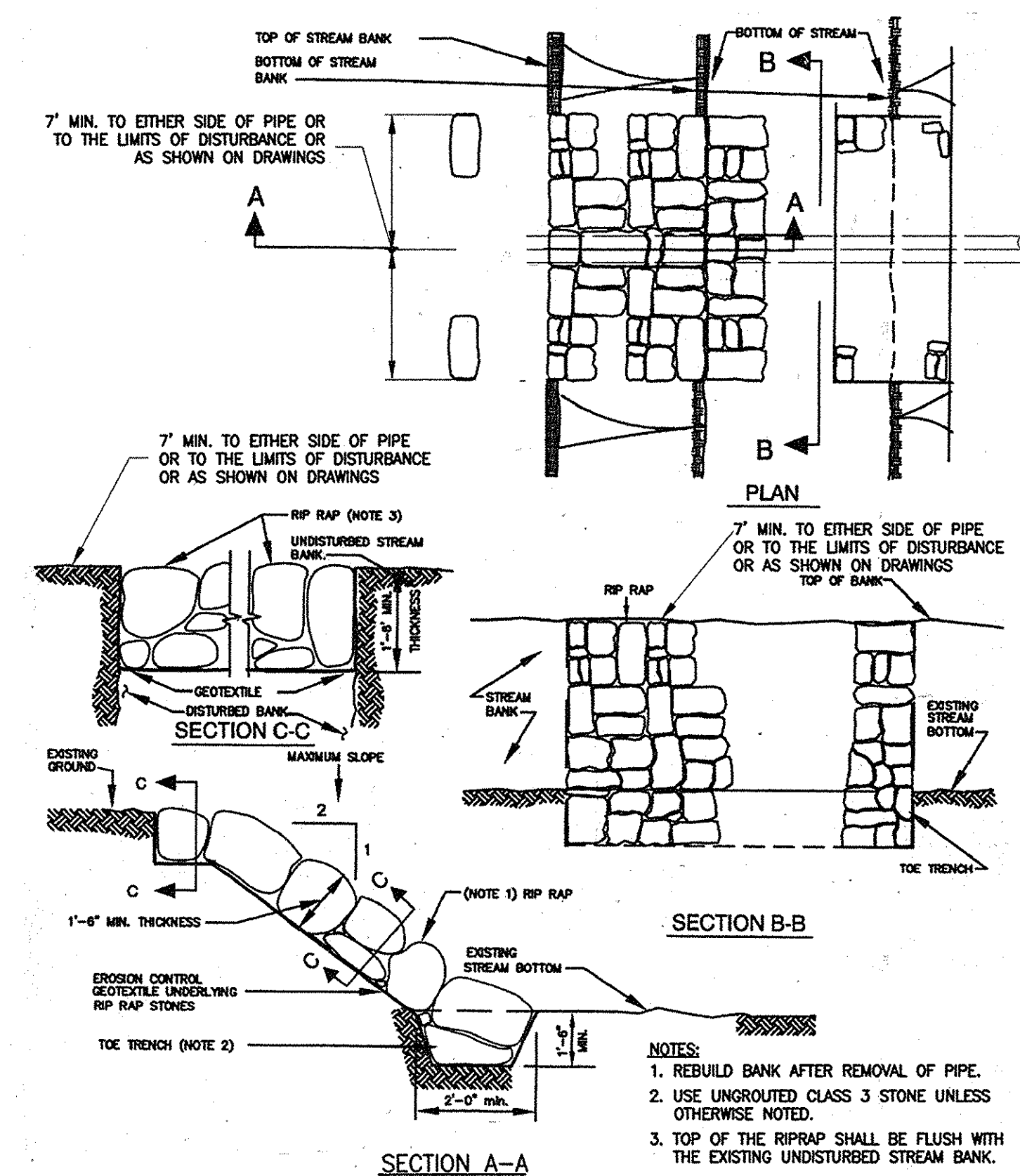


PERMANENT TURF REINFORCEMENT MAT DETAIL
NOT TO SCALE

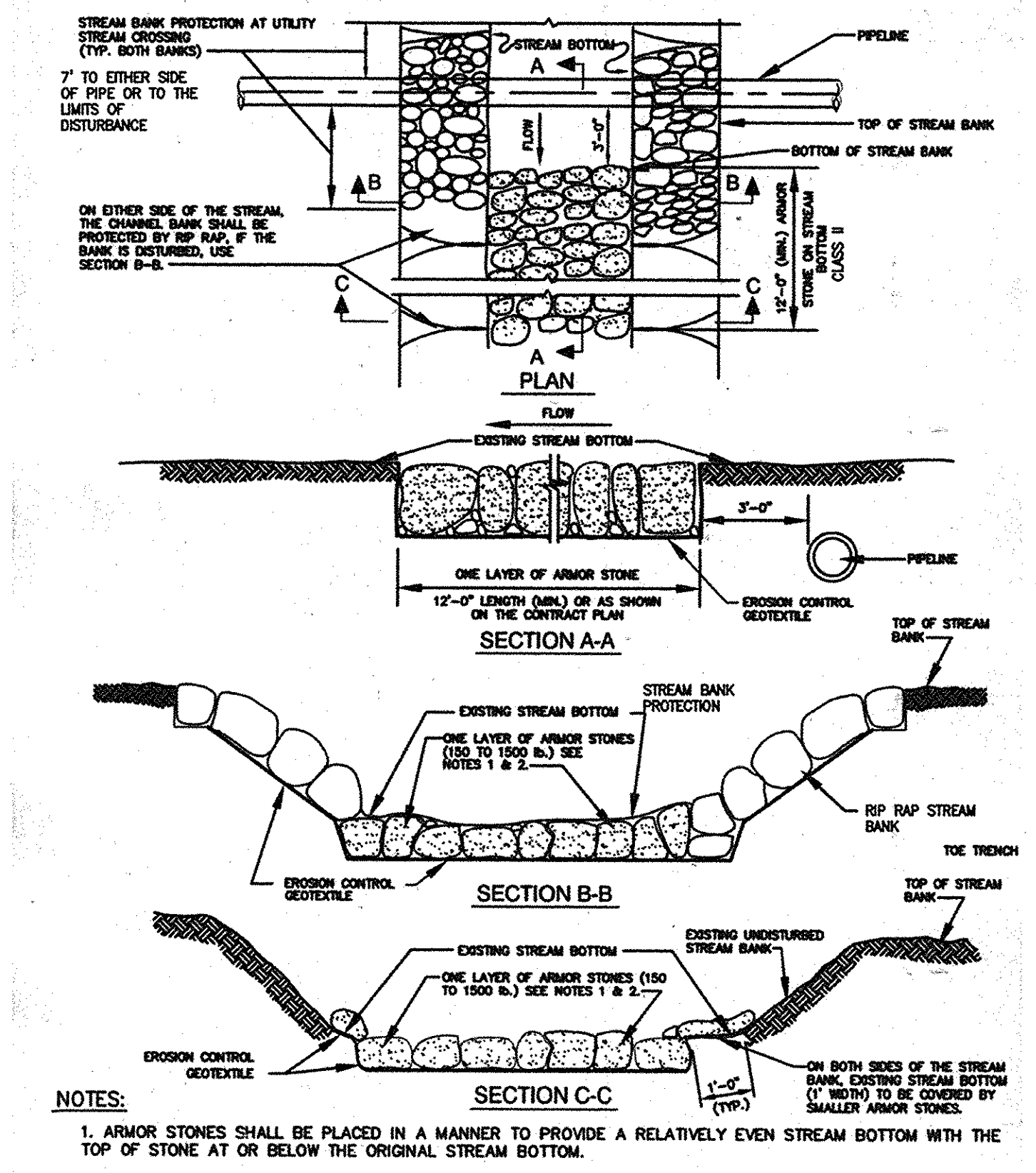


MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT
NATURAL RESOURCES CONSERVATION SERVICE WATER MANAGEMENT ADMINISTRATION

