

# HOWARD COUNTY

## DEPARTMENT OF PUBLIC WORKS

### ELLCOTT CITY, MARYLAND 21043

POINT	NORTHING	EASTING	ELEV.	DESCRIPTION
100	554698.1524	1389109.5643	72.93	REBAR & CAP
101	554375.0888	1389127.6581	88.72	MAG NAIL
102	554665.6764	1388896.4914	54.56	REBAR & CAP
103	554673.3548	1388679.6323	54.04	REBAR & CAP
104	554641.2696	1388489.6959	56.03	REBAR & CAP
105	554691.3044	1388304.0859	61.97	REBAR & CAP
106	554604.4207	1388083.0542	66.97	REBAR & CAP
107	554546.8687	1387860.5866	66.35	REBAR & CAP
108	554493.6287	1387658.6814	67.16	REBAR & CAP
109	554436.7011	1387494.4671	66.18	REBAR & CAP
110	554343.5730	1387392.7225	66.64	REBAR & CAP
200	554427.3393	1387279.1086	80.81	OPUS-RS H&T
201	554313.5633	1387011.5304	81.63	OPUS-RS H&T
203	554720.2155	1388556.7484	57.22	REBAR & CAP
204	554854.4447	1388575.4453	59.49	REBAR & CAP
205	554871.7045	1388405.7681	54.96	REBAR & CAP
206	554783.3500	1388287.5916	60.40	REBAR & CAP
209	554736.5407	1388133.3874	56.39	REBAR & CAP

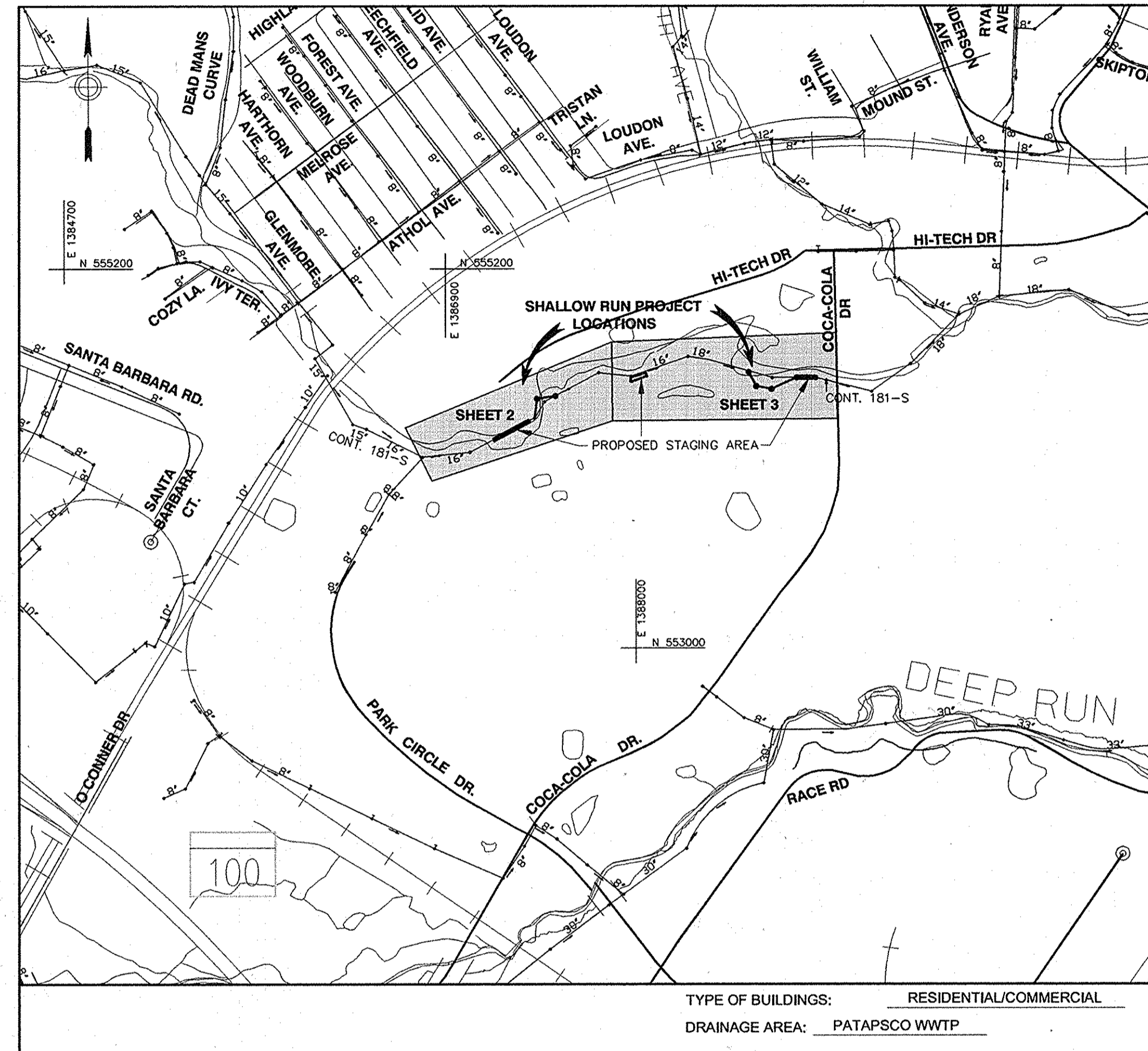
**SURVEY CONTROL**

**B.M. #1**  
 HOWARD CO. CONTROL PT. 38GA  
 CONCRETE MONUMENT  
 NAD 83 (Adj 1991): N 555,897.317 E  
 1,390,132.1323  
 NAVD 88: EL. 24.6366

**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	NORTHING	EASTING
MANHOLE #2589A (HO. CO. STD. G-5.12)	554,461.32	1,387,535.00
MANHOLE #2590 (HO. CO. STD. G-5.12)	554,445.05	1,387,428.01
MANHOLE #2586C (HO. CO. STD. G-5.12)	554,600.12	1,388,649.81
MANHOLE #2586B (HO. CO. STD. G-5.12)	554,516.80	1,388,694.37
MANHOLE #2586A (HO. CO. STD. G-5.12)	554,501.15	1,388,781.95
MANHOLE #2586 (HO. CO. STD. G-5.12)	554,567.19	1,388,927.68

ITEM	UNIT	ESTIMATE	AS-BUILT	SUPPLIER
20" DIP SEWER MAIN	L.F.	104	—	—
21" PVC SEWER MAIN	L.F.	440	—	—
STD. 4'-0" PRECAST MANHOLE WT (HO. CO. STD. G-5.12)	EA.	3	—	—
STD. 4'-0" PRECAST DOGHOUSE WT MANHOLE (HO. CO. STD. G-5.14)	EA.	3	—	—
ADDITIONAL MANHOLE DEPTH	V.F.	31	—	—



**VICINITY MAP**  
 SCALE: 1" = 600'

# SHALLOW RUN SEWER RELOCATION & STREAM RESTORATIONS

CAPITAL PROJECT S-6268  
 CONTRACT NO. 10-4830

**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	SHALLOW RUN PLAN & PROFILE
3	SHALLOW RUN PLAN & PROFILE
4	CROSS SECTIONS FOR PLACEMENT OF RIPRAP
5	SEDIMENT AND EROSION CONTROL SPECIFICATIONS
6	SEDIMENT AND EROSION CONTROL DETAILS AND NOTES
7	SEDIMENT AND EROSION CONTROL DETAILS
8	MISCELLANEOUS DETAILS
9	STREAM RESTORATION SEDIMENT AND EROSION CONTROL DETAILS & SPECIFICATIONS

**LEGEND**

- △— TRVERSE
- 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. DallaPalma* 4/8/2014  
 Signature of Engineer Date

- 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 October 2008 for Shallow Run & redone in 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.
  - Backfill all low spots over existing sewer to provide positive drainage as noted on the drawing. Approximate locations are shown. Contractor is to confirm all low spots and use approved backfill.
  - 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 2591**

- 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 2591= 2.83 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.

EP14-020

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.

*Joshua Gliptis* 4/11/14  
 Signature of Developer Date

JOSHUA GLIPTIS  
 Print Name

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. DallaPalma* 4/8/2014  
 Signature of Engineer Date

Thomas N. DallaPalma  
 Print Name

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

*John K. Roberts* 4/10/14  
 Howard Soil Conservation District Date

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

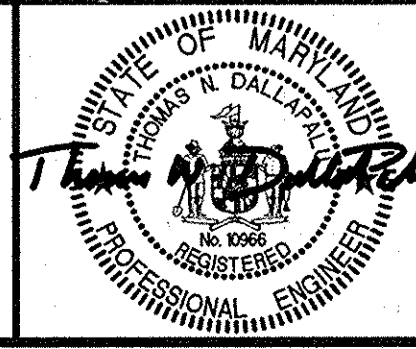
*Thomas N. DallaPalma* 4/11/14  
 DIRECTOR OF PUBLIC WORKS DATE

*Thomas N. DallaPalma* 4/11/14  
 CHIEF, BUREAU OF UTILITIES DATE

*Thomas N. DallaPalma* 4/11/14  
 CHIEF, BUREAU OF ENGINEERING DATE

*Thomas N. DallaPalma* 4/11/14  
 CHIEF, UTILITY DESIGN DIVISION DATE

**Dewberry**  
 Dewberry Consultants LLC  
 3106 LORD BALTIMORE DRIVE  
 SUITE 110  
 BALTIMORE, MD 21244-2862  
 410.265.9500  
 FAX: 410.295.8875



