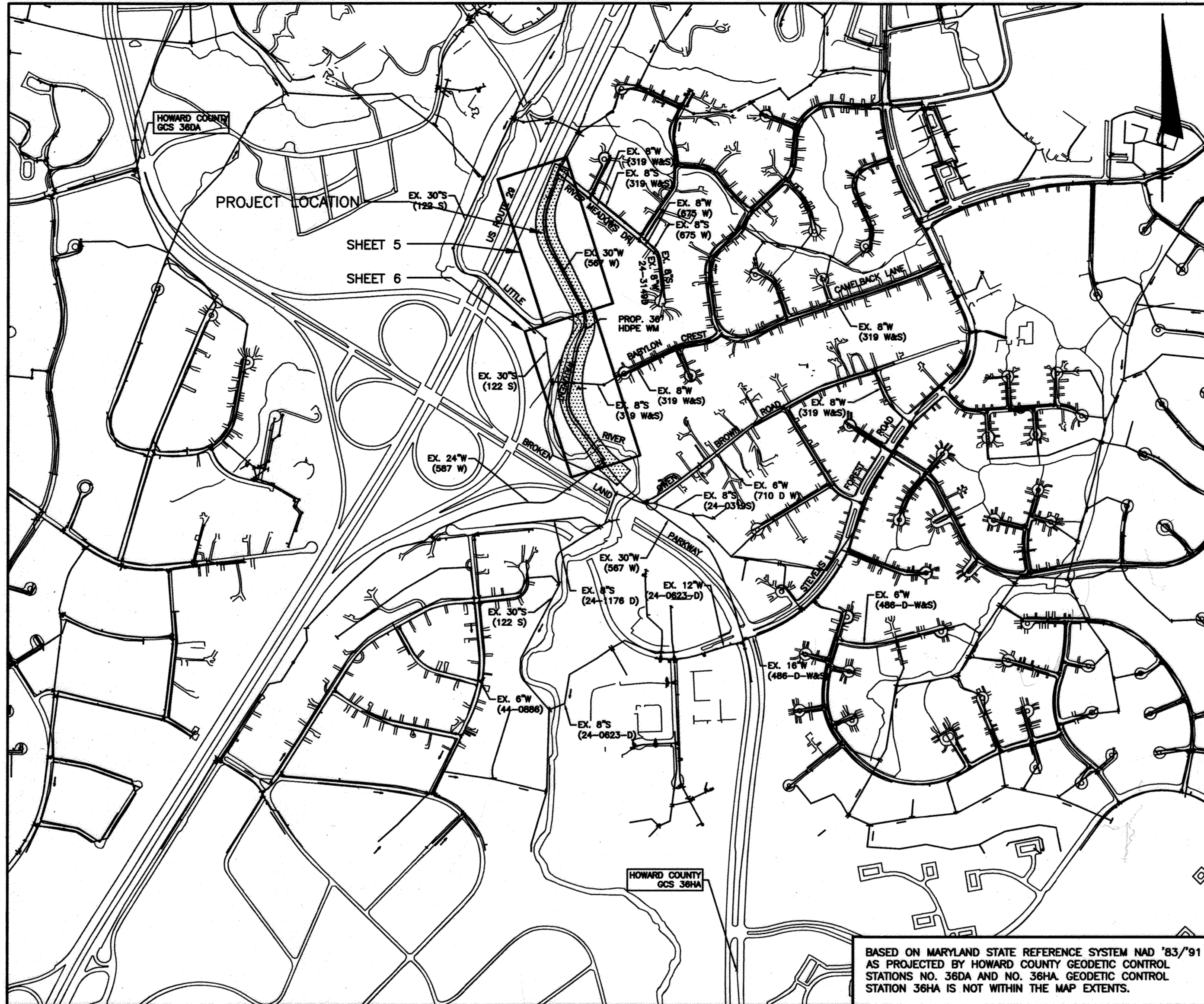


QUANTITIES					
ITEM	BID AMOUNT	UNIT	AS-BUILT AMOUNT	MATERIAL	SUPPLIER
36" HDPE WATERMAIN	2182	L.F.	2098		
36" DIP WATERMAIN (RJ)	30	L.F.	9.2		
30" DIP WATERMAIN (RJ)	48	L.F.	71.1		
24" DIP WATERMAIN (RJ)	20	L.F.	14.9		
30" RJ CROSS	1	EA.	1		
36" HPDE x 36" DIP TRANSITION	2	EA.	2		
30" MECHANICAL JOINT SLEEVE	2	EA.	1		
PCCP TRANSITION FLANGE	4	EA.	6		
36" PLUG (RJ)	1	EA.	1		
36" RSGV	1	EA.	1		
30" RSGV	4	EA.	5		
24" RSGV	1	EA.	1		
36"x24" DIP TEE (RJ)	2	EA.	1		
30"x24" DIP TEE (RJ)	2	EA.	1		
THRUST BLOCK	2	EA.	0		
THRUST COLLAR	3	L.F.	4		
AIR VALVE ASSEMBLY	1	EA.	1		
CORROSION PROTECTION SYSTEM	1	L.S.	1		
TEST PITS	4	EA.	0		
30" PLUG (RJ)	0	EA.	1		

**GENERAL NOTES:**

- EXISTING UTILITIES AND STRUCTURES SHOWN ARE FROM THE BEST AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR TO THEIR SATISFACTION PRIOR TO CONSTRUCTION. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES AND STRUCTURES TO THE SATISFACTION OF THE OWNER AND ENGINEER BY THE CONTRACTOR AT THEIR EXPENSE.
- TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED IN MARCH, 2007 BY A. MORTON THOMAS ASSOCIATES, INC. PHONE 301-881-2545.
- THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE REFERENCE SYSTEM NAD 83/91 AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 36DA AND NO. 36HA. ALL VERTICAL CONTROLS ARE BASED ON NAVD 88. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE LISTED ON SHEET 4.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- UNLESS OTHERWISE SHOWN, CLEAR ALL UTILITIES BY A MINIMUM OF 12 INCHES AND ALL SEWER LINES BY A MINIMUM OF 18 INCHES. CLEAR ALL UTILITY POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
- FOR DETAILS NOT SHOWN ON THE DRAWING, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB SITE AT ALL TIMES.
- ALL DUCTILE IRON PIPE USED ON THE PUBLIC WATER SYSTEM SHALL BE CLASS 54. DUCTILE IRON FITTINGS SHALL MEET THE REQUIREMENTS OF THE HOWARD COUNTY DESIGN MANUAL VOLUME IV - STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND SHALL BE EXTERIOR EPOXY COATED IN ACCORDANCE WITH AWWA C116.
- EXCEPT AS INDICATED ON THE PLANS ALL MAINS SHALL BE HIGH-DENSITY POLYETHYLENE (HDPE) PIPE MEETING THE REQUIREMENTS OF AWWA C906 DR11, RATED FOR A WORKING PRESSURE OF 115-PSI WITH AN ADDITIONAL SURGE ALLOWANCE OF 80-PSI AND A FACTOR OF SAFETY OF 1.39, AND THE HOWARD COUNTY DESIGN MANUAL VOLUME IV - STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND ALL SUBSEQUENT AMENDMENTS THERETO.
- WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL AT THE LOCATIONS OF THE TEST PITS. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PITS IS INCLUDED IN THE SPECIFICATIONS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
- THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:
 

AT&T.....	1-800-252-1133
BGE (CONTRACTOR SERVICES).....	410-850-4620
BGE (UNDERGROUND DAMAGE CONTROL).....	410-787-9068
BGE (EMERGENCY).....	410-685-1400
BUREAU OF UTILITIES.....	410-313-4900
COLONIAL PIPELINE CO.....	410-795-1390
MISS UTILITY.....	1-800-257-7777
HOWARD COUNTY BUREAU OF HIGHWAYS.....	410-313-7450
VERIZON.....	1-800-743-0033/410-224-9210
MCI WORLDCOM.....	1-800-624-9675
QWEST.....	1-800-283-4237
COMCAST.....	410-931-4600
- THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410) 313-7450 AT LEAST FIVE WORKING DAYS BEFORE OPEN CUTTING OR BORING/JACKING OF ANY COUNTY ROAD FOR LAYING WATER/SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.114(A) OF THE HOWARD COUNTY CODE.
- THE ROOTS, TRUNKS, AND BRANCHES OF TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT POSSIBLE. TREES AND SHRUBS LOCATED WITHIN THE TEMPORARY CONSTRUCTION STRIP ARE NOT TO BE REMOVED UNLESS APPROVED BY THE OWNER OR ENGINEER PRIOR TO CONSTRUCTION WORK. THE OWNER OR ENGINEER MAY REQUIRE THE CONTRACTOR TO REMOVE SPECIFIC TREES IF SIGNIFICANT DAMAGE TO THE ROOT STRUCTURE OF THOSE TREES OR SHRUBS OCCURS DURING CONSTRUCTION.
- CONTRACTOR SHALL REMOVE TREES, STUMPS, AND ROOTS ALONG LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.
- TOPS OF ALL WATER MAINS SHALL HAVE A MINIMUM OF 4'-0" OF COVER UNLESS OTHERWISE NOTED.
- VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES, UNLESS OTHERWISE NOTED.



WATER AND SEWER CODE FOR COUNTY USE ONLY:	
WATER CODE NO.	F04
NO. OF CONNECTIONS	0
SEWER CODE NO.	N/A
NO. OF CONNECTIONS	0
DRAINAGE AREA	LITTLE PATUXENT

# US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN PARALLEL

## CAPITAL PROJECT: W-8265 CONTRACT NO.: 44-4592 HOWARD COUNTY, MARYLAND DEPARTMENT OF PUBLIC WORKS

INDEX OF DRAWINGS	
DRAWING NO.	TITLE
1	COVER SHEET, GENERAL NOTES AND DRAWING INDEX
2	KEY MAP, LEGEND AND ABBREVIATIONS
3	SCHEDULES AND TABLES
4	HYDRAULIC PROFILE
5	PARTIAL PLAN AND PROFILE - STA. 0+00.00 TO STA. 12+00.00
6	PARTIAL PLAN AND PROFILE - STA. 12+00.00 TO STA. 21+46.42
7	ACCESS ROAD PLAN AND DETAILS
8	CONNECTION AND MISCELLANEOUS DETAILS
9	GENERAL DETAILS
10	NOT USED
11	CORROSION CONTROL LAYOUT
12	CORROSION DETAILS - 1
13	CORROSION DETAILS - 2
14	CORROSION DETAILS - 3
15	FOREST STAND DELINEATION PLAN
16	FOREST STAND DELINEATION PLAN
17	FOREST CONSERVATION PLAN
18	FOREST CONSERVATION PLAN
19	FOREST CONSERVATION PLAN DETAILS
20	SEDIMENT CONTROL PLAN - STA. 0+00 TO STA. 12+50
21	SEDIMENT CONTROL PLAN - STA. 12+50 TO ACCESS ROAD
22	SEDIMENT CONTROL PLAN - ACCESS ROAD FROM STEVENS FOREST ROAD
23	STREAM DIVERSION PLAN
24	SEDIMENT CONTROL DETAILS
25	SEDIMENT CONTROL NOTES AND DETAILS
26	STREAM DIVERSION AND CONSTRUCTION DETAILS

**GENERAL NOTES CONT'D:**

- ALL FITTINGS ON THE MAIN SHALL BE BUTTRESSED/ANCHORED WITH CONCRETE IN ACCORDANCE WITH THE STANDARD DETAILS UNLESS OTHERWISE PROVIDED FOR ON THE DRAWINGS. WHEN ANCHORING HDPE PIPE, CONTRACTOR SHALL PROVIDE MANUFACTURER RECOMMENDED FUSIBLE RESTRAINT DEVICE FOR APPROVAL FROM THE ENGINEER.
- ALL CONNECTIONS FROM HDPE TO NON-HDPE PIPE SHALL BE FULLY RESTRAINED.
- THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.
- ALL TIE-INS TO EXISTING WATER MAINS SHALL BE COORDINATED WITH THE HOWARD COUNTY BUREAU OF UTILITIES AT LEAST 10 WORKING DAYS PRIOR TO SCHEDULING WORK. THE LOCATIONS FOR ISOLATION, ALONG WITH A PROPOSED SEQUENCE OF CONSTRUCTION, ARE CONTAINED HEREIN. HOWEVER, A DETAILED PLAN FOR SHUTDOWN OF EXISTING WATER MAINS SHALL BE SUBMITTED BY THE CONTRACTOR FOR APPROVAL BY THE COUNTY.
- THE CONTRACTOR SHALL LOCATE ANY WATER AND OR SEWER CONNECTIONS, AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THESE EXISTING CONNECTIONS. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE. ALL EXISTING CONNECTIONS SHALL BE RECONNECTED UPON COMPLETION OF CONSTRUCTION IN ACCORDANCE WITH COUNTY STANDARDS. TEMPORARY SERVICE SHALL BE PROVIDED AS REQUIRED.
- EXISTING STORM DRAINS DISTURBED BY THE CONSTRUCTION SHALL BE REPLACED IN KIND AT THE SAME LINE AND GRADE AS THE EXISTING STORM DRAINS.
- ANY TREES, OUTSIDE OF EXISTING EASEMENTS, DISTURBED BY CONSTRUCTION SHALL BE REPLACED IN KIND. (3" CALIPER MINIMUM.)
- THE CONTRACTOR MUST FOLLOW ALL CONDITIONS AND REQUIREMENTS AS SET FORTH IN THE REQUIRED PERMITS FOR THIS PROJECT AND PROVIDED IN THE PROJECT SPECIFICATIONS.
- WHERE THE PROPOSED MAIN PARALLELS EXISTING MAINS, THE APPROXIMATE ELEVATION OF THE EXISTING MAIN IS SHOWN IN THE PROFILES. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING MAIN AS WELL AS ANY EXISTING THRUST RESTRAINT.
- ANY SECTIONS OF THE EXISTING 30-INCH PCCP WATER MAIN REMOVED AS PART OF THIS PROJECT SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE REGULATIONS.
- TRACER WIRE AND TEST STATIONS SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH SECTION 1002.03.04. ADDITIONALLY, PROVIDE DETECTION TAPE IN ACCORDANCE WITH SECTION 905.01.05 OF THE COUNTY DESIGN MANUAL.
- CONTRACTOR SHALL NOT EXCEED 80% OF MANUFACTURER'S ALLOWABLE MINIMUM BENDING RADIUS FOR HDPE PIPING SPECIFIED.

GP-09-046

SEDIMENT CONTROL MEASURES FOR THIS CONTRACT WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.

HOWARD SOIL CONSERVATION DISTRICT CERTIFICATION:  
THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT (SCD).

*John P. Blanton* 4/1/12  
Howard Soil Conservation District Date

ENGINEERS 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 AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

*[Signature]* 10-24-12  
Signature of Engineer - Registration Number Date

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

*[Signature]* 10-5-12  
Signature of Developer Date

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*[Signature]* 10/24/12  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 10/24/12  
CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 10/24/12  
CHIEF - BUREAU OF ENGINEERING DATE

*[Signature]* 10/24/12  
CHIEF/UTILITY DESIGN DIVISION DATE

**O BRIEN & GERE**  
4201 MITCHELLVILLE ROAD  
SUITE 500  
BOWIE, MD 20716  
PHONE: 301-731-5622

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. 18523, EXPIRATION DATE 12/08/2013

*[Signature]*  
PROFESSIONAL ENGINEER

DSN. BY: CAB  
DRN. BY: RPW  
CHK. BY: RJD  
DATE: SEPT. 2012

RJD 1 RECORD DRAWING  
RJD 0 ISSUED FOR BID  
BY NO. REVISION

09/12  
DATE

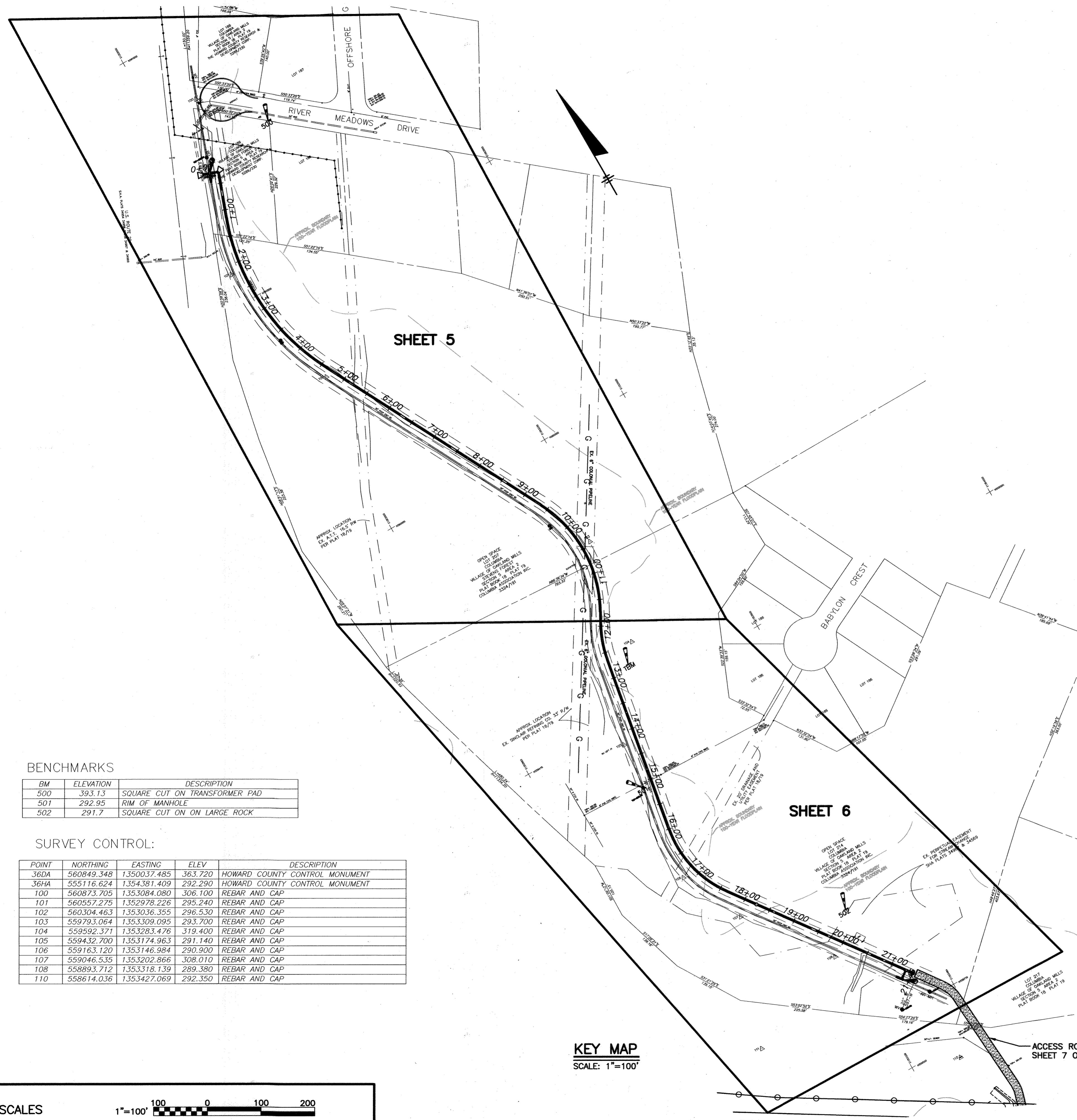
COVER SHEET

600' SCALE MAP NO. 36 BLOCK NO.

US ROUTE 29 / BROKEN LAND PARKWAY  
TRANSMISSION MAIN PARALLEL

CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO.: 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 1 OF 26



**BENCHMARKS**

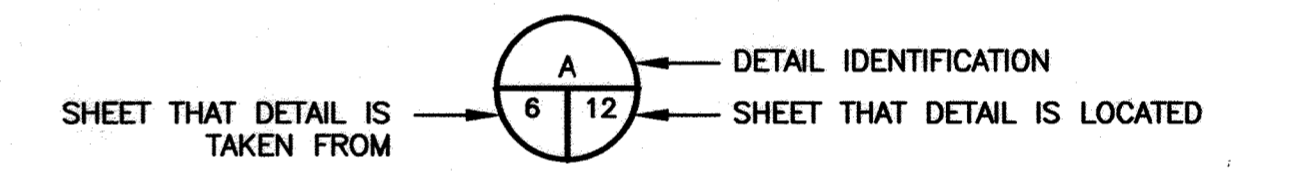
BM	ELEVATION	DESCRIPTION
500	393.13	SQUARE CUT ON TRANSFORMER PAD
501	292.95	RIM OF MANHOLE
502	291.7	SQUARE CUT ON ON LARGE ROCK

**SURVEY CONTROL:**

POINT	NORTHING	EASTING	ELEV	DESCRIPTION
36DA	560849.348	1350037.485	363.720	HOWARD COUNTY CONTROL MONUMENT
36HA	555116.624	1354381.409	292.290	HOWARD COUNTY CONTROL MONUMENT
100	560873.705	1353084.080	306.100	REBAR AND CAP
101	560557.275	1352978.226	295.240	REBAR AND CAP
102	560504.463	1353036.355	296.530	REBAR AND CAP
103	559793.064	1353309.095	293.700	REBAR AND CAP
104	559592.371	1353283.476	319.400	REBAR AND CAP
105	559432.700	1353174.963	291.140	REBAR AND CAP
106	559163.120	1353146.984	290.900	REBAR AND CAP
107	559046.535	1353202.866	308.010	REBAR AND CAP
108	558893.712	1353318.139	289.380	REBAR AND CAP
110	558614.036	1353427.069	292.350	REBAR AND CAP

**LEGEND**  
(PLAN AND PROFILE SHEETS)

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>----- SIDEWALK</li> <li>----- PAVEMENT (EDGE)</li> <li>----- GRAVEL (EDGE)</li> <li>----- CONCRETE (EDGE)</li> <li>----- BUILDING</li> <li>----- CENTERLINE</li> <li>----- SHA THRU HIGHWAY RIGHT-OF-WAY</li> <li>----- PROPERTY LINE/RIGHT-OF-WAY</li> <li>----- GUARDRAIL</li> <li>----- FENCE (WOOD)</li> <li>----- FENCE IRON, RAIL</li> <li>----- FENCE(CHAINLINK)</li> <li>----- UNGD ELECTRIC LINE</li> <li>----- UNGD CABLE LINE</li> <li>----- UNGD FIBER OPTIC LINE</li> <li>----- OVERHEAD UTILITIES</li> <li>----- SANITARY SEWER</li> <li>----- STORM DRAIN</li> <li>----- WATER MAIN</li> <li>----- PROPOSED WATER</li> <li>----- GAS</li> <li>----- DITCH</li> <li>----- STREAM</li> <li>----- WOODLINE</li> <li>----- BUSH</li> <li>----- RIP-RAP DITCH</li> <li>----- MILL AND OVERLAY</li> <li>----- BORING LOCATION</li> <li>----- TEST PIT LOCATION</li> <li>----- BM #</li> <li>----- OREBAR</li> <li>----- FLY</li> <li>----- ABANDON IN PLACE EX. WM</li> </ul> | <ul style="list-style-type: none"> <li>○ MAIL BOX</li> <li>○ VENT</li> <li>○ STORM DRAIN MH</li> <li>○ HEADWALL/ENDWALL</li> <li>○ DROP INLET GRATE</li> <li>○ DROP INLET</li> <li>○ ROAD SIGN</li> <li>○ TELE. JUNC. BOX</li> <li>○ UTILITY POLE</li> <li>○ LIGHT POLE</li> <li>○ GUY WIRE</li> <li>○ GROUND LIGHT</li> <li>○ ELEC. TRANSFORMER</li> <li>○ ELEC. MH</li> <li>○ ELEC. JUNC. BOX</li> <li>○ SPOT ELEVATION</li> <li>○ CABLE BOX</li> <li>○ SAN. SEW. MH</li> <li>○ CLEAN OUT</li> <li>○ WATER VALVE</li> <li>○ RSG VALVE</li> <li>○ WATER METER</li> <li>○ WATER MAIN VALVE VAULT</li> <li>○ IRRIGATION VALVE</li> <li>○ FIRE HYDRANT</li> <li>○ GAS VENT PIPE</li> <li>○ GAS VALVE</li> <li>○ GAS PUMP</li> <li>○ GAS LINE MARKER</li> <li>○ IRON PIPE FOUND</li> <li>○ REBAR AND CAP</li> <li>○ TRAVERSE STATION</li> <li>○ POINT OF CONNECTION</li> </ul> |
|---|---|

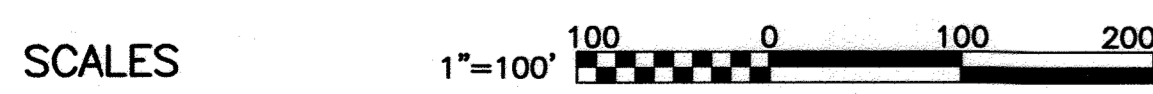


**ABBREVIATION**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>APPROX. APPROXIMATE</li> <li>ARV MH AIR RELEASE MANHOLE</li> <li>BE BURY ELEVATION</li> <li>BFV BUTTERFLY VALVE</li> <li>BGE BALTIMORE GAS &amp; ELECTRIC</li> <li>BL BURY LENGTH</li> <li>BLDG. BUILDING</li> <li>BOT BOTTOM</li> <li>C&amp;G CURB AND GUTTER</li> <li>CMP CORRUGATED METAL PIPE</li> <li>CONC. CONCRETE</li> <li>CONSTR. CONSTRUCTION</li> <li>CONTR. CONTRACT</li> <li>DEG. DEGREE</li> <li>DET OR DTL. DETAIL</li> <li>DIP DUCTILE IRON PIPE</li> <li>DR DRIVE</li> <li>E OR ELEC. ELECTRIC</li> <li>EA EACH</li> <li>ESMT EASEMENT</li> <li>EX EXISTING</li> <li>FH FIRE HYDRANT</li> <li>FLG FLANGE</li> <li>FMV FLOW METER VAULT</li> <li>G GAS</li> <li>GCS GEODETIC CONTROL SYSTEM</li> <li>GV GATE VALVE</li> <li>HB HORIZONTAL BEND</li> <li>HC HOWARD COUNTY</li> <li>HCR HORIZONTAL CURVE RADIUS</li> <li>HDP HORIZONTAL DEFLECTION POINT</li> <li>HDPZ HIGH DENSITY POLYETHYLENE</li> <li>HORIZ. HORIZONTAL</li> <li>INV INVERT</li> <li>JT JOINT</li> <li>LF LINEAR FOOT</li> <li>LOD LIMIT OF DISTURBANCE</li> <li>MAC MACADAM</li> <li>MBR MINIMUM BENDING RADIUS</li> <li>MD MARYLAND</li> <li>MH MANHOLE</li> <li>MIN MINIMUM</li> <li>NIC NOT IN CONTRACT</li> <li>NO NUMBER</li> <li>PC POINT OF CURVE</li> <li>PCCP PRESTRESSED CONCRETE CYLINDER PIPE</li> <li>PEDESTAL PEDESTAL</li> <li>PO POST OFFICE OR PUSH ON</li> <li>PROPP. PROPOSED</li> <li>PT POINT OF POINT OF TANGENCY</li> <li>PVC PVC PIPE OR POINT OF VERTICAL CURVATURE</li> <li>PVD POINT OF VERTICAL DEFLECTION</li> <li>PVI POINT OF VERTICAL INTERSECTION</li> <li>PVMT PAVEMENT</li> <li>PVT POINT OF VERTICAL TANGENCY</li> </ul> | <ul style="list-style-type: none"> <li>R/W RIGHT OF WAY</li> <li>RAD OR R RADIUS</li> <li>RCP REINF. CONC. PIPE</li> <li>RD ROAD</li> <li>REQD. REQUIRED</li> <li>RJ RESTRAINED JOINT</li> <li>ROW RIGHT-OF-WAY</li> <li>RSGV RESILIENT SEAT GATE VALVE</li> <li>RSWV RESILIENT WEDGE GATE VALVE</li> <li>S SEWER</li> <li>SAN SANITARY</li> <li>SB SOIL BORING</li> <li>SD STORM DRAIN</li> <li>SHA STATE HIGHWAY ADMINISTRATION</li> <li>SHC SEWER HOUSE CONNECTION</li> <li>SHEET SHEET</li> <li>S.S. STAINLESS STEEL</li> <li>STA STATION</li> <li>STD STANDARD</li> <li>TB RENO TO BE RENOVATED (FUTURE)</li> <li>TBR TO BE REMOVED (FUTURE)</li> <li>TELE TELEPHONE</li> <li>TEMP TEMPORARY</li> <li>TP TEST PIT</li> <li>TRANS TRANSFORMER</li> <li>UNF UTILITY NOT FOUND</li> <li>VB VERTICAL BEND</li> <li>VCR VERTICAL CURVE RADIUS</li> <li>VERT VERTICAL</li> <li>W WATER</li> <li>W/ WITH</li> <li>WHC WATER HOUSE CONNECTION</li> <li>WM WATER MAIN</li> </ul> |
|--|--|

**LANDSCAPING**

- |  |
|--|
| <ul style="list-style-type: none"> <li>APP APPLE</li> <li>BPE BRADFORD PEAR</li> <li>CHE CHERRY</li> <li>DEC DECIDUOUS</li> <li>DOG DOGWOOD</li> <li>HEM HEMLOCK</li> <li>HIC HICKORY</li> <li>HOL HOLLY</li> <li>LOC LOCUST</li> <li>MAG MAGNOLIA</li> <li>MAP MAPLE</li> <li>MUL MULBERRY</li> <li>PIN PINE</li> <li>POP POPLAR</li> <li>SPR SPRUCE</li> <li>SYC SYCAMORE</li> <li>WAL WALNUT</li> <li>WIL WILLOW</li> </ul> |
|--|



**KEY MAP**  
SCALE: 1"=100'

2012 © O'BRIEN & GERE, INC.

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

*[Signature]* 10/6/12  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 10/12/12  
CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 10/12/12  
CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE**

4201 MITCHELLVILLE ROAD  
SUITE 500  
BOWIE, MD 20716  
PHONE: 301-731-5622

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. 18523, EXPIRATION DATE 12/08/2013.

*[Seal]*

DSN. BY:	CAB			
DRN. BY:	RPW			
CHK. BY:	RJD	RJD	1	RECORD DRAWING
DATE:	SEPT. 2012	RJD	0	ISSUED FOR BID
		BY	NO.	REVISION
				DATE

**KEY MAP, LEGEND AND ABBREVIATIONS**

600' SCALE MAP NO. 36 BLOCK NO.

**US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN PARALLEL**

CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO.: 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 2 OF 26

FILE NO. 33498-XXXF

SOIL BORING SCHEDULE				
NUMBER	STATION	NORTHING	EASTING	DEPTH
B-1	0+16.70	560810.63	1353079.72	14.6'
B-2	3+00	560540.45	1352998.24	10.8'
B-3	6+50	560211.89	1353100.93	10.8'
B-4	9+00	559989.96	1353216.03	10.7'
B-5	12+00	559707.57	1353277.38	10.8'
B-6	15+00	559420.96	1353197.52	16.7'
B-7	18+00	559127.28	1353187.71	12.2'
B-8	19+00	559045.24	1353244.71	17.1'
B-9	22+00	558803.14	1353421.89	14.8'

TEST PIT SCHEDULE				
NUMBER	STATION	NORTHING	EASTING	UTILITY
TP-1	0+12.75	560741.39	1353036.55	30" PCCP WATER
TP-2	5+23.78	560263.52	1353074.16	4" PVC AT&T CONDUIT
TP-3	10+57.60	559780.37	1353290.79	6" GAS
TP-4	21+47.00	558782.98	1353410.70	30" PCCP WATER

RESTORATION SCHEDULE ALONG 36" WATER MAIN		
STATION		DESCRIPTION OF LOCATION/RESTORATION TYPE
FROM	TO	
0+00	19+98	DESCRIPTION: GRASSED AREA AND EX. TRAIL RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH MDE REQUIREMENTS. RESTORE EX. TRAIL IN KIND.
19+98	20+47	DESCRIPTION: EX. LITTLE PATUXENT RIVER CROSSING RESTORATION:
20+47	21+46	DESCRIPTION: GRASSED AREA AND EX. TRAIL RESTORATION: SEED ENTIRE DISTURBED AREA IN ACCORDANCE WITH SHA REQUIREMENTS. RESTORE EX. TRAIL IN KIND, AT A MINIMUM, PROVIDE 6 FOOT WIDE PATH OF 6-INCHES OF WOOD CHIPS LAID ON FILTER FABRIC FOR THE LENGTH OF THE DISTURBANCE.

36" DIA. WATER MAIN COORDINATE TABLE			
STATION	ITEM	NORTHING	EASTING
0+00.00	30" PLUG	560745.78	1353024.58
0+05.67	30" GV	560743.82	1353029.91
0+12.75	30" CROSS	560741.39	1353036.55
0+20.81	30" GV	560738.62	1353044.12
0+28.98	30" 90° HB	560735.31	1353051.54
0+36.84	36"x30" REDUCER	560727.81	1353049.38
1+14.94	PC	560654.51	1353022.51
4+61.58	PT	560318.70	1353045.55
9+36.76	PC	559896.90	1353264.29
11+72.37	PT	559670.77	1353260.75
11+96.02	PC	559650.34	1353249.32
12+63.23	PT	559586.83	1353226.70
16+00.72	PC	559254.73	1353168.27
17+63.24	PT	559100.67	1353204.15
18+20.94	AIR/VACUUM MANHOLE	559052.20	1353239.62
21+28.13	36"x24" TEE	558806.36	1353419.55
21+42.06	24" GV	558798.13	1353408.28
21+46.42	30"x24" TEE	558795.54	1353404.76

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

*[Signature]* 10/8/12  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 10/5/12  
CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 10/8/12  
CHIEF - BUREAU OF ENGINEERING DATE

*[Signature]* 10/5/12  
CHIEF/UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE**  
4201 MITCHELLVILLE ROAD  
SUITE 500  
BOWIE, MD 20716  
PHONE: 301-731-5622

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. 18223, EXPIRATION DATE 12/08/2015

*[Seal]*  
ROBERT JOHN DILLON  
PROFESSIONAL ENGINEER

DSN. BY: CAB  
DRN. BY: RPW  
CHK. BY: RJD  
DATE: SEPT. 2012

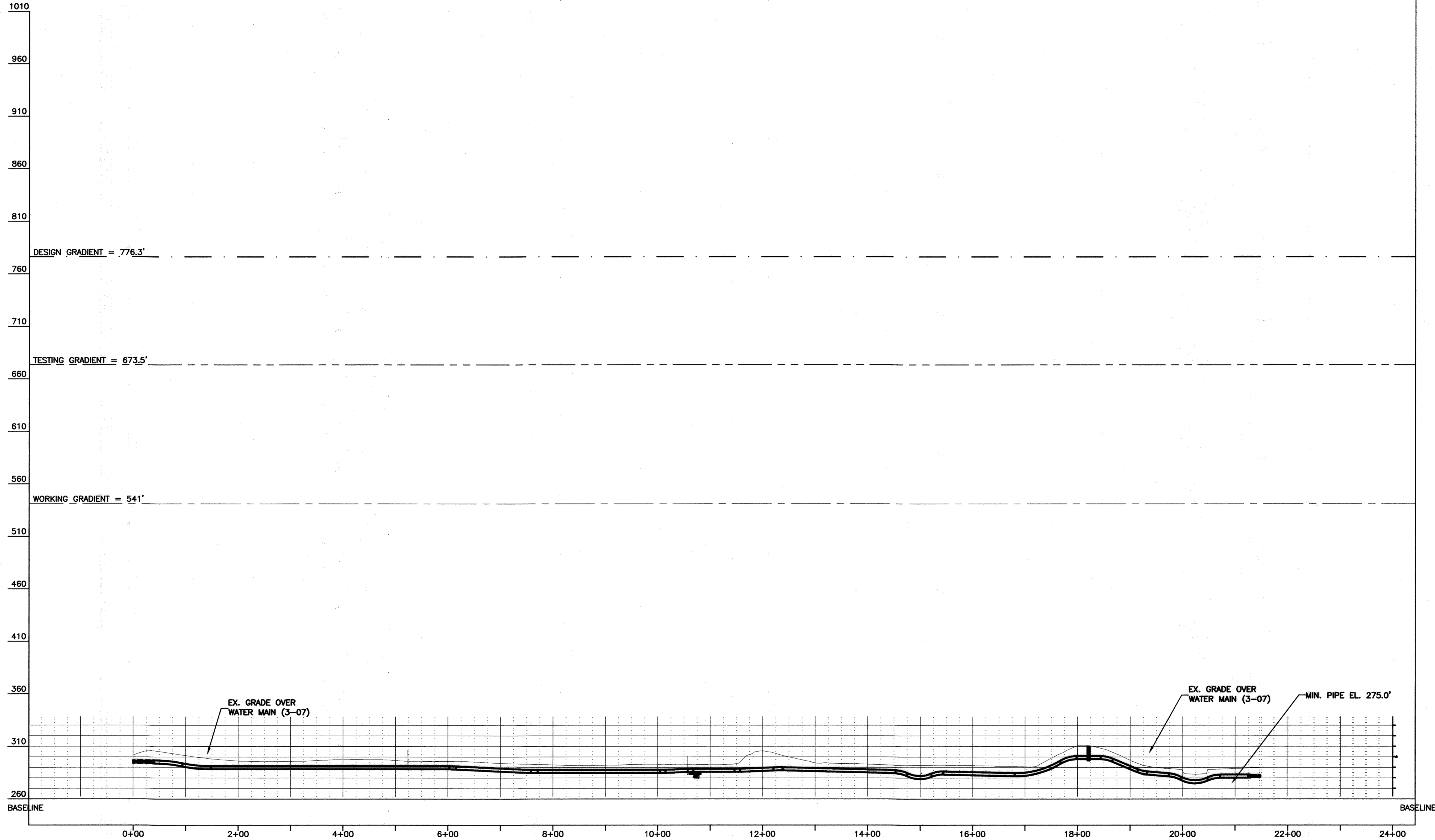
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ISSUED FOR BID  
REVISION

**SCHEDULES AND TABLES**

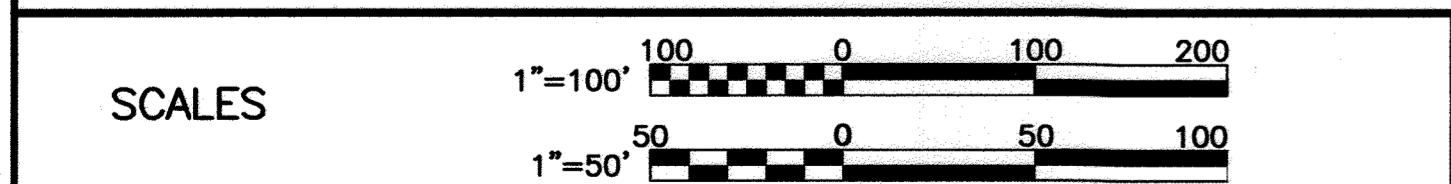
600' SCALE MAP NO. 36 BLOCK NO.

**US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN PARALLEL**  
CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO.: 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 3 OF 26



**HYDRAULIC PROFILE**  
 HORIZ. SCALE: 1"=100'  
 VERT. SCALE: 1"=50'



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

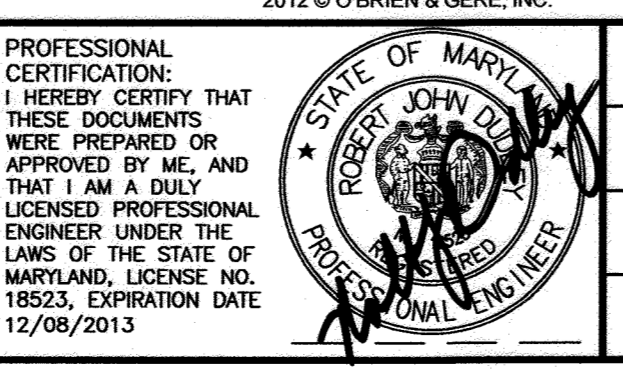
*Janet A. ...* 10/26/12  
 DIRECTOR OF PUBLIC WORKS DATE

*Steve Shaver (Acting)* 10/8/12  
 CHIEF - BUREAU OF ENGINEERING DATE

*Silvia ...* 10/15/12  
 CHIEF, BUREAU OF UTILITIES DATE

*...* 10/5/12  
 CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE**  
 4201 MITCHELLVILLE ROAD  
 SUITE 500  
 BOWIE, MD 20716  
 PHONE: 301-731-5622



DSN. BY:	CAB			
DRN. BY:	RPW			
CHK. BY:	RJD	RJD 1	RECORD DRAWING	04/12
DATE:	SEPT. 2012	RJD 0	ISSUED FOR BID	09/12
		BY NO.	REVISION	DATE

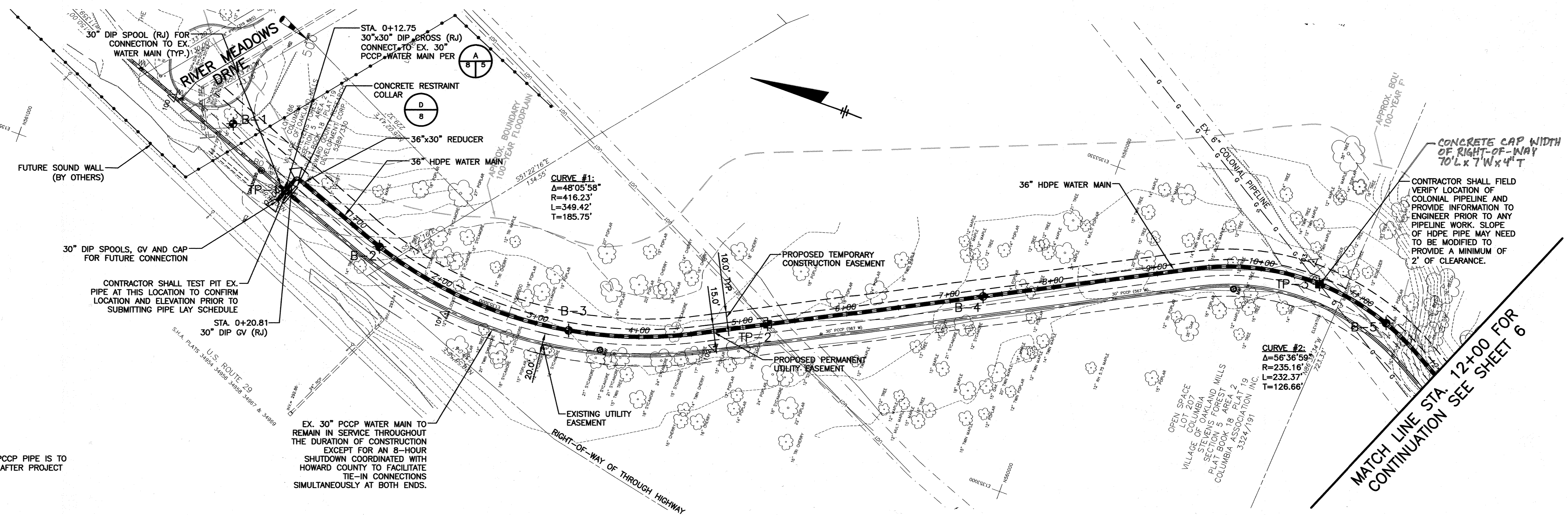
**HYDRAULIC PROFILE**

600' SCALE MAP NO. 36 BLOCK NO.

**US ROUTE 29 / BROKEN LAND PARKWAY**  
 TRANSMISSION MAIN PARALLEL

CAPITAL PROJECT: W-8265  
 CONTRACT NO.: 44-4592  
 ELECTION DISTRICT NO.: 6  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 4 OF 26  
 FILE NO. 33498-XXXF



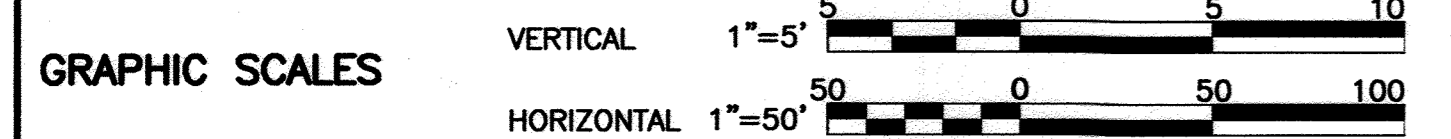
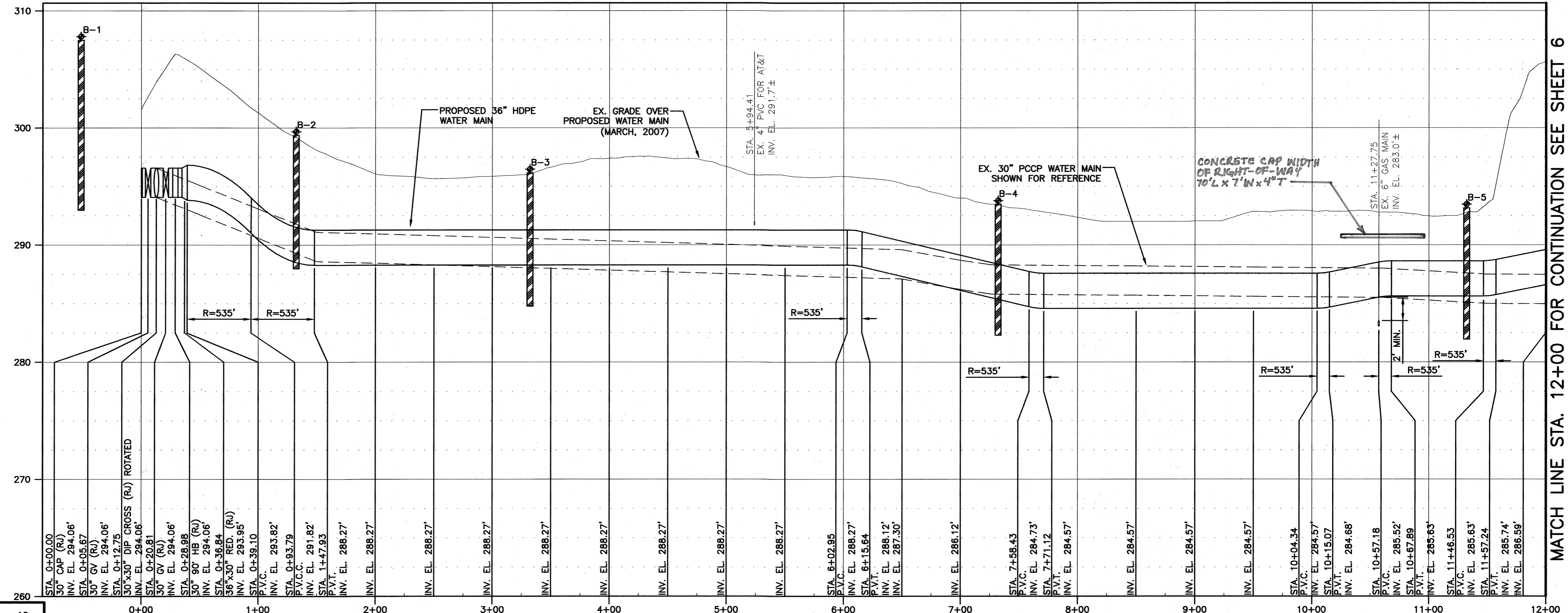
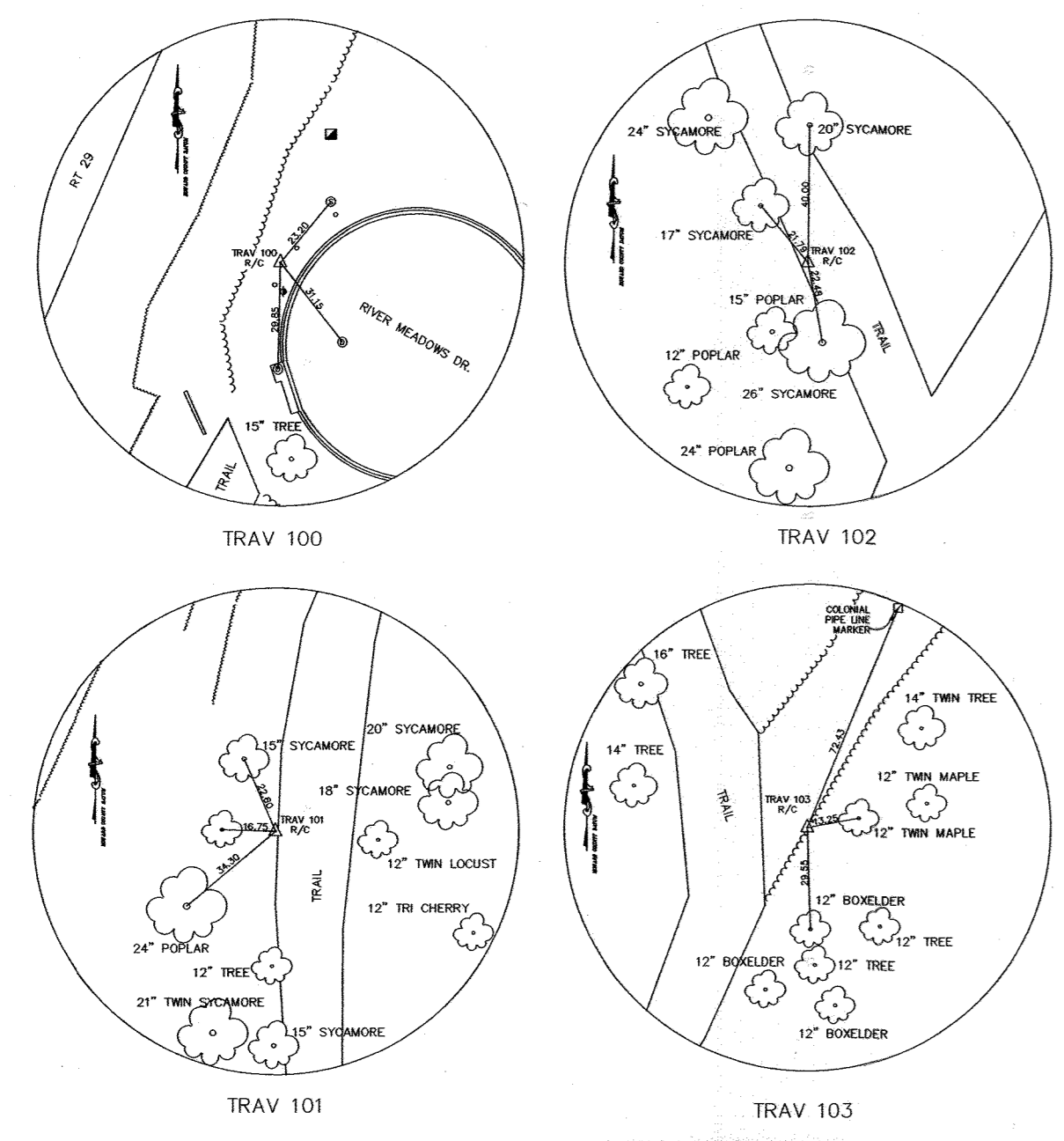
**GENERAL NOTES:**

- EXISTING 30-INCH PCPP PIPE IS TO REMAIN IN SERVICE AFTER PROJECT COMPLETION.

