

HOWARD COUNTY

Capital Project #D-1158

Great Drum Circle

Stream Rehabilitation Project

Storm Water Management Division

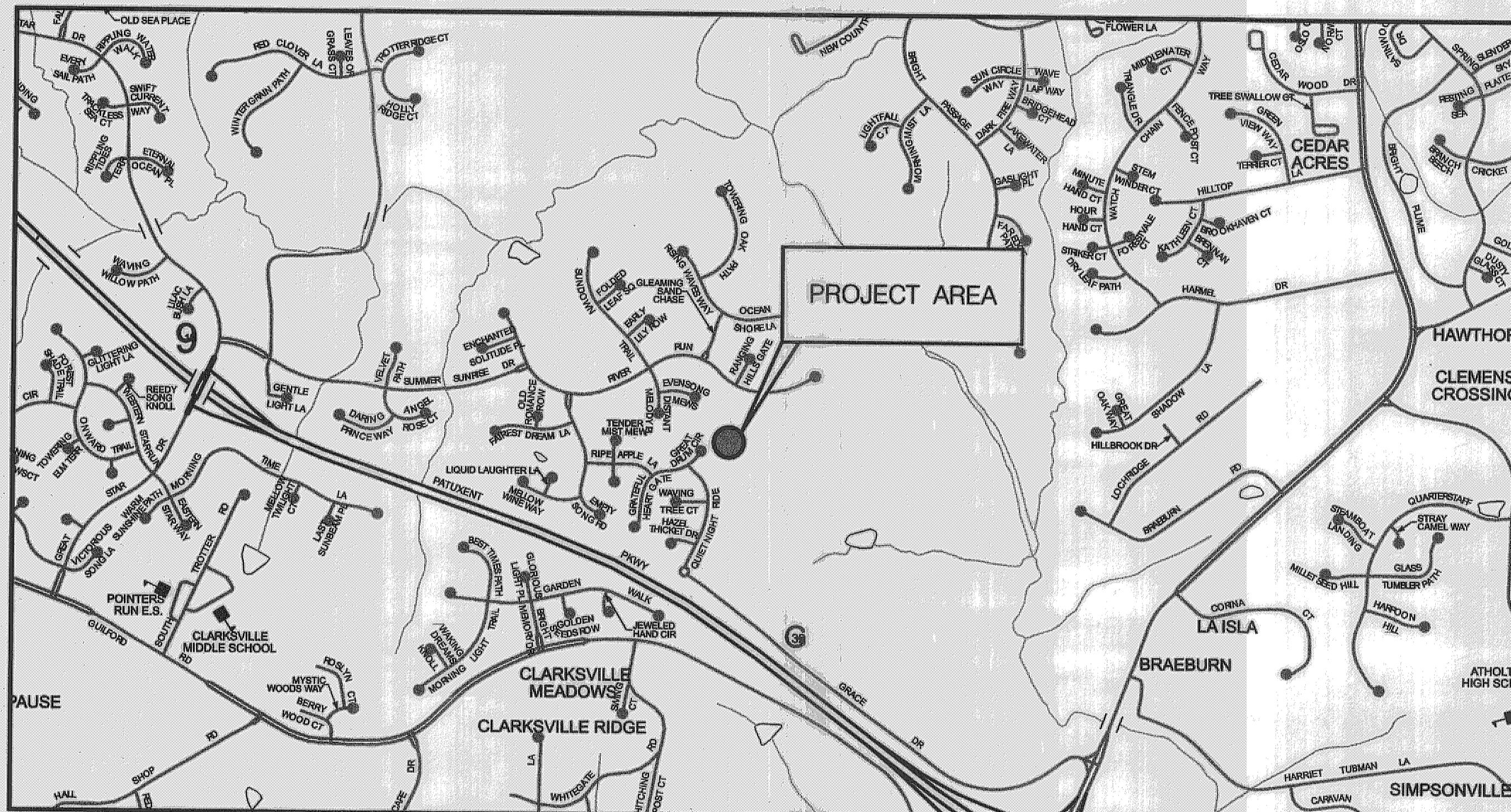
Bureau Of Environmental Services

INDEX OF SHEETS

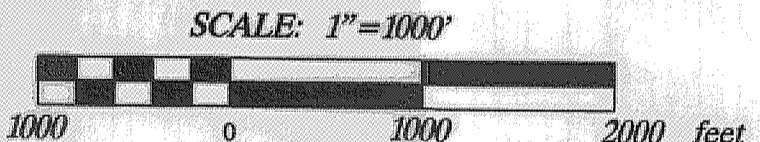
SHEET NO.	TITLE
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LEGEND

PROPOSED MEDIAN BARRIER	
ELECTRICAL HAND BOX - SIGNALS	
FLOW LINE	
STATE, COUNTY OR CITY LINES	
PROPOSED TRAFFIC BARRIER	
EXISTING TRAFFIC BARRIER	
PROPOSED FENCE LINE	
EXISTING FENCE LINE	
RIGHT OF WAY LINE	
EXISTING ROADWAY	
BASE OR SURVEY LINE	
TRAVERSE POINT	
APPROXIMATE LIMITS OF CUT AND/OR FILL	
PROPOSED MAJOR CONTOUR	
PROPOSED MINOR CONTOUR	
LIMIT OF DISTURBANCE	
EXISTING MAJOR CONTOURS	
EXISTING MINOR CONTOURS	
EXISTING PIPE/CULVERT	
EXISTING DROP INLET	
WETLAND	
HEDGE / TREE LINE	
BUSH / TREE	
CONIFEROUS TREE	
LIGHT POLE	



HORIZONTAL DATUM	NAD 83 / 91
VERTICAL DATUM	NAVD 88



- GENERAL NOTES**
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MDSA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
 - THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST FIVE (5) WORKING DAYS PRIOR TO ANY WORK BEING DONE.
 - THIS PLAN IS PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
 - THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS /BUREAU OF ENGINEERING CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
 - SURVEY OF THIS SITE WAS PERFORMED BY AB CONSULTANTS, INC.-DECEMBER 2009.
 - THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. BENCHMARKS SHOWN HEREON WERE PROVIDED BY AB CONSULTANTS INC.
 - STORMWATER MANAGEMENT IS NOT REQUIRED FOR THIS PROJECT SINCE THE PROJECT WILL NOT ADD IMPERVIOUS AREA.
 - OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND MCCORMICK TAYLOR DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY SUCH INFORMATION TO HIS OWN SATISFACTION.
 - THE EXISTING INFORMATION SHOWN ON THESE PLANS WAS TAKEN FROM THE BEST AVAILABLE SOURCES AND SHALL BE VERIFIED BEFORE STARTING CONSTRUCTION. THE HOWARD COUNTY DOES NOT GUARANTEE THE COMPLETENESS OR THE CORRECTNESS OF THE SHOWN INFORMATION.
 - THE CONTRACTORS SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY. ALL UTILITIES SHALL HAVE A CLEARANCE BY A MINIMUM OF 6 INCHES VERTICALLY AND A MINIMUM OF 5 FEET HORIZONTALLY.
 - SHOULD THE CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY MCCORMICK TAYLOR IMMEDIATELY TO RESOLVE THE SITUATION.
 - ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS.
 - THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
 - SITE DEVELOPMENT DETAILS ARE REFERENCED FROM THE AS-BUILT PLANS FOR THE VILLAGE OF RIVER HILL, SECTION 2 AREA 6 PHASE 1 (F-96-98).
 - A JOINT PERMIT APPLICATION HAS BEEN SUBMITTED TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT FOR THIS PROJECT. (TRACKING NUMBER #201060555)
 - PROJECT IMPACTS INCLUDE WORK IN A USE 1-P STREAM. INSTREAM WORK MAY NOT BE CONDUCTED DURING THE PERIOD BETWEEN MARCH 1 THROUGH JUNE 15.

PROFESSIONAL CERTIFICATION

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

LICENSE NO. 32013, EXPIRATION DATE: 7/5/2011

DESIGN CERTIFICATION

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

OWNER'S/DEVELOPER'S CERTIFICATION

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

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

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

HOWARD SCD _____ DATE _____

11/23/10 DATE
 Amy L. Hribar DESIGNER'S SIGNATURE
 MARYLAND REGISTRATION NUMBER 32013
 AMY L. HRIBAR PRINTED NAME

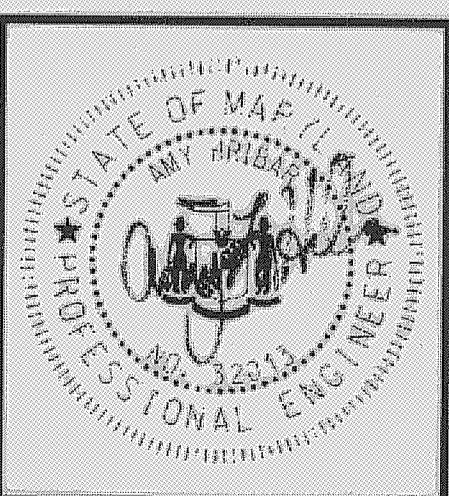
11/29/10 DATE
 Howard E. Saltzman OWNER /DEVELOPER SIGNATURE
 Howard E. Saltzman Chief, Stormwater Management Division
 PRINTED NAME AND TITLE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

11/29/10 DATE
 Evelyn E. Donds CHIEF, BUREAU OF ENVIRONMENTAL SERVICES
 11/29/10 DATE
 Howard E. Saltzman CHIEF, STORMWATER MANAGEMENT DIVISION

McCormick Taylor
 Engineers & Planners Since 1946
 509 South Exeter Street
 4th Floor
 Baltimore, Maryland 21202
 (410) 662-7400

Howard County
 MARYLAND
 Storm Water Management Division
 Bureau of Environmental Services
 6751 Columbia Gateway Drive, Suite 514
 Columbia, Maryland 21046-3143
 (410) 313-6444



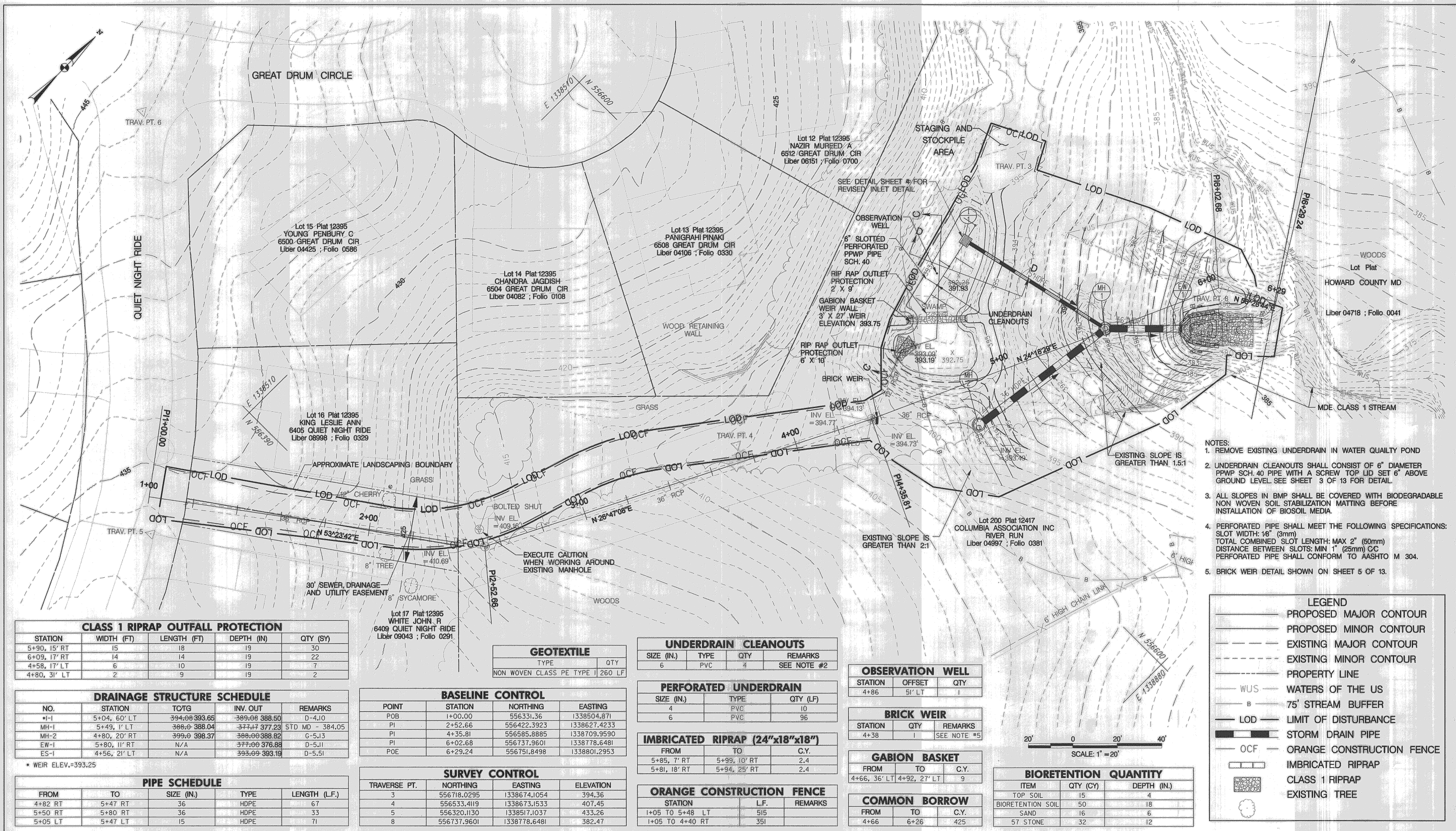
DES:	ALH	AS-BUILT	10/12/11
DRN:	MR		
CHK:	CB		
DATE:	9/7/10		
BY	NO.	REVISION	DATE

HOWARD COUNTY STORMWATER MANAGEMENT EVALUATION
GREAT DRUM CIRCLE STREAM REHABILITATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY F 96-98 BIO

TITLE SHEET

SCALE AS SHOWN
 SHEET 1 OF 13

EP-10-31



- NOTES:
1. REMOVE EXISTING UNDERDRAIN IN WATER QUALITY POND
 2. UNDERDRAIN CLEANOUTS SHALL CONSIST OF 6" DIAMETER PPWP SCH. 40 PIPE WITH A SCREW TOP LID SET 6" ABOVE GROUND LEVEL SEE SHEET 3 OF 13 FOR DETAIL.
 3. ALL SLOPES IN BMP SHALL BE COVERED WITH BIODEGRADABLE NON WOVEN SOIL STABILIZATION MATTING BEFORE INSTALLATION OF BIOSOIL MEDIA.
 4. PERFORATED PIPE SHALL MEET THE FOLLOWING SPECIFICATIONS:
SLOT WIDTH: 1/8" (3mm)
TOTAL COMBINED SLOT LENGTH: MAX 2' (50mm)
DISTANCE BETWEEN SLOTS: MIN 1" (25mm) CC
PERFORATED PIPE SHALL CONFORM TO AASHTO M 304.
 5. BRICK WEIR DETAIL SHOWN ON SHEET 5 OF 13.

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- WUS - WATERS OF THE US
- B - 75' STREAM BUFFER
- LOD - LIMIT OF DISTURBANCE
- STORM DRAIN PIPE
- OCF - ORANGE CONSTRUCTION FENCE
- IMBRICATED RIPRAP
- CLASS 1 RIPRAP
- EXISTING TREE

CLASS 1 RIPRAP OUTFALL PROTECTION

STATION	WIDTH (FT)	LENGTH (FT)	DEPTH (IN)	QTY (SY)
5+90, 15' RT	15	18	19	30
6+09, 17' RT	14	14	19	22
4+58, 17' LT	6	10	19	7
4+80, 31' LT	2	9	19	2

DRAINAGE STRUCTURE SCHEDULE

NO.	STATION	TO/TO	INV. OUT	REMARKS
MH-1	5+04, 60' LT	394.08-393.65	389.08-388.50	D-4.10
MH-1	5+49, 1' LT	388.0-388.04	377.47-377.23	STD MD - 384.05
MH-2	4+80, 20' RT	399.0-398.37	388.08-388.82	G-5.13
EW-1	5+80, 11' RT	N/A	377.06-376.88	D-5.11
ES-1	4+56, 21' LT	N/A	393.09-393.19	D-5.51

* WEIR ELEV.=393.25

PIPE SCHEDULE

FROM	TO	SIZE (IN.)	TYPE	LENGTH (L.F.)
4+82 RT	5+47 RT	36	HDPE	67
5+50 RT	5+80 RT	36	HDPE	33
5+05 LT	5+47 LT	15	HDPE	71

GEOTEXTILE

TYPE	QTY
NON WOVEN CLASS PE TYPE I	260 LF

BASELINE CONTROL

POINT	STATION	NORTHING	EASTING
POB	1+00.00	556331.36	1338504.871
PI	2+52.66	556422.3923	1338627.4233
PI	4+35.81	556585.8885	1338709.9590
PI	6+02.68	556737.9601	1338778.6481
POE	6+29.24	556751.8498	1338801.2953

SURVEY CONTROL

TRAVERSE PT.	NORTHING	EASTING	ELEVATION
3	556718.0295	1338674.1054	394.36
4	556533.4119	1338673.1533	407.45
5	556320.1130	1338517.1037	433.26
8	556737.9601	1338778.6481	382.47

UNDERDRAIN CLEANOUTS

SIZE (IN.)	TYPE	QTY	REMARKS
6	PVC	4	SEE NOTE #2

PERFORATED UNDERDRAIN

SIZE (IN.)	TYPE	QTY (LF)
4	PVC	10
6	PVC	96

IMBRICATED RIPRAP (24"x18"x18")