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

**SHALLOW RUN SEWER RELOCATION & STREAM RESTORATION**

CAPITAL PROJECT NO. S-6268  
 CONTRACT NO. 10-4830

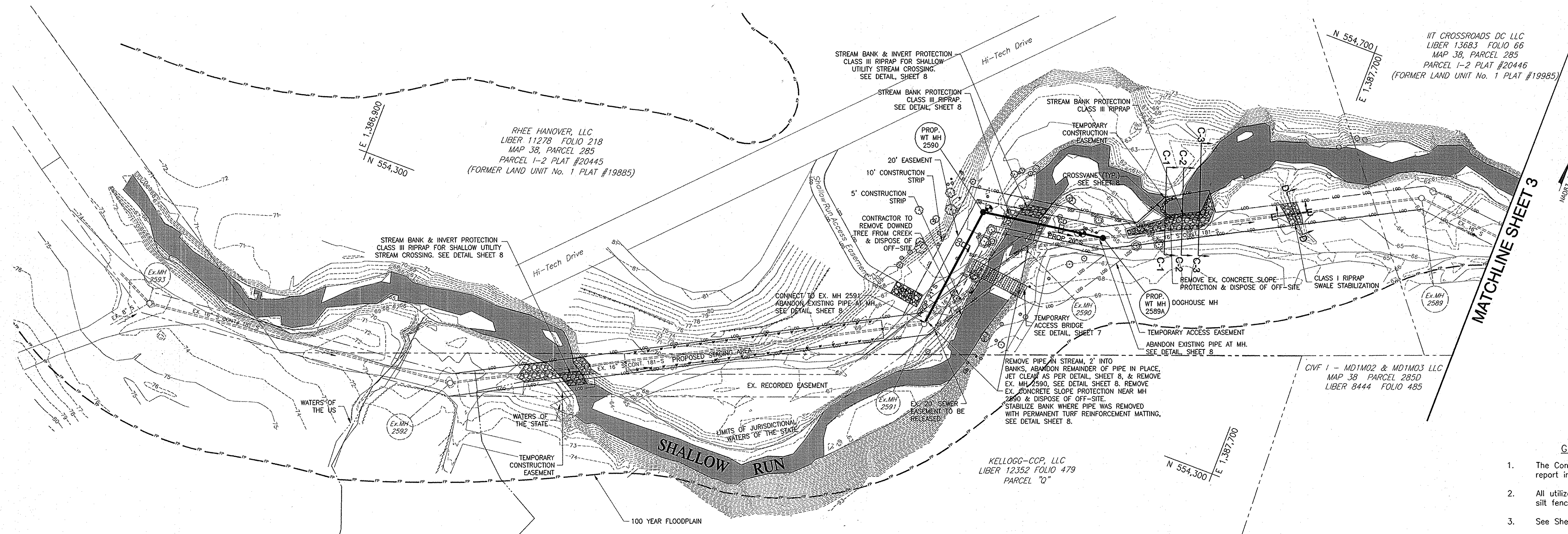
**TITLE SHEET**

600' SCALE MAP NO. 37 BLOCK NO. 5 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN  
 SHEET 1 OF 9

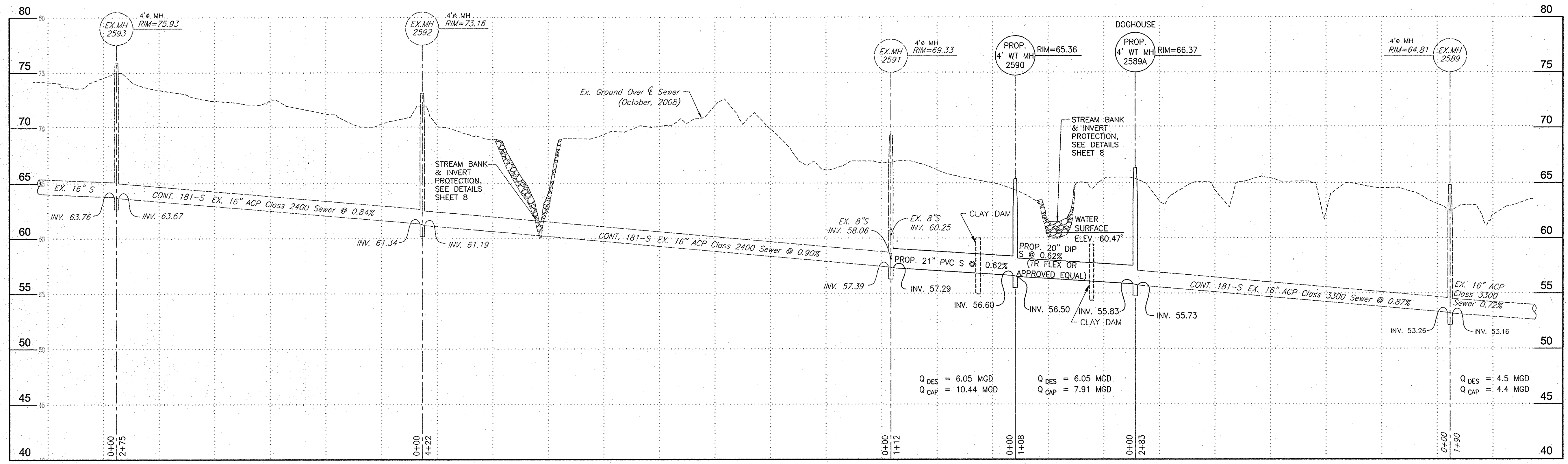


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 Last Saved: Jan 30, 2014, 1:51pm  
 XREF: 3 - 240 Projects\00000004 - Coal Cols Sewer Rehabilitation (CDD) - CDDA COA PLAN.dwg



**PLAN**  
SCALE: 1" = 50'

- GENERAL NOTES**
- The Contractor is to reference the geotechnical report in the specifications.
  - All utilized staging areas are to be protected with silt fence as directed.
  - See Sheet 4 for cross sections.



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

- SHALLOW RUN SEQUENCE OF CONSTRUCTION BETWEEN MH 2589 & 2591**
- 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.
  - Provide silt fence, stabilized construction entrance, temporary access bridge and all other devices as shown on the contract drawings prior to commencement of the work.
  - Provide sewer by-pass as needed.
  - Commence sewer main installation @ Prop. MH 2589A.
  - Build and complete backfill of sewer to within five feet of MH 2591.
  - Provide mirror and low pressure air test of the new sewer.
  - Connect to MH # 2591.
  - Form new channel in Ex. MH 2591 and Prop. MH 2589A.
  - 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 8 of 9.
  - Provide bank and stream stabilization and low spot stabilization between MH 2589 to MH 2589A, and MH 2591 and MH 2592.
  - Seed, mulch, stabilize and remove all debris before commencement of work on the next area of work.

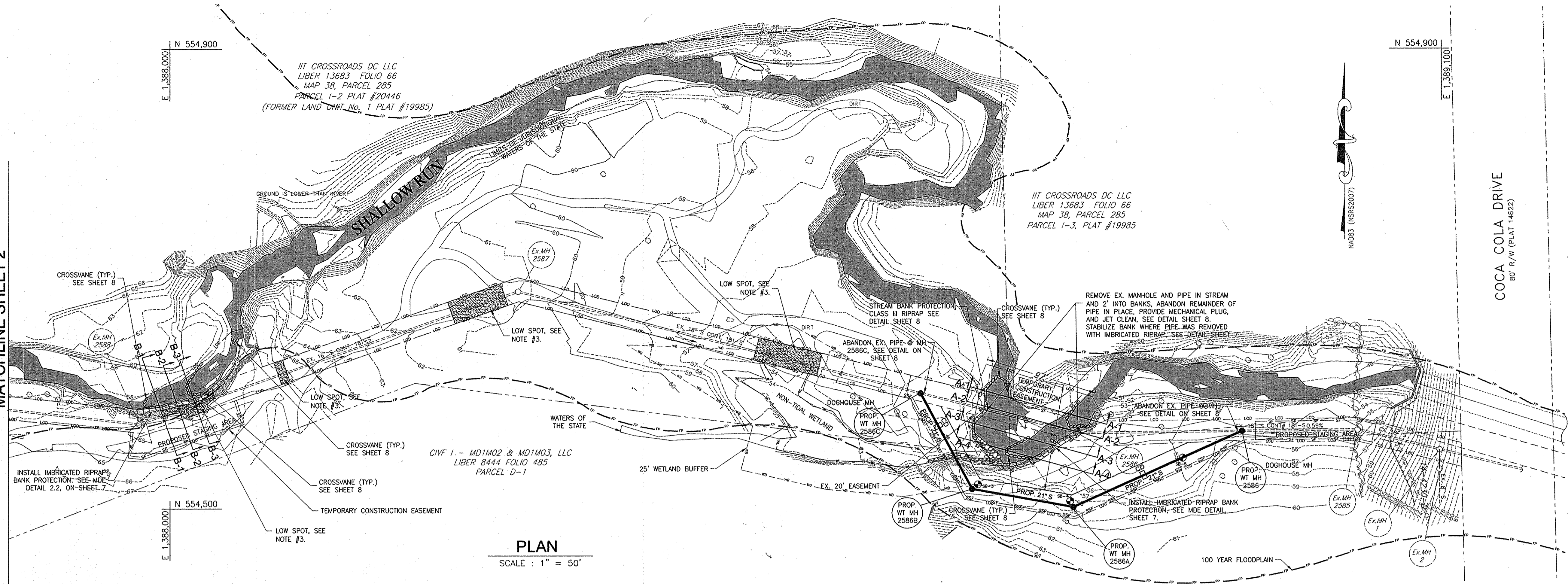
<b>DEPARTMENT OF PUBLIC WORKS</b> HOWARD COUNTY, MARYLAND Director of Public Works: <i>[Signature]</i> 4/11/14 Chief, Bureau of Utilities: <i>[Signature]</i> 4/11/14	<b>Dewberry</b> Dewberry Consultants LLC 3106 LORD BALTIMORE DRIVE SUITE 110 BALTIMORE, MD 21244-2662 410.265.8500 FAX: 410.265.8875		DES: LAL DRN: RLI CHK: TND DATE: 04/2014	<b>SHALLOW RUN PLAN AND PROFILE</b>	SCALE: AS SHOWN SHEET 2 OF 9
<b>SHALLOW RUN SEWER RELOCATION &amp; STREAM RESTORATION</b> CAPITAL PROJECT NO. S-6268 CONTRACT NO. 10-4830 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND		600' SCALE MAP NO. 37 BLOCK NO. 5			