EX. 30" PCPP WATER MAIN TO REMAIN IN SERVICE THROUGHOUT THE DURATION OF CONSTRUCTION EXCEPT FOR AN 8-HOUR SHUTDOWN COORDINATED WITH HOWARD COUNTY TO FACILITATE TIE-IN CONNECTIONS SIMULTANEOUSLY AT BOTH ENDS.

CONTRACTOR SHALL FIELD VERIFY LOCATION OF COLONIAL PIPELINE AND PROVIDE INFORMATION TO ENGINEER PRIOR TO ANY PIPELINE WORK. SLOPE OF HDPE PIPE MAY NEED TO BE MODIFIED TO PROVIDE A MINIMUM OF 2' OF CLEARANCE.

MATCH LINE STA. 12+00 FOR CONTINUATION SEE SHEET 6



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

Director of Public Works: *[Signature]* 10/22/12  
 Chief, Bureau of Utilities: *[Signature]* 10/15/12

Steve Shaner (Acting) 10/11/12  
 Chief - Bureau of Engineering

*[Signature]* 10/15/12  
 Chief, Utility Design Division

**O'BRIEN & GERE**  
 4201 MITCHELLVILLE ROAD  
 SUITE 500  
 BOWIE, MD 20716  
 PHONE: 301-731-5622

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. 118523, EXPIRATION DATE 12/08/2013.

*[Professional Seal]*

DSN. BY:	RPW	DATE:	SEPT. 2012
DRN. BY:	RPW	DATE:	09/12
CHK. BY:	RJD	DATE:	04/16
RJD 1	RECORD DRAWING	ISSUED FOR BID	09/12
BY NO.		REVISION	

**PLAN AND PROFILE**  
 STA. 0+00.00 TO STA. 12+00.00

600' SCALE MAP NO. 36 BLOCK NO.

**US ROUTE 29 / BROKEN LAND PARKWAY**  
 TRANSMISSION MAIN PARALLEL

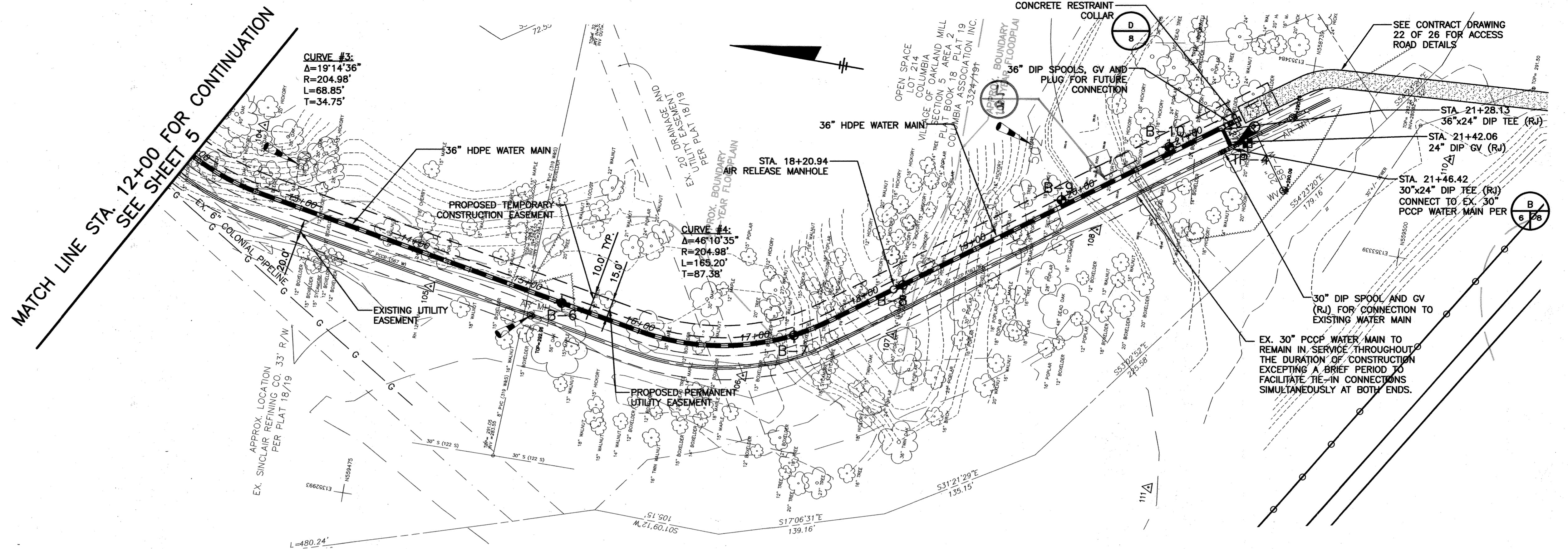
CAPITAL PROJECT: W-8265  
 CONTRACT NO.: 44-4592  
 ELECTION DISTRICT NO.: 6  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 5 OF 26  
 FILE NO. 33498-XXXF

MATCH LINE STA. 12+00 FOR CONTINUATION  
SEE SHEET 5

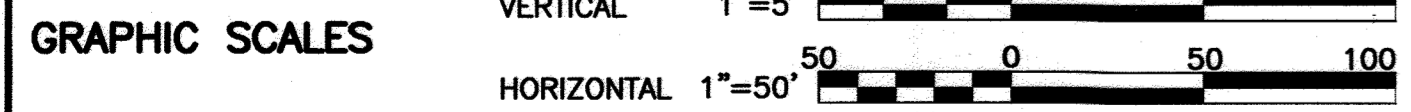
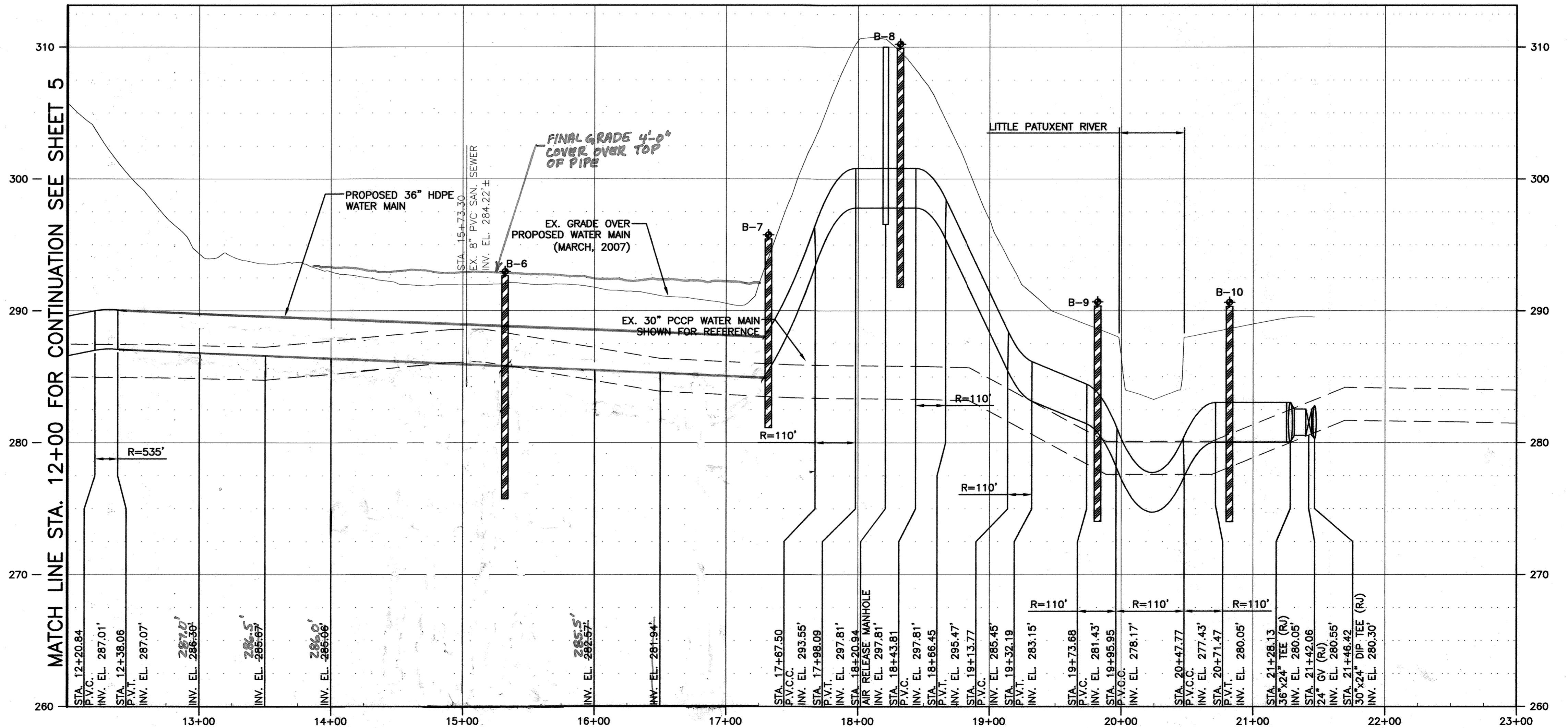
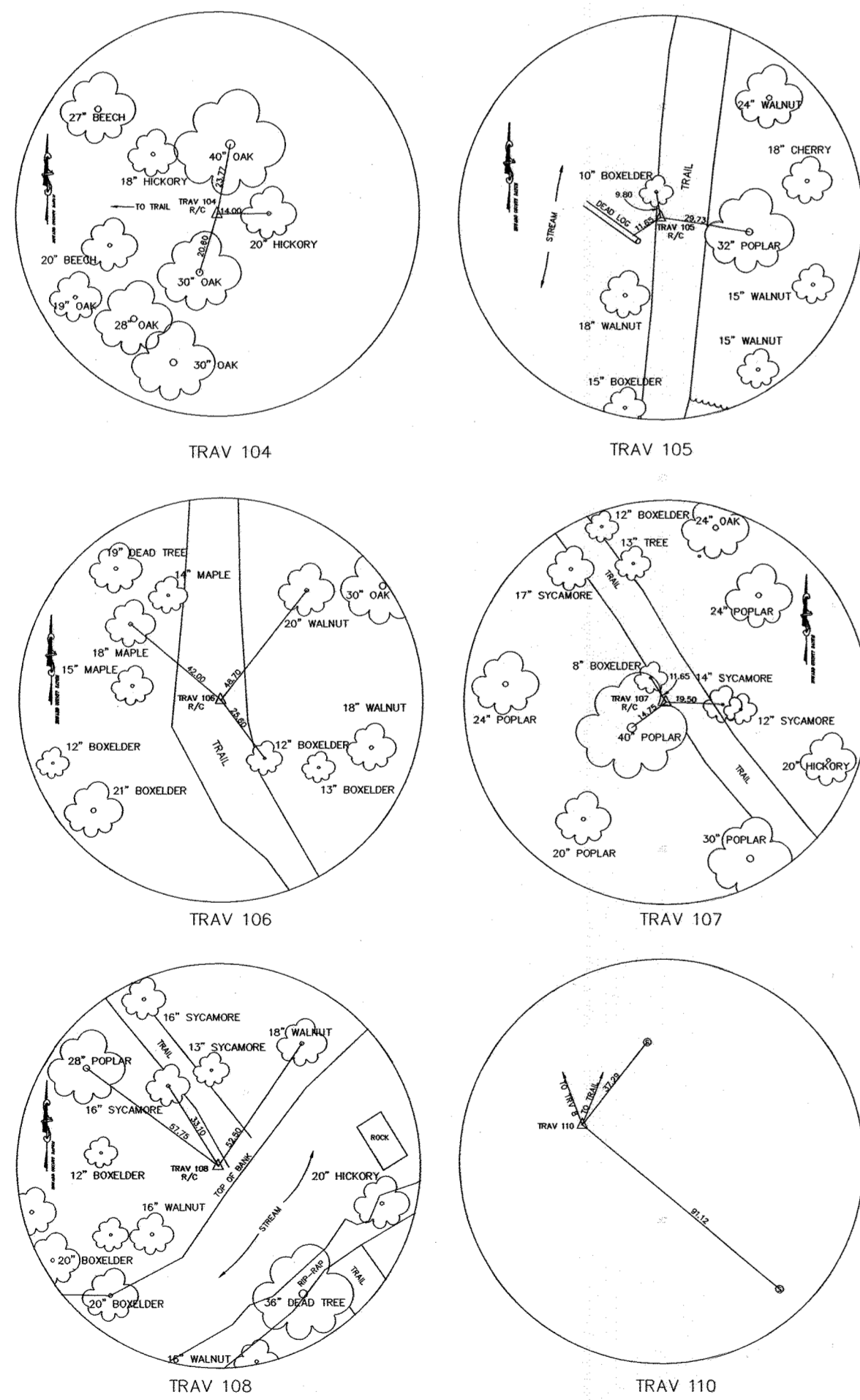
CURVE #3:  
Δ=19°14'36"  
R=204.98'  
L=68.85'  
T=34.75'

CURVE #4:  
Δ=46°10'35"  
R=204.98'  
L=163.20'  
T=87.38'



**GENERAL NOTES:**

- EXISTING 30-INCH PCPP PIPE IS TO REMAIN IN SERVICE AFTER PROJECT COMPLETION.



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

Director of Public Works: *10/22/12*  
Steve Shuman (Acting) 10/8/12  
Chief, Bureau of Engineering

Chief, Bureau of Utilities: *10/15/12*  
RJD  
Chief/Utility Design Division

**O'BRIEN & GERE**  
4201 MITCHELLVILLE ROAD  
SUITE 500  
BOWIE, MD 20716  
PHONE: 301-731-5622

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. 18533, EXPIRATION DATE 12/08/2013

STATE OF MARYLAND  
ROBERT JOHN  
REGISTERED PROFESSIONAL ENGINEER

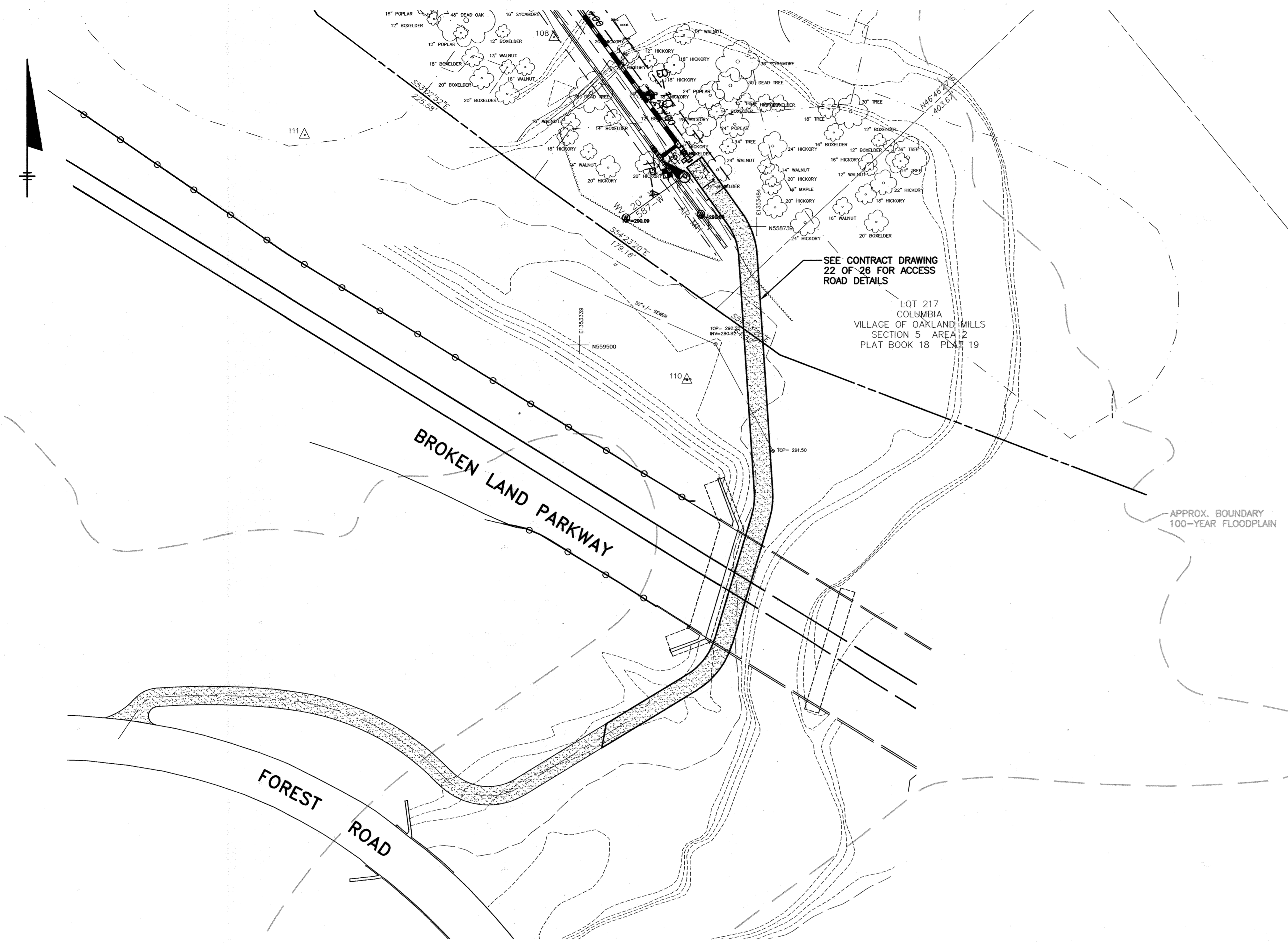
DSN. BY:	RPW
DRN. BY:	RPW
CHK. BY:	RJD
DATE:	SEPT. 2012
RJD 1	RECORD DRAWING
RJD 0	ISSUED FOR BID
BY NO.	REVISION
DATE:	09/12

**PLAN AND PROFILE**  
STA 12+00.00 TO STA 21+46.42

60' SCALE MAP NO. 36 BLOCK NO.

**US ROUTE 29 / BROKEN LAND PARKWAY**  
TRANSMISSION MAIN PARALLEL

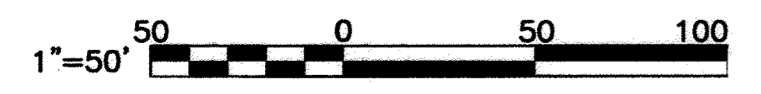
CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO.: 6  
HOWARD COUNTY, MARYLAND



SEE CONTRACT DRAWING 22 OF 26 FOR ACCESS ROAD DETAILS

LOT 217  
COLUMBIA  
VILLAGE OF OAKLAND MILLS  
SECTION 5 AREA 12  
PLAT BOOK 18 PLATE 19

APPROX. BOUNDARY  
100-YEAR FLOODPLAIN



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

*[Signature]* 10/2/12  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 10/15/12  
CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 10/8/12  
Steve Shuman (Acting)  
CHIEF - BUREAU OF ENGINEERING DATE

*[Signature]* 10/5/12  
CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE**  
4201 MITCHELLVILLE ROAD  
SUITE 500  
BOWIE, MD 20716  
PHONE: 301-731-5622

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. 18553, EXPIRATION DATE 12/08/2015

*[Signature]*  
ROBERT JOHN  
PROFESSIONAL ENGINEER

DSN. BY:	RPW			
DRN. BY:	ABS			
CHK. BY:	RJD	RJD	1	RECORD DRAWING
DATE:	SEPT. 2012	RJD	0	ISSUED FOR BID
		BY	NO.	REVISION
				DATE
				09/12

**ACCESS ROAD PLAN AND DETAILS**

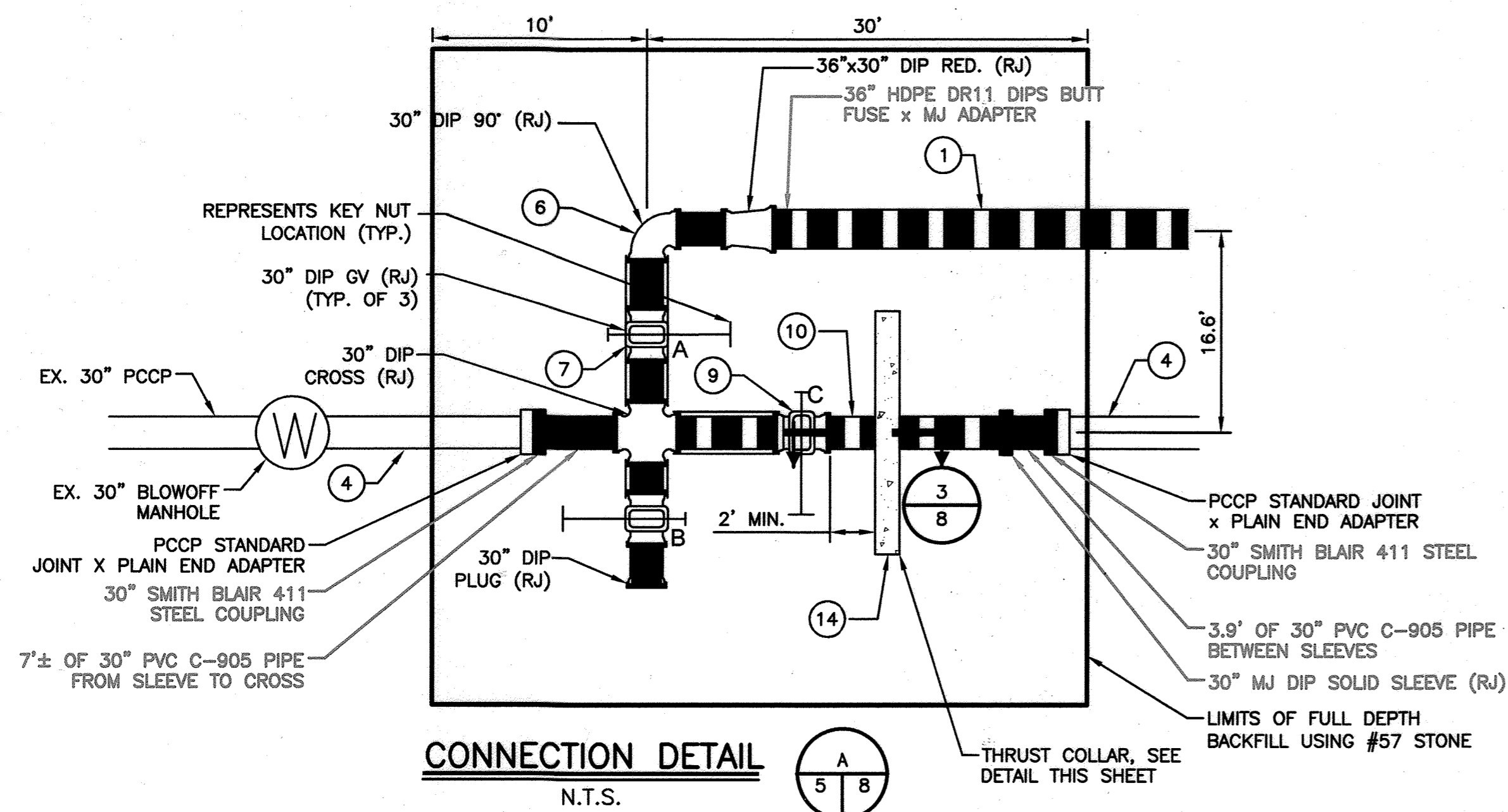
600' SCALE MAP NO. 36 BLOCK NO.

**US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN PARALLEL**

CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO.: 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 7 OF 26  
FILE NO. 33498-XXX

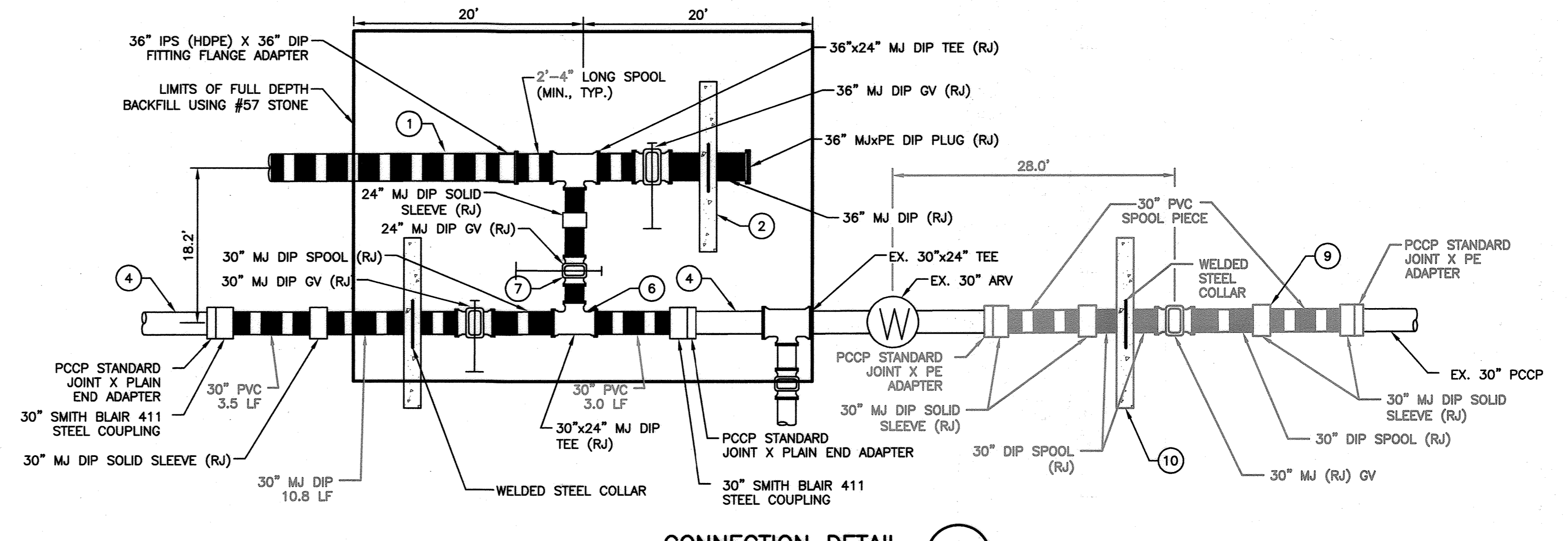
I:\HOWARD-CO.2343\40662.BROKEN-LAND.DWG\SHEETS\40662-007-DR.DWG



**CONNECTION DETAIL A**  
N.T.S.

**NOTES FOR CONNECTIONS AT STA 0+00.00**

- 1 INSTALL PROPOSED 36" HDPE WATER MAIN PER PLANS, UP TO AND INCLUDING THE 36"x30" MJ DI REDUCER (RJ).
- 2 INSTALL TEMPORARY MJ PLUG ON OPEN END OF THE REDUCER.
- 3 OPEN BY-PASS PIPING SYSTEM TO ISOLATE THE EXISTING 30" PCCP PIPE WITHIN THE AREA OF THE PROPOSED CUT-IN CONNECTION.
- 4 REMOVE TWO FULL 30" PCCP PIPE SECTIONS (EACH APPROXIMATELY 16 FOOT IN LENGTH).
- 5 PERFORM DE-WATERING OF CHLORINATED WATER FROM THE EXISTING WATER MAIN AND GROUNDWATER, IF ENCOUNTERED.
- 6 REMOVE TEMPORARY MJ PLUG FORM END OF REDUCER AND INSTALL 30" PE X PE DI SPOOL PIECE AND 30" MJ DI 90 DEGREE BEND (RJ). THE CENTERLINE OF THE 90 DEGREE BEND SHALL BE PLACED ACCORDING TO THE COORDINATES SHOWN, WHICH PLACES THE 90 DEGREE BEND IN THE SAME ALIGNMENT WITH THE FUTURE CONNECTION FROM ROUTE 29.
- 7 INSTALL 30" MJ GATE VALVE "A" (RJ), 30" PE X PE DI SPOOL PIECES EACH SIDE OF GATE VALVE "A", 30" MJ DI CROSS (RJ), 30" PE X PE DI SPOOL PIECE, 30" MJ GATE VALVE "B" (RJ), 30" PE X MJ DI SPOOL PIECE, AND MJ PLUG. INSTALL THE CENTERLINE OF THE CROSS AND MJ PLUG ACCORDING TO THE COORDINATES SHOWN TO ALIGN WITH THE CENTERLINE OF THE UPPER 30" 90 DEGREE BEND AND TO ALIGN THE CENTERLINE OF THE CROSS WITH THE CENTERLINE OF THE EXISTING 30" PCCP WATER MAIN.
- 8 INSTALL TEMPORARY MJ PLUG ON LEFT SIDE OF CROSS.
- 9 INSTALL 30" MJ GATE VALVE "C" (RJ), 30" PE X PE DI SPOOL PIECES, AND 30" MJ DI SOLID SLEEVE (RJ), BETWEEN THE CROSS AND GATE VALVE "C".
- 10 INSTALL THE 30" PE X PE DI SPOOL PIECE ON THE RIGHT SIDE OF GATE VALVE "C", ALONG WITH A WELDED ON STEEL COLLAR AT THE LOCATION SHOWN AND A TEMPORARY RJ DI CAP ON THE END OF THIS SAME 30" DI SPOOL PIECE.
- 11 INSTALL TEMPORARY MJ PLUG ON OPEN END OF THE 30" CROSS.
- 12 PRESSURE TEST, DISINFECT, AND SAMPLE WATER IN NEWLY INSTALLED PIPING SYSTEM.
- 13 REMOVE TEMPORARY RJ CAP AND MJ PLUG, AND INSTALL 30" PE X PE PVC CLOSURE PIECES, PCCP X PE STEEL ADAPTERS, AND COUPLINGS AT BOTH ENDS OF THE CUT-IN CONNECTION. DISINFECT PRIOR TO INSTALLATION.
- 14 CONSTRUCT CONCRETE THRUST COLLAR ON THE NEW 30" PE X PE DI SPOOL PIECE (AT LOCATION SHOWN) IN ACCORDANCE WITH DETAIL "D".
- 15 AFTER COMPLETING THIS CUT-IN CONNECTION, VALVES "A" AND "B" SHALL REMAIN CLOSED. VALVE "C" SHALL REMAIN OPEN AND THE EXISTING WATER MAIN PLACED BACK IN SERVICE. VALVE "C" SHALL NOT BE CLOSED FOR ANY REASON UNTIL THE CONCRETE THRUST COLLAR IS APPROPRIATELY BACKFILLED AND FULL CONCRETE STRENGTH HAS BEEN ACHIEVED.



**CONNECTION DETAIL B**  
N.T.S.

**NOTES FOR CONNECTIONS AT STA 21+46.42**

- 1 INSTALL PROPOSED 36" HDPE WATER MAIN PER PLANS, UP TO PROPOSED 36" MJ DI PLUG (RJ) AND THE INITIAL 24" PE X PE DI SPOOL PIECE. PLACE TEMPORARY RJ DI CAP ON THE END OF THE 24" DI SPOOL PIECE.
- 2 CONSTRUCT CONCRETE THRUST COLLAR ON THE NEW 36" PE X PE DI SPOOL PIECE (AT LOCATION SHOWN) IN ACCORDANCE WITH DETAIL "D".
- 3 OPEN BY-PASS PIPING SYSTEM TO ISOLATE THE EXISTING 30" PCCP PIPE WITHIN THE AREA OF THE PROPOSED CUT-IN CONNECTION.
- 4 REMOVE TWO FULL 30" PCCP PIPE SECTIONS (EACH APPROXIMATELY 16 FOOT IN LENGTH).
- 5 PERFORM DE-WATERING OF ACCUMULATED WATER FROM THE EXISTING WATER MAIN AND GROUNDWATER, IF ENCOUNTERED.
- 6 INSTALL 30"x24" MJ DI TEE (RJ), 30" MJ GATE VALVE "B" (RJ), 30" PE X PE DI SPOOL PIECES ON BOTH SIDES OF GATE VALVE "B", WELDED ON STEEL COLLAR AT THE LOCATION SHOWN ON THE 30" DI SPOOL PIECE, AND TEMPORARY RJ DI CAP ON END OF THE PE DI SPOOL PIECE (IN LIEU OF THE MJ DI SOLID SLEEVE).
- 7 INSTALL 24" MJ GATE VALVE "A" (RJ) AND 24" PE X PE DI SPOOL PIECE BETWEEN THE TEE AND GATE VALVE "A". REMOVE TEMPORARY RJ CAP FROM PREVIOUSLY INSTALLED 24" PE X PE DI SPOOL PIECE AND INSTALL 24" MJ DI SOLID SLEEVE IN ITS PLACE. INSTALL PE X PE DI SPOOL PIECE BETWEEN GATE VALVE "A" AND THE MJ DI SOLID SLEEVE.
- 8 INSTALL TEMPORARY MJ PLUG ON OPEN END OF THE 30" TEE RUN AND PRESSURE TEST, DISINFECT, AND SAMPLE WATER IN NEWLY INSTALLED PIPING SYSTEM.
- 9 REMOVE TEMPORARY RJ CAP AND MJ PLUG, AND INSTALL 30" PE X PE PVC CLOSURE PIECES, PCCP X PE STEEL ADAPTERS, AND COUPLINGS AT BOTH ENDS OF THE CUT-IN CONNECTION. DISINFECT PRIOR TO INSTALLATION.
- 10 CONSTRUCT CONCRETE THRUST COLLAR ON THE NEW 30" PE X PE DI SPOOL PIECE (AT LOCATION SHOWN) IN ACCORDANCE WITH DETAIL "D".
- 11 AFTER COMPLETING THIS CUT-IN CONNECTION, VALVE "A" (LABEL 36" VALVE AS "A") AND "B" (LABEL THE 24" VALVE AS "B") SHALL REMAIN CLOSED. VALVE "A" SHALL NOT BE OPENED FOR ANY REASON UNTIL THE CONCRETE THRUST COLLAR IS APPROPRIATELY BACKFILLED AND FULL CONCRETE STRENGTH HAS BEEN ACHIEVED.
- 12 VALVE "C" (LABEL 30" VALVE AS "C") SHALL REMAIN OPEN AND THE EXISTING WATER MAIN PLACED BACK IN SERVICE. VALVE "C" SHALL NOT BE CLOSED FOR ANY REASON UNTIL THE CONCRETE THRUST COLLAR IS APPROPRIATELY BACKFILLED AND FULL CONCRETE STRENGTH HAS BEEN ACHIEVED.

**NOTES FOR GATE VALVE INSERTION AT STA 21+46.42**

- 1 OPEN BY-PASS PIPING SYSTEM TO ISOLATE THE EXISTING 30" PCCP PIPE WITHIN THE AREA OF THE PROPOSED 30" GATE VALVE INSERTION.
- 2 REMOVE TWO FULL 30" PCCP PIPE SECTIONS (EACH APPROXIMATELY 16 FOOT IN LENGTH).
- 3 PERFORM DE-WATERING OF CHLORINATED WATER FROM THE EXISTING WATER MAIN AND GROUNDWATER, IF ENCOUNTERED.
- 4 INSTALL 30" MJ GATE VALVE (RJ), 30" PE X PE DI SPOOL PIECES ON BOTH SIDES OF THE 30" GATE VALVE, AND A WELDED ON STEEL COLLAR AT THE LOCATION SHOWN ON THE 30" PE X PE DI SPOOL PIECE.
- 5 INSTALL TEMPORARY RJ DI CAPS ON OPEN ENDS OF 30" DI SPOOL PIECES.
- 6 PRESSURE TEST, DISINFECT, AND SAMPLE WATER IN NEWLY INSTALLED PIPING SYSTEM.
- 7 REMOVE TEMPORARY RJ DI CAPS AND REPLACE WITH 30" MJ DI SOLID SLEEVES (RJ).
- 8 INSTALL 30" PE X PE PVC CLOSURE PIECES, PCCP X PE STEEL ADAPTERS, AND COUPLINGS AT BOTH ENDS OF THE CUT-IN CONNECTION. DISINFECT PRIOR TO INSTALLATION.
- 9 CONSTRUCT CONCRETE THRUST COLLAR ON THE NEW 30" PE X PE DI SPOOL PIECE (AT LOCATION SHOWN) IN ACCORDANCE WITH DETAIL "D".
- 10 THE 30" GATE VALVE SHALL REMAIN OPEN AND THE EXISTING WATER MAIN PLACED BACK IN SERVICE. VALVE "C" AND SHALL NOT BE CLOSED FOR ANY REASON UNTIL THE CONCRETE THRUST COLLAR IS APPROPRIATELY BACKFILLED AND FULL CONCRETE STRENGTH HAS BEEN ACHIEVED.

**GENERAL NOTES RELATED TO CUT-IN CONNECTIONS AND GATE VALVE INSERTION WORK**

1. THE CONTRACTOR SHALL HAVE ALL MANPOWER, EQUIPMENT AND MATERIALS ON-SITE AND READY TO USE PRIOR TO BEGINNING ANY PART OF THE WORK RELATED TO CUT-IN CONNECTIONS OR GATE VALVE INSERTION.
2. CONTRACTOR IS RESPONSIBLE FOR CUTTING ALL DI SPOOL PIECES TO THE APPROPRIATE LENGTHS REQUIRED. PRE-CUT ALL DI SPOOL PIECES AS IS APPROPRIATE, LEAVING ANY CRITICAL DI SPOOL PIECES TO BE CUT IN THE FIELD BASED ON ACTUAL FIELD MEASUREMENT.
3. CONTRACTOR SHALL CUT THE 30" PVC CLOSURE PIECES BASED ON ACTUAL FIELD MEASUREMENT. CONTRACTOR SHALL HAVE SUFFICIENT EXTRA PVC PIPE ON-SITE SHOULD CLOSURE PIECES NEED TO BE RE-CUT.
4. THE CONTRACTOR SHALL SUBMIT A DETAILED FINAL LAYOUT OF BOTH CUT-IN CONNECTIONS AND THE GATE VALVE INSERTION TO THE ENGINEER FOR APPROVAL. LABEL ALL ITEMS TO BE INCLUDED IN THE FINAL LAYOUT TO INDICATE WHAT EACH ITEM IS, AND THEIR LOCATION, NOMINAL SIZE AND ACTUAL DIMENSIONS, MATERIAL, TYPE OF JOINT, TYPE OF MJ RESTRAINT, AND SIMILAR.
5. CONTRACTOR SHALL FIELD LOCATE ALL JOINTS ON THE EXISTING 30" PCCP WATER MAIN AT LEAST 30 DAYS PRIOR TO THE SCHEDULED CUT-IN CONNECTIONS AND GATE VALVE INSERTION WORK.
6. ONCE THE EXISTING 30" PCCP PIPE SECTIONS ARE BEING REMOVED, THE CONTRACTOR SHALL NOTIFY HOWARD COUNTY IMMEDIATELY SHOULD ANY ISSUES BE FOUND REGARDING THE CONDITION (OR OTHER) OF THE REMAINING PCCP PIPE OR JOINTS.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY BLOCKING.
8. UNLESS OTHERWISE NOTED, ALL FITTINGS, VALVES, AND SPECIALS SHALL BE MJ AND SHALL BE RESTRAINED USING WEDGE ACTION RETAINER GLANDS (MEG-A-LUG OR APPROVED EQUAL).
9. BACKFILL (WITHIN LIMITS SHOWN), FULL DEPTH, INCLUDING PIPE EMBEDMENT AND BACKFILL ABOVE THE PIPE EMBEDMENT (TO 12-INCHES BELOW FINISHED GRADE) USING GRADED AGGREGATE BASE (GAB) MATERIAL COMPACTED TO 95% STANDARD PROCTOR.
10. REQUIREMENTS FOR A BY-PASS PIPING SYSTEM WILL BE PROVIDED AT A LATER DATE.
11. DUE TO THE AGE OF THE EXISTING 30" WATER MAIN SYSTEM, COMPLETE CLOSURE (ZERO FLOW) OF EXISTING GATE VALVES (USED AS PART OF THE BY-PASS SYSTEM) MIGHT NOT BE POSSIBLE. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO DE-CHLORINATE AND REMOVE ALL WATER DISCHARGED FROM THE EXISTING 30" WATER MAIN AS A RESULT OF LINE VALVES NOT FULLY CLOSING.
12. NO WATER (INCLUDING DE-CHLORINATED WATER) SHALL BE DISCHARGED TO ANY WATERCOURSE OR WETLAND, UNLESS APPROVED IN WRITING AND/OR PERMITTED TO DO SO BY THE APPROPRIATE GOVERNING AUTHORITY, AND IF NEEDED, SHALL TRANSPORT SAID WATER TO A LOCATION APPROVED FOR SUCH DISCHARGE. THE CONTRACTOR SHALL SUBMIT IN WRITING, ITS PROPOSED MEANS AND METHOD FOR REMOVAL OF CHLORINATED AND/OR GROUND WATER FOR GOVERNING AUTHORITY APPROVAL. ALL COSTS RELATED TO WATER REMOVAL - INCLUDING ALL TREATMENT, PUMPING, TRANSPORTING, DISPOSAL, AS WELL AS ALL REQUIREMENTS FOR EROSION AND SEDIMENT CONTROL OF THE WATER PRIOR TO DISCHARGE, SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

GRAPHIC SCALES 1/2"=1'-0"

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

Director of Public Works: *[Signature]* 10/22/11  
 Chief - Bureau of Engineering: *[Signature]* 10/10/12  
 Chief, Bureau of Utilities: *[Signature]* 10/11/12  
 Chief/Utility Design Division: *[Signature]* 10/10/12

**O'BRIEN & GERE**  
4201 MITCHELLVILLE ROAD  
SUITE 500  
BOWIE, MD 20716  
PHONE: 301-731-5622

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. 18523. EXPIRATION DATE 12/08/2013.