FROM	TO	C.Y.
5+85, 7' RT	5+99, 10' RT	2.4
5+81, 18' RT	5+94, 25' RT	2.4

ORANGE CONSTRUCTION FENCE

STATION	L.F.	REMARKS
1+05 TO 5+48 LT	515	
1+05 TO 4+40 RT	351	

OBSERVATION WELL

STATION	OFFSET	QTY
4+86	51' LT	1

BRICK WEIR

STATION	QTY	REMARKS
4+38	1	SEE NOTE #5

GABION BASKET

FROM	TO	C.Y.
4+66, 36' LT	4+92, 27' LT	9

COMMON BORROW

FROM	TO	C.Y.
4+66	6+26	425

BIORETENTION QUANTITY

ITEM	QTY (CY)	DEPTH (IN.)
TOP SOIL	15	4
BIORETENTION SOIL	50	18
SAND	16	6
57 STONE	32	12

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

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

John R. Robertson 12/2/10
DATE

McCormick Taylor
Engineers & Planners Since 1946

509 South Exeter Street
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Howard County
MARYLAND

Storm Water Management Division
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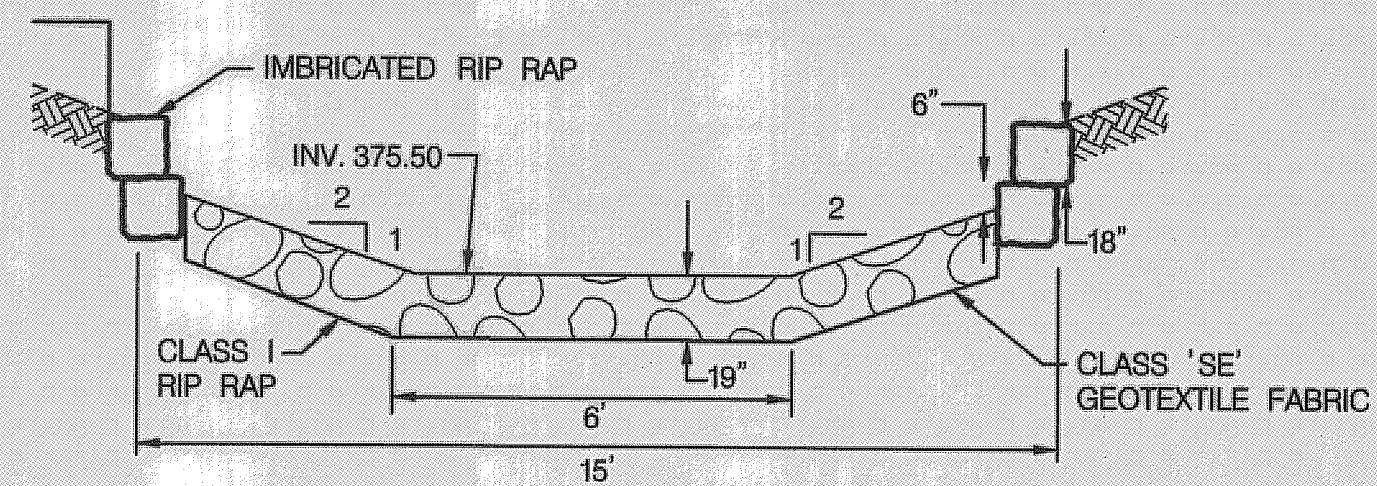
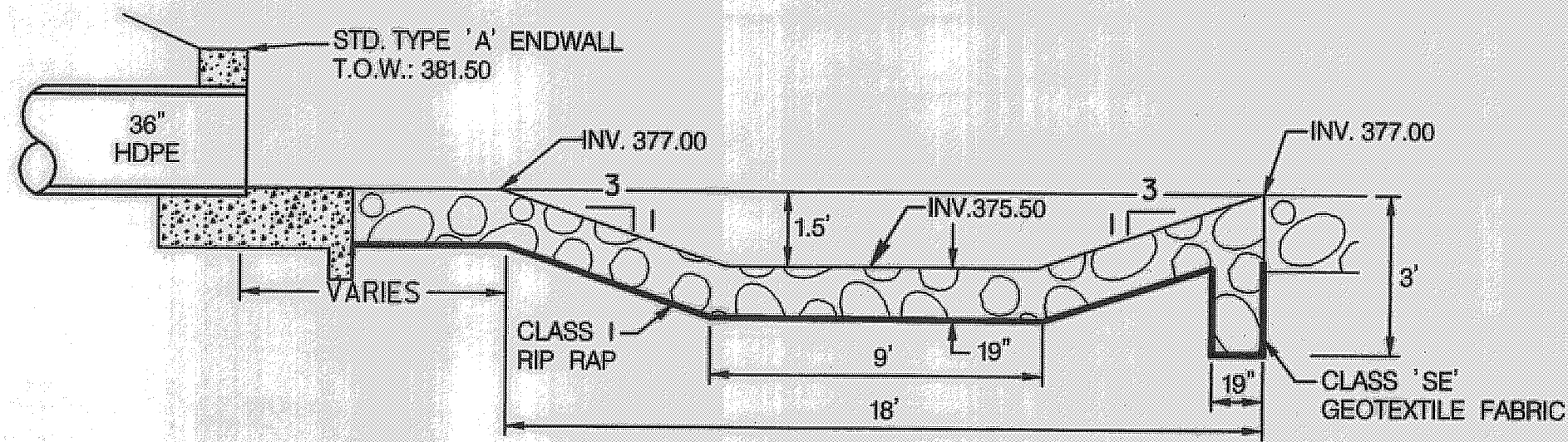
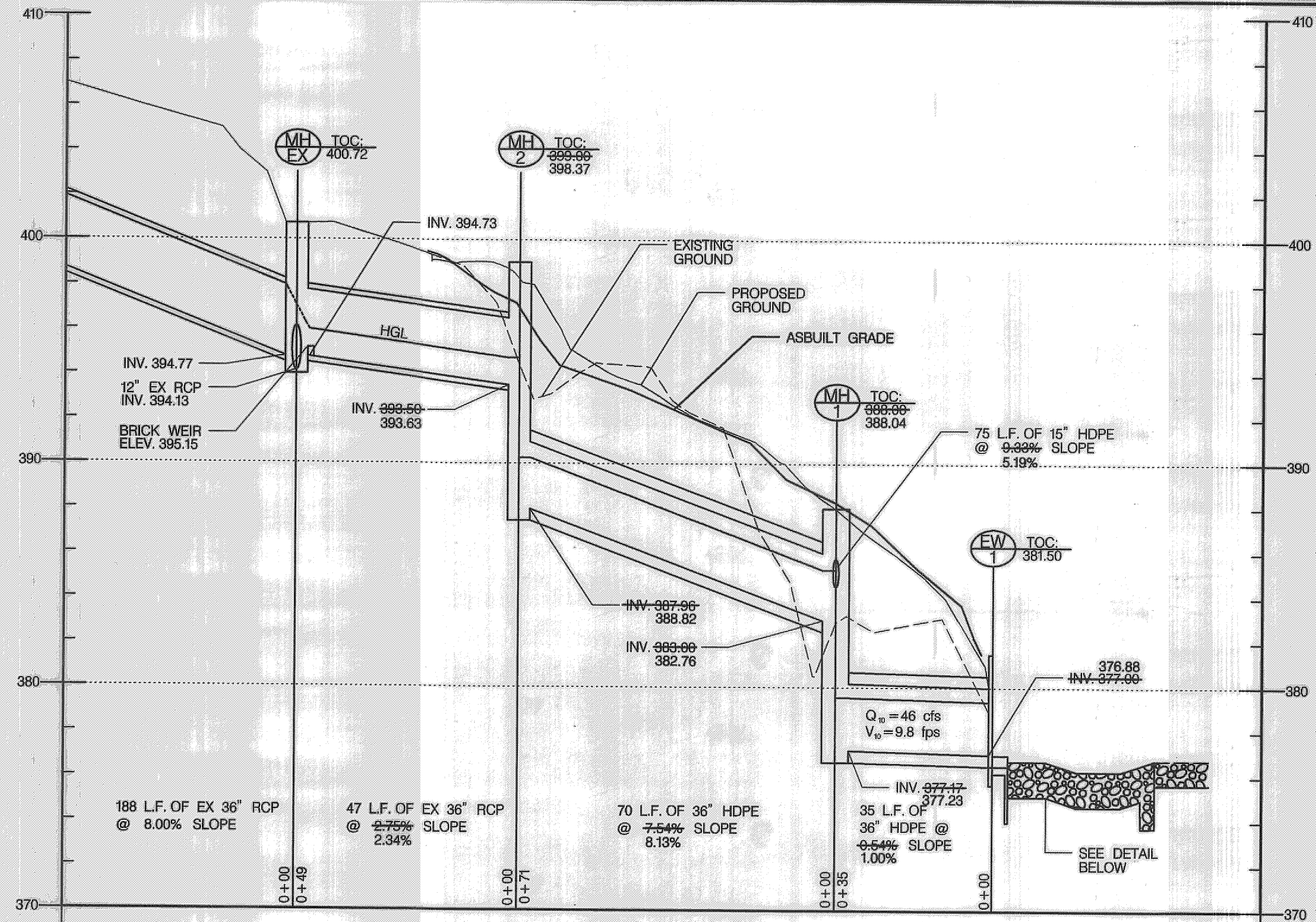
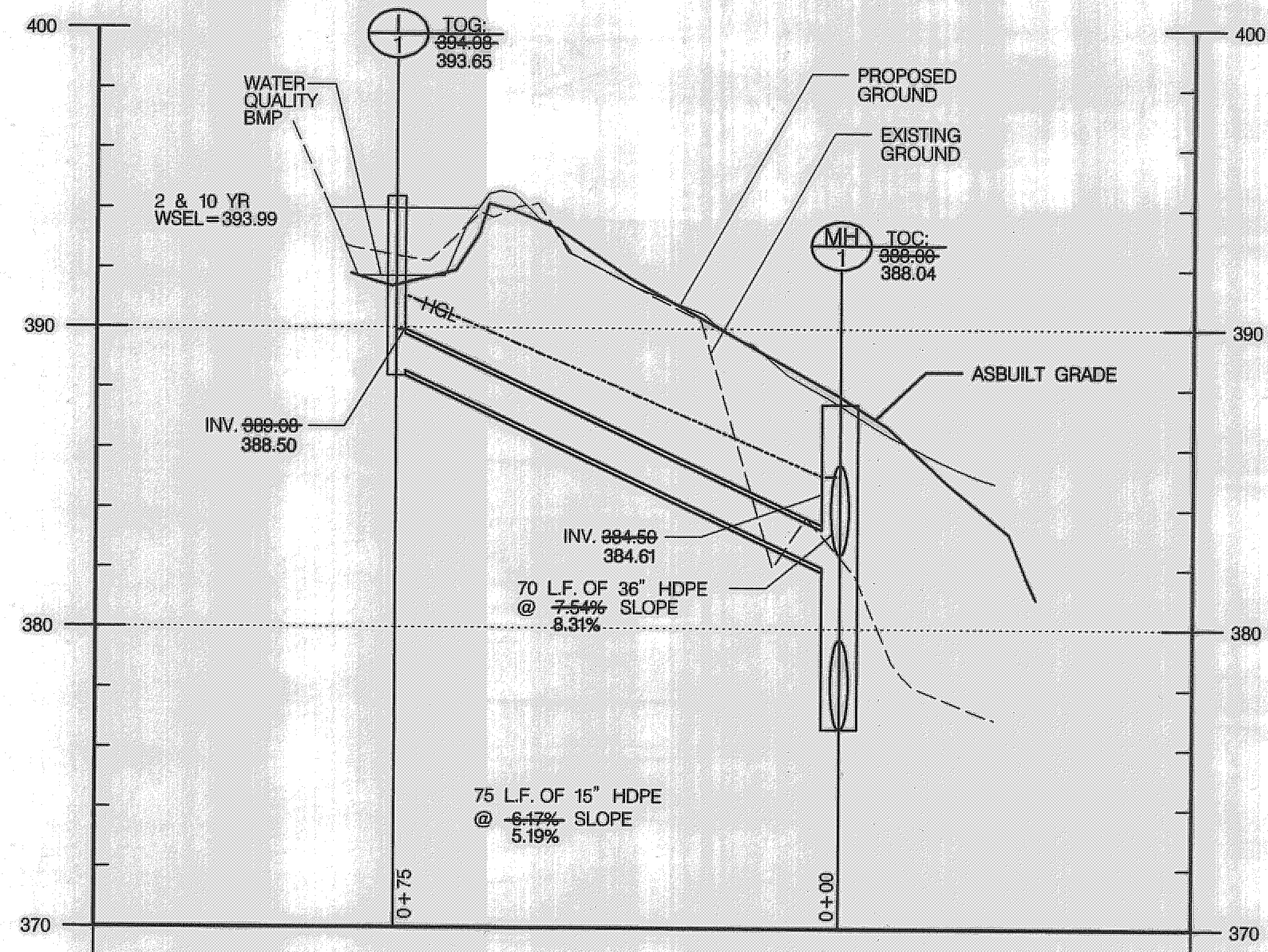
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HOWARD COUNTY F 96-98 BIO

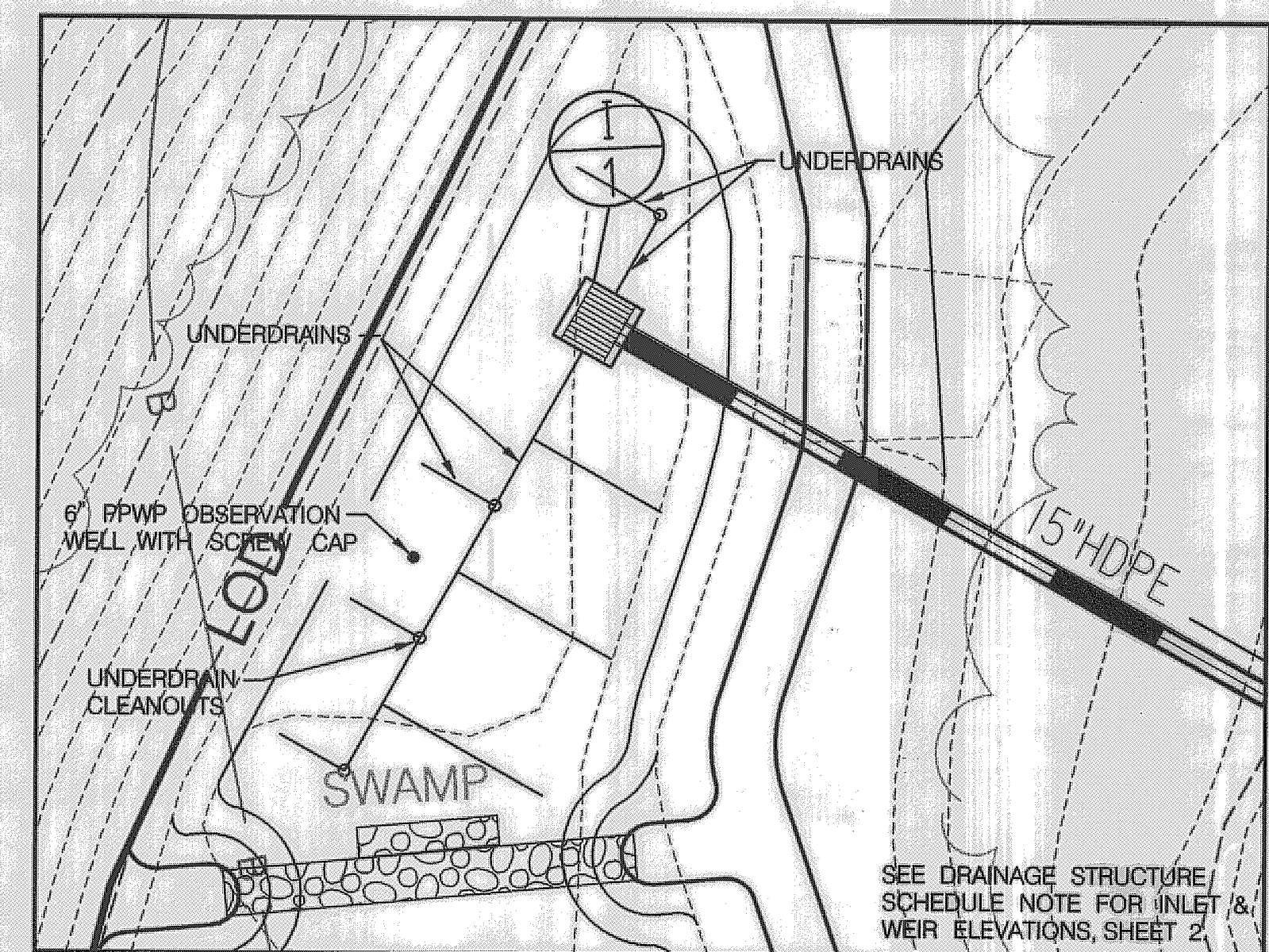
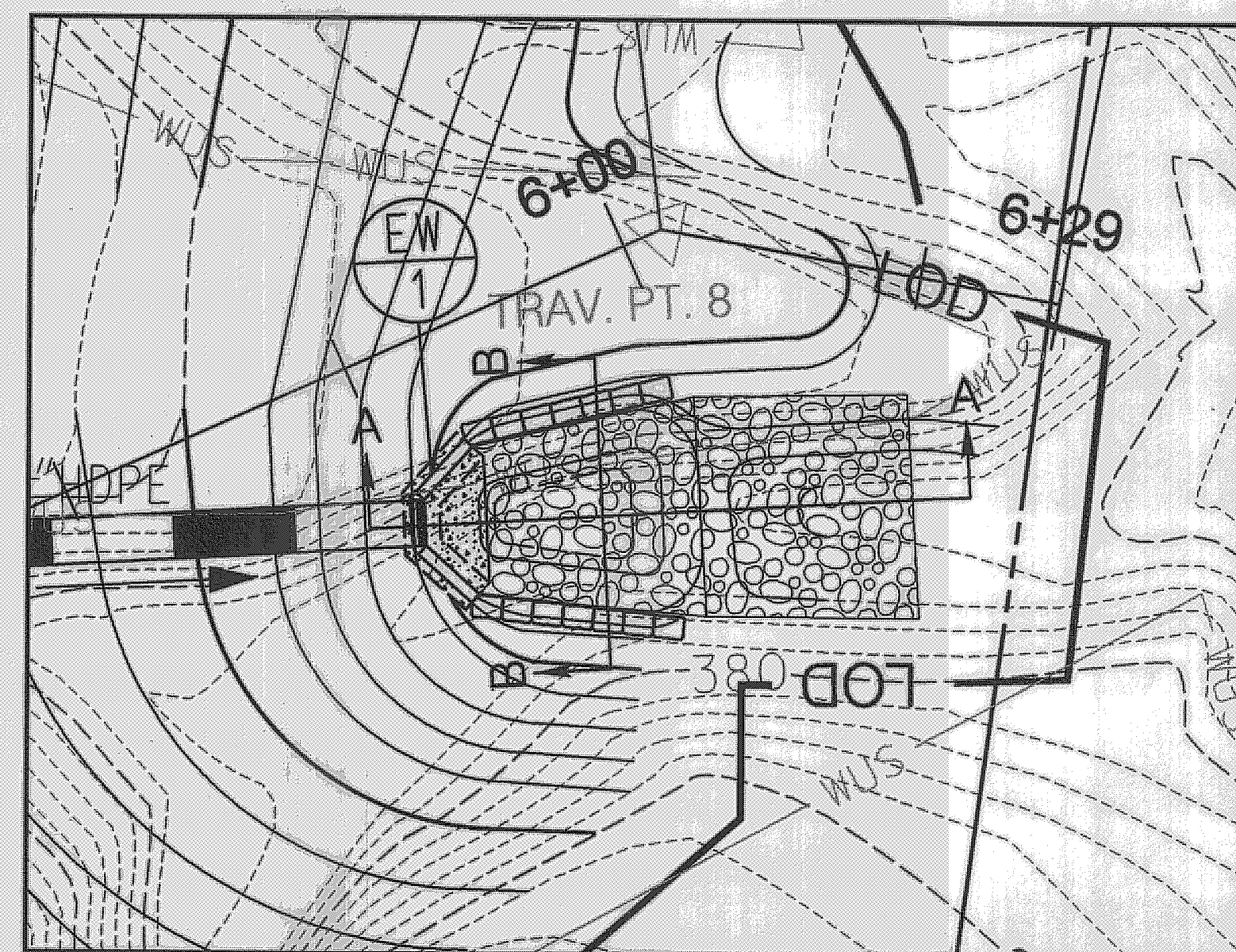
SITE PLAN

SCALE: 1" = 20'

SHEET 2 OF 13



FILTER FABRIC LINING GEOTEXTILE CLASS 'SE' SHALL BE EMBEDDED A MINIMUM OF 4" AND SHALL EXTEND 6" BEYOND THE EDGE OF RIPRAP.



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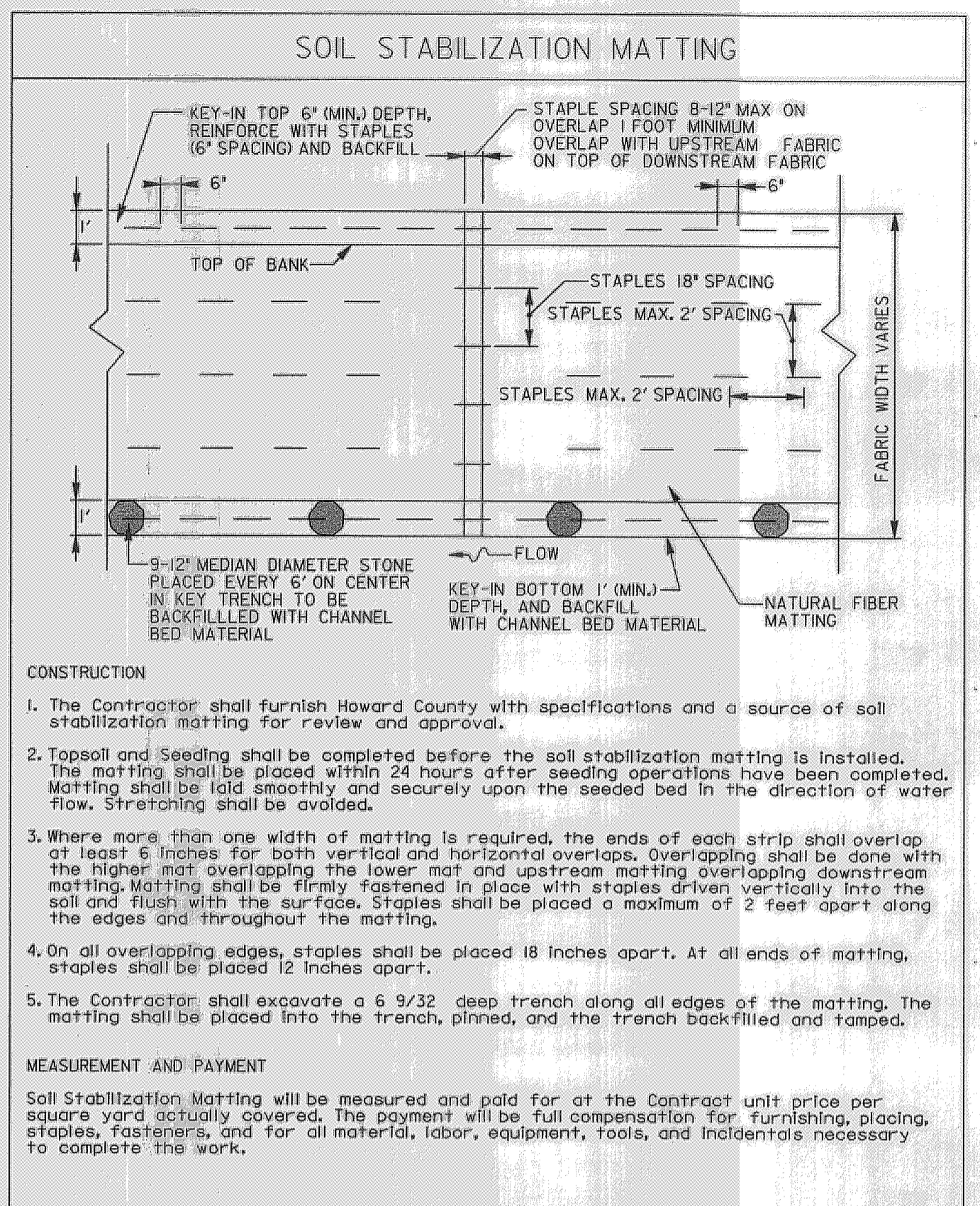
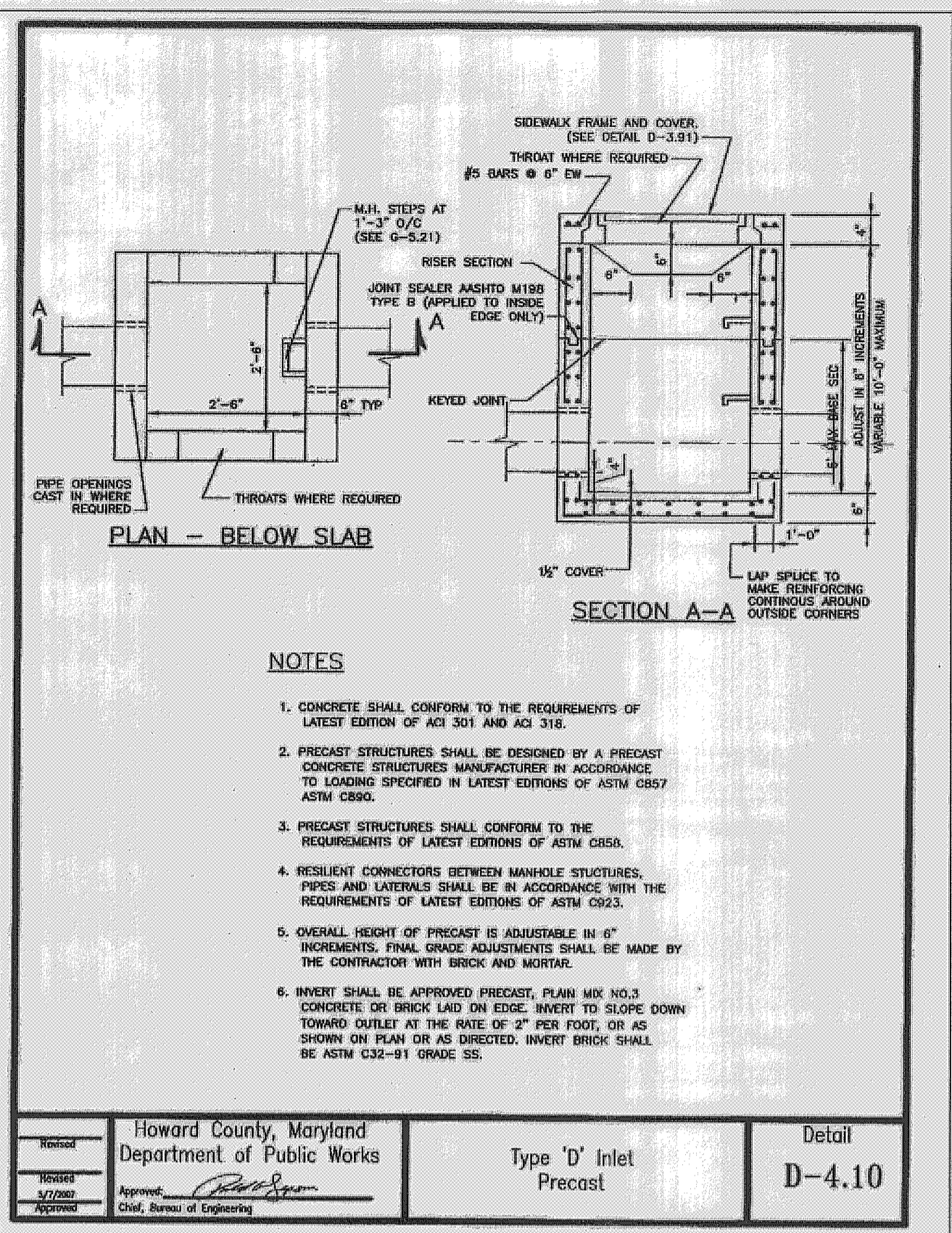
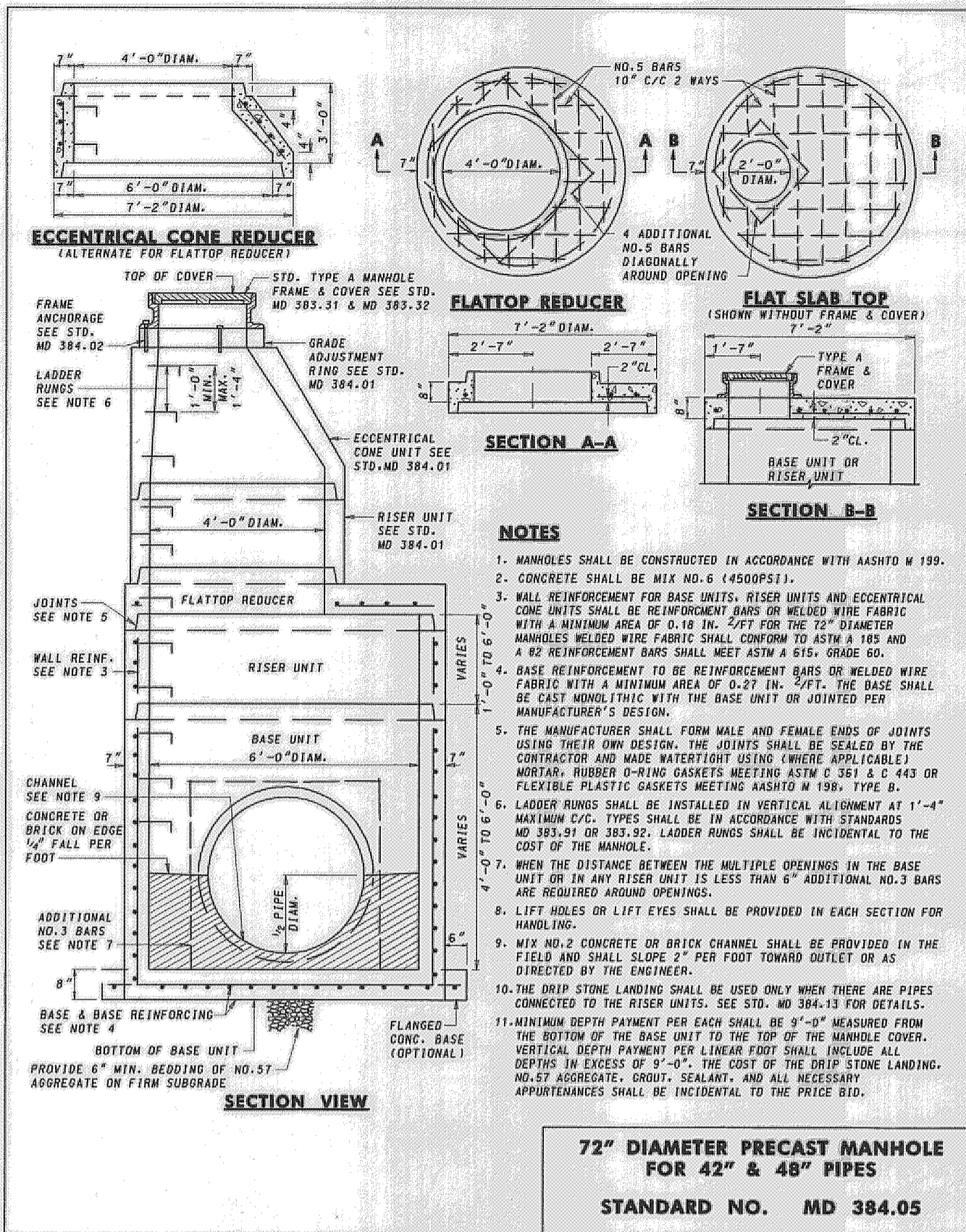
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DRAINAGE DETAILS & PIPE PROFILES

SCALE
 AS SHOWN
 SHEET
 3 OF 13



NOTES:

- CONTRACTOR SHALL PROVIDE 3"-6" BEVEL AROUND PIPE OPENINGS UPSTREAM HEADWALL.

