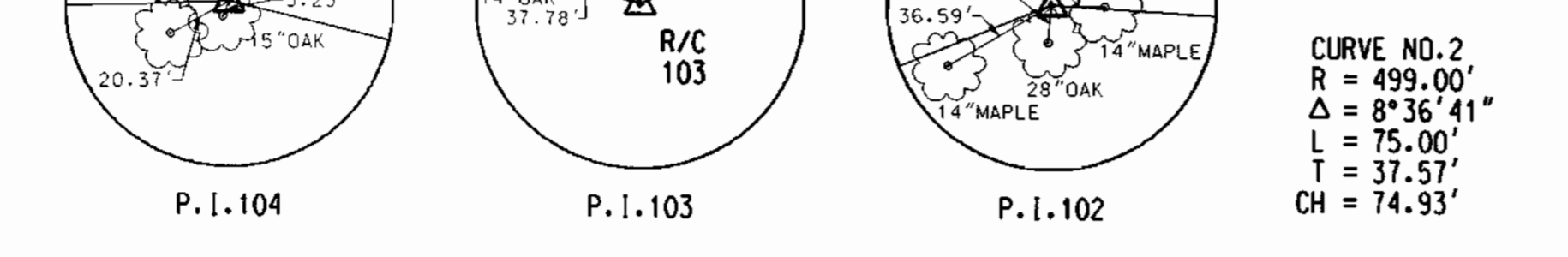


CONTROL SCHEDULE AND BENCH MARKS				
NUMBER	DESCRIPTION	NORTH	EAST	ELEV.
P. I. 1086	HUB/TACK	566877.67	1380873.03	269.54
P. I. 0008	REBAR & CAP	566765.54	1380927.54	283.68
P. I. 101	REBAR & CAP	566894.02	1380702.39	298.42
P. I. 102	REBAR & CAP	566895.31	1380598.04	269.51
P. I. 103	REBAR & CAP	566794.74	1380346.72	288.40
P. I. 104	REBAR & CAP	566844.70	1380136.48	275.17
P. I. 1087	HUB/TACK	566924.73	1381154.21	261.75
B.M. 5251	RR/SPIKE IN 24" OAK NEAR TRAVERSE 102			272.13
B.M. 5255	RR/SPIKE IN 36" POPLAR NEAR PROP. MHS			279.09

**NOTES:**

- NO TREES ARE TO BE DAMAGED OR REMOVED OUTSIDE THE UTILITY EASEMENT EVEN WHEN THE LIMIT OF DISTURBANCE (LOD) EXTENDS ANOTHER 5' BEYOND THE EASEMENT.
- ACCESS TO THE PIPELINE CONSTRUCTION SHALL BE THROUGH THE STABILIZED CONSTRUCTION ENTRANCE LOCATED IN THE PUMPING STATION CONSTRUCTION SITE. IF THE EROSION AND SEDIMENT CONTROL MEASURES FOR THE PUMPING STATION ARE NOT IN PLACE, ADDITIONAL MEASURES WILL BE INSTALLED AT THE DIRECTION OF THE ENGINEER AND UPON APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR.

8" WATER MAIN LOCATION DATA				
STATION	DESCRIPTION	NORTH	EAST	
0+00	LIMIT OF WORK-8" CAP	567085.39	1380187.82	
0+03	45" HB	567082.61	1380188.95	
0+06	11.25" HB	567081.45	1380191.72	
0+13	22.5" HB	567079.97	1380198.99	
1+04	45" HB	567093.85	1380290.70	
1+96	22.5" & 11.25" HBS.	567039.14	1380364.94	
4+08	22.5" & 11.25" HBS.	567029.42	1380575.99	
5+20	11.25" VB	566962.76	1380666.44	
5+40	11.25" VB	566950.89	1380682.54	
5+70	11.25" VB	566933.10	1380706.69	
5+80	11.25" VB	566927.16	1380714.74	
6+72	45" HB	566872.45	1380788.98	
7+48	PI CURVE NO. 1	566883.76	1380863.69	
8+25	LIMIT OF WORK 8" CAP	566883.76	1380940.68	



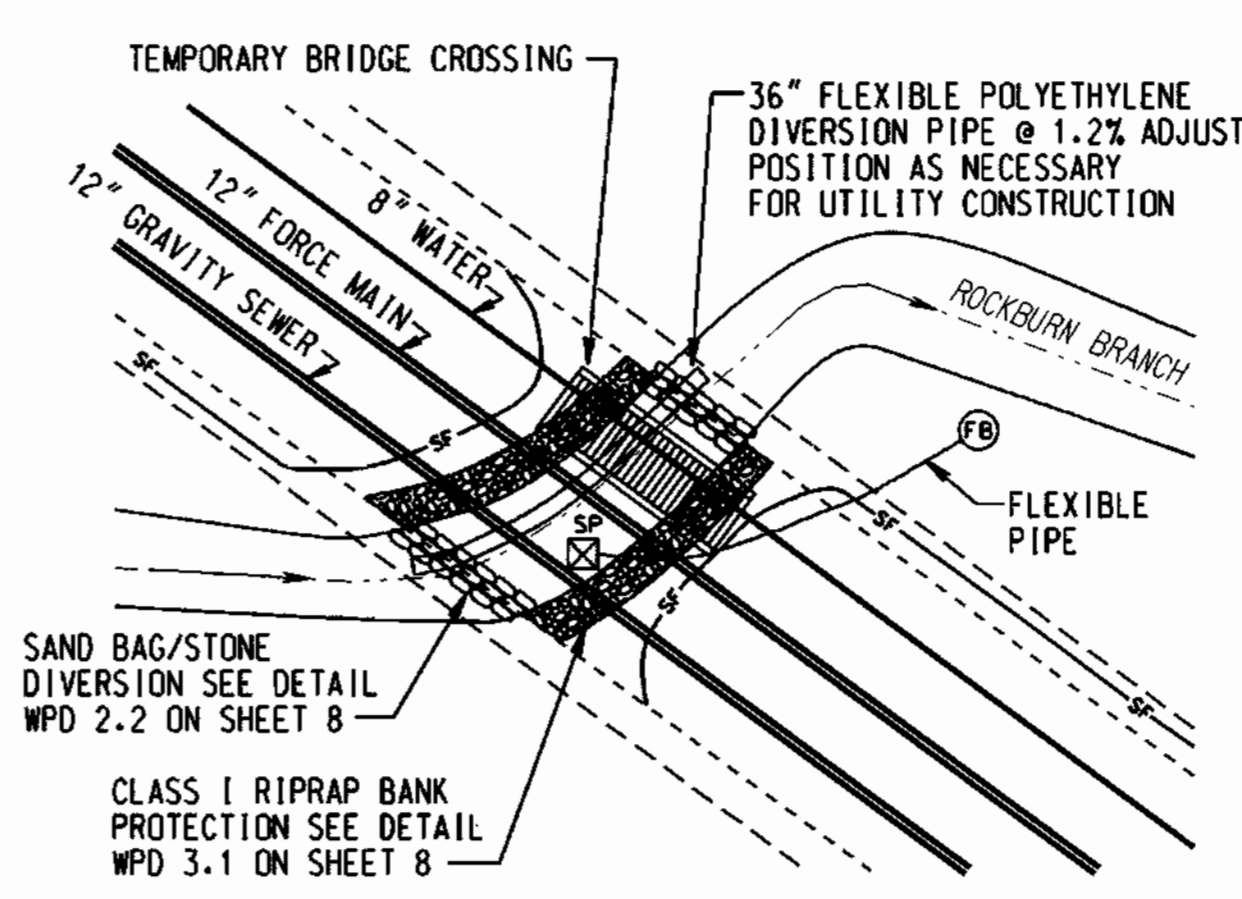
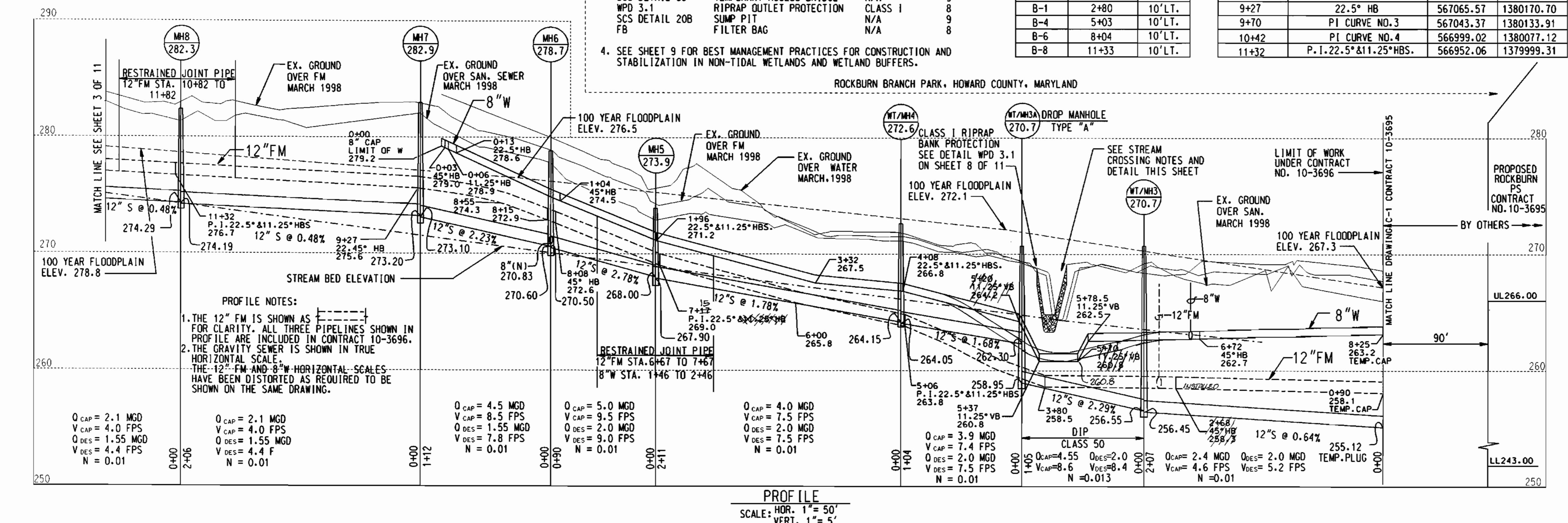
- STREAM CROSSING NOTES:**
- DELAY ALL WORK IN THE STREAM UNTIL THE START OF A 5-DAY CLEAR-WEATHER FORECAST. COMPLETE ALL WORK IN THE STREAM WITHIN THESE 5-DAYS.
  - FOLLOW THE SEQUENCE OF CONSTRUCTION: WATERWAY CROSSING FOR ALL WORK IN THE STREAM. (SEE SHEET 8 OF 11)
  - FOR THE STREAM CROSSING SHOWN ON THIS SHEET THE CONTRACTOR SHALL USE THE FOLLOWING CONSTRUCTION DETAILS:
  - SEE SHEET 9 FOR BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND STABILIZATION IN NON-TIDAL WETLANDS AND WETLAND BUFFERS.