STATE OF MARYLAND PROFESSIONAL ENGINEER

DSN. BY:	CAB			
DRN. BY:	RPW	RJD 3	RECORD DRAWING	04/16
		RJD 2	DESIGN REVISION NO. 1	03/14
CHK. BY:	RJD	RJD 1	REVISED PER ADDENDUM NO. 1	02/13
		RJD 0	ISSUED FOR BID	09/12
DATE:	SEPT. 2012	BY NO.	REVISION	DATE

**CONNECTION AND MISCELLANEOUS DETAILS**

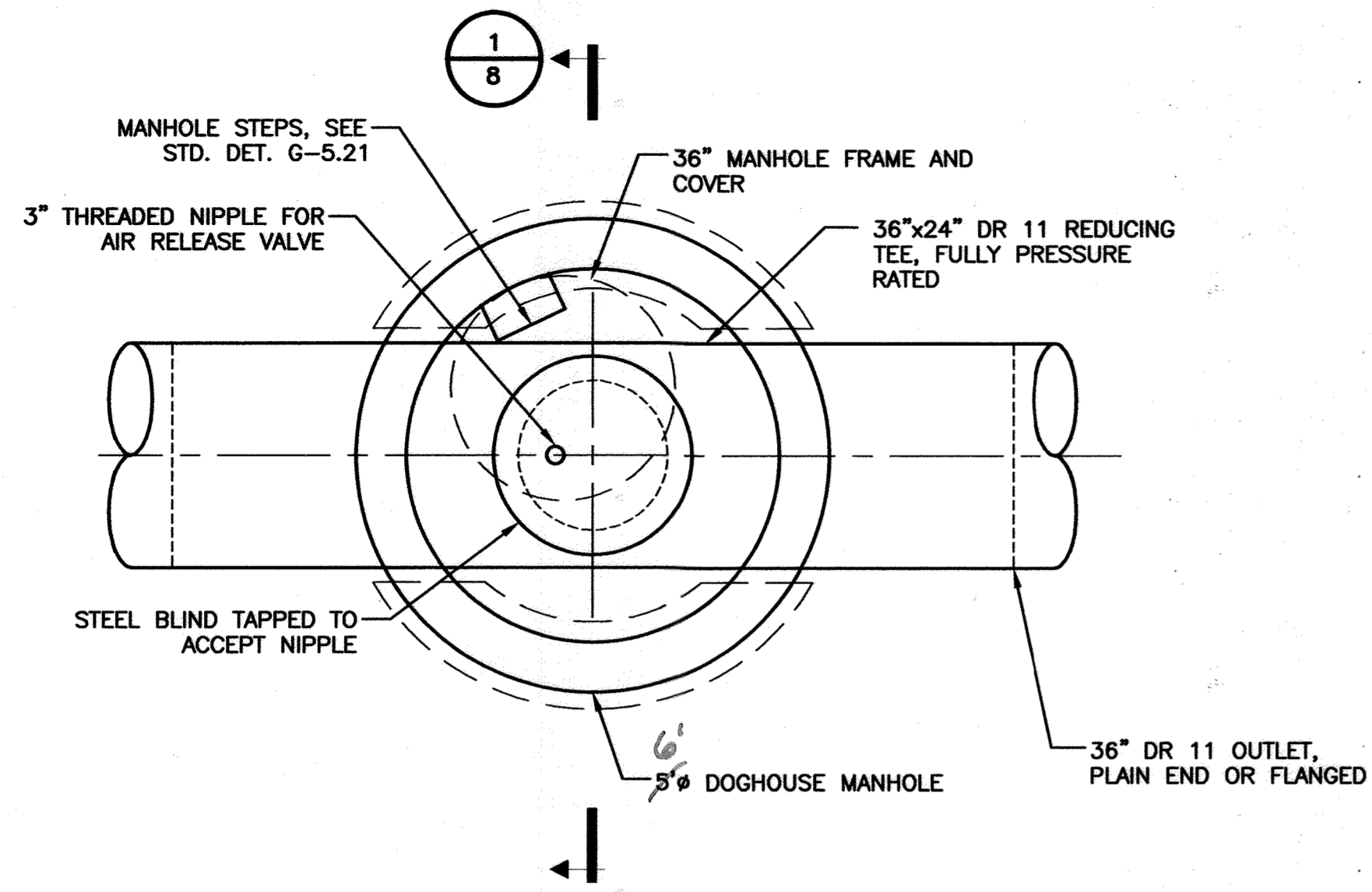
600' SCALE MAP NO.	36	BLOCK NO.	
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**US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN PARALLEL**

CAPITAL PROJECT: W-8265  
 CONTRACT NO.: 44-4592  
 ELECTION DISTRICT NO.: 6  
 HOWARD COUNTY, MARYLAND

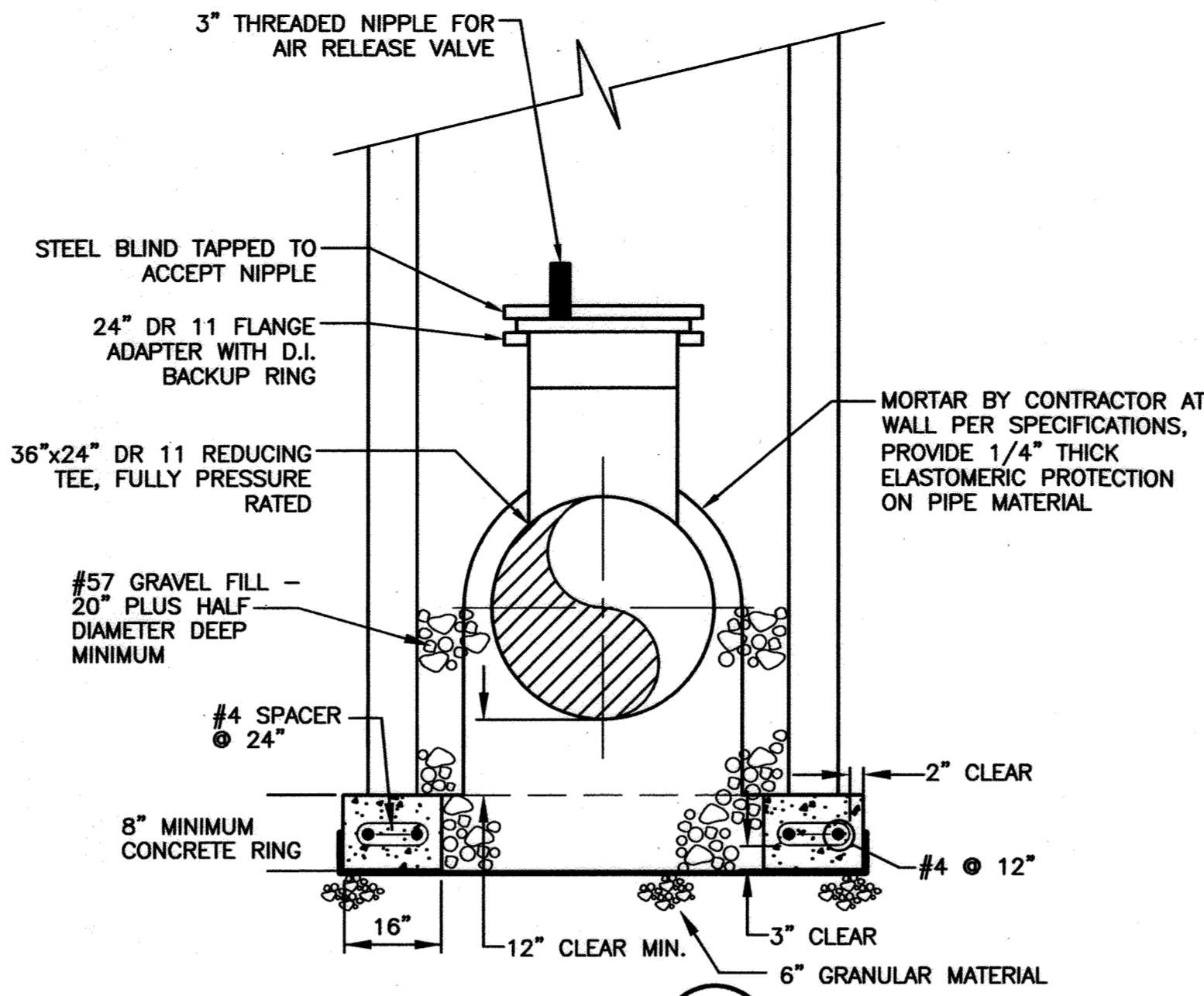
SCALE AS SHOWN  
 SHEET 8 OF 26  
 FILE NO. 33498-XXXF



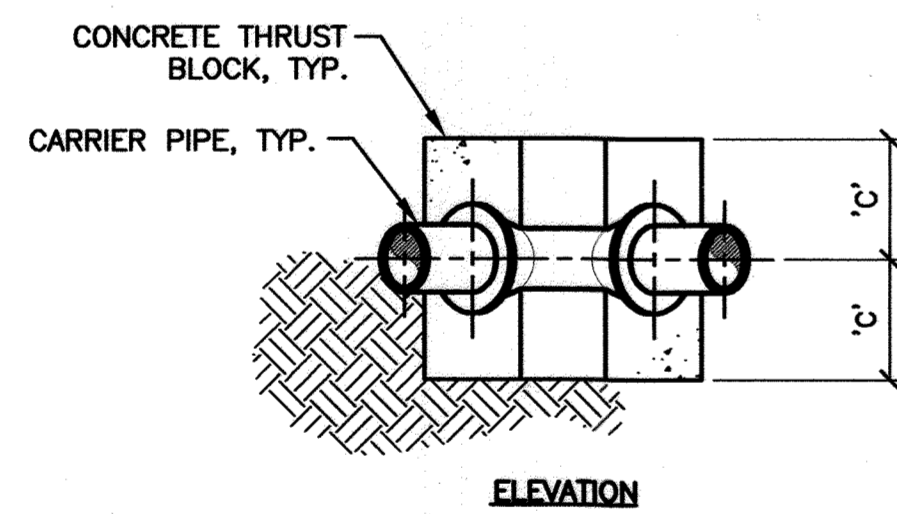
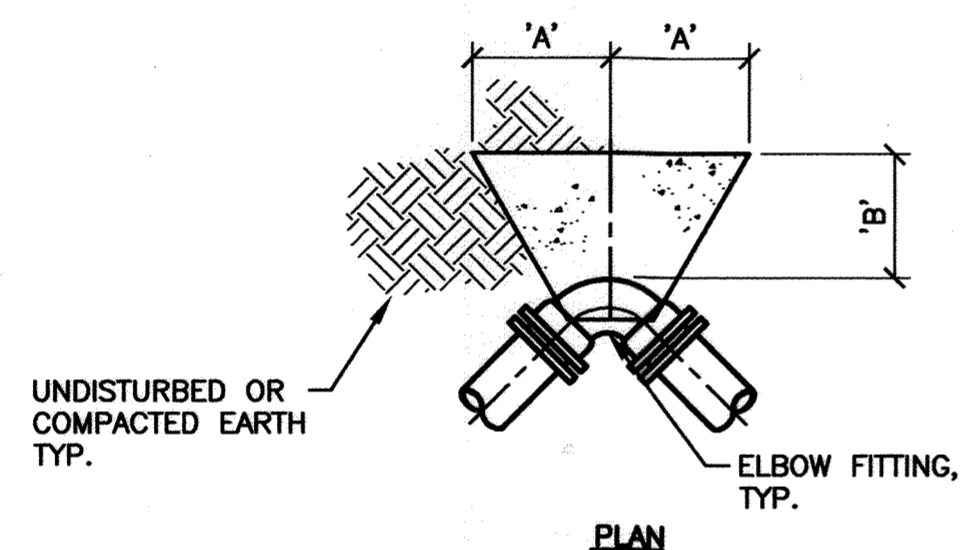


**ARV MANHOLE - PLAN**  
SCALE: 1/2"=1'-0"

**DETAIL NOTE:**  
1. CONTRACTOR SHALL FIELD LOCATE AIR INTAKE ENTRANCE/EXIT LOCATION AS DIRECTED BY ENGINEER.

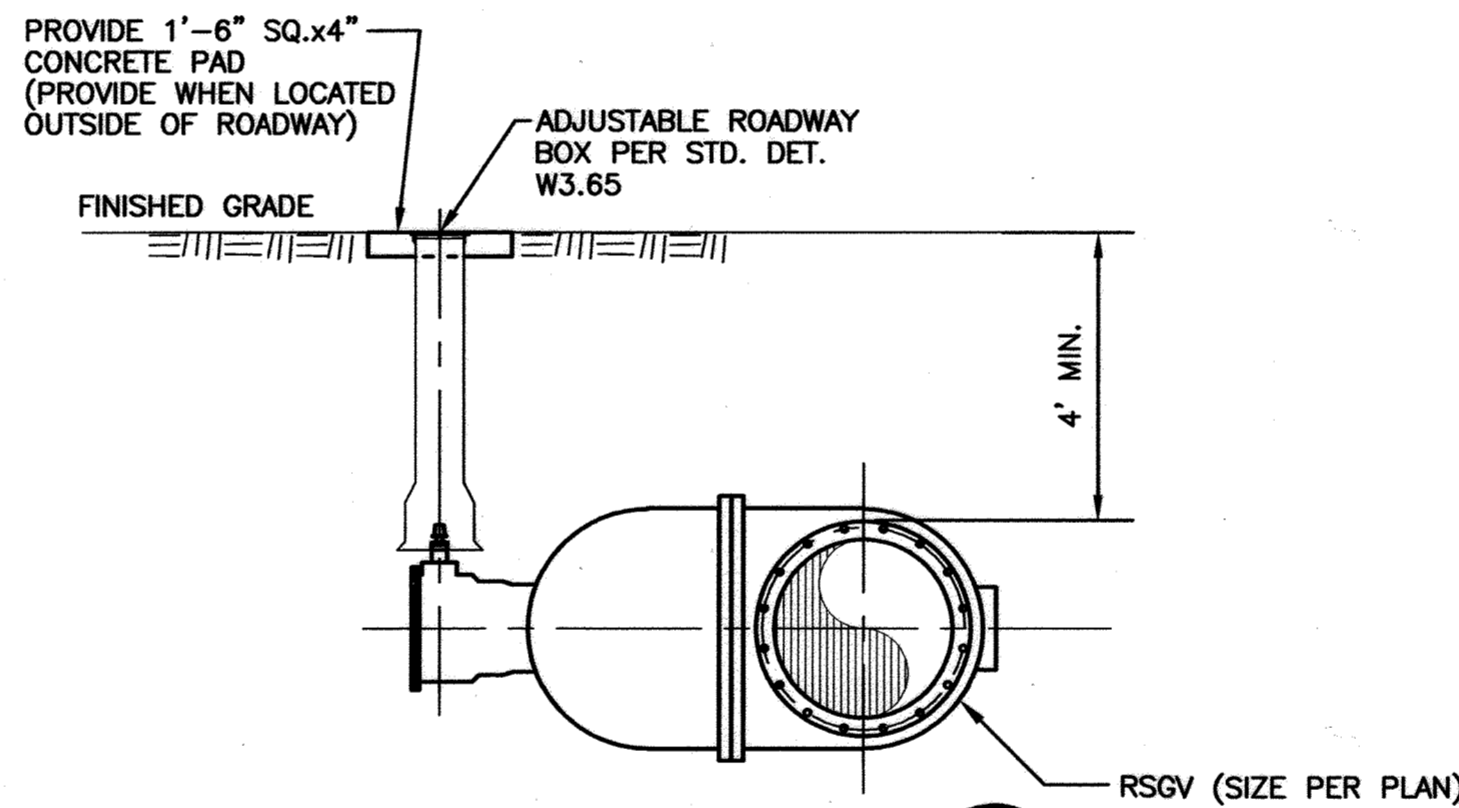


**SECTION**  
SCALE: 1/2"=1'-0"

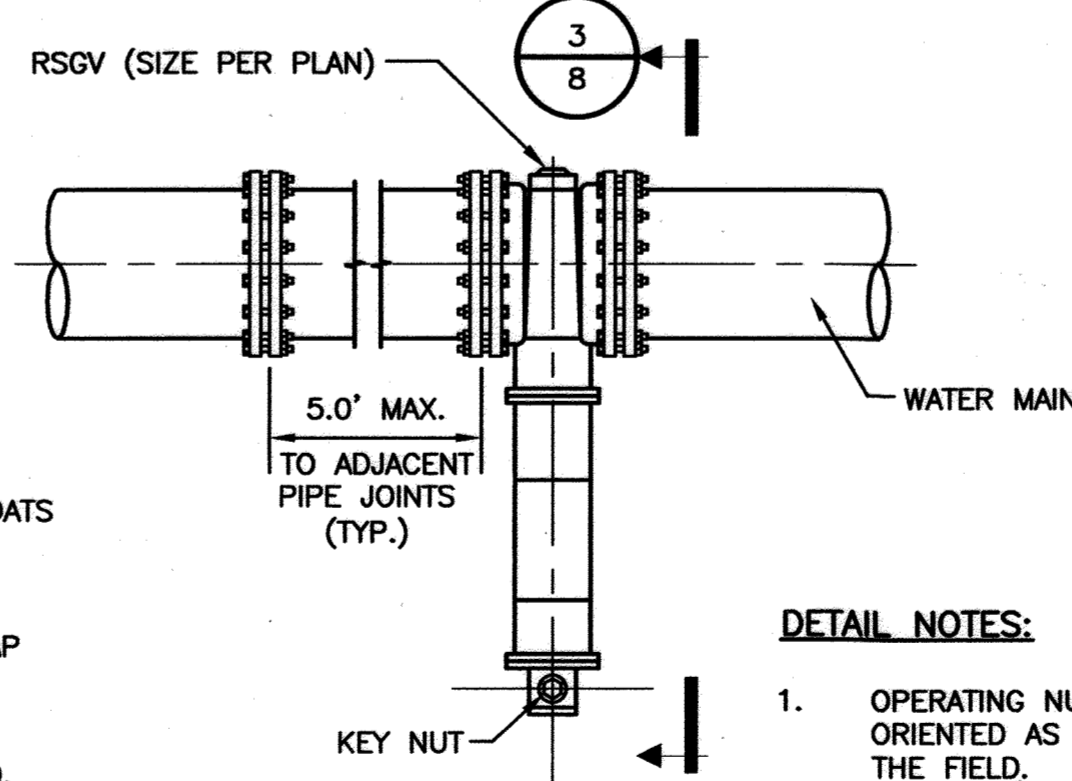


HDPE			
FITTING/SIZE	A	B	C
36" 90° ELBOW/DEAD END	12.0'	10.0'	6.0'

**90° THRUST BLOCK DETAIL**  
NOT TO SCALE



**SECTION**  
N.T.S.



**PLAN**  
N.T.S.

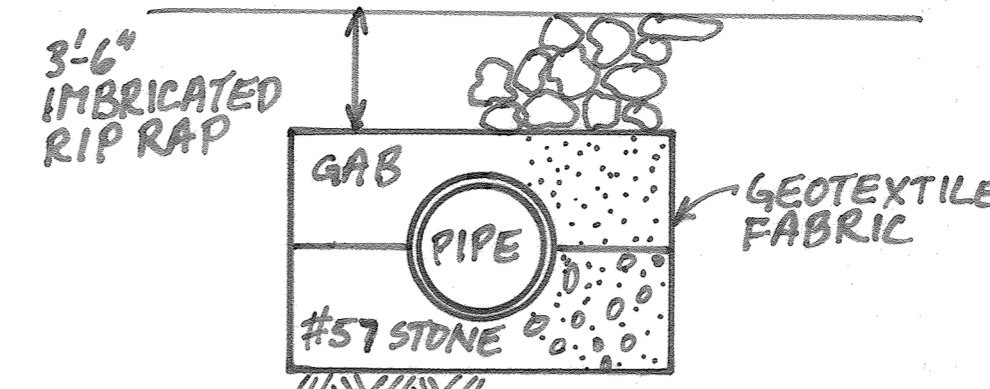
**30" & 36" RSGV - DETAIL**  
N.T.S.

**DRAWING NOTES:**

1. COAT EXPOSED STEEL FITTINGS WITH 2 COATS OF ROYSTON R-28 MASTIC, PER MANUFACTURER'S RECOMMENDATIONS.
2. ON ALL GATE VALVES, PROVIDE A 3/4" TAP WITH PLUGS ON EACH SIDE OF THE GATE VALVE OPERATOR.
3. REGARDLESS OF REINFORCEMENT DEPICTED, MANHOLE SHALL BE FURNISHED WITH LIFTING EYES SUITABLE FOR LIFTING WITHOUT CRACKING OR DAMAGING MANHOLE. MANUFACTURER SHALL PROVIDE LIFTING HOOKS AND EMBEDMENT AS REQUIRED FOR LIFTING WITHOUT DAMAGE.

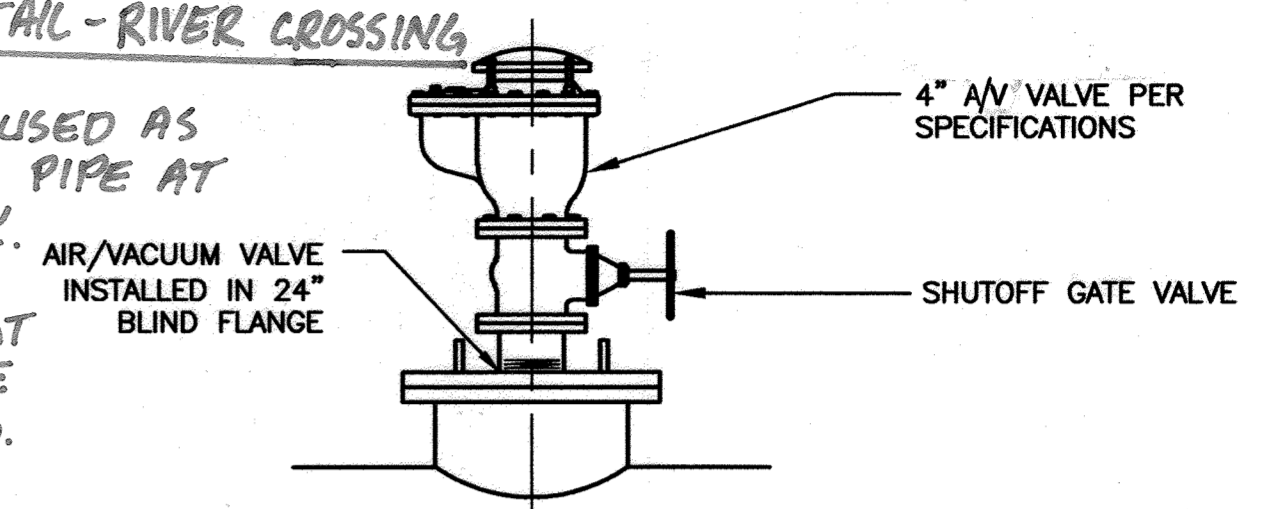
**DETAIL NOTES:**

1. OPERATING NUT SHALL BE ORIENTED AS DIRECTED IN THE FIELD.

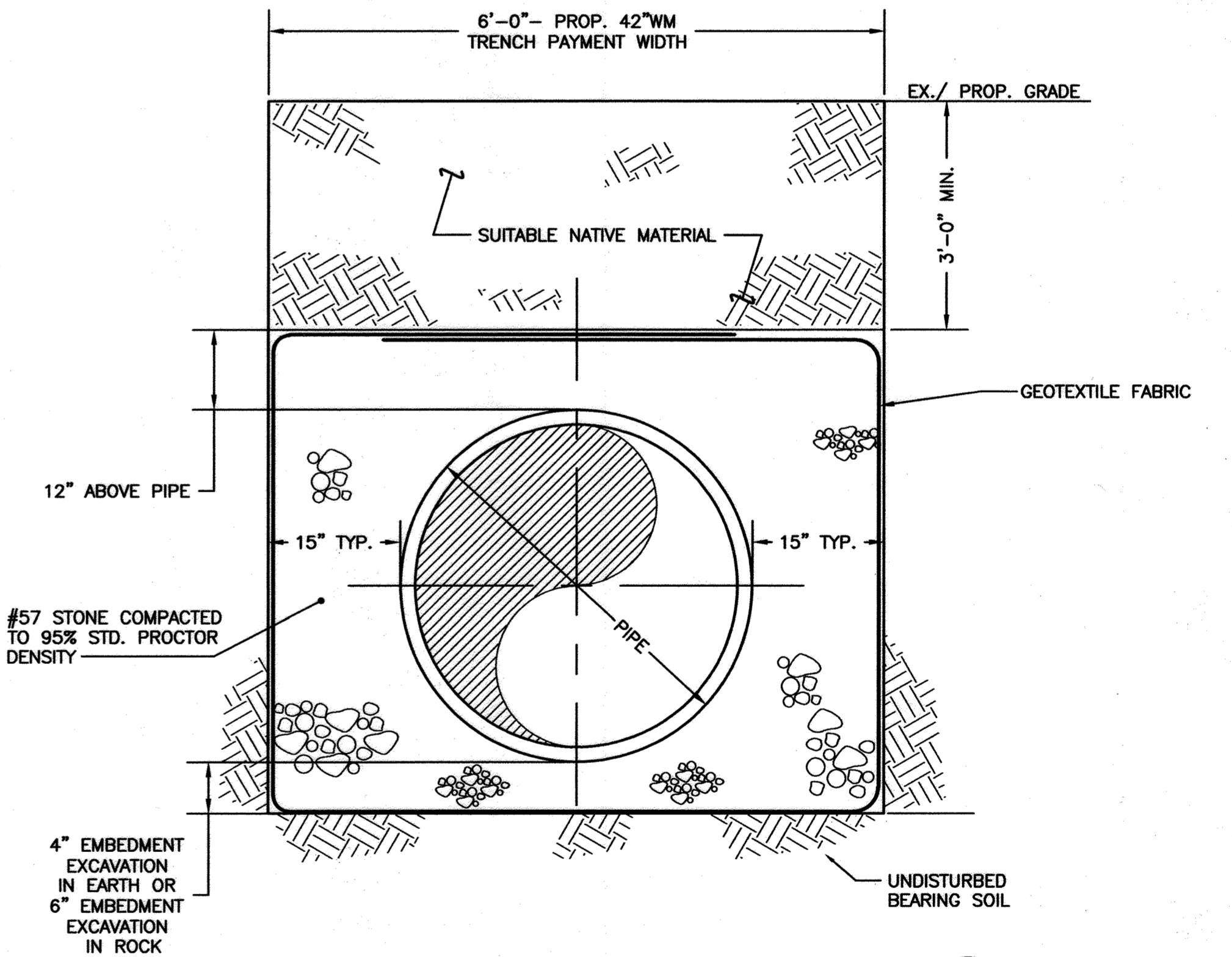


**PIPE TRENCH DETAIL - RIVER CROSSING**

NOTES: CLAY SOIL USED AS BACKFILL AROUND PIPE AT EACH RIVER BANK. THE CLAY STOPS ARE 10 L.F. LONG AT EACH SIDE OF THE RIVER CROSSING.



**TYPICAL AUTOMATIC AIR/VACUUM VALVE/ACCESS MANHOLE ASSEMBLY - DETAIL**  
SCALE: 1/2"=1'-0"



**TYPICAL PIPE TRENCH DETAIL (UNPAVED)**  
N.T.S.

**DETAIL NOTES:**

1. TRENCH SHALL BE COMPACTED TO 95% STD. PROCTOR DENSITY, 8" LAYERS MAXIMUM.
2. REFER TO RESTORATION SCHEDULE FOR RESTORATION REQUIREMENTS.

SCALES 1/2"=1'-0"

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Director of Public Works: [Signature] 10/22/12  
 Chief, Bureau of Engineering: Steve Shaver (Acting) 10/8/12  
 Chief, Bureau of Utilities: [Signature] 10/16/12  
 Chief, Utility Design Division: [Signature] 10/15/12

**O'BRIEN & GERE**  
4201 MITCHELLVILLE ROAD  
SUITE 500  
BOWIE, MD 20716  
PHONE: 301-731-5622

PROFESSIONAL CERTIFICATION:  
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DSN. BY: CAB  
DRN. BY: RPW  
CHK. BY: RJD  
DATE: SEPT. 2012

BY	NO.	REVISION	DATE
RJD	1	RECORD DRAWING	04/16
RJD	0	ISSUED FOR BID	09/12

GENERAL DETAILS

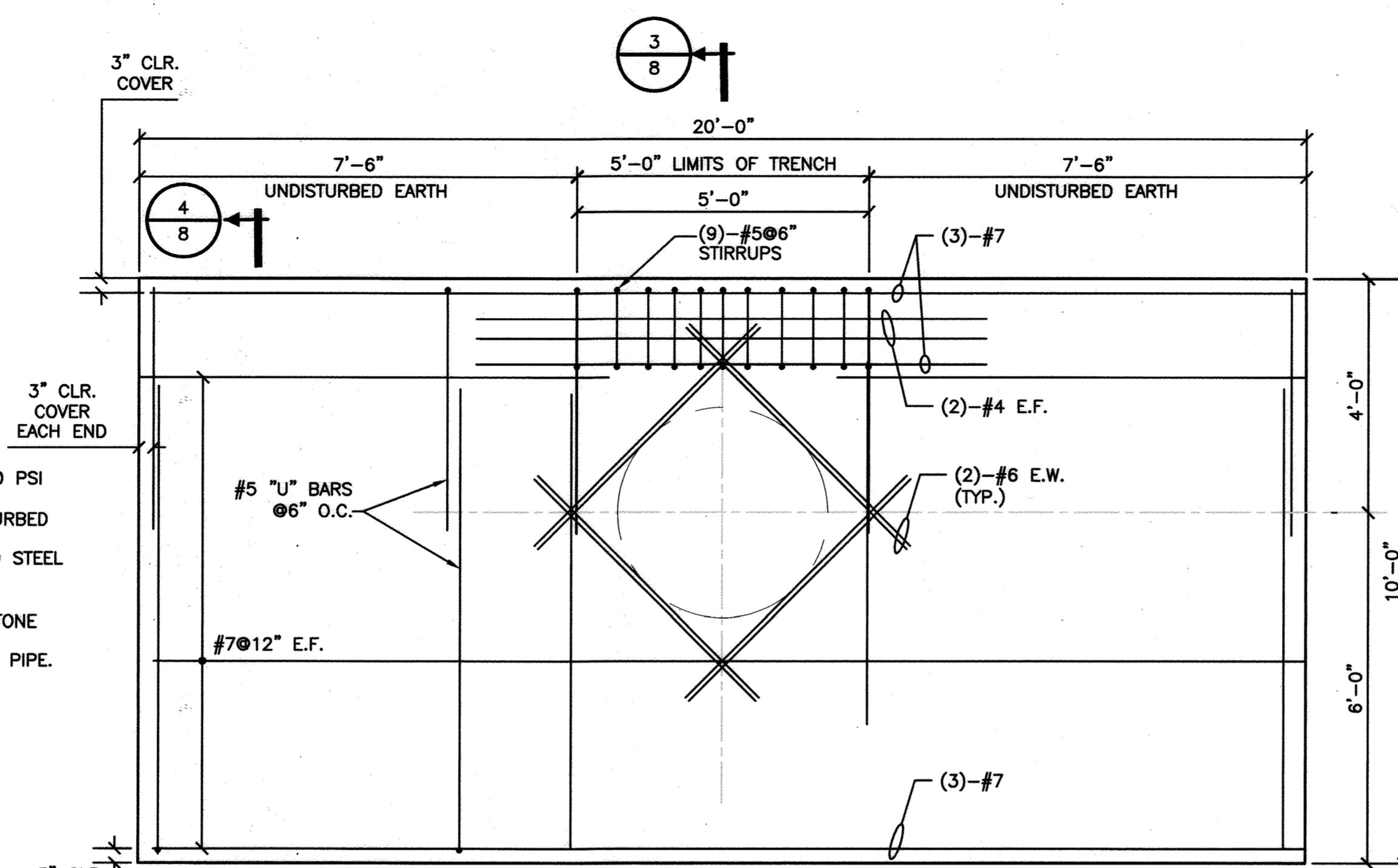
600' SCALE MAP NO. 36 BLOCK NO.

US ROUTE 29 / BROKEN LAND PARKWAY  
TRANSMISSION MAIN PARALLEL  
CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO.: 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 9 OF 26

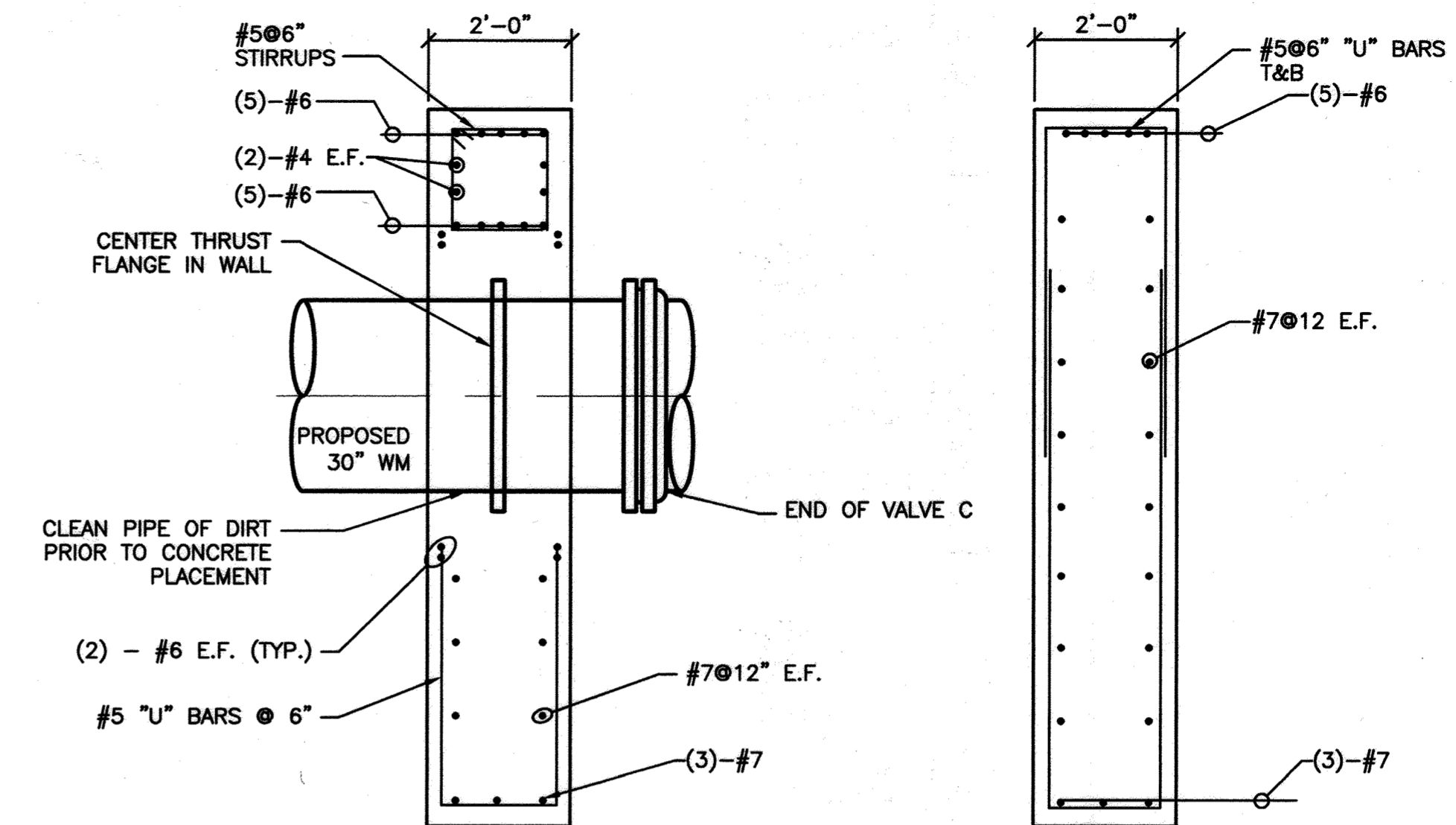
**NOTES:**

1. ALL CONCRETE SHALL BE EARLY HIGH STRENGTH (5,000 PSI COMPRESSIVE STRENGTH).
2. ALL BEARING SURFACES SHALL BE CARRIED TO UNDISTURBED EARTH.
3. APPLY COAL TAR PROTECTIVE COATING TO ALL EXPOSED STEEL PER AWWA C-203.
4. PROVIDE A MINIMUM OF 3" COVER OVER ALL REBAR.
5. PROVIDE A MINIMUM 12" COMPACTED DEPTH OF #57 STONE BEDDING BELOW EXTENT OF CONCRETE POUR.
6. THRUST COLLAR TO BE PLACED AFTER INSTALLATION OF PIPE. SUPPORT OF THE PIPE DURING THIS WORK IS THE RESPONSIBILITY OF THE CONTRACTOR.



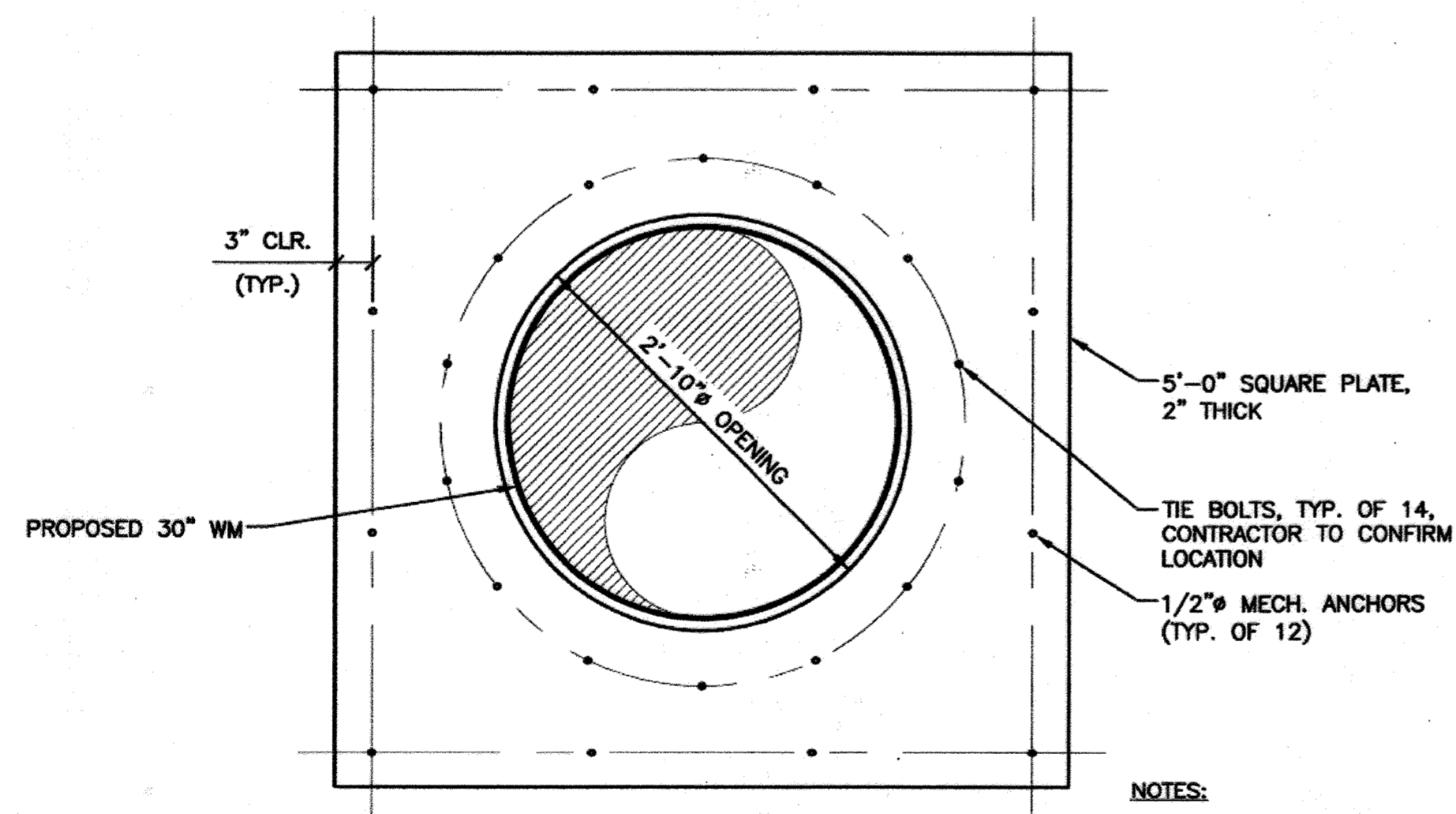
**REINFORCED CONCRETE THRUST COLLAR ELEVATION - DETAIL "D"**

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



**SECTION 3**  
SCALE: 1/2"=1'-0"

**SECTION 4**  
SCALE: 1/2"=1'-0"

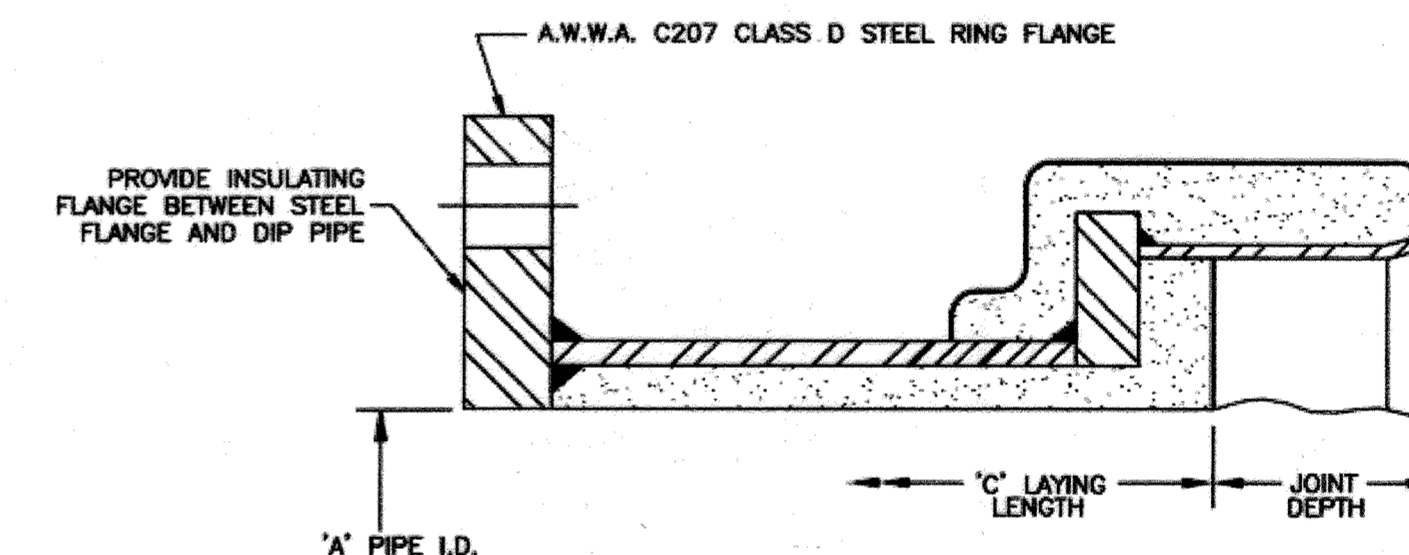


**STEEL PLATE DETAIL**

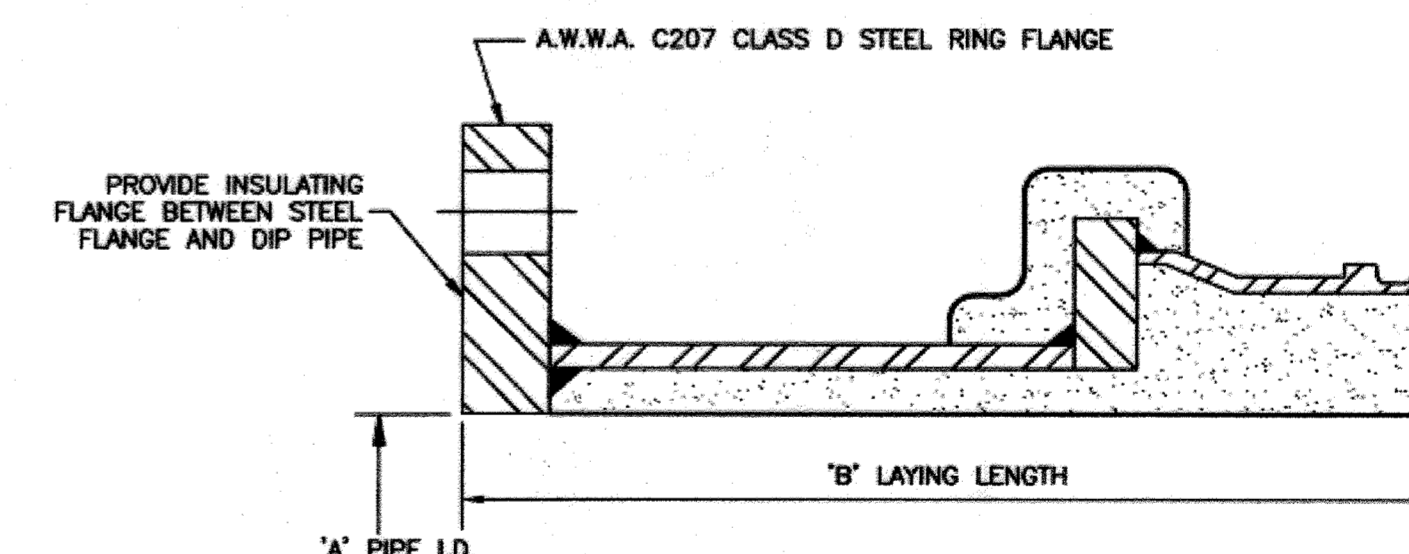
SCALE: 1"=1'-0"

**NOTES:**

1. ALL BURIED TIED RODS, NUTS, WASHERS, AND TIE BOLTS SHALL BE PAINTED WITH 2 COATS OF BITUMASTIC PAINT.
2. AFTER CUTTING THE HOLES FOR THE PIPE, THE STEEL PLATE SHALL BE PAINTED WITH 2 COATS OF BITUMASTIC ENAMEL PRIOR TO PLACEMENT ON THE THRUST BLOCK AND CONNECTION OF TIE-RODS.



**BELL BY FLANGE ADAPTER**



**SPIGOT BY FLANGE ADAPTER**

A	B	C	JOINT DEPTH
36"	1.63'	1.30'	3 7/8"

**NOTES:**

- 1) MESH AND MORTAR AS SHOWN (MESH NOT SHOWN FOR CLARITY).
- 2) ALL EXPOSED STEEL (EXCEPT FLANGE FACE AND BOLT HOLES) TO BE PAINTED IN ACCORDANCE WITH SPECIFICATION 909.20.
- 3) FLANGE FACE AND BOLT HOLES TO BE PAINTED WITH ZINC RICH PAINT.

**PCCP STANDARD JOINT x FLANGE ADAPTER DETAIL**

N.T.S.