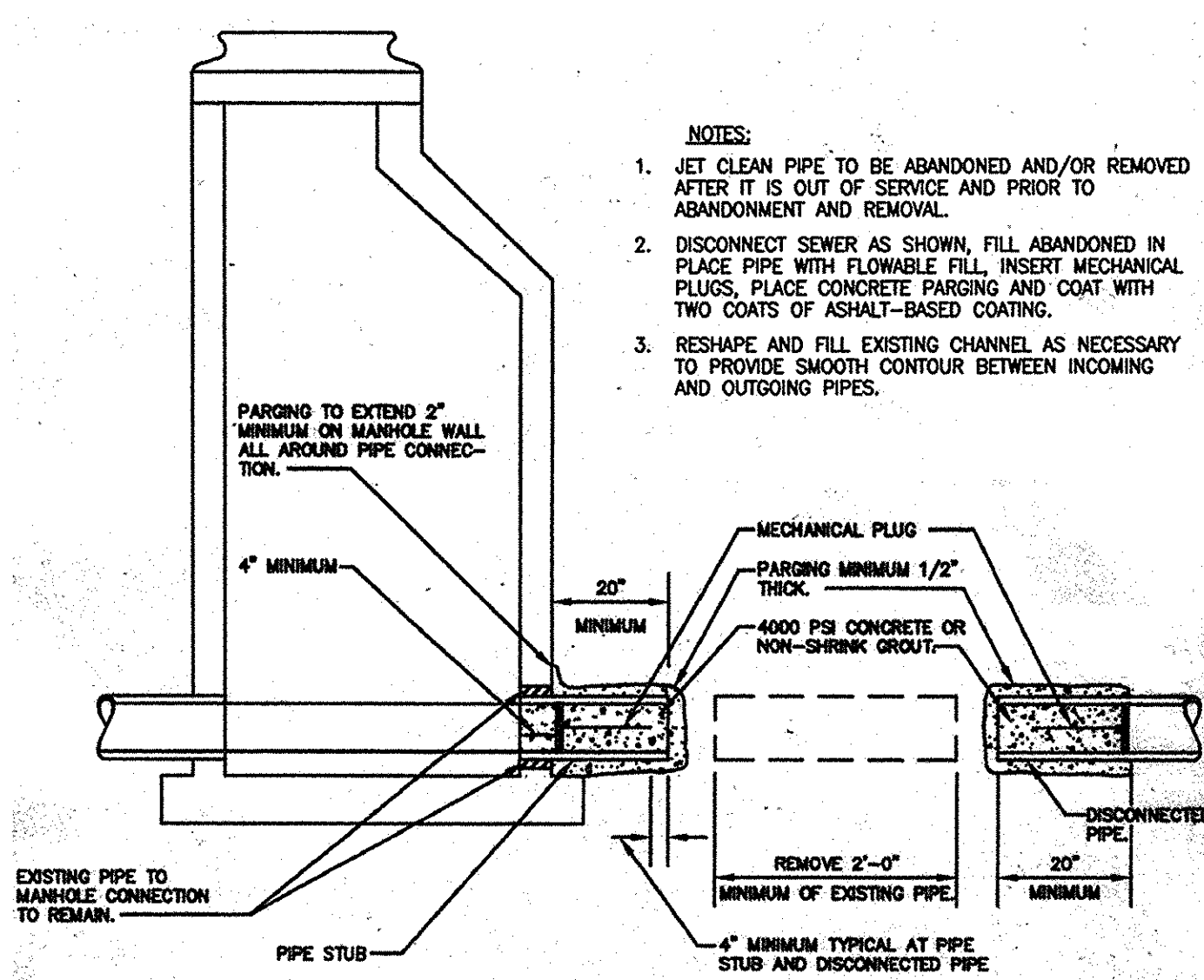
- CONSTRUCTION SPECIFICATIONS**
- PROVIDE 1 CUBIC FOOT OF STORAGE FOR EACH GALLON PER MINUTE OF PUMP CAPACITY. REQUIRED STORAGE VOLUME MAY BE ATTAINED BY PLACEMENT OF TANKS IN PARALLEL WITH INFLOW EVENLY DISTRIBUTED AMONG TANKS. OVERTOPPING OF TANKS IS NOT PERMITTED.
 - USE 60 INCH CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER FOR THE INNER PIPE LINE PIPE WITH NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION 11-1 MATERIALS, SANDWICHED BETWEEN, AND ATTACHED TO, 3/8 INCH HARDWARE CLOTH.
 - OVERLAP GEOTEXTILE 8 INCHES MINIMUM AT VERTICAL SEAM AND AT THE BOTTOM PLATE.
 - ANCHOR GEOTEXTILE AT BOTTOM OF TANK WITH 4 INCHES OF 2 TO 3 INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE.
 - USE 72 INCH CORRUGATED METAL OR PLASTIC OUTER PIPE WITH PERMANENT OUTFLOW PIPE WITH INVERT LOWER THAN INFLOW PIPE.
 - INFLOW PIPE MUST DISCHARGE INTO INNER PIPE AND BE REMOVABLE.
 - PLACE TANK ON LEVEL SURFACE AND DISCHARGE TO A STABLE AREA AT A NON-EROSIVE RATE.
 - A PORTABLE SEDIMENT TANK REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT FROM INNER PIPE WHEN IT REACHES TWO FEET IN DEPTH. IF SYSTEM CLOS, PULL OUT INNER PIPE, REMOVE ACCUMULATED SEDIMENT, AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.



STREAM BANK PROTECTION
NOT TO SCALE



STREAM INVERT PROTECTION FOR SHALLOW UTILITY STREAM CROSSING
NOT TO SCALE



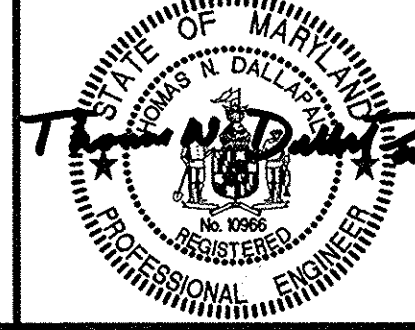
ABANDONMENT OF PIPE AT MANHOLE AND LEFT IN PLACE
NOT TO SCALE

03-01-2016
AS-BUILTS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: [Signature] 4/11/14
Chief, Bureau of Engineering: [Signature] 4/11/14
Chief, Bureau of Utilities: [Signature] 4/11/14
Chief, Utility Design Division: [Signature] 4/11/14

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DES:	LAL				
DRN:	RLI				
CHK:	TND				
DATE:	04/2014	BY NO.		REVISIONS	DATE

MISCELLANEOUS DETAILS

600' SCALE MAP NO. 43-38 BLOCK NO. 43-20

DEEP RUN SEWER RELOCATION AND STREAM RESTORATION

CAPITAL PROJECT NO. S-6268
CONTRACT NO. 10-4829
ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN
SHEET 6 OF 7

MGWC 2.1: RIPRAP

Rigid engineering technique for bank stabilization

DESCRIPTION

Riprap is used to protect and stabilize embankment soils from the erosive forces of flowing water and piping forces resulting from groundwater seepage. A well-engineered riprap system should consist of the following:

- a filter layer of gravel or cloth designed to prevent soil movement into or through the riprap layer while allowing water to drain from the embankment, and
- a stone layer of appropriate gradation and thickness to resist the shearing forces of channelized water.