DETAIL	DESCRIPTION	SIZE	ILLUSTRATED ON SHEET
WPD 5.1	UTILITY CROSSING	N/A	9
WPD 2.2	DIVERSION PIPE	36"	8
SCS DETAIL 35	TEMPORARY ACCESS BRIDGE	N/A	9
WPD 3.1	RIPRAP OUTLET PROTECTION	CLASS I	8
SCS DETAIL 20B	SUMP PIT	N/A	9
FB	FILTER BAG	N/A	8

12" FORCE MAIN LOCATION DATA				
STATION	DESCRIPTION	NORTH	EAST	
0+90	LIMIT OF WORK-TEMP. PLUG	566893.76	1380940.74	
1+68	PI CURVE NO. 2	566893.76	1380862.93	
2+68	45" HB	566878.72	1380763.61	
5+06	P. I. 22.5" & 11.25" HBS.	567019.57	1380572.50	
7+17	P. I. 22.5" & 11.25" HBS.	567029.29	1380361.45	
8+08	45" HB	567083.35	1380288.10	
9+27	22.5" HB	567065.57	1380170.70	
9+70	PI CURVE NO. 3	567043.37	1380133.91	
10+42	PI CURVE NO. 4	566999.02	1380077.12	
11+32	P. I. 22.5" & 11.25" HBS.	566952.06	1379999.31	

RESTORATION SCHEDULE (BASED ON SEWER MAIN ALIGNMENT) *				
MH TO MH	STA. TO STA.	TYPE		
2 3	0+00 1+45	SEED & MULCH		
" "	1+45 1+80	WETLAND STABILIZATION		
" "	1+80 2+07	SEED & MULCH		
3 3A	0+00 0+58	SEED & MULCH		
" "	0+58 0+98	RIP-RAP		
" "	0+98 1+05	SEED & MULCH		
3A 4	0+00 1+04	SEED & MULCH		
4 5	0+00 - 0+40, RIGHT	WETLAND STABILIZATION		
4 5	0+00 2+11	SEED & MULCH		
5 6	0+00 0+90	SEED & MULCH		
6 7	0+00 1+12	SEED & MULCH		
7 8	0+00 2+06	SEED & MULCH		
8 9	0+00 0+65	SEED & MULCH		

\* USE EROSION CONTROL MATTING (ECM) ACROSS EASEMENT IN PLACE OF MULCH IN AREAS SHOWN ON PLAN AS



**DETAIL - STREAM DIVERSION BETWEEN MANHOLES 3 AND 3A**  
NO SCALE

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

PREPARED BY: **WR&A** Whitman, Reardon and Associates, LLP.

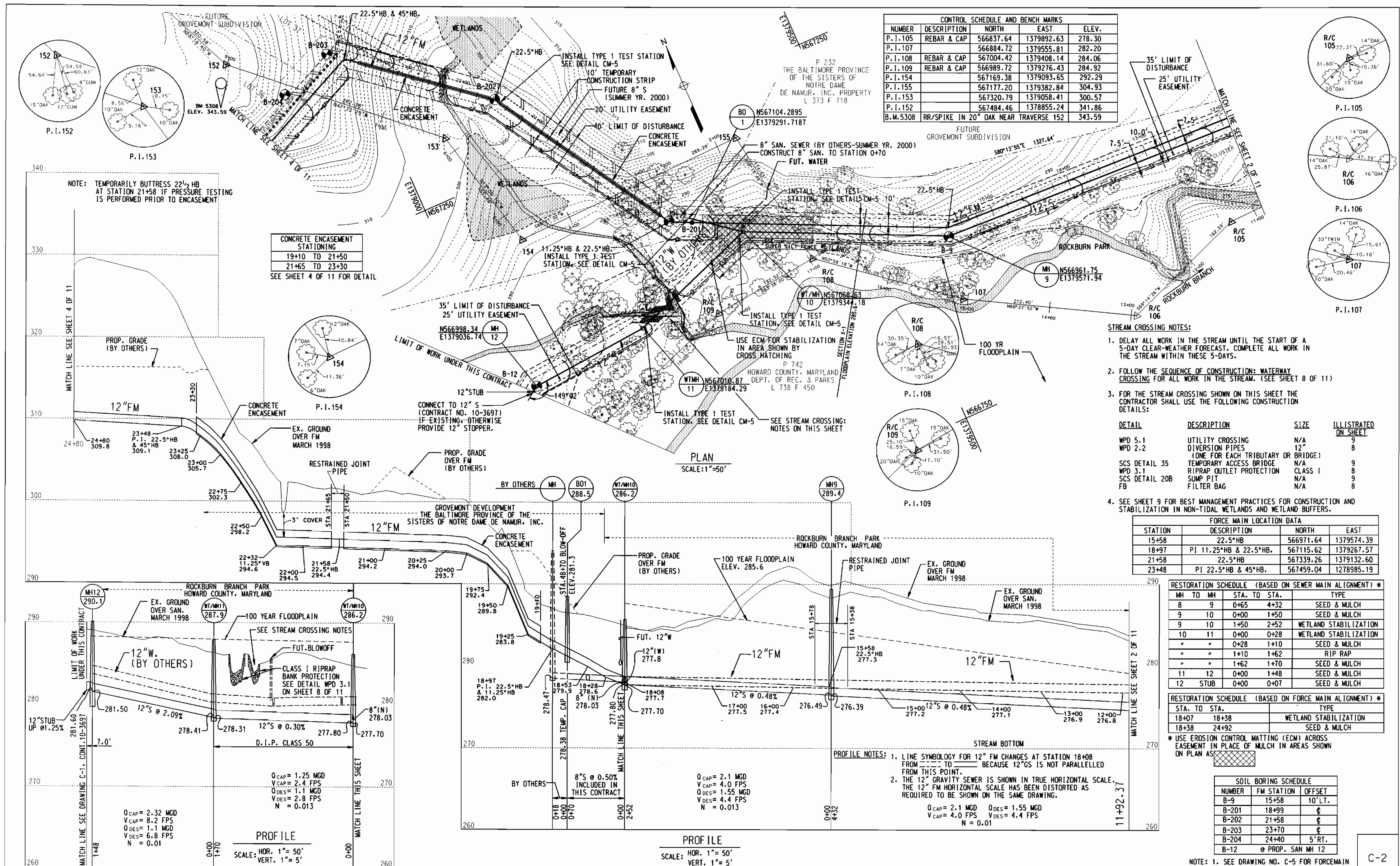
DES: WRD/EJM  
DRN: EJM/GWG  
CHK: JAA  
DATE: 12/07/98

PLAN AND PROFILE  
12" INTERCEPTOR SEWER AND 12" FORCE MAIN

ROCKBURN FORCE MAIN AND GRAVITY SEWER  
CAPITAL PROJECT NO. S-6200  
CONTRACT NO. 10-3696  
FIRST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 2 OF 11





CONTROL SCHEDULE AND BENCH MARKS				
NUMBER	DESCRIPTION	NORTH	EAST	ELEV.
P.I. 105	REBAR & CAP	566837.64	1379892.63	278.30
P.I. 107	REBAR & CAP	566884.72	1379555.81	282.20
P.I. 108	REBAR & CAP	567004.42	1379408.14	284.06
P.I. 109	REBAR & CAP	566989.72	1379276.43	284.92
P.I. 154		567169.38	1379093.65	292.29
P.I. 155		567177.20	1379382.84	304.93
P.I. 153		567320.79	1379058.41	300.57
P.I. 152		567484.46	1378855.24	341.86
B.M. 5308	RR/SPIKE IN 20" OAK NEAR TRAVERSE 152			343.59

- STREAM CROSSING NOTES:**
1. DELAY ALL WORK IN THE STREAM UNTIL THE START OF A 5-DAY CLEAR-WEATHER FORECAST. COMPLETE ALL WORK IN THE STREAM WITHIN THESE 5-DAYS.
  2. FOLLOW THE SEQUENCE OF CONSTRUCTION: WATERWAY CROSSING FOR ALL WORK IN THE STREAM. (SEE SHEET 8 OF 11)
  3. FOR THE STREAM CROSSING SHOWN ON THIS SHEET THE CONTRACTOR SHALL USE THE FOLLOWING CONSTRUCTION DETAILS:
- | DETAIL         | DESCRIPTION  | SIZE    | ILLUSTRATED ON SHEET |
|----------------|--|---------|----------------------|
| WPD 5.1        | UTILITY CROSSING                                   | N/A     | 9                    |
| WPD 2.2        | DIVERSION PIPES (ONE FOR EACH TRIBUTARY OR BRIDGE) | 12"     | 8                    |
| SCS DETAIL 35  | TEMPORARY ACCESS BRIDGE                            | N/A     | 9                    |
| WPD 3.1        | RIPRAP OUTLET PROTECTION                           | CLASS I | 8                    |
| SCS DETAIL 20B | SUMP PIT   | N/A     | 9                    |
| FB             | FILTER BAG   | N/A     | 8                    |
4. SEE SHEET 9 FOR BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND STABILIZATION IN NON-TIDAL WETLANDS AND WETLAND BUFFERS.

FORCE MAIN LOCATION DATA			
STATION	DESCRIPTION	NORTH	EAST
15+58	22.5" HB	566971.64	1379574.39
18+97	PI 11.25" HB & 22.5" HB.	567115.62	1379267.57
21+58	22.5" HB	567339.26	1379132.60
23+48	PI 22.5" HB & 45" HB.	567459.04	1278985.19

RESTORATION SCHEDULE (BASED ON SEWER MAIN ALIGNMENT) *				
MH TO MH	STA. TO STA.	TYPE		
8	9	0+65	4+32	SEED & MULCH
9	10	0+00	1+50	SEED & MULCH
9	10	1+50	2+52	WETLAND STABILIZATION
10	11	0+00	0+28	WETLAND STABILIZATION
"	"	0+28	1+10	SEED & MULCH
"	"	1+10	1+62	RIP RAP
"	"	1+62	1+70	SEED & MULCH
11	12	0+00	1+48	SEED & MULCH
12	STUB	0+00	0+07	SEED & MULCH

RESTORATION SCHEDULE (BASED ON FORCE MAIN ALIGNMENT) *		
STA. TO STA.	TYPE	
18+07	18+38	WETLAND STABILIZATION
18+38	24+92	SEED & MULCH

\* USE EROSION CONTROL MATTING (ECM) ACROSS EASEMENT IN PLACE OF MULCH IN AREAS SHOWN ON PLAN AS

SOIL BORING SCHEDULE		
NUMBER	FM STATION	OFFSET
B-9	15+58	10' LT.
B-201	18+99	€
B-202	21+58	€
B-203	23+70	€
B-204	24+40	5' RT.
B-12	@ PROP. SAN MH 12	

NOTE: 1. SEE DRAWING NO. C-5 FOR FORCEMAIN BLOW-OFF DETAIL.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

DATE: 2-18-99  
DATE: 2-18-99

DATE: 2-18-99  
DATE: 2-18-99

PREPARED BY: Whitman, Reardon and Associates, LLP.

DATE: 12/07/98

STATE OF MARYLAND PROFESSIONAL ENGINEER

DES: WRD/EJM  
DRN: EJM/CWG  
CHK: JAA

REVISION: BY NO. DATE

PLAN AND PROFILE  
12" INTERCEPTOR SEWER  
AND 12" FORCE MAIN

600' SCALE MAP NO. 31 BLOCK NO. 23

ROCKBURN FORCE MAIN  
AND GRAVITY SEWER  
CAPITAL PROJECT NO. S-6200  
CONTRACT NO. 10-3696  
FIRST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