- NOTES:
1. PROVIDE ADDITIONAL SUPER SILT FENCE AT THE DIRECTION OF THE HOWARD COUNTY CONSTRUCTION INSPECTOR OR REPRESENTATIVE TO CONTROL EROSION & CONTAIN SURFACE DRAINAGE OR DISTURBED AREAS & TO MINIMIZE SEDIMENTATION OF ADJACENT WATERCOURSES & LANDS THROUGHOUT LIFE OF CONTRACT.
  2. ALL SUPER SILT FENCE IS SHOWN 2' INSIDE LOD FROM ACTUAL LOCATION FOR CLARITY. LOCATE AT LOD.
  3. PROVIDE STRUCTURAL FILL IN ALL LOW SPOTS TO MATCH EXISTING GRADE AND PROVIDE POSITIVE DRAINAGE IN UNIFORM LIFTS OF 8 INCHES MAXIMUM IN UNCOMPACTED THICKNESS AND COMPACT TO NOT LESS THAN 95 PERCENT OF MAXIMUM DRY DENSITY, FOLLOWING ASTM D698, AT MOISTURE CONTENT WITHIN 2 PERCENT OPTIMUM FOR MATERIAL TO THE LIMITS SHOWN HERE.
  4. SEE SHEET 4 FOR CROSS SECTIONS.

MATCHLINE SHEET 2

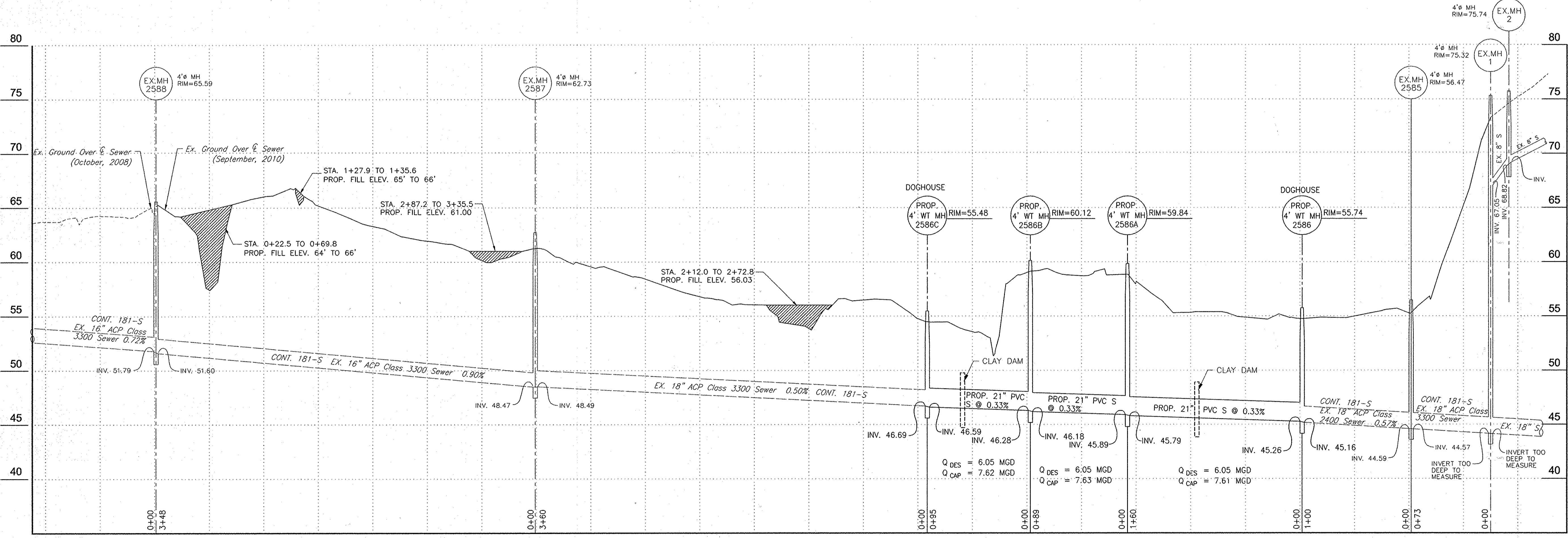
Note: All utilized staging areas are to be protected with silt fence as directed.



**PLAN**  
SCALE: 1" = 50'

**SHALLOW RUN SEQUENCE OF CONSTRUCTION BETWEEN MH 2587 & 2585**

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 silt fence, stabilized construction entrance, temporary access bridge and all other devices as shown on the contract drawings prior to commencement of the work.
3. Provide sewer by-pass as needed.
4. Build sewer main from Prop. MH 2586 to MH 2586C.
5. Provide mirror and low pressure air test of the new sewer.
6. 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 8 of 9.
7. Provide bank and stream stabilization and low spot stabilization between MH 2586 and MH 2587 & MH 2587 to MH 2588.
8. 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'

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

**Dewberry**  
Dewberry Consultants LLC  
3106 LORD BALTIMORE DRIVE  
SUITE 110  
BALTIMORE, MD 21244-2662  
410.265.9500  
FAX: 410.265.9875



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

**SHALLOW RUN PLAN AND PROFILE**

**SHALLOW RUN SEWER RELOCATION & STREAM RESTORATION**

CAPITAL PROJECT NO. S-6268  
CONTRACT NO. 10-4830

ELECTION DISTRICT NO. 5  
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN  
SHEET 3 OF 9

Plotted by: (none) on: Fri, Apr 08, 2014 at 2:39pm  
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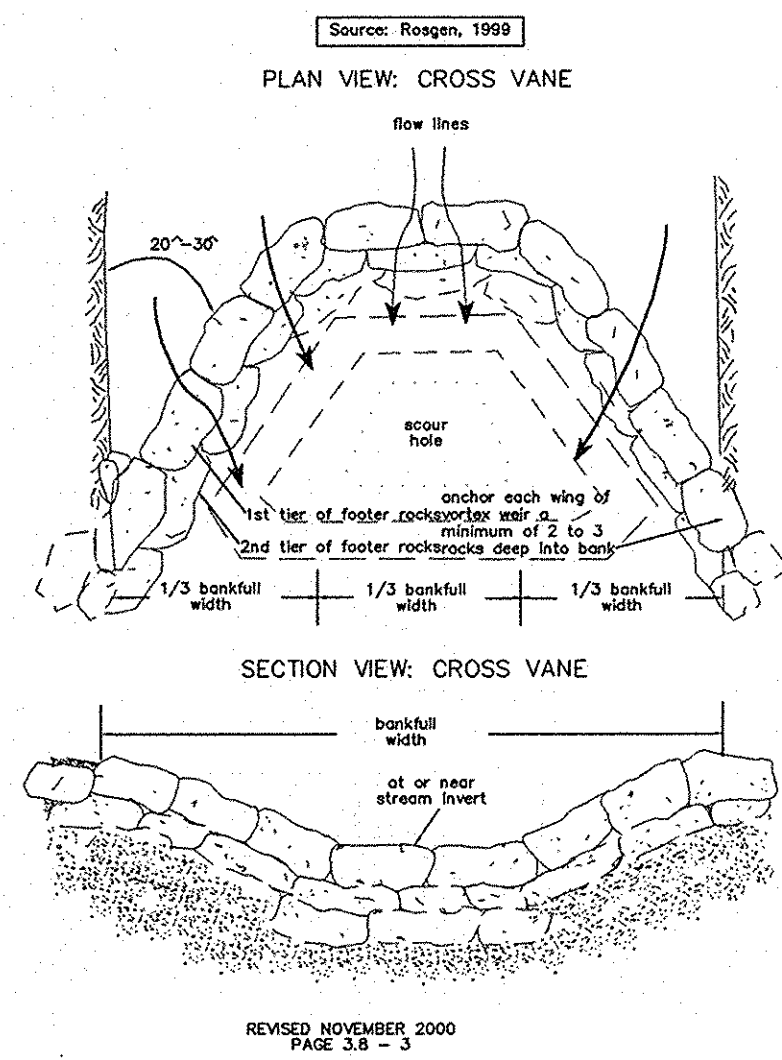