C  
7

GRAPHIC SCALES 1/2"=1'-0"

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

*Lang V. ...* 10/22/11  
DIRECTOR OF PUBLIC WORKS DATE

*Steve Shannon (Chief)* 10/10/12  
CHIEF - BUREAU OF ENGINEERING DATE

*Steve C. ...* 10/10/12  
CHIEF, BUREAU OF UTILITIES DATE

*Chris ...* 10/10/12  
CHIEF/UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE**

4201 MITCHELLVILLE ROAD  
SUITE 500  
BOWIE, MD 20716  
PHONE: 301-731-5622

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STATE OF MARYLAND  
PROFESSIONAL ENGINEER

DSN. BY:	CAB			
DRN. BY:	RPW	RJD 3	RECORD DRAWING	04/16
		RJD 2	DESIGN REVISION NO. 1	03/14
CHK. BY:	RJD	RJD 1	REVISED PER ADDENDUM NO. 1	02/13
		RJD 0	ISSUED FOR BID	09/12
DATE:	SEPT. 2012	BY	NO.	REVISION

**CONNECTION AND MISCELLANEOUS DETAILS**

600' SCALE MAP NO. 36 BLOCK NO. \_\_\_\_\_

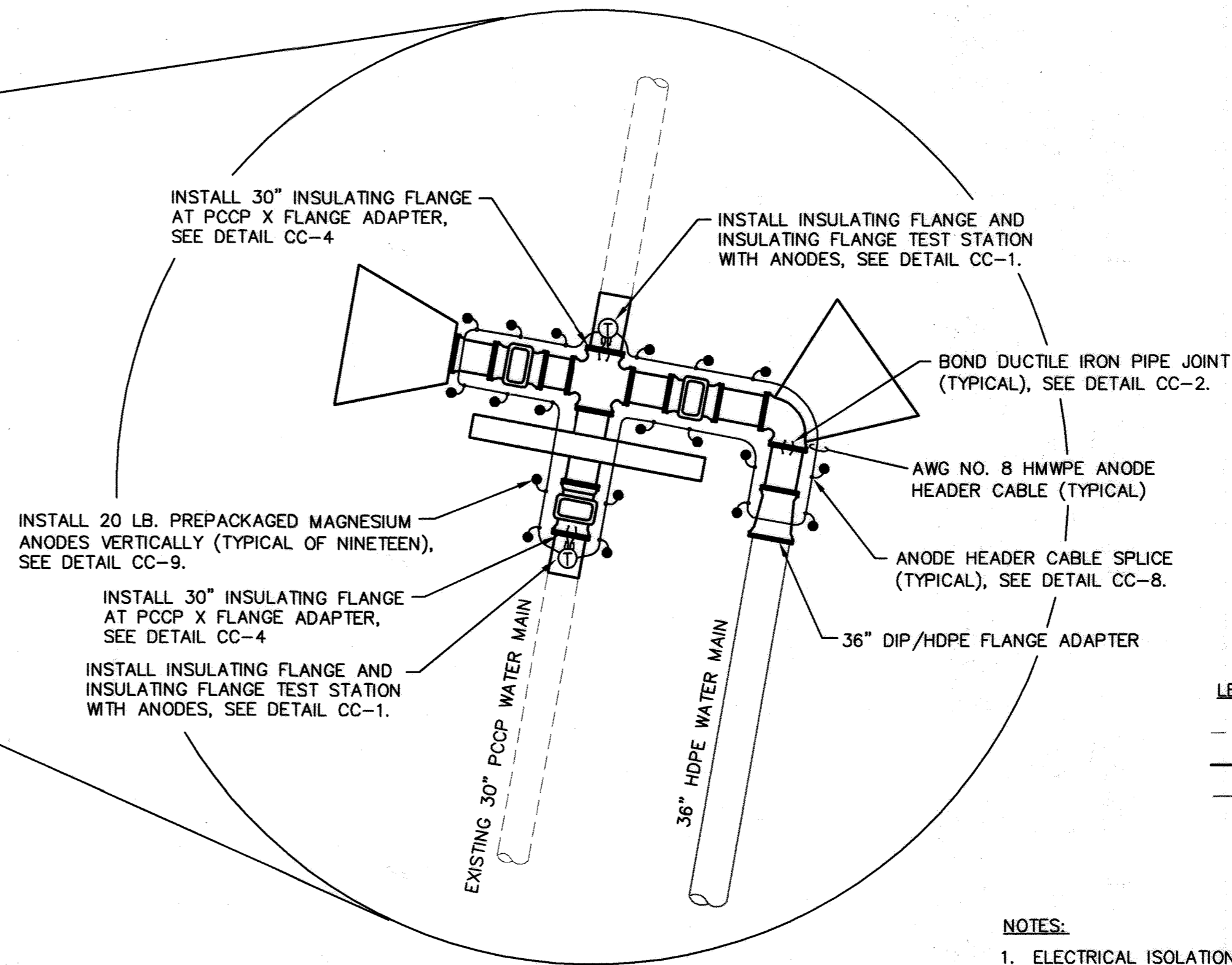
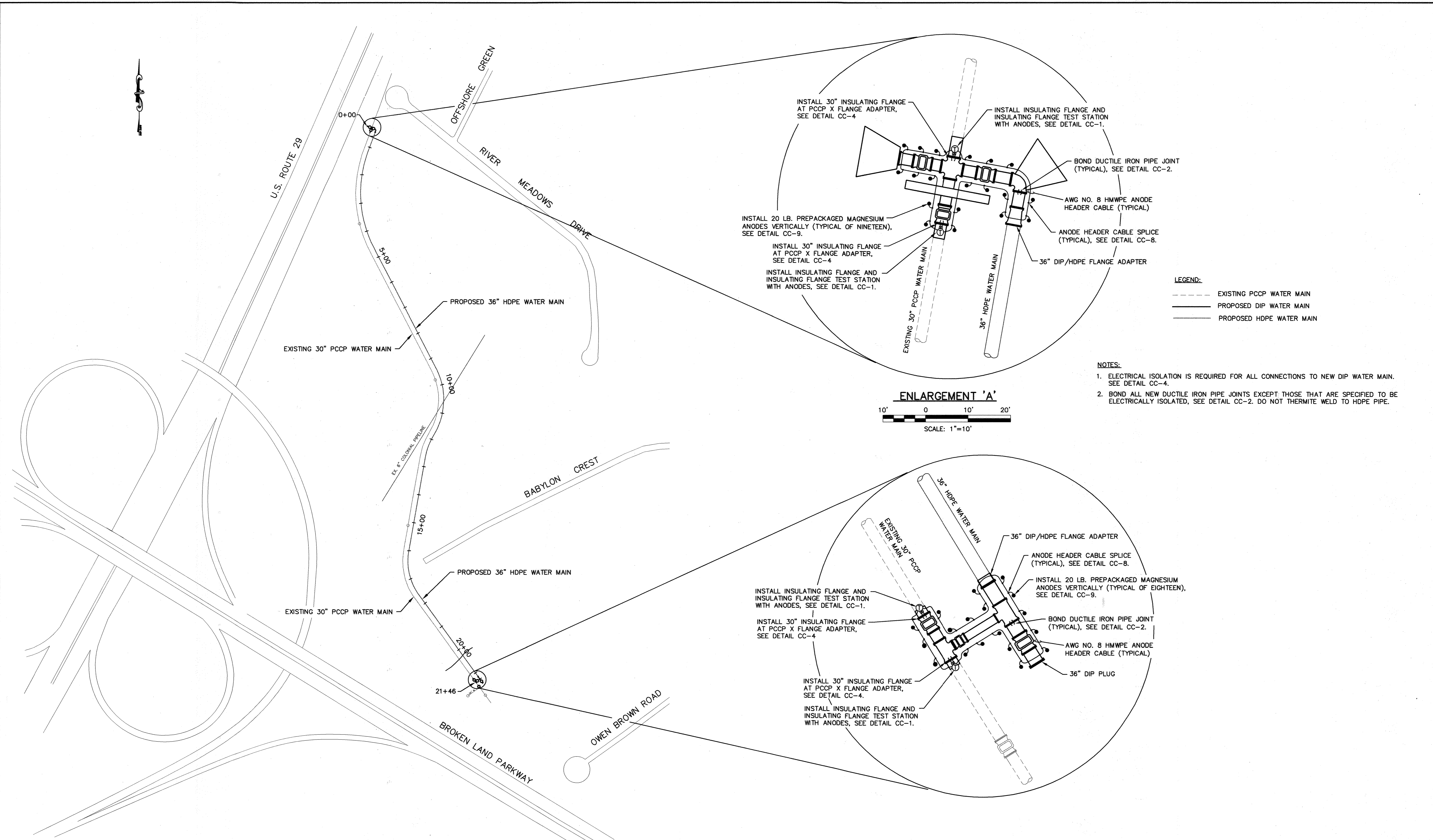
**US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN PARALLEL**

CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO.: 6  
HOWARD COUNTY, MARYLAND

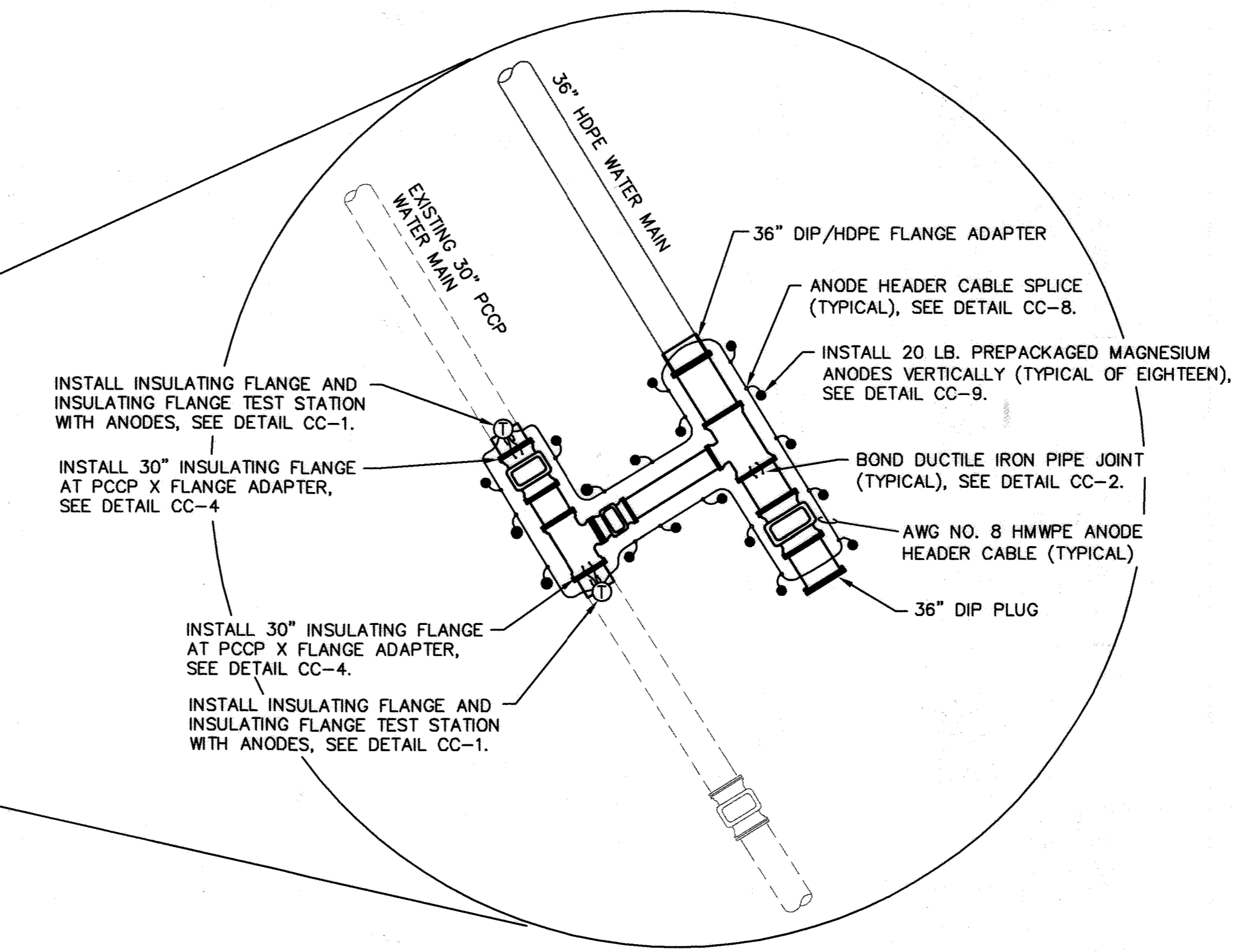
SCALE AS SHOWN

SHEET 10 OF 26

FILE NO. 33498-XXXF



**ENLARGEMENT 'A'**  
 10' 0 10' 20'  
 SCALE: 1"=10'



**ENLARGEMENT 'B'**  
 10' 0 10' 20'  
 SCALE: 1"=10'

**LEGEND:**  
 --- EXISTING PCCP WATER MAIN  
 --- PROPOSED DIP WATER MAIN  
 --- PROPOSED HDPE WATER MAIN

**NOTES:**  
 1. ELECTRICAL ISOLATION IS REQUIRED FOR ALL CONNECTIONS TO NEW DIP WATER MAIN. SEE DETAIL CC-4.  
 2. BOND ALL NEW DUCTILE IRON PIPE JOINTS EXCEPT THOSE THAT ARE SPECIFIED TO BE ELECTRICALLY ISOLATED, SEE DETAIL CC-2. DO NOT THERMITE WELD TO HDPE PIPE.

**CORROSION CONTROL LAYOUT**

150' 0 150' 300'  
 SCALE: 1"=150'

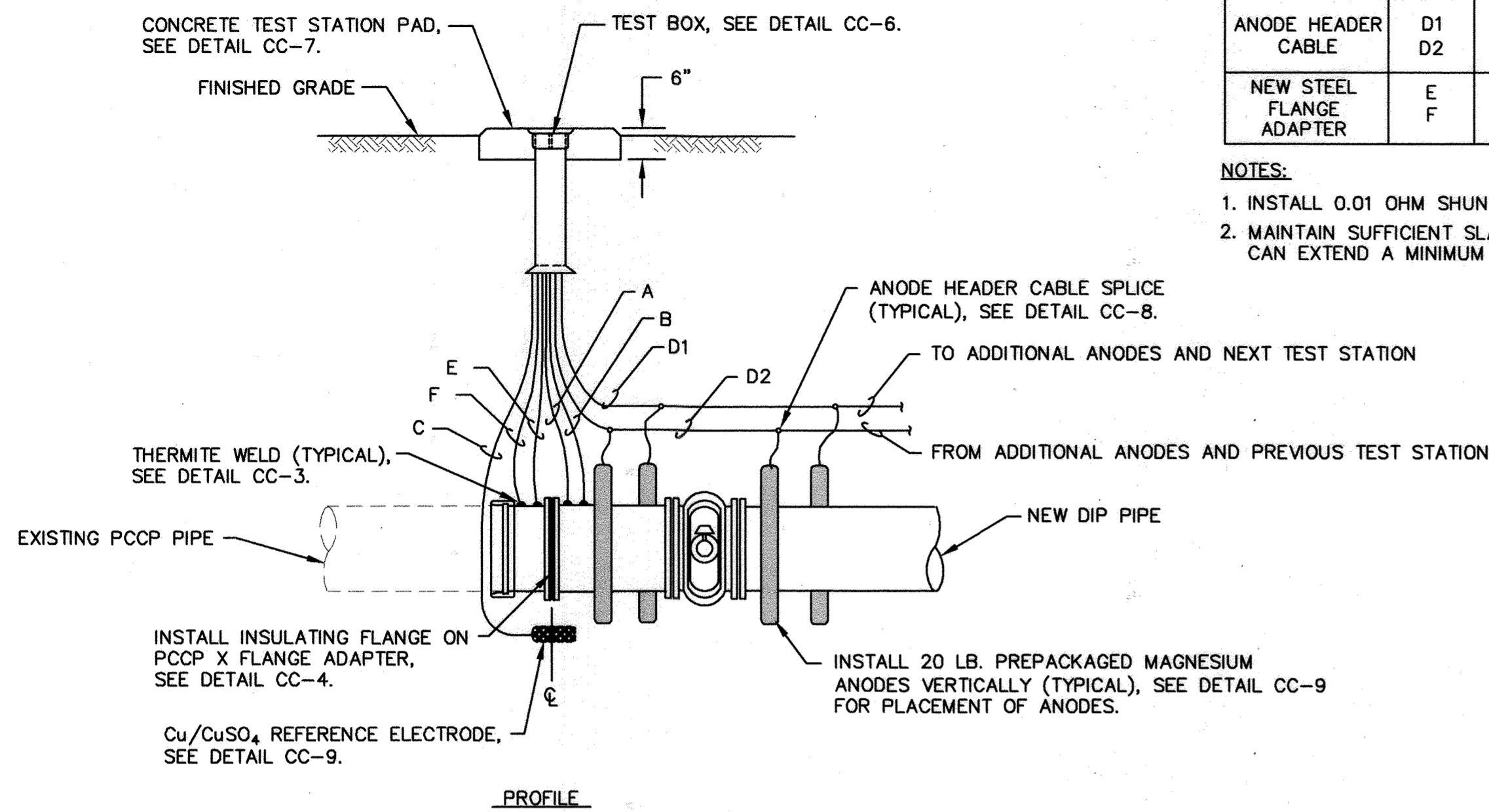
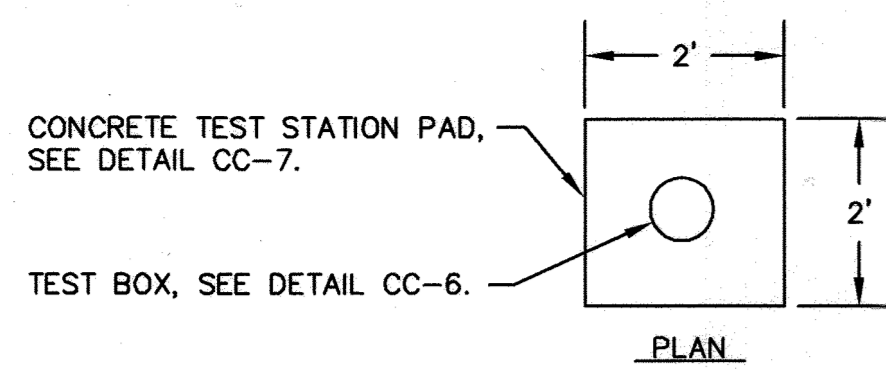
THIS DRAWING IS NOT APPLICABLE FOR USE AS STANDARD CORROSION CONTROL PROCEDURES FOR OTHER PROJECTS DUE TO VARIABLE CONDITIONS AT OTHER SITES. NEITHER THIS DESIGN NOR ANY PART THEREOF MAY BE DUPLICATED IN ANY WAY FOR OTHER PROJECTS OR MODIFIED IN ANY WAY FOR THIS OR OTHER PROJECTS, EXCEPT BY WRITTEN AGREEMENT WITH RUSSELL CORROSION CONSULTANTS, INC.

<b>DEPARTMENT OF PUBLIC WORKS</b> HOWARD COUNTY, MARYLAND <i>Ray Chow</i> 10/20/12 DIRECTOR OF PUBLIC WORKS DATE <i>Steve Shuman (Chief)</i> 10/8/12 CHIEF - BUREAU OF ENGINEERING DATE <i>John Chen</i> 10/15/12 CHIEF, BUREAU OF UTILITIES DATE <i>Paul D. L...</i> 10/5/12 CHIEF, UTILITY DESIGN DIVISION DATE		 Columbia, Maryland	 MICHAEL H. HOZELLA PROFESSIONAL ENGINEER STATE OF MARYLAND LICENSE NO. 17083, EXPIRATION DATE 09/27/2014
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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. 17083, EXPIRATION DATE 09/27/2014.	DSN. BY: TRF DRN. BY: DJD CHK. BY: MJS DATE: MAY 2009	DD 0 BY NO.	RJD 1 RECORD DRAWING ISSUED FOR BID REVISION	09/16 3/12 DATE
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<b>CORROSION CONTROL LAYOUT</b> 600' SCALE MAP NO. _____ BLOCK NO. _____	
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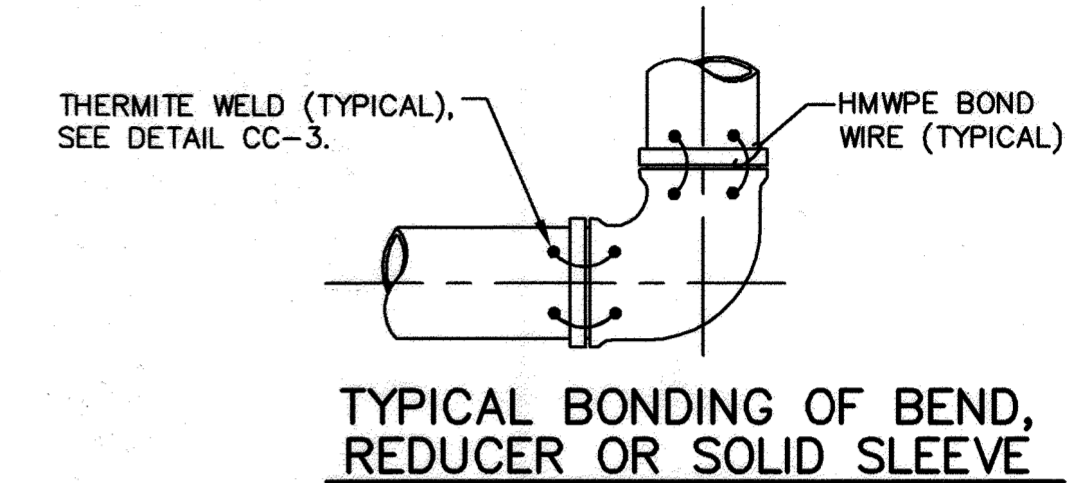
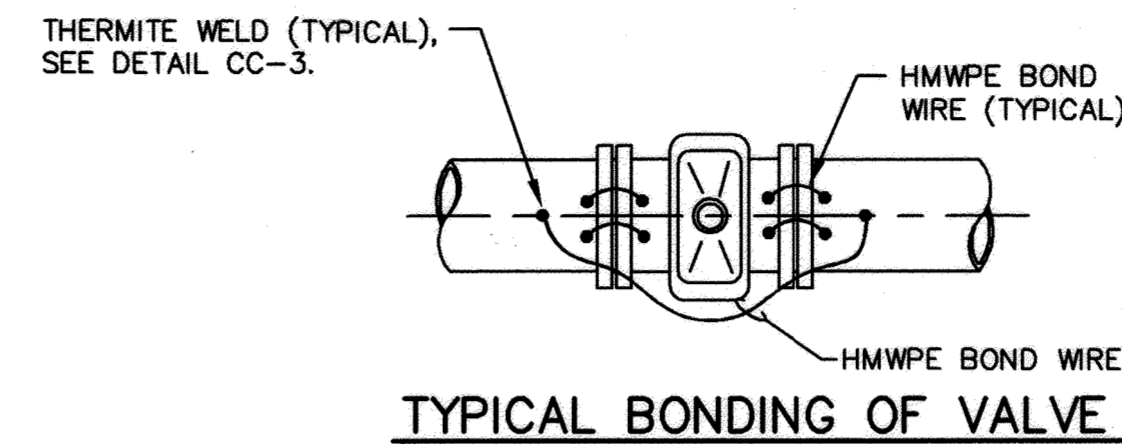
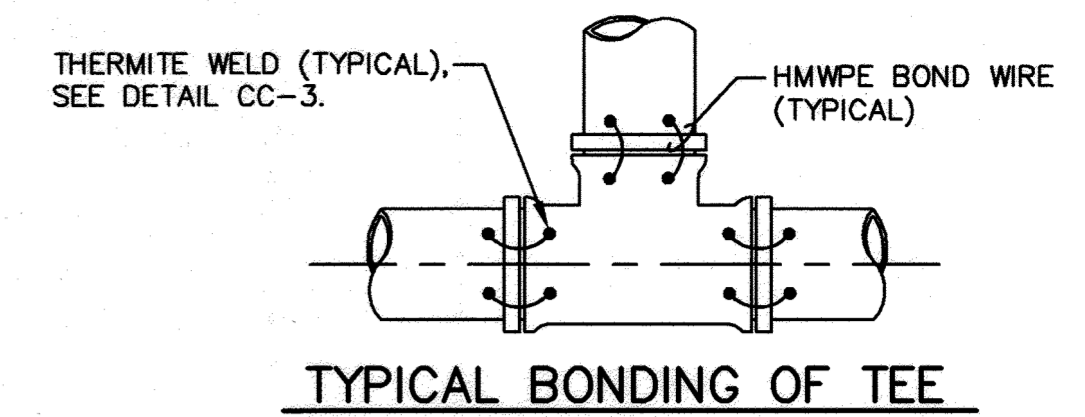
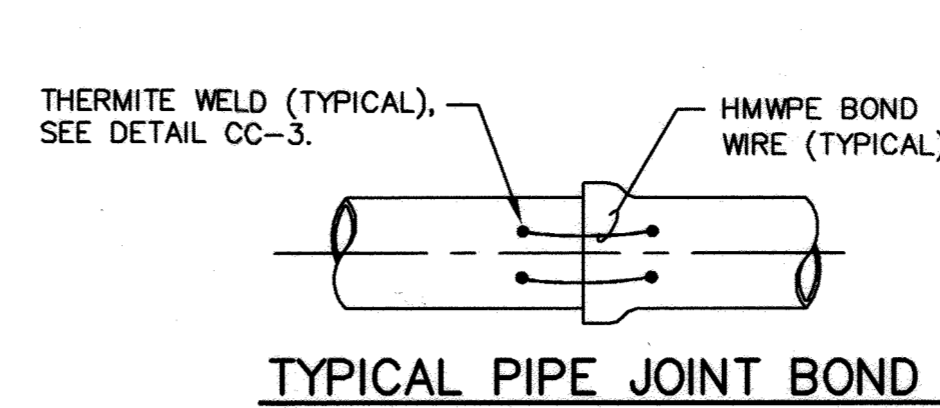
<b>US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN REPLACEMENT</b> CAPITAL PROJECT: W-8265 CONTRACT NO.: 44-4592 ELECTION DISTRICT NO. 6 HOWARD COUNTY, MARYLAND
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**DETAIL CC-1: INSULATING FLANGE TEST STATION WITH ANODES**

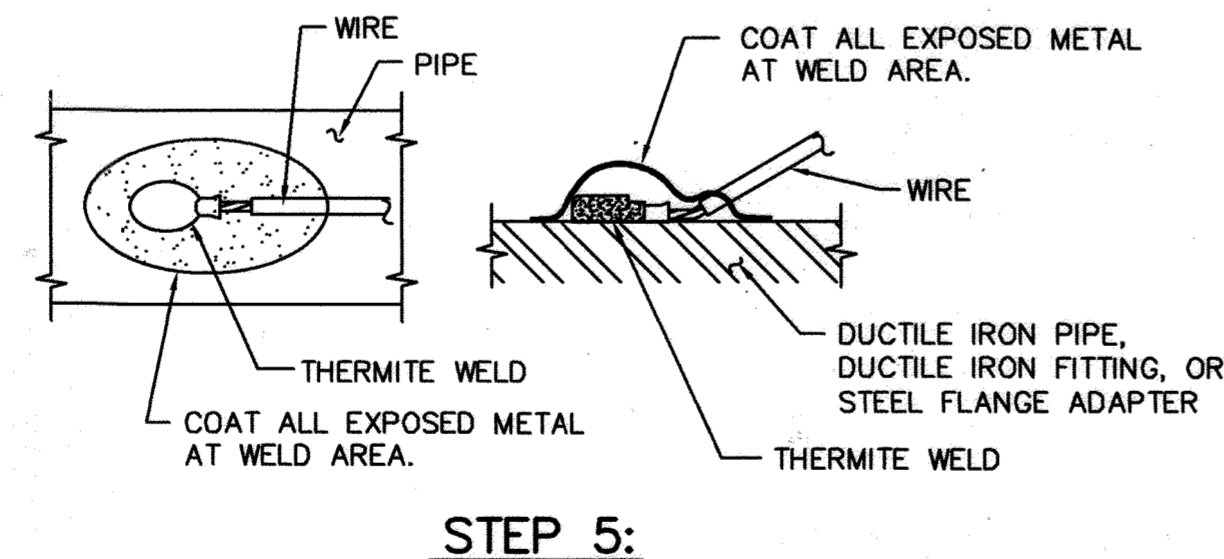
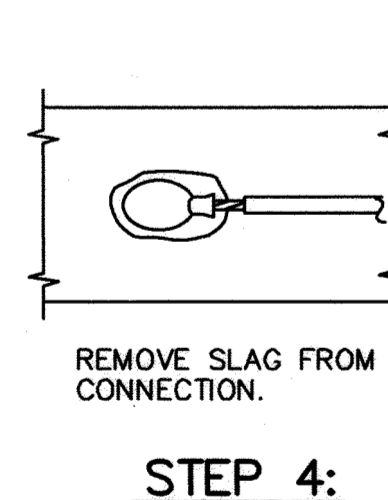
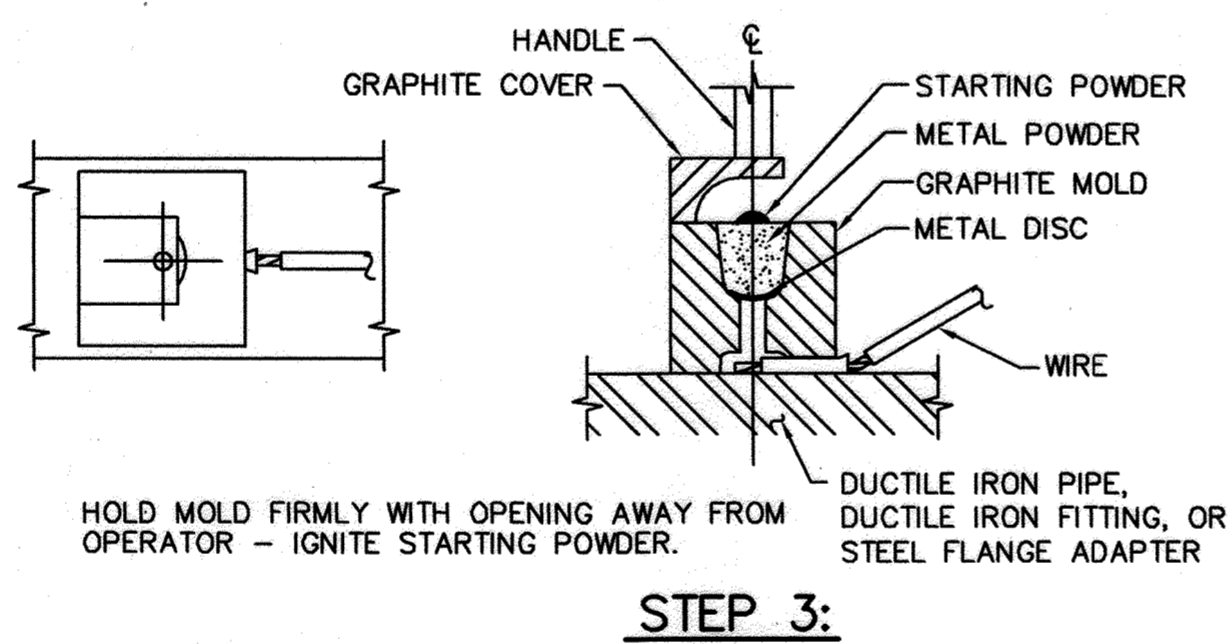
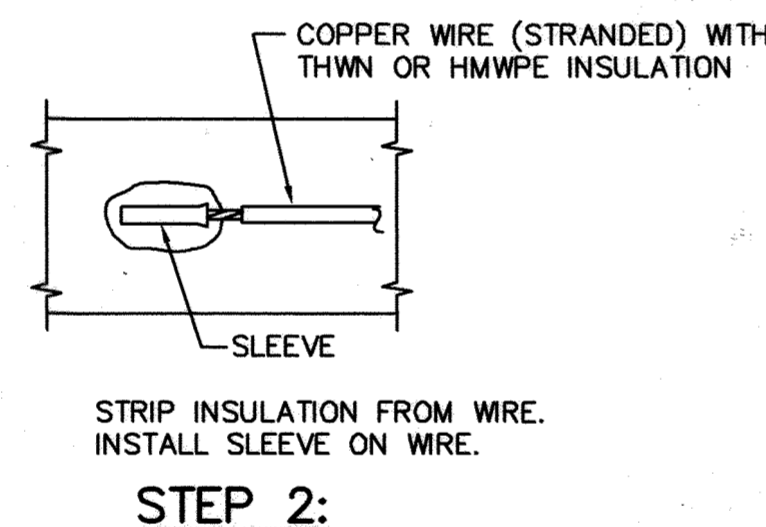
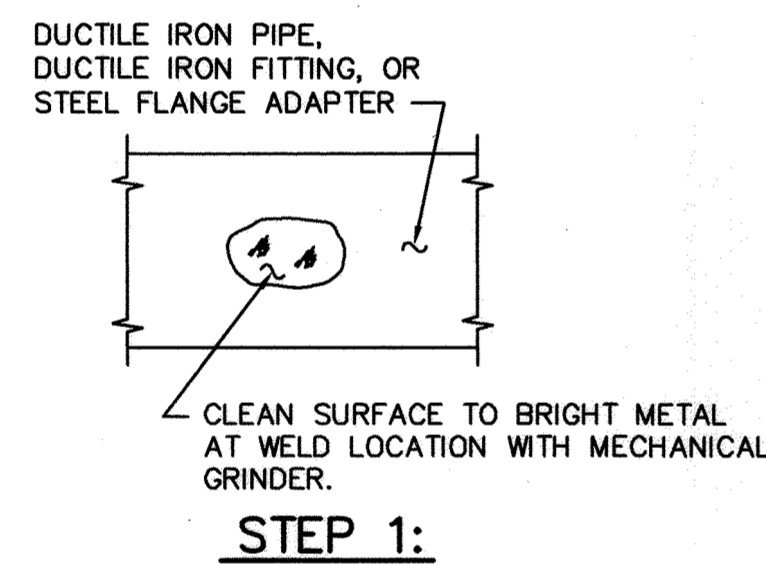
WIRING SCHEDULE					
DESCRIPTION	WIRE	TEST STATION TERMINAL	AWG WIRE SIZE	TYPE OF INSULATION	COLOR OF INSULATION
NEW DIP VALVE	A B	1 3	#10	THWN	BLUE BLUE
PERMANENT REFERENCE ELECTRODE	C	6	#14	HMWPE	BLACK
ANODE HEADER CABLE	D1 D2	4 4	#8 #8	HMWPE	BLACK BLACK
NEW STEEL FLANGE ADAPTER	E F	2 5	#8 #10	THWN	WHITE WHITE

- NOTES:
1. INSTALL 0.01 OHM SHUNT BETWEEN TERMINALS #1 AND #4.
  2. MAINTAIN SUFFICIENT SLACK IN THE TEST WIRES SO THAT THE WIRES CAN EXTEND A MINIMUM OF 18" FROM THE TEST BOX.



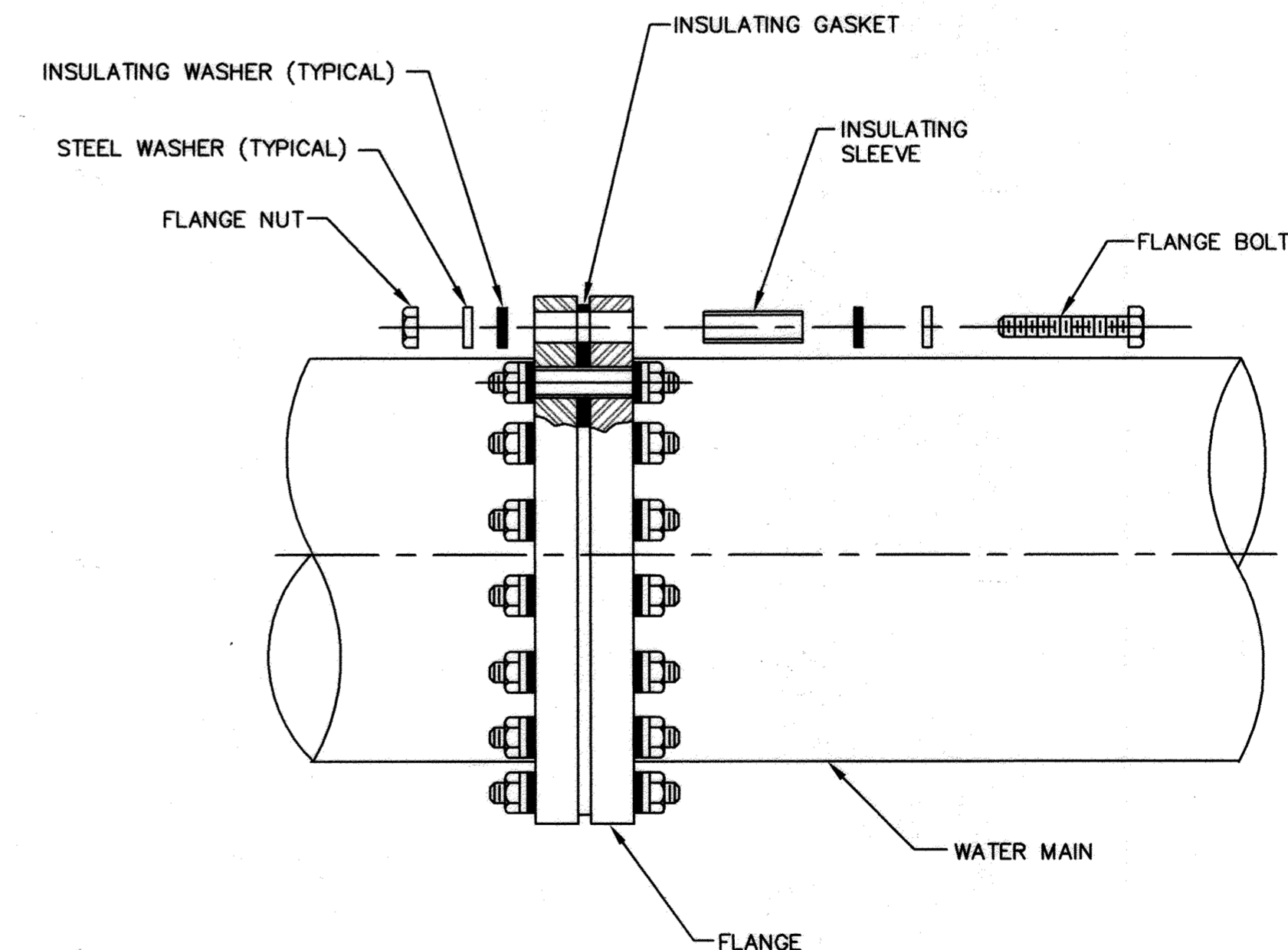
- NOTES:
1. BOND ALL DUCTILE IRON PIPE JOINTS, INCLUDING THOSE ON PIPE, FITTINGS, VALVES, ETC., EXCEPT THOSE SPECIFIED TO BE INSULATED.
  2. THERMITE WELD BONDING WIRES TO TOP OF PIPE OR FITTING.
  3. WIRE SIZE FOR BONDING JOINTS SHALL BE AWG NO. 4.

**DETAIL CC-2: DUCTILE IRON PIPE JOINT BONDING**



- NOTES:
1. THERMITE WELDS MADE TO DUCTILE IRON PIPE, DUCTILE IRON FITTING, OR STEEL FLANGE ADAPTER SHALL BE COATED WITH A PREFABRICATED ONE PIECE PLASTIC CAP FILLED WITH ELASTOMERIC MATERIAL.
  2. DO NOT THERMITE WELD TO HDPE PIPE.

**DETAIL CC-3: THERMITE WELD**



- NOTES:
1. SEE DETAIL CC-5 FOR EXTERNAL COATING OF INSULATING FLANGE.
  2. ALL INSULATING FLANGES SHALL BE PROVIDED WITH A TEST STATION, SEE DETAIL CC-1.

**DETAIL CC-4: INSULATING FLANGE**

THIS DRAWING IS NOT APPLICABLE FOR USE AS STANDARD CORROSION CONTROL PROCEDURES FOR OTHER PROJECTS DUE TO VARIABLE CONDITIONS AT OTHER SITES. NEITHER THIS DESIGN NOR ANY PART THEREOF MAY BE REPRODUCED IN ANY MANNER FOR OTHER PROJECTS OR MODIFIED IN ANY WAY FOR THIS OR OTHER PROJECTS EXCEPT BY WRITTEN AGREEMENT WITH RUSSELL CORROSION CONSULTANTS, INC.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Jan 7 2010* 10/26/12  
DIRECTOR OF PUBLIC WORKS DATE

*Steve Shanon (Acting)* 10/8/12  
CHIEF - BUREAU OF ENGINEERING DATE

*Steve Chen* 10/12/12  
CHIEF, BUREAU OF UTILITIES DATE

*Debra Pava* 10/15/12  
CHIEF, UTILITY DESIGN DIVISION DATE

RUSSELL CORROSION CONSULTANTS, INC.  
Columbia, Maryland

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. 17083, EXPIRATION DATE 09/27/2014

DSN. BY: TRF

DRN. BY: DJD

CHK. BY: MJS

DATE: MAY 2009

RJD 1 RECORD DRAWING

DD 0 ISSUED FOR BID

BY NO. REVISION

04/16 3/12

DATE

CORROSION CONTROL  
DETAILS - 1

600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

US ROUTE 29 / BROKEN LAND PARKWAY  
TRANSMISSION MAIN REPLACEMENT

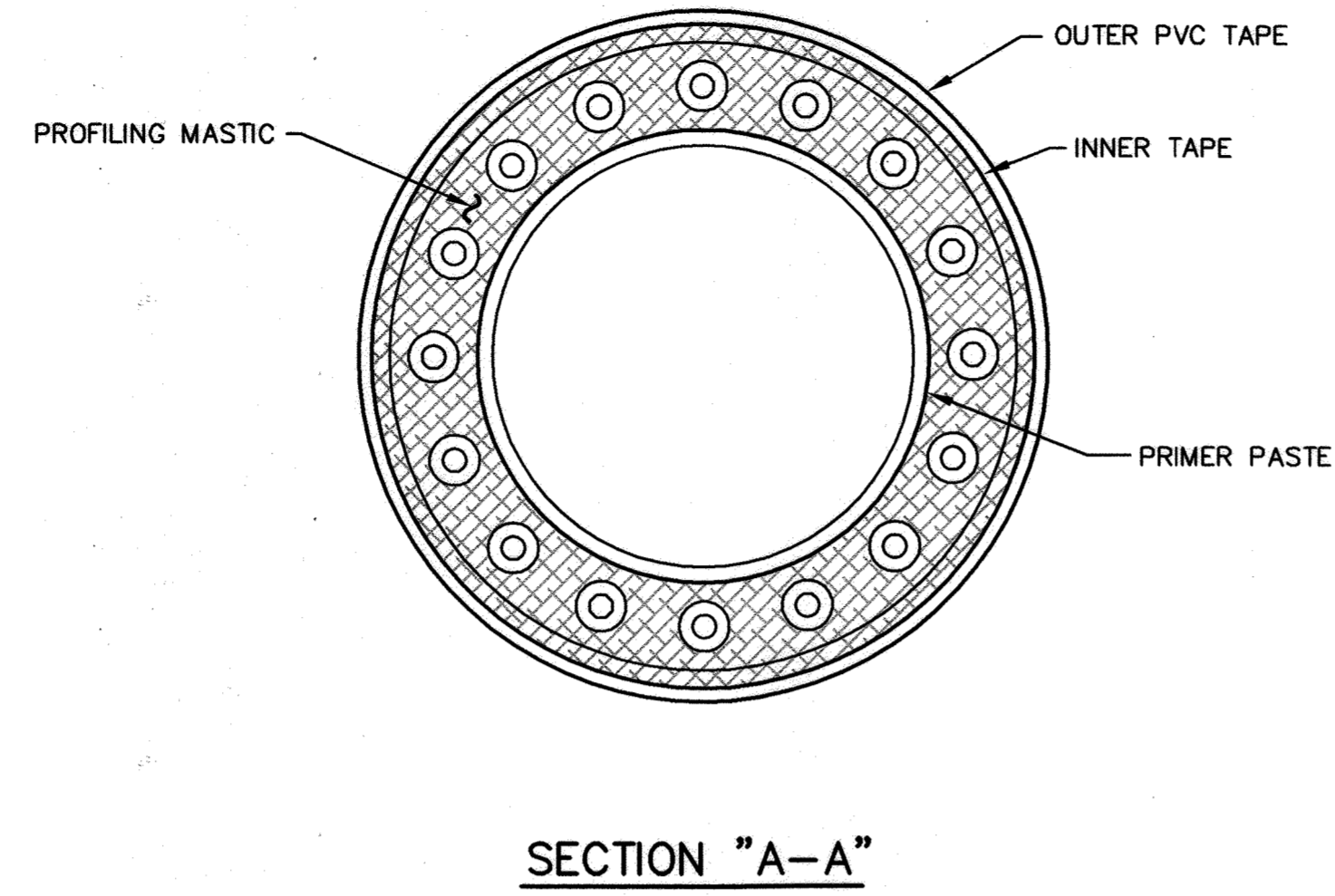
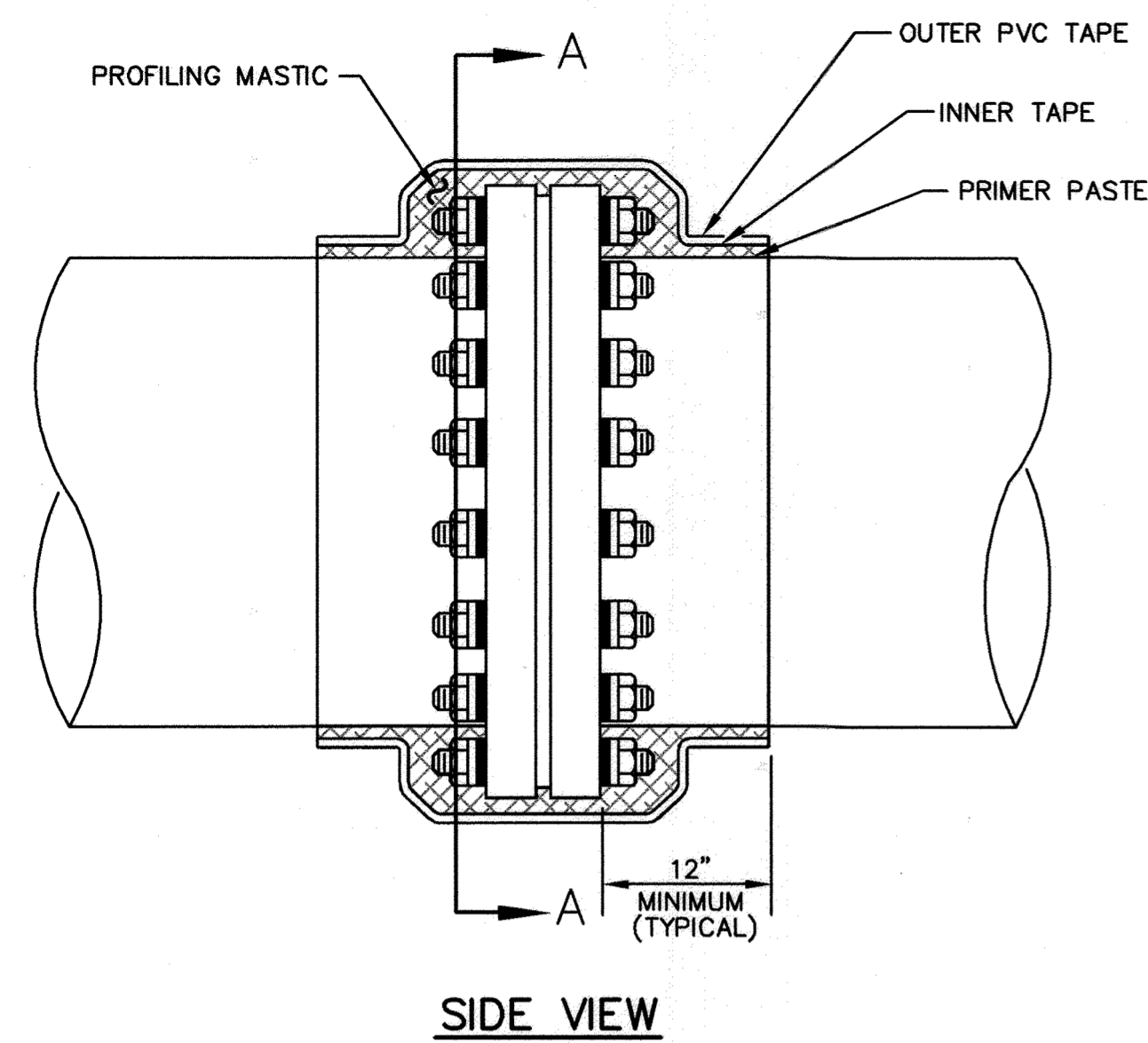
CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

CP-2

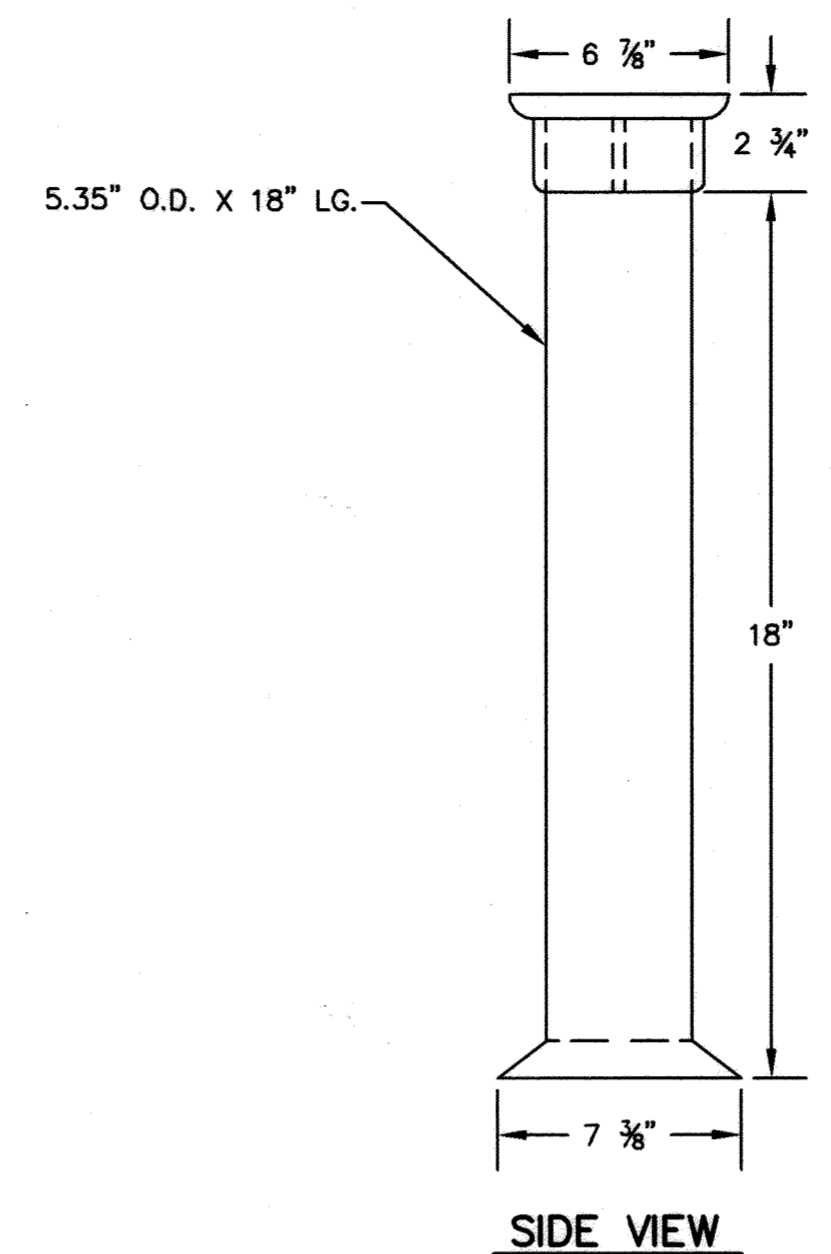
SCALE AS SHOWN

SHEET 12 OF 26

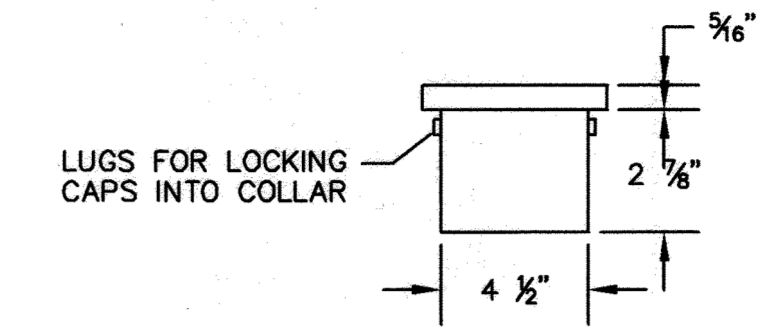
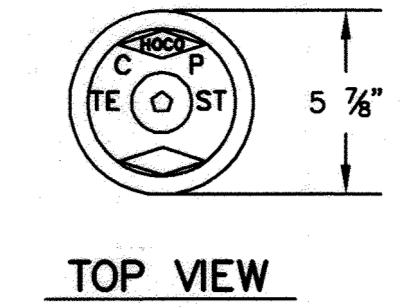
FILE NO. 33498