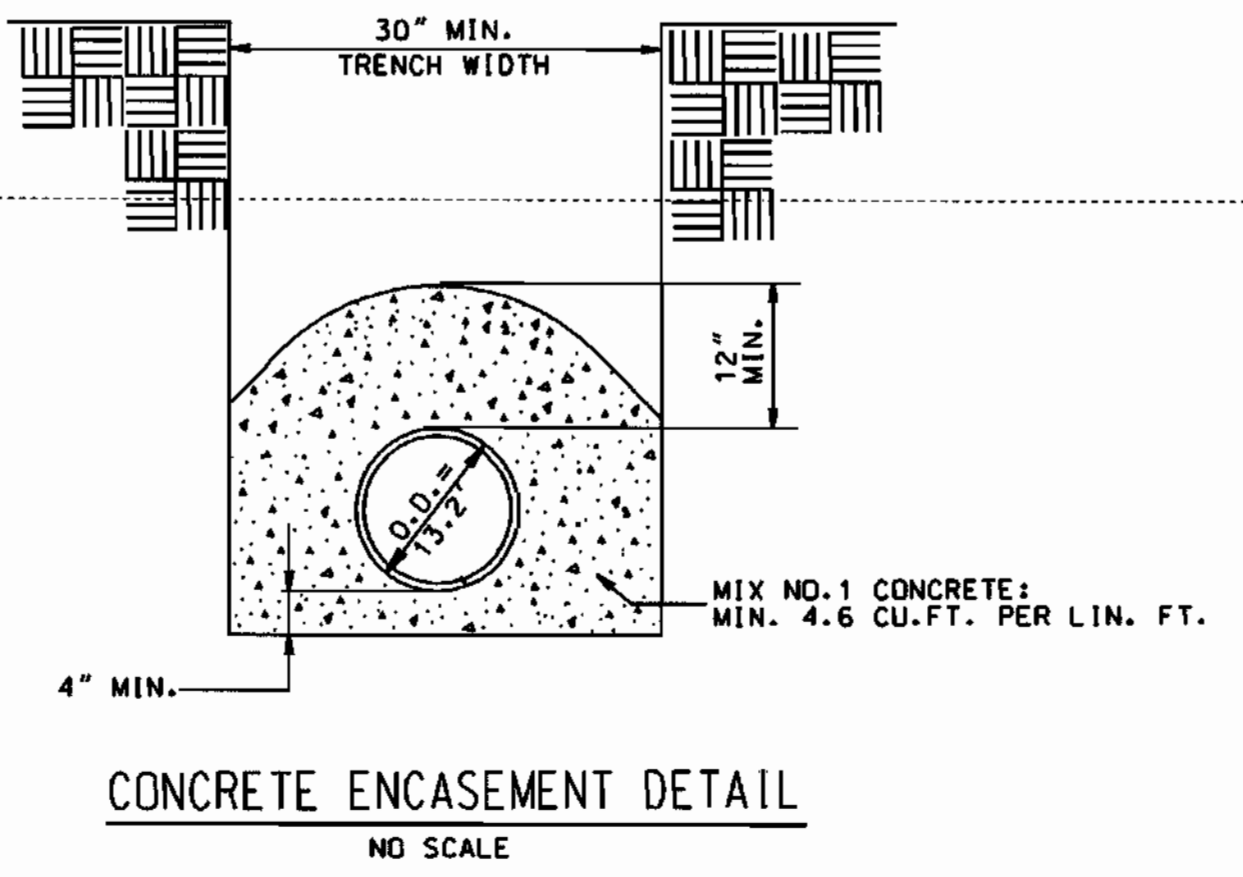
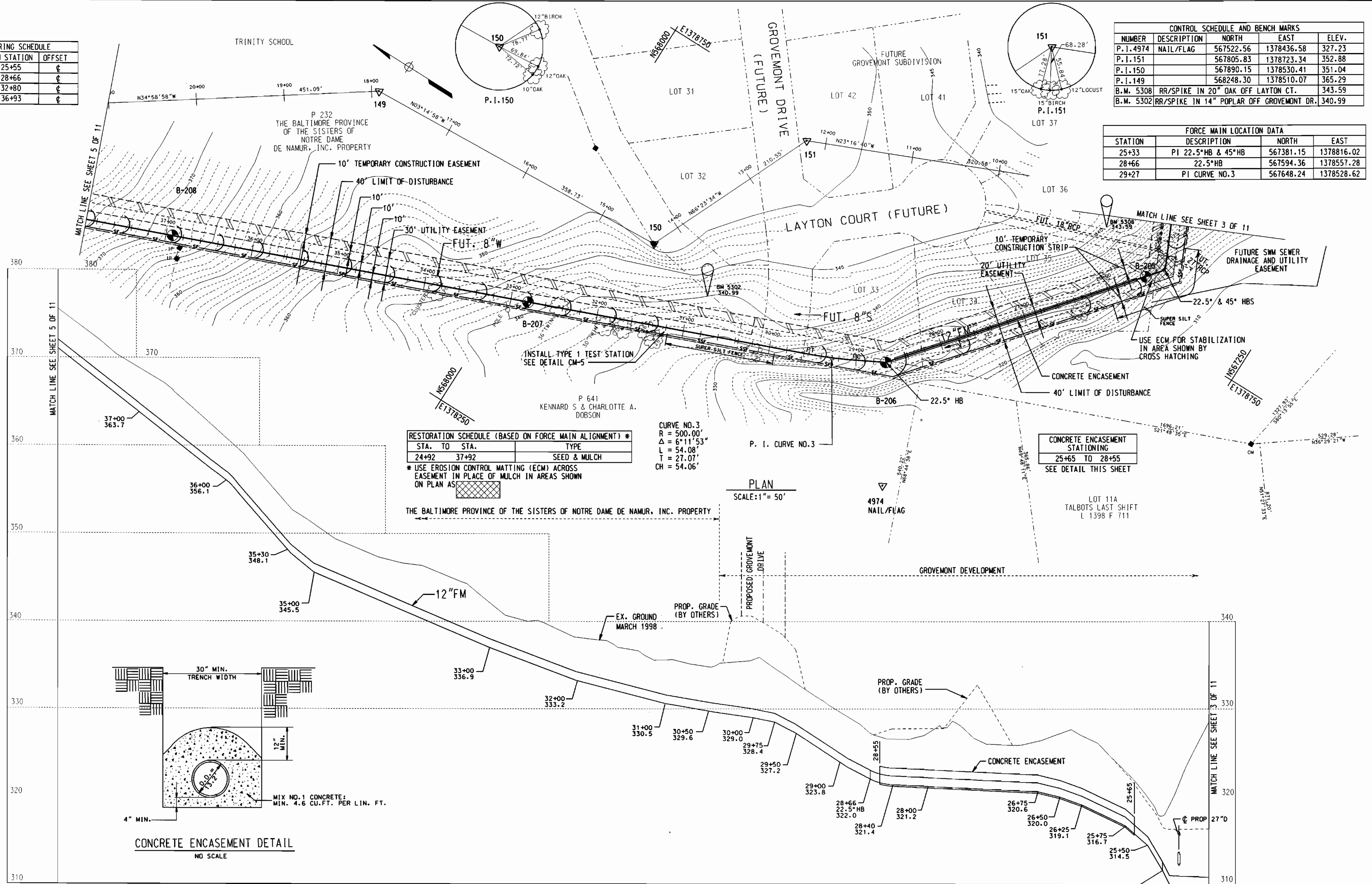
SCALE AS SHOWN  
SHEET 3 OF 11



SOIL BORING SCHEDULE		
NUMBER	FM STATION	OFFSET
B-205	25+55	☐
B-206	28+66	☐
B-207	32+80	☐
B-208	36+93	☐

CONTROL SCHEDULE AND BENCH MARKS				
NUMBER	DESCRIPTION	NORTH	EAST	ELEV.
P.I. 4974	NAIL/FLAG	567522.56	1378436.58	327.23
P.I. 151		567805.83	1378723.34	352.88
P.I. 150		567890.15	1378530.41	351.04
P.I. 149		568248.30	1378510.07	365.29
B.M. 5308	RR/SPIKE IN 20" OAK OFF LAYTON CT.			343.59
B.M. 5302	RR/SPIKE IN 14" POPLAR OFF GROVEMONT DR.			340.99

FORCE MAIN LOCATION DATA				
STATION	DESCRIPTION	NORTH	EAST	ELEV.
25+33	PI 22.5" HB & 45" HB	567381.15	1378816.02	
28+66	22.5" HB	567594.36	1378557.28	
29+27	PI CURVE NO.3	567648.24	1378528.62	

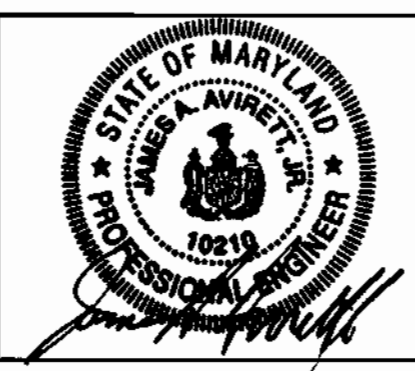


PROFILE  
SCALE: HOR. 1" = 50'  
VERT. 1" = 5'

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

2/18/99  
2-18-99

PREPARED BY:  
**WR&A**  
Whitman, Reardon and Associates, LLP.



DES: WRD/EJM  
DRN: EJM/GWG  
CHK: JAA  
DATE: 12/07/98

PLAN AND PROFILE OF 12" FORCE MAIN

600' SCALE MAP NO. 31 BLOCK NO. 16,22&23

ROCKBURN FORCE MAIN AND GRAVITY SEWER  
CAPITAL PROJECT NO. S-6200  
CONTRACT NO. 10-3696  
FIRST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 4 OF 11



**STREAM CROSSING NOTES:**

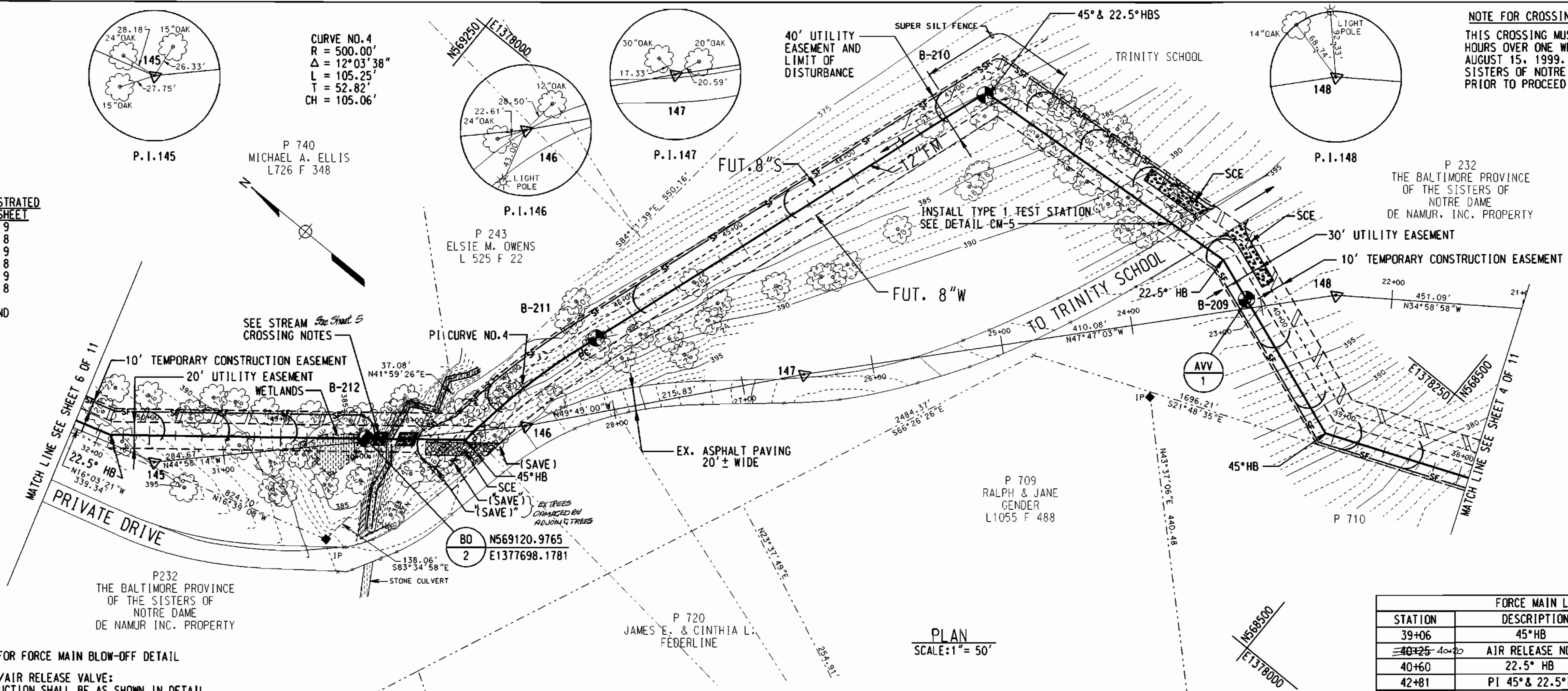
1. DELAY ALL WORK IN THE STREAM UNTIL THE START OF A 5-DAY CLEAR-WEATHER FORECAST. COMPLETE ALL WORK IN THE STREAM WITHIN THESE 5-DAYS.
  2. FOLLOW THE SEQUENCE OF CONSTRUCTION: WATERWAY CROSSING FOR ALL WORK IN THE STREAM. (SEE SHEET 8 OF 11)
  3. FOR THE STREAM CROSSING SHOWN ON THIS SHEET THE CONTRACTOR SHALL USE THE FOLLOWING CONSTRUCTION DETAILS:
- | DETAIL         | DESCRIPTION              | SIZE    | ILLUSTRATED ON SHEET |
|----------------|--------------------------|---------|----------------------|
| WPD 5.1        | UTILITY CROSSING         | N/A     | 9                    |
| WPD 2.2        | DIVERSION PIPES          | 24"     | 8                    |
| SCS DETAIL 35  | TEMPORARY ACCESS BRIDGE  | N/A     | 9                    |
| WPD 3.1        | RIPRAP OUTLET PROTECTION | CLASS 1 | 8                    |
| SCS DETAIL 20B | SUMP PIT                 | N/A     | 9                    |
| FB             | FILTER BAG               | N/A     | 8                    |
4. SEE SHEET 9 FOR BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND STABILIZATION IN NON-TIDAL WETLANDS AND WETLAND BUFFERS.