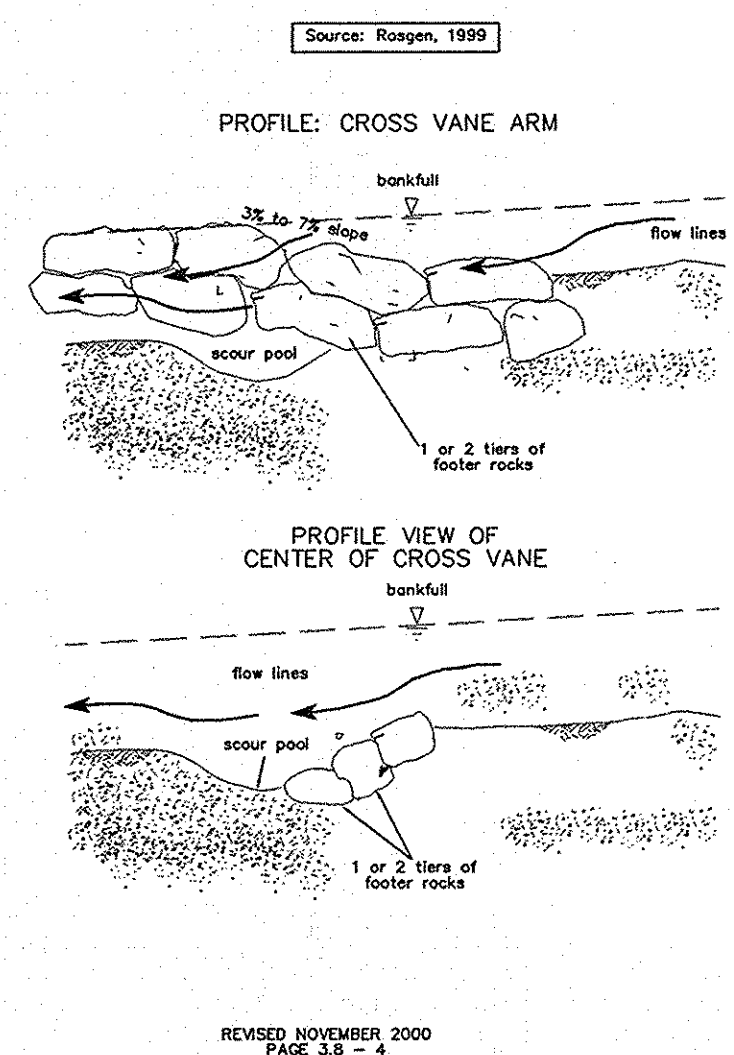


DETAIL 3.8(a): CROSS VANES



CROSS VANE  
NOT TO SCALE

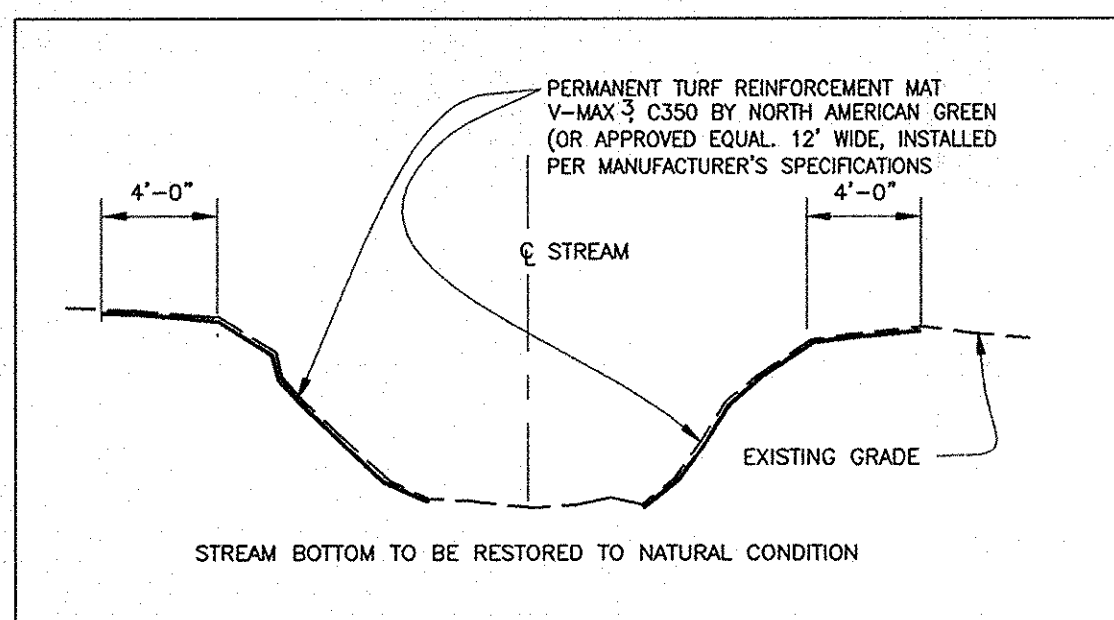
DETAIL 3.8(b): CROSS VANES



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 on 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.



PERMANENT TURF REINFORCEMENT MAT DETAIL  
NOT TO SCALE

**MGCWC 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, hydro-carbons, 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.

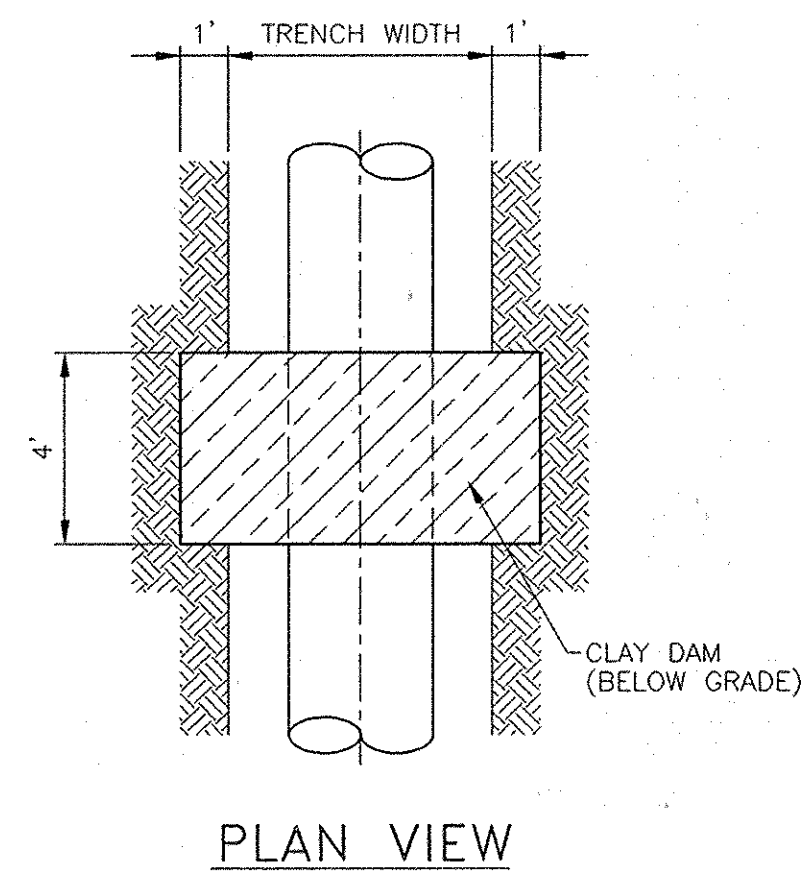
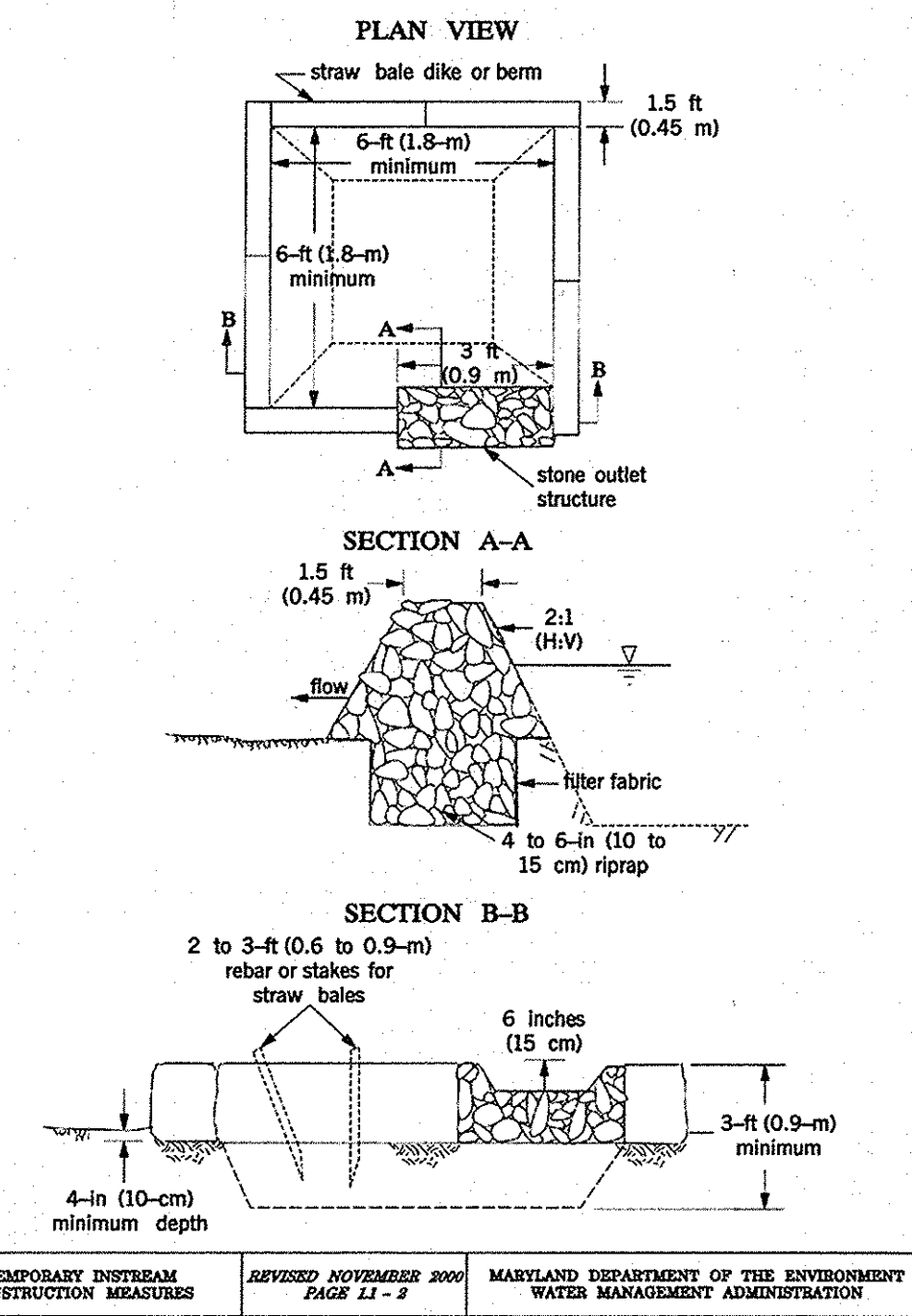
**INSTALLATION GUIDELINES**

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.