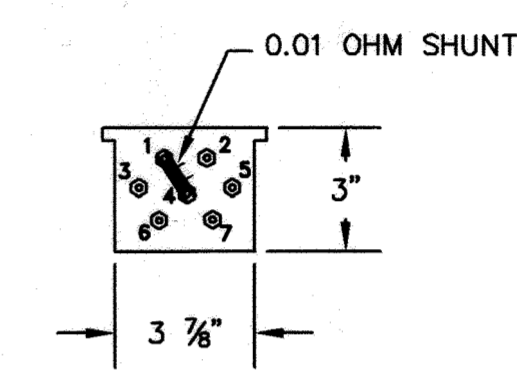
DETAIL CC-5: INSULATING FLANGE COATING



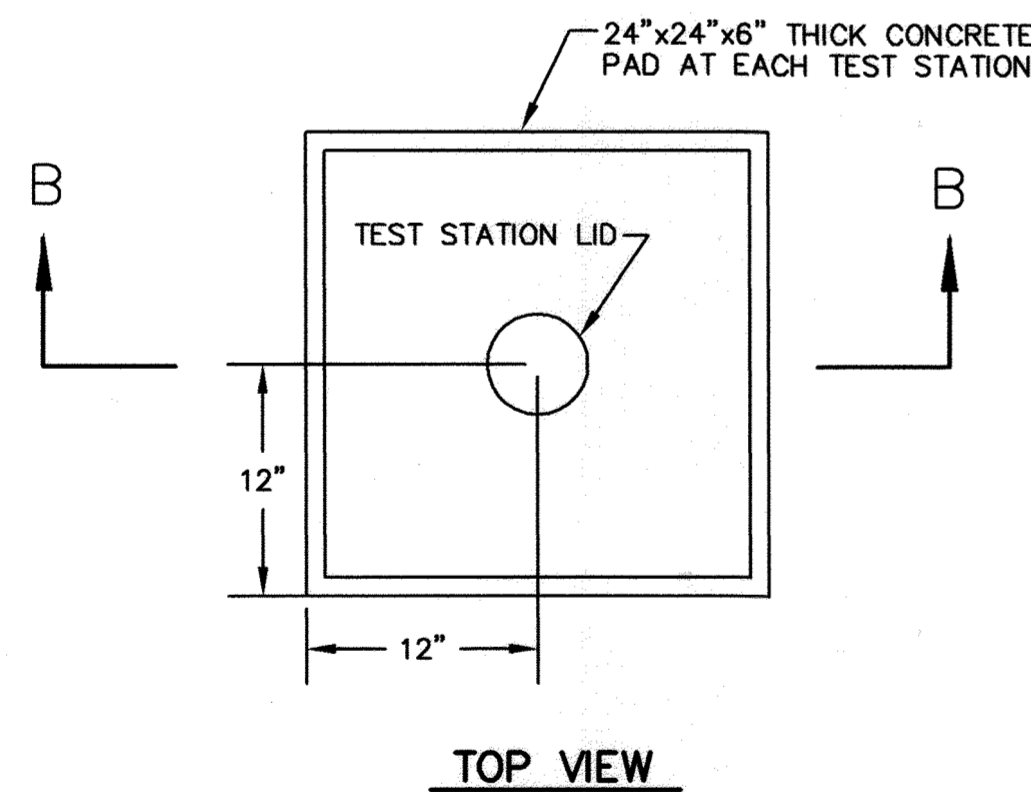
TEST BOX BODY



TEST BOX LID

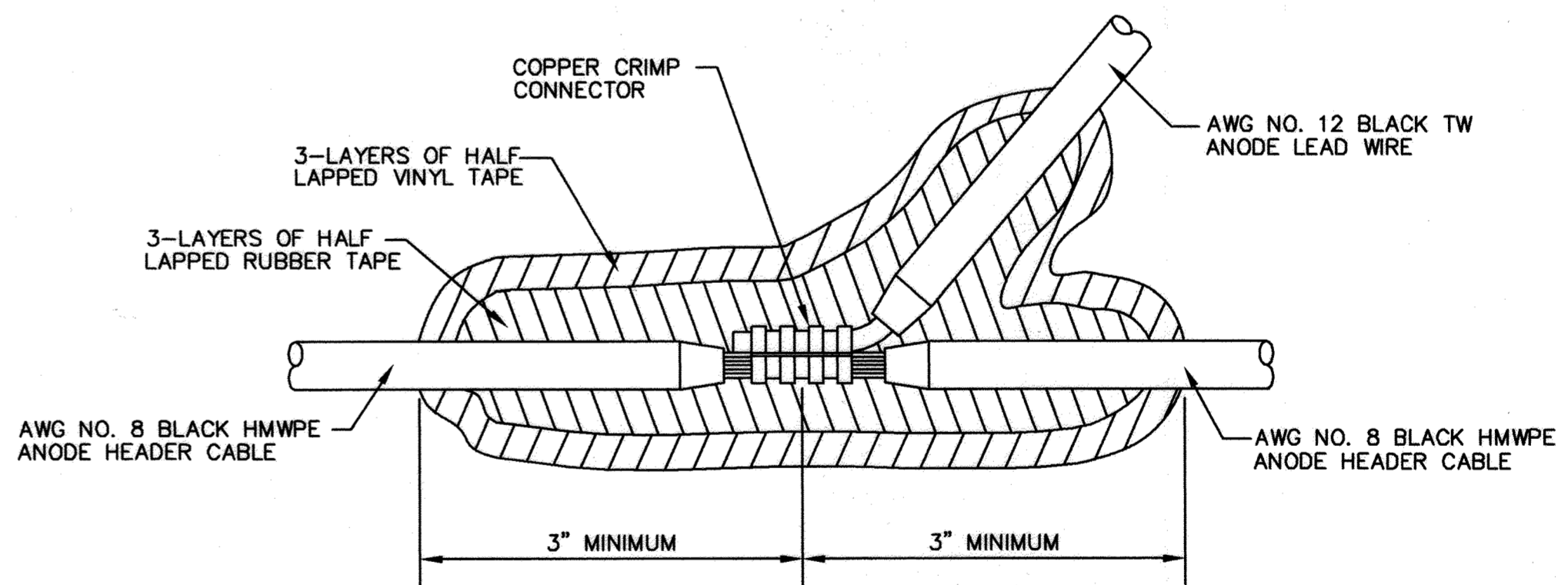
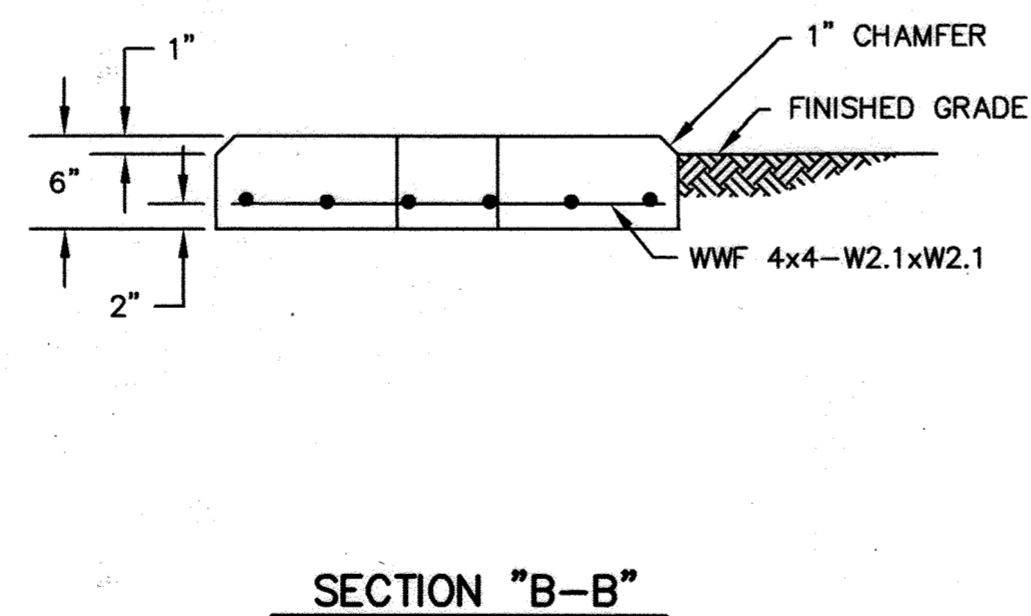


DETAIL CC-6: TEST BOX



TEST STATION PAD

DETAIL CC-7: CONCRETE TEST STATION PAD



DETAIL CC-8: ANODE HEADER CABLE SPLICE

THIS DRAWING IS NOT APPLICABLE FOR USE AS STANDARD CORROSION CONTROL PROCEDURES FOR OTHER PROJECTS DUE TO VARIABLE CONDITIONS AT OTHER SITES. NEITHER THIS DESIGN NOR ANY PART THEREOF MAY BE DUPLICATED IN ANY WAY FOR OTHER PROJECTS OR MODIFIED IN ANY WAY FOR THIS OR OTHER PROJECTS, EXCEPT BY WRITTEN AGREEMENT WITH RUSSELL CORROSION CONSULTANTS, INC.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
DIRECTOR OF PUBLIC WORKS  
Steve Shaver (Chief) 10/8/12  
CHIEF - BUREAU OF ENGINEERING  
10/5/12  
CHIEF, UTILITY DESIGN DIVISION

RUSSELL CORROSION CONSULTANTS, INC.  
Columbia, Maryland

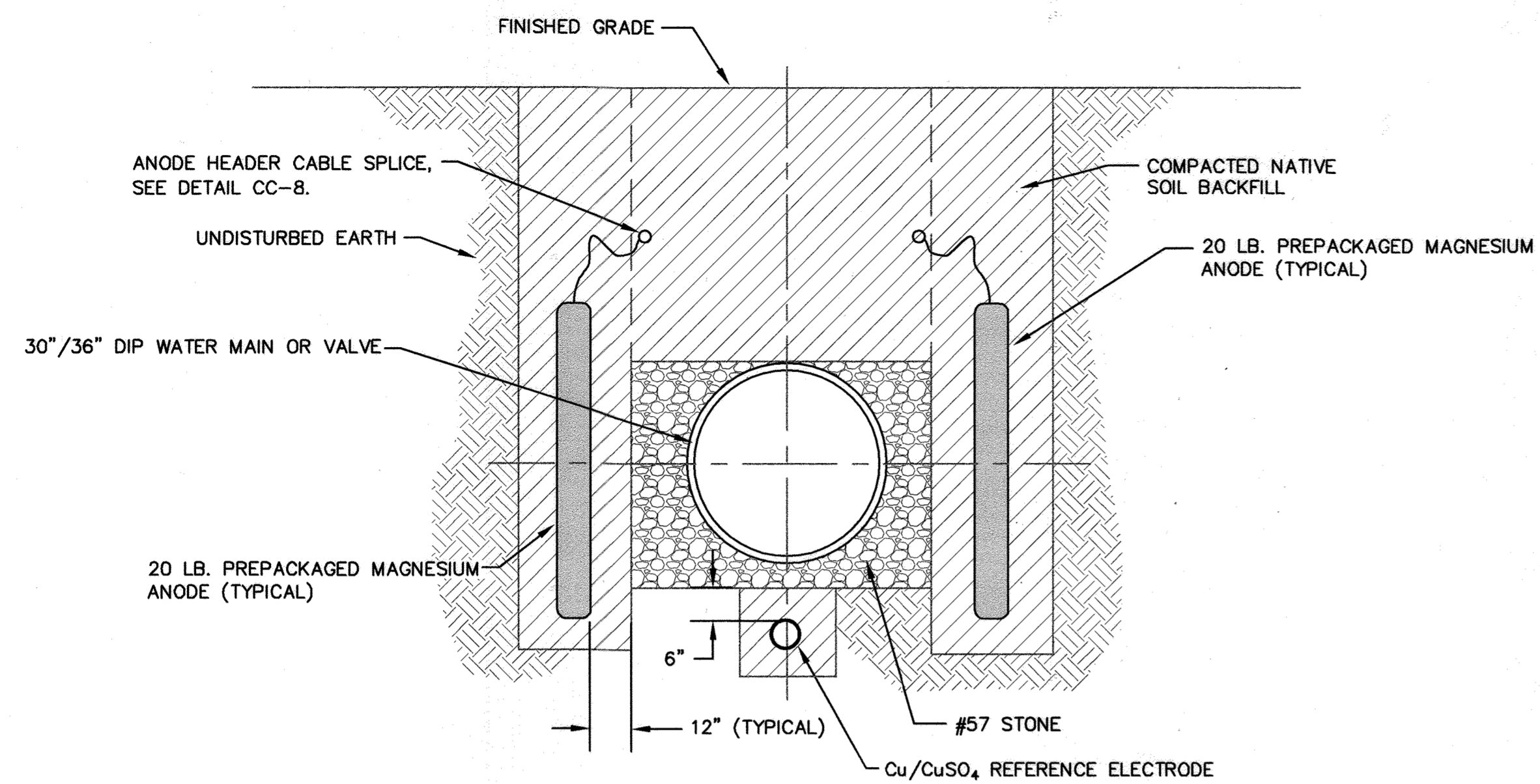
PROFESSIONAL CERTIFICATION:  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 17083, EXPIRATION DATE 09/27/2014  
MICHAEL J. SHELTON  
PROFESSIONAL ENGINEER

DSN. BY: TRF  
DRN. BY: DJD  
CHK. BY: MJS  
DATE: MAY 2009  
RJD 1 RECORD DRAWING  
DD 0 ISSUED FOR BID  
BY NO. REVISION DATE 04/16 3/12

CORROSION CONTROL DETAILS - 2  
600' SCALE MAP NO. BLOCK NO.

US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN REPLACEMENT  
CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

CP-3  
SCALE AS SHOWN  
SHEET 13 OF 26  
FILE NO. 33498



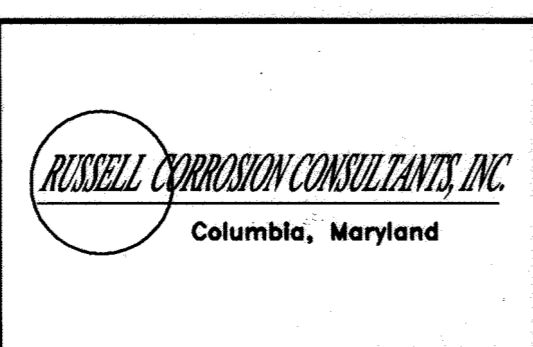
**NOTES:**

1. INSTALL ANODES AND REFERENCE ELECTRODES IN NATIVE SOIL. DO NOT BACKFILL PREPACKAGED ANODES OR REFERENCE ELECTRODES WITH SAND OR STONE.
2. BACKFILL PREPACKAGED MAGNESIUM ANODES WITH A MINIMUM OF 12 INCHES NATIVE SOIL ON ALL SIDES.

**DETAIL CC-9: REFERENCE ELECTRODE AND ANODE PLACEMENT**

THIS DRAWING IS NOT APPLICABLE FOR USE AS STANDARD CORROSION CONTROL PROCEDURES FOR OTHER PROJECTS DUE TO VARIABLE CONDITIONS AT OTHER SITES. NEITHER THIS DESIGN NOR ANY PART THEREOF MAY BE DUPLICATED IN ANY WAY FOR OTHER PROJECTS OR MODIFIED IN ANY WAY FOR THIS OR OTHER PROJECTS, EXCEPT BY WRITTEN AGREEMENT WITH RUSSELL CORROSION CONSULTANTS, INC.

DEPARTMENT OF PUBLIC WORKS		HOWARD COUNTY, MARYLAND	
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
DIRECTOR OF PUBLIC WORKS	DATE	CHIEF - BUREAU OF ENGINEERING	DATE
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
CHIEF, BUREAU OF UTILITIES	DATE	CHIEF, UTILITY DESIGN DIVISION	DATE



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. 17083, EXPIRATION DATE 09/27/2014

*[Signature]*

MICHAEL J. HERRLIGA

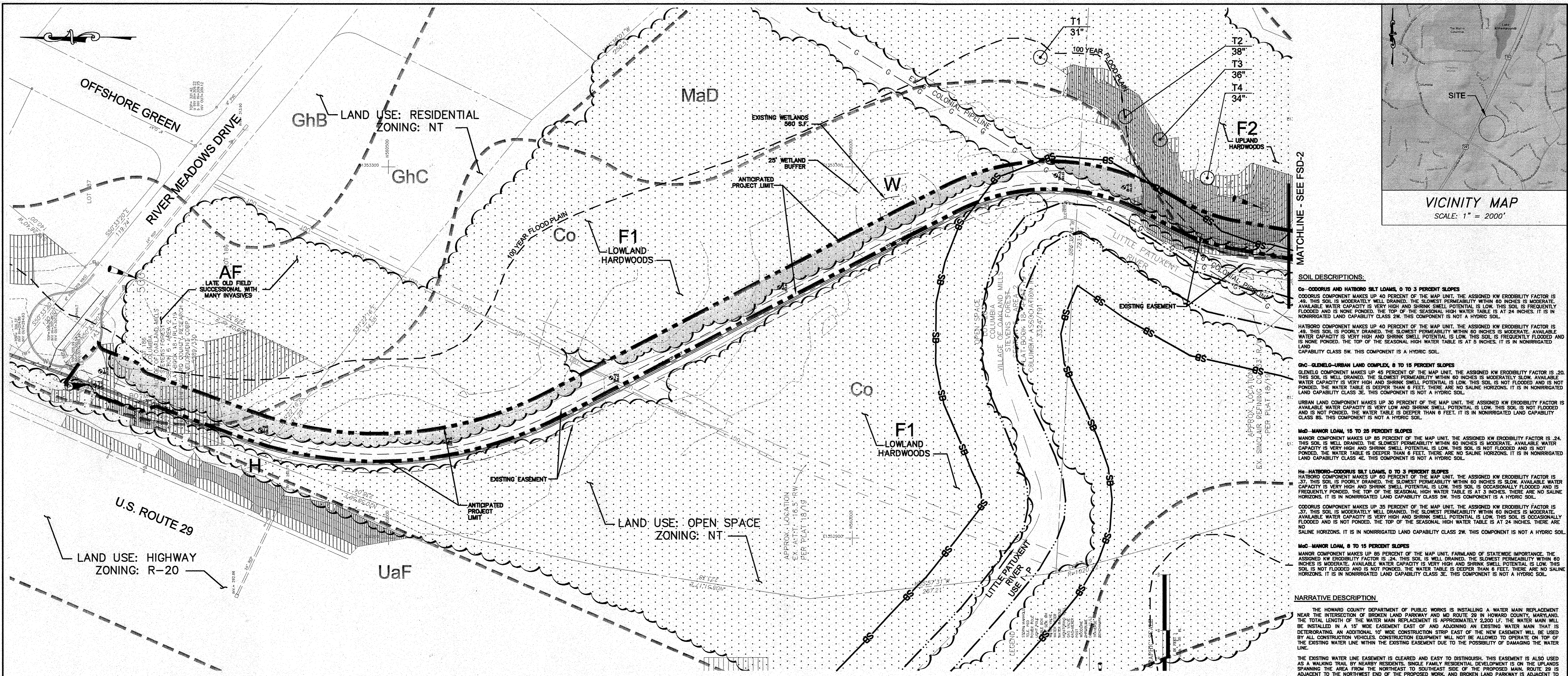
DSN. BY:	TRF		
DRN. BY:	DJD		
CHK. BY:	MJS		
DATE:	MAY 2009		
BY	NO.	REVISION	DATE
RJD	1	RECORD DRAWING	04/12
DD	0	ISSUED FOR BID	3/12

CORROSION CONTROL DETAILS - 3

600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN REPLACEMENT

CAPITAL PROJECT: W-8265  
 CONTRACT NO.: 44-4592  
 ELECTION DISTRICT NO. 6  
 HOWARD COUNTY, MARYLAND



**SOIL DESCRIPTIONS:**

**Co - COODRUS AND HARBORO SILT LOAMS, 0 TO 3 PERCENT SLOPES**  
 COODRUS COMPONENT MAKES UP 40 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS 48. THIS SOIL IS MODERATELY WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS FREQUENTLY FLOODED AND IS NOT PONDED. THE TOP OF THE SEASONAL HIGH WATER TABLE IS AT 24 INCHES. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 2W. THIS COMPONENT IS NOT A HYDRIC SOIL.

**HARBORO COMPONENT MAKES UP 40 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS 49. THIS SOIL IS POORLY DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS FREQUENTLY FLOODED AND IS NOT PONDED. THE TOP OF THE SEASONAL HIGH WATER TABLE IS AT 5 INCHES. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 5W. THIS COMPONENT IS A HYDRIC SOIL.**

**GhC - GLENDEL-URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES**  
 GLENDEL COMPONENT MAKES UP 45 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS 20. THIS SOIL IS WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS SLOW. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS NOT FLOODED AND IS NOT PONDED. THE WATER TABLE IS DEEPER THAN 8 FEET. THERE ARE NO SALINE HORIZONS. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 3E. THIS COMPONENT IS NOT A HYDRIC SOIL.

**URBAN LAND COMPONENT MAKES UP 30 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS 45. THIS SOIL IS MODERATELY WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS NOT FLOODED AND IS NOT PONDED. THE WATER TABLE IS DEEPER THAN 8 FEET. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 3E. THIS COMPONENT IS NOT A HYDRIC SOIL.**

**MaD - MANOR LOAM, 15 TO 35 PERCENT SLOPES**  
 MANOR COMPONENT MAKES UP 85 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS 24. THIS SOIL IS WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS OCCASIONALLY FLOODED AND IS NOT PONDED. THE WATER TABLE IS DEEPER THAN 8 FEET. THERE ARE NO SALINE HORIZONS. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 4E. THIS COMPONENT IS NOT A HYDRIC SOIL.

**Hg - HARBORO-COODRUS SILT LOAMS, 0 TO 3 PERCENT SLOPES**  
 HARBORO COMPONENT MAKES UP 60 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS 48. THIS SOIL IS MODERATELY WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS OCCASIONALLY FLOODED AND IS NOT PONDED. THE TOP OF THE SEASONAL HIGH WATER TABLE IS AT 3 INCHES. THERE ARE NO SALINE HORIZONS. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 5W. THIS COMPONENT IS A HYDRIC SOIL.

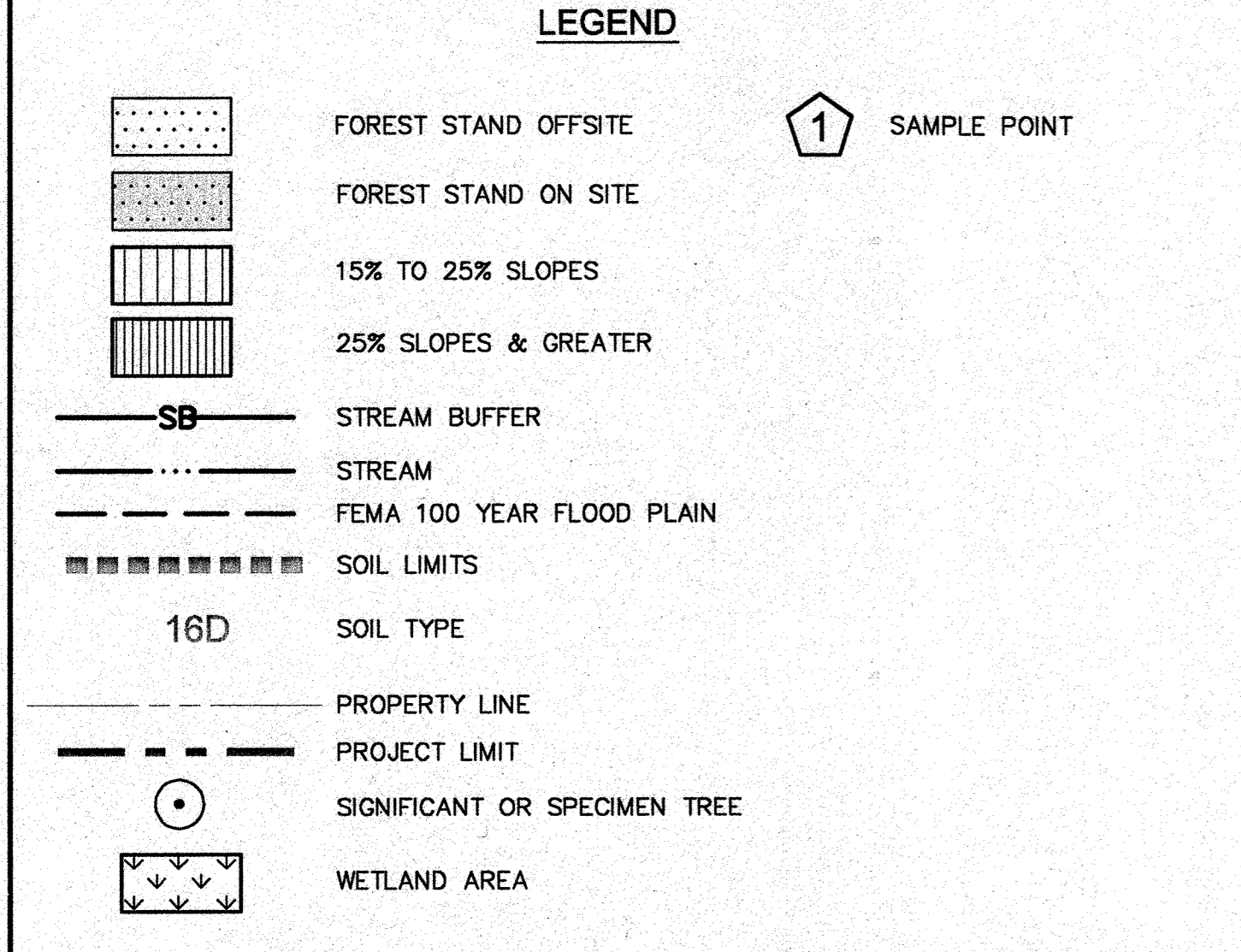
**COODRUS COMPONENT MAKES UP 35 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS 37. THIS SOIL IS MODERATELY WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS OCCASIONALLY FLOODED AND IS NOT PONDED. THE TOP OF THE SEASONAL HIGH WATER TABLE IS AT 24 INCHES. THERE ARE NO SALINE HORIZONS. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 2W. THIS COMPONENT IS NOT A HYDRIC SOIL.**

**MaC - MANOR LOAM, 8 TO 15 PERCENT SLOPES**  
 MANOR COMPONENT MAKES UP 85 PERCENT OF THE MAP UNIT. FARMLAND OF STATEWIDE IMPORTANCE. THE ASSIGNED KW EROSION FACTOR IS 24. THIS SOIL IS WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS OCCASIONALLY FLOODED AND IS NOT PONDED. THE WATER TABLE IS DEEPER THAN 8 FEET. THERE ARE NO SALINE HORIZONS. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 3E. THIS COMPONENT IS NOT A HYDRIC SOIL.

**NARRATIVE DESCRIPTION**

THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS IS INSTALLING A WATER MAIN REPLACEMENT NEAR THE INTERSECTION OF BROOKLAND PARKWAY AND MD ROUTE 29 IN HOWARD COUNTY, MARYLAND. THE TOTAL LENGTH OF THE WATER MAIN REPLACEMENT IS APPROXIMATELY 2,200 LF. THE WATER MAIN WILL BE INSTALLED IN A 15' WIDE EASEMENT EAST OF AND ADJOINING AN EXISTING WATER MAIN THAT IS DETERIORATING AN ADDITIONAL 10' WIDE CONSTRUCTION STRIP EAST OF THE NEW EASEMENT WILL BE USED BY ALL CONSTRUCTION VEHICLES. CONSTRUCTION EQUIPMENT WILL NOT BE ALLOWED TO OPERATE ON TOP OF THE EXISTING WATER LINE WITHIN THE EXISTING EASEMENT DUE TO THE POSSIBILITY OF DAMAGING THE WATER LINE.

THE EXISTING WATER LINE EASEMENT IS CLEARED AND EASY TO DISTINGUISH. THIS EASEMENT IS ALSO USED AS A WALKING TRAIL BY NEARBY RESIDENTS. SINGLE FAMILY RESIDENTIAL DEVELOPMENT IS ON THE UPLANDS SPANNING THE AREA FROM THE NORTHEAST TO SOUTHWEST SIDE OF THE PROPOSED MAIN. ROUTE 29 IS ADJACENT TO THE NORTHEAST END OF THE PROPOSED WORK, AND BROOKLAND PARKWAY IS ADJACENT TO THE SOUTHWEST END OF THE PROJECT. MOST OF THE PROPOSED PROJECT IS WITHIN THE FLOODPLAIN OF THE LITTLE PATUMENT RIVER. THE WATER MAIN IS ON THE WEST SIDE OF THE WATER MAIN. AT THE SOUTHWEST END OF THE PROJECT THE RIVER SWITCHES BACK AND THE WATER MAIN WILL CROSS UNDER IT BEFORE CONNECTING BACK TO THE EXISTING WATER MAINS. THERE IS AN ATT EASEMENT AS WELL AS A COLONIAL GAS PIPELINE EASEMENT WHICH CROSS THE WATER MAIN ALIGNMENT. THE GAS PIPELINE IS CONTRIBUTING TO THE DEGENERATION OF THE EXISTING RCP WATER MAIN.



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

**EXHIBIT 3-2**  
**FOREST STAND ANALYSIS TABLE**

Applicant: *Howard County Department of Public Works* Project Name: *Water Main Improvement Broken Land Park* Submission No. \_\_\_\_\_

KEY	A. TYPE OF COMMUNITY	B. AREA	C. SOIL INFORMATION	D. EXISTING VEGETATION	E. STAND CHARACTERISTICS	F. FOREST AREA	G. HABITAT VALUE
			1. Soil Types 2. Typical forest cover for soil type	(Dominant Species and Approx.%)	1. Size (Diameter) 2. Age 3. General Condition	(Acres)	(1-5)
F1	SYCAMORE/GREEN ASH	0.8449	Co HARDWOODS	RED MAPLE/BOXELDER 95%	18-30" 50	0.3309	GOOD
AF	TULIP POPLAR	0.0971	GhC N/A	EARLY SERIAL	6-12" 25	0.0000	N/A
F2	CHESTNUT OAK	0.2471	MaD N/A	OAK/BEECH/HICKORY	18-30" 50	0.1644	N/A

\* AREA MEASURED TO THE NEAREST 1.10 ACRE  
 † WETLAND AREA 0.0007 AC±  
 \*\* SOURCE: HOWARD COUNTY SOIL SURVEY, USDA  
 WETLAND BUFFER 0.0466 AC±  
 STREAM BUFFER 0.3620 AC±  
 >25% SLOPE 0.1860 AC±

**GENERAL NOTES**

- TAX MAP: 36
- GRID: 8
- NET TRACT AREA: 2.1605 AC±
- ON SITE FOREST AREA: 1.1891 AC±

**Tree Summary**

Tree #	Scientific Name	Common Name	D.B.H (inches)	Comments
T1	<i>Fraxinus pennsylvanica</i>	Green Ash	31	
T2	<i>Fagus sylvatica</i>	Beech	38	
T3	<i>Fagus sylvatica</i>	Beech	36	
T4	<i>Quercus rubra</i>	Red Oak	34	
T5	<i>Liriodendron tulipifera</i>	Tulip Poplar	32	
T6	<i>Quercus alba</i>	White Oak	41	
T7	<i>Quercus alba</i>	White Oak	41	very poor condition
T8	<i>Quercus alba</i>	White Oak	30	
T9	<i>Nyssa sylvatica</i>	Black Gum	30	
T10	<i>Quercus alba</i>	White Oak	34	very poor condition
T11	<i>Platanus occidentalis</i>	Sycamore	32	leaning, undercut

**STAND A1:** THE NORTHWEST END OF THE PROPOSED WORK IS ADJACENT TO THE END OF THE CUL-DE-SAC OF RIVER MEADOWS DRIVE AND ROUTE 29. THE FIRST SEVERAL HUNDRED FEET OF THE PROJECT IS BORDERED BY SCRUBBY REDWOOD AND MID-RANGE DECIDUOUS TREES. ASSOCIATED BRNARS AND INVASIVES, THE SOILS ARE Gc-CLEND-URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES. THE EXISTING WATER MAIN IS ON THE WEST SIDE OF THE WATER MAIN. AT THE SOUTHWEST END OF THE PROJECT THE RIVER SWITCHES BACK AND THE WATER MAIN WILL CROSS UNDER IT BEFORE CONNECTING BACK TO THE EXISTING WATER MAINS. THERE IS AN ATT EASEMENT AS WELL AS A COLONIAL GAS PIPELINE EASEMENT WHICH CROSS THE WATER MAIN ALIGNMENT. THE GAS PIPELINE IS CONTRIBUTING TO THE DEGENERATION OF THE EXISTING RCP WATER MAIN.

**STAND B1:** AFTER THIS SECTION THE ALIGNMENT ENTERS AN AREA OF FLOODPLAIN AND LOWLAND HARDWOODS ON Co-COODRUS AND HARBORO SILT LOAMS, 0-3 PERCENT SLOPES. THIS IS THE FOREST TYPE THAT MOST OF THE ALIGNMENT TRAVELSES. THE EXCEPTION IS TWO SHORT SECTIONS OF UPLAND HARDWOODS ON GhC-GLENDEL-URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES. FIRST IS AN AREA WHERE THE RIVER COMES CLOSE TO THE EXISTING WATER MAIN AND AN ABRUPT SLOPE. THE NEW PIPELINE WILL CUT INTO THE FLOODPLAIN OF THIS SLOPE. SECOND IS AN AREA WHERE THE RIVER CROSSES ANOTHER ABRUPT, STEEPLY SLOPING UPLAND AREA BEFORE RETURNING TO THE FLOODPLAIN AT THE SOUTHWEST END. THE LOWLAND HARDWOODS ARE TYPICAL COVER FOR THIS SOIL TYPE. THE CLEARED EASEMENT CREATES GAPS IN THE CANOPY, BUT THE ADJACENT FOREST HAS GOOD FOREST STRUCTURE VALUE. THE CANOPY HAS FEW GAPS AND THE DOMINANT TREES ARE COMMONLY RED MAPLE AND BOX ELDER IN THE 18" TO 30" DBH RANGE. UNDERSTORY TREES ARE ALSO WELL REPRESENTED. THE SHRUB LAYER IS SPARSE AND INVASIVES ARE COMMON IN THE HERBACEOUS LAYER. ALL OF THE FOREST IS WITHIN THE 100 YEAR FLOOD PLAIN, AND IS THEREFORE A RETENTION PRIORITY AREA.

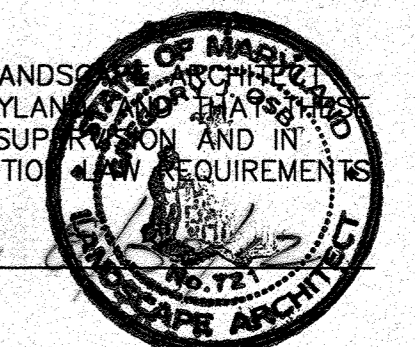
**STAND E2:** THE UPLAND HARDWOODS THAT THE EASEMENT TRAVELSES ALSO HAVE GOOD FOREST STRUCTURE VALUE. WITH SOME OF THE CANOPY CREATED BY THE EASEMENT, THE DOMINANT TREES ARE OAKS, BEECH AND HICKORIES IN THE 18" TO 30" DBH RANGE. UNDERSTORY TREES ARE ALSO WELL REPRESENTED, BUT THE SHRUB AND HERBACEOUS LAYERS ARE SPARSE. THIS FOREST PLAYS AN IMPORTANT ROLE IN BUFFERING THE FLOOD PLAN AND STREAM FROM STORMWATER RUNOFF AND IS THEREFORE PRIORITY RETENTION AREA.

THE IMPACT OF THE PROPOSED CLEARING WILL BE SIMILAR TO WHAT ALREADY EXISTS AT THE CURRENT CLEARED EASEMENT. SOME LARGER TREES, INCLUDING SPECIMEN TREES, WILL NEED TO BE REMOVED AND THIS WILL HAVE A NEGATIVE IMPACT OVER THE SHORT TERM. THE LONG TERM IMPACT IS EXPECTED TO BE MINOR.

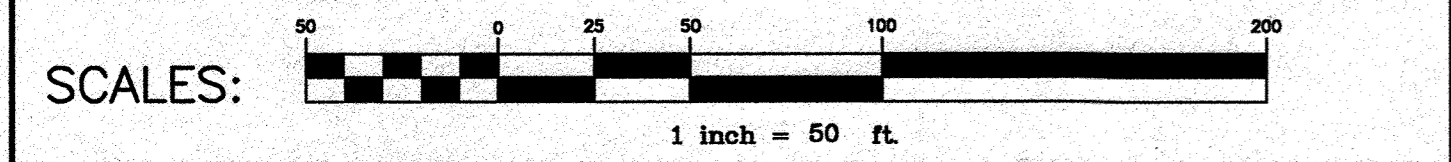
**CERTIFICATION**

I CERTIFY THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. ALL DOCUMENTS WERE PREPARED UNDER MY SUPERVISION AND IN COMPLIANCE WITH THE FOREST CONSERVATION ACT REQUIREMENTS.

*Gregory J. Osband*  
 GREGORY J. OSBAND  
 LICENSE NUMBER MD-RLA #721



**AMT**  
 A. MORTON THOMAS AND ASSOCIATES, INC.  
 CONSULTING ENGINEERS  
 12760 TWINBROOK PARKWAY ROCKVILLE, MD 20862  
 (301) 881-2545 FAX: (301) 881-0814  
 EMAIL: AMT@AMTENGINEERING.COM



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

*Jayden* 10/22/12  
 DIRECTOR OF PUBLIC WORKS DATE

*Steve Shavandatsis* 10/18/12  
 CHIEF - BUREAU OF ENGINEERING DATE

*Silvia Chen* 10/18/12  
 CHIEF, BUREAU OF UTILITIES DATE

*Ol' Don* 10/15/12  
 CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE**  
 ENGINEERS, INC.  
 8401 Corporate Drive  
 Suite 400  
 Landover, Maryland 20785  
 (301) 731-5622  
 FAX: (301) 577-4737

DSN. BY: ATR					
DRN. BY: DEN					
CHK. BY: MAE					
DATE: 9/04/12	BY: RJD	NO. 1	RECORD DRAWING	DATE: 04/16	

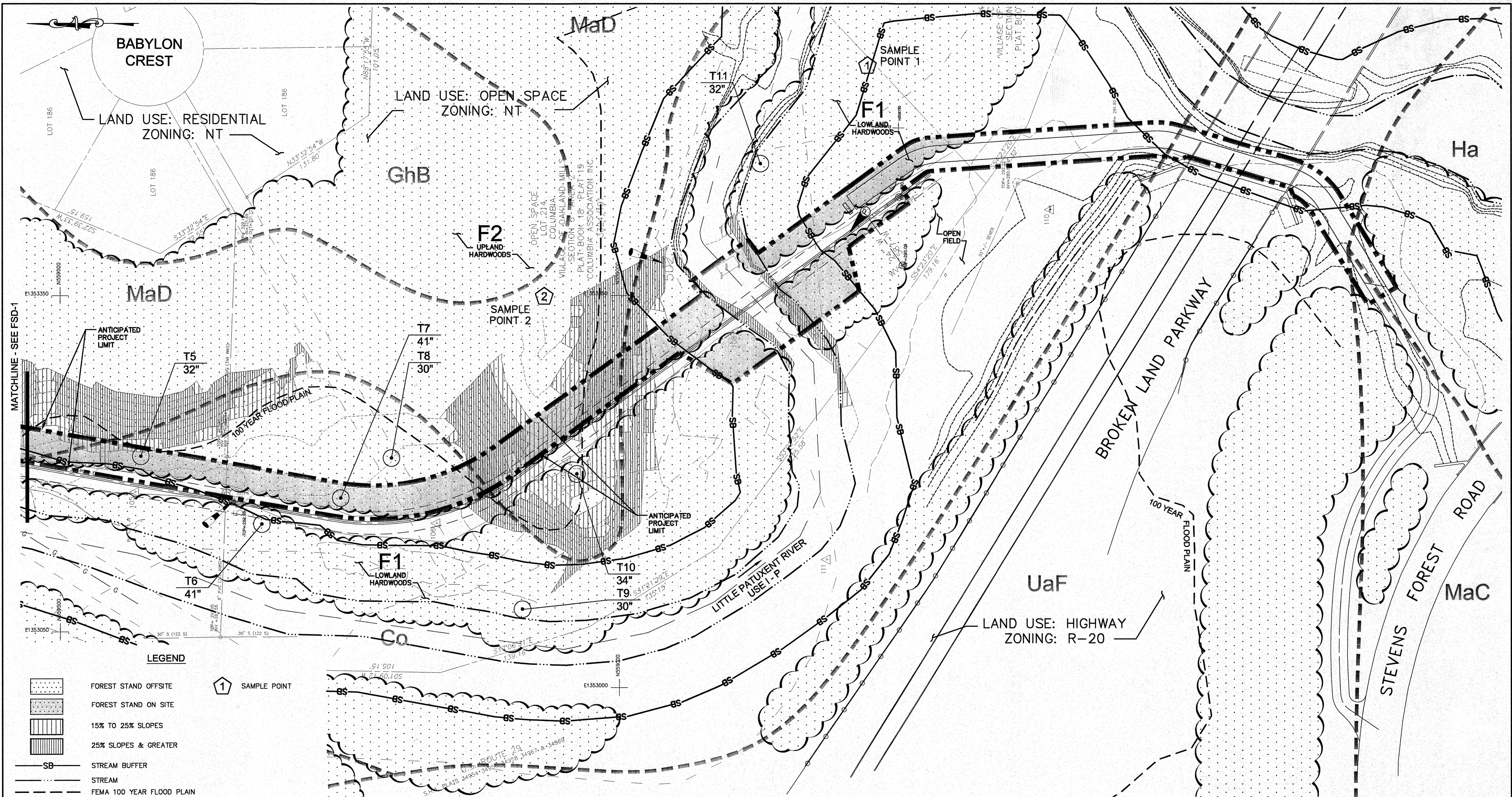
**FOREST STAND DELINEATION PLAN**

600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

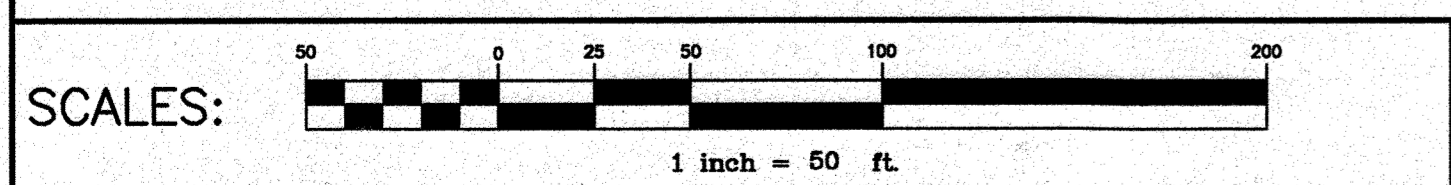
**US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN REPLACEMENT**

CAPITAL PROJECT: W-8265  
 CONTRACT NO.: 44-4512  
 ELECTION DISTRICT NO. 6  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 FSD-1  
 SHEET 15 OF 26



- LEGEND**
- FOREST STAND OFFSITE
  - FOREST STAND ON SITE
  - 15% TO 25% SLOPES
  - 25% SLOPES & GREATER
  - STREAM BUFFER
  - STREAM
  - FEMA 100 YEAR FLOOD PLAN
  - SOIL LIMITS
  - SOIL TYPE 16D
  - PROPERTY LINE
  - PROJECT LIMIT
  - SIGNIFICANT OR SPECIMEN TREE
  - WETLAND AREA
  - SAMPLE POINT



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

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER THIS DOCUMENT.

**CERTIFICATION**

I CERTIFY THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND AND THAT THESE DOCUMENTS WERE PREPARED UNDER MY SUPERVISION AND IN COMPLIANCE WITH THE FOREST CONSERVATION LAW REQUIREMENTS.