CONTROL SCHEDULE AND BENCH MARKS				
NUMBER	DESCRIPTION	NORTH	EAST	ELEV.
P.I. 148		568617.89	1378251.45	397.05
P.I. 147		568893.43	1377947.74	401.91
P.I. 146		569032.89	1377783.00	389.73
P.I. 145		569234.41	1377581.82	394.62
B.M. 5255				

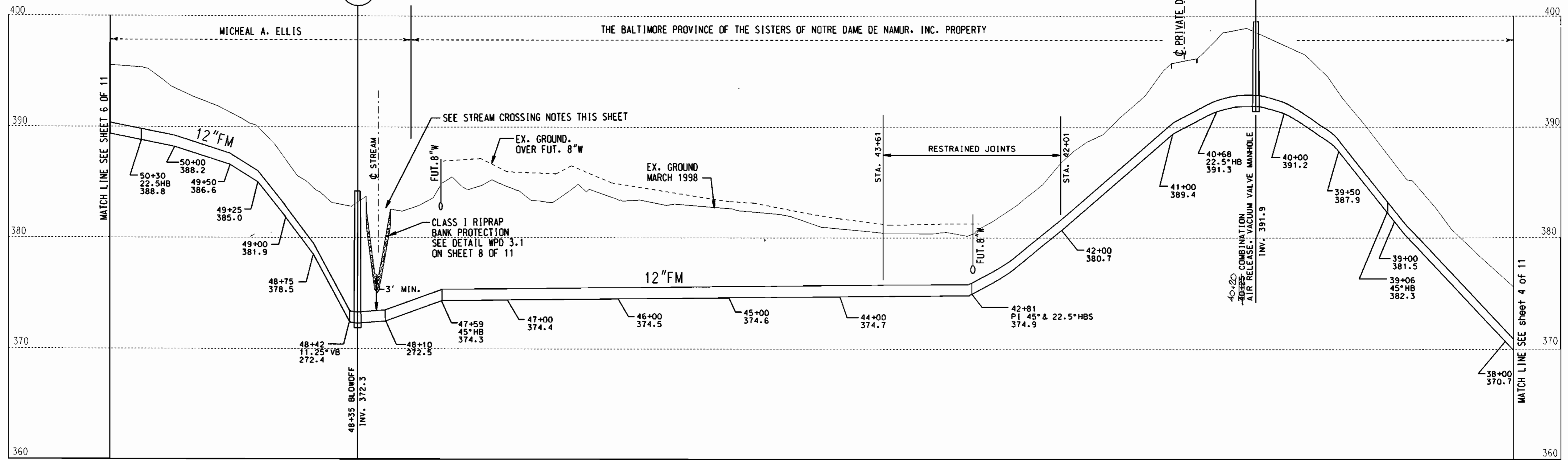
RESTORATION SCHEDULE (BASED ON FORCE MAIN ALIGNMENT)		
STA. TO STA.	TYPE	
37+92 - 40+75	SEED & MULCH	
40+75 - 41+05	ASPHALT PAVING	
41+05 - 47+95	SEED & MULCH	
47+95 - 48+25	RIP-RAP	
48+25 - 48+40	SEED & MULCH	
48+40 - 48+75	WETLANDS	
48+75 - 50+58	SEED & MULCH	

SOIL BORING SCHEDULE		
NUMBER	FM STATION	OFFSET
B-209	40+25	⊕
B-210	42+82	⊕
B-211	46+32	⊕
B-212	48+35	⊕

- NOTES: 1. SEE SHEET 6 OF 11 FOR FORCE MAIN BLOW-OFF DETAIL
2. COMBINATION VACUUM/AIR RELEASE VALVE:
- a. MANHOLES CONSTRUCTION SHALL BE AS SHOWN IN DETAIL W4.11 VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS.
  - b. THE VALVE SHALL BE FIGURE 935 BY G.A. INDUSTRIES OR SIMILAR MODEL BY APCD, VALVEMATIC, OR APPROVED EQUAL.



FORCE MAIN LOCATION DATA			
STATION	DESCRIPTION	NORTH	EAST
39+06	45° HB	568557.24	1378164.81
40+25	AIR RELEASE NO. 1	568668.45	1378205.83
40+60	22.5° HB	568701.57	1378218.05
42+81	PI 45° & 22.5° HBS	568922.09	1378202.73
46+99	PI CURVE NO. 4	569054.79	1377805.62
47+59	45° HB	569061.54	1377745.59
48+35	BLOWOFF NO. 2	569120.98	1377698.18
50+30	22.5° HB	569273.08	1377576.83



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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

Prepared by: *Whitman, Reardon and Associates, LLP.*

DATE: 2-18-99

PREPARED BY: **WR&A**  
Whitman, Reardon and Associates, LLP.

DATE: 2-18-99

DES: WRD/EJM  
DRN: EJM/GWG  
CHK: JAA  
DATE: 12/07/98

REVISION: 1. ASBUILT'S CONDITIONS ADDED TO PLAN

PLAN AND PROFILE OF 12" FORCE MAIN

600' SCALE MAP NO. 31 BLOCK NO. 16

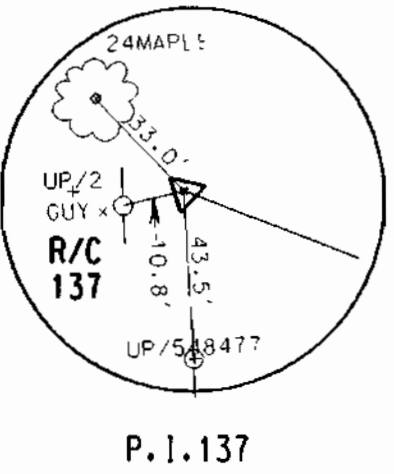
ROCKBURN FORCE MAIN AND GRAVITY SEWER CAPITAL PROJECT NO. S-6200 CONTRACT NO. 10-3696 FIRST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

C-4

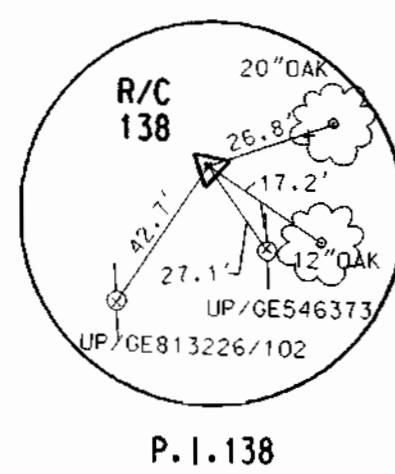
SCALE AS SHOWN

SHEET 5 OF 11

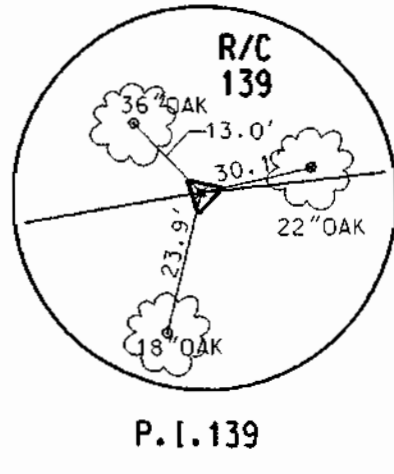




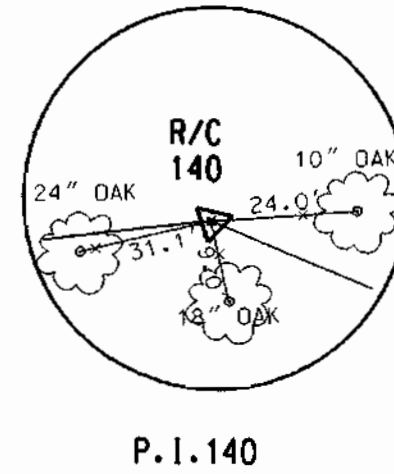
P. I. 137



P. I. 138



P. I. 139



P. I. 140

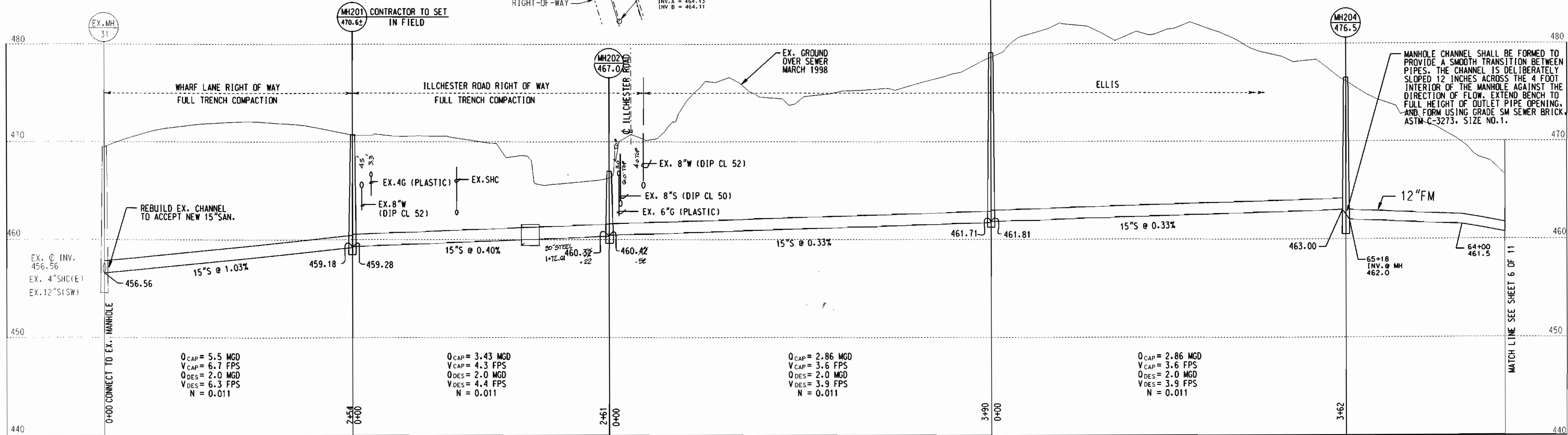
SOIL BORING SCHEDULE		
NUMBER	STATION	OFFSET
B-217	@ MH 204	€
B-218	@ MH 203	€

NOTE: 1. THE EXISTING PRIVATE DRIVEWAY HAS BEEN SHADED FOR CLARITY. THE CONTRACTOR SHALL MAKE EVERY ATTEMPT TO PROTECT AND SAVE AS MANY TREES AS POSSIBLE, ESPECIALLY THOSE MARKED AS "SAVE", WITHIN THE LIMIT OF DISTURBANCE.  
2. A SMALL DIAMETER PLASTIC PIPE WATER SERVICE FOR THE ELLIS PROPERTY IS BURIED APPROXIMATELY 3 TO 4' DEEP ALONG THE SOUTH EDGE OF SAID PRIVATE DRIVEWAY FROM ILLCHESTER ROAD TO THE ELLIS RESIDENCE. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THIS WATER SERVICE, AND ALL OTHER BURIED UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS, THROUGHOUT THE DURATION OF THIS CONTRACT.