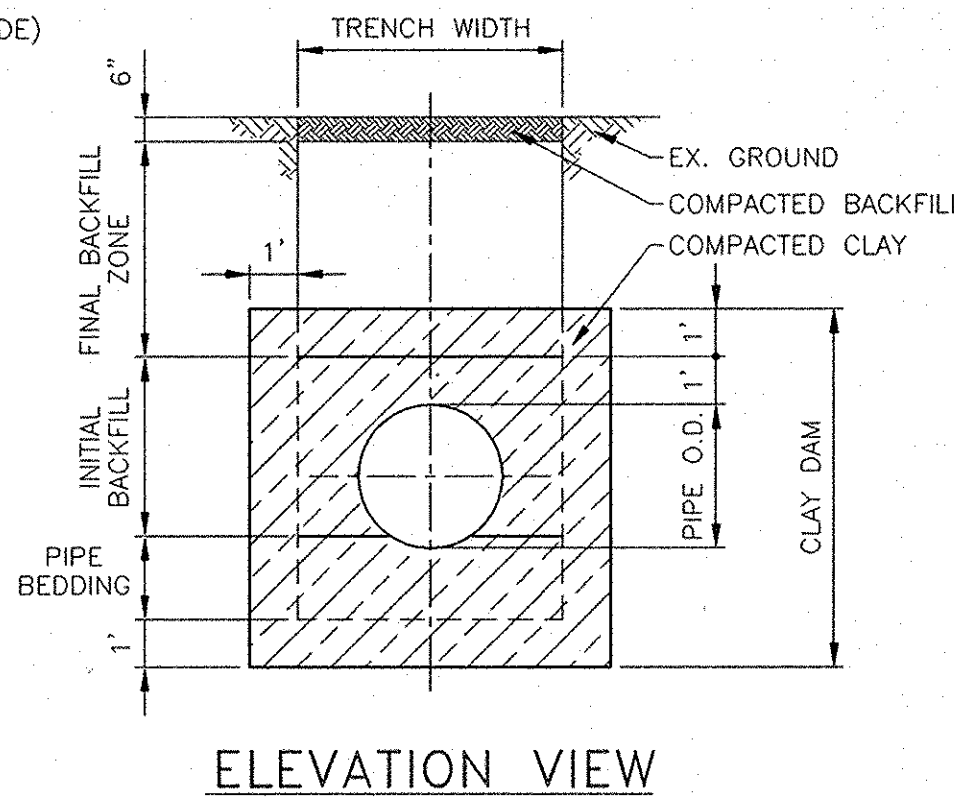
**Maryland's Guidelines To Waterway Construction  
DETAIL 1.1: DEWATERING BASINS**



PLAN VIEW

**CLAY DAM NOTES:**

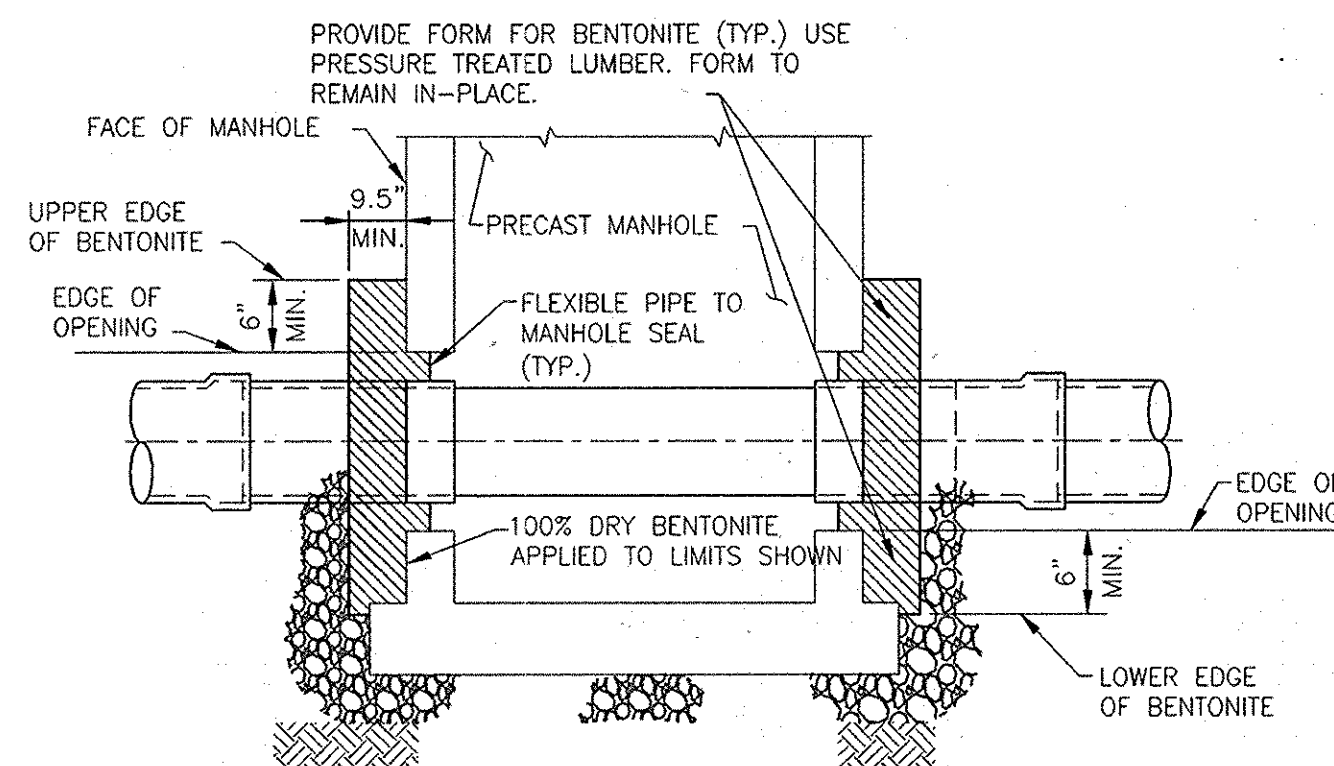
- CLAY DAM SHALL BE INSTALLED AT INTERVALS NO GREATER THAN 500 FEET AND AS SHOWN ON THE PLANS.
- CLAY DAM LENGTH SHALL BE 4 FEET ALONG THE PIPE AXIS, AND SHALL BE PLACED FROM UNDERCUT SUBGRADE OR TRENCH SUBGRADE UP TO 1 FOOT OVER THE INITIAL BACKFILL.
- PLACE CLAY DAM IN 6" LIFTS, USING CLAY MEETING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



ELEVATION VIEW

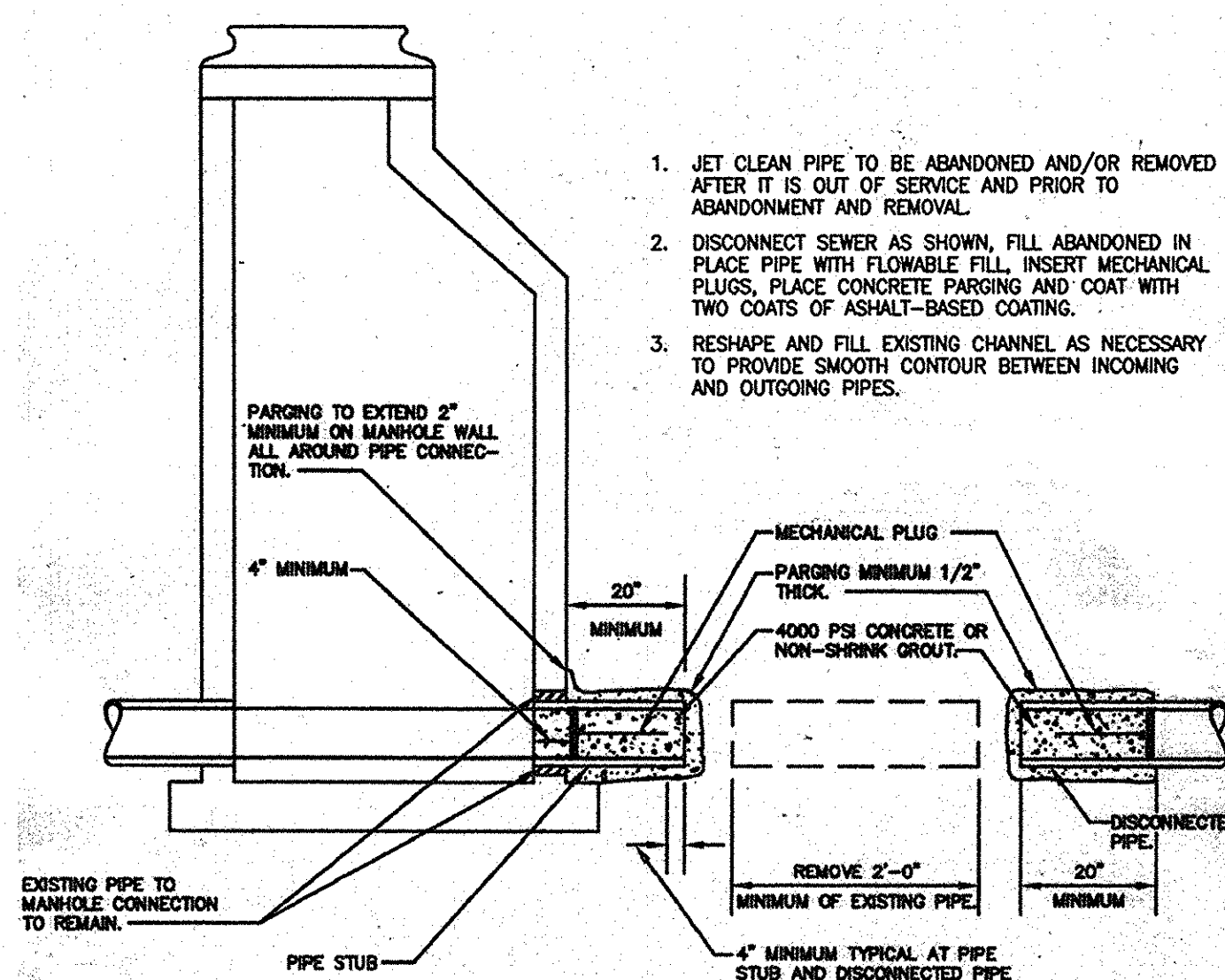
**CLAY DAM TYPICAL PIPE BEDDING DETAIL**