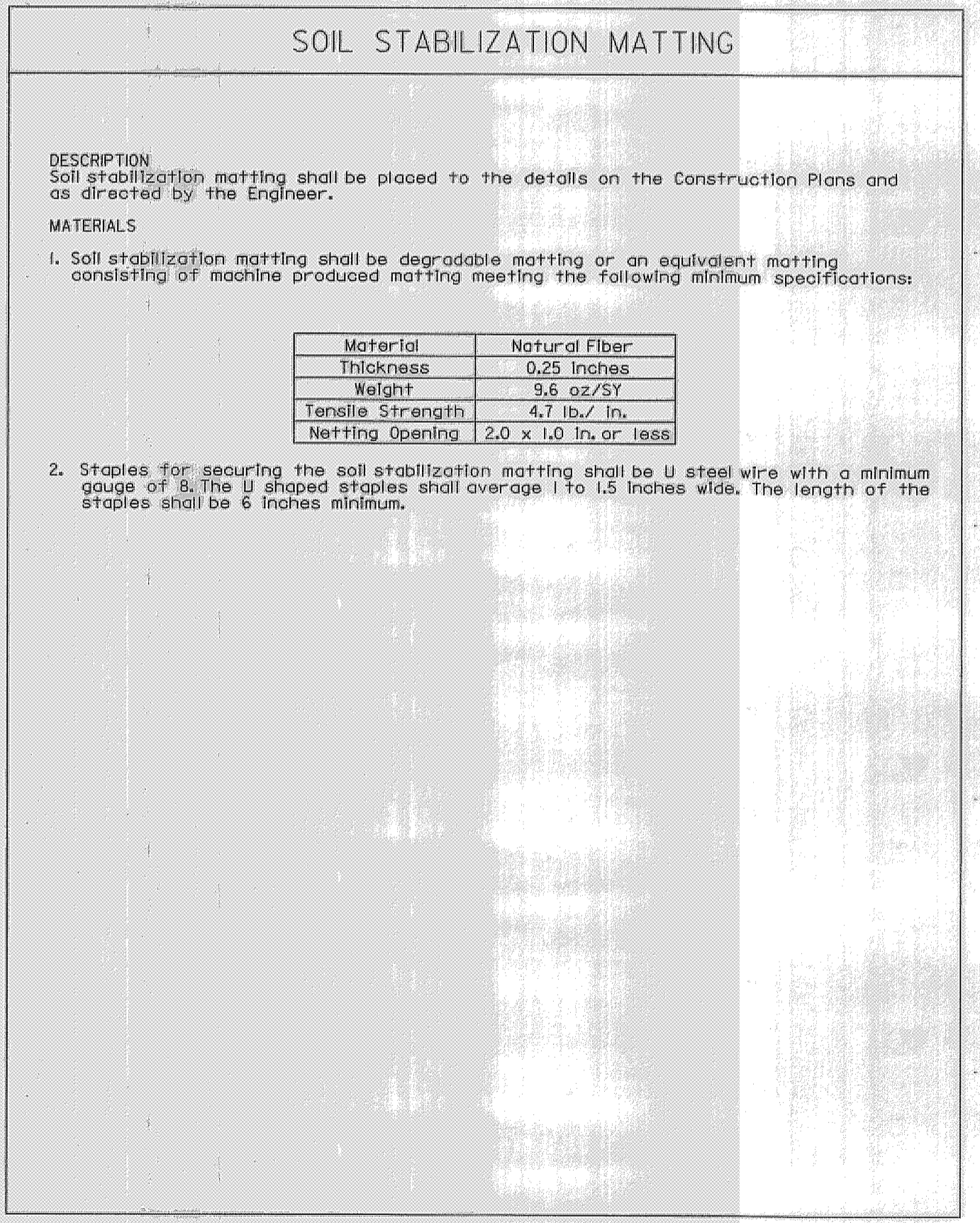
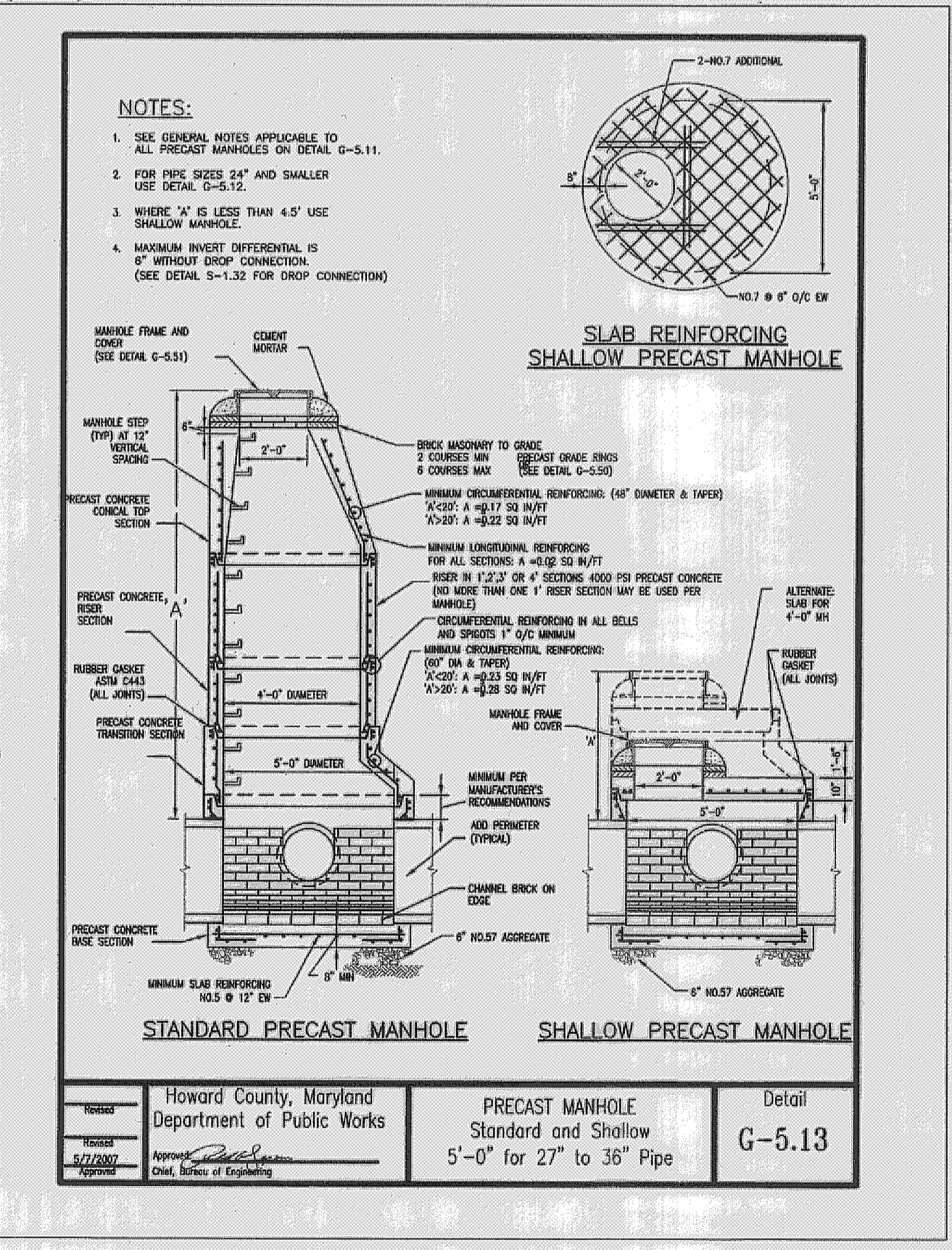
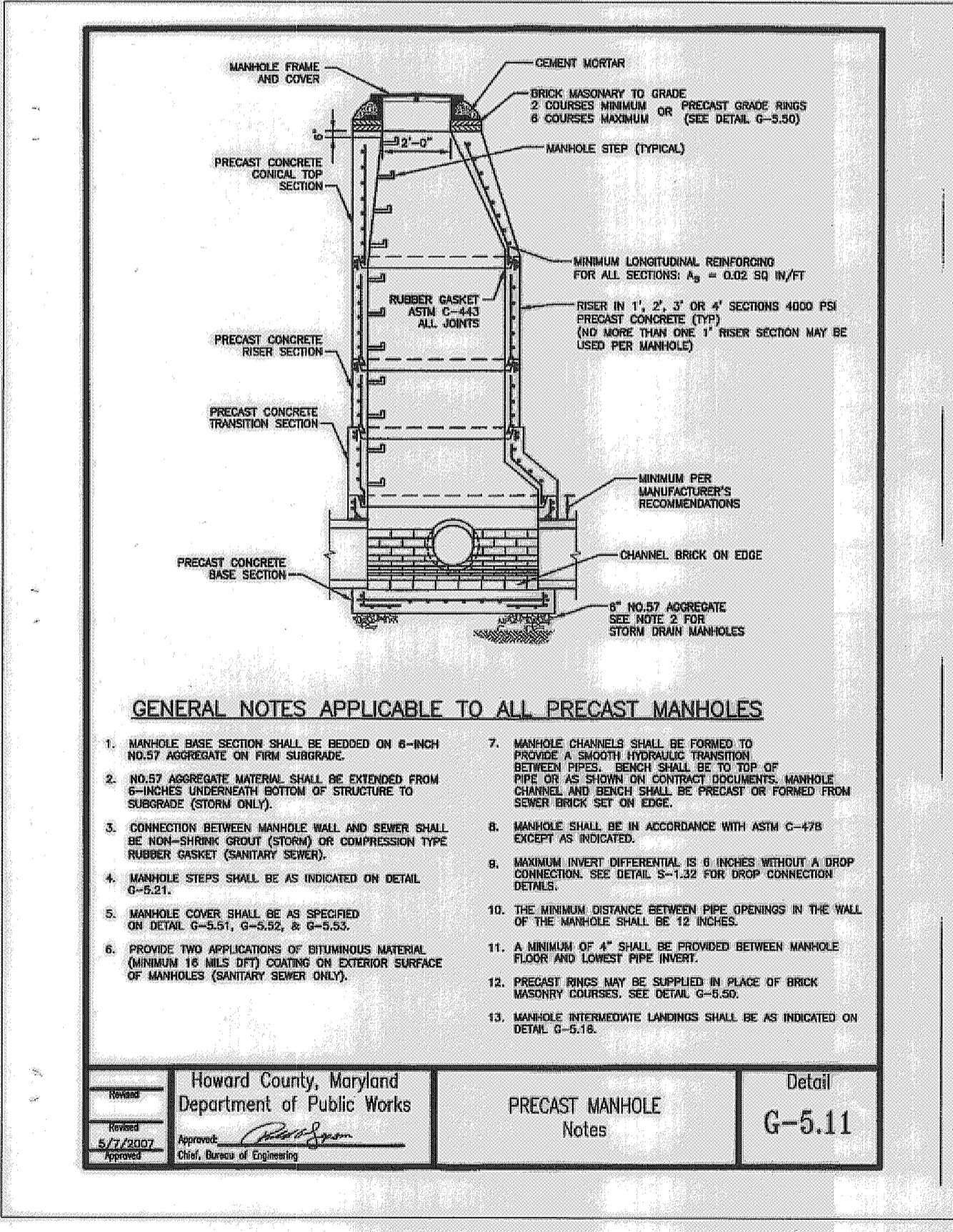
W	D	F	G	H	J	K	L	M	N	R	Δ VOL. CY	Δ - BASED ON 5:1 CHANNEL SIDE SLOPES AND 4:5 AVULE
12"	2'-4"	7'-8"	3'-0"	2'-0"	2'-0"	8"	8"	8"	#8-12" O/C		1.00	
18"	3'-0"	7'-8"	3'-0"	2'-0"	2'-0"	8"	8"	8"	#8-12" O/C		1.70	
24"	3'-6"	7'-8"	3'-0"	2'-0"	2'-0"	8"	8"	8"	#8-12" O/C		2.00	
30"	4'-0"	7'-8"	3'-0"	2'-0"	2'-0"	8"	8"	8"	#8-12" O/C		2.85	
36"	4'-6"	7'-8"	3'-0"	2'-0"	2'-0"	8"	8"	8"	#8-12" O/C		3.15	
42"	5'-0"	7'-8"	3'-0"	2'-0"	2'-0"	8"	8"	8"	#8-12" O/C		3.87	
48"	5'-6"	7'-8"	3'-0"	2'-0"	2'-0"	8"	8"	8"	#8-12" O/C		5.08	
54"	6'-0"	7'-8"	3'-0"	2'-0"	2'-0"	8"	8"	8"	#8-12" O/C		6.20	
60"	6'-6"	7'-8"	3'-0"	2'-0"	2'-0"	8"	8"	8"	#8-12" O/C		7.88	
66"	7'-0"	7'-8"	3'-0"	2'-0"	2'-0"	8"	8"	8"	#8-12" O/C		9.14	
72"	7'-6"	7'-8"	3'-0"	2'-0"	2'-0"	8"	8"	8"	#8-12" O/C		11.10	

FRONT ELEVATION **SECTION A-A** **SECTION B-B**

Howard County, Maryland
Department of Public Works

TYPE 'A' Headwall Circular Pipe

Detail D-5.11



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HOWARD SCD DATE

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Howard County
MARYLAND

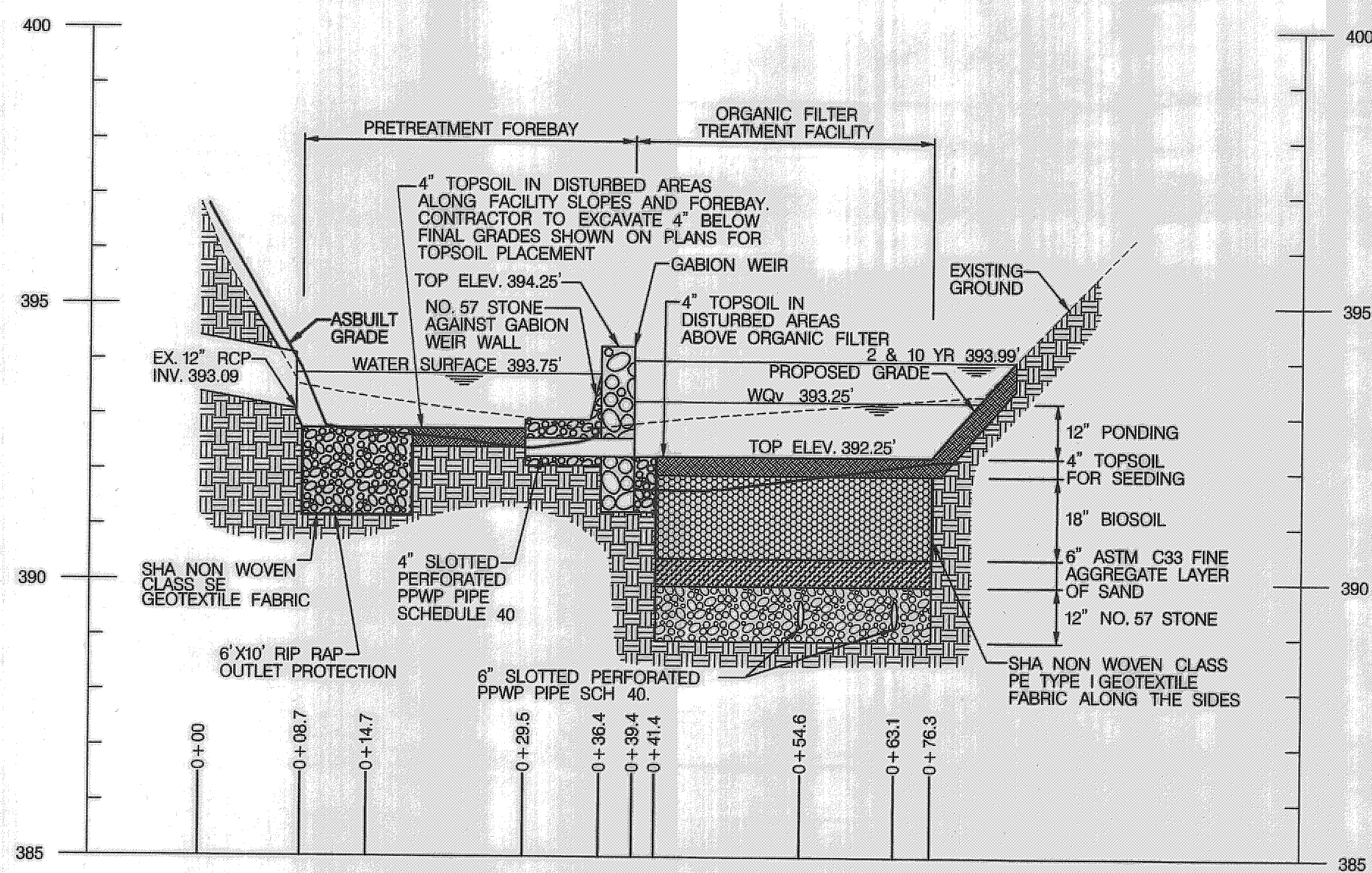
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HOWARD COUNTY STORMWATER MANAGEMENT EVALUATION GREAT DRUM CIRCLE STREAM REHABILITATION PROJECT CAPITAL PROJECT D-1158 HOWARD COUNTY F 96-98 BIO

TYPICAL DETAILS

SCALE NOT TO SCALE SHEET 4 OF 19

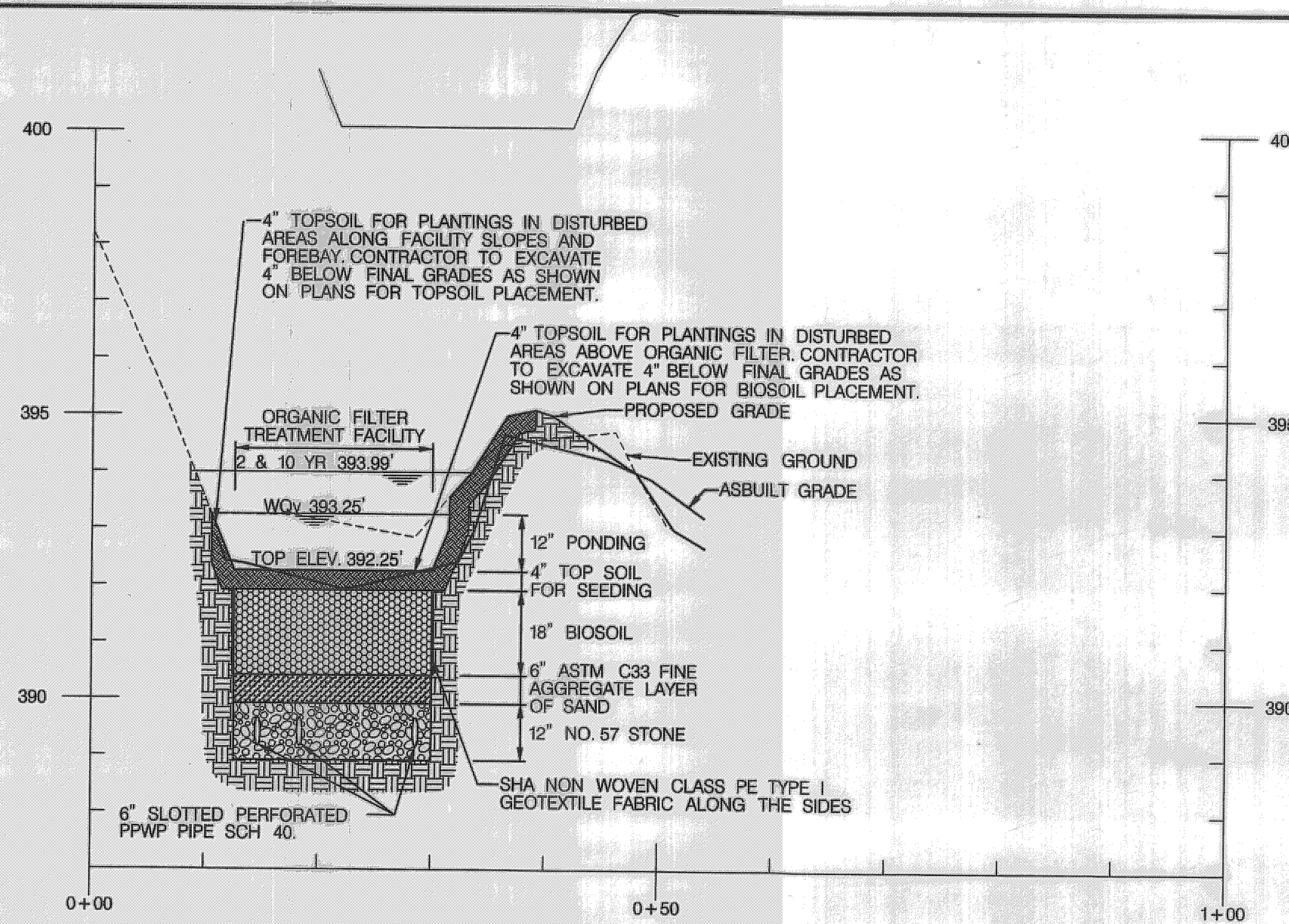


SECTION C-C - ORGANIC FILTER FACILITY

SCALE: HORIZ. 1" = 10'
VERT. 1" = 2'