CONTROL SCHEDULE AND BENCH MARKS				
NUMBER	DESCRIPTION	NORTH	EAST	ELEV.
P. I. 140	REBAR & CAP	569603.19	1377411.24	474.81
P. I. 139	REBAR & CAP	570811.02	1377173.88	481.77
P. I. 138	REBAR & CAP	571071.57	1376838.07	470.01
P. I. 137	REBAR & CAP	571509.45	1376668.02	465.90

FORCE MAIN LOCATION DATA			
STATION	DESCRIPTION	NORTH	EAST
65+18	DISCHARGE INTO MH 204	570612.32	1377384.71

RESTORATION SCHEDULE (BASED ON SEWER & FM ALIGNMENTS)				
MH TO MH	STA. TO	STA.	TYPE	
31	201	0+00	2+54	ASPHALT PAVING
201	202	0+00	0+19	ASPHALT PAVING
"	"	0+19	1+86	SOD
"	"	1+86	2+61	SEED & MULCH
202	203	0+00	0+10	SEED & MULCH
"	"	0+10	0+35	ASPHALT PAVING
"	"	0+35	3+90	SEED & MULCH
202	203	0+00	3+62	SEED & MULCH
OVER FM	65+18	63+56		SEED & MULCH

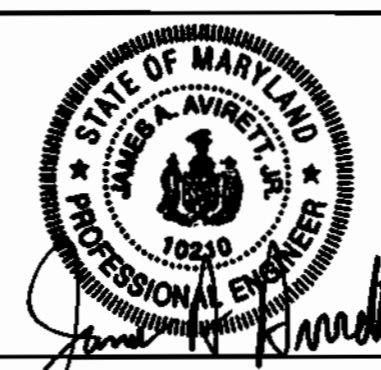


PROFILE  
SCALE: HOR. 1" = 50'  
VERT. 1" = 5'

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

Director of Public Works: *John J. ...* DATE: 2-18-99  
 Chief, Bureau of Engineering: *Robert J. ...* DATE: 2-18-99  
 Chief, Bureau of Utilities: *...* DATE: 2-18-99  
 Chief, Utility Design Division: *...* DATE: 2-18-99

PREPARED BY:  
**WR&A**  
Whitman, Reardon and Associates, LLP.



DES:	WRD/EJM
DRN:	EJM/GWG
CHK:	JAA
DATE:	12/07/98
KCI:	1
BY:	NO.
REVISION:	ASBUILT CONDITIONS ADDED TO PLAN

PLAN AND PROFILE  
12" FORCE MAIN  
14" & 15" GRAVITY SEWER

600' SCALE MAP NO. 31 BLOCK NO. 10&16

ROCKBURN FORCE MAIN  
AND GRAVITY SEWER  
CAPITAL PROJECT NO. S-6200  
CONTRACT NO. 10-3696  
FIRST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

C-6  
SCALE AS SHOWN  
SHEET 7 OF 11



**SEDIMENT CONTROL NOTES**

- A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF UTILITIES, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION. (410-313-1855)
- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND REVISIONS THERETO.
- FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: (a) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1; (b) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 7, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
- ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS, SOD, TEMPORARY SEEDING, AND MULCHING (SEC. G). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
- ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMITS FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- SITE ANALYSIS:
 

TOTAL AREA OF SITE	1000 ACRES
AREA TO BE ROCKED OR PAVED	6,668 ACRES
AREA TO BE VEGETATIVELY STABILIZED	0.078 ACRES
TOTAL CUT	6.59 ACRES
TOTAL FILL	20000 CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION:	APPROVED
- ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
- TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACKFILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER. IMMEDIATELY FOLLOWING PIPE INSTALLATION, THE TRENCH SHALL BE BACKFILLED, COMPACTED AND IMMEDIATELY STABILIZED (MULCHED, SEEDED, AND OR SODDED MECHANICAL STABILIZATION) AT THE END OF EACH WORKING DAY. SILT FENCE SHALL BE PLACED IMMEDIATELY DOWNHILL OF ANY DISTURBED AREA INTENDED TO REMAIN DISTURBED LONGER THAN ONE (1) DAY.

**REQUIRED SEQUENCE OF CONSTRUCTION**

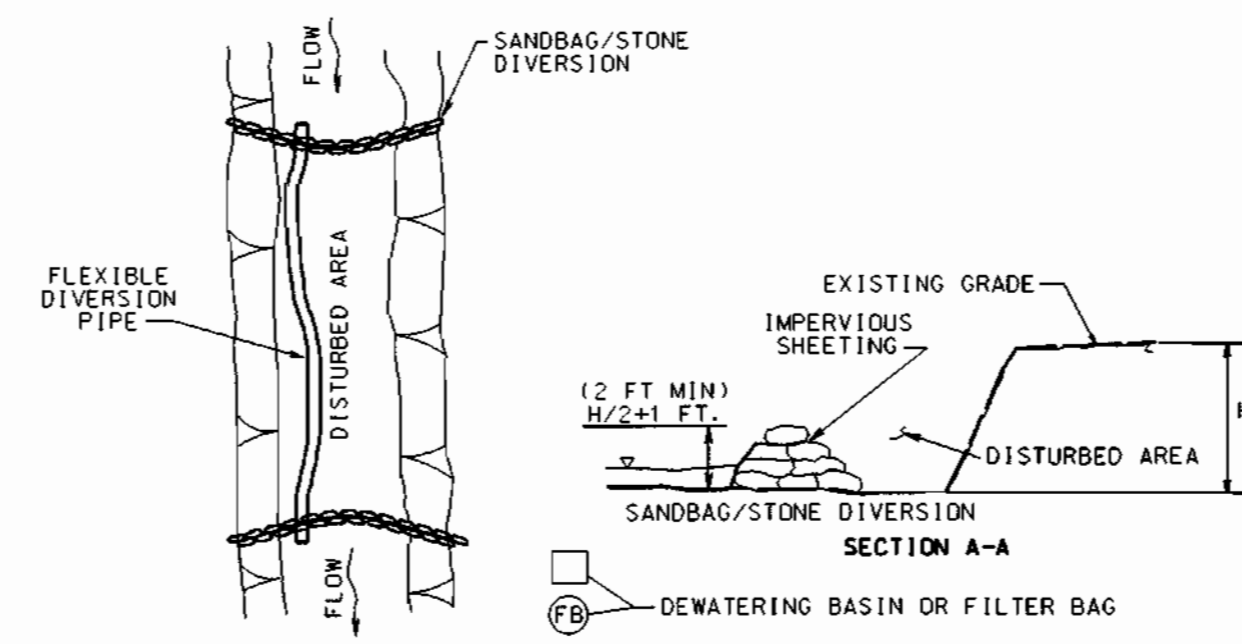
- OBTAIN THE REQUIRED GRADING PERMIT. (10 DAYS)
- NOTIFY MISS UTILITY 48 HOURS BEFORE BEGINNING ANY WORK @ (1-800-257-7777). NOTIFY HOWARD COUNTY SEDIMENT CONTROL DIVISION 24 HOURS BEFORE STARTING ANY WORK @ 410-313-1870 (12 DAYS)
- INSTALL THE REQUIRED SEDIMENT AND EROSION CONTROL DEVICES AND STABILIZE CONSTRUCTION ENTRANCE AS INDICATED ON THESE PLANS. (5 DAYS)
- CONSTRUCT PIPELINES AS SHOWN ON THE CONSTRUCTION DRAWINGS, KEEPING ALL CONSTRUCTION ACTIVITIES WITHIN THE LIMIT OF DISTURBANCE. SEE SEDIMENT CONTROL NOTE NO. 11. ALL TREES SHALL BE PRESERVED AND PROTECTED OUTSIDE OF THE UTILITY EASEMENTS, ALTHOUGH THEY MAY BE WITHIN THE LIMITS OF DISTURBANCE. (150 DAYS)
- THE CONTRACTOR SHALL INSPECT AND PROVIDE NECESSARY MAINTENANCE ON THE SEDIMENT AND EROSION CONTROL DEVICES SHOWN HEREON, AFTER EACH RAINFALL AND ON A DAILY BASIS. (2 DAYS)
- REMOVE SEDIMENT FROM ROADWAY AND DRESS STONE CONSTRUCTION ENTRANCE AS REQUIRED. (1 DAY)
- FINE GRADE ALL AREAS DISTURBED BY PIPELINE CONSTRUCTION AND STABILIZE ACCORDING TO RESTORATION SCHEDULES ON EACH SHEET OF THE CONSTRUCTION DRAWINGS. FOR PERMANENT AND TEMPORARY SEEDING IN THE WETLANDS AND WETLAND BUFFERS, SEE NOTES 18 AND 19 UNDER BEST MANAGEMENT PRACTICES IN NON-TIDAL WETLANDS AND WETLAND BUFFERS ON SHEET 9 OF 11.
- FOLLOWING SUCCESSFUL STABILIZATION OF ALL DISTURBED AREAS, AND AFTER PERMITS HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL MEASURES AND STABILIZE REMAINING DISTURBED AREAS WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH. (5 DAYS)

**SEQUENCE OF CONSTRUCTION: WATERWAY CROSSING**

- OBTAIN THE REQUIRED PERMITS/APPROVALS FROM THE APPROPRIATE AGENCIES.
- NOTIFY THE COMPLIANCE DIVISION OF THE MARYLAND WATER MANAGEMENT ADMINISTRATION AT LEAST FIVE (5) DAYS PRIOR TO INITIATION OF CONSTRUCTION AND FIVE (5) DAYS AFTER WORK ENDS. THE BALTIMORE OFFICE IS (410) 631-3510.
- CONTRACTOR SHALL NOTE THE TIME OF YEAR RESTRICTIONS ON WORK WITHIN THE STREAM SHOWN ON THE PERMITS.
- INSTALL TEMPORARY ACCESS BRIDGE (DETAIL 35 ON SHEET 9 OF 11), EITHER THE DIVERSION PIPE OR THE SANDBAG/STONE DIVERSION (DETAILS WPD 2-2 AND 2-3 ON THIS SHEET, WHICHEVER IS CALLED FOR ON THE DRAWINGS, THE FILTER BAG (DETAIL THIS SHEET) AND THE SUMP PIT (DETAIL 20-B, SHEET 9 OF 11). THE SEDIMENT CONTROL INSPECTOR MUST APPROVE ALL CONTROLS BEFORE COMMENCING WORK.
- INSTALL PIPELINE AND RIPRAP BANK PROTECTION (DETAIL THIS SHEET) ACCORDING TO THE DRAWINGS AND SPECIFICATIONS DURING A TIME OF FAVORABLE WEATHER FORECAST.
- WITH MINIMAL DISTURBANCE REMOVE DIVERSION CONTROLS, BRIDGE AND FILTER BAG AND STABILIZE ALL DISTURBED AREAS.

**SEDIMENT CONTROL LEGEND**

- SF— SILT FENCE
- SSF— SUPER SILT FENCE
- LOD LIMIT OF DISTURBANCE
- [Symbol] UTILITY CROSSING
- [Symbol] STABILIZED CONSTRUCTION ENTRANCE
- [Symbol] FILTER BAG
- [Symbol] SUMP PIT
- [Symbol] EROSION CONTROL MATTING



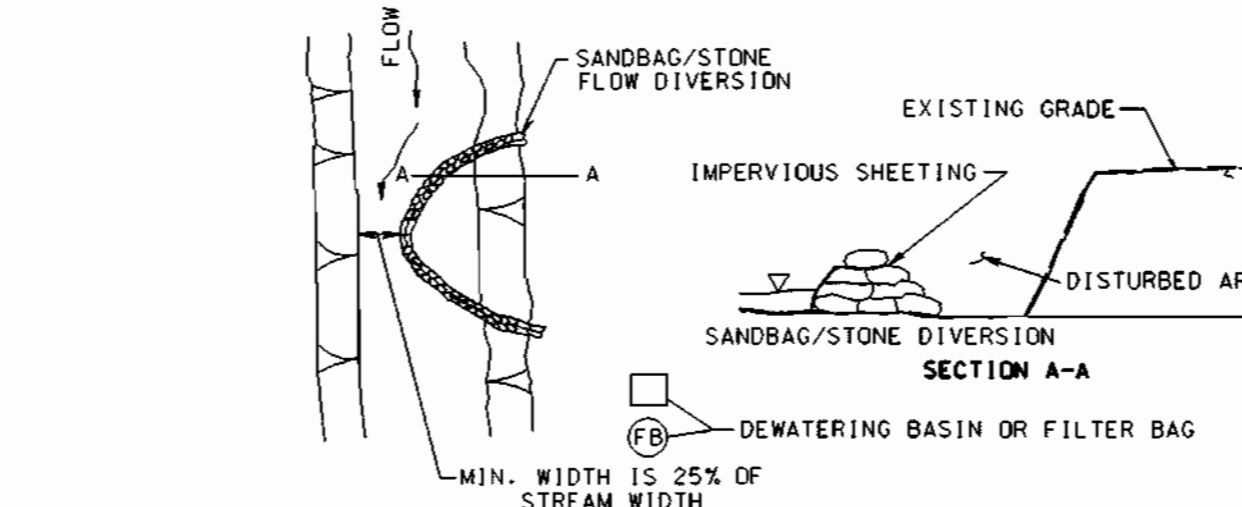
**1. DESCRIPTION**  
THE WORK SHALL CONSIST OF INSTALLING A FLOW DIVERSION STRUCTURE WHEN CONSTRUCTION ACTIVITIES TAKE PLACE WITHIN THE STREAM CHANNEL SUCH AS CULVERT CONSTRUCTION OR CULVERT REPLACEMENT.