NO SCALE



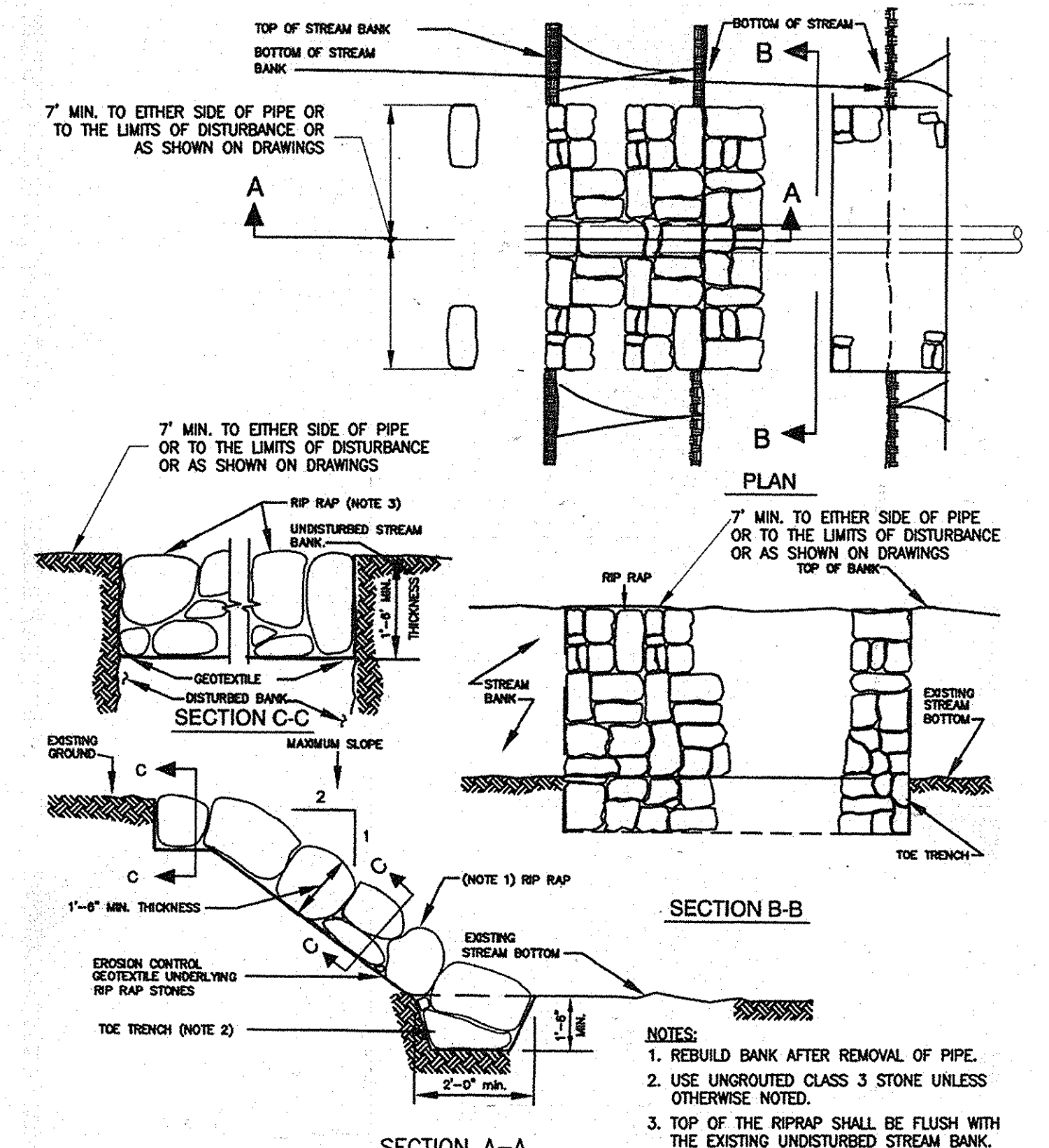
**PIPE TO MANHOLE CONNECTIONS**

NOT TO SCALE



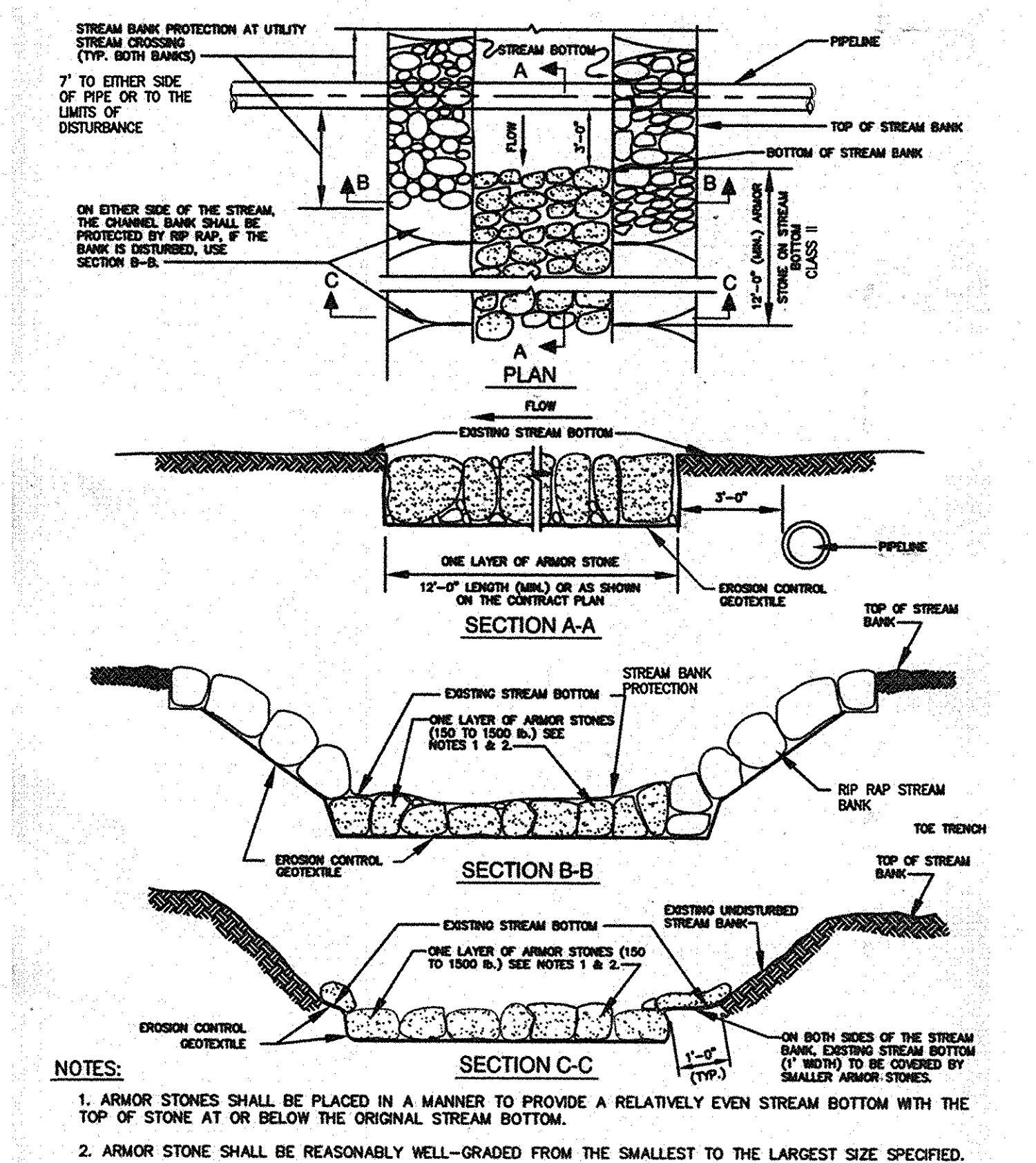
**ABANDONMENT OF PIPE AT MANHOLE  
AND LEFT IN PLACE**

NOT TO SCALE



**STREAM BANK PROTECTION**

NOT TO SCALE



**STREAM INVERT PROTECTION FOR  
SHALLOW UTILITY STREAM CROSSING**

NOT TO SCALE

- NOTES:
- ARMOR STONES SHALL BE PLACED IN A MANNER TO PROVIDE A RELATIVELY EVEN STREAM BOTTOM WITH THE TOP OF STONE AT OR BELOW THE ORIGINAL STREAM BOTTOM.
  - ARMOR STONE SHALL BE REASONABLY WELL-GRADED FROM THE SMALLEST TO THE LARGEST SIZE SPECIFIED.

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

Director of Public Works: *John A. ...* 4/11/14  
 Chief, Bureau of Utilities: *...* 4/11/14  
 Chief, Bureau of Engineering: *...* 4/11/14  
 Chief, Utility Design Division: *...* 4/11/14

**Dewberry**  
 Dewberry Consultants LLC  
 3106 LORD BALTIMORE DRIVE  
 SUITE 110  
 BALTIMORE, MD 21244-2662  
 410.285.8900  
 FAX: 410.285.8875



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

**MISCELLANEOUS DETAILS**

600' SCALE MAP NO. 37 BLOCK NO. 5

**SHALLOW RUN SEWER RELOCATION  
& STREAM RESTORATION**

CAPITAL PROJECT NO. S-6268  
 CONTRACT NO. 10-4830  
 ELECTION DISTRICT NO. 5  
 HOWARD COUNTY, MARYLAND

SCALE:  
AS  
SHOWN  
SHEET  
8 OF 9



**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 1/4 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  
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**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 channel.