EFFECTIVE USES & LIMITATIONS

When properly designed and installed, riprap is an effective method where soil conditions, water turbulence and velocity, expected vegetative cover, and groundwater conditions are such that the soil may erode under the design flow conditions. Some common areas of riprap applicability are:

- diversion channel banks and/or bottoms,
- roadside ditches,
- drop structure outlets, and
- laterally expanding banks threatening infrastructure or personal property.

Additionally, properly graded riprap forms a flexible, self-healing cover which can be easily repaired in localized areas by the timely replacement of stone. Uniform-grade riprap can also be used with a geotextile filter cloth.

Filter cloth should only be utilized when the bank material is noncohesive such as sand or gravel.

MATERIAL SPECIFICATIONS

- **Filters:** Material and design specifications for granular filters are found in Table 3.1a.

Table 3.1a: Granular Filter Material Grading Specifications

% less than	U.S. Standard sieve size
100	2 1/2 in (64 mm)
85-100	1 in (25 mm)
60-100	3/4 in (19 mm)
35-70	No. 10
20-50	No. 40
3-20	No. 200

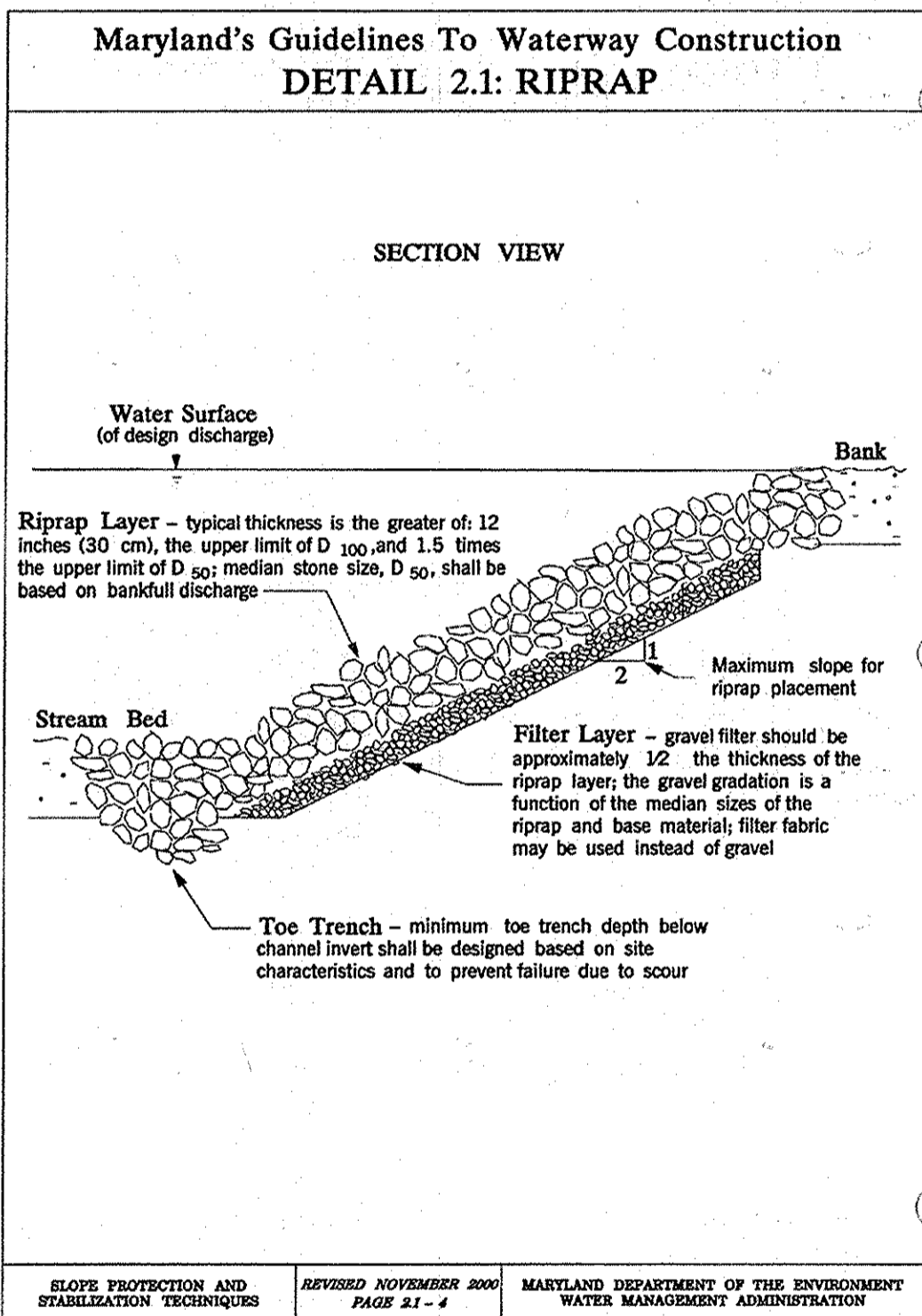
The thickness of the filter should not be less than 6 inches (15 cm). Generally, filters that are one-half the thickness of the riprap layer are satisfactory.