*Gregory J. Osband*  
GREGORY J. OSBAND  
LICENSE NUMBER MD RLA #721



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12750 TWINBROOK PARKWAY ROCKVILLE, MD 20862  
(301) 881-2545 FAX: (301) 881-0814  
EMAIL: AMT@AMTENGINEERING.COM

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Janet M. ...* 10/22/12  
DIRECTOR OF PUBLIC WORKS DATE

*Steve Shanahan (Acting)* 10/8/12  
CHIEF - BUREAU OF ENGINEERING DATE

*Steve Chan* 10/11/12  
CHIEF, BUREAU OF UTILITIES DATE

*Of ...* 10/5/12  
CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE**  
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DSN. BY:	ATR			
DRN. BY:	DEN			
CHK. BY:	MAE			
DATE:	9/04/12			
BY:	RJD	NO.	1	RECORD DRAWING
REVISION:				
DATE:	04/16			

FOREST STAND  
DELINEATION PLAN

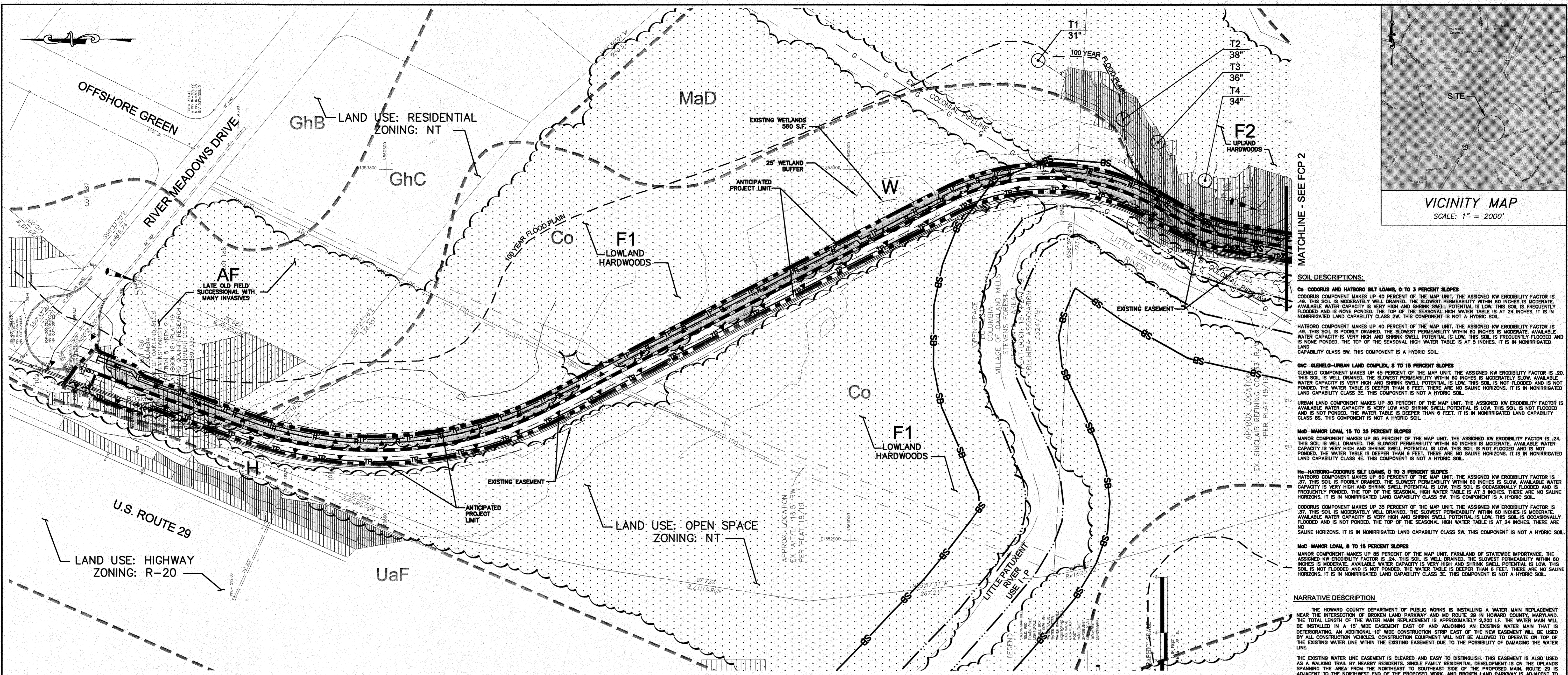
600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

US ROUTE 29 / BROKEN LAND PARKWAY  
TRANSMISSION MAIN REPLACEMENT

CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
FSD-2  
SHEET 16 OF 26  
FILE NO. 32122





**SOIL DESCRIPTIONS:**

**Co - CODORUS AND HARBORO SILT LOAMS, 0 TO 3 PERCENT SLOPES**  
 CODORUS COMPONENT MAKES UP 40 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS .49. THIS SOIL IS MODERATELY WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS FREQUENTLY FLOODED AND IS NONE PONDED. THE TOP OF THE SEASONAL HIGH WATER TABLE IS AT 24 INCHES. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 2W. THIS COMPONENT IS NOT A HYDRIC SOIL.

**HARBORO COMPONENT MAKES UP 40 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS .49. THIS SOIL IS POORLY DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS FREQUENTLY FLOODED AND IS NONE PONDED. THE TOP OF THE SEASONAL HIGH WATER TABLE IS AT 5 INCHES. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 5W. THIS COMPONENT IS A HYDRIC SOIL.**

**GhC - GLENHOLD-URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES**  
 GLENHOLD COMPONENT MAKES UP 45 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS .20. THIS SOIL IS WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS NOT FLOODED AND IS NOT PONDED. THE WATER TABLE IS DEEPER THAN 6 FEET. THERE ARE NO SALINE HORIZONS. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 3E. THIS COMPONENT IS NOT A HYDRIC SOIL.

**URBAN LAND COMPONENT MAKES UP 30 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS .20. THIS SOIL IS WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS NOT FLOODED AND IS NOT PONDED. THE WATER TABLE IS DEEPER THAN 6 FEET. THERE ARE NO SALINE HORIZONS. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 3E. THIS COMPONENT IS NOT A HYDRIC SOIL.**

**MaD - MANOR LOAM, 15 TO 25 PERCENT SLOPES**  
 MANOR COMPONENT MAKES UP 85 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS .24. THIS SOIL IS WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS NOT FLOODED AND IS NOT PONDED. THE WATER TABLE IS DEEPER THAN 6 FEET. THERE ARE NO SALINE HORIZONS. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 4E. THIS COMPONENT IS NOT A HYDRIC SOIL.

**H - HARBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES**  
 HARBORO COMPONENT MAKES UP 60 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS .37. THIS SOIL IS MODERATELY WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS OCCASIONALLY FLOODED AND IS NOT PONDED. THE TOP OF THE SEASONAL HIGH WATER TABLE IS AT 3 INCHES. THERE ARE NO SALINE HORIZONS. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 5W. THIS COMPONENT IS A HYDRIC SOIL.

**CODORUS COMPONENT MAKES UP 35 PERCENT OF THE MAP UNIT. THE ASSIGNED KW EROSION FACTOR IS .37. THIS SOIL IS MODERATELY WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS OCCASIONALLY FLOODED AND IS NOT PONDED. THE TOP OF THE SEASONAL HIGH WATER TABLE IS AT 24 INCHES. THERE ARE NO SALINE HORIZONS. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 2W. THIS COMPONENT IS NOT A HYDRIC SOIL.**

**MaC - MANOR LOAM, 8 TO 15 PERCENT SLOPES**  
 MANOR COMPONENT MAKES UP 85 PERCENT OF THE MAP UNIT. FARMLAND OF STATEWIDE IMPORTANCE. THE ASSIGNED KW EROSION FACTOR IS .24. THIS SOIL IS WELL DRAINED. THE SLOWEST PERMEABILITY WITHIN 60 INCHES IS MODERATE. AVAILABLE WATER CAPACITY IS VERY HIGH AND SHRINK SWELL POTENTIAL IS LOW. THIS SOIL IS NOT FLOODED AND IS NOT PONDED. THE WATER TABLE IS DEEPER THAN 6 FEET. THERE ARE NO SALINE HORIZONS. IT IS IN NONIRRIGATED LAND CAPABILITY CLASS 3E. THIS COMPONENT IS NOT A HYDRIC SOIL.

**NARRATIVE DESCRIPTION**

THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS IS INSTALLING A WATER MAIN REPLACEMENT NEAR THE INTERSECTION OF BROKEN LAND PARKWAY AND MD ROUTE 29 IN HOWARD COUNTY, MARYLAND. THE TOTAL LENGTH OF THE WATER MAIN REPLACEMENT IS APPROXIMATELY 2,200 LF. THE WATER MAIN WILL BE INSTALLED IN A 15' WIDE EASEMENT EAST OF AND ADJOINING AN EXISTING WATER MAIN THAT IS DETERIORATING. AN ADDITIONAL 10' WIDE CONSTRUCTION STRIP EAST OF THE NEW EASEMENT WILL BE USED BY ALL CONSTRUCTION VEHICLES. CONSTRUCTION EQUIPMENT WILL NOT BE ALLOWED TO OPERATE ON TOP OF THE EXISTING WATER LINE WITHIN THE EXISTING EASEMENT DUE TO THE POSSIBILITY OF DAMAGING THE WATER LINE.

THE EXISTING WATER LINE EASEMENT IS CLEARED AND EASY TO DISTINGUISH. THIS EASEMENT IS ALSO USED AS A WALKING TRAIL BY NEARBY RESIDENTS. SINGLE FAMILY RESIDENTIAL DEVELOPMENT IS ON THE UPLANDS SPANNING THE AREA FROM THE NORTHWEST TO SOUTHEAST SIDE OF THE PROPOSED MAIN. ROUTE 29 IS ADJACENT TO THE NORTHWEST END OF THE PROPOSED WORK AND BROKEN LAND PARKWAY IS ADJACENT TO THE SOUTHEAST END OF THE PROJECT. MOST OF THE PROPOSED PROJECT IS WITHIN THE FLOODPLAIN OF THE LITTLE PATUXENT RIVER WHICH HAS A HIGH WATER TABLE THAT IS TYPICAL OF THE REST OF THE PROJECT. THE RIVER SWITCHES BACK AND THE WATER MAIN WILL CROSS UNDER IT BEFORE CONNECTING BACK TO THE EXISTING WATER MAINS. THERE IS AN ATT EASEMENT AS WELL AS A COLONIAL GAS PIPELINE EASEMENT WHICH CROSS THE WATER MAIN ALIGNMENT. THE 8" GAS PIPELINE IS CONTRIBUTING TO THE DEGENERATION OF THE EXISTING RCP WATER MAIN.

STAND #1: THE NORTHWEST END OF THE PROPOSED WORK IS ADJACENT TO THE END OF THE CUL-DE-SAC OF RIVER MEADOWS DRIVE AND ROUTE 29. THE FIRST SEVERAL HUNDRED FEET OF THE PROJECT IS BORDERED BY SCRUBBY HEDGEROW AND FOREST EDGE CONDITIONS. EARLY SERAL TREES SPECIES, ASSORTED BRNARS AND INVASIVES, THE SOILS ARE GNC-GLENHOLD-URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES. THE FOREST EDGE ON THE EAST SIDE OF THE ALIGNMENT IS ASSOCIATED WITH AN AREA OF DISTURBED LAND AND ABANDONED FIELD AND HAS A MUCH YOUNGER TREE STAND THAN IS TYPICAL OF THE REST OF THE FOREST ALONG THE ALIGNMENT. ALL OF THE FOREST IS WITHIN THE 100 YEAR FLOOD PLAIN, AND IS THEREFORE A RETENTION AREA.

STAND #2: AFTER THIS SECTION THE ALIGNMENT ENTERS AN AREA OF FLOODPLAIN AND LOWLAND HARDWOODS ON CO-CODORUS AND HARBORO SILT LOAMS, 0 TO 3 PERCENT SLOPES. THIS IS THE FOREST TYPE THAT MOST OF THE ALIGNMENT TRAVELSES. THE EXCEPTION IS TWO SHORT SECTIONS OF UPLAND HARDWOODS ON MA-MANOR LOAM, 15 TO 25 PERCENT SLOPES. FIRST IS AN AREA WHERE THE RIVER COMES CLOSE TO THE EXISTING WATER MAIN AND AN ABRUPT SLOPE. THE NEW PIPELINE WILL CUT INTO THE LOWER PART OF THIS SLOPE BEFORE RETURNING TO THE FLOODPLAIN. THE SECOND IS AN AREA WHERE THE EASEMENT CROSSES ANOTHER ABRUPT SLOPING UPLAND AREA BEFORE RETURNING TO THE FLOODPLAIN AT THE SOUTHEAST END. THE LOWLAND HARDWOODS ARE TYPICAL COVER FOR THIS SOIL TYPE. THE CLEARED EASEMENT CREATES GAPS IN THE CANOPY, BUT THE ADJACENT FOREST HAS GOOD FOREST STRUCTURE VALUE. THE CANOPY HAS FEW GAPS AND THE DOMINANT TREES ARE COMMONLY RED MAPLE AND BOX ELDER IN THE 16" TO 30" DBH RANGE. UNDERSTORY TREES ARE ALSO WELL REPRESENTED. THE SHRUB LAYER IS SPARSE AND INVASIVES ARE COMMON IN THE HERBACEOUS LAYER. ALL OF THE FOREST IS WITHIN THE 100 YEAR FLOOD PLAIN, AND IS THEREFORE A RETENTION PRIORITY AREA.

STAND #3: THE UPLAND HARDWOODS THAT THE EASEMENT TRAVELSES ALSO HAVE GOOD FOREST STRUCTURE VALUE, WITH SOME GAPS IN THE CANOPY CREATED BY CLEARING OF THE EASEMENT. THE DOMINANT TREES ARE OAKS, BEECH, AND HICKORIES IN THE 18" TO 30" DBH RANGE. UNDERSTORY TREES ARE WELL REPRESENTED, BUT THE SHRUB AND HERBACEOUS LAYERS ARE SPARSE. THIS FOREST PLAYS AN IMPORTANT ROLE IN BUFFERING THE FLOOD PLAIN AND STREAM FROM STORMWATER RUNOFF AND IS THEREFORE PRIORITY RETENTION AREA.

THE IMPACT OF THE PROPOSED CLEARING WILL BE SIMILAR TO WHAT ALREADY EXISTS AT THE CURRENT CLEARED EASEMENT. SOME LARGER TREES, INCLUDING SPECIMEN TREES, WILL NEED TO BE REMOVED AND THIS WILL HAVE A NEGATIVE IMPACT OVER THE SHORT TERM. THE LONG TERM IMPACT IS EXPECTED TO BE MINOR.

**LEGEND**

- FOREST STAND OFFSITE TO REMAIN
- FOREST STAND ON SITE TO BE REMOVED
- 15% TO 25% SLOPES
- 25% SLOPES & GREATER
- STREAM BUFFER
- STREAM
- FEMA 100 YEAR FLOOD PLAIN
- SOIL LIMITS
- SOIL TYPE
- PROPERTY LINE
- PROJECT LIMIT
- SIGNIFICANT OR SPECIMEN TREE
- WETLAND AREA
- SAMPLE POINT
- TREE PROTECTION FENCING
- SIGNIFICANT OR SPECIMEN TREE TO BE REMOVED
- TREE PROTECTION SIGNAGE
- LIMITS OF ROOT PRUNING

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

**EXHIBIT 3-2 FOREST STAND ANALYSIS TABLE**

Applicant: *Howard County Department of Public Works* Project Name: *Water Main Improvement Broken Land Park Submission No.*

KEY	A. TYPE OF COMMUNITY	B. AREA	C. SOIL INFORMATION			D. EXISTING VEGETATION (Dominant Species and Approx. %)	E. STAND CHARACTERISTICS			F. FOREST AREA IN SENSITIVE ENVIRONMENTS (Acres)†	G. HABITAT VALUE
			1. Soil Types	2. Typical forest cover for soil type	3. Woodland Suitability Index		1. Size (Diam)	2. Age	3. General Conditions		
F1	SYCAMORE/GREEN ASH	0.8449	Co	HARDWOODS	75-84	RED MAPLE/BOX ELDER 50%	18-30"	50	GOOD	0.3309	GOOD
AF	TULIP POPLAR	0.0971	GhC	N/A	N/A	EARLY SERAL OAK/BEECH/HICKORY	6-12"	25	FAIR	0.0000	N/A
F2	CHESTNUT OAK	0.2471	MaD	N/A	N/A		18-30"	50	GOOD	0.1644	N/A

\* AREA MEASURED TO THE NEAREST 1.10 ACRE  
 \*\* SOURCE: HOWARD COUNTY SOIL SURVEY, USDA

† WETLAND AREA 0.0007 AC±  
 WETLAND BUFFER 0.0486 AC±  
 STREAM BUFFER 0.3620 AC±  
 >25% SLOPE 0.1860 AC±

**Tree Summary**

Tree #	Scientific Name	Common Name	D.B.H (inches)	Comments
T1	<i>Fraxinus pennsylvanica</i>	Green Ash	31	
T2	<i>Fagus sylvatica</i>	Beech	38	
T3	<i>Fagus sylvatica</i>	Beech	36	
T4	<i>Quercus rubra</i>	Red Oak	34	
T5	<i>Liriodendron tulipifera</i>	Tulip Poplar	32	
T6	<i>Quercus alba</i>	White Oak	41	
T7	<i>Quercus alba</i>	White Oak	41	very poor condition
T8	<i>Quercus alba</i>	White Oak	30	
T9	<i>Nyssa sylvatica</i>	Black Gum	30	
T10	<i>Quercus alba</i>	White Oak	34	very poor condition
T11	<i>Platanus occidentalis</i>	Sycamore	32	leaning, undercut

SHADED TYPE DENOTES TREE TO BE REMOVED.

- GENERAL NOTES**
- TAX MAP: 36
  - GRID: B
  - NET TRACT AREA: 2.1605 AC±
  - ON SITE FOREST AREA: 1.1891 AC±
  - ON SITE FOREST TO BE REMOVED: 1.1891 AC±

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**CERTIFICATION**

I CERTIFY THAT I AM A DULY LICENSED LAND SURVEYOR AND THAT THESE DOCUMENTS WERE PREPARED UNDER MY SUPERVISION AND IN COMPLIANCE WITH THE FOREST CONSERVATION LAW REQUIREMENTS.

*Gregory J. Osband*  
 GREGORY J. OSBAND  
 LICENSE NUMBER MD RLA #721

**AMT**  
 CONSULTING ENGINEERS  
 A. MORTON THOMAS AND ASSOCIATES, INC.  
 12750 TWINBROOK PARKWAY ROCKVILLE MD 20852  
 (301) 881-2646 FAX: (301) 881-0814  
 EMAIL: AMT@AMTENGINEERING.COM

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

*J. Alan* 10/22/12  
 DIRECTOR OF PUBLIC WORKS DATE

*Steve Starnan (4 chis)* 10/8/12  
 CHIEF - BUREAU OF ENGINEERING DATE

*Steve Chen* 10/15/12  
 CHIEF, BUREAU OF UTILITIES DATE

*My Don Price* 10/15/12  
 CHIEF UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE**  
 ENGINEERS, INC.  
 8401 Corporate Drive  
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 FAX: (301) 577-4737

DSN. BY: ATR			
DRN. BY: DEN			
CHK. BY: MAE			
DATE: 9/04/12	R1D 1	RECORD DRAWING	04/16
BY NO.		REVISION	DATE

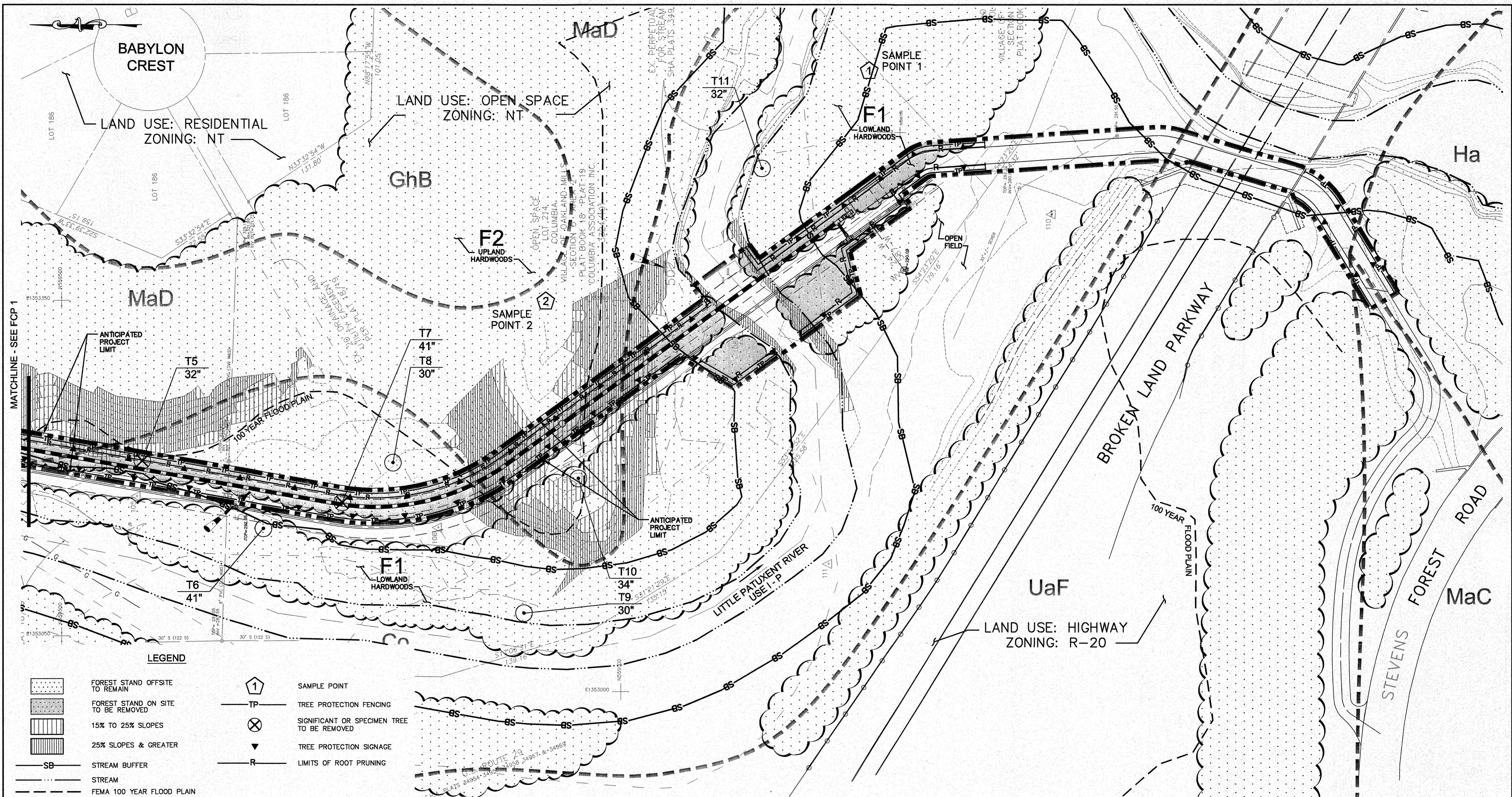
600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

**US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN REPLACEMENT**

FOREST CONSERVATION PLAN

CAPITAL PROJECT: W-8265  
 CONTRACT NO.: 44-0000-4592  
 ELECTION DISTRICT NO. 6  
 HOWARD COUNTY, MARYLAND

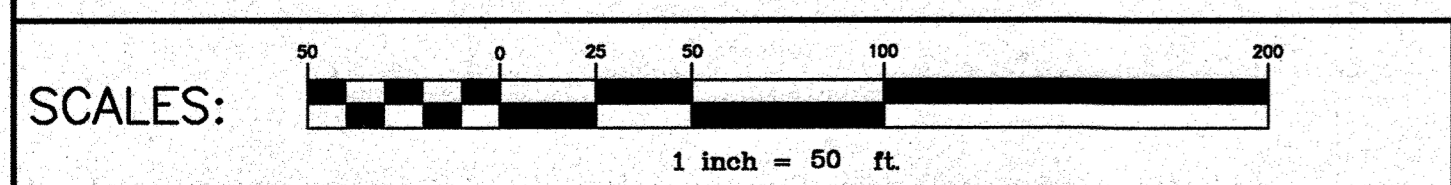
SCALE AS SHOWN  
 SHEET 17 OF 26



PLAN  
SCALE: 1"=50'

**LEGEND**

	FOREST STAND OFFSITE TO REMAIN		SAMPLE POINT
	FOREST STAND ON SITE TO BE REMOVED		TREE PROTECTION FENCING
	15% TO 25% SLOPES		SIGNIFICANT OR SPECIMEN TREE TO BE REMOVED
	25% SLOPES & GREATER		TREE PROTECTION SIGNAGE
	STREAM BUFFER		LIMITS OF ROOT PRUNING
	STREAM		
	FEMA 100 YEAR FLOOD PLAIN		
	SOIL LIMITS		
	SOIL TYPE		
	PROPERTY LINE		
	PROJECT LIMIT		
	SIGNIFICANT OR SPECIMEN TREE		
	WETLAND AREA		



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*Gregory V. Osband*  
GREGORY V. OSBAND  
LICENSE NUMBER MD RLA #721



**AMT**  
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12760 TWINBROOK PARKWAY ROCKVILLE, MD 20862  
(301) 881-2646 FAX: (301) 881-0814  
EMAIL: AMT@AMTENGINEERING.COM

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Janet M. ...* 10/22/11  
DIRECTOR OF PUBLIC WORKS DATE

*Steve Sauer (Chief)* 10/8/12  
CHIEF - BUREAU OF ENGINEERING DATE

*Steve Chen* 10/19/12  
CHIEF, BUREAU OF UTILITIES DATE

*Clayton ...* 10/5/12  
CHIEF, UTILITY DESIGN DIVISION DATE

**O'Brien & Gere**  
ENGINEERS, INC.  
8401 Corporate Drive  
Suite 400  
Landover, Maryland 20785  
(301) 731-5622  
FAX: (301) 577-4737

DSN. BY: ATR			
DRN. BY: DEN			
CHK. BY: MAE			
DATE: 9/04/12	RJD	1 RECORD DRAWING	04/16
BY NO.		REVISION	DATE

FOREST CONSERVATION PLAN

600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

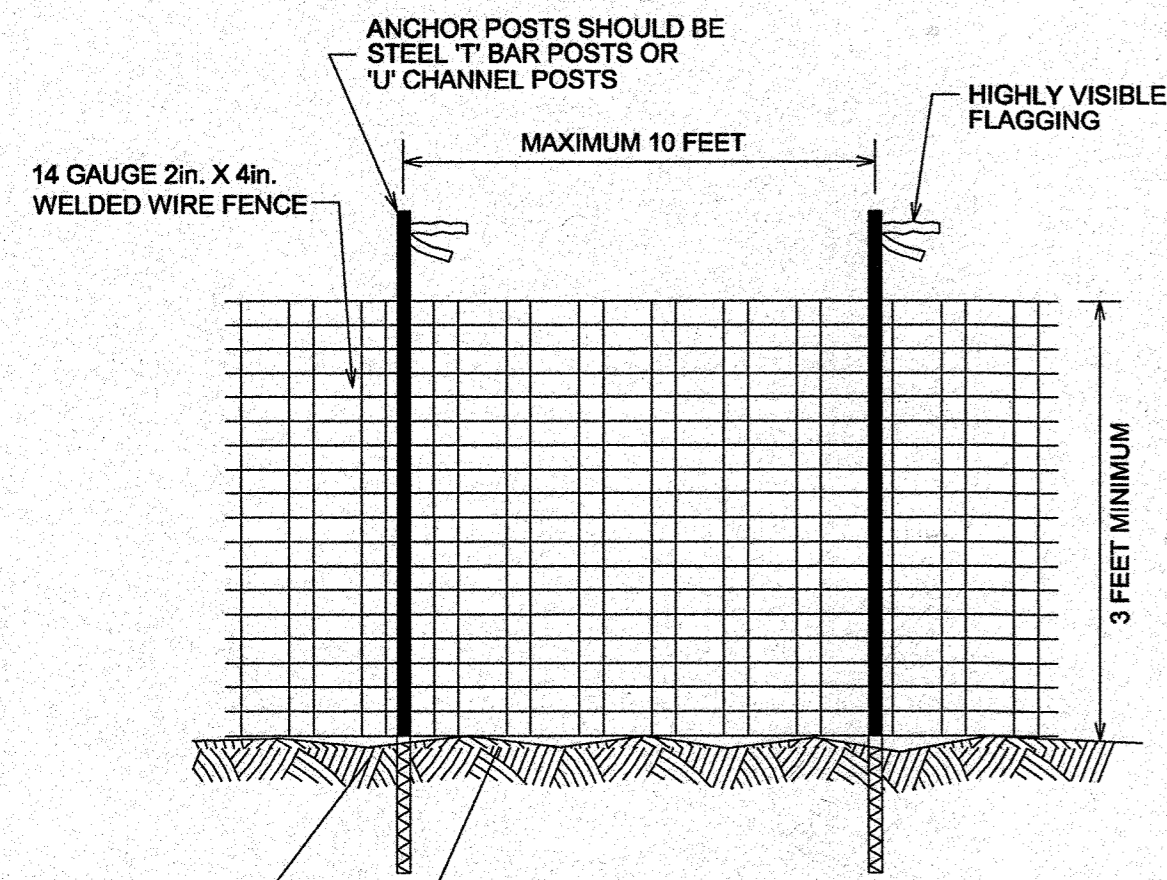
US ROUTE 29 / BROKEN LAND PARKWAY  
TRANSMISSION MAIN REPLACEMENT

CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-**4592**  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
FCP-2  
SHEET 18 OF 26

FILE NO. 32122

**TREE PROTECTION FENCING**  
**WIRE MESH**



- NOTES:**
1. FOREST PROTECTION DEVICE ONLY.
  2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
  3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLATION OF DEVICE.
  4. ROOT DAMAGE SHOULD BE AVOIDED.
  5. PROTECTIVE SIGNAGE IS REQUIRED.
  6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.
  7. ALTERNATIVE TREE PROTECTION DEVICES: SUPER SILT FENCE, OR SNOW FENCE OR 3 STRANDS OF SMOOTH 12 GAUGE WIRE. ATTACH HIGHLY VISIBLE FLAGGING TO WIRES @ 12" O.C.

NOT TO SCALE

**SIGNAGE**

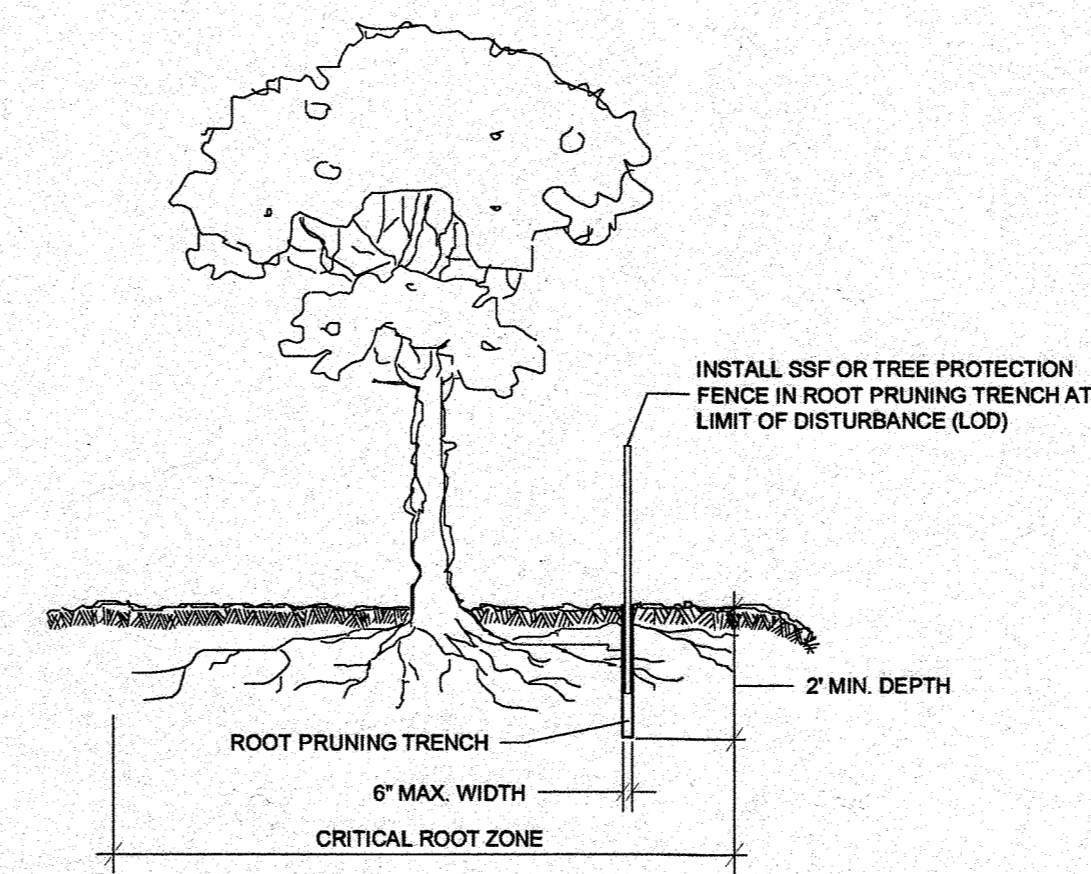


- NOTES:**
1. ATTACHMENT OF SIGNS TO TREES IS PROHIBITED.
  2. SIGNS SHOULD BE PROPERLY MAINTAINED.
  3. AVOID INJURY TO ROOTS WHEN PLACING POSTS FOR THE SIGNS.

NOT TO SCALE

**STRESS REDUCTION MEASURE**

**ROOT PRUNING**



- NOTES:**
1. RETENTION AREAS WILL BE SET AS PART OF THE REVIEW PROCESS.
  2. BOUNDARIES OF RETENTION AREAS SHOULD BE STAKED AND FLAGGED PRIOR TO TRENCHING.
  3. EXACT LOCATION OF TRENCH SHOULD BE IDENTIFIED.
  4. ROOTS SHOULD BE CLEANLY CUT USING VIBRATORY KNIFE OR OTHER ACCEPTABLE EQUIPMENT.
  5. TRENCH SHOULD BE IMMEDIATELY BACKFILLED WITH SOIL REMOVED OR OTHER HIGH ORGANIC SOIL.

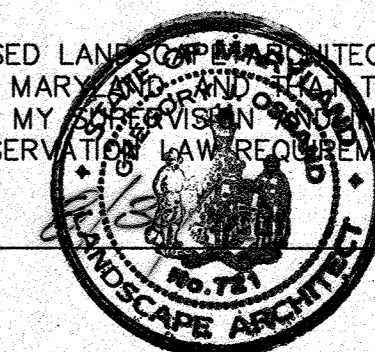
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**CERTIFICATION**

I CERTIFY THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND AND THESE DOCUMENTS WERE PREPARED UNDER MY SUPERVISION AND IN COMPLIANCE WITH THE FOREST CONSERVATION LAW REQUIREMENTS.

*Gregory J. Osband*  
GREGORY J. OSBAND  
LICENSE NUMBER MD RLA #721



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EMAIL: AMT1@AMTENGINEERING.COM

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Gregory J. Osband* 10/22/12  
DIRECTOR OF PUBLIC WORKS DATE  
*Steve Shaver (Acting)* 10/8/12  
CHIEF - BUREAU OF ENGINEERING DATE  
*Silva Chen* 10/12/12  
CHIEF, BUREAU OF UTILITIES DATE  
*Orlando P. Ponce* 10/5/12  
CHIEF, UTILITY DESIGN DIVISION DATE  
*RJD*

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FAX: (301) 577-4737

DSN. BY:	ATR				
DRN. BY:	DEN				
CHK. BY:	MAE				
DATE:	9/04/12				
BY	RJD	NO.	1	REVISION	04/16

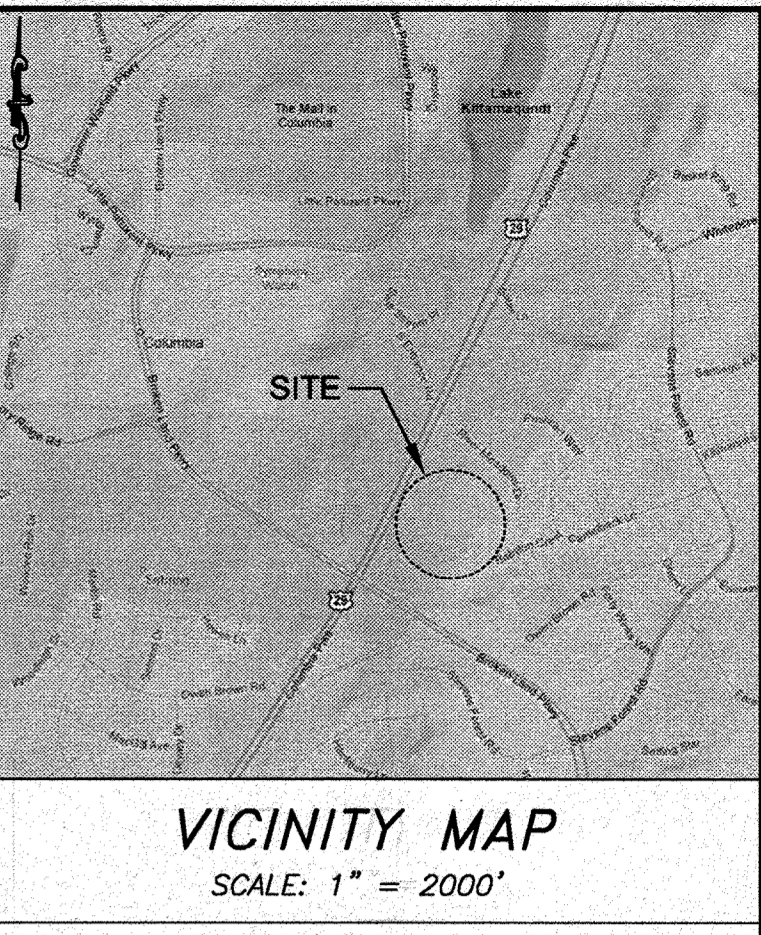
FOREST CONSERVATION  
PLAN DETAILS

600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

US ROUTE 29 / BROKEN LAND PARKWAY  
TRANSMISSION MAIN REPLACEMENT  
CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-**4592**  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN  
FCP-3  
SHEET  
19 OF 26

FILE NO. 32122



**LEGEND - SEDIMENT CONTROL**

LIMIT OF DISTURBANCE	— LOD —
SILT FENCE	— SF —
SUPER SILT FENCE	— SSF —
TREE PROTECTION	— TP —
STABILIZED CONSTRUCTION ENTRANCE	SCE

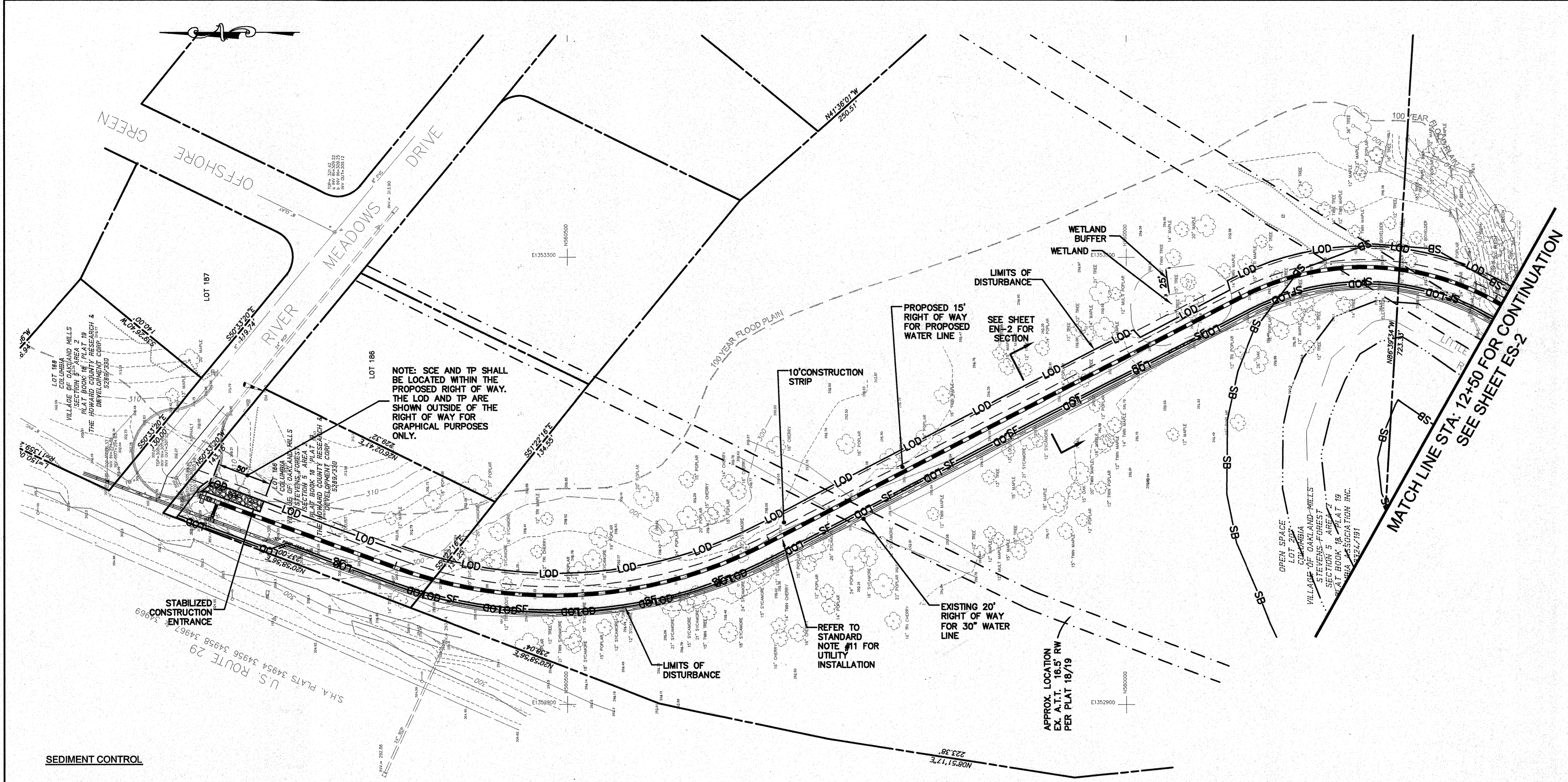
**SILT FENCE STATION**

FROM	TO
STA: 0+00 RT	STA: 12+50 RT

**STABILIZED CONSTRUCTION ENTRANCE**

NAME	STATION	LENGTH
SCE #1	0+00 LT	50'

- NOTES:**
- CONSTRUCTION OF THE WATER LINE SHALL BE LIMITED TO THAT WHICH CAN BE BACKFILLED AND STABILIZED AT THE END OF EACH WORK DAY.
  - ADDITIONAL INSTALLATION OF STABILIZED CONSTRUCTION ENTRANCE IF NEEDED, SHALL BE LOCATED BY THE INSPECTOR.
  - FINAL UTILITY ACCESS AREAS TO BE DETERMINED IN THE FIELD WITH APPROVAL FROM INSPECTOR.
  - ALL EXCESS SOIL GENERATED DUE TO THE EXCAVATION OF THE WATERLINE AND ITS BACKFILL MUST BE REMOVED FROM THE 100-YEAR FLOODPLAIN. STOCKPILING AT THE SITE IS NOT PERMITTED.
  - SEE SHEET ES-2 FOR CONDITIONS AND MANAGEMENT PRACTICES FOR WORK IN NONTIDAL WETLANDS AND BUFFERS.
  - SEE SHEET EN-2 FOR OVERALL SEQUENCE OF CONSTRUCTION AND SHEET ES-4 FOR STREAM DIVERSION SEQUENCE OF CONSTRUCTION.



**SEDIMENT CONTROL**

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 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."

Signature of Developer: *Robert Diaz* Date: 10-5-12  
 Print name below signature: ROBERT DIAZ

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 and that it was prepared in accordance with the requirements of the Howard Soil Conservation District."

Signature of Engineer: *Matthew A. Ernest* Date: 8-30-12  
 MATTHEW A. ERNEST

**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. 32151, EXPIRATION DATE 07/18/13."

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

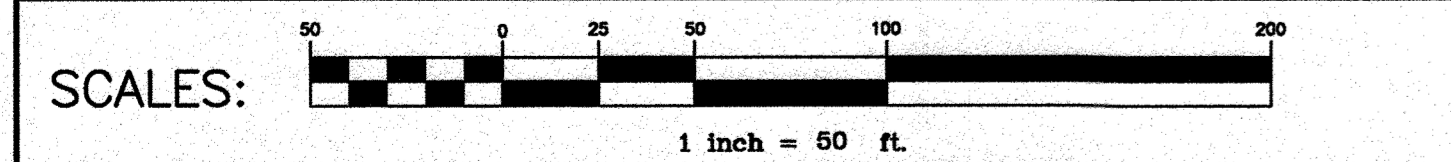
THIS PLAN IS FOR EROSION AND SEDIMENT CONTROL PURPOSES ONLY

NOTE TO THE CONTRACTOR: "EROSION AND SEDIMENT CONTROL SHALL BE STRICTLY ENFORCED"

**GENERAL LEGEND**

- SB — 50' STREAM BUFFER
- — — STREAM
- - - - - FEMA 100 YEAR FLOOD PLAIN

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DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

Director of Public Works: *John A. ...* DATE: 10/2/12  
 Chief, Bureau of Utilities: *Steve Shaver* DATE: 10/8/12  
 Chief, Utility Design Division: *Matthew A. Ernest* DATE: 10/5/12

**O'BRIEN & GERE ENGINEERS, INC.**  
 8401 Corporate Drive Suite 400  
 Landover, Maryland 20785  
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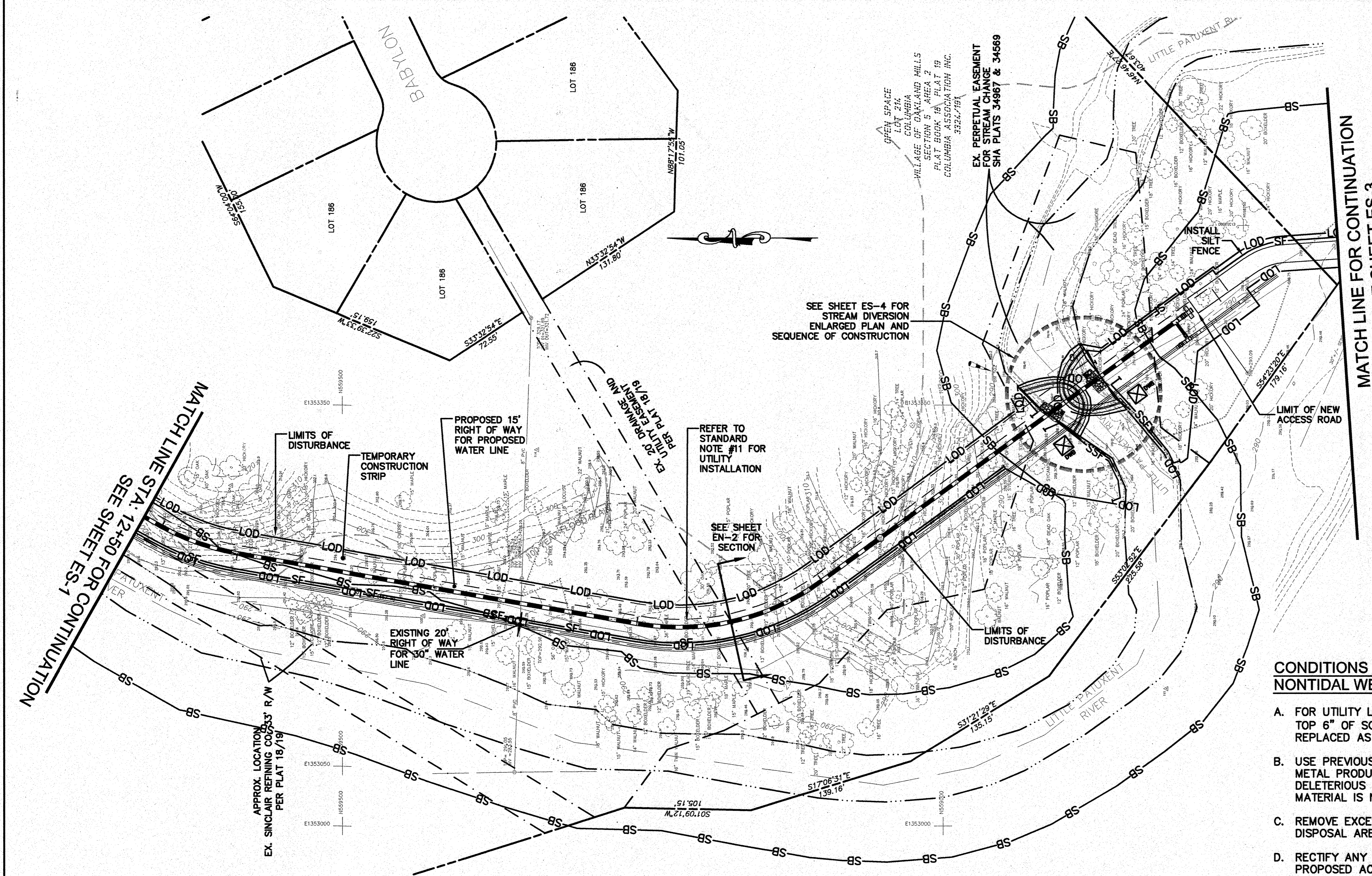
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DRN. BY: DEN			
CHK. BY: MAE			
DATE: 9/04/12	RJD	1	RECORD DRAWING
BY NO.		REVISION	DATE

SEDIMENT CONTROL PLAN  
 STA 0+00 TO STA 12+50

600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

US ROUTE 29 / BROKEN LAND PARKWAY  
 TRANSMISSION MAIN REPLACEMENT

CAPITAL PROJECT: W-8265  
 CONTRACT NO.: 44-4592  
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 HOWARD COUNTY, MARYLAND

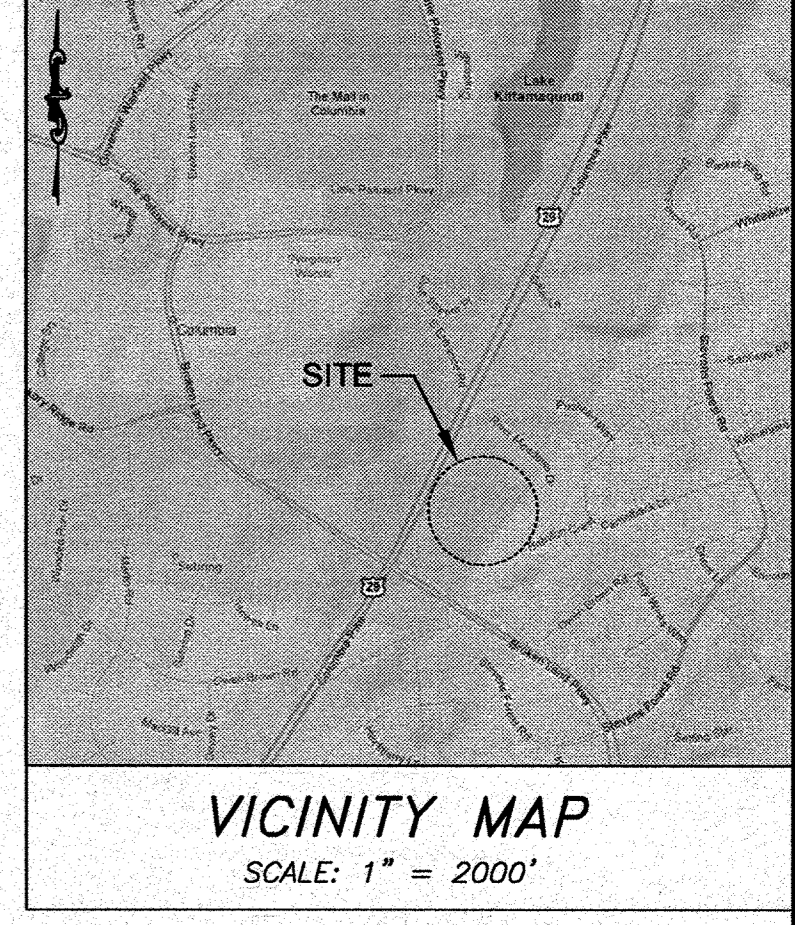


**NOTES:**

- CONSTRUCTION OF THE WATER LINE SHALL BE LIMITED TO THAT WHICH CAN BE BACKFILLED AND STABILIZED AT THE END OF EACH WORK DAY.
- ADDITIONAL INSTALLATION OF STABILIZED CONSTRUCTION ENTRANCE IF NEEDED, SHALL BE LOCATED BY THE INSPECTOR.
- FINAL UTILITY ACCESS AREAS TO BE DETERMINED IN THE FIELD WITH APPROVAL FROM INSPECTOR.
- ALL EXCESS SOIL GENERATED DUE TO THE EXCAVATION OF THE WATERLINE AND ITS BACKFILL MUST BE REMOVED FROM THE 100-YEAR FLOODPLAIN. STOCKPILING AT THE SITE IS NOT PERMITTED.
- SEE SHEET ES-2 FOR CONDITIONS AND MANAGEMENT PRACTICES FOR WORK IN NONTIDAL WETLANDS AND BUFFERS.
- SEE SHEET EN-2 FOR OVERALL SEQUENCE OF CONSTRUCTION AND SHEET ES-4 FOR STREAM DIVERSION SEQUENCE OF CONSTRUCTION.