**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 ultra-violet radiation, tearing, and 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 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).

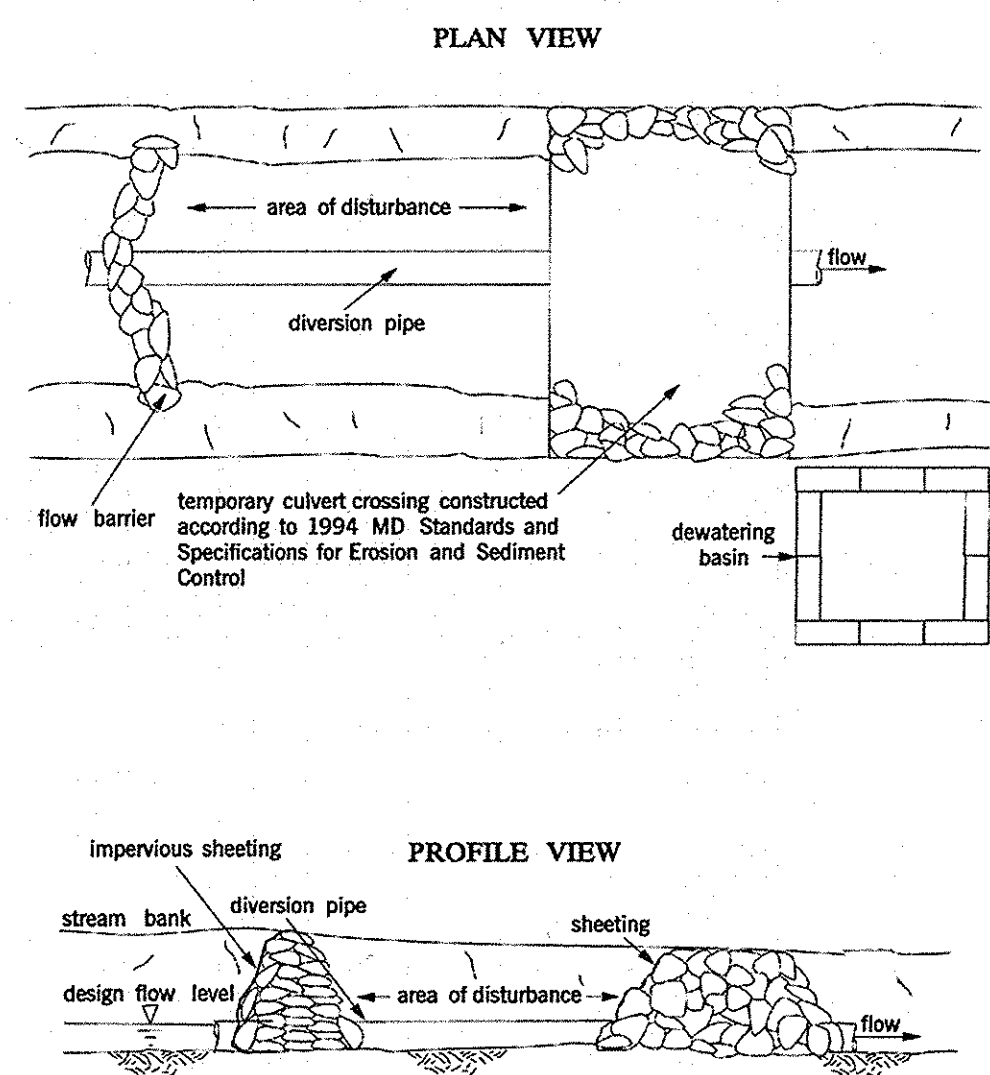
TEMPORARY INSTREAM CONSTRUCTION MEASURES

MARYLAND DEPARTMENT OF THE ENVIRONMENT  
WATERWAY CONSTRUCTION GUIDELINES  
REVISED NOVEMBER 2000

**MGWC 1.3: CULVERT PIPE WITH ACCESS ROAD**

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.

**Maryland's Guidelines To Waterway Construction  
DETAIL 1.3: CULVERT PIPE W/ACCESS ROAD**



TEMPORARY INSTREAM CONSTRUCTION MEASURES  
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WATER MANAGEMENT ADMINISTRATION

**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**

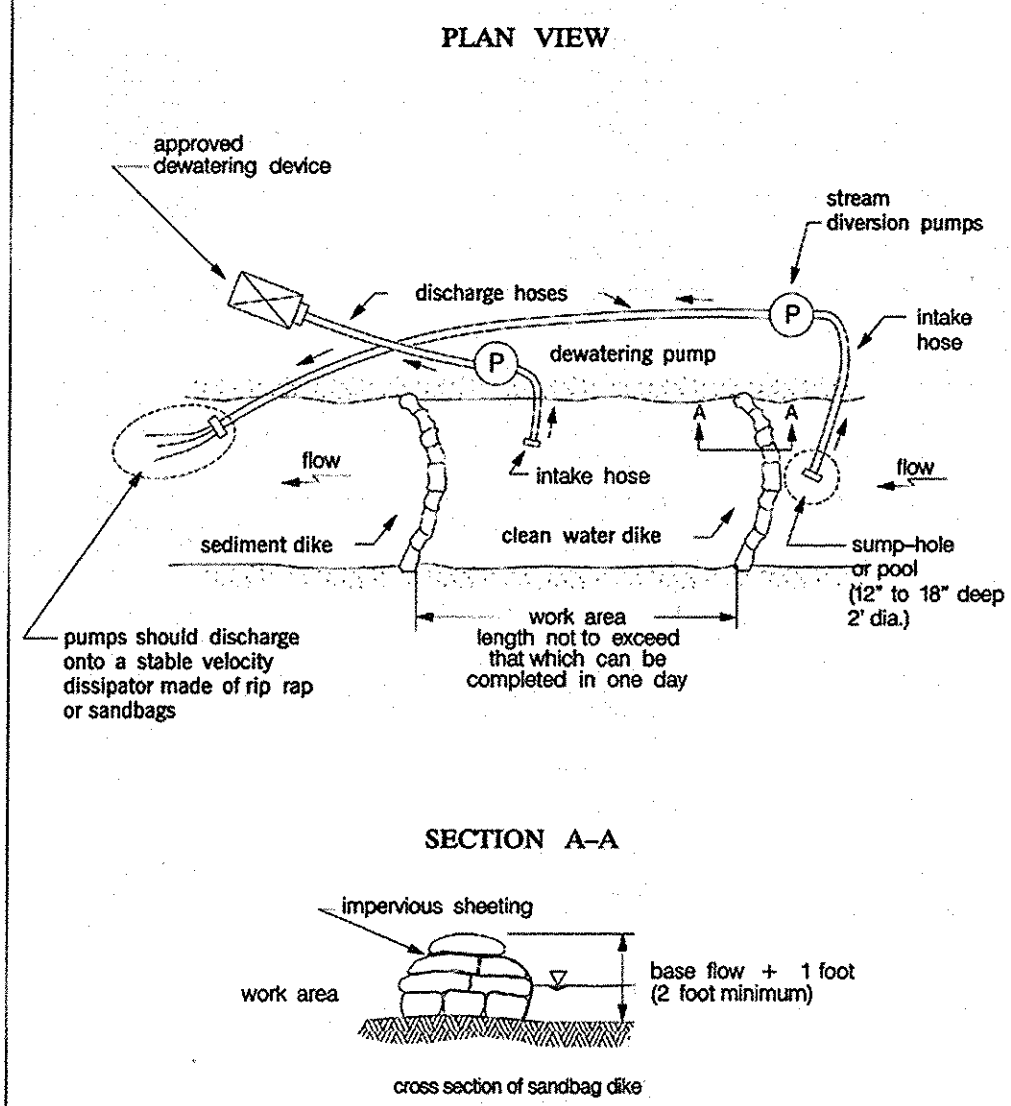
Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):

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**

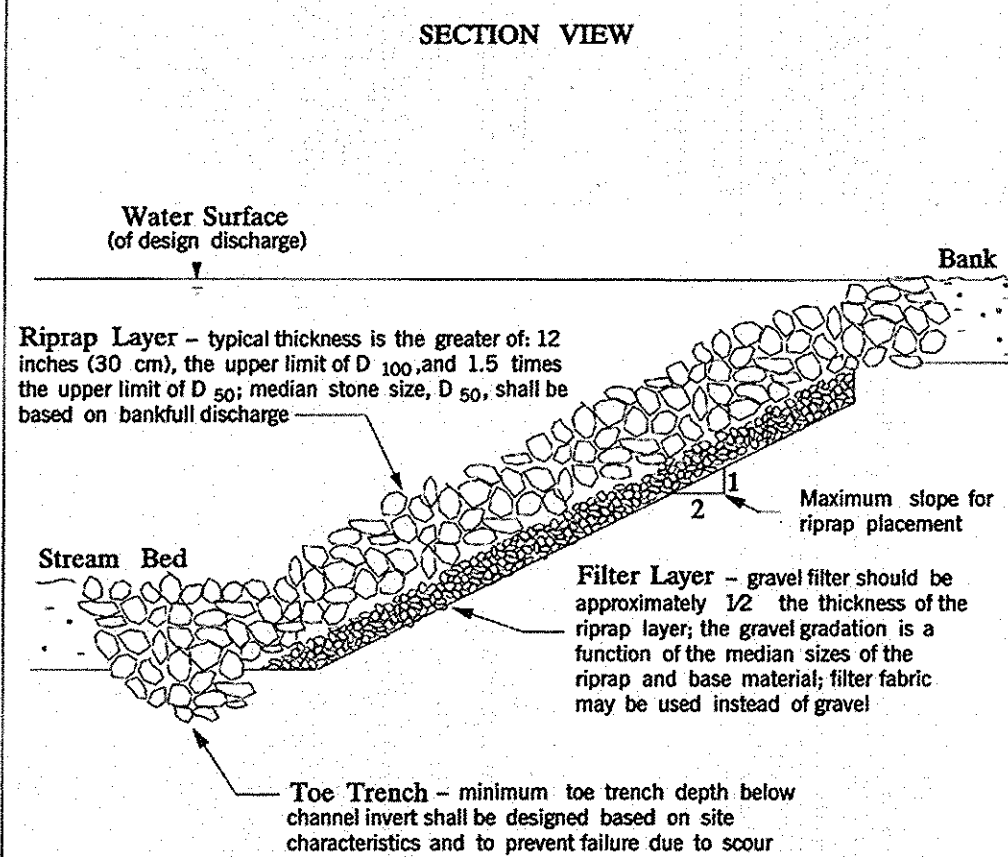
7. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.
8. Traversing a channel reach with equipment 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.