Synthetic filter cloth may be used cautiously based on the 1994 MD Standards and Specifications for Soil Erosion and Sediment Control.

- **Riprap:** The maximum diameter or weight of stone for riprap should be based upon the design flow velocity using Figure 3.1. This chart is based on a maximum slope of 2H:1V. The stone gradations for Classes I-III are found in Table 3.1b.

SLOPE PROTECTION AND STABILIZATION TECHNIQUES

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATERWAY CONSTRUCTION GUIDELINES
REVISED NOVEMBER 2000



MGWC 1.3: CULVERT PIPE WITH ACCESS ROAD

Temporary measure for providing access to stream enhancement sites

DESCRIPTION

The work should consist of installing a culvert pipe and associated access road for the purpose of erosion control when construction activities occur within the stream corridor.

EFFECTIVE USES & LIMITATIONS

Culvert pipes with access roads can be used effectively for installation of utility lines at stream crossings.

Diversions which have an insufficient flow capacity can fail and severely erode the disturbed channel section under construction. Therefore, in-channel construction activities should occur only during periods of low rainfall.

MATERIAL SPECIFICATIONS

Materials for culverts with temporary access roads should meet the following requirements:

- **Riprap:** Riprap should be sized to resist a stream's baseflow if the duration of the project is less than one month. Otherwise, the riprap should be designed to resist bankfull discharge.
- **Sandbags:** Sandbags should consist of materials which are resistant to ultraviolet radiation, tearing, and puncture and should be woven tight enough to prevent leakage of fill material (i.e., sand, fine gravel, etc.).
- **Sheeting:** Sheeting should consist of polyethylene or other material which is impervious and resistant to puncture and tearing.

INSTALLATION GUIDELINES

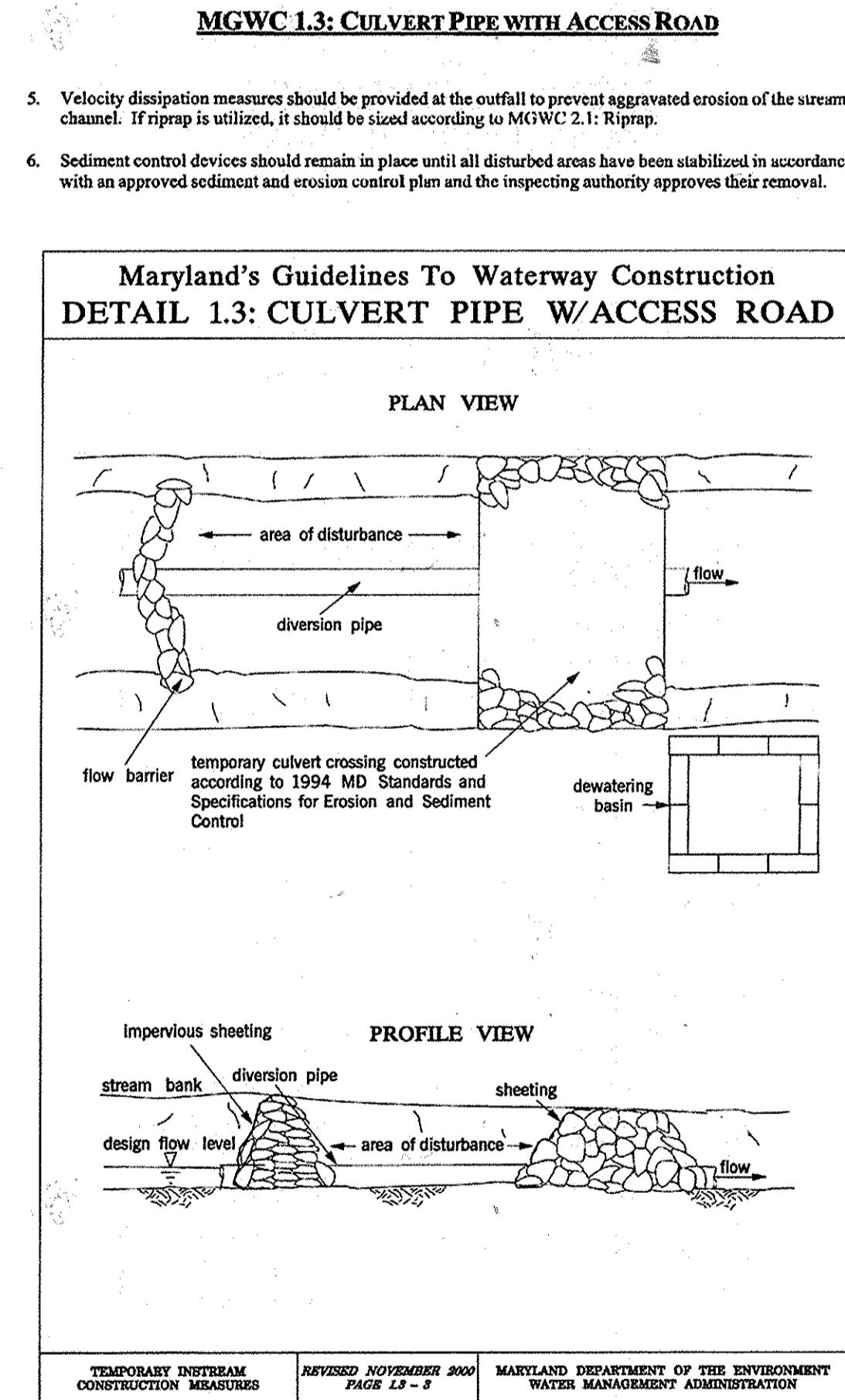
All erosion and sediment control devices including mandatory dewatering basins should be installed as the first order of business according to a plan approved by the WMA or local authority. Installation should proceed from upstream to downstream during low flow conditions. Additionally, all excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA or local authority.