**CONDITIONS AND MANAGEMENT PRACTICES FOR WORK IN NONTIDAL WETLANDS AND BUFFERS**

- FOR UTILITY LINE INSTALLATION, STRIP, STOCKPILE AND MAINTAIN SEPARATELY THE TOP 6" OF SOIL MATERIAL FROM THE NONTIDAL WETLANDS AND BUFFER, TO BE REPLACED AS THE TOP LAYER OF THE BACKFILL MATERIAL.
- USE PREVIOUSLY EXCAVATED MATERIAL AS BACKFILL UNLESS IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIALS OR ANY OTHER DELETERIOUS SUBSTANCE. USE CLEAN BORROW MATERIAL WHEN EXCAVATED MATERIAL IS NOT SUITABLE FOR USE AS BACKFILL.
- REMOVE EXCESS FILL OR CONSTRUCTION MATERIAL OR DEBRIS TO AN UPLAND DISPOSAL AREA, OUTSIDE OF ANY FLOODPLAIN, WATERWAY, WETLAND OR BUFFER.
- RECTIFY ANY NONTIDAL WETLANDS AND BUFFERS TEMPORARILY IMPACTED BY THE PROPOSED ACTIVITY. ALL STABILIZATION IN THE WETLAND AND BUFFER SHALL BE ONE OF THE FOLLOWING RECOMMENDED SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), OATS (UNIOLA SP.) AND/OR RYE (SECALE CEREALE). OTHER NON-PERSISTANT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN THE WETLAND OR BUFFER. ALL TEMPORARY FILLS SHALL BE REMOVED IN THEIR ENTIRETY ON OR BEFORE THE COMPLETION OF CONSTRUCTION.
- AFTER UTILITY LINE INSTALLATION HAS BEEN COMPLETED, MAKE POST CONSTRUCTION GRADES AND ELEVATIONS OF NONTIDAL WETLANDS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS.
- PLACE HEAVY EQUIPMENT MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO THE NONTIDAL WETLANDS.
- TO PROTECT IMPORTANT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM AS FOLLOWS:  
  
CLASS 1 WATERS: IN-STREAM WORK MAY NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
- NO REMOVAL OF VEGETATION, GRADING, FILLING, DRAINING OR OTHER ALTERATION OF THE NONTIDAL WETLANDS OR BUFFER OUTSIDE THE LIMITS OF DISTURBANCE SHALL OCCUR WITHOUT WRITTEN AUTHORIZATION FROM THE WATER MANAGEMENT ADMINISTRATION.



**LEGEND - SEDIMENT CONTROL**

LIMIT OF DISTURBANCE	— LOD —
SILT FENCE	— SF —
SUPER SILT FENCE	— SSF —
TREE PROTECTION	— TP —
DEWATERING BASIN	☒

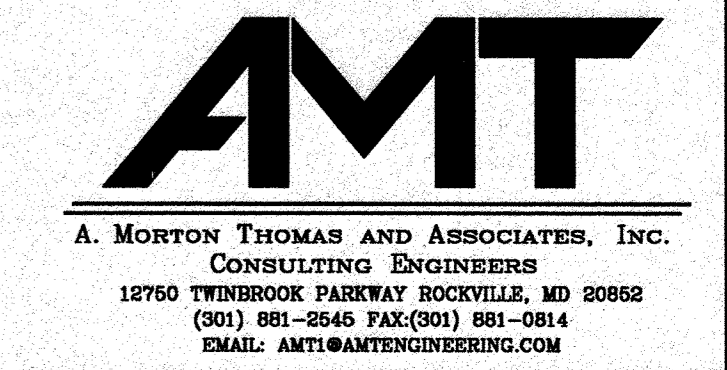
**SILT FENCE STATION**

FROM	TO
STA: 12+50 RT	STA: 20+12 RT
STA: 21+37 LT	STA: 22+20 LT

NOTE:  
SEE SHEET ES-4 FOR SUPER SILT FENCE LOCATION

**GENERAL LEGEND**

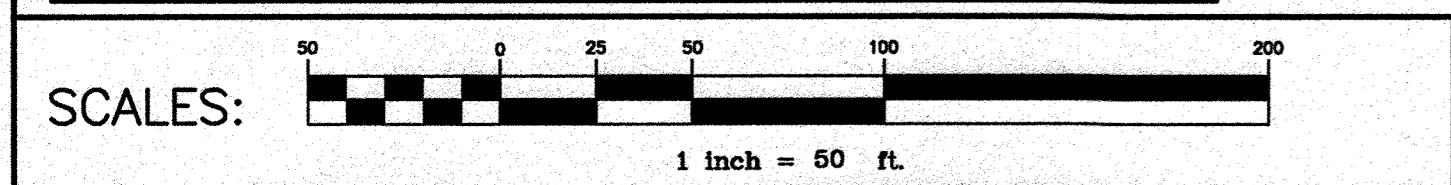
— SB —	50' STREAM BUFFER
— — —	STREAM
— — — — —	FEMA 100 YEAR FLOOD PLAN



**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. 32151, EXPIRATION DATE 02/18/13."

*[Signature]*  
B-3002



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER THIS DOCUMENT.

THIS PLAN IS FOR EROSION AND SEDIMENT CONTROL PURPOSES ONLY  
NOTE TO THE CONTRACTOR: "EROSION AND SEDIMENT CONTROL SHALL BE STRICTLY ENFORCED"

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*[Signature]* 10/8/12  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 10/15/12  
CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 10/15/12  
CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE**  
ENGINEERS, INC.  
8401 Corporate Drive  
Suite 400  
Landover, Maryland 20785  
(301) 731-5622  
FAX: (301) 577-4737

DSN. BY: ATR					
DRN. BY: DEN					
CHK. BY: MAE					
DATE: 9/04/12	RJD	1	RECORD DRAWING	04/16	
BY NO.			REVISION	DATE	

SEDIMENT CONTROL PLAN  
STA 12+50 TO ACCESS ROAD

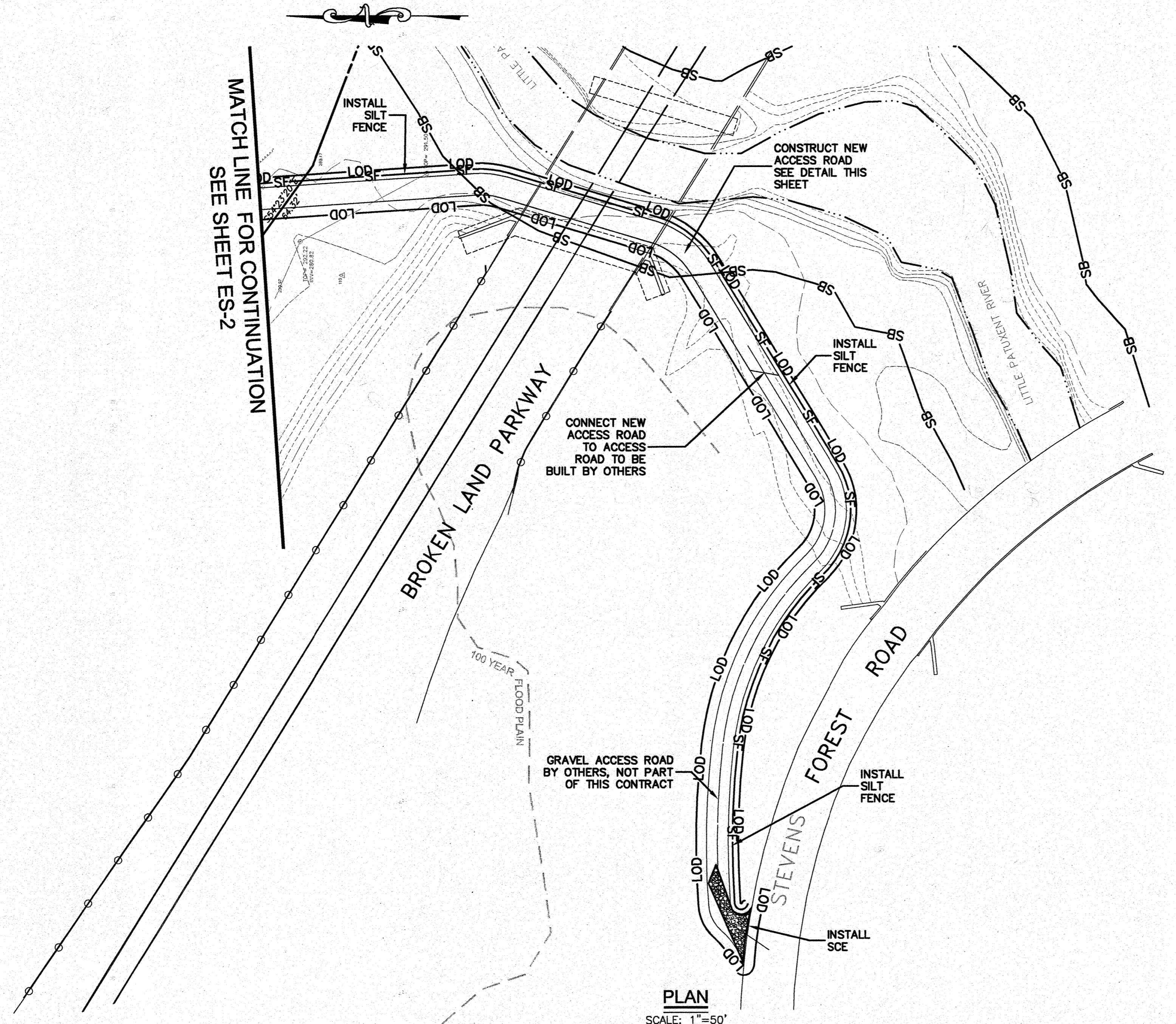
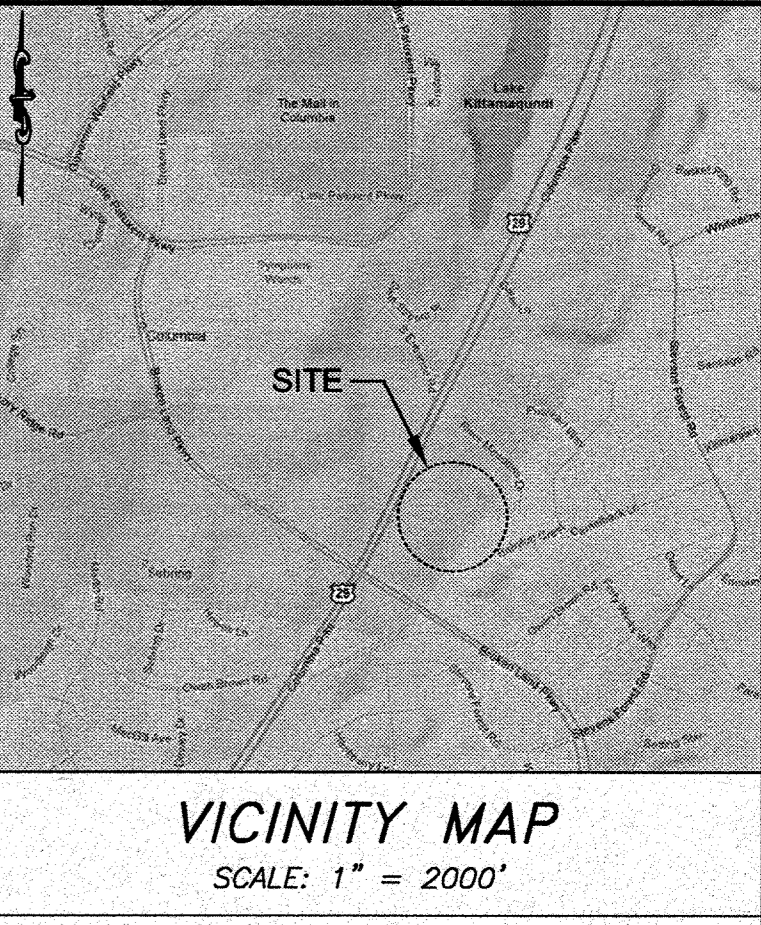
600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

US ROUTE 29 / BROKEN LAND PARKWAY  
TRANSMISSION MAIN REPLACEMENT

CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
ES-2 SHEET 21 OF 26

FILE NO. 32122-

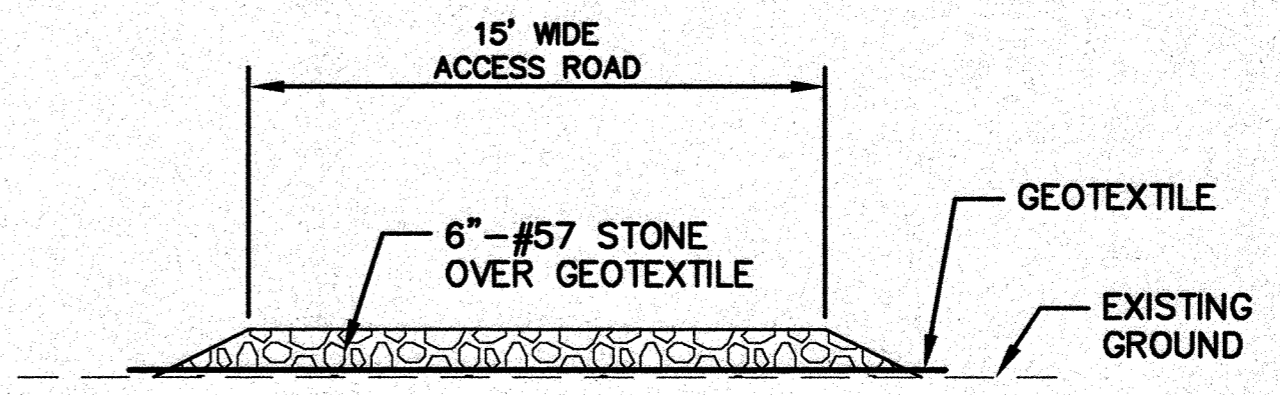


**LEGEND - SEDIMENT CONTROL**

- LIMIT OF DISTURBANCE — LOD —
- SILT FENCE — SF —
- SUPER SILT FENCE — SSF —
- TREE PROTECTION — TP —
- STABILIZED CONSTRUCTION ENTRANCE [Symbol] SCE

**NOTES:**

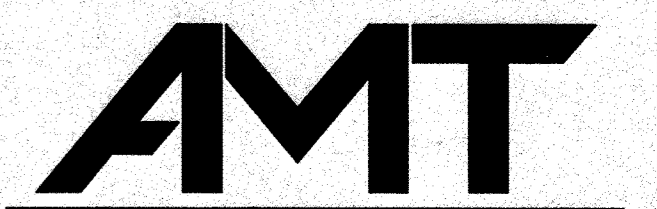
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3. FINAL UTILITY ACCESS AREAS TO BE DETERMINED IN THE FIELD WITH APPROVAL FROM INSPECTOR.
4. ALL EXCESS SOIL GENERATED DUE TO THE EXCAVATION OF THE WATERLINE AND ITS BACKFILL MUST BE REMOVED FROM THE 100-YEAR FLOODPLAIN. STOCKPILING AT THE SITE IS NOT PERMITTED.
5. SEE SHEET ES-2 FOR CONDITIONS AND MANAGEMENT PRACTICES FOR WORK IN NONTIDAL WETLANDS AND BUFFERS.
6. SEE SHEET EN-2 FOR OVERALL SEQUENCE OF CONSTRUCTION AND SHEET ES-4 FOR STREAM DIVERSION SEQUENCE OF CONSTRUCTION.



TEMPORARY ACCESS ROAD TYPICAL SECTION  
NOT TO SCALE

**GENERAL LEGEND**

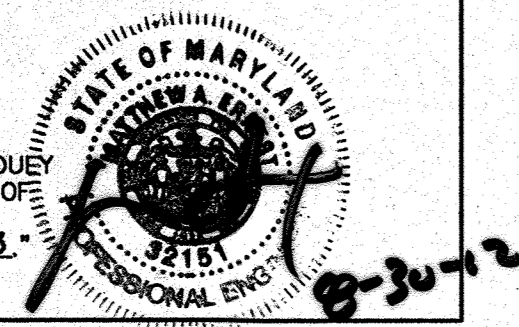
- SB — 50' STREAM BUFFER
- ··· — STREAM
- - - - FEMA 100 YEAR FLOOD PLAIN



A. MORTON THOMAS AND ASSOCIATES, INC.  
CONSULTING ENGINEERS  
12750 TWINBROOK PARKWAY ROCKVILLE, MD 20850  
(301) 881-2646 FAX (301) 881-0814  
EMAIL: AMT@AMTENGINEERING.COM

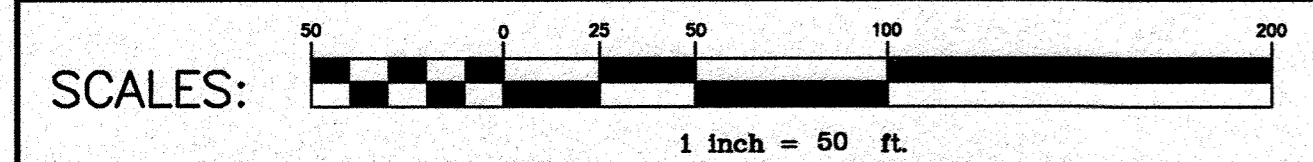
**PROFESSIONAL CERTIFICATION**

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DUELY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 32151, EXPIRATION DATE 07/18/13



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Jan 7* 10/2/12  
DIRECTOR OF PUBLIC WORKS DATE

*Steve Staves (Acting)* 10/8/12  
CHIEF - BUREAU OF ENGINEERING DATE

*Steve Staves* 10/12/12  
CHIEF, BUREAU OF UTILITIES DATE

*Don Fine* 10/5/12  
CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE**  
ENGINEERS, INC.

8401 Corporate Drive  
Suite 400  
Landover, Maryland 20785  
(301) 731-5622  
FAX: (301) 577-4737

DSN. BY: ATR			
DRN. BY: DEN			
CHK. BY: MAE			
DATE: 9/04/12	RJD	1 RECORD DRAWING	04/16
BY NO.		REVISION	DATE

SEDIMENT CONTROL PLAN  
ACCESS ROAD FROM STEVENS  
FOREST ROAD

600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

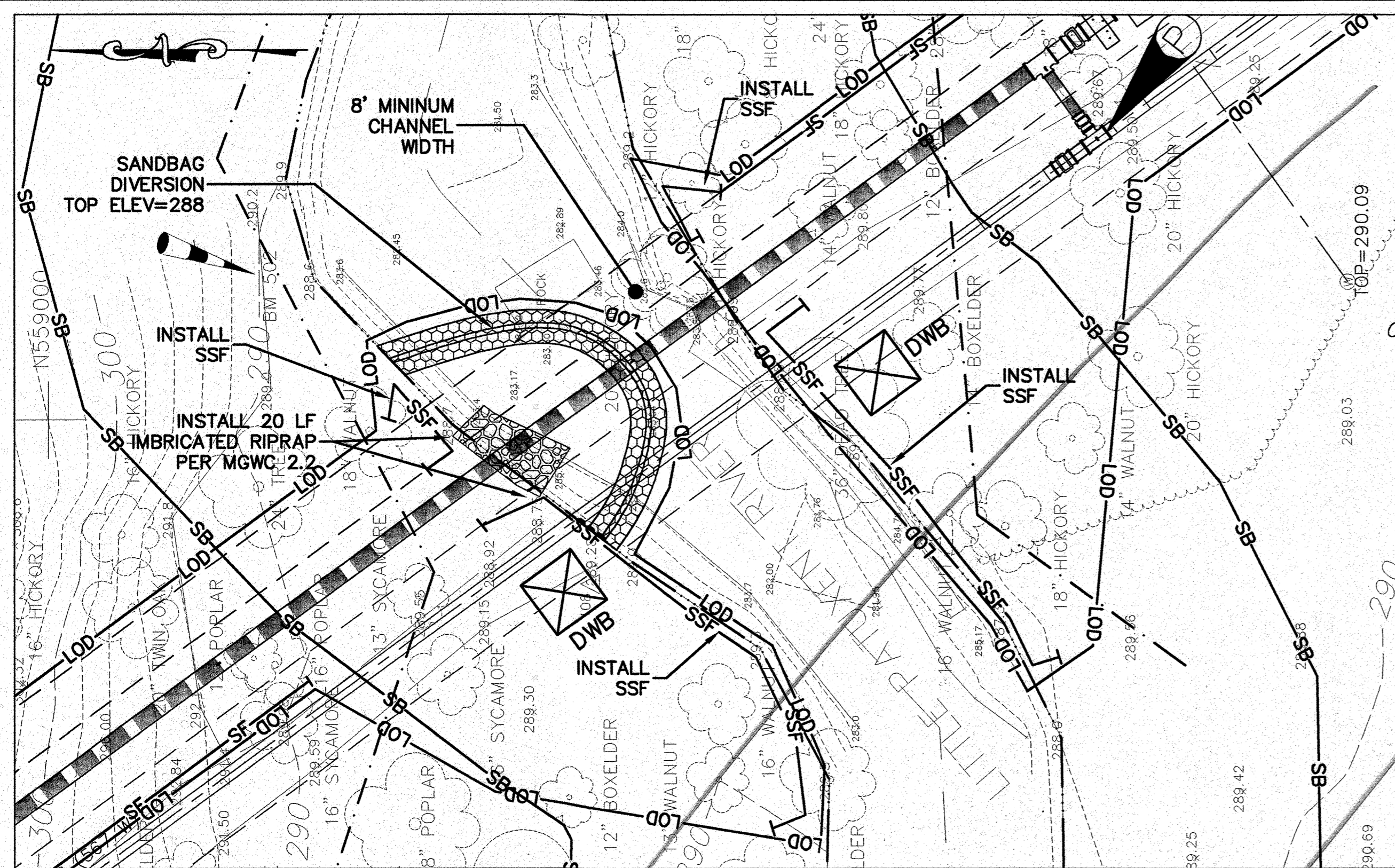
US ROUTE 29 / BROKEN LAND PARKWAY  
TRANSMISSION MAIN REPLACEMENT

CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

ES-3  
SHEET 22 OF 26

FILE NO. 32122-

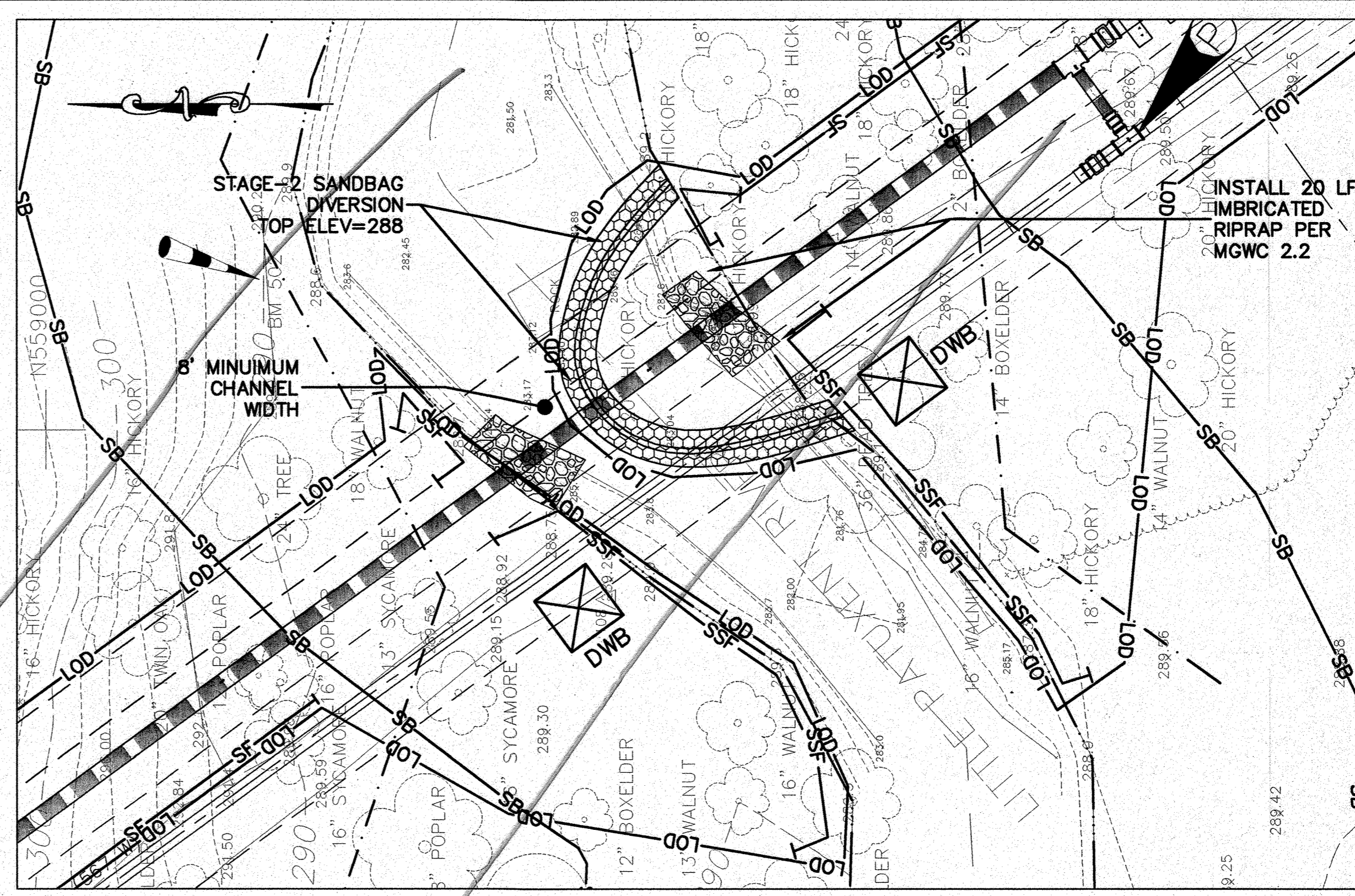


PLAN - DIVERSION CHANNEL STAGE 1

SCALE: 1"=20'

**STREAM DIVERSION SEQUENCE OF CONSTRUCTION - STAGE-1:**

1. INSTALL DEWATERING BASIN(S) AS SHOWN IN ACCORDANCE WITH MGWC DETAIL 1.1 ON SHEET EN-3.
2. INSTALL STAGE-1 STONE/SANDBAG DIVERSION IN ACCORDANCE WITH THE MGWC DETAIL 1.5 ON SHEET EN-3.
3. CONSTRUCT WATER LINE ACROSS THE STREAM DIVERSION UP TO THE LOCATION OF THE STAGE-1 DIVERSION. THE STREAM CHANNEL CONSTRUCTION SHALL BE IN ACCORDANCE WITH MGWC DETAILS 4.2(a) AND 4.2(b) ON SHEET EN-3.
4. ONCE THE STAGE-1 WATER LINE IS INSTALLED, STABILIZE THE STREAM BANK WITH IMBRICATED RIPRAP IN ACCORDANCE MGWC DETAIL 2.2 ON SHEET EN-3.
5. ONCE THE STAGE-1 STREAM BANK RIPRAP IS INSTALLED AND THE STREAM CHANNEL IS STABILIZED, WITH THE APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE THE STAGE-1 DIVERSION AND PROCEED WITH STAGE-2.



PLAN - DIVERSION CHANNEL STAGE 2

SCALE: 1"=20'

**STREAM DIVERSION SEQUENCE OF CONSTRUCTION - STAGE-2:**

1. REBUILD THE STONE/SANDBAG DIVERSION FOR STAGE-2 IN ACCORDANCE MGWC DETAIL 1.5 ON SHEET EN-3.
2. COMPLETE THE CONSTRUCTION OF THE WATER LINE ACROSS THE STREAM DIVERSION. THE STREAM CHANNEL CONSTRUCTION SHALL BE IN ACCORDANCE WITH MGWC DETAIL 4.2(a) AND 4.2(b) ON SHEET EN-3.
3. ONCE THE WATER LINE IS CONSTRUCTED BEYOND THE STREAM BANK, INSTALL IMBRICATED RIPRAP ALONG THE STREAM BANK IN ACCORDANCE WITH MGWC DETAIL 2.2 ON SHEET EN-3.
4. ONCE THE STREAM CHANNEL AND STREAM BANK IS STABILIZED, WITH THE APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE THE STAGE-2 STREAM DIVERSION AND STABILIZED ANY REMAINING DISTURBED AREAS.

*NOT USED*

**NOTES:**

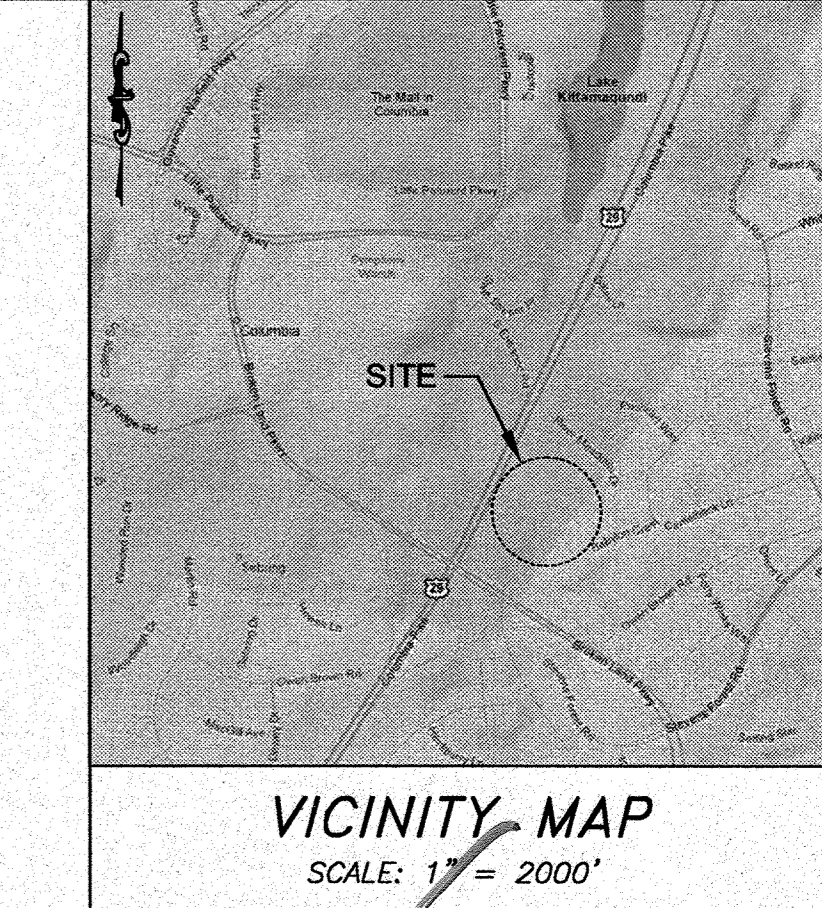
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**LEGEND - SEDIMENT CONTROL**

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- SILT FENCE — SF
- SUPER SILT FENCE — SSF
- TREE PROTECTION — TP
- DEWATERING BASIN [Symbol]

**GENERAL LEGEND**

- SB — 50' STREAM BUFFER
- — — — — STREAM
- — — — — FEMA 100 YEAR FLOOD PLAIN



VICINITY MAP  
SCALE: 1" = 2000'

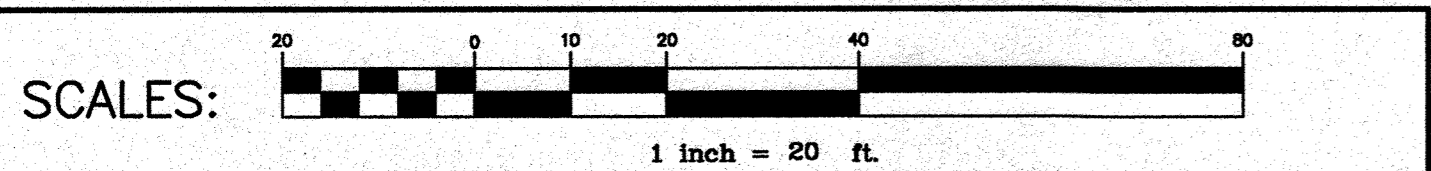
*PORTADAM COFFERDAM SYSTEM  
USE FOR RIVER CROSSING*

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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*[Signature]* 10/28/12  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 10/19/12  
CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 10/15/12  
CHIEF, UTILITY DESIGN DIVISION DATE

**O'BRIEN & GERE**  
ENGINEERS, INC.

8401 Corporate Drive  
Suite 400  
Landover, Maryland 20785  
(301) 731-5622  
FAX: (301) 577-4737

DSN. BY: ATR			
DRN. BY: DEN			
CHK. BY: MAE			
DATE: 9/04/12	RJD	1 RECORD DRAWING	04/16
BY NO.		REVISION	DATE

600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

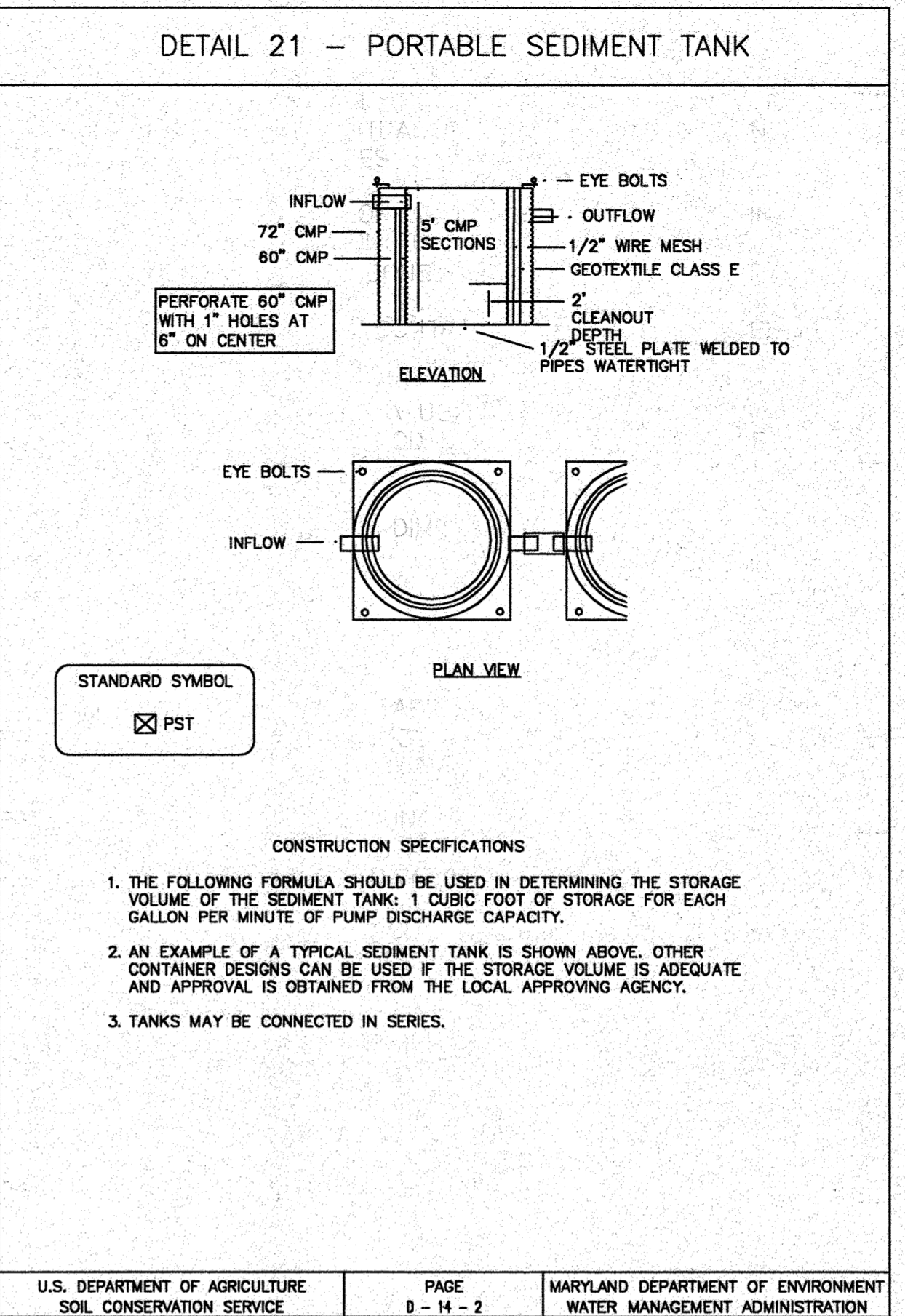
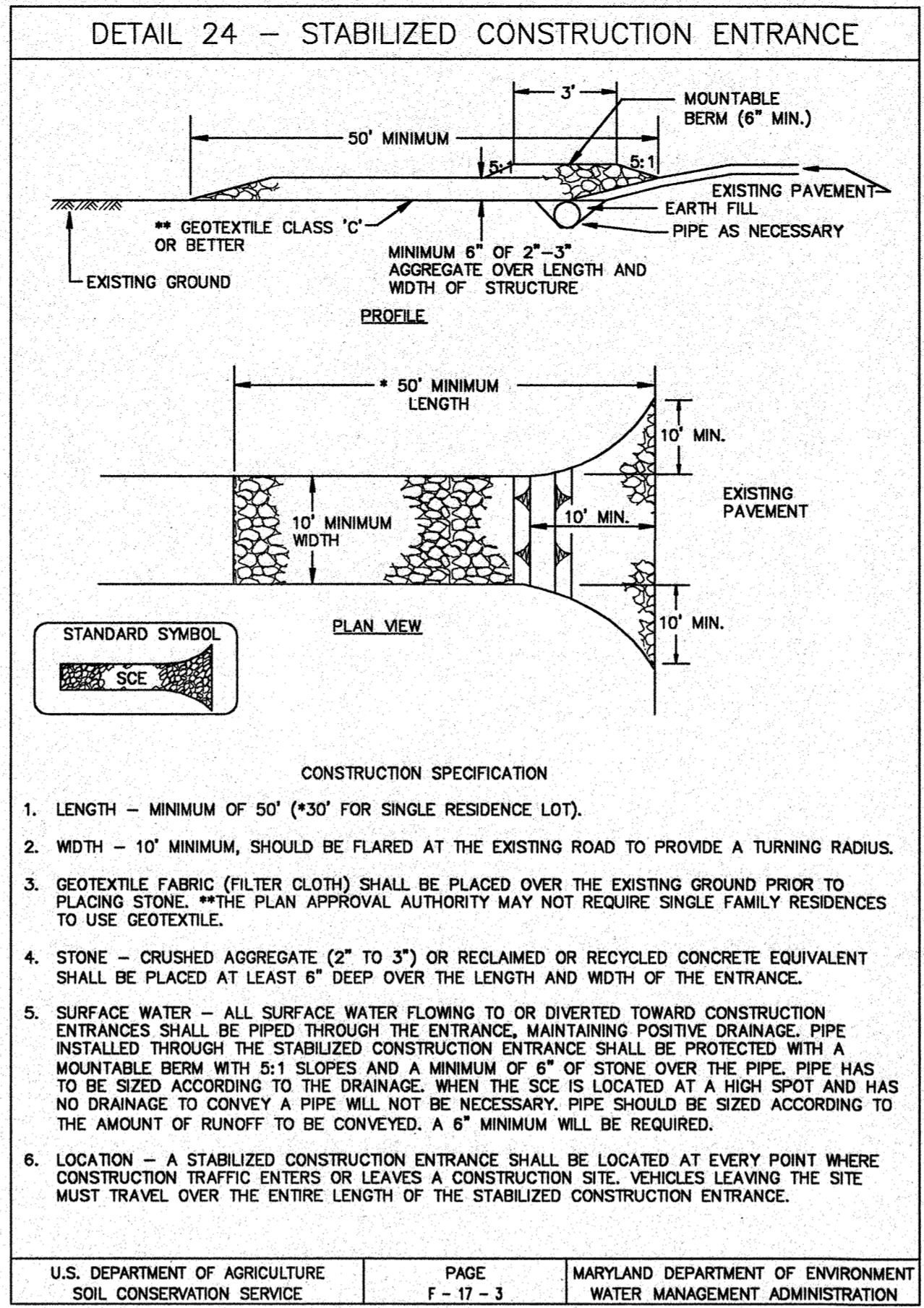
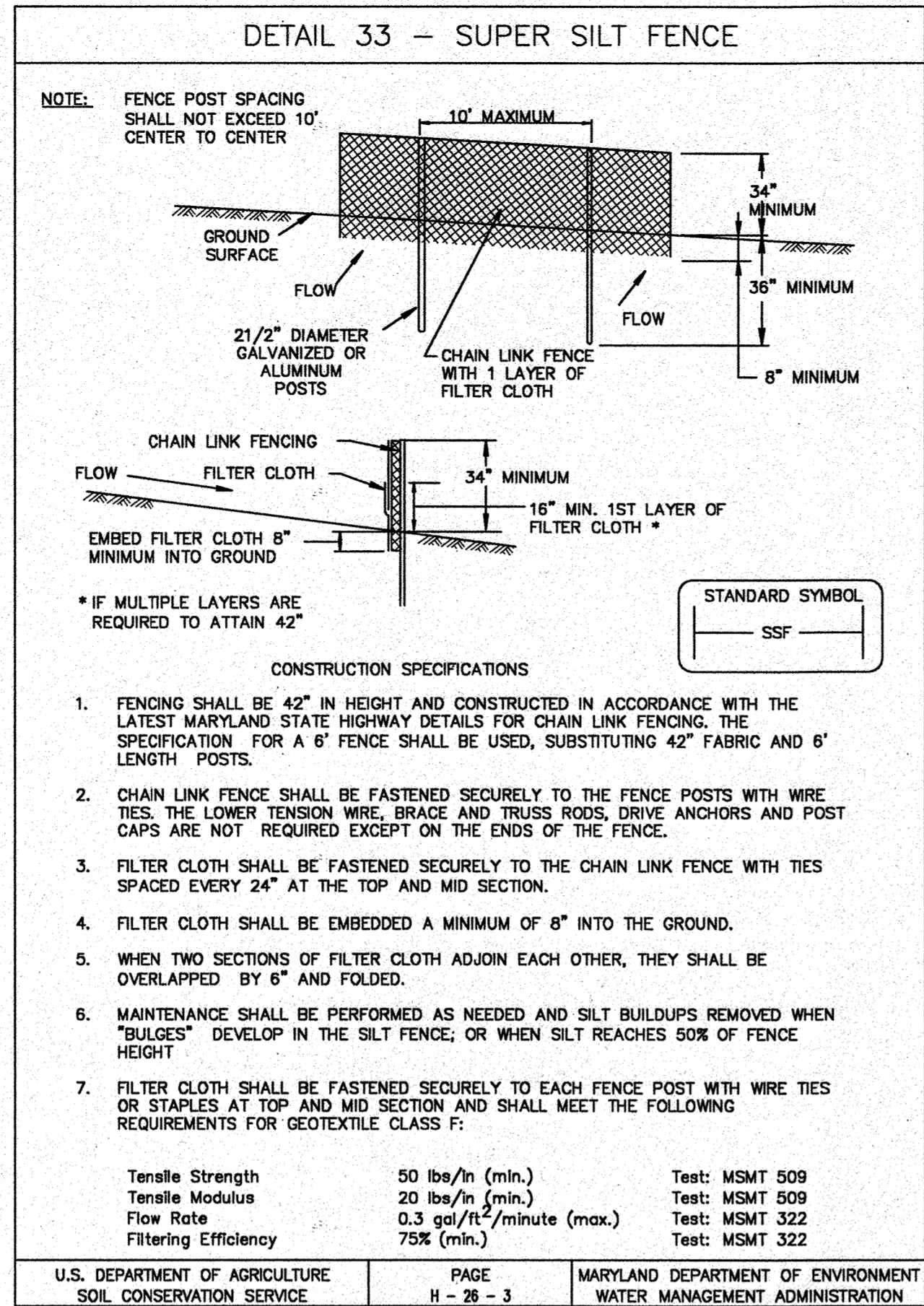
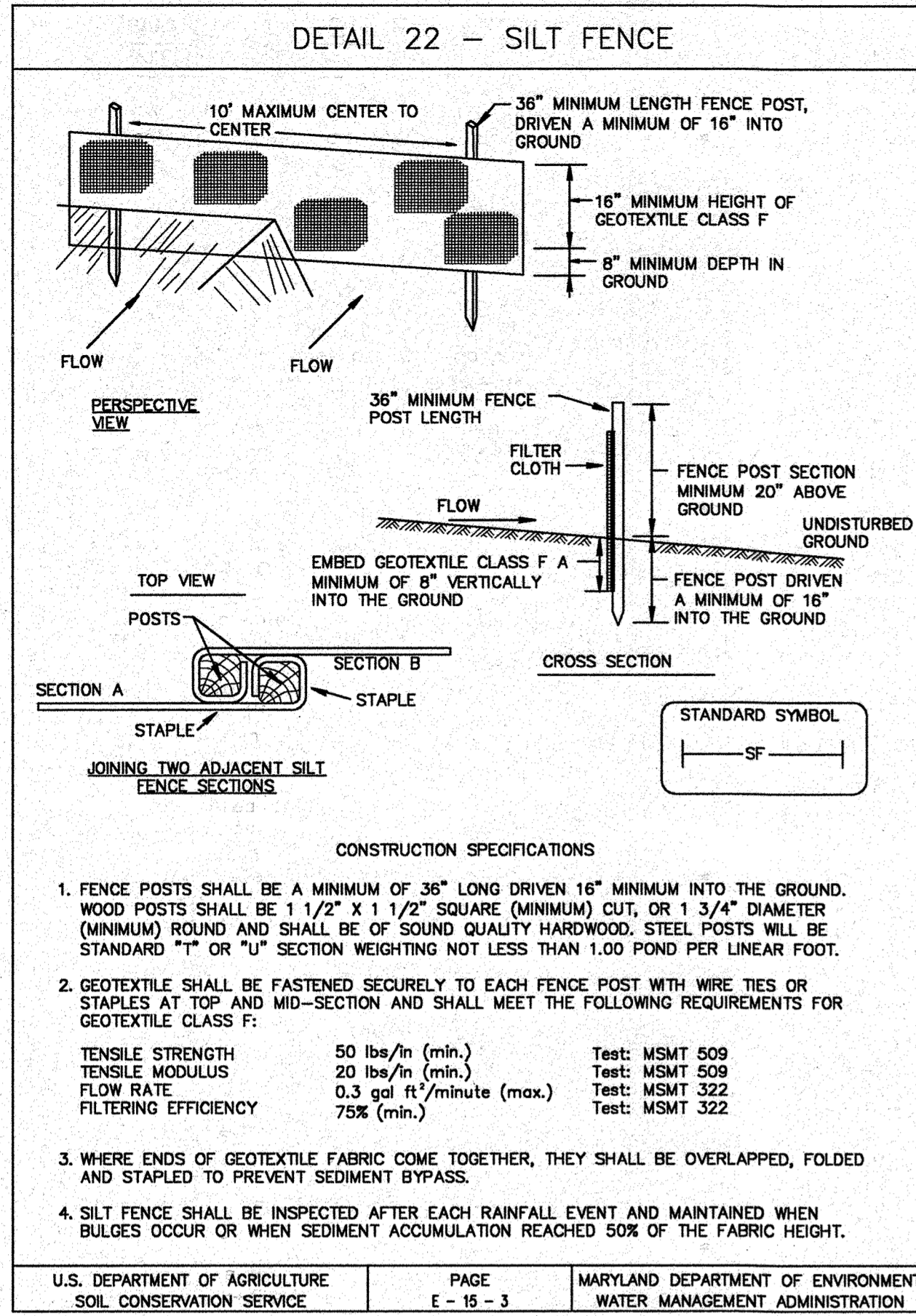
US ROUTE 29 / BROKEN LAND PARKWAY  
TRANSMISSION MAIN REPLACEMENT

CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-**4592**  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
ES-4  
SHEET 23 OF 26

**AMT**  
A. MORTON THOMAS AND ASSOCIATES, INC.  
CONSULTING ENGINEERS  
12760 TWINBROOK PARKWAY ROCKVILLE, MD 20852  
(301) 881-2646 FAX: (301) 881-0814  
EMAIL: AMT@AMTENGINEERING.COM

FILE NO. 32122



### 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

NOTE: 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.