**2. MATERIAL SPECIFICATIONS**  
1. SANDBAGS: SANDBAGS SHALL CONSIST OF MATERIAL WHICH ARE RESISTANT TO ULTRA-VIOLET RADIATION, TEARING AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL (I.E., SAND, FINE GRAVEL, ETC.).  
2. STONE: STONE SHALL BE WASHED AND HAVE A MINIMUM DIAMETER OF 6 INCHES.  
3. SHEETING: SHEETING SHALL CONSIST OF POLYETHYLENE OR OTHER MATERIAL WHICH IS IMPERVIOUS AND RESISTANT TO PUNCTURE AND TEARING.

**3. CONSTRUCTION REQUIREMENTS**  
1. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED AS THE FIRST ORDER OF WORK.  
2. THE HEIGHT OF THE SANDBAG/STONE DIVERSION STRUCTURE SHALL BE ONE HALF THE DISTANCE FROM THE STREAM BED TO THE BANK PLUS ONE FOOT, AS INDICATED IN SECTION A-A. THE SANDBAGS SHALL BE PLACED ON A SMOOTH, PREPARED SURFACE.  
3. ALL EXCAVATED MATERIALS SHALL BE DISPOSED OF IN A SCD APPROVED DISPOSAL AREA OUTSIDE THE 100-YEAR FLOODPLAIN UNLESS OTHERWISE APPROVED ON THE PLANS BY THE WR&A.  
4. ALL DEWATERING OF THE CONSTRUCTION AREA SHALL BE PUMPED TO A FILTER BAG OR OTHERWISE APPROVED ON THE PLANS BY THE WR&A.  
5. SHEETING SHALL BE OVERLAPPED A MINIMUM OF 18 INCHES.  
6. THE DIVERSION PIPE SHALL HAVE A MINIMUM DIAMETER OF SUFFICIENT SIZE TO CONVEY THE NORMAL STREAM FLOW.  
7. IF NECESSARY, SILT FENCE OR STRAWBALES SHALL BE INSTALLED AROUND THE PERIMETER OF THE WORK AREA.  
8. SEDIMENT CONTROL DEVICES ARE TO REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED AND THE INSPECTING AUTHORITY APPROVES THEIR REMOVAL.  
9. THE FLEXIBLE PIPE MAY BE MOVED WITHIN THE STREAM BED TO ACCOMMODATE UTILITY CONSTRUCTION. HOWEVER, IT SHALL BE RETURNED TO A SECURE POSITION CAPABLE OF FULL HYDRAULIC CAPACITY AT THE END OF EACH DAY.

**\* MODIFIED DIVERSION PIPE WPD 2.2**

\* DETAIL WPD 2.2 HAS BEEN MODIFIED TO SHOW A FLEXIBLE DIVERSION PIPE WITHIN THE STREAM INSTEAD OF EXCAVATED INTO THE BANK.

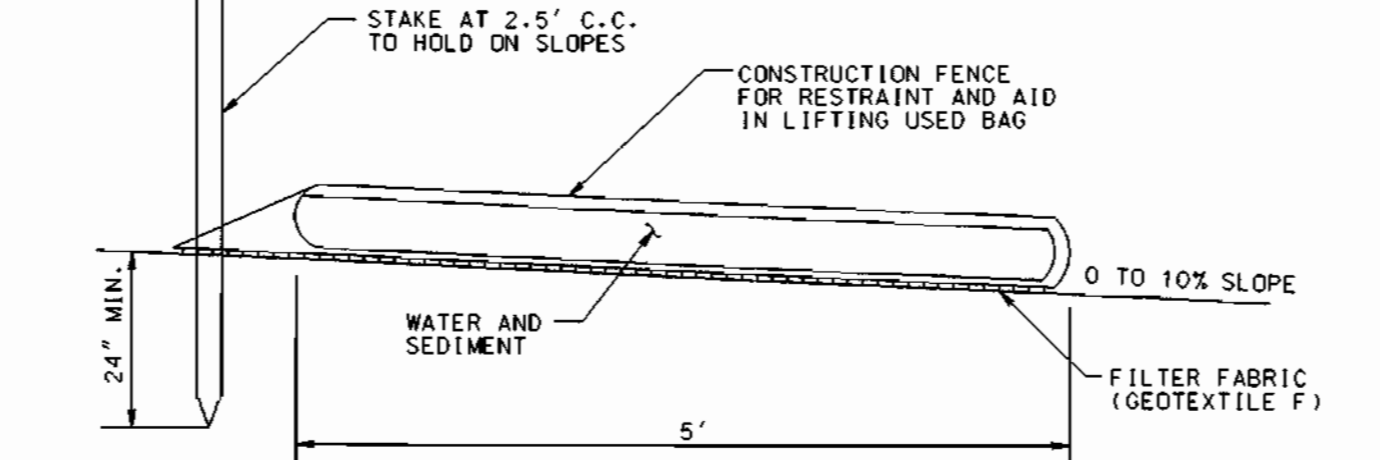
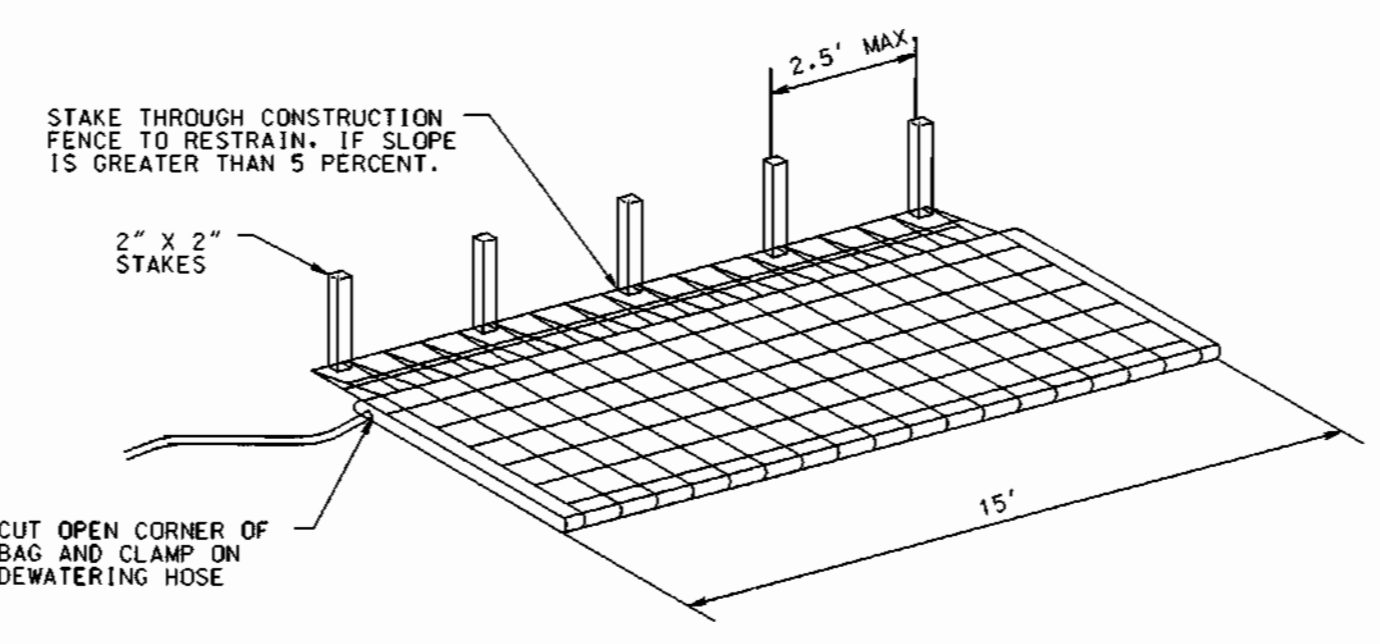


**1. DESCRIPTION**  
THE WORK SHALL CONSIST OF INSTALLING FLOW DIVERSIONS FOR THE PURPOSE OF EROSION CONTROL WHEN CONSTRUCTION ACTIVITIES TAKE PLACE WITHIN THE STREAM CHANNEL SUCH AS BANK STABILIZATION OR BRIDGE ABUTMENT CONSTRUCTION.

**2. MATERIAL SPECIFICATIONS**  
1. SANDBAGS: SANDBAGS SHALL CONSIST OF MATERIALS WHICH ARE RESISTANT TO ULTRA-VIOLET RADIATION, TEARING AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL (I.E., SAND, FINE GRAVEL, ETC.).  
2. STONE: STONE SHALL BE WASHED AND HAVE A MINIMUM DIAMETER OF 6 INCHES.  
3. SHEETING: SHEETING SHALL CONSIST OF POLYETHYLENE OR OTHER MATERIAL WHICH IS IMPERVIOUS AND RESISTANT TO PUNCTURE AND TEARING.

**3. CONSTRUCTION REQUIREMENTS**  
1. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED AS THE FIRST ORDER OF WORK.  
2. THE DIVERSION STRUCTURE SHALL BE INSTALLED FROM UPSTREAM TO DOWNSTREAM.  
3. THE HEIGHT OF THE DIVERSION STRUCTURE SHALL BE ONE HALF THE DISTANCE FROM STREAM BED TO STREAM BANK PLUS ONE FOOT, AS INDICATED ON THE CROSS SECTION VIEW.  
4. ALL EXCAVATED MATERIALS SHALL BE DISPOSED OF IN A SCD APPROVED DISPOSAL AREA OUTSIDE THE 100-YEAR FLOODPLAIN UNLESS OTHERWISE APPROVED ON THE PLANS BY THE WR&A.  
5. ALL DEWATERING OF THE CONSTRUCTION AREA SHALL BE PUMPED TO A DEWATERING BASIN OR FILTER BAG PRIOR TO RE-ENTERING THE STREAM.  
6. SHEETING SHALL BE OVERLAPPED SUCH THAT THE UPSTREAM PORTION COVERS THE DOWNSTREAM PORTION WITH AT LEAST AN 18-INCH OVERLAP.  
7. SEDIMENT CONTROL DEVICES ARE TO REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED IN ACCORDANCE WITH AN APPROVED SEDIMENT AND EROSION CONTROL PLAN AND THE INSPECTING AUTHORITY APPROVES THEIR REMOVAL.