A culvert pipe with a temporary access road should be constructed as follows (refer to Detail 1.3):

1. Culverts should have a minimum capacity sufficient to convey the stream's base flow for projects with duration of 2 weeks or less. For projects of longer duration, culverts should have a capacity sufficient to convey the 2-year flow.
2. Sandbag or stone flow barriers should be sized and installed as detailed in MGWC 1.5: Sandbag/Stone Channel Diversion. The materials should be sized to withstand normal streamflow velocities.
3. All sediment laden flow from the construction site should be pumped to a dewatering basin built according to MGWC 1.1: Dewatering Basins prior to re-entering the stream.
4. Temporary culvert crossings should be constructed in accordance with the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control (refer to Section 4, Stream Crossings, Maryland's Guidelines to Waterway Construction).
5. Velocity dissipation measures should be provided at the outfall to prevent aggravated erosion of the stream channel. If riprap is utilized, it should be sized according to MGWC 2.1: Riprap.
6. Sediment control devices should remain in place until all disturbed areas have been stabilized in accordance with an approved sediment and erosion control plan and the inspecting authority approves their removal.

TEMPORARY INSTREAM CONSTRUCTION MEASURES

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATERWAY CONSTRUCTION GUIDELINES
REVISED NOVEMBER 2000



MGWC 1.2: PUMP-AROUND PRACTICE

Temporary measure for dewatering in-channel construction sites

DESCRIPTION

The work should consist of installing a temporary pump around and supporting measures to divert flow around in-stream construction sites.