**Maryland's Guidelines To Waterway Construction  
DETAIL 1.2: PUMP-AROUND PRACTICE**



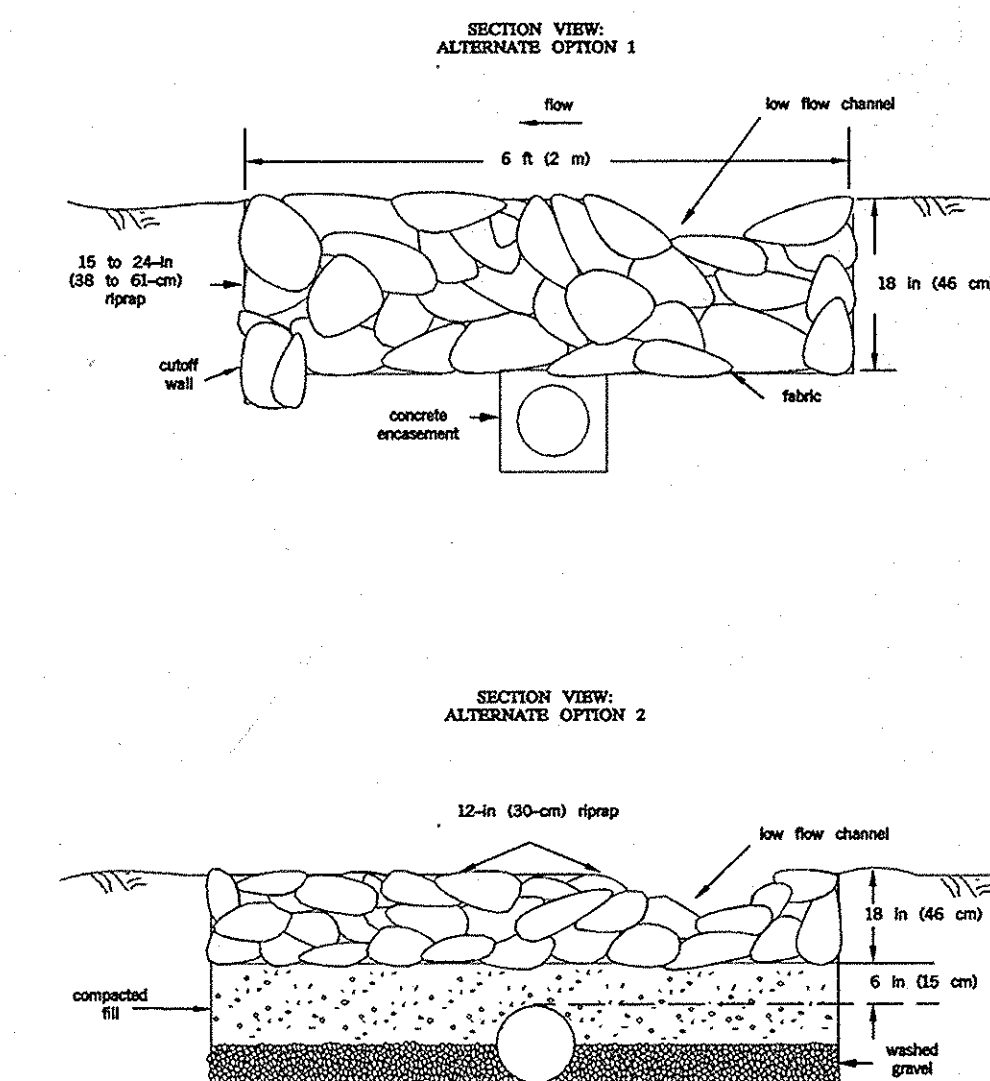
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DETAIL 2.1: RIPRAP**



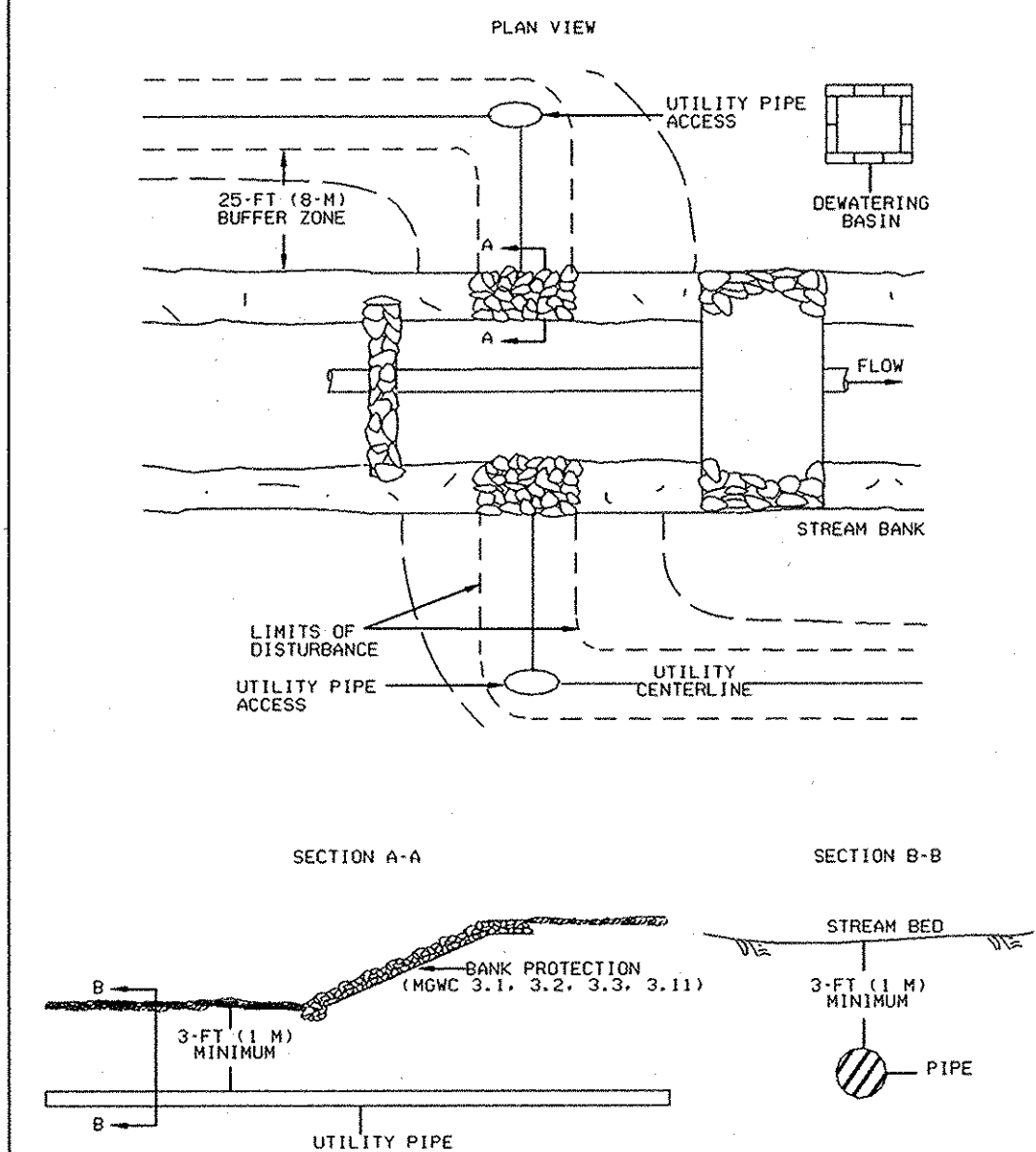
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**Maryland's Guidelines To Waterway Construction  
DETAIL 4.2(b): UTILITY CROSSING**



STREAM CROSSINGS  
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**Maryland's Guidelines To Waterway Construction  
DETAIL 4.2(a): UTILITY CROSSING**

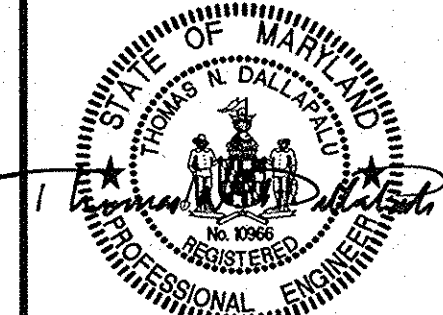


STREAM CROSSINGS  
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WATER MANAGEMENT ADMINISTRATION

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

Director of Public Works: [Signature] DATE: 4/12/14  
 Chief, Bureau of Engineering: [Signature] DATE: 4/12/14  
 Chief, Bureau of Utilities: [Signature] DATE: 4/12/14  
 Chief, Utility Design Division: [Signature] DATE: 4/12/14

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

NO.	REVISIONS	DATE

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

600' SCALE MAP NO. 37  
BLOCK NO. 5

**SHALLOW RUN SEWER RELOCATION  
& STREAM RESTORATION**

CAPITAL PROJECT NO. S-6268  
CONTRACT NO. 10-4830  
ELECTION DISTRICT NO. 5  
HOWARD COUNTY, MARYLAND

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