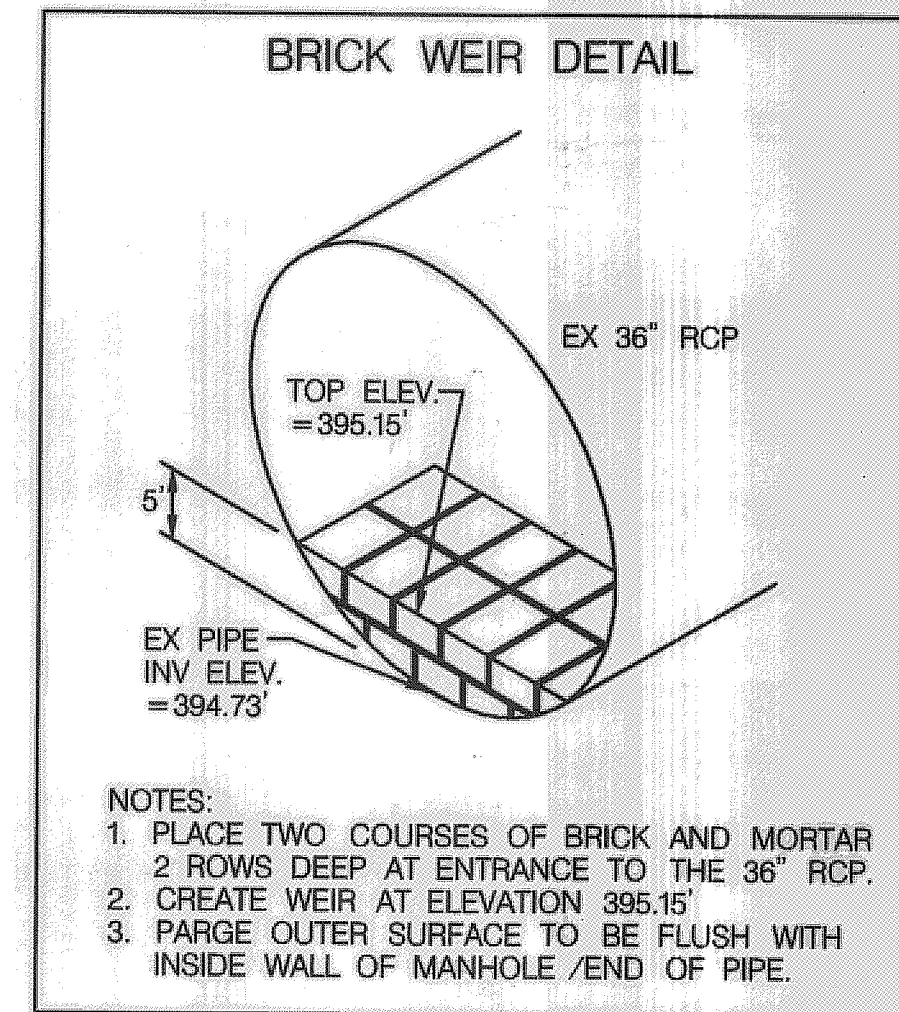
NOTES

- FOR ALL DISTURBED AREAS, REGARDLESS OF SLOPE, FOUR (4) INCHES OF TOPSOIL OR BIOSOIL SHALL BE USED, AS SPECIFIED.
- ORGANIC FILTER SHALL NOT BE PLACED IN SERVICE UNTIL ALL OF THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED. HEAVY EQUIPMENT AND TRAFFIC SHALL BE RESTRICTED FROM THE PROPOSED SAND FILTER LOCATION TO MINIMIZE COMPACTION OF THE SOIL.
- THE ORGANIC FILTER AND FOREBAYS SHALL BE SEEDED AS SPECIFIED UNDER EROSION AND SEDIMENT CONTROL GENERAL NOTES, PAGE 6 OF 9.

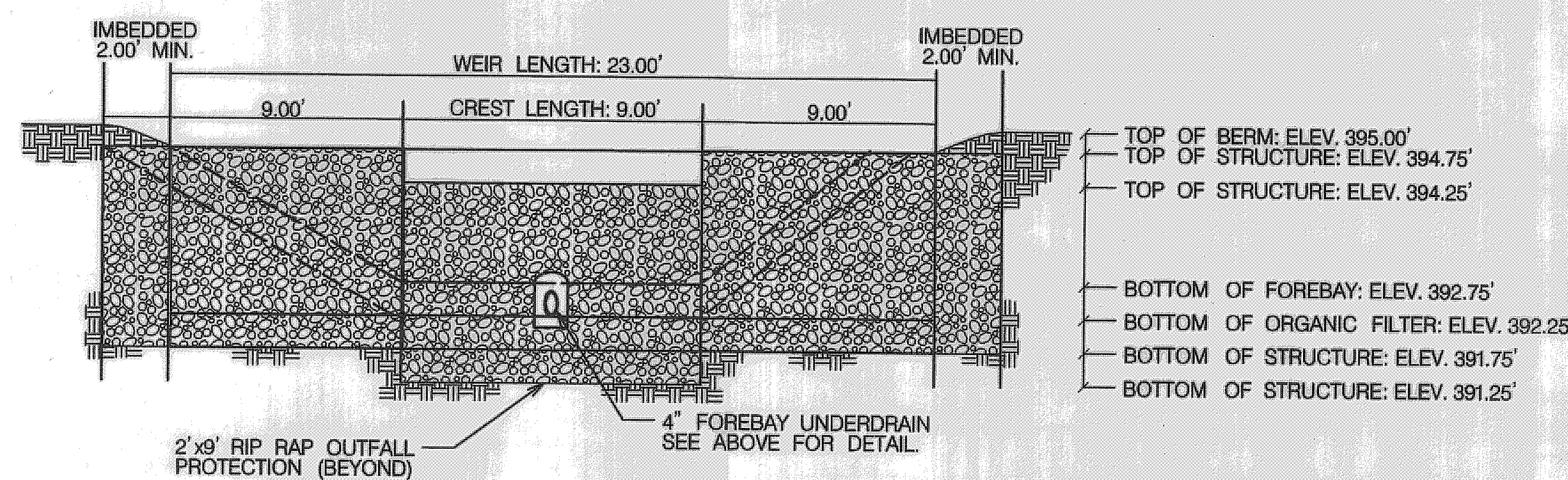


PROFILE D-D ORGANIC FILTER FACILITY

SCALE: HORIZ. 1" = 10'
VERT. 1" = 2'

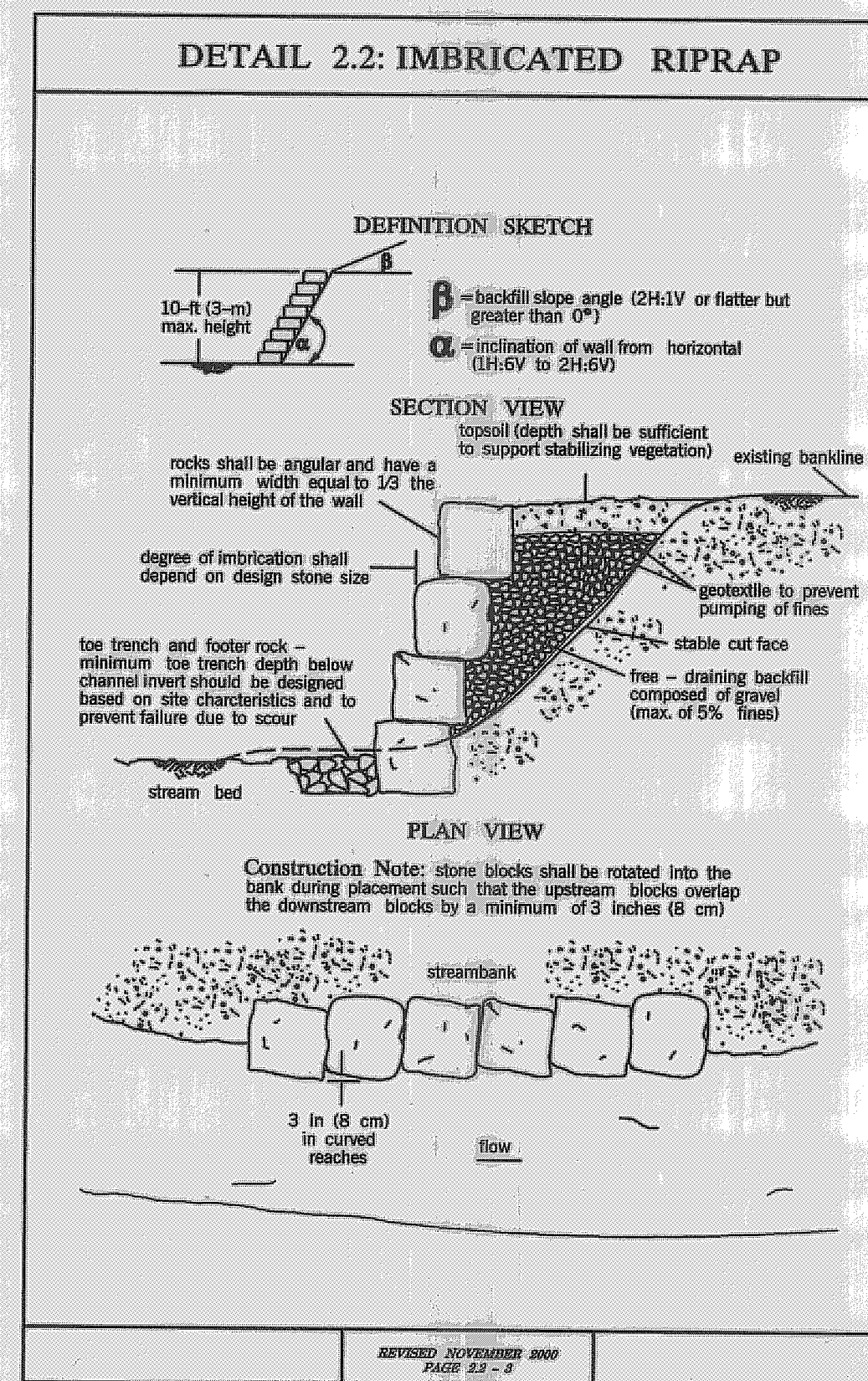


- NOTES:
- PLACE TWO COURSES OF BRICK AND MORTAR
 - ROWS DEEP AT ENTRANCE TO THE 36" RCP.
 - CREATE WEIR AT ELEVATION 395.15'
 - PARGE OUTER SURFACE TO BE FLUSH WITH INSIDE WALL OF MANHOLE /END OF PIPE.



GABION BASKET WEIR WALL PROFILE

SCALE: HORIZ. 1" = 5'
VERT. 1" = 10'



MGWC 2.2: IMBRICATED RIPRAP

Field engineering technique for bank stabilization

DESCRIPTION

Imbricated 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 imbricated riprap revetment 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 wall of appropriate size and positioning to resist the shearing forces of channelized water and the lateral earth pressures of the developed bank.

EFFECTIVE USES & LIMITATIONS

When properly designed and installed, imbricated riprap revetments resist lateral earth pressures to some extent and can be an effective method of bank armoring 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 and threaten infrastructure or personal property.

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

MATERIAL SPECIFICATIONS

Materials for imbricated riprap construction and installation should meet the following requirements:

- Filter:** Synthetic fabric filter may be used cautiously based on the *1994 HUD Standards and Specifications for Soil Erosion and Sediment Control*. Whenever possible, however, granular filters with a minimum thickness of 6 inches (15 cm) should be used with a gradation as found in Table 2.2.

Percent Less Than	U.S. Standard Sieve Size
100	2 1/2 in (64 mm)
85-100	1 1/2 in (38 mm)
60-100	1/2 in (13 mm)
35-70	No. 10
20-30	No. 40
1-2	No. 200

- Toe Riprap:** The maximum diameter or weight of stone for toe riprap should be based upon the bank full stream channel velocity as detailed in the MGWC 2.1, Riprap and Figure 2.1.
- Imbricated Stones:** Imbricated riprap should be angular and blocky in shape such that they are stackable and should be sufficiently large to resist displacement by both the design storm event and the site-specific lateral earth stresses. Therefore, the length of the longest size of each stone should be the greater of 1/2 the height of the proposed wall and the size necessary to resist the design stream flow according to MGWC 2.1, Riprap. A typical minimum axis length is 24 inches (0.6 meters).

Source: *Practical Handbook of Stormwater Management*, Maryland Department of the Environment, Baltimore, Maryland, 2009. Page 2.2-1

MGWC 2.2: IMBRICATED RIPRAP

Approximate Cost (\$1999): \$90 per square ft.

INSTALLATION GUIDELINES

All erosion and sediment control devices, including diverting basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. The recommended construction procedure for imbricated riprap is as follows (refer to Detail 2.2):

- The stream should be diverted according to a WMA recommended procedure (see Section 1, Temporary Stream Construction Measures, Maryland's Guidelines to Waterway Construction), and the construction area should be dewatered.
- All excavation should be made in reasonably close conformity with the existing stream slope and bed. The slope of the cut face should be in the range of 1H:6V to 2H:6V. Loose material at the toe of the embankment should be excavated and a stable foundation reached, usually within 2 to 3 feet (0.6 to 0.9 meters) of the surface. The subgrade should be smooth, firm, and free from protruding objects or voids that would affect the proper positioning of the first layer of stones.
- A graded granular filter or filter fabric should be placed on the face of the cut slope to prevent the migration of fine materials through the revetment. If filter fabric is used, it should be carefully and loosely placed on the prepared slope and secured. Adjacent strips should overlap a minimum of 8 inches (0.20 meters). If the filter fabric is torn or damaged, it should be repaired or replaced.
- The rock layers should be neatly stacked with staggered joints so that each stone rests firmly on two stones in the tier below. Additionally, smaller stones should be used to fill voids so that each rock rests solidly on the previous rock layer with minimal separation for movement. Upon completion of the first layer of stone, the toe trench should be filled with Class III riprap sized according to MGWC 2.1. Riprap or additional imbricated stone. Two footer stones should be used where high potential for channel incision exists. The height of the imbricated revetment is dictated by the size of the stone used, and the height should not exceed 3 times the length of the longest axis and should not be greater than 10 feet (3 meters).
- Placement of the granular backfill should occur concurrently with the stone placement. The backfill slope angle should be 2H:1V or flatter but should be greater than 9 degrees to facilitate drainage. Once all of the backfill is in place, it should be covered with a filter layer and a layer of topsoil sufficient to support a native vegetation cover.
- The disturbed sections of the channel, including the slopes and stream bed, should be stabilized with methods approved by the WMA.

Note: The use of rock sizes ABW 1-3: Backfill stones should be considered to dissipate excessive toe velocities.

Source: *Practical Handbook of Stormwater Management*, Maryland Department of the Environment, Baltimore, Maryland, 2009. Page 2.2-2

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

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

HOWARD SCD

McCormick Taylor
Engineers & Planners
Since 1946

509 South Exeter Street
4th Floor
Baltimore, Maryland 21202
(410) 662-7400

Howard County
MARYLAND

Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
(410) 313-6146

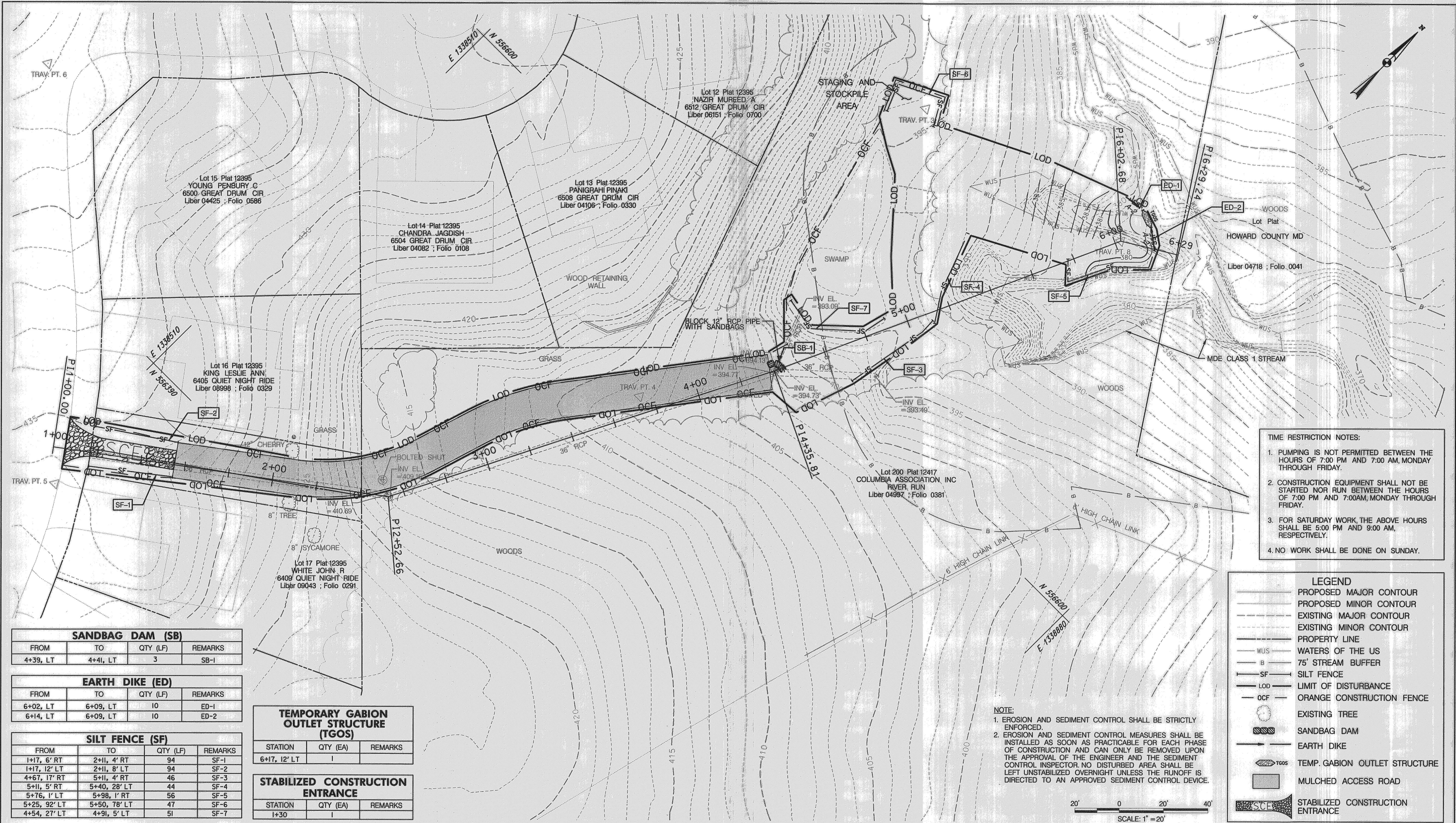
DES: AH	ALH	AS-BUILT	10/2/11
DRN: MR			
CHK: CB			
DATE: 9/7/10	BY	NO.	DATE
		REVISION	

**HOWARD COUNTY STORMWATER MANAGEMENT EVALUATION
GREAT DRUM CIRCLE STREAM REHABILITATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY F 96-98 BIO**

TYPICAL DETAILS

SCALE: AS NOTED

SHEET: 5 OF 13



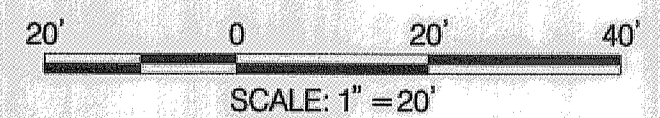
- TIME RESTRICTION NOTES:**
1. PUMPING IS NOT PERMITTED BETWEEN THE HOURS OF 7:00 PM AND 7:00 AM, MONDAY THROUGH FRIDAY.
 2. CONSTRUCTION EQUIPMENT SHALL NOT BE STARTED NOR RUN BETWEEN THE HOURS OF 7:00 PM AND 7:00 AM, MONDAY THROUGH FRIDAY.
 3. FOR SATURDAY WORK, THE ABOVE HOURS SHALL BE 5:00 PM AND 9:00 AM, RESPECTIVELY.
 4. NO WORK SHALL BE DONE ON SUNDAY.

LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- WUS — WATERS OF THE US
- B — 75' STREAM BUFFER
- SF — SILT FENCE
- LOD — LIMIT OF DISTURBANCE
- OCF — ORANGE CONSTRUCTION FENCE
- EXISTING TREE
- ▨ SANDBAG DAM
- EARTH DIKE
- TEMP. GABION OUTLET STRUCTURE
- MULCHED ACCESS ROAD
- STABILIZED CONSTRUCTION ENTRANCE

NOTE:

1. EROSION AND SEDIMENT CONTROL SHALL BE STRICTLY ENFORCED.
2. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AS SOON AS PRACTICABLE FOR EACH PHASE OF CONSTRUCTION AND CAN ONLY BE REMOVED UPON THE APPROVAL OF THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.