**SANDBAG/STONE DIVERSION WPD 2.3**



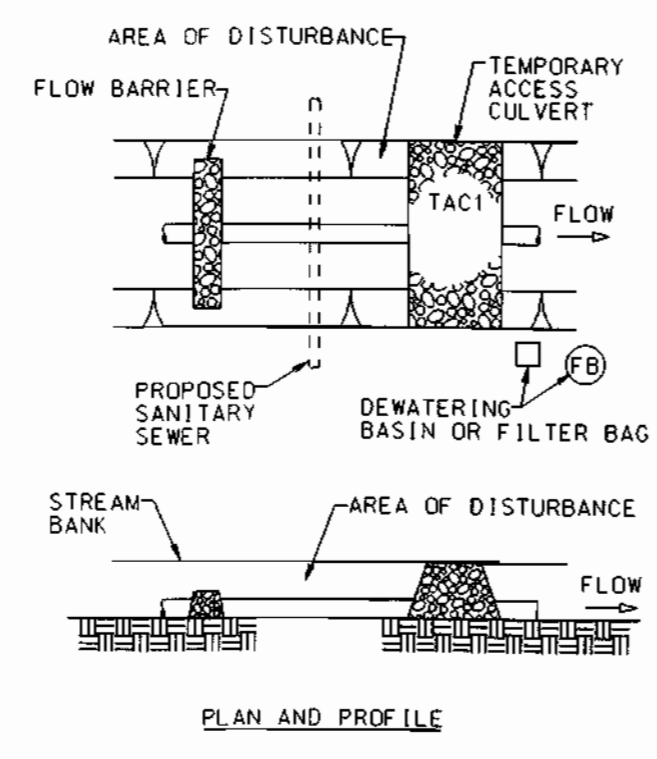
**NOTES:**  
1. FILTER BAG SHALL BE PLACED ON A SLOPING OR LEVEL, WELL GRADED VEGETATED SITE SUCH THAT WATER WILL FLOW AWAY FROM DEVICE AND ANY WORK AREAS.  
2. WIDTH AND LENGTH SHALL BE AS SHOWN.  
3. THE FILTER BAG MUST BE STAKED IN PLACE AND SECURED TO THE PUMP DISCHARGE LINE.  
4. FILTER BAG SHALL NOT BE USED FOR DISCHARGE FLOWS GREATER THAN 300 GPM.  
5. DEVICE SHALL BE REMOVED AND DISPOSED OF AFTER BAG IS FILLED WITH SEDIMENT. SEDIMENT FROM BAG SHALL BE SPREAD IN AN UPLAND AREA.  
6. FILTER FABRIC SHALL MEET THE FOLLOWING REQUIREMENTS FOR GEOTEXTILE CLASS F:  
TENSILE STRENGTH 50 LBS/IN (MIN.) TEST: MSMT 509  
TENSILE MODULUS 20 LBS/IN (MIN.) TEST: MSMT 509  
FLOW RATE 0.3 GAL/FT<sup>2</sup>/MINUTE (MAX.) TEST: MSMT 322  
FILTERING EFFICIENCY 75% (MIN.) TEST: MSMT 322

**FILTER BAG  
TEMPORARY EROSION CONTROL MEASURE (FB)**

**I. DESCRIPTION**  
THE WORK SHALL CONSIST OF INSTALLING A FLOW DIVERSION STRUCTURE IN CONJUNCTION WITH A TEMPORARY CULVERT CROSSING DURING IN-STREAM CONSTRUCTION SUCH AS UTILITY CROSSINGS.

**II. CONSTRUCTION REQUIREMENTS**  
1. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED AS THE FIRST ORDER OF BUSINESS.  
2. PIPES MUST BE SIZED TO ACCOMMODATE NORMAL STREAM FLOW.  
3. THE FLOW BARRIER SHALL BE CONSTRUCTED OF SANDBAGS, WASHED RIPRAP OR OTHER APPROVED MATERIAL AS PER WPD 2.3. THE MATERIALS SHALL BE SIZED TO WITHSTAND NORMAL STREAM FLOW VELOCITIES.  
4. THE HEIGHT OF THE FLOW BARRIER SHALL BE ONE HALF THE DISTANCE FROM STREAM BED TO STREAM BANK PLUS ONE FOOT.  
5. ALL DEWATERING OF THE CONSTRUCTION AREA SHALL BE PUMPED TO A DEWATERING BASIN (WPD 1.1) OR FILTER BAG (SEE DETAIL THIS SHEET) PRIOR TO RE-ENTERING THE STREAM.  
6. THE TEMPORARY CULVERT CROSSING SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DETAIL 36, 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SEDIMENT AND EROSION CONTROL.  
7. SEDIMENT CONTROL DEVICES SHALL 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.

**CULVERT PIPE WITH ACCESS ROAD WPD 2.1**

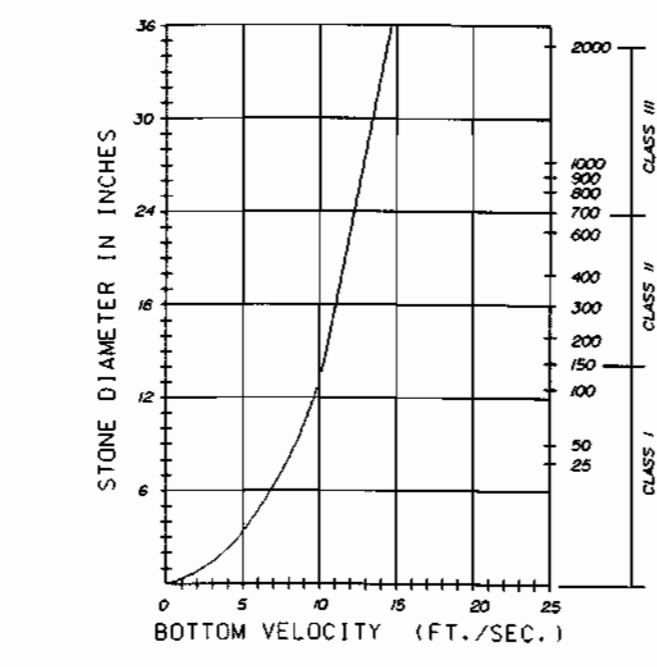
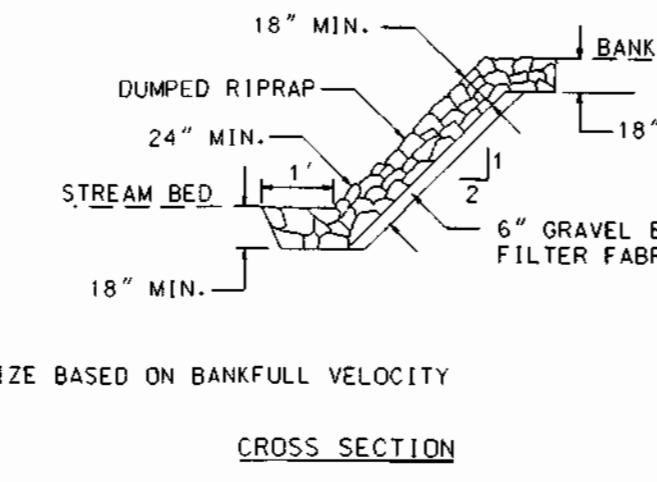


**I. DESCRIPTION**  
THIS WORK SHALL CONSIST OF PROTECTING SLOPES AND CHANNELS FROM EROSION WITH COVERINGS OF STONE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS SHOWN ON THIS DRAWING.

**II. MATERIAL SPECIFICATIONS**  
1. BEDDINGS:  
A. BANK RUN GRAVEL SHALL MEET THE FOLLOWING REQUIREMENTS:  

% LESS THAN	U.S. STANDARD SIEVE SIZE
100	2 1/2 IN.
85 - 100	1 IN.
60 - 100	1/2 IN.
35 - 100	NO. 10
20 - 50	NO. 40
3 - 20	NO. 200

  
 B. GEOTEXTILE FILTER FABRIC SHALL MEET THE FOLLOWING REQUIREMENTS:  
 TENSILE STRENGTH 200 LBS.  
 BURST STRENGTH 350 LBS.  
 PUNCTURE STRENGTH 70 LBS.  
 PERMEABILITY .20 CM/SEC.  
 ELONGATION AT FAILURE 30 %  
 MINIMUM LAP LENGTH 24 IN.  
  
 2. RIPRAP:  
 THE MAXIMUM WEIGHT OF STONE SHALL BE BASED UPON THE BANKFULL STREAM CHANNEL VELOCITY, USING THE GIVEN CHART. THE GRADATION OF THE STONE SHALL BE AS INDICATED.



**SIZE RIPRAP PER STREAM VELOCITY**

RIPRAP GRADATION	SIZE	PERCENT OF TOTAL WEIGHT SMALLER THAN THE GIVEN SIZE
CLASS I	150 LB (70KG) 2 LB (1KG)	100 10 MAX.
CLASS II	700 LB (320KG) 20 LB (10KG)	100 10 MAX.
CLASS III	2000 LB (910KG) 40 LB (20KG)	100 10 MAX.

**RIPRAP BANK PROTECTION WPD 3.1**

BY THE DEVELOPER:  
"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 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."  
  
 [Signature]  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 DIV. OF WATER AND SEWER  
 DATE: 1-21-99

BY THE ENGINEER:  
"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."  
  
 [Signature]  
 JAMES A. AVIRETT JR. P.E. 10210  
 DATE: 1/20/99

THESE PLANS HAVE BEEN REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.  
  
 [Signature]  
 USDA-NATURAL RESOURCES CONSERVATION SERVICE  
 DATE: 1/24/99  
  
 THESE PLANS FOR SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
  
 [Signature]  
 HOWARD COUNTY  
 DATE: 1/20/99

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND. [Signature] 2/18/99 DIRECTOR OF PUBLIC WORKS [Signature] 2-18-99 CHIEF, BUREAU OF UTILITIES		PREPARED BY: <b>WR&amp;A</b> Whitman, Reardon and Associates, LLP. [Signature]		DES: WRD/EJM DRN: EJM/GWG CHK: JAA DATE: 12/09/98		SEDIMENT CONTROL NOTES AND DETAILS		ROCKBURN FORCE MAIN & GRAVITY SEWER CAPITAL PROJECT NO. S-6200 CONTRACT NO. 10-3696 FIRST ELECTION DISTRICT HOWARD COUNTY, MARYLAND		SCALE AS SHOWN SHEET 8 OF 11 SC-1
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20.0 STANDARDS AND SPECIFICATIONS

FOR VEGETATIVE STABILIZATION

Definition

Using vegetation as cover for barren soil to protect it from forces that cause erosion.

Purpose

Vegetative Stabilization specifications are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas, and improving wildlife habitat and visual resources.

Conditions Where Practice Applies

This practice shall be used on denuded areas as specified on the plans and may be used on highly erodible or critically eroding areas. This specification is divided into Temporary Seeding, to quickly establish vegetative cover for short duration (up to one year), and Permanent Seeding, for long term vegetative cover. Examples of applicable areas for Temporary Seeding are temporary soil stockpiles, cleared areas being left idle between construction phases, earth dikes, etc. and for Permanent Seeding are lawns, dams, cut and fill slopes and other areas at final grade, former stockpile and staging areas, etc.

Effects on Water Quality and Quantity

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Vegetation, over time, will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control devices must remain in place during grading, seeded preparation, seeding, mulching and vegetative establishment to prevent large quantities of sediment and associated chemicals and nutrients from washing into surface waters.

Section I - Vegetative Stabilization Methods and Materials

A. Site Preparation

- i. Install erosion and sediment control structures (either temporary or permanent) such as diversions, grade stabilization structures, berms, waterways, or sediment control basins.
- ii. Perform all grading operations at right angles to the slope. Final grading and shaping is not usually necessary for temporary seeding.
- iii. Schedule required soil tests to determine soil amendment composition and application rates for sites having disturbed area over 5 acres.

B. Soil Amendments (Fertilizer and Lime Specifications)

- i. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas over 5 acres. Soil analysis may be performed by the University of Maryland or a recognized commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
- ii. Fertilizers shall be uniform in composition, free flowing and suitable for accurate application by approved equipment. Manure may be substituted for fertilizer with prior approval from the appropriate state authority. Fertilizers shall all be delivered to the site fully labeled according to the applicable state fertilizer laws and shall bear the name, trade name or trademark and warrantee of the producer.
- iii. Lime materials shall be ground limestone (hydrated or burnt lime may be substituted) which contains at least 50% total oxides (calcium oxide plus magnesium oxide). Limestone shall be ground to such fineness that at least 50% will pass through a #100 mesh sieve and 98 - 100% will pass through a #20 mesh sieve.
- iv. Incorporate lime and fertilizer into the top 3 - 5" of soil by disking or other suitable means.

C. Seeded Preparation

- i. Temporary Seeding
  - a. Seeded preparation shall consist of loosening soil to a depth of 3" to 5" by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on a construction equipment. After the soil is loosened it should not be rolled or dragged smooth but left in the roughened condition. Sloped areas (greater than 3:1) should be tracked leaving the surface in an irregular condition with ridges running parallel to the contour of the slope.
  - b. Apply fertilizer and lime as prescribed on the plans.
  - c. Incorporate lime and fertilizer into the top 3 - 5" of soil by disking or other suitable means.
- ii. Permanent Seeding
  - a. Minimum soil conditions required for permanent vegetative establishment:
    1. Soil pH shall be between 6.0 and 7.0
    2. Soluble salts shall be less than 500 parts per million (ppm).
    3. The soil shall contain less than 40% clay but enough fine grained material (60% silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception is if lowgrass or serotia lespedeza is to be planted, then a sandy soil (40% silt plus clay) would be acceptable.
    4. Soil shall contain 1.5% minimum organic matter by weight.
    5. Soil must contain sufficient pore space to permit adequate root penetration.
    6. If these conditions cannot be met by soils on site, adding topsoil is required in accordance with Section 21 Standard and Specification for Topsoil.
  - b. Areas previously graded in conformance with the drawings shall be maintained in a true and even grade, then scarified or otherwise loosened to a depth of 3 - 5" to permit bonding of the topsoil to the surface area and to create horizontal erosion check slots to prevent topsoil from sliding down a slope.
  - c. Apply soil amendments as per soil test or as included on the plans.
  - d. Mix soil amendments into the top 3 - 5" of topsoil by disking or other suitable means. Lawn areas should be raked to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Where site conditions will not permit normal seeded preparation, loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface. Steep slopes (steeper than 3:1) should be tracked by a dozer leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. The top 1 - 3" of soil should be loose and friable. Seeded loosening may not be necessary on newly disturbed areas.