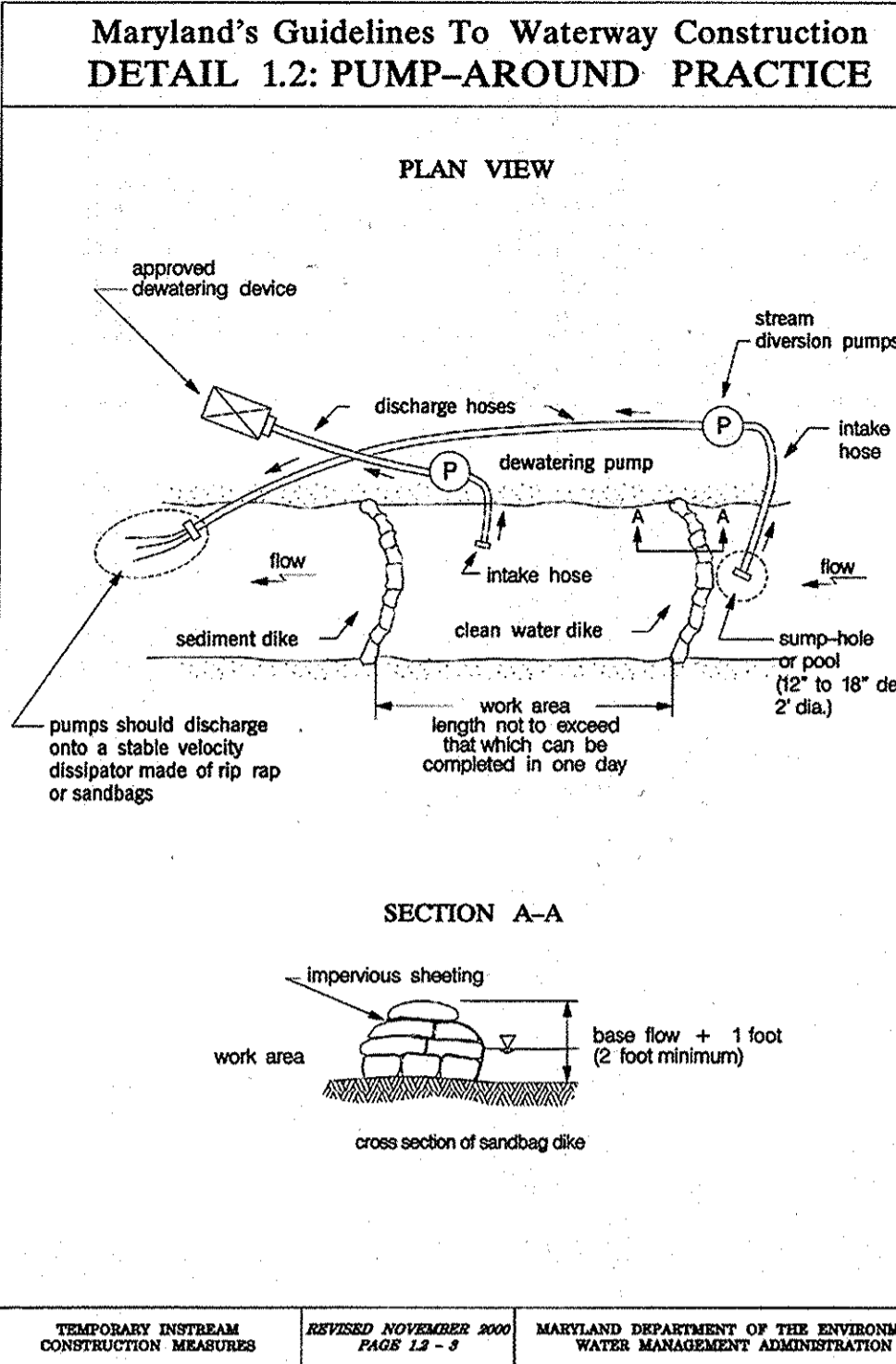
IMPLEMENTATION SEQUENCE

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

1. Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the county's or utility company's satisfaction.
2. The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
3. The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the WMA or local authority.
4. Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
5. Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.
6. Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of riprap or sandbags.

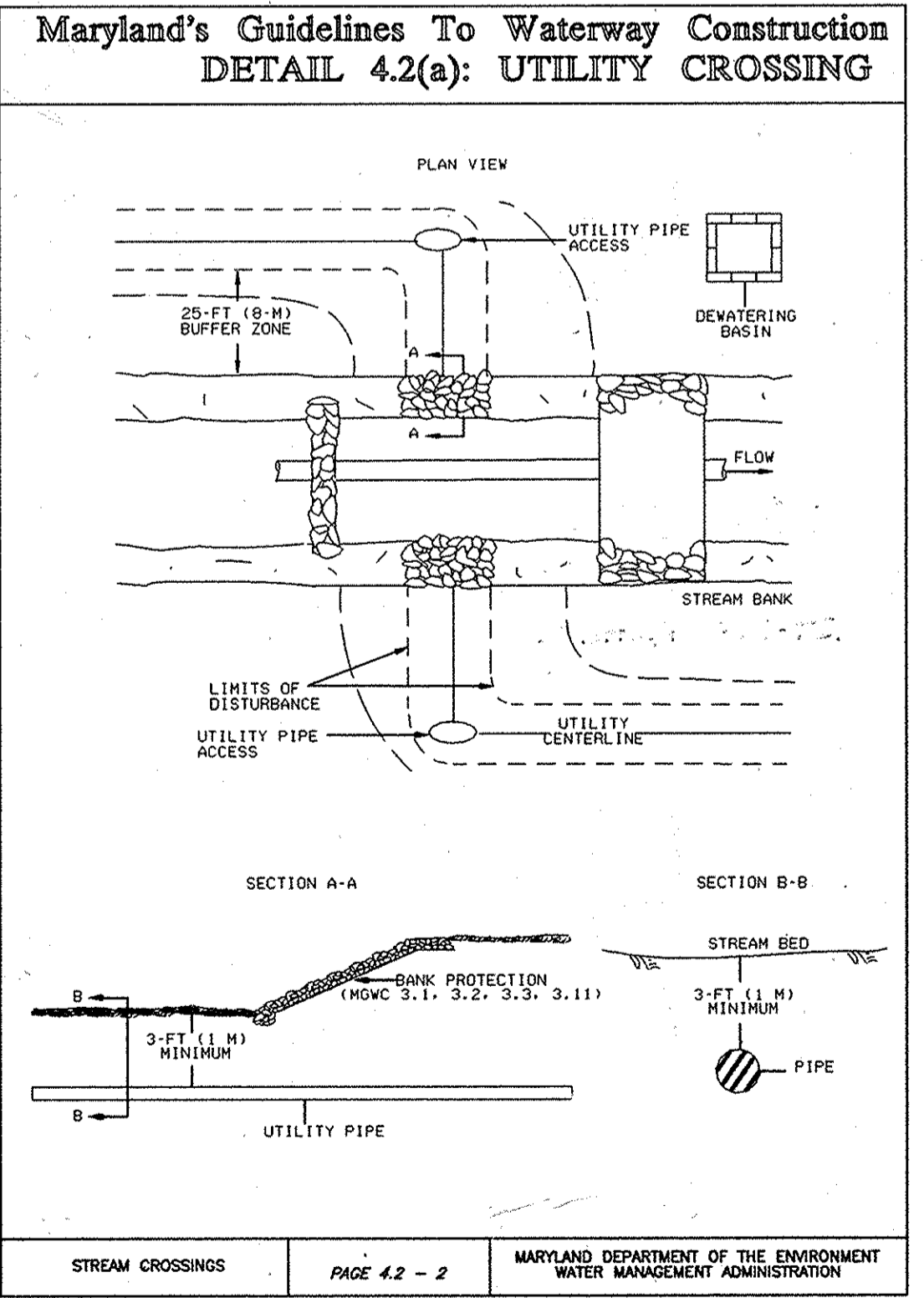
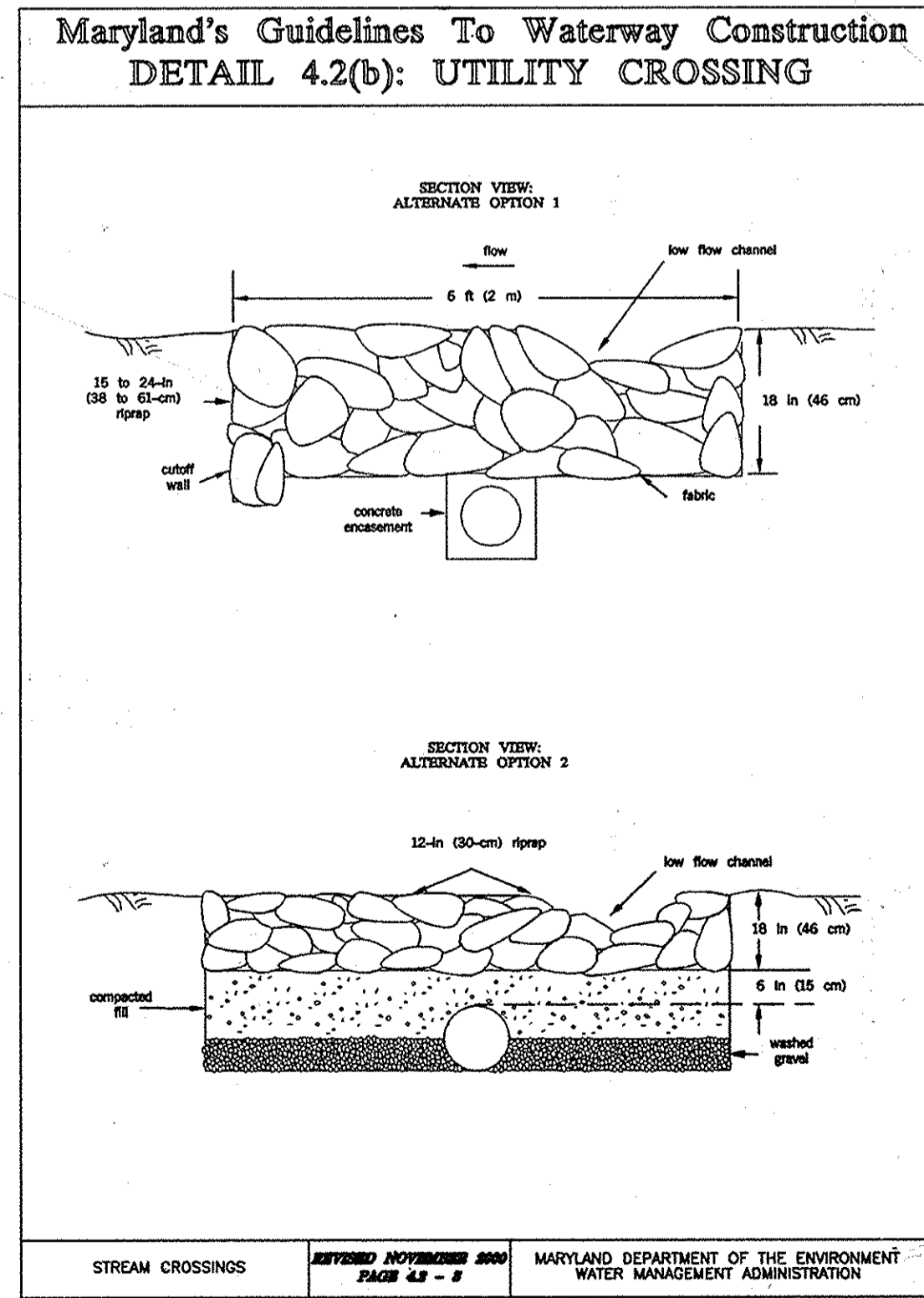
MGWC 1.2: PUMP-AROUND PRACTICE

7. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.
8. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified. (See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction).
9. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans.
10. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.
11. A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.
12. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.
13. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
14. After construction, all disturbed areas should be regraded and revegetated as per the planning plan.



SLOPE PROTECTION AND STABILIZATION TECHNIQUES
REVISED NOVEMBER 2000
PAGE 2.1-1
MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

TEMPORARY INSTREAM CONSTRUCTION MEASURES
REVISED NOVEMBER 2000
PAGE 1.3-1
MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION



**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**

Director of Public Works: [Signature] 4/11/14
 Chief, Bureau of Utilities: [Signature] 4/11/14

Chief, Bureau of Engineering: [Signature] 4/11/14
 Chief, Utility Design Division: [Signature] 4/11/14

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Professional Engineer Seal: [Seal]

DES: LAL
 DRN: RLI
 CHK: TND
 DATE: 04/2014

**STREAM RESTORATION
SEDIMENT AND EROSION
CONTROL DETAILS & SPECIFICATIONS**

600' SCALE MAP NO. 43-38
 BLOCK NO. 2320
 REVISIONS
 SHEET 7 OF 7

**DEEP RUN SEWER RELOCATION AND
STREAM RESTORATION**
 CAPITAL PROJECT NO. S-6268
 CONTRACT NO. 10-4829
 ELECTION DISTRICT NO. 5
 HOWARD COUNTY, MARYLAND

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