SANDBAG DAM (SB)

FROM	TO	QTY (LF)	REMARKS
4+39, LT	4+41, LT	3	SB-1

EARTH DIKE (ED)

FROM	TO	QTY (LF)	REMARKS
6+02, LT	6+09, LT	10	ED-1
6+14, LT	6+09, LT	10	ED-2

SILT FENCE (SF)

FROM	TO	QTY (LF)	REMARKS
1+17, 6' RT	2+11, 4' RT	94	SF-1
1+17, 12' LT	2+11, 8' LT	94	SF-2
4+67, 17' RT	5+11, 4' RT	46	SF-3
5+11, 5' RT	5+40, 28' LT	44	SF-4
5+76, 1' LT	5+98, 1' RT	56	SF-5
5+25, 92' LT	5+50, 78' LT	47	SF-6
4+54, 27' LT	4+91, 5' LT	51	SF-7

TEMPORARY GABION OUTLET STRUCTURE (TGOS)

STATION	QTY (EA)	REMARKS
6+17, 12' LT	1	

STABILIZED CONSTRUCTION ENTRANCE

STATION	QTY (EA)	REMARKS
I+30	1	

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

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

John R. Roberts 12/2/10
 HOWARD SCD DATE

McCormick Taylor
 Engineers & Planners Since 1946

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 (410) 662-7400

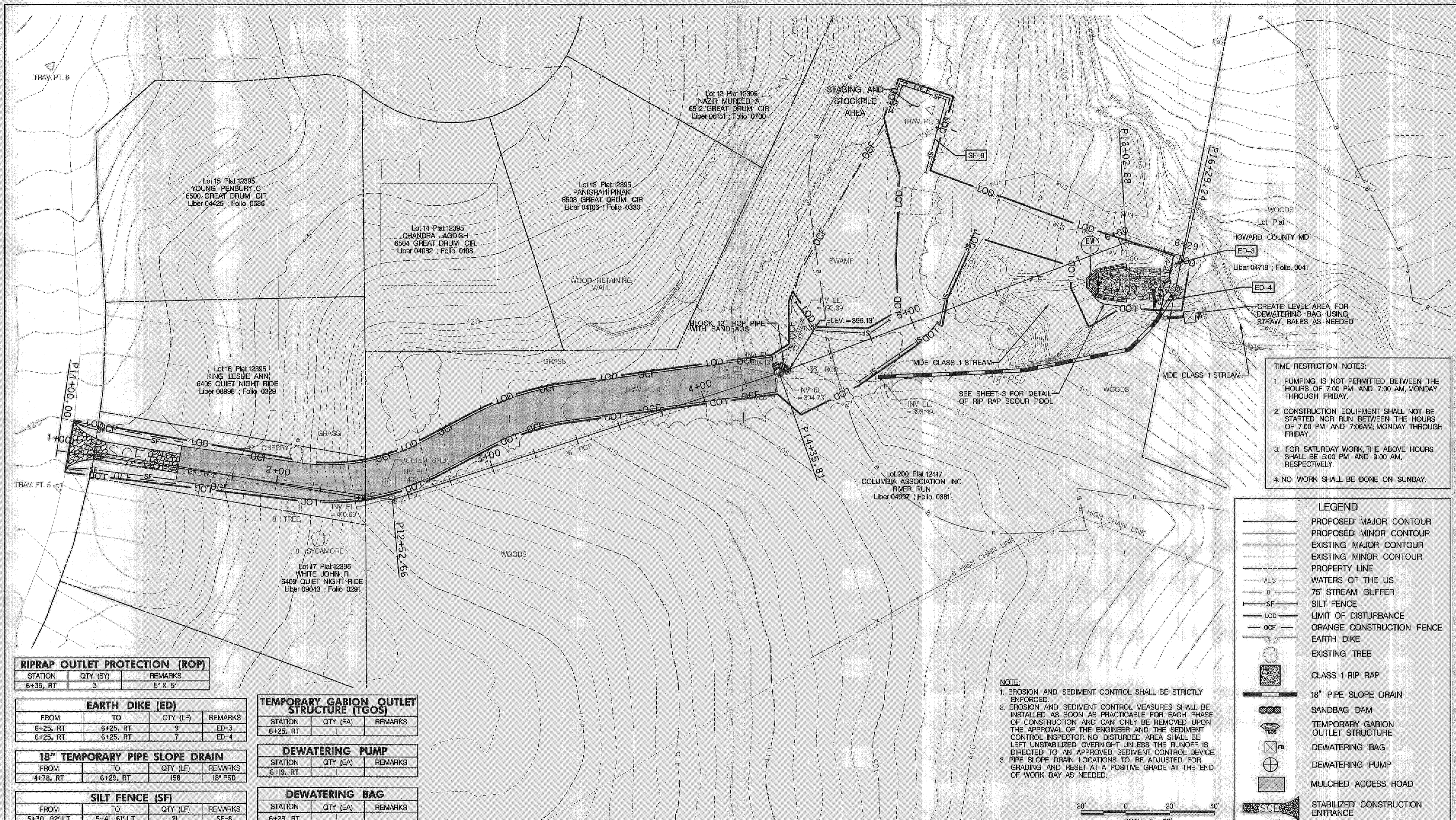
Howard County
 MARYLAND

Storm Water Management Division
 Bureau of Environmental Services
 6751 Columbia Gateway Drive, Suite 514
 Columbia, Maryland 21046-3143
 (410) 313-6146

DES: AH				
DRN: MR				
CHK: CB				
DATE: 9/7/10	BY	NO.	REVISION	DATE

HOWARD COUNTY STORMWATER MANAGEMENT EVALUATION
 GREAT DRUM CIRCLE STREAM REHABILITATION PROJECT
 CAPITAL PROJECT D-1158
 HOWARD COUNTY F 96-98 BIO
 EROSION AND SEDIMENT CONTROL PLAN
 PHASE 1

SCALE
 1" = 20'
 SHEET
 6 OF 13



- TIME RESTRICTION NOTES:**
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- 75' STREAM BUFFER
- SILT FENCE
- LIMIT OF DISTURBANCE
- ORANGE CONSTRUCTION FENCE
- EARTH DIKE
- EXISTING TREE
- CLASS 1 RIP RAP
- 18" PIPE SLOPE DRAIN
- SANDBAG DAM
- TEMPORARY GABION OUTLET STRUCTURE
- DEWATERING BAG
- DEWATERING PUMP
- MULCHED ACCESS ROAD
- STABILIZED CONSTRUCTION ENTRANCE

NOTE:

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3. PIPE SLOPE DRAIN LOCATIONS TO BE ADJUSTED FOR GRADING AND RESET AT A POSITIVE GRADE AT THE END OF WORK DAY AS NEEDED.



RIPRAP OUTLET PROTECTION (ROP)

STATION	QTY (SY)	REMARKS
6+35, RT	3	5' X 5'

EARTH DIKE (ED)

FROM	TO	QTY (LF)	REMARKS
6+25, RT	6+25, RT	9	ED-3
6+25, RT	6+25, RT	7	ED-4

18" TEMPORARY PIPE SLOPE DRAIN

FROM	TO	QTY (LF)	REMARKS
4+78, RT	6+29, RT	158	18" PSD

SILT FENCE (SF)

FROM	TO	QTY (LF)	REMARKS
5+30, 92' LT	5+41, 61' LT	21	SF-8

TEMPORARY GABION OUTLET STRUCTURE (TGOS)

STATION	QTY (EA)	REMARKS
6+25, RT	1	

DEWATERING PUMP

STATION	QTY (EA)	REMARKS
6+19, RT	1	

DEWATERING BAG

STATION	QTY (EA)	REMARKS
6+29, RT	1	

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

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John R. Kolontar
HOWARD SCD

12/2/20
DATE

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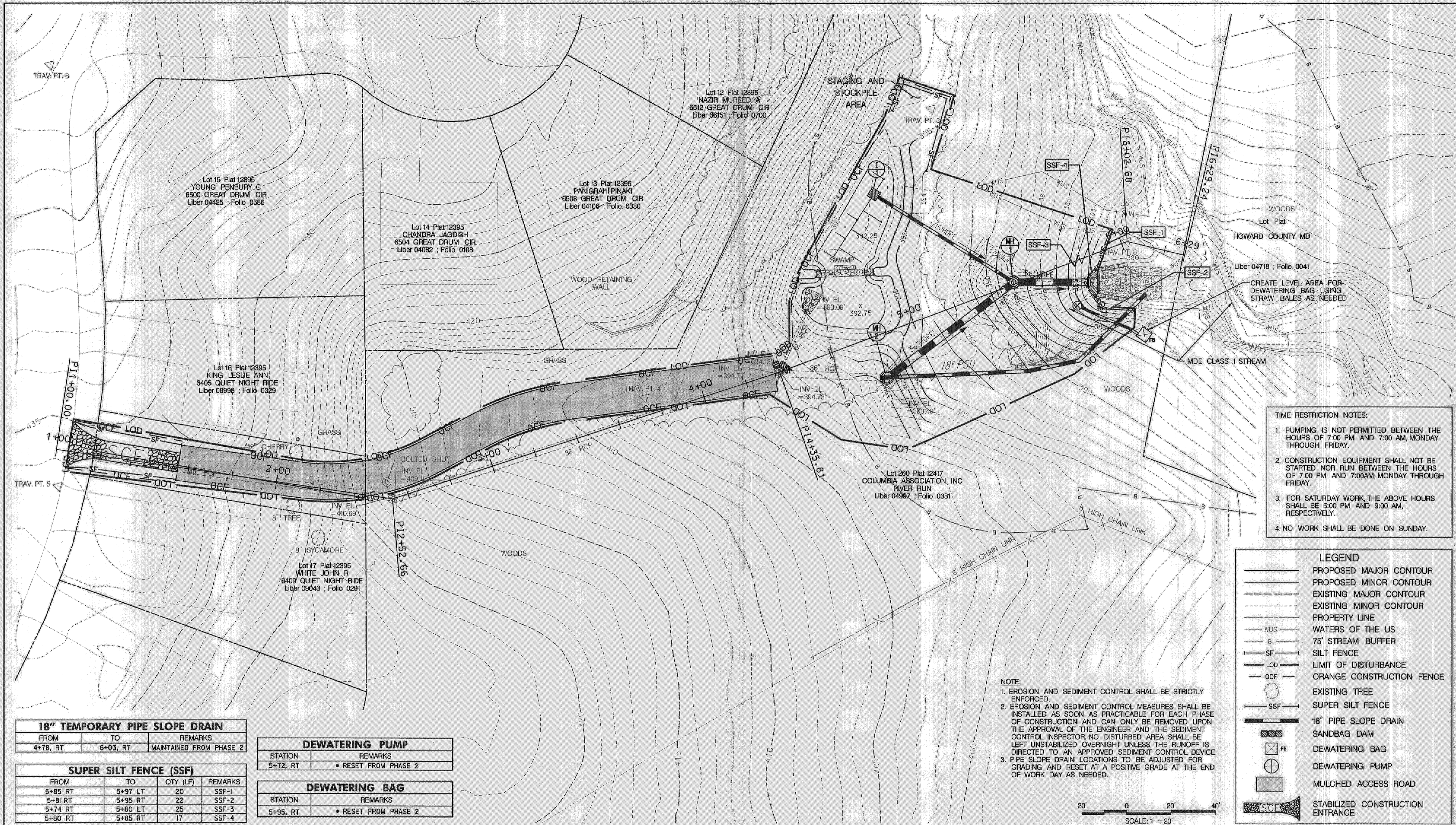
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HOWARD COUNTY STORMWATER MANAGEMENT EVALUATION
GREAT DRUM CIRCLE STREAM REHABILITATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY F 96-98 BIO
EROSION AND SEDIMENT CONTROL PLAN
PHASE 2

SCALE: 1" = 20'
SHEET: 7 OF 13



TIME RESTRICTION NOTES:

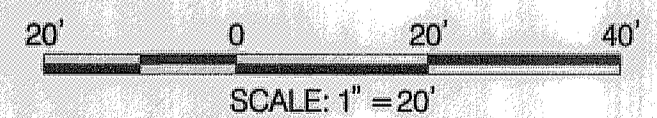
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- LOD — LIMIT OF DISTURBANCE
- OCF — ORANGE CONSTRUCTION FENCE
- ⊕ — EXISTING TREE
- SSF — SUPER SILT FENCE
- ▨ — 18" PIPE SLOPE DRAIN
- ▧ — SANDBAG DAM
- ⊗ — DEWATERING BAG
- ⊕ — DEWATERING PUMP
- — MULCHED ACCESS ROAD
- SCS — STABILIZED CONSTRUCTION ENTRANCE

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3. PIPE SLOPE DRAIN LOCATIONS TO BE ADJUSTED FOR GRADING AND RESET AT A POSITIVE GRADE AT THE END OF WORK DAY AS NEEDED.



18" TEMPORARY PIPE SLOPE DRAIN

FROM	TO	REMARKS
4+78, RT	6+03, RT	MAINTAINED FROM PHASE 2

DEWATERING PUMP

STATION	REMARKS
5+72, RT	* RESET FROM PHASE 2

SUPER SILT FENCE (SSF)

FROM	TO	QTY (LF)	REMARKS
5+85 RT	5+97 LT	20	SSF-1
5+81 RT	5+95 RT	22	SSF-2
5+74 RT	5+80 LT	25	SSF-3
5+80 RT	5+85 RT	17	SSF-4

DEWATERING BAG

STATION	REMARKS
5+95, RT	* RESET FROM PHASE 2

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

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John R. Robertson
HOWARD SCD

12/2/10
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HOWARD COUNTY STORMWATER MANAGEMENT EVALUATION
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CAPITAL PROJECT D-1158
HOWARD COUNTY F 96-98 BIO
EROSION AND SEDIMENT
CONTROL PLAN
PHASE 3

SCALE
1" = 20'
SHEET
8 OF 13

EROSION AND SEDIMENT CONTROL - GENERAL NOTES

HOWARD SOIL CONSERVATION DISTRICT TEMPORARY SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE RE-DISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: - LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: - APPLY 600 LBS/ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ. FT.).

SEEDING: - FOR PERIODS MARCH 1 - APRIL 30 AND FROM AUGUST 15 - OCTOBER 15, SEED WITH 2-1/2 BUSHEL PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ. FT.), FOR THE PERIOD MAY 1 - AUGUST 14, SEED WITH 3 LBS / ACRE OF WEEPING LOVEGRASS (.07 LBS/1000 FT.). FOR THE PERIOD NOVEMBER 16 - FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS/ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING: - APPLY 1-1/2 TO 2 TONS/ACRE (70 TO 90 LBS/1000 SQ. FT.) OF UNROTTED WEED-FREE, SMALL GRAIN STRAW IMMEDIATELY SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL. NO ASPHALT EMULSION SHALL BE USED FOR ANCHORING. ONLY A NON-TOXIC, LATEX BACKING MATERIAL IS ALLOWED.

REFER TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR ADDITIONAL RATES AND METHODS NOT COVERED.

SEQUENCE OF CONSTRUCTION

PHASE 1

1. OBTAIN GRADING PERMIT AND MDE PERMIT (TRACKING NUMBER #201060555).
2. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST FIVE (5) DAYS PRIOR TO THE START OF WORK. THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION (410) 313-1880 A MINIMUM OF 5 DAYS PRIOR TO THE START OF ANY CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY THE HOWARD COUNTY BUREAU OF UTILITIES (410) 313-4900 AND MARYLAND DEPARTMENT OF ENVIRONMENT INSPECTOR AT (301) 665-2850, FIVE (5) DAYS BEFORE ANY LAND DISTURBING ACTIVITY.
3. ORANGE HIGH VISIBILITY FENCE SHALL BE MANUALLY INSTALLED WHERE INDICATED ON THE PLANS. THIS SHALL BE COMPLETED BY AND INSPECTED AT THE PRECONSTRUCTION MEETING. (1 DAY)
4. THE CONTRACTOR SHALL COORDINATE AN ON-SITE PRE-CONSTRUCTION MEETING WHICH SHALL INCLUDE, BUT NOT BE LIMITED TO, THE COUNTY PROJECT MANAGER, THE ENGINEER, AND A REPRESENTATIVE FROM HOWARD COUNTY CONSTRUCTION INSPECTION. (1 DAY)
5. CONSTRUCT THE FOLLOWING PERIMETER CONTROLS AS SHOWN ON THE PLAN: STABILIZED CONSTRUCTION ENTRANCE AND PHASE 1 SILT FENCE, CLEARING ONLY THE AREA NEEDED TO INSTALL THE E&S CONTROLS. (1 DAY)
6. DURING A 5 DAY DRY FORECAST FROM THE NATIONAL WEATHER SERVICE, BLOCK THE 12" PIPE AT SB-1 AND INSTALL SSF AND TSOS PER PHASE 1. (1 DAY)
7. COMPLETE PHASE 1 GRADING AND STABILIZE WITH SOIL STABILIZATION MATTING. (3 DAYS)

PHASE 2

8. WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR AND DURING A 5 DAY DRY FORECAST FROM THE NATIONAL WEATHER SERVICE, REMOVE SSF-1, SSF-2 AND TSOS FROM PHASE 1. INSTALL TSOS, SILT FENCE, DEWATERING PUMP, DEWATERING BAG, RIPRAP OUTLET PROTECTION AND PIPE SLOPE DRAIN AS SHOWN ON PLANS FOR PHASE 2. (1 DAY)
9. CONSTRUCT EW-1, IMBRICATED RIPRAP WALL, SCOUR POOL AND COMPLETE PHASE 2 GRADING. (5 DAYS)
10. STABILIZE DISTURBED AREA IN PHASE 2 WITH SOIL STABILIZATION MATTING. (1 DAY)

PHASE 3

11. WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR AND DURING A 5 DAY DRY FORECAST FROM THE NATIONAL WEATHER SERVICE, REMOVE TSOS AND INSTALL AND RESET SILT FENCE, SUPER SILT FENCE PSD AND DEWATERING PUMP AS SHOWN ON PLANS FOR PHASE 3. (1 DAY)
12. INSTALL 36 INCH STORM DRAIN PIPE FROM EW-1 TO MH-1. BACKFILL AREA WITH SPECIFIED MATERIAL PER PHASE 3 PLAN FROM DOWNSTREAM TO UPSTREAM. INSTALL MH-1. TEMPORARILY BLOCK 15 INCH OPENING IN MH-1. INSTALL ADDITIONAL 36 INCH STORM DRAIN PIPE. CONTRACTOR SHALL DISCONNECT PSD AND INSTALL MH-2 THE SAME DAY TO COMPLETE THE 36 INCH STORM DRAIN SYSTEM. (4 DAYS)
13. INSTALL I-1 AND 15 INCH STORM DRAIN PIPE FROM MH-1 TO I-1. GRADE AREA PER PLAN. (4 DAYS)
14. STABILIZE DISTURBED AREA IN PHASE 3 WITH SOIL STABILIZATION MATTING INCLUDING THE SIDE SLOPES OF THE ORGANIC FILTER BMP. (1 DAY)
15. INSTALL UNDERDRAIN WITH CLEANOUTS, OBSERVATION WELL AND FILTER MEDIA MAKING SURE TO MINIMIZE COMPACTION TO THE SUBSURFACE. STABILIZE ANY DISTURBED AREAS AT THE END OF THE DAY. (1 DAY)
16. DURING A 3 DAY DRY FORECAST FROM THE NATIONAL WEATHER SERVICE, BUILD BRICK WEIR IN EXISTING STORM DRAIN MANHOLE AND REMOVE SB-1. (2 DAYS)
17. INSTALL LANDSCAPING PER PLAN. (1 DAY)
18. STABILIZE TEMPORARY CONSTRUCTION ACCESS AND GRADE TO FINAL ELEVATIONS REMOVING ALL RUTS. (1 DAY)
19. WHEN AREAS ARE FULLY STABILIZED, AND UPON PERMISSION FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE THE REMAINING SEDIMENT CONTROL DEVICES AND STABILIZE ANY DISTURBED AREAS. (1 DAY)

IN-CHANNEL PUMPING NOTES

1. AT THE END OF EACH WORK DAY, THE WORK AREA MUST BE STABILIZED AND THE PUMP AROUND REMOVED FROM THE CHANNEL. REFER TO THE DETAILS AND SPECIFICATIONS FOR MWC 1.2; PUMP-AROUND PRACTICE INCLUDED ON THE PLANS.
2. TYPICALLY THERE IS NO BASEFLOW FROM THE STORMDRAIN SYSTEM OUTFALL. THE CONTRACTOR SHALL USE A PUMP AND DIVERSION HOSES TO ACCOMMODATE A 3 INCH DISCHARGE DIAMETER AND THE FLOWS ANTICIPATED DURING CONSTRUCTION IN THE CHANNEL SECTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING A CONSTRUCTION PHASE DEWATERING SYSTEM, INCLUDING A TEMPORARY SYSTEM OF PUMPS, DRAINAGE DITCHES AND, SANDBAG/ STONE DIVERSIONS, AS REQUIRED TO REMOVE WATER FROM ANY SOURCE, INCLUDING GROUND WATER, AND MAINTAIN WORKABLE, DRY CONDITIONS IN THE WORK AREA. ALL WATER PUMPED FROM WORK AREA MUST PASS THROUGH A FILTER BAG.

HOWARD SOIL CONSERVATION DISTRICT PERMANANT SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

1. **PREFERRED** - APPLY 2 TONS/ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ. FT.) AND 600 LBS/ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ.FT) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS/ACRE 30-0-0 UREAFORM FERTILIZER (9 LBS/1000 SQ. FT.).
2. **ACCEPTABLE** - APPLY 2 TONS/ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ. FT.) AND 1000 LBS/ACRE 10-10-10 FERTILIZER (23 LBS/1000 SQ. FT.) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL.

SEEDING - FOR THE PERIODS MARCH 1 - APRIL 30, AND AUGUST 1 - OCTOBER 15, SEED WITH 60 LBS / ACRE (1.4 LBS/1000 SQ. FT.) OF KENTUCKY 31 TALL FESCUE. FOR THE PERIOD MAY 1 - JULY 31, SEED WITH 60 LBS KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS/ACRE (0.05 LBS/100 SQ. FT.) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 - FEBRUARY 28, PROTECT SITE BY: **OPTION 1** - TWO TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. **OPTION 2** - USE SOD. **OPTION 3** - SEED WITH 60 LBS/ACRE KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS/ACRE WELL ANCHORED STRAW.

MULCHING - APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ. FT.) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL. NO ASPHALT EMULSION SHALL BE USED FOR ANCHORING. ONLY A NON-TOXIC, LATEX TACKING MATERIAL IS ALLOWED.

MAINTENANCE - INSPECT ALL SEEDING AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

HOWARD COUNTY CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).

2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.

3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN A) 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.

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

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

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

7. SITE ANALYSIS:

TOTAL AREA OF SITE	0.61 ACRES
AREA DISTURBED	0.61 ACRES
AREA TO BE ROOFED OR PAVED	0 ACRES
AREA TO BE VEGETATIVELY STABILIZED	0.61 ACRES
TOTAL CUT	121.3 CU. YDS.
TOTAL FILL	546.6 CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION	SEE NOTE 12 BELOW.

8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.

9. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

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

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

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

STANDARD AND SPECIFICATIONS FOR TOPSOIL

DEFINITION

PLACEMENT OF TOPSOIL OVER A PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION.

PURPOSE

TO PROVIDE A SUITABLE, SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.

CONDITIONS WHERE PRACTICE APPLIES

I. THIS PRACTICE IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:

- A. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
- B. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
- C. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
- D. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.

II. FOR THE PURPOSE OF THESE STANDARDS AND SPECIFICATIONS, AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN FOR ADEQUATE STABILIZATION. AREAS HAVING SLOPES STEEPER THAN 2:1 SHALL HAVE THE APPROPRIATE STABILIZATION SHOWN ON THE PLANS.

CONSTRUCTION AND MATERIAL SPECIFICATIONS

I. TOPSOIL SALVAGED FROM THE EXISTING SITE MAY BE USED PROVIDED THAT IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-SCS IN COOPERATION WITH MARYLAND AGRICULTURAL EXPERIMENTAL STATION.

II. TOPSOIL SPECIFICATIONS - SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING:

- A. TOPSOIL SHALL BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. REGARDLESS, TOPSOIL SHALL NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND SHALL CONTAIN LESS THAN 5% BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1-1/2" IN DIAMETER.
- B. TOPSOIL MUST BE FREE OF PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACKGRASS, JOHNSONGRASS, NUTSEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
- C. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, GROUND LIMESTONE SHALL BE SPREAD AT THE RATE OF 4-8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL. LIME SHALL BE DISTURBED UNIFORMLY OVER DESIGNATED AREAS AND WORKED INTO THE SOIL IN CONJUNCTION WITH TILLAGE OPERATIONS AS DESCRIBED IN THE FOLLOWING PROCEDURES.

III. FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES:

- A. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION - SECTION - VEGETATIVE STABILIZATION METHODS AND MATERIALS.

IV. FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES:

- A. ON SOIL MEETING TOPSOIL SPECIFICATIONS, OBTAIN TEST RESULTS DICTATING FERTILIZER AND LIME AMENDMENTS REQUIRED TO BRING THE SOIL INTO COMPLIANCE WITH THE FOLLOWING:
 1. PH FOR TOPSOIL SHALL BE BETWEEN 6.0 AND 7.5. IF THE TESTED SOIL DEMONSTRATES A PH OF LESS THAN 6.0, SUFFICIENT LIME SHALL BE PRESCRIBED TO RAISE THE PH TO 6.5 OR HIGHER.
 2. ORGANIC CONTENT OF TOPSOIL SHALL BE NOT LESS THAN 1.5 PERCENT BY WEIGHT.
 3. TOPSOIL HAVING SOLUBLE SALT CONTENT GREATER THAN 500 PARTS PER MILLION SHALL NOT BE USED.
 4. NO SOD OR SEED SHALL BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME AS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.

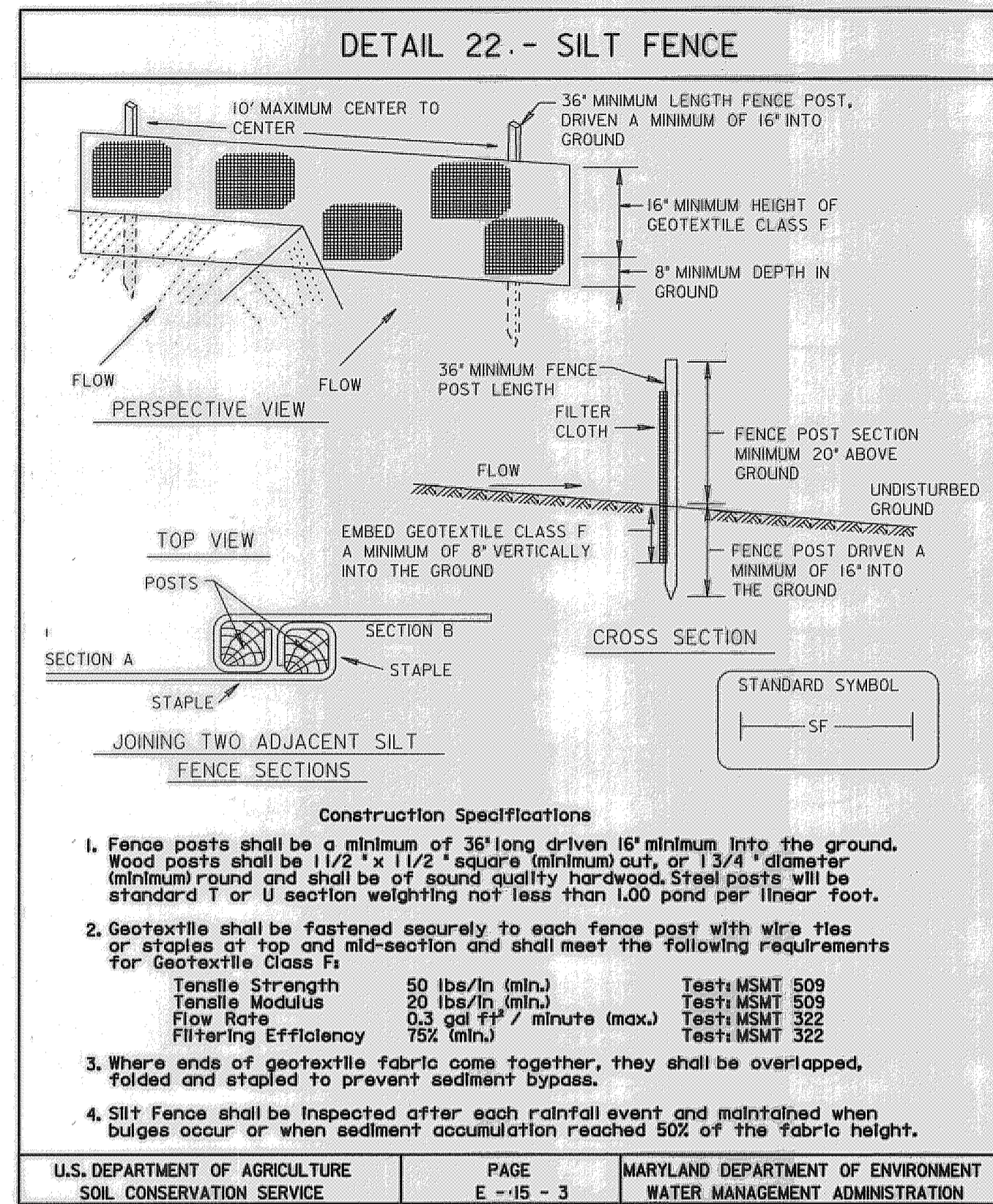
NOTE: TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST, AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.

- B. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION - SECTION VEGETATIVE STABILIZATION METHODS AND MATERIALS.

V. TOPSOIL APPLICATION

- A. WHEN TOPSOILING, MAINTAIN NEEDED EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, EARTH DIKES, SLOPE SILT FENCE AND SEDIMENT TRAPS AND BASINS.
- B. GRADES ON THE AREAS TO BE TOPSOILED, WHICH HAVE BEEN PREVIOUSLY ESTABLISHED, SHALL BE MAINTAINED, ALBEIT 4" - 8" HIGHER IN ELEVATION.
- C. TOPSOIL SHALL BE UNIFORMLY DISTRIBUTED IN A 4" - 8" LAYER AND LIGHTLY COMPACTED TO A MINIMUM THICKNESS OF 4". SPREADING SHALL BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS SHALL BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
- D. TOPSOIL SHALL NOT BE PLACED WHILE THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.

<p>REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS</p> <p>THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT</p> <p><i>John R. Roberts</i> HOWARD SCD</p> <p style="text-align: right;">12/2/10 DATE</p>	<p>McCormick Engineers & Planners Since 1946 Taylor</p> <p>509 South Exeter Street 4th Floor Baltimore, Maryland 21202 (410) 662-7400</p>	<p>Howard County MARYLAND</p> <p>Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046-3143 (410) 313-6146</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DES: AH</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>DRN: MR</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CHK: CB</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>DATE: 9/7/10</td> <td>BY</td> <td>NO.</td> <td>REVISION</td> <td>DATE</td> </tr> </table>	DES: AH					DRN: MR					CHK: CB					DATE: 9/7/10	BY	NO.	REVISION	DATE	<p>HOWARD COUNTY STORMWATER MANAGEMENT EVALUATION GREAT DRUM CIRCLE STREAM REHABILITATION PROJECT CAPITAL PROJECT D-1158 HOWARD COUNTY F 96-98 BIO EROSION AND SEDIMENT CONTROL NOTES</p>	<p>SCALE NOT TO SCALE</p> <p>SHEET 9 OF 19</p>
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DRN: MR																									
CHK: CB																									
DATE: 9/7/10	BY	NO.	REVISION	DATE																					



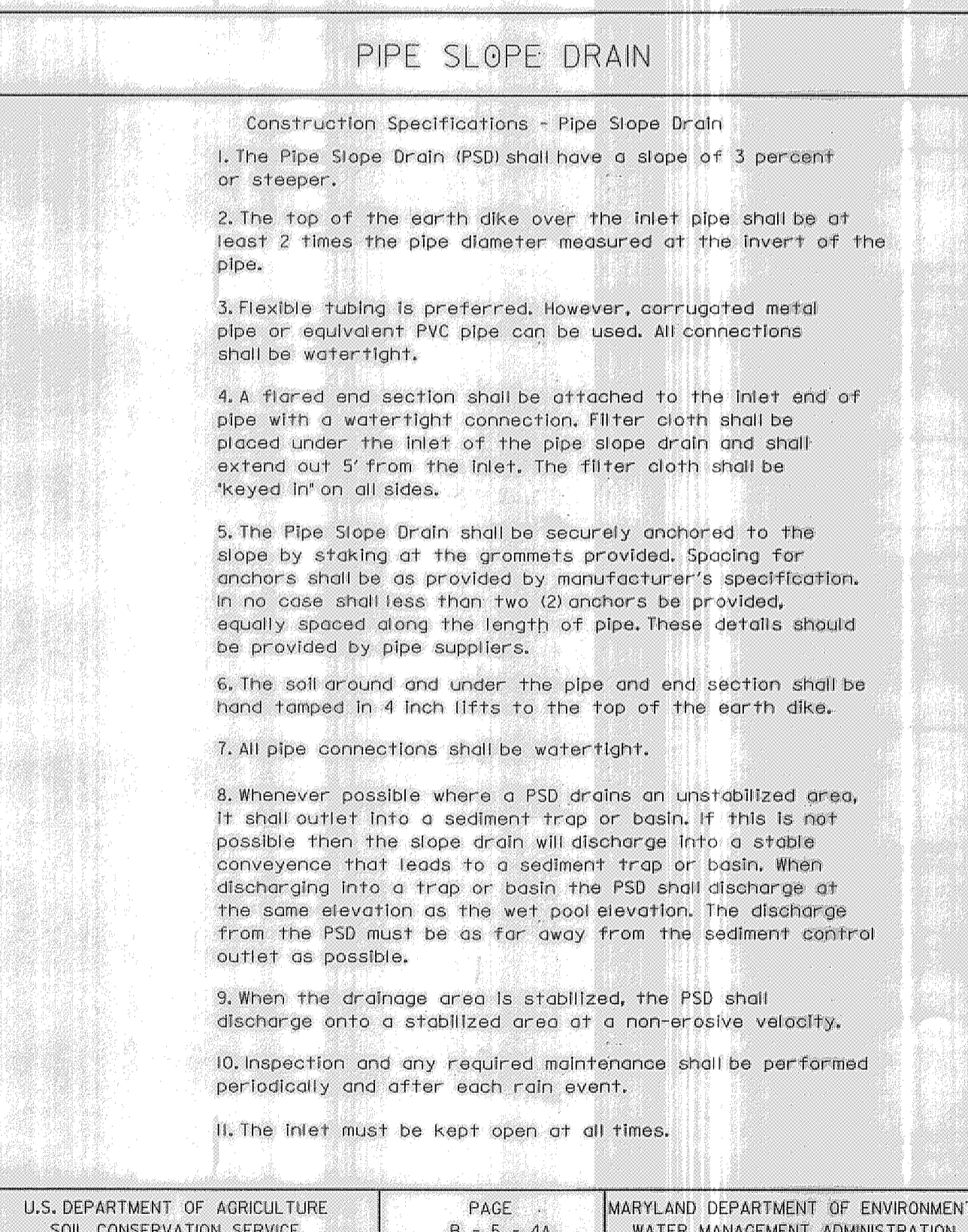
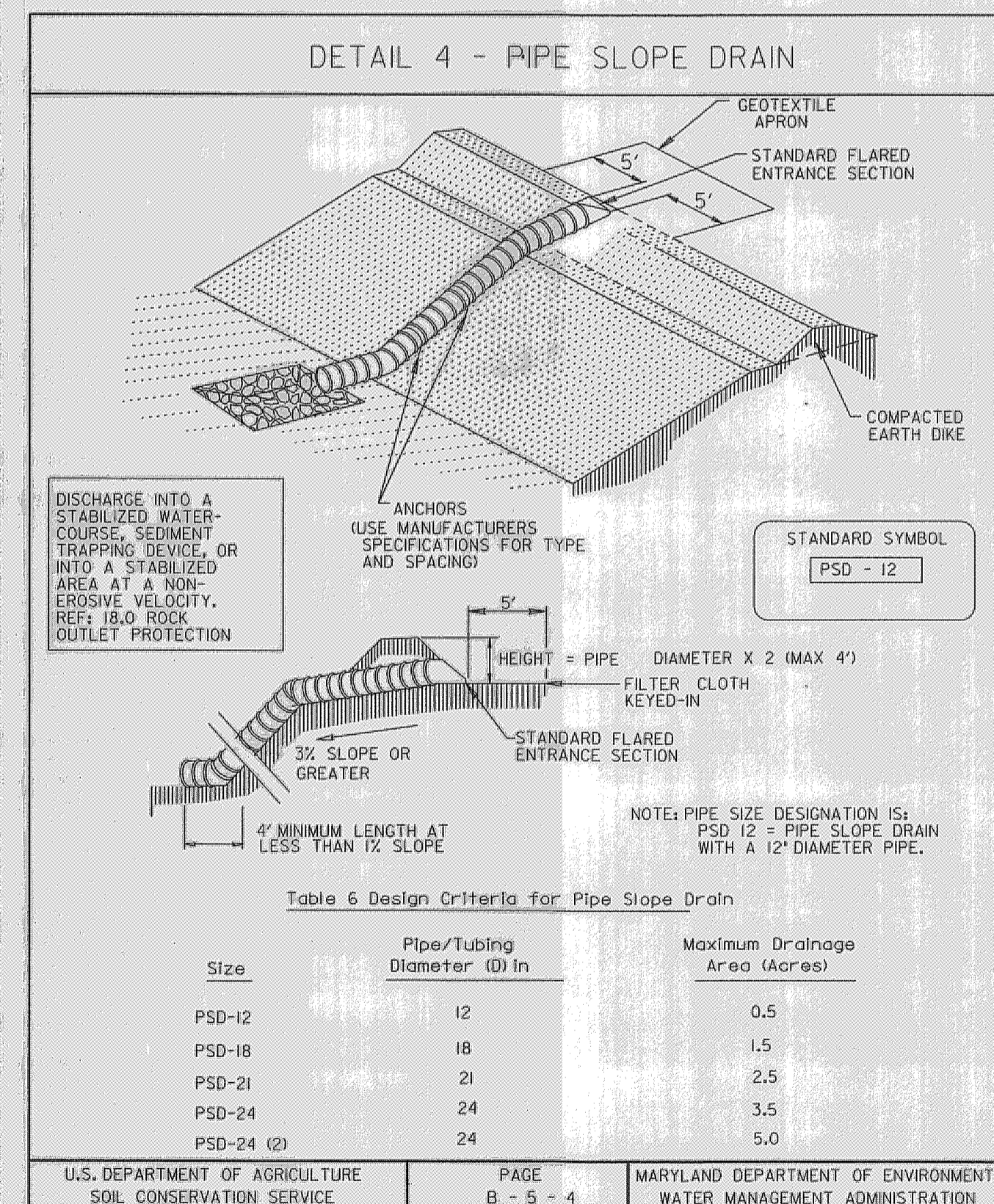
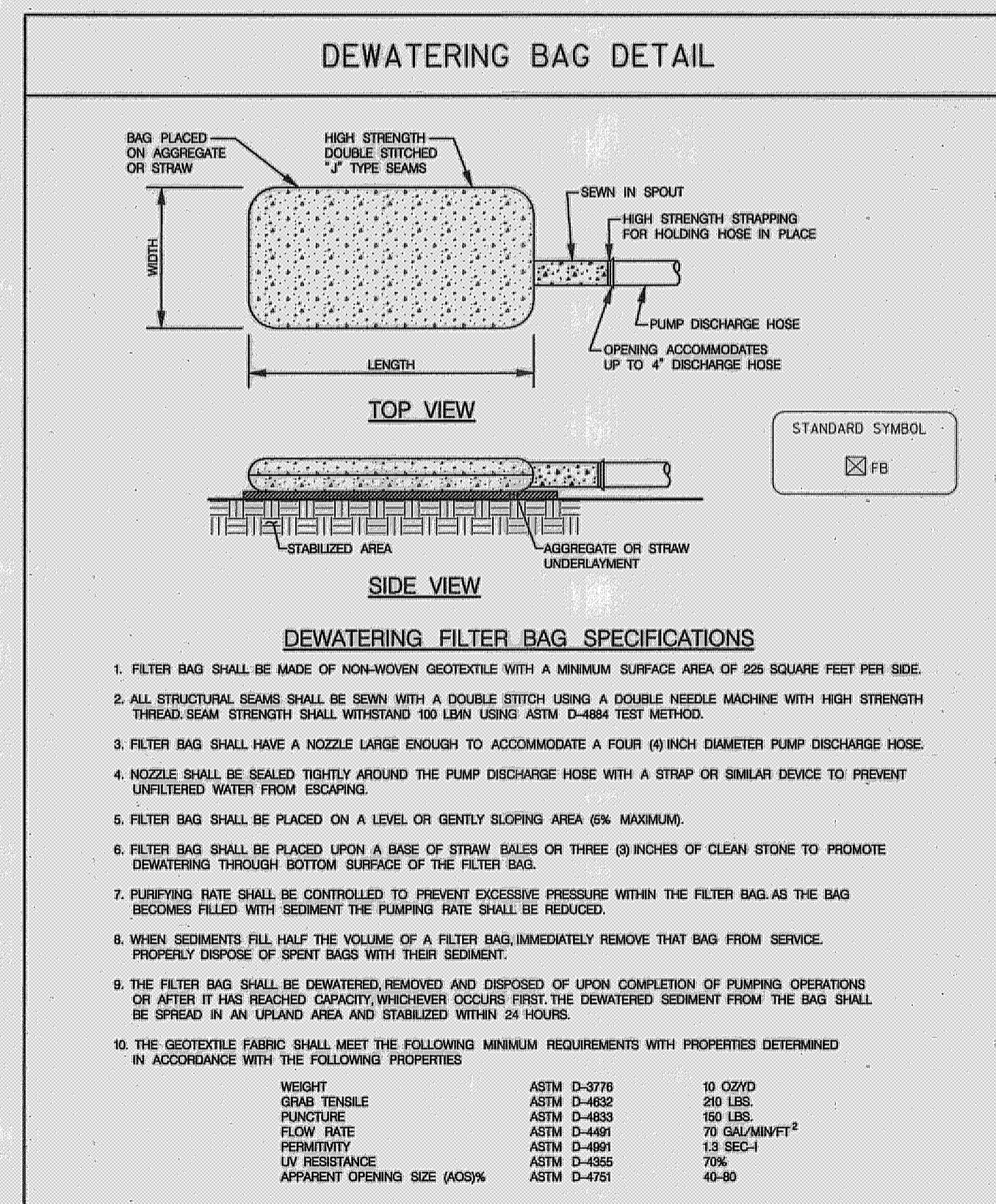
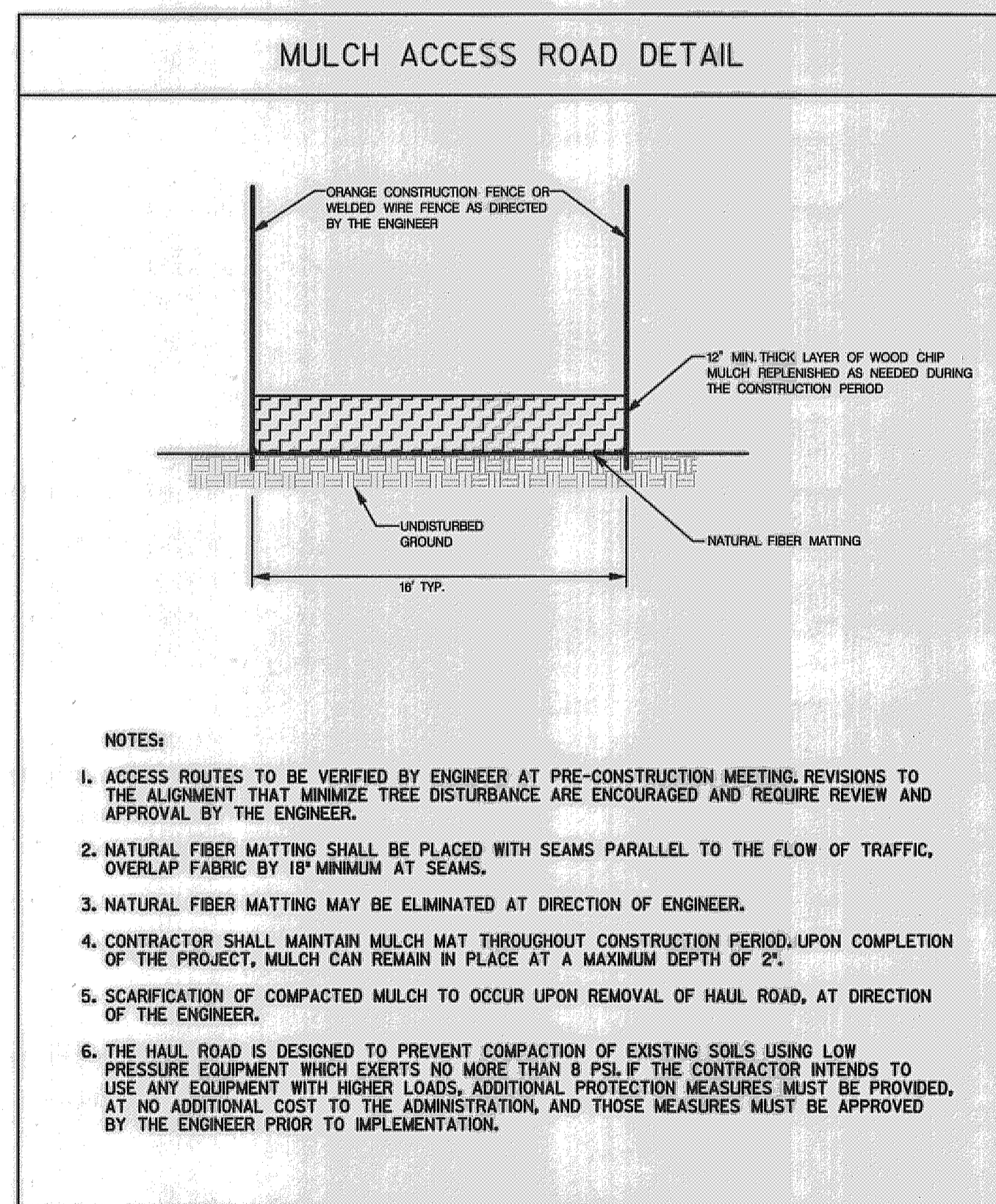
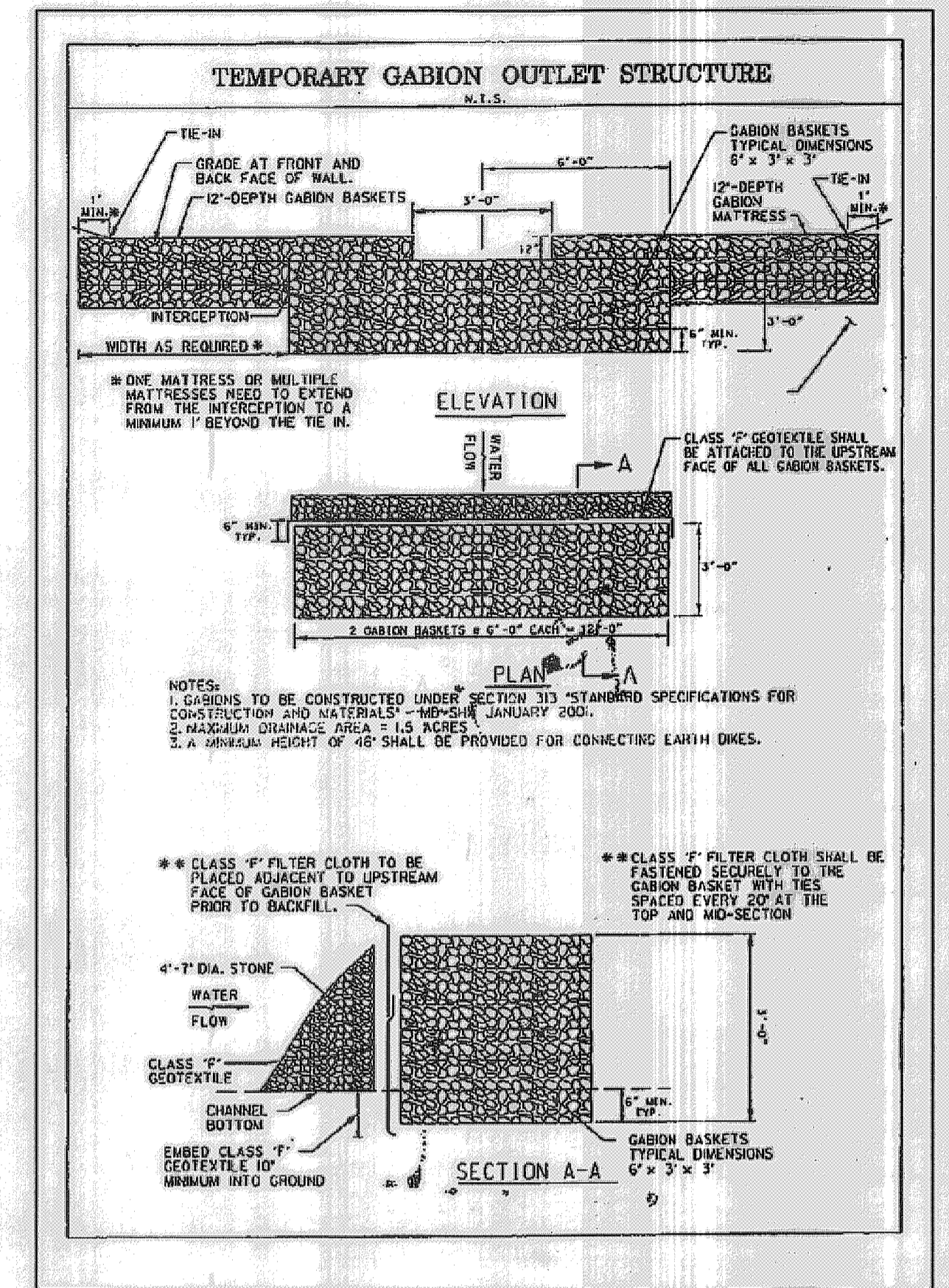
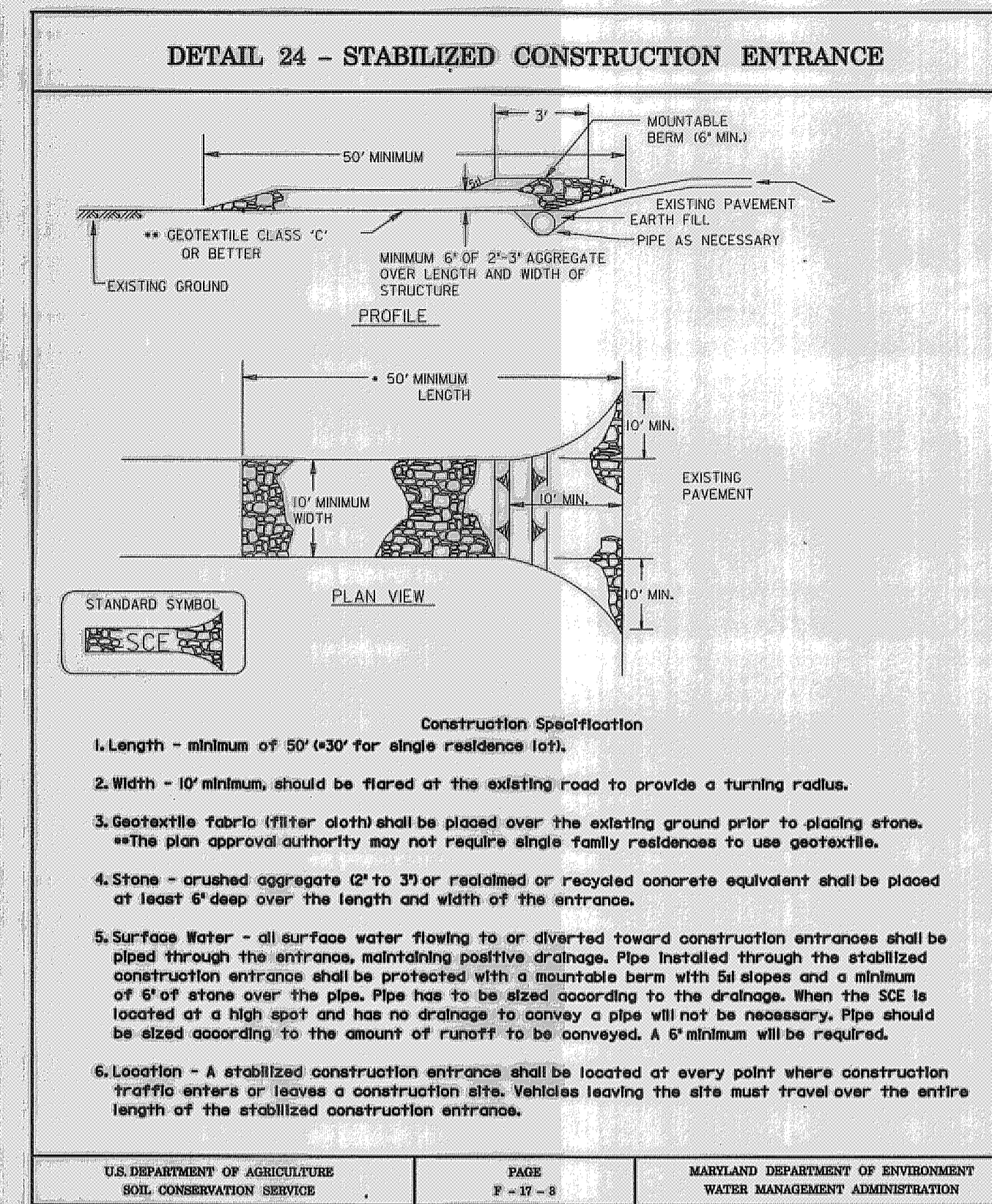
SILT FENCE