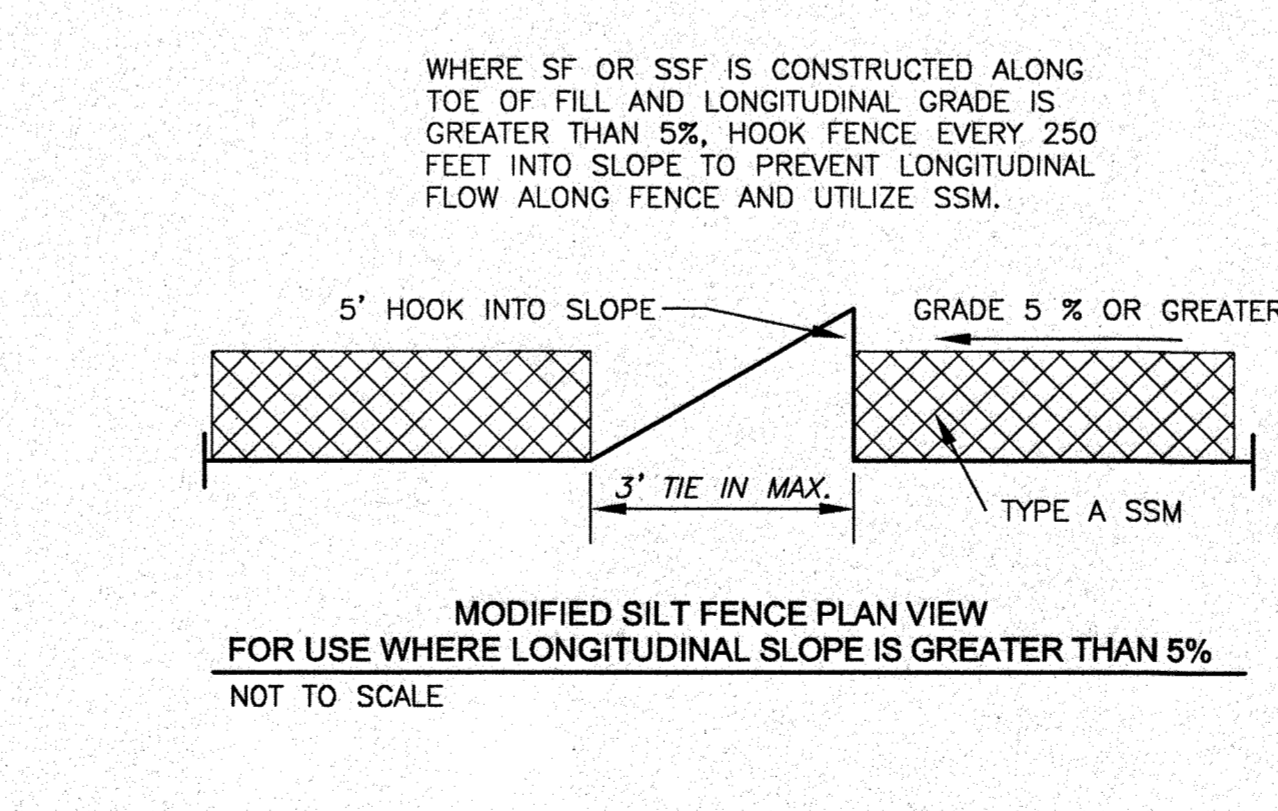
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE E-15-3A MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

### SUPER SILT FENCE

DESIGN CRITERIA

SLOPE	SLOPE STEEPNESS	SLOPE LENGTH (MAXIMUM)	SILT FENCE LENGTH (MAXIMUM)
0 - 10%	0 - 10:1	UNLIMITED	UNLIMITED
10 - 20%	10:1 - 5:1	200 FEET	1,500 FEET
20 - 33%	5:1 - 3:1	100 FEET	1,000 FEET
33 - 50%	3:1 - 2:1	100 FEET	500 FEET
50% +	2:1 +	50 FEET	250 FEET

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



**PROFESSIONAL CERTIFICATION**

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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Director of Public Works: *Ray Chen* 10/22/12  
Chief, Bureau of Engineering: *Steve Sharan (Mch)* 10/8/12  
Chief, Bureau of Utilities: *William Chen* 10/12/12  
Chief, Utility Design Division: *Dee Don* 10/5/12

**O'BRIEN & GERE ENGINEERS, INC.**  
8401 Corporate Drive Suite 400 Landover, Maryland 20785 (301) 731-5622 FAX: (301) 577-4737

DSN. BY: ATR			
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CHK. BY: MAE			
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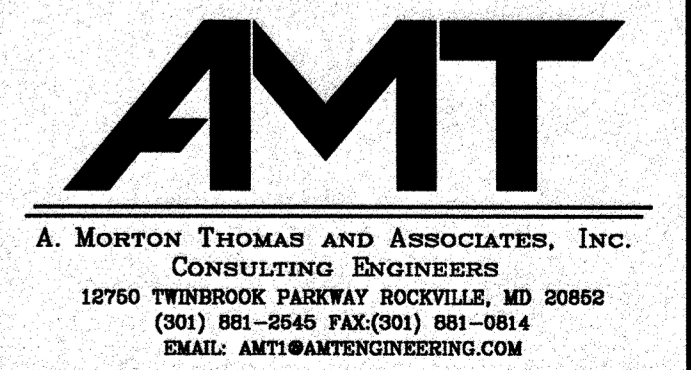
SEDIMENT CONTROL DETAILS

600' SCALE MAP NO. \_\_\_\_\_ BLOCK NO. \_\_\_\_\_

US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN REPLACEMENT

CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
EN-1 SHEET 24 OF 26  
FILE NO. 32122





**HOWARD SOIL 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 SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL and revisions thereto.
3. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within: a) 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 SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding (Sec. 51), sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52). Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
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	2.60 Acres
Area Disturbed	2.60 Acres
Area to be roofed or paved	0.0 Acres
Area to be vegetatively stabilized	2.00 Acres
Total Cut	1,600 Cu. Yds.
Total Fill	1,520 Cu. Yds.
Offsite waste/borrow area location:	LOCATION TO BE DETERMINED
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 lengths or that which shall be back-filled and stabilized by the end of each work day, whichever is shorter.

**HOWARD SOIL CONSERVATION DISTRICT PERMANENT 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 Tall Fescue (no K-31 Fescue allowed). For the period May 1 -- July 31, seed with 60 lbs Tall Fescue (no K-31 Fescue allowed) per acre and 2 lbs/acre (.05 lbs/1000 sq. ft.) of weeping love grass. 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 Tall Fescue (no K-31 Fescue allowed) 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 or 218 gallons per acre (5 gal/1000 sq. ft.) of emulsified asphalt on flat areas. On slope 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq. ft.) for anchoring.

**Maintenance:** -- Inspect all seeding areas and make needed repairs, replacements and reseeds.

**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 sq. 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 after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gal. per acre (5 gal/1000 sq. ft.) of emulsified asphalt on flat areas. On slope 8 ft. or higher, use 348 gal. per acre (8 gal/1000 sq. ft.) for anchoring.

Refer to the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for additional rates and methods not covered.

**NOTES:**

1. EARTHWORK QUANTITIES SHOWN HERE ON ARE APPROXIMATE AND ARE FOR THE REVIEWING AGENCY USE ONLY. THE CONTRACTOR MUST MAKE HIS OWN DETERMINATION OF EARTHWORK QUANTITIES.
2. VOLUMETRIC DISTRIBUTIONS SHOWN HEREON ARE SUBJECT TO GEOTECHNICAL OBSERVATION, TESTING AND CONFIRMATION TO BE PERFORMED BY THE CONTRACTOR'S TESTING AGENCY DURING CONSTRUCTION.
3. STOCKPILING ON SITE IS NOT PERMITTED. CONTRACTOR TO HAUL ANY EXCESS MATERIAL FROM THE SITE.
4. LITTLE PATUXENT RIVER IS CLASSIFIED AS A USE 1 STREAM. INSTREAM WORK MAY NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
5. DIRECT DISCHARGE OF UNTREATED (FOR SEDIMENT CONTROL) WATER IS NOT ALLOWED INTO STREAM.

**SEQUENCE OF CONSTRUCTION**

1. THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS SEDIMENT CONTROL DIVISION AT (301-313-1855) WITHIN SEVEN (7) DAYS TO HOLD A PRE-CONSTRUCTION MEETING BETWEEN HOWARD COUNTY AND PROJECT REPRESENTATIVES.
2. WITH THE APPROVAL OF THE HOWARD COUNTY INSPECTOR, INSTALL SCE AT RIVERS MEADOW DRIVE AND STEVEN FOREST ROAD. CLEAR AND GRUB AREA TO INSTALL SEDIMENT CONTROL MEASURES/DEVICES AT LOCATIONS WHERE WORK WILL BE EACH DAY AND AS SHOWN ON PLANS.
3. INSTALL SEDIMENT CONTROL MEASURES INCLUDING SILT FENCE, SUPER SILT FENCE, AND TREE PROTECTION FENCE. INSTALL EXTENSION OF THE ACCESS ROAD (TO BE BUILT UNDER A SEPARATE PROJECT) LEADING FROM STEVEN FOREST ROAD.
5. START CLEARING AND GRUBBING FOR AND INSTALL THE WATER MAIN. INSTALL WATER MAIN LINE (SEE PLANS) THAT CAN BE BACKFILLED, COMPACTED AND STABILIZED AT THE END OF EACH DAY, AND/OR PER HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTE #11. FOLLOW ANY MAINTENANCE OF TRAFFIC PLANS.
6. CONTINUE WATER MAIN INSTALLATION UP TO THE CROSSING AT THE LITTLE PATUXENT RIVER. SEE SHEET ES-4 FOR STREAM DIVERSION CONSTRUCTION SEQUENCE OF CONSTRUCTION.
7. COMPLETE WATER MAIN INSTALLATION.
8. STABILIZE REMAINING DISTURBED AREAS. WITH APPROVAL OF THE HOWARD COUNTY SCD INSPECTOR, REMOVE THE SEDIMENT CONTROL MEASURES AND STABILIZE THE AREAS ASSOCIATED WITH EROSION AND SEDIMENT CONTROL REMOVAL ACTIVITIES.

**"MISS UTILITY" NOTE**

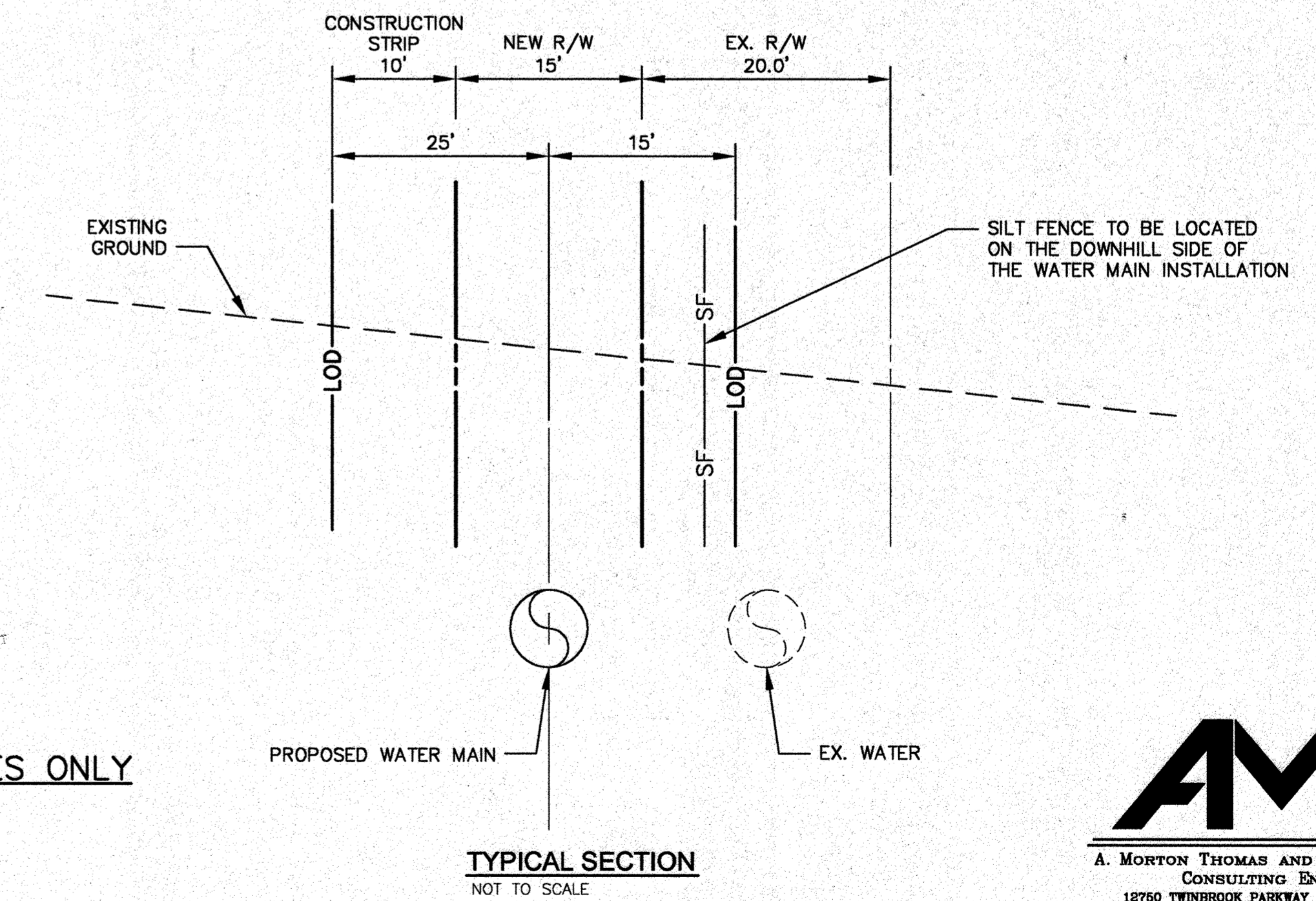
CALL "MISS UTILITY" AT 1-800-257-7777, 48 HOURS PRIOR TO THE START OF WORK. THE EXCAVATOR MUST NOTIFY ALL PUBLIC UTILITY COMPANIES WITH UNDERGROUND FACILITIES IN THE AREA OF PROPOSED EXCAVATION AND HAVE THOSE FACILITIES LOCATED BY THE UTILITY COMPANIES PRIOR TO COMMENCING EXCAVATION.

**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. 32151, EXPIRATION DATE 07/18/13.

**THIS PLAN IS FOR EROSION AND SEDIMENT CONTROL PURPOSES ONLY**

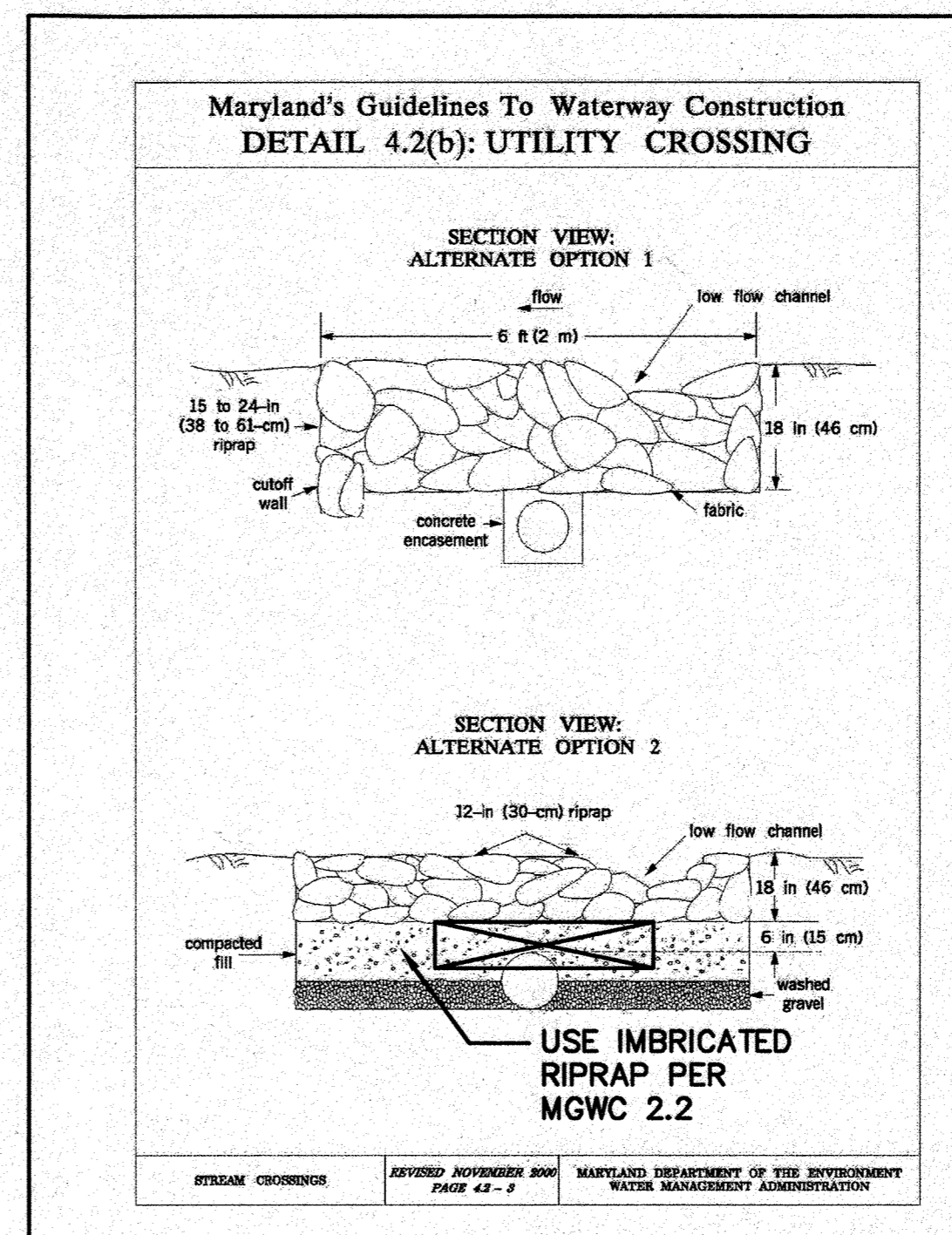
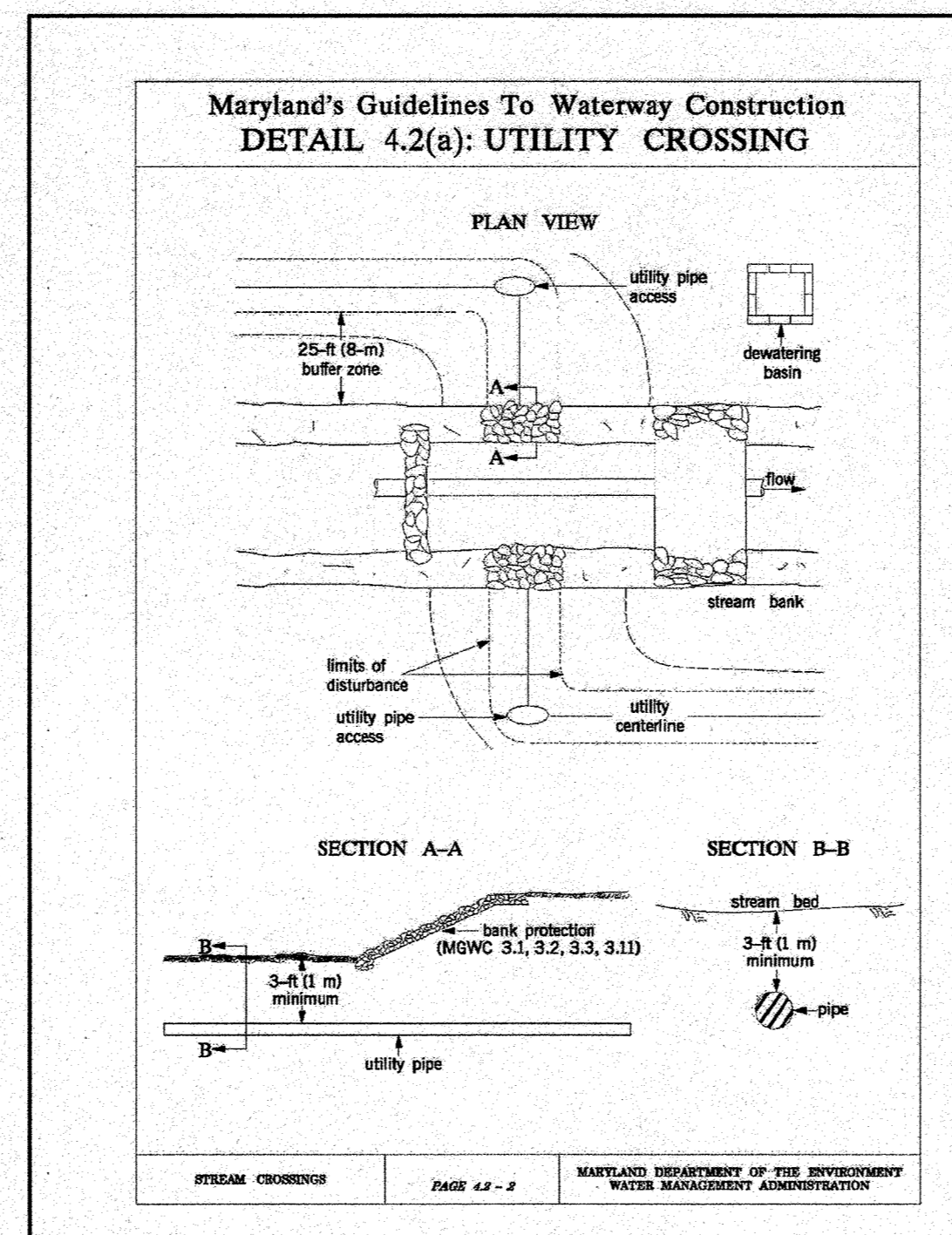
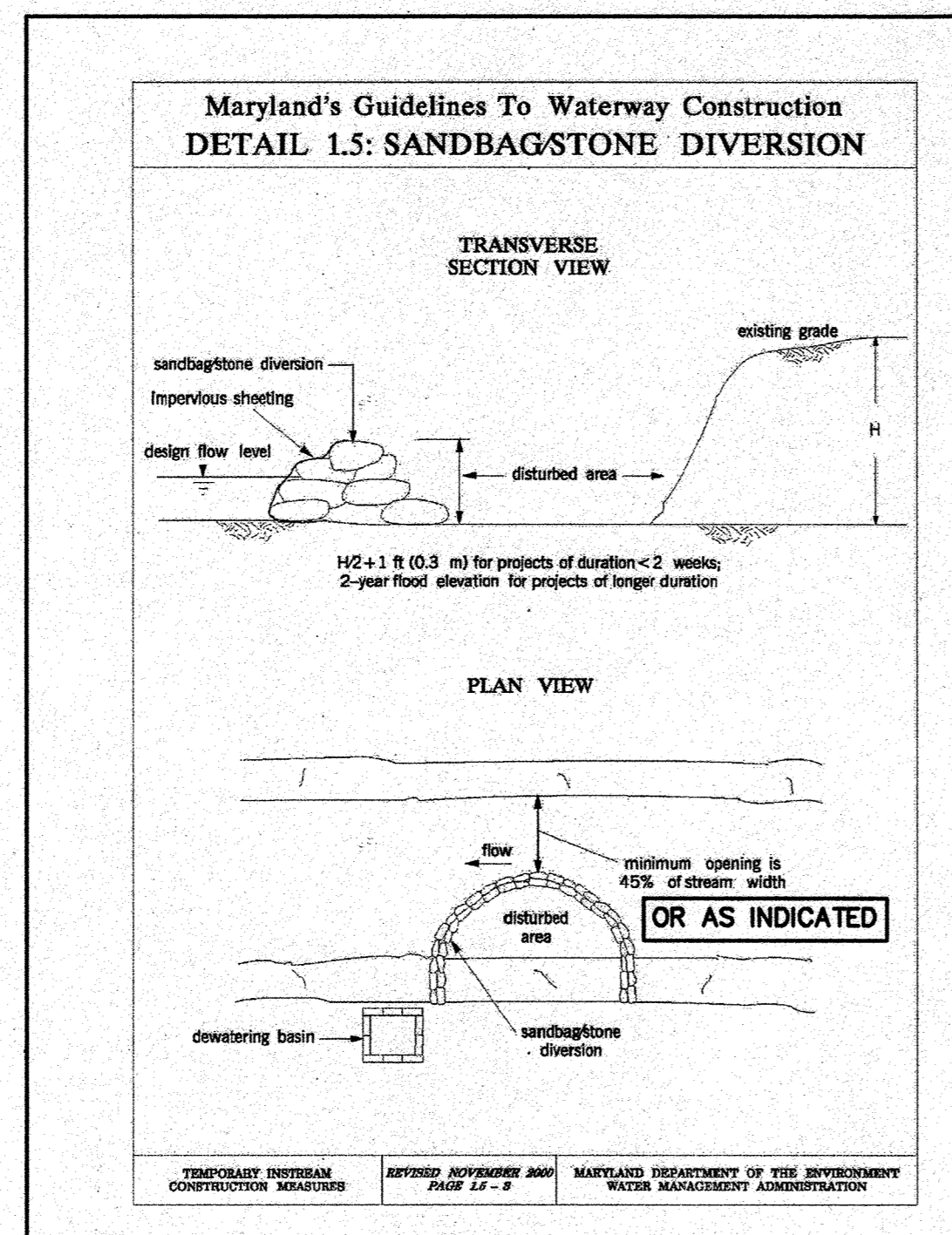
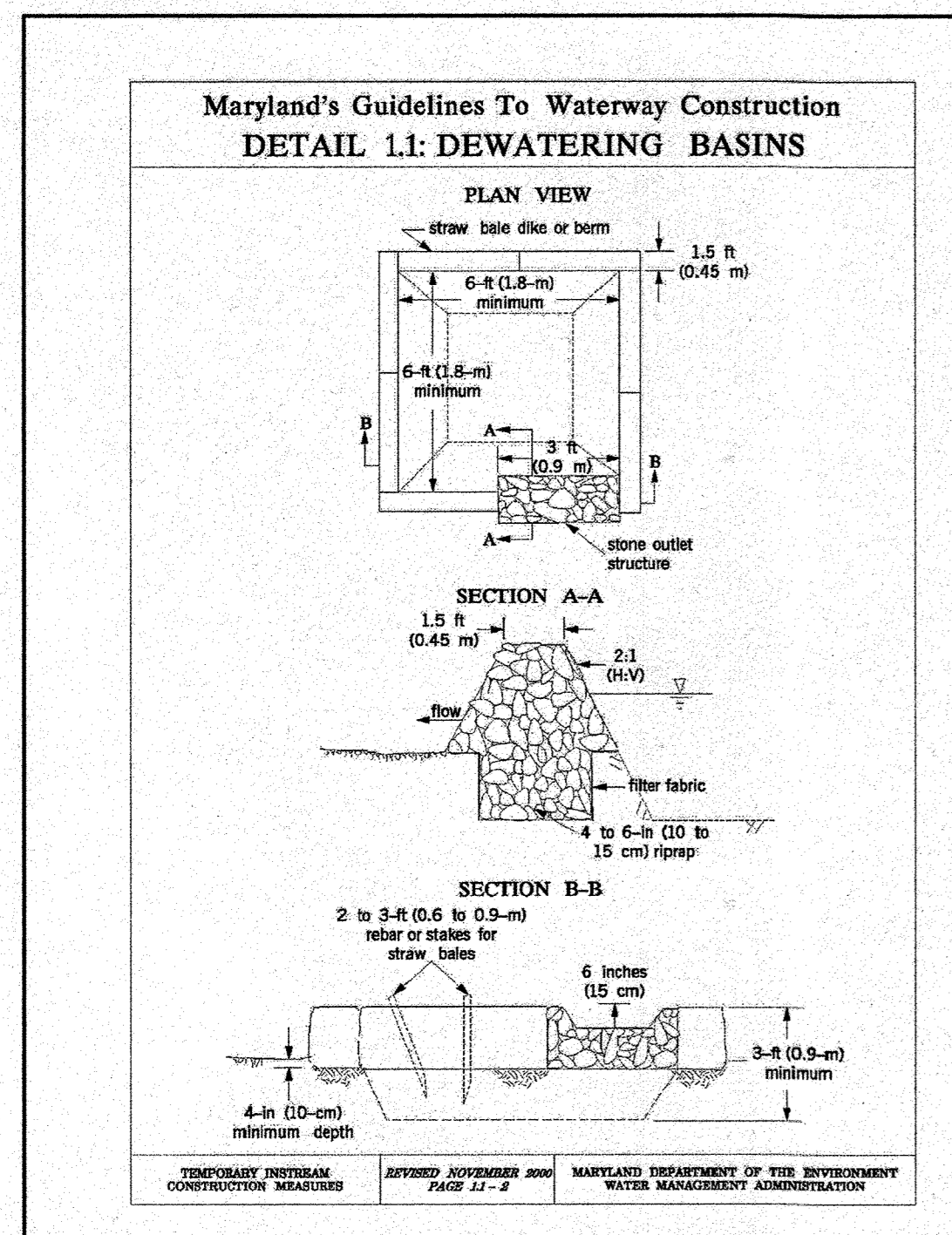
**NOTE TO THE CONTRACTOR: "EROSION AND SEDIMENT CONTROL SHALL BE STRICTLY ENFORCED"**



**AMT**  
 A. MORTON THOMAS AND ASSOCIATES, INC.  
 CONSULTING ENGINEERS  
 12750 TWINBROOK PARKWAY ROCKVILLE, MD 20852  
 (301) 881-2545 FAX: (301) 881-0814  
 EMAIL: AMT1@AMTENGINEERING.COM

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Director of Public Works: <i>[Signature]</i> 10/22/12 Chief, Bureau of Utilities: <i>[Signature]</i> 10/15/12	OBRIEN & GERE ENGINEERS, INC. 8401 Corporate Drive Suite 400 Landover, Maryland 20785 (301) 731-5622 FAX: (301) 577-4737	DSN. BY: ATR			SEDIMENT CONTROL NOTES & DETAILS	US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN REPLACEMENT CAPITAL PROJECT: W-8265 CONTRACT NO.: 44-4592 ELECTION DISTRICT NO. 8 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN EN-2 SHEET 25 OF 26
		DRN. BY: DEN					

FILE NO. 32122



### MGWC 2.2: IMBRICATED RIPRAP

*Riprap engineering technique for bank stabilization*

**DESCRIPTION**  
Imbricated riprap is used to protect and stabilize embankment walls 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 embankment 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 encasement where soil conditions, water table and velocity, exposed vegetation cover, and groundwater conditions are such that the soil may erode under the design flow conditions and upstream 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 filter fabric may be used consistently based on the 1994 AASHTO Standards and Specifications for Soil Erosion and Sediment Control. Wherever possible, however, granular filters with a minimum thickness of 6 inches (15 cm) should be used with a gradation as noted in Table 2.2.  
**Table 2.2: Granular Filter Material Gradation Specifications**

Percent Less Than	U.S. Standard Sieve Size	1 1/2 in (38 mm)
100	1 1/2 in (38 mm)	100
85-100	1 in (25 mm)	100
60-100	3/4 in (19 mm)	100
35-70	No. 10	100
20-50	No. 40	100
3-20	No. 200	100

• **Top Riprap:** The maximum diameter or weight of stone for top riprap should be based upon the backfill stream channel velocity as detailed in the MGWC 2.1: Riprap and Figure 2.1.  
• **Intermediate Stone:** 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 stream and the transverse lateral earth stresses. Therefore, the length of the longest axis of each stone should be the greater of 1/3 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 (61 cm).

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### MGWC 2.2: IMBRICATED RIPRAP

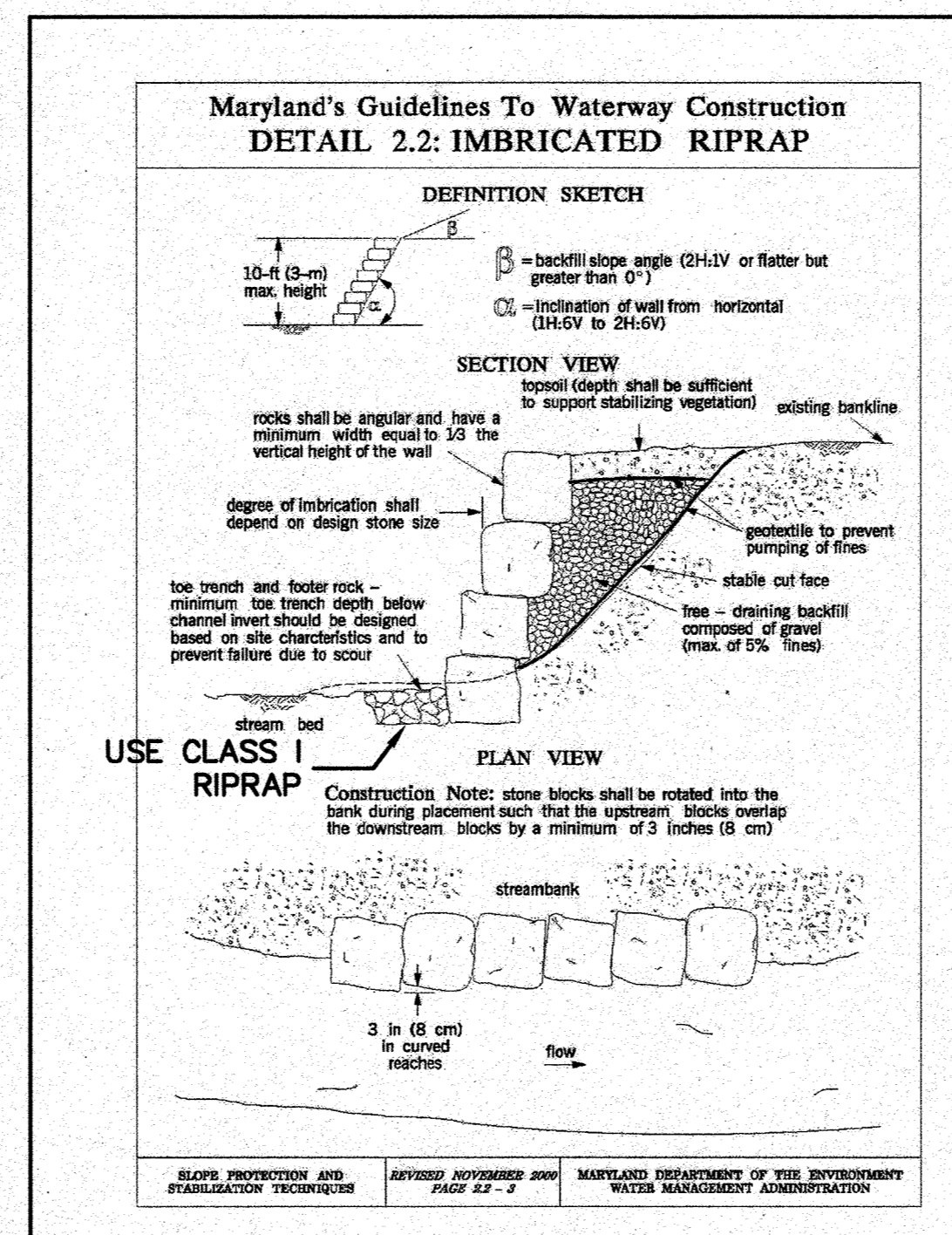
*Approximate Cost (\$/cu yd)*  
\$70 per cu yd

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

- The stream should be dewatered according to a WMA recommended procedure (see Section 1, Temporary Interim 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:1V to 2H:1V. Loose material on the toe of the embankment should be excavated until a stable foundation is reached, usually within 3 to 5 feet (1 to 1.5 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 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 6 inches (15 cm). If the filter fabric is torn or damaged, it should be repaired or replaced.
- The rock layer should be neatly stacked with staggered joints so that each stone rests firmly on two stones in the layer below. Additionally, smaller stones should be used to fill voids so that each rock rests solidly on the previous rock layer with minimal opportunity for movement. Upon completion of the first layer of stone, the toe trench should be filled with Class III riprap according to MGWC 2.1: Riprap or additional imbricated stone. Two footer stones should be used where high potential for channel incision exists. The length 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 with 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 1:1 degree 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 (MGWC 3.3: Rock Piles) should be considered to dissipate excessive toe velocities.*

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### MGWC 2.1: RIPRAP

*Approximate Cost (\$/cu yd)*  
\$70 per cu yd

**Table 2.1: Stone Gradations for Riprap Stone Classes**

Class	Size	% Total Weight < Given Size
I	150 lb (68 kg) 2 ft (1 m)	100 10 max
II	700 lb (320 kg) 20 ft (10 m)	100 10 max
III	2000 lb (900 kg) 40 ft (20 m)	100 10 max

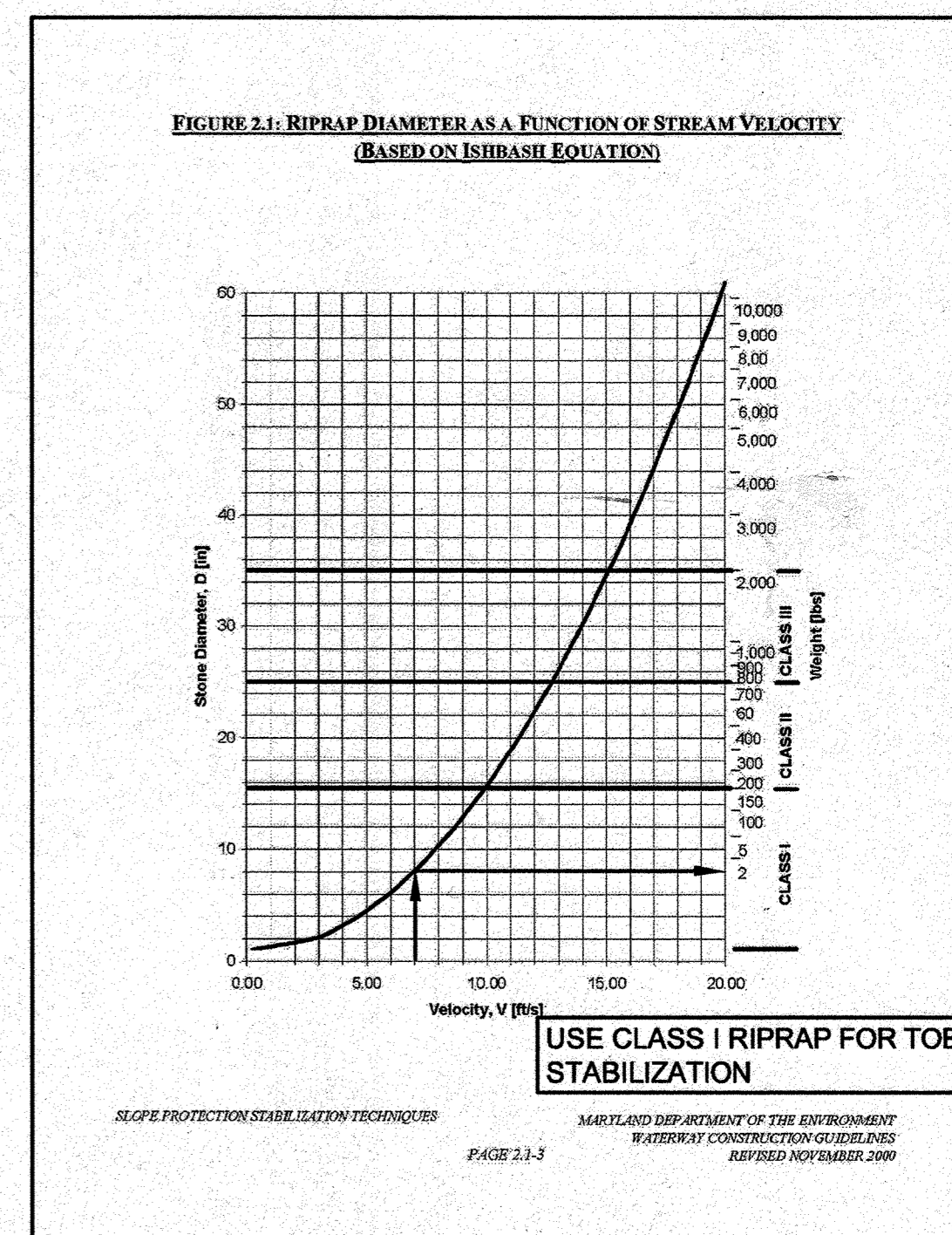
*Utilities and bridges should incorporate angular rock to promote interlocking.*

**INSTALLATION GUIDELINES**  
All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Once a slope stabilization project is initiated, preparation and placement of the riprap should immediately follow the initial disturbance to maintain the channel for further slope degradation. The recommended construction procedure for riprap is as follows beginning with initial slope preparation (refer to Detail 2.1):

- The contractor should install all sediment and erosion control devices as the first order of business.
- Excavation should be made in reasonably close conformity with the existing stream slope and bed.
- All fill on the subgrade should be compacted to a density approximating that of the surrounding undisturbed material.
- Provision must be made to anchor the riprap to the stream bed so as to provide protection against undermining. If this cannot be accomplished by creating a toe trench, an alternative method of protection must receive prior written approval from the WMA or local authority.
  - The filter layer or blanket should be placed immediately after slope preparation.
  - The stone for granular filter should be spread in a uniform layer to the specified depth. Where more than one layer is employed, they should be spread such that there is minimal mixing.
  - When cloth filters are used, special care should be taken not to damage the fabric during riprap placement.
- Riprap placement should begin with the toe. The larger stones, as specified by the design gradation, should be placed in the toe and along the perimeter of the slope and channel protection. The riprap should be placed with suitable equipment in such a manner as to produce a reasonably graded mass of stones with zero drop height. The placing of stones that cause excessive suspension is not allowed. Where appropriate, a low flow channel should be constructed through the riprap.
- Any excavation voids existing along the edge of the completed slope and channel protection should be backfilled and compacted.
- All disturbed areas should be permanently stabilized in accordance with an approved sediment and erosion control plan.

*Note: The use of rock sizes (MGWC 3.3: Rock Piles) should be considered to redirect high-velocity flows at the toe.*

**SLOPE PROTECTION AND STABILIZATION TECHNIQUES**  
MARYLAND DEPARTMENT OF THE ENVIRONMENT  
WATERWAY CONSTRUCTION GUIDELINES  
REVISED NOVEMBER 2000  
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**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. 32161, EXPIRATION DATE 7/18/13."

*Signature: Steve Shovan (Noting) 10/8/12*  
DATE: 10/8/12  
CHIEF - BUREAU OF ENGINEERING

*Signature: Steve Shovan (Noting) 10/5/12*  
DATE: 10/5/12  
CHIEF UTILITY DESIGN DIVISION

*Signature: [illegible]*  
DATE: [illegible]  
CHIEF, BUREAU OF UTILITIES

STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
32161

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER THIS DOCUMENT.

THIS PLAN IS FOR EROSION AND SEDIMENT CONTROL PURPOSES ONLY

NOTE TO THE CONTRACTOR: "EROSION AND SEDIMENT CONTROL SHALL BE STRICTLY ENFORCED"

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DSN. BY:	ATR				
DRN. BY:	DEN				
CHK. BY:	MAE				
DATE:	9/04/12	RJD	1	RECORD DRAWING	04/16
BY:	NO.			REVISION	DATE

STREAM DIVERSION AND CONSTRUCTION DETAILS

600' SCALE MAP NO. BLOCK NO.

US ROUTE 29 / BROKEN LAND PARKWAY TRANSMISSION MAIN REPLACEMENT  
CAPITAL PROJECT: W-8265  
CONTRACT NO.: 44-4592  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
EN-3  
SHEET 26 OF 26

**AMT**  
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FILE NO. 32122