D. Seed Specifications

- i. All seed must meet the requirements of the Maryland State Seed Law. All seed shall be subject to re-testing by a recognized seed laboratory. All seed used shall have been tested within the 6 months immediately preceding the date of sowing such material on this job.
 

Note: Seed tags shall be made available to the inspector to verify type and rate of seed used.
- ii. Inoculant - The inoculant for treating legume seed in the seed mixtures shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species. Inoculants shall not be used later than the date indicated on the container. Add fresh inoculant as directed on package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 - 80°F. can weaken bacteria and make the inoculant less effective.

E. Methods of Seeding

- i. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer), broadcast or drop seeder, or a cultipacker seeder.
    - a. If fertilizer is being applied at the time of seeding, the application rates amounts will not exceed the following: nitrogen: maximum of 100 lbs. per acre total of soluble nitrogen: P205 (phosphorous): 200 lbs/acre; K20 (potassium): 200 lbs/acre.
    - b. Lime - use only ground agricultural limestone. (Up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
    - c. Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without interruption.
  - ii. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
    - a. Seed spread dry shall be incorporated into the subsoil at the rates prescribed on the temporary or Permanent Seeding Summaries or Tables 25 or 26. The seeded area shall then be rolled with a weighted roller, to provide good seed to soil contact.
    - b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.
  - iii. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
    - a. Cultipacker seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seeded must be firm after planting.
    - b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.
- F. Mulch Specifications (In order of preference)
- i. Straw shall consist of thoroughly threshed wheat, rye or oat straw, reasonably bright in color, and shall not be musty, moldy, caked, decayed, or excessively dusty and shall be free of noxious weed seeds as specified in the Maryland Seed Law.
  - ii. Wood Cellulose Fiber Mulch (WCFM)
    - a. WCFM shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state.
    - b. WCFM shall be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
    - c. WCFM, including dye, shall contain no germination or growth inhibiting factors.
    - d. WCFM materials shall be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material shall form a blotter-like ground cover, on application, having moisture absorption and percolation properties and shall cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
    - e. WCFM material shall contain no elements or compounds of concentration levels that will be phytotoxic.
    - f. WCFM must conform to the following physical requirements: fiber length to approximately 10 mm., diameter approximately 1 mm., pH range of 4.0 to 8.5, ash content of 1.6% maximum and water holding capacity of 90% minimum.
- Note: Only sterile straw mulch should be used in areas where one species of grass is desired.

G. Mulching Seeded Areas - Mulch shall be applied to all seeded areas immediately after seeding.

- i. If grading is completed outside of the seeding season, mulch alone shall be applied as prescribed in this section and maintained until the seeding season returns and seeding can be performed in accordance with these specifications.
  - ii. When straw mulch is used, it shall be spread over all seeded areas at the rate of 2 tons/acre. Mulch shall be applied to a uniform loose depth of between 1" and 2". Mulch applied shall achieve a uniform distribution and depth so that the soil surface is not exposed. If a mulch anchoring tool is to be used, the rate should be increased to 2.5 tons/acre.
  - iii. Wood cellulose fiber used as a mulch shall be applied at a net dry weight of 1,500 lbs. per acre. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 lbs. of wood cellulose fiber per 100 gallons of water.
- H. Securing Straw Mulch (Mulch Anchoring): Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon size of area and erosion hazard:
- i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of two (2) inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should be used on the contour if possible.
  - ii. Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 pounds/acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
  - iii. Application of liquid binders should be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. The remainder of area should be appear uniform after binder application. Synthetic binders - such as Acrylic DLR (Agra-Tack), DCA-70, Petrosel, Terra Tax II, Terra Tack AR or other approved equal may be used at rates recommended by the manufacturer to anchor mulch.
  - iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer's recommendations. Netting is usually available in rolls 4' to 15' feet wide and 300 to 3,000 feet long.

Section II - Temporary Seeding

Vegetation - annual grass or grain used to provide cover on disturbed areas for up to 12 months. For longer duration of vegetative cover, Permanent Seeding is required.

A. Seed Mixtures - Temporary Seeding

- i. Select one or more of the species or mixtures listed in Table 26 for the appropriate Plant Hardiness Zone (from Figure 5) and enter them in the Temporary Seeding Summary below, along with application rates, seeding dates and seeding depths. If this Summary is not put on the plans and completed, then Table 26 must be put on the plans.
- ii. For sites having soil tests performed, the rates shown on this table shall be deleted and the rates recommended by the testing agency shall be written in. Soil tests are not required for Temporary Seeding.

TEMPORARY SEEDING SUMMARY

SEED MIXTURE (FOR HARDINESS ZONE 6-b)				FERTILIZER RATE (10-10-10)	LIME RATE	
FROM TABLE 26						
NO.	SPECIES	APPLICATION RATE (lb/acre)	SEEDING DATES	SEEDING DEPTHS		
	ANNUAL RYEGRASS	50	3/1 - 4/30 8/15 - 11/1	1/4"-1/2"	600 lb/acre (15 lb/1000 sf)	2 tons/acre (100 lb/1000 sf)

Section III: Permanent Seeding

Seeding grass and legumes to establish ground cover for a minimum period of one year on disturbed areas generally receiving low maintenance.

A. Seed Mixtures - Permanent Seeding

- i. Select one or more of the species or mixtures listed in Table 25 for the appropriate Plant Hardiness Zone (from Figure 5) and enter them in the Permanent Seeding Summary below, along with application rates and seeding dates. Seeding depths can be estimated using Table 26. If this summary is not put on the construction plans and completed, then Table 25 must be put on the plans. Additional planting specifications for exceptional sites such as shorelines, streambanks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-SSS Technical Field Office Guide, Section 342 - Critical Area Planting, For special lawn maintenance areas, see Section IV Sod and V Turfgrass.
- ii. For sites having disturbed area over 5 acres, the rates shown on this table shall be deleted and the rates recommended by the soil testing agency shall be written.
- iii. For areas receiving low maintenance, apply ureaform fertilizer (46-0-0) at 3 1/2 lbs./1000 sq. ft. (150 lbs/acre), in addition to the above soil amendments shown in the table below, to be performed at the time of seeding.

PERMANENT SEEDING SUMMARY

Seed Mixture (For Hardiness Zone 6-b)				Fertilizer Rate (10-20-20)			Lime Rate
FROM TABLE 25							
NO.	SPECIES	APPLICATION RATE (lb/acre)	SEEDING DATES	SEEDING DEPTHS	N	P205	K20
2	KENTUCKY BLUEGRASS 50%	150	3/1 - 5/15 8/15 - 11/15	1/4"-1/2"			
	CREeping RED FESCUE 40%				90 lb/acre (2.0lb/1000 sf)	175 lb/acre (4 lb/1000 sf)	175 lbs/acre (4 lb/1000 sf)
	RED TOP 10%						2 tons/acre (100 lb/1000 sf)

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

A. General Specifications

- i. Class of turfgrass sod shall be Maryland or Virginia State Certified or Approved. Sod labels shall be made available to the job foreman and inspector.
- ii. Sod shall be machine cut at a uniform soil thickness of 3/4", plus or minus 1/4", at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Individual pieces of sod shall be cut to the suppliers width and length. Maximum allowable deviation from standard widths and lengths shall be 5 percent. Broken pods and torn or uneven ends will not be acceptable.
- iii. Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
- iv. Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
- v. Sod shall be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period shall be approved by an agronomist or soil scientist prior to its installation.

B. Sod Installation

- i. During periods of excessively high temperature or in areas having dry subsoil, the subsoil shall be lightly irrigated immediately prior to laying the sod.
- ii. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and tightly wedged against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
- iii. Wherever possible, sod shall be laid with the long edges parallel to the contour and with staggering joints. Sod shall be rolled and tamped, pegged or otherwise secured to prevent slippage on slopes and to ensure solid contact between sod roots and the underlying soil surface.
- iv. Sod shall be watered immediately following rolling or tamping until the underside of the new sod pod and soil surface below the sod are thoroughly wet. The operations of laying, tamping and irrigating for any piece of sod shall be completed within eight hours.

C. Sod Maintenance

- i. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of 4". Watering should be done during the heat of the day to prevent wilting.
- ii. After the first week, sod watering is required as necessary to maintain adequate moisture content.
- iii. The first mowing of sod should not be attempted until the sod is firmly rooted. No more than 1/3 of the grass leaf shall be removed by the initial cutting or subsequent cuttings. Grass height shall be maintained between 2" and 3" unless otherwise specified.

SECTION IV - TURFGRASS ESTABLISHMENT

Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance. Areas to receive seed shall be tilled by disking or other approved methods to a depth of 2 to 4 inches, leveled and raked to prepare a proper seedbed. Stones and debris over 1/4 inches in diameter shall be removed. The resulting seedbed shall be in such condition that future mowing of grasses will pose no difficulty.

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

A. Turfgrass Mixtures

- i. Kentucky Bluegrass - Full sun mixture - For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and eastern shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds/1000 square feet. A minimum of three bluegrass cultivars should be chosen ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.
- ii. Kentucky Bluegrass/Perennial Rye - Full sun mixture - For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture/1000 square feet. A minimum of 3 Kentucky Bluegrass Cultivars must be chosen, with each cultivar ranging from 10% to 35% of the mixture by weight.
- iii. Tall Fescue/Kentucky Bluegrass - Full sun mixture - For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes: certified Tall Fescue Cultivars 95 - 100%, certified Kentucky Bluegrass Cultivars 0 - 5%. Seeding rate: 5 to 8 lb/1000 sf. One or more cultivars may be blended.
- iv. Kentucky Bluegrass/Fine Fescue - Shade Mixture - For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf areas. Mixture includes: certified Kentucky Bluegrass Cultivars 30-40% and certified Fine Fescue and 60-70%. Seeding rate: 1 1/2 - 3 lbs/1000 square feet. A minimum of 3 Kentucky bluegrass cultivars must be chosen, with each cultivar ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.

NOTE: Turfgrass varieties should be selected from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland".

B. Ideal times of seeding

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

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

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

C. Irrigation

If soil moisture is deficient, supply new seedlings with adequate water for plant growth (1/2" - 1" every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedlings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

D. Repair and Maintenance

Inspect all seeded areas for failures and make necessary repairs, replacements, and reseeding within the planting season.

- i. Once the vegetation is established, the site shall have 95% groundcover to be considered adequately stabilized.
- ii. If the stand provides less than 40% ground coverage, overseeding and fertilizing using half of the rates originally applied may be necessary.
- iii. If the stand provides between 40% and 94% ground coverage, overseeding and fertilizing using half of the rates originally applied may be necessary.
- iv. Maintenance fertilizer rates for permanent seedings are shown in Table 24. For lawns and other medium to high maintenance turfgrass areas refer to the University of Maryland publication "Lawn Care in Maryland" Bulletin No. 171.

SC-3

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

2/18/99  
DIRECTOR OF PUBLIC WORKS

2-18-99  
CHIEF, BUREAU OF UTILITIES

2-18-99  
CHIEF, BUREAU OF ENGINEERING

2-18-99  
CHIEF, UTILITY DESIGN DIVISION

PREPARED BY:

**WR&A**  
Whitman, Reardon and Associates, LLP.



DES: WRD/EJM					
DRN: EJM/GWG					
CHK: JAA					
DATE: 12/09/98	BY: NO.	REVISION	DATE	600' SCALE MAP NO.	BLOCK NO.

SEDIMENT CONTROL NOTES AND SCHEDULES

ROCKBURN FORCE MAIN & GRAVITY SEWER  
CAPITAL PROJECT NO. S-6200  
CONTRACT NO. 10-3696  
FIRST ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET  
10 OF 11