Silt Fence Design Criteria

Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

Notes: In areas of less than 2% slope and sandy soils (USDA general classification system, soil class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE E-15-3A MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

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

John R. Hester
HOWARD SCD

mp/h
DATE

McCormick & Taylor
Engineers & Planners Since 1946

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Howard County
MARYLAND

Storm Water Management Division
Bureau of Environmental Services
6751 Columbia Gateway Drive, Suite 514
Columbia, Maryland 21046-3143
(410) 313-6146

DES: AH				
DRN: MR				
CHK: CB				
DATE: 9/7/10				
BY	NO.	REVISION	DATE	

HOWARD COUNTY STORMWATER MANAGEMENT EVALUATION
GREAT DRUM CIRCLE STREAM REHABILITATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY F 96-98 BIO
EROSION AND SEDIMENT CONTROL DETAIL SHEET

SCALE
NOT TO SCALE
SHEET
10 OF 13

STANDARD AND SPECIFICATION FOR BIORETENTION SOIL MIXTURE (BSM)

BSM SHALL BE A HOMOGENEOUS MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN 2 IN. AND SHALL BE FREE FROM ANY PARTS OF BERMUDA GRASS, QUACKGRASS, JOHNSONGRASS, MUGWORT, NUTSEDGE, POISON IVY, CANADIAN THISTLE, TEARTHUMB, PHRAGMITES, OR OTHER NOXIOUS WEEDS AS SPECIFIED IN COMAR 15.08.01.05.

BSM SHALL BE A BLENDED MIXTURE OF SAND, MULCH, AND PLANTING SOIL AS FOLLOWS:

- (A) SAND: THE SAND SHALL COMPOSE 50 PERCENT BY VOLUME OF THE BSM. THE SAND SHALL BE FINE AGGREGATE, SECTION 901.
- (B) MULCH: THE MULCH SHALL COMPOSE 20 PERCENT BY VOLUME OF THE BSM. THE MULCH SHALL BE DOUBLE SHREDDED HARDWOOD BARK CONSISTING OF THE BARK FROM HARDWOOD TREES WHICH HAS BEEN MILLED AND SCREENED TO A MAXIMUM 2 IN. PARTICLE SIZE AND PROVIDE A UNIFORM TEXTURE FREE FROM SAWDUST, TOXIC SUBSTANCES, AND FOREIGN MATERIALS AND SHALL BE AGED AT LEAST 6 MONTHS.
- (C) PLANTING SOIL: THE PLANTING SOIL SHALL COMPOSE 30 PERCENT BY VOLUME OF THE BSM. THE PLANTING SOIL SHALL BE A NATURAL OR FURNISHED, FRIABLE SOIL, UNIFORM IN COLOR AND TEXTURE.

PLANTING SOIL SHALL BE FROM A STOCKPILE THAT HAS BEEN CONSTRUCTED BY THE PRODUCER AND THE STOCKPILE SHALL BE CONSTRUCTED SO THE PILE IS IDENTIFIABLE. SAMPLING AND TESTING WILL BE COMPLETED IN CONFORMANCE WITH MSMT 356.

PLANTING SOIL SHALL HAVE AN ORGANIC CONTENT BETWEEN 1.5 TO 10 PERCENT BY WEIGHT WHEN TESTED AS SPECIFIED IN T 194.

GRADING ANALYSIS SHALL BE AS FOLLOWS:

SEIVE SIZE	MINIMUM PERCENT PASSING BY WEIGHT
2 IN.	100
NO. 4	90
NO. 10	80

PLANTING SOIL SHALL BE ANALYZED FOR SAND, SILT, AND CLAY AS SPECIFIED IN T 88. THE TEXTURAL ANALYSIS SHALL BE AS FOLLOWS:

SOIL PARTICLE SIZES, MM	PERCENT PASSING BY WEIGHT
SAND (2.0-0.050)	50-85
SILT (0.050-0.002)	5-45
CLAY (LESS THAN 0.002)	5-10

PLANTING SOIL THAT FAILS TO MEET THE MINIMUM REQUIREMENTS SHALL BE REPLACED AT NO ADDITIONAL COST TO THE COUNTY. BSM SHALL BE FROM A STOCKPILE THAT HAS BEEN CONSTRUCTED BY THE PRODUCER AND THE STOCKPILE SHALL BE CONSTRUCTED SO THE PILE IS IDENTIFIABLE. SAMPLING AND TESTING WILL BE COMPLETED IN CONFORMANCE WITH MSMT 356. THE BSM SHALL HAVE A PH VALUE NOT LESS THAN 5.5 AND NOT MORE THAN 7.5 AND SHALL MEET THE FOLLOWING NUTRIENT CRITERIA WHEN TESTED AS SPECIFIED BY THE UNIVERSITY OF DELAWARE COLLEGE OF AGRICULTURE AND NATURAL RESOURCES SOIL TESTING PROGRAM:

NUTRIENT	LIMIT, PPM
MAGNESIUM	MIN. 35
PHOSPHOROUS (PHOSPHATE)	MIN. 75
POTASSIUM	MIN. 85
SULFUR SALTS	NOT TO EXCEED 300

AMENDMENTS: ANY BSM NOT MEETING THE NUTRIENT REQUIREMENTS SHALL BE AMENDED BY THE PRODUCER AT THE DIRECTION OF THE ADMINISTRATION'S LANDSCAPE OPERATIONS DIVISION. ALL AMENDMENTS SHALL BE MIXED UNIFORMLY INTO THE BSM AS FOLLOWS:

- A) THE PH SHALL BE CORRECTED WITH THE RECOMMENDED AMOUNT OF DOLOMITIC LIMESTONE OR SULFUR (90%).
- B) MAGNESIUM SHALL BE CORRECTED WITH THE RECOMMENDED AMOUNT OF DOLOMITIC LIMESTONE.
- C) PHOSPHORUS SHALL BE CORRECTED WITH THE RECOMMENDED AMOUNT OF 5-20-20 FERTILIZER.
- D) POTASSIUM SHALL BE CORRECTED WITH THE RECOMMENDED AMOUNT OF 0-0-60 FERTILIZER.

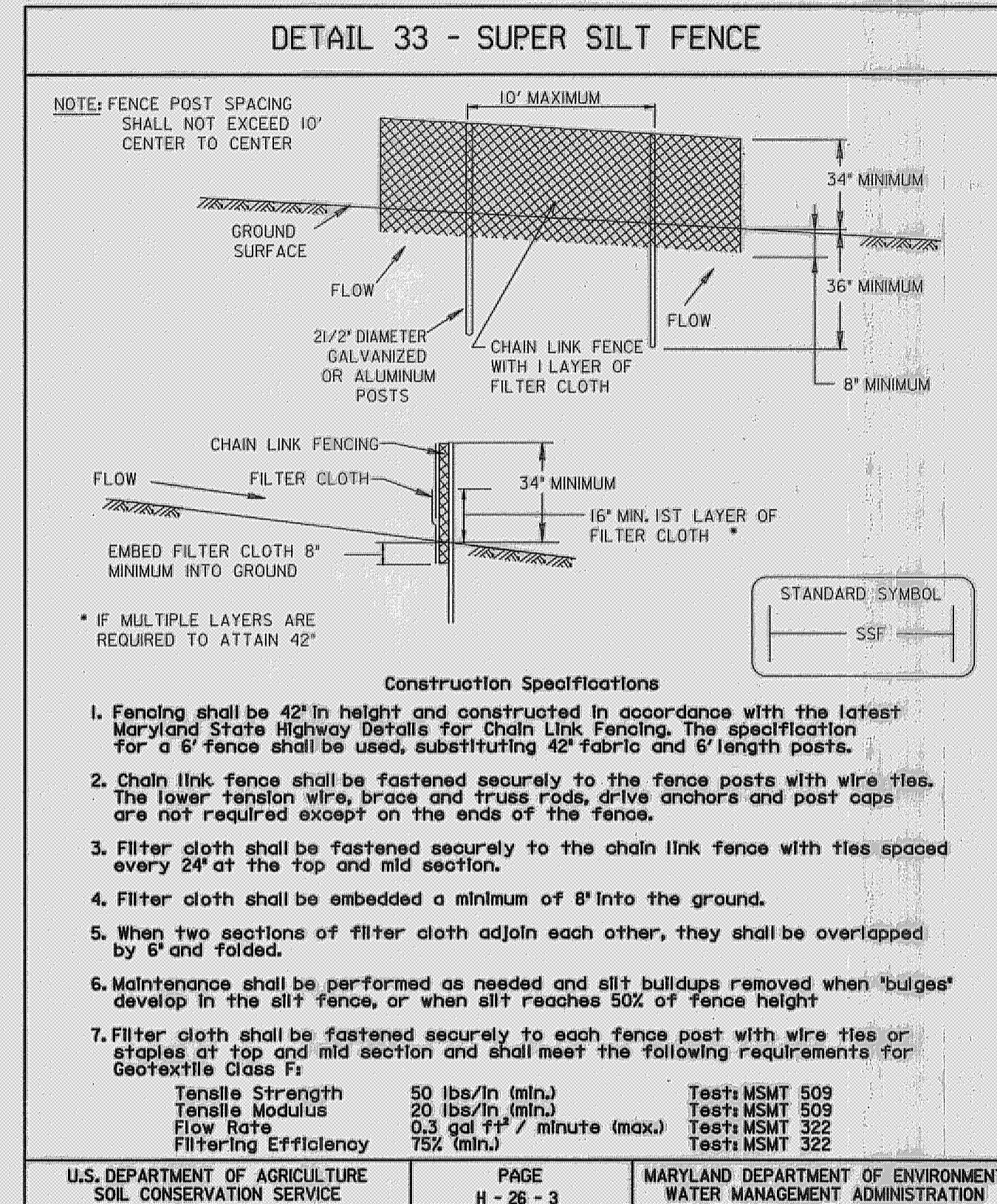
THE USE OF ANY OTHER AMENDMENT MATERIALS IS PROHIBITED. THE ADDITION OF MATERIAL TO CORRECT ANY OTHER NUTRIENT DEFICIENCIES IS PROHIBITED.

ADDITIONAL REQUIREMENTS:

BSM SHALL HAVE A MINIMUM ORGANIC CONTENT NO LESS THAN 1.5 PERCENT BY WEIGHT WHEN TESTED AS SPECIFIED IN T 194. BSM SHALL BE ANALYZED FOR SAND, SILT, AND CLAY AS SPECIFIED IN T 88. THE TEXTURAL ANALYSIS SHALL BE AS FOLLOWS:

SOIL PARTICLE SIZES, MM	PERCENT PASSING BY WEIGHT
SAND (2.0-0.050)	55-85
SILT (0.050-0.002)	0-20
CLAY (LESS THAN 0.002)	1-5

THE ADDITION OF MATERIALS TO THE BSM STOCKPILE TO CORRECT TEXTURAL ANALYSIS DEFICIENCIES IS PROHIBITED. BSM THAT FAILS TO MEET THE MINIMUM REQUIREMENTS SHALL BE REPLACED AT NO ADDITIONAL COST TO THE COUNTY. THE ADDITION OF BSM OR OTHER MATERIAL TO THE APPROVED STOCKPILE IS PROHIBITED. STOCKPILE PROTECTION: BSM STOCKPILES SHALL BE PROTECTED FROM WEATHER.

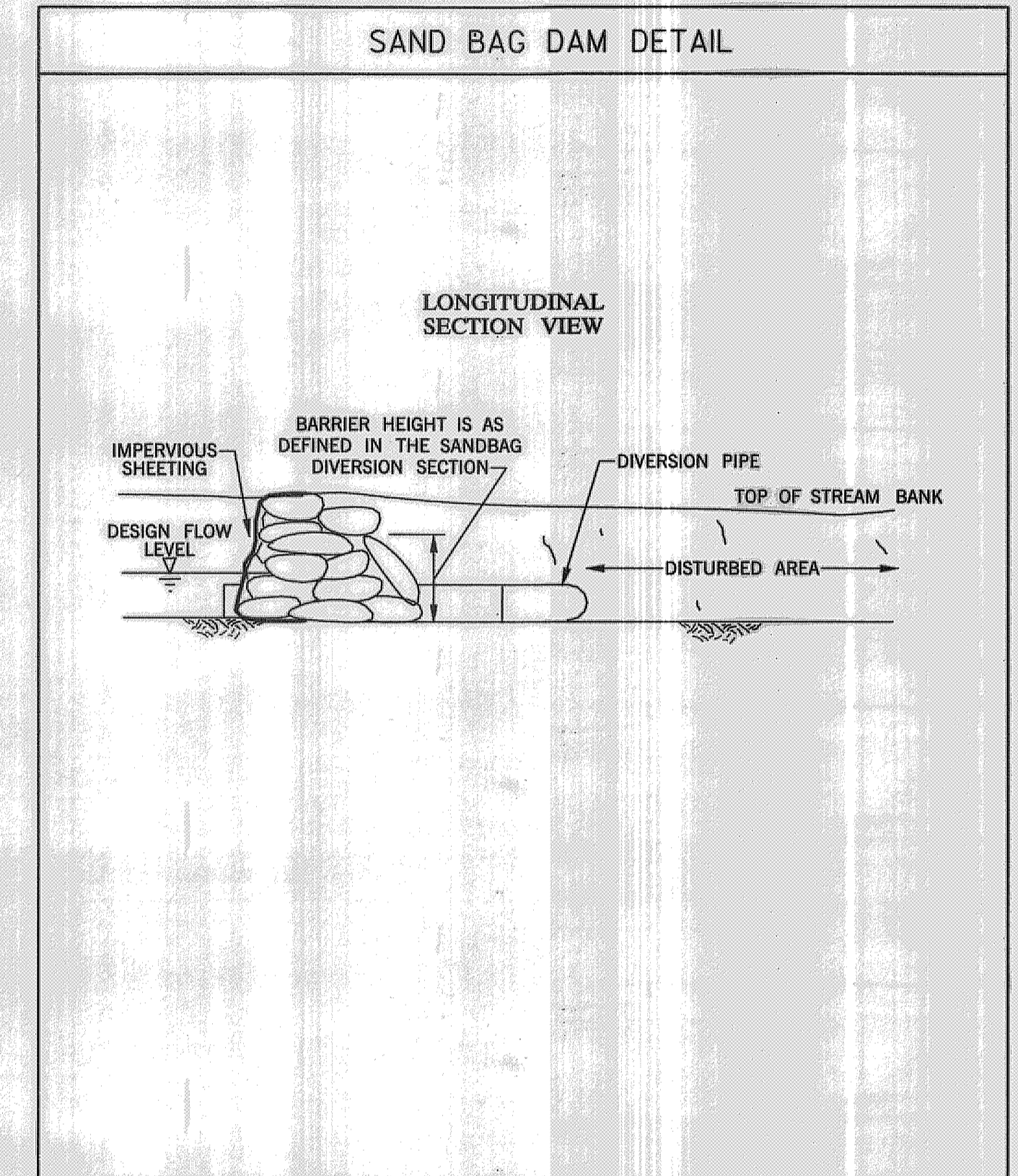


DETAIL 33 - SUPER SILT FENCE

Design Criteria

Slope	Slope Steepness	Slope Length (maximum)	Silt Fence Length (maximum)
0 - 10%	0 - 10d	Unlimited	Unlimited
10 - 20%	10d - 5d	200 feet	1,500 feet
20 - 33%	5d - 3d	100 feet	1,000 feet
33 - 50%	3d - 2d	100 feet	500 feet
50% +	2d +	50 feet	250 feet

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE H - 26 - 3A MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



<p>REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS</p> <p>THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT</p> <p><i>John R. Robertson</i></p> <p>HOWARD SCD</p>	<p>McCormick & Taylor</p> <p>Engineers & Planners Since 1946</p> <p>509 South Exeter Street 4th Floor Baltimore, Maryland 21202 (410) 662-7400</p>	<p>Howard County</p> <p>MARYLAND</p> <p>Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046-3143 (410) 313-6146</p>	DES: AH				<p>HOWARD COUNTY STORMWATER MANAGEMENT EVALUATION GREAT DRUM CIRCLE STREAM REHABILITATION PROJECT CAPITAL PROJECT D-1158 HOWARD COUNTY F 96-98 BIO EROSION AND SEDIMENT CONTROL DETAIL SHEET</p>	SCALE
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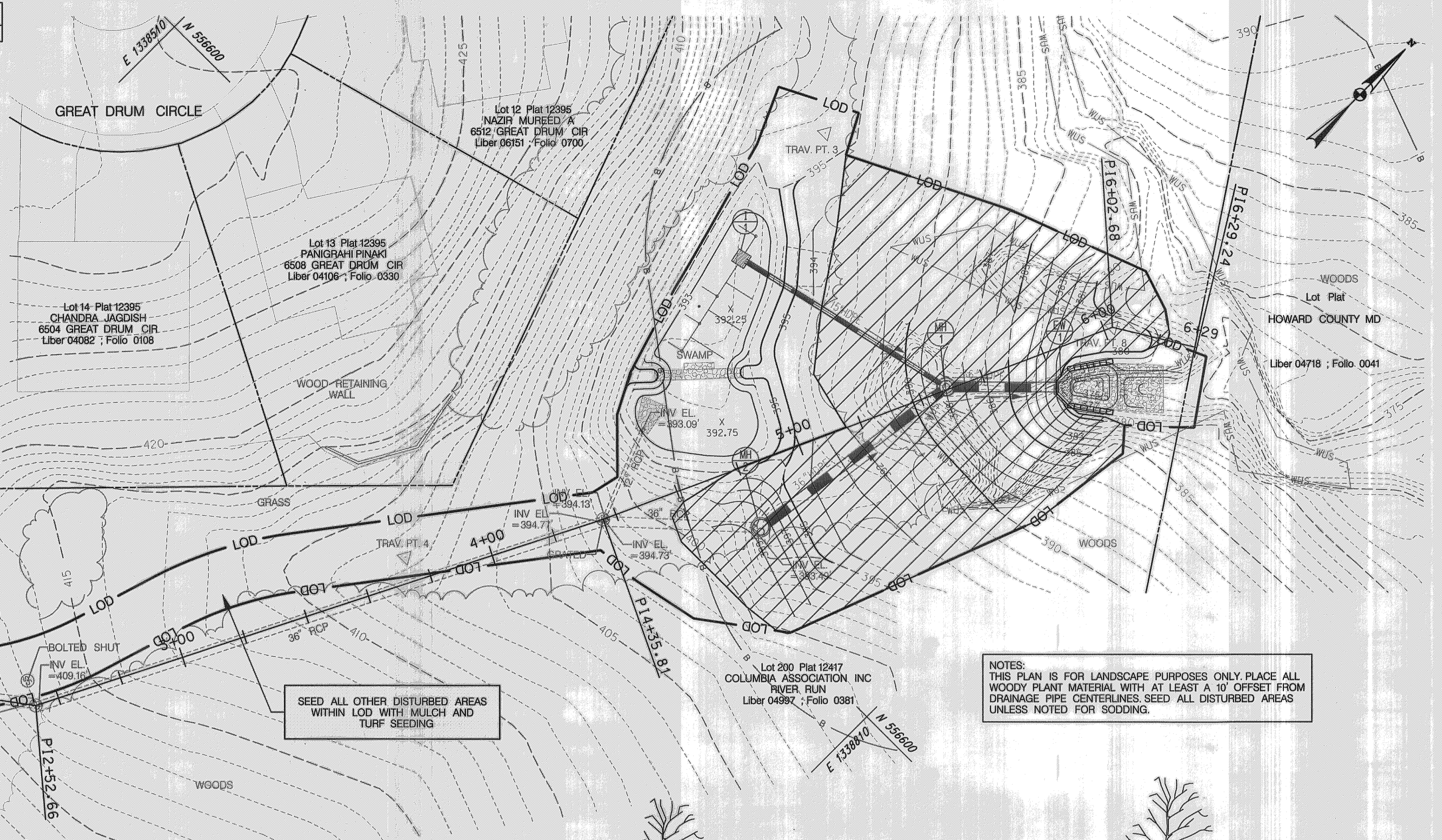
Upland Reforestation Plantings-11,358 SF		
Quantity	Species	Size
10	Acer rubrum / Red Maple	5' H, Container
10	Quercus alba / White Oak	5' H, Container
10	Liriodendron tulipifera / Tulip poplar	5' H, Container
8	Amelanchier canadensis / Serviceberry	5' H, Container
8	Aronia arbutifolia / Red Chokeberry	24" H, Container
8	Lindera benzoin / Spicebush	24" H, Container

Soil Stabilization Matting
1653 SY

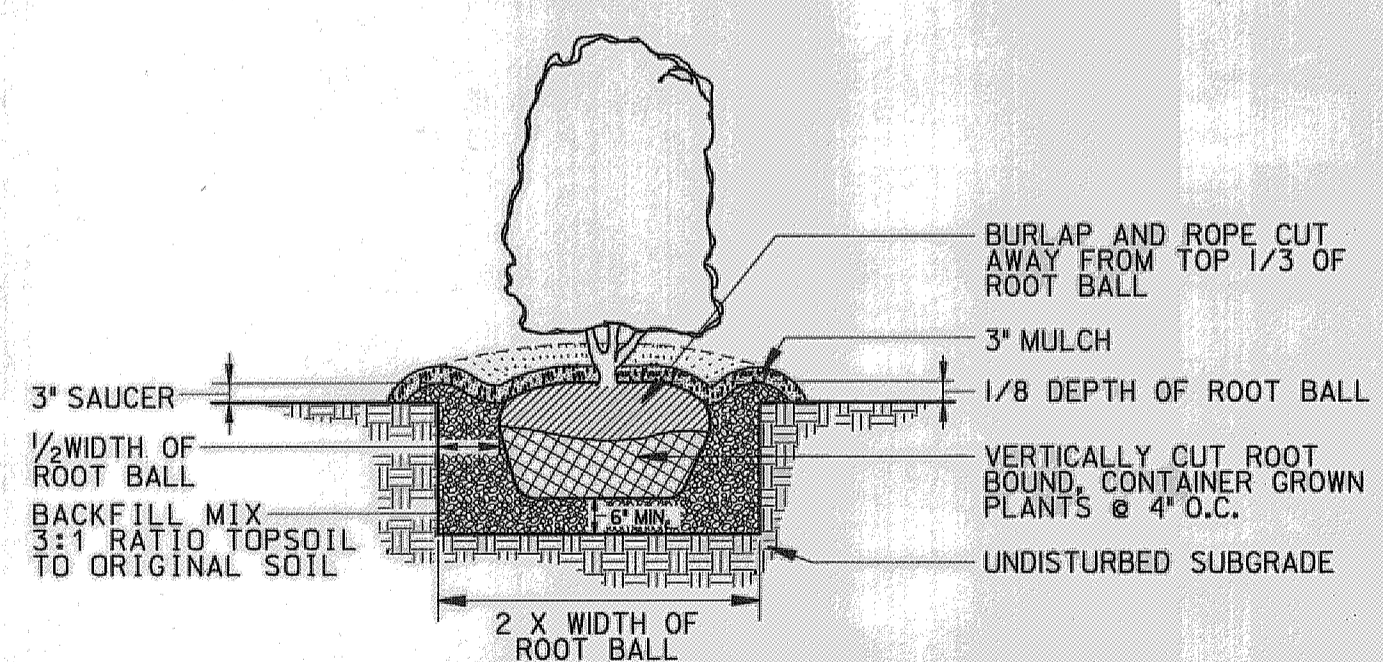
- Notes:
1. Plantings shall be placed in field as directed by the Engineer.
2. Seed Reforestation Area with Seed Mix and Soil Stabilization Matting

Upland Reforestation and BMP Seed Mix-14,871 SF at 60 lb/ac		
	Species	Lbs.
40%	Lolium multiflorum / Annual Rye	8.4
15%	Andropogon virginicum / Big Bluestem	3.1
15%	Agrostis alba / Redtop	3.2
15%	Elymus canadensis / Wild Rye	3.2
15%	Festuca rubra / Red Fescue	3.1
100%	Total	21

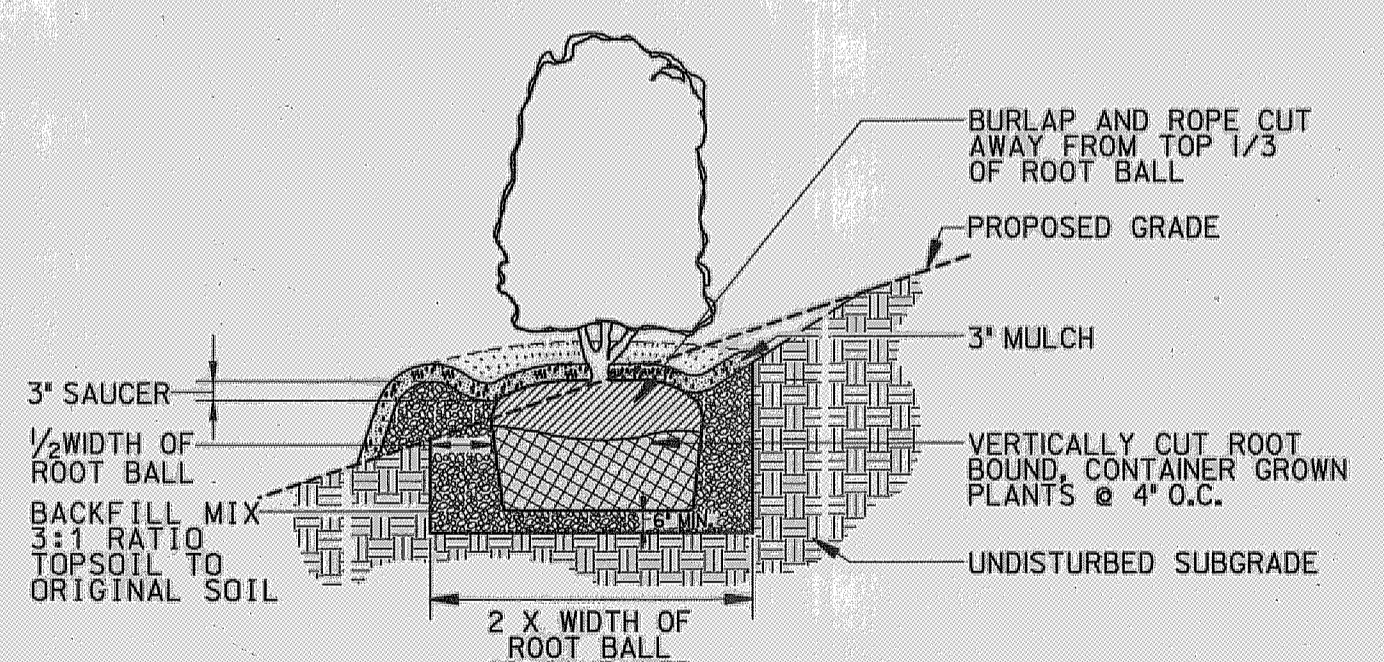
Note: Use with straw mulch.



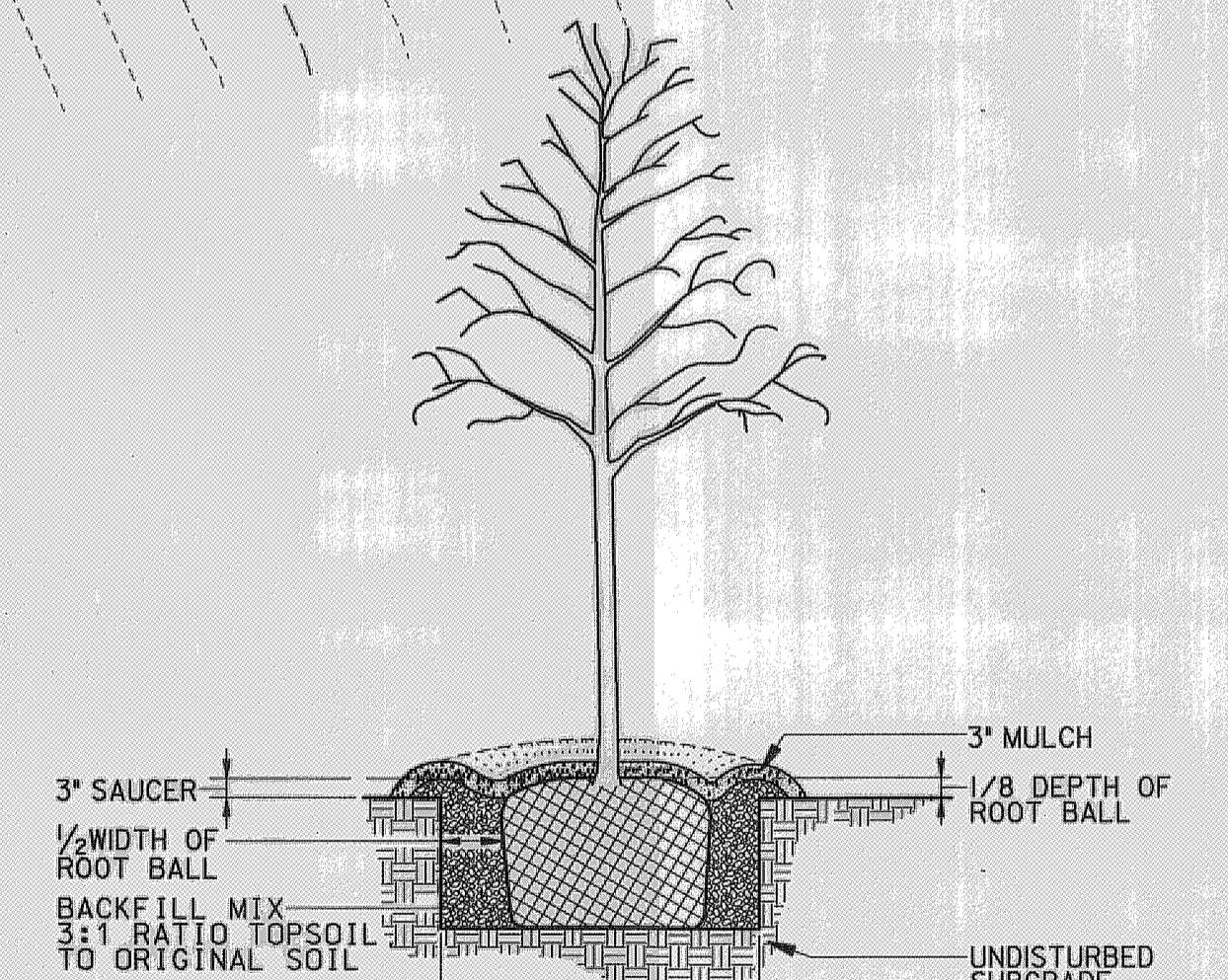
NOTES:
THIS PLAN IS FOR LANDSCAPE PURPOSES ONLY. PLACE ALL WOODY PLANT MATERIAL WITH AT LEAST A 10' OFFSET FROM DRAINAGE PIPE CENTERLINES. SEED ALL DISTURBED AREAS UNLESS NOTED FOR SODDING.



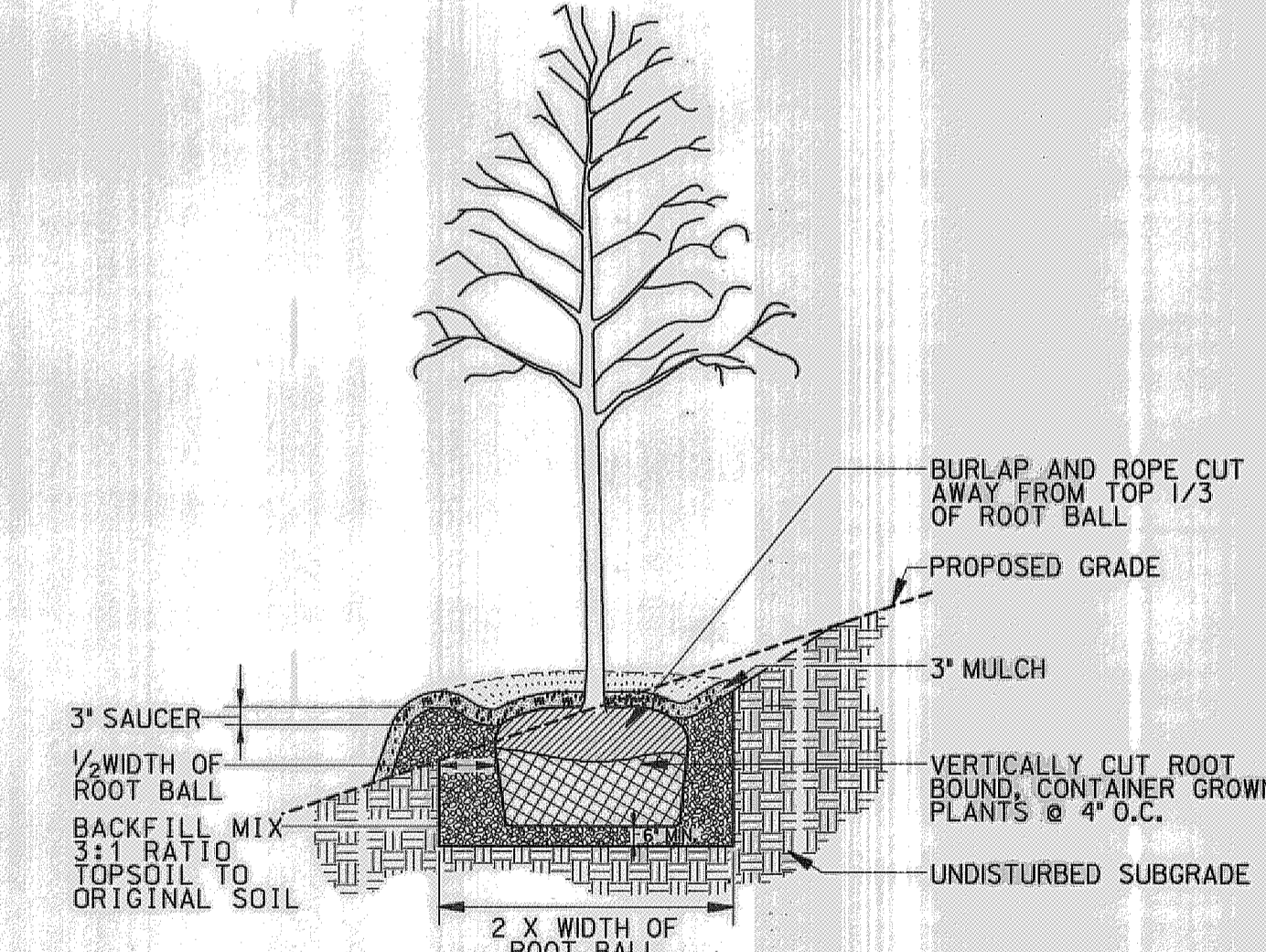
SHRUB PLANTING DETAIL
B & B AND CONTAINER GROWN
NOT TO SCALE



SLOPE PLANTING DETAIL
FOR ALL SHRUBS
B & B AND CONTAINER GROWN
NOT TO SCALE



DECIDUOUS TREE PLANTING DETAIL
CONTAINER GROWN
NOT TO SCALE



SLOPE PLANTING DETAIL
FOR ALL TREES
CONTAINER GROWN
NOT TO SCALE

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS
THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT
John R. Roberts
HOWARD SCD
DATE: 12/2/10

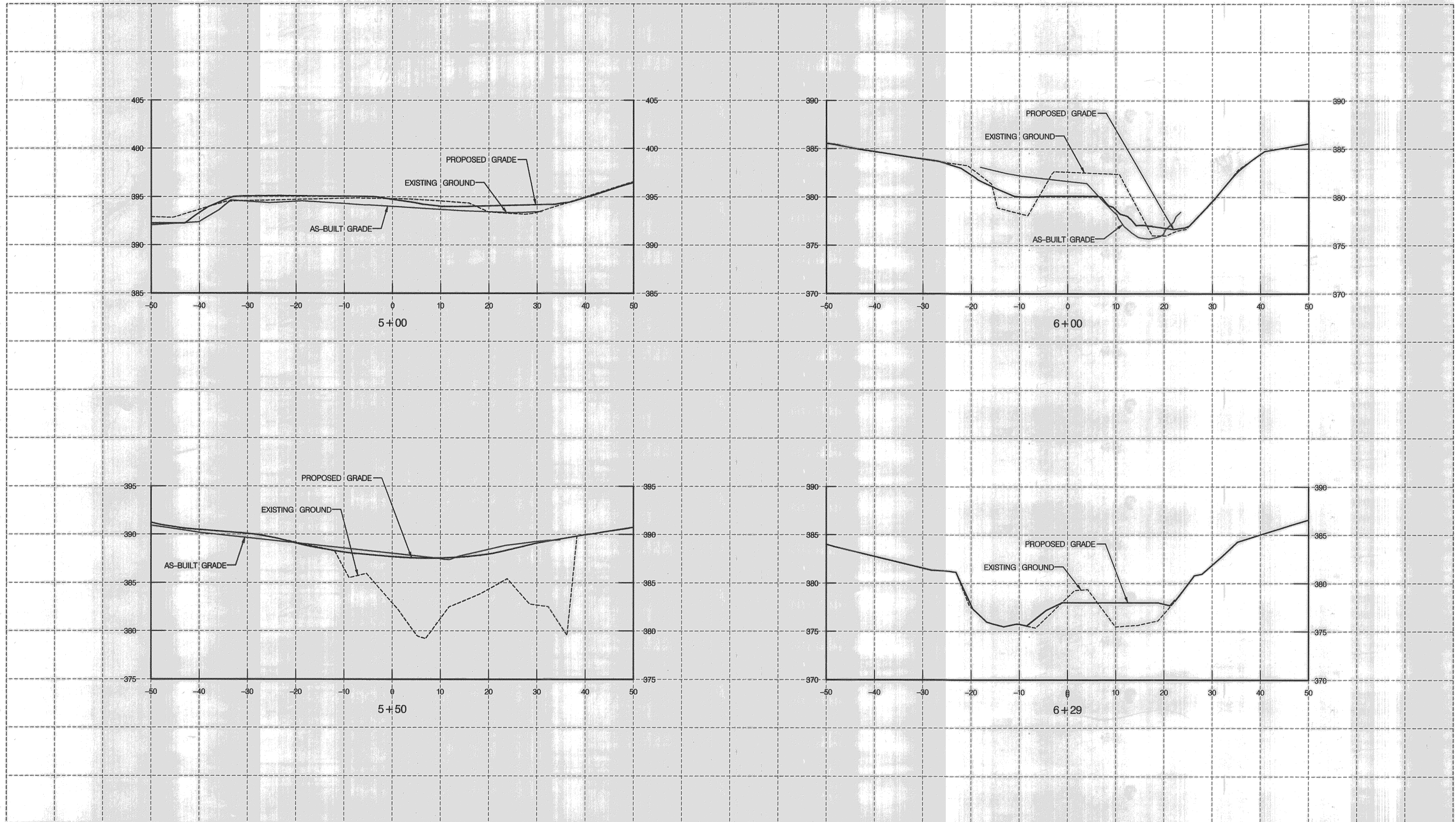
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HOWARD COUNTY STORMWATER MANAGEMENT EVALUATION
GREAT DRUM CIRCLE STREAM REHABILITATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY F 96-98 BIO
LANDSCAPING PLAN

SCALE
1" = 20'
SHEET
12 OF 13



SCALE
HORIZONTAL: 1"=10' VERTICAL: 1"= 5'

LEGEND
---EXISTING ---PROPOSED

**REVIEWED FOR HOWARD SCD
AND MEETS TECHNICAL REQUIREMENTS**

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

HOWARD SCD

[Signature]

DATE

**McCormick
Taylor**
Engineers & Planners
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MARYLAND

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DES: AH	ALH	AS-BUILT	10/12/11
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DATE: 9/7/10	BY	NO.	REVISION
			DATE

**HOWARD COUNTY STORMWATER MANAGEMENT EVALUATION
GREAT DRUM CIRCLE STREAM REHABILITATION PROJECT
CAPITAL PROJECT D-1158
HOWARD COUNTY F 96-98 BIO**

CROSS SECTIONS

SCALE
AS
SHOWN

SHEET
13 